



Coal Combustion Residual Legacy Rule Third 6-Month Applicability Extension Report

Osage Power Plant, Osage, Wyoming

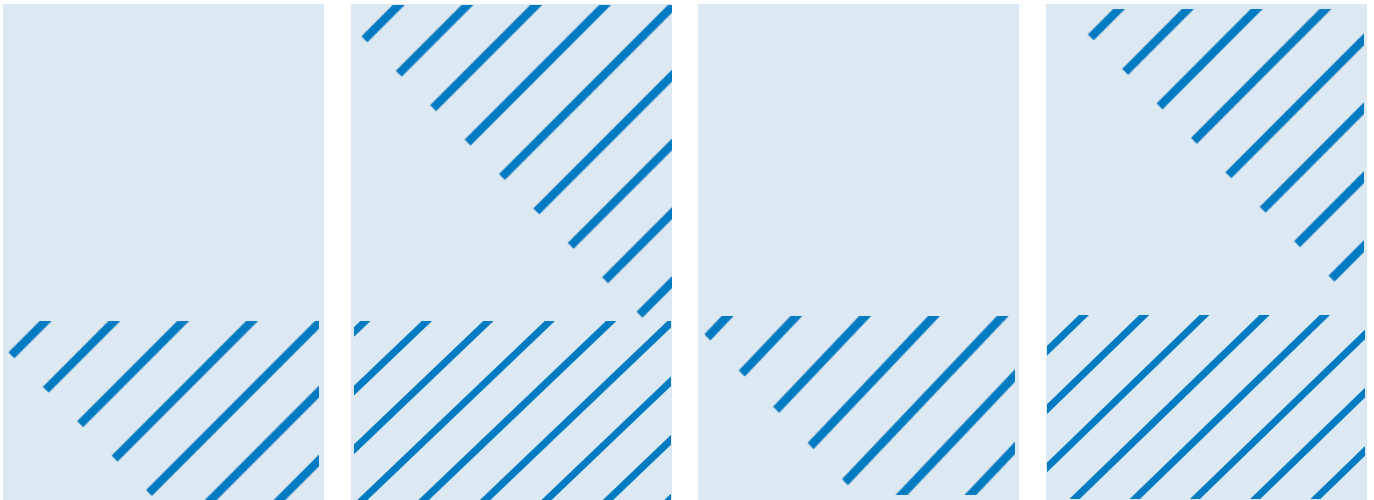
Prepared for:
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Prepared by
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November 2025

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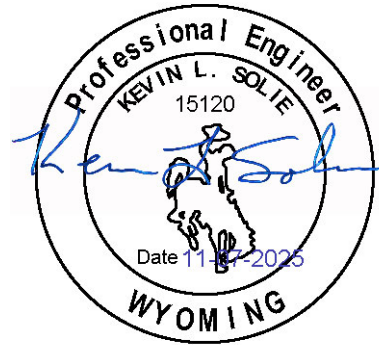
Certification

I hereby certify that I have examined facility records and, being familiar with the provisions of 40 CFR 257 Subpart D, attest that this Field Investigation Work Plan and Certification have been prepared by me or under my direct supervision in accordance with good engineering practice, including consideration of relevant industry standards and the requirements of 40 CFR § 257.100(f)(1)(iii). I further certify that I am a duly Licensed Professional Engineer under the laws of the State of Wyoming and that I have professional experience with surface impoundment design, operation, monitoring and closure.

The services performed by Barr for this Project have been conducted in a manner consistent with the level of skill and care ordinarily exercised by other members of the profession currently practicing in this area. No other warranty, expressed or implied, is made.



