Stantec Consulting Services Inc.
10509 Timberwood Circle, Suite 100, Louisville, Kentucky 40223-5308

October 12, 2021
File: rpt_034_let_175568465
Revision 0

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

RE: Periodic Hazard Potential Classification Assessment
Gypsum Disposal Area
EPA CCR Rule
TVA Paradise Fossil Plant
Drakesboro, Kentucky

1.0 PURPOSE

This letter documents certification that the Gypsum Disposal Area at the Tennessee Valley Authority (TVA) Paradise Fossil Plant is in compliance with the hazard potential classification requirements set forth in 40 CFR 257.73(a)(2) of the EPA CCR Rule. The EPA CCR Final Rule requires periodic hazard potential classification assessments, certified by a professional engineer, every five years. The initial certification of hazard potential classification was placed in the operating record on October 12, 2016.

2.0 INITIAL HAZARD CLASSIFICATION ASSESSMENT

The initial hazard potential classification assessment is attached. The results of the initial assessment assigned a hazard potential classification rating of "significant" for the Gypsum Disposal Area because a failure or mis-operation could result in off-site release of coal combustion residuals (CCR) and is unlikely to result in loss of human life.

3.0 CURRENT HAZARD CLASSIFICATION ASSESSMENT

Stantec reviewed the results of the initial assessment and the changes in conditions that have occurred in the past five years at the site. The following operational changes and other factors were considered in this periodic assessment:

1. Coal fired power generation at Paradise ceased operation February 2020. The Gypsum Disposal Area ceased receiving CCR and non-CCR wastestreams

2. Cross-sectional geometry of the perimeter dikes has not changed.

3. Annual and weekly inspections conducted since 2015 were reviewed as part of this assessment. No observations have been made that would affect the hazard assessment.

Re: **Periodic Hazard Potential Classification Assessment**
Gypsum Disposal Area
EPA CCR Rule
TVA Paradise Fossil Plant
Drakesboro, Kentucky

4. Monthly instrumentation (i.e., piezometer) monitoring conducted since 2015 has been reviewed and the phreatic condition at the critical cross section has not changed.

Based on our review, there are no conditions that have changed in the past five years that would cause the results of the initial hazard classification to have changed.

4.0 SUMMARY OF FINDINGS

Based on a review of the initial hazard potential classification assessment and the current site conditions, the result of this hazard potential classification assessment is that the Gypsum Disposal Area at the Paradise Fossil Plant meets the requirements for classification as a "significant" hazard impoundment (as defined in 40 CFR § 257.53).

5.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, Stephen H. Bickel, being a Professional Engineer in good standing in the Commonwealth of Kentucky, 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 hazard potential classification assessment for the TVA Paradise Fossil Plant's Gypsum Disposal Area meets the requirements specified in 40 CFR 257.73(a)(2).

SIGNATURE Stephen H. Bickel DATE 10/12/2021

ADDRESS: Stantec Consulting Services Inc.
10509 Timberwood Circle, Suite 100
Louisville, Kentucky 40223-5308

TELEPHONE: (502) 212-5075

ATTACHMENTS: Initial Hazard Potential Classification Assessment

INITIAL HAZARD POTENTIAL CLASSIFICATION ASSESSMENT

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

October 5, 2016
File: rpt_012_let_175565009
Revision 0

Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402

RE: Initial Hazard Potential Classification Assessment
Gypsum Disposal Area
EPA Final Coal Combustion Residuals (CCR) Rule
TVA Paradise Fossil Plant
Drakesboro, Kentucky

1.0 PURPOSE

This letter documents Stantec's certification of the initial hazard potential classification assessment for the TVA Paradise Fossil Plant's Gypsum Disposal Area. 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 Gypsum Disposal Area has been assigned a significant hazard potential classification rating.

2.0 BASIS FOR CLASSIFICATION RATING

As described in the attached assessment report, the hazard potential classification rating of "significant" was assigned to Gypsum Disposal Area because a failure or mis-operation would result in no probable loss of human life, but could cause economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. In 2013, an assessment was completed. Riverside Road downstream was identified as potentially impacted during a breach. No other structures or critical infrastructure were identified within the flow paths resulting from potential breach scenarios reviewed. Loss of life was considered improbable due to the intermittent use of the road and transient nature of persons entering this area. However, a breach could result in off-site release of CCRs. Review of the 2013 analysis and current conditions at the Gypsum Disposal Area concluded that the existing hazard classification is applicable.

