BERTIN ENGINEERING

STORMWATER DRAINAGE ANALYSIS

RESIDENTIAL DEVELOPMENT
BLOCK 4201.01, LOT 33.03
GROVERS MILL ROAD & MALL ACCESS ROAD
TOWNSHIP OF LAWRENCE, MERCER COUNTY, NEW JERSEY
BE# 21-210

DATE PREPARED:	**OCTOBER 12, 2023**
DATE REVISED:	**JUNE 13, 2024**
DATE REVISED:	**APRIL 16, 2025**

CALISTO J. BERTIN, P.E.
N.J.P.E. LICENSE NO. 28845

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STORMWATER DRAINAGE ANALYSIS

TOWNHOUSE DEVELOPMENT
BLOCK 4201.01, LOT 33.03
GROVERS MILL ROAD & MALL ACCESS ROAD
TOWNSHIP OF LAWRENCE, MERCER COUNTY, NEW JERSEY
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I. PROJECT SUMMARY

The proposed project consists of developing a vacant lot into a proposed residential development with 5 multifamily buildings. The entire site has an area of 6.86 acres. The existing site is mostly wooded. The proposed development will add 2.707 acres of impervious and contain 1.340 acres of new roof area.

For the stormwater drainage analysis, the portion of the site being disturbed will be considered the area of study. The area of study drains into the existing stormwater drainage system located in Grovers Mill Road. The total size of the studied drainage area is 5.229 acres.

Due to the increase in impervious surface, small-scale infiltration basins will be required to reduce the proposed runoff to meet the required rate reductions. The outlet of the drainage system will tie directly into the existing stormwater system in Grovers Mill Road. To address water quality, runoff from the proposed parking areas and driveways be treated by a sand filter located in each aboveground infiltration basin.

Below is a summary of the stormwater analysis results for Current Precipitation:

Frequency (year)	Existing (cfs)	Proposed (cfs)	Change (cfs)	% Exist.	Max. Allowable %
2	1.79	0.87	0.92	48.7%	50%
10	6.76	2.70	4.06	39.9%	75%
100	19.88	15.49	4.39	77.9%	80%

Below is a summary of the stormwater analysis results for Future Precipitation:

Frequency (year)	Existing (cfs)	Proposed (cfs)	Change (cfs)	% Exist.	Max. Allowable %
2	3.02	1.14	1.88	37.7%	50%
10	9.27	5.20	4.07	56.1%	75%
100	31.01	24.32	6.69	78.4%	80%

As per the above table, runoff directed towards the Grovers Mill Road stormwater system will be reduced to levels below the existing with the required reductions for all design storms.

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II. STORMWATER DRAINAGE CALCULATIONS

1. DESIGN CRITERIA

All hydrographs and peak flow rates were calculated utilizing the Technical Release 55 (TR-55) method.

Rainfall distribution = C

County precipitation depths (P) for the 2, 10 & 100 year storm events have been adjusted for current and future conidtions based on N.J.A.C. 7:8-5.7(c) & (d).

2. EXISING RUNOFF

I) Area of Concern:

Drainage Area	Total (acres)	Woods (acres)	
		HSG B	HSG C
Existing	5.229	2.998	2.231

The existing drainage area is located in multiple soil types (see Soil Boundary Map).

CN Values (Hydrologic Group A), Woods (B) = 55 (Good Condition)
Woods (C) = 70 (Good Condition)

II) Peak Discharge (as determined by TR-55):

Existing Drainage Area						
			Current		Future	
Frequency (year)	Curve Number	T_c (min)	Rainfall, P (in)	Peak Discharge (cfs)	Rainfall, P (in)	Peak Discharge (cfs)
2	61	16.4	3.34	1.79	3.84	3.02
10			5.11	6.76	5.86	9.27
100			8.66	19.88	11.33	31.01

3. PROPOSED RUNOFF

The proposed pavement area and roof runoff will be directed into three small-scale infiltration (Prop - Basin 1, Prop - Basin 2 & Prop - Basin 3). The discharge from Basins 1 & 2 will be directed into Basin 3. The outflow from Basin 3 will flow into the existing drainage system on Grovers Mill Road. The remaining portion of the proposed drainage area (Prop - Bypass) will flow towards the wetlands to the southeast and eventually enter the Grovers Mill Road drainage system.

Drainage Area	Total (acres)	Pervious (acres)		Impervious (acres)
		HSG B	HSG C	
Prop - Basin 1	0.809	0.196	0.155	0.458
Prop - Basin 2	0.925	0.535	0.000	0.390
Prop - Basin 3	3.027	0.456	0.706	1.865
Prop - Bypass	0.468	0.214	0.210	0.044

CN Values: Pervious (B) = 79 (Poor Condition)
Pervious (C) = 86 (Poor Condition)
Impervious = 98

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4. PROPOSED RUNOFF - BASIN 1

I) Peak Discharge: Proposed Drainage Area - Basin 1 (as determined by TR-55):

Proposed Drainage Area - Basin 1 (Pervious)						
			Current		Future	
Frequency (year)	Curve Number	T_c (min)	Rainfall, P (in)	Peak Discharge (cfs)	Rainfall, P (in)	Peak Discharge (cfs)
2	82	9.2	3.34	0.68	3.84	0.85
10			5.11	1.29	5.86	1.56
100			8.66	2.55	11.33	3.49

Proposed Drainage Area - Basin 1 (Impervious)						
			Current		Future	
Frequency (year)	Curve Number	T_c (min)	Rainfall, P (in)	Peak Discharge (cfs)	Rainfall, P (in)	Peak Discharge (cfs)
2	98	1.6	3.34	1.67	3.84	1.93
10			5.11	2.57	5.86	2.95
100			8.66	4.37	11.33	5.72

CURRENT: Proposed Drainage Area - Basin 1 (Combined)						
Storm (year)	Pervious		Impervious		Combined	
	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)
2	0.68	12.15	1.67	12.10	2.27	12.10
10	1.29	12.15	2.57	12.10	3.73	12.10
100	2.55	12.15	4.37	12.10	6.70	12.10

FUTURE: Proposed Drainage Area - Basin 1 (Combined)						
Storm (year)	Pervious		Impervious		Combined	
	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)
2	0.85	12.15	1.93	12.10	2.68	12.10
10	1.56	12.15	2.95	12.10	4.36	12.10
100	3.49	12.13	5.72	12.10	8.93	12.10

II) Detention Structure Summary - Basin 1:

Outlet Control: 80 LF of 15" HDPE @ 2.8%, Inv 74.00
4" Orifice at Elevation 76.00
(2) 3' Rect. Weirs at Elevation 76.50
4'x4' Overflow Riser at Elevation 77.00

Depth vs. Storage			
Elevation (ft)	Discharge (cfs)	Storage (cf)	
75.50	0.00	0	
76.00	0.00	2,876	<-Elevation of Lowest Orifice = 76.00
77.00	7.17	8,723	
77.50	9.97	11,695	

CURRENT: Inflow vs. Outflow					
Storm (year)	Inflow		Outflow		
	Peak Flow (cfs)	Time (hr)	Peak Flow (cfs)	Time (hr)	Peak Elev. (ft)
2	2.27	12.10	0.15	13.40	76.29
10	3.73	12.10	0.90	12.37	76.60
100	6.70	12.10	4.93	12.13	76.88

FUTURE: Inflow vs. Outflow					
Storm (year)	Inflow		Outflow		
	Peak Flow (cfs)	Time (hr)	Peak Flow (cfs)	Time (hr)	Peak Elev. (ft)
2	2.68	12.10	0.21	13.20	76.41
10	4.36	12.10	1.77	12.25	76.68
100	8.93	12.10	7.04	12.13	76.99

III) Emergency Spillway Design:

Basin 1 contains an emergency spillway designed for the unrouted 100 Year Storm flow.

Use $Q = 3.2 \times L \times H^{1.5}$ to solve for L (weir Length) with H = 0.5 ft Q_{100} = 8.93 cfs

8.93 cfs = 3.2 x L x 0.5^1.5 L = 7.9 ft Use 8 ft

Check Allowable Discharge Velocity: V = 2.4 ft/s (Allowable Discharge Velocity)

V = Q / A = 8.93 cfs / (8 ft x 0.5 ft) = 2.23 ft/s < 2.4 ft/s **OK**

The elevation of the emergency spillway is 77.00 with a peak emergency 100-year water elevation of 77.50.

5. PROPOSED RUNOFF - BASIN 2

I) Peak Discharge: Proposed Drainage Area - Basin 2 (as determined by TR-55):

Proposed Drainage Area - Basin 2 (Pervious)						
Frequency (year)	Curve Number	T_c (min)	Current		Future	
			Rainfall, P (in)	Peak Discharge (cfs)	Rainfall, P (in)	Peak Discharge (cfs)
2	79	14.1	3.34	0.77	3.84	0.98
10			5.11	1.55	5.86	1.90
100			8.66	3.21	11.33	4.46

Proposed Drainage Area - Basin 2 (Impervious)						
Frequency (year)	Curve Number	T_c (min)	Current		Future	
			Rainfall, P (in)	Peak Discharge (cfs)	Rainfall, P (in)	Peak Discharge (cfs)
2	98	13.7	3.34	1.07	3.84	1.23
10			5.11	1.65	5.86	1.89
100			8.66	2.80	11.33	3.67

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CURRENT: Proposed Drainage Area - Basin 2 (Combined)						
Storm (year)	Pervious		Impervious		Combined	
	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)
2	0.77	12.20	1.07	12.18	1.84	12.20
10	1.55	12.20	1.65	12.18	3.20	12.20
100	3.21	12.20	2.80	12.18	6.00	12.20

FUTURE: Proposed Drainage Area - Basin 2 (Combined)						
Storm (year)	Pervious		Impervious		Combined	
	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)
2	0.98	12.20	1.23	12.18	2.21	12.20
10	1.90	12.20	1.89	12.18	3.78	12.20
100	4.46	12.20	3.67	12.18	8.12	12.20

II) Detention Structure Summary - Basin 2:

Outlet Control: 11 LF of 15" HDPE @ 2.0%, Inv 71.50
4"x10" Orifice at Elevation 73.33
3' Rect. Weir at Elevation 74.00
4'x4' Overflow Riser at Elevation 74.50

Depth vs. Storage		
Elevation (ft)	Discharge (cfs)	Storage (cf)
73.00	0.00	0
74.00	0.95	7,650
74.50	4.73	12,194

<-Elevation of Lowest Orifice = 73.33

CURRENT: Inflow vs. Outflow					
Storm (year)	Inflow		Outflow		
	Peak Flow (cfs)	Time (hr)	Peak Flow (cfs)	Time (hr)	Peak Elev. (ft)
2	1.84	12.20	0.28	12.90	73.54
10	3.20	12.20	0.79	12.62	73.84
100	6.00	12.20	2.70	12.42	74.29

FUTURE: Inflow vs. Outflow					
Storm (year)	Inflow		Outflow		
	Peak Flow (cfs)	Time (hr)	Peak Flow (cfs)	Time (hr)	Peak Elev. (ft)
2	2.21	12.20	0.44	12.72	73.62
10	3.78	12.20	0.93	12.62	73.98
100	8.12	12.20	4.68	12.37	74.50

III) Emergency Spillway Design:

Basin 2 contains an emergency spillway designed for the unrouted 100 Year Storm flow.

Use $Q = 3.2 \times L \times H^{1.5}$ to solve for L (weir Length) with H = 0.5 ft Q_{100} = 8.12 cfs

8.12 cfs = 3.2 x L x 0.5^1.5 L = 7.2 ft Use 8 ft

Check Allowable Discharge Velocity: V = 2.4 ft/s (Allowable Discharge Velocity)

V = Q / A = 8.12 cfs / (8 ft x 0.5 ft) = 2.03 ft/s < 2.4 ft/s **OK**

The elevation of the emergency spillway is 74.50 with a peak emergency 100-year water elevation of 75.00.

6. PROPOSED RUNOFF - BASIN 3

I) Peak Discharge: Proposed Drainage Area - Basin 3 (as determined by TR-55):

Proposed Drainage Area - Basin 3 (Pervious)						
			Current		Future	
Frequency (year)	Curve Number	T_c (min)	Rainfall, P (in)	Peak Discharge (cfs)	Rainfall, P (in)	Peak Discharge (cfs)
2	83	19.0	3.34	1.77	3.84	2.21
10			5.11	3.34	5.86	4.02
100			8.66	6.55	11.33	8.95

Proposed Drainage Area - Basin 3 (Impervious)						
			Current		Future	
Frequency (year)	Curve Number	T_c (min)	Rainfall, P (in)	Peak Discharge (cfs)	Rainfall, P (in)	Peak Discharge (cfs)
2	98	3.9	3.34	7.10	3.84	8.19
10			5.11	10.93	5.86	12.55
100			8.66	18.59	11.33	24.34

CURRENT: Proposed Drainage Area - Basin 3 (Combined)										
Storm (year)	Pervious		Impervious		Basin 1 Outflow		Basin 2 Outflow		Combined	
	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)
2	1.77	12.25	7.10	12.10	0.15	13.40	0.28	12.90	8.27	12.10
10	3.34	12.25	10.93	12.10	0.90	12.37	0.79	12.62	13.67	12.10
100	6.55	12.25	18.59	12.10	4.93	12.13	2.70	12.42	28.58	12.12

FUTURE: Proposed Drainage Area - Basin 3 (Combined)										
Storm (year)	Pervious		Impervious		Basin 1 Outflow		Basin 2 Outflow		Combined	
	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)
2	2.21	12.25	8.19	12.10	0.21	13.20	0.44	12.72	9.73	12.10
10	4.02	12.25	12.55	12.10	1.77	12.25	0.93	12.62	16.38	12.12
100	8.95	12.25	24.34	12.10	7.04	12.13	4.68	12.37	38.98	12.12

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II) Detention Structure Summary - Basin 3:

Outlet Control: 37 LF of 24" RCP @ 3.0%, Inv 66.00
3" Orifice at Elevation 67.75
(3) 5"x32" Orifices at Elevation 69.00
3' Rect. Weir at Elevation 70.00
4'x4' Overflow Riser at Elevation 70.50

Depth vs. Storage		
Elevation (ft)	**Discharge (cfs)**	**Storage (cf)**
67.00	0.00	0
68.00	0.08	15,721
69.00	0.25	31,649
70.00	14.62	47,783
71.00	29.33	64,120

<-Elevation of Lowest Orifice = 67.75

CURRENT: Inflow vs. Outflow					
Storm (year)	**Inflow**		**Outflow**		
	Peak Flow (cfs)	**Time (hr)**	**Peak Flow (cfs)**	**Time (hr)**	**Peak Elev. (ft)**
2	8.27	12.10	0.22	20.90	68.74
10	13.67	12.10	2.51	13.07	69.19
100	28.58	12.12	13.80	12.38	69.91

FUTURE: Inflow vs. Outflow					
Storm (year)	**Inflow**		**Outflow**		
	Peak Flow (cfs)	**Time (hr)**	**Peak Flow (cfs)**	**Time (hr)**	**Peak Elev. (ft)**
2	9.73	12.10	0.46	16.78	69.02
10	16.38	12.12	4.75	12.60	69.30
100	38.98	12.12	21.73	12.35	70.49

III) Emergency Spillway Design:

Basin 3 contains an emergency spillway designed for the unrouted 100 Year Storm flow.

Use $Q = 3.2 \times L \times H^{1.5}$ to solve for L (weir Length) with H = 0.5 ft Q_{100} = 38.98 cfs
38.98 cfs = 3.2 x L x 0.5^1.5 L = 34.5 ft Use 35 ft

Check Allowable Discharge Velocity: V = 2.4 ft/s (Allowable Discharge Velocity)
V = Q / A = 38.98 cfs / (35 ft x 0.5 ft) = 2.23 ft/s < 2.4 ft/s **OK**

The elevation of the emergency spillway is 70.50 with a peak emergency 100-year water elevation of 71.00.

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7. PROPOSED RUNOFF - BYPASS

I) Peak Discharge: Proposed Drainage Area - Bypass (as determined by TR-55):

Proposed Drainage Area - Bypass (Pervious)						
			Current		Future	
Frequency (year)	Curve Number	T_c (min)	Rainfall, P (in)	Peak Discharge (cfs)	Rainfall, P (in)	Peak Discharge (cfs)
2	82	11.8	3.34	0.73	3.84	0.91
10			5.11	1.39	5.86	1.68
100			8.66	2.75	11.33	3.77

Proposed Drainage Area - Bypass (Impervious)						
			Current		Future	
Frequency (year)	Curve Number	T_c (min)	Rainfall, P (in)	Peak Discharge (cfs)	Rainfall, P (in)	Peak Discharge (cfs)
2	98	6.5	3.34	0.16	3.84	0.18
10			5.11	0.25	5.86	0.28
100			8.66	0.42	11.33	0.55

CURRENT: Proposed Drainage Area - Bypass (Combined)						
Storm (year)	Pervious		Impervious		Combined	
	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)
2	0.73	12.18	0.16	12.12	0.85	12.17
10	1.39	12.18	0.25	12.12	1.57	12.17
100	2.75	12.18	0.42	12.12	3.07	12.17

FUTURE: Proposed Drainage Area - Bypass (Combined)						
Storm (year)	Pervious		Impervious		Combined	
	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)
2	0.91	12.18	0.18	12.12	1.05	12.17
10	1.68	12.18	0.28	12.12	1.89	12.17
100	3.77	12.17	0.55	12.12	4.20	12.15

8. PROPOSED RUNOFF - COMBINED (TOTAL)

CURRENT: Proposed Drainage Area						
Storm (year)	Basin 3 Route		Bypass		Combined	
	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)
2	0.22	20.90	0.85	12.17	0.87	12.17
10	2.51	13.07	1.57	12.17	2.70	13.03
100	13.80	12.38	3.07	12.17	15.49	12.27

FUTURE: Proposed Drainage Area						
Storm (year)	Basin 3 Route		Bypass		Combined	
	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)	Peak (cfs)	Time (hr)
2	0.46	16.78	1.05	12.17	1.14	12.17
10	4.75	12.60	1.89	12.17	5.20	12.58
100	21.73	12.35	4.20	12.15	24.32	12.27

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9. EXISTING VS. PROPOSED RUNOFF

CURRENT: Proposed Drainage Area				
Frequency (year)	Existing (cfs)	Proposed (cfs)	Change (cfs)	% Exist.
2	1.79	0.87	0.92	48.7%
10	6.76	2.70	4.06	39.9%
100	19.88	15.49	4.39	77.9%

FUTURE: Proposed Drainage Area				
Frequency (year)	Existing (cfs)	Proposed (cfs)	Change (cfs)	% Exist.
2	3.02	1.14	1.88	37.7%
10	9.27	5.20	4.07	56.1%
100	31.01	24.32	6.69	78.4%

The calculations indicate that the proposed site redevelopment with infiltration decreases the surface runoff for the three deisgn storms. As per N.J.A.C. 7:8-5.6(b)3, the required rate reductions have been met for both the Current and Future percipitation depths.

10. WATER QUALITY DESIGN

The above ground detention basin is designed with a sand filter to treat the pavement area directed into the drainage system for the Stormwater Quality Design Storm. As per N.J.A.C. 7:8-5.6, the BMP flow rate is determined using NRCS methodology based on the following criteria:

T_d (Storm Duration) = 2 hours
I = 0.625 inches/hr for Stormwater Quality Design Storm (See Table 5-1)

I) Area of Analysis:

Treated drainage areas are equal to the infilltration basin areas.

Drainage Area	Total (acres)	Pervious (acres)		Impervious (acres)
		HSG B	HSG C	
Prop - Treated 1	0.809	0.196	0.155	0.458
Prop - Treated 2	0.925	0.535	0.000	0.390
Prop - Treated 3	3.027	0.456	0.706	1.865

II) Treated Area 1 (Prop - Basin 1) Routed Through Basin 1:

Proposed Drainage Area - Treated 1							
		Pervious		Impervious		Combined	
Frequency (year)	Rainfall, P (in)	Peak (cfs)	Volume (cf)	Peak (cfs)	Volume (cf)	Peak (cfs)	Volume (cf)
WQ	1.25	0.20	278	1.32	1,613	1.43	1,891

Inflow vs. Outflow					
Storm (year)	Inflow		Outflow		
	Peak Flow (cfs)	Time (hr)	Peak Flow (cfs)	Time (hr)	Peak Elev. (ft)
WQ	1.43	1.08	0.00	n/a	75.83

Entire Water Quality Storm Volume is contained within the basin below the lowest orifice.

III) Treated Area 2 (Prop - Basin 2) Routed Through Basin 2:

Proposed Drainage Area - Treated 2							
		Pervious		Impervious		Combined	
Frequency (year)	Rainfall, P (in)	Peak (cfs)	Volume (cf)	Peak (cfs)	Volume (cf)	Peak (cfs)	Volume (cf)
WQ	1.25	0.16	297	0.91	1,465	1.04	1,761

Inflow vs. Outflow					
Storm (year)	Inflow		Outflow		
	Peak Flow (cfs)	Time (hr)	Peak Flow (cfs)	Time (hr)	Peak Elev. (ft)
WQ	1.04	1.18	0.00	n/a	73.23

Entire Water Quality Storm Volume is contained within the basin below the lowest orifice.

IV) Treated Area 3 (Prop - Basin 3) Routed Through Basin 3:

Proposed Drainage Area - Treated 3									
		Pervious		Impervious		Basins 1 & 2		Combined	
Frequency (year)	Rainfall, P (in)	Peak (cfs)	Volume (cf)	Peak (cfs)	Volume (cf)	Peak (cfs)	Volume (cf)	Peak (cfs)	Volume (cf)
WQ	1.25	0.51	1,031	5.69	7,004	0.00	0	5.81	8,035

Inflow vs. Outflow					
Storm (year)	Inflow		Outflow		
	Peak Flow (cfs)	Time (hr)	Peak Flow (cfs)	Time (hr)	Peak Elev. (ft)
WQ	5.81	1.08	0.00	n/a	67.51

Entire Water Quality Storm Volume is contained within the basin below the lowest orifice.

11. STORMWATER RECHARGE REQUIREMENT

As per the NJDEP, the required amount of groundwater recharge is determined by the Annual Groundwater Recharge Analysis worksheet (see attached). According to page 1 of the worksheet, there is an annual recharge deficit for the post-development condition of 47,406 (Vdef) for the portion of the site to be disturbed (5.229 acres).
Basin 1 collects a large amount of the impervious area from the pavement. The amount of impervious area collected is 19,950 sf (Aimp) and provides the Annual BMP Recharge Volume (Vdef) at a calculated BMP effective depth (dBMP) of 5.0 inches. Since the provided BMP effective depth in the basin of 6 inches (below lowest orifice) is greater than the calculated depth, the stormwater recharge requirement is satisfied. This calculation omits the additional recharge provided by the other infiltration basins utilized on the property. See the attached Soil Maps for the locations of the referenced soil types.

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JOB	21-210: Residential Development - Lawrence, NJ		
SHEET NO.	10	OF	13
CALCULATED BY	MBL	DATE	4/16/2025
CHECKED BY	CJB	DATE	4/16/2025
SCALE			

12. STORM SEWER ANALYSIS TABLE

The following table lists the areas collected by the proposed storm sewer. See the attached Storm Sewer Design Calculations for pipe capacity calculations.

Use c = 0.99 for impervious areas
0.25 for pervious areas (HSG B)
0.51 for pervious areas (HSG C)

Inlet	Imperv. (Acres)	Perv. B (Acres)	Perv. C (Acres)	Total (Acres)	Weighted c
DI#1	0.095	0.020	0.003	0.118	0.85
DI#2	0.000	0.187	0.000	0.187	0.25
DI#3	0.192	0.015	0.000	0.207	0.94
DI#4	0.000	0.083	0.000	0.083	0.25
DI#5	0.109	0.037	0.000	0.146	0.80
DI#6	0.093	0.013	0.011	0.117	0.86
DI#7	0.450	0.061	0.029	0.540	0.88
DI#8	0.038	0.005	0.034	0.077	0.73
DI#9	0.356	0.000	0.046	0.402	0.94
DI#10	0.097	0.016	0.067	0.180	0.75
DI#11	0.082	0.000	0.006	0.088	0.96
TD#3	0.039	0.005	0.053	0.097	0.69
TD#2	0.059	0.001	0.011	0.071	0.91
DMH#2	0.028	0.053	0.022	0.103	0.51

13. PREFORMED SCOUR HOLE DESIGN

Scour holes are designed for the 25-year storm. A scour hole is proposed for each discharge point into the two above-ground basins.

Scour Hole #1:

Q_{25} = 1.27 cfs (See Storm Sewer Design Calculations)
D_o = 15 in
T_w = $0.2D_o$ = 0.25 ft

Length of Hole Bottom (L) = $3 \times D_o$ = **3.75 ft**
Width of Hole Bottom (W) = $2 \times W_o$ = **2.50 ft**
Median Stone Dia. (d_{50}) = $(0.0125 / 0.2D_o) \times (Q / W_o)^{4/3}$ = **0.05 ft (Use 6" = 0.5 ft)**

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Scour Hole #2:

A = 0.282 ac
c = 0.98 for impervious areas
I_{25} = 7.28 in/hr (T_c = 5 min.)

Q_{25} = 0.98 x 7.28 x 0.282 = **2.01 cfs**
D_o = 10 in
T_w = $0.2D_o$ = 0.17 ft

Length of Hole Bottom (L) = 3 x D_o = **2.50 ft**
Width of Hole Bottom (W) = 2 x W_o = **1.67 ft**
Median Stone Dia. (d_{50}) = (0.0125 / $0.2D_o$) x (Q / W_o)$^{4/3}$ = **0.09 ft (Use 4" = 0.33 ft)**

Scour Hole #3:

A = 0.299 ac
c = 0.98 for impervious areas
I_{25} = 7.28 in/hr (T_c = 5 min.)

