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**GREDELL Engineering Resources, Inc.**

**Sikeston Board of Municipal Utilities  
Sikeston Power Station  
Bottom Ash Pond  
Emergency Action Plan**

*Prepared for:*



**Sikeston Power Station  
1551 West Wakefield Avenue  
Sikeston, MO 63801**

April 17, 2017

**Sikeston Board of Municipal Utilities  
Sikeston Power Station  
Bottom Ash Pond  
Emergency Action Plan**

**April 17, 2017**

**Table of Contents**

<b>PROFESSIONAL ENGINEER’S CERTIFICATION.....</b>	<b>1</b>
<b>1.0 INTRODUCTION.....</b>	<b>2</b>
1.1    40 CFR §257.73(a)(3) Emergency Action Plan .....	2
<b>2.0 BACKGROUND.....</b>	<b>3</b>
2.1    Bottom Ash Pond Description .....	3
2.2    Hazard Potential Classification Summary .....	4
<b>3.0 EMERGENCY RECOGNITION AND DETECTION .....</b>	<b>4</b>
3.1    Site Inspections .....	4
3.2    Monthly Instrumentation Monitoring .....	5
<b>4.0 NOTIFICATION PROCEDURES.....</b>	<b>5</b>
4.1    Notification Responsibilities .....	5
4.2    Sequence of Notification .....	5
4.3    Methods of Notification .....	6
<b>5.0 EMERGENCY OPERATIONS.....</b>	<b>6</b>
5.1    Methods of Response.....	6
5.2    Annual Emergency Responders Meeting.....	6
<b>6.0 IMPLEMENTATION OF THE EMERGENCY ACTION PLAN .....</b>	<b>7</b>
<b>7.0 MAINTAINING AND AMENDING THE EMERGENCY ACTION PLAN.....</b>	<b>7</b>
<b>8.0 RECORDKEEPING, NOTIFICATION AND INTERNET POSTING.....</b>	<b>8</b>
<b>9.0 REFERENCES.....</b>	<b>8</b>

**Figures**

Figure 1 – Aerial View

Figure 2 – Approximate Affected Area

**Tables**

Table 1 – Emergency Response Notification List

# PROFESSIONAL ENGINEER'S CERTIFICATION

40 CFR 257.73(a)(3) Emergency Action Plan.

I, Andrew David Rackers, P.E., a professional engineer licensed in the State of Missouri, hereby certify in accordance with 40 CFR 257.73(a)(3) that this emergency action plan for the Sikeston Board of Municipal Utilities, Sikeston Power Station, Bottom Ash Pond meets the requirements of 40 CFR 257.73(a)(3) as found in federal regulation 40 CFR 257, Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments and has been prepared using methods and procedures consistent with the professional standard of care and customary practice for engineering investigations of projects of this nature.

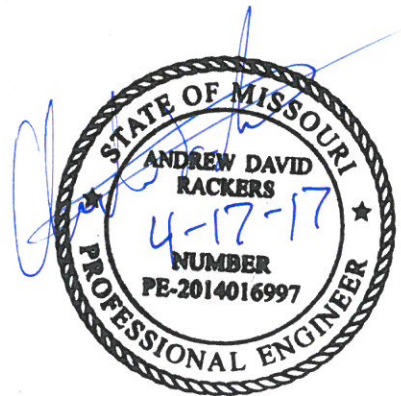
Name: Andrew David Rackers, P.E.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Registration Number: PE-2014016997

State of Registration: Missouri



## 1.0 INTRODUCTION

In accordance with the scope of services outlined in the Sikeston Board of Municipal Utilities (SBMU) Work Order No. 9 dated March 6, 2017, GREDELL Engineering Resources, Inc. (Gredell Engineering) assembled this Emergency Action Plan (EAP) for the SBMU Sikeston Power Station (SPS) Bottom Ash Pond, a coal combustion residual (CCR) surface impoundment. The purpose of this EAP is to develop an implementation procedure that will allow the facility and staff to respond to for a potential surface impoundment failure. This EAP meets the requirements in Title 40 of the United States Code of Federal Regulations, Part 257, Subpart D – Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments (the Federal CCR Rule), Section (§) 257.73(a)(3), *Emergency Action Plan*.

