

HDR 10yr SN1-3

Prepared by VT Agency of Natural Resources

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.680	81	CNadj (2S)
10.140	71	CNadj (14S)
6.360	75	CNadj per 2.2.5.3 (1S)
5.380	70	Woods, Good, HSG C (1e)
2.660	77	Woods, Good, HSG D (1e, 3S)
10.140	77	calculated per 2.2.4.2 (4S)
36.360	74	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
5.380	HSG C	1e
2.660	HSG D	1e, 3S
28.320	Other	1S, 2S, 4S, 14S
36.360		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	11.820	11.820	CNadj	2S, 14S
0.000	0.000	0.000	0.000	6.360	6.360	CNadj per 2.2.5.3	1S
0.000	0.000	5.380	2.660	0.000	8.040	Woods, Good	1e, 3S
0.000	0.000	0.000	0.000	10.140	10.140	calculated per 2.2.4.2	4S
0.000	0.000	5.380	2.660	28.320	36.360	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	91.00	90.80	20.0	0.0100	0.013	12.0	0.0	0.0
2	3P	95.00	94.80	24.0	0.0083	0.013	15.0	0.0	0.0
3	3P	97.50	97.00	60.0	0.0083	0.013	12.0	0.0	0.0
4	9P	84.80	84.00	20.0	0.0400	0.013	12.0	0.0	0.0
5	14P	85.00	84.50	40.0	0.0125	0.013	4.0	0.0	0.0
6	14P	86.00	83.50	50.0	0.0500	0.013	24.0	0.0	0.0
7	15P	81.00	80.50	20.0	0.0250	0.013	24.0	0.0	0.0

HDR 10yr SN1-3

Type II 24-hr 10yr Storm Rainfall=3.99"

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Time span=5.00-60.00 hrs, dt=0.05 hrs, 1101 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
 Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1e: Pre SN001	Runoff Area=6.360 ac 0.00% Impervious Runoff Depth=1.40" Tc=20.2 min CN=WQ Runoff=9.38 cfs 0.740 af
Subcatchment 1S: Post SN001	Runoff Area=6.360 ac 0.00% Impervious Runoff Depth=1.66" Tc=20.1 min CN=75 Runoff=11.45 cfs 0.879 af
Subcatchment 2S: Post SN002	Runoff Area=1.680 ac 0.00% Impervious Runoff Depth=2.11" Tc=8.1 min CN=81 Runoff=5.78 cfs 0.296 af
Subcatchment 3S: Pre SN002	Runoff Area=1.680 ac 0.00% Impervious Runoff Depth=1.80" Tc=8.9 min CN=77 Runoff=4.80 cfs 0.253 af
Subcatchment 4S: Post SN003	Runoff Area=10.140 ac 0.00% Impervious Runoff Depth=1.80" Tc=19.8 min CN=77 Runoff=20.16 cfs 1.524 af
Subcatchment 14S: Pre SN003	Runoff Area=10.140 ac 0.00% Impervious Runoff Depth=1.39" Tc=26.2 min CN=71 Runoff=12.63 cfs 1.172 af
Reach 13R: receiving water	Inflow=12.34 cfs 1.277 af Outflow=12.34 cfs 1.277 af
Pond 1P: Forebay	Peak Elev=93.17' Storage=0.064 af Inflow=11.45 cfs 0.879 af Outflow=11.35 cfs 0.879 af
Pond 2P: Bioretention #1	Peak Elev=92.85' Storage=0.295 af Inflow=11.35 cfs 0.879 af Discarded=0.11 cfs 0.176 af Primary=3.88 cfs 0.703 af Secondary=0.00 cfs 0.000 af Outflow=4.00 cfs 0.879 af
Pond 3P: Dry Pond #2	Peak Elev=98.05' Storage=6,035 cf Inflow=5.78 cfs 0.296 af Outflow=1.06 cfs 0.270 af
Pond 9P: Forebay	Peak Elev=85.14' Storage=2,347 cf Inflow=0.51 cfs 0.367 af 12.0" Round Culvert n=0.013 L=20.0' S=0.0400 '/' Outflow=0.48 cfs 0.367 af
Pond 10P: Bioretention #2	Peak Elev=83.55' Storage=3,993 cf Inflow=0.48 cfs 0.367 af Discarded=0.05 cfs 0.145 af Secondary=0.27 cfs 0.220 af Outflow=0.32 cfs 0.366 af
Pond 14P: diversion manhole	Peak Elev=88.69' Inflow=20.16 cfs 1.524 af Primary=0.51 cfs 0.367 af Secondary=19.65 cfs 1.157 af Outflow=20.16 cfs 1.524 af
Pond 15P: Dry Pond #2	Peak Elev=84.42' Storage=16,150 cf Inflow=19.65 cfs 1.157 af Primary=12.18 cfs 1.056 af Secondary=0.17 cfs 0.001 af Outflow=12.34 cfs 1.056 af

Total Runoff Area = 36.360 ac Runoff Volume = 4.865 af Average Runoff Depth = 1.61"
100.00% Pervious = 36.360 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1e: Pre SN001

Runoff = 9.38 cfs @ 12.14 hrs, Volume= 0.740 af, Depth= 1.40"

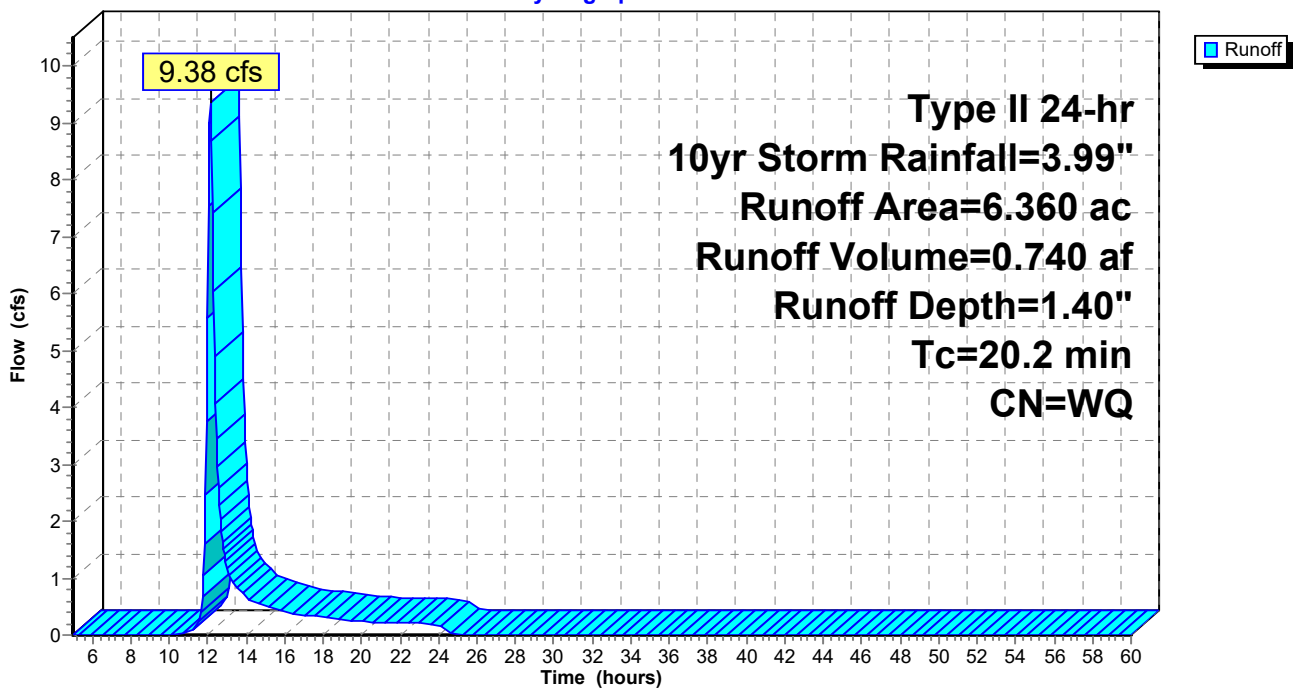
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10yr Storm Rainfall=3.99"

Area (ac)	CN	Description
5.380	70	Woods, Good, HSG C
0.980	77	Woods, Good, HSG D
6.360		Weighted Average
6.360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.2					Direct Entry, Watershed Lag Method

Subcatchment 1e: Pre SN001

Hydrograph



Summary for Subcatchment 1S: Post SN001

Runoff = 11.45 cfs @ 12.14 hrs, Volume= 0.879 af, Depth= 1.66"

