INITIAL RUN-ON AND RUN-OFF CONTROL PLAN
40 C.F.R. PART 257.81
HUFFAKER ROAD (PLANT HAMMOND) PRIVATE INDUSTRIAL LANDFILL
(HUFFAKER ROAD LANDFILL)
GEORGIA POWER COMPANY

EPA's "Disposal of Coal Combustion Residuals from Electric Utilities" Final Rule (40 C.F.R. Part 257 and Part 261), §257.81, requires the owner or operator of an existing or new CCR landfill or any lateral expansion of a CCR landfill to prepare a run-on and run-off control system plan to document how these control systems have been designed and constructed to meet the applicable requirements of this section of the rule.

The CCR landfill known as the Huffaker Road Landfill is located in Floyd County, west of Rome, Georgia on Plant Hammond property. Huffaker Road Landfill is comprised of Active Cells A, B and E, and future Cells C & D. Cells A & B were recently retrofitted with composite liners. Cell E was permitted and constructed with a minimum 2-ft. compacted clay liner. The facility consists of the CCR storage cells, a leachate pond for Cells A&B, and separate storm water runoff ponds and clear pools. Future Cells C & D will also be constructed in the same manner as Cells A and B.

The storm water flows have been calculated using the Natural Resources Conservation Service (NRCS) method (also known as the Soil Conservation Service (SCS) method) using the 25-yr/100-yr, 24-hr storm event. The storm water detention system has been designed in accordance with the Georgia Soil and Water Conservation Commission requirements as well as other local, city, and government codes. The post developed storm water discharge was designed to be less than the pre-developed storm water discharge in accordance with the requirements of the State of Georgia.

Storm basin calculation data was determined from the existing topography and from the Urban Hydrology for Small Watersheds (TR-55). This site is located in a Type II Rainfall Distribution. Precipitation values were determined from Technical Paper No. 40 (TP-40), "Rainfall Frequency Atlas of the United States, 1961"and NOAA Atlas 14.

The NRCS provides information on 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 2011 and used to generate appropriate precipitation curves, runoff curve numbers and storm basin runoff values.

Huffaker Road Landfill Cells are designed and constructed with perimeter berms and drainage ditches around the cells that prevent stormwater run-on during the peak discharge of a 24-hr, 25-yr storm from flowing onto the active portion of the landfill. The leachate pond collects and controls the anticipated amount of leachate generated from the leachate collection system of Cells A&B over a period of 7 days as well as the quantity of rainfall from a 24-hr, 100-yr storm event that falls directly into the leachate pond. Storm water run-off from the Cells A&B and E is routed through sedimentation/clarifying ponds designed to handle the run-off from a 24-hr, 100-yr storm. 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. Part 257.81.

10/12/16

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Licensed State of Georgia, PE No. 17419

GEORGIA REGISTERED No. 17419 PROFESSIONAL ENGINEER JAMES C. PEGUES, JR.

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

for

Plant Hammond Huffaker Road Parcels A and B

Prepared by:

Southern Company Services
Technical Services

Originator: _____ 10/13/16
Curtis R. Upchurch Date

Reviewer: _____ 10/13/16
Jason S. Wilson Date

Approval: _____ 10/13/16
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 Plant Hammond Huffaker Road Landfill Parcels A and B 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 Coal Combustion Residuals (CCR) from Electric Utilities (EPA 40 CFR 257).

2.0 Summary of Conclusions

2.1 Site Overview

The Plant Hammond Huffaker Road Landfill Parcels A and B is located on Georgia Power Company property on Huffaker Road approximately 4 miles northeast of Plant Hammond and 1 mile northwest of Rome, Georgia. The total area occupied by Huffaker Road Landfill Parcels A and B is 37.8 acres. Table 1 below does not include the areas for perimeter ditches and roads which are included in the total area of 37.8 acres. There are no off-site areas draining into the parcels or the sediment pond and clear pool downstream and only stormwater run-off from rain falling directly in the cell, ponds and aggregate surfaced perimeter roads must be collected and controlled. Parcels A and B are lined with a 24 inch clay layer and 60 mil hdpe liner. Stormwater run-off from the active portion of the Parcels (ash contact water) is collected in an underdrain leachate system and sump and then pumped into a lined leachate collection pond. Water from this leachate pond is reused for ash conditioning in the active portion of the parcels or will be transported to the Plant for treatment. Stormwater run-off from the non-active areas of the parcels (aggregate roads, soil cover grassed areas above stacked ash and areas covered with an HDPE rain flap) is routed thru the cell and perimeter ditches into the sediment basin and clear pool. From the clear pool it is then discharged into a rip rap lined ditch at the southwest corner of the cell which outfalls into Smith Creek just east of the clear pool.

An overview of Huffaker Road Landfill Parcels A and B is provided in Table 1 below.

Table 1 – Huffaker Road Landfill Parcels A and B Site Characteristics

Pond Description	Storage Cells	Sedimentation Pond	Clear Pool	Leachate Pond
Size (Acres)	29.1	4.6	0.6	0.7
Outlet Type	12' Flat bottom ditch, S=4.0%, w/2.5:1 S.S.	48" Riser with 36" dia. outlet pipe CMP	48" Riser w/ 36" dia. outlet pipe CMP	20' Trapezoidal Spillway, 6:1 S.S., (Control Structure – No Discharge)
Outlets To	Sedimentation Pond	Clear Pool	Ditch to Smith Creek	Ditch to Smith Creek

2.2 Run-on Control System Plan

There is no stormwater run-on into Parcels A and B due to the construction of perimeter berm/roads at the outer boundaries. Any run-off that was directed to the parcel areas was diverted by the initial design which now prevents any water

encroachment. For further information on this hydraulic design, see SCS Calculation No. C-HM-01208-01, Plant Hammond, Huffaker Road Coal Combustion By-Products Storage Site, 9/27/04.

2.3 Run-off Control System Plan

A hydrologic and hydraulic model was developed for the Huffaker Road Landfill Parcels A and B to determine the hydraulic capacity of the parcels. 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 Table 2 below:

Table 2-Flood Routing Results for Huffaker Road Landfill Parcels A and B

Plant Hammond	Normal Pool El (ft)	Top of embankment El (ft)	Peak Water Surface Elevation (ft)	Freeboard* (ft)	Peak Inflow (cfs)	Peak Outflow (cfs)
Parcels A and B	No pool	Varies Low Pt. @ EL. 654.75	N/A No ponding in cell	Parcel outlet d = 1.2 ft. Outlet to Sed. Pond d = 1.3 ft.	N/A	207 (Parcels) 254 (Parcels & Perim. Ditch)

*Freeboard is measured from the top of 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. Huffaker Road Landfill Parcels A andB Design Storm Distribution

Return Frequency (years)	Storm Duration (hours)	Rainfall Total (Inches)	Rainfall Source	Storm Distribution
25	24	6.32	NOAA Atlas 14	SCS Type II

The drainage area for the Huffaker Road Landfill Parcels A and B was delineated based on LiDAR data acquired for the Plant in 2015. 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. Time of

Concentration calculations were also developed based on methodologies prescribed in TR-55.

A table of the pertinent basin characteristics of the landfill is provided below in Table(s) 4(a) through 4(c).

Table 4(a) - Landfill Hydrologic Information (Parcels A and B)

Drainage Basin Area (acres)	26.7 (29.1 less active face area)
Hydrologic Curve Number, CN	96
Hydrologic Methodology	SCS Method
Time of Concentration (minutes)	8.9
Hydrologic Software	Hydraflow Hydrographs

Table 4(a) - Landfill Hydrologic Information (Perimeter Road & Ditches)

Drainage Basin Area (acres)	2.78
Hydrologic Curve Number, CN	74
Hydrologic Methodology	SCS Method
Time of Concentration (minutes)	21.3
Hydrologic Software	Hydraflow Hydrographs

Table 4(c) - Landfill Hydrologic Information (Sediment Pond & Clear Pool Areas)

Drainage Basin Area (acres)	5.2
Hydrologic Curve Number, CN	96
Hydrologic Methodology	SCS Method
Time of Concentration (minutes)	5.0
Hydrologic Software	Hydraflow Hydrographs

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 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 USGS online soils database. Time of Concentration calculations were developed based on the overland flow method as described in the National Engineering Handbook Part 630, Chapter 15.

