PERIODIC RUN-ON AND RUN-OFF CONTROL PLAN
40 C.F.R. PART 257.81
PLANT DANIEL NORTH ASH MANAGEMENT UNIT
MISSISSIPPI POWER COMPANY

EPA's "Disposal of Coal Combustion Residuals from Electric Utilities Final Rule (40 C.F.R. Part 257 and Part 261) establishes certain run-on and run-off control requirements for CCR landfills. Per §257.81, the owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill must design, construct, operate and maintain a run-on control system to prevent flow onto the active and/or closed portion of the CCR unit during the peak discharge from a 24-hour, 25-year storm. In addition, the owner or operator must design, construct, operate and maintain a run-off control system from the active and/or closed portion of the CCR unit to collect and control at least the water volume resulting from a 24-hour, 25-year storm. The owner or operator also must prepare a written plan documenting how the run-on and run-off control system plans have been designed and constructed to meet the requirements of the referenced sections of the rules. Each plan is to be supported by appropriate engineering calculations. In addition, §257.81(c)(4) requires periodic run-on and run-off control system plans be prepared every 5 years.

The North Ash Management Unit (NAMU) is located at Mississippi Power Company's Plant Daniel. The facility is constructed with a 24-inch compacted clay liner overlain by a geocomposite clay liner (GCL) and consists of dry CCR storage cell and a sedimentation pond.

The storm water flows have been calculated using the Natural Resources Conservation Service method (also known as the Soil Conservation Service (SCS) method) using 24-hour storm events. The storm water detention system has been designed in accordance with the Mississippi Nonhazardous Solid Waste Management Regulations requirements, as well as other local, city, and government codes.

Runoff curve number data was determined using Table 2-2A from the Urban Hydrology for Small Watersheds (TR-55). Values for Type III Rainfall Distribution were determined from National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Precipitation Frequency Data Server, Volume 9, Version 2.

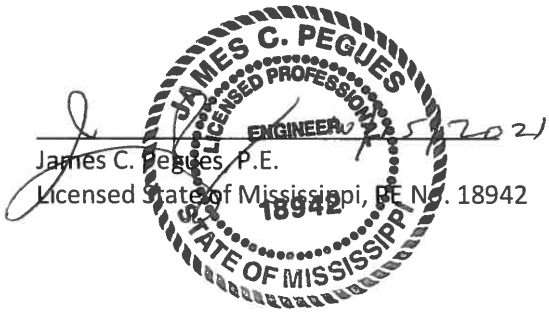
The NRCS provided information on the soil characteristics and hydrologic groups present at the site. It was determined that the hydrological group "B" should be used to best reflect the characteristics of the soils on site. This information was placed into Hydraflow Hydrographs 2019 and used to generate appropriate precipitation curves, runoff curve numbers and storm basin runoff values.

The NAMU is designed and constructed with perimeter berms that prevent run-on to the landfill. The water level in the sedimentation pond is controlled by pumps, which moves the run-off water to an intermediate discharge tank outside the CCR landfill footprint. During a 25-year, 24-hour storm event, the discharge into the sedimentation pond results in a water level rise to approximately EL 16.9. This is below the crest elevation of EL 18, leaving additional storage capacity available, if needed, for larger storm events.

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 run-on and run-off control system plan meets the requirements of 40 C.F.R. §257.81.



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Run-on and Run-off Control System Plan for Landfills:
Calculation Summary

for

Plant Daniel North Ash Management Unit

Prepared by:

Southern Company T&PS Environmental Solutions

Originator: _____ 9/29/2021
Ashley O. Grissom Date

Reviewer: _____ 10/04/2021
Gerrad W. Wilson Date

Approval: _____ 10/4/2021
James C. Pegues Date

1.0 Purpose of Calculation

The purpose of this report is to demonstrate the run-on and run-off controls of the subject CCR landfill in order to prepare a run-on and run-off control system 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

2.1 Site Overview

The Plant Daniel North Ash Management Unit (NAMU) is located on Mississippi Power Company property in Moss Point, Mississippi. The total area occupied by the landfill is 39.8 acres. The facility includes a perimeter dike around the dry ash cell to contain surface rainfall run-off. Run-off from this area is directed into a sedimentation pond via interior perimeter ditches and culverts. Water from the sedimentation pond is pumped to the NPDES discharge.