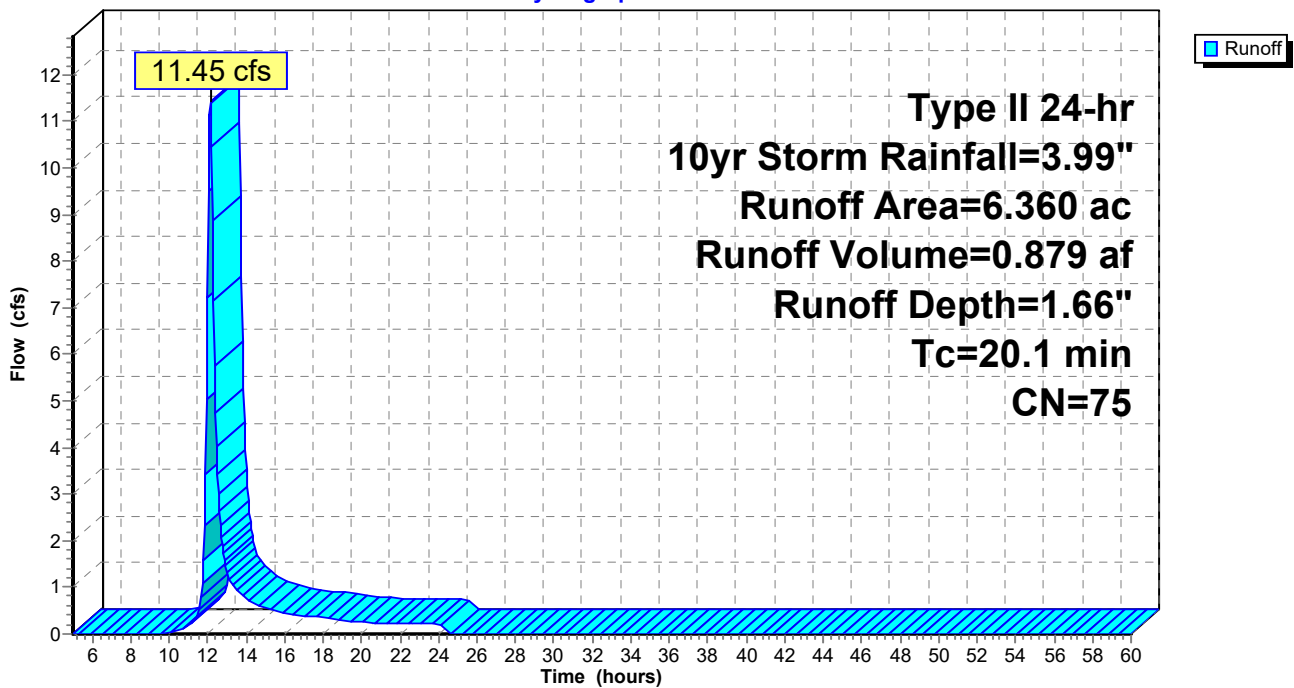
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10yr Storm Rainfall=3.99"

Area (ac)	CN	Description
* 6.360	75	CNadj per 2.2.5.3
6.360		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1					Direct Entry, Watershed Lag per 2.2.4.3

Subcatchment 1S: Post SN001

Hydrograph



Summary for Subcatchment 2S: Post SN002

Runoff = 5.78 cfs @ 12.00 hrs, Volume= 0.296 af, Depth= 2.11"

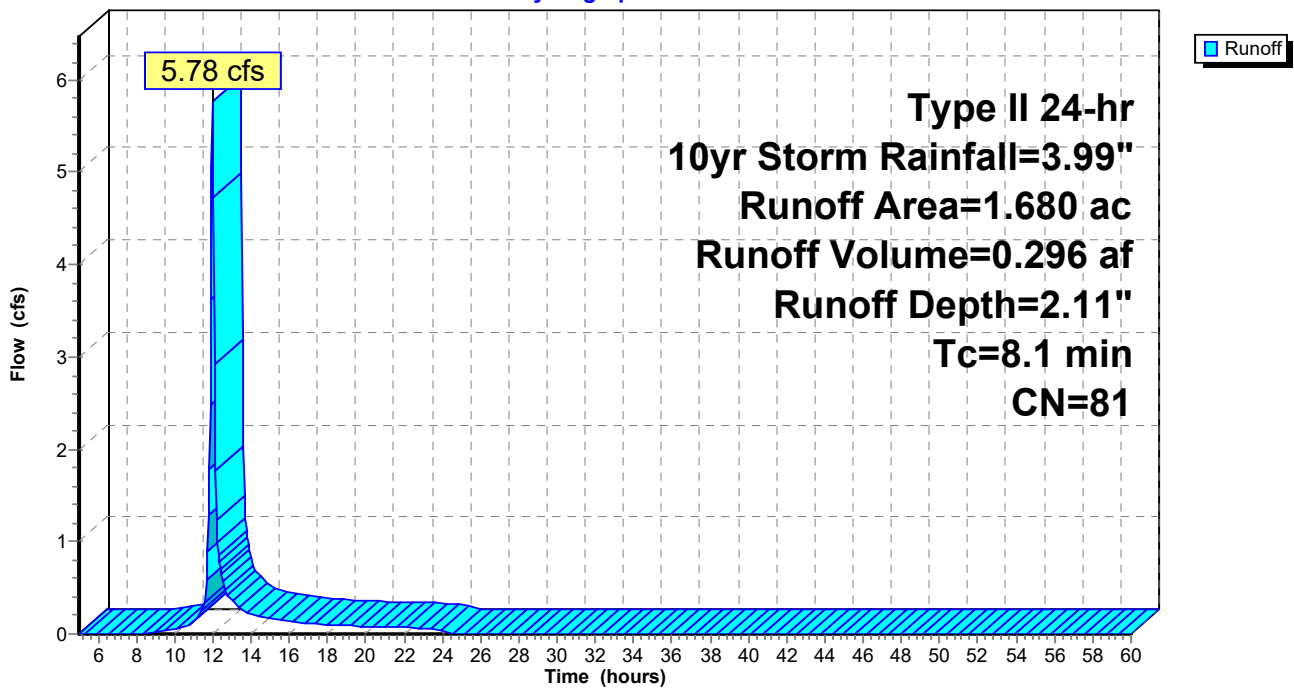
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10yr Storm Rainfall=3.99"

Area (ac)	CN	Description
* 1.680	81	CNadj
1.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1					Direct Entry, Watershed Lag

Subcatchment 2S: Post SN002

Hydrograph



Summary for Subcatchment 3S: Pre SN002

Runoff = 4.80 cfs @ 12.01 hrs, Volume= 0.253 af, Depth= 1.80"

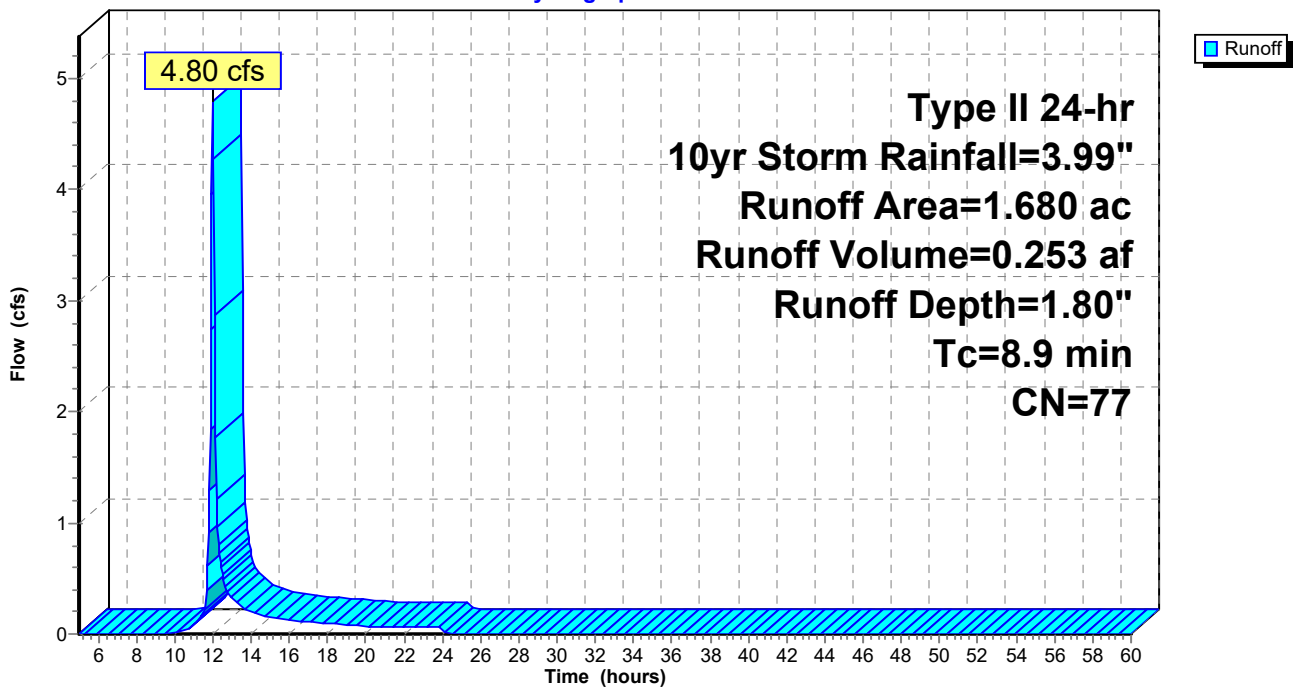
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10yr Storm Rainfall=3.99"