Q_{25} = 0.98 x 7.28 x 0.299 = **2.13 cfs**
D_o = 10 in
T_w = $0.2D_o$ = 0.17 ft

Length of Hole Bottom (L) = 3 x D_o = **2.50 ft**
Width of Hole Bottom (W) = 2 x W_o = **1.67 ft**
Median Stone Dia. (d_{50}) = (0.0125 / $0.2D_o$) x (Q / W_o)$^{4/3}$ = **0.09 ft (Use 4" = 0.33 ft)**

Scour Hole #4:

Q_{25} = 12.34 cfs (See Storm Sewer Design Calculations)
D_o = 18 in
T_w = $0.2D_o$ = 0.30 ft

Length of Hole Bottom (L) = 3 x D_o = **4.50 ft**
Width of Hole Bottom (W) = 2 x W_o = **3.00 ft**
Median Stone Dia. (d_{50}) = (0.0125 / $0.2D_o$) x (Q / W_o)$^{4/3}$ = **0.69 ft (Use 9" = 0.75 ft)**

Scour Hole #5:

Q_{25} = 0.35 cfs (See Storm Sewer Design Calculations)
D_o = 6 in
T_w = $0.2D_o$ = 0.10 ft

Length of Hole Bottom (L) = 3 x D_o = **1.50 ft**
Width of Hole Bottom (W) = 2 x W_o = **1.00 ft**
Median Stone Dia. (d_{50}) = (0.0125 / $0.2D_o$) x (Q / W_o)$^{4/3}$ = **0.08 ft (Use 4" = 0.33 ft)**

Scour Hole #6:

A = 0.370 ac
c = 0.98 for impervious areas
I_{25} = 7.28 in/hr (T_c = 5 min.)

Q_{25} = 0.98 x 7.28 x 0.370 = **2.64 cfs**
D_o = 10 in
T_w = $0.2D_o$ = 0.17 ft

Length of Hole Bottom (L) = 3 x D_o = **2.50 ft**
Width of Hole Bottom (W) = 2 x W_o = **1.67 ft**
Median Stone Dia. (d_{50}) = (0.0125 / $0.2D_o$) x (Q / W_o)$^{4/3}$ = **0.09 ft (Use 4" = 0.33 ft)**

14. GROUNDWATER MOUNDING ANALYSIS

Basin #1:

The soils report was prepared by Wham Engineering Services, Inc. on June 10, 2024. A percolation rate of 10 in/hr is used at TP-7.

Time to Drain 100 Year Volume:

Test Infiltration Rate:	18.5 in/hr		
Design Infiltration Rate (1/2 Test Rate)	9.25 in/hr	=	0.771 ft/hr
Volume Below Lowest Orifice:	2,876 cf		
Area of Infiltration	5,720 sf		

Time to Drain: 2,876 cf / (5720 sf x 0.771 ft/hr)
= 0.65 hours

Elevation of Groundwater: 70 (16 ft down from existing grade elevation of TP-7)
Bottom of Basin Elevation: 75.50
Groundwater Mounding Height at Center: 3.251 ft (From Groundwater Mounding Calculator)
Elevaton of Groundwater Mounding at Center: 3.251 ft + 70.0 = 73.25 (Below basin bottom)

Since groundwater mounding at center is lower than bottom of basin, analysis is ok.

Basin #2:

The soils report was prepared by Wham Engineering Services, Inc. on March 29, 2023. A percolation rate of 10 in/hr is used at TP-2. SHWT is based on TP-3.

Time to Drain 100 Year Volume:

Test Infiltration Rate:	10 in/hr		
Design Infiltration Rate (1/2 Test Rate)	5 in/hr	=	0.417 ft/hr
Volume Below Lowest Orifice:	2,339 cf		
Area of Infiltration	6,711 sf		

Time to Drain: 2,339 cf / (6711 sf x 0.417 ft/hr)
= 0.84 hours

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Elevation of Groundwater: 71 (10 ft down from existing grade elevation of TP-3)
Bottom of Basin Elevation: 73.00
Groundwater Mounding Height at Center: 2.333 ft (From Groundwater Mounding Calculator)
Elevaton of Groundwater Mounding at Center: 2.333 ft + 71.0 = 73.33 (Above basin bottom)

Since groundwater mounding at center is higher than bottom of basin, additional analysis is required.

Trial Design Infiltration Rate / Factor: 0.350 in/hr = 0.029 ft/hr
Time to Drain x Factor: 2,339 cf / (6711 sf x 0.029 ft/hr) = 11.95 hours
Groundwater Mounding Height at Center: 1.999 ft (From Groundwater Mounding Calculator)
Elevaton of Groundwater Mounding at Center: 1.999 ft + 71 = 73.00 (Basin bottom)

Basin #3:

The soils report was prepared by Wham Engineering Services, Inc. on March 29, 2023. A percolation rate of 23 in/hr is used at TP-1A. SHWT is based on TP-1.

Time to Drain 100 Year Volume:
Test Infiltration Rate: 23 in/hr
Design Infiltration Rate (1/2 Test Rate) 11.5 in/hr = 0.958 ft/hr
Volume Below Lowest Orifice: 11,771 cf
Area of Infiltration 15,617 sf

Time to Drain: 11,771 cf / (15617 sf x 0.958 ft/hr)
= 0.79 hours

Elevation of Groundwater: 64.5 (4 ft down from existing grade elevation of TP-1)
Bottom of Basin Elevation: 67.00
Groundwater Mounding Height at Center: 5.040 ft (From Groundwater Mounding Calculator)
Elevaton of Groundwater Mounding at Center: 5.040 ft + 64.5 = 69.54 (Above basin bottom)

Since groundwater mounding at center is higher than bottom of basin, additional analysis is required.

Trial Design Infiltration Rate / Factor: 0.244 in/hr = 0.020 ft/hr
Time to Drain x Factor: 11,771 cf / (15617 sf x 0.020 ft/hr) = 37.07 hours
Groundwater Mounding Height at Center: 2.500 ft (From Groundwater Mounding Calculator)
Elevaton of Groundwater Mounding at Center: 2.500 ft + 64.5 = 67.00 (Basin bottom)

New Jersey Groundwater Recharge Spreadsheet Version 2.0 November 2003

Annual Groundwater Recharge Analysis (based on GSR-32)

Select Township ↓	Average Annual P (in)	Climatic Factor
MERCER CO., LAWRENCE TWP	44.9	1.43

Project Name:	21-210
Description:	Lawrence, NJ
Analysis Date:	04/16/25

Pre-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.734	Woods	Pits, Muck	0.0	-
2	0.898	Woods	Matapeake	13.0	42,519
3	0.938	Woods	Matapeake	13.0	44,413
4	0.365	Woods	Portsmouth	0.0	-
5	0.063	Woods	Sassafras	13.3	3,036
6	0.295	Woods	Othello	0.0	-
7	1.936	Woods	Fallsington	0.0	-
8	0				
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	5.2			Total Annual Recharge (in)	Total Annual Recharge (cu-ft)
				4.7	89,967

Post-Developed Conditions

Land Segment	Area (acres)	TR-55 Land Cover	Soil	Annual Recharge (in)	Annual Recharge (cu.ft)
1	0.404	Open space	Pits, Muck	0.0	-
2	0.46	Open space	Matapeake	12.9	21,577
3	0.385	Open space	Matapeake	12.9	18,059
4	0.175	Open space	Portsmouth	0.0	-
5	0.061	Open space	Sassafras	13.2	2,926
6	0.151	Open space	Othello	0.0	-
7	0.836	Open space	Fallsington	0.0	-
8	2.757	Impervious areas	Fallsington	0.0	-
9	0				
10	0				
11	0				
12	0				
13	0				
14	0				
15	0				
Total =	5.2			Total Annual Recharge (in)	Total Annual Recharge (cu.ft)
				2.2	42,561

Annual Recharge Requirements Calculation ↓

% of Pre-Developed Annual Recharge to Preserve =	100%	Total Impervious Area (sq.ft) 120,095
Post-Development Annual Recharge Deficit=	*47,406*	(cubic feet)

Recharge Efficiency Parameters Calculations (area averages)

RWC=	1.33	(in)	DRWC=	0.83	(in)
ERWC =	0.38	(in)	EDRWC=	0.24	(in)

Procedure to fill the Pre-Development and Post-Development Conditions Tables

For each land segment, first enter the area, then select TR-55 Land Cover, then select Soil. Start from the top of the table and proceed downward. Don't leave blank rows (with A=0) in between your segment entries. Rows with A=0 will not be displayed or used in calculations. For impervious areas outside of standard lots select "Impervious Areas" as the Land Cover. Soil type for impervious areas are only required if an infiltration facility will be built within these areas.

Project Name	Description	Analysis Date	BMP or LID Type
21-210	Lawrence, NJ	04/16/25	Infiltration Basin 1

Recharge BMP Input Parameters

Parameter	Symbol	Value	Unit
BMP Area	ABMP	5720.0	sq.ft
BMP Effective Depth, this is the design variable	dBMP	5.0	in
Upper level of the BMP surface (negative if above ground)	dBMPu	12.0	in
Depth of lower surface of BMP, must be>=dBMPu	dEXC	18.0	in
Post-development Land Segment Location of BMP , Input Zero if Location is distributed or undetermined	SegBMP	0	unitless

Root Zone Water capacity Calculated Parameters

Parameter	Symbol	Value	Unit
Empty Portion of RWC under Post-D Natural Recharge	ERWC	0.38	in
ERWC Modified to consider dEXC	EDRWC	0.24	in
Empty Portion of RWC under Infilt. BMP	RERWC	0.19	in

Recharge Design Parameters

Parameter	Symbol	Value	Unit
Inches of Runoff to capture	Qdesign	1.46	in
Inches of Rainfall to capture	Pdesign	1.68	in
Recharge Provided Avg. over Imp. Area		28.5	in
Runoff Captured Avg. over imp. Area		32.7	in

BMP Calculated Size Parameters

ABMP/Aimp	Aratio	0.29	unitless
BMP Volume	VBMP	2,369	cu.ft

CALCULATION CHECK MESSAGES

Volume Balance-> OK
dBMP Check---> OK
dEXC Check---> OK

BMP Location---> Location is selected as distributed or undetermined

Parameters from Annual Recharge Worksheet

Parameter	Symbol	Value	Unit
Post-D Deficit Recharge (or desired recharge volume)	Vdef	47,406	cu.ft
Post-D Impervious Area (or target Impervious Area)	Aimp	19,950	sq.ft
Root Zone Water Capacity	RWC	1.33	in
RWC Modified to consider dEXC	DRWC	0.83	in
Climatic Factor	C-factor	1.43	no units
Average Annual P	Pavg	44.9	in
Recharge Requirement over Imp. Area	dr	4.7	in

System Performance Calculated Parameters

Parameter		Value	Unit
Annual BMP Recharge Volume		47,406	cu.ft
Avg BMP Recharge Efficiency		87.2%	Represents % Infiltration Recharged
%Rainfall became Runoff		77.7%	%
%Runoff Infiltrated		93.7%	%
%Runoff Recharged		13.6%	%
%Rainfall Recharged		10.5%	%

OTHER NOTES

Pdesign is accurate only after BMP dimensions are updated to make rech volume= deficit volume. The portion of BMP infiltration prior to filling and the area occupied by BMP are ignored in these calculations. Results are sensetive to dBMP, make sure dBMP selected is small enough for BMP to empty in less than 3 days. For land Segment Location of BMP if you select "impervious areas" RWC will be minimal but not zero as determined by the soil type and a shallow root zone for this Land Cover allowing consideration of lateral flow and other losses.

How to solve for different recharge volumes: By default the spreadsheet assigns the values of total deficit recharge volume "Vdef" and total proposed impervious area "Aimp" from the "Annual Recharge" sheet to "Vdef" and "Aimp" on this page. This allows solution for a single BMP to handle the entire recharge requirement assuming the runoff from entire impervious area is available to the BMP.
To solve for a smaller BMP or a LID-IMP to recharge only part of the recharge requirement, set Vdef to your target value and Aimp to impervious area directly connected to your infiltration facility and then solve for ABMP or dBMP. To go back to the default configuration clik the "Default Vdef & Aimp" button.

STORM SEWER DESIGN CALCULATIONS

PROJECT: Townhouse Development - Lawrence, NJ
PROJECT No: 21-210

BY: MBL
CHK'D: CJB
DATE: 4/16/25

STORM EVENT: 25 Year

NOAA Precipitation Frequency Table						
Duration (min	5	10	15	30	60	120
Intensity (in/hr	7.28	5.80	4.90	3.63	2.42	1.51

Drainage Structure		Area	Runoff			Inlet			Pipe					Pipe Design						
From	To	A Acres	Coef. C	C x A	Sum CA	Tc min	i in/hr	Q cfs	Tc min	Tt min	T total min	i in/hr	Q cfs	Dia in	Manning's n	Length ft	Slope %	Q full cfs	V full fps	V design fps
DI#1	DMH#1	0.12	0.85	0.10	0.10	10	5.80	0.58	10	-	10.00	5.80	0.58	15	0.012	39	1.00	7.0	5.7	3.6
TD#3	DMH#1	0.10	0.69	0.07	0.07	10	5.80	0.41	10	-	10.00	5.80	0.41	6	0.011	6	2.00	0.9	4.6	4.6
DMH#1	DMH#2				0.17	10	5.80		10	0.02	10.02	5.80	0.99	15	0.012	61	1.00	7.0	5.7	4.1
DMH#2	PSH#1	0.10	0.51	0.05	0.22	10	5.80	0.29	10.02	0.25	10.27	5.75	1.27	15	0.012	40	1.00	7.0	5.7	4.5
OCS#1	DI#2							2.17					2.17	15	0.012	80	2.80	11.7	9.5	7.3
DI#2	DI#3	0.19	0.25	0.05	0.05	10	5.80	0.29	10	-	10.00	5.80	2.46	15	0.012	53	1.30	8.0	6.5	5.7
DI#3	DMH#3	0.21	0.94	0.19	0.24	10	5.80	1.10	10	0.15	10.15	5.77	3.55	15	0.012	136	1.50	8.6	7.0	6.8
OCS#2	DMH#3					10	5.80	1.05	10	-	10.00	5.80	1.05	15	0.012	11	2.00	9.9	8.1	5.3
DMH#3	DMH#4				0.24	10	5.80		10.15	0.33	10.48	5.71	4.59	15	0.012	96	1.20	7.7	6.3	6.6
DI#4	DI#5	0.08	0.25	0.02	0.02	10	5.80	0.12	10	-	10.00	5.80	0.12	15	0.012	54	1.00	7.0	5.7	2.5
DI#5	DMH#4	0.15	0.80	0.12	0.14	10	5.80	0.70	10	0.36	10.36	5.74	0.80	15	0.012	15	2.00	9.9	8.1	4.9
DI#7	DI#8	0.54	0.88	0.48	0.48	10	5.80	2.78	10	-	10.00	5.80	2.78	15	0.012	60	1.80	9.4	7.7	6.7
DI#8	DI#11	0.08	0.73	0.06	0.54	10	5.80	0.35	10	0.15	10.15	5.77	3.12	15	0.012	151	3.60	13.3	10.8	9.2
DI#9	DI#10	0.40	0.94	0.38	0.38	10	5.80	2.20	10	-	10.00	5.80	2.20	15	0.012	21	1.00	7.0	5.7	5.1
DI#10	DI#11	0.18	0.75	0.14	0.52	10	5.80	0.81	10	0.07	10.07	5.79	3.01	15	0.012	23	1.00	7.0	5.7	5.6
DI#11	DI#6	0.09	0.96	0.08	1.14	10	5.80	0.46	10.15	0.27	10.42	5.72	6.52	15	0.012	194	1.00	7.0	5.7	6.5
DI#6	DMH#4	0.12	0.86	0.10	1.24				10.42	0.5	10.92	5.63	6.98	18	0.012	9	1.00	11.4	6.5	6.8
DMH#4	FES#1				1.62	10	5.80		10.92	0.02	10.94	5.63	12.34	18	0.012	48	1.20	12.5	7.1	8.1
TD#2	PSH#5	0.07	0.91	0.06	0.06	10	5.80	0.35	10	-	10.00	5.80	0.35	6	0.011	42	0.60	0.5	2.5	2.8
OCS#3	EX IN							6.16					6.16	24	0.013	19	5.00	50.6	16.1	11.3

TABLE 7.1

TYPICAL RUNOFF COEFFICIENTS (C VALUES) FOR 100 YEAR FREQUENCY STORM

Land Use Description		Hydrologic Soil Group A	B	C	D
Cultivated land:					
without conservation treatment		0.49	0.67	0.81	0.88
with conservation treatment		0.27	0.43	0.61	0.67
Pasture or range land:					
poor condition		0.38	0.63	0.78	0.84
good condition		NA	0.25	0.51	0.65
Meadow: good condition		NA	NA	0.44	0.61
Wood or forest land:					
thin stand, poor cover, no mulch		NA	NA	0.59	0.79
good cover		NA	NA	0.45	0.59
Open spaces, lawns, parks, golf courses, cemeteries:					
good condition, grass cover on 75% or more of area		NA	0.25	0.51	0.65
fair condition, grass cover on 50–75% of area		NA	0.45	0.63	0.74
Commercial and business areas (85% impervious)		0.84	0.90	0.93	0.96
Industrial districts (72% impervious)		0.67	0.81	0.88	0.92
Residential:					
Average lot size	Average impervious				
⅛ acre	65%	0.59	0.76	0.86	0.90
¼ acre	38%	0.25	0.55	0.70	0.80
⅓ acre	30%	NA	0.49	0.67	0.78
½ acre	25%	NA	0.45	0.65	0.76
1 acre	20%	NA	0.41	0.63	0.74
Paved parking lots, roofs, driveways, etc.		0.99	0.99	0.99	0.99
Streets and roads:					
paved with curbs and storm sewers		0.99	0.99	0.99	0.99
gravel		0.57	0.76	0.84	0.88
dirt		0.49	0.69	0.80	0.84

Note: NA denotes information is not available; design engineers should rely on another authoritative source.

Source: New Jersey Department of Environmental Protection, Technical Manual for Land Use Regulation Program, Bureaus of Inland and Coastal Regulations, Stream Encroachment Permits (Trenton, New Jersey: Department of Environmental Protection, Revised September 1995) p. 12.

NOAA Atlas 14, Volume 2, Version 3
Location name: Lawrence Township, New Jersey, USA*
Latitude: 40.2864°, Longitude: -74.6847°
Elevation: 71 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.08** (3.68-4.50)	**4.86** (4.42-5.38)	**5.78** (5.22-6.38)	**6.46** (5.82-7.12)	**7.28** (6.53-8.03)	**7.88** (7.04-8.70)	**8.48** (7.55-9.38)	**9.05** (8.00-10.0)	**9.76** (8.54-10.9)	**10.3** (8.94-11.5)
10-min	**3.25** (2.95-3.60)	**3.89** (3.53-4.30)	**4.63** (4.18-5.11)	**5.16** (4.66-5.69)	**5.80** (5.21-6.40)	**6.28** (5.61-6.93)	**6.74** (5.99-7.45)	**7.17** (6.34-7.96)	**7.72** (6.76-8.60)	**8.11** (7.04-9.08)
15-min	**2.71** (2.46-3.00)	**3.26** (2.96-3.60)	**3.90** (3.53-4.31)	**4.35** (3.93-4.80)	**4.90** (4.40-5.41)	**5.30** (4.74-5.85)	**5.68** (5.05-6.28)	**6.03** (5.33-6.69)	**6.47** (5.67-7.22)	**6.78** (5.89-7.60)
30-min	**1.86** (1.68-2.05)	**2.25** (2.04-2.49)	**2.77** (2.51-3.06)	**3.15** (2.84-3.48)	**3.63** (3.26-4.01)	**3.99** (3.57-4.40)	**4.35** (3.87-4.81)	**4.70** (4.15-5.21)	**5.15** (4.51-5.74)	**5.49** (4.77-6.16)
60-min	**1.16** (1.05-1.28)	**1.41** (1.28-1.56)	**1.78** (1.61-1.96)	**2.05** (1.85-2.26)	**2.42** (2.17-2.67)	**2.70** (2.42-2.98)	**3.00** (2.66-3.31)	**3.29** (2.91-3.65)	**3.70** (3.24-4.12)	**4.01** (3.48-4.49)
2-hr	**0.703** (0.636-0.779)	**0.857** (0.775-0.949)	**1.09** (0.982-1.20)	**1.26** (1.14-1.39)	**1.51** (1.35-1.66)	**1.70** (1.52-1.88)	**1.90** (1.68-2.10)	**2.11** (1.86-2.34)	**2.40** (2.09-2.68)	**2.63** (2.27-2.95)
3-hr	**0.515** (0.463-0.574)	**0.627** (0.566-0.699)	**0.796** (0.716-0.888)	**0.928** (0.832-1.03)	**1.11** (0.992-1.24)	**1.26** (1.12-1.40)	**1.42** (1.25-1.58)	**1.58** (1.38-1.77)	**1.81** (1.56-2.03)	**2.00** (1.70-2.25)
6-hr	**0.327** (0.294-0.367)	**0.397** (0.357-0.445)	**0.502** (0.450-0.562)	**0.589** (0.525-0.657)	**0.713** (0.630-0.796)	**0.817** (0.717-0.911)	**0.929** (0.807-1.04)	**1.05** (0.902-1.17)	**1.22** (1.03-1.37)	**1.37** (1.14-1.55)
12-hr	**0.197** (0.177-0.223)	**0.238** (0.214-0.270)	**0.304** (0.271-0.343)	**0.359** (0.320-0.405)	**0.442** (0.390-0.497)	**0.514** (0.449-0.578)	**0.593** (0.511-0.666)	**0.681** (0.578-0.767)	**0.812** (0.676-0.920)	**0.925** (0.756-1.05)
24-hr	**0.114** (0.104-0.125)	**0.138** (0.127-0.151)	**0.176** (0.161-0.193)	**0.208** (0.190-0.228)	**0.257** (0.233-0.280)	**0.299** (0.268-0.326)	**0.345** (0.307-0.376)	**0.396** (0.349-0.433)	**0.473** (0.410-0.518)	**0.539** (0.461-0.592)
2-day	**0.066** (0.060-0.072)	**0.080** (0.073-0.088)	**0.102** (0.093-0.112)	**0.120** (0.110-0.132)	**0.147** (0.133-0.161)	**0.170** (0.153-0.186)	**0.195** (0.174-0.214)	**0.223** (0.197-0.244)	**0.263** (0.229-0.290)	**0.298** (0.256-0.329)
3-day	**0.046** (0.043-0.051)	**0.056** (0.052-0.061)	**0.071** (0.065-0.078)	**0.084** (0.077-0.092)	**0.102** (0.093-0.111)	**0.118** (0.106-0.128)	**0.134** (0.121-0.146)	**0.152** (0.136-0.167)	**0.179** (0.157-0.196)	**0.201** (0.175-0.221)
4-day	**0.037** (0.034-0.040)	**0.044** (0.041-0.048)	**0.056** (0.052-0.061)	**0.066** (0.060-0.072)	**0.080** (0.073-0.087)	**0.091** (0.083-0.099)	**0.104** (0.094-0.113)	**0.117** (0.105-0.128)	**0.137** (0.121-0.149)	**0.153** (0.134-0.167)
7-day	**0.024** (0.022-0.027)	**0.029** (0.027-0.032)	**0.037** (0.034-0.040)	**0.043** (0.039-0.046)	**0.051** (0.047-0.056)	**0.058** (0.053-0.064)	**0.066** (0.060-0.072)	**0.074** (0.067-0.081)	**0.086** (0.076-0.094)	**0.096** (0.084-0.105)
10-day	**0.019** (0.018-0.021)	**0.023** (0.021-0.025)	**0.028** (0.026-0.031)	**0.033** (0.030-0.036)	**0.039** (0.036-0.042)	**0.044** (0.040-0.048)	**0.049** (0.045-0.053)	**0.055** (0.049-0.059)	**0.062** (0.056-0.068)	**0.069** (0.061-0.075)
20-day	**0.013** (0.012-0.014)	**0.015** (0.014-0.016)	**0.018** (0.017-0.020)	**0.021** (0.020-0.022)	**0.024** (0.023-0.026)	**0.027** (0.025-0.029)	**0.030** (0.027-0.032)	**0.032** (0.030-0.034)	**0.036** (0.033-0.038)	**0.039** (0.035-0.042)
30-day	**0.011** (0.010-0.011)	**0.013** (0.012-0.013)	**0.015** (0.014-0.016)	**0.017** (0.016-0.018)	**0.019** (0.018-0.020)	**0.021** (0.019-0.022)	**0.022** (0.021-0.024)	**0.024** (0.022-0.025)	**0.026** (0.024-0.028)	**0.028** (0.026-0.030)
45-day	**0.009** (0.008-0.009)	**0.011** (0.010-0.011)	**0.012** (0.012-0.013)	**0.014** (0.013-0.014)	**0.015** (0.014-0.016)	**0.016** (0.016-0.017)	**0.018** (0.017-0.019)	**0.019** (0.018-0.020)	**0.020** (0.019-0.021)	**0.021** (0.020-0.023)
60-day	**0.008** (0.008-0.008)	**0.009** (0.009-0.010)	**0.011** (0.010-0.011)	**0.012** (0.011-0.013)	**0.013** (0.013-0.014)	**0.014** (0.013-0.015)	**0.015** (0.014-0.016)	**0.016** (0.015-0.017)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical

Basin 1

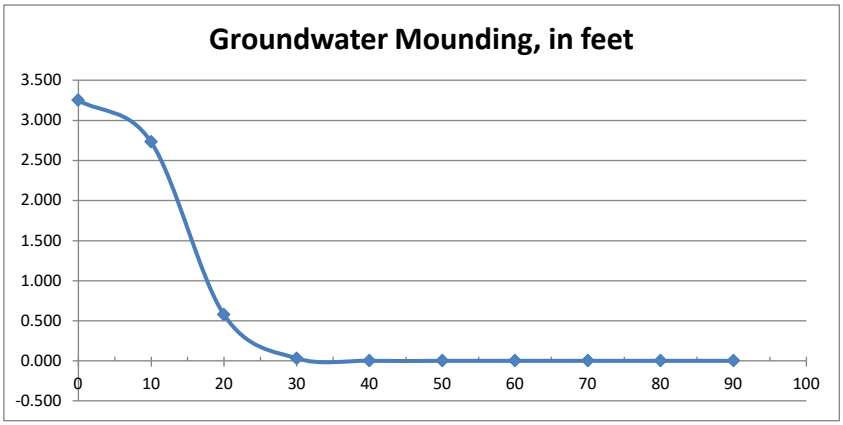
Input Values

9.25	*R*	Recharge rate (permeability rate) (in/hr)
		Specific yield, Sy (dimensionless)
0.150	Sy	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
		Horizontal hydraulic conductivity (in/hr)
9.25	Kh	Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
15.000	x	1/2 length of basin (x direction, in feet)
98.000	y	1/2 width of basin (y direction, in feet)
0.65	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

13.251	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
3.251	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
3.251	0
2.731	10
0.576	20
0.032	30
0.002	40
0.001	50
0.001	60
0.001	70
0.001	80
0.001	90