An overview of the facility is provided in Table 1 below.

Table 1. Landfill site characteristics

Description	Dry ash cell	Sedimentation Pond
Size (Acres)	29.73	3.42
Outlet Type	Three 48" HDPE pipes	Two 13" pump lines
Outlets To	Sedimentation Pond	Pumped to the NPDES discharge

2.2 Run-on Control System Plan

There is no stormwater run-on into the facility because it is contained within earthen berms that prevent stormwater from the surrounding area from entering the ash cell.

2.3 Run-off Control System Plan

A hydrologic and hydraulic model was developed for the Plant Daniel NAMU landfill to determine the hydraulic capacity of the sedimentation pond. The design storm for the purposes of run-off control system plans is the 24-hour, 25-year rainfall event. The results of routing the design storm event through the landfill are presented in the following table:

Table 2. Flood Routing Results

Plant Daniel	Normal Pool El (ft)	Top of embankment El (ft)	Peak Water Surface Elevation (ft)	Freeboard* (ft)	Peak Inflow (cfs)	Peak Outflow (cfs)
Sed. pond	12.0	18.0	16.88	1.12	333.65	22.28

*Freeboard is measured from the top of the embankment to the peak water surface elevation

3.0 Methodology

3.1 HYDROLOGIC ANALYSES

The design storm for all run-on/run-off analyses is a 24-hour, 25-year rainfall event. A summary of the design storm parameters and rainfall distribution methodology for these calculations is summarized below in Table 3.

Table 3. Design Storm Distribution

Return Frequency (years)	Storm Duration (hours)	Rainfall Total (Inches)	Rainfall Source	Storm Distribution
25	24	10.9	NOAA Atlas 14	SCS Type III

The drainage area for the Plant Daniel NAMU landfill was delineated based on design topography developed for construction of the facility in 2006 and as-built data. Run-off 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 methods prescribed in TR-55. Soil types were obtained from the Natural Resources Conservation Service. Land use areas were delineated based on aerial photography and design data. Time of Concentration was also developed based on methodologies prescribed in TR-55.

A table of the pertinent basin characteristics of the landfill is provided below in Table 4.

Table 4. Landfill Hydrologic Information

Drainage Basin Area (acres)	39.78
Hydrologic Curve Number, CN	85
Hydrologic Methodology	SCS Method
Time of Concentration (minutes)	12.99
Hydrologic Software	Hydraflow Hydrographs

Run-off values were determined by importing the characteristics developed above into a hydrologic model with the Hydraflow Hydrographs Extension for AutoCAD Civil 3D 2019.

3.2 HYDRAULIC ANALYSES

Storage values for the sedimentation pond were determined by developing a stage-storage relationship utilizing contour data. The discharge system at the Plant Daniel NAMU landfill consists of a pump structure. The pump structure consists of two 13” HDPE lines that pump water to the NPDES discharge. Based on the pump information provided, the data was inserted into Hydraflow Hydrographs to determine the pond performance during the design storm. Results are shown in Table 2.

4.0 SUPPORTING INFORMATION

4.1 CURVE NUMBER

Terrain Type	Area (ac)	Curve Number
Water/HDPE	3.22	100
Bare Ash	29.8	86
Gravel	2.76	85
Grass cover	4.00	61

4.2 STAGE-STORAGE TABLE OF SEDIMENTATION POND

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	12.00	137,965	0	0
1.00	13.00	152,513	145,239	145,239
2.00	14.00	170,170	161,342	306,581
3.00	15.00	189,430	179,800	486,381
4.00	16.00	209,593	199,512	685,892
5.00	17.00	231,265	220,429	906,321
6.00	18.00	254,477	242,871	1,149,192

