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MEMORANDUM

To: Chairman James Patterson

From: Andrew Fetherston, P.E.

Date: December 29, 2020

Re: Warwick Meadows, Phase IV – Dam Modifications
Tax Lots 218-1-91, 92, 93, 94 & 96 and 219-1-2.2
Warwick, Orange County, New York
MC Project No. 15002429D

Introduction:

As stated in previous reports, the existing Warwick Meadows dam was originally intended to provide peak mitigation for the overall Warwick Commons development. Additionally, Warwick Meadows dam is a Class B NYSDEC regulated Dam. with outstanding violations. As part of the current site plan approval, the previous Engineer Vanderbeek, prepared a plan to raise the crest of the dam and provide additional spillway capacity for the dam.

As part of the amended site plans application, Maser has prepared a hydraulic model of two (2) dam modification scenarios, the previously approved Vanderbeek Dam improvements and a dam decommissioning alternative. The supporting documentation and figures below show, that in both dam modification scenarios, the peak flows for the overall development have been mitigated and the NYSDEC Violations have been addressed.

Existing Conditions:

As part of rebuilding the hydraulic model of the existing dam and watersheds, the previous reports were reviewed and incorporated into our model. In previous reports, a single 244-acre watershed with a curve number (CN) of 74 and a time of concentration (TC) of 73.9 minutes was used as the existing condition. To provide a comparison to previous reports, this singular watershed was routed to the existing dam with current rainfall depths and included in our analysis. This watershed will be referred to as "Existing total" In the tables below.

Additionally, a second existing condition scenario was analyzed. The watershed was split into two separate watersheds. The first watershed was the existing conditions of the project site only. This watershed had an area of 15.2 acres, a CN of 83 and a TC 17 minutes. The second watershed was the remaining 228.8 acres tributary to the dam. The second watershed utilized the same curve number and TC and the "Existing total" watershed. This analysis provides an accurate way to gauge the impacts of the proposed project site development. The two separate watersheds were combined and routed to the dam. These watersheds will be referred to as "Existing split" in the tables below

Project Site Development Impacts :

As noted above, the updated "Existing split" watershed analysis breaks out the project site from the overall tributary area to the dam. The table below shows that the proposed development will cause an increase in the curve number of the proposed watersheds, producing greater runoff then the existing conditions. This increase in runoff was originally intended to be mitigated at the dam as described in previously approved drainage reports.

Existing Conditions		
	Area	**CN**
WS E1	15.26	83
Total	15.26	83
Proposed Conditions		
	Total Area	**CN**
WS 1	0.55	88.00
WS 2	2.50	93.00
WS 3	1.10	85.00
WS 4	0.44	90.00
WS 5	0.75	91.00
WS 6	0.27	96.00
WS 7	1.02	88.00
WS 8	0.55	88.00
WS 9	0.59	94.00
WS 10	0.97	95.00
WS A	2.71	87.00
WS B	3.50	81.00
WS C	0.25	79.00
Totals	15.26	88.00

In addition to the proposed site improvements, stormwater mitigation practices have been proposed on site. In the September 2020 SWPPP submitted by our office, these stormwater practices were only analyses for their water quality and runoff reduction benefits. However, due to the high infiltration rates found during on-site soil testing, the stormwater mitigation practices also provide

peak reduction benefits (see Appendix 15 of the September 2020 SWPPP for soil testing results). As shown in the chart below, the proposed stormwater mitigation practices provide peak detention below that of the undeveloped condition.

Design Point	Storm Events	Existing	Proposed	Diff.	Percent
DP 1	1	15.12	7.26	-7.86	-52.0%
	10	38.08	21.60	-16.48	-43.3%
	100	80.10	80.07	-0.03	0.0%

In summation while the dam was originally intended to provide peak mitigation for the proposed development, this requirement has been met through the use of on-site stormwater mitigation practices. With this in mind, an analysis of the flows from the dam was still performed.

Proposed Conditions:

To provide a comparison to the existing split condition noted above, the proposed onsite watersheds were routed through their respective mitigation practices and combined with the remaining offsite area tributary to the dam (similar to the "Existing split"). As noted in the table above the flows from this watershed to the dam have already been reduced by the onsite mitigation practices. This watershed routing scenario will be referred to as "Proposed split" in the tables below.

The watersheds in the "Proposed split" scenario were routed to the existing dam as it is today, in addition to the two possible dam modification scenarios. A summary of each analysis scenario has been included in the table below.

Watershed	Structure	Storm Events	Peak flow	Peak Elevation
Existing - total	Existing dam	1	62.41	641.18
		10	213.29	642.16
		100	525.79	649.45
		150% 100	789.06	650.30
Existing split	Existing dam	1	61.07	641.17
		10	206.09	642.12
		100	506.46	649.37
		150% 100	758.36	650.21
Proposed split	Existing dam	1	59.76	641.16
		10	203.56	642.11
		100	506.85	649.38
		150% 100	754.81	650.20
Proposed split	Vanderbeek - Modification	1	59.76	641.16
		10	203.56	642.11
		100	488.95	647.73
		150% 100	752.9	650.21
Proposed split	Dam Decommission	1	60.04	634.33
		10	204.07	636.20
		100	501.38	641.10
		150% 100	753.75	642.60

As shown in the table, both dam modification scenarios provide reduction in the peak flows at the dam during the 1,10 and 100 year flows. This reduction, along with the water quality and runoff reduction addressed in the previous SWPPP prepared by Maser, meet the requirements the stormwater pollution prevention plan for the proposed development.

Finally, the dam modifications were reviewed for compliance with New York State dam safety standards. The proposed Vanderbeek modification will raise the road provide adequate freeboard and spillway capacity. The proposed dam decommissioning well reduces the peak impoundment height and volumes below the thresholds to be considered a regulated dam by NYSDEC. Because it is no longer considered a dam, there violations will be addressed.

ABF/cpm
cc: Leiby Katz
Nathan Ungar
Dave Everett

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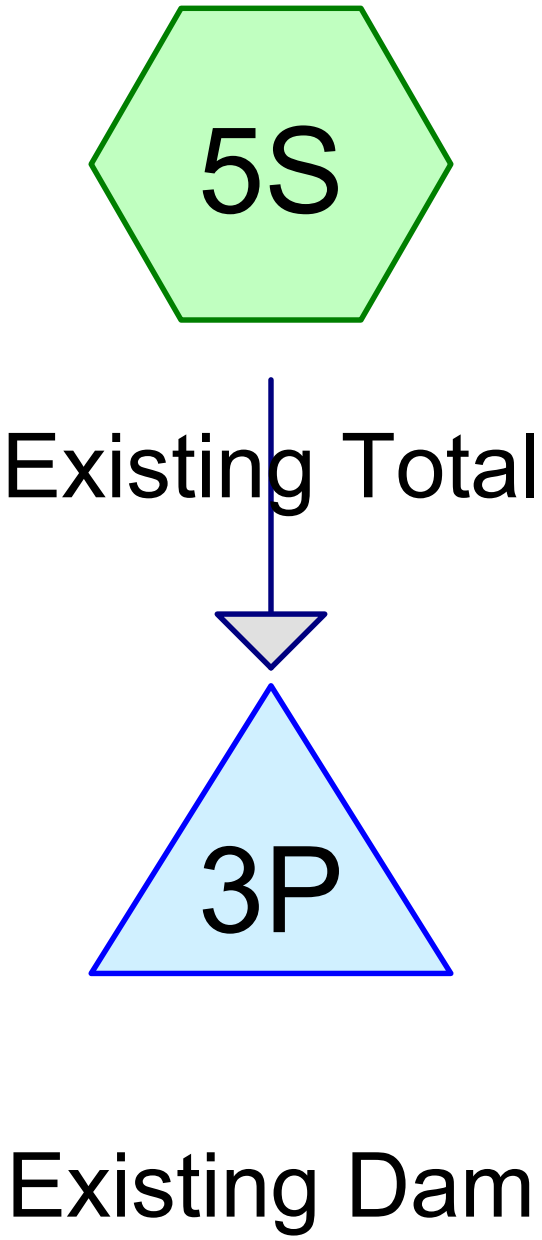
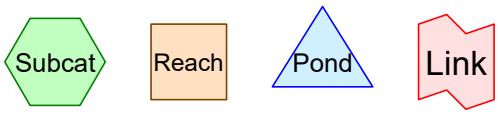
EXISTING TOTAL WATERSHED – EXISTING DAM





Routing Diagram for 201228 Warwick-onsite
Prepared by Maser Consulting PA, Printed 12/29/2020
HydroCAD® 10.10-3a s/n 08816 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment 5S: Existing Total

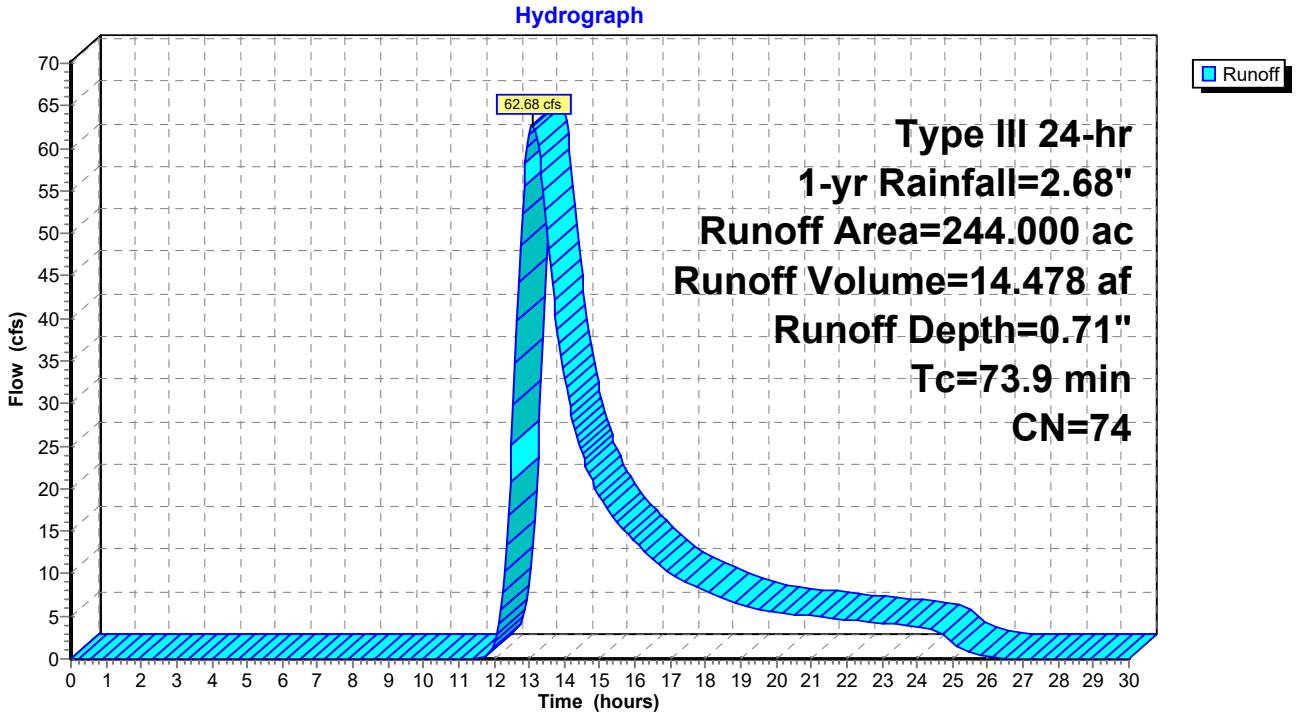
Runoff = 62.68 cfs @ 13.08 hrs, Volume= 14.478 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.68"

	Area (ac)	CN	Description
*	244.000	74	
	244.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry,**

Subcatchment 5S: Existing Total



Summary for Pond 3P: Existing Dam

Inflow Area =	244.000 ac,	0.00% Impervious,	Inflow Depth =	0.71"	for 1-yr event
Inflow =	62.68 cfs @	13.08 hrs,	Volume=	14.478 af	
Outflow =	62.41 cfs @	13.14 hrs,	Volume=	14.059 af,	Atten= 0%, Lag= 3.7 min
Primary =	62.41 cfs @	13.14 hrs,	Volume=	14.059 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 641.18' @ 13.14 hrs Storage= 42,196 cf

Plug-Flow detention time= 36.8 min calculated for 14.036 af (97% of inflow)
Center-of-Mass det. time= 21.2 min (958.4 - 937.2)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

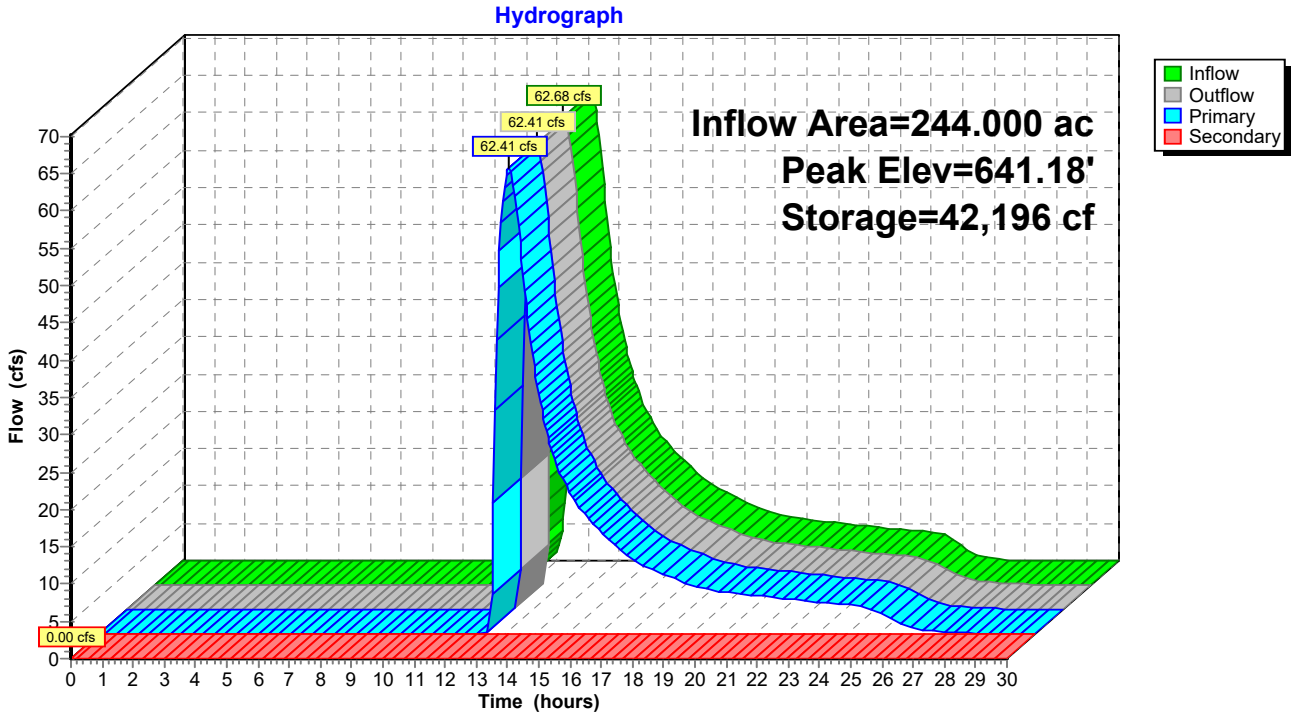
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=61.58 cfs @ 13.14 hrs HW=641.18' (Free Discharge)
└─**1=Culvert** (Passes 61.58 cfs of 244.38 cfs potential flow)
  ├─**2=4' sharp crested weir** (Weir Controls 16.30 cfs @ 3.55 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 2.13 cfs @ 3.61 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Weir Controls 2.13 cfs @ 3.61 fps)
  └─**5=top of str** (Weir Controls 41.02 cfs @ 2.62 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=630.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Existing Dam



Summary for Subcatchment 5S: Existing Total

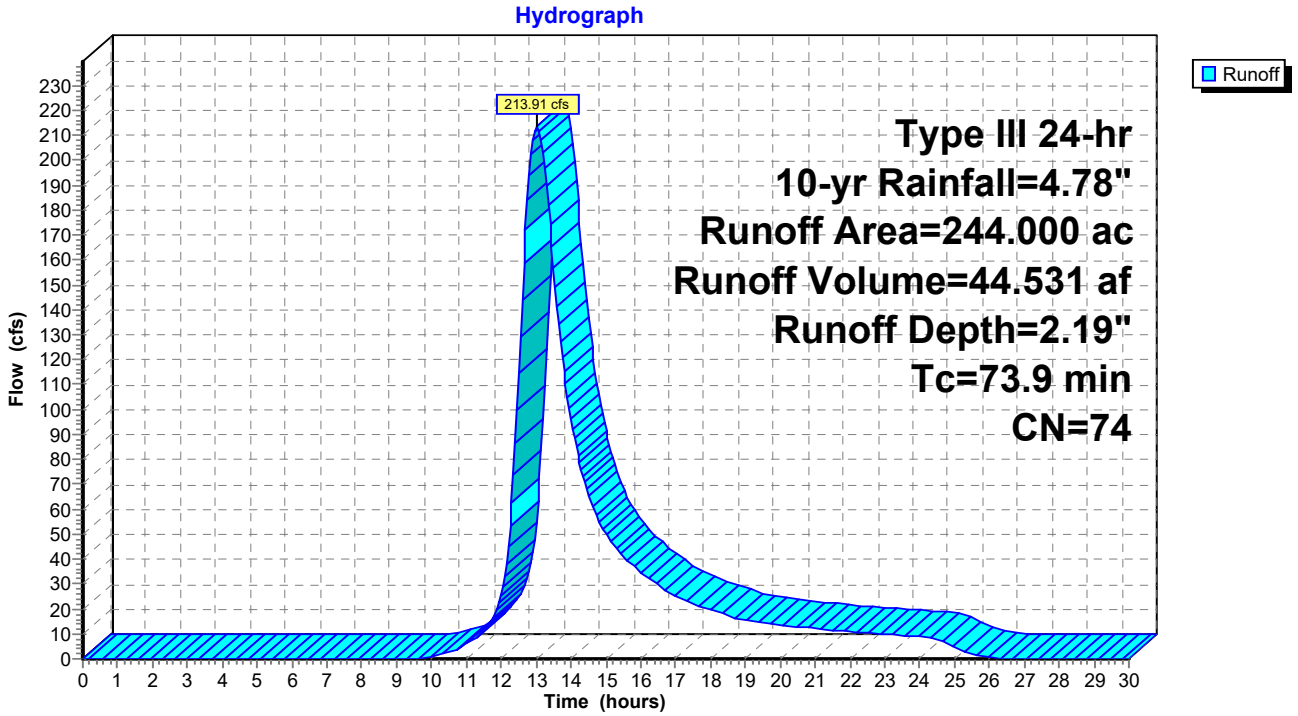
Runoff = 213.91 cfs @ 13.03 hrs, Volume= 44.531 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.78"

	Area (ac)	CN	Description
*	244.000	74	
	244.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry,**

Subcatchment 5S: Existing Total



Summary for Pond 3P: Existing Dam

Inflow Area = 244.000 ac, 0.00% Impervious, Inflow Depth = 2.19" for 10-yr event
Inflow = 213.91 cfs @ 13.03 hrs, Volume= 44.531 af
Outflow = 213.29 cfs @ 13.06 hrs, Volume= 44.111 af, Atten= 0%, Lag= 1.7 min
Primary = 213.29 cfs @ 13.06 hrs, Volume= 44.111 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 642.16' @ 13.06 hrs Storage= 63,724 cf

Plug-Flow detention time= 16.1 min calculated for 44.111 af (99% of inflow)
Center-of-Mass det. time= 10.4 min (913.0 - 902.7)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

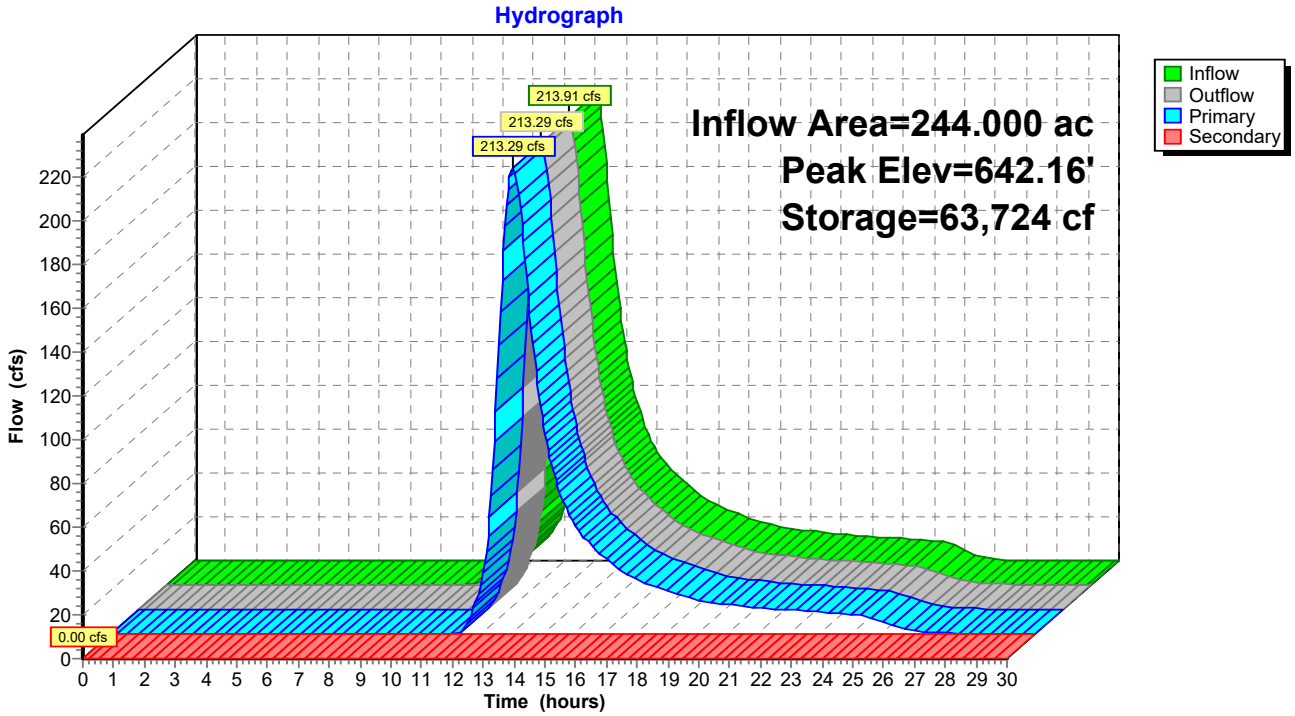
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=213.06 cfs @ 13.06 hrs HW=642.16' (Free Discharge)
└─**1=Culvert** (Passes 213.06 cfs of 261.65 cfs potential flow)
  ├─**2=4' sharp crested weir** (Weir Controls 39.27 cfs @ 4.81 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 5.27 cfs @ 4.88 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Weir Controls 5.27 cfs @ 4.88 fps)
  └─**5=top of str** (Weir Controls 163.26 cfs @ 4.28 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=630.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 3P: Existing Dam



Summary for Subcatchment 5S: Existing Total

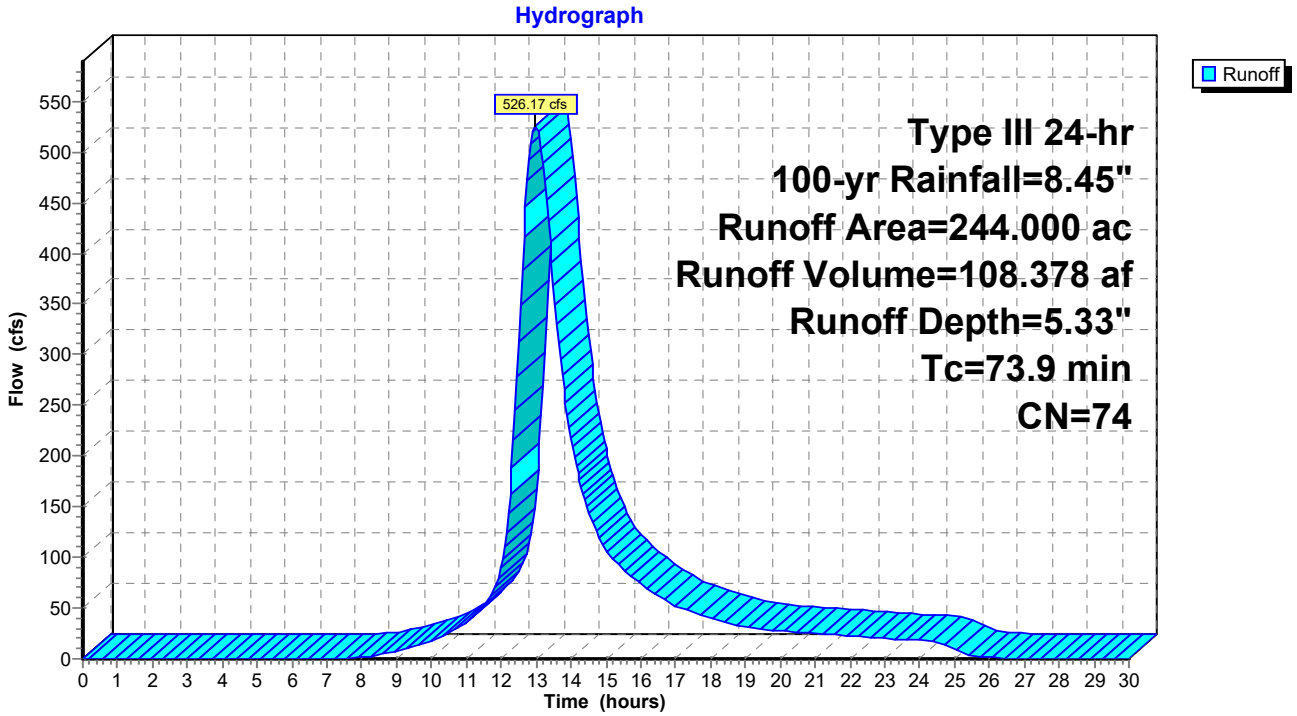
Runoff = 526.17 cfs @ 12.99 hrs, Volume= 108.378 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.45"

	Area (ac)	CN	Description
*	244.000	74	
	244.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry,**

Subcatchment 5S: Existing Total



Summary for Pond 3P: Existing Dam

Inflow Area = 244.000 ac, 0.00% Impervious, Inflow Depth = 5.33" for 100-yr event
Inflow = 526.17 cfs @ 12.99 hrs, Volume= 108.378 af
Outflow = 525.79 cfs @ 13.04 hrs, Volume= 107.957 af, Atten= 0%, Lag= 3.1 min
Primary = 365.50 cfs @ 13.04 hrs, Volume= 102.764 af
Secondary = 160.30 cfs @ 13.04 hrs, Volume= 5.192 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 649.45' @ 13.04 hrs Storage= 295,299 cf

Plug-Flow detention time= 12.2 min calculated for 107.957 af (100% of inflow)
Center-of-Mass det. time= 9.7 min (886.7 - 877.1)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

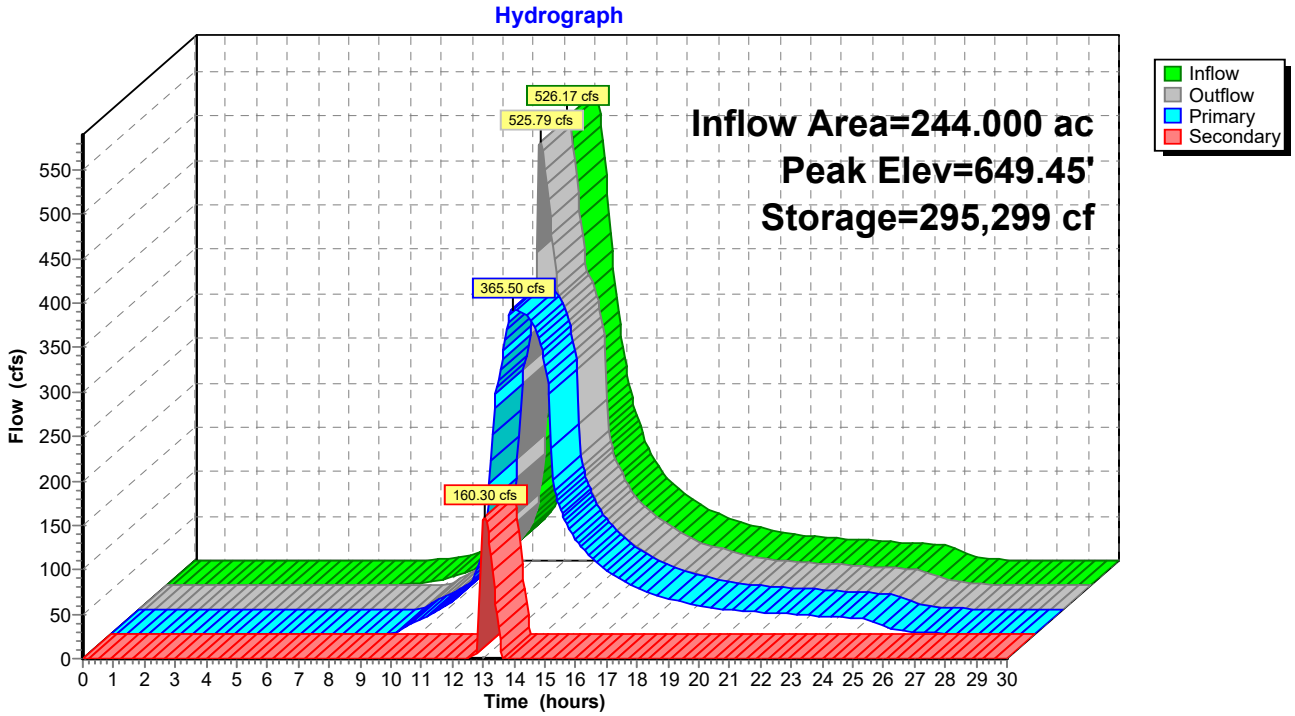
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=365.47 cfs @ 13.04 hrs HW=649.44' (Free Discharge)
└─**1=Culvert** (Inlet Controls 365.47 cfs @ 18.61 fps)
  ├─**2=4' sharp crested weir** (Passes < 289.97 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Passes < 48.17 cfs potential flow)
  ├─**4=Broad-Crested Rectangular Weir** (Passes < 48.17 cfs potential flow)
  └─**5=top of str** (Passes < 2,042.31 cfs potential flow)

Secondary OutFlow Max=158.60 cfs @ 13.04 hrs HW=649.44' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Weir Controls 158.60 cfs @ 2.59 fps)

Pond 3P: Existing Dam



Summary for Subcatchment 5S: Existing Total

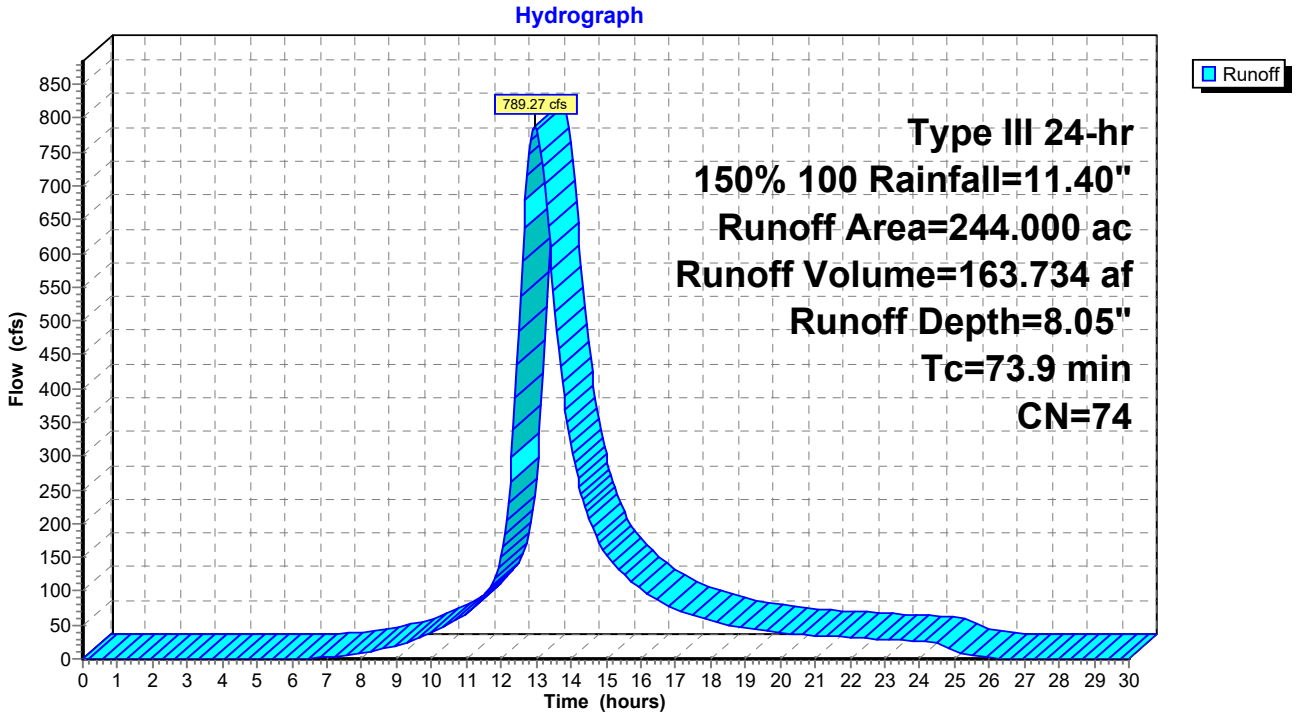
Runoff = 789.27 cfs @ 12.97 hrs, Volume= 163.734 af, Depth= 8.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 150% 100 Rainfall=11.40"

	Area (ac)	CN	Description
*	244.000	74	
	244.000		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry,**

Subcatchment 5S: Existing Total



Summary for Pond 3P: Existing Dam

Inflow Area = 244.000 ac, 0.00% Impervious, Inflow Depth = 8.05" for 150% 100 event
Inflow = 789.27 cfs @ 12.97 hrs, Volume= 163.734 af
Outflow = 789.06 cfs @ 12.98 hrs, Volume= 163.312 af, Atten= 0%, Lag= 0.2 min
Primary = 375.74 cfs @ 12.98 hrs, Volume= 137.045 af
Secondary = 413.32 cfs @ 12.98 hrs, Volume= 26.267 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 650.30' @ 12.98 hrs Storage= 308,922 cf

Plug-Flow detention time= 9.9 min calculated for 163.041 af (100% of inflow)
Center-of-Mass det. time= 8.4 min (873.8 - 865.4)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