Area (ac)	CN	Description
1.680	77	Woods, Good, HSG D
1.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9					Direct Entry, Watershed Lag

Subcatchment 3S: Pre SN002

Hydrograph



Summary for Subcatchment 4S: Post SN003

Runoff = 20.16 cfs @ 12.13 hrs, Volume= 1.524 af, Depth= 1.80"

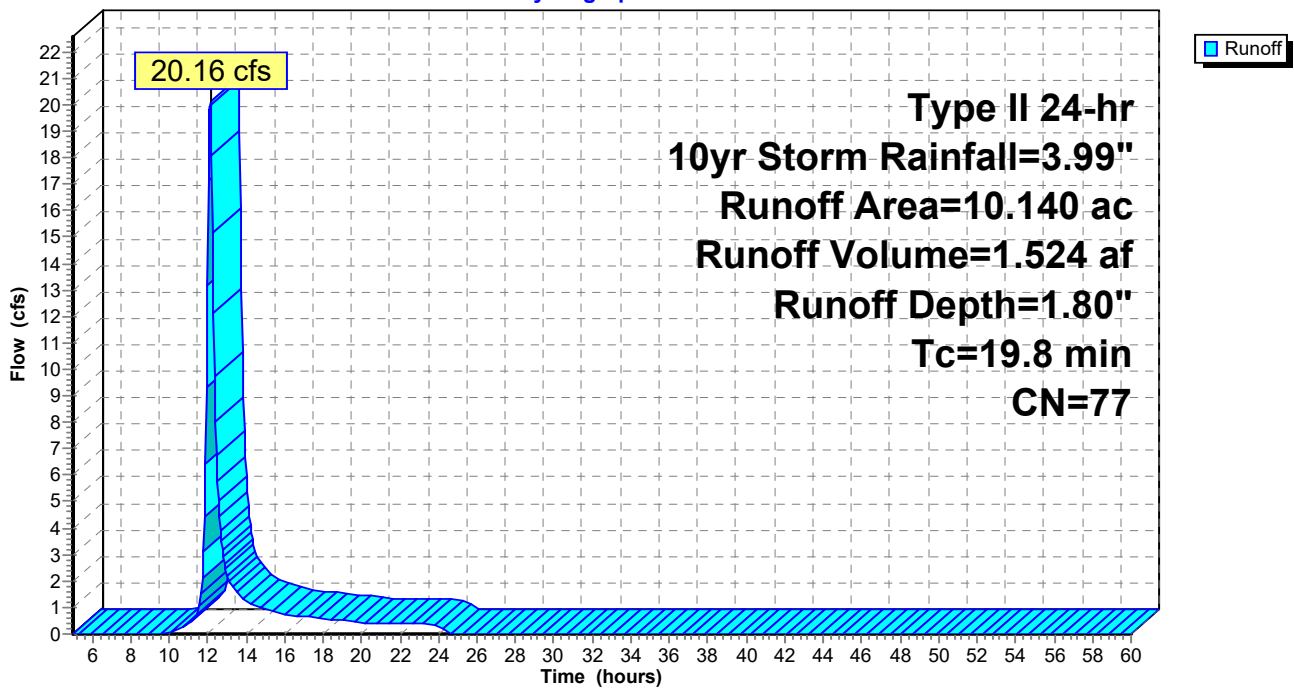
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10yr Storm Rainfall=3.99"

Area (ac)	CN	Description
* 10.140	77	calculated per 2.2.4.2
10.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.8					Direct Entry, Lag method of Tc

Subcatchment 4S: Post SN003

Hydrograph



Summary for Subcatchment 14S: Pre SN003

Runoff = 12.63 cfs @ 12.22 hrs, Volume= 1.172 af, Depth= 1.39"

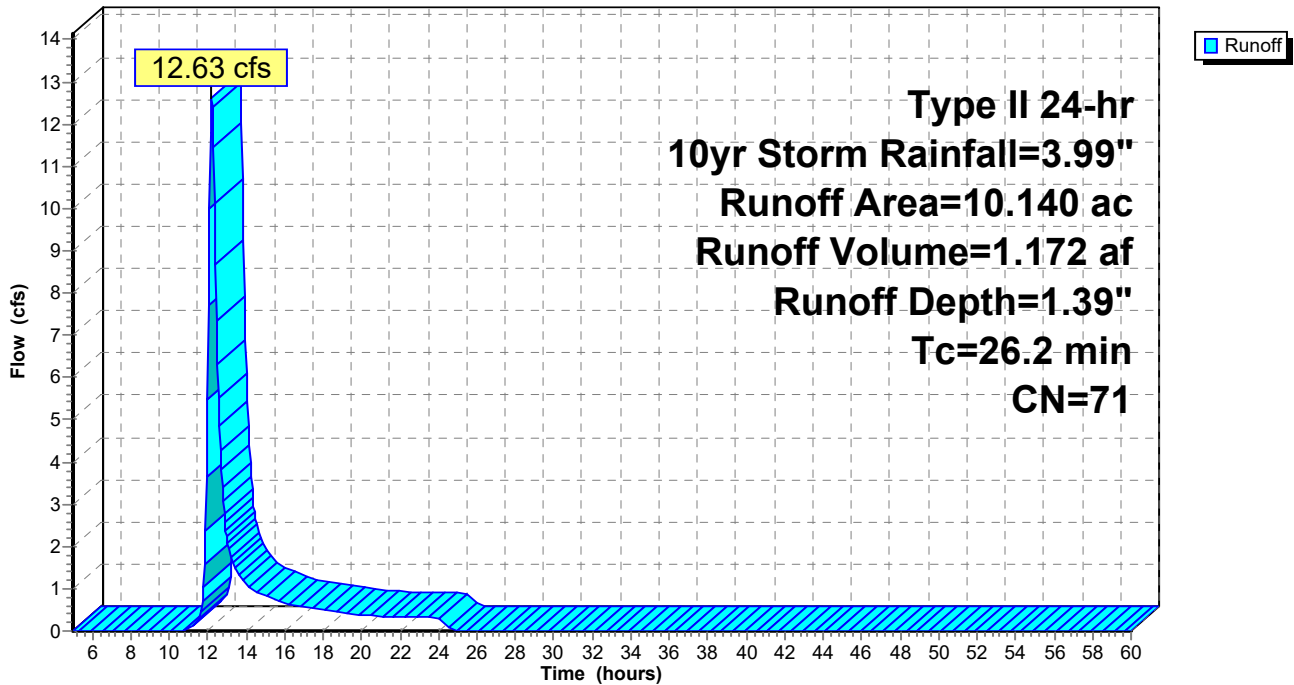
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Type II 24-hr 10yr Storm Rainfall=3.99"

Area (ac)	CN	Description
* 10.140	71	CNadj
10.140		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
26.2					Direct Entry, Tc per 2.2.4.3

Subcatchment 14S: Pre SN003

Hydrograph



Summary for Reach 13R: receiving water

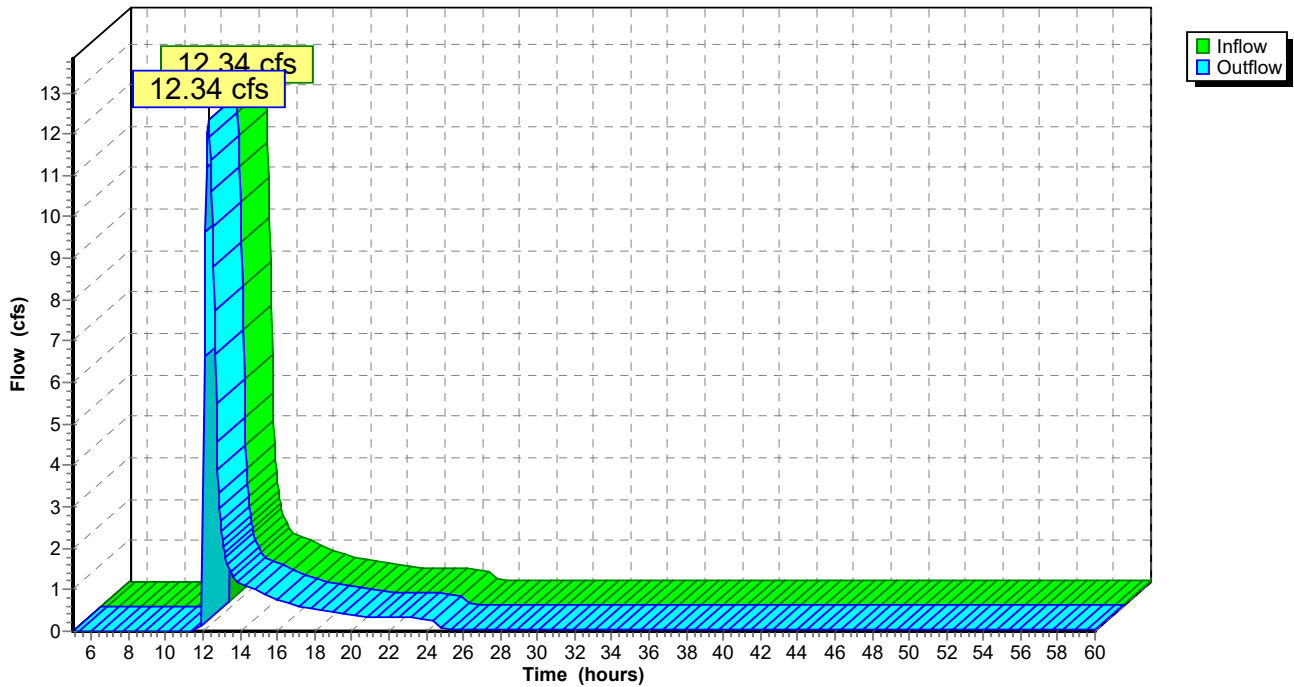
[40] Hint: Not Described (Outflow=Inflow)