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

Basin 2

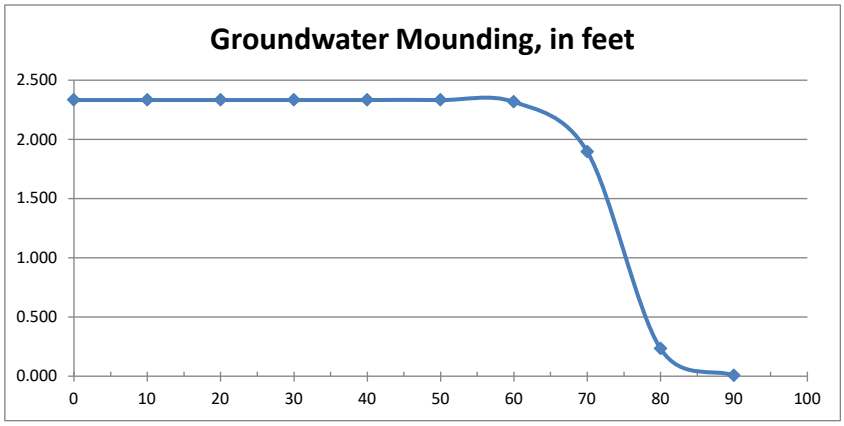
Input Values

5.00	*R*	Recharge rate (permeability rate) (in/hr)
		Specific yield, Sy (dimensionless)
0.150	Sy	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
		Horizontal hydraulic conductivity (in/hr)
5.00	Kh	Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
74.000	x	1/2 length of basin (x direction, in feet)
28.000	y	1/2 width of basin (y direction, in feet)
0.84	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

12.333	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
2.333	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
2.333	0
2.333	10
2.333	20
2.333	30
2.333	40
2.333	50
2.317	60
1.897	70
0.232	80
0.005	90

Re-Calculate Now



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Basin 2 - Modified

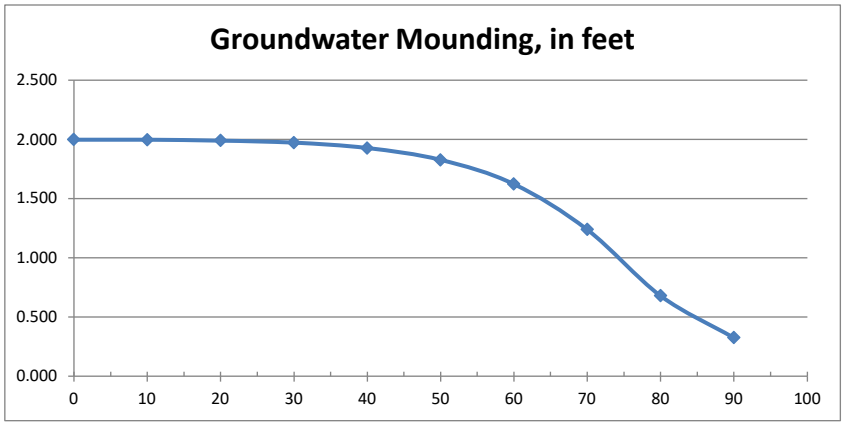
Input Values

0.35	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
5.00	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
74.000	x	1/2 length of basin (x direction, in feet)
28.000	y	1/2 width of basin (y direction, in feet)
11.95	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

11.999	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
1.999	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
1.999	0
1.997	10
1.991	20
1.972	30
1.927	40
1.827	50
1.623	60
1.238	70
0.678	80
0.324	90

Re-Calculate Now



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Basin 3

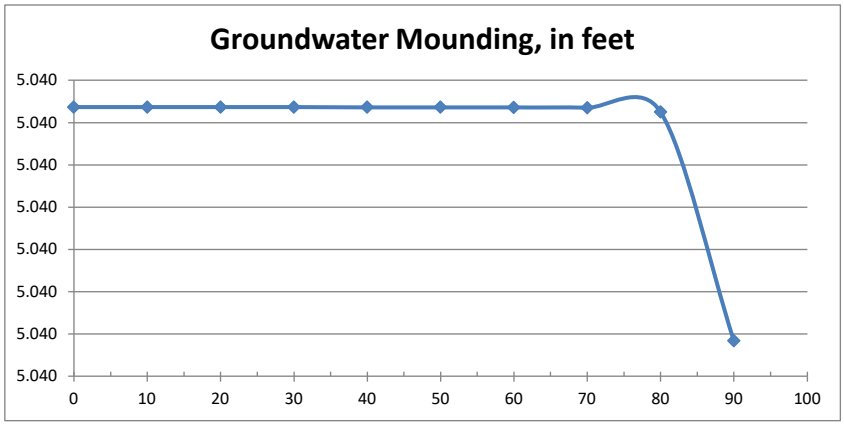
Input Values

11.50	*R*	Recharge rate (permeability rate) (in/hr)
		Specific yield, Sy (dimensionless)
0.150	Sy	default value is 0.15; max value is 0.2 provided that a lab test data is submitted
		Horizontal hydraulic conductivity (in/hr)
11.50	Kh	Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
130.000	x	1/2 length of basin (x direction, in feet)
30.000	y	1/2 width of basin (y direction, in feet)
0.79	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

15.040	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
5.040	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
5.040	0
5.040	10
5.040	20
5.040	30
5.040	40
5.040	50
5.040	60
5.040	70
5.040	80
5.040	90

Re-Calculate Now



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Basin 3 - Modified

Input Values

0.24	*R*	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
11.50	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
130.000	x	1/2 length of basin (x direction, in feet)
30.000	y	1/2 width of basin (y direction, in feet)
37.07	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

12.500	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
2.500	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
2.500	0
2.497	10
2.489	20
2.475	30
2.453	40
2.423	50
2.380	60
2.324	70
2.248	80
2.148	90

Re-Calculate Now

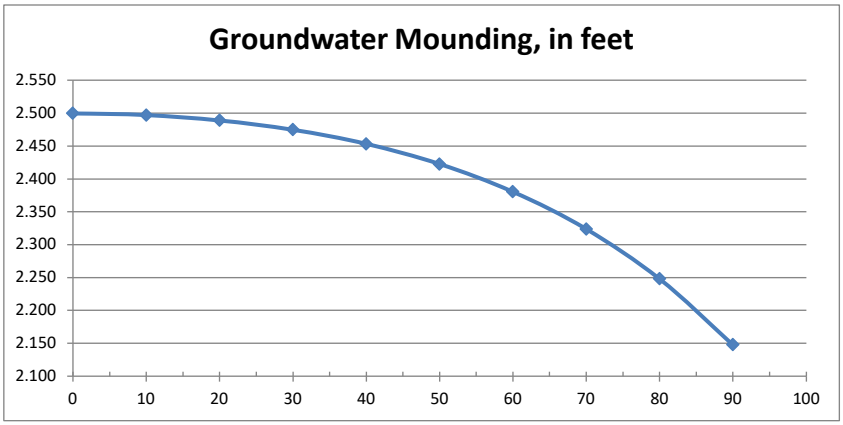

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Table 5-2: NJDEP 1.25-Inch/2-Hour Stormwater Runoff Water Quality Design Storm Rainfall Distribution

Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)	Time (Minutes)	Cumulative Rainfall (Inches)
1	0.00166	41	0.1728	81	1.0906
2	0.00332	42	0.1796	82	1.0972
3	0.00498	43	0.1864	83	1.1038
4	0.00664	44	0.1932	84	1.1104
5	0.00830	45	0.2000	85	1.1170
6	0.00996	46	0.2117	86	1.1236
7	0.01162	47	0.2233	87	1.1302
8	0.01328	48	0.2350	88	1.1368
9	0.01494	49	0.2466	89	1.1434
10	0.01660	50	0.2583	90	1.1500
11	0.01828	51	0.2783	91	1.1550
12	0.01996	52	0.2983	92	1.1600
13	0.02164	53	0.3183	93	1.1650
14	0.02332	54	0.3383	94	1.1700
15	0.02500	55	0.3583	95	1.1750
16	0.03000	56	0.4116	96	1.1800
17	0.03500	57	0.4650	97	1.1850
18	0.04000	58	0.5183	98	1.1900
19	0.04500	59	0.5717	99	1.1950
20	0.05000	60	0.6250	100	1.2000
21	0.05500	61	0.6783	101	1.2050
22	0.06000	62	0.7317	102	1.2100
23	0.06500	63	0.7850	103	1.2150
24	0.07000	64	0.8384	104	1.2200
25	0.07500	65	0.8917	105	1.2250
26	0.08000	66	0.9117	106	1.2267
27	0.08500	67	0.9317	107	1.2284
28	0.09000	68	0.9517	108	1.2300
29	0.09500	69	0.9717	109	1.2317
30	0.10000	70	0.9917	110	1.2334
31	0.10660	71	1.0034	111	1.2351
32	0.11320	72	1.0150	112	1.2367
33	0.11980	73	1.0267	113	1.2384
34	0.12640	74	1.0383	114	1.2400
35	0.13300	75	1.0500	115	1.2417
36	0.13960	76	1.0568	116	1.2434
37	0.14620	77	1.0636	117	1.2450
38	0.15280	78	1.0704	118	1.2467
39	0.15940	79	1.0772	119	1.2483
40	0.16600	80	1.0840	120	1.2500

Hydraflow Table of Contents Current Rainfall

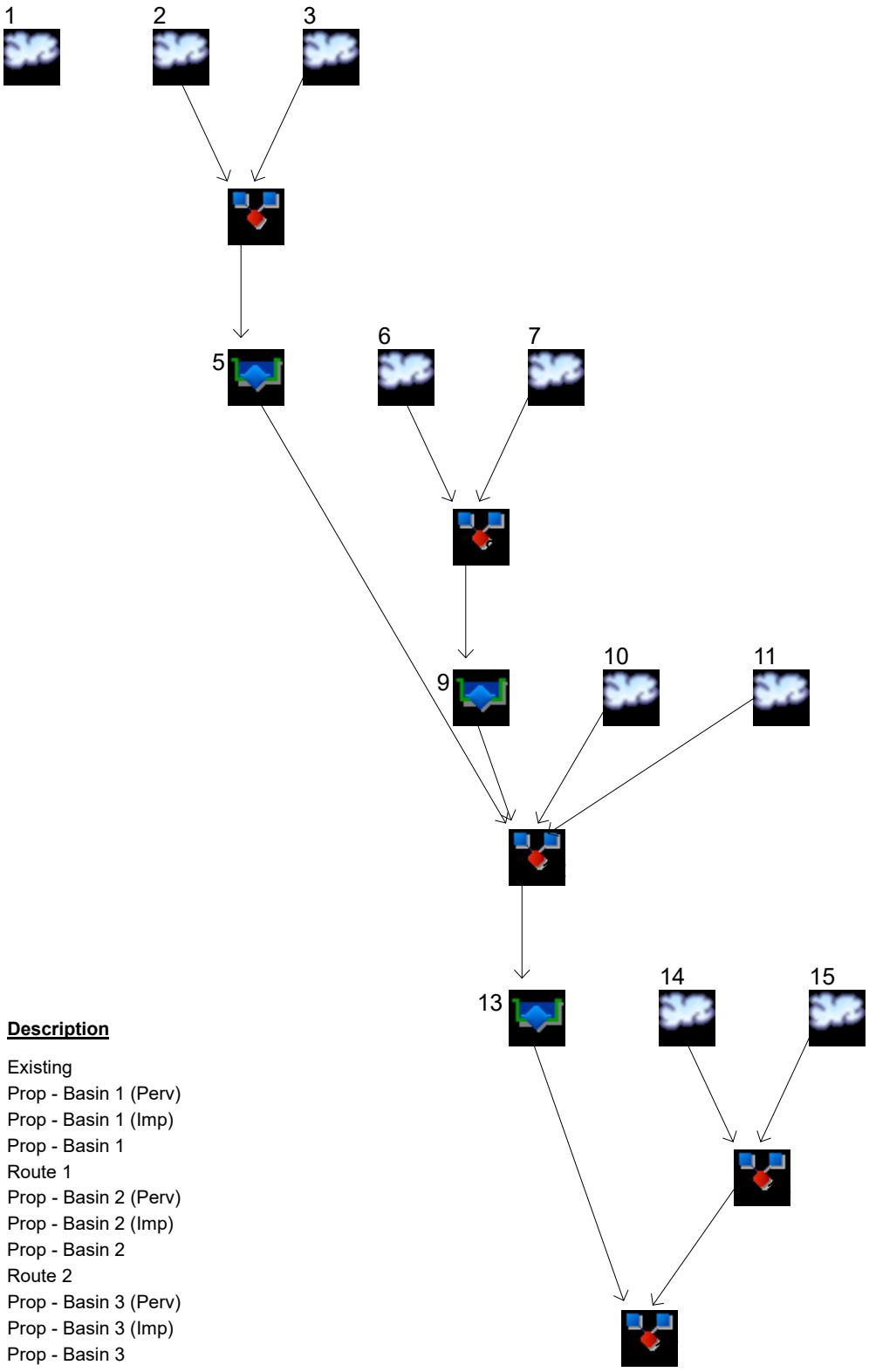
21-210 (C).gpw

Hydraflow Hydrographs by Intelisolve v9.25

Wednesday, Apr 16, 2025

100 - Year

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	SCS Runoff	Existing
2	SCS Runoff	Prop - Basin 1 (Perv)
3	SCS Runoff	Prop - Basin 1 (Imp)
4	Combine	Prop - Basin 1
5	Reservoir	Route 1
6	SCS Runoff	Prop - Basin 2 (Perv)
7	SCS Runoff	Prop - Basin 2 (Imp)
8	Combine	Prop - Basin 2
9	Reservoir	Route 2
10	SCS Runoff	Prop - Basin 3 (Perv)
11	SCS Runoff	Prop - Basin 3 (Imp)
12	Combine	Prop - Basin 3
13	Reservoir	Route 3
14	SCS Runoff	Prop - Bypass (Perv)
15	SCS Runoff	Prop - Bypass (Imp)
16	Combine	Prop - Bypass
17	Combine	Proposed

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	1.791	1	736	9,658	------	------	------	Existing
2	SCS Runoff	0.678	1	729	2,104	------	------	------	Prop - Basin 1 (Perv)
3	SCS Runoff	1.671	1	726	4,843	------	------	------	Prop - Basin 1 (Imp)
4	Combine	2.271	1	726	6,947	2, 3	------	------	Prop - Basin 1
5	Reservoir	0.148	1	804	4,046	4	76.29	4,571	Route 1
6	SCS Runoff	0.768	1	732	2,802	------	------	------	Prop - Basin 2 (Perv)
7	SCS Runoff	1.069	1	731	4,399	------	------	------	Prop - Basin 2 (Imp)
8	Combine	1.836	1	732	7,200	6, 7	------	------	Prop - Basin 2
9	Reservoir	0.283	1	774	4,891	8	73.54	4,146	Route 2
10	SCS Runoff	1.771	1	735	7,275	------	------	------	Prop - Basin 3 (Perv)
11	SCS Runoff	7.102	1	726	21,034	------	------	------	Prop - Basin 3 (Imp)
12	Combine	8.271	1	726	37,247	5, 9, 10, 11	------	------	Prop - Basin 3
13	Reservoir	0.220	1	1254	21,746	12	68.74	27,557	Route 3
14	SCS Runoff	0.728	1	731	2,502	------	------	------	Prop - Bypass (Perv)
15	SCS Runoff	0.160	1	727	512	------	------	------	Prop - Bypass (Imp)
16	Combine	0.845	1	730	3,014	14, 15	------	------	Prop - Bypass
17	Combine	0.872	1	730	24,759	13, 16	------	------	Proposed

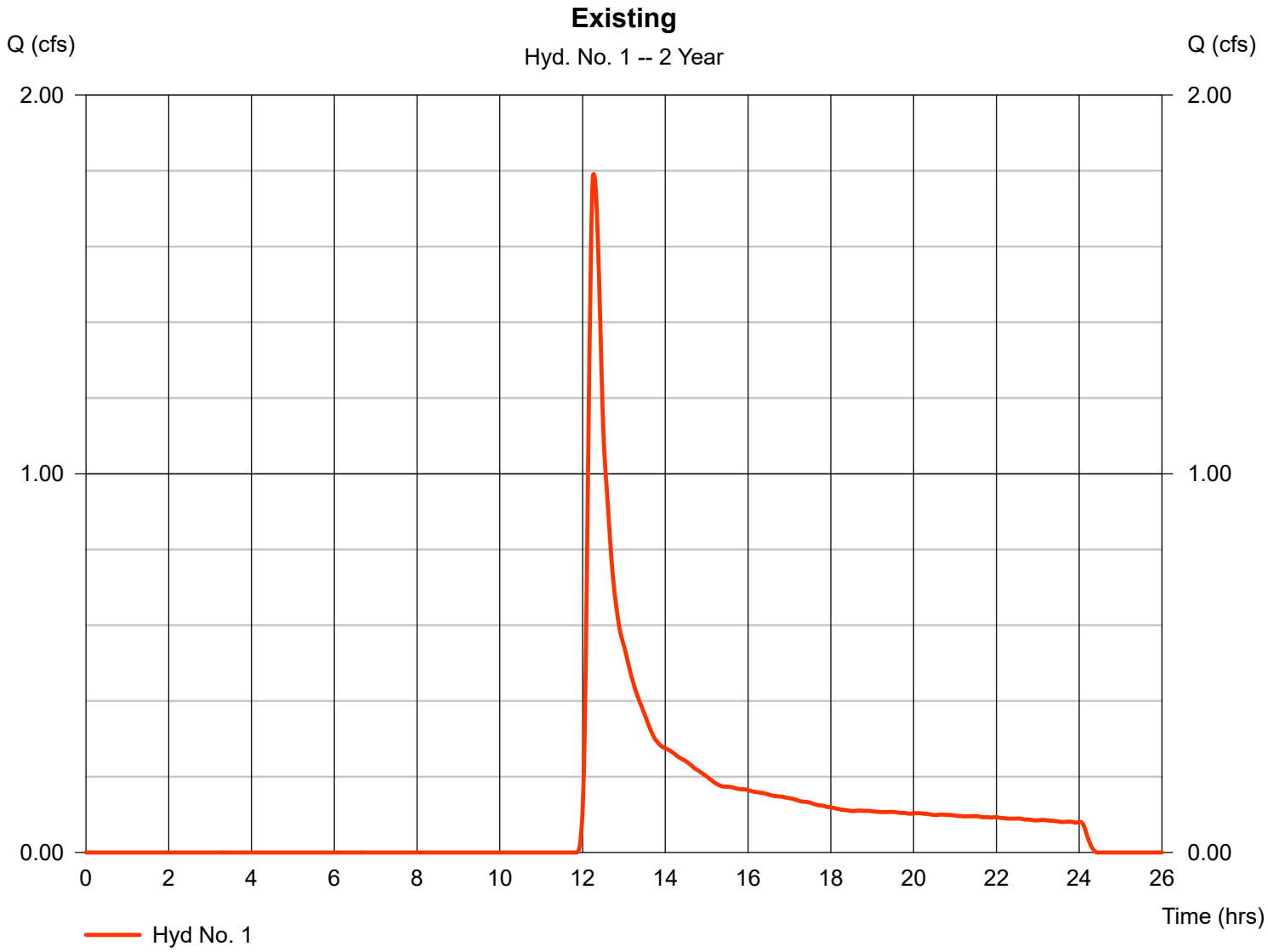
Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.791 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.27 hrs
Time interval	=	1 min	Hyd. volume	=	9,658 cuft
Drainage area	=	5.229 ac	Curve number	=	61*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.40 min
Total precip.	=	3.34 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(2.998 x 55) + (2.231 x 70)] / 5.229



TR55 Tc Worksheet

Hyd. No. 1

Existing

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.31		0.00		0.00		
Land slope (%)	= 6.00		0.00		0.00		
Travel Time (min)	**= 13.61**	**+**	**0.00**	**+**	**0.00**	**=**	**13.61**
Shallow Concentrated Flow							
Flow length (ft)	= 559.00		0.00		0.00		
Watercourse slope (%)	= 4.40		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 3.38		0.00		0.00		
Travel Time (min)	**= 2.75**	**+**	**0.00**	**+**	**0.00**	**=**	**2.75**
Channel Flow							
X sectional flow area (sqft)	= 7.07		0.00		0.00		
Wetted perimeter (ft)	= 9.43		0.00		0.00		
Channel slope (%)	= 1.00		0.00		0.00		
Manning's n-value	= 0.013		0.015		0.015		
Velocity (ft/s)	= 9.45		0.00		0.00		
Flow length (ft)	= 10.0		0.0		0.0		
Travel Time (min)	**= 0.02**	**+**	**0.00**	**+**	**0.00**	**=**	**0.02**

Total Travel Time, Tc ..... 16.40 min

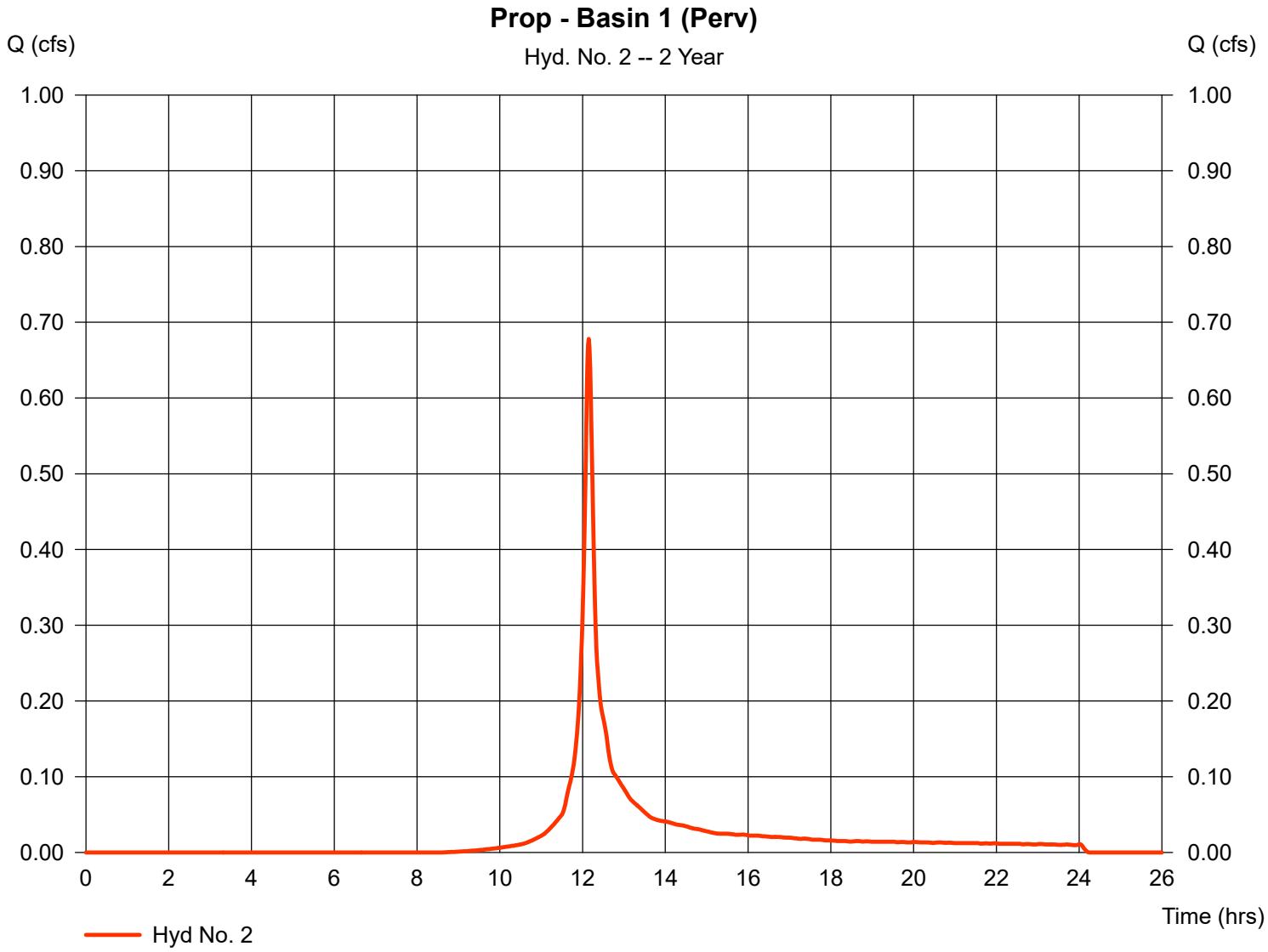
Hydrograph Report

Hyd. No. 2

Prop - Basin 1 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.678 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.15 hrs
Time interval	=	1 min	Hyd. volume	=	2,104 cuft
Drainage area	=	0.351 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.20 min
Total precip.	=	3.34 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.196 x 79) + (0.155 x 86)] / 0.351



TR55 Tc Worksheet

Hyd. No. 2

Prop - Basin 1 (Perv)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 72.0		28.0		0.0		
Two-year 24-hr precip. (in)	= 3.31		3.31		0.00		
Land slope (%)	= 3.60		4.40		0.00		
Travel Time (min)	**= 8.53**	**+**	**0.31**	**+**	**0.00**	**=**	**8.84**
Shallow Concentrated Flow							
Flow length (ft)	= 4.00		0.00		0.00		
Watercourse slope (%)	= 4.40		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	= 4.26		0.00		0.00		
Travel Time (min)	**= 0.02**	**+**	**0.00**	**+**	**0.00**	**=**	**0.02**
Channel Flow							
X sectional flow area (sqft)	= 0.20		1.23		0.00		
Wetted perimeter (ft)	= 1.57		3.93		0.00		
Channel slope (%)	= 2.00		1.00		0.00		
Manning's n-value	= 0.011		0.012		0.015		
Velocity (ft/s)	= 4.75		5.70		0.00		
Flow length (ft)	= 6.0		101.0		0.0		
Travel Time (min)	**= 0.02**	**+**	**0.30**	**+**	**0.00**	**=**	**0.32**

