# Inflow Design Flood Control System Plan

*Plant McDonough-Atkinson*
*Ash Pond 3 (AP-3) and Ash Pond 4 (AP-4)*

Revision 01

November 2020

Prepared for:

**Georgia Power Company**

Prepared by:

**Golder Associates Inc.**

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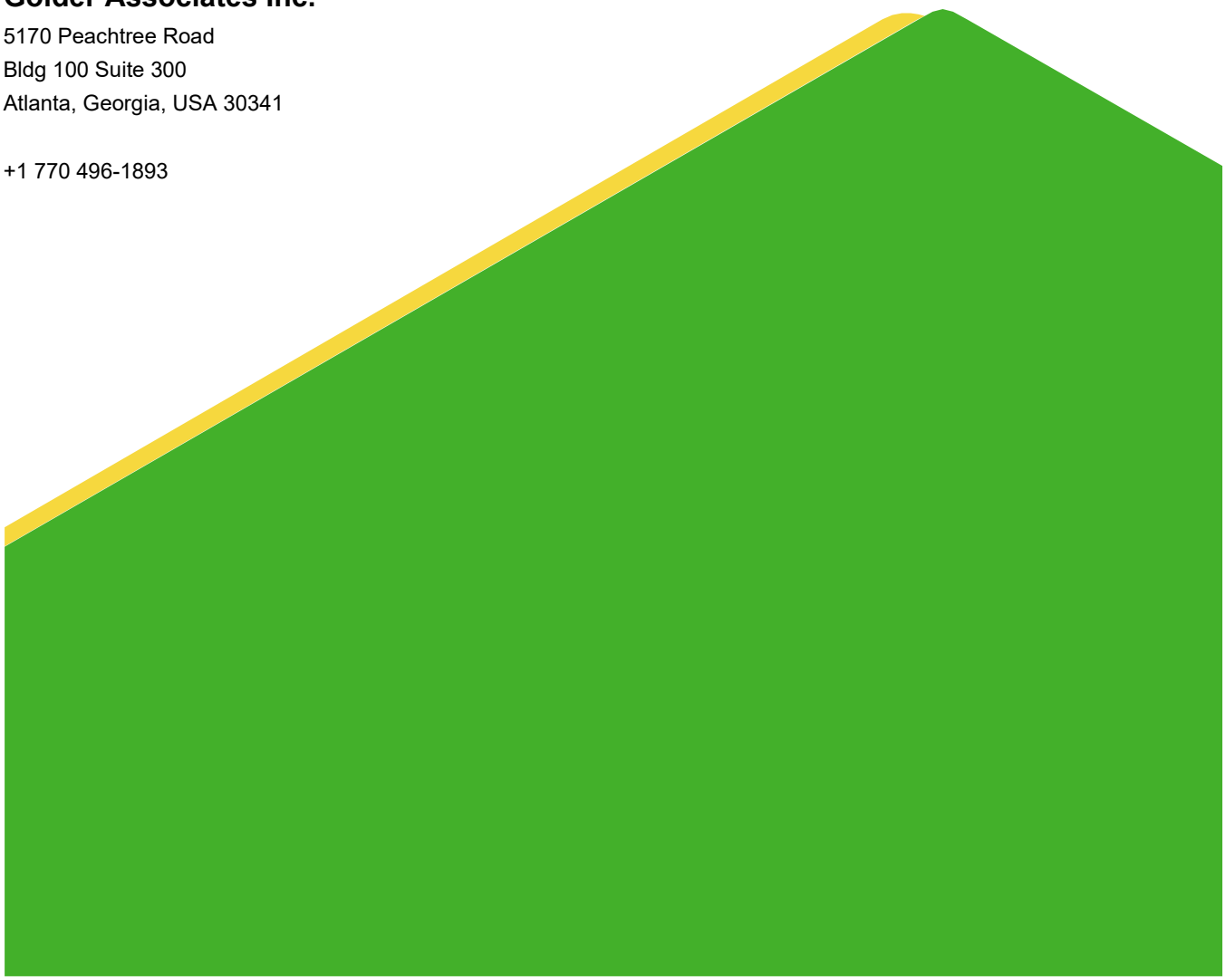

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**APPENDICES**

# CERTIFICATION

This Inflow Design Flood Control System Plan for Georgia Power Company (Georgia Power)'s Ash Pond 3 (AP-3) and Ash Pond 4 (AP-4), located at Plant McDonough-Atkinson (Plant McDonough), was prepared by Golder Associates Inc. (Golder).

