



Stantec Consulting Services Inc.
1409 North Forbes Road, Lexington KY 40511-2024

October 6, 2016
File: rpt_002_let_175565009
Revision 0

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

**RE: Initial Hazard Potential Classification Assessment
Bottom Ash Pond
EPA Final Coal Combustion Residuals (CCR) Rule
TVA Cumberland Fossil Plant
Cumberland City, Tennessee**

1.0 PURPOSE

This letter documents Stantec's certification of the initial hazard potential classification assessment for the TVA Cumberland Fossil Plant's Bottom Ash Pond. The EPA Final CCR Rule requires owners or operators of CCR surface impoundments to conduct initial and periodic hazard potential classification assessments of the unit, assign one of three potential hazard classification ratings to it, and provide the basis for the rating, as per 40 CFR 257.73(a)(2). Hazard potential classification ratings define the consequences in the event of a failure – *the ratings have nothing to do with the likelihood of failure or the structural stability of the impoundment*. Based on this assessment, the Bottom Ash Pond has been assigned a low hazard potential classification rating.

2.0 BASIS FOR CLASSIFICATION RATING

As described in the attached report, the hazard potential classification rating of "low" was assigned to the Bottom Ash Pond because a failure or mis-operation would result in no probable loss of human life, and potential impacts would likely be minor and principally limited to TVA property.

3.0 SUMMARY OF FINDINGS

The attached report presents the analysis for the initial hazard potential classification assessment. The results demonstrate that the impoundment meets the hazard potential classification of "low."



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**RE: Initial Hazard Potential Classification Assessment
Bottom Ash Pond
EPA Final Coal Combustion Residuals (CCR) Rule
TVA Cumberland Fossil Plant
Cumberland City, Tennessee**

4.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, John S. Montgomery, being a Professional Engineer in good standing in the State of Tennessee, do hereby certify, to the best of my knowledge, information, and belief:

1. that the information contained in this certification is prepared in accordance with the accepted practice of engineering;
2. that the information contained herein is accurate as of the date of my signature below; and
3. that the initial hazard potential classification assessment for the TVA Cumberland Fossil Plant's Bottom Ash Pond meets the requirements specified in 40 CFR 257.73(a)(2).

SIGNATURE

DATE

October 6, 2016

ADDRESS:

Stantec Consulting Services Inc.
1409 North Forbes Road
Lexington, Kentucky 40511-2024

TELEPHONE: (859) 422-3000

ATTACHMENTS: Initial Hazard Potential Classification Assessment



Initial Hazard Potential Classification Assessment

Cumberland Fossil Plant – Bottom
Ash Pond
Cumberland City, Tennessee



Prepared for:
Tennessee Valley Authority
Chattanooga, Tennessee

Prepared by:
Stantec Consulting Services Inc.
Lexington, Kentucky

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INITIAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

Rating
October 6, 2016

1.0 RATING

This report documents the hazard potential classification assessment for the Bottom Ash Pond at Cumberland Fossil Plant (CUF) as required per the Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities [RIN-2050-AE81; FRL-9149-4] (EPA Final CCR Rule) § 257.73 (a)(2). Hazard potential classifications are based on the consequences of failure or mis-operation and are not a measure of the condition of the unit. The applicable hazard potential classifications are defined in the EPA Final CCR Rule § 257.53 as follows:

- (1) High hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.
- (2) Significant hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns.
- (3) Low hazard potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the surface impoundment owner's property.

Based on these definitions the Bottom Ash Pond is classified as a low hazard potential CCR surface impoundment.

This report contains supporting documentation for the hazard potential classification assessment. The hazard potential classification for this structure was determined by a visual assessment and a review of available data conducted by Stantec in August, 2015.

INITIAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

Basis of Rating
October 6, 2016

2.0 BASIS OF RATING

2.1 INTRODUCTION

The Tennessee Valley Authority (TVA) has contracted Stantec Consulting Services Inc. (Stantec) to review and update previous hazard potential classification assessments as needed and to prepare the accompanying certification for selected impoundments at various TVA Plants.