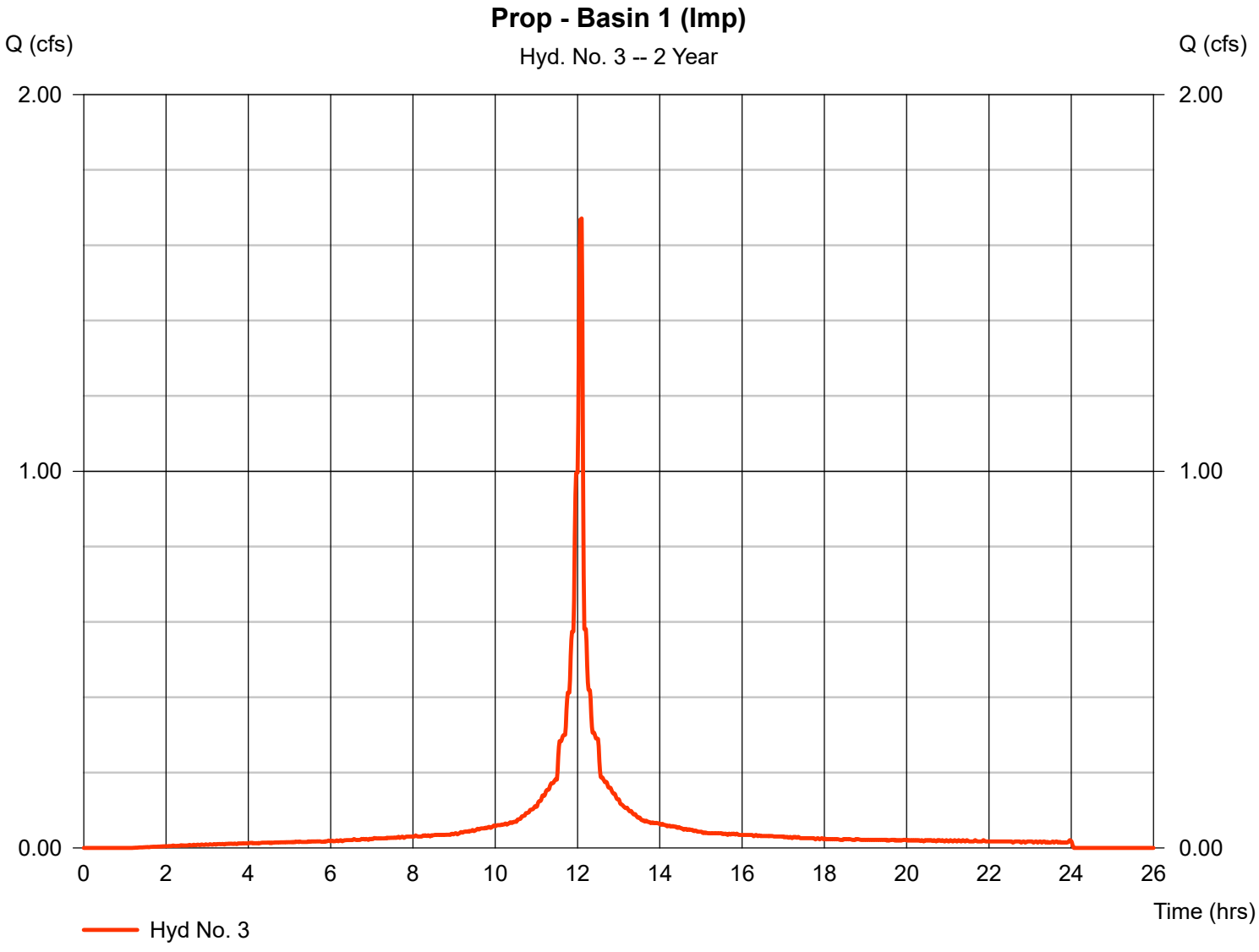
Total Travel Time, Tc ..... 9.20 min

Hydrograph Report

Hyd. No. 3

Prop - Basin 1 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.671 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	4,843 cuft
Drainage area	=	0.458 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	1.60 min
Total precip.	=	3.34 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 3

Prop - Basin 1 (Imp)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.31		0.00		0.00		
Land slope (%)	= 2.20		0.00		0.00		
Travel Time (min)	**= 1.15**	**+**	**0.00**	**+**	**0.00**	**=**	**1.15**
Shallow Concentrated Flow							
Flow length (ft)	= 14.00		0.00		0.00		
Watercourse slope (%)	= 2.70		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	= 3.34		0.00		0.00		
Travel Time (min)	**= 0.07**	**+**	**0.00**	**+**	**0.00**	**=**	**0.07**
Channel Flow							
X sectional flow area (sqft)	= 1.23		0.00		0.00		
Wetted perimeter (ft)	= 3.93		0.00		0.00		
Channel slope (%)	= 1.00		0.00		0.00		
Manning's n-value	= 0.012		0.015		0.015		
Velocity (ft/s)	= 5.70		0.00		0.00		
Flow length (ft)	= 140.0		0.0		0.0		
Travel Time (min)	**= 0.41**	**+**	**0.00**	**+**	**0.00**	**=**	**0.41**

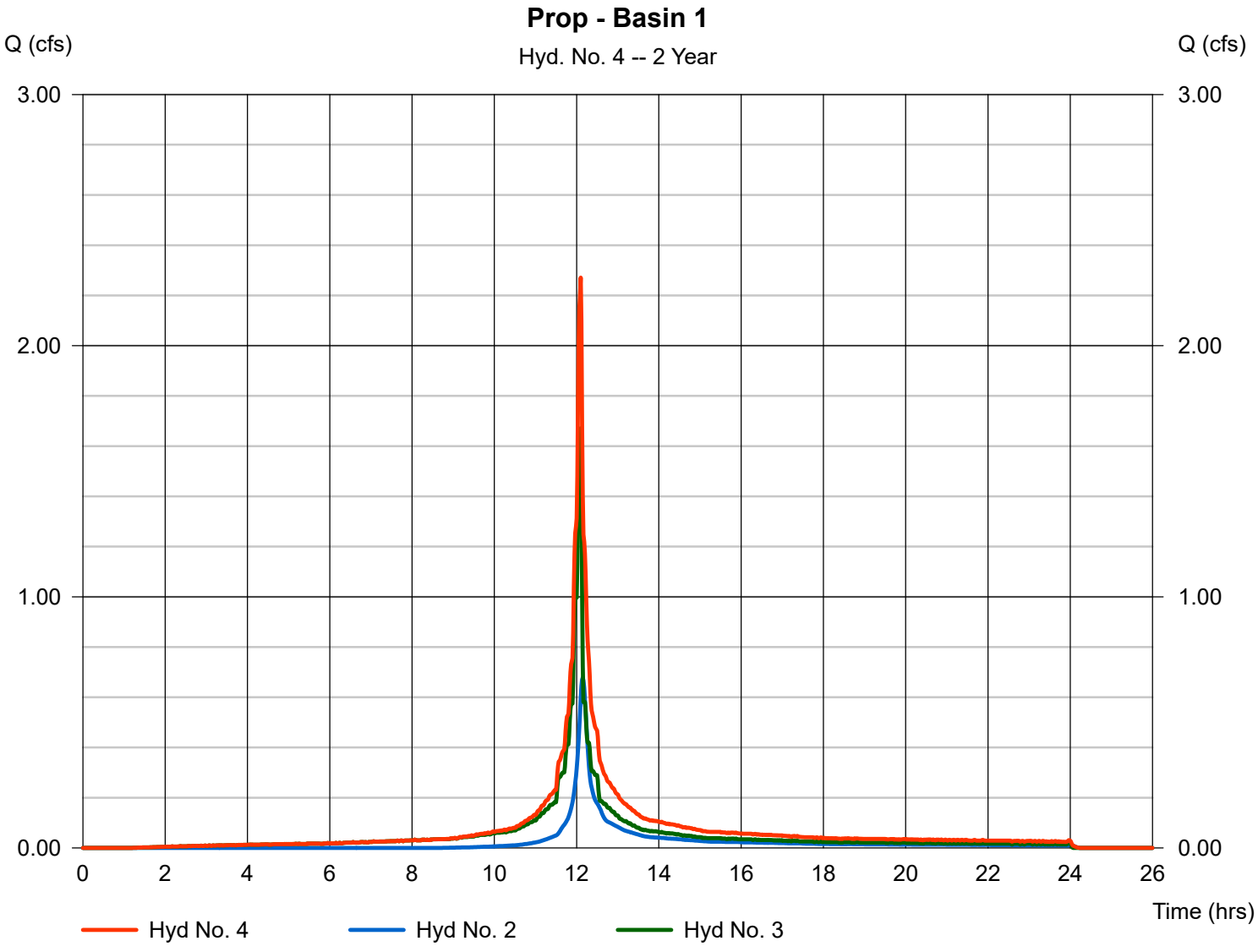
Total Travel Time, Tc ..... 1.60 min

Hydrograph Report

Hyd. No. 4

Prop - Basin 1

Hydrograph type	= Combine	Peak discharge	= 2.271 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 6,947 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 0.809 ac



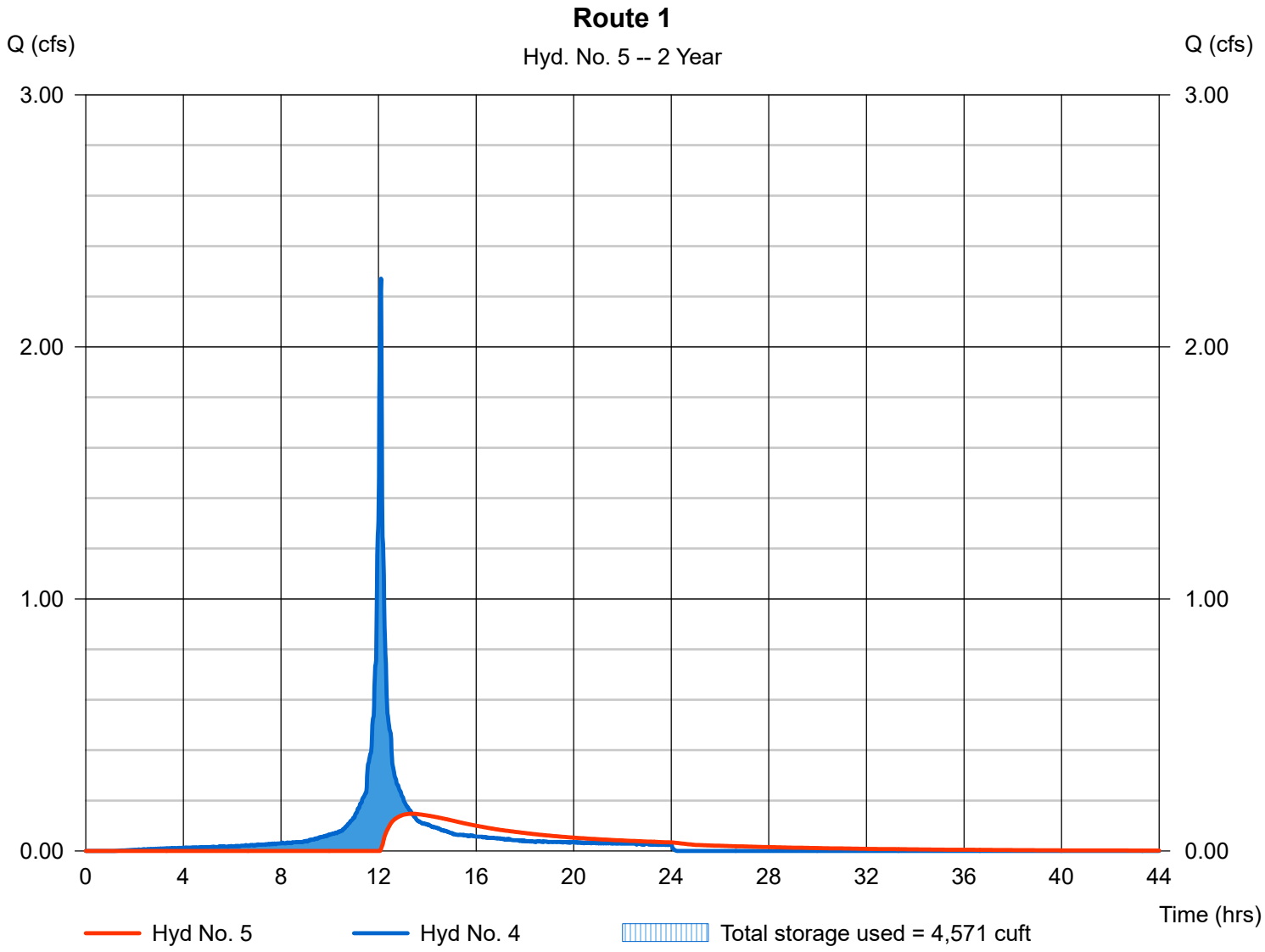
Hydrograph Report

Hyd. No. 5

Route 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.148 cfs
Storm frequency	=	2 yrs	Time to peak	=	13.40 hrs
Time interval	=	1 min	Hyd. volume	=	4,046 cuft
Inflow hyd. No.	=	4 - Prop - Basin 1	Max. Elevation	=	76.29 ft
Reservoir name	=	Basin 1	Max. Storage	=	4,571 cuft

Storage Indication method used.



Pond No. 1 - Basin 1

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 75.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	75.50	5,720	0	0
0.50	76.00	5,783	2,876	2,876
1.50	77.00	5,911	5,847	8,723
2.00	77.50	5,977	2,972	11,695

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	4.00	0.00	0.00
Span (in)	= 15.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 74.00	76.00	0.00	0.00
Length (ft)	= 80.00	0.00	0.00	0.00
Slope (%)	= 2.80	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	3.00	3.00	0.00
Crest El. (ft)	= 77.00	76.50	76.50	0.00
Weir Coeff.	= 3.20	3.20	3.20	3.33
Weir Type	= Riser	Rect	Rect	---
Multi-Stage	= Yes	Yes	Yes	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

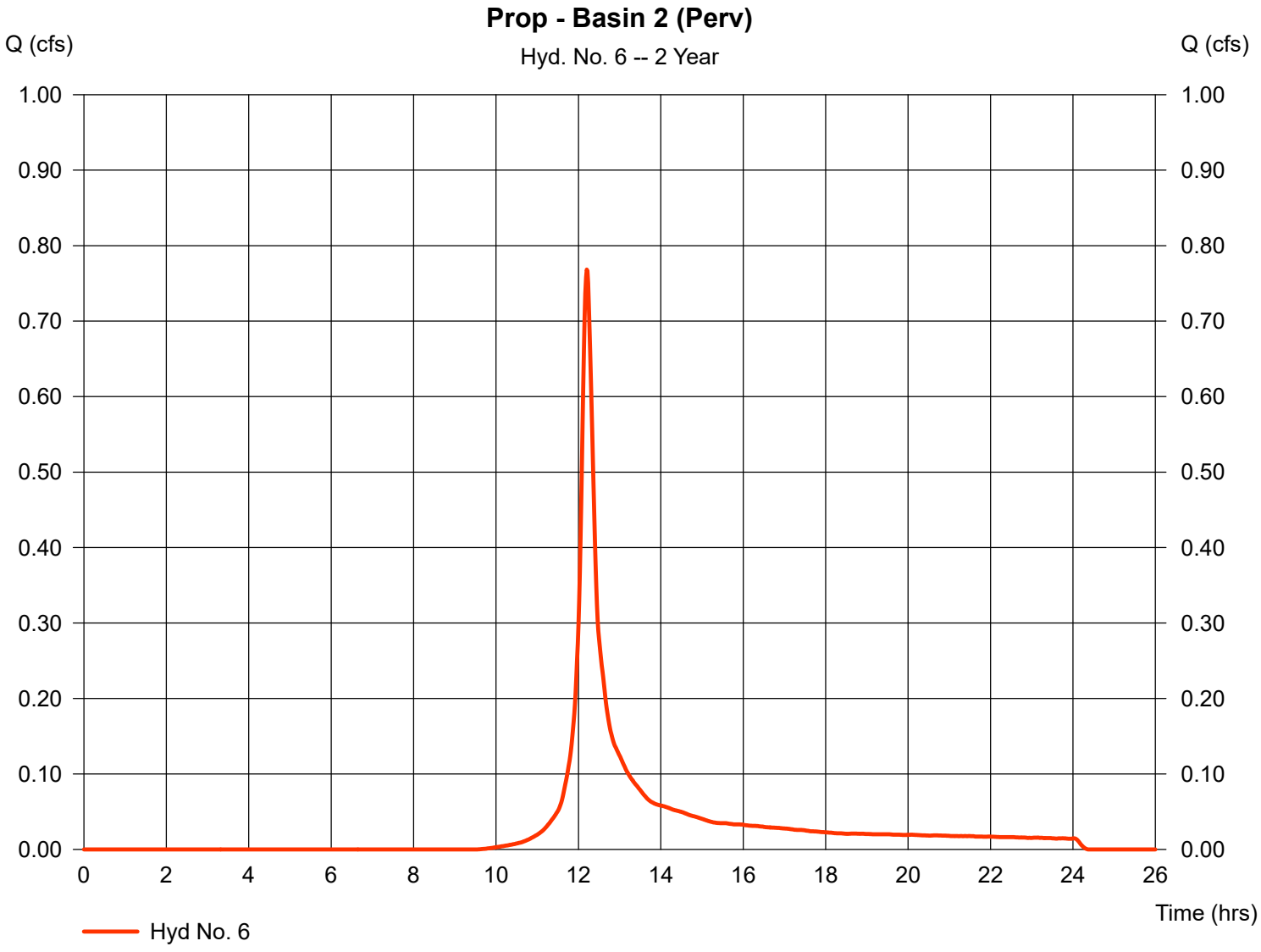
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	75.50	0.00	0.00	---	---	0.00	0.00	0.00	---	---	---	0.000
0.50	2,876	76.00	5.53 ic	0.00	---	---	0.00	0.00	0.00	---	---	---	0.000
1.50	8,723	77.00	7.17 ic	0.38 ic	---	---	0.00	3.39	3.39	---	---	---	7.172
2.00	11,695	77.50	9.99 ic	0.05 ic	---	---	5.47 s	2.22 s	2.22 s	---	---	---	9.970

Hydrograph Report

Hyd. No. 6

Prop - Basin 2 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.768 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.20 hrs
Time interval	=	1 min	Hyd. volume	=	2,802 cuft
Drainage area	=	0.535 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.10 min
Total precip.	=	3.34 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 6

Prop - Basin 2 (Perv)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.31		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 14.03**	**+**	**0.00**	**+**	**0.00**	**=**	**14.03**
Shallow Concentrated Flow							
Flow length (ft)	= 20.00		0.00		0.00		
Watercourse slope (%)	= 7.60		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 4.45		0.00		0.00		
Travel Time (min)	**= 0.07**	**+**	**0.00**	**+**	**0.00**	**=**	**0.07**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	= 0.00		0.00		0.00		
Flow length (ft)	= 0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

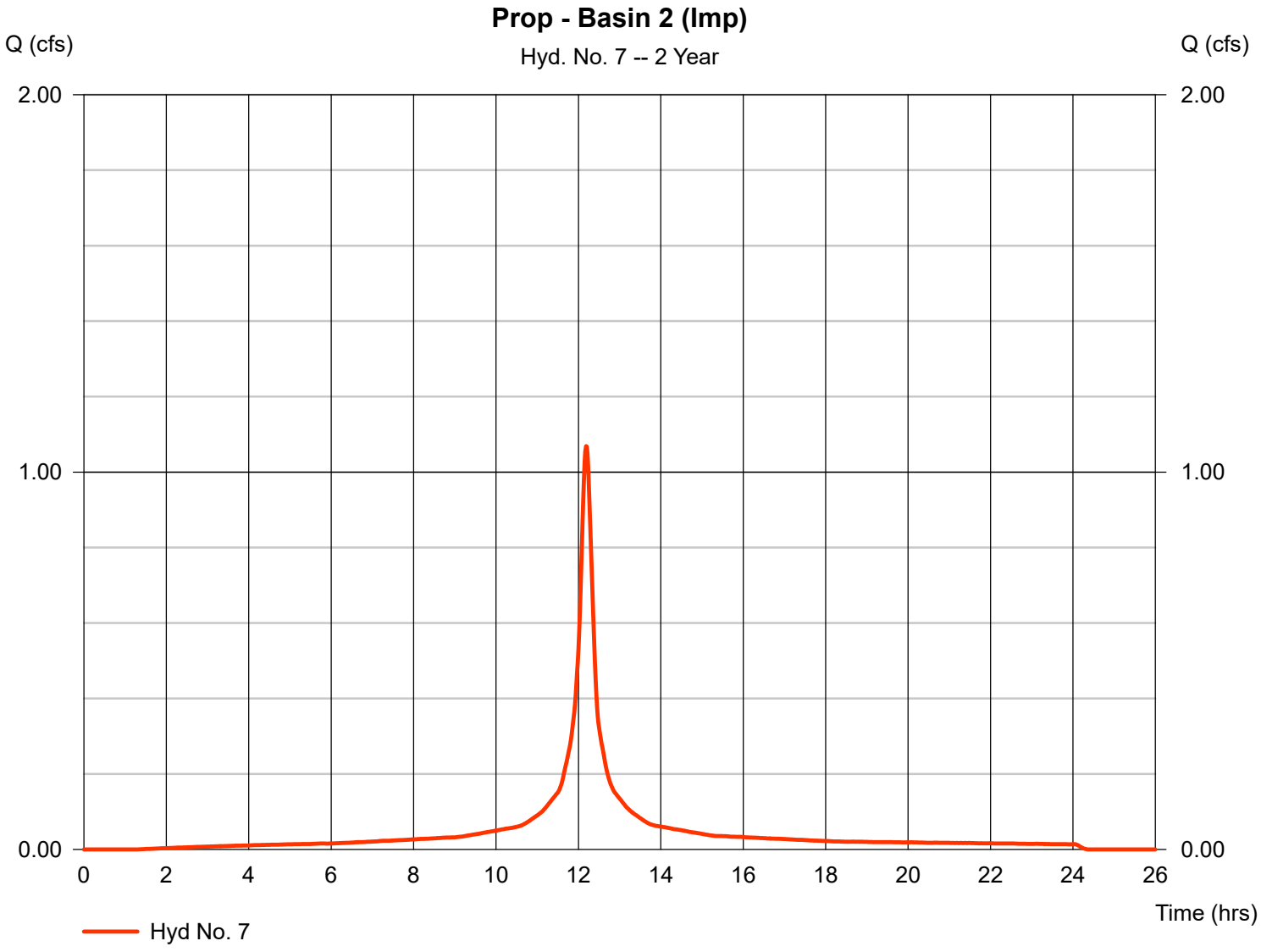
Total Travel Time, Tc ..... 14.10 min

Hydrograph Report

Hyd. No. 7

Prop - Basin 2 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.069 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	4,399 cuft
Drainage area	=	0.390 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.70 min
Total precip.	=	3.34 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 7

Prop - Basin 2 (Imp)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.240		0.011		
Flow length (ft)	= 5.0		95.0		0.0		
Two-year 24-hr precip. (in)	= 3.31		3.31		0.00		
Land slope (%)	= 2.00		2.00		0.00		
Travel Time (min)	**= 0.11**	**+**	**13.47**	**+**	**0.00**	**=**	**13.58**
Shallow Concentrated Flow							
Flow length (ft)	= 20.00		0.00		0.00		
Watercourse slope (%)	= 7.60		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 4.45		0.00		0.00		
Travel Time (min)	**= 0.07**	**+**	**0.00**	**+**	**0.00**	**=**	**0.07**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	= 0.00		0.00		0.00		
Flow length (ft)	= 0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

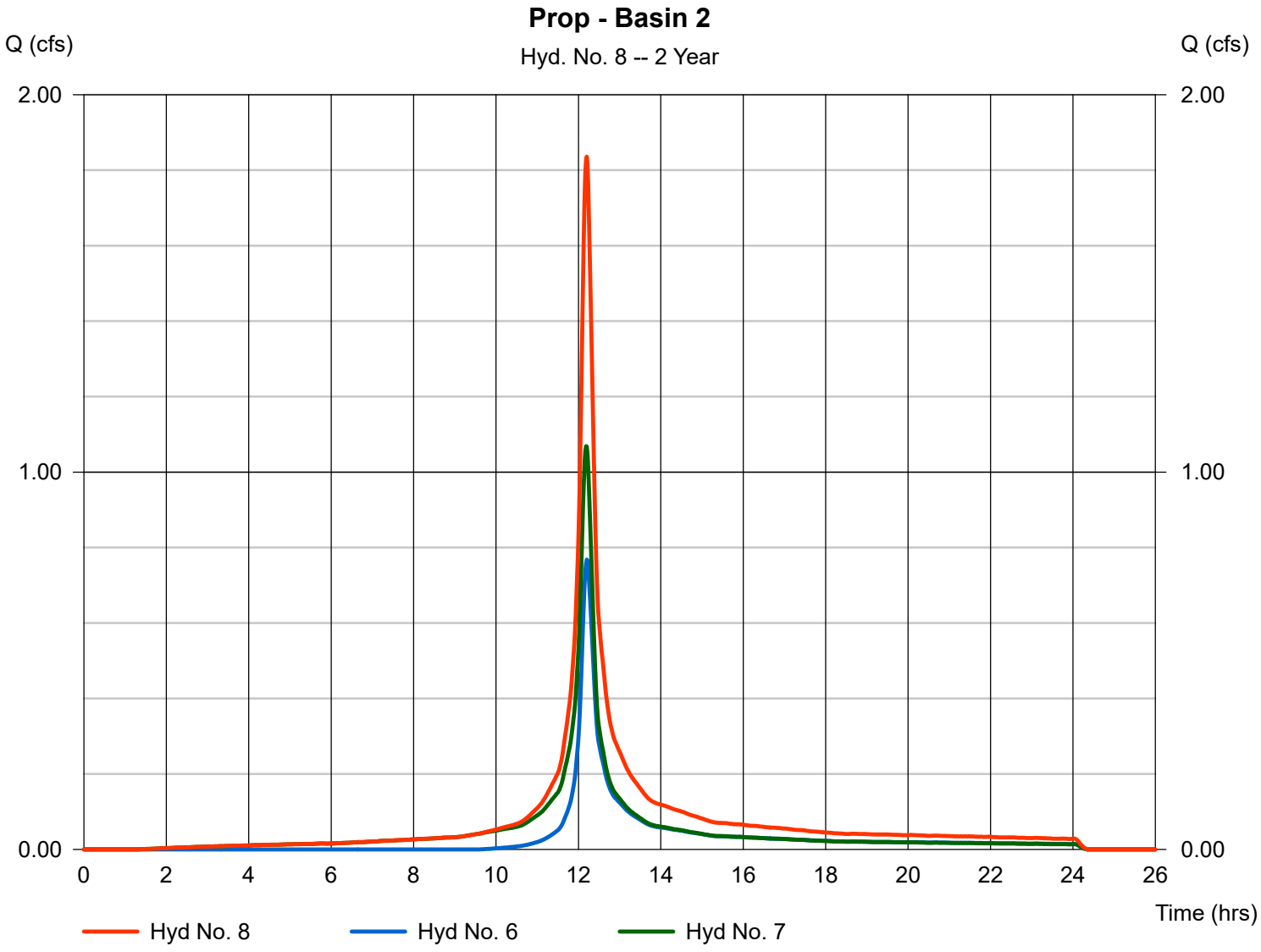
Total Travel Time, Tc ..... 13.70 min

Hydrograph Report

Hyd. No. 8

Prop - Basin 2

Hydrograph type	= Combine	Peak discharge	= 1.836 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 1 min	Hyd. volume	= 7,200 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 0.925 ac