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 "significant."

RE: Initial Hazard Potential Classification Assessment
Gypsum Disposal Area
EPA Final Coal Combustion Residuals (CCR) Rule
TVA Paradise Fossil Plant
Drakesboro, Kentucky

4.0 QUALIFIED PROFESSIONAL ENGINEER CERTIFICATION

I, John S. Montgomery, being a Professional Engineer in good standing in the Commonwealth of Kentucky, 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 Paradise Fossil Plant's Gypsum Disposal Area meets the requirements specified in 40 CFR 257.73(a)(2).

SIGNATURE John S. Montgomery DATE October 5, 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

Paradise Fossil Plant – Gypsum Disposal Area
Drakesboro, Kentucky

Prepared for:
Tennessee Valley Authority
Chattanooga, Tennessee

Prepared by:
Stantec Consulting Services Inc.
Lexington, Kentucky

October 5, 2016
Revision 0

Table of Contents

1.0 RATING

This report documents the Hazard Potential Classification Assessment for the Gypsum Disposal Area at Paradise Fossil Plant (PAF) 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 Gypsum Disposal Area is classified as a significant 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 review of a previous assessment conducted by Stantec in September, 2013.

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.

PAF is located in Muhlenberg County, Kentucky. The plant is located adjacent to the Green River, approximately 50 miles northwest of Bowling Green, KY. The Gypsum Disposal Area ultimately discharges into the Green River via the Peabody Ash Pond. A site overview figure is included in the appendix.

2.2 SOURCE DATA

The Gypsum Disposal Area was included as part of an assessment previously conducted in 2013. Stilling Pond 1 was considered in that study along with the Gypsum Stilling Pond 1 and Gypsum Disposal Area Stilling Pond 2 as a single system which was referenced in the report as "Scrubber Sludge Complex". Based on the findings, it was recommended that the hazard classification of the "Scrubber Sludge Complex", including the Gypsum Disposal Area, be listed as a significant hazard.

2.3 POTENTIAL FAILURE SCENARIOS

It was noted in the 2013 study that a breach of the "Scrubber Sludge Complex" could possibly cause a secondary breach of the Peabody Ash Pond due to the inflow volume of water and gypsum. It was also noted that a breach of the Peabody Ash Pond would likely result in flow through the culverts at Riverside Road potentially impacting the road. It was determined that this was a local road, was intermittently used and the at-risk populations were considered transient. Therefore, loss of life from a breach of the impoundment was not envisioned. However, a breach could result in off-site release of CCRs.

As part of this initial hazard classification assessment, site conditions were reviewed to determine if changes have occurred to the impoundment or to downstream areas that would affect the conclusions of the 2013 study. No significant changes have been identified and it is concluded the hazard classification determination is appropriate.

2.4 HAZARD CLASSIFICATION

Findings of this review and assessment demonstrate that a breach of the impoundment results in no probable loss of human life, but could cause economic loss or environmental damage. It is Stantec's opinion the impoundment fits the definition for a significant hazard potential CCR surface impoundment (as defined in the EPA Final CCR Rule §257.53).