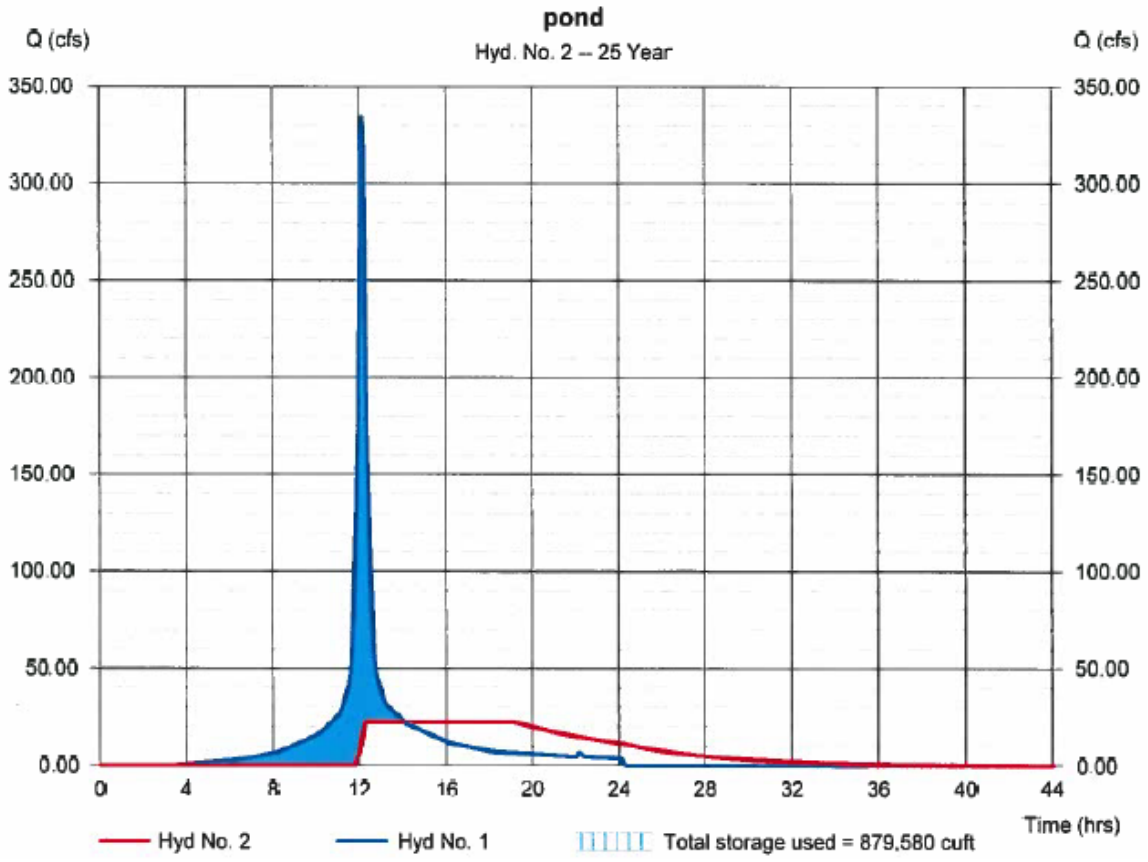
4.3 TIME OF CONCENTRATION

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 300.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 6.10		0.00		0.00		
Land slope (%)	= 1.40		0.00		0.00		
Travel Time (min)	**= 2.44**	**+**	**0.00**	**+**	**0.00**	**=**	**2.44**
Shallow Concentrated Flow							
Flow length (ft)	= 706.00		0.00		0.00		
Watercourse slope (%)	= 1.40		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=1.91		0.00		0.00		
Travel Time (min)	**= 6.16**	**+**	**0.00**	**+**	**0.00**	**=**	**6.16**
Channel Flow							
X sectional flow area (sqft)	= 118.50		0.00		0.00		
Wetted perimeter (ft)	= 22.00		0.00		0.00		
Channel slope (%)	= 0.26		0.00		0.00		
Manning's n-value	= 0.080		0.015		0.015		
Velocity (ft/s)	=2.93						
			0.00				
					0.00		
Flow length (ft)	({0})773.0		0.0		0.0		
Travel Time (min)	**= 4.39**	**+**	**0.00**	**+**	**0.00**	**=**	**4.39**
Total Travel Time, Tc							**12.99 min**

4.4 RESULTS

Hydrograph type	= Reservoir	Peak discharge	= 22.28 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.30 hrs
Time interval	= 2 min	Hyd. volume	= 1,038,890 cuft
Inflow hyd. No.	= 1 - Cell and sed pond - ash combined	Max. Elevation	= 16.88 ft
Reservoir name	= Storage Volume	Max. Storage	= 879,580 cuft

Storage Indication method used.



4.5 DRAINAGE BASIN