### 1.1 40 CFR §257.73(a)(3) Emergency Action Plan

§257.73(a)(3), which requires the emergency action plan completed by Gredell Engineering, is provided for reference below.

*(a)(3)(i) No later than April 17, 2017, the owner or operator of a CCR unit determined to be either a high hazard potential CCR surface impoundment or a significant hazard potential CCR surface impoundment under paragraph (a)(2) of this section must prepare and maintain a written EAP. At a minimum the EAP must:*

*(a)(3)(i)(A) Define the events or circumstances involving the CCR unit that represent a safety emergency, along with a description of the procedures that will be followed to detect a safety emergency in a timely manner;*

*(a)(3)(i)(B) Define responsible persons, their respective responsibilities, and notification procedures in the event of a safety emergency involving the CCR unit;*

*(a)(3)(i)(C) Provide contact information of emergency responders;*

*(a)(3)(i)(D) Include a map which delineates the downstream area which would be affected in the event of a CCR unit failure and a physical description of the CCR unit; and*

*(a)(3)(i)(E) Include provisions for an annual face-to-face meeting or exercise between representatives of the owner or operator of the CCR unit and the local emergency responders.*

*(a)(3)(ii)(A) The owner or operator of a CCR unit subject to the requirements of paragraph (a)(3)(i) of this section may amend the written EAP at any time provided the revised plan is placed in the facility's operating record as required by §257.105(f)(6). The owner or operator must amend the written EAP whenever there is a change in conditions that would substantially affect the EAP in effect.*

*(a)(3)(ii)(B) The written EAP must be evaluated, at a minimum, every 5 years to ensure the information required in paragraph (a)(3)(i) of this section is accurate. As necessary, the EAP must be updated and a revised EAP placed in the facility's operating record as required by §257.105(f)(6).*

*(a)(3)(iii)(A) If the owner or operator of a CCR unit determines during a periodic hazard potential assessment that the CCR unit is no longer classified as either a high hazard potential CCR surface impoundment or a significant hazard potential CCR surface impound, then the owner or operator of the CCR unit is no longer subject to the requirement to prepare and maintain a written EAP beginning on the date of the periodic hazard potential assessment documentation is placed in the facility's operating record as required by 257.105(f)(5).*

*(a)(3)(iii)(B) If the owner or operator of a CCR unit classified as a low hazard potential CCR surface impoundment subsequently determines that the CCR unit is properly re-classified as either a high hazard potential CCR surface impoundment or a significant hazard potential CCR surface impoundment, then the owner or operator of the CCR unit must prepare a written EAP for the CCR unit as required by paragraph of (a)(3)(i) of this section within six months of completing such periodic hazard potential assessment.*

*(a)(3)(iv) The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer stating that the written EAP, and any subsequent amendment of the EAP, meets the requirements of paragraph (a)(3) of this section.*

*(a)(3)(v) The EAP must be implemented once events or circumstances involving the CCR unit that represent a safety emergency are detected, including conditions identified during periodic structural stability assessments, annual inspections, and inspections by a qualified person.*

## **2.0 BACKGROUND**

The Federal CCR Rule requires an EAP for all CCR surface impoundments with hazard potential classifications of significant or high. Due to the topography, surrounding population, and volume of impounded process water and CCR, the Bottom Ash Pond at SPS was classified as a significant hazard potential by the October 17, 2016 Initial Hazard Potential Classification for the Bottom Ash Pond (Gredell Engineering, 2016). The following sections describe the Bottom Ash Pond and summarize the Initial Hazard Potential Classification for the Bottom Ash Pond.

### **2.1 Bottom Ash Pond Description**

SPS is located in the western part of the City of Sikeston, south of West Wakefield Avenue, and east of Route BB in Scott County, Missouri. The Bottom Ash Pond at SPS resides to the southeast of SPS, and directly south of SPS's coal pile and Fly Ash Pond. The Bottom Ash Pond occupies approximately 61 acres with a minimum and consistent berm elevation of 322.3 feet.

Based on an aerial survey conducted by Surdex Corporation on May 6, 2016, the Bottom Ash Pond has an approximate remaining volumetric capacity of 250 acre-feet (ac-ft) (10,890,000 cubic feet [ft<sup>3</sup>]).

