INFLOW DESIGN FLOOD CONTROL SYSTEM PLAN
40 C.F.R. PART 257.82
PLANT WANSLEY ASH POND 1 (AP-1)
GEORGIA POWER COMPANY

EPA's "Disposal of Coal Combustion Residuals from Electric Utilities" Final Rule (40 C.F.R. Part 257 and Part 261), §257.82, requires the owner or operator of an existing or new CCR surface impoundment, or any lateral expansion of a CCR surface impoundment, to design, construct, operate and maintain an inflow design flood control system. The inflow design flood control system must be capable of safely managing flow during and following the peak discharge of the specified inflow design flood. The owner or operator of the CCR unit must also prepare a written plan documenting how the inflow flood control system has been designed and constructed to meet the requirements of §257.82.

The CCR surface impoundment known as Plant Wansley AP-1 is located on Plant Wansley property, in Heard and Carroll Counties, Carrollton, Georgia. AP-1 is a 343-acre surface impoundment designed to store CCR and water. The specified inflow design flood was determined by considering rainfall that falls within the limits of the surface impoundment, stormwater runoff from approximately 290 acres of adjoining watershed, and a nominal amount (relative to rainfall) of process flows. Collected stormwater is temporarily stored within the limits of the surface impoundment, and discharged through a 42-inch diameter corrugated metal pipe (CMP) that serves as the primary spillway, which is located on the southwestern end of the pond (decant water intake structure). The 42-inch CMP splits into a 36-inch diameter and 10-inch diameter pipe, respectively, downstream of the pond as it makes its way back toward Plant Wansley. The 36-inch pipe returns water back to Plant Wansley and the 10-inch pipe discharges water into a detention pond on the south end of the Plant property. An auxiliary spillway system consisting of a 36-inch diameter CMP and a 45-foot wide concrete broad crested weir is located on the west end of the surface impoundment along the western embankment.

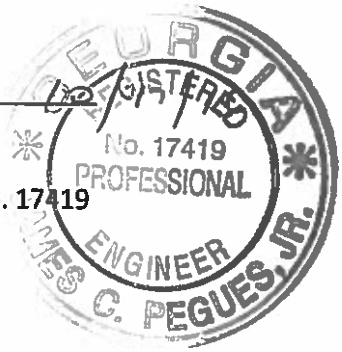
The inflow design flood has been calculated using the Natural Resources Conservation Service method (also known as the Soil Conservation Service (SCS) method) for a 100-yr storm event, which is required for a Low hazard potential facility. Runoff curve number data was determined using Table 2-2A from the Urban Hydrology for Small Watersheds (TR-55). Appendix A and B from the TR-55 were used to determine the rainfall distribution methodology. Precipitation values were determined from NOAA's Precipitation Frequency Data Server (Atlas-14).

The NRCS provided information on the soil characteristics and hydrologic groups present at the site. It was determined that hydrological group "B" best reflects the characteristics of the soils on site and as such was used to develop inputs for the calculations. This information was placed into Hydraflow Hydrographs 2013 and used to generate appropriate precipitation curves, storm basin routing information, and resulting rating curves to evaluate surface impoundment capacity.

Calculations indicate that AP-1 can safely store and pass the specified inflow design storm (24-hr, 100-yr storm event). This plan is supported by appropriate engineering calculations which are attached.

The facility is operated subject to and in accordance with § 257.3-3 of EPA's regulations.

I hereby certify that the inflow design flood control system plan meets the requirements of 40 C.F.R. Part 257.82.



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Inflow Design Control System Plan:
Hydrologic and Hydraulic Calculation Summary

for

Plant Wansley Ash Pond

Prepared by:

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1.0 Purpose of Calculation

The purpose of this report is to demonstrate the hydraulic capacity of the subject CCR impoundment in order to prepare an inflow design flood control plan as required by the United States Environmental Protection Agency's (EPA) final rule for Disposal of CCR from Electric Utilities (EPA 40 CFR 257).

2.0 Summary of Conclusions

A hydrologic and hydraulic model was developed for the Plant Wansley Ash Pond to determine the hydraulic capacity of the impoundment. The design storm for the Plant Wansley Ash Pond is a 100-year rainfall event. Southern Company has selected a storm length of 24-hours for all inflow design flood control plans. The results of routing a 100-year, 24-hour rainfall event through the impoundment are presented in Table 1 below:

Table 1. Flood Routing Results

Plant Wansley	Normal Pool El (ft)	Top of embankment El (ft)	Emergency Spillway Crest El (ft)	Peak Water Surface Elevation (ft	Freeboard* (ft)	Peak Inflow (cfs)	Peak Outflow (cfs)
Ash Pond	798.0	805.0	802.6	799.56	3.04	2279	38.32

*Freeboard is measured from the spillway crest to the peak water surface elevation

3.0 Methodology

3.1 HYDROLOGIC ANALYSES

The Plant Wansley Ash Pond is classified as a low hazard structure. The design storm for a low hazard structure is a 100-year rainfall event. A summary of the design storm parameters and rainfall distribution methodology for these calculations is summarized below in Table 2.