CUF is located in Stewart County, Tennessee at the confluence of Wells Creek and the Cumberland River. The plant is located on the southern bank of the Cumberland River, approximately 60 miles northwest of Nashville, Tennessee. The Bottom Ash Pond is located to the east of the Dry Ash Stack. Process and storm water flow from the Bottom Ash Pond and is conveyed to the Stilling Pond via a system of pipes and ditches. A culvert with two, 54-inch diameter pipes discharges to the North Ditch. The Bottom Ash Pond dike crest elevation varies with a minimum elevation of approximately 399 feet. Based on the available topographic mapping, the pond surface is approximately 5.3 acres with a current water storage volume of approximately 7 acre-feet from the crest to the ash level. The layout of the facility and the potential failure directions are shown on the figure provided in the appendix.

For CUF, there is no documentation available for a hazard potential classification assessment for the Bottom Ash Pond, but a hazard assessment is required per the EPA Final CCR Rule. Therefore, Stantec has prepared the hazard assessment for this unit as documented in this report.

2.2 SOURCE DATA

The following information was used to perform the hazard assessment of the Bottom Ash Pond:

- Aerial Imagery provided by TVA and dated June, 2014.
- Field topographic and hydrographic survey information for the area around the Bottom Ash Pond which was provided by TVA. The field survey is dated October 2014.

2.3 POTENTIAL FAILURE SCENARIOS

The Bottom Ash Pond is surrounded by higher ground to the south and southeast; therefore a breach of the pond in these directions is not considered plausible. However, if a breach were to occur at various other locations, flow resulting from those breaches would likely be intercepted by process and storm flow ditches in the area which would direct the flow to the Stilling Pond. Those failure scenarios were evaluated as summarized below and are shown on the figure in the appendix.

INITIAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

Basis of Rating
October 6, 2016

2.3.1 Breach toward the Southwest

A breach of the pond to the southwest would likely result in flow to a ditch located along the base of the Dry Ash Stack. The crest of the ditch is at approximate elevation 403 feet, which is higher than the crest of the Bottom Ash Pond embankment, elevation 399 feet. Therefore, a breach in this direction would likely be contained within the ditch and the Bottom Ash Pond and on TVA's property.

2.3.2 Breach toward the Northeast

A breach of the pond to the northeast would likely result in flow to a ditch located between the Bottom Ash Pond and the CUF yard area. It is possible this ditch could overflow resulting in process water flowing into the CUF yard or a ditch/culvert system which outfalls at the Cumberland River. The ditch/culvert system is approximately 2,200 feet long. Given the small volume of the Bottom Ash Pond and the fact that bottom ash has limited mobility, CCR materials will principally remain on TVA property.

Further, access roads may be impacted. However, given the transient nature of their use, loss of life due to a breach of the facility is not probable.

2.4 HAZARD CLASSIFICATION

Findings of this review and assessment demonstrate that a breach of the Bottom Ash Pond would result in no probable loss of life. In addition, it is Stantec's opinion that any impacts to would be principally limited to TVA property. Therefore, the impoundment fits the definition for a low hazard potential CCR surface impoundment (as defined in the EPA Final CCR Rule §257.53).

INITIAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

References
October 6, 2016

3.0 REFERENCES

1. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities [RIN-2050-AE81; FRL-9149-4]. April 2015.