Inflow = 12.34 cfs @ 12.30 hrs, Volume= 1.277 af
Outflow = 12.34 cfs @ 12.30 hrs, Volume= 1.277 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs

Reach 13R: receiving water

Hydrograph



Summary for Pond 1P: Forebay

Inflow Area = 6.360 ac, 0.00% Impervious, Inflow Depth = 1.66" for 10yr Storm event
 Inflow = 11.45 cfs @ 12.14 hrs, Volume= 0.879 af
 Outflow = 11.35 cfs @ 12.15 hrs, Volume= 0.879 af, Atten= 1%, Lag= 0.6 min
 Primary = 11.35 cfs @ 12.15 hrs, Volume= 0.879 af

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs / 2
 Starting Elev= 92.80' Surf.Area= 0.031 ac Storage= 0.052 af
 Peak Elev= 93.17' @ 12.15 hrs Surf.Area= 0.035 ac Storage= 0.064 af (0.012 af above start)
 Flood Elev= 93.75' Surf.Area= 0.041 ac Storage= 0.086 af (0.034 af above start)

Plug-Flow detention time= 44.0 min calculated for 0.827 af (94% of inflow)
 Center-of-Mass det. time= 1.5 min (857.6 - 856.0)

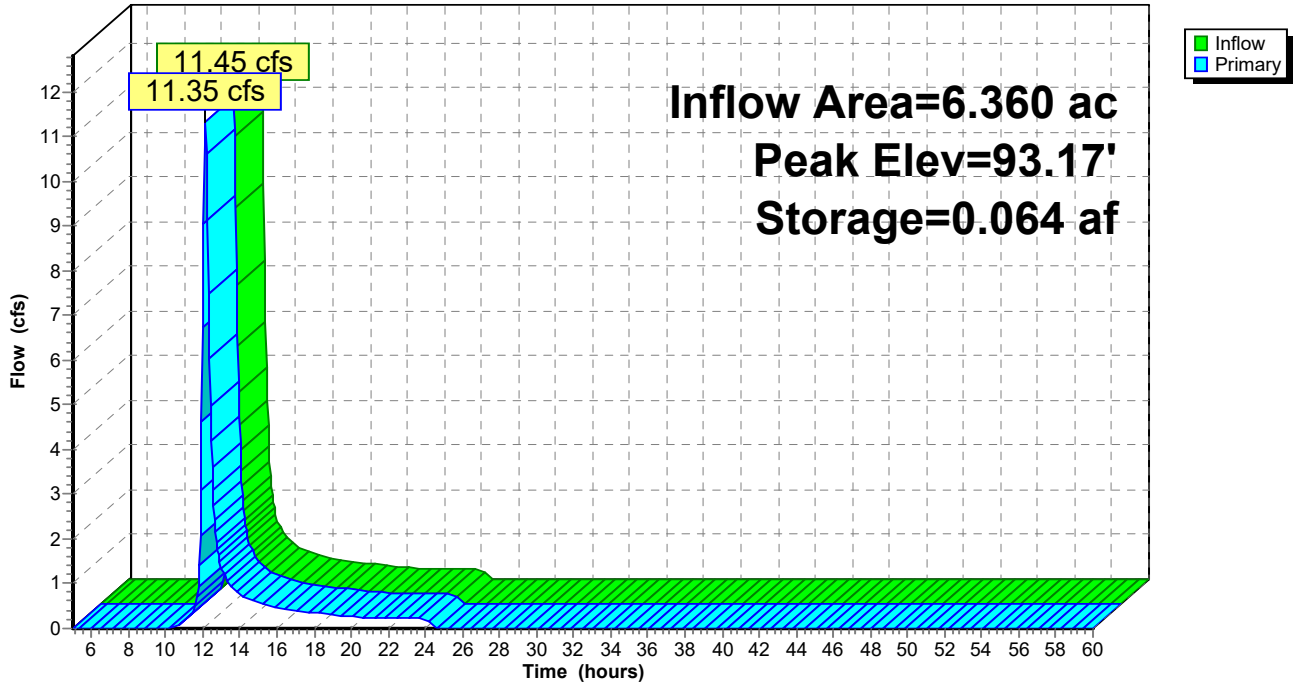
Volume	Invert	Avail.Storage	Storage Description			
#1	90.00'	0.096 af	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)	
90.00	0.008	81.0	0.000	0.000	0.008	
91.00	0.014	110.0	0.011	0.011	0.018	
92.00	0.024	129.0	0.019	0.030	0.027	
93.00	0.033	148.0	0.028	0.058	0.037	
94.00	0.044	168.0	0.038	0.096	0.049	

Device	Routing	Invert	Outlet Devices										
#1	Primary	92.80'	20.0' long x 6.0' breadth Broad-Crested Rectangular Weir										
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00										
			2.50 3.00 3.50 4.00 4.50 5.00 5.50										
			Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65										
			2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83										

Primary OutFlow Max=11.29 cfs @ 12.15 hrs HW=93.17' (Free Discharge)
 ↑1=**Broad-Crested Rectangular Weir** (Weir Controls 11.29 cfs @ 1.52 fps)

Pond 1P: Forebay

Hydrograph



Summary for Pond 2P: Bioretention #1

[79] Warning: Submerged Pond 1P Primary device # 1 by 0.05'

Inflow Area = 6.360 ac, 0.00% Impervious, Inflow Depth = 1.66" for 10yr Storm event
 Inflow = 11.35 cfs @ 12.15 hrs, Volume= 0.879 af
 Outflow = 4.00 cfs @ 12.47 hrs, Volume= 0.879 af, Atten= 65%, Lag= 19.3 min
 Discarded = 0.11 cfs @ 12.47 hrs, Volume= 0.176 af
 Primary = 3.88 cfs @ 12.47 hrs, Volume= 0.703 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Peak Elev= 92.85' @ 12.47 hrs Surf.Area= 0.131 ac Storage= 0.295 af
 Flood Elev= 103.00' Surf.Area= 0.155 ac Storage= 0.458 af

Plug-Flow detention time= 183.0 min calculated for 0.879 af (100% of inflow)
 Center-of-Mass det. time= 182.9 min (1,040.4 - 857.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	90.00'	0.458 af	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
90.00	0.077	248.0	0.000	0.000	0.077
91.00	0.095	267.0	0.086	0.086	0.096
92.00	0.114	286.0	0.104	0.190	0.116
93.00	0.134	305.0	0.124	0.314	0.138
94.00	0.155	325.0	0.144	0.458	0.162

Device	Routing	Invert	Outlet Devices
#1	Secondary	93.00'	20.0' long x 8.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#2	Primary	91.00'	12.0" Round Culvert L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 91.00' / 90.80' S= 0.0100 1/1' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#3	Discarded	90.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 87.00'

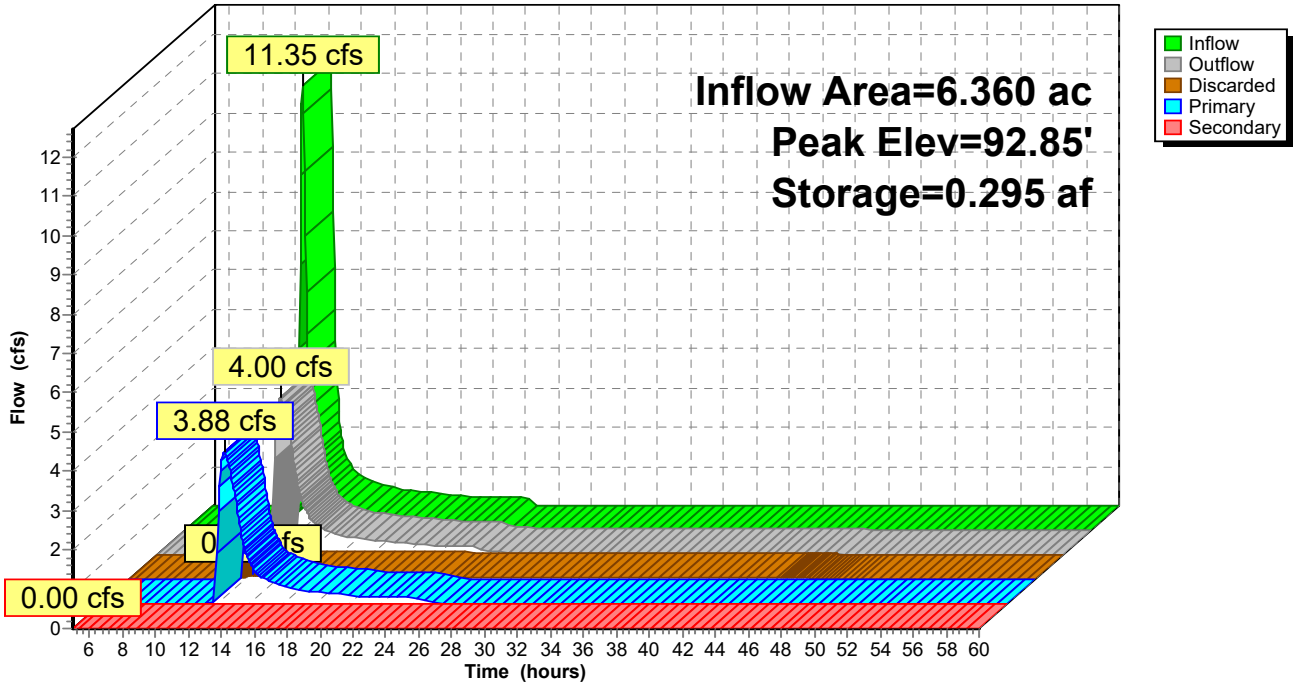
Discarded OutFlow Max=0.11 cfs @ 12.47 hrs HW=92.85' (Free Discharge)
 ↑3=Exfiltration (Controls 0.11 cfs)