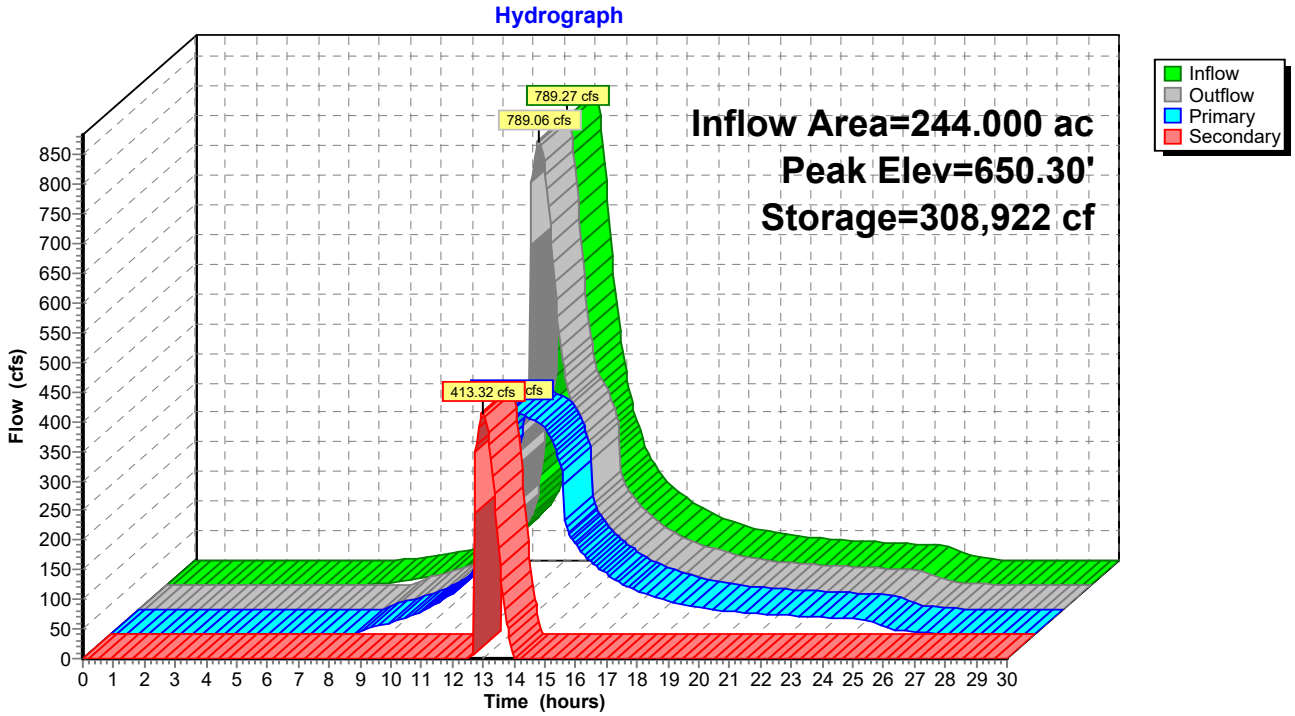
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

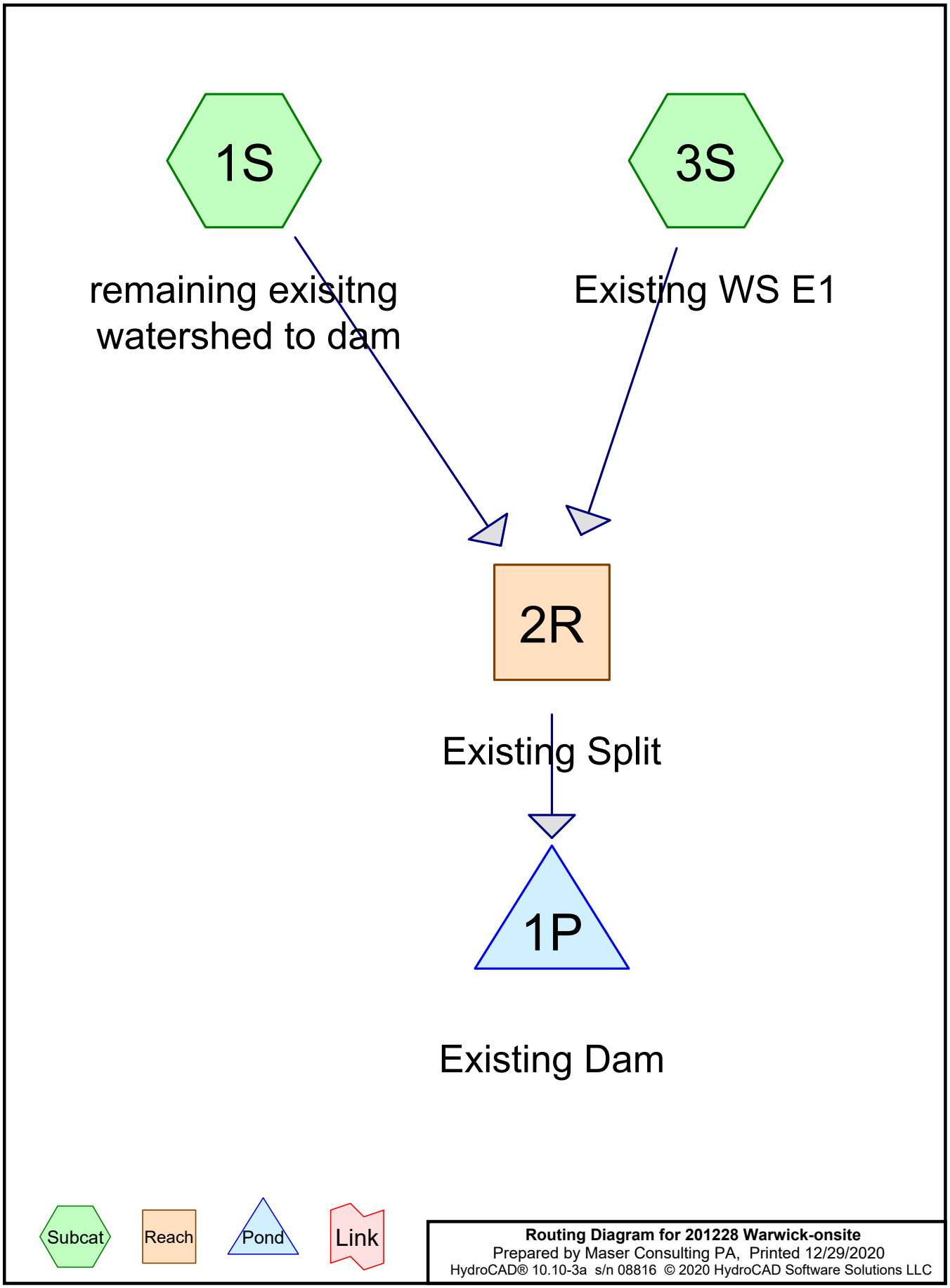
Primary OutFlow Max=375.73 cfs @ 12.98 hrs HW=650.29' (Free Discharge)
└─**1=Culvert** (Inlet Controls 375.73 cfs @ 19.14 fps)
  ├─**2=4' sharp crested weir** (Passes < 320.84 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Passes < 54.83 cfs potential flow)
  ├─**4=Broad-Crested Rectangular Weir** (Passes < 54.83 cfs potential flow)
  └─**5=top of str** (Passes < 2,340.67 cfs potential flow)

Secondary OutFlow Max=412.51 cfs @ 12.98 hrs HW=650.29' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Weir Controls 412.51 cfs @ 3.54 fps)

Pond 3P: Existing Dam



EXISTING SPLIT WATERSHED – EXISTING DAM



Routing Diagram for 201228 Warwick-onsite
Prepared by Maser Consulting PA, Printed 12/29/2020
HydroCAD® 10.10-3a s/n 08816 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: remaining exisitng watershed to dam

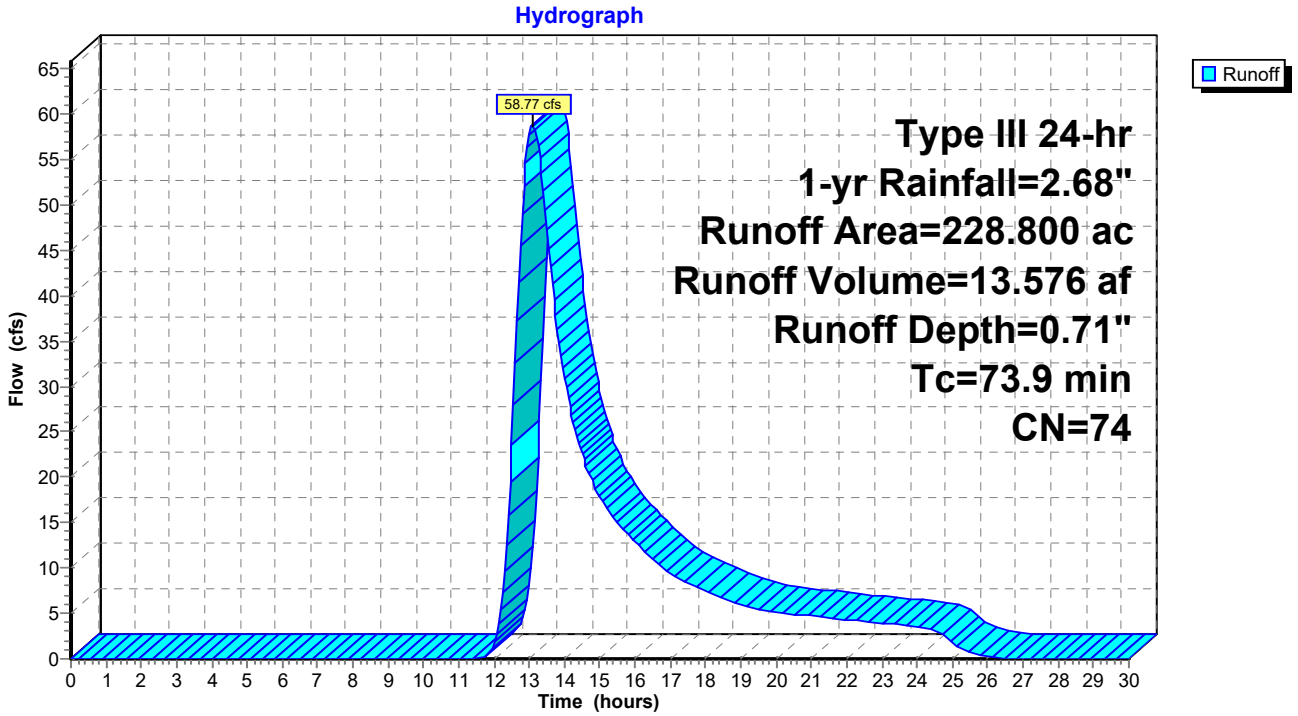
Runoff = 58.77 cfs @ 13.08 hrs, Volume= 13.576 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.68"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 1S: remaining exisitng watershed to dam



Summary for Subcatchment 3S: Existing WS E1

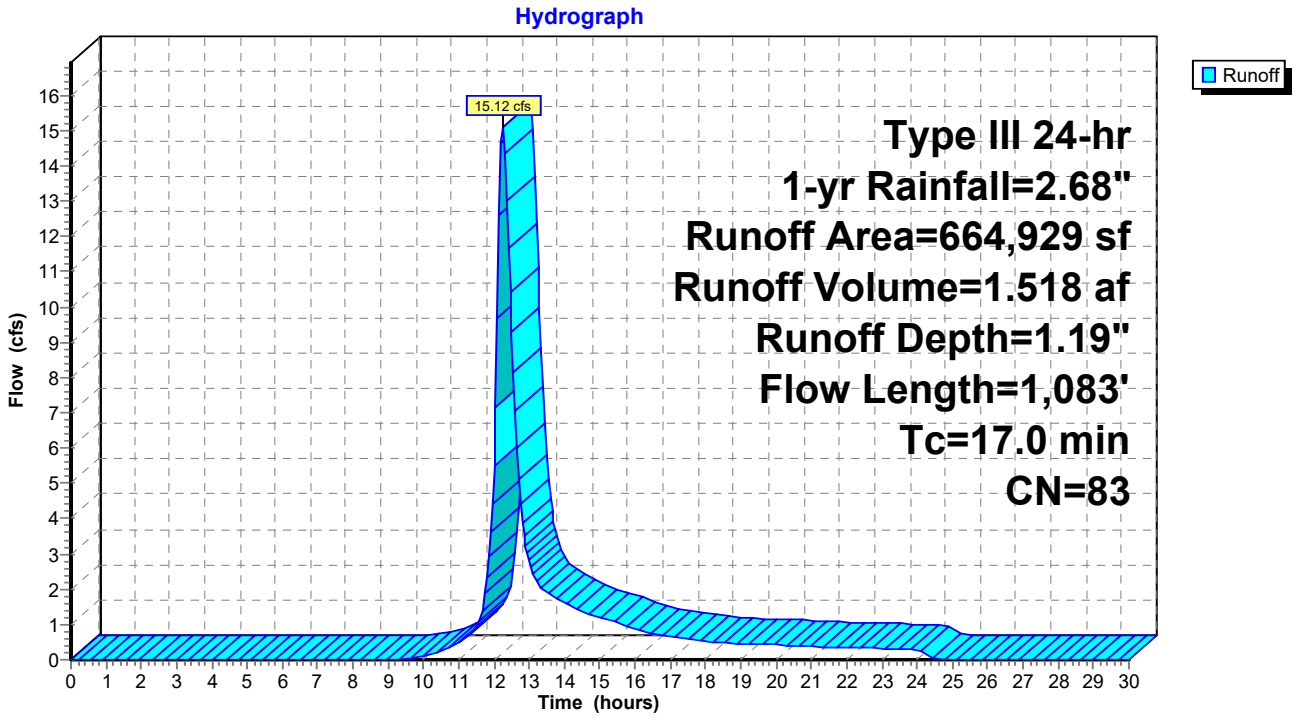
Runoff = 15.12 cfs @ 12.24 hrs, Volume= 1.518 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.68"

Area (sf)	CN	Description
42,999	98	Paved parking, HSG D
24,491	89	<50% Grass cover, Poor, HSG D
96,069	78	Meadow, non-grazed, HSG D
24,245	83	Brush, Poor, HSG D
9,892	77	Brush, Poor, HSG C
397,885	83	Woods, Poor, HSG D
69,348	77	Woods, Poor, HSG C
664,929	83	Weighted Average
621,930		93.53% Pervious Area
42,999		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.1500	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.17"
5.5	497	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	70	0.0620	15.49	19.01	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
1.8	416	0.0670	3.88		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.0	1,083	Total			

Subcatchment 3S: Existing WS E1



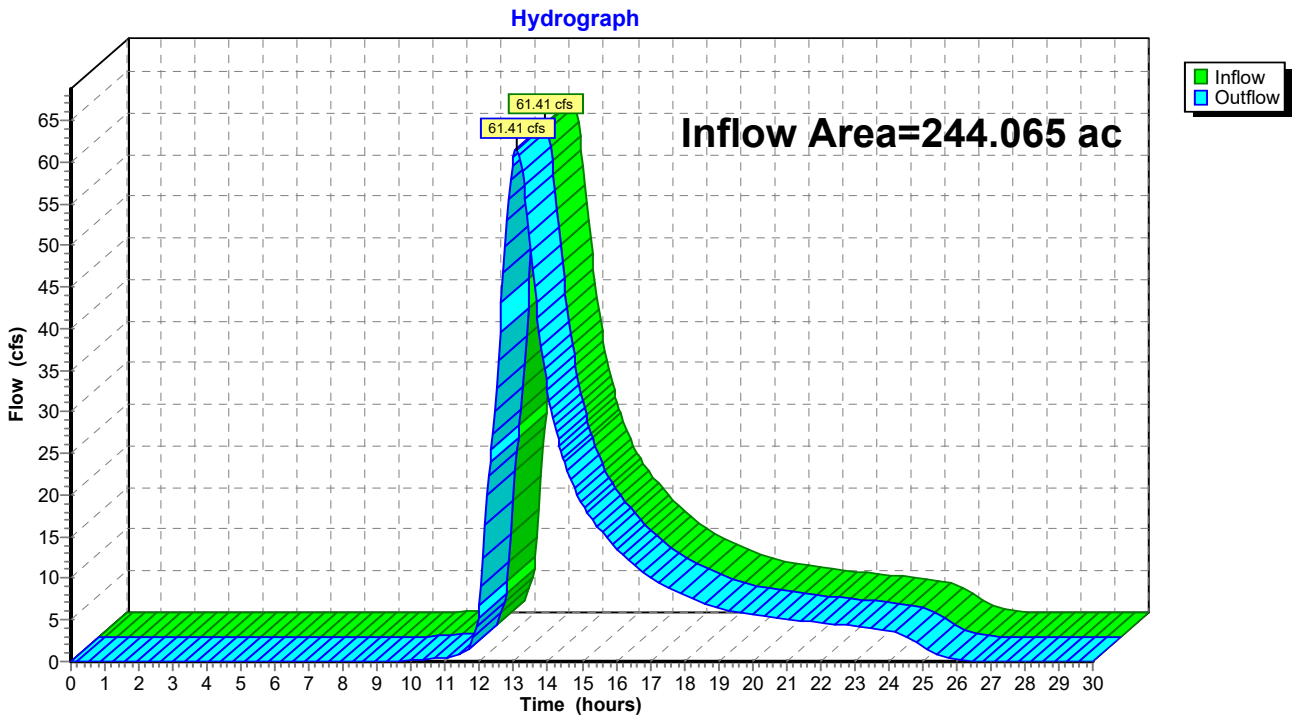
Summary for Reach 2R: Existing Split

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

Inflow Area = 244.065 ac, 0.40% Impervious, Inflow Depth = 0.74" for 1-yr event
Inflow = 61.41 cfs @ 13.07 hrs, Volume= 15.095 af
Outflow = 61.41 cfs @ 13.07 hrs, Volume= 15.095 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 2R: Existing Split



Summary for Pond 1P: Existing Dam

Inflow Area =	244.065 ac,	0.40% Impervious,	Inflow Depth =	0.74"	for 1-yr event
Inflow =	61.41 cfs @	13.07 hrs,	Volume=	15.095 af	
Outflow =	61.07 cfs @	13.13 hrs,	Volume=	14.675 af,	Atten= 1%, Lag= 3.5 min
Primary =	61.07 cfs @	13.13 hrs,	Volume=	14.675 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 641.17' @ 13.13 hrs Storage= 41,960 cf

Plug-Flow detention time= 36.2 min calculated for 14.651 af (97% of inflow)
Center-of-Mass det. time= 21.3 min (949.8 - 928.6)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

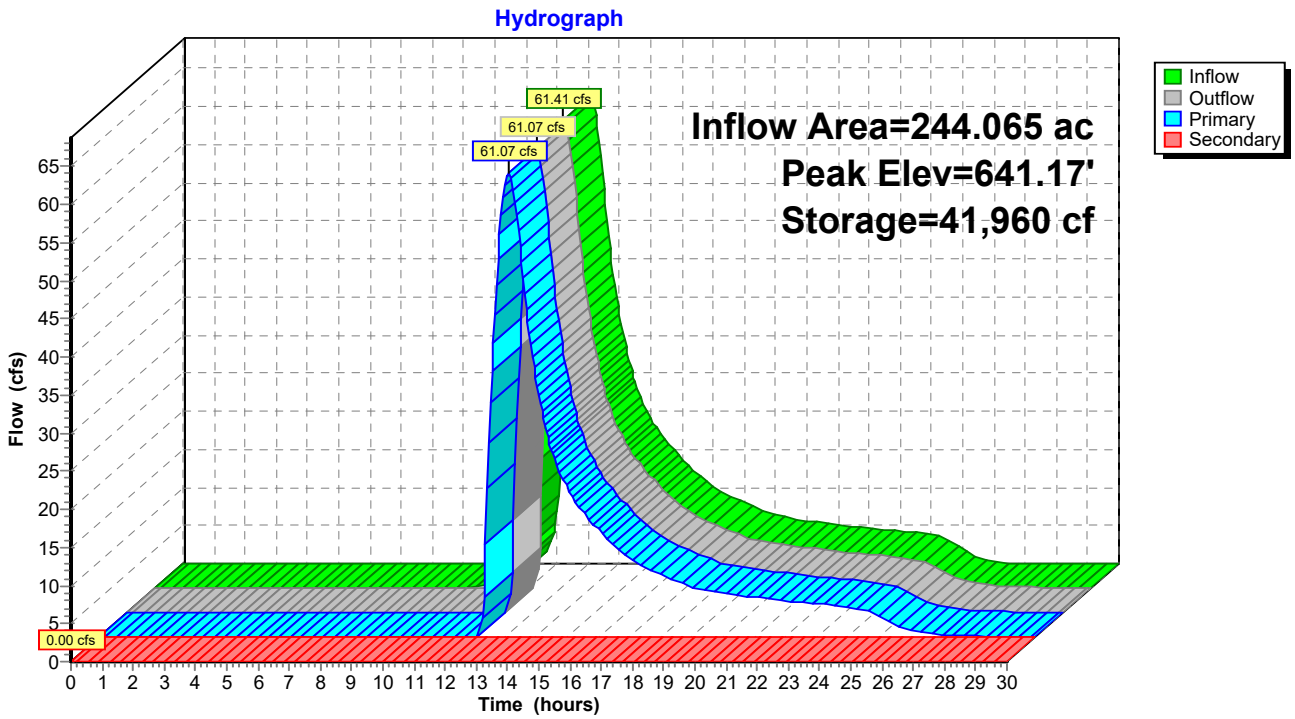
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=60.15 cfs @ 13.13 hrs HW=641.17' (Free Discharge)
└─**1=Culvert** (Passes 60.15 cfs of 244.18 cfs potential flow)
  ├─**2=4' sharp crested weir** (Weir Controls 16.08 cfs @ 3.54 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 2.10 cfs @ 3.59 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Weir Controls 2.10 cfs @ 3.59 fps)
  └─**5=top of str** (Weir Controls 39.87 cfs @ 2.59 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=630.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Existing Dam



Summary for Subcatchment 1S: remaining exisitng watershed to dam

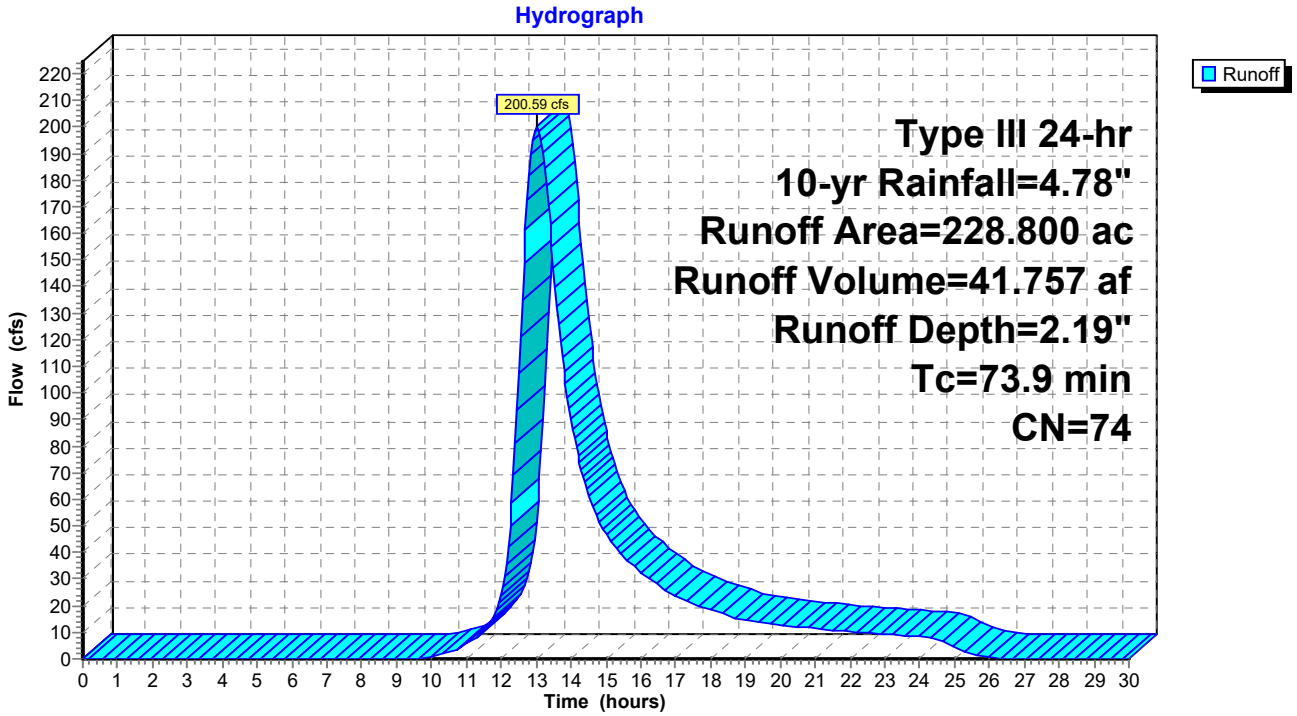
Runoff = 200.59 cfs @ 13.03 hrs, Volume= 41.757 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.78"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 1S: remaining exisitng watershed to dam



Summary for Subcatchment 3S: Existing WS E1

[47] Hint: Peak is 200% of capacity of segment #3

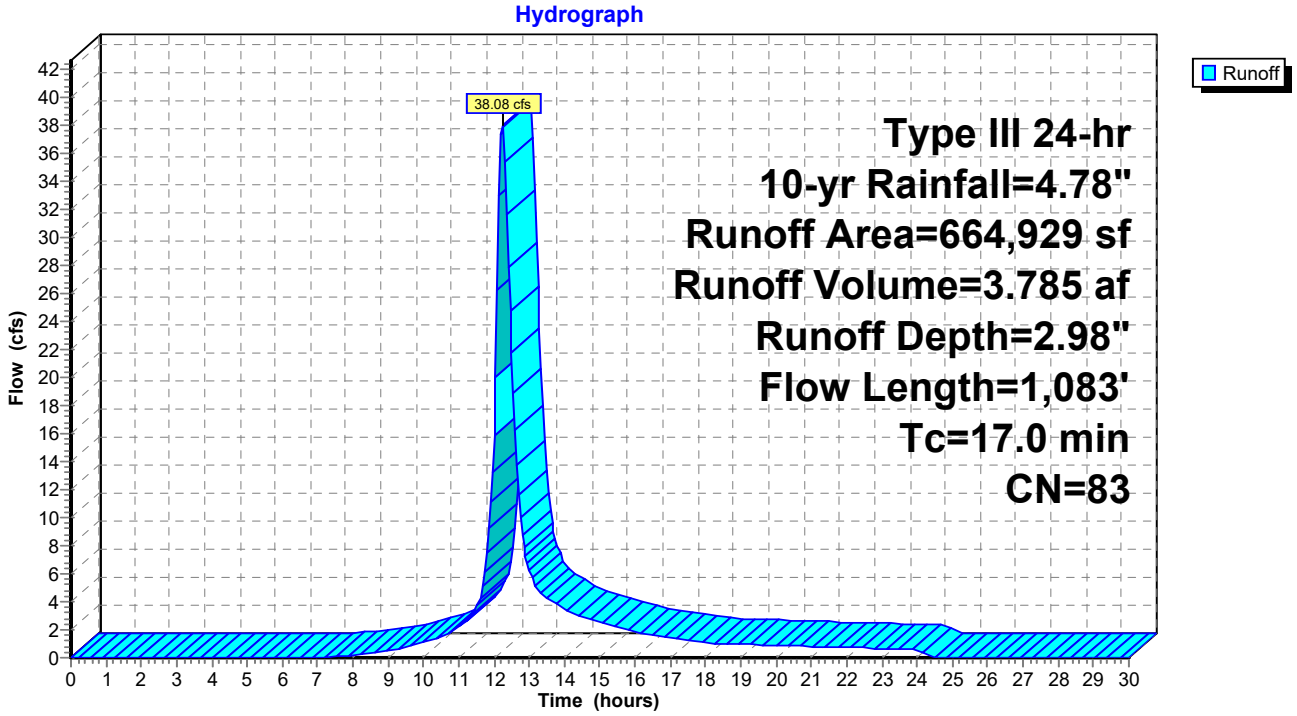
Runoff = 38.08 cfs @ 12.23 hrs, Volume= 3.785 af, Depth= 2.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.78"

Area (sf)	CN	Description
42,999	98	Paved parking, HSG D
24,491	89	<50% Grass cover, Poor, HSG D
96,069	78	Meadow, non-grazed, HSG D
24,245	83	Brush, Poor, HSG D
9,892	77	Brush, Poor, HSG C
397,885	83	Woods, Poor, HSG D
69,348	77	Woods, Poor, HSG C
664,929	83	Weighted Average
621,930		93.53% Pervious Area
42,999		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.1500	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.17"
5.5	497	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	70	0.0620	15.49	19.01	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
1.8	416	0.0670	3.88		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.0	1,083	Total			

Subcatchment 3S: Existing WS E1



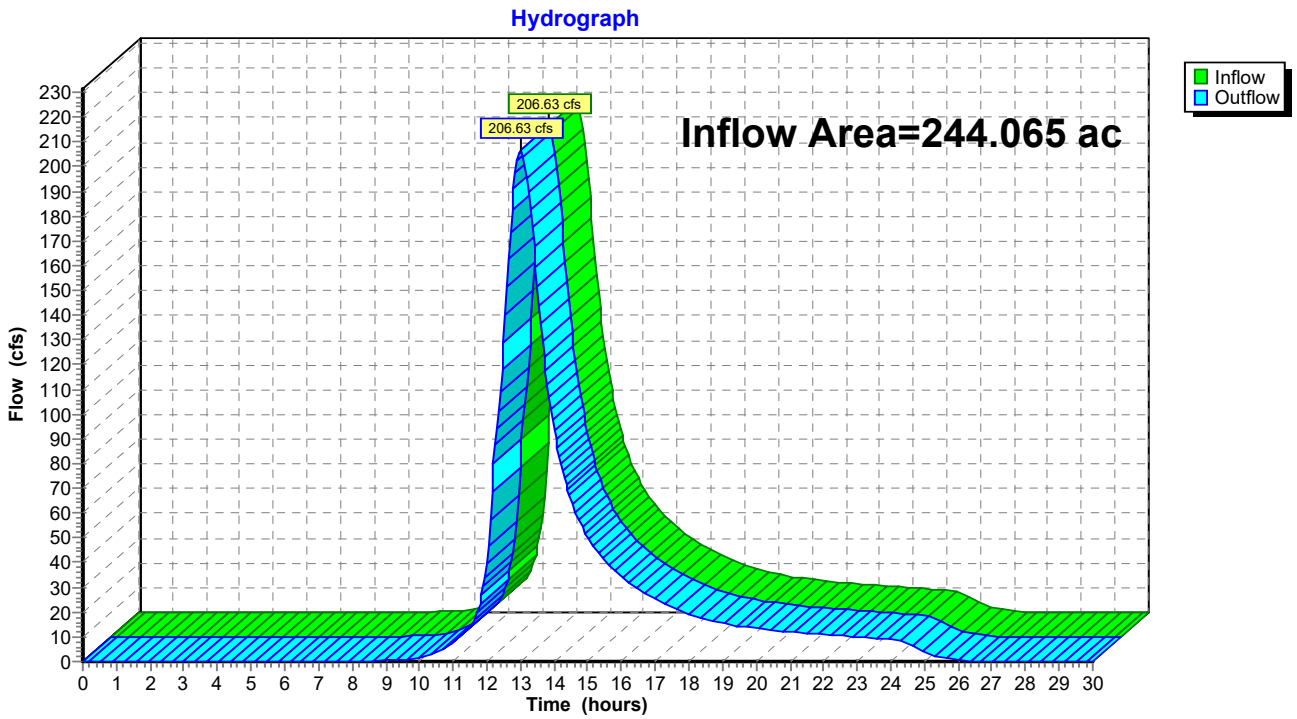
Summary for Reach 2R: Existing Split

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

Inflow Area = 244.065 ac, 0.40% Impervious, Inflow Depth = 2.24" for 10-yr event
Inflow = 206.63 cfs @ 13.03 hrs, Volume= 45.543 af
Outflow = 206.63 cfs @ 13.03 hrs, Volume= 45.543 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 2R: Existing Split



Summary for Pond 1P: Existing Dam

Inflow Area = 244.065 ac, 0.40% Impervious, Inflow Depth = 2.24" for 10-yr event
Inflow = 206.63 cfs @ 13.03 hrs, Volume= 45.543 af
Outflow = 206.09 cfs @ 13.05 hrs, Volume= 45.123 af, Atten= 0%, Lag= 1.5 min
Primary = 206.09 cfs @ 13.05 hrs, Volume= 45.123 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 642.12' @ 13.05 hrs Storage= 62,797 cf

Plug-Flow detention time= 16.2 min calculated for 45.123 af (99% of inflow)
Center-of-Mass det. time= 10.6 min (906.8 - 896.3)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

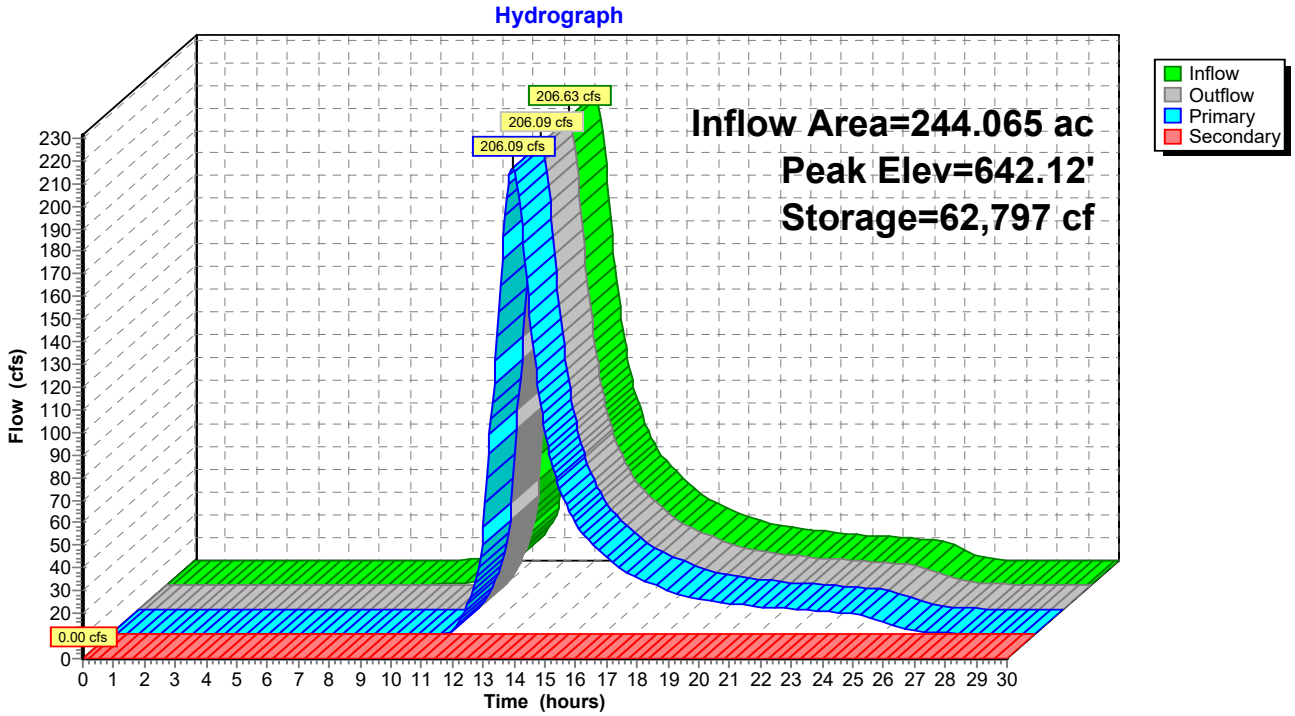
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=205.99 cfs @ 13.05 hrs HW=642.12' (Free Discharge)
└─**1=Culvert** (Passes 205.99 cfs of 260.98 cfs potential flow)
  ├─**2=4' sharp crested weir** (Weir Controls 38.24 cfs @ 4.76 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 5.13 cfs @ 4.83 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Weir Controls 5.13 cfs @ 4.83 fps)
  └─**5=top of str** (Weir Controls 157.49 cfs @ 4.23 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=630.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Existing Dam



