PowerSouth Energy Cooperative

Charles R. Lowman Power Plant
Leroy, AL

Hazard Potential Classification

Issued October 2016

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PowerSouth Energy Cooperative

DRAFT REPORT

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APPENDIXES

1.0 SCOPE OF SERVICES

PowerSouth Energy Cooperative (PowerSouth) requested CDG Engineers and Associates, Inc. (CDG) to perform a site evaluation and assign a hazard potential classification for the Unit #1 Bottom Ash Pond, Unit 2/3 Bottom Ash Pond, and Scrubber Waste Pond at the Charles R. Lowman Power Plant as required in section 257.73 (a) (2) of EPA's Disposal of Coal Combustion Residuals from Electric Utilities (CCR rule). In association with this scope of services, CDG conducted site investigations of the impoundments as well as the upstream and downstream areas which may be affected in the event of a failure of the impoundment berms.

The hazard potential classification assessment has been prepared in accordance with guidance provided in FEMA's *Federal Guidelines for Dam Safety: Hazard Potential Classification System for Dams.*

2.0 PROJECT DESCRIPTION

The Charles R. Lowman Power Plant in Leroy, AL has three impoundments that were investigated and assigned a hazard potential classification: Unit #1 Bottom Ash Pond, Unit #2/#3 Bottom Ash Pond, and the Scrubber Waste Pond. In evaluating the hazard potential for each impoundment CDG performed site investigations through visual observation of the upstream and downstream inundation zones to identify and document areas which, if the dam should fail or be misoperated for any reason, may result in probable loss of human life and/or impact on economic, environmental, and lifeline interests. The investigation was conducted in accordance with guidance provided by the Association of State Dam Safety Officials (ASDSO) "Guideline for Assigning Hazard Potential Classification to Dams", FEMA Publication No. 333 **"**Federal Guidelines for Dam Safety: Hazard Potential Classification System**"** and the US Army Corps of Engineers "Safety of Dams – Policy and Procedures" (ER 1110-2-1156). The basis for classification is determined using the presumptive method based on site investigations and readily available information to evaluate the potential for the probable loss of human life and impacts on economic, environmental, and lifeline interests. A summary of the considerations which led to each pond's assigned hazard potential classification is provided in Section 3. A further discussion on the basis for determination of each is provided below.

2.1 Criteria used in evaluating Loss of Life Potential

FEMA Publication No. 333 – "Federal Guidelines for Dam Safety: Hazard Potential Classification System *for Dams"* states that the difference between Significant and High Hazard Potential rating include the probable loss of human life, regardless of the magnitude of other losses. If no loss of life is probable as the result of dam failure or misoperation, the dam should be classified as Low or Significant Hazard Potential. The term "probable" indicates that the scenario used to predict the loss of human life must be reasonable and realistic. In the definition of High Hazard Potential FEMA-333 does not contemplate the possible loss of life of the occasional user of the downstream or upstream area such as an occasional recreational user of the river and downstream lands, passer-by, persons working on the dam, or non-overnight outdoor user of downstream lands.

CDG maintained these definitions during its evaluation of the potential for probable loss of human life.

2.2 Criteria used in evaluating Economic Impact

USACE Publication ER 1110-2-1156 (Oct 2011) states that economic losses can be classified as either direct or indirect. Direct losses are generally defined as economic losses due to flood damage of homes, businesses, and infrastructure while indirect losses are those due to the interruption of services provided by either the failed facility or by damaged infrastructure in the downstream inundation area.

Direct losses evaluated in CDG's assessment include property losses due to the immediate deposition of sediments and CCR waste. Indirect losses evaluated in CDG's assessment include the loss of power generation capability at the Plant, and loss of navigation of the Tombigbee River.

2.3 Criteria used in evaluating Environmental Impact

USACE Publication ER 1110-2-1156 (Oct 2011) states that environmental losses are those where project failure or misoperation can result in the need for mitigative measures, or can cause irreparable damage to the environment.

In considering the environmental losses which may occur in the event of a failure due to flooding or misoperation, CDG considered the potential impact of sediment and CCR waste deposition in areas of inundation, and water impacts associated with the release of process water used in Plant operations.