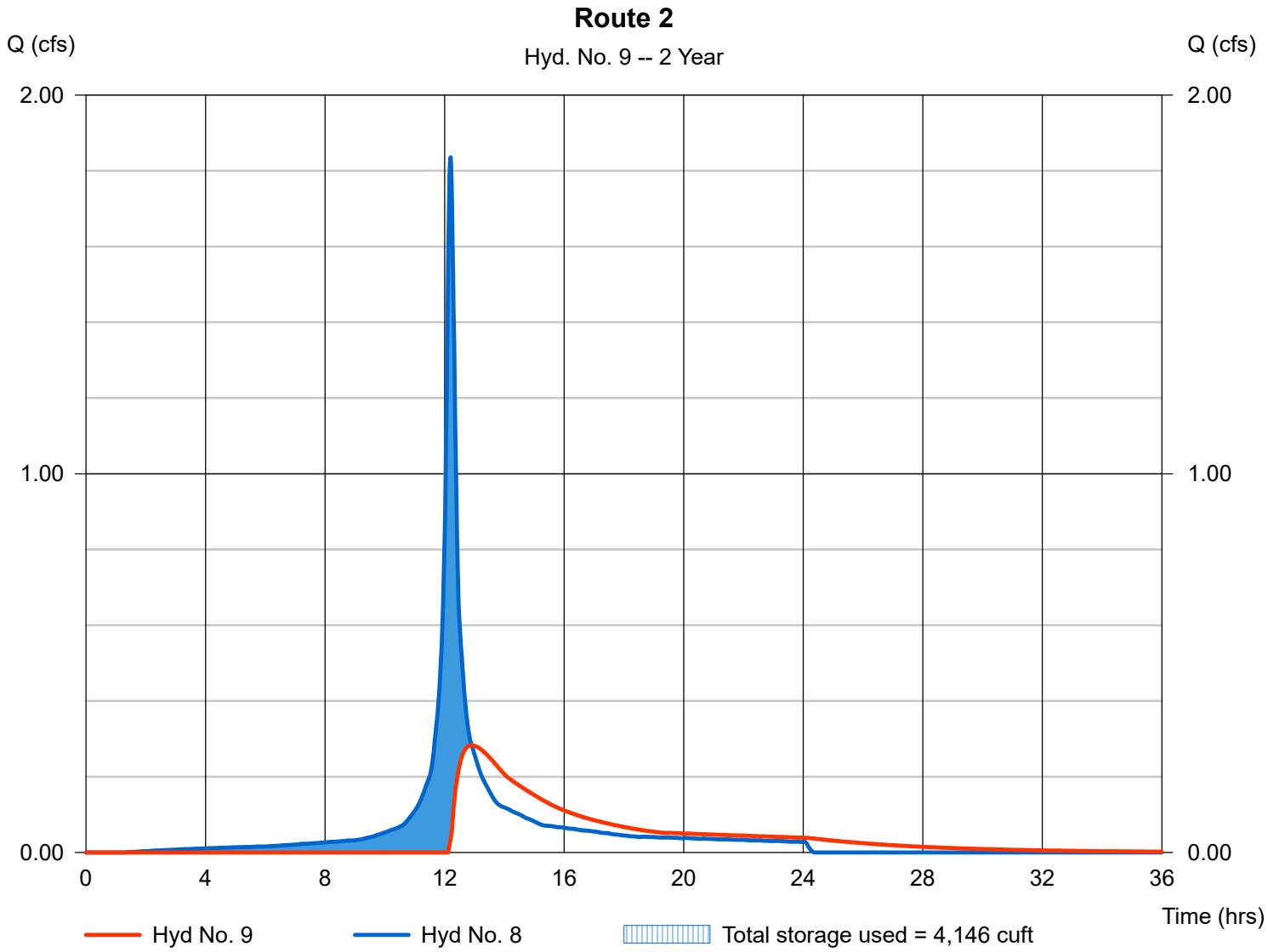
Hydrograph Report

Hyd. No. 9

Route 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.283 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.90 hrs
Time interval	=	1 min	Hyd. volume	=	4,891 cuft
Inflow hyd. No.	=	8 - Prop - Basin 2	Max. Elevation	=	73.54 ft
Reservoir name	=	Basin 2	Max. Storage	=	4,146 cuft

Storage Indication method used.



Pond No. 2 - Basin 2

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 73.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	73.00	6,711	0	0
1.00	74.00	8,589	7,650	7,650
1.50	74.50	9,587	4,544	12,194

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	4.00	0.00	0.00
Span (in)	= 15.00	10.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 71.50	73.33	0.00	0.00
Length (ft)	= 11.00	0.00	0.00	0.00
Slope (%)	= 2.00	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	3.00	0.00	0.00
Crest El. (ft)	= 74.50	74.00	0.00	0.00
Weir Coeff.	= 3.20	3.20	3.33	3.33
Weir Type	= Riser	Rect	---	---
Multi-Stage	= Yes	Yes	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	73.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.000
1.00	7,650	74.00	5.15 oc	0.95 ic	---	---	0.00	0.00	---	---	---	---	0.949
1.50	12,194	74.50	5.15 oc	1.34 ic	---	---	0.00	3.39	---	---	---	---	4.734

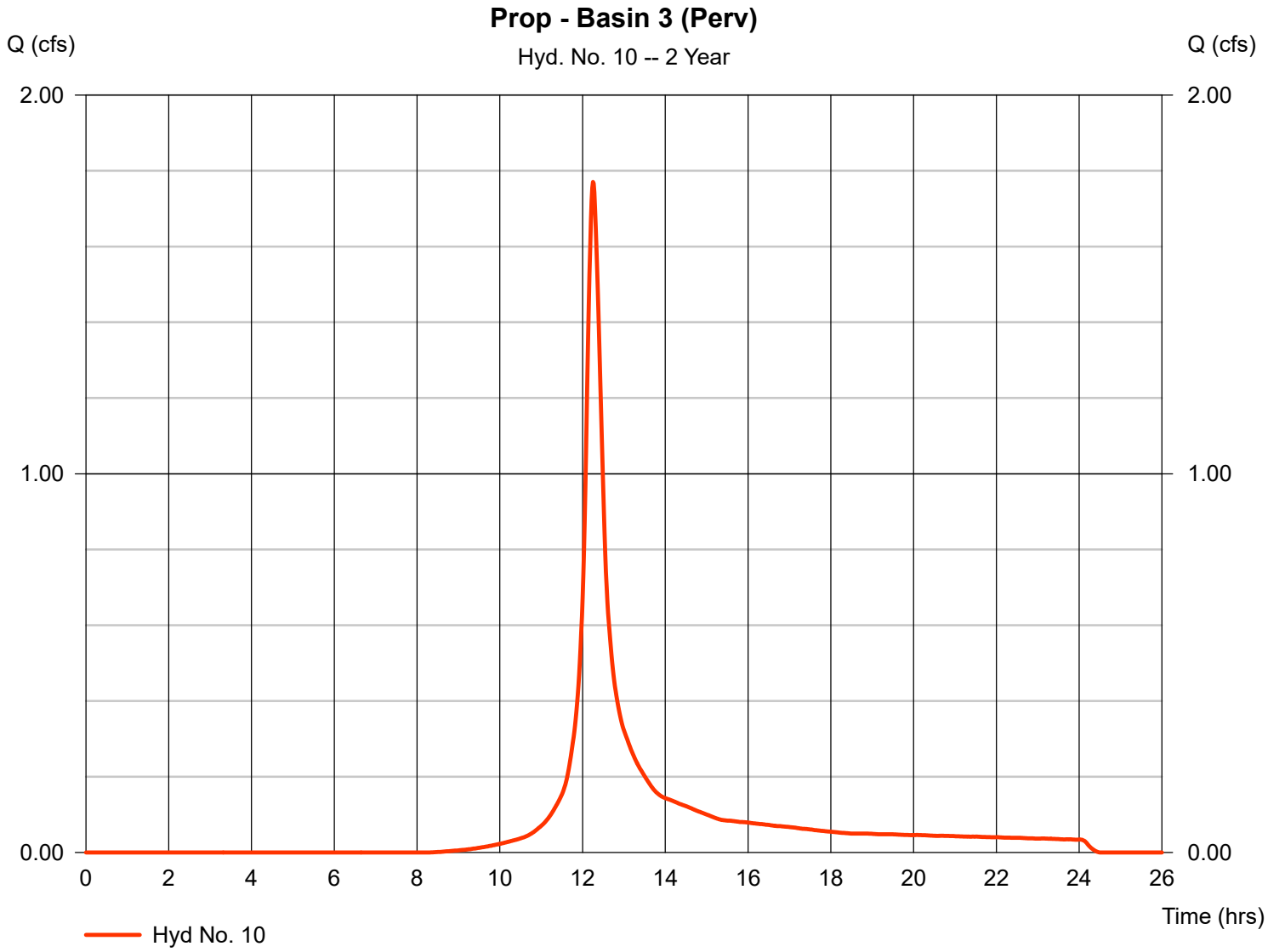
Hydrograph Report

Hyd. No. 10

Prop - Basin 3 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.771 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.25 hrs
Time interval	=	1 min	Hyd. volume	=	7,275 cuft
Drainage area	=	1.162 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.00 min
Total precip.	=	3.34 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.456 x 79) + (0.706 x 86)] / 1.162



TR55 Tc Worksheet

Hyd. No. 10

Prop - Basin 3 (Perv)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.31		0.00		0.00		
Land slope (%)	= 3.60		0.00		0.00		
Travel Time (min)	**= 11.09**	**+**	**0.00**	**+**	**0.00**	**=**	**11.09**
Shallow Concentrated Flow							
Flow length (ft)	= 0.00		0.00		0.00		
Watercourse slope (%)	= 0.00		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 0.00		0.00		0.00		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**
Channel Flow							
X sectional flow area (sqft)	= 2.50		1.23		1.77		
Wetted perimeter (ft)	= 5.39		3.14		4.71		
Channel slope (%)	= 2.40		1.40		1.20		
Manning's n-value	= 0.240		0.012		0.012		
Velocity (ft/s)	= 0.57		7.84		7.05		
Flow length (ft)	= 256.0		177.0		54.0		
Travel Time (min)	**= 7.42**	**+**	**0.38**	**+**	**0.13**	**=**	**7.93**

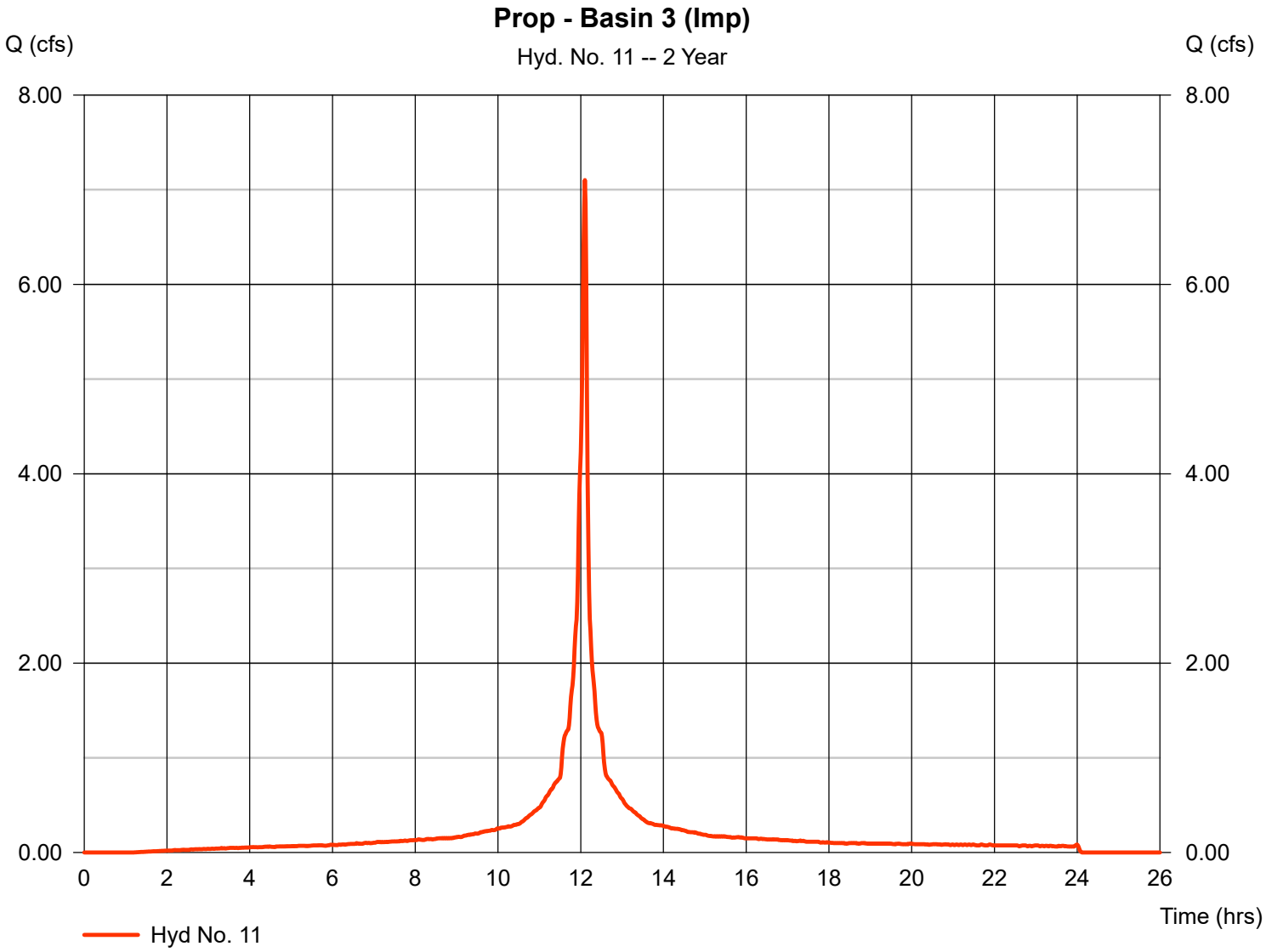
Total Travel Time, Tc ..... 19.00 min

Hydrograph Report

Hyd. No. 11

Prop - Basin 3 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.102 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	21,034 cuft
Drainage area	=	1.865 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	3.90 min
Total precip.	=	3.34 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 11

Prop - Basin 3 (Imp)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.024		0.011		
Flow length (ft)	= 16.0		84.0		0.0		
Two-year 24-hr precip. (in)	= 3.31		3.31		0.00		
Land slope (%)	= 2.00		3.60		0.00		
Travel Time (min)	**= 0.28**	**+**	**1.53**	**+**	**0.00**	**=**	**1.80**
Shallow Concentrated Flow							
Flow length (ft)	= 133.00		0.00		0.00		
Watercourse slope (%)	= 1.00		0.00		0.00		
Surface description	= Paved		Paved		Paved		
Average velocity (ft/s)	= 2.03		0.00		0.00		
Travel Time (min)	**= 1.09**	**+**	**0.00**	**+**	**0.00**	**=**	**1.09**
Channel Flow							
X sectional flow area (sqft)	= 1.23		1.77		0.00		
Wetted perimeter (ft)	= 3.93		4.71		0.00		
Channel slope (%)	= 3.10		1.00		0.00		
Manning's n-value	= 0.012		0.012		0.015		
Velocity (ft/s)	= 10.03		6.44		0.00		
Flow length (ft)	= 211.0		248.0		0.0		
Travel Time (min)	**= 0.35**	**+**	**0.64**	**+**	**0.00**	**=**	**0.99**

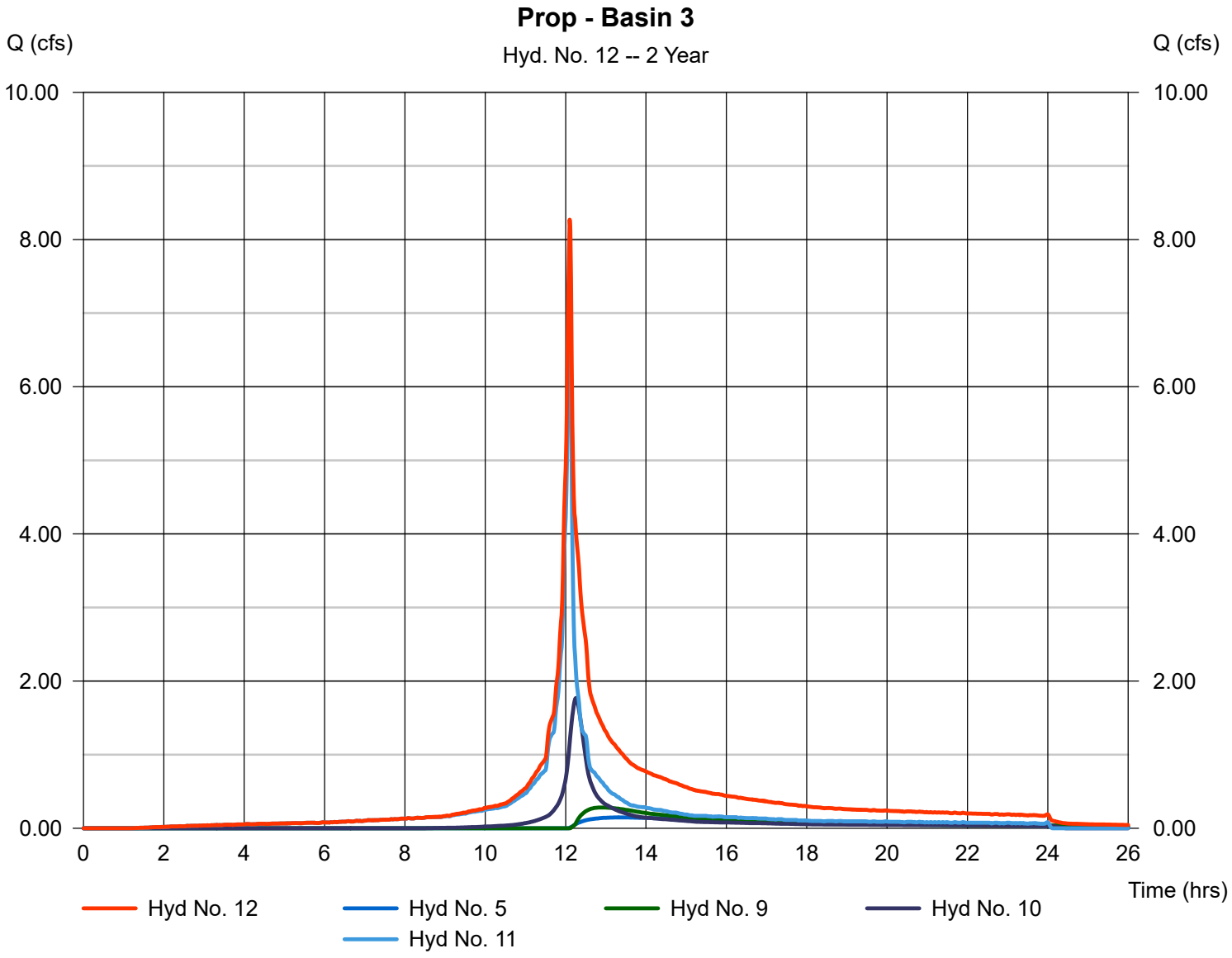
Total Travel Time, Tc ..... 3.90 min

Hydrograph Report

Hyd. No. 12

Prop - Basin 3

Hydrograph type	=	Combine	Peak discharge	=	8.271 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	37,247 cuft
Inflow hyds.	=	5, 9, 10, 11	Contrib. drain. area	=	3.027 ac



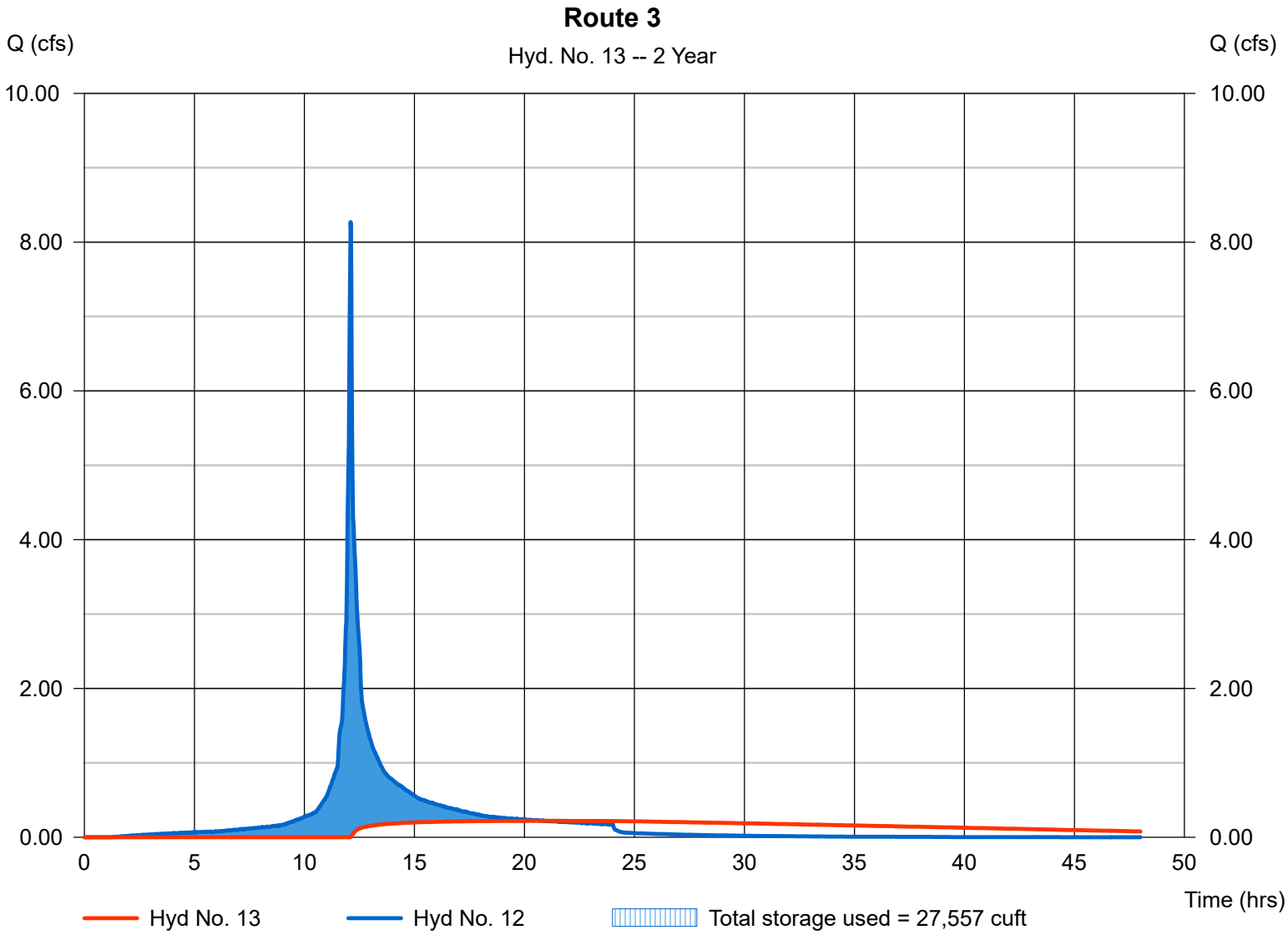
Hydrograph Report

Hyd. No. 13

Route 3

Hydrograph type	=	Reservoir	Peak discharge	=	0.220 cfs
Storm frequency	=	2 yrs	Time to peak	=	20.90 hrs
Time interval	=	1 min	Hyd. volume	=	21,746 cuft
Inflow hyd. No.	=	12 - Prop - Basin 3	Max. Elevation	=	68.74 ft
Reservoir name	=	Basin 3	Max. Storage	=	27,557 cuft

Storage Indication method used.



