

**40 CFR Parts 257**

Checklist for P.E. Annual Inspection for CCR Surface Impoundments, § 257.83(b)

**Sikeston BMU Sikeston Power Station Bottom Ash Surface Impoundment**

**Annual Inspection**

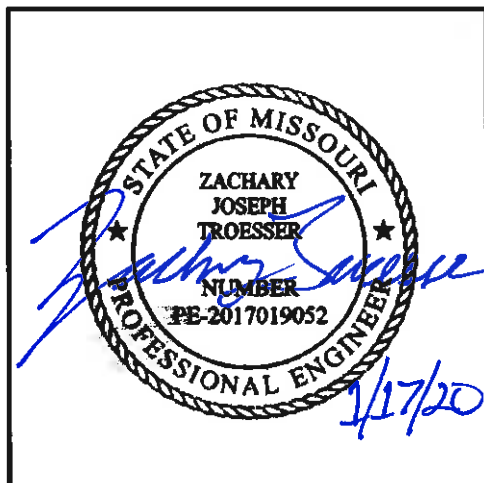
Requirements	Signs of actual or potential structural weakness	Disruptions or potential disruption to the operation and safety of the unit (257.83(b)(vi))
CCR Unit and appurtenant structures 257.83(b)(ii)	None Observed. Potential seepage along northern embankment west of the Fly Ash Pond and in the southwestern embankment noted on	None Observed. Continue to monitor.
Hydraulic structures underlying the base of the CCR unit 257.83(b)(iii)	None Observed. Continue to monitor.	Visual observation indicates some sediment in stormwater culverts have self-cleaned during heavy rains. Sediment basin was sufficient at time of inspection but requires periodic cleaning to allow continued self-cleaning of stormwater culverts. Separated corrugated metal pipe seams still require repair.

The 2019 Annual Inspection included a review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record in general accordance with 257.83(b)(i).

Minor maintenance items associated with routine upkeep and items that require further investigation and/or corrective action observed during the 2019 Annual Inspection presently do not impact the structural integrity of the embankment. SBMU plans to address these items in a timely manner through normal maintenance.

GREDELL Engineering Resources, Inc.

Engineer's Seal



Zachary Troesser, P.E.  
Missouri License: PE-2017019052  
Date: January 17, 2020

SIKESTON POWER STATION – BOTTOM ASH POND  
2019 ANNUAL INSPECTION CHECK SHEET

**SIKESTON POWER STATION**  
Bottom Ash Pond  
Annual Inspection Check Sheet

Date	December 4, 2019
Inspector	Zachary Troesser, P.E.
Pool Level	Estimated el. 319.9
Temperature	Low 50°s
Weather	Sunny, damp

Date of Previous Annual Inspection: August 23, 2018

Date of Previous Periodic Inspection: The date of most recent weekly inspection report reviewed for this Annual Inspection was December 1, 2019.

Description of Emergency (EC) or Immediate Maintenance (IM) conditions observed since the last annual inspection:

Rutting and potholes in the northern perimeter road and on the berm access ramps were noted on weekly inspection reports by plant personnel on several occasions throughout the year. A review of weekly reports for the entire year indicate that rutting and potholes occasionally occur due to heavy truck traffic, but are remedied by routine maintenance (i.e., grading the road). Rutting on top of the berms also is not as significant as rutting and erosion on the exterior slopes of the berms.

Describe any action taken to restore or improve safety and integrity of impounding structure:

The rutting and potholes were corrected by grading the road on one or more occasions in 2019. In response to the observations of potential berm seepage, a field investigation and office evaluation was completed in mid-2018 by Reitz & Jens, Inc. as a subconsultant to Gredell Engineering. The conclusion of that evaluation is that the possible seepage did not have a negative impact on the stability of the embankment. Field conditions have not changed in the last year.

Describe any modifications to the geometry of the impounding structure since the previous annual inspection:

Bottom Ash reclamation stock pile in NW has seen minor changes due to the ongoing excavating of bottom ash, stockpiling the ash and periodically hauling it away for reclamation. The overall volume of the material remained the same in 2019, or slightly decreased, as reported by SBMU staff.