Kevin L. Solie
Wyoming PE-15120



November 7, 2025
Date



CCR Legacy Rule Third 6-Month Applicability Extension Report

November 2025



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Appendix A EPA Memorandum dated July 10, 2025

1 Introduction

On May 8, 2024, EPA finalized the Coal Combustion Residual (CCR) Legacy Rule, which includes new regulations for inactive surface impoundments at inactive electric utilities, referred to as "legacy CCR surface impoundments." In addition, the new regulation included requirements for CCR surface impoundments and landfills that closed prior to the effective date of the 2015 CCR Rule and other areas where CCRs were disposed of or managed on land outside of regulated units at active facilities. These newly regulated areas are referred to as "CCR management units" or CCRMUs. The Legacy Rule offers owners the ability to secure additional time (up to 18 months, in 6-month increments) to complete an applicability report for the sole reason of determining through field investigation whether the unit contains both CCRs and liquids. The second CCR Legacy Rule 6-month extension report was completed on May 5, 2025. Black Hills Power (BHP) is in the process of conducting the field investigation described later in this report. On behalf of BHP, Barr Engineering Co. (Barr) has prepared this CCR Legacy Rule third and final 6-month applicability extension report for two potential legacy surface impoundments at the Osage Power Plant (Osage).

In the time since the second extension was published, EPA issued a memorandum on July 10, 2025 entitled "Memorandum: Considerations for the Identification and Elimination of Free Liquids in Coal Combustion Residuals (CCR) Surface Impoundments and Landfills (40 CFR Part 257, Subpart D) Docket ID No. EPA-HQ-OLEM-2020-0107-106." The memorandum, from Steven Cook, Principal Deputy Assistant Administrator, essentially rescinded the April 22, 2024 EPA memorandum cited and included in previous Osage applicability extension reports. The July 10, 2025 memorandum explains that the previously issued EPA guidance on how to identify and interpret free liquids was not to be relied upon or used to implement regulatory requirements.

EPA has indicated that the current Legacy Rule will be modified in the future, and extensions have been proposed. Further, EPA is anticipated to provide additional clarification on the definition of free liquids which may affect methods and interpretations that are the basis of this investigation. Given current regulatory uncertainty and in the absence of further EPA guidance, a final six-month extension is warranted. The site will continue to be evaluated as per the workplan and additional monitoring to determine potential seasonal effects on groundwater elevations in the area will be conducted.

1.1 Background information

BHP owns and previously operated Osage, a coal-fired power plant located near Osage, Wyoming. The now-decommissioned facility included three 11.5-megawatt steam turbine generation units that were put into service between 1948 and 1952. Black Hills Energy suspended operations at Osage in October 2010 and retired the facility March 21, 2014; the powerhouse was subsequently demolished. Based on a review of publicly available data from the US Energy Information Administration (EIA), Osage has not provided power to the "grid" since well before 2015. No other power generating operations occur at the site and it appears no power has been provided to transmission or distribution systems after October 19, 2015. Accordingly, Osage is classified as an "inactive facility" under the Legacy CCR Rule.

During facility operation, CCRs from the plant were placed into surface impoundments located to the south and east of the generating station. Osage Fly Ash #1 (also referred to as the Old Ash Landfill) is

located east of the former generating station and appears to have operated until approximately 1993. In 1993, a permit was issued by Wyoming Department of Environmental Quality (WYDEQ) for Osage Fly Ash #2 (also referred to as the New Ash Landfill), located south and east of the former generating station. While both appeared to be operated as surface impoundments (CCRs were conveyed to the disposal units via a water-slurry pipeline from the power plant), both units were permitted as industrial landfills by WYDEQ. Both Osage units are included on EPA's list of Legacy Surface Impoundments (listed as Osage-1 and Osage-2).

Owners of Legacy surface impoundments must make an applicability determination and prepare an applicability report, indicating whether or not the unit is subject to the Legacy Rule. Existing and available information, however, does not provide a sufficient basis to determine applicability, i.e., it is not evident that the unit contained free liquids on or after October 19, 2015.