APPENDIX BREACH SCENARIOS

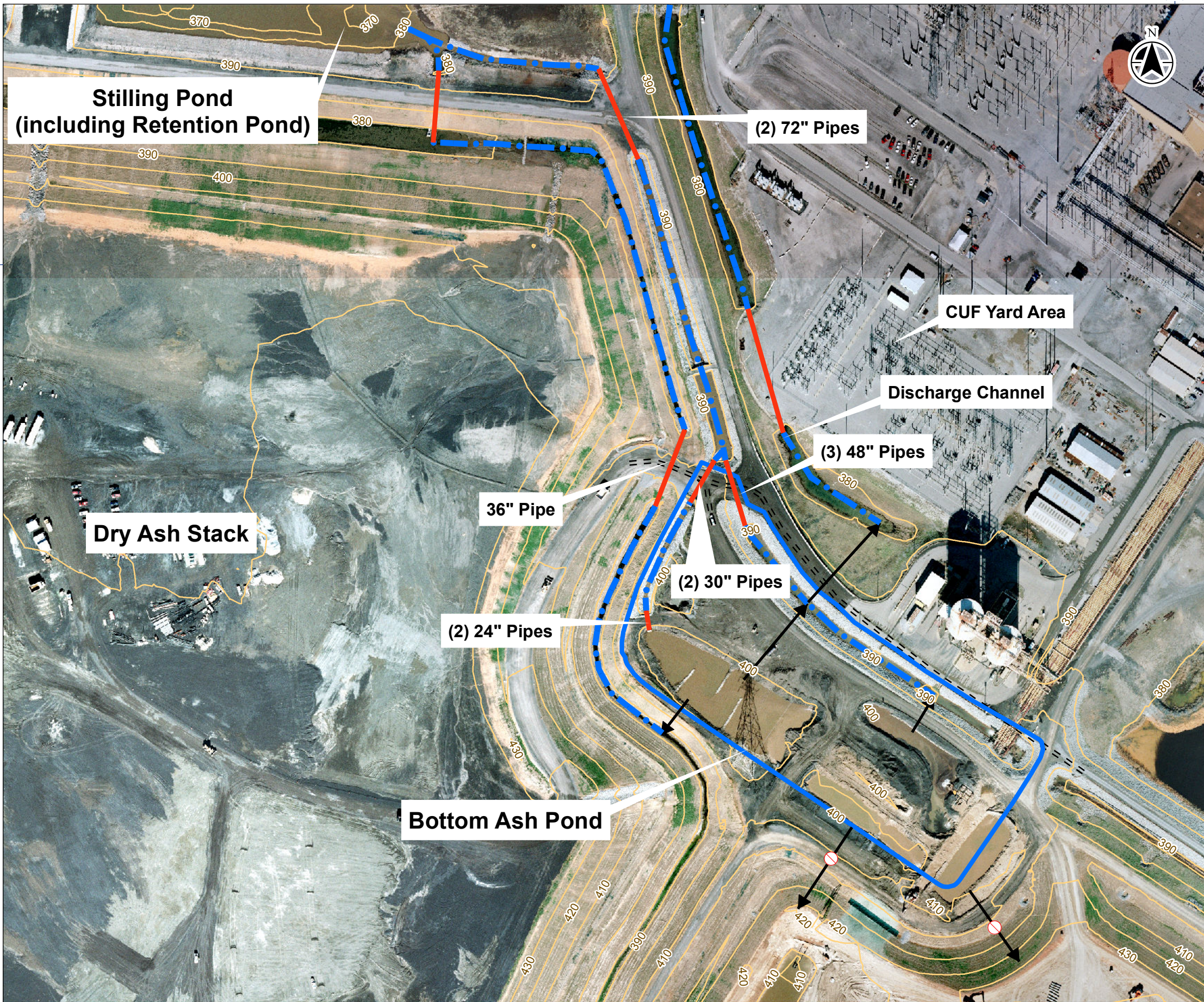
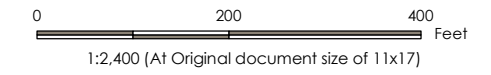
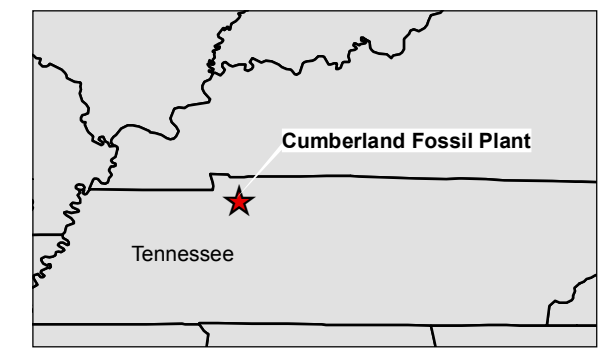


Figure No. **1**
 Title **Breach Scenarios CUF - Bottom Ash Pond**
 Client/Project Tennessee Valley Authority
 Cumberland Fossil Plant (CUF)
 Hazard Potential Classification Assessment
 Project Location: Stewart County, TN
 Prepared by MMM on 2015-08-07
 Technical Review by AWG on 2016-09-30
 Independent Review by WRM on 2016-09-30



Legend

- ➔ Potential Breach Direction of Flow
- ⊘ Direction in Which Breach Cannot Occur
- Pipes
- Ditch
- == Access Roads Potentially Impacted by Breach
- 10ft Contours
- Approximate Facility Limits



Notes
 1. Coordinate System: NAD 1927 StatePlane Tennessee FIPS 4100
 2. TVA Topographic Data for area around Bottom Ash Pond dated October, 2014.
 3. TVA Aerial Imagery dated June, 2014



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