Run-off values were determined by importing the characteristics developed above into a hydrologic model in Hydraflow Hydrographs Extension of AutoCad Civil 3D, 2013.

3.2 HYDRAULIC ANALYSES

Storage values for the sediment pond, clear pool, and leachate pond were determined by developing a stage-storage relationship utilizing contour data. With the outlet spillway in the perimeter berm of Parcel A and B landfill water cannot pool in the storage area and therefore a stage storage curve was not developed for the landfill. Instead, the outlet was checked for depth of flow and velocity during the 25 year storm and the resultant freeboard noted. See section 4.4 of this summary. The spillway systems for both the Sediment Pond and the Clear Pool consist of a primary spillway and an auxiliary spillway. The primary spillways are 48” diameter vertical risers and have a sharp crested weir length of 12.6-feet. Each riser has a 36-inch diameter corrugated

metal outlet pipe. The auxiliary spillways are trapezoidal spillways in the dikes lined with Recyclex TRM matting and grassed. A summary of spillway information is presented below in Tables 5(a) and 5(b).

Table 5(a)—Sediment Pond Spillway Attribute Table

Spillway Component	US Invert El (feet)	DS Invert El (feet)	Dimension	Slope (ft/ft)	Length (ft)	Spillway Capacity (cfs)
Primary	643.0	642.7	36” Dia. CMP (48” Dia. riser)	0.006	60.0	70.7
Auxiliary	648.5	648.5	Trapezoidal Crest L=20’, 3:1 S.S.	0.000	20.0	122.4

Table 5(b)—Clear Pool Spillway Attribute Table

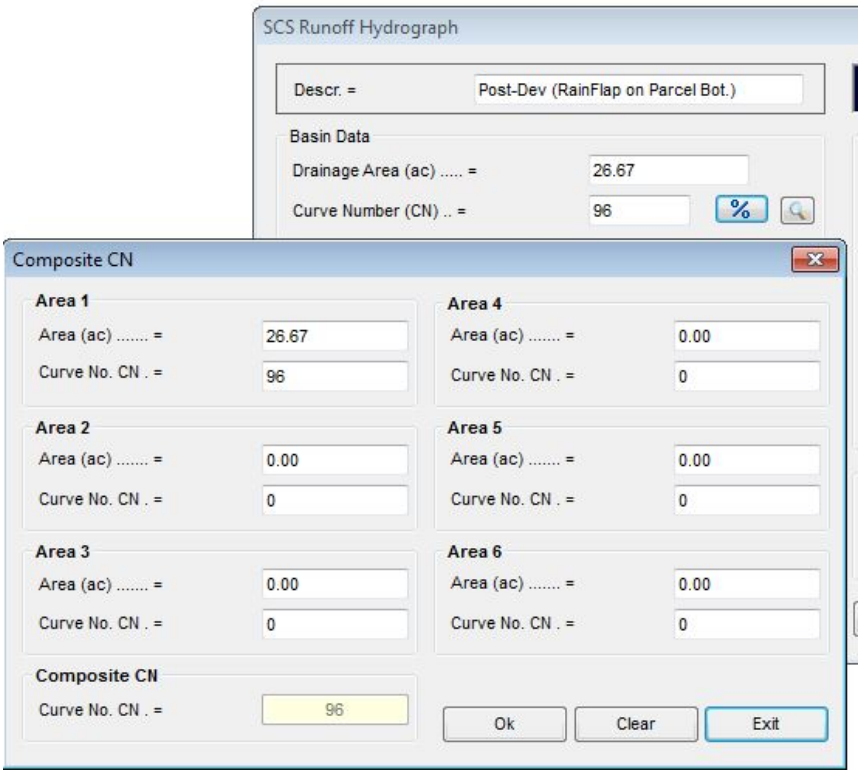
Spillway Component	US Invert El (feet)	DS Invert El (feet)	Dimension	Slope (ft/ft)	Length (ft)	Spillway Capacity (cfs)
Primary	642.0	641.35	36” Dia. CMP (48” Dia. riser)	0.01	65.0	79.0
Auxiliary	648.0	648.0	Trapezoidal Crest L=20’, 3:1 S.S.	0.000	20.0	188.4

Based on the spillway attributes listed above, a rating curve was developed and inserted into Hydraflow Hydrographs software to analyze pond performance during the design storm. Results are shown in Table 1.

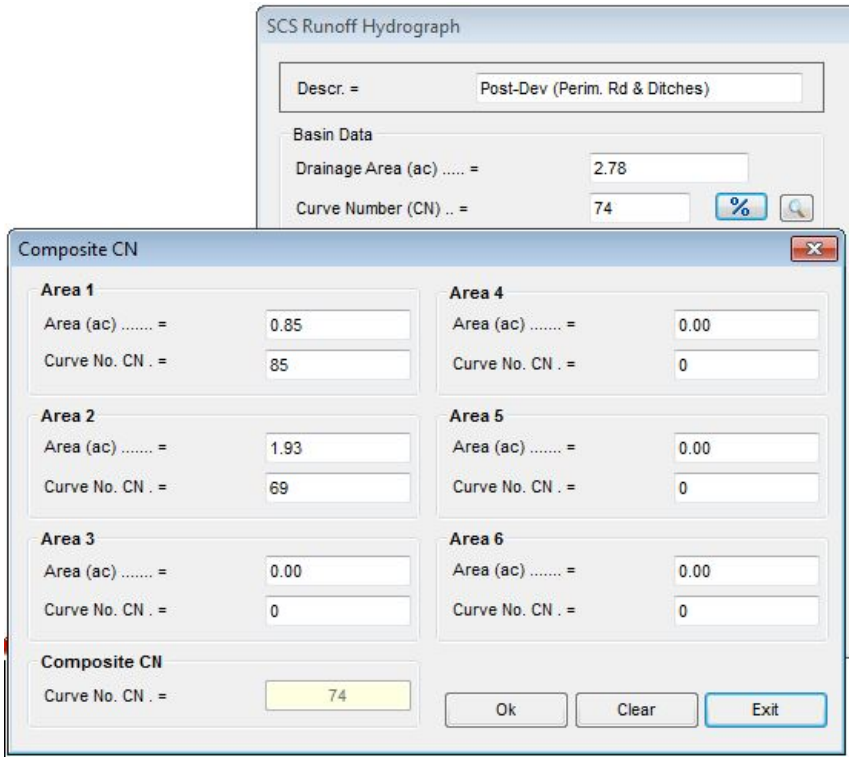
4.0 SUPPORTING INFORMATION

4.1 CURVE NUMBER

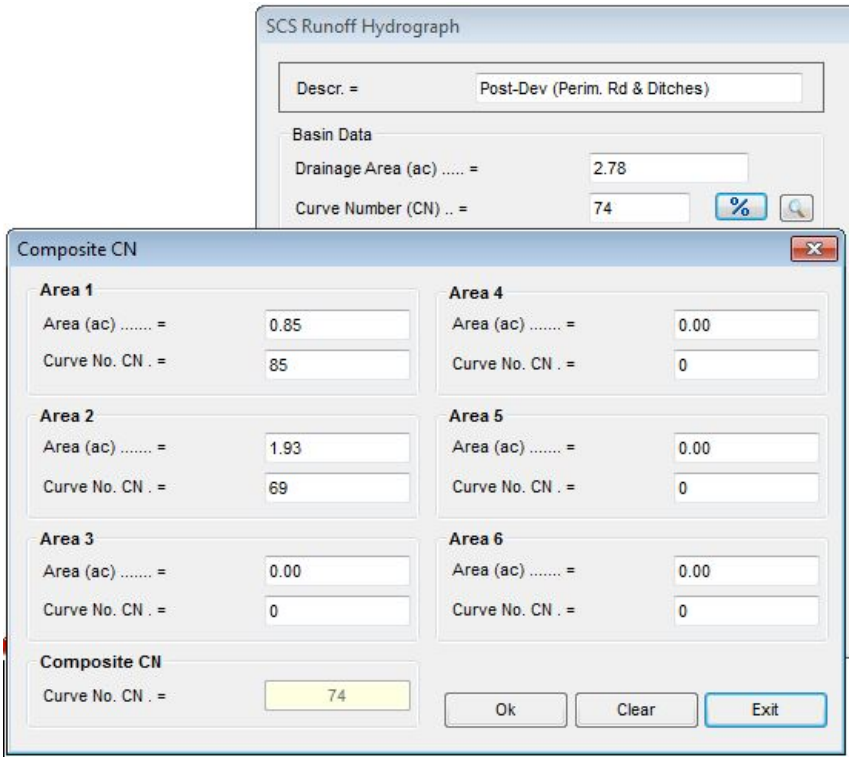
4.1.1 PARCELS A AND B (RAINFLAP COVERED AREA)