Describe any modifications to the operation of the impounding structure since the previous annual inspection:

As described above, additional quantities of bottom ash have reportedly been removed for reclamation, possibly creating more CCR storage volume and more process water and rainwater storage volume. However, actual volume increases or decreases in the Bottom Ash Pond have not been quantified.

List the approximate remaining storage capacity (Cubic Yards) of the impounding structure:

Estimated available storage is ~ 380,000 CY below el. 320 (allowing 2+ feet of freeboard). This has not significantly changed in 2019, and may have decreased, due to SBMU's ongoing, successful bottom ash reclamation efforts.

List the approximate maximum, minimum and present depth and elevation of the impounded water since the previous annual inspection:

Estimated from inspection reports for 2019: Max. Elev. 320.4 (Depth 18.4); Min. Elev. 316.0 (Depth 14.0'); Depth on 12-4-19 = Elev. 319.9 (Depth 17.9')

List the approximate maximum, minimum and present depth and elevation of the impounded CCR since the previous annual inspection:

Estimated from 2016 aerial survey: CCR occupies approximately 60 acres at an approx. Max. Elev. 318.8 (Depth 16.8'). Min. depth is estimated to be less than 5' or Elev. 307 located beneath the surface of the impounded water. Elevation and Depth of impounded CCR do not change rapidly from year to year due to SBMU's ongoing, successful ash reclamation efforts.

SIKESTON POWER STATION – BOTTOM ASH POND  
2019 ANNUAL INSPECTION CHECK SHEET

Approximate volume of impounded water and CCR at the time of the inspection:

Estimated Volume CCR 1,164,000 CY (235 Million Gallons, or MG). Estimated Volume of water 220,000 CY (44.5 MG). This has not significantly changed in 2019 due to SBMU's ongoing, successful bottom ash reclamation efforts.

Describe any changes to the downstream watershed since the last annual inspection:

No changes to the downstream watershed have occurred since the 2019 Annual Inspection.

SIKESTON POWER STATION – BOTTOM ASH POND  
2019 ANNUAL INSPECTION CHECK SHEET

Inlet and Outlet Works		
Item	Condition Code	Comments
Outlet Condition	GC	Concrete intake with stop logs, discharges into buried 10-inch carbon fiber pipe that runs north and then west to Process Waste Pond. (Water Recirculation Structure is no longer operational and the emergency overflow to the Fly Ash Pond is blocked by impounded fly ash at the emergency overflow outlet.) No change since 2016.
Gate Condition/ Operability	GC	Stop logs originally controlled water level but are not present at the structure and no longer used. A control valve north of the discharge is utilized for flow control. No change since 2016.
Leakage	NE	No leakage observed. No Change since 2016.
Outfall Condition	GC	Discharge pipe is at Process Waste Pond. Approximately 1.5' of the discharge pipe is damaged along the east side of the pipe at the outfall, but does not compromise the operation of the discharge pipe. No change since 2016.
Discharge (color and/or sediment)	NE	Discharge was observed to be relatively clear and substantially free of sediment.
Obstructions	NE	Flow to outlet structure can become obstructed by weeds and dead vegetation. Routinely trim weeds at the outlet during warm weather months.
Instrumentation	GC	<p>Water level is measured by staff gauge at the inactive Recycle Water Recirculation Structure. Staff gauge markings were observed to have been repainted since the last annual inspection. The maximum recorded reading of the staff gauge between November 4, 2018 and December 4, 2019 was 4 feet or elevation 319.9 feet.</p> <p>There are two (2) piezometers (installed ~ 2011) constructed within the Bottom Ash Pond perimeter berms that serve to monitor water or saturation within the pond berms. These are identified as P-8 and P-10. Total depths are approximately 25 feet and 19.5 feet, respectively. P-8 was reportedly dry in November 2018, and reported water levels ranged from 23.03 to 24.43 feet below the top of casing in 2019. P- 10 water levels fluctuated between 8.97 and 14.02 feet below casing in 2019. Monthly inspection reports through January 2019 indicated that P-10 was missing its flush-mount cover, however, subsequent reports indicate the cover was replaced and is in good condition.</p>
Inlet Piping Condition	GC	Inlet pipe for bottom ash (estimated 8 to 10-inch iron pipe) is in good condition. Pipe trench sump discharge pipe (4-inch PVC pipe) and plant operations wastewater inlet (12-inch iron pipe) were in good condition. Makeup water pipe (8-inch iron pipe) was in good condition.