Osage is an inactive facility and, depending on the outcome of the field investigation, the Legacy Rule may apply to other CCRMUs onsite. The Legacy Rule requires the preparation of a Facility Evaluation Report (FER), with the purpose of determining whether any CCRMU exist on-site, and, if so, to delineate the lateral and vertical extent of the unit(s). This report is not intended to address FER requirements. As indicated earlier, the Legacy Rule may not be applicable at Osage and a FER may not be required. If, however, Osage is determined to be regulated under the Legacy Rule, FER Part 1 would be due February 9, 2026, and FER Part 2 would be due February 9, 2027.

1.2 Purpose

The Legacy Rule offers owners the ability to secure additional time to complete an applicability report for the sole reason of determining through field investigation whether the unit contains both CCRs and liquids (and is subject to all the CCR Legacy Rule requirements for inactive impoundments). As per the EPA memorandum dated July 10, 2025, BHP will not use the EPA memorandum entitled "Considerations for the Identification and Elimination of Free Liquids in Coal Combustion Residuals (CCR) Surface Impoundments and Landfills" dated April 22, 2024, to guide field investigation efforts. The EPA memorandum from July 10, 2025 is attached as Appendix A.

If, during implementation of the written field investigation workplan (described in detail in later sections), BHP determines that the unit contains CCRs and free liquids, BHP will cease operating under the extension provisions and prepare an applicability report within 14 days of determining that the unit contains free liquids. BHP would also comply with the remaining Legacy Rule requirement deadlines under new timeframes, to be determined by adding the total length of the extension(s) to each of the deadlines specified in the Legacy Rule.

Alternatively, if BHP determines that the former Osage surface impoundments do not contain both CCR and liquids during implementation of the written field investigation work plan, BHP will prepare a notification stating that the field investigation has concluded and has determined that the unit does not contain both CCR and liquids and therefore does not meet the definition of a Legacy CCR surface impoundment. BHP would place the notification in the facility's operating record as required by § 257.105(k)(3).

1.3 Extension Report Requirements

The Legacy Rule applicability extension report (extension report) consists of three parts. First, the extension report must include general identifying information about the potential legacy impoundment, including the owner or operation of the site, the name associated with the unit, and information about the location of the unit at the facility. This information is the same as the first three elements of the applicability report under § 257.100(f)(1)(i)(A) through (C). Second, the extension report must include a statement by the owner or operator that available information does not provide a sufficient basis to determine that the inactive impoundment contained free liquids on or after October 19, 2015. Finally, the applicability extension report must contain a written field investigation work plan. The purpose of this plan is to describe the approach the owner or operator intends to follow to determine whether the inactive impoundment contains free liquids.

2 General Information Requirements

Following a restatement of the regulatory text, each requirement is addressed in *italics*.

2.1 Owner Contact information

§ 257.100(f)(1)(i)(A). The name and address of the person(s) owning and operating the legacy CCR surface impoundment with their business phone number and email address.

The closed surface impoundments at Osage Power Plant are owned by Black Hills Power. The corporate address for Black Hills Power is 7001 Mount Rushmore Road, P.O. Box 1400, Rapid City, SD 57709.

BHP's business phone number is 888.890.5554.

BHP's corporate email address is Contact customer service | Black Hills Energy or <https://www.blackhillsenergy.com/contact-customer-service>

2.2 CCR Surface Impoundment Name

§ 257.100(f)(1)(i)(B). The name associated with the legacy CCR surface impoundment.

The names commonly associated with the potential legacy CCR surface impoundments are Osage Fly Ash #1 and Osage Fly Ash #2.

2.3 Location

§ 257.100(f)(1)(i)(C). Information to identify the legacy CCR surface impoundment, including a figure of the facility and where the unit is located at the facility, facility address, and the latitude and longitude of the facility.

The facility is located near the community of Osage, in Section 15, Township 46 North, Range 63 West, in Weston County, Wyoming. The facility is located at Latitude 43.9686 N, Longitude 104.4076 W. Figure 1 shows the general location of the facility.

3 Owner/Operator Statement Requirements

Following a restatement of the regulatory text, each requirement is addressed in *italics*.