4.1.2 PERIMETER DITCHES AND ROADS



4.1.3 POND AREAS



4.2 STAGE-STORAGE TABLE

4.2.1 SEDIMENT POND

Pond Name: Sediment Pond 1

Row	Stage	Elevation	Contour Area	Incremental Storage	Total Storage	Total Discharge
	(ft)	(ft)	(sqft)	(cuft)	(cuft)	(cfs)
0	0.00	642.00	3,113	0.000	0.000	0.000
1	1.00	643.00	30,855	16,984	16,984	0.000
2	2.00	644.00	80,928	55,892	72,876	0.000
3	3.00	645.00	137,926	109,427	182,303	0.000
4	4.00	646.00	162,280	150,103	332,406	0.000
5	5.00	647.00	168,474	165,377	497,783	0.000
6	6.00	648.00	174,708	171,591	669,374	0.000
7	7.00	649.00	180,981	177,845	847,218	60.24
8	8.00	650.00	187,294	184,138	1,031,356	166.26
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

4.2.2 CLEAR POOL

Pond Name: Clear Pool #1

Row	Stage	Elevation	Contour Area	Incremental Storage	Total Storage	Total Discharge
	(ft)	(ft)	(sqft)	(cuft)	(cuft)	(cfs)
0	0.00	642.00	1,268	0.000	0.000	0.000
1	1.00	643.00	15,306	8,287	8,287	0.000
2	2.00	644.00	17,082	16,194	24,481	0.000
3	3.00	645.00	18,464	17,773	42,254	0.000
4	4.00	646.00	19,885	19,175	61,429	0.000
5	5.00	647.00	21,345	20,615	82,044	0.000
6	6.00	648.00	22,845	22,095	104,139	40.90
7	7.00	649.00	24,384	23,615	127,753	111.25
8	8.00	650.00	25,962	25,173	152,926	216.25
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

4.3 TIME OF CONCENTRATION

SCS TR-55 Time of Concentration Computations Report

Sheet Flow Equation

Tc = (0.007 * ((n * Lf)^0.8)) / ((P^0.5) * (Sf^0.4))

Where:

Tc = Time of Concentration (hrs)
n = Manning's Roughness
Lf = Flow Length (ft)
P = 2 yr, 24 hr Rainfall (inches)
Sf = Slope (ft/ft)

Shallow Concentrated Flow Equation

V = 16.1345 * (Sf^0.5) (unpaved surface)
V = 20.3282 * (Sf^0.5) (paved surface)
V = 15.0 * (Sf^0.5) (grassed waterway surface)
V = 10.0 * (Sf^0.5) (nearly bare & untilled surface)
V = 9.0 * (Sf^0.5) (cultivated straight rows surface)
V = 7.0 * (Sf^0.5) (short grass pasture surface)
V = 5.0 * (Sf^0.5) (woodland surface)
V = 2.5 * (Sf^0.5) (forest w/heavy litter surface)

Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hrs)
Lf = Flow Length (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)

Channel Flow Equation

V = (1.49 * (R^(2/3)) * (Sf^0.5)) / n
R = Aq / Wp
Tc = (Lf / V) / (3600 sec/hr)

Where:

Tc = Time of Concentration (hrs)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
Aq = Flow Area (ft^2)
Wp = Wetted Perimeter (ft)
V = Velocity (ft/sec)
Sf = Slope (ft/ft)
n = Manning's Roughness

Water Travel Velocity Equation

V = (g*D)^0.5
Tc = ((Lf / V) /60sec/min)

Where:

Tc = Time of Concentration (hrs)
D = Mean Depth (ft)
g = Gravitational Constant (32.2 ft/sec)
Lf = Flow Length (ft)
R = Hydraulic Radius (ft)
V = Velocity (ft/sec)

4.3.1 RAINFLAP COVERED AREA (PARCELS A AND B), Tc:

TR55 Tc Worksheet

Hyd. No. 1

Post-Dev (RainFlap on Parcel Bot.)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.013		0.011		0.011		
Flow length (ft)	= 0.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 0.00		0.00		0.00		
Land slope (%)	= 0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Shallow Concentrated Flow							
Flow length (ft)	= 415.00		870.00		0.00		
Watercourse slope (%)	= 3.40		1.03		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=3.75		2.06		0.00		
Travel Time (min)	**= 1.85**	**+**	**7.03**	**+**	**0.00**	**=**	**8.87**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

Total Travel Time, Tc ..... 8.90 min

4.3.2 PERIMETER ROADS AND DITCHES (PARCELS A AND B), Tc:

TR55 Tc Worksheet

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No. 2

Post-Dev (Perim. Rd & Ditches)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.150		0.011		0.011		
Flow length (ft)	= 65.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.80		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 6.37**	**+**	**0.00**	**+**	**0.00**	**=**	**6.37**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 1.75		0.00		0.00		
Wetted perimeter (ft)	= 5.65		0.00		0.00		
Channel slope (%)	= 1.40		0.00		0.00		
Manning's n-value	= 0.030		0.015		0.015		
Velocity (ft/s)	=2.68						
			0.00				
					0.00		
Flow length (ft)	({0})2405.0		0.0		0.0		
Travel Time (min)	**= 14.94**	**+**	**0.00**	**+**	**0.00**	**=**	**14.94**

Total Travel Time, Tc ..... 21.30 min

4.3.3 POND AREAS (PARCELS A AND B), Tc:

TR55 Tc Worksheet

Hyd. No. 3

Post-Dev (Pond Areas)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.000		0.000		0.000		
Flow length (ft)	= 0.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 0.00		0.00		0.00		
Land slope (%)	= 0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	=						
Average velocity (ft/s)	=0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.000		0.000		0.000		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Total Travel Time, Tc							**5.00 min**

4.4 POND RATING CURVES

4.4.1 SEDIMENT POND REPORT WITH RATING CURVE:

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 — Thursday, 09 / 29 / 2016

Pond No. 1 - Sediment Pond 1

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 642.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	642.00	3,113	0	0
1.00	643.00	30,855	16,984	16,984
2.00	644.00	80,928	55,892	72,876
3.00	645.00	137,926	109,427	182,303
4.00	646.00	162,280	150,103	332,406
5.00	647.00	168,474	165,377	497,783
6.00	648.00	174,708	171,591	669,374
7.00	649.00	180,981	177,845	847,218
8.00	650.00	187,294	184,138	1,031,356

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	0.00	0.00	Inactive
Span (in)	= 36.00	0.00	0.00	1.00
No. Barrels	= 1	0	0	20
Invert El. (ft)	= 643.00	0.00	0.00	648.00
Length (ft)	= 50.00	0.00	0.00	0.00
Slope (%)	= 0.60	0.00	0.00	n/a
N-Value	= .022	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.57	20.00	0.00	0.00
Crest El. (ft)	= 648.00	648.50	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Ciplti	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / 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	642.00	0.00	---	---	0.00	0.00	0.00	---	---	---	---	0.000
1.00	16,984	643.00	0.00	---	---	0.00	0.00	0.00	---	---	---	---	0.000
2.00	72,876	644.00	0.00	---	---	0.00	0.00	0.00	---	---	---	---	0.000
3.00	182,303	645.00	0.00	---	---	0.00	0.00	0.00	---	---	---	---	0.000
4.00	332,406	646.00	0.00	---	---	0.00	0.00	0.00	---	---	---	---	0.000
5.00	497,783	647.00	0.00	---	---	0.00	0.00	0.00	---	---	---	---	0.000
6.00	669,374	648.00	0.00	---	---	0.00	0.00	0.00	---	---	---	---	0.000
7.00	847,218	649.00	41.86 oc	---	---	0.00	41.86	23.55	---	---	---	---	65.40
8.00	1,031,356	650.00	70.73 oc	---	---	0.00	70.73 s	122.35	---	---	---	---	193.08