Table 2. Ash Pond Storm Distribution

Hazard Classification	Return Frequency (years)	Storm Duration (hours)	Rainfall Total (Inches)	Rainfall Source	Storm Distribution
Low	100	24	7.92	NOAA Atlas 14	SCS Type II

The drainage area for the Plant Wansley Ash Pond was delineated based on LiDAR data acquired for the Plant in 2014. Runoff characteristics were developed based on the Soil Conservation Service (SCS) methodologies as outlined in TR-55. An overall SCS curve number for the drainage area was developed based on the National Engineering Handbook Part 630, Chapter 9 which provides a breakdown of curve numbers for each soil type and land use combination. Soil types were obtained from the NCSS online

soils database. Land use areas were delineated based on aerial photography. Time of Concentration was developed using TR-55.

A table of the pertinent basin characteristics of the Ash Pond is provided below in Table 3.

Table 3. Ash Pond Hydrologic Information

Drainage Basin Area (acres)	634
Hydrologic Curve Number, CN	72
Hydrologic Methodology	SCS Method
Time of Concentration (minutes)	34.8
Hydrologic Software	Hydraflow Hydrographs

Runoff values were determined by importing the characteristics developed above into a hydrologic model with the Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2013.

Process flows from Plant Wansley were considered in this analysis. Based on normal plant operations, the Ash Pond receives an additional 50.5 MGD (78.2 cfs) maximum of inflow from the Plant.

3.2 HYDRAULIC ANALYSES

Storage values for the Ash Pond were determined by developing a stage-storage relationship utilizing contour data. The discharge system at the Plant Wansley Ash Pond consists of a primary discharge structure and an auxiliary spillway. The primary discharge structure consists of a 42" gravity flow pipe. The invert elevation of the pipe is EL 800.62. The auxiliary spillway is a concrete trapezoidal weir with a crest elevation of EL 802.6.

Based on the discharge data listed previously, the data was inserted into Hydraflow Hydrographs to determine the pond performance during the design storm. Results are shown in Table 1.

4.0 SUPPORTING INFORMATION

4.1 CURVE NUMBER

Terrain Type	Area (ac)	Curve Number
Water	250	100
Bare Gypsum/Ash	60	79
Woods	324	50

4.2 STAGE-STORAGE TABLE

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	798.00	11,559,660	0	0
1.00	799.00	11,638,650	11,599,160	11,599,160
2.00	800.00	11,717,770	11,678,200	23,277,360
2.62	800.62	11,766,880	7,280,240	30,557,600
3.00	801.00	11,797,000	4,477,140	35,034,740
4.00	802.00	11,876,350	11,836,680	46,871,420
5.00	802.60	11,924,020	11,900,180	58,771,600

4.3 TIME OF CONCENTRATION

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.92		0.00		0.00		
Land slope (%)	= 6.70		0.00		0.00		
Travel Time (min)	**= 28.81**	**+**	**0.00**	**+**	**0.00**	**=**	**28.81**
Shallow Concentrated Flow							
Flow length (ft)	= 720.00		0.00		0.00		
Watercourse slope (%)	= 9.70		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=5.03		0.00		0.00		
Travel Time (min)	**= 2.39**	**+**	**0.00**	**+**	**0.00**	**=**	**2.39**
Channel Flow							
X sectional flow area (sqft)	= 168.00		0.00		0.00		
Wetted perimeter (ft)	= 47.00		0.00		0.00		
Channel slope (%)	= 4.50		0.00		0.00		
Manning's n-value	= 0.100		0.015		0.015		
Velocity (ft/s)	=7.42						
			0.00				
					0.00		
Flow length (ft)	({0})1620.0		0.0		0.0		
Travel Time (min)	**= 3.64**	**+**	**0.00**	**+**	**0.00**	**=**	**3.64**
Total Travel Time, Tc							**34.80 min**

4.4 DISCHARGE TABLE

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	798.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.00	11,599,160	799.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.00	23,277,360	800.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.62	30,557,600	800.62	---	---	---	---	0.00	---	---	---	---	38.32	38.32
3.00	35,034,740	801.00	---	---	---	---	0.00	---	---	---	---	38.32	38.32
4.00	46,871,420	802.00	---	---	---	---	0.00	---	---	---	---	38.32	38.32
5.00	58,771,600	802.60	---	---	---	---	0.00	---	---	---	---	38.32	38.32

4.5 DRAINAGE BASIN