



Documentation of Initial  
Hazard Potential  
Classification  
Assessment

GMF Pond  
Duck Creek Power Station  
Fulton County, Illinois

## Table of Contents

Section	Page No.
<b>Executive Summary .....</b>	<b>1</b>
<b>1. Introduction .....</b>	<b>2</b>
1.1. Background .....	2
1.2. Location.....	2
<b>2. Source Data.....</b>	<b>2</b>
<b>3. Potential Failure Scenarios .....</b>	<b>3</b>
3.1. Unit Description.....	3
3.2. Failure Scenarios.....	3
3.2.1. North .....	3
3.2.2. South .....	3
3.2.3. East .....	3
3.2.4. West.....	4
<b>4. Hazard Classification .....</b>	<b>4</b>

## List of Appendixes

Appendix A Site Overview Figure

## Executive Summary

This report documents the hazard potential classification assessment for the GMF Pond at the Duck Creek Power Station as required per the CCR Rule in 40 C.F.R. § 257.73 (a)(2). The applicable hazard potential classifications are defined in 40 C.F.R. § 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 and the analysis herein, the GMF 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 CCR unit was determined by a visual assessment conducted by Stantec in August, 2016.

# 1. Introduction

## 1.1. Background

The CCR Rule was published in the Federal Register on April 17, 2015. The Rule requires that a hazard potential classification assessment be performed for existing CCR surface impoundments that are not incised. A previously completed assessment may be used in lieu of the initial assessment provided the previous hazard assessment was completed no earlier than April 17, 2013. The applicable hazard potential classifications are defined in the CCR Rule 40 C.F.R. § 257.53 as follows:

*High Hazard Potential CCR surface impoundment means a diked surface impoundment where failure or mis-operation will probably cause loss of human life.*

*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.*

*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.*

Dynegy has contracted Stantec Consulting Services Inc. (Stantec) to prepare hazard potential classification assessments for selected impoundments<sup>1</sup>.

It was determined that there was no existing available hazard potential classification assessment documentation for the GMF Pond.

## 1.2. Location

The Duck Creek Power Station is located in Canton, Illinois, roughly 50 miles west of Bloomington, Illinois. The GMF Pond is bound to the west by North Bethel Cemetery Road, a local plant access road, and a railroad. A site overview figure is included in Appendix A.

# 2. Source Data

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

- Topographic data, NAD 1983 StatePlane Illinois West FIPS 1202 Feet

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<sup>1</sup> Dynegy Administrative Services Company (Dynegy) contracted Stantec on behalf of the Duck Creek Power Station owner, Illinois Power Resources Generating, LLC. Thus, Dynegy is referenced in this report.

- Basemap Imagery, NAD 1983 StatePlane Illinois West FIPS 1202 Feet
- Gypsum Management Facility Record Drawings, February 2008

### **3. Potential Failure Scenarios**

#### **3.1. Unit Description**

The GMF Pond is located directly north of the GMF Recycle Pond, east of North Bethel Cemetery Road. The pond encompasses approximately 30 acres and is graded to the south, where water discharges into a channel to flow into the GMF Recycle Pond. From the GMF Recycle Pond, water exits through piping into the Duck Creek Cooling Pond.

#### **3.2. Failure Scenarios**

Four failure scenarios were evaluated as summarized below.

##### **3.2.1. North**

A breach of the GMF Pond to the north would discharge into localized depressions which flow into the Duck Creek Cooling Pond. Because this water typically discharges to the Duck Creek Cooling Pond under normal operating procedures, a breach in this direction is not a severe threat. The impact to the water surface elevation of Duck Creek Cooling Pond would not be significant. A breach in this direction would likely be contained within the Duck Creek Cooling Pond and on the Duck Creek Power Station property.