4.4.2 CLEAR POOL POND REPORT WITH RATING CURVE:

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 — Thursday, 09 / 29 / 2016

Pond No. 2 - Clear Pool #1

Pond Data

Contours -User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 642.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	642.00	1,268	0	0
1.00	643.00	15,306	8,287	8,287
2.00	644.00	17,082	16,194	24,481
3.00	645.00	18,464	17,773	42,254
4.00	646.00	19,885	19,175	61,429
5.00	647.00	21,345	20,615	82,044
6.00	648.00	22,845	22,095	104,139
7.00	649.00	24,384	23,615	127,753
8.00	650.00	25,962	25,173	152,926

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	0.00	0.00	0.00
Span (in)	= 36.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 642.00	0.00	0.00	0.00
Length (ft)	= 65.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .022	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 12.57	20.00	0.00	0.00
Crest El. (ft)	= 647.00	648.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= 1	Ciplti	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / 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	642.00	0.00	---	---	---	0.00	0.00	---	---	---	---	0.000
1.00	8,287	643.00	0.00	---	---	---	0.00	0.00	---	---	---	---	0.000
2.00	24,481	644.00	0.00	---	---	---	0.00	0.00	---	---	---	---	0.000
3.00	42,254	645.00	0.00	---	---	---	0.00	0.00	---	---	---	---	0.000
4.00	61,429	646.00	0.00	---	---	---	0.00	0.00	---	---	---	---	0.000
5.00	82,044	647.00	0.00	---	---	---	0.00	0.00	---	---	---	---	0.000
6.00	104,139	648.00	41.86 oc	---	---	---	41.86	0.00	---	---	---	---	41.86
7.00	127,753	649.00	69.79 oc	---	---	---	69.78 s	66.60	---	---	---	---	136.38
8.00	152,926	650.00	78.99 oc	---	---	---	78.98 s	188.37	---	---	---	---	267.35

4.4.3 LEACHATE POND REPORT:

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 — Thursday, 09 / 29 / 2016

Pond No. 4 - Leachate Pond

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	652.50	n/a	0	0
0.50	653.00	n/a	487	487
1.50	654.00	n/a	4,432	4,919
2.25	654.75	n/a	7,348	12,267
2.50	655.00	n/a	3,624	15,891
3.50	656.00	n/a	17,775	33,666
4.50	657.00	n/a	22,707	56,373
5.50	658.00	n/a	22,707	79,080
6.00	658.50	n/a	12,297	91,377
6.50	659.00	n/a	12,930	104,307
7.50	660.00	n/a	27,785	132,092

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 658.50	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Ciplti	---	---	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 0.000 (by Wet area)			
TW Elev. (ft)	= 0.00			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / 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	652.50	---	---	---	---	0.00	---	---	---	---	---	0.000
0.50	487	653.00	---	---	---	---	0.00	---	---	---	---	---	0.000
1.50	4,919	654.00	---	---	---	---	0.00	---	---	---	---	---	0.000
2.25	12,267	654.75	---	---	---	---	0.00	---	---	---	---	---	0.000
2.50	15,891	655.00	---	---	---	---	0.00	---	---	---	---	---	0.000
3.50	33,666	656.00	---	---	---	---	0.00	---	---	---	---	---	0.000
4.50	56,373	657.00	---	---	---	---	0.00	---	---	---	---	---	0.000
5.50	79,080	658.00	---	---	---	---	0.00	---	---	---	---	---	0.000
6.00	91,377	658.50	---	---	---	---	0.00	---	---	---	---	---	0.000
6.50	104,307	659.00	---	---	---	---	23.55	---	---	---	---	---	23.55
7.50	132,092	660.00	---	---	---	---	122.35	---	---	---	---	---	122.35

4.5 RESULTS:

4.5.1 Hydrograph Summary

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	206.96	3	717	530,599	-----	-----	-----	Post-Dev (RainFlap on Parcel Bot.)
2	SCS Runoff	9.672	3	726	34,002	-----	-----	-----	Post-Dev (Perim. Rd & Ditches)
3	SCS Runoff	40.43	3	717	103,653	-----	-----	-----	Post-Dev (Pond Areas)
4	Combine	46.65	3	717	137,655	2, 3	-----	-----	Add
5	Combine	253.61	3	717	668,254	1, 4	-----	-----	Add
6	Reservoir(i)	0.000	3	n/a	0	5	647.99	668,254	Post Dev. to Ponds
8	SCS Runoff	17.95	3	717	43,976	-----	-----	-----	Active Face/Area
9	Reservoir	0.000	3	n/a	0	8	656.45	43,976	Leachate Pond

Run-on Run-off_calcs.gpw | Return Period: 25 Year | Thursday, 09 / 29 / 2016

4.5.2 HYDROGRAPHS:

Rain Flap Covered Area:

Hydrograph Report

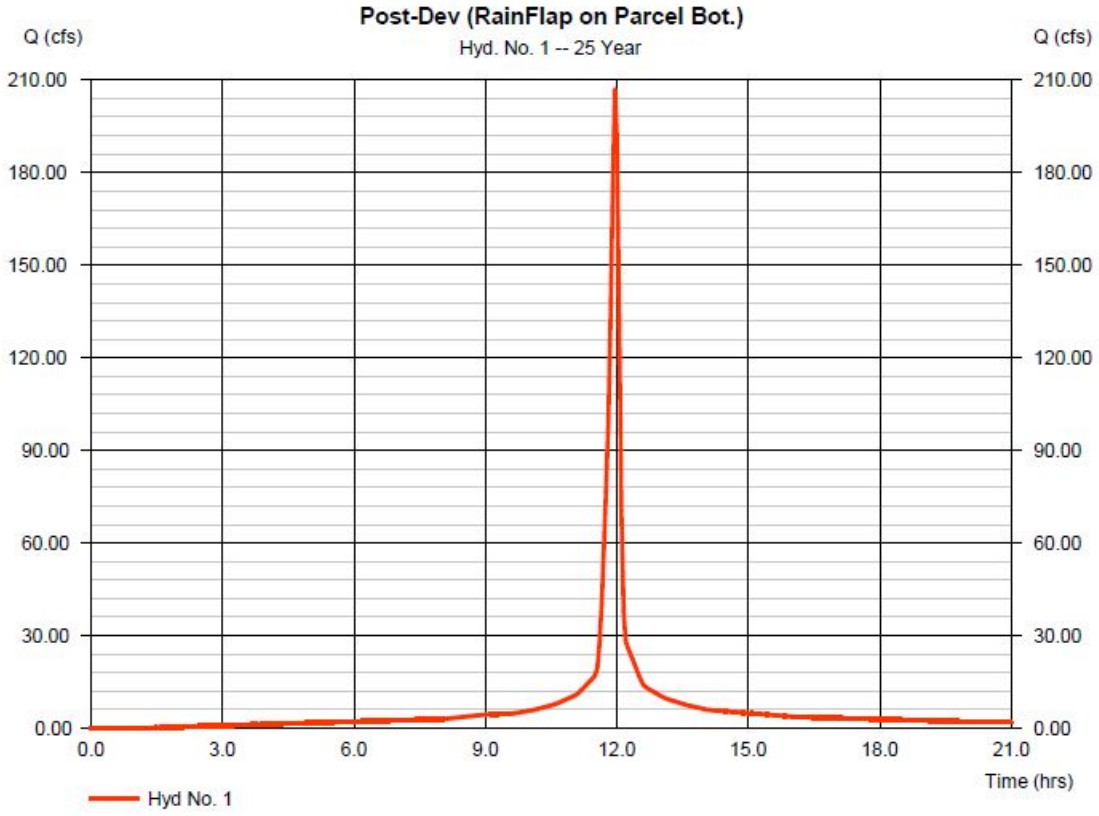
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 — Thursday, 09 / 29 / 2016

Hyd. No. 1

Post-Dev (RainFlap on Parcel Bot.)