Pond No. 3 - Basin 3

Pond Data

Contours - User-defined contour areas. Average end area method used for volume calculation. Begining Elevation = 67.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	67.00	15,617	0	0
1.00	68.00	15,825	15,721	15,721
2.00	69.00	16,031	15,928	31,649
3.00	70.00	16,236	16,134	47,783
4.00	71.00	16,439	16,338	64,120

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	3.00	5.00	0.00
Span (in)	= 24.00	3.00	32.00	0.00
No. Barrels	= 1	1	3	0
Invert El. (ft)	= 66.00	67.75	69.00	0.00
Length (ft)	= 37.00	0.00	0.00	0.00
Slope (%)	= 3.00	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	3.00	0.00	Inactive
Crest El. (ft)	= 70.50	70.00	0.00	0.00
Weir Coeff.	= 3.20	3.20	3.33	3.20
Weir Type	= Riser	Rect	---	---
Multi-Stage	= Yes	Yes	No	Yes

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	67.00	0.00	0.00	0.00	---	0.00	0.00	---	0.00	---	---	0.000
1.00	15,721	68.00	5.35 ic	0.08 ic	0.00	---	0.00	0.00	---	0.00	---	---	0.084
2.00	31,649	69.00	5.35 ic	0.25 ic	0.00	---	0.00	0.00	---	0.00	---	---	0.251
3.00	47,783	70.00	14.63 ic	0.34 ic	14.28 ic	---	0.00	0.00	---	0.00	---	---	14.62
4.00	64,120	71.00	29.33 ic	0.12 ic	7.84 ic	---	15.08 s	6.30 s	---	0.00	---	---	29.33

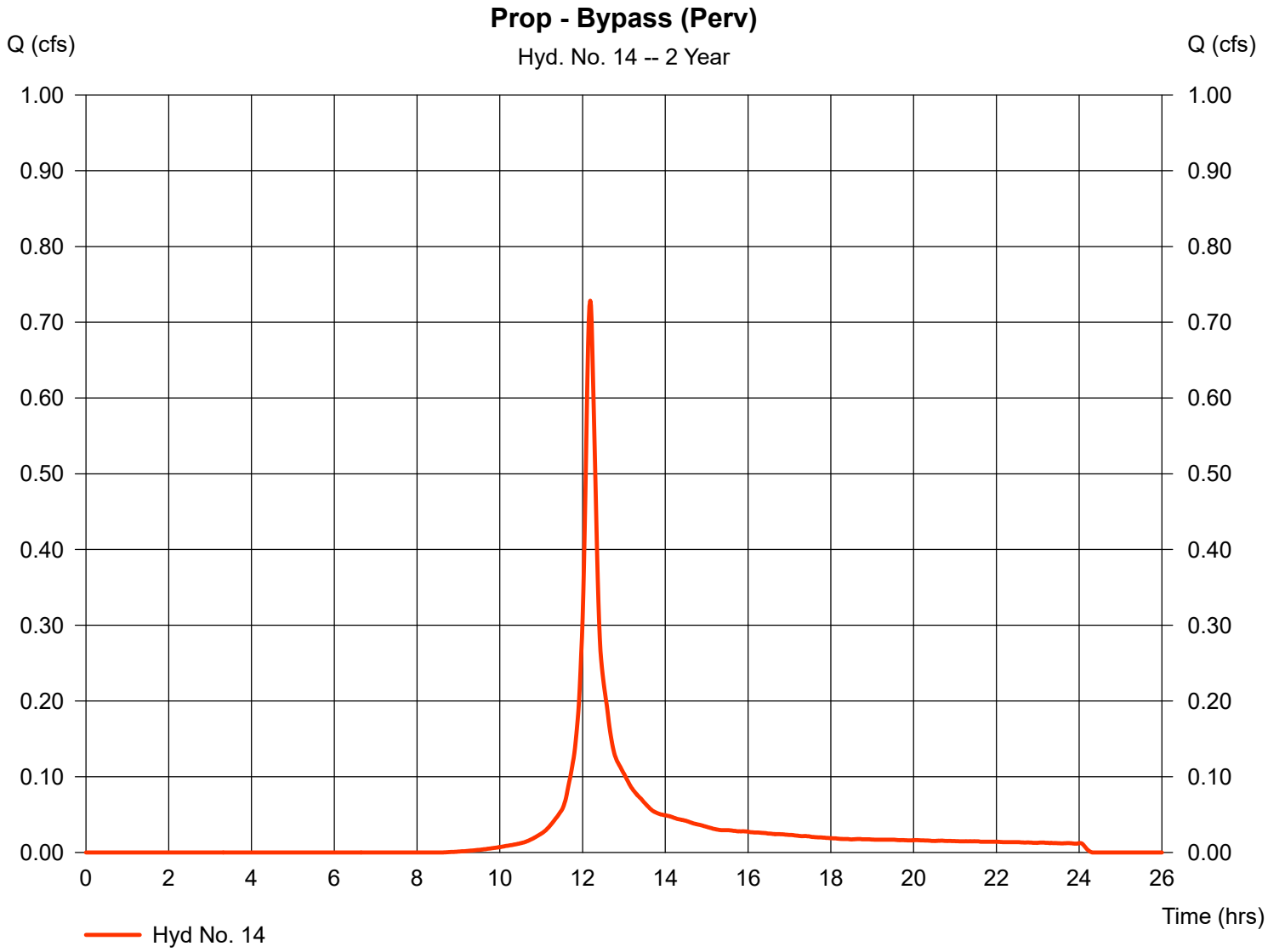
Hydrograph Report

Hyd. No. 14

Prop - Bypass (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.728 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	2,502 cuft
Drainage area	=	0.424 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.80 min
Total precip.	=	3.34 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.214 x 79) + (0.210 x 86)] / 0.424



TR55 Tc Worksheet

Hyd. No. 14

Prop - Bypass (Perv)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.31		0.00		0.00		
Land slope (%)	= 7.50		0.00		0.00		
Travel Time (min)	**= 8.27**	**+**	**0.00**	**+**	**0.00**	**=**	**8.27**
Shallow Concentrated Flow							
Flow length (ft)	= 507.00		0.00		0.00		
Watercourse slope (%)	= 2.20		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 2.39		0.00		0.00		
Travel Time (min)	**= 3.53**	**+**	**0.00**	**+**	**0.00**	**=**	**3.53**
Channel Flow							
X sectional flow area (sqft)	= 7.07		0.00		0.00		
Wetted perimeter (ft)	= 9.43		0.00		0.00		
Channel slope (%)	= 2.00		0.00		0.00		
Manning's n-value	= 0.013		0.015		0.015		
Velocity (ft/s)	= 13.37		0.00		0.00		
Flow length (ft)	= 10.0		0.0		0.0		
Travel Time (min)	**= 0.01**	**+**	**0.00**	**+**	**0.00**	**=**	**0.01**

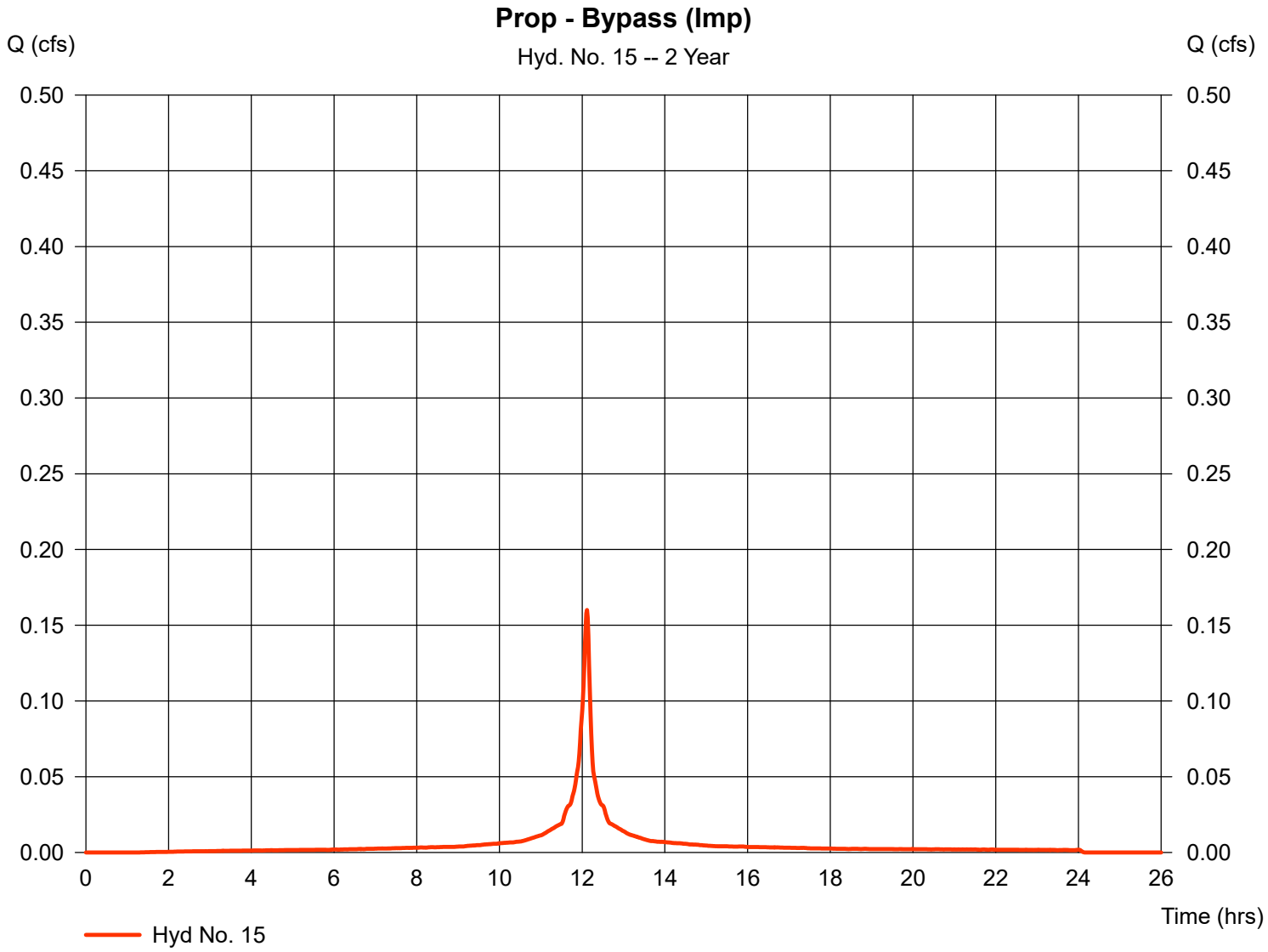
Total Travel Time, Tc ..... 11.80 min

Hydrograph Report

Hyd. No. 15

Prop - Bypass (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.160 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.12 hrs
Time interval	=	1 min	Hyd. volume	=	512 cuft
Drainage area	=	0.044 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.50 min
Total precip.	=	3.34 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 15

Prop - Bypass (Imp)

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.011		0.240		0.011		
Flow length (ft)	= 84.0		16.0		0.0		
Two-year 24-hr precip. (in)	= 3.31		3.31		0.00		
Land slope (%)	= 2.00		7.50		0.00		
Travel Time (min)	**= 1.04**	**+**	**1.91**	**+**	**0.00**	**=**	**2.95**
Shallow Concentrated Flow							
Flow length (ft)	= 507.00		0.00		0.00		
Watercourse slope (%)	= 2.20		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 2.39		0.00		0.00		
Travel Time (min)	**= 3.53**	**+**	**0.00**	**+**	**0.00**	**=**	**3.53**
Channel Flow							
X sectional flow area (sqft)	= 7.07		0.00		0.00		
Wetted perimeter (ft)	= 9.43		0.00		0.00		
Channel slope (%)	= 2.00		0.00		0.00		
Manning's n-value	= 0.013		0.015		0.015		
Velocity (ft/s)	= 13.37		0.00		0.00		
Flow length (ft)	= 10.0		0.0		0.0		
Travel Time (min)	**= 0.01**	**+**	**0.00**	**+**	**0.00**	**=**	**0.01**

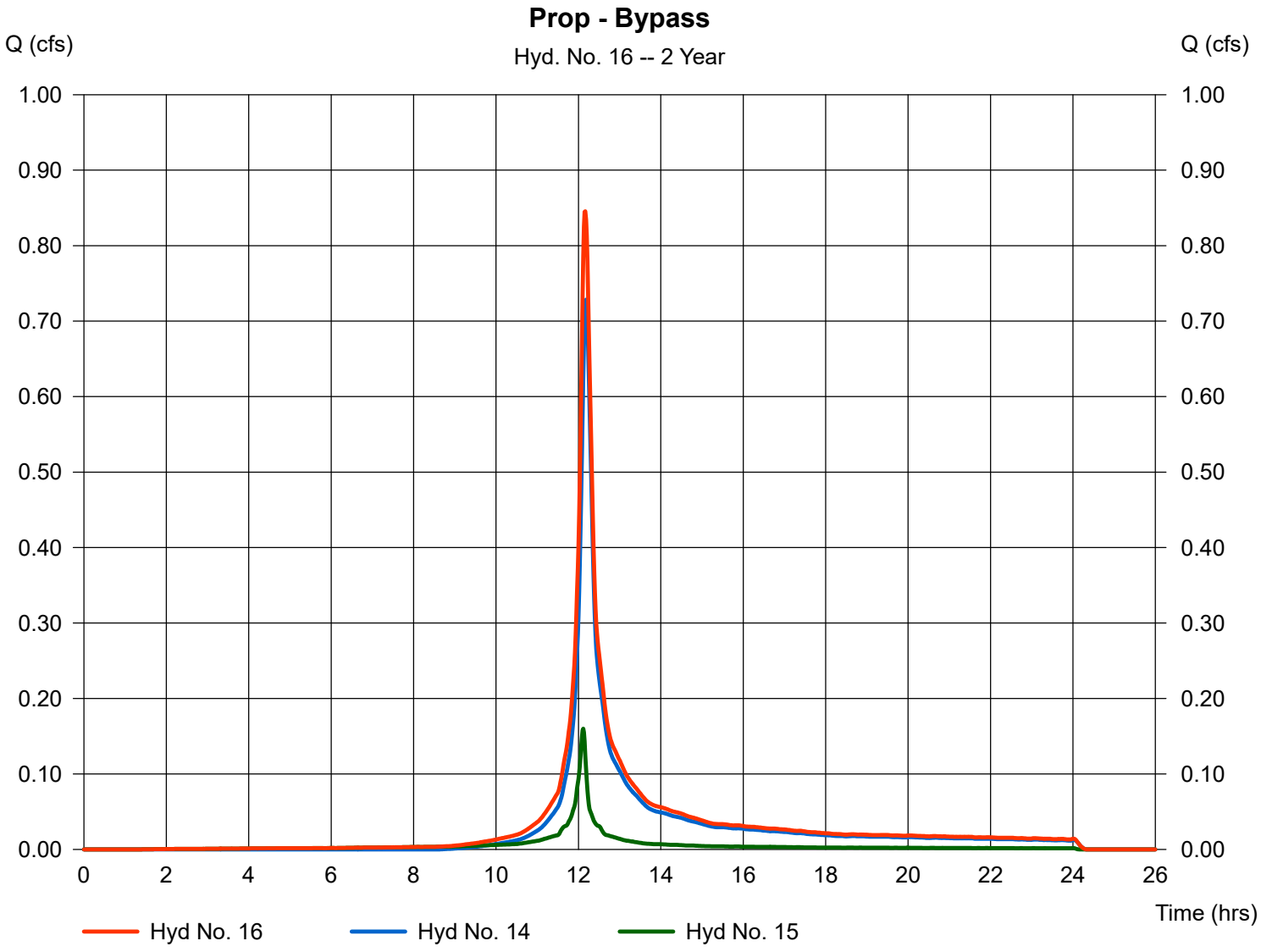
Total Travel Time, Tc ..... 6.50 min

Hydrograph Report

Hyd. No. 16

Prop - Bypass

Hydrograph type	=	Combine	Peak discharge	=	0.845 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.17 hrs
Time interval	=	1 min	Hyd. volume	=	3,014 cuft
Inflow hyds.	=	14, 15	Contrib. drain. area	=	0.468 ac

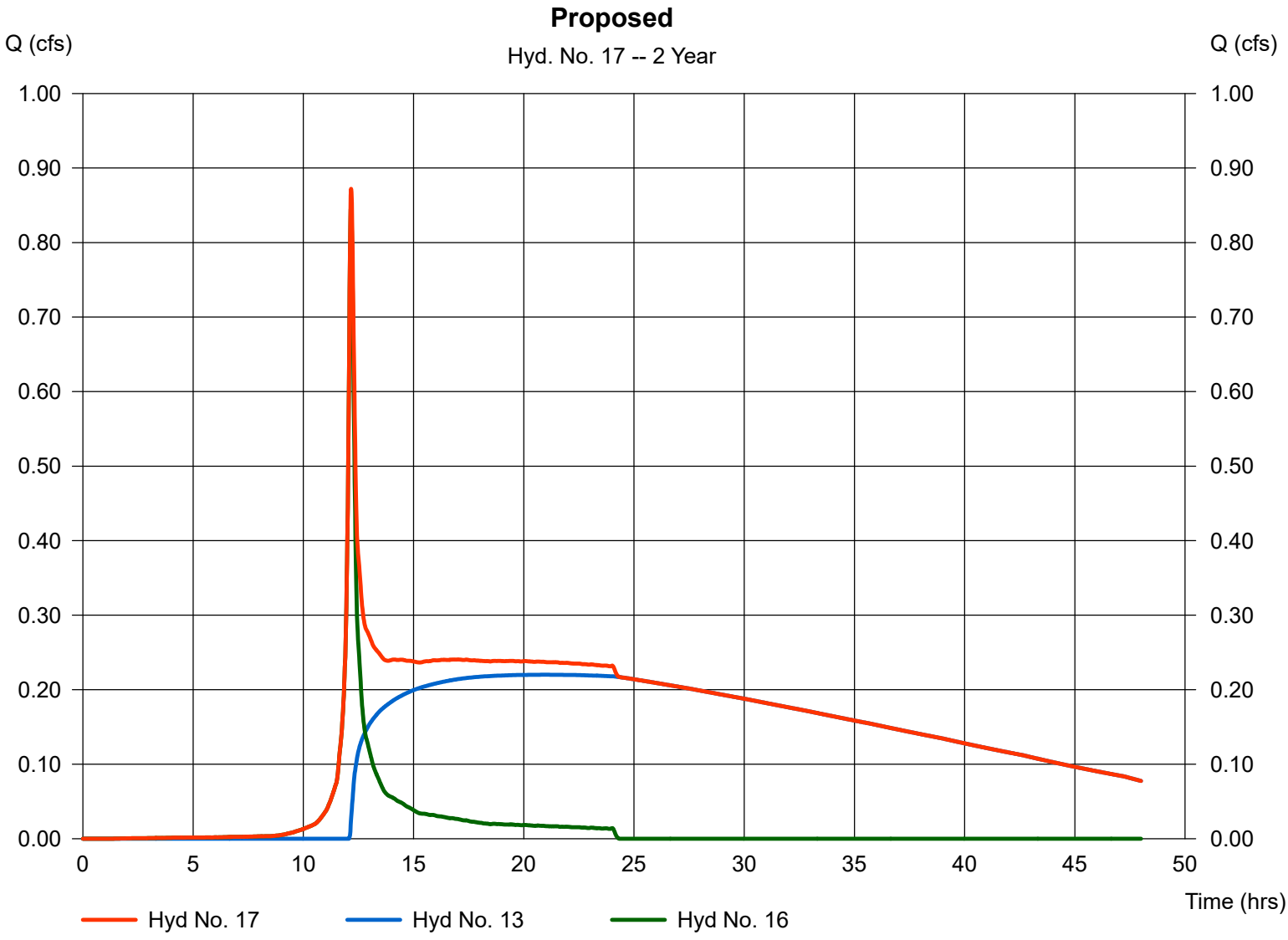


Hydrograph Report

Hyd. No. 17

Proposed

Hydrograph type	= Combine	Peak discharge	= 0.872 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 1 min	Hyd. volume	= 24,759 cuft
Inflow hyds.	= 13, 16	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	6.757	1	734	27,591	------	------	------	Existing
2	SCS Runoff	1.290	1	729	4,049	------	------	------	Prop - Basin 1 (Perv)
3	SCS Runoff	2.570	1	726	7,595	------	------	------	Prop - Basin 1 (Imp)
4	Combine	3.734	1	726	11,644	2, 3	------	------	Prop - Basin 1
5	Reservoir	0.904	1	742	8,744	4	76.60	6,394	Route 1
6	SCS Runoff	1.551	1	732	5,625	------	------	------	Prop - Basin 2 (Perv)
7	SCS Runoff	1.647	1	731	6,899	------	------	------	Prop - Basin 2 (Imp)
8	Combine	3.195	1	732	12,524	6, 7	------	------	Prop - Basin 2
9	Reservoir	0.785	1	757	10,214	8	73.84	6,450	Route 2
10	SCS Runoff	3.337	1	735	13,809	------	------	------	Prop - Basin 3 (Perv)
11	SCS Runoff	10.93	1	726	32,990	------	------	------	Prop - Basin 3 (Imp)
12	Combine	13.67	1	726	65,757	5, 9, 10, 11	------	------	Prop - Basin 3
13	Reservoir	2.505	1	784	48,382	12	69.19	34,669	Route 3
14	SCS Runoff	1.390	1	731	4,814	------	------	------	Prop - Bypass (Perv)
15	SCS Runoff	0.246	1	727	803	------	------	------	Prop - Bypass (Imp)
16	Combine	1.574	1	730	5,617	14, 15	------	------	Prop - Bypass
17	Combine	2.699	1	782	54,000	13, 16	------	------	Proposed

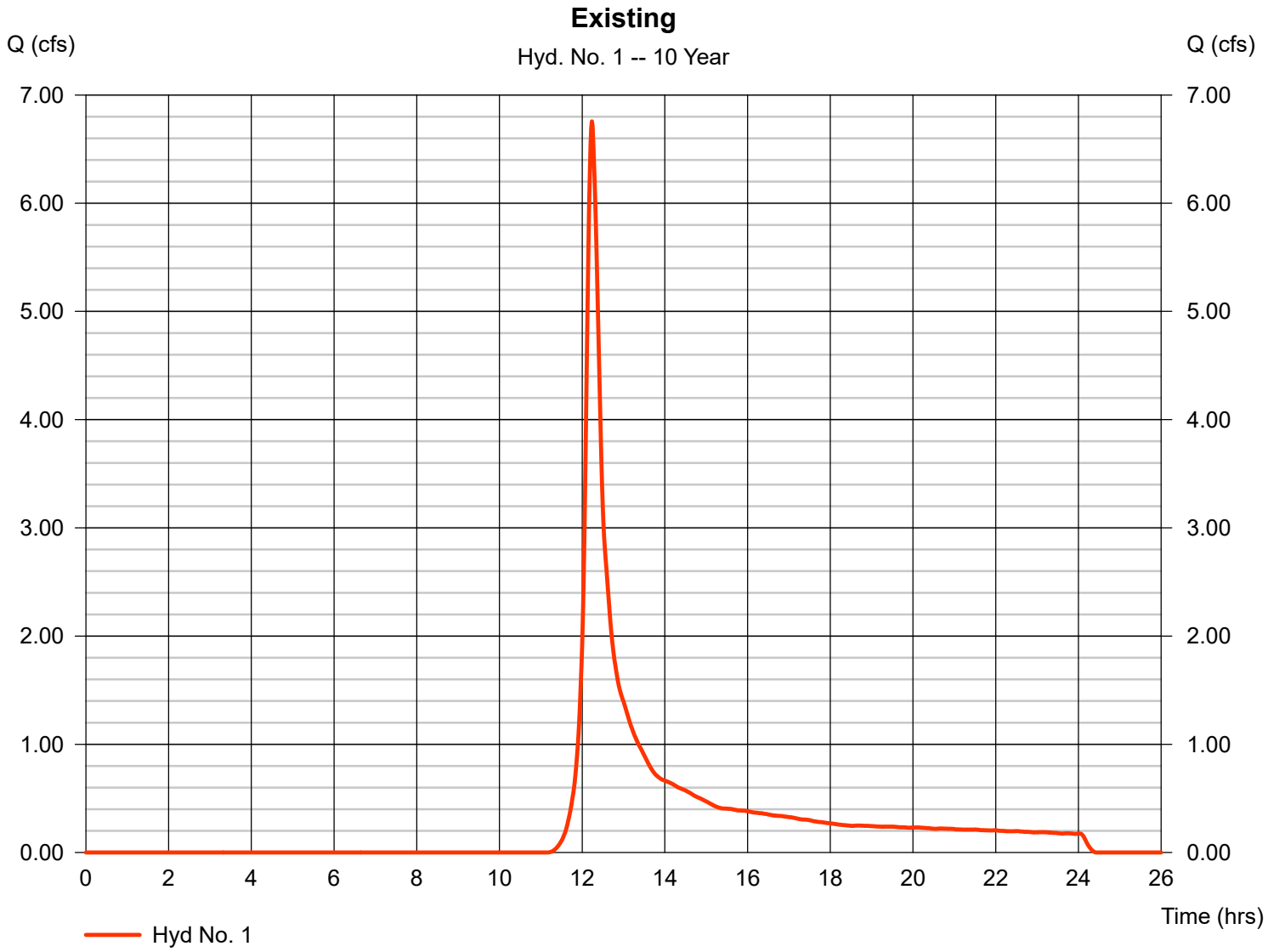
Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.757 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.23 hrs
Time interval	=	1 min	Hyd. volume	=	27,591 cuft
Drainage area	=	5.229 ac	Curve number	=	61*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.40 min
Total precip.	=	5.11 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(2.998 x 55) + (2.231 x 70)] / 5.229



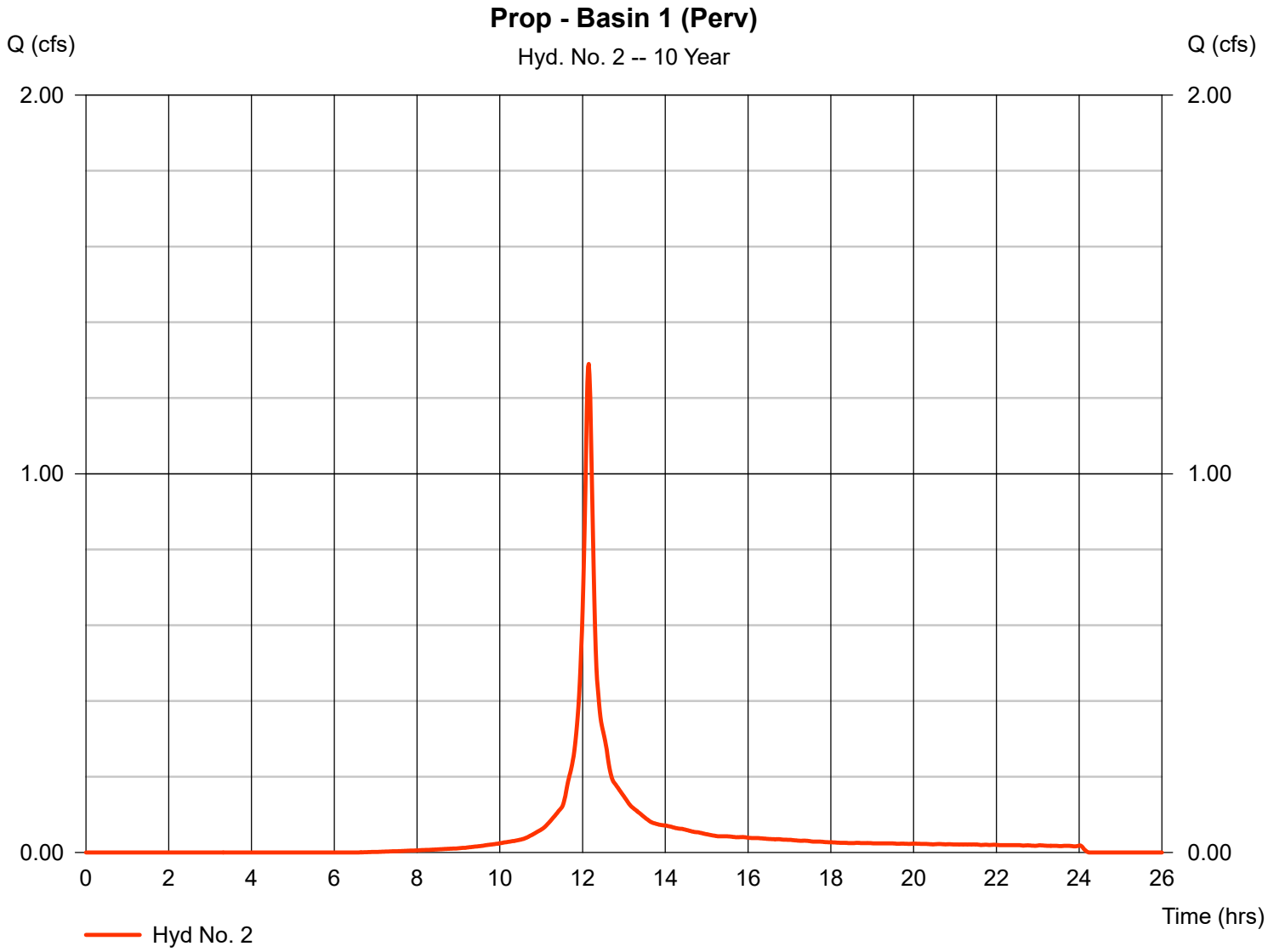
Hydrograph Report

Hyd. No. 2

Prop - Basin 1 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.290 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.15 hrs
Time interval	=	1 min	Hyd. volume	=	4,049 cuft
Drainage area	=	0.351 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.20 min
Total precip.	=	5.11 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.196 x 79) + (0.155 x 86)] / 0.351