##### **3.2.2. South**

A breach of the GMF Pond to the south would discharge into the GMF Recycle Pond and may flood the pump house. The GMF Pond is currently graded to drain to the GMF Recycle Pond, a relative low spot. If the GMF Recycle Pond exceeds capacity, the ground surrounding the recycle pond is graded to drain to the Duck Creek Cooling Pond. The impact to the water surface elevation of Duck Creek Cooling Pond would not be significant due to the relative size of the GMF Pond relative to the Cooling Pond. A transmission tower is located in between the GMF Recycling Pond and the Duck Creek Cooling Pond. Power outage would not likely occur if the transmission tower was inundated. The breach could harm the structural integrity of the tower and immediate repairs may be necessary. Otherwise, a breach in this direction would likely be contained within the Duck Creek Cooling Pond and on the Duck Creek Power Station property.

##### **3.2.3. East**

A breach of the GMF Pond to the east would flow into the low-lying areas, which discharge to the Duck Creek Cooling Pond. The impact to the water surface elevation of Duck Creek Cooling Pond would not be significant. A transmission tower

is also located east of the GMF Pond. Power outage would not likely occur if the transmission tower was inundated. The breach could harm the structural integrity of the tower and immediate repairs may be necessary. A breach in this direction would likely be contained within the Duck Creek Cooling Pond and on the Duck Creek Power Station property.

#### **3.2.4. West**

A breach of the GMF Pond to the west would overtop the access road, railroad, and North Bethel Cemetery Road. This road is used primarily as entrance to the plant by personnel. The ditches running parallel with these roads and railroads are graded to drain south and discharge into localized depressions southwest of the GMF Pond. A culvert runs under the railroad connecting to low-lying areas which discharge to the Duck Creek Cooling Pond. The impact to the water surface elevation of Duck Creek Cooling Pond would not be significant. Therefore, a breach in this direction would likely be contained within the Duck Creek Cooling Pond.

### **4. Hazard Classification**

Only Duck Creek Power Station owned structures were identified within the paths of the identified potential breach scenarios for the GMF Pond at the Duck Creek Power Station. Potential public impacts from a breach are limited to portions of North Bethel Cemetery Road and the railroad to/from the power station. North Bethel Cemetery Road is intermittently used and the at-risk populations are considered transient. In accordance with Federal guidelines, loss of life is not considered probable for scenarios where persons are only temporarily in the potential inundation area (Reference 2).

Per analysis findings outlined above, it is in Stantec's opinion that a breach of the GMF Pond does not represent a probable threat to human life. However, it is anticipated that a breach failure of the containment dike would result in the release of the stored CCR materials into downstream areas and waterways which can cause environmental damage. Therefore, the impoundment fits the definition for a Significant hazard potential CCR surface impoundment (as defined in the CCR Rule §257.53).

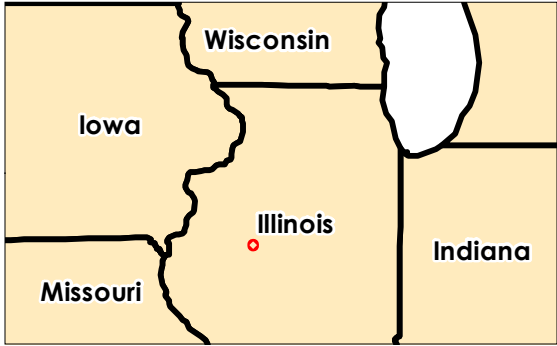
### **5. References**

1. EPA Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, 40 CFR § 257 and § 261 (effective April 17, 2015).
2. Federal Emergency Management Association (FEMA). (2004). *Hazard Potential Classification System for Dams*.

Appendix A

Site Overview Figure





- Notes**
1. Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
  2. Aerial Source: 2015 NAIP Imagery
  3. Impoundment Boundaries Provided by Client (Dated 9/9/2015)

0 800 Feet  
1:9,000 (At original document size of 11x17)



Project Location 175605019  
Latitude: 40.466181 Prepared by WSW on 2016-10-06  
Longitude: -89.984236 Technical Review by NS on 2016-10-06  
Fulton County, Illinois Independent Review by MH on 2016-10-06

Client/Project  
Dynegy  
Duck Creek Power Station  
Hazard Potential Classification Assessment

Figure No.  
**1**

Title  
**Site Overview Figure  
GMF Pond  
Duck Creek Power Station**

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