SPS and the Bottom Ash Pond are located at a transition between agricultural and urban areas. The Bottom Ash Pond is surrounded by agricultural, commercial, and residential areas. Residential areas are located approximately 150 feet east/southeast of the Bottom Ash Pond. Commercial areas are located approximately 700 feet south of the Bottom Ash Pond. The remaining area around the Bottom Ash Pond that is not part of the SPS facility is agricultural land. There is City of Sikeston-owned property to the east, south, and west of the Bottom Ash Pond. See Figure 1 – Aerial View, for a depiction of the Bottom Ash Pond.

## **2.2 Hazard Potential Classification Summary**

Hydraflow extension of Autodesk Civil 3D (2016, Autodesk, Inc.) was used to model a worst-case scenario breach due to failure of the berm or misoperation of the Bottom Ash Pond. Using the *Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams* (FEMA, April 2004) and the results of the Hydraflow model, the Bottom Ash Pond was classified as a Significant Hazard Potential. The model determined pond water from a worst-case scenario breach in the Bottom Ash Pond berm would likely travel off SPS property into the adjacent residential area to the southeast, but would not result in probable loss of human life. Because the flood water encroached on the nearby residential area, it was concluded that the flood water would likely cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns (Gredell Engineering, 2016).

Figure 2 – Approximate Affected Area, depicts the downstream area that may be affected by a breach, due to failure of the berm or misoperation of the Bottom Ash Pond.

## **3.0 EMERGENCY RECOGNITION AND DETECTION**

The Bottom Ash Pond at SPS is equipped with monitoring devices and is inspected regularly by plant personnel to detect a potential safety emergency. A safety emergency may include, but is not limited to, an overtopping of the surface impoundment berm, seepage through the surface impoundment berm, or detection of a subsurface release by monitoring equipment. The subsections below describe the monitoring devices and regularly conducted inspections by plant personnel to detect a safety emergency in a timely manner.

### **3.1 Site Inspections**

Per §257.83(a)(i) and (ii), the Bottom Ash Pond shall be inspected for the appearance of potential or actual structural weakness (e.g., erosion and slumping) and for other conditions which are

disrupting or may disrupt the safety of the Bottom Ash Pond. The inspections shall include the discharge of all outlets of hydraulic structures passing through or beneath the Bottom Ash Pond for excessive or abnormally low flow, abnormal discoloration, debris, or sediment. Outlets of hydraulic structures that are inspected for the Bottom Ash Pond include the primary discharge to the Process Waste Pond and the Compress Road stormwater culvert passing beneath the Bottom Ash Pond. By conducting regular inspections of the berm and hydraulic structures of the Bottom Ash Pond, a potential safety emergency can be detected in a timely manner.

### **3.2 Monthly Instrumentation Monitoring**

Per §257.83(a)(iii), instrumentation associated with the Bottom Ash Pond shall be monitored at a frequency not exceeding 30 days. Instrumentation associated with the Bottom Ash Pond includes piezometers installed in the berm of the Bottom Ash Pond and a staff gauge to monitor the water level in the Bottom Ash Pond. By monitoring the instrumentation associated with the Bottom Ash Pond, the instrumentation can be maintained and repaired, as needed, to ensure proper operation to detect a potential safety emergency in a timely manner.

## **4.0 NOTIFICATION PROCEDURES**

In the event detection methods determine there is a potential or actual safety emergency, responsible personnel will begin notification procedures. Notification procedures may include, but are not limited to, alerting SPS personnel, emergency responders, and emergency response organizations using various contact methods (e.g., telephone).

### **4.1 Notification Responsibilities**

In the event a potential or actual safety emergency is detected during routine or non-routine inspections, or by other persons (e.g., surrounding residents or businesses), prompt notification shall be made to the primary or secondary SPS environmental coordinators. The primary or secondary environmental coordinators (or their designee) is responsible for contacting emergency responders and emergency response organizations. Table 1 provides contact information for the primary and secondary SPS environmental coordinators and outside emergency responders and emergency response agencies.

### **4.2 Sequence of Notification**

In the event of a potential or actual safety emergency, it is the primary or secondary SPS environmental coordinator's (or their designee's) responsibility to promptly call 911. Contact with 911 will ensure prompt contact is made with all local emergency response personnel (e.g., the local fire department, ambulance district, and sheriff's department). The primary or secondary SPS environmental coordinator (or their designee) shall contact the designated environmental response contractors to begin mitigation procedures. The worst-case scenario failure or release

from the Bottom Ash Pond at the SPS would be a release of CCR and process water into the residential area to the east/southeast of the Bottom Ash Pond. Notification of SPS environmental coordinators, emergency responders, and emergency response agencies is crucial to the safety of affected persons and property involved if a breach or spill were to occur.