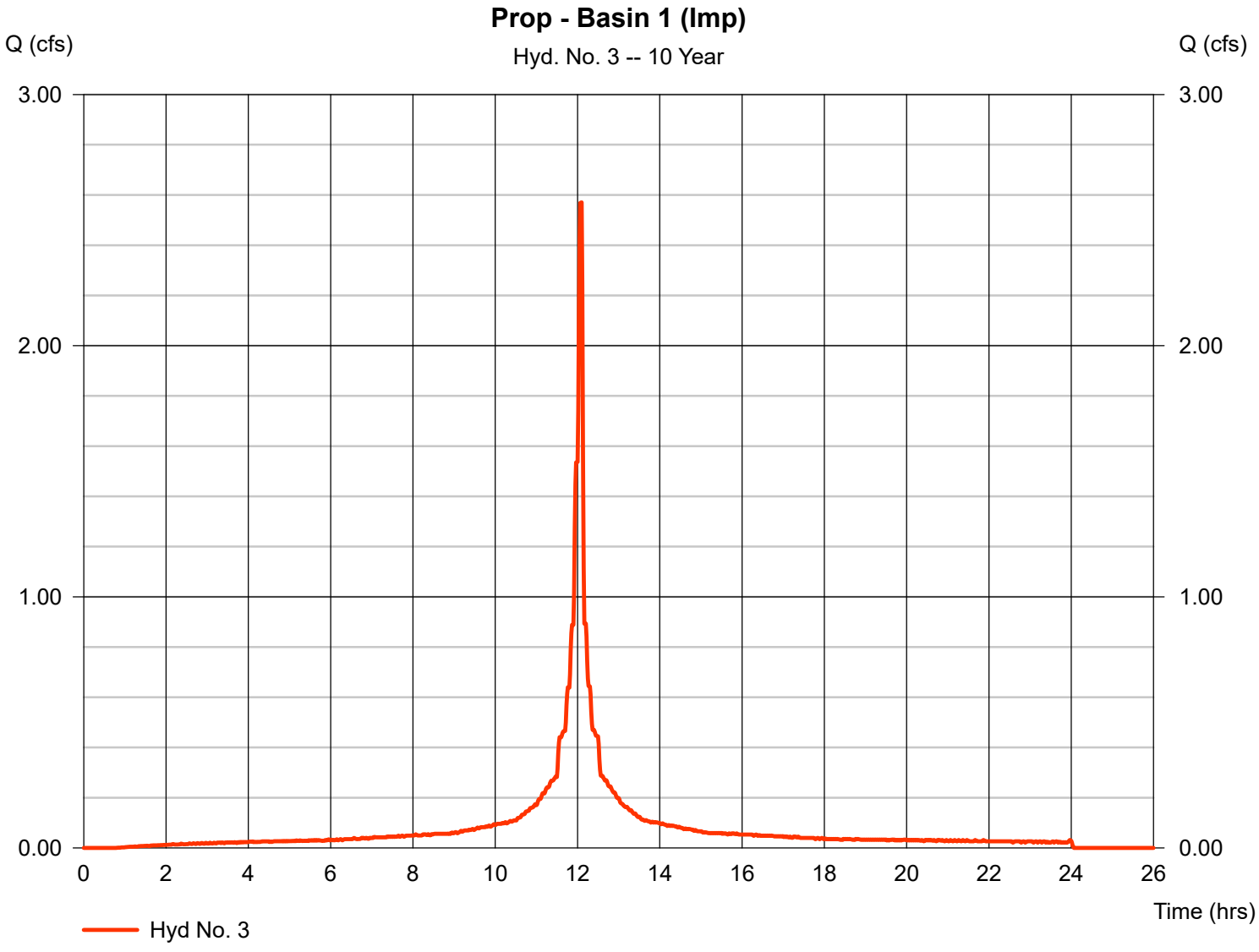


Hydrograph Report

Hyd. No. 3

Prop - Basin 1 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.570 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	7,595 cuft
Drainage area	=	0.458 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	1.60 min
Total precip.	=	5.11 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

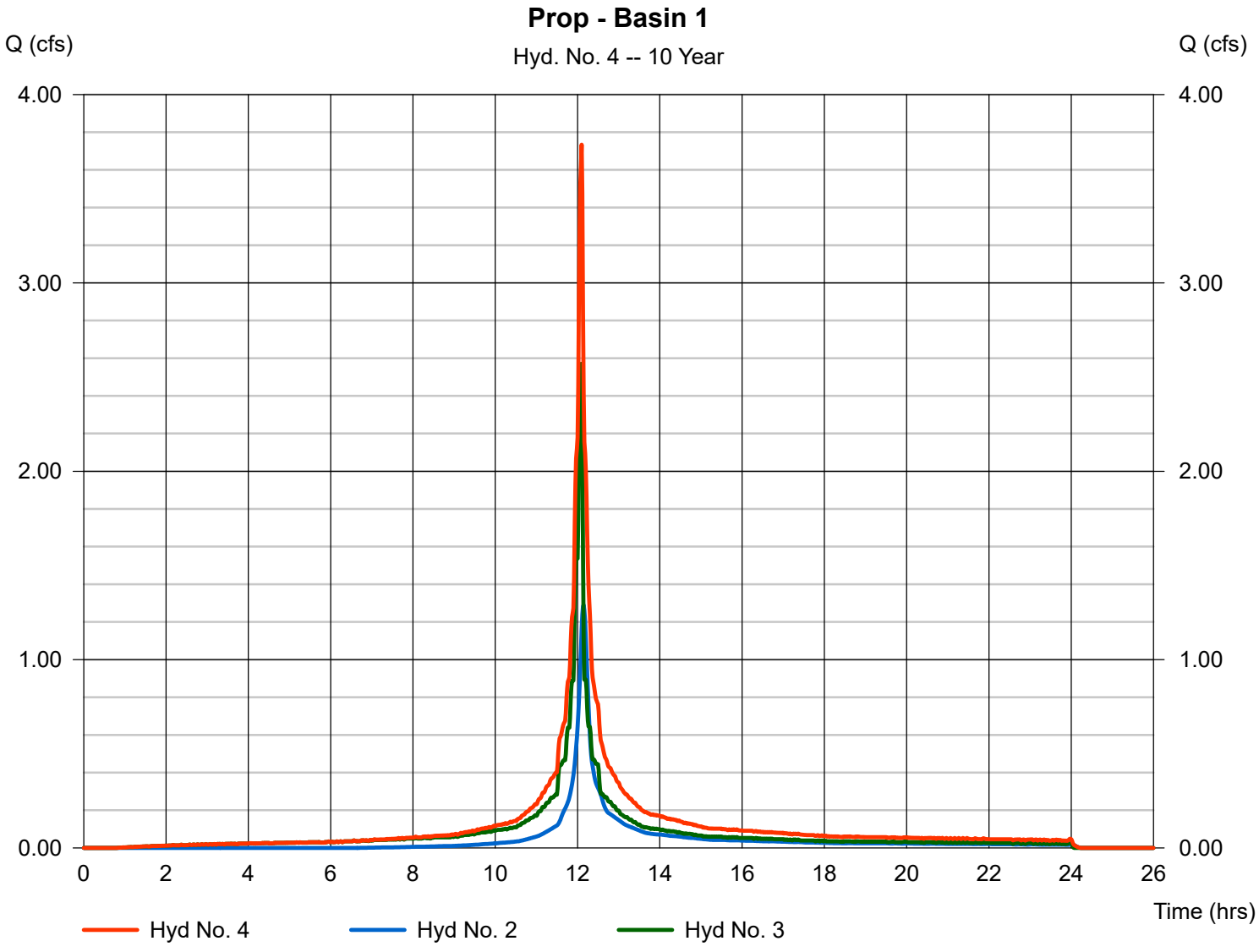


Hydrograph Report

Hyd. No. 4

Prop - Basin 1

Hydrograph type	= Combine	Peak discharge	= 3.734 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 11,644 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 0.809 ac



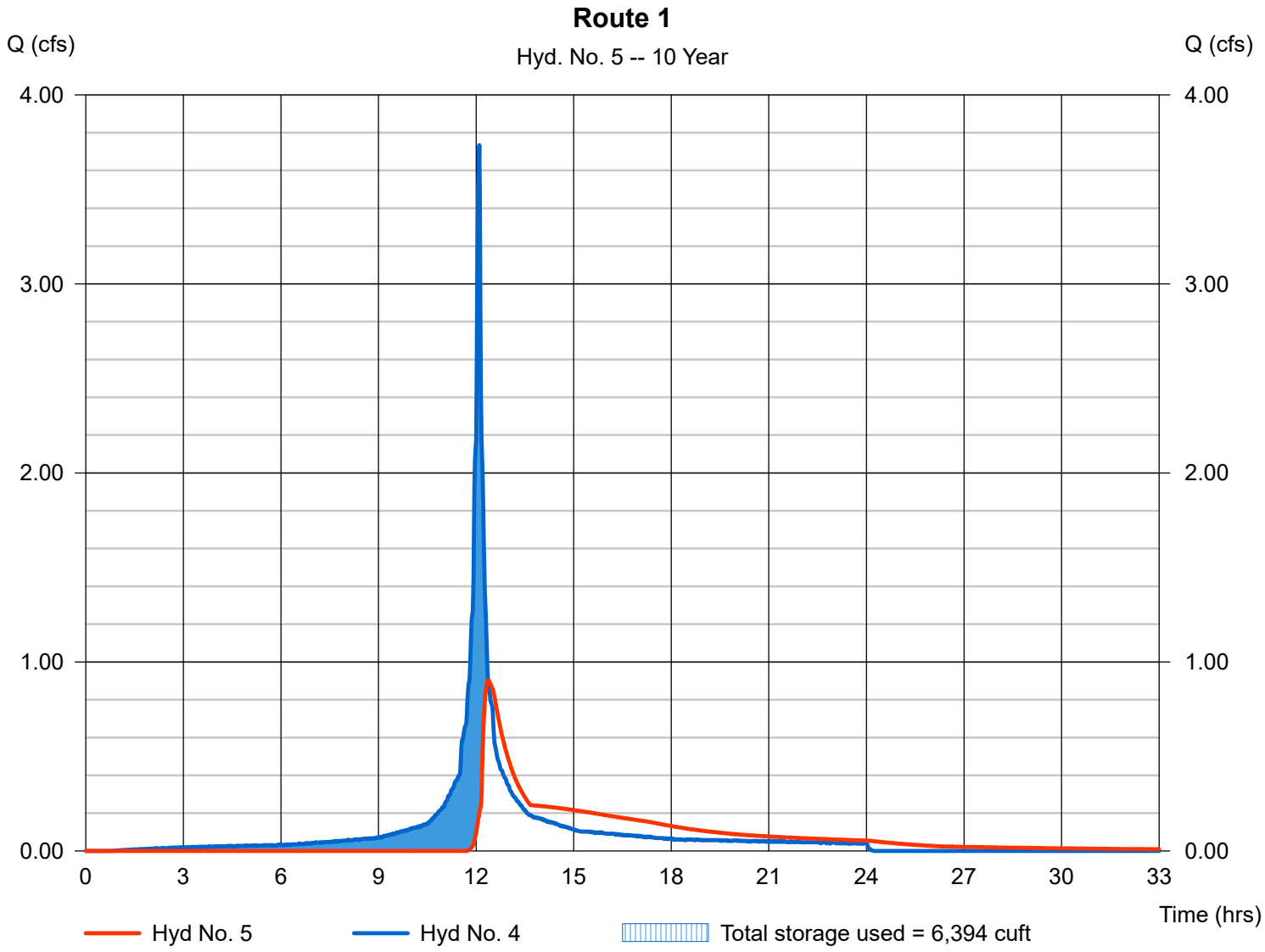
Hydrograph Report

Hyd. No. 5

Route 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.904 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.37 hrs
Time interval	=	1 min	Hyd. volume	=	8,744 cuft
Inflow hyd. No.	=	4 - Prop - Basin 1	Max. Elevation	=	76.60 ft
Reservoir name	=	Basin 1	Max. Storage	=	6,394 cuft

Storage Indication method used.

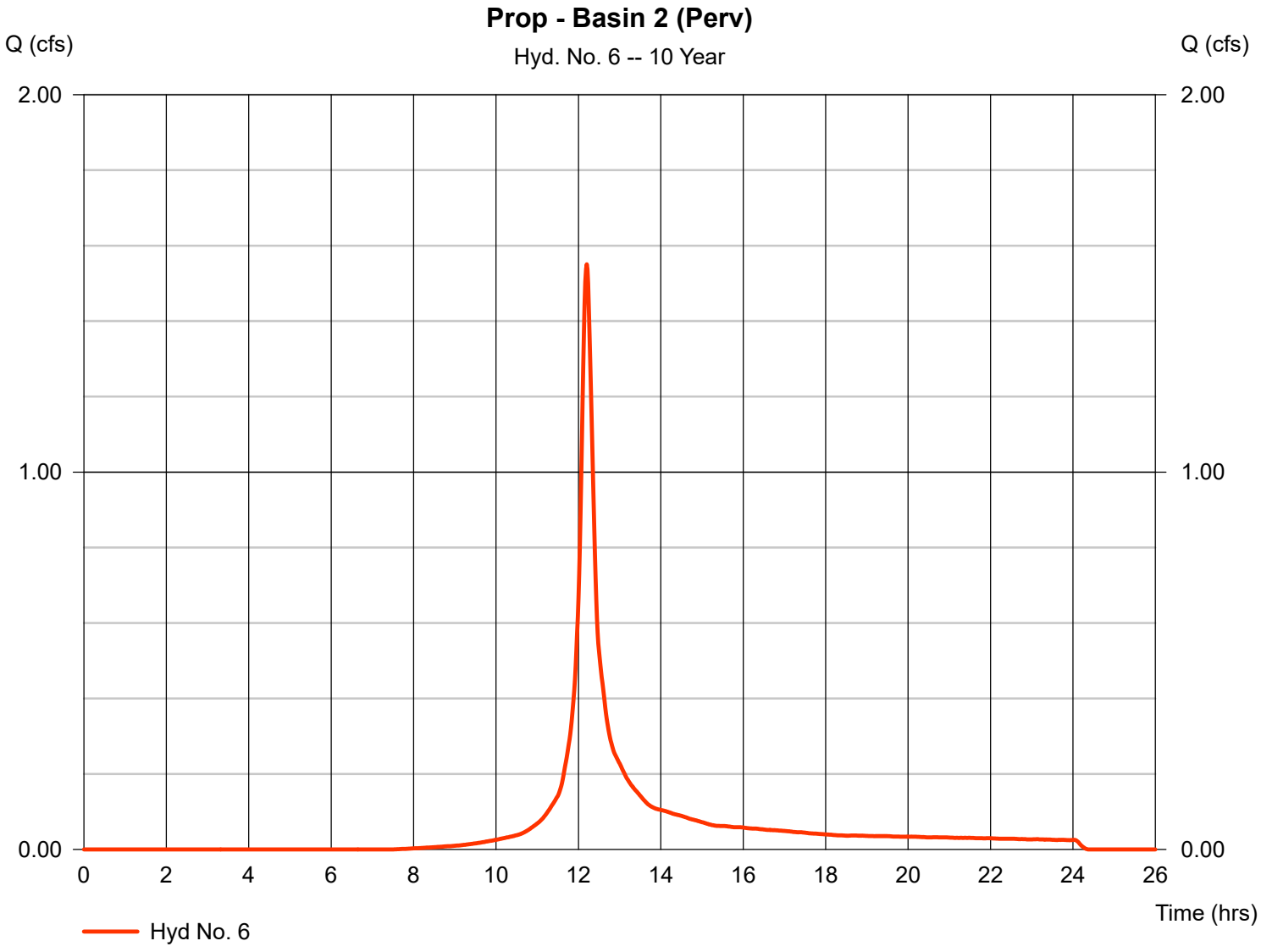


Hydrograph Report

Hyd. No. 6

Prop - Basin 2 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.551 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.20 hrs
Time interval	=	1 min	Hyd. volume	=	5,625 cuft
Drainage area	=	0.535 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.10 min
Total precip.	=	5.11 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

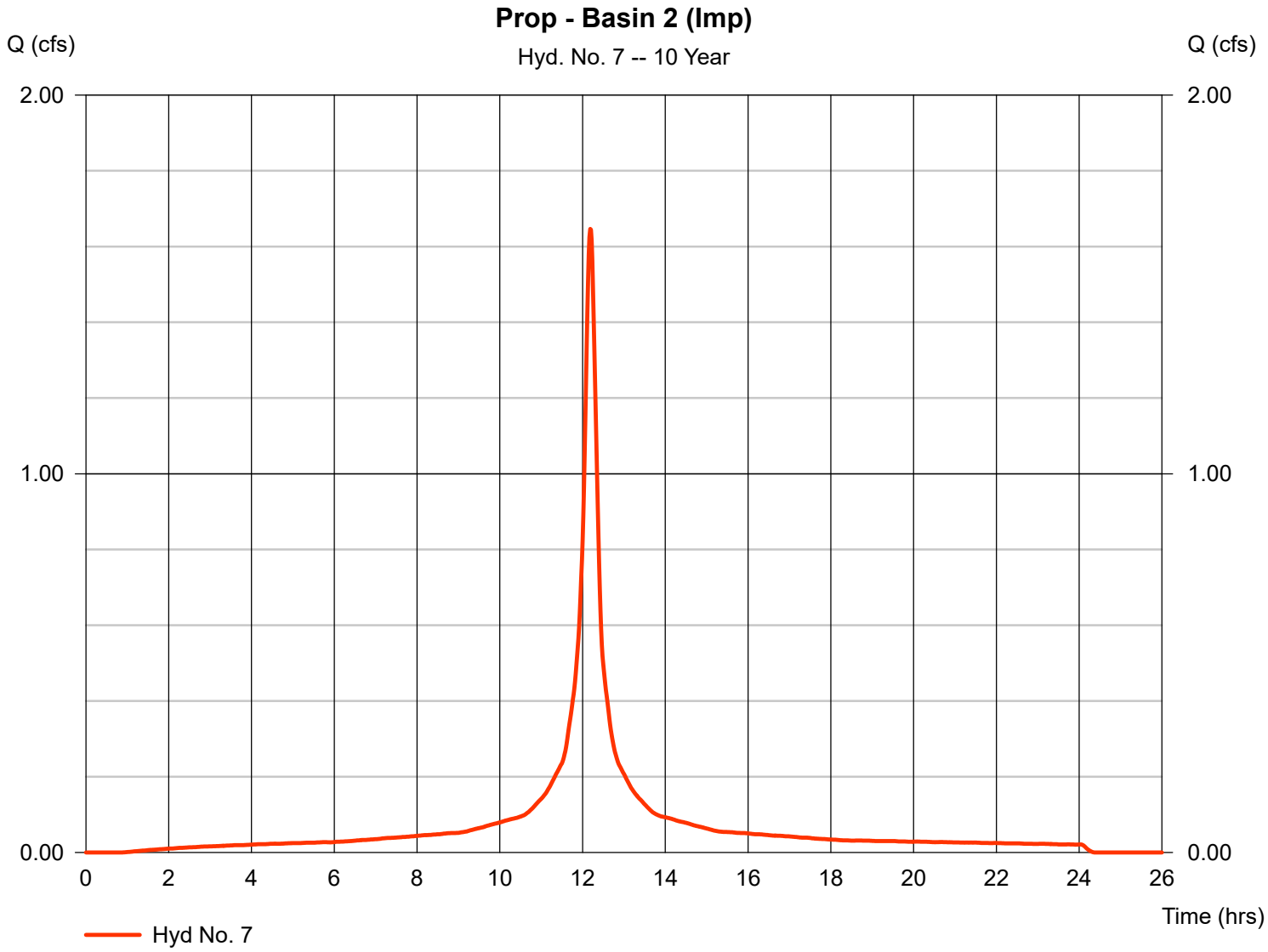


Hydrograph Report

Hyd. No. 7

Prop - Basin 2 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.647 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	6,899 cuft
Drainage area	=	0.390 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.70 min
Total precip.	=	5.11 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

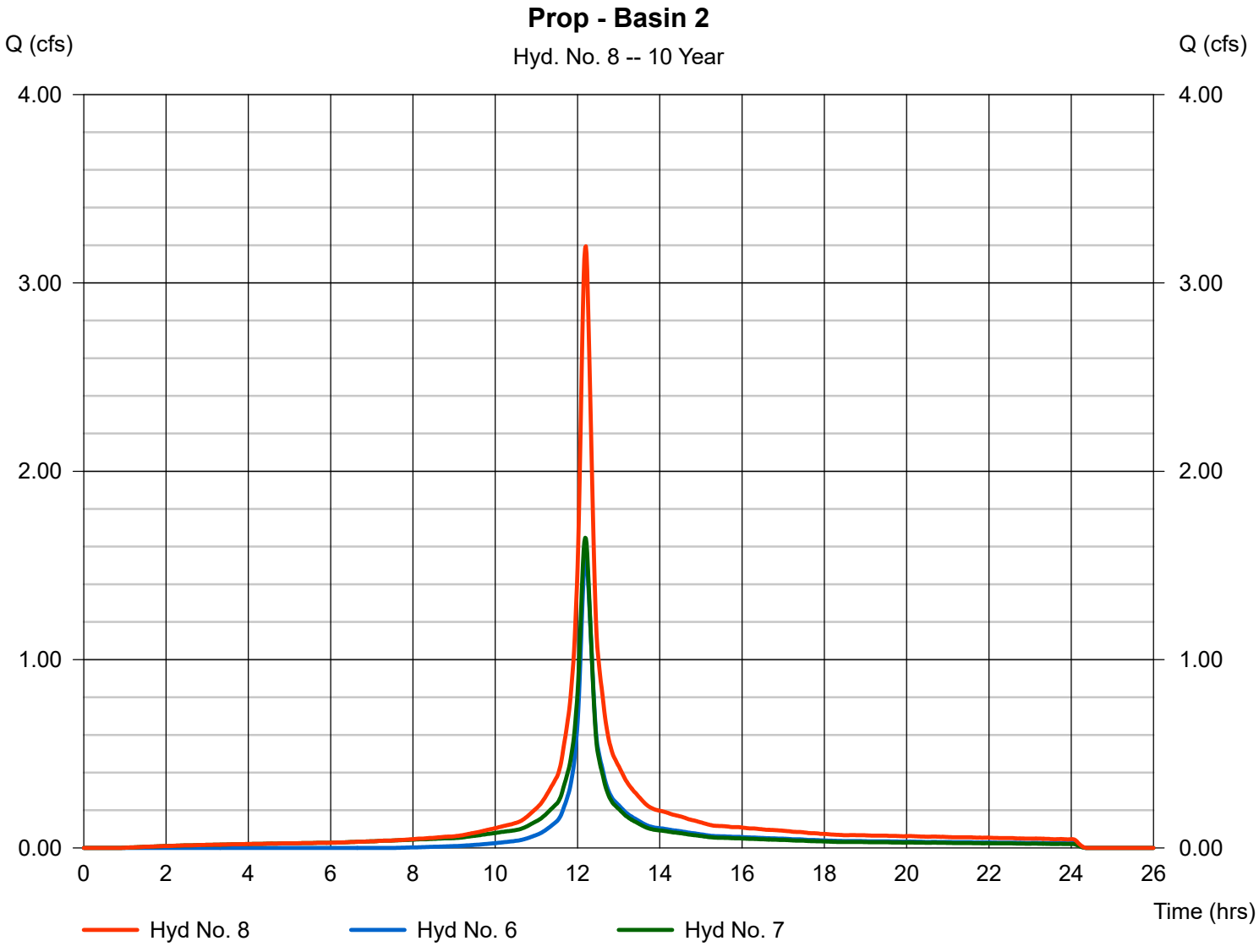


Hydrograph Report

Hyd. No. 8

Prop - Basin 2

Hydrograph type	= Combine	Peak discharge	= 3.195 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 1 min	Hyd. volume	= 12,524 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 0.925 ac



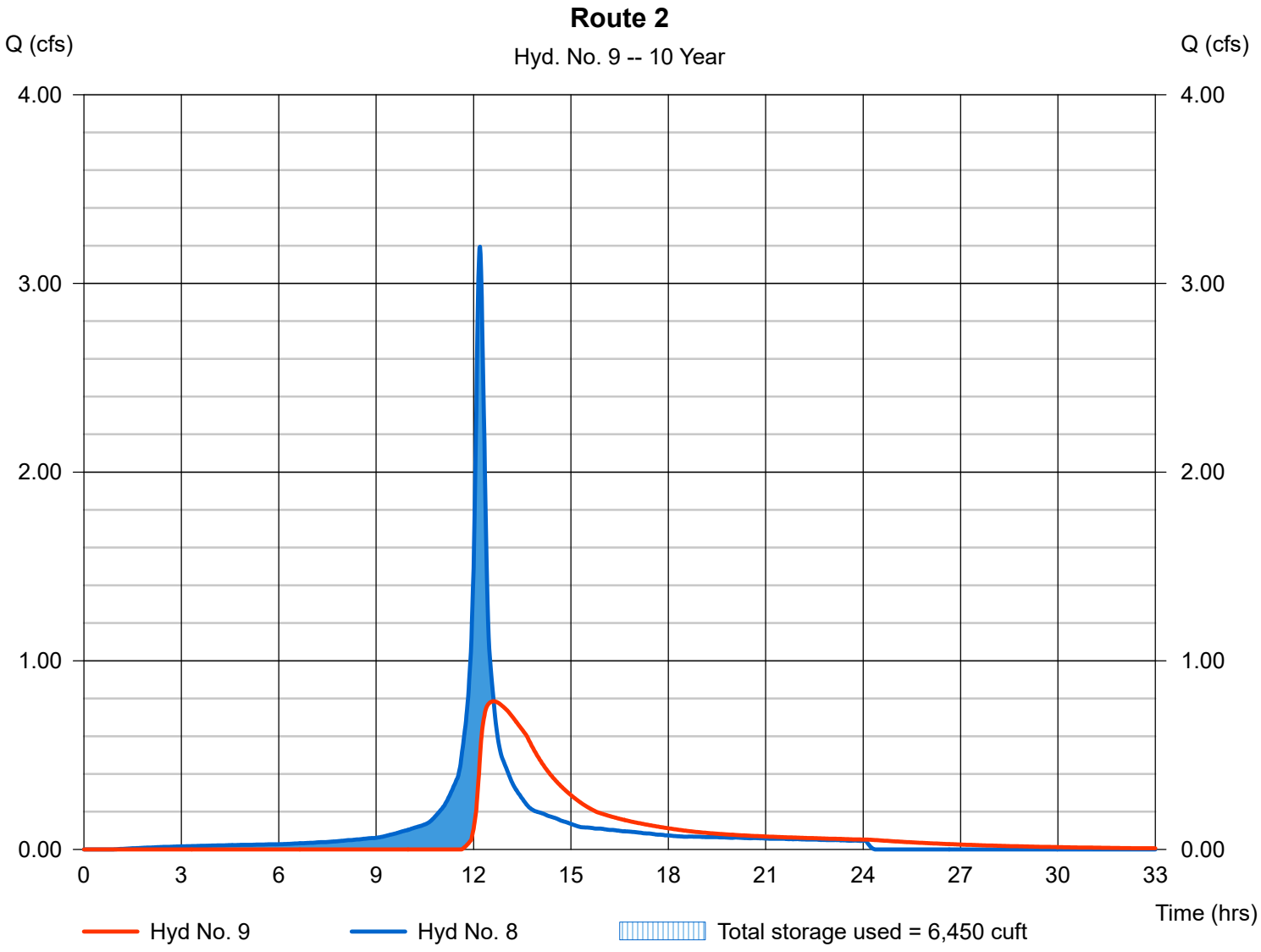
Hydrograph Report

Hyd. No. 9

Route 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.785 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.62 hrs
Time interval	=	1 min	Hyd. volume	=	10,214 cuft
Inflow hyd. No.	=	8 - Prop - Basin 2	Max. Elevation	=	73.84 ft
Reservoir name	=	Basin 2	Max. Storage	=	6,450 cuft

Storage Indication method used.