Hydrograph type	= SCS Runoff	Peak discharge	= 206.96 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.95 hrs
Time interval	= 3 min	Hyd. volume	= 530,599 cuft
Drainage area	= 26.670 ac	Curve number	= 96*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 8.90 min
Total precip.	= 6.32 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(26.670 x 96)] / 26.670



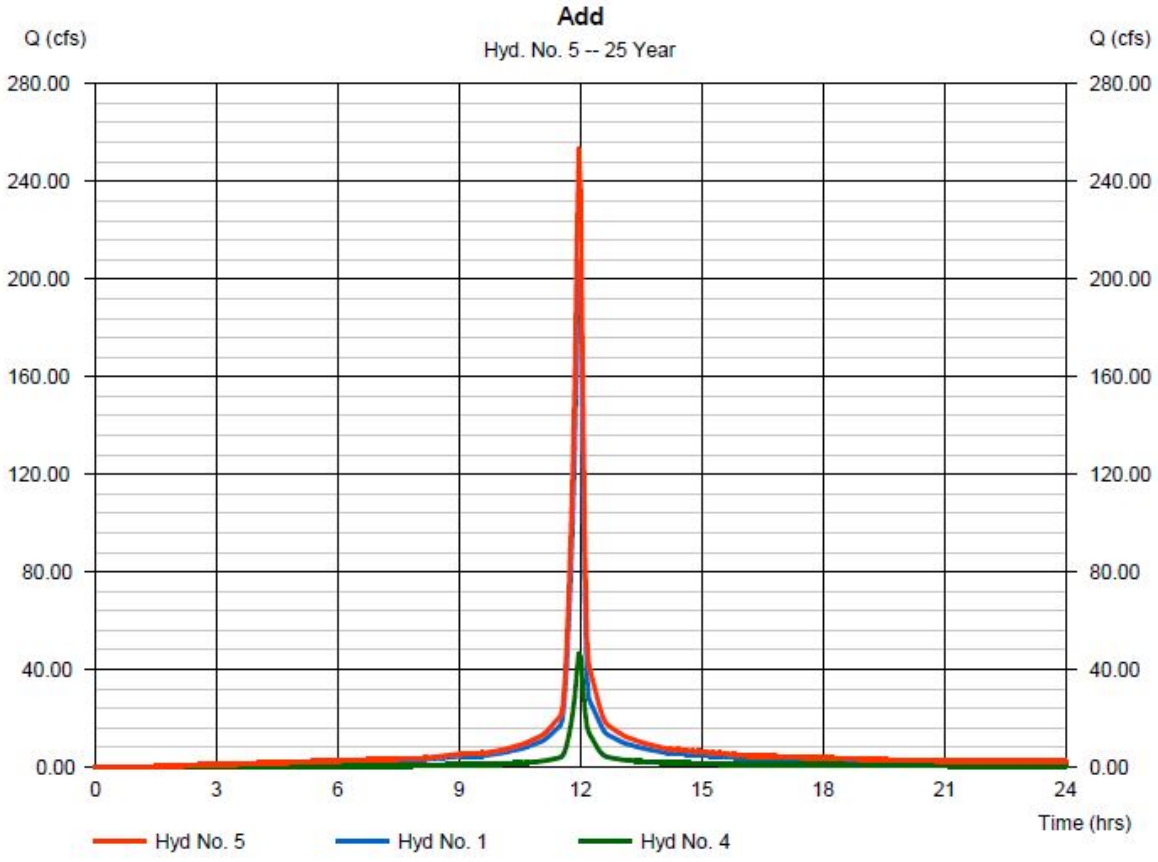
COMBINED PARCELS A AND B RAIN FLAP AREA AND PERIMETER DITCH/ROADS

Hydrograph Report

Hyd. No. 5

Add

Hydrograph type	= Combine	Peak discharge	= 253.61 cfs
Storm frequency	= 25 yrs	Time to peak	= 11.95 hrs
Time interval	= 3 min	Hyd. volume	= 668,254 cuft
Inflow hyds.	= 1, 4	Contrib. drain. area	= 26.670 ac



SEDIMENT POND & CLEAR POOL:

Hydrograph Report

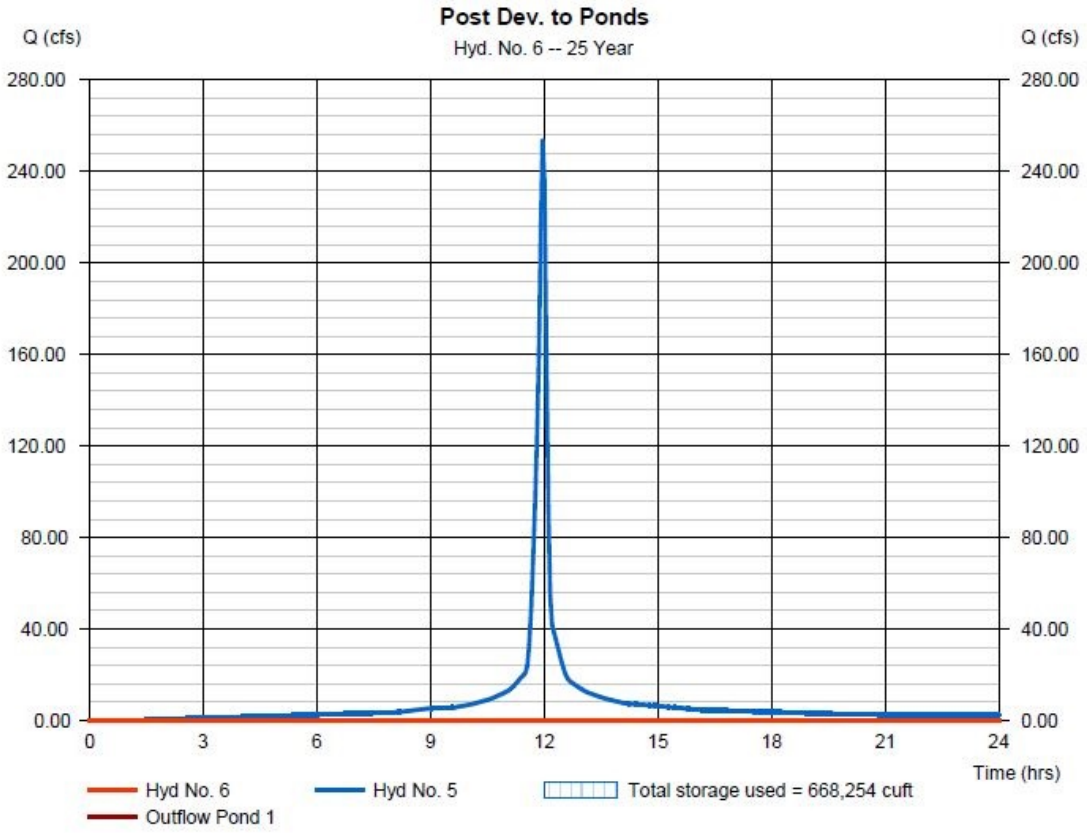
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 — Thursday, 09 / 29 / 2016

Hyd. No. 6

Post Dev. to Ponds

Hydrograph type	= Reservoir (Interconnected)	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 3 min	Hyd. volume	= 0 cuft
Reservoir	= Sediment Pond 1	Reservoir	= Clear Pool #1
Inflow hyd.	= 5 - Add	Other Inflow hyd.	= None
Max. Elevation	= 647.99 ft	Max. Elevation	= 642.00 ft
Max. Storage	= 668,254 cuft	Max. Storage	= 0 cuft

Interconnected Pond Routing. Storage Indication method used.



LEACHATE POND:

Hydrograph Report

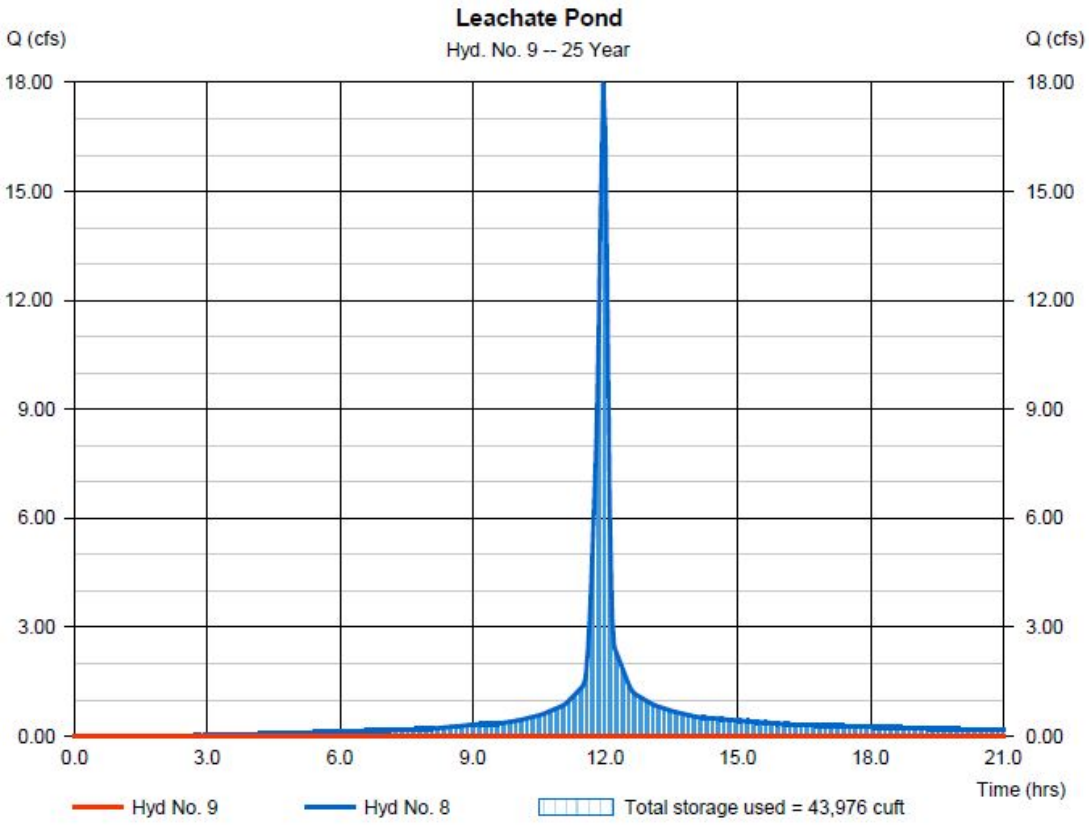
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 — Thursday, 09 / 29 / 2016

Hyd. No. 9

Leachate Pond

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 25 yrs	Time to peak	= n/a
Time interval	= 3 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 8 - Active Face/Area	Max. Elevation	= 656.45 ft
Reservoir name	= Leachate Pond	Max. Storage	= 43,976 cuft

Storage Indication method used.



4.5.3 PARCELS A AND B OUTLET SPILLWAY:

Channel Report

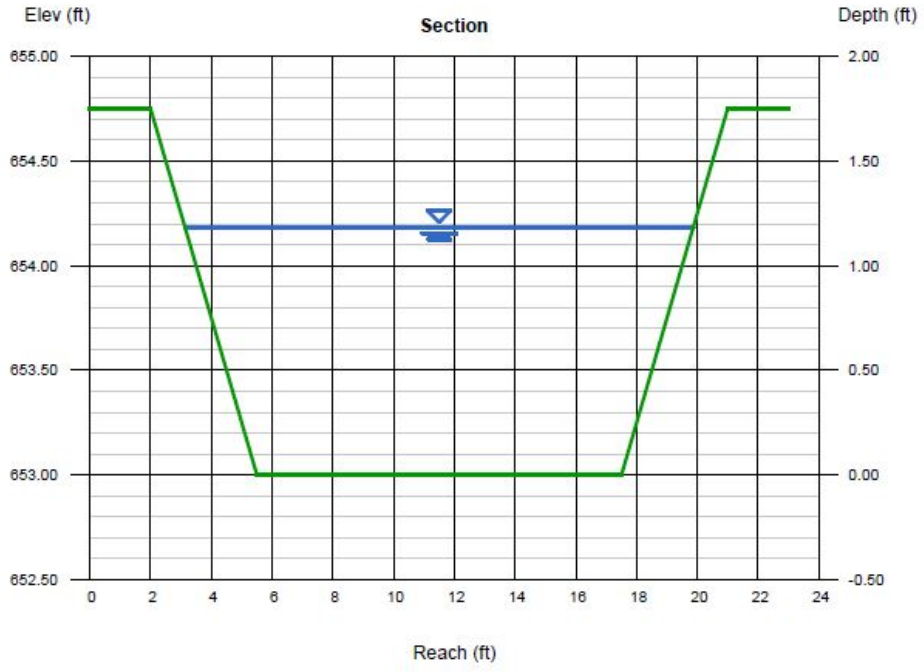
Hydraflow Express Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. Sunday, Sep 25 2016

Parcels A&B Outlet

Trapezoidal	
Bottom Width (ft)	= 12.00
Side Slopes (z:1)	= 2.00, 2.00
Total Depth (ft)	= 1.75
Invert Elev (ft)	= 653.00
Slope (%)	= 1.00
N-Value	= 0.012

Calculations	
Compute by:	Known Q
Known Q (cfs)	= 207.00

Highlighted	
Depth (ft)	= 1.18
Q (cfs)	= 207.00
Area (sqft)	= 16.94
Velocity (ft/s)	= 12.22
Wetted Perim (ft)	= 17.28
Crit Depth, Yc (ft)	= 1.75
Top Width (ft)	= 16.72
EGL (ft)	= 3.50



4.5.4 PARCELS A AND B AND PERIMETER DITCH DISCHARGE DITCH TO SEDIMENT POND:

Channel Report

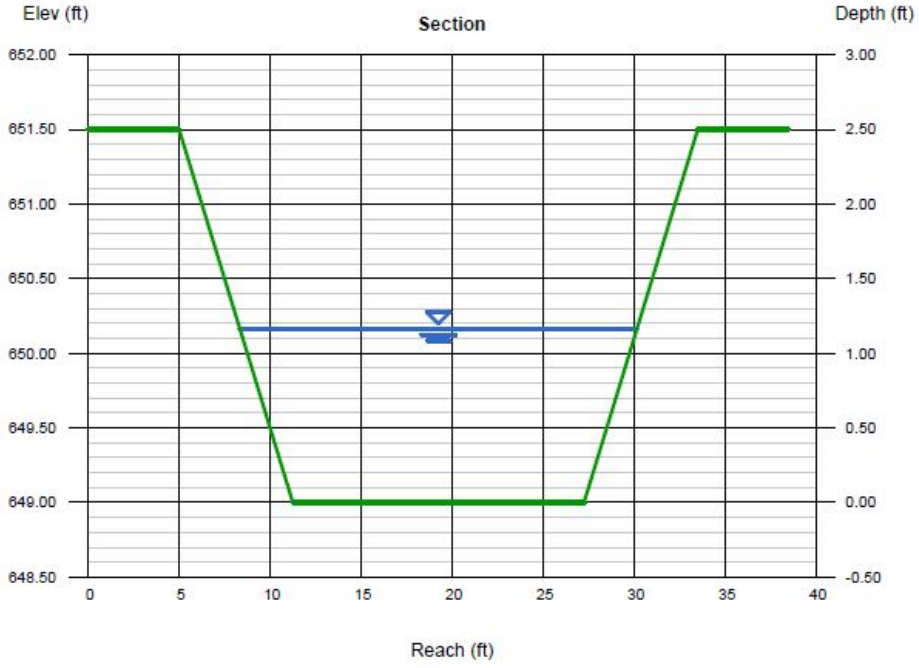
Hydraflow Express Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. Sunday, Sep 25 2016