§ 257.100(f)(1)(iii)(A)(2). A statement by the owner or operator that to the best of their knowledge or belief, existing and available information does not provide a sufficient basis to determine that the unit contained free liquids on or after October 19, 2015.

3.1 Statement

I, Mark Lux, have personally examined and am familiar with the information submitted in this applicability extension report and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. To the best of BHP's knowledge or belief, as current owner of the closed Osage Power Plant surface impoundments, existing and available information does not provide a sufficient basis to determine that the units contained free liquids on or after October 19, 2015.

A handwritten signature in black ink, appearing to read "Mark Lux".

Mark Lux
Vice President Power Delivery

November 8, 2025

4 Field Investigation Workplan

The required elements of the Osage field investigation work plan are discussed below. Following a restatement of the regulatory text, each requirement is addressed in *italics*.

4.1 Site Characterization Approach

§ 257.100 (f)(1)(iii)(A)(3)(i). A detailed description of the approach to characterize the physical, topographic, geologic, hydrogeologic, and hydraulic properties of the CCR in the unit and native geologic materials beneath and surrounding the unit, and how those properties will be used to investigate for the presence of free liquids in the CCR unit.

Given the site is regulated by WYDEQ, extensive site-specific and regional geologic and hydrogeologic site information is available in the permit file (WYDEQ Solid and Hazardous Waste Division Permit No. 20.043). The information includes soil boring logs, geologic cross-sections, historic groundwater monitoring data, and other site-specific information relating to the design, construction, operation, monitoring and closure of the facility. This large body of existing data will help inform the preparation of an updated Conceptual Site Model (CSM) for the Osage facility.

Preparation of the CSM will require additional field efforts, including but not limited to the utilization of direct measurements and observations which enable the identification CCRs and the measurement of free liquids in CCRs. In a groundwater context, standard piezometers and monitoring wells are common tools used for the direct measurement of water levels in the saturated zone. The presence of free-standing water in a well or piezometer is a direct indicator of free liquids which have drained from pore spaces into the boring under ambient pressures and temperatures.

4.2 Methods and Tools

§ 257.100 (f)(1)(iii)(A)(3)(ii). A detailed description of the methods and tools that will be employed to determine whether the inactive impoundment contains free liquids, the rationale for choosing these methods and tools, and how these methods and tools will be implemented, and at what level of spatial resolution at the CCR unit to identify and monitor the presence of free liquids.

The footprint of Osage Fly Ash #1 (OFA1) is approximately 6.5 acres, while Osage Fly Ash #2 (OFA2) occupies approximately 45 acres. The sites have been closed and reclaimed in accordance with WYDEQ requirements, including the installation of a cover system comprised of a two-foot-thick layer of compacted soil and an additional six inches of topsoil. The cover system was graded to promote runoff and has been revegetated with native grasses. Based on historic permit drawings, the elevation of the base of OFA2 ranges from approximately 4305 to 4320 feet. The elevation of the top of the closure system is approximately 4330 to 4340 feet. Accordingly, CCR thicknesses are estimated to be on the order of 20 to 35 feet for OFA2. CCR thickness for OFA1 is not precisely known but is assumed to be similar to OFA2. The use of piezometers or monitoring wells to determine CCR thickness and the presence of free liquids appears to be appropriate for the site. Accordingly, BHP's field investigation included the extensive use of piezometers.

Site work was conducted April 2025 and included the drilling and installation of 20 piezometers within the perimeter of the former ponds at a rate of approximately one piezometer per 2.5 acres. The driller used a

7822DT GeoProbe™ to collect continuous sample core in 5' intervals utilizing direct-push technology. A geologist/engineer logged the soil and observed the drilling and determined piezometer screen depth. Samples of solids (CCRs and native soils) were collected at 2.5' intervals and retained for future laboratory analysis, if deemed necessary.