2.4 Criteria used in evaluating Lifeline Disruption

The American Society of Civil Engineers defines lifeline systems to include transportation systems (including highways, airports, rail lines, waterways, ports and harbor facilities) and utility systems (electric power plants, electrical transmission lines, gas and liquid fuel pipelines, telecommunication systems, water supply, and wastewater treatment facilities).

In considering the lifeline disruptions which may occur in the event of a failure due to flooding or misoperation, CDG considered the potential impacts which may occur in the event of a dam failure. The corresponding flood wave would contain process water, sediments and CCR waste which may impact lifeline facilities foundation systems, and other service related structures.

3.0 UNIT #1 BOTTOM ASH POND

Assigned Hazard Potential Rating: SIGNIFICANT

Basis for Classification

Potential for Probable Loss of Human Life:

- None.

Potential for Economic Loss:

- Direct:
  - A breach could result in damage/washout to electrical transmission towers.
- Indirect:
  - A breach could result in material deposited into navigable portions of the Tombigbee River.
  - A breach could result in material being deposited to the Plant's discharge canal.

Potential for Environmental Damage:

- A breach could result in the deposition of materials in the Tombigbee River.

- A breach could result in the release of CCR wastewater in the Tombigbee River.

Potential for Lifeline Disruption:
- A breach could result in damage to electrical transmission towers.

4.0 UNIT #2/#3 BOTTOM ASH POND

Assigned Hazard Potential Rating: SIGNIFICANT

Basis for Classification

Potential for Probable Loss of Human Life:
- None.

Potential for Economic Loss:
- Direct:
    - A breach could result in damage/washout to electrical transmission towers.
    - A breach could result in damage/washout to the entrance roadway and bridge system.
    - A breach could result in damage to the Plant's primary recycle-water pumping station.
    - A breach could result in damage/washout to the Norfolk Southern railroad line serving the Plant.

- Indirect:
    - A breach could result in the disruption of water supply to the Power Plant

Potential for Environmental Damage:
- A breach could result in the deposition of materials containing sediments and CCR waste into floodways of the Tombigbee River, including wetlands.
- A breach could result in the release of CCR wastewater into floodways of the Tombigbee River.
- A breach could result in damage/washout of the dam for the Scrubber Waste Pond causing additional environmental damage to floodways of the Tombigbee River and wetlands.

Potential for Lifeline Disruption:
- A breach could result in damage/washout to electrical transmission towers.
- A breach could result in damage/washout to the Plant's entrance roadway and bridge system.

5.0 SCRUBBER WASTE POND

Assigned Hazard Potential Rating: SIGNIFICANT

Basis for Classification

Potential for Probable Loss of Human Life:
- None.

Potential for Economic Loss:

- Direct:
    - A breach could result in damage/washout to the entrance roadway and bridge system.
    - A breach could result in damage to the Plant's primary recycle-water pumping station.
    - A breach could result in damage/washout to the Norfolk Southern railroad line serving the Plant.

- Indirect:
    - A breach could result in the disruption of water supply to the Plant.

Potential for Environmental Damage:

- A breach could result in the deposition of materials containing sediments and CCR waste into floodways of the Tombigbee River, including wetlands.
- A breach could result in the release of CCR wastewater into floodways of the Tombigbee River.
- A breach could result in damage/washout of the dam for the Unit #2/#3 Bottom Ash Pond causing additional environmental damage to floodways of the Tombigbee River and wetlands.

Potential for Lifeline Disruption:

- A breach could result in damage/washout to electrical transmission towers.
- A breach could result in damage/washout of the dam for the Unit #2/#3 Bottom Ash Pond causing damage/washout to the Plant's entrance roadway and bridge system.

6.0 GENERAL REMARKS AND CLOSING

The conclusions presented in this report are based upon currently accepted engineering principles, practices, and standards in the area where the services were provided. No other warranty, expressed or implied, is made.

The findings in this report were developed from visual observations made by CDG personnel during the site investigation phase, documents provided by the client and from the industry guidance available. If significant changes are made to the use of the upstream and downstream areas or capacity of the impoundments, CDG should be allowed to review our findings in light of the changes to determine if an alternate hazard potential classification is warranted.

7.0 REFERENCES

- Federal Guidelines for Dam Safety (2004): "Hazard Potential Classification System for Dams," Federal Emergency Management Agency, Interagency Committee on Dam Safety, April.