#### **4.3 Methods of Notification**

The use of land-line telephones and cellular phones shall be the primary method of communication between all SPS personnel, emergency responders, and emergency response agencies. Alternative methods of communication between all SPS personnel and emergency personnel include, but are not limited, to two-way radios or the SPS paging system.

### **5.0 EMERGENCY OPERATIONS**

Response to a potential or actual safety emergency is paramount to prevent or reduce the impact of a release from the Bottom Ash Pond into the surrounding community and the environment. The methods of response described below provide a plan for addressing a potential safety or actual emergency. However, the method of response is contingent upon the conditions encountered by emergency response personnel and should be adjusted accordingly.

#### **5.1 Methods of Response**

Prompt and efficient response to a potential or actual safety emergency can prevent or reduce the severity of the impact of a release from the Bottom Ash Pond into the surrounding community or environment. Coordination between internal SPS personnel and external entities will be required and field operations may need to be performed in adverse conditions. Mitigating the occurrence of a potential safety emergency or the impact of an actual safety emergency must take place promptly after notifying appropriate emergency responders and emergency response agencies.

Mitigation techniques differ depending on the nature of the safety emergency and should be directed by the SPS environmental coordinator (or their designee) and the emergency response team. The primary methods of mitigating potential impact from a safety emergency condition include, but are not limited to, regulating flow from the Bottom Ash Pond through the primary discharge to prevent or reduce flow through a release point; minimizing flooding potential using standard flood protection measures; and coordinating emergency repairs to the Bottom Ash Pond.

#### **5.2 Annual Emergency Responders Meeting**

An annual face-to-face meeting will be held with local emergency responders in accordance with §257.73(a)(3)(i)(E). The annual meeting will be held regardless of whether or not a safety emergency occurred the previous year. Content of the annual meeting will include, but is not limited to, general information about SPS and the Bottom Ash Pond; content of the EAP; potential



risks associated with the Bottom Ash Pond; preventative measures SPS is undertaking to reduce the potential impact of a safety emergency; and the role of local emergency responders during a safety emergency. Summary documentation of the annual face-to-face meeting will be recorded in written form and placed in SPS's operating record.

If a safety emergency condition occurs prior to the scheduled annual meeting with local emergency responders, the annual meeting date may be moved to a time shortly after the safety emergency. In addition to the content of the annual meeting previously stated, the meeting will also discuss and evaluate the safety emergency, the notification procedures, and response to the safety emergency.

## **6.0 IMPLEMENTATION OF THE EMERGENCY ACTION PLAN**

Events or circumstances that represent a safety emergency may be detected by SPS personnel or SPS representatives during the periodic structural stability assessments, annual inspections, and inspections by a qualified person. In accordance with §257.73(a)(3)(v), SPS shall activate the EAP once events or circumstances that represent a potential or actual safety emergency involving the Bottom Ash Pond are detected. Written documentation of EAP implementation shall be prepared by SPS. Written documentation shall include, but is not limited to, a description of the Bottom Ash Pond, a description of the safety emergency, and mitigating actions taken by SPS or their environmental response team.

## **7.0 MAINTAINING AND AMENDING THE EMERGENCY ACTION PLAN**

In accordance with §257.73(a)(3)(ii)(A), SPS reserves the right to amend this EAP at any time and SPS must amend the EAP whenever there is a change in conditions that would substantially affect the EAP.

In accordance with §257.73(a)(3)(ii)(B), the EAP must be evaluated every five years (minimum) to ensure the content of the EAP is accurate and in accordance with §257.73(a)(3).

In accordance with §257.73(a)(3)(iii)(A), if SPS determines during a future periodic hazard potential assessment the Bottom Ash Pond is no longer classified as a high or significant hazard potential, the Bottom Ash Pond is no longer subject to the EAP, effective the date of the future periodic hazard potential assessment documentation is placed in the SPS's operating record.