SIKESTON POWER STATION – BOTTOM ASH POND  
2019 ANNUAL INSPECTION CHECK SHEET

Item	Condition Code	Inlet and Outlet Works
		Comments
Emergency Spillway	Not Operational	A buried 30-inch pipe was designed to convey excess water from the Bottom Ash Pond to the Fly Ash Pond, as needed. The discharge end of the structure in the Fly Ash Pond is blocked by impounded CCR. The swing gate on the Bottom Ash Pond inlet side of the structure is closed. As a result of other reports completed by Gredell Engineering related to CCR compliance, it was determined to be advantageous to SBMU to construct an emergency spillway. Upon request from SBMU, Gredell Engineering designed an emergency spillway consisting of a shallow, broad-crested weir to be constructed along the northern berm of the Bottom Ash Pond and west of the Fly Ash Pond. SBMU stated during the annual inspection that the emergency spillway will be put out to bid in 2020.
Other: Buried Storm Water Box Culvert	OB (overall)  OB (metal culvert seam damage)	Dual buried box culvert conveys offsite stormwater from the east side of the Bottom Ash Pond (west end of Compress Road) to the west side of the Pond. The inlet was observed to be dry and in good condition. The culverts discharge through corrugated metal culverts into an open channel on the west side. In 2017, a sediment basin was dug out below the pipe discharges, increasing the sediment capacity below discharges. This appeared to have increased the flow velocity and flush out the sediment build up in the culverts during heavy rainfall events. In 2019, the sediment basin was observed to be partially filled with sediment. Therefore, it is recommended to continue to monitor the sediment basin and to clean out solids/debris before it has the potential to restrict discharge flow.  It has been previously noted that the southern corrugated metal culvert had two small areas where the seams are damaged and separated. The bituminous lining in both culverts is degraded in the area of the damage. Ongoing observation has indicated that the damaged areas are currently stable and do not impact the stability of the Bottom Ash Pond. It is recommended that these two damaged areas continue to be observed and possibly scheduled for the future.

SIKESTON POWER STATION – BOTTOM ASH POND  
2019 ANNUAL INSPECTION CHECK SHEET

Earth Embankment		
Item	Condition Code	Comments
Vertical & Horizontal Alignment of Crest	GC	No visible evidence of deformation of embankment.
Seepage/Wetness / Ponding Areas	OB (Ponding)	Water ponds occasionally in the perimeter flat bottom ditch inside rail loop. This appears to be caused by the flat grade of the railroad bed and does not appear to be seepage. The ponding restricts mowing (maintaining) the ditch, but otherwise is not a concern.
	OB (Northern Berm Seepage)	An area along the northern berm of the Bottom Ash Pond, west of the Fly Ash Pond was identified as an area of potential seepage from the Bottom Ash Pond during prior inspections. No visual observation of erosion of the outer berm soils were observed in 2016 through 2019. 2019 observation indicates the area continues to be maintained. In mid-2018, Gredell Engineering subcontracted to Reitz & Jens, Inc. (St. Louis) to complete an evaluation of the area of the northern embankment of the Bottom Ash Pond. The report stated that the possible seepage did not have a negative impact on the stability of the embankments. Therefore, it is recommended that this area continue to be visually monitored to note any change in conditions. Future remediation of the wet area may be appropriate at a future date based on regulatory or other considerations.
Erosion/Rutting	MM	No evidence of erosion or rutting on the outside slopes of the berms were observed in 2019. However, weekly inspections noted minor rutting in gravel roads and ramps were noted in the weekly inspections. A few minor potholes were observed on the gravel berm roads but the gravel ramps were in good condition during our annual inspection. The rutting appears to be caused by heavy truck traffic during periods of wet weather. While these ruts do not have the same significance as rutting and erosion on the outside slopes of the berms, they should be corrected to maintain a consistent vertical height of the perimeter berms. SBMU staff periodically remediated the conditions noted by grading the road surfaces.
Fencing	NI	Fencing is not adjacent to the Bottom Ash Pond.
Vegetation	GC	Vegetation on exterior slopes is generally maintained at less than 6 inches, however this federal CCR rule criteria has been remanded and, therefore, is not currently applicable.
Sloughs/Slides/ Cracks	GC	No evidence was observed in 2019.
Animal Control	GC	No evidence of animal burrows or holes were observed in 2019.
Other	NA	No other items were observed that are applicable to the federal CCR rules.