Primary OutFlow Max=3.88 cfs @ 12.47 hrs HW=92.85' (Free Discharge)
 ↑2=Culvert (Inlet Controls 3.88 cfs @ 4.94 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=90.00' (Free Discharge)
 ↑1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 2P: Bioretention #1

Hydrograph



Summary for Pond 3P: Dry Pond #2

Inflow Area = 1.680 ac, 0.00% Impervious, Inflow Depth = 2.11" for 10yr Storm event
 Inflow = 5.78 cfs @ 12.00 hrs, Volume= 0.296 af
 Outflow = 1.06 cfs @ 12.24 hrs, Volume= 0.270 af, Atten= 82%, Lag= 14.7 min
 Primary = 1.06 cfs @ 12.24 hrs, Volume= 0.270 af

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Peak Elev= 98.05' @ 12.24 hrs Surf.Area= 3,626 sf Storage= 6,035 cf

Plug-Flow detention time= 552.0 min calculated for 0.270 af (91% of inflow)
 Center-of-Mass det. time= 507.7 min (1,335.5 - 827.8)

Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	9,788 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.00	2,300	0	0
97.00	2,900	2,600	2,600
98.00	3,588	3,244	5,844
99.00	4,300	3,944	9,788

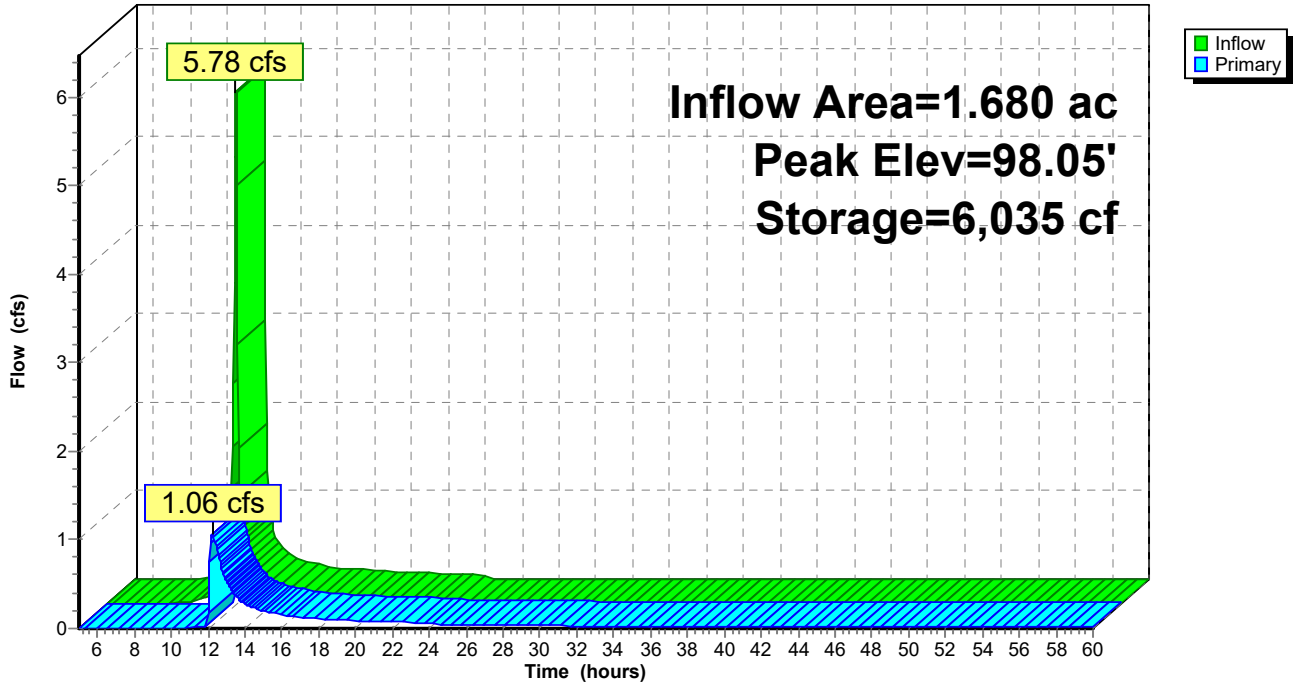
Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	15.0" Round Culvert L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 95.00' / 94.80' S= 0.0083 ' S= 0.0083 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	96.00'	1.0" Vert. Orifice/Grate C= 0.600
#3	Primary	97.50'	12.0" Round Culvert L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 97.50' / 97.00' S= 0.0083 ' S= 0.0083 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.06 cfs @ 12.24 hrs HW=98.05' (Free Discharge)

- 1=Culvert (Passes 0.04 cfs of 8.12 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.04 cfs @ 6.83 fps)
- 3=Culvert (Barrel Controls 1.02 cfs @ 3.32 fps)

Pond 3P: Dry Pond #2

Hydrograph



Summary for Pond 9P: Forebay

[79] Warning: Submerged Pond 14P Primary device # 1 INLET by 0.14'

Inflow Area = 10.140 ac, 0.00% Impervious, Inflow Depth = 0.43" for 10yr Storm event
 Inflow = 0.51 cfs @ 12.13 hrs, Volume= 0.367 af
 Outflow = 0.48 cfs @ 12.23 hrs, Volume= 0.367 af, Atten= 7%, Lag= 5.8 min
 Primary = 0.48 cfs @ 12.23 hrs, Volume= 0.367 af

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Starting Elev= 84.80' Surf.Area= 1,069 sf Storage= 1,962 cf
 Peak Elev= 85.14' @ 12.23 hrs Surf.Area= 1,174 sf Storage= 2,347 cf (385 cf above start)

Plug-Flow detention time= 120.9 min calculated for 0.322 af (88% of inflow)
 Center-of-Mass det. time= 16.9 min (1,042.1 - 1,025.2)

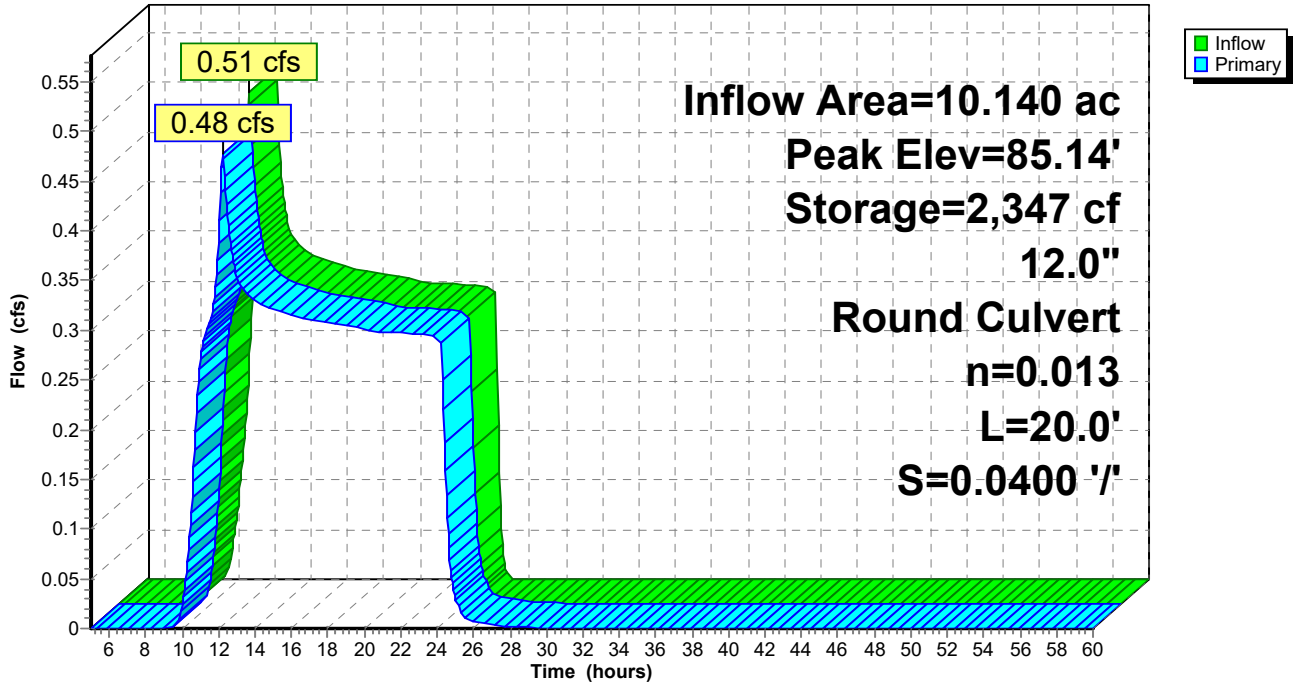
Volume	Invert	Avail.Storage	Storage Description			
#1	82.00'	3,471 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
82.00	385	76.0	0	0	385	
83.00	593	91.0	485	485	601	
84.00	842	107.0	714	1,199	872	
85.00	1,130	123.0	982	2,182	1,187	
86.00	1,455	139.0	1,289	3,471	1,545	