Summary for Subcatchment 1S: remaining exisitng watershed to dam

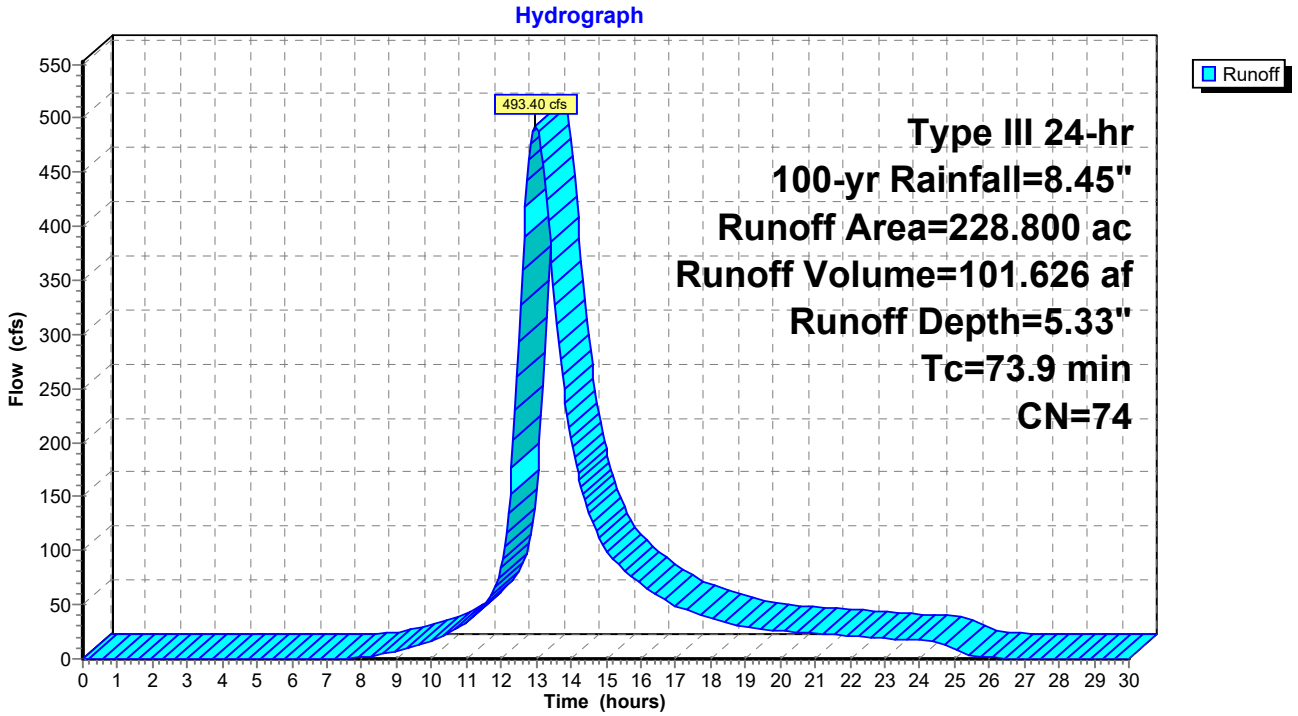
Runoff = 493.40 cfs @ 12.99 hrs, Volume= 101.626 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.45"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 1S: remaining exisitng watershed to dam



Summary for Subcatchment 3S: Existing WS E1

[47] Hint: Peak is 421% of capacity of segment #3

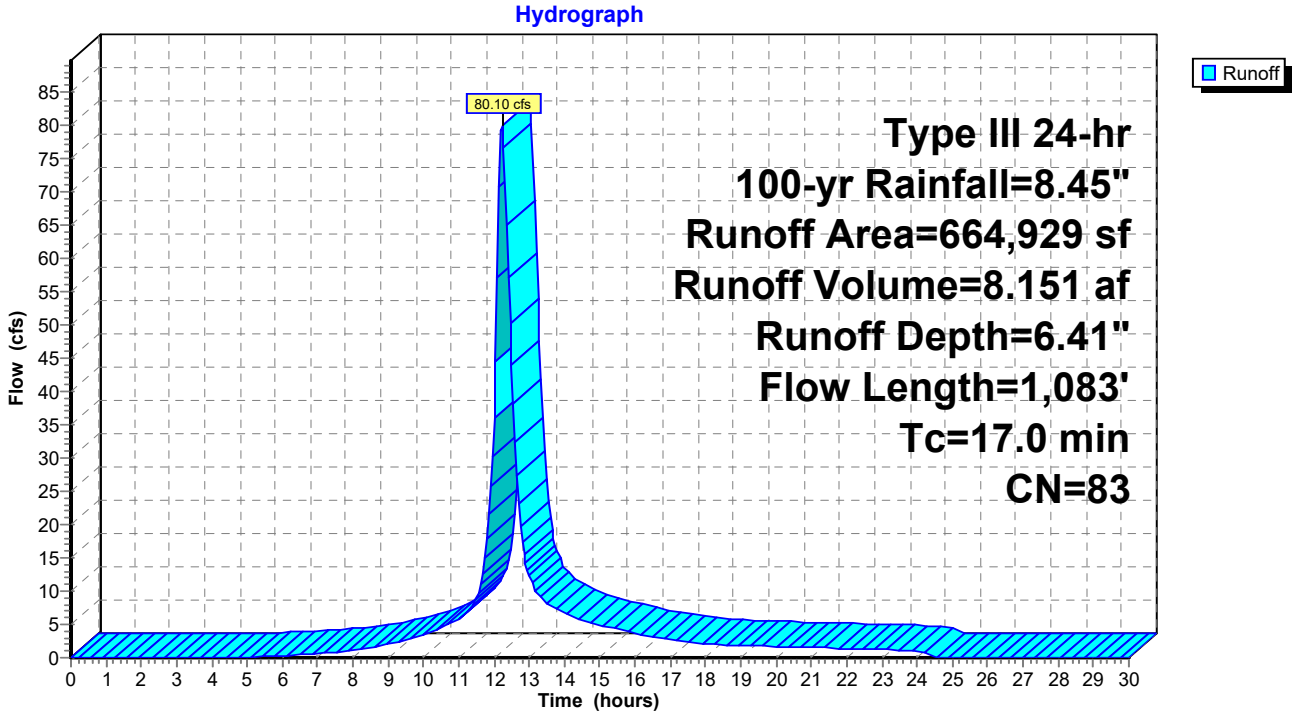
Runoff = 80.10 cfs @ 12.23 hrs, Volume= 8.151 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.45"

Area (sf)	CN	Description
42,999	98	Paved parking, HSG D
24,491	89	<50% Grass cover, Poor, HSG D
96,069	78	Meadow, non-grazed, HSG D
24,245	83	Brush, Poor, HSG D
9,892	77	Brush, Poor, HSG C
397,885	83	Woods, Poor, HSG D
69,348	77	Woods, Poor, HSG C
664,929	83	Weighted Average
621,930		93.53% Pervious Area
42,999		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.1500	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.17"
5.5	497	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	70	0.0620	15.49	19.01	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
1.8	416	0.0670	3.88		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.0	1,083	Total			

Subcatchment 3S: Existing WS E1



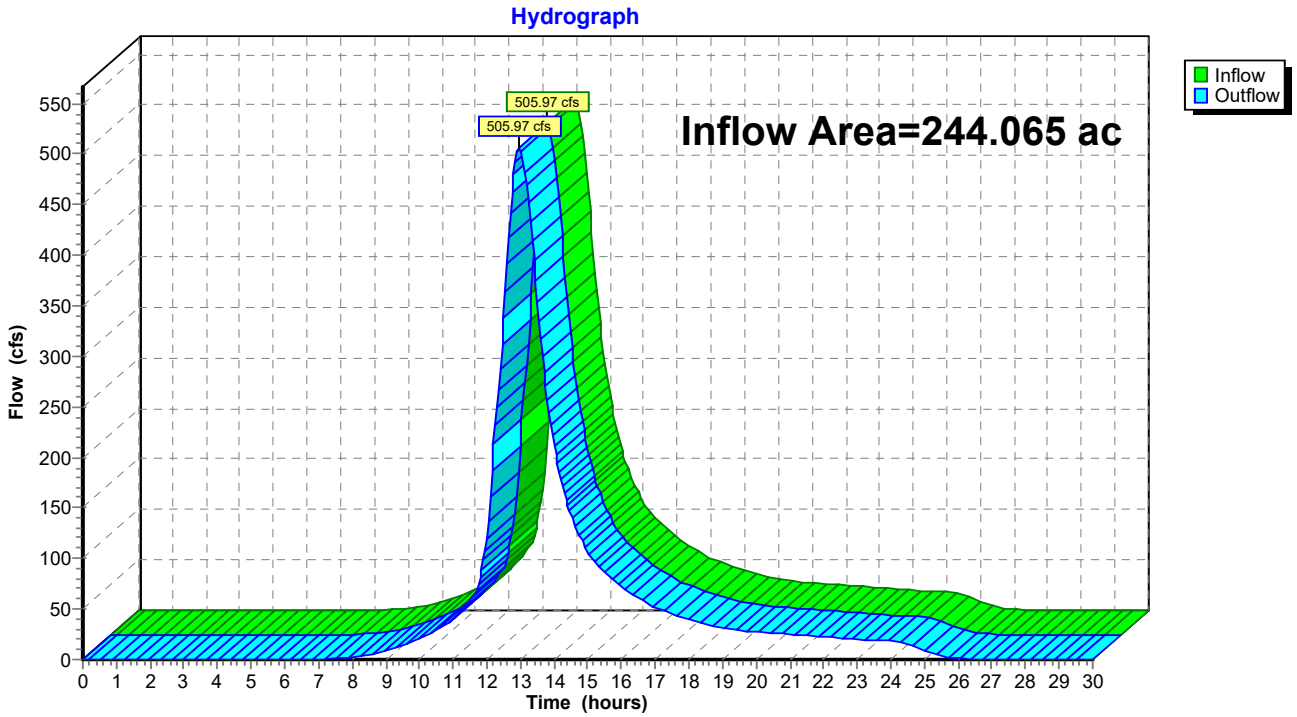
Summary for Reach 2R: Existing Split

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

Inflow Area = 244.065 ac, 0.40% Impervious, Inflow Depth = 5.40" for 100-yr event
Inflow = 505.97 cfs @ 12.98 hrs, Volume= 109.777 af
Outflow = 505.97 cfs @ 12.98 hrs, Volume= 109.777 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 2R: Existing Split



Summary for Pond 1P: Existing Dam

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 244.065 ac, 0.40% Impervious, Inflow Depth = 5.40" for 100-yr event
Inflow = 505.97 cfs @ 12.98 hrs, Volume= 109.777 af
Outflow = 506.46 cfs @ 13.06 hrs, Volume= 109.357 af, Atten= 0%, Lag= 4.8 min
Primary = 364.61 cfs @ 13.06 hrs, Volume= 105.054 af
Secondary = 141.84 cfs @ 13.06 hrs, Volume= 4.303 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 649.37' @ 13.06 hrs Storage= 294,135 cf

Plug-Flow detention time= 12.2 min calculated for 109.357 af (100% of inflow)
Center-of-Mass det. time= 9.7 min (881.3 - 871.6)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

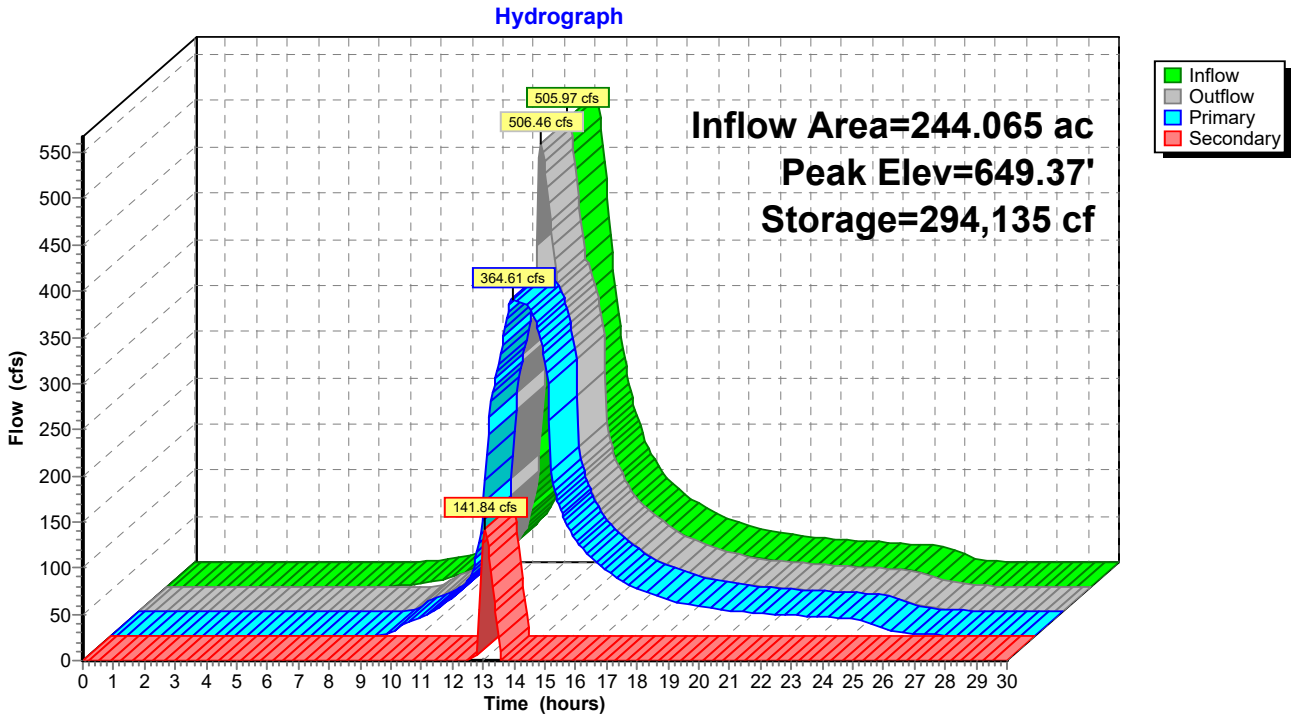
Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir**

Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
Coef. (English)	2.57	2.62	2.70	2.67	2.66	2.67	2.66	2.64

Primary OutFlow Max=364.55 cfs @ 13.06 hrs HW=649.37' (Free Discharge)
- **1=Culvert** (Inlet Controls 364.55 cfs @ 18.57 fps)
  - **2=4' sharp crested weir** (Passes < 287.21 cfs potential flow)
  - **3=Broad-Crested Rectangular Weir** (Passes < 47.60 cfs potential flow)
  - **4=Broad-Crested Rectangular Weir** (Passes < 47.60 cfs potential flow)
  - **5=top of str** (Passes < 2,016.57 cfs potential flow)

Secondary OutFlow Max=140.28 cfs @ 13.06 hrs HW=649.37' (Free Discharge)
- **6=Broad-Crested Rectangular Weir** (Weir Controls 140.28 cfs @ 2.49 fps)

Pond 1P: Existing Dam



Summary for Subcatchment 1S: remaining exisitng watershed to dam

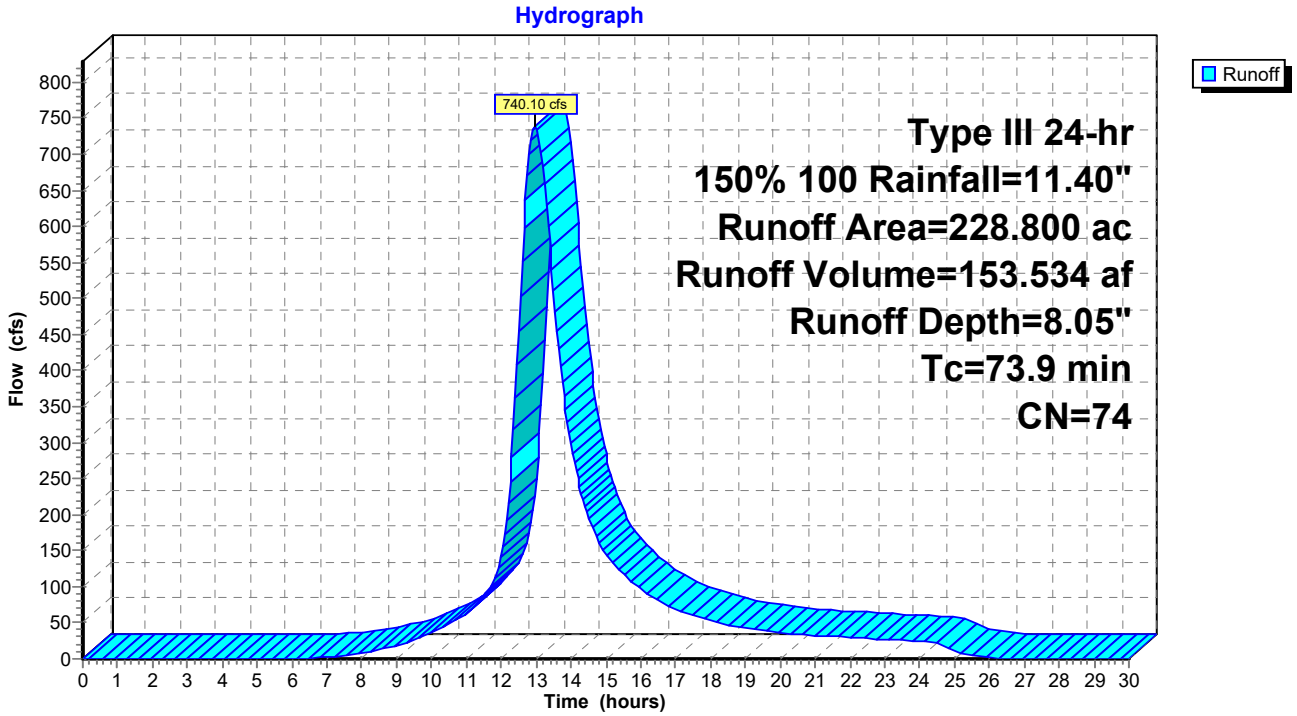
Runoff = 740.10 cfs @ 12.97 hrs, Volume= 153.534 af, Depth= 8.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 150% 100 Rainfall=11.40"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 1S: remaining exisitng watershed to dam



Summary for Subcatchment 3S: Existing WS E1

[47] Hint: Peak is 600% of capacity of segment #3

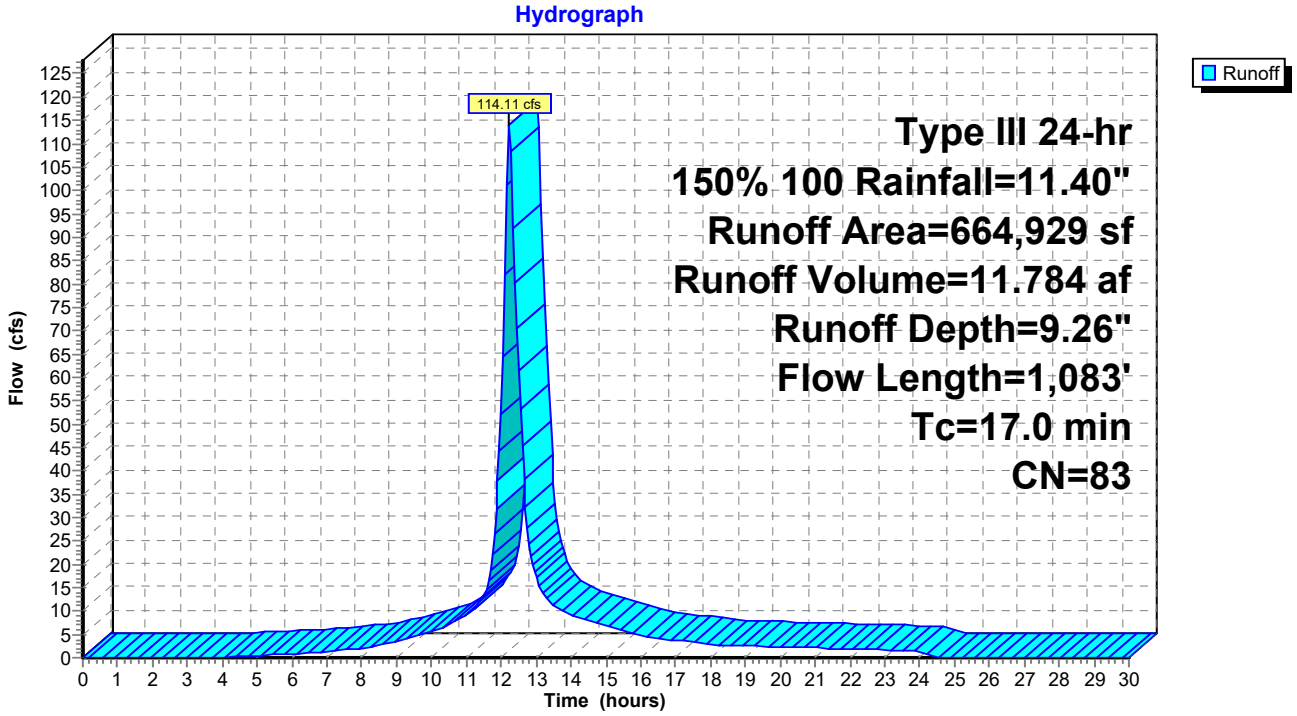
Runoff = 114.11 cfs @ 12.22 hrs, Volume= 11.784 af, Depth= 9.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 150% 100 Rainfall=11.40"

Area (sf)	CN	Description
42,999	98	Paved parking, HSG D
24,491	89	<50% Grass cover, Poor, HSG D
96,069	78	Meadow, non-grazed, HSG D
24,245	83	Brush, Poor, HSG D
9,892	77	Brush, Poor, HSG C
397,885	83	Woods, Poor, HSG D
69,348	77	Woods, Poor, HSG C
664,929	83	Weighted Average
621,930		93.53% Pervious Area
42,999		6.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.1500	0.17		**Sheet Flow,** Woods: Light underbrush n= 0.400 P2= 3.17"
5.5	497	0.0900	1.50		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.1	70	0.0620	15.49	19.01	**Pipe Channel,** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011 Concrete pipe, straight & clean
1.8	416	0.0670	3.88		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
17.0	1,083	Total			

Subcatchment 3S: Existing WS E1



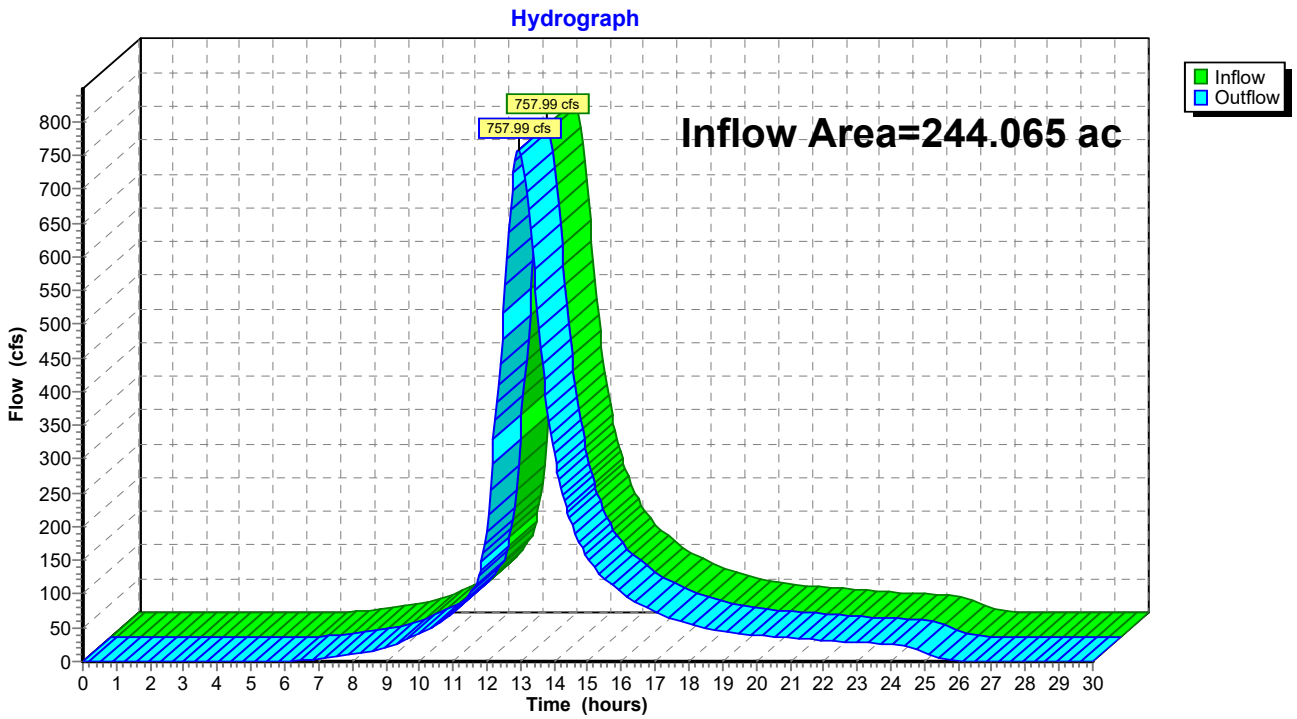
Summary for Reach 2R: Existing Split

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

Inflow Area = 244.065 ac, 0.40% Impervious, Inflow Depth = 8.13" for 150% 100 event
Inflow = 757.99 cfs @ 12.96 hrs, Volume= 165.318 af
Outflow = 757.99 cfs @ 12.96 hrs, Volume= 165.318 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 2R: Existing Split



Summary for Pond 1P: Existing Dam

[88] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 244.065 ac, 0.40% Impervious, Inflow Depth = 8.13" for 150% 100 event
Inflow = 757.99 cfs @ 12.96 hrs, Volume= 165.318 af
Outflow = 758.36 cfs @ 12.97 hrs, Volume= 164.897 af, Atten= 0%, Lag= 0.6 min
Primary = 374.70 cfs @ 12.97 hrs, Volume= 139.680 af
Secondary = 383.66 cfs @ 12.97 hrs, Volume= 25.217 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 650.21' @ 12.97 hrs Storage= 307,518 cf

Plug-Flow detention time= 10.3 min calculated for 164.897 af (100% of inflow)
Center-of-Mass det. time= 8.6 min (868.9 - 860.3)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

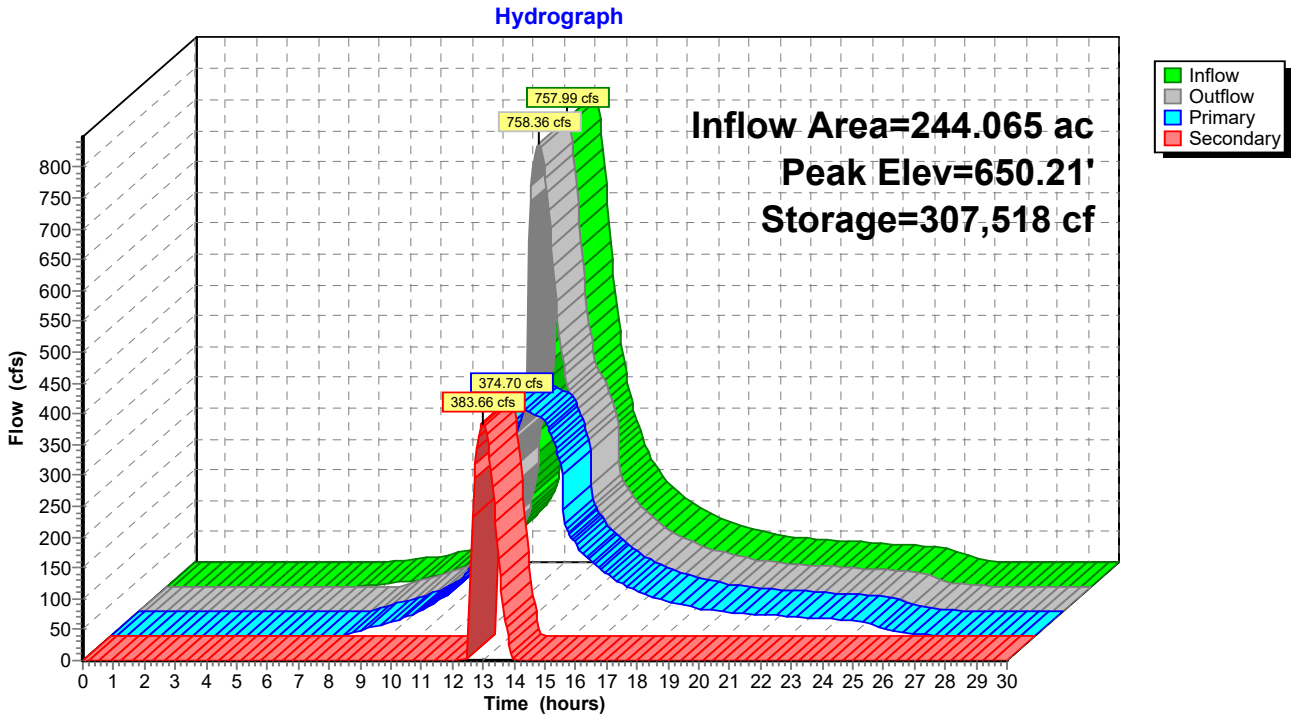
Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir**

Head (feet)	0.20	0.40	0.60	0.80	1.00	1.20	1.40	1.60
Coef. (English)	2.57	2.62	2.70	2.67	2.66	2.67	2.66	2.64

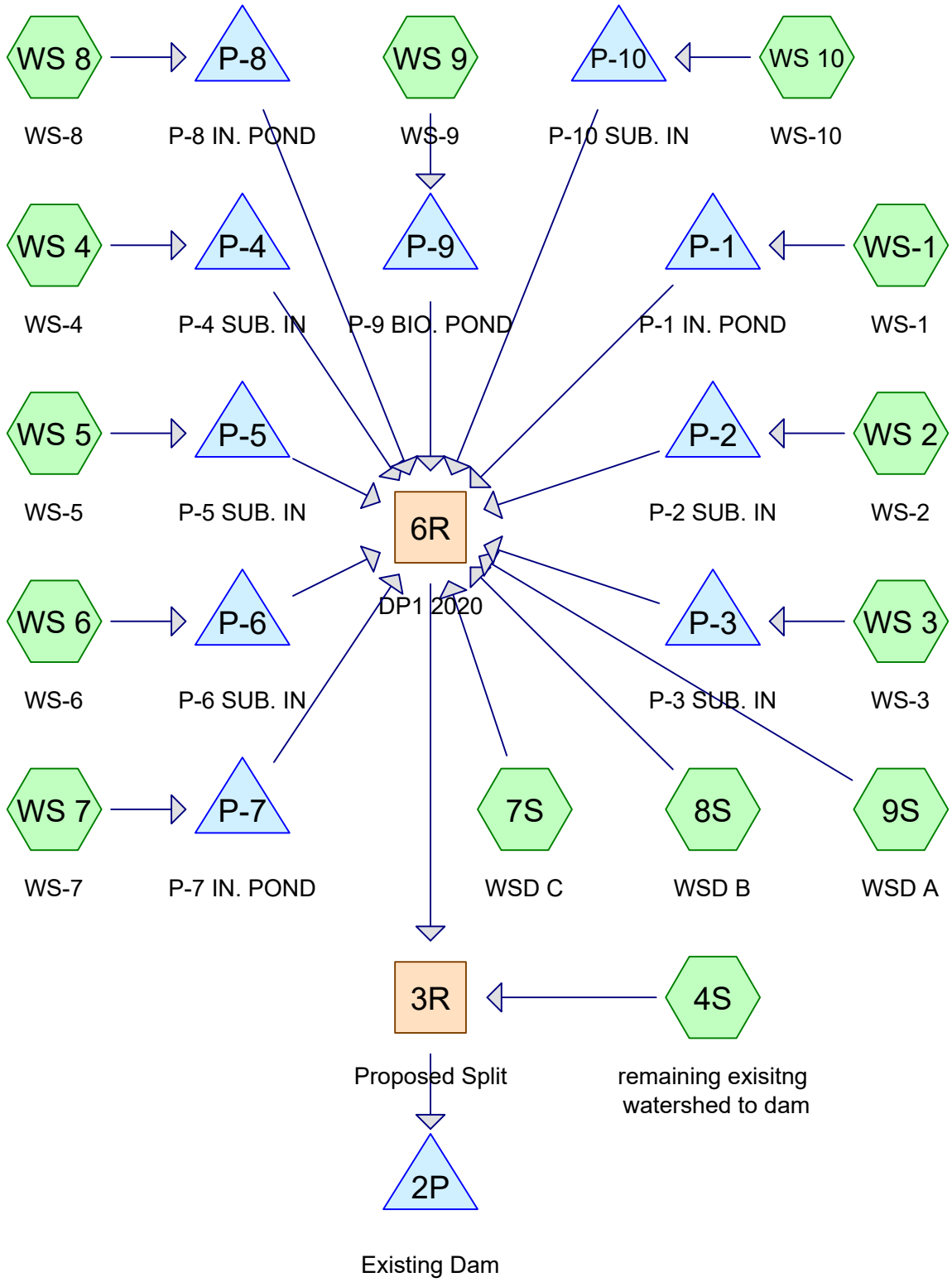
Primary OutFlow Max=374.67 cfs @ 12.97 hrs HW=650.21' (Free Discharge)
- **1=Culvert** (Inlet Controls 374.67 cfs @ 19.08 fps)
  - **2=4' sharp crested weir** (Passes < 317.65 cfs potential flow)
  - **3=Broad-Crested Rectangular Weir** (Passes < 54.12 cfs potential flow)
  - **4=Broad-Crested Rectangular Weir** (Passes < 54.12 cfs potential flow)
  - **5=top of str** (Passes < 2,308.93 cfs potential flow)

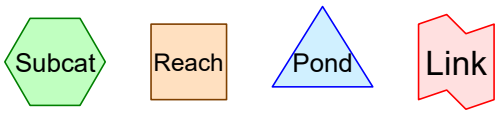
Secondary OutFlow Max=382.30 cfs @ 12.97 hrs HW=650.21' (Free Discharge)
- **6=Broad-Crested Rectangular Weir** (Weir Controls 382.30 cfs @ 3.45 fps)