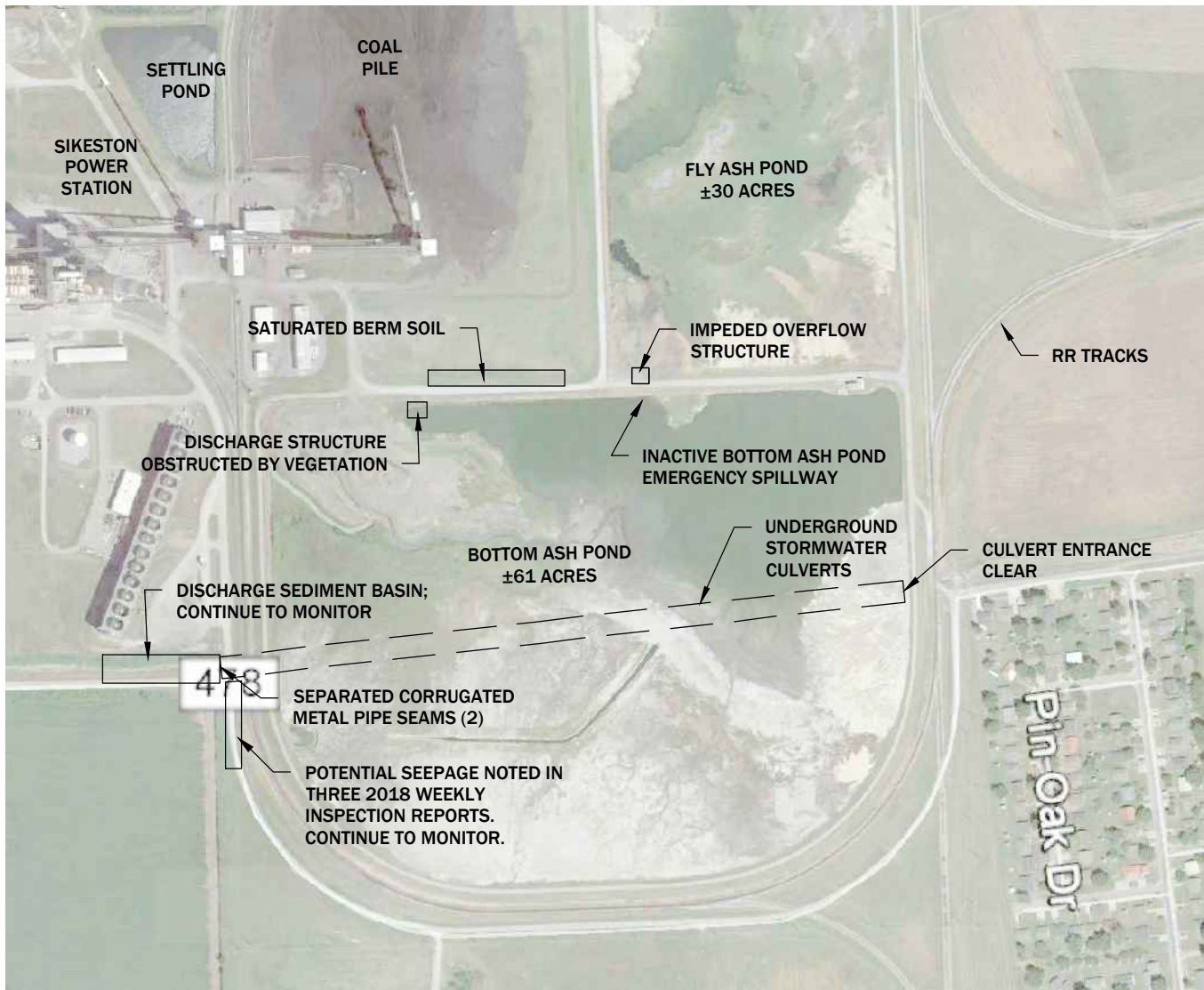
SIKESTON POWER STATION – BOTTOM ASH POND  
2019 ANNUAL INSPECTION CHECK SHEET

Condition Codes: EC Emergency Condition – a serious safety condition exists that requires immediate action.  
IM Immediate Maintenance – an item that requires maintenance within about 30 days to ensure safety or operation.  
MM Minor Maintenance – item needing minor maintenance or repair within 6 months.  
OB Observation – condition requires regular observation to ensure that the condition does not become worse.  
GC Good Condition.  
NE No Evidence of a problem.  
NI Not Inspected. State reason in comments.

Note location of observations on attached plan sheet (Figure 1).

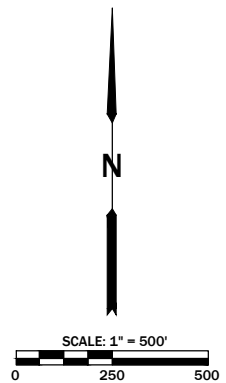
Additional Notes:

1. NONE



**NOTES**

1. MINOR MAINTENANCE ITEMS INCLUDE CLEARING VEGETATION FROM SURFACE IMPOUNDMENT DISCHARGE.
2. ITEMS REQUIRING FURTHER OBSERVATION, INVESTIGATION OR CORRECTIVE ACTION INCLUDE:
  - a. SATURATED BERM SOIL ALONG NORTHERN BERM, WEST OF THE FLY ASH POND. (SAME AS 2018)