I certify that this document was prepared in accordance with the requirements of the United States Environmental Protection Agency's "Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments" Final Rule (40 C.F.R. Part 257), §257.82 and §257.100(e)(4)(ii).


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# 1.0 INTRODUCTION

This Inflow Design Flood Control System Plan was prepared for Georgia Power's AP-3 and AP-4, located at Plant McDonough in Cobb County, Georgia. Pursuant to 40 CFR §257.82 and §257.100(e)(4)(ii), the owner or operator of an existing CCR surface impoundment is required to design, construct, operate, and maintain an inflow design flood control system capable of adequately managing flow during and following the peak discharge of the specified inflow design flood. The owner or operator must prepare an inflow design system plan documenting how the inflow design flood control system has been designed and constructed to meet the requirements of §257.82.

AP-3 and the adjacent AP-4 are currently being consolidated and closed in place as combined unit AP-3/4 in accordance with §257.102(d), and are in the process of obtaining a solid waste permit under the Georgia Rules for Solid Waste Management, 391-3-4-.10.

# 2.0 INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN

## Hazard Potential Classification

As indicated in the *Hazard Potential Classification Assessment* for AP-3 and AP-4, the current conditions for the impoundments are assigned a "Low" hazard potential for AP-3 and "High" hazard potential rating for AP-4 per 40 CFR §257.73.

## Inflow Design Flood

According to 40 CFR §257.82(a)(3)(ii), a hazard potential rating of "High" for AP-4 requires an evaluation of the probable maximum flood event (PMP). The 6-hour PMP storm depth for the site is 30.5 inches.

## Inflow and Outflow Control

At the time of this submittal, AP-3 and AP-4 are undergoing construction activities to consolidate and close in place as combined CCR unit AP-3/4. As such, the 6-hour PMP was utilized for the combined unit, although only AP-4 is designated a "High" hazard potential. The hydrologic conditions of AP-3/4 in the interim condition were evaluated as were captured through a survey in October 2017. The topography analyzed represents construction conditions in progress towards the closure of combined CCR unit AP-3/4. These conditions include a system of three temporary detention ponds that retain stormwater during the construction process. Storage capacity of each pond in this interim condition is connected at certain areas, and along with the use of pumps during the construction process, allows all runoff during storm events to be contained in the available storage volume. The configuration and stage-storage curve safely contain the inflow design flood.

AP-3/4's interim condition systems were modeled within the Autodesk Storm and Sanitary Analysis (SSA) program. The analysis was conducted using the 6-hour PMP, which was modeled as 30.5 inches of rain. Based on this analysis, AP-3/4's inflow design flood control system is capable of adequately managing the inflow from the PMP storm event without overtopping the embankment of any of the system's detention ponds, and has adequate capacity to manage the resulting outflow. A detailed memorandum outlining the analysis of the stormwater system is provided in Appendix A.

# 3.0 CONCLUSIONS

I certify that AP-3 and AP-4's inflow design flood control system plan in the interim condition meets the requirements of 40 CFR §257.82 and §257.100(e)(4)(ii).

# Hydrology and Hydraulic Design for AP-3 and AP-4 Interim Construction Conditions

# CALCULATIONS

| | | | |
|---|---|---|---|
| **Date:** | 19 March 2018 | **Made by:** | Jimmy D. Grimes |
| **Subject:** | Inflow Design Flood Control System - Hydrology and Hydraulic Calculation | **Checked by:** | LDH / LS |
| | | **Reviewed by:** | Gregory L. Hebeler |
| **Project:** | **ASH POND 3 (AP-3) AND ASH POND 4 (AP-4)** **PLANT MCDONOUGH-ATKINSON, GEORGIA POWER COMPANY** | | |

## 1.0 OBJECTIVE

The objective of this report is to demonstrate engineering calculations for the hydraulic capacity of Ash Pond 3 (AP-3) and Ash Pond 4 (AP-4) as required by the United States Environmental Protection Agency's final rule for Disposal of CCR from Electric Utilities. AP-3 and AP-4, located at Georgia Power Company's Plant McDonough-Atkinson (Plant McDonough) were evaluated during closure construction from the LiDAR (light detection and ranging) survey taken on 03 October 2017.