Pond 1P: Existing Dam



PROPOSED SPLIT WATERSHED – EXISTING DAM





Routing Diagram for 201228 Warwick-onsite
Prepared by Maser Consulting PA, Printed 12/29/2020
HydroCAD® 10.10-3a s/n 08816 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment 4S: remaining exisitng watershed to dam

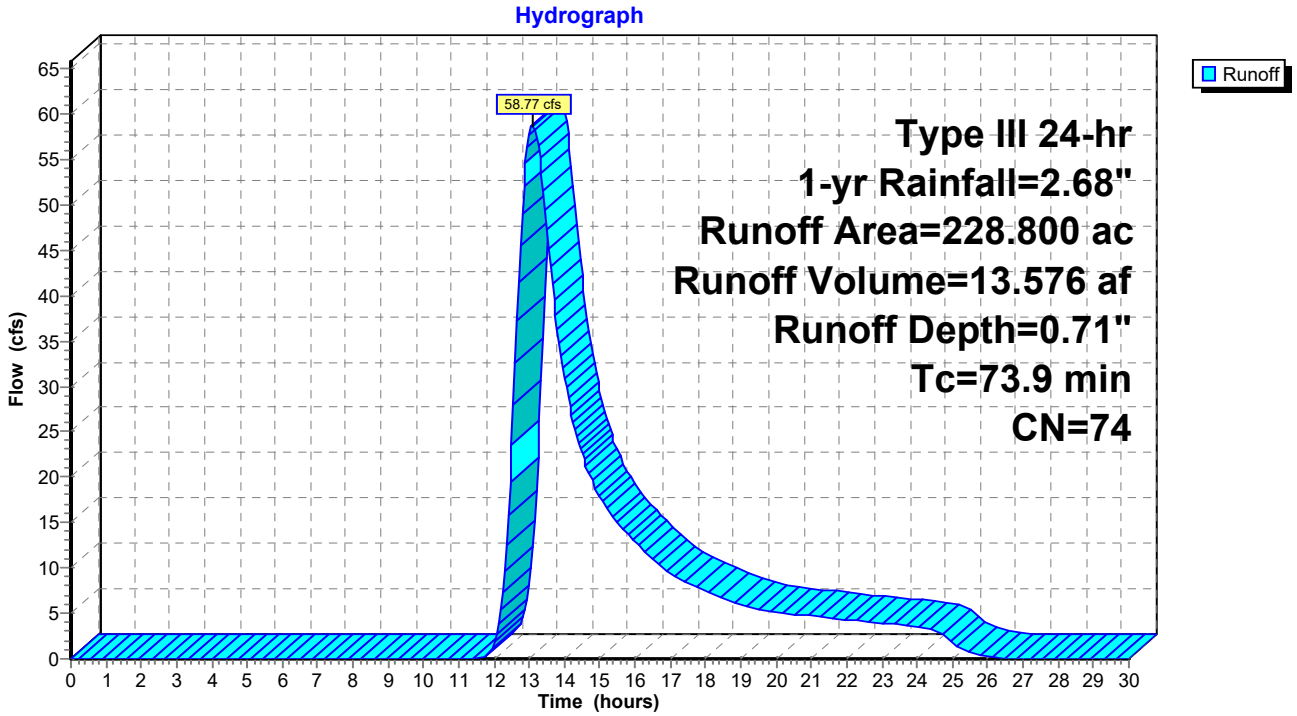
Runoff = 58.77 cfs @ 13.08 hrs, Volume= 13.576 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.68"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

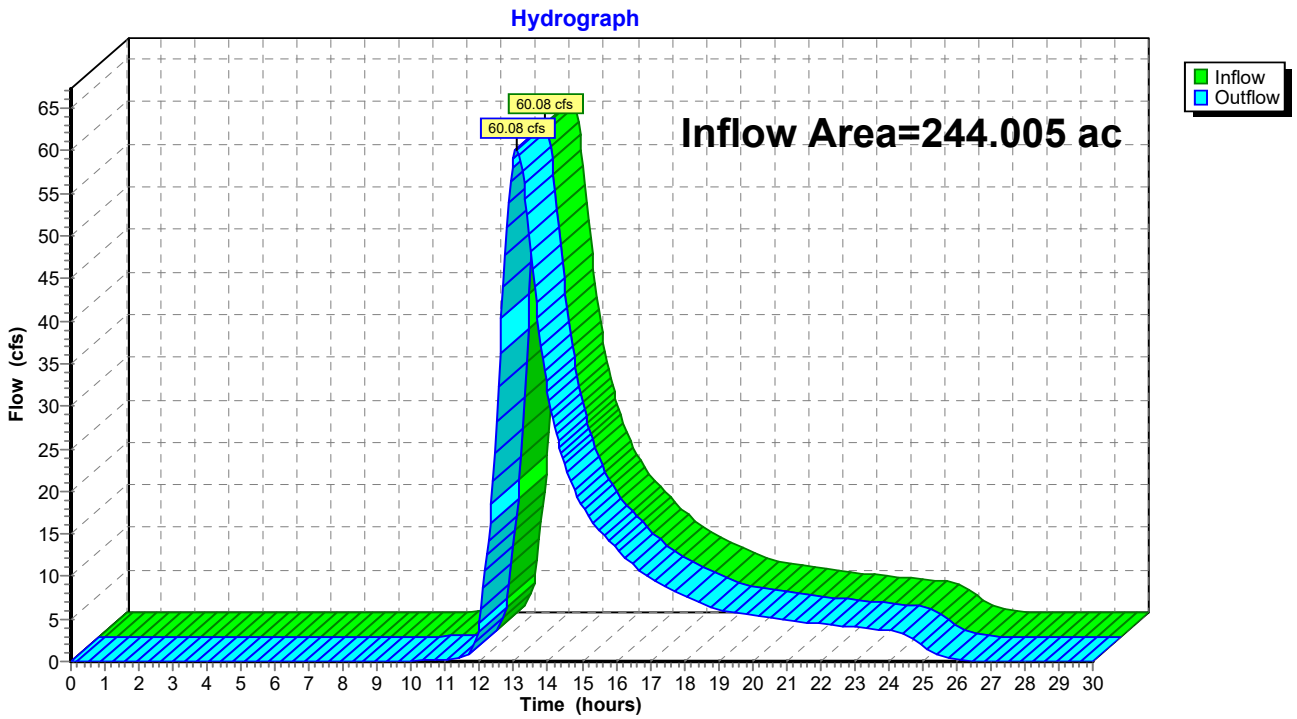


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 0.70" for 1-yr event
Inflow = 60.08 cfs @ 13.07 hrs, Volume= 14.327 af
Outflow = 60.08 cfs @ 13.07 hrs, Volume= 14.327 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

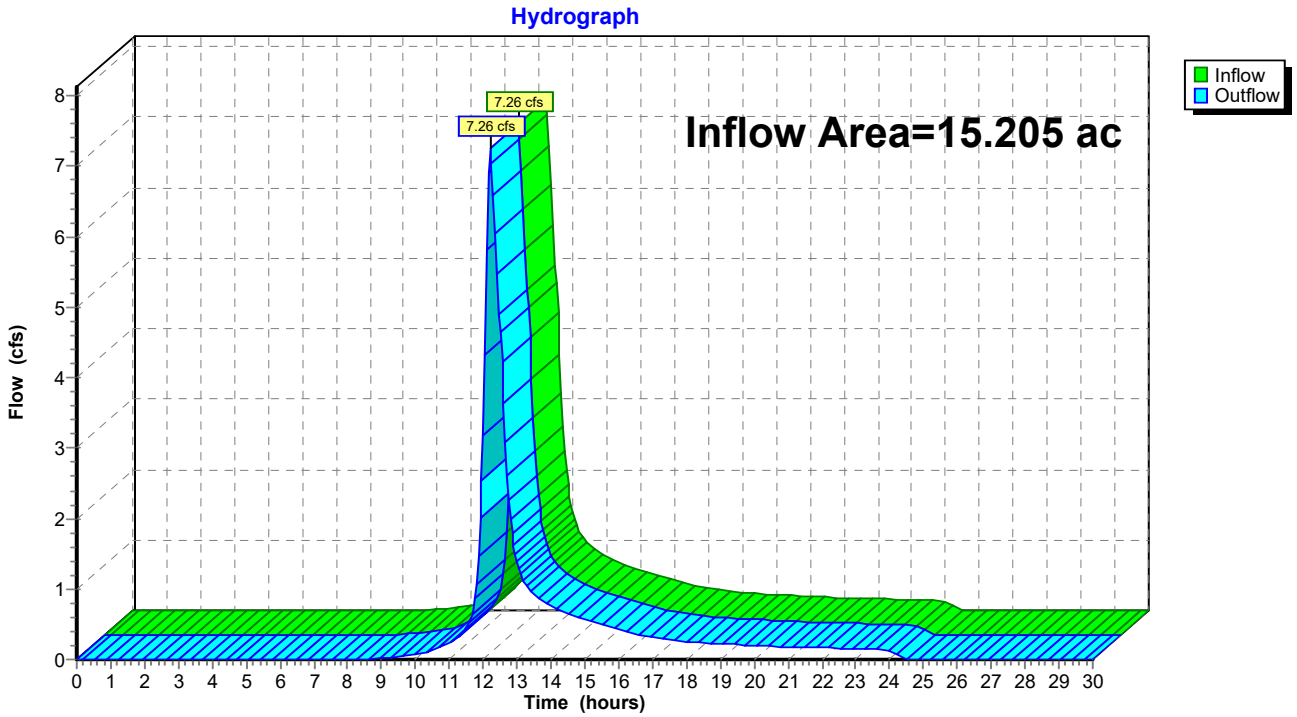


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 0.59" for 1-yr event
Inflow = 7.26 cfs @ 12.21 hrs, Volume= 0.751 af
Outflow = 7.26 cfs @ 12.21 hrs, Volume= 0.751 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 2P: Existing Dam

Inflow Area =	244.005 ac,	2.45% Impervious,	Inflow Depth =	0.70"	for 1-yr event
Inflow =	60.08 cfs @	13.07 hrs,	Volume=	14.327 af	
Outflow =	59.76 cfs @	13.14 hrs,	Volume=	13.908 af,	Atten= 1%, Lag= 3.7 min
Primary =	59.76 cfs @	13.14 hrs,	Volume=	13.908 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 641.16' @ 13.14 hrs Storage= 41,727 cf

Plug-Flow detention time= 37.9 min calculated for 13.908 af (97% of inflow)
Center-of-Mass det. time= 21.8 min (954.2 - 932.4)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

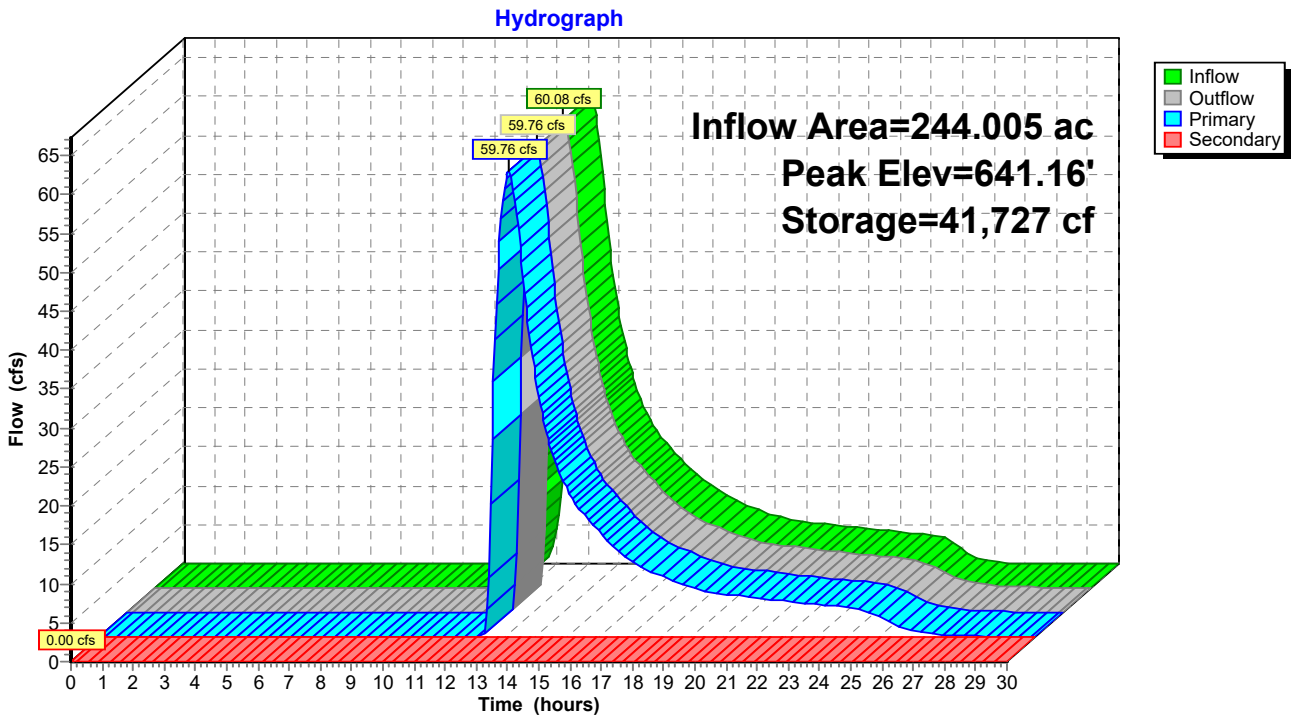
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=58.79 cfs @ 13.14 hrs HW=641.16' (Free Discharge)
└─**1=Culvert** (Passes 58.79 cfs of 243.98 cfs potential flow)
  ├─**2=4' sharp crested weir** (Weir Controls 15.86 cfs @ 3.52 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 2.07 cfs @ 3.58 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Weir Controls 2.07 cfs @ 3.58 fps)
  └─**5=top of str** (Weir Controls 38.78 cfs @ 2.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=630.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Existing Dam



Summary for Subcatchment 4S: remaining exisitng watershed to dam

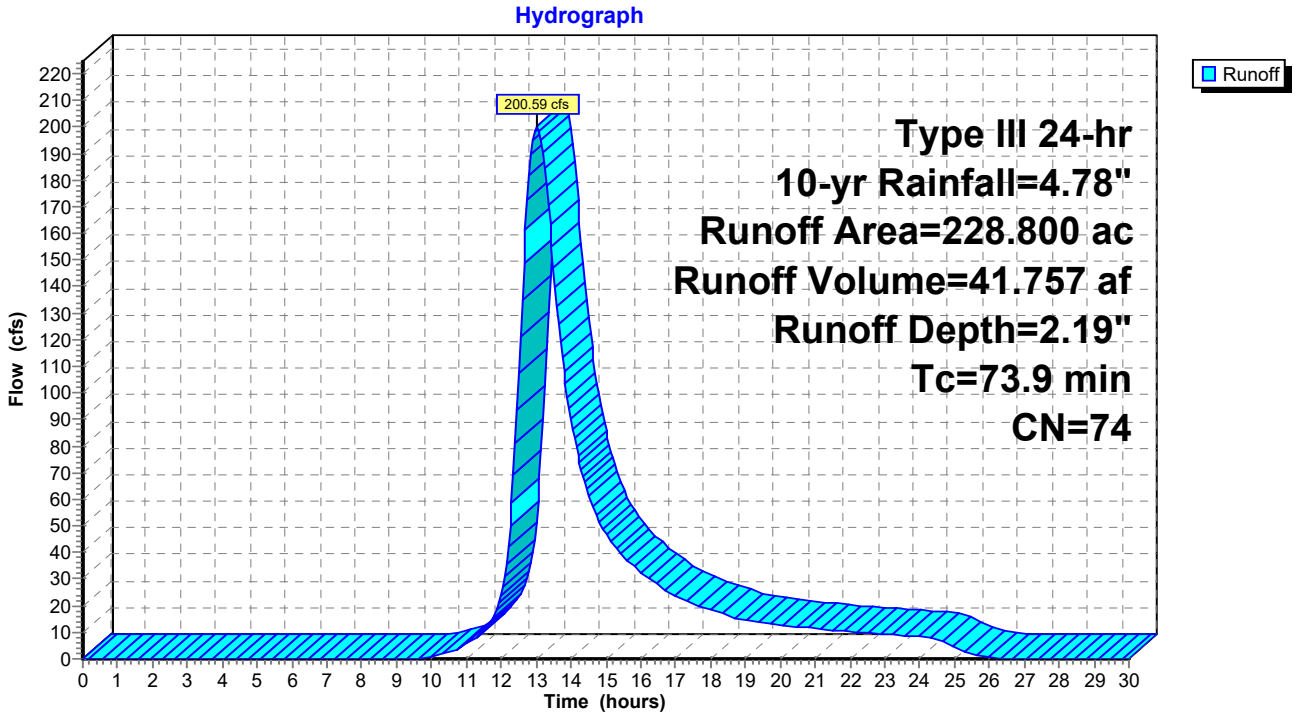
Runoff = 200.59 cfs @ 13.03 hrs, Volume= 41.757 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.78"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

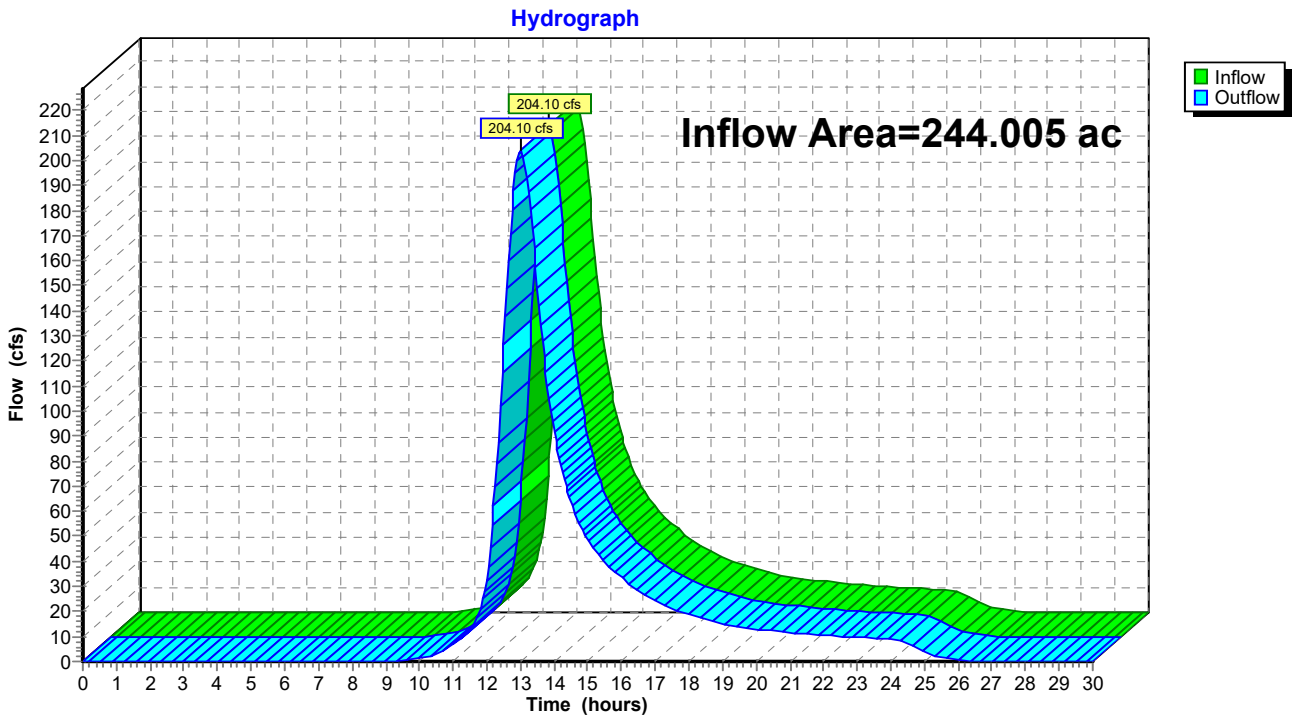


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 2.16" for 10-yr event
Inflow = 204.10 cfs @ 13.03 hrs, Volume= 43.900 af
Outflow = 204.10 cfs @ 13.03 hrs, Volume= 43.900 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

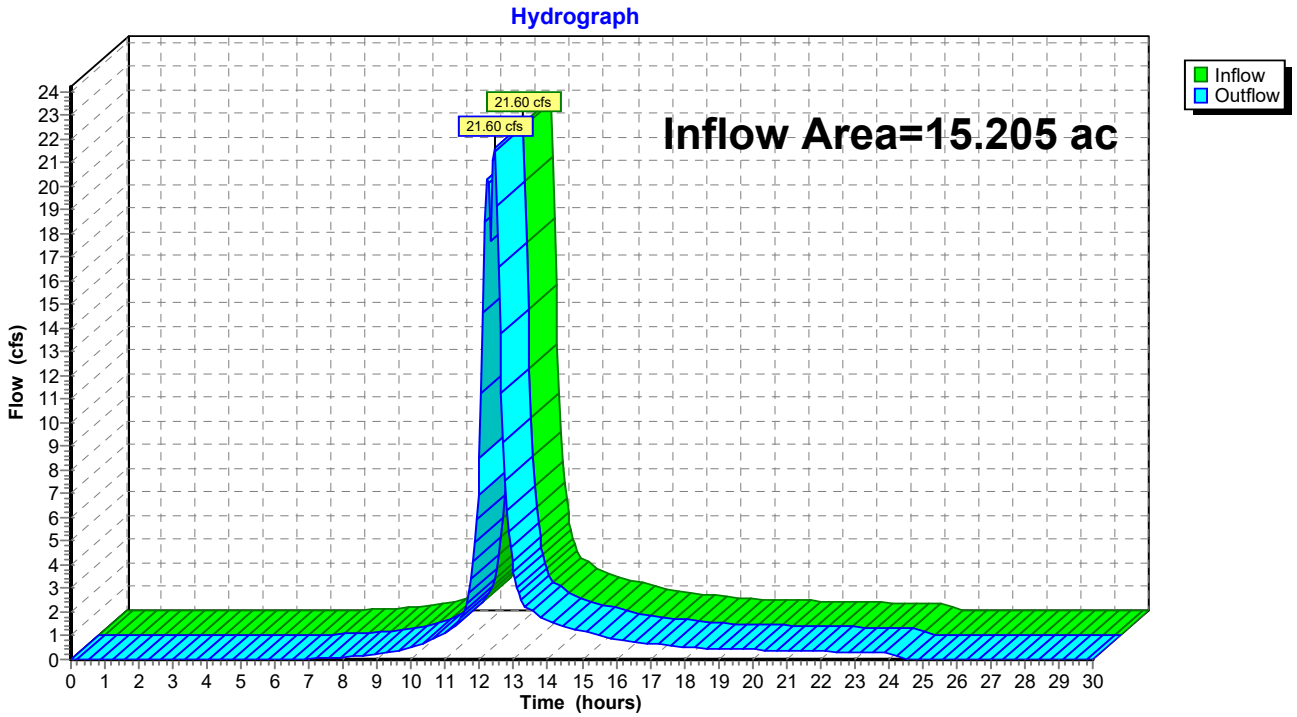


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 1.69" for 10-yr event
Inflow = 21.60 cfs @ 12.43 hrs, Volume= 2.143 af
Outflow = 21.60 cfs @ 12.43 hrs, Volume= 2.143 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 2P: Existing Dam

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 2.16" for 10-yr event
Inflow = 204.10 cfs @ 13.03 hrs, Volume= 43.900 af
Outflow = 203.56 cfs @ 13.05 hrs, Volume= 43.480 af, Atten= 0%, Lag= 1.5 min
Primary = 203.56 cfs @ 13.05 hrs, Volume= 43.480 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 642.11' @ 13.05 hrs Storage= 62,467 cf

Plug-Flow detention time= 16.1 min calculated for 43.408 af (99% of inflow)
Center-of-Mass det. time= 10.6 min (908.8 - 898.2)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

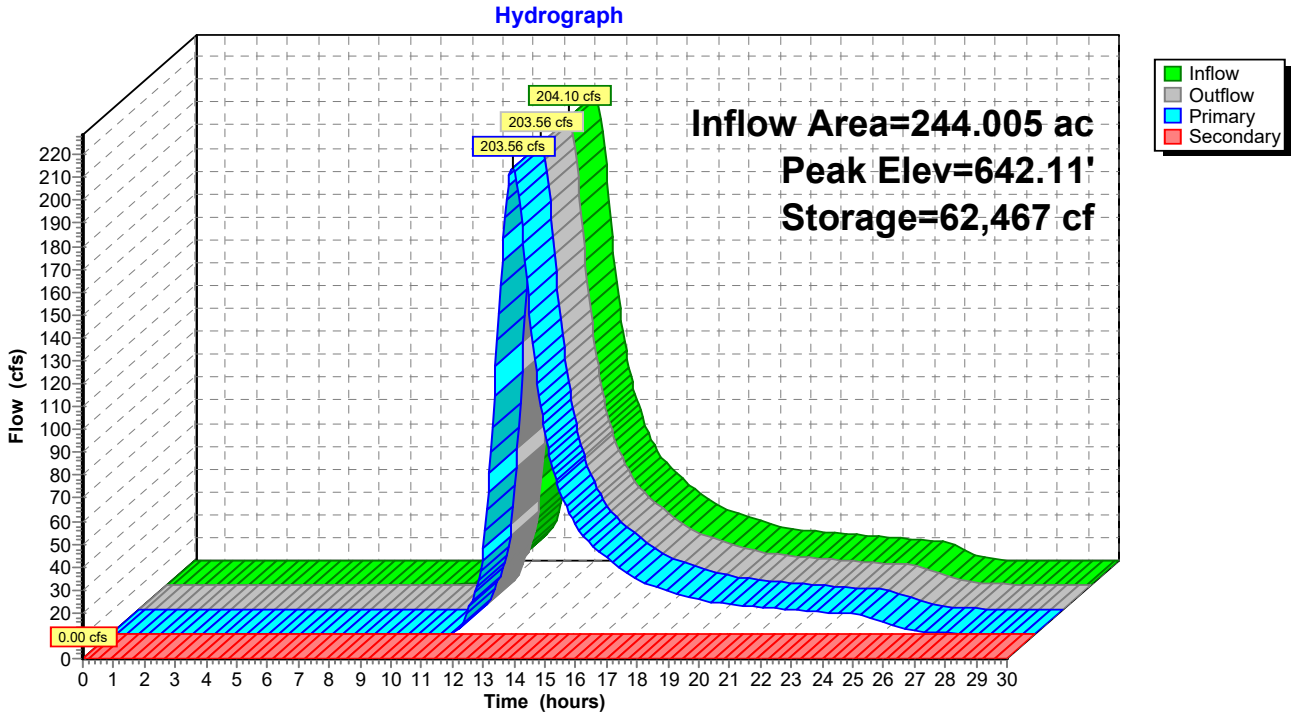
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=203.43 cfs @ 13.05 hrs HW=642.11' (Free Discharge)
└─**1=Culvert** (Passes 203.43 cfs of 260.74 cfs potential flow)
  ├─**2=4' sharp crested weir** (Weir Controls 37.87 cfs @ 4.75 fps)
  ├─**3=Broad-Crested Rectangular Weir** (Weir Controls 5.07 cfs @ 4.82 fps)
  ├─**4=Broad-Crested Rectangular Weir** (Weir Controls 5.07 cfs @ 4.82 fps)
  └─**5=top of str** (Weir Controls 155.41 cfs @ 4.21 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=630.00' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 2P: Existing Dam



Summary for Subcatchment 4S: remaining exisitng watershed to dam

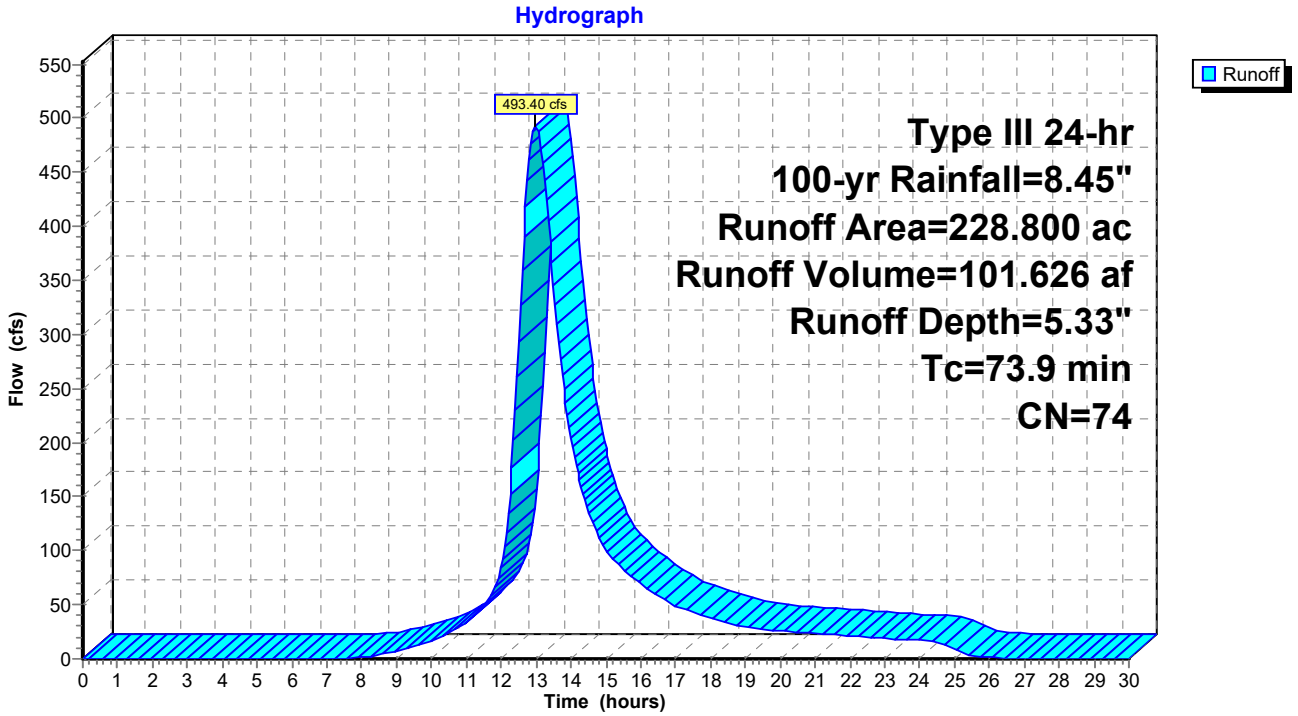
Runoff = 493.40 cfs @ 12.99 hrs, Volume= 101.626 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.45"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

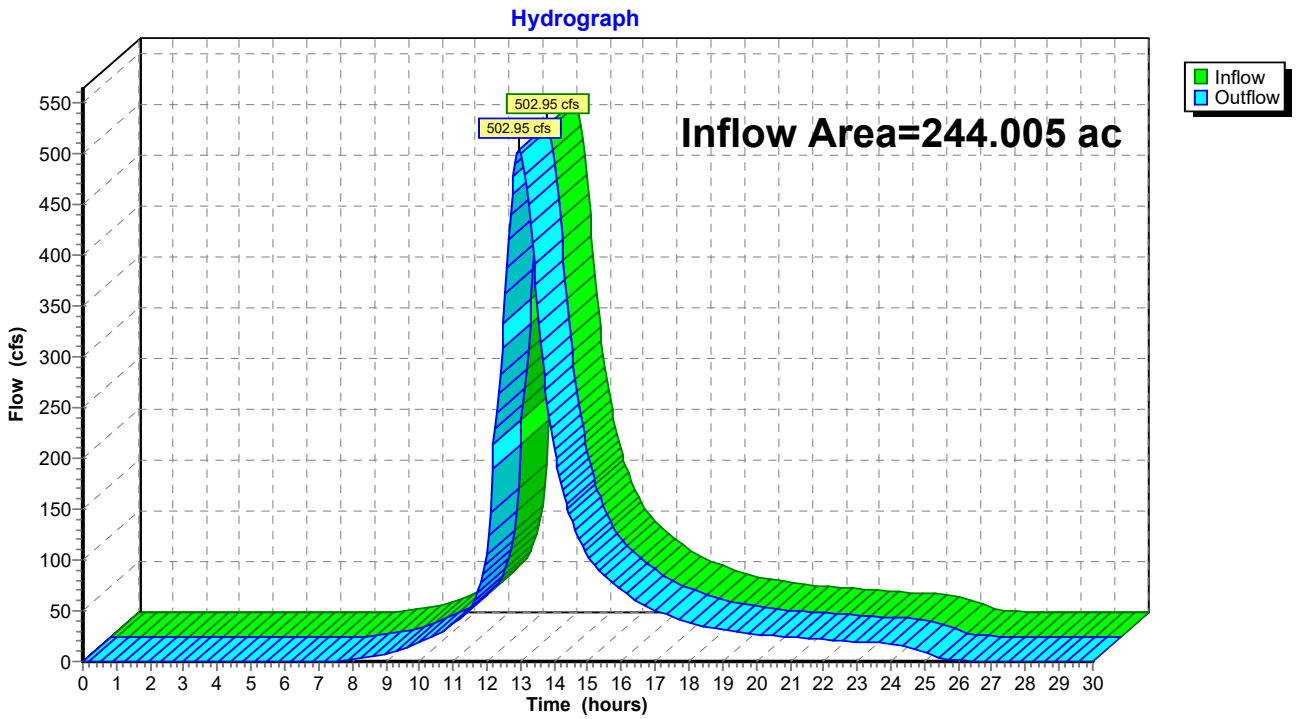


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 5.27" for 100-yr event
Inflow = 502.95 cfs @ 12.98 hrs, Volume= 107.178 af
Outflow = 502.95 cfs @ 12.98 hrs, Volume= 107.178 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