## **8.0 RECORDKEEPING, NOTIFICATION AND INTERNET POSTING**

The original EAP shall be placed in SPS's operating record [§257.105(f)(6)], notification of the availability of the EAP shall be provided to the State Director [§257.106(f)(5)], and the EAP shall be posted to SPS's CCR Web Site [§257.107(f)(5)]. After an amendment to the EAP, the most current EAP shall replace the previous version of the EAP in SPS's operating record and shall be posted to SPS's CCR Web Site. Notification of availability of an amended EAP shall be provided to the State Director.

Documentation of the annual face-to-face meeting between SPS and local emergency responders prepared by SPS shall be placed in SPS's operating record [§257.105(f)(7)], notification of the availability of the prepared documentation shall be provided to the State Director [§257.106(f)(6)], and the documentation shall be posted to SPS's CCR Web Site [§257.107(f)(6)].

Documentation prepared by SPS of all activations of the EAP shall be placed in SPS's operating record [§257.105(f)(8)], notification of the availability of the prepared documentation shall be provided to the State Director [§257.106(f)(7)], and the documentation shall be posted to SPS's CCR Web Site [§257.107(f)(7)].

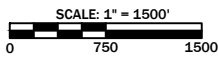
## **9.0 REFERENCES**

Autodesk, Inc. (2016). Autodesk Civil 3D, Hydraflow Extension [Computer Software].  
San Rafael, CA.

Federal Emergency Management Agency, 2013. "Federal Guidelines for Dam Safety Emergency Action Planning for Dams."

Gredell Engineering Resources, Inc., 2016. "Sikeston Board of Municipal Utilities Sikeston Power Station Bottom Ash Pond Hazard Potential Classification Assessment."

# Figures



**EMERGENCY ACTION PLAN  
BOTTOM ASH POND  
SIKESTON POWER STATION**

**GREDELL Engineering Resources, Inc.**

**ENVIRONMENTAL ENGINEERING LAND - AIR - WATER**

1505 East High Street  
Jefferson City, Missouri

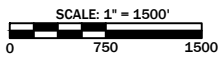
Telephone: (573) 659-9078  
Facsimile: (573) 659-9079

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

**FIGURE 1 - AERIAL VIEW**

DATE 4/2017	SCALE AS NOTED	PROJECT NAME SIKESTON	REVISION
DRAWN AJK	APPROVED TG	FILE NAME EMRGNCY ACTION PLAN	SHEET # 1 OF 1





M:\Share\CADDFiles\SIKESTON\POND CLOSURE\EMRGNCY ACTION PLAN.dwg, FIGURE 2 - APPROXIMATE AFFECTED AREA, 4/12/2017 9:32:24 AM

**EMERGENCY ACTION PLAN  
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 2 - APPROXIMATE  
AFFECTED AREA**

DATE 4/2017	SCALE AS NOTED	PROJECT NAME SIKESTON	REVISION
DRAWN AJK	APPROVED TG	FILE NAME EMRGNCY ACTION PLAN	SHEET # 1 OF 1

# Table

**Sikeston Power Station  
Emergency Action Plan  
Table 1  
Emergency Response Notification List**

<b>Title</b>	<b>Name</b>	<b>Phone</b>
Police Department	Police Department	911 or (573)-471-6200
Fire Department	Fire Department	911 or (573)-471-3558
Ambulance	Ambulance Service	911
Hospital	Delta Medical Center 1008 N Main Street Sikeston, MO 63801	(573) 471-1600
Primary Environmental Coordinator, Results Engineer/Plant Chemist SBMU – Power Plant	Mark McGill	(573) 475-3131 (W) or (573) 683-1549 (M)
Secondary Environmental Coordinator, Site Safety/Security SBMU – Power Plant	Steve Turnbow	(573) 475-3127 (W) or (573) 620-0354 (M)
Plant Manager, SBMU - Power Plant	Don Miller	(573) 471-5000 (W) or (573) 475-3112 (M)
Operations Superintendent, SBMU - Power Plant	Bryan Housman	(573) 471-5000 (W) or (573) 475-3114 (M)
Operations Manager, SBMU - Power Plant	Jeff Winders, P.E.	(573) 471-3328 (W) or (573) 475-3229 (M)
General Manager, SBMU - Power Plant	Rick Landers	(573) 475-3228 (W) or (573) 380-4704 (M)