## 2.0 METHODOLOGY

The October 2017 conditions were analyzed at AP-3 and AP-4 to determine if adequate capacity exists in the interim condition to safely store storm inflow from a series of storm events. Golder delineated a basin that contributes to a system of three temporary detention ponds that retain stormwater during the construction process, named temporary ponds A, B, and C. The storage capacity of each pond in this interim condition is connected at certain areas. This fact along with the use of pumps during the construction process allows all runoff during storm events to enter the storage volume within temporary pond B. A simplified runoff volume was calculated assuming that all rainfall in AP-3 and AP-4 is translated into runoff. This total runoff amount was then compared to the total storage present in temporary pond B to determine if adequate capacity exists in the interim condition.

## 3.0 PRECIPITATION

**Table 1: 24 Hour Storm Depths**

| Storm Event | Depth (in) |
|---|---|
| 100 year | 7.52 |
| 1000 year | 10.40 |

National Oceanic and Atmospheric Association (NOAA)'s Atlas 14 was used to determine storm depths for a series of 24 hour storms ranging from the 100 year to 1000 year storm event as shown in Table 1. The 6 hour probable maximum precipitation (PMP) storm was also analyzed, with a total PMP storm depth of 30.5 inches as taken from the NOAA and United States Department of the Army Corps of Engineers Hydrometeorological Report No. 51 – Probable Maximum Precipitation Estimates, United States East of the 105th Meridian.

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## 4.0 STAGE STORAGE

A stage storage curve was generated for temporary pond B based on October 2017 LiDAR information. Table 2 provides this storage information for temporary pond B:

**Table 2: Stage-Storage Curve for Temporary Pond B**

| Elevation | Volume (acre-ft) |
|---|---|
| 798 | 0.00 |
| 800 | 0.39 |
| 805 | 5.60 |
| 810 | 18.42 |
| 815 | 44.63 |
| 820 | 96.25 |
| 825 | 179.22 |
| 830 | 277.60 |
| 835 | 388.40 |

## 5.0 HYDROLOGY AND RUNOFF VOLUME ANALYSIS

An analysis of the hydrology of AP-3 and AP-4 was performed based on topography present in October 2017. A single watershed was delineated which encompasses the area of AP-3 and AP-4 (**Error! Reference source not found.**). All rainfall into AP-3 and AP-4 was converted to runoff. All runoff generated within the basin can be stored within temporary pond B. Table 3 gives an estimation of the peak water surface elevation and freeboard within temporary pond B. An elevation of 835 ft-msl was taken as the pond embankment elevation and was used to calculate freeboard levels. It was shown that adequate capacity exists within temporary pond B to store the runoff from each storm event:

**Table 3: AP-3 and AP-4 Hydrology Parameters and Runoff Volume**

| | Basin Size (acres) | Storm Depth (in) | Assumed Runoff Volume (acre-ft) | Approximate Peak Water Elevation (ft-msl) | Approximate Freeboard (ft) |
|---|---|---|---|---|---|
| 100 Year, 24 Hour Storm | 79.1 | 7.52 | 49.57 | 816 | 19 |
| 1000 Year, 24 Hour Storm | 79.1 | 10.4 | 68.55 | 818 | 17 |
| PMP, 6 Hour Storm | 79.1 | 30.5 | 201.05 | 827 | 8 |

## 6.0 REFERENCES


Haubner, S., Reese, A., Brown, T., Claytor, R., & Debo, T. (2001). Georgia stormwater management manual: Volume 2 technical handbook. *Georgia: Atlanta Regional Commission and Georgia Department of Natural Resources—Environmental Protection Division Atlanta*, 844.

Perica, S., Martin, D., Pavlovic, S., Roy, I., Laurent, M. S., Trypaluk, C. A. R. L., & Bonnin, G. (2013). NOAA Atlas 14 Volume 9 Version 2, Precipitation-Frequency Atlas of the United States, Southeastern States. *NOAA, National Weather Service, Silver Spring, MD*, 18.

SCS, U. (1986). Urban hydrology for small watershed (technical release 55). *Washington, DC: US Department of Agriculture*.

Schreiner, L. C., & Riedel, J. T. (1978). Hydrometeorological Report No. 51: Probable Maximum Precipitation Estimates, United States East of the 105th Meridian. U.S. Department of Commerce, National Oceanic and Atmospheric Administration and U.S. Department of the Army, Corps of Engineers.


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