Device	Routing	Invert	Outlet Devices
#1	Primary	84.80'	12.0" Round Culvert L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 84.80' / 84.00' S= 0.0400 1' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.47 cfs @ 12.23 hrs HW=85.14' (Free Discharge)
 ↑1=Culvert (Inlet Controls 0.47 cfs @ 1.99 fps)

Pond 9P: Forebay

Hydrograph



Summary for Pond 10P: Bioretention #2

Inflow Area = 10.140 ac, 0.00% Impervious, Inflow Depth = 0.43" for 10yr Storm event
 Inflow = 0.48 cfs @ 12.23 hrs, Volume= 0.367 af
 Outflow = 0.32 cfs @ 14.82 hrs, Volume= 0.366 af, Atten= 33%, Lag= 155.5 min
 Discarded = 0.05 cfs @ 14.82 hrs, Volume= 0.145 af
 Secondary = 0.27 cfs @ 14.82 hrs, Volume= 0.220 af

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Peak Elev= 83.55' @ 14.82 hrs Surf.Area= 3,053 sf Storage= 3,993 cf
 Flood Elev= 102.00' Surf.Area= 4,035 sf Storage= 9,134 cf

Plug-Flow detention time= 384.2 min calculated for 0.366 af (100% of inflow)
 Center-of-Mass det. time= 382.3 min (1,424.4 - 1,042.1)

Volume	Invert	Avail.Storage	Storage Description			
#1	82.00'	9,134 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
82.00	2,138	182.0	0	0	2,138	
83.00	2,714	201.0	2,420	2,420	2,748	
84.00	3,350	220.0	3,026	5,447	3,418	
85.00	4,035	239.0	3,687	9,134	4,149	

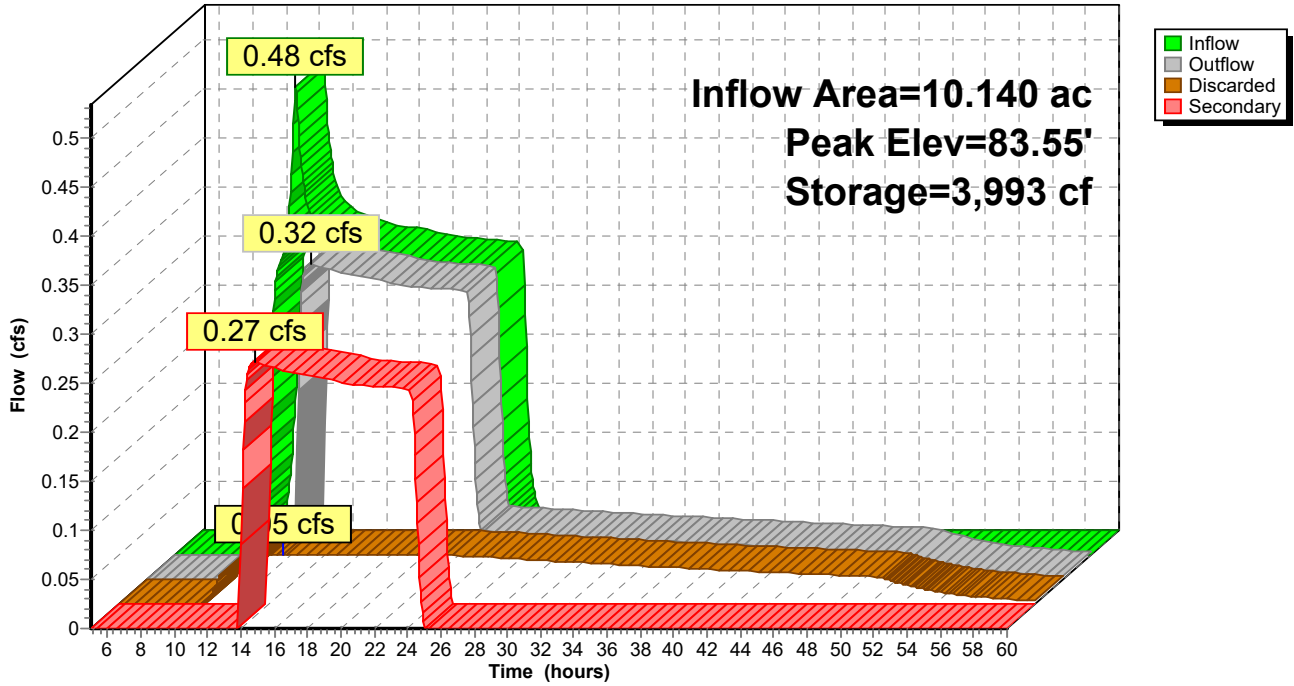
Device	Routing	Invert	Outlet Devices									
#1	Discarded	82.00'	0.500 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 79.00'									
#2	Secondary	83.50'	8.0' long x 5.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88									

Discarded OutFlow Max=0.05 cfs @ 14.82 hrs HW=83.55' (Free Discharge)
 ↑1=Exfiltration (Controls 0.05 cfs)

Secondary OutFlow Max=0.18 cfs @ 14.82 hrs HW=83.55' (Free Discharge)
 ↑2=Broad-Crested Rectangular Weir (Weir Controls 0.18 cfs @ 0.50 fps)

Pond 10P: Bioretention #2

Hydrograph



Summary for Pond 14P: diversion manhole

[58] Hint: Peaked 0.69' above defined flood level

Inflow Area = 10.140 ac, 0.00% Impervious, Inflow Depth = 1.80" for 10yr Storm event
 Inflow = 20.16 cfs @ 12.13 hrs, Volume= 1.524 af
 Outflow = 20.16 cfs @ 12.13 hrs, Volume= 1.524 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.51 cfs @ 12.13 hrs, Volume= 0.367 af
 Secondary = 19.65 cfs @ 12.13 hrs, Volume= 1.157 af

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Peak Elev= 88.69' @ 12.13 hrs
 Flood Elev= 88.00'

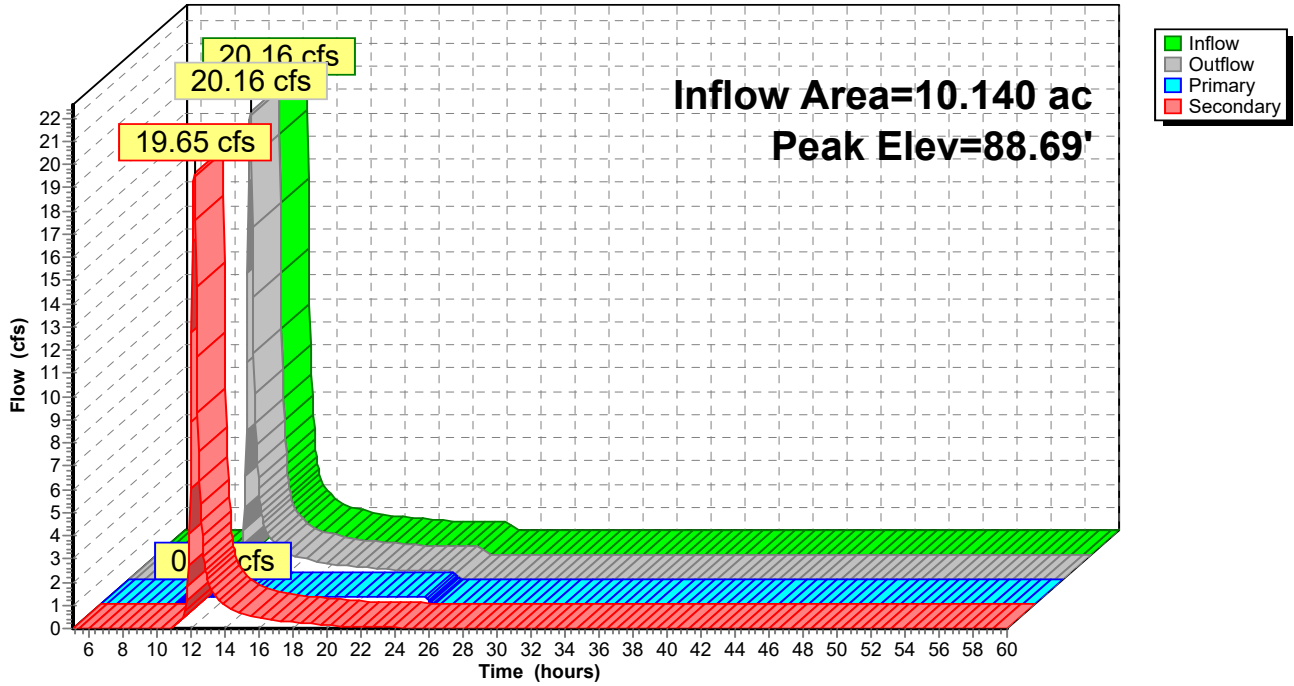
Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	4.0" Round Culvert L= 40.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 85.00' / 84.50' S= 0.0125 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.09 sf
#2	Secondary	86.00'	24.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 86.00' / 83.50' S= 0.0500 '/ Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.51 cfs @ 12.13 hrs HW=88.64' (Free Discharge)
 ↑1=Culvert (Barrel Controls 0.51 cfs @ 5.87 fps)