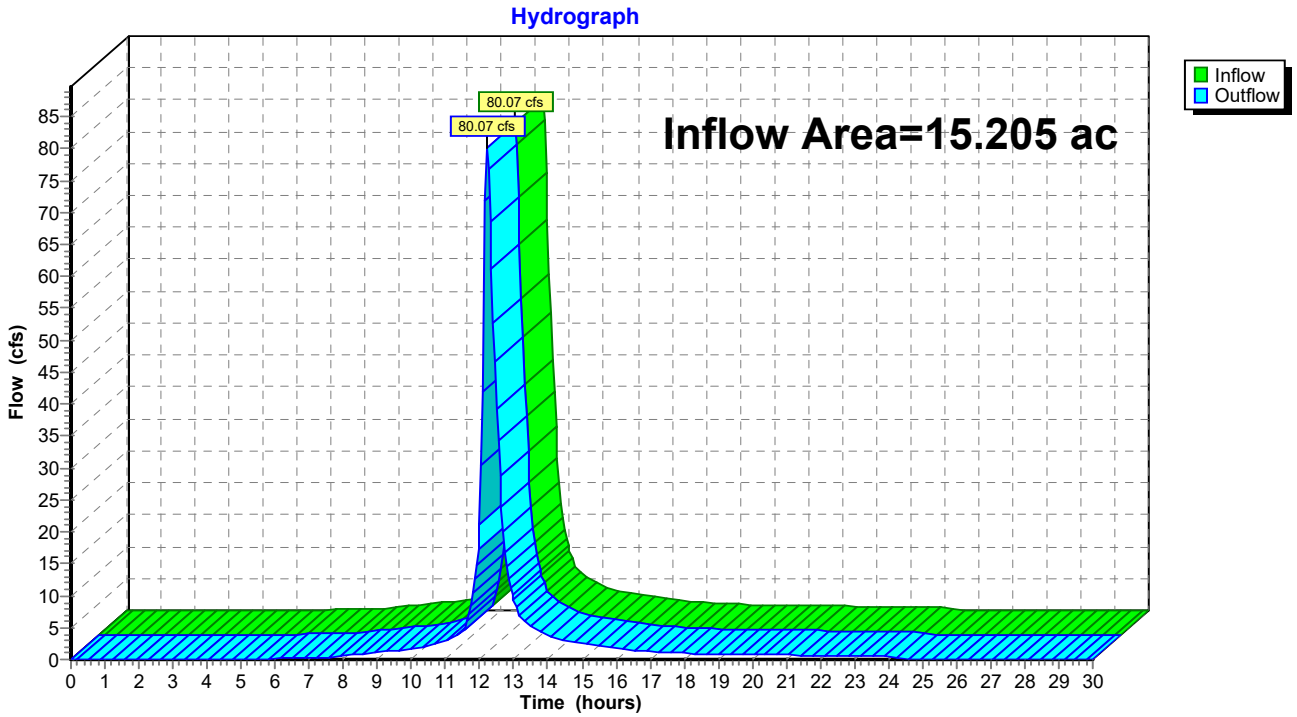


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 4.38" for 100-yr event
Inflow = 80.07 cfs @ 12.21 hrs, Volume= 5.552 af
Outflow = 80.07 cfs @ 12.21 hrs, Volume= 5.552 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 2P: Existing Dam

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 5.27" for 100-yr event
Inflow = 502.95 cfs @ 12.98 hrs, Volume= 107.178 af
Outflow = 506.85 cfs @ 13.06 hrs, Volume= 106.757 af, Atten= 0%, Lag= 5.2 min
Primary = 364.64 cfs @ 13.06 hrs, Volume= 102.691 af
Secondary = 142.21 cfs @ 13.06 hrs, Volume= 4.066 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 649.38' @ 13.06 hrs Storage= 294,172 cf

Plug-Flow detention time= 12.3 min calculated for 106.757 af (100% of inflow)
Center-of-Mass det. time= 9.7 min (882.0 - 872.3)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

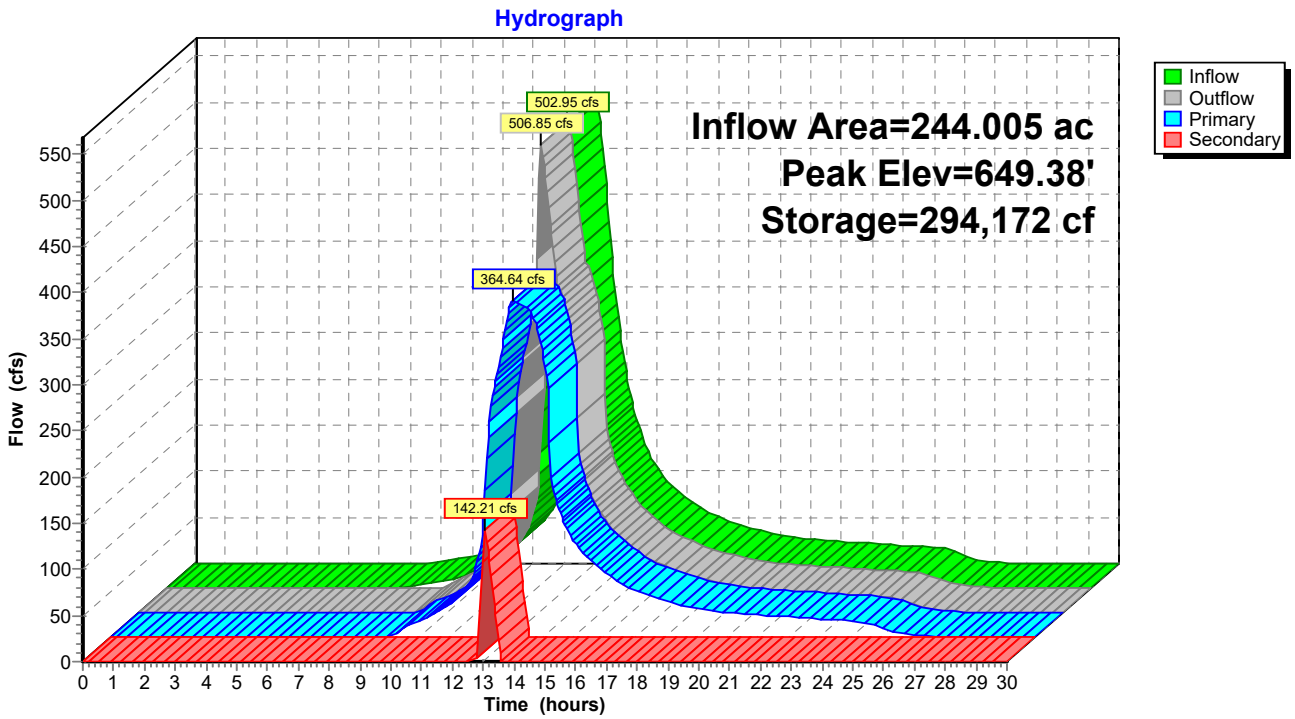
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=364.42 cfs @ 13.06 hrs HW=649.36' (Free Discharge)
└─**1=Culvert** (Inlet Controls 364.42 cfs @ 18.56 fps)
  ├─**2=4' sharp crested weir** (Passes < 286.82 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Passes < 47.52 cfs potential flow)
  ├─**4=Broad-Crested Rectangular Weir** (Passes < 47.52 cfs potential flow)
  └─**5=top of str** (Passes < 2,012.94 cfs potential flow)

Secondary OutFlow Max=137.75 cfs @ 13.06 hrs HW=649.36' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Weir Controls 137.75 cfs @ 2.47 fps)

Pond 2P: Existing Dam



Summary for Subcatchment 4S: remaining exisitng watershed to dam

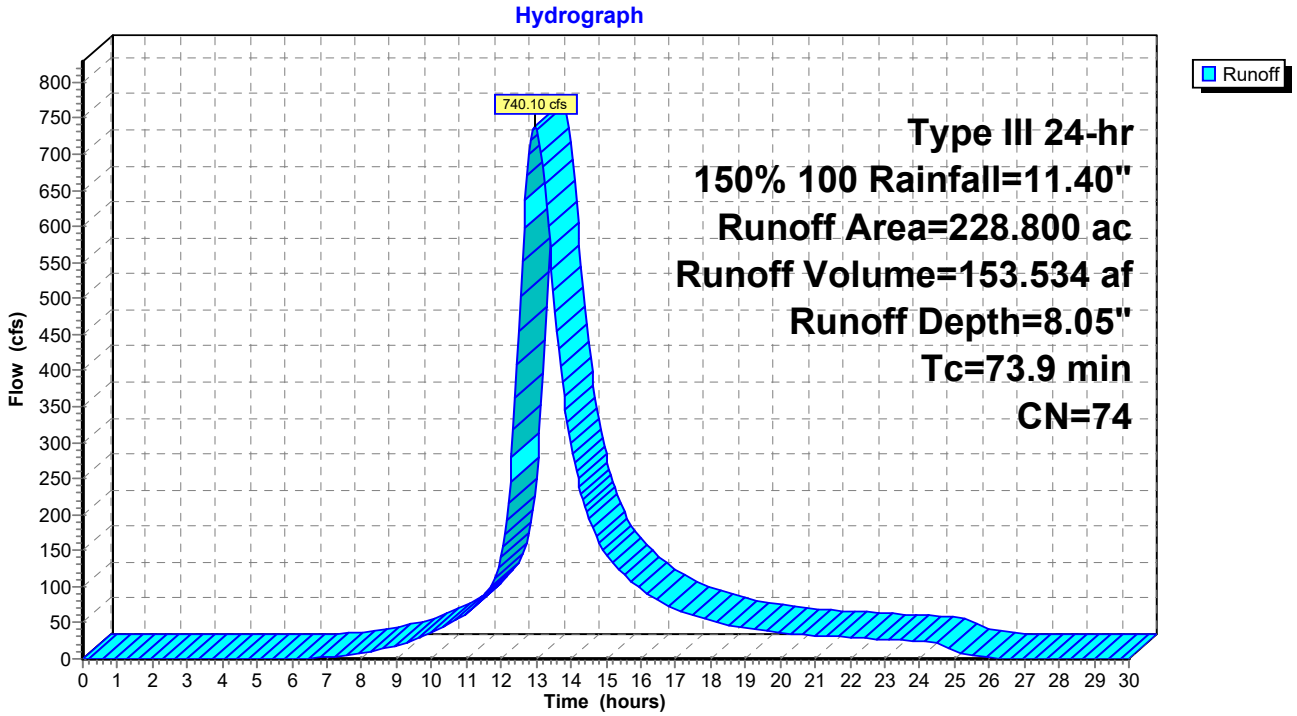
Runoff = 740.10 cfs @ 12.97 hrs, Volume= 153.534 af, Depth= 8.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 150% 100 Rainfall=11.40"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

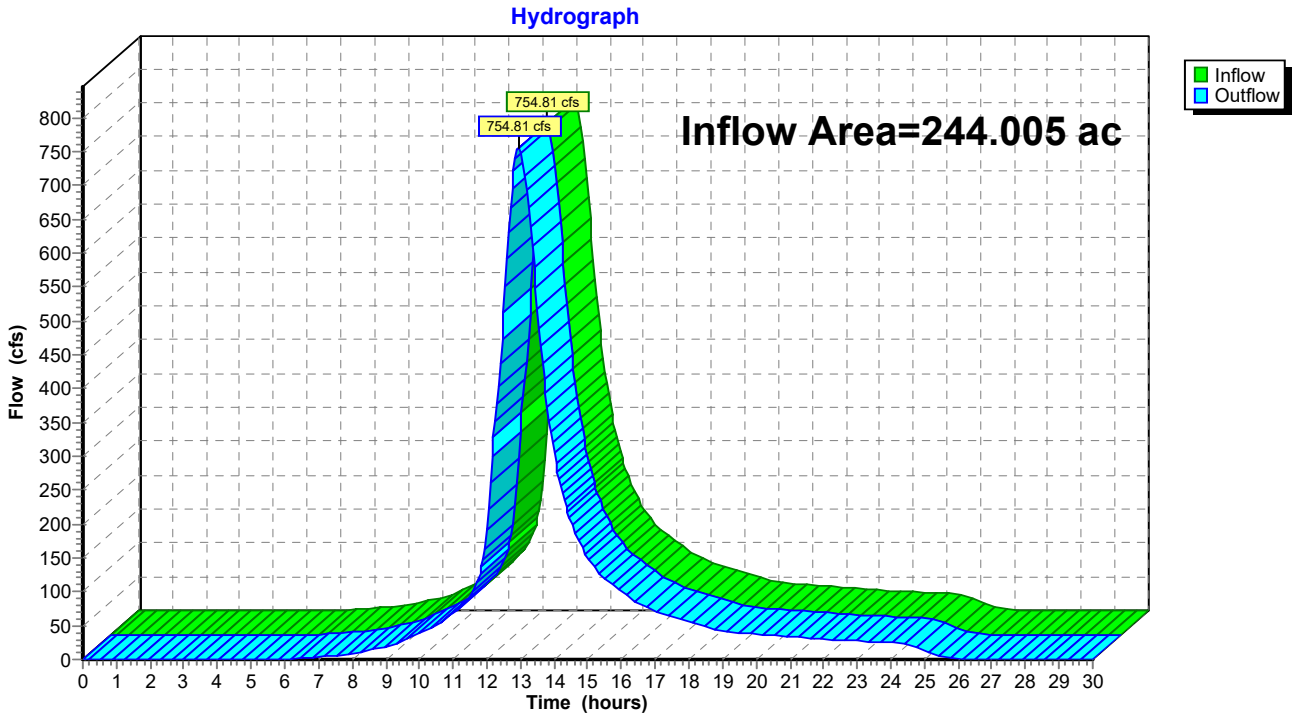


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 7.97" for 150% 100 event
Inflow = 754.81 cfs @ 12.96 hrs, Volume= 162.109 af
Outflow = 754.81 cfs @ 12.96 hrs, Volume= 162.109 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

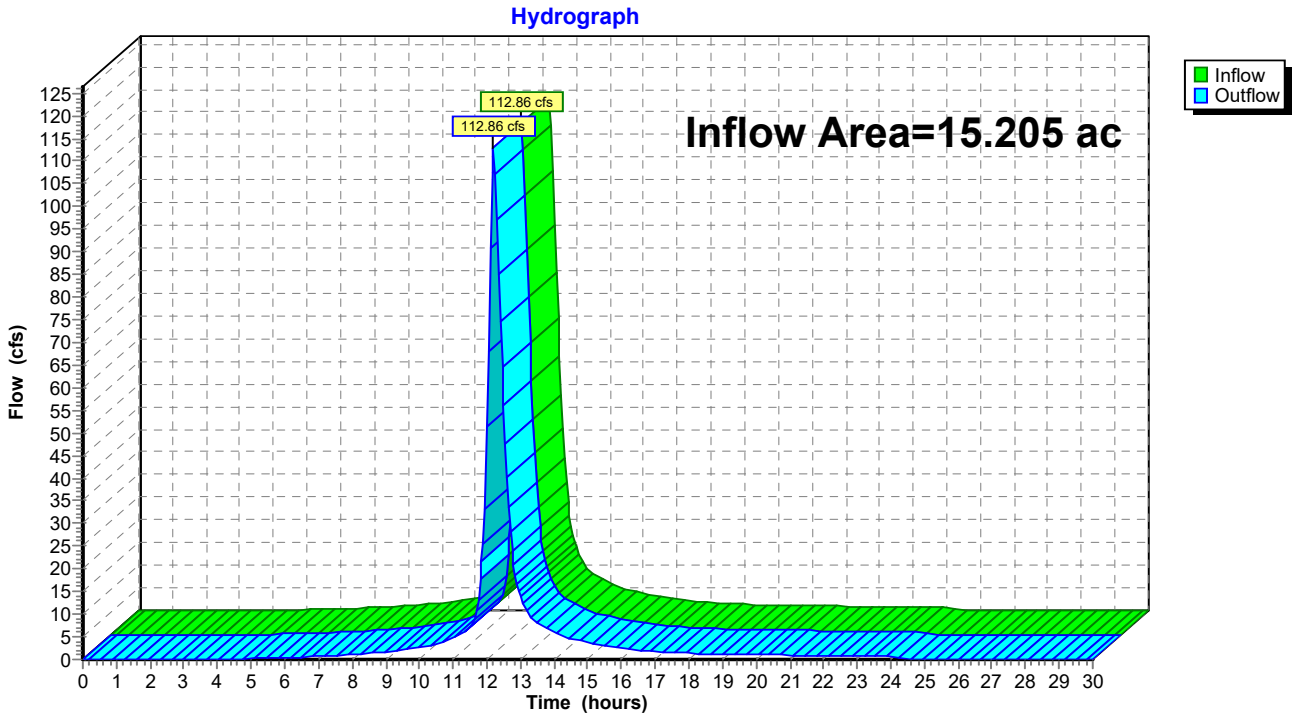


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 6.77" for 150% 100 event
Inflow = 112.86 cfs @ 12.20 hrs, Volume= 8.575 af
Outflow = 112.86 cfs @ 12.20 hrs, Volume= 8.575 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 2P: Existing Dam

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 7.97" for 150% 100 event
Inflow = 754.81 cfs @ 12.96 hrs, Volume= 162.109 af
Outflow = 755.16 cfs @ 12.97 hrs, Volume= 161.688 af, Atten= 0%, Lag= 0.6 min
Primary = 374.59 cfs @ 12.97 hrs, Volume= 136.930 af
Secondary = 380.57 cfs @ 12.97 hrs, Volume= 24.758 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 650.20' @ 12.97 hrs Storage= 307,366 cf

Plug-Flow detention time= 10.4 min calculated for 161.688 af (100% of inflow)
Center-of-Mass det. time= 8.6 min (869.3 - 860.6)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

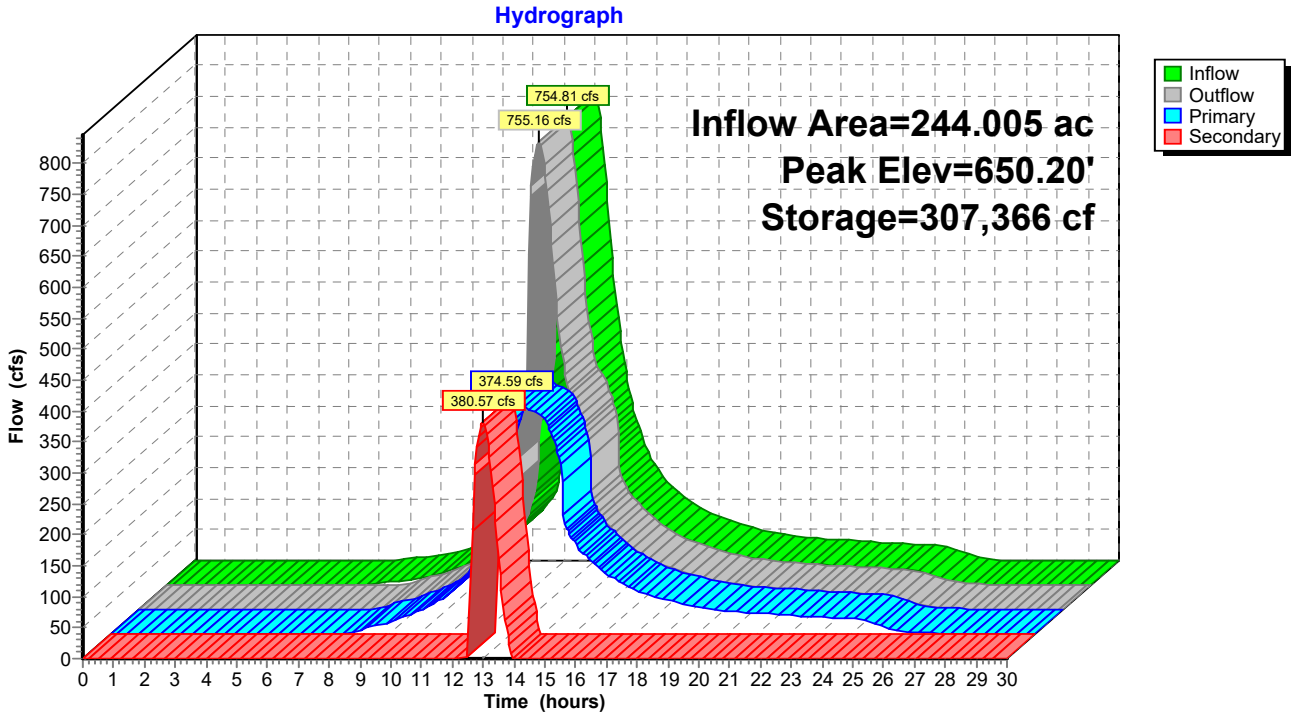
Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	648.50'	**65.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

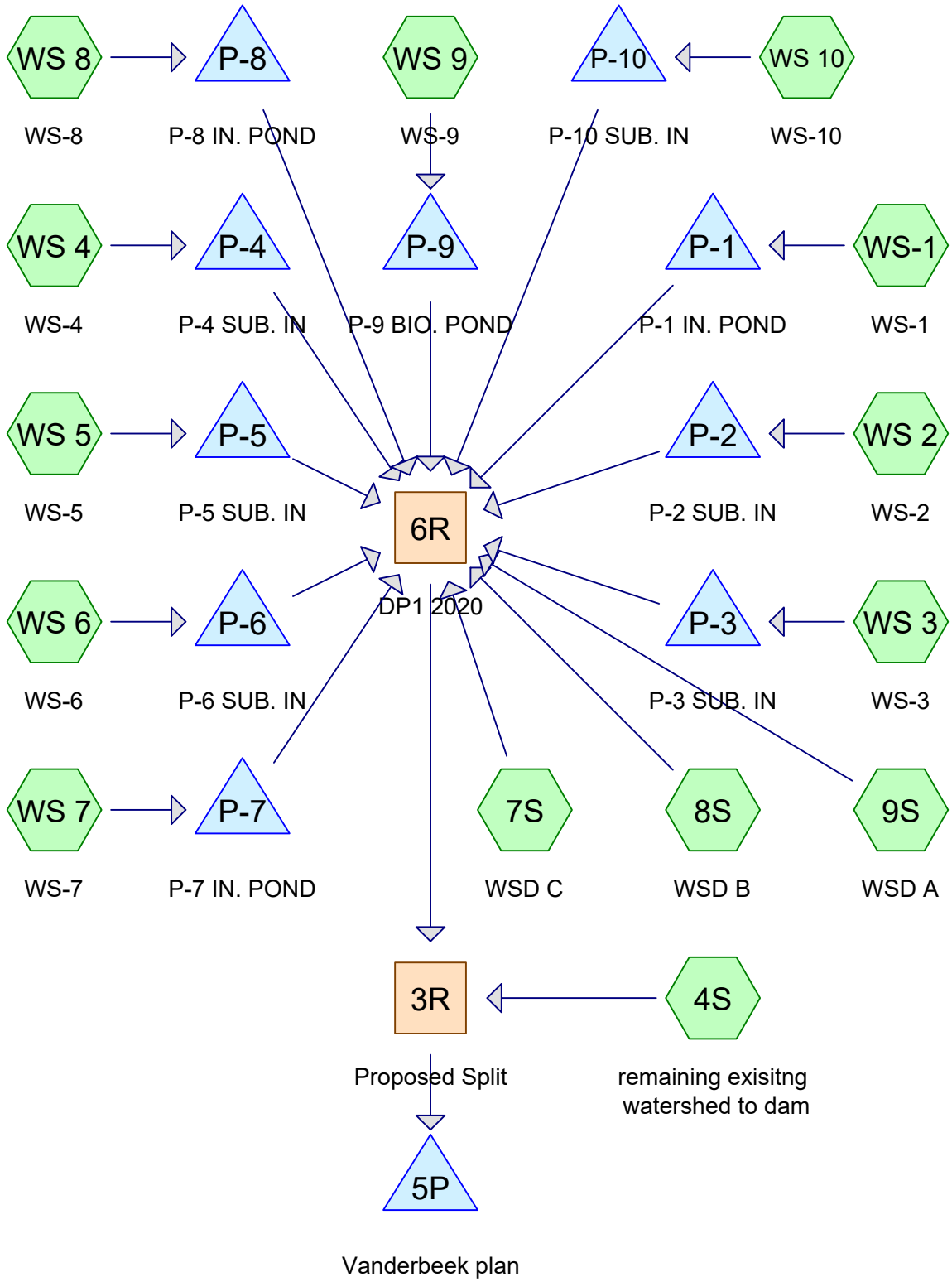
Primary OutFlow Max=374.56 cfs @ 12.97 hrs HW=650.20' (Free Discharge)
└─**1=Culvert** (Inlet Controls 374.56 cfs @ 19.08 fps)
  ├─**2=4' sharp crested weir** (Passes < 317.31 cfs potential flow)
  ├─**3=Broad-Crested Rectangular Weir** (Passes < 54.05 cfs potential flow)
  ├─**4=Broad-Crested Rectangular Weir** (Passes < 54.05 cfs potential flow)
  └─**5=top of str** (Passes < 2,305.55 cfs potential flow)

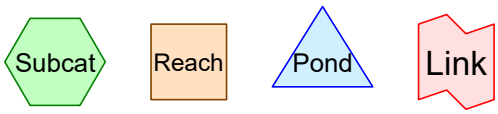
Secondary OutFlow Max=379.12 cfs @ 12.97 hrs HW=650.20' (Free Discharge)
└─**6=Broad-Crested Rectangular Weir** (Weir Controls 379.12 cfs @ 3.44 fps)

Pond 2P: Existing Dam



PROPOSED SPLIT WATERSHED – VANDERBEEK DAM





Routing Diagram for 201228 Warwick-onsite
Prepared by Maser Consulting PA, Printed 12/29/2020
HydroCAD® 10.10-3a s/n 08816 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment 4S: remaining exisitng watershed to dam

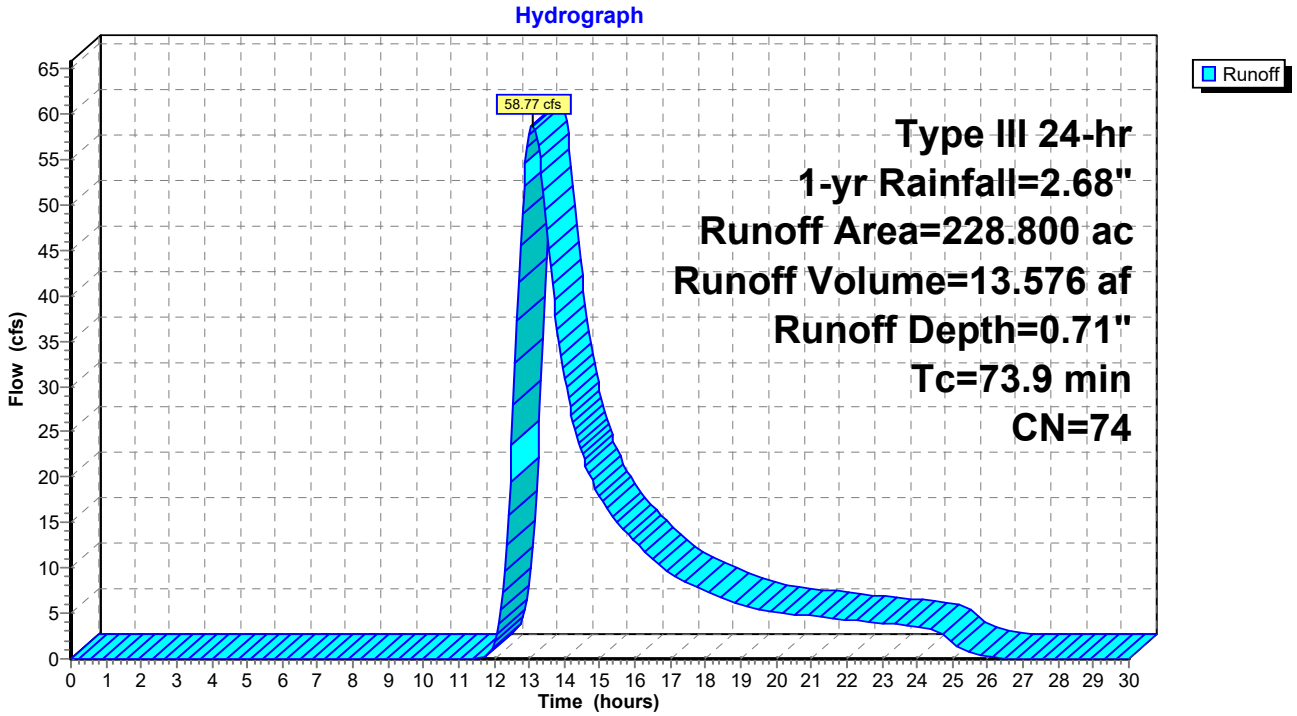
Runoff = 58.77 cfs @ 13.08 hrs, Volume= 13.576 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.68"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

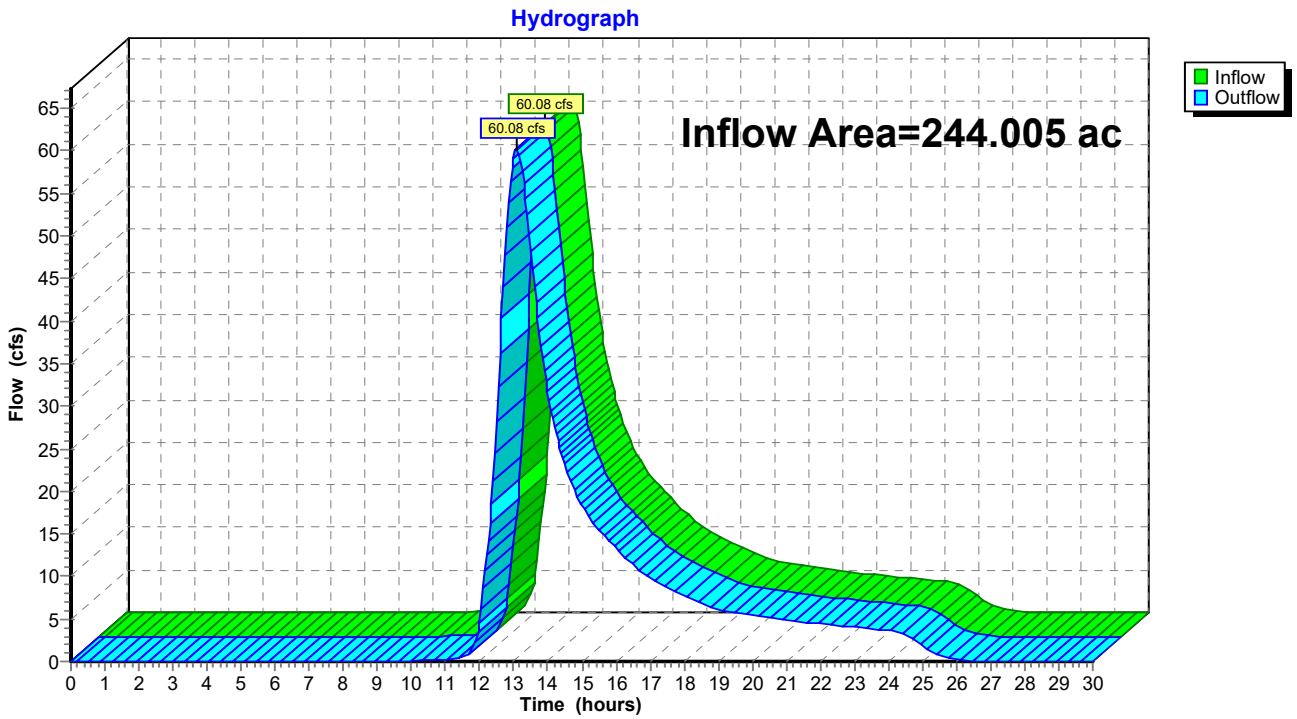


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 0.70" for 1-yr event
Inflow = 60.08 cfs @ 13.07 hrs, Volume= 14.327 af
Outflow = 60.08 cfs @ 13.07 hrs, Volume= 14.327 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

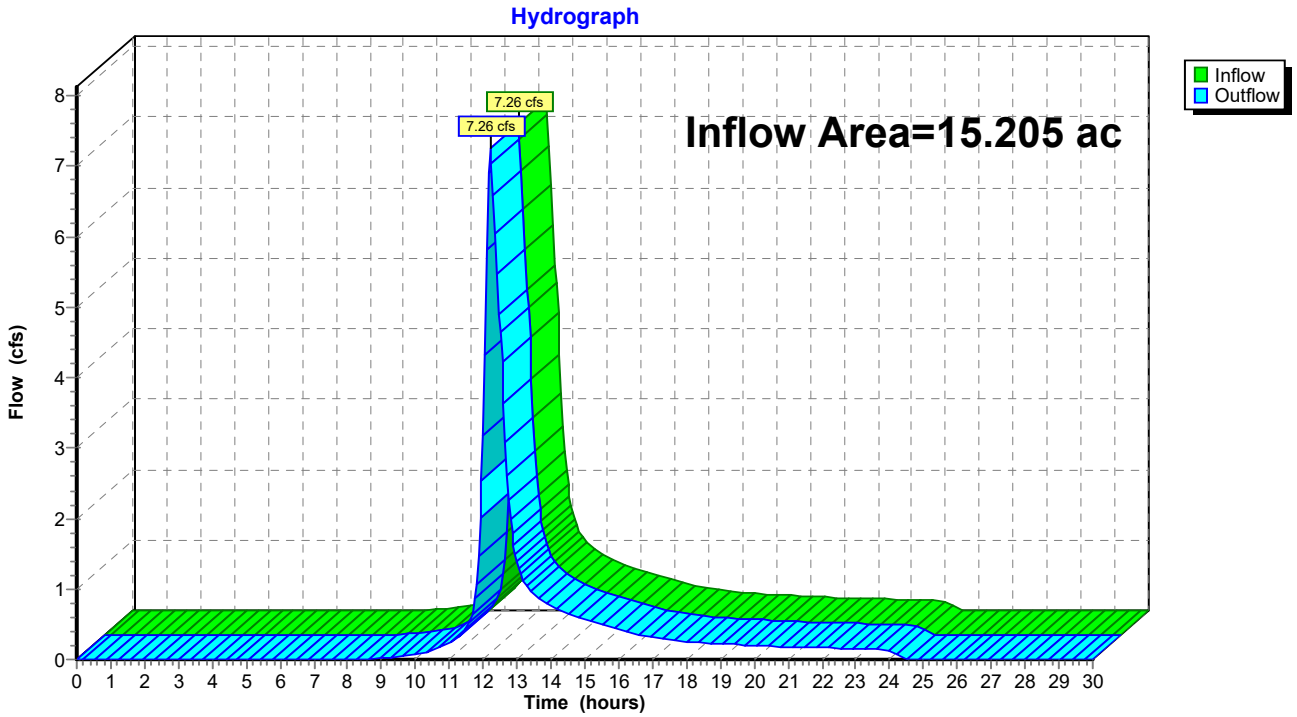


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 0.59" for 1-yr event
Inflow = 7.26 cfs @ 12.21 hrs, Volume= 0.751 af
Outflow = 7.26 cfs @ 12.21 hrs, Volume= 0.751 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 5P: Vanderbeak plan

Inflow Area =	244.005 ac,	2.45% Impervious,	Inflow Depth =	0.70"	for 1-yr event
Inflow =	60.08 cfs @	13.07 hrs,	Volume=	14.327 af	
Outflow =	59.76 cfs @	13.14 hrs,	Volume=	13.908 af,	Atten= 1%, Lag= 3.7 min
Primary =	59.76 cfs @	13.14 hrs,	Volume=	13.908 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 641.16' @ 13.14 hrs Storage= 41,727 cf

Plug-Flow detention time= 37.9 min calculated for 13.908 af (97% of inflow)
Center-of-Mass det. time= 21.8 min (954.2 - 932.4)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