Piezometers were installed using 1" diameter PVC with 5' or 10' well screens. Sand was placed around and above the well screen (as applicable) and bentonite seal was placed above the sandpack to the ground surface. If there are any free liquids in the pore spaces around the piezometer screen, they will drain into the piezometer and the water level in the standpipe will rise to a level related to the level of saturation in the pore spaces. In essence, the water level in the piezometer is a direct measure of the readily separable liquids in the vicinity of the piezometer and will provide direct evidence of the presence of free liquids.

4.3 Groundwater Elevation Determination

§ 257.100 (f)(1)(iii)(A)(3)(iii). A detailed description of how groundwater elevations will be determined, and at what level of spatial resolution, in relation to the sides and bottom of the CCR unit and how any interaction of the groundwater table with the CCR unit will be evaluated, and at what level of spatial resolution.

The top of casing (TOC) and ground surface elevation for each well have been surveyed to 0.1 foot accuracy. Groundwater elevations have been and will continue to be determined manually, using an electric water level tape by field personnel. The site footprint and the anticipated number of measuring points (20 piezometers within a 50-acre site) is not insignificant, but water level measurements could be taken in a relatively narrow time window (within an 8-hour period) and would provide a point-in-time snapshot of water levels at Osage.

4.4 Stormwater Evaluation

§ 257.100 (f)(1)(iii)(A)(3)(iv). A plan for evaluating stormwater flow over the surface of the unit, stormwater drainage from the unit, and stormwater infiltration into the unit and how those processes may result in the formation of free liquids in the CCR unit. This plan must include a current topographic map showing surface water flow and any pertinent natural or man-made features present relevant to stormwater drainage, infiltration and related processes.

Stormwater flow and direction were determined by utilizing a one-foot interval contour map of the site and surrounding area. See Figure 2. Climatic conditions (relatively low local precipitation, coupled with high evapotranspiration rates) tend to diminish the likelihood of stormwater infiltration. Further, the compacted soil cover system and site grading to promote positive drainage both function to greatly reduce the infiltration of stormwater.

Infiltration into closed surface impoundments will be estimated using EPA's HELP Model. The site-specific conditions discussed above will be input to estimate infiltration into the CCRs. The one-foot contour map will be reviewed to identify areas that could be interpreted to collect or accumulate stormwater. Finally, the contour map will undergo ground-truthing via visual inspection, focusing on evidence of erosion or stormwater ponding.

4.5 Estimated Timeline

§ 257.100 (f)(1)(iii)(A)(3)(v). An estimated timeline to complete the workplan and make a determination if the CCR unit contains free liquids.

BHP began implementing the field work plan during April 2025 and work will continue through the year to capture seasonal variation in groundwater elevations. Drilling and piezometer installation at the site were completed in early April 2025. After piezometer installation, water levels will be obtained on a periodic basis for at least six to twelve months, in order to observe any seasonal fluctuations in the potentiometric surface. As this effort will take additional time, this is the third and final extension report that will be prepared and posted to BHP's publicly available CCR compliance data website.

4.6 Interpretation of Results

§ 257.100 (f)(1)(iii)(A)(3)(vi). A narrative discussion of how the results from implementing the workplan will determine whether the unit contains free liquids specified.

If there is any free liquid in the pore spaces in CCRs around the piezometer screen, it will drain into the piezometer and the water level in the standpipe will rise to a level related to the level of saturation in the pore spaces. In essence, the water level in the piezometer is a direct measure of the readily separable liquids in the vicinity of the piezometer and will provide direct evidence of the presence of free liquids. EPA indicated it intends to revise the Legacy Rule, which may impact definitions, interpretations, and ultimately, the Legacy Rule applicability determinations for this site and others.

4.7 Anticipated Problems

§ 257.100 (f)(1)(iii)(A)(3)(vii). A narrative discussion describing any anticipated problems that may be encountered during implementation of the workplan and what actions will be taken to resolve the problems, and anticipated timeframes necessary for such a contingency.