Secondary OutFlow Max=19.40 cfs @ 12.13 hrs HW=88.64' (Free Discharge)
 ↑2=Culvert (Inlet Controls 19.40 cfs @ 6.17 fps)

Pond 14P: diversion manhole

Hydrograph



Summary for Pond 15P: Dry Pond #2

[79] Warning: Submerged Pond 14P Secondary device # 2 OUTLET by 0.92'

Inflow = 19.65 cfs @ 12.13 hrs, Volume= 1.157 af
 Outflow = 12.34 cfs @ 12.30 hrs, Volume= 1.056 af, Atten= 37%, Lag= 10.0 min
 Primary = 12.18 cfs @ 12.29 hrs, Volume= 1.056 af
 Secondary = 0.17 cfs @ 12.30 hrs, Volume= 0.001 af

Routing by Stor-Ind method, Time Span= 5.00-60.00 hrs, dt= 0.05 hrs
 Peak Elev= 84.42' @ 12.29 hrs Surf.Area= 5,858 sf Storage= 16,150 cf
 Flood Elev= 103.00' Surf.Area= 7,027 sf Storage= 26,311 cf

Plug-Flow detention time= 206.1 min calculated for 1.055 af (91% of inflow)
 Center-of-Mass det. time= 174.6 min (969.2 - 794.6)

Volume	Invert	Avail.Storage	Storage Description			
#1	81.00'	26,311 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
81.00	3,662	229.0	0	0	3,662	
82.00	4,256	246.0	3,955	3,955	4,347	
83.00	4,890	261.0	4,569	8,525	5,003	
84.00	5,563	277.0	5,223	13,747	5,739	
85.00	6,276	293.0	5,916	19,663	6,519	
86.00	7,027	308.0	6,648	26,311	7,297	

Device	Routing	Invert	Outlet Devices
#1	Secondary	84.40'	10.0' long x 6.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.37 2.51 2.70 2.68 2.68 2.67 2.65 2.65 2.65 2.65 2.66 2.66 2.67 2.69 2.72 2.76 2.83
#2	Primary	81.00'	24.0" Round Culvert L= 20.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 81.00' / 80.50' S= 0.0250 1/1' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	81.00'	1.0" Vert. Orifice/Grate C= 0.600
#4	Device 2	83.00'	28.0" W x 6.0" H Vert. Orifice/Grate X 2.00 C= 0.600

Primary OutFlow Max=12.16 cfs @ 12.29 hrs HW=84.42' (Free Discharge)

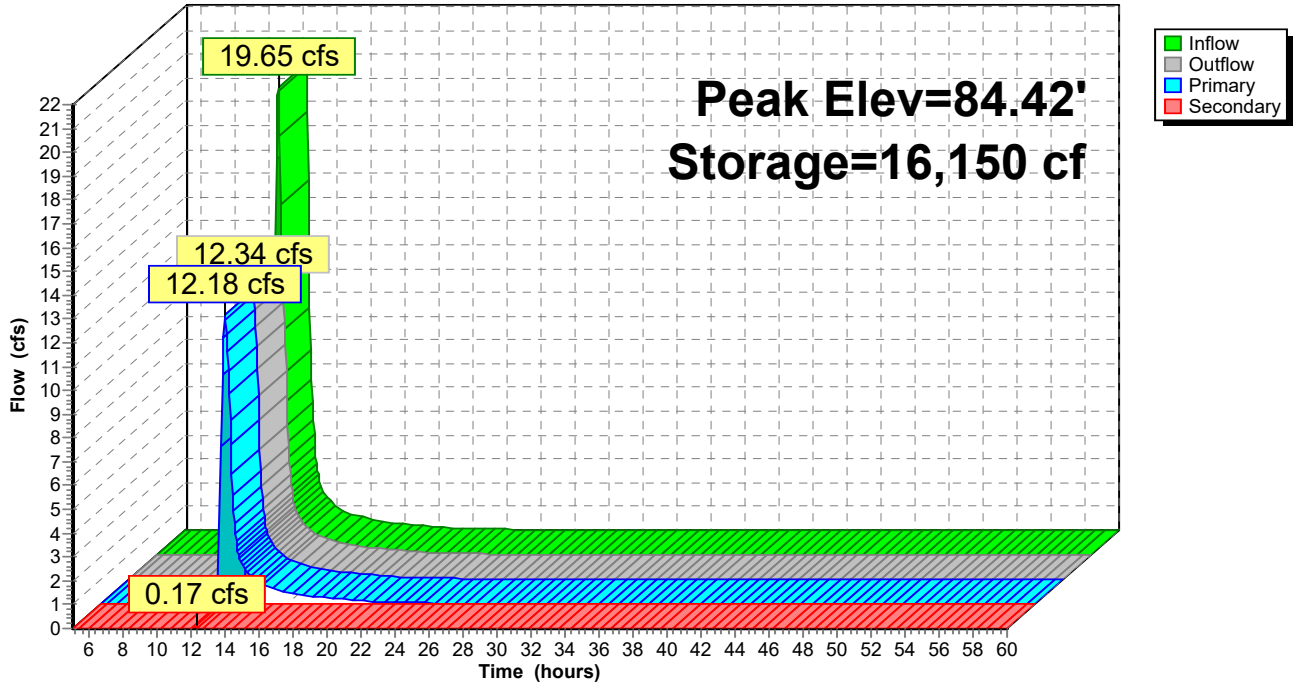
- ↑ 2=Culvert (Passes 12.16 cfs of 23.52 cfs potential flow)
- ↑ 3=Orifice/Grate (Orifice Controls 0.05 cfs @ 8.85 fps)
- ↑ 4=Orifice/Grate (Orifice Controls 12.11 cfs @ 5.19 fps)

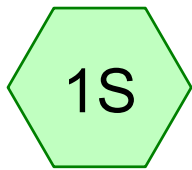
Secondary OutFlow Max=0.07 cfs @ 12.30 hrs HW=84.42' (Free Discharge)

- ↑ 1=Broad-Crested Rectangular Weir (Weir Controls 0.07 cfs @ 0.34 fps)

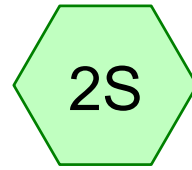
Pond 15P: Dry Pond #2

Hydrograph

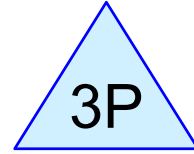




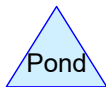
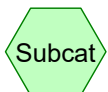
existing condition



Developed Condition



dry pond



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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.680	80	CNadj (2S)
1.680	77	Woods, Good, HSG D (1S)
3.360	79	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.000	HSG C	
1.680	HSG D	1S
1.680	Other	2S
3.360		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	1.680	1.680	CNadj	2S
0.000	0.000	0.000	1.680	0.000	1.680	Woods, Good	1S
0.000	0.000	0.000	1.680	1.680	3.360	TOTAL AREA	

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Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3P	95.00	94.80	24.0	0.0083	0.013	15.0	0.0	0.0
2	3P	97.50	97.00	60.0	0.0083	0.013	12.0	0.0	0.0

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Type II 24-hr 1yr Storm Rainfall=2.20"

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Time span=5.00-80.00 hrs, dt=0.05 hrs, 1501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: existing condition	Runoff Area=1.680 ac 0.00% Impervious Runoff Depth=0.56" Tc=8.9 min CN=77 Runoff=1.40 cfs 0.078 af
Subcatchment 2S: Developed Condition	Runoff Area=1.680 ac 0.00% Impervious Runoff Depth=0.69" Tc=8.3 min CN=80 Runoff=1.83 cfs 0.096 af
Pond 3P: dry pond	Peak Elev=97.15' Storage=3,033 cf Inflow=1.83 cfs 0.096 af Outflow=0.03 cfs 0.094 af