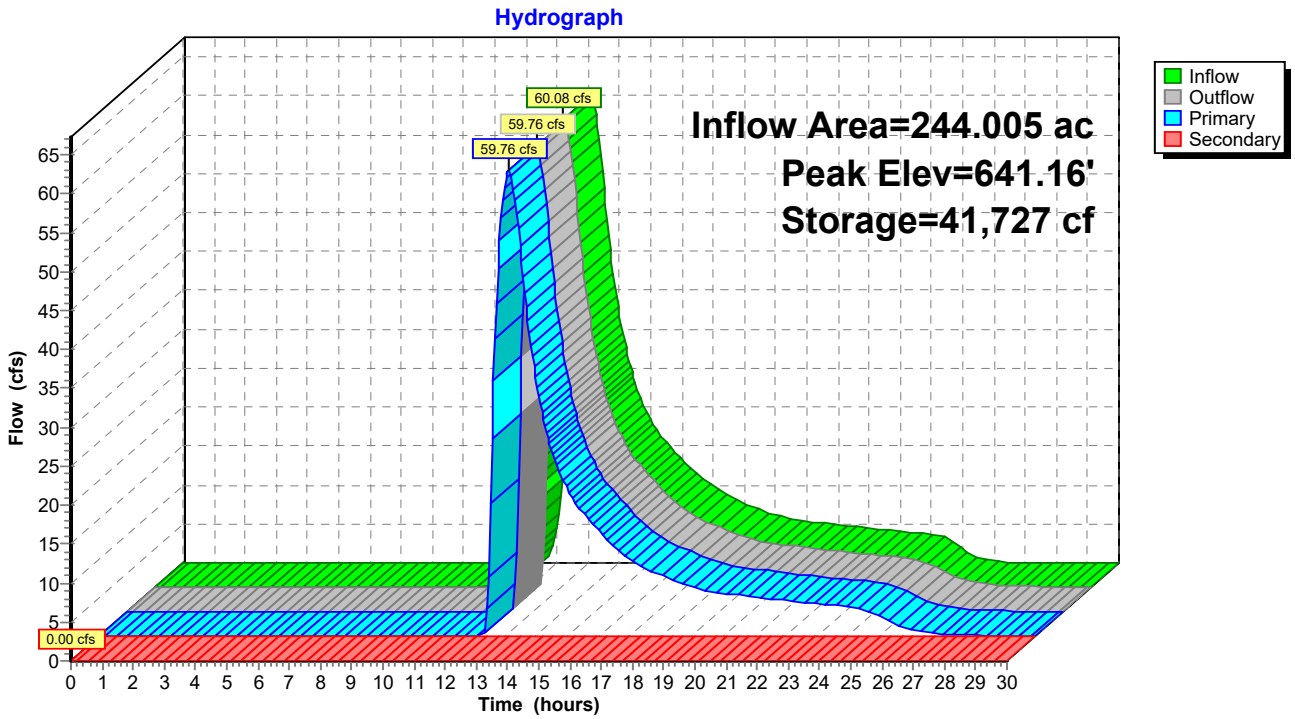
Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	645.00'	**60.0" W x 60.0" H Box 2 5x5 culverts X 2.00** L= 67.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 645.00' / 643.00' S= 0.0299 '/' Cc= 0.900

n= 0.011, Flow Area= 25.00 sf

Primary OutFlow Max=58.79 cfs @ 13.14 hrs HW=641.16' (Free Discharge)
- **1=Culvert** (Passes 58.79 cfs of 243.98 cfs potential flow)
  - **2=4' sharp crested weir** (Weir Controls 15.86 cfs @ 3.52 fps)
  - **3=Broad-Crested Rectangular Weir** (Weir Controls 2.07 cfs @ 3.58 fps)
  - **4=Broad-Crested Rectangular Weir** (Weir Controls 2.07 cfs @ 3.58 fps)
  - **5=top of str** (Weir Controls 38.78 cfs @ 2.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=630.00' (Free Discharge)
- **6=2 5x5 culverts** (Controls 0.00 cfs)

Pond 5P: Vanderbeak plan



Summary for Subcatchment 4S: remaining exisitng watershed to dam

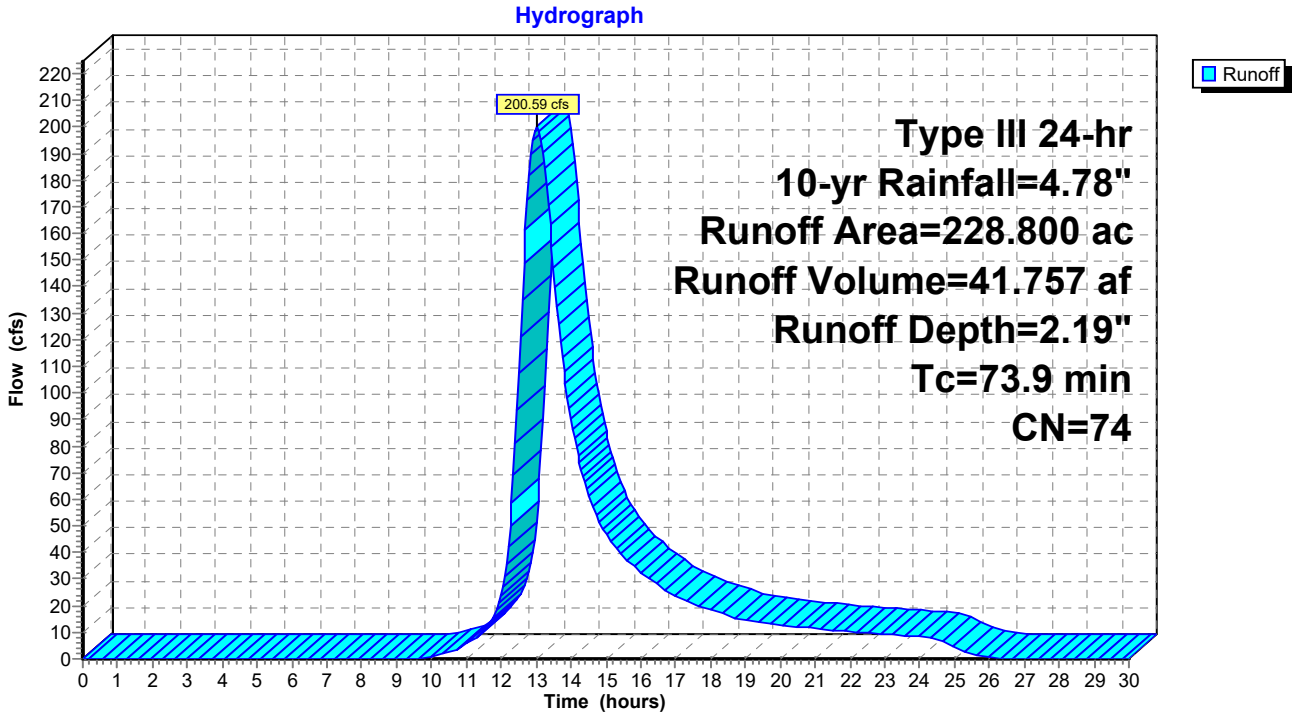
Runoff = 200.59 cfs @ 13.03 hrs, Volume= 41.757 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.78"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

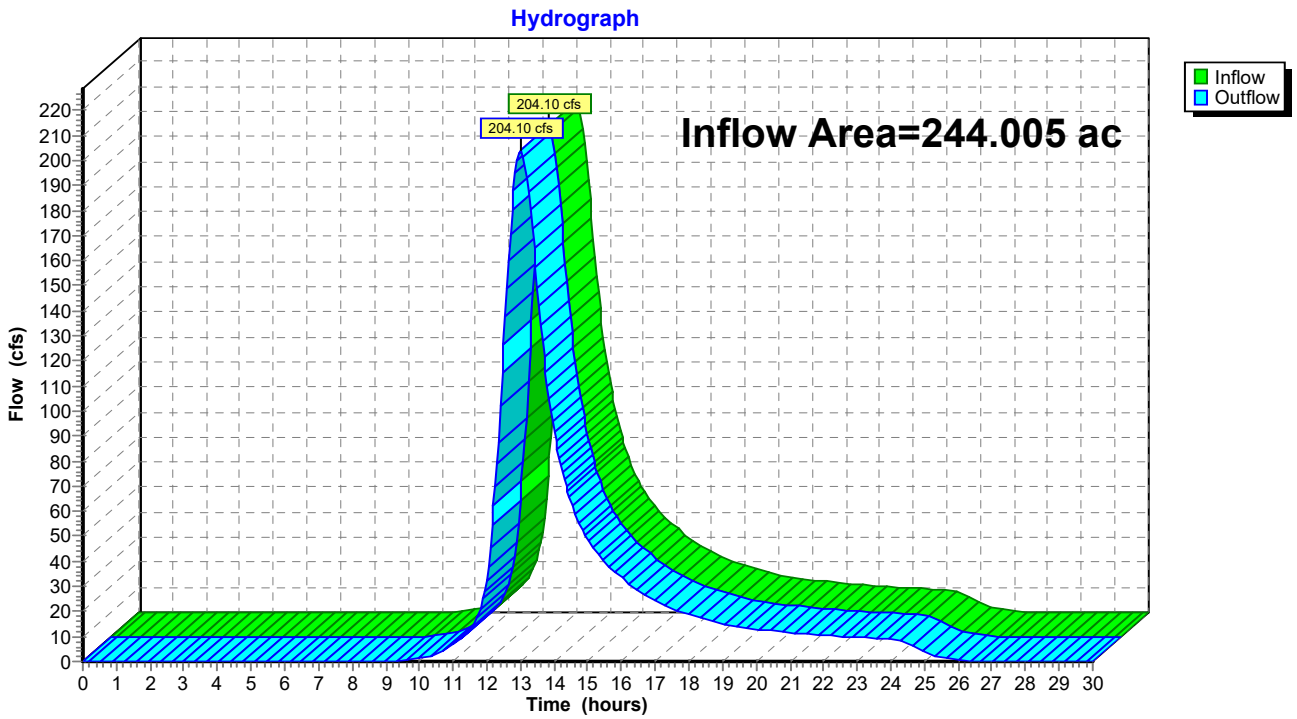


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 2.16" for 10-yr event
Inflow = 204.10 cfs @ 13.03 hrs, Volume= 43.900 af
Outflow = 204.10 cfs @ 13.03 hrs, Volume= 43.900 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

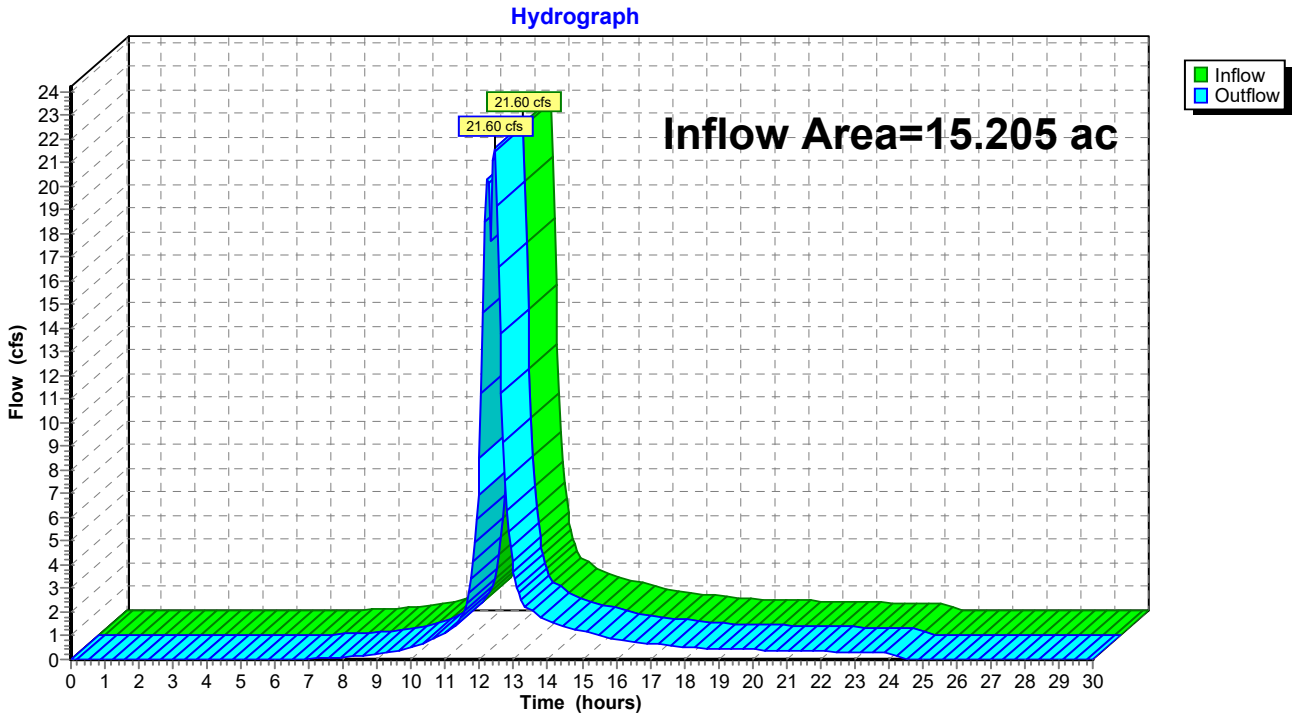


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 1.69" for 10-yr event
Inflow = 21.60 cfs @ 12.43 hrs, Volume= 2.143 af
Outflow = 21.60 cfs @ 12.43 hrs, Volume= 2.143 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 5P: Vanderbeak plan

Inflow Area =	244.005 ac,	2.45% Impervious,	Inflow Depth =	2.16"	for 10-yr event
Inflow =	204.10 cfs @	13.03 hrs,	Volume=	43.900 af	
Outflow =	203.56 cfs @	13.05 hrs,	Volume=	43.480 af,	Atten= 0%, Lag= 1.5 min
Primary =	203.56 cfs @	13.05 hrs,	Volume=	43.480 af	
Secondary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 642.11' @ 13.05 hrs Storage= 62,467 cf

Plug-Flow detention time= 16.1 min calculated for 43.408 af (99% of inflow)
Center-of-Mass det. time= 10.6 min (908.8 - 898.2)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

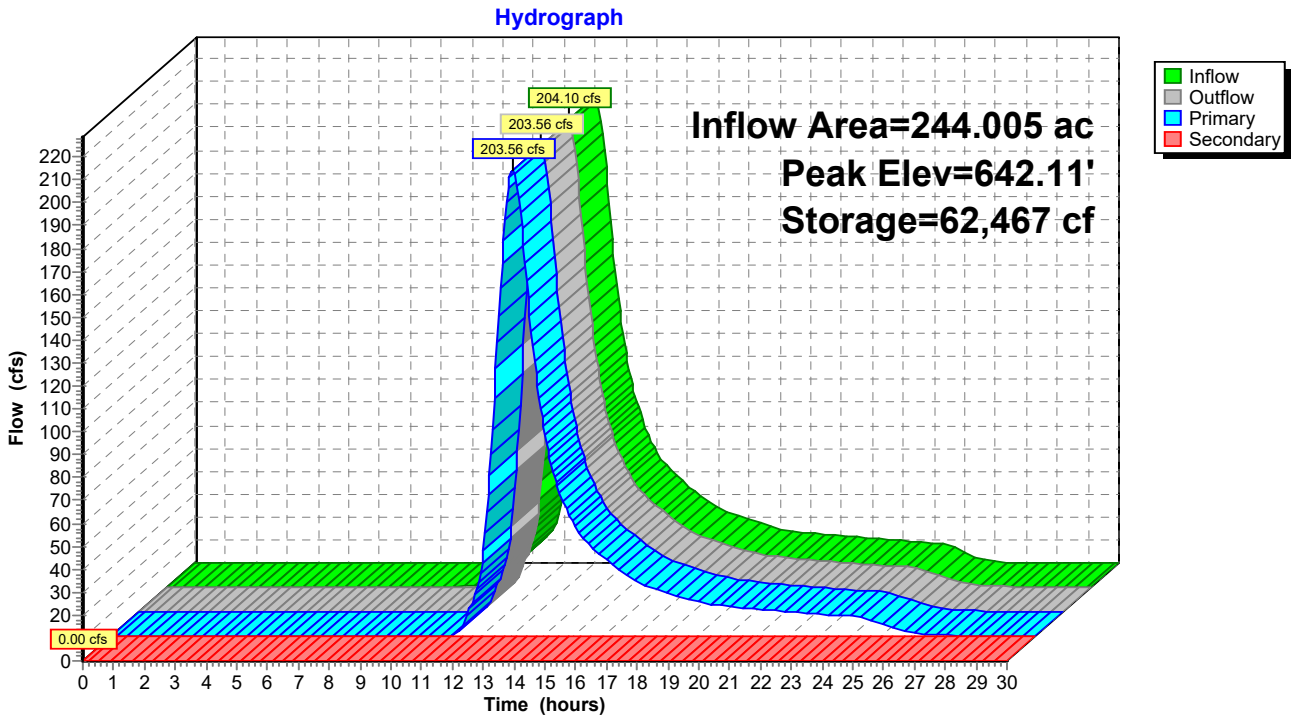
Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	645.00'	**60.0" W x 60.0" H Box 2 5x5 culverts X 2.00** L= 67.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 645.00' / 643.00' S= 0.0299 '/' Cc= 0.900

n= 0.011, Flow Area= 25.00 sf

Primary OutFlow Max=203.43 cfs @ 13.05 hrs HW=642.11' (Free Discharge)
- **1=Culvert** (Passes 203.43 cfs of 260.74 cfs potential flow)
  - **2=4' sharp crested weir** (Weir Controls 37.87 cfs @ 4.75 fps)
  - **3=Broad-Crested Rectangular Weir** (Weir Controls 5.07 cfs @ 4.82 fps)
  - **4=Broad-Crested Rectangular Weir** (Weir Controls 5.07 cfs @ 4.82 fps)
  - **5=top of str** (Weir Controls 155.41 cfs @ 4.21 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=630.00' (Free Discharge)
- **6=2 5x5 culverts** (Controls 0.00 cfs)

Pond 5P: Vanderbeak plan



Summary for Subcatchment 4S: remaining exisitng watershed to dam

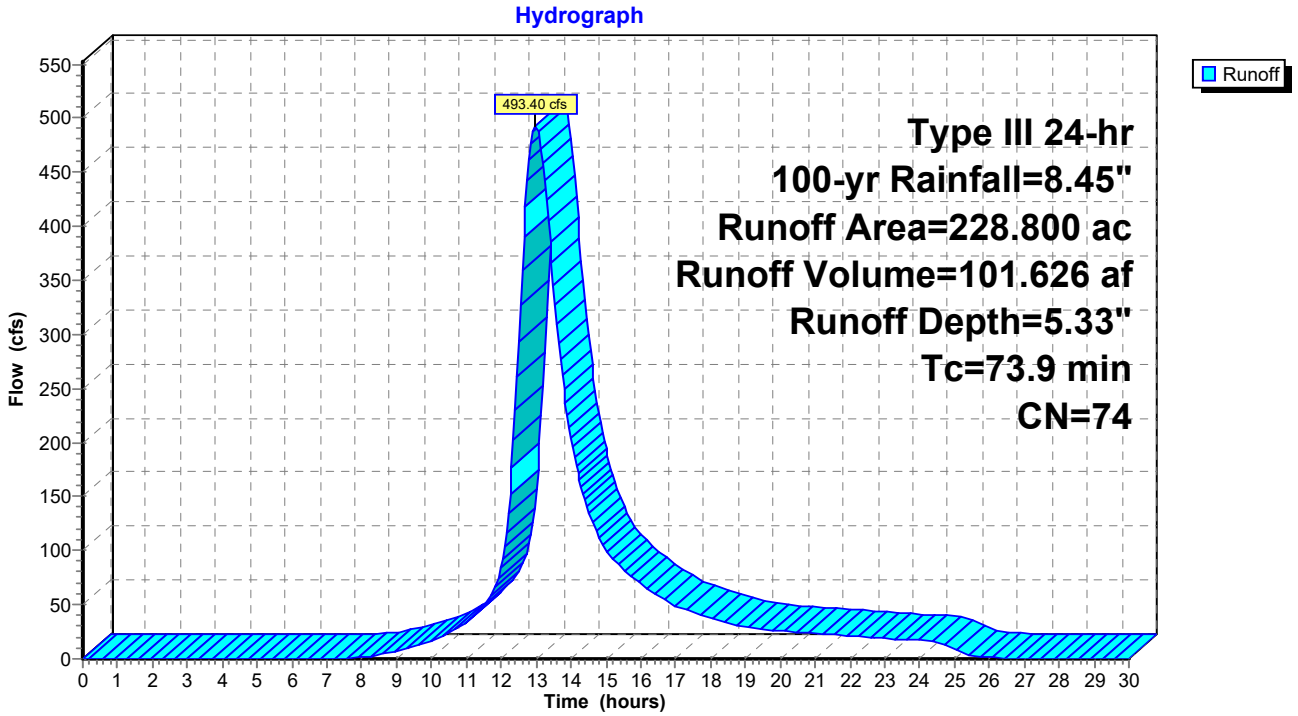
Runoff = 493.40 cfs @ 12.99 hrs, Volume= 101.626 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.45"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

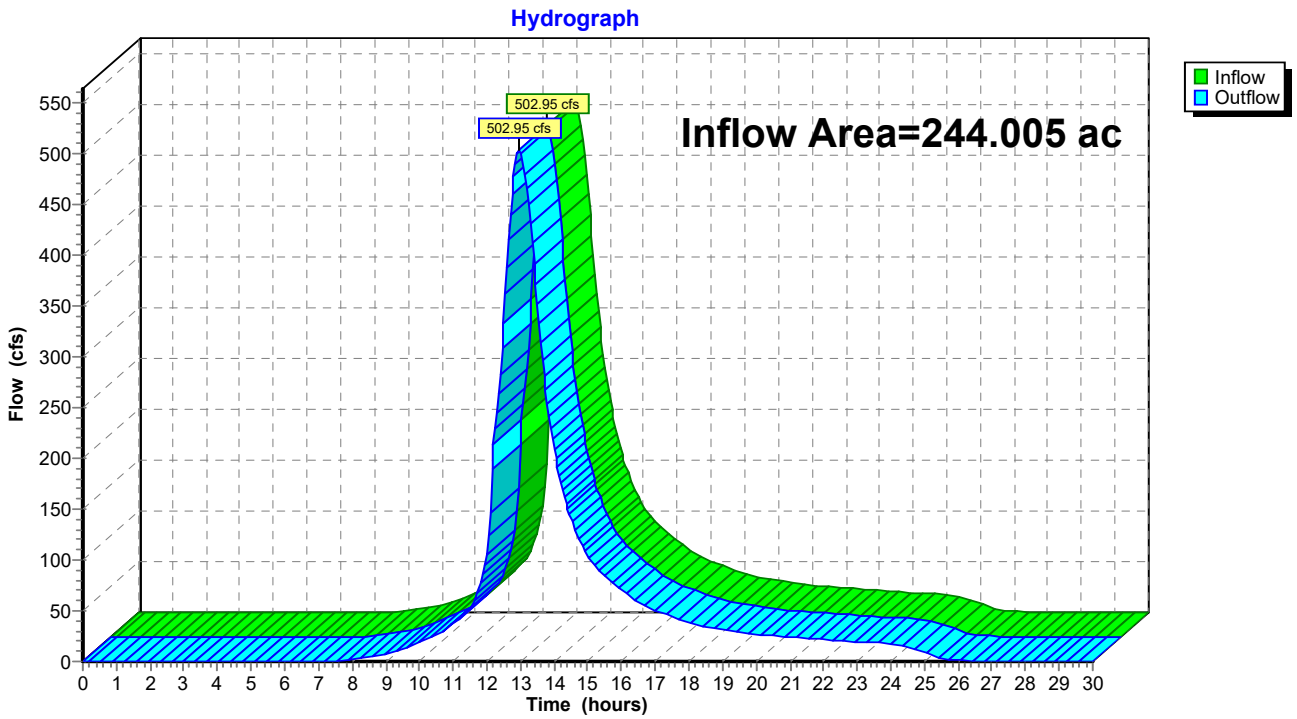


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 5.27" for 100-yr event
Inflow = 502.95 cfs @ 12.98 hrs, Volume= 107.178 af
Outflow = 502.95 cfs @ 12.98 hrs, Volume= 107.178 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

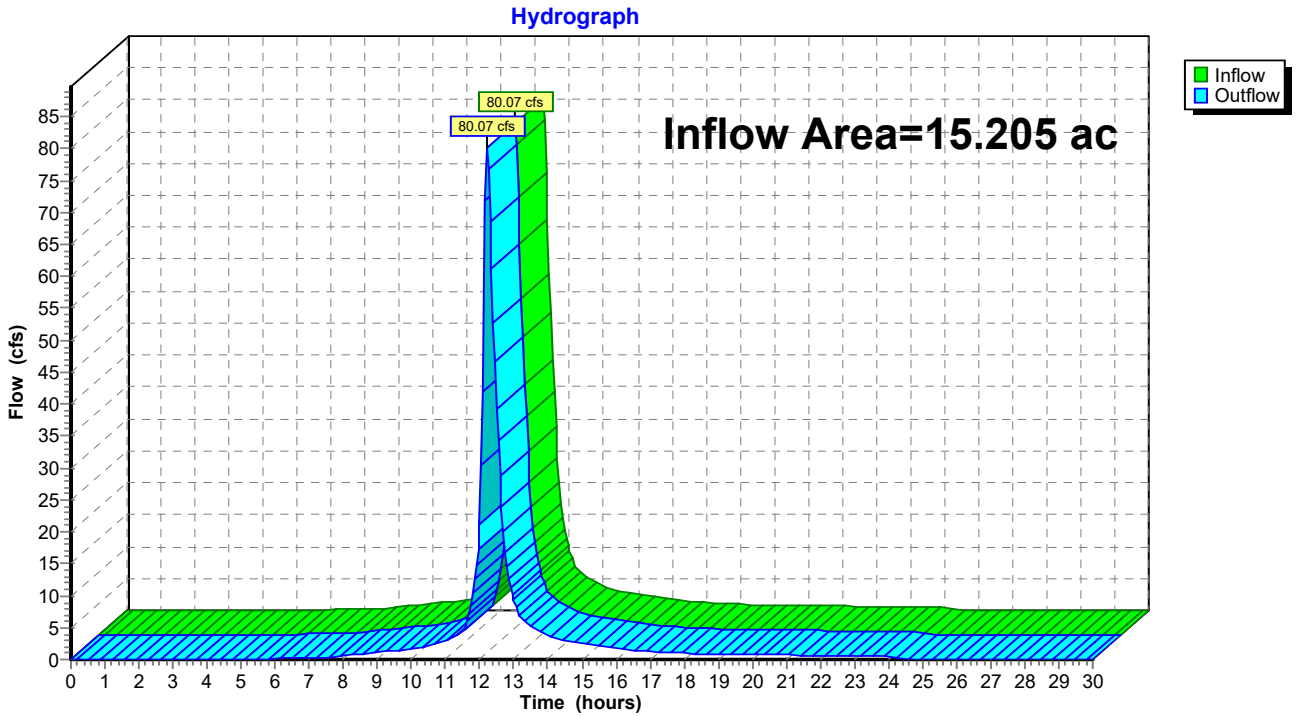


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 4.38" for 100-yr event
Inflow = 80.07 cfs @ 12.21 hrs, Volume= 5.552 af
Outflow = 80.07 cfs @ 12.21 hrs, Volume= 5.552 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 5P: Vanderbeak plan

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 5.27" for 100-yr event
Inflow = 502.95 cfs @ 12.98 hrs, Volume= 107.178 af
Outflow = 488.95 cfs @ 13.11 hrs, Volume= 106.757 af, Atten= 3%, Lag= 8.1 min
Primary = 343.91 cfs @ 13.11 hrs, Volume= 98.977 af
Secondary = 145.04 cfs @ 13.11 hrs, Volume= 7.779 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 647.73' @ 13.11 hrs Storage= 232,718 cf

Plug-Flow detention time= 10.9 min calculated for 106.579 af (99% of inflow)
Center-of-Mass det. time= 8.6 min (880.8 - 872.3)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

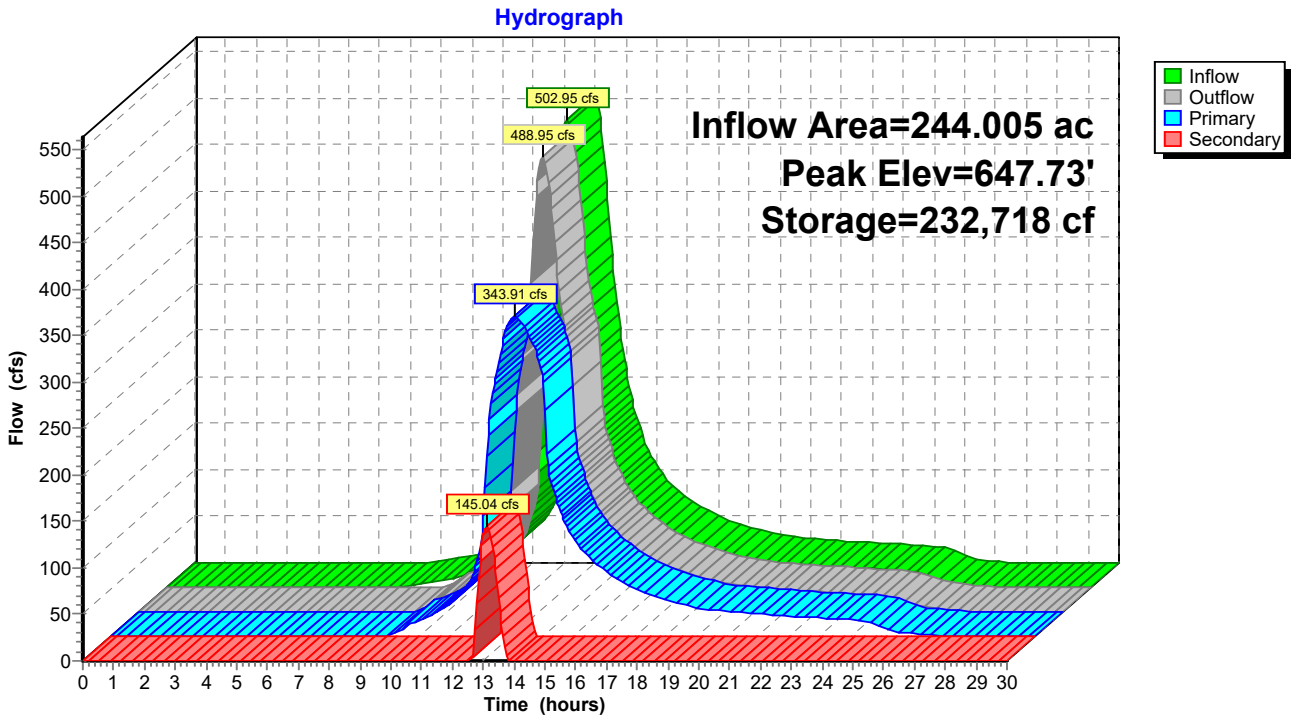
Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	645.00'	**60.0" W x 60.0" H Box 2 5x5 culverts X 2.00** L= 67.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 645.00' / 643.00' S= 0.0299 '/' Cc= 0.900

n= 0.011, Flow Area= 25.00 sf

Primary OutFlow Max=343.85 cfs @ 13.11 hrs HW=647.73' (Free Discharge)
- **1=Culvert** (Inlet Controls 343.85 cfs @ 17.51 fps)
  - **2=4' sharp crested weir** (Passes < 226.71 cfs potential flow)
  - **3=Broad-Crested Rectangular Weir** (Passes < 35.66 cfs potential flow)
  - **4=Broad-Crested Rectangular Weir** (Passes < 35.66 cfs potential flow)
  - **5=top of str** (Passes < 1,483.86 cfs potential flow)

Secondary OutFlow Max=144.63 cfs @ 13.11 hrs HW=647.73' (Free Discharge)
- **6=2 5x5 culverts** (Inlet Controls 144.63 cfs @ 5.30 fps)

Pond 5P: Vanderbeak plan



Summary for Subcatchment 4S: remaining exisitng watershed to dam

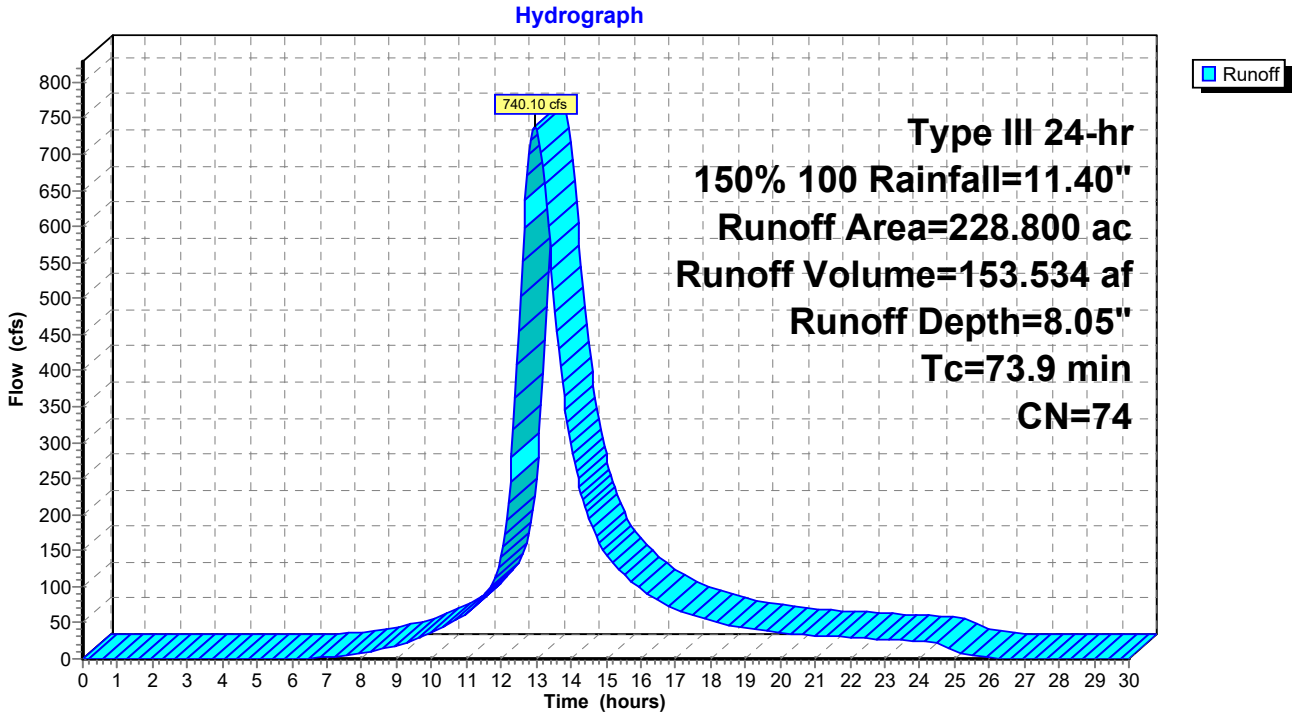
Runoff = 740.10 cfs @ 12.97 hrs, Volume= 153.534 af, Depth= 8.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 150% 100 Rainfall=11.40"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