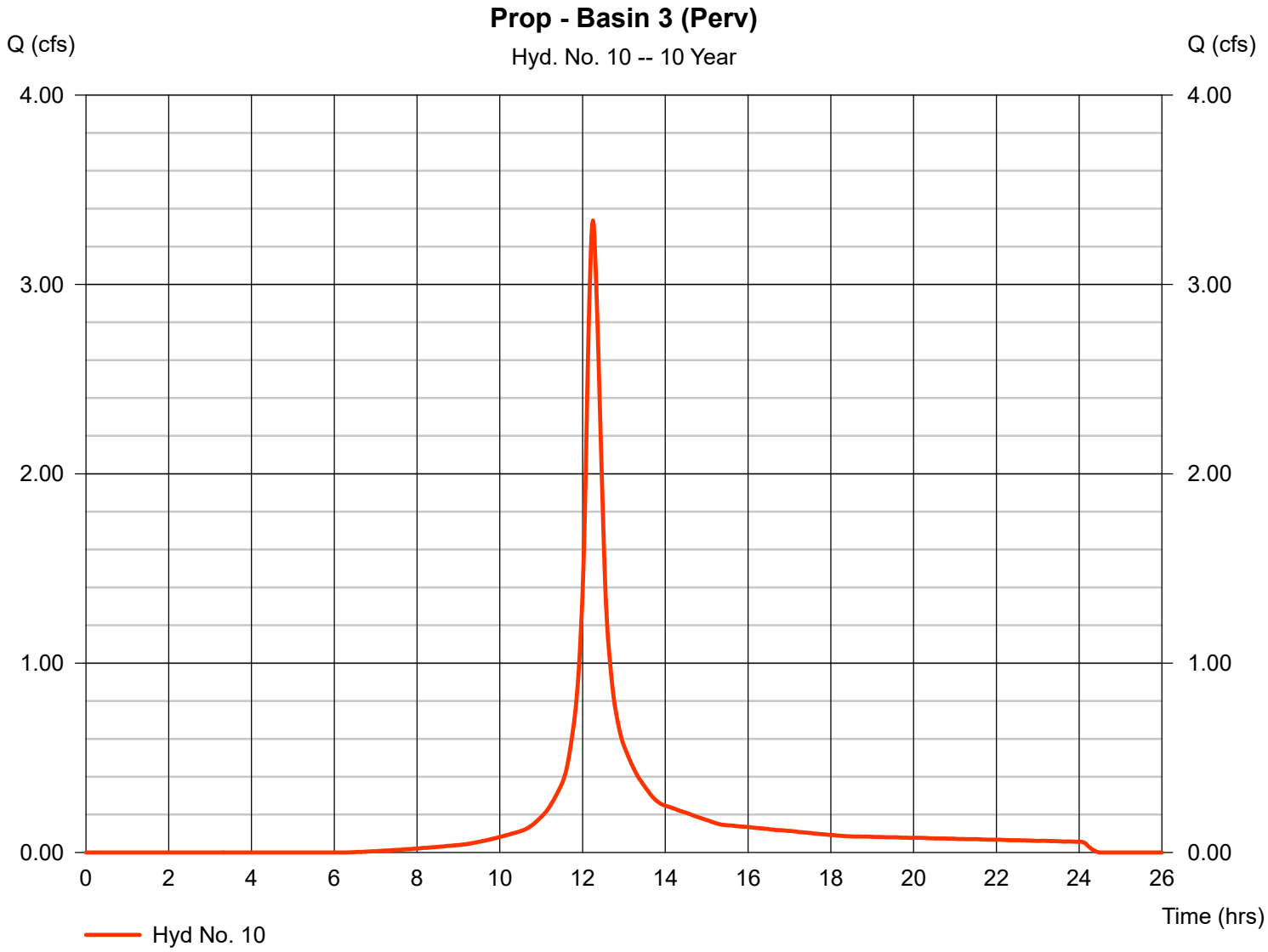
Hydrograph Report

Hyd. No. 10

Prop - Basin 3 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.337 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.25 hrs
Time interval	=	1 min	Hyd. volume	=	13,809 cuft
Drainage area	=	1.162 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.00 min
Total precip.	=	5.11 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.456 x 79) + (0.706 x 86)] / 1.162

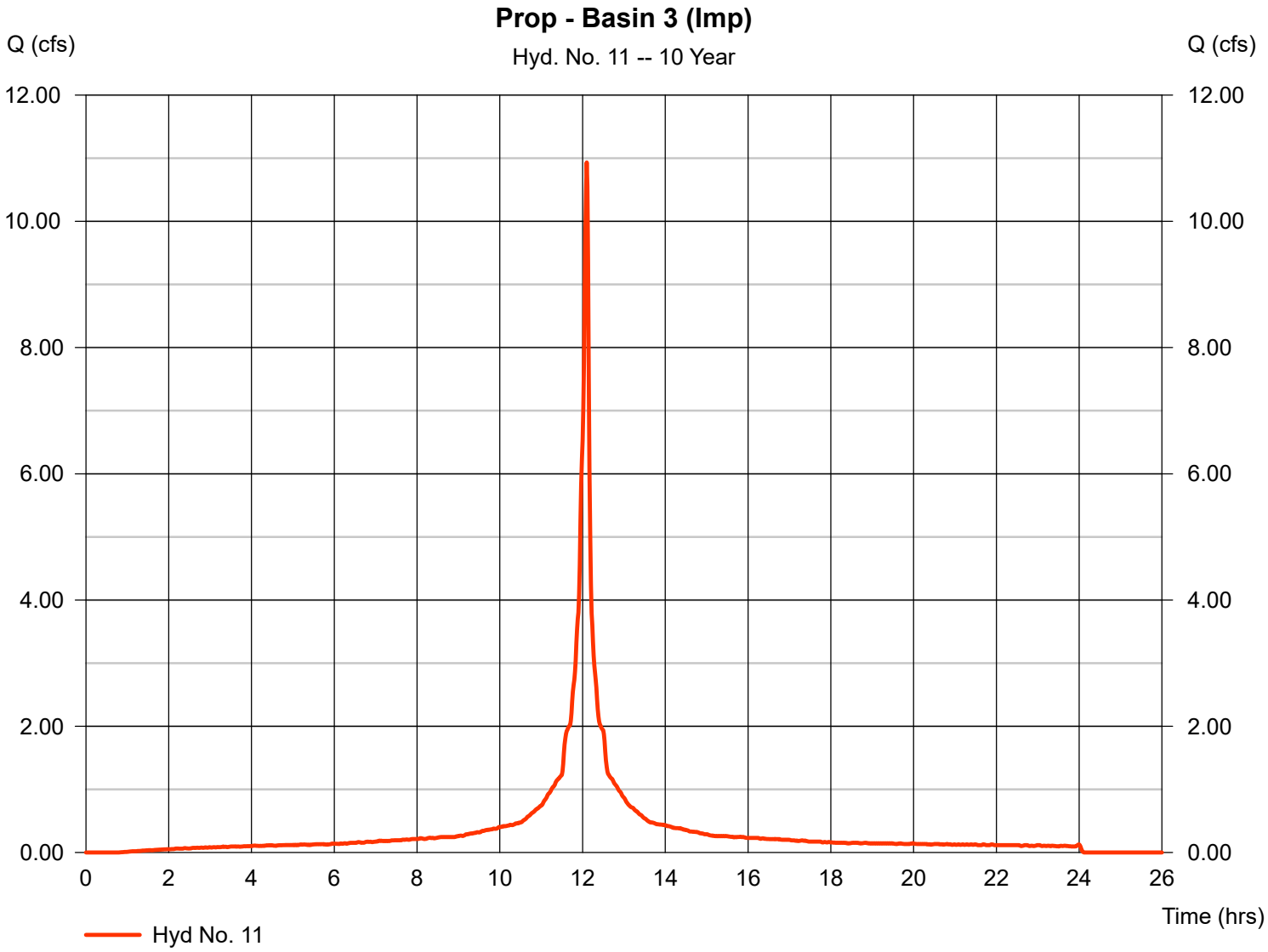


Hydrograph Report

Hyd. No. 11

Prop - Basin 3 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.93 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	32,990 cuft
Drainage area	=	1.865 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	3.90 min
Total precip.	=	5.11 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

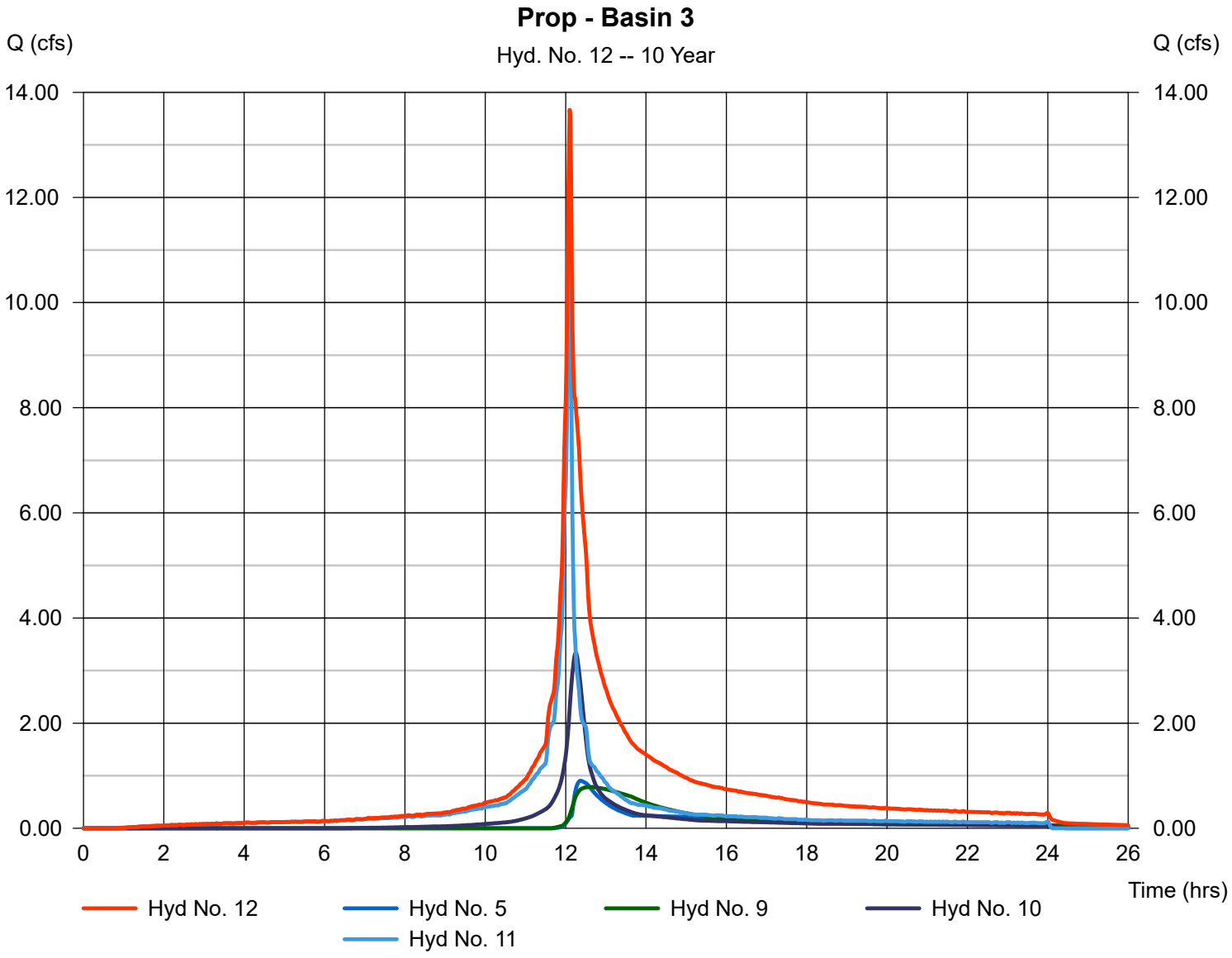


Hydrograph Report

Hyd. No. 12

Prop - Basin 3

Hydrograph type	= Combine	Peak discharge	= 13.67 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 65,757 cuft
Inflow hyds.	= 5, 9, 10, 11	Contrib. drain. area	= 3.027 ac



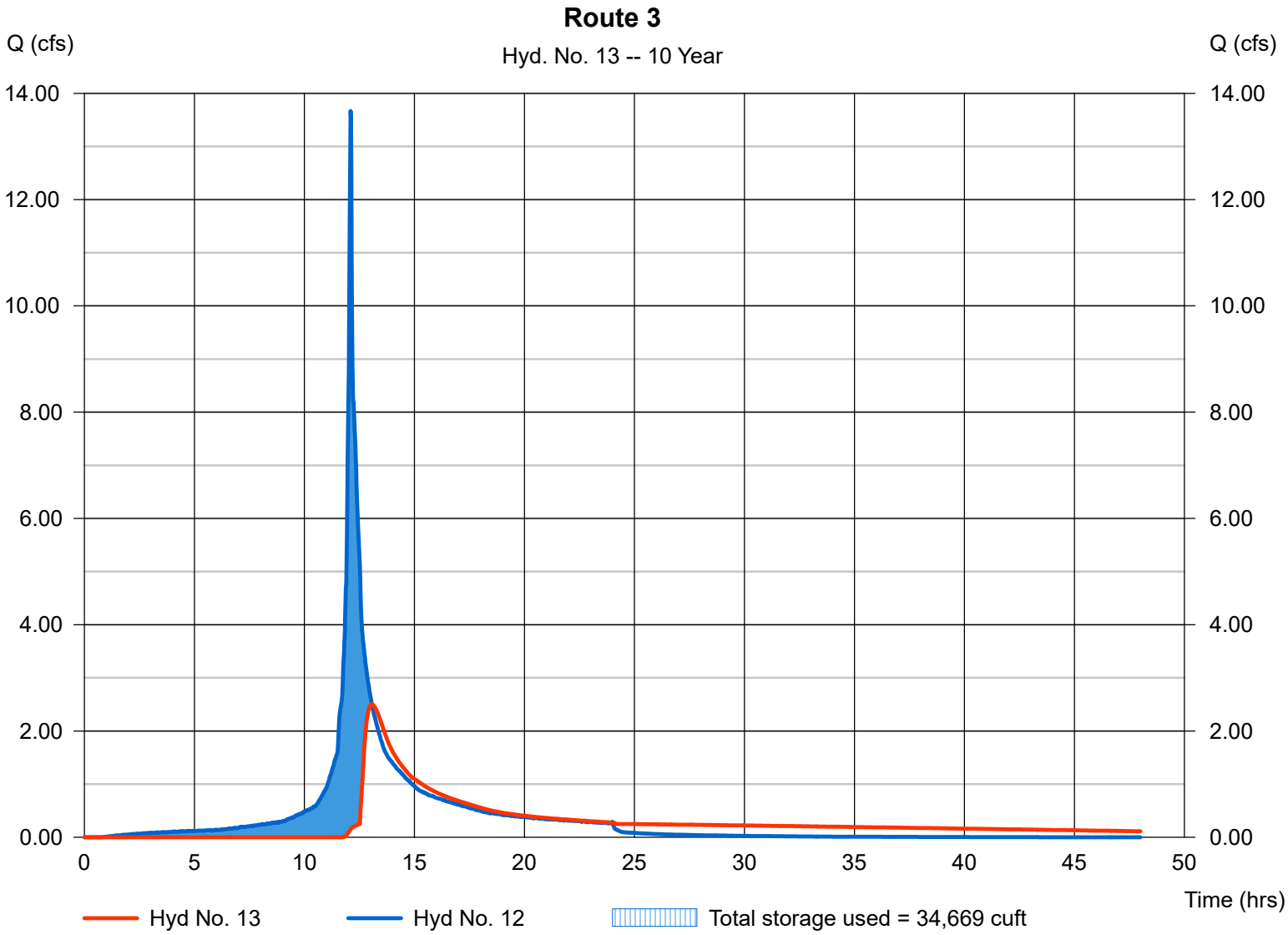
Hydrograph Report

Hyd. No. 13

Route 3

Hydrograph type	=	Reservoir	Peak discharge	=	2.505 cfs
Storm frequency	=	10 yrs	Time to peak	=	13.07 hrs
Time interval	=	1 min	Hyd. volume	=	48,382 cuft
Inflow hyd. No.	=	12 - Prop - Basin 3	Max. Elevation	=	69.19 ft
Reservoir name	=	Basin 3	Max. Storage	=	34,669 cuft

Storage Indication method used.



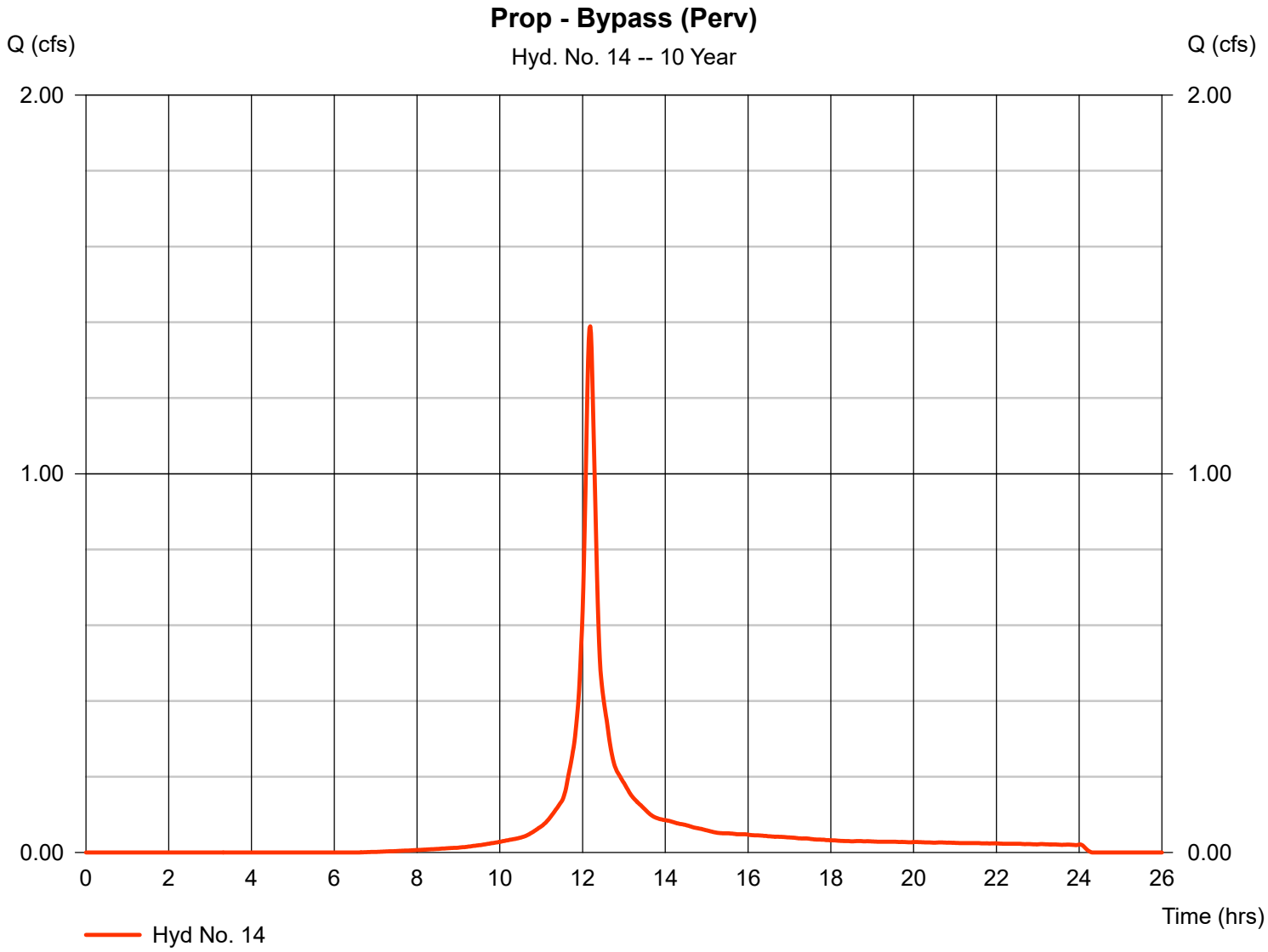
Hydrograph Report

Hyd. No. 14

Prop - Bypass (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.390 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	4,814 cuft
Drainage area	=	0.424 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.80 min
Total precip.	=	5.11 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.214 x 79) + (0.210 x 86)] / 0.424

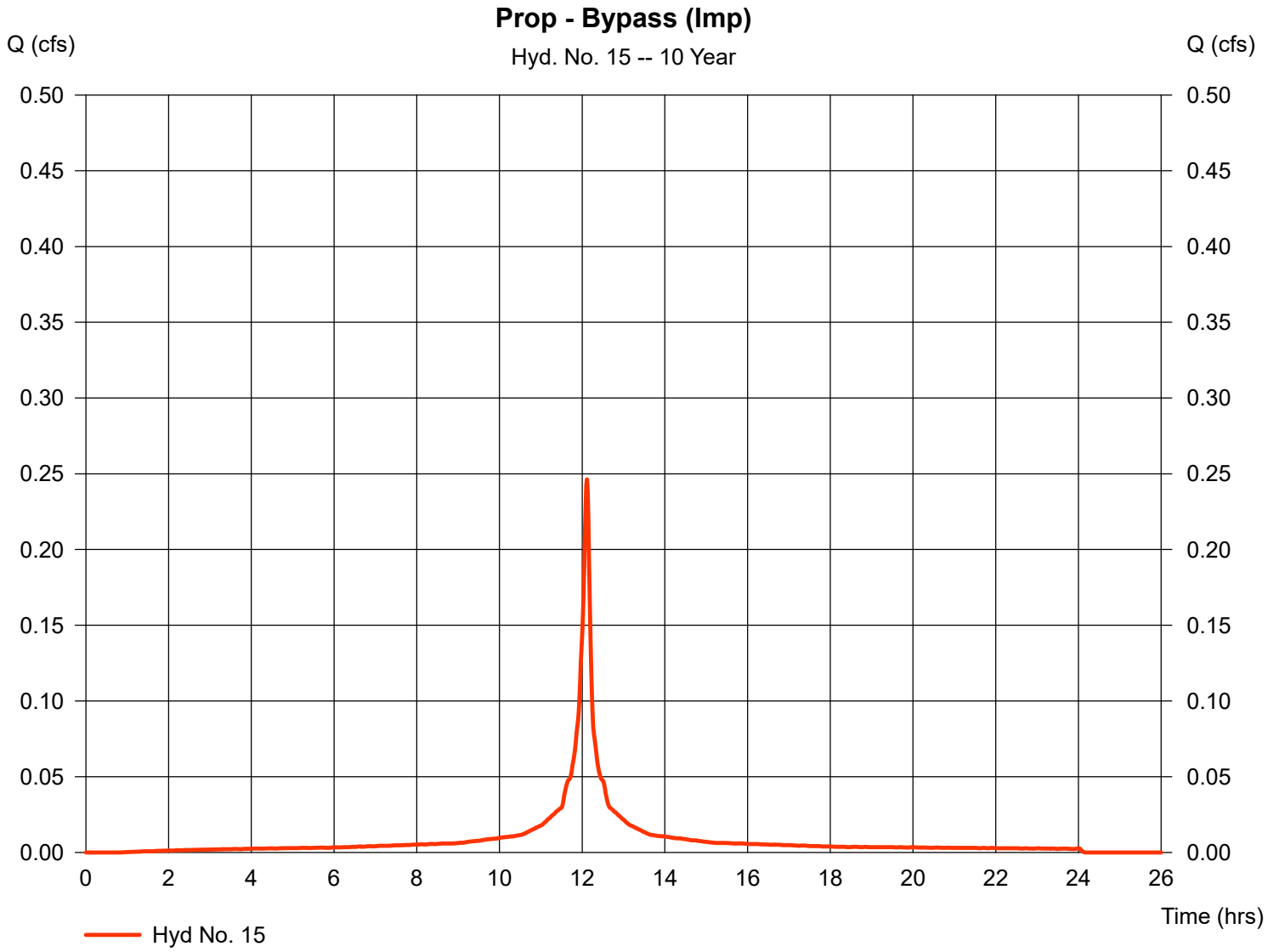


Hydrograph Report

Hyd. No. 15

Prop - Bypass (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.246 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.12 hrs
Time interval	=	1 min	Hyd. volume	=	803 cuft
Drainage area	=	0.044 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.50 min
Total precip.	=	5.11 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