Total Runoff Area = 3.360 ac Runoff Volume = 0.175 af Average Runoff Depth = 0.62"
100.00% Pervious = 3.360 ac 0.00% Impervious = 0.000 ac

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Type II 24-hr 1yr Storm Rainfall=2.20"

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Summary for Subcatchment 1S: existing condition

Runoff = 1.40 cfs @ 12.02 hrs, Volume= 0.078 af, Depth= 0.56"

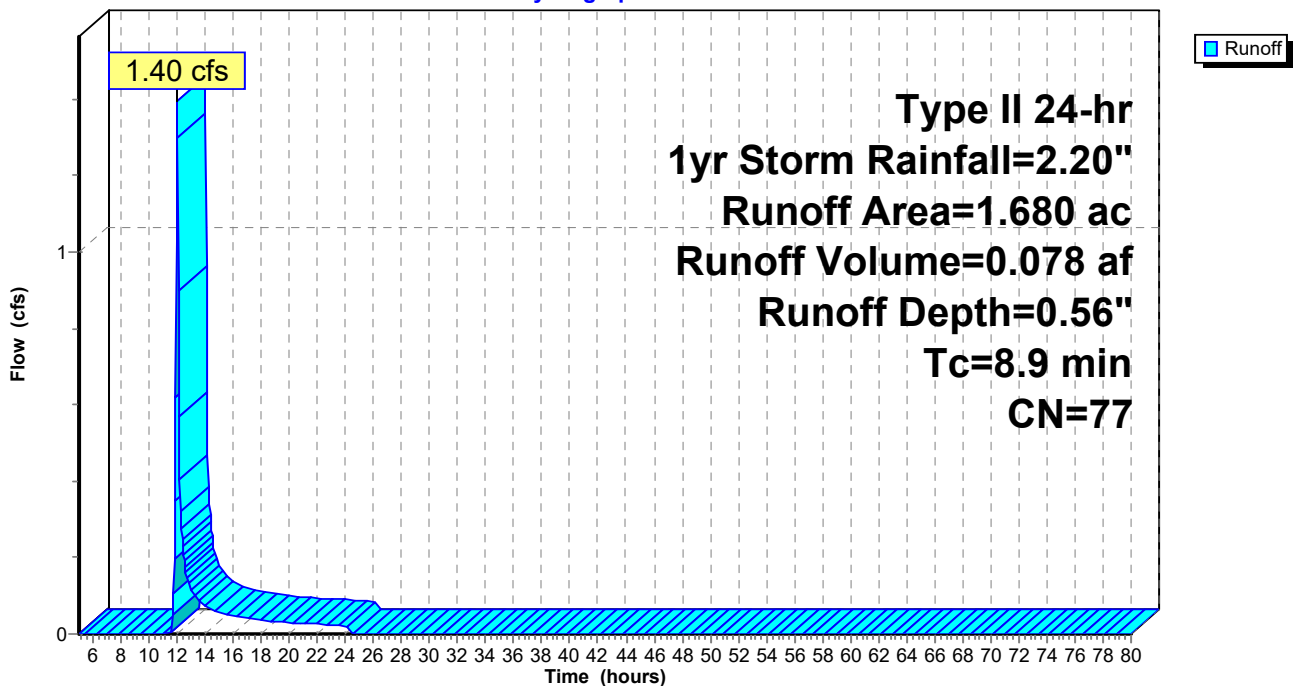
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-80.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1yr Storm Rainfall=2.20"

Area (ac)	CN	Description
1.680	77	Woods, Good, HSG D
1.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9					Direct Entry, Watershed Lag

Subcatchment 1S: existing condition

Hydrograph



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Type II 24-hr 1yr Storm Rainfall=2.20"

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Summary for Subcatchment 2S: Developed Condition

Runoff = 1.83 cfs @ 12.01 hrs, Volume= 0.096 af, Depth= 0.69"

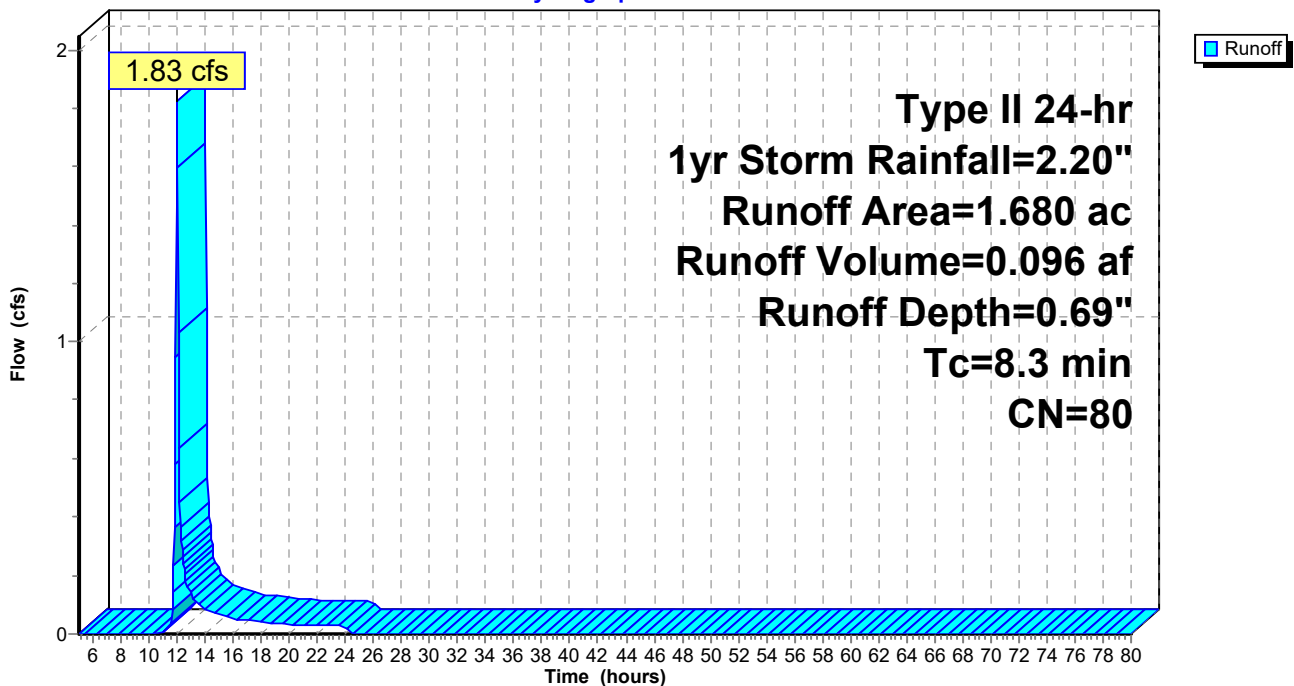
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 5.00-80.00 hrs, dt= 0.05 hrs
Type II 24-hr 1yr Storm Rainfall=2.20"

Area (ac)	CN	Description
* 1.680	80	CNadj
1.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.3					Direct Entry, Watershed Lag

Subcatchment 2S: Developed Condition

Hydrograph



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Type II 24-hr 1yr Storm Rainfall=2.20"

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Summary for Pond 3P: dry pond

Inflow Area = 1.680 ac, 0.00% Impervious, Inflow Depth = 0.69" for 1yr Storm event
 Inflow = 1.83 cfs @ 12.01 hrs, Volume= 0.096 af
 Outflow = 0.03 cfs @ 23.01 hrs, Volume= 0.094 af, Atten= 98%, Lag= 660.4 min
 Primary = 0.03 cfs @ 23.01 hrs, Volume= 0.094 af

Routing by Stor-Ind method, Time Span= 5.00-80.00 hrs, dt= 0.05 hrs
 Peak Elev= 97.15' @ 23.01 hrs Surf.Area= 3,001 sf Storage= 3,033 cf

Plug-Flow detention time= 1,326.5 min calculated for 0.094 af (98% of inflow)
 Center-of-Mass det. time= 1,314.7 min (2,177.8 - 863.1)

Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	9,788 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.00	2,300	0	0
97.00	2,900	2,600	2,600
98.00	3,588	3,244	5,844
99.00	4,300	3,944	9,788

Device	Routing	Invert	Outlet Devices
#1	Primary	95.00'	15.0" Round Culvert L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 95.00' / 94.80' S= 0.0083 ' S= 0.0083 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	96.00'	1.0" Vert. Orifice/Grate C= 0.600
#3	Primary	97.50'	12.0" Round Culvert L= 60.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 97.50' / 97.00' S= 0.0083 ' S= 0.0083 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.03 cfs @ 23.01 hrs HW=97.15' (Free Discharge)

- 1=Culvert (Passes 0.03 cfs of 6.43 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.03 cfs @ 5.06 fps)
- 3=Culvert (Controls 0.00 cfs)

Pond 3P: dry pond

Hydrograph