  - b. SEPARATED CORRUGATED METAL PIPE SEAMS AT THE DISCHARGE OF THE SOUTHERN STORMWATER CULVERT PASSING BENEATH THE BOTTOM ASH POND. (SAME AS 2018. REPORTED NOT REPAIRED)
  - c. GRASS LINED CHANNEL AT THE DISCHARGE OF THE STORMWATER AT THE OUTLET OF THE STORMWATER CULVERTS PASSING BENEATH THE BOTTOM ASH POND FROM EAST TO WEST HAS BEEN CLEARED OF BRUSH AND EXCAVATED TO CREATE A SEDIMENT BASIN. BASIN PARTIALLY FILLED WITH SEDIMENT AND DEBRIS. RE-EXCAVATE AS NEEDED.
3. ITEMS IDENTIFIED DURING THE ANNUAL INSPECTION WHICH DO NOT REQUIRE MAINTENANCE INCLUDE:
  - a. THE IMPEDED OVERFLOW STRUCTURE BETWEEN THE BOTTOM ASH POND AND THE FLY ASH POND.



**2019 ANNUAL P.E. INSPECTION  
BOTTOM ASH POND  
SIKESTON POWER STATION**

**GREDELL Engineering Resources, Inc.**

**ENVIRONMENTAL ENGINEERING LAND - AIR - WATER**

1505 East High Street  
Jefferson City, Missouri

Telephone: (573) 659-9078  
Facsimile: (573) 659-9079

MO CORP. ENGINEERING LICENSE NO. E-2001001669-D

**FIGURE 1**

DATE	SCALE	PROJECT NAME	REVISION
1/2020	AS NOTED	SIKESTON	
DRAWN FL	APPROVED ZT	FILE NAME 2019 PE INSPECTION	SHEET # 1 OF 1