The direct-push drilling method may not be able to penetrate well-indurated layers of CCRs, if present at the site. The initial response will be to offset and attempt to drill 5-10' away from the initial boring. If offsetting the boring location does not lead to a successful piezometer installation, the drilling method would then be modified, using GeoProbe™ auger attachments. Should these methods be determined to be unworkable, a larger hollow-stem auger (HSA) rig would be utilized to complete the borings. It is anticipated that a HSA rig could be mobilized to the site within 30 days of determining the need. Finally, a test pit or open excavation may be utilized in certain areas if deemed appropriate.

4.8 Engineer Certification

§ 257.100 (f)(1)(iii)(A)(3)(viii). The owner of the CCR unit must obtain a written certification from a qualified professional engineer stating that the field investigation work plan meets the requirements of paragraph (f)(1)(iii)(A)(3) of this section.

Please see qualified professional engineer certification at beginning of this report.



Figures





Figure 1
Site Location Map



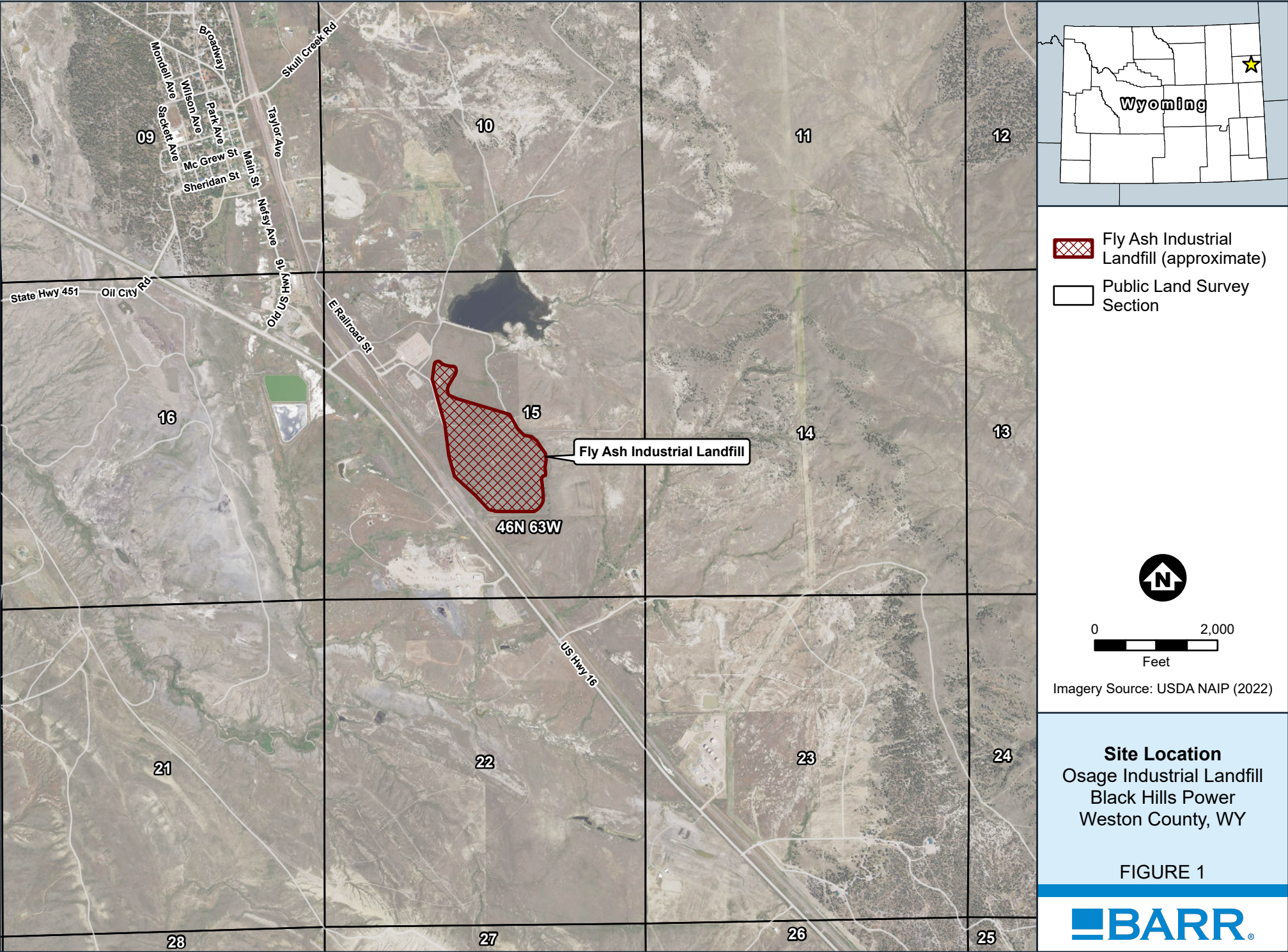
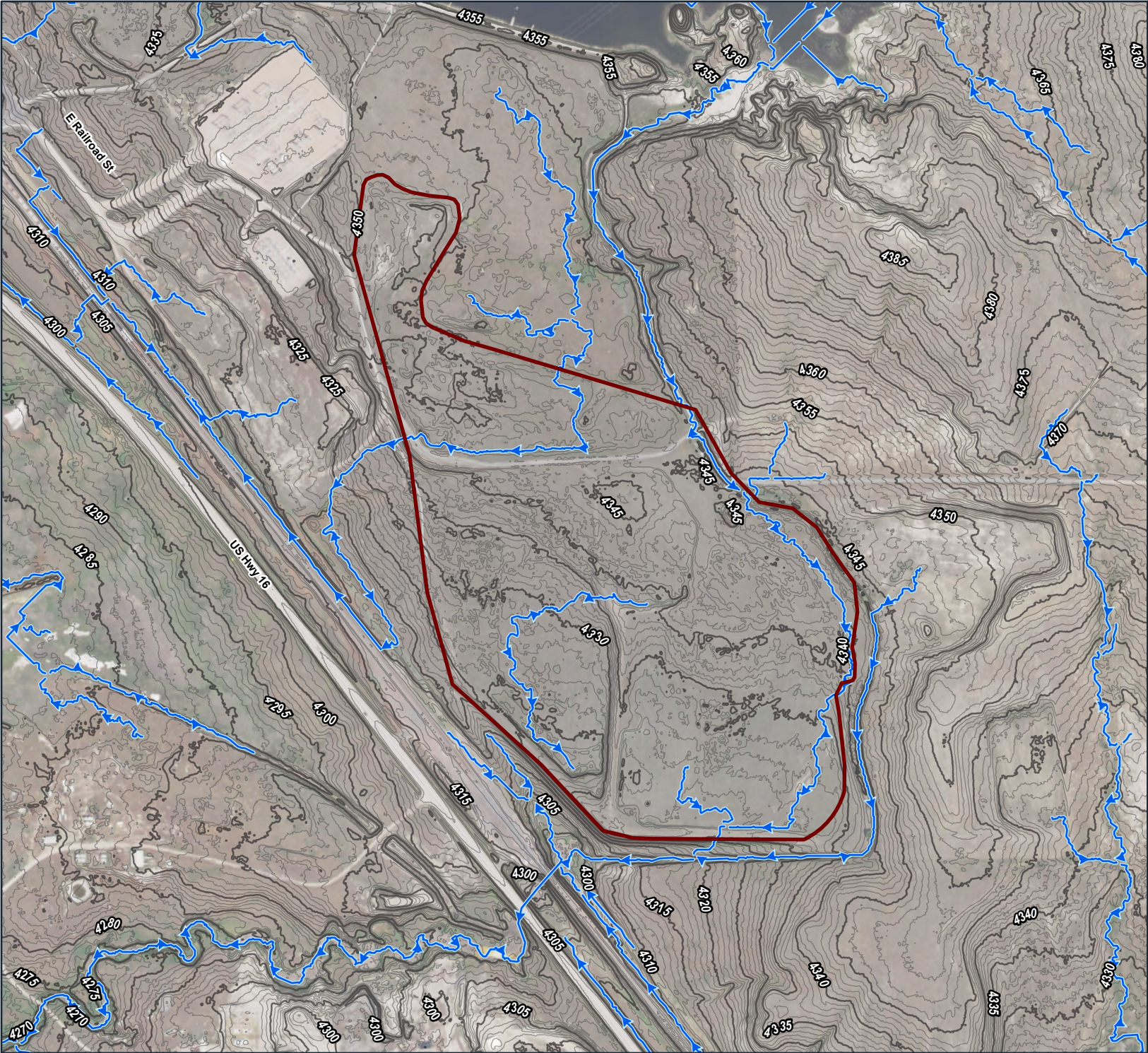