3.0 REFERENCES

1. Stantec, September 30, 2013. Dam Safety Hazard Classification Projects Summary Report.

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

APPENDIX
SITE OVERVIEW FIGURE

Stantec

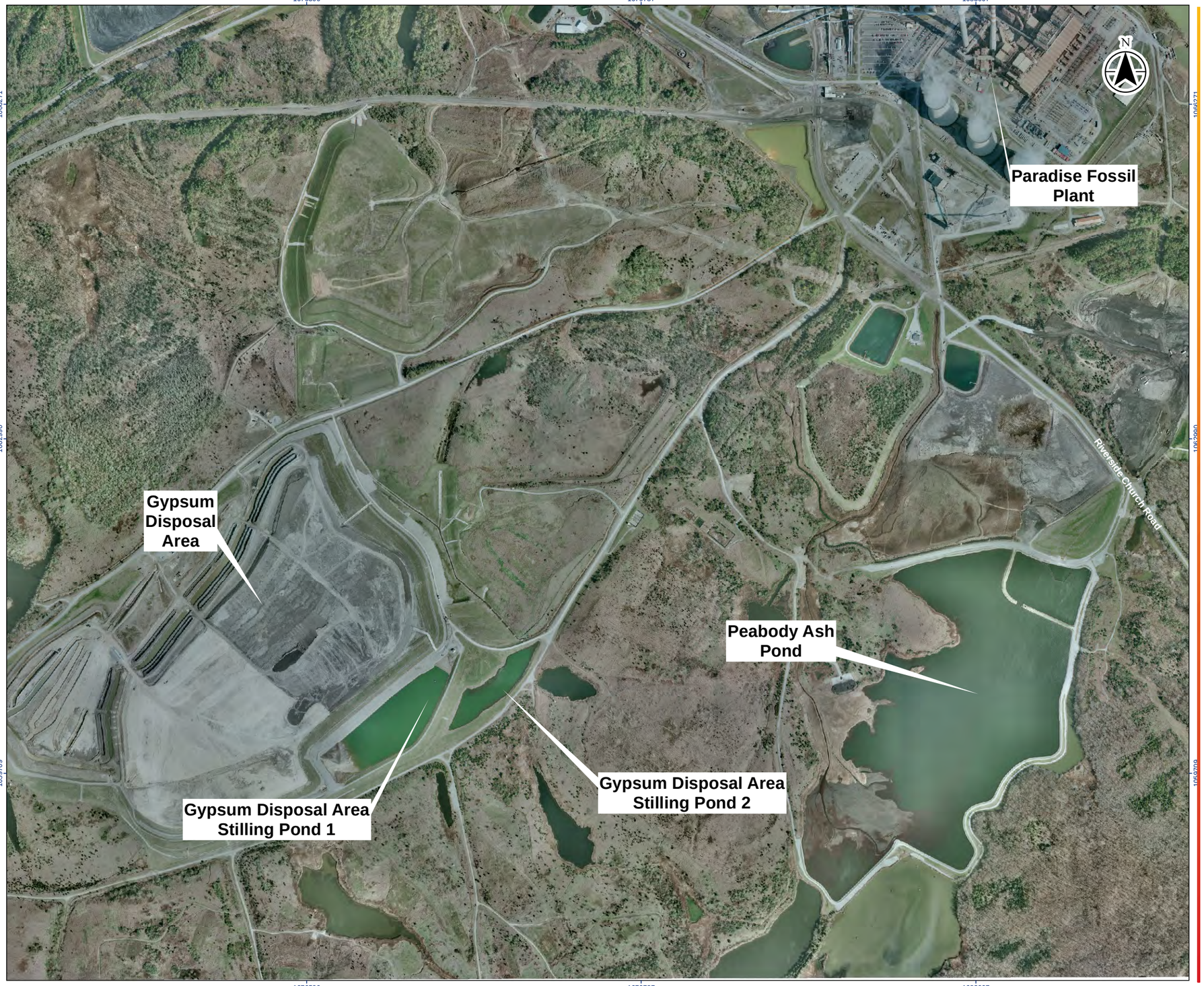


Figure No.
1

Title

Site Overview
PAF - Gypsum Disposal Area

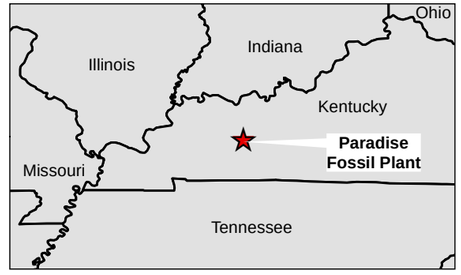
Client/Project
Tennessee Valley Authority
Paradise Fossil Plant (PAF)
Hazard Potential Classification Assessment

Project Location:
Muhlenberg County, Kentucky

Prepared by BSJ on 2015-06-29
Technical Review by AWG on 2016-09-30
Independent Review by WRM on 2016-09-30

0 500 1,000 Feet

1:12,000 (At Original document size of 11x17)



Notes
1. Coordinate System: NAD 1983 StatePlane Tennessee FIPS 4100 Feet
2. TVA Aerial Imagery Dated 2016.
3. State boundaries produced by ESRI, U.S. Department of Commerce, U.S. Census Bureau.

Stantec

TVA

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