Parcels A&B with Perim Dt. Outlet into Sediment Pond

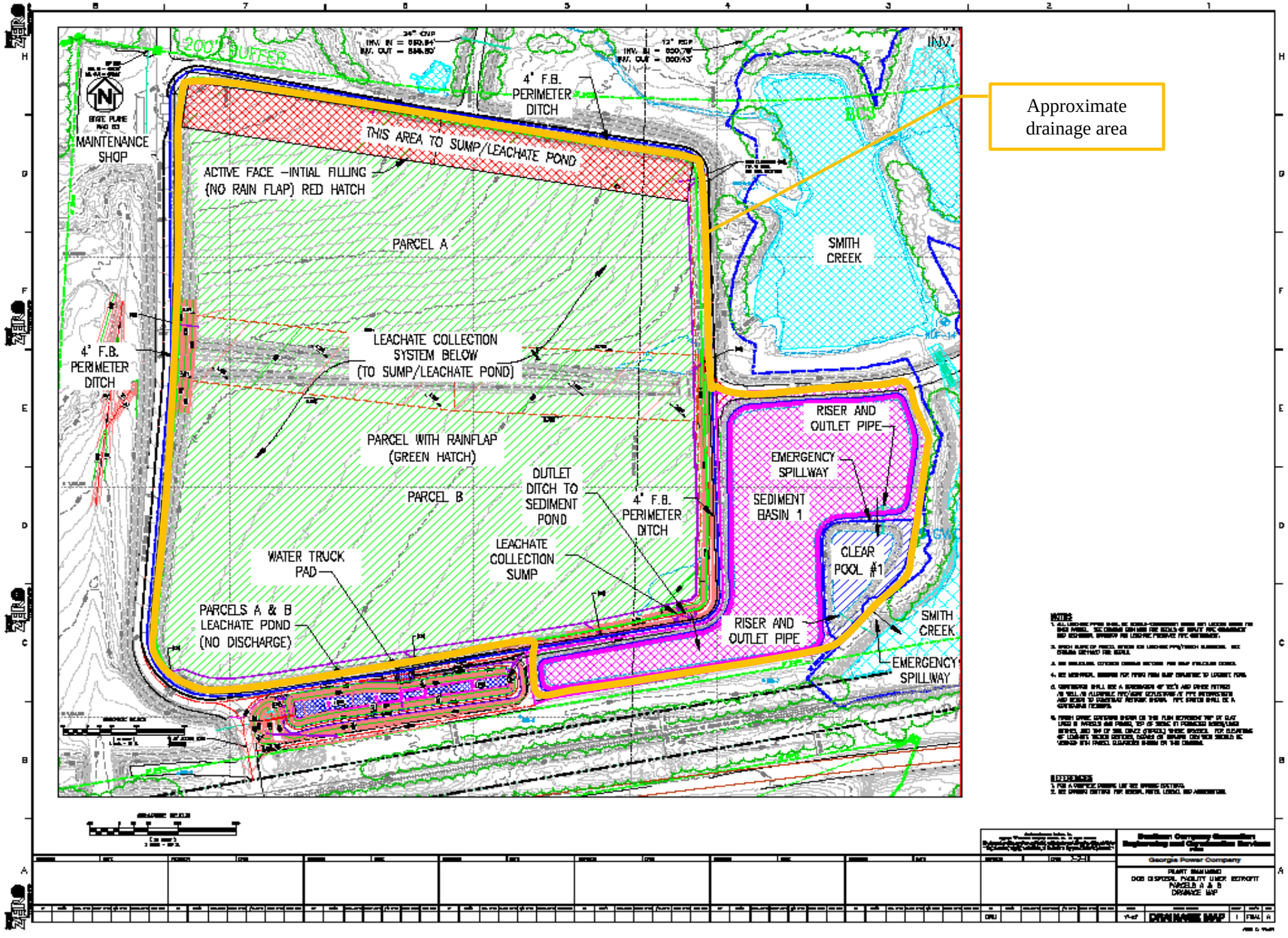
Trapezoidal	
Bottom Width (ft)	= 16.00
Side Slopes (z:1)	= 2.50, 2.50
Total Depth (ft)	= 2.50
Invert Elev (ft)	= 649.00
Slope (%)	= 5.60
N-Value	= 0.030

Calculations	
Compute by:	Known Q
Known Q (cfs)	= 254.00

Highlighted	
Depth (ft)	= 1.16
Q (cfs)	= 254.00
Area (sqft)	= 21.92
Velocity (ft/s)	= 11.59
Wetted Perim (ft)	= 22.25
Crit Depth, Yc (ft)	= 1.80
Top Width (ft)	= 21.80
EGL (ft)	= 3.25



4.6 DRAINAGE BASIN



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

for

Plant Hammond Huffaker Road Landfill Parcel E

Prepared by:

Southern Company Services
Technical Services

Originator: _____ 10/6/16
Curtis R. Upchurch Date

Reviewer: _____ 10/11/16
Jason S. Wilson Date

Approval: _____ 10/12/16
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 Plant Hammond Huffaker Road 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 Coal Combustion Residuals (CCR) from Electric Utilities (EPA 40 CFR 257).

2.0 Summary of Conclusions

2.1 Site Overview

The Plant Hammond Huffaker Road Landfill Parcel E is located on Georgia Power Company property on Huffaker Road approximately 4 miles northeast of Plant Hammond and 1 mile northwest of Rome, Georgia. The total area occupied by the CCR landfill is 27.38 acres. There are no off-site areas draining into the cell or the sediment pond and clear pool downstream and only stormwater run-off from rain falling directly in the cell, ponds and aggregate surfaced perimeter roads must be collected and controlled. Stormwater is routed thru the cell and perimeter ditches into the sediment basin and clear pool and is then discharged into a ditch at the southwest corner of the cell. The ditch outfalls into Smith Creek located approximately 200 feet south of the clear pool.

An overview of Huffaker Road Landfill Parcel E is provided in Table 1 below.

Table 1 – Huffaker Road Landfill Parcel E Site Characteristics

Pond Description	Parcel E	Sedimentation Pond	Clear Pool
Size (Acres)	23.42	2.87	1.09
Outlet Type	12' Flat bottom ditch, S=4.0%, w/2.5:1 S.S.	48" Riser connected to a 36" CMP	48" Riser connected to a 36" CMP
Outlets To	Sedimentation Pond	Clear Pool	Ditch to Smith Creek

2.2 Run-on Control System Plan

There is no contributory stormwater run-on into Parcel E because a series of perimeter ditches, spillways, and roadways prevent overland flow from migrating into the Cell, Sediment Basin No. 3, and Clear Pool No. 3. Reference the Plant Hammond Huffaker Road CCB Storage Facility - Parcel E Run-on / Run-off Study calculations (Calc No. DC-HM-HAM16037-002) for information.

2.3 Run-off Control System Plan

A hydrologic and hydraulic model was developed for the Huffaker Road Landfill Parcel E to determine the hydraulic capacity of the Cell. 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 Table 2 below:

Table 2-Flood Routing Results for Huffaker Road Landfill Parcel E

Plant Hammond	Normal Pool El (ft)	Top of embankment El (ft)	Peak Water Surface Elevation (ft)	Freeboard * (ft)	Peak Inflow (cfs)	Peak Outflow (cfs)
Parcel E	No pool	633.00	627.18	5.82	119.32	4.74

*Freeboard is measured from the top of 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. Huffaker Road Landfill Parcel E Design Storm Distribution

Return Frequency (years)	Storm Duration (hours)	Rainfall Total (Inches)	Rainfall Source	Storm Distribution
25	24	6.32	NOAA Atlas 14	SCS Type II

The drainage area for the Huffaker Road Landfill Parcel Ewas delineated based on LiDAR data acquired for the Plant in 2015. 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. A conservative time of concentration was assumed as there are not any contributory drainage areas or overland flow beyond simply the footprint of the Cell, Sediment Basin No. 3 and Clear Pool No. 3.

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

Table 4—Landfill Hydrologic Information (Parcel E)

Drainage Basin Area (acres)	27.38
Hydrologic Curve Number, CN (weighted)	77
Hydrologic Methodology	SCS Method
Time of Concentration (minutes)	6
Hydrologic Software	Bentley Pond Pack

Run-off values were determined by importing the surface characteristics into a hydrologic model within Bentley's Pond Pack software.

3.2 HYDRAULIC ANALYSES

Storage values for the landfill were determined by developing a stage-storage relationship utilizing contour data. The spillway system at the Huffaker Road Landfill Parcel E consists of a primary spillway from the Cell proper draining into Sediment Basin No. 3. The primary spillway is a trapezoidal rip rap weir that drains the Cell's perimeter ditch into Sediment Basin No. 3.

The Sediment Basin No. 3 drainage system consists of a primary 48” diameter corrugated metal riser (with trash rack) with a top elevation of 630.00. This riser is drained by a 60 foot long - 36” diameter corrugated metal culvert that discharges into Clear Pool No. 3. A 20-foot wide trapezoidal auxiliary spillway also handles overflow from Sediment Basin No. 3 into Clear Pool No. 3.

The Clear Pool No. 3 drainage system consists of a primary 48” diameter corrugated metal riser (with trash rack) with a top elevation of 629.00. This riser is drained by an 86 foot long - 36” diameter corrugated metal culvert that discharges into a swale that feeds into Smith Creek. A 20 foot wide emergency trapezoidal spillway also handles overflow from Clear Pool No. 3 into the same swale that feeds into Smith Creek.

A summary of spillway information is presented below in Table 5.