Figure 2

Stormwater Flow Map





-  Fly Ash Industrial Landfill (approximate)
-  5-foot Contour
-  1-foot Contour
-  Water Flow Direction

Notes:
Elevation data derived from 2019
LiDAR data, downloaded from the
USGS National Map.



Imagery Source: USDA NAIP (2022)

Surface Water Flow
Osage Industrial Landfill
Black Hills Power
Weston County, WY

FIGURE 2



Appendix A

EPA Memorandum





OFFICE OF LAND AND EMERGENCY MANAGEMENT

WASHINGTON, D.C. 20460

July 10, 2025

MEMORANDUM

SUBJECT: Memorandum: Considerations for the Identification and Elimination of Free Liquids in Coal Combustion Residuals (CCR) Surface Impoundments and Landfills (40 CFR Part 257, Subpart D). Docket ID No. EPA-HQ-OLEM-2020-0107-1068

FROM: Steven Cook, Principal Deputy Assistant Administrator **STEVEN COOK**

TO: Regional Land, Chemical, and Redevelopment Division Directors

Digitally signed by
STEVEN COOK
Date: 2025.07.10
15:02:16 -04'00'

The EPA included a document titled, “*Memorandum: Considerations for the Identification and Elimination of Free Liquids in Coal Combustion Residuals (CCR) Surface Impoundments and Landfills (40 CFR Part 257, Subpart D) April 19, 2024*” (“Free Liquids Memorandum”) in the docket for the final Legacy CCR Surface Impoundments and CCR Management Units Final Rule on May 8, 2024. EPA-HQ-OLEM-2020-0107-1068. The Free Liquids Memorandum was drafted in response to public comments received on the proposed rule (88 Fed. Reg. 31982, May 18, 2023), to provide regulated entities with information on available methods for determining whether free liquids are present in CCR units, as required under the regulatory performance standards. See, 40 C.F.R. §§ 257.53, 257.102(d).

Since publication of the final rule, the EPA has received information that the Free Liquids Memorandum has caused confusion, including among the regulated community. EPA understands that some have interpreted the Free Liquids Memorandum to create new requirements or modify existing requirements that must be met to comply with the federal CCR regulations in 40 C.F.R. part 257. Others have indicated that they have treated it as setting a performance standard and incorporated it into specifications for work to be performed. To address this confusion, the EPA is issuing the following clarification.

The Free Liquids Memorandum does not impose legally binding requirements on the EPA, states, or the regulated community. It is not a regulation, nor does it augment or modify the existing regulations in 40 C.F.R. part 257. States and regulated entities are not required to adopt any of the methods discussed in the Free Liquids Memorandum or to follow any of the other statements contained therein. States and regulated entities must comply only with applicable regulatory and statutory requirements.

Given the confusion caused by the Free Liquids Memorandum, it should not be relied upon or used by EPA personnel to carry out the Agency's work to implement the regulatory requirements of this program. Additionally, the EPA intends to provide further clarification on these issues at a later time.

cc: Mallory Richardson, Principal Deputy Associate Administrator
Office of Policy

Carolyn Hoskinson, Office Director
Office of Resource Conservation and Recovery

Andrew Baca, Deputy Office Director
Office of Resource Conservation and Recovery