- Safety of Dams – Policy and Procedures (ER 1110-2-1156): Department of the Army, US Army Corps of Engineers, October.

- "Guideline for Assigning Hazard Potential Classification to Dams", Association of State Dam Safety Officials (ASDSO), September 2010.

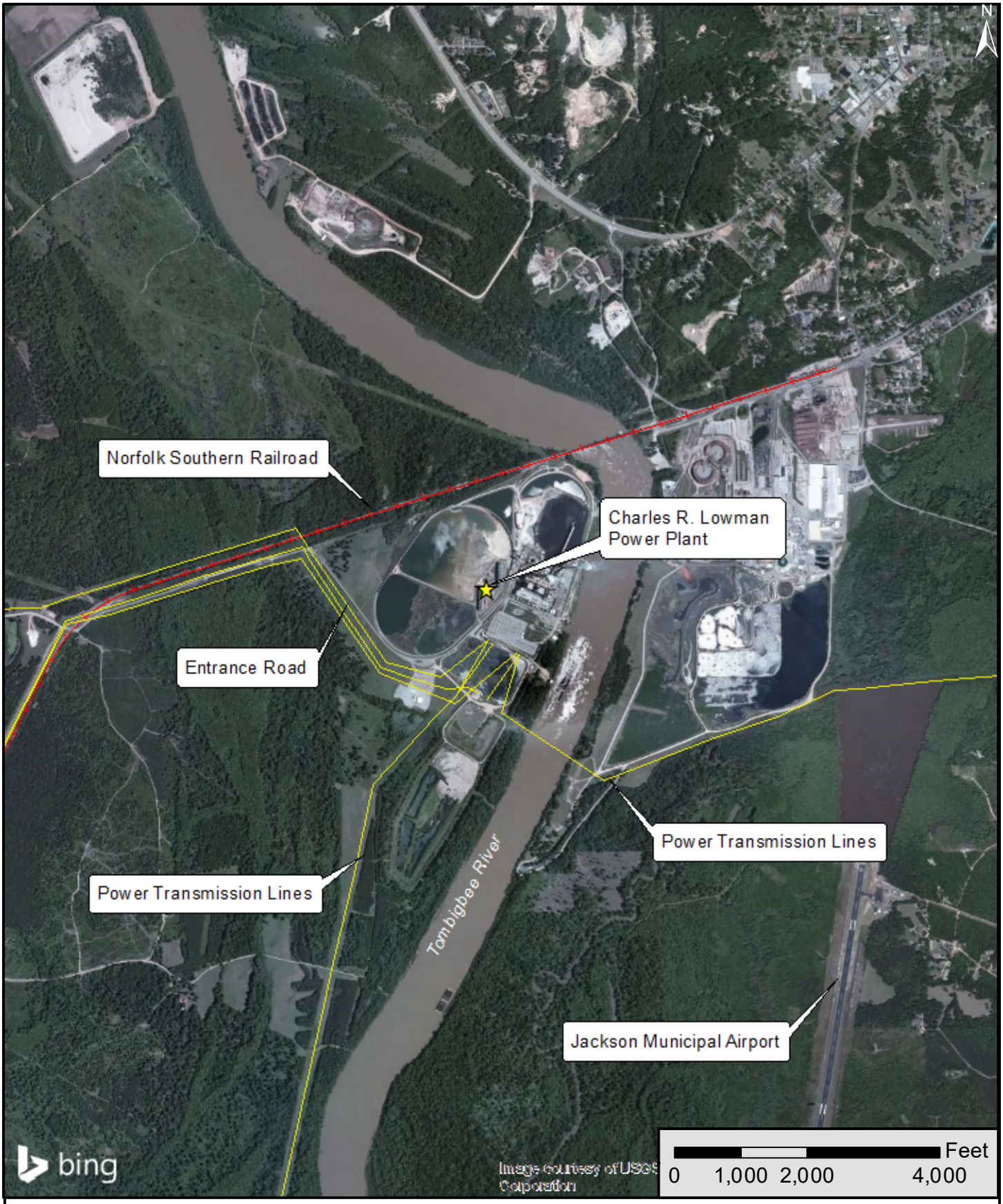

Figure 1 - Critical Infrastructure Map

Charles R. Lowman Power Plant
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Figure 2 - Aerial Map of Impoundments

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