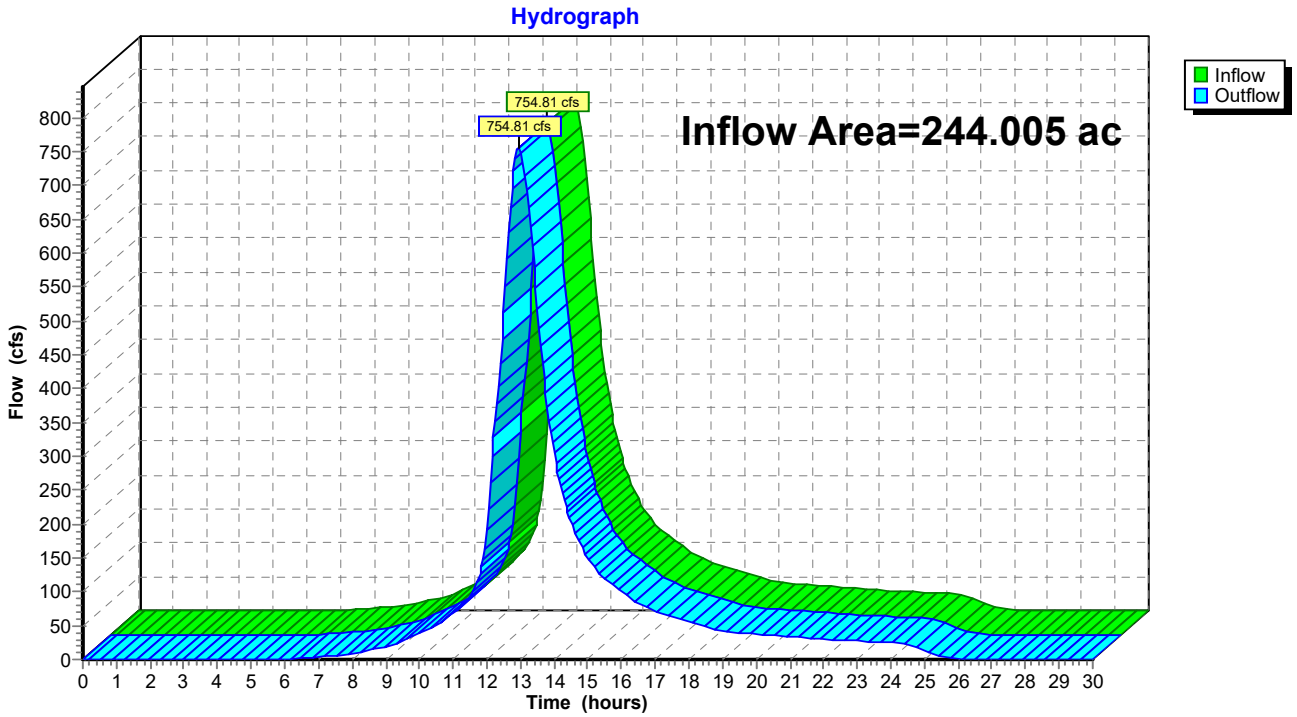


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 7.97" for 150% 100 event
Inflow = 754.81 cfs @ 12.96 hrs, Volume= 162.109 af
Outflow = 754.81 cfs @ 12.96 hrs, Volume= 162.109 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

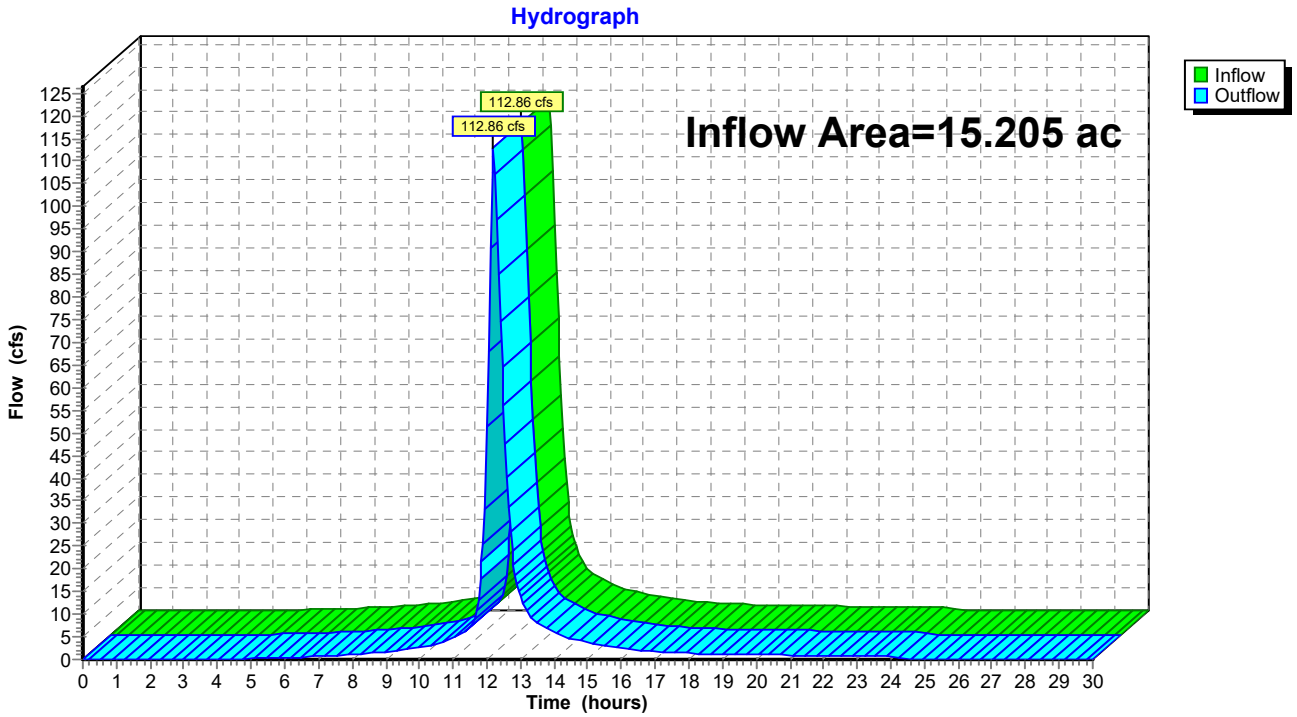


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 6.77" for 150% 100 event
Inflow = 112.86 cfs @ 12.20 hrs, Volume= 8.575 af
Outflow = 112.86 cfs @ 12.20 hrs, Volume= 8.575 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 5P: Vanderbeak plan

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 7.97" for 150% 100 event
Inflow = 754.81 cfs @ 12.96 hrs, Volume= 162.109 af
Outflow = 752.90 cfs @ 13.01 hrs, Volume= 161.688 af, Atten= 0%, Lag= 2.9 min
Primary = 374.69 cfs @ 13.01 hrs, Volume= 133.255 af
Secondary = 378.20 cfs @ 13.01 hrs, Volume= 28.432 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 650.21' @ 13.01 hrs Storage= 307,504 cf

Plug-Flow detention time= 9.7 min calculated for 161.688 af (100% of inflow)
Center-of-Mass det. time= 7.9 min (868.5 - 860.6)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

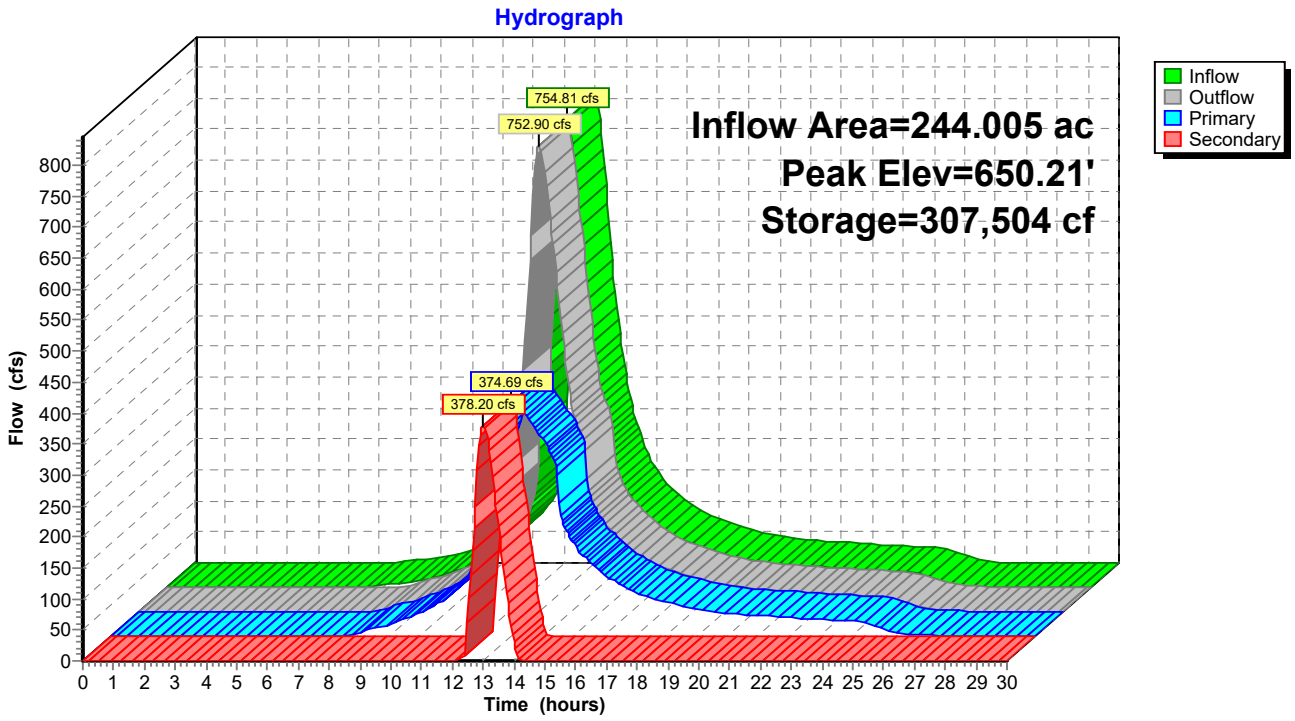
Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Device 1	640.00'	**4.0' long 4' sharp crested weir** 1 End Contraction(s)
#3	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	640.00'	**0.5' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#6	Secondary	645.00'	**60.0" W x 60.0" H Box 2 5x5 culverts X 2.00** L= 67.0' Box, headwall w/3 square edges, Ke= 0.500 Inlet / Outlet Invert= 645.00' / 643.00' S= 0.0299 '/' Cc= 0.900

n= 0.011, Flow Area= 25.00 sf

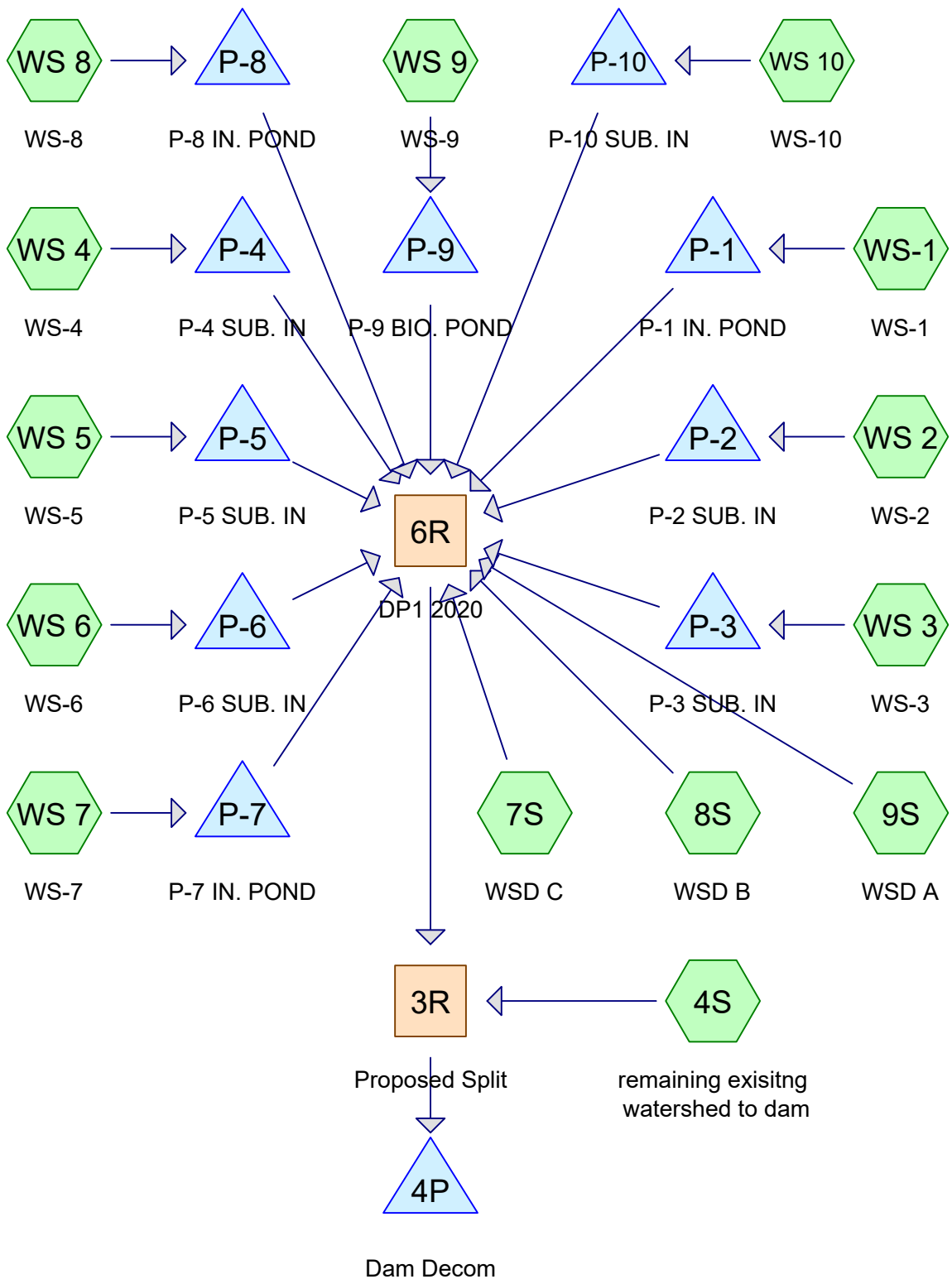
Primary OutFlow Max=374.66 cfs @ 13.01 hrs HW=650.20' (Free Discharge)
- **1=Culvert** (Inlet Controls 374.66 cfs @ 19.08 fps)
  - **2=4' sharp crested weir** (Passes < 317.59 cfs potential flow)
  - **3=Broad-Crested Rectangular Weir** (Passes < 54.11 cfs potential flow)
  - **4=Broad-Crested Rectangular Weir** (Passes < 54.11 cfs potential flow)
  - **5=top of str** (Passes < 2,308.38 cfs potential flow)

Secondary OutFlow Max=378.14 cfs @ 13.01 hrs HW=650.20' (Free Discharge)
- **6=2 5x5 culverts** (Inlet Controls 378.14 cfs @ 7.56 fps)

Pond 5P: Vanderbeak plan



PROPOSED SPLIT WATERSHED – DECOMMISSION DAM



Subcat Reach Pond Link

Routing Diagram for 201228 Warwick-onsite
Prepared by Maser Consulting PA, Printed 12/29/2020
HydroCAD® 10.10-3a s/n 08816 © 2020 HydroCAD Software Solutions LLC

Summary for Subcatchment 4S: remaining exisitng watershed to dam

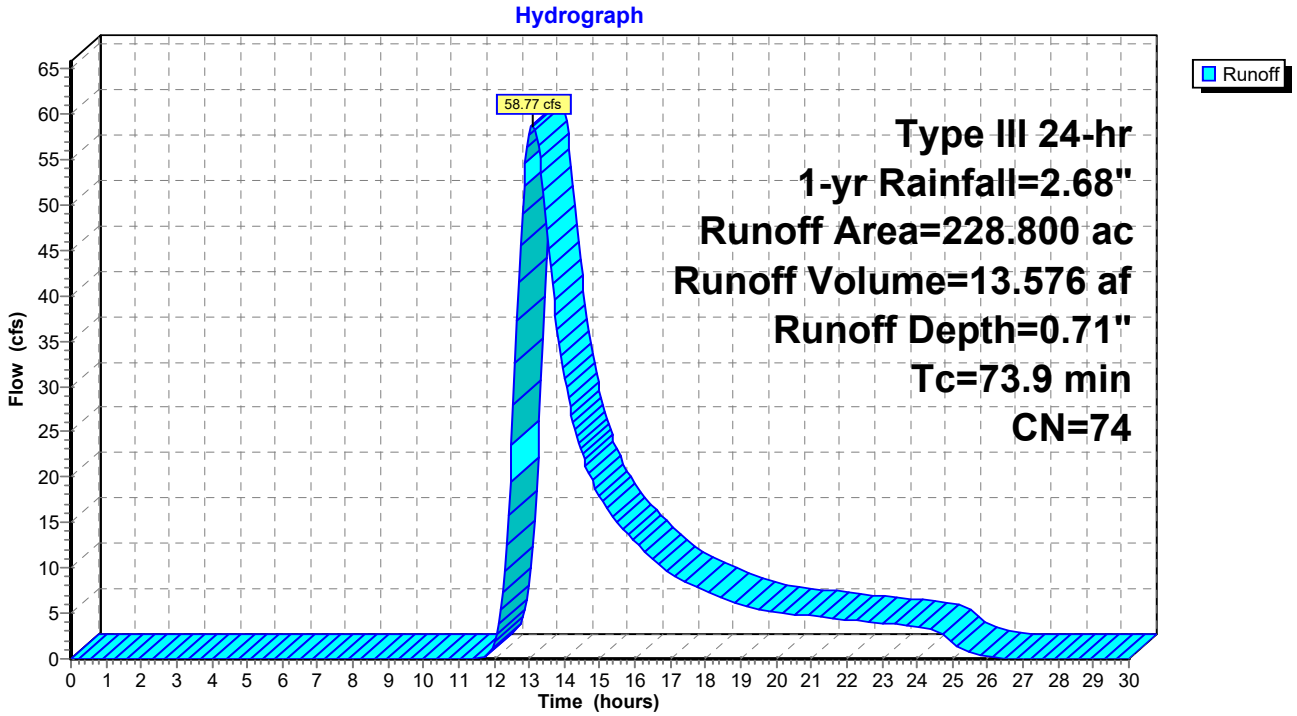
Runoff = 58.77 cfs @ 13.08 hrs, Volume= 13.576 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-yr Rainfall=2.68"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

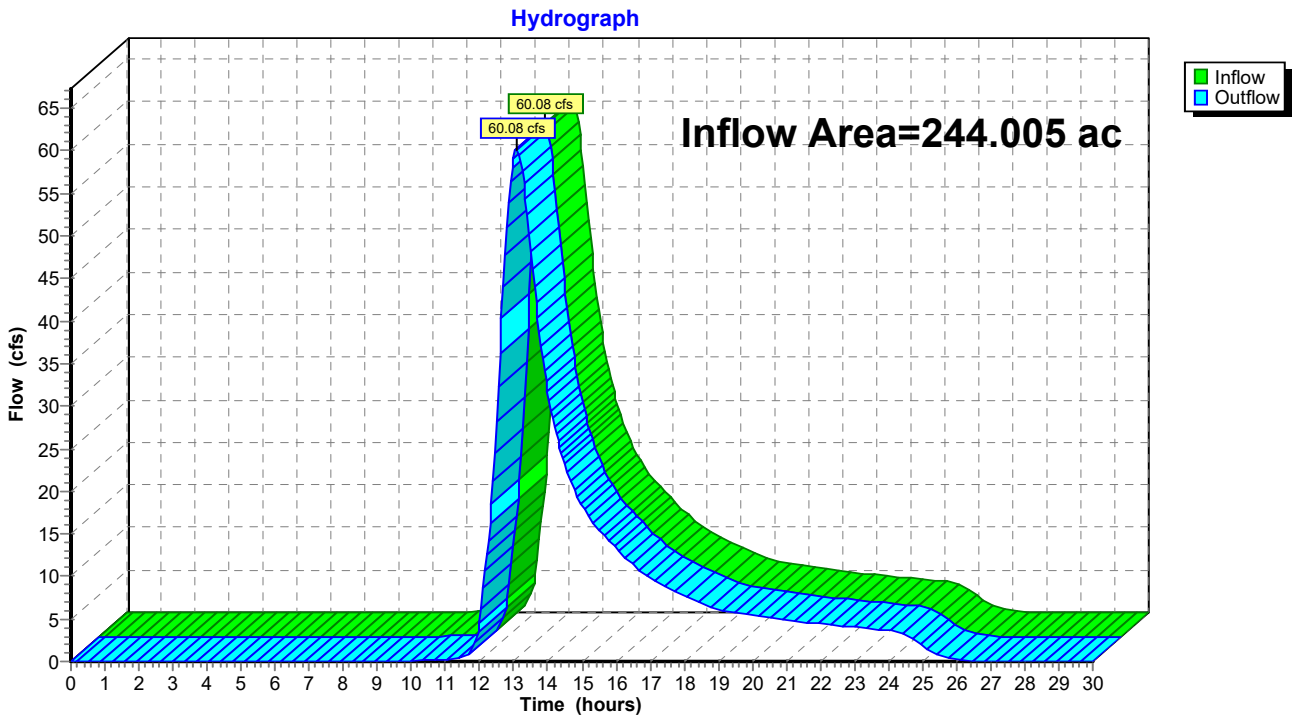


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 0.70" for 1-yr event
Inflow = 60.08 cfs @ 13.07 hrs, Volume= 14.327 af
Outflow = 60.08 cfs @ 13.07 hrs, Volume= 14.327 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

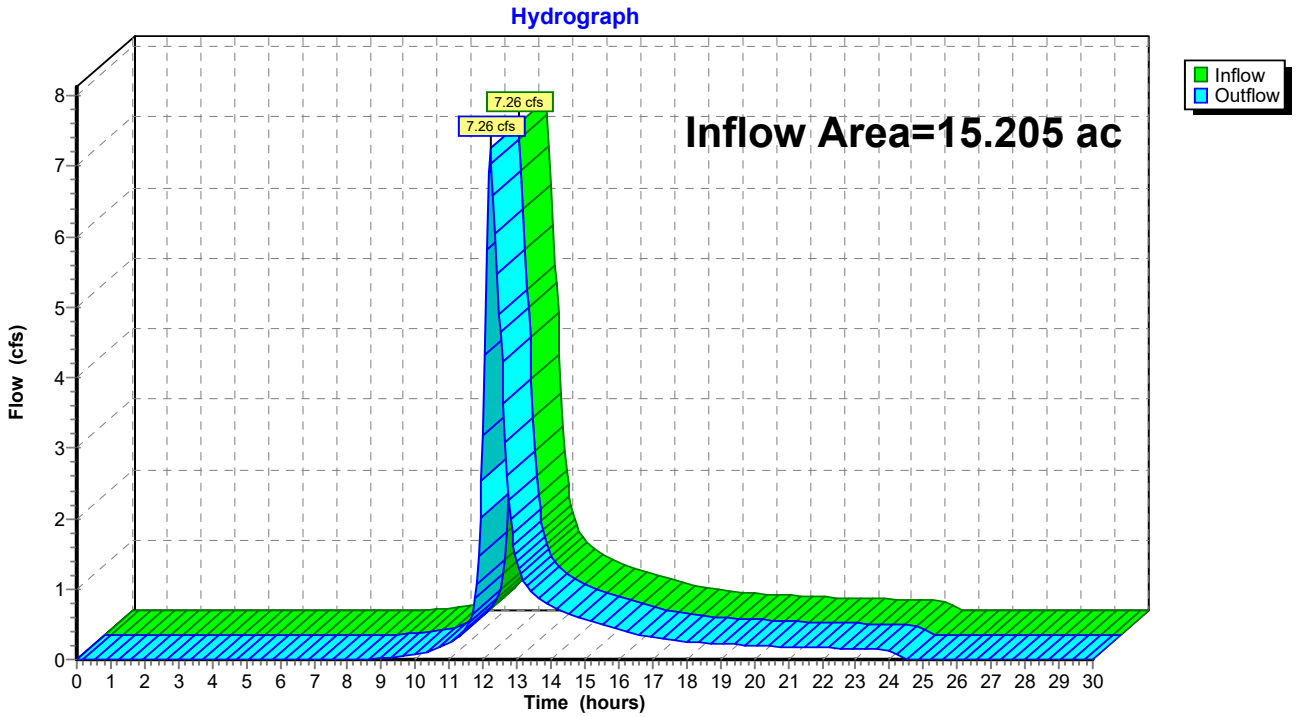


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 0.59" for 1-yr event
Inflow = 7.26 cfs @ 12.21 hrs, Volume= 0.751 af
Outflow = 7.26 cfs @ 12.21 hrs, Volume= 0.751 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 4P: Dam Decom

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 0.70" for 1-yr event
Inflow = 60.08 cfs @ 13.07 hrs, Volume= 14.327 af
Outflow = 60.04 cfs @ 13.09 hrs, Volume= 14.223 af, Atten= 0%, Lag= 0.9 min
Primary = 60.04 cfs @ 13.09 hrs, Volume= 14.223 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 634.33' @ 13.09 hrs Storage= 7,880 cf

Plug-Flow detention time= 7.6 min calculated for 14.199 af (99% of inflow)
Center-of-Mass det. time= 3.5 min (935.9 - 932.4)

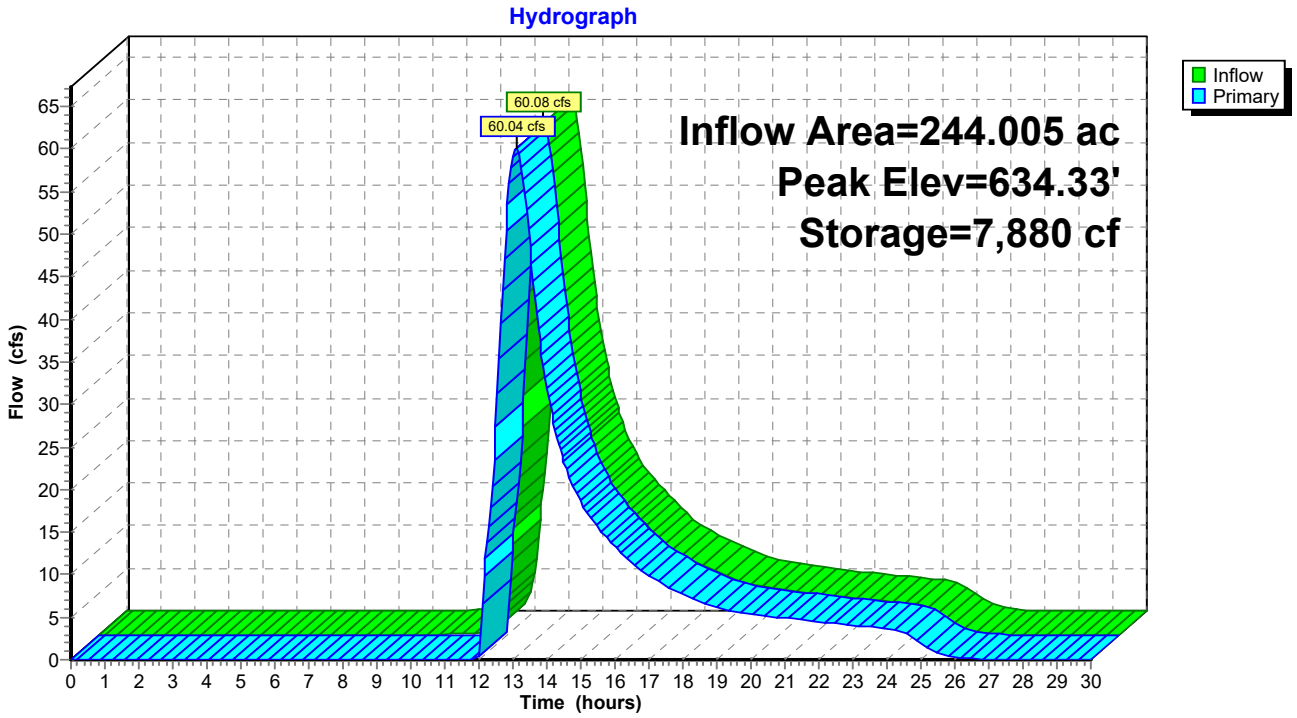
Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Primary	632.50'	**60.0" Round Culvert X 2.00** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.50' / 627.60' S= 0.0490 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 19.63 sf
#3	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=59.88 cfs @ 13.09 hrs HW=634.33' (Free Discharge)
- **1=Culvert** (Passes 0.00 cfs of 46.57 cfs potential flow)
  - **3=top of str** (Controls 0.00 cfs)
- **2=Culvert** (Inlet Controls 59.88 cfs @ 4.60 fps)

Pond 4P: Dam Decom



Summary for Subcatchment 4S: remaining exisitng watershed to dam

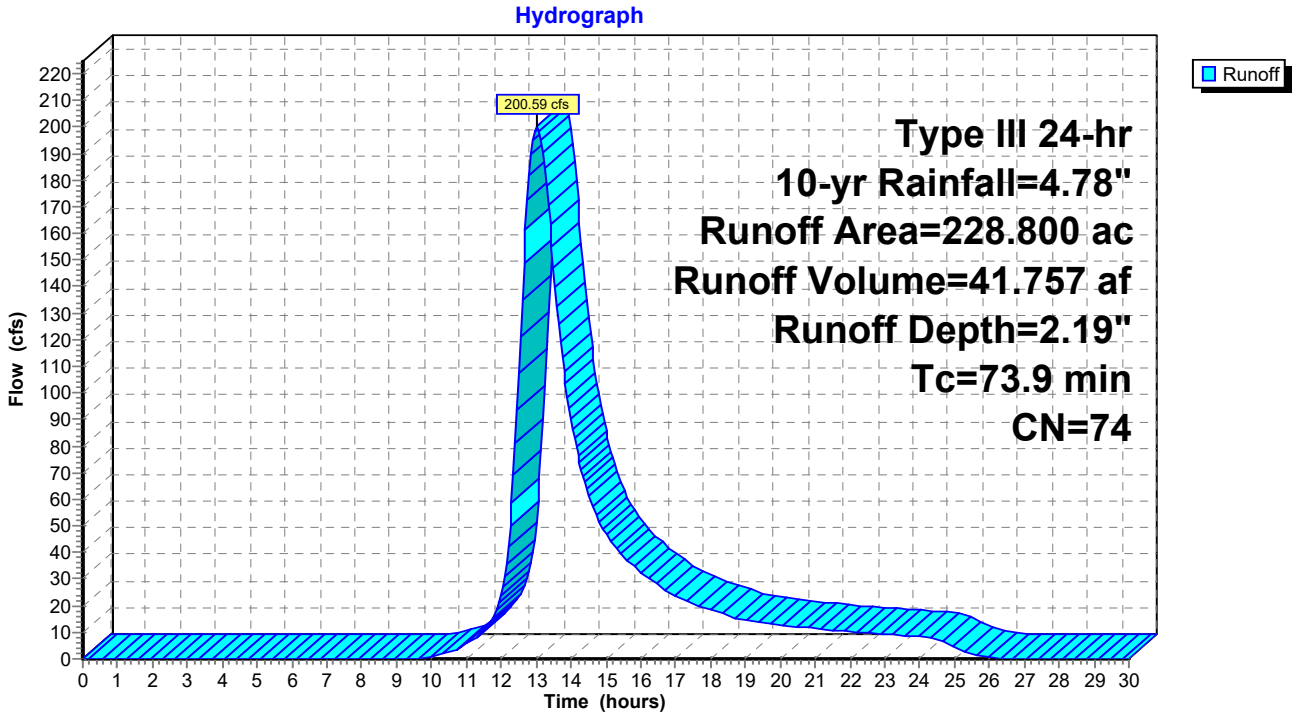
Runoff = 200.59 cfs @ 13.03 hrs, Volume= 41.757 af, Depth= 2.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-yr Rainfall=4.78"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

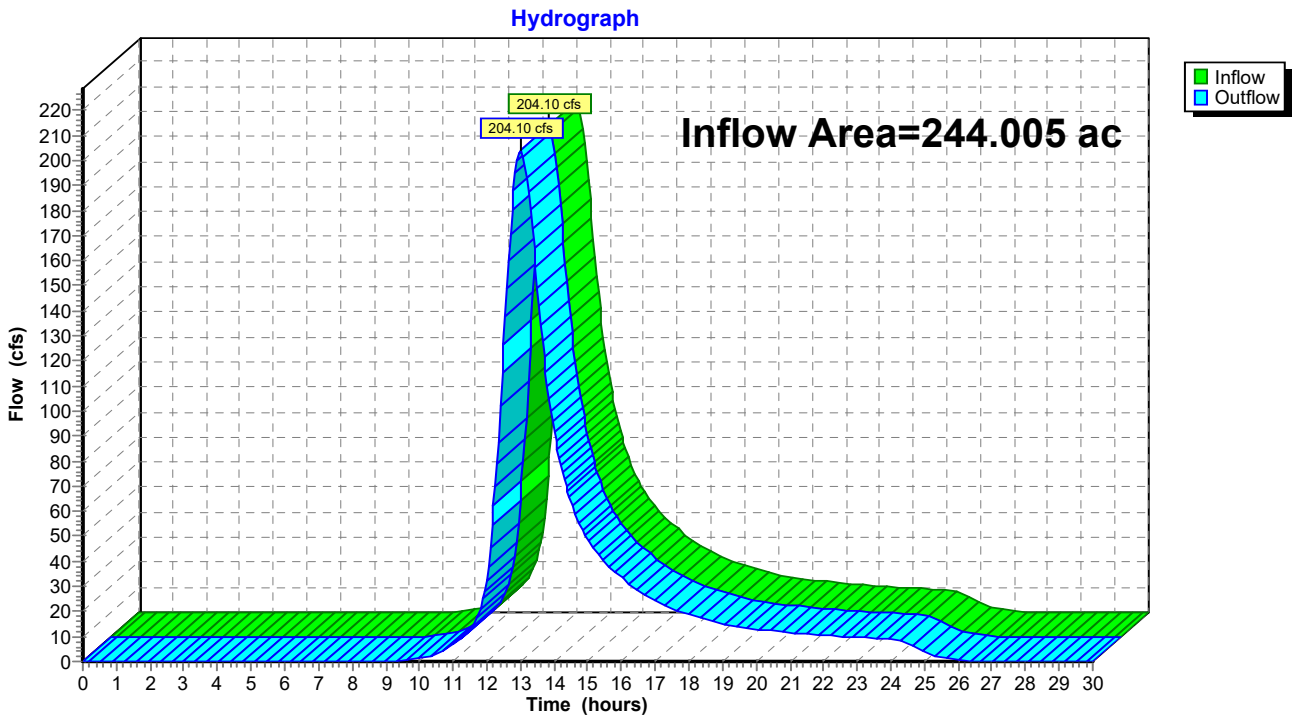


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 2.16" for 10-yr event
Inflow = 204.10 cfs @ 13.03 hrs, Volume= 43.900 af
Outflow = 204.10 cfs @ 13.03 hrs, Volume= 43.900 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