Table 5—Spillway Attribute Table*

Spillway Component	US Invert El (feet)	DS Invert El (feet)	Dimension (ft)	Slope (%)	Length (ft)	Spillway Capacity (cfs)
Cell Spillway	632.00	630.00	12	4.0	20	N/A**
Sed. Basin No. 3 riser	630.00	623.70	4 ft (diameter) 6.75 ft (height)	0.00	N/A	N/A
Sed. Basin No. 3 culvert	624.00	623.70	3 ft (diameter)	0.50	60	N/A
Sed. Basin No. 3 emergency spillway	631.00	631.00	30 ft (Top width) 20 ft (Bottom Width)	0.00	15.5	N/A
Clear Pool No. 3 riser	629.00	622.00	4 ft (diameter) 7 ft (height)	0.00	N/A	N/A
Clear Pool No. 3 culvert	622.00	620.00	3 ft (diameter)	2.33	86.0	N/A
Clear Pool No. 3 emergency spillway	631.00	631.00	32 ft (Top width) 20 ft (Bottom Width)	0.00	20.5	N/A

*All spillway design information can be found on Drawing H9155.
**N/A = Not available

Based on the spillway attributes listed above, a rating curve was developed and inserted into Pond Pack Detention Pond Design and Modeling Software, Haested Methods, Inc. to analyze pond performance during the design storm. Results are shown in Table 2.

4.0 SUPPORTING INFORMATION

4.1 CURVE NUMBER

4.1.1 CELL E AND SEDIMENT BASIN NO. 3

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
Direct Pond Runoff & Drainage Area	99	3.400			99.00
Stacking Area E	74	23.280			74.00
COMPOSITE AREA & WEIGHTED CN --->		26.680			77.19 (77)

S/N: 321F01F2E1C6 SOUTHERN COMPANY
PondPack Ver: Compute Time: Date:

4.1.2 CLEAR POOL NO. 3

RUNOFF CURVE NUMBER DATA

Soil/Surface Description	CN	Area acres	Impervious Adjustment %C	%UC	Adjusted CN
Direct Runoff to Clear Pool	99	1.000			99.00
COMPOSITE AREA & WEIGHTED CN --->		1.000			99.00 (99)

S/N: 321F01F2E1C6 SOUTHERN COMPANY
PondPack Ver: Compute Time: Date:

4.2 STAGE-STORAGE TABLE

4.2.1 SEDIMENT BASIN NO. 3

File.... C:\Haestad\Huffaker1\SEDPOND3.PPW

USER DEFINED VOLUME RATING TABLE

Elevation (ft)	Volume (ac-ft)
624.00	.130
625.00	.760
626.00	2.140
627.00	4.040
628.00	6.080
629.00	8.210
630.00	10.410
631.00	12.690
632.00	15.060
633.00	17.510

4.2.2 CLEAR POOL NO. 3

File.... C:\Haestad\Huffaker1\SEDPOND3.PPW

USER DEFINED VOLUME RATING TABLE

Elevation (ft)	Volume (ac-ft)
622.00	.000
623.00	.360
624.00	.910
625.00	1.510
626.00	2.140
627.00	2.810
628.00	3.530
629.00	4.290
630.00	5.090

4.3 TIME OF CONCENTRATION

A conservative time of concentration was assumed as there are not any contributory drainage areas or overland flow impacting the Cell, Sediment Basin No. 3 and Clear Pool No. 3. A Time of Concentration of 6 minutes or 0.10 hours was assumed.

4.4 RESULTS

4.4.1 PARCEL E

25-YEAR, 24-HOUR STORM EVENT

```
Type.... ICPM Node Routing Summary                              Page 10.10
Name.... SED POND 3          Tag: Dev 25                       Event: 25 yr
File.... C:\Haestad\Huffaker1\SEDPOND3.PPW
Storm... TypeII  24hr   Tag: Dev 25

                          ICPM POND ROUTING SUMMARY

 HYG Dir           = C:\Haestad\Huffaker1\
 Inflow  HYG file = SED POND 3     IN Dev 25
 Outflow HYG file = SED POND 3   OUT Dev 25

 Pond Node   Data = SED POND 3
 Pond Volume Data = SED POND 3
 Pond Outlet Data = OUTLET 3

 No Infiltration

 INITIAL CONDITIONS                    CALCULATION TOLERANCES
 ----------------------------------    ----------------------------------
 Starting WS Elev =   626.00 ft        Target Convergence=     .200 cfs +/-
 Starting Volume  =    2.140 ac-ft     Max. Iterations   =       35 loops
 Starting Outflow =      .00 cfs       ICPM   Time Step  =    .0500 hrs
                                       Output Time Step  =    .0500 hrs
 ----------------------------------    ICPM Ending Time  =  35.0000 hrs
                                       ----------------------------------

                          MAXIMUM STORAGE
                      Tp, hrs    Elev, ft    Vol, ac-ft
                     ---------  ---------   ----------
                      14.7500      628.68         7.533

                    FORWARD FLOW PEAKS       REVERSE FLOW PEAKS
                    Tp, hrs     Qp, cfs      Tp, hrs     Qp, cfs
                   ---------   ---------    ---------   ---------
  Pond Inflow.....  12.0500      119.32        .0000         .00
  Pond Outflow....  13.5500        4.74        .0000         .00

                      TOTAL VOLUME IN          TOTAL VOLUME OUT
                    Vol, ac-ft  Direction     Vol, ac-ft  Direction
                   ------------ -------     ------------ -------
  Pond Inflow.....       8.517  Forward            .000  Reverse
  Pond Outflow....        .000  Reverse           6.264  Forward

  MASS BALANCE (ac-ft)
  ----------------------------
+ Initial Vol.....       2.140
+ Total Vol IN....       8.517
- Total Vol OUT...       6.264
- Ending Pond Vol.       4.444  <-- (At 35.0000 hrs  Elev.= 627.20 ft)
                   ------------
  Difference......       -.050 ac-ft  (.590% of Inflow Volume)
```

4.4.2 PARCEL E
100-YEAR, 24-HOUR STORM EVENT

```
Type.... ICPM Node Routing Summary                          Page 10.12
Name.... SED POND 3          Tag: Dev100                  Event: 100 yr
File.... C:\Haestad\Huffaker1\SEDPOND3.PPW
Storm... TypeII  24hr   Tag: Dev100


                        ICPM POND ROUTING SUMMARY

 HYG Dir           = C:\Haestad\Huffaker1\
 Inflow  HYG file  = SED POND 3    IN Dev100
 Outflow HYG file  = SED POND 3   OUT Dev100

 Pond Node   Data  = SED POND 3
 Pond Volume Data  = SED POND 3
 Pond Outlet Data  = OUTLET 3

 No Infiltration

 INITIAL CONDITIONS                    CALCULATION TOLERANCES
 ----------------------------------    --------------------------------
 Starting WS Elev =   626.00 ft        Target Convergence=     .200 cfs +/-
 Starting Volume  =    2.140 ac-ft     Max. Iterations   =      35 loops
 Starting Outflow =      .00 cfs       ICPM   Time Step  =    .0500 hrs
                                       Output Time Step  =    .0500 hrs
 ----------------------------------    ICPM Ending Time  =  35.0000 hrs
                                       --------------------------------

                          MAXIMUM STORAGE
                      Tp, hrs    Elev, ft    Vol, ac-ft
                     ---------   ---------   ----------
                      14.3000      629.44         9.177


                    FORWARD FLOW PEAKS        REVERSE FLOW PEAKS
                    Tp, hrs     Qp, cfs       Tp, hrs     Qp, cfs
                   ---------   ---------     ---------   ---------
 Pond Inflow.....  12.0500       154.84         .0000         .00
 Pond Outflow....  13.6000         6.59         .0000         .00


                      TOTAL VOLUME IN          TOTAL VOLUME OUT
                    Vol, ac-ft  Direction     Vol, ac-ft  Direction
                   -----------  -------     -----------  -------
 Pond Inflow.....      11.117   Forward           .000   Reverse
 Pond Outflow....        .000   Reverse          8.146   Forward


 MASS BALANCE (ac-ft)
 ----------------------------
+ Initial Vol.....       2.140
+ Total Vol IN....      11.117
- Total Vol OUT...       8.146
- Ending Pond Vol.       5.191  <-- (At 35.0000 hrs  Elev.= 627.56 ft)
                   -----------
 Difference......       -.080 ac-ft  (.723% of Inflow Volume)
```

4.5 DRAINAGE BASIN