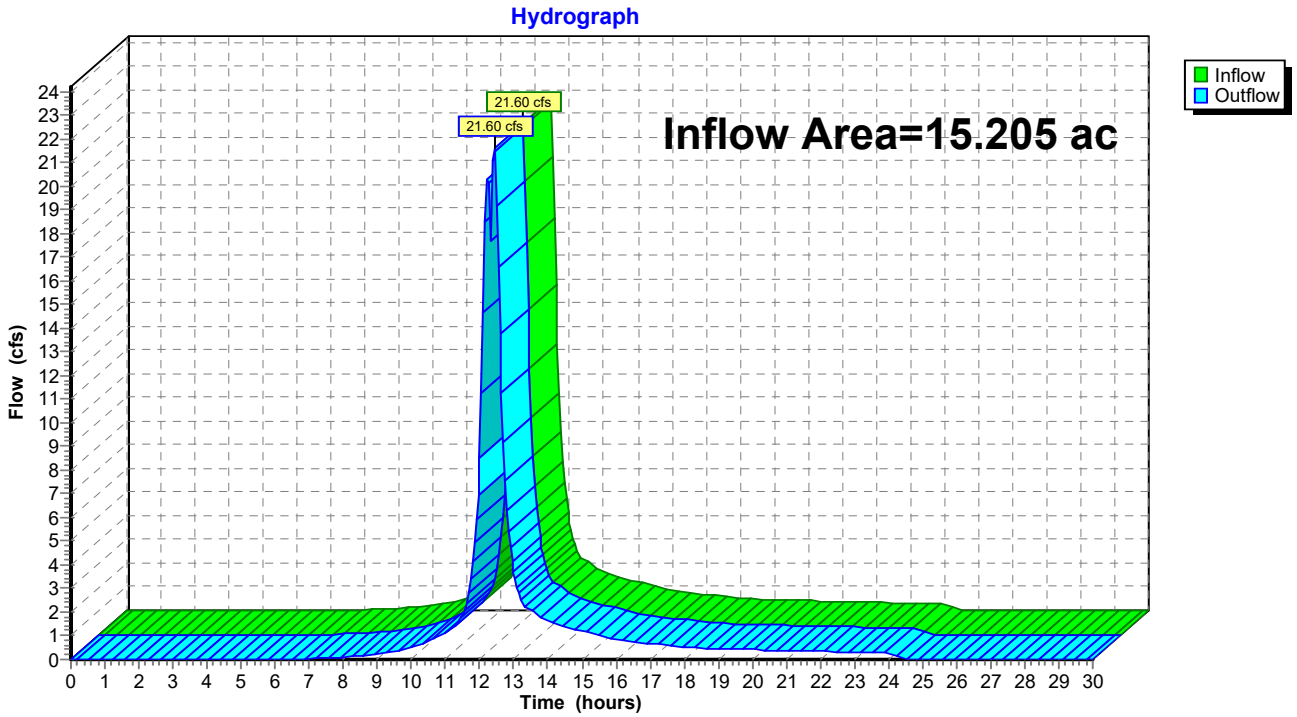


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 1.69" for 10-yr event
Inflow = 21.60 cfs @ 12.43 hrs, Volume= 2.143 af
Outflow = 21.60 cfs @ 12.43 hrs, Volume= 2.143 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 4P: Dam Decom

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 2.16" for 10-yr event
Inflow = 204.10 cfs @ 13.03 hrs, Volume= 43.900 af
Outflow = 204.07 cfs @ 13.03 hrs, Volume= 43.796 af, Atten= 0%, Lag= 0.3 min
Primary = 204.07 cfs @ 13.03 hrs, Volume= 43.796 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 636.20' @ 13.03 hrs Storage= 11,285 cf

Plug-Flow detention time= 3.2 min calculated for 43.723 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (900.0 - 898.2)

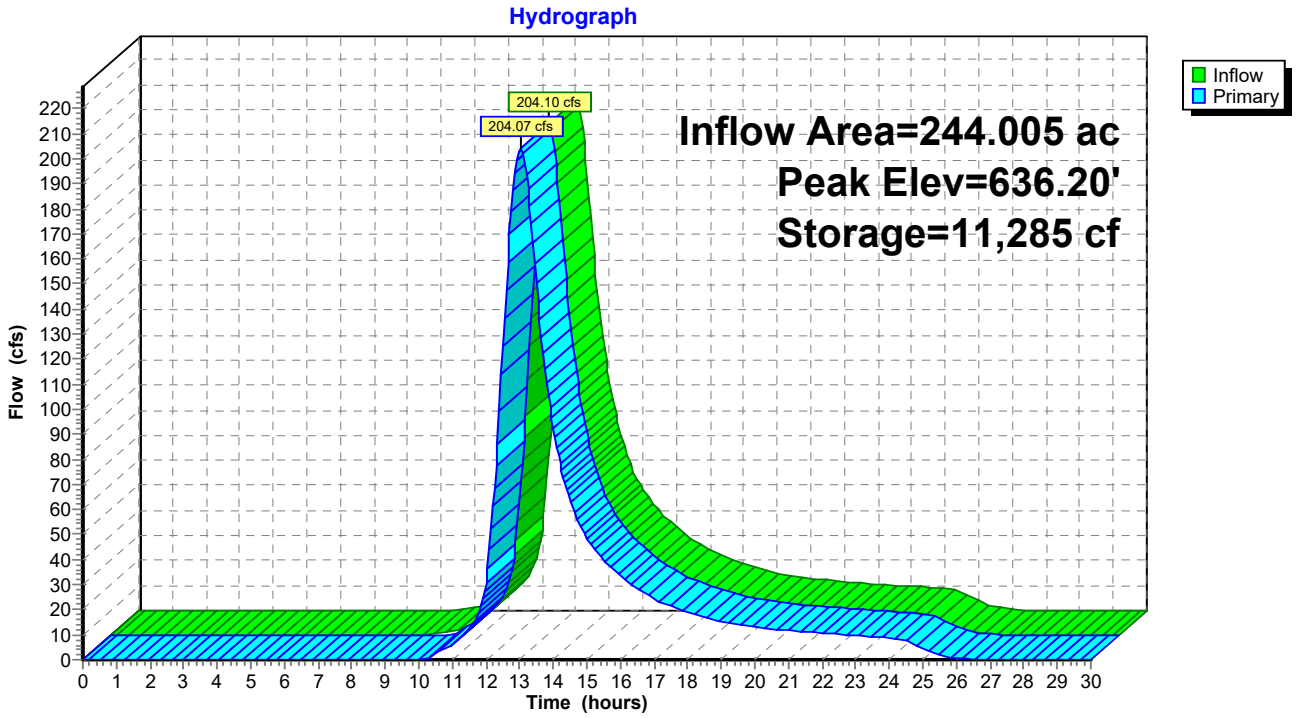
Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Primary	632.50'	**60.0" Round Culvert X 2.00** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.50' / 627.60' S= 0.0490 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 19.63 sf
#3	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=203.79 cfs @ 13.03 hrs HW=636.20' (Free Discharge)
- **1=Culvert** (Passes 0.00 cfs of 122.73 cfs potential flow)
  - **3=top of str** (Controls 0.00 cfs)
- **2=Culvert** (Inlet Controls 203.79 cfs @ 6.55 fps)

Pond 4P: Dam Decom



Summary for Subcatchment 4S: remaining exisitng watershed to dam

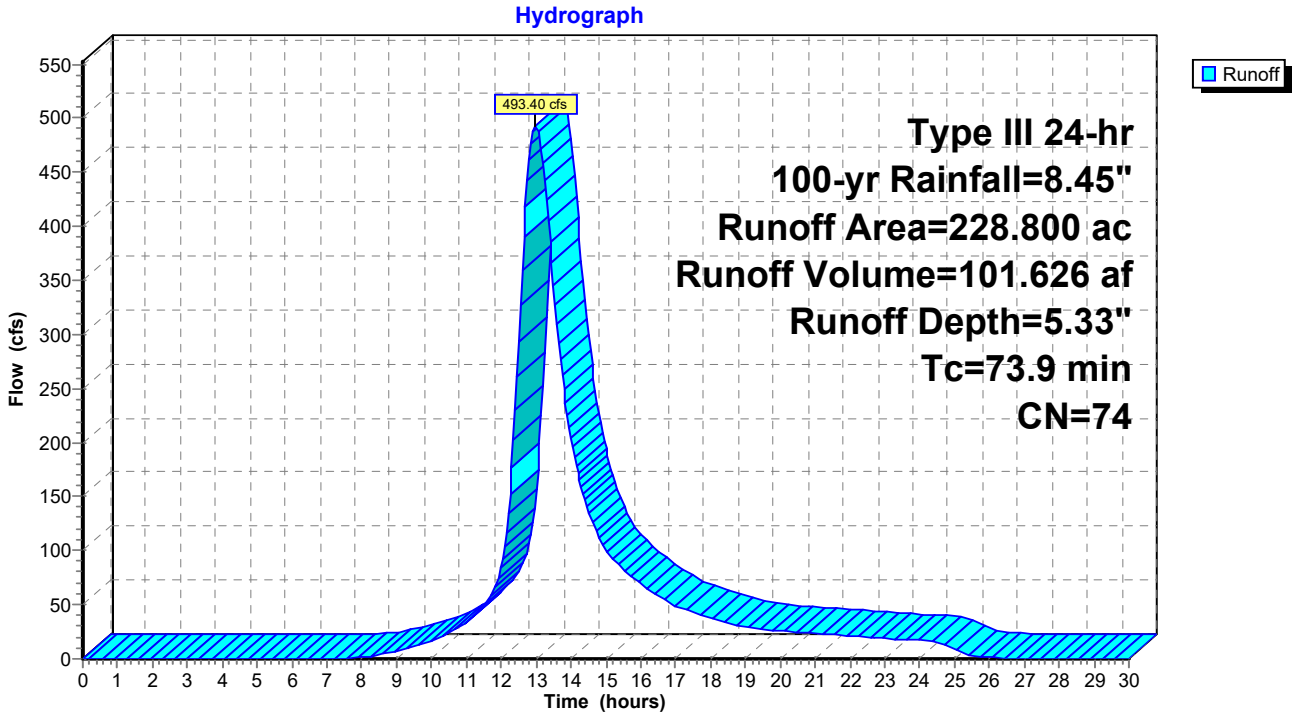
Runoff = 493.40 cfs @ 12.99 hrs, Volume= 101.626 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-yr Rainfall=8.45"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

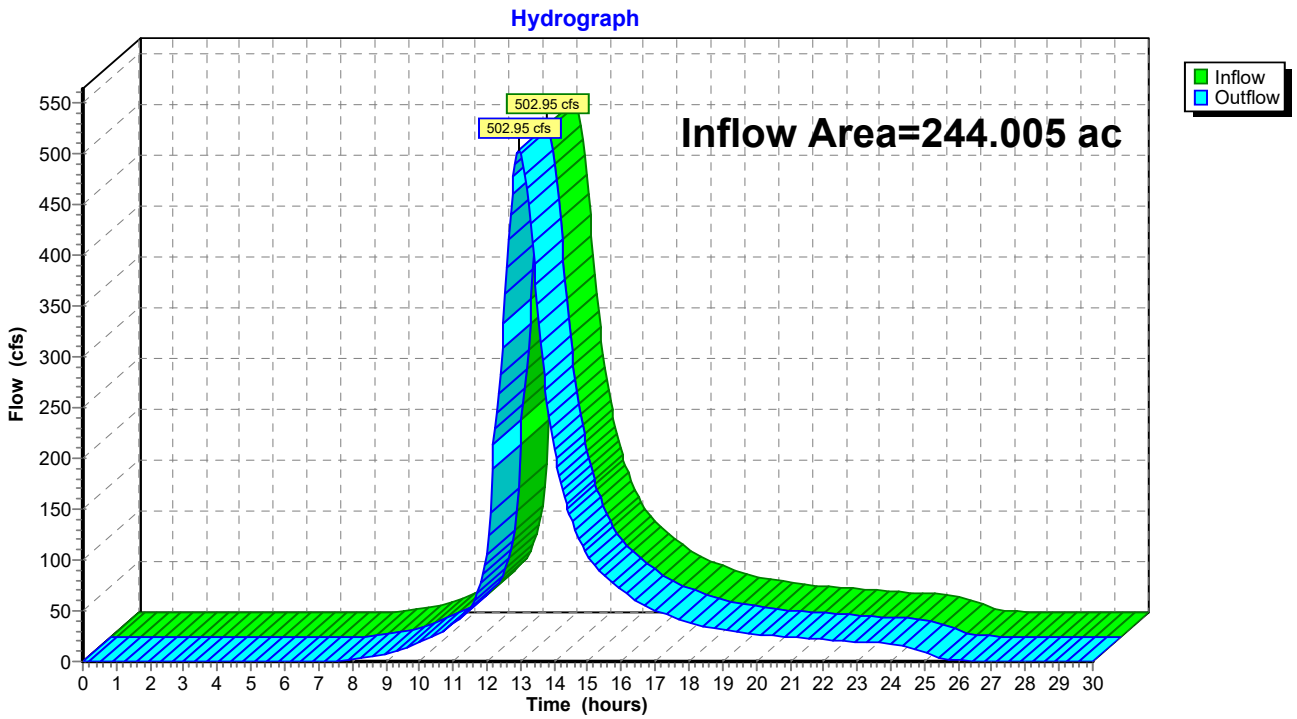


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 5.27" for 100-yr event
Inflow = 502.95 cfs @ 12.98 hrs, Volume= 107.178 af
Outflow = 502.95 cfs @ 12.98 hrs, Volume= 107.178 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

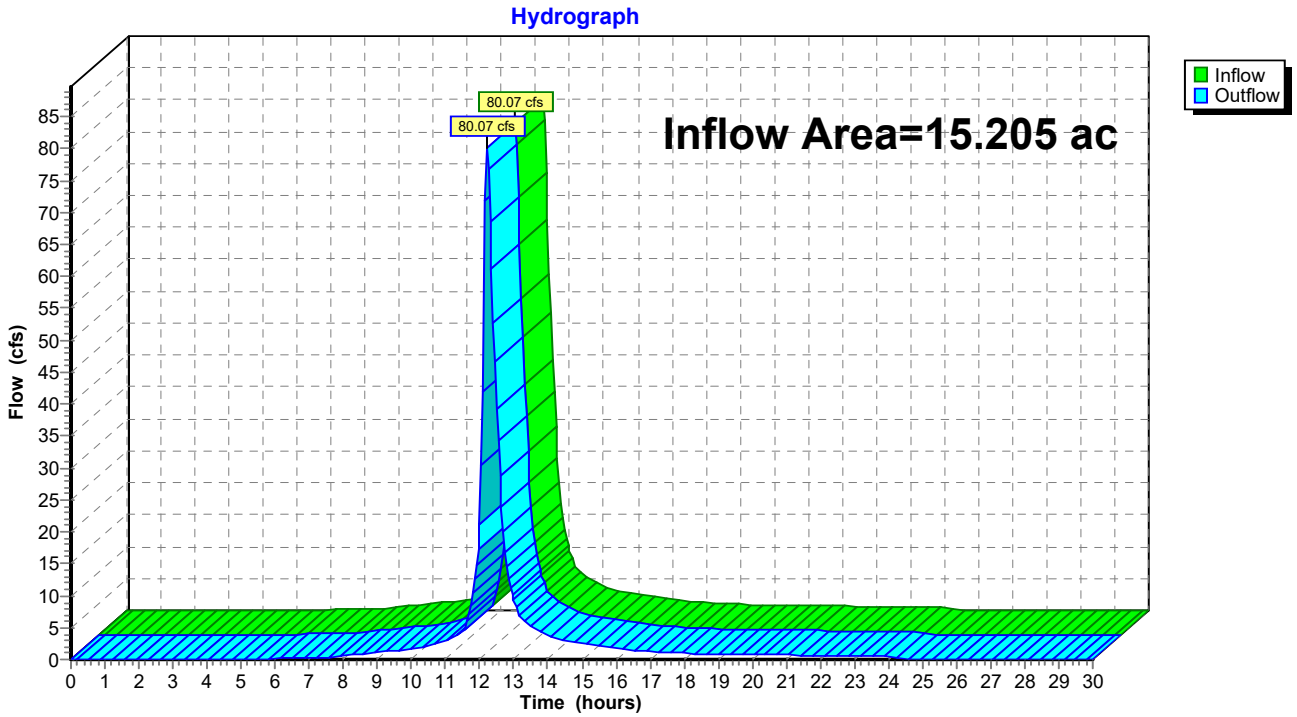


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 4.38" for 100-yr event
Inflow = 80.07 cfs @ 12.21 hrs, Volume= 5.552 af
Outflow = 80.07 cfs @ 12.21 hrs, Volume= 5.552 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 4P: Dam Decom

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 5.27" for 100-yr event
Inflow = 502.95 cfs @ 12.98 hrs, Volume= 107.178 af
Outflow = 501.38 cfs @ 13.03 hrs, Volume= 107.073 af, Atten= 0%, Lag= 3.3 min
Primary = 501.38 cfs @ 13.03 hrs, Volume= 107.073 af

Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 641.10' @ 13.03 hrs Storage= 40,515 cf

Plug-Flow detention time= 2.1 min calculated for 107.073 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (873.6 - 872.3)

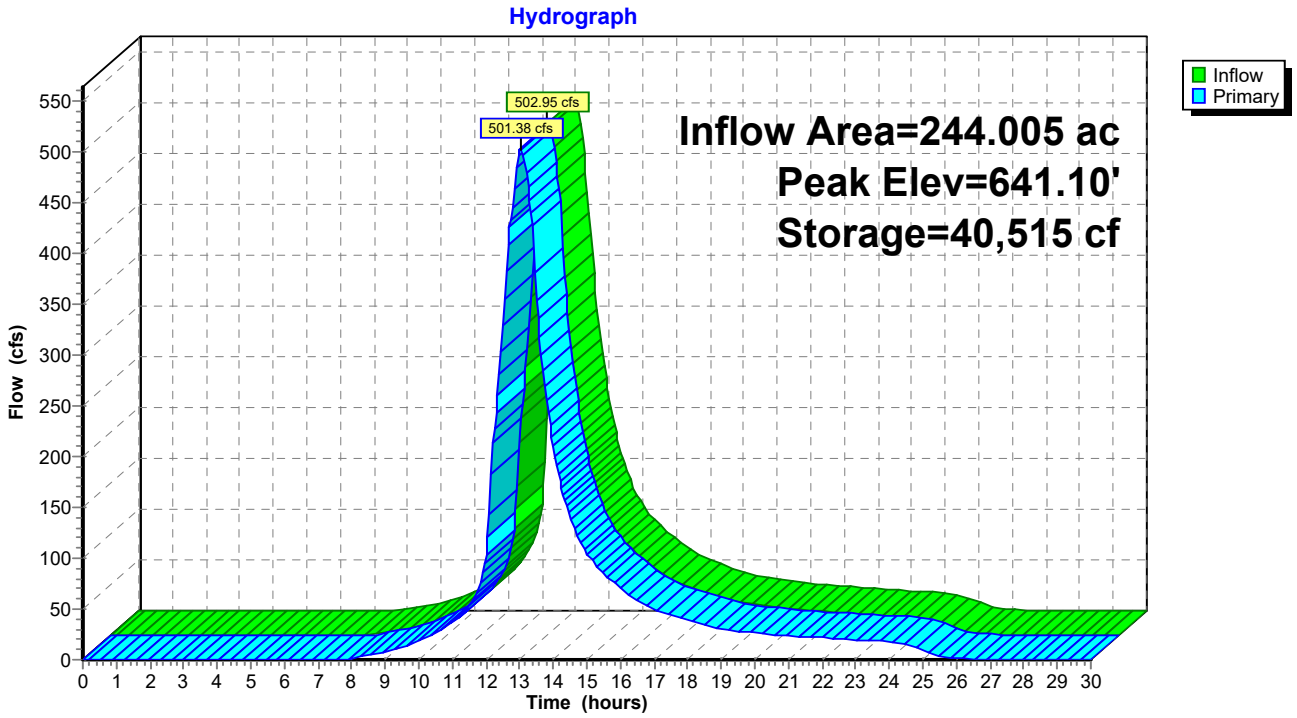
Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Primary	632.50'	**60.0" Round Culvert X 2.00** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.50' / 627.60' S= 0.0490 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 19.63 sf
#3	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=499.99 cfs @ 13.03 hrs HW=641.10' (Free Discharge)
- **1=Culvert** (Passes 32.97 cfs of 242.89 cfs potential flow)
  - **3=top of str** (Weir Controls 32.97 cfs @ 2.39 fps)
- **2=Culvert** (Inlet Controls 467.02 cfs @ 11.89 fps)

Pond 4P: Dam Decom



Summary for Subcatchment 4S: remaining exisitng watershed to dam

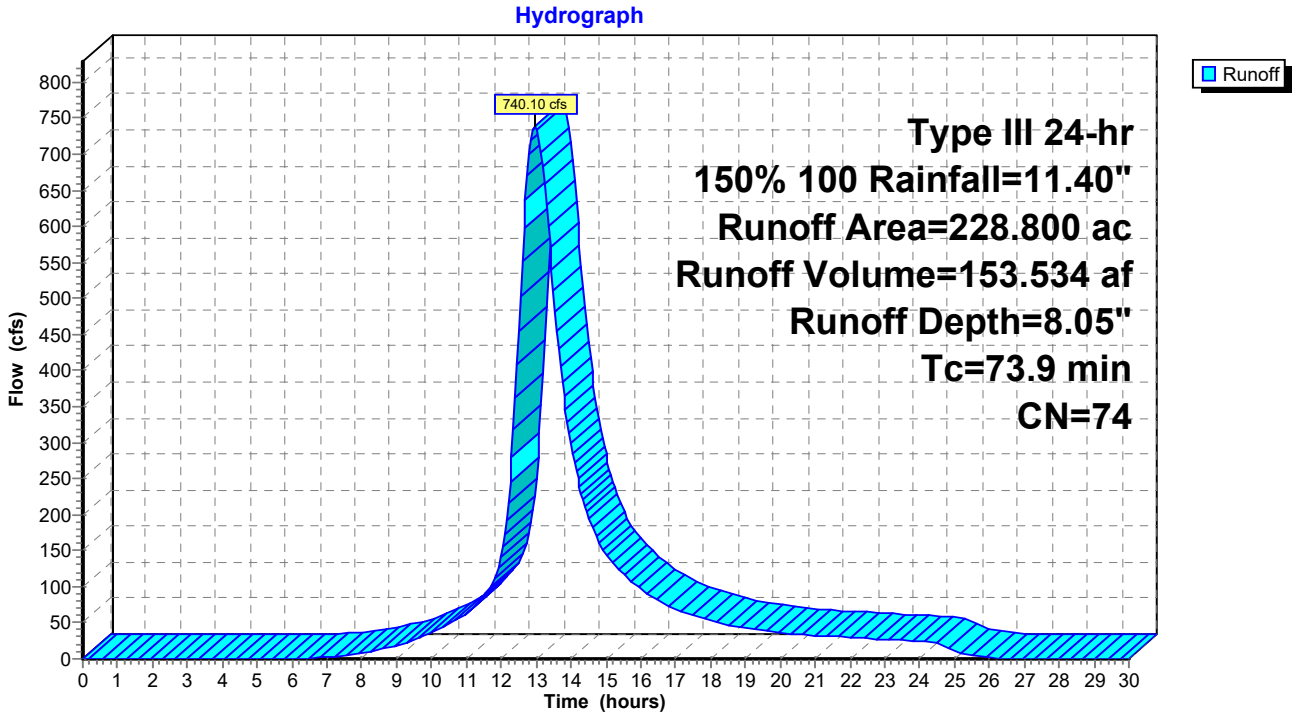
Runoff = 740.10 cfs @ 12.97 hrs, Volume= 153.534 af, Depth= 8.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 150% 100 Rainfall=11.40"

	Area (ac)	CN	Description
*	228.800	74	
	228.800		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
73.9					**Direct Entry, 73.9**

Subcatchment 4S: remaining exisitng watershed to dam

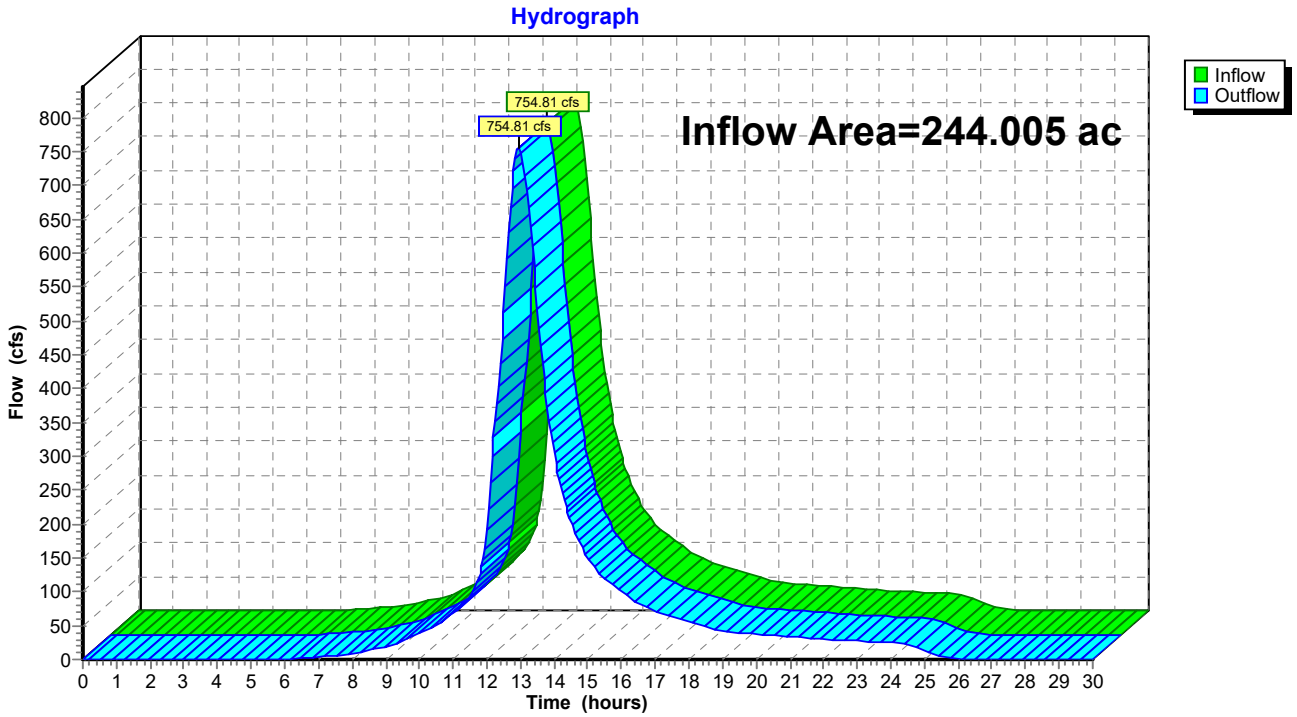


Summary for Reach 3R: Proposed Split

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 7.97" for 150% 100 event
Inflow = 754.81 cfs @ 12.96 hrs, Volume= 162.109 af
Outflow = 754.81 cfs @ 12.96 hrs, Volume= 162.109 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 3R: Proposed Split

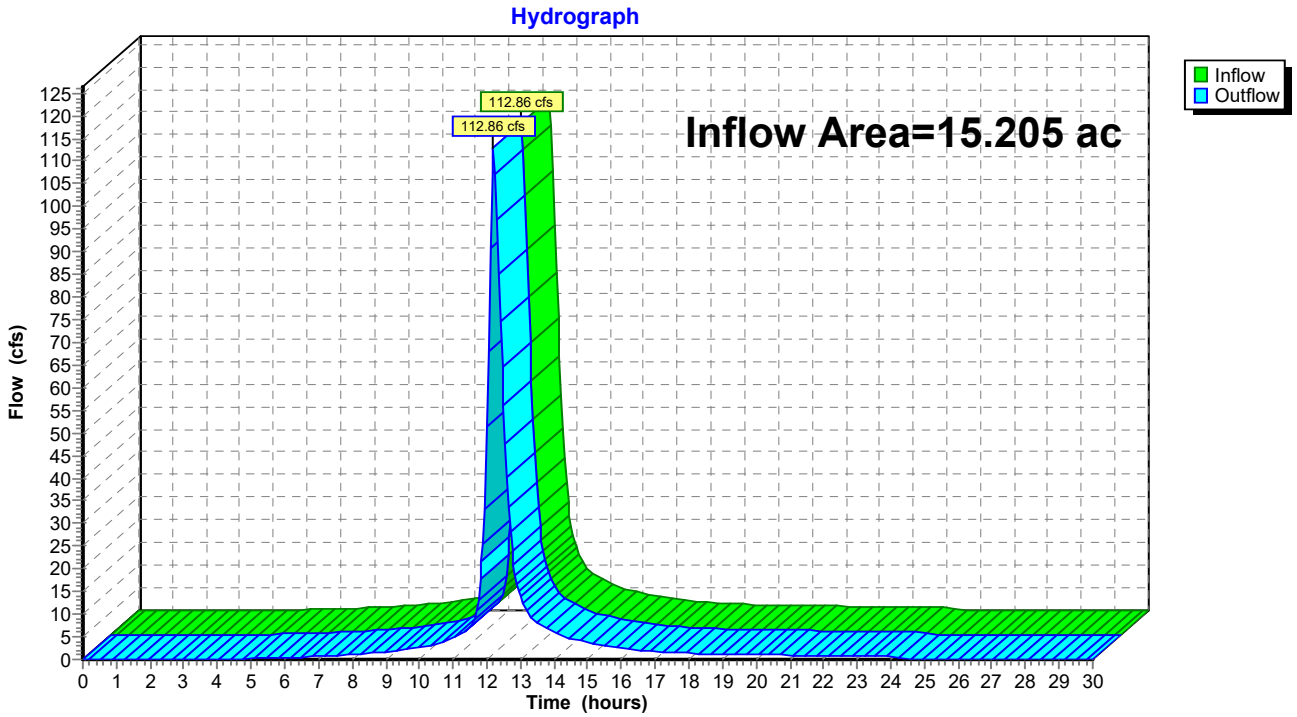


Summary for Reach 6R: DP1 2020

Inflow Area = 15.205 ac, 39.30% Impervious, Inflow Depth = 6.77" for 150% 100 event
Inflow = 112.86 cfs @ 12.20 hrs, Volume= 8.575 af
Outflow = 112.86 cfs @ 12.20 hrs, Volume= 8.575 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs

Reach 6R: DP1 2020



Summary for Pond 4P: Dam Decom

Inflow Area = 244.005 ac, 2.45% Impervious, Inflow Depth = 7.97" for 150% 100 event
Inflow = 754.81 cfs @ 12.96 hrs, Volume= 162.109 af
Outflow = 753.75 cfs @ 12.99 hrs, Volume= 162.004 af, Atten= 0%, Lag= 2.2 min
Primary = 753.75 cfs @ 12.99 hrs, Volume= 162.004 af

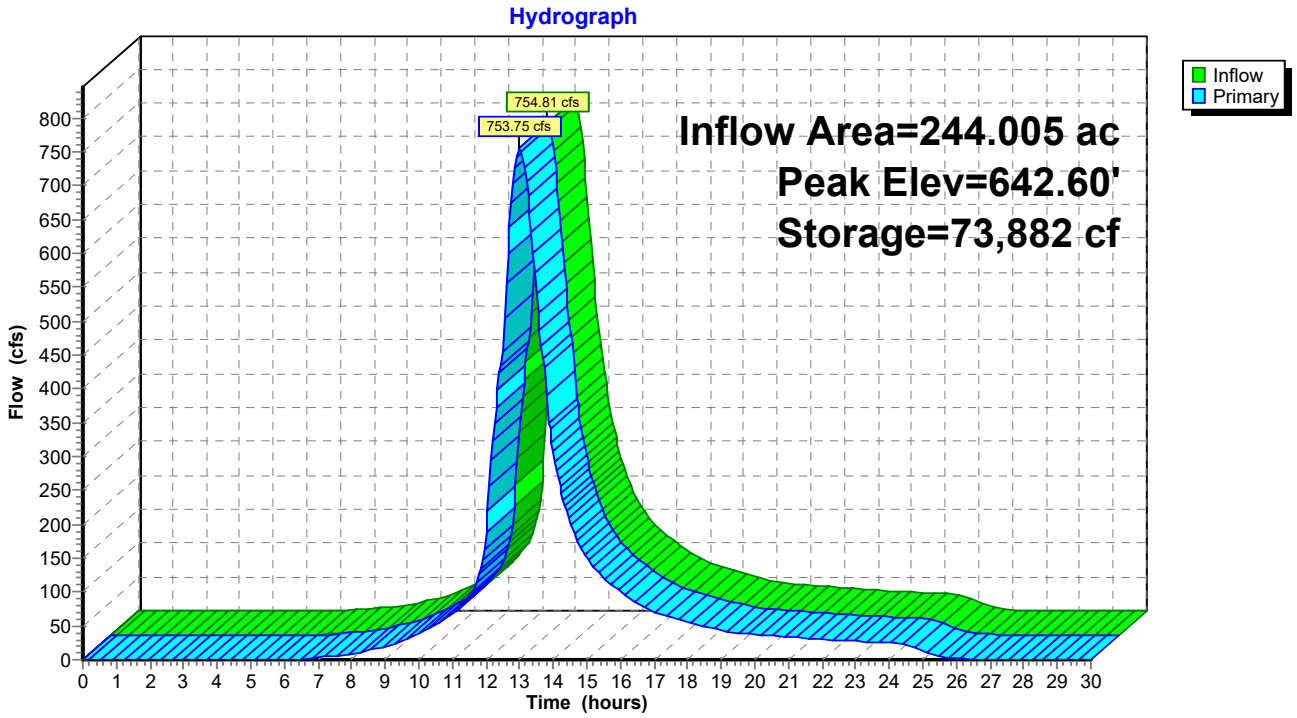
Routing by Stor-Ind method, Time Span= 0.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 642.60' @ 12.99 hrs Storage= 73,882 cf

Plug-Flow detention time= 2.0 min calculated for 162.004 af (100% of inflow)
Center-of-Mass det. time= 1.4 min (862.0 - 860.6)

Volume	Invert	Avail.Storage	Storage Description
#1	630.00'	344,271 cf	**Custom Stage Data** Listed below

Elevation (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
630.00	0	0
640.00	18,200	18,200
641.00	20,038	38,238
642.00	21,780	60,018
643.00	23,087	83,105
644.00	25,700	108,805
645.00	28,750	137,555
646.00	33,106	170,661
647.00	33,155	203,816
648.00	39,460	243,276
649.00	44,867	288,143
652.50	56,128	344,271

Device	Routing	Invert	Outlet Devices
#1	Primary	632.00'	**60.0" Round Culvert** L= 100.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.00' / 627.60' S= 0.0440 '/' Cc= 0.900 n= 0.025, Flow Area= 19.63 sf
#2	Primary	632.50'	**60.0" Round Culvert X 2.00** L= 100.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 632.50' / 627.60' S= 0.0490 '/' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 19.63 sf
#3	Device 1	640.50'	**23.0' long x 0.5' breadth top of str** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=753.53 cfs @ 12.99 hrs HW=642.60' (Free Discharge)
- **1=Culvert** (Passes 232.28 cfs of 269.06 cfs potential flow)
  - **3=top of str** (Weir Controls 232.28 cfs @ 4.81 fps)
- **2=Culvert** (Inlet Controls 521.25 cfs @ 13.27 fps)

Pond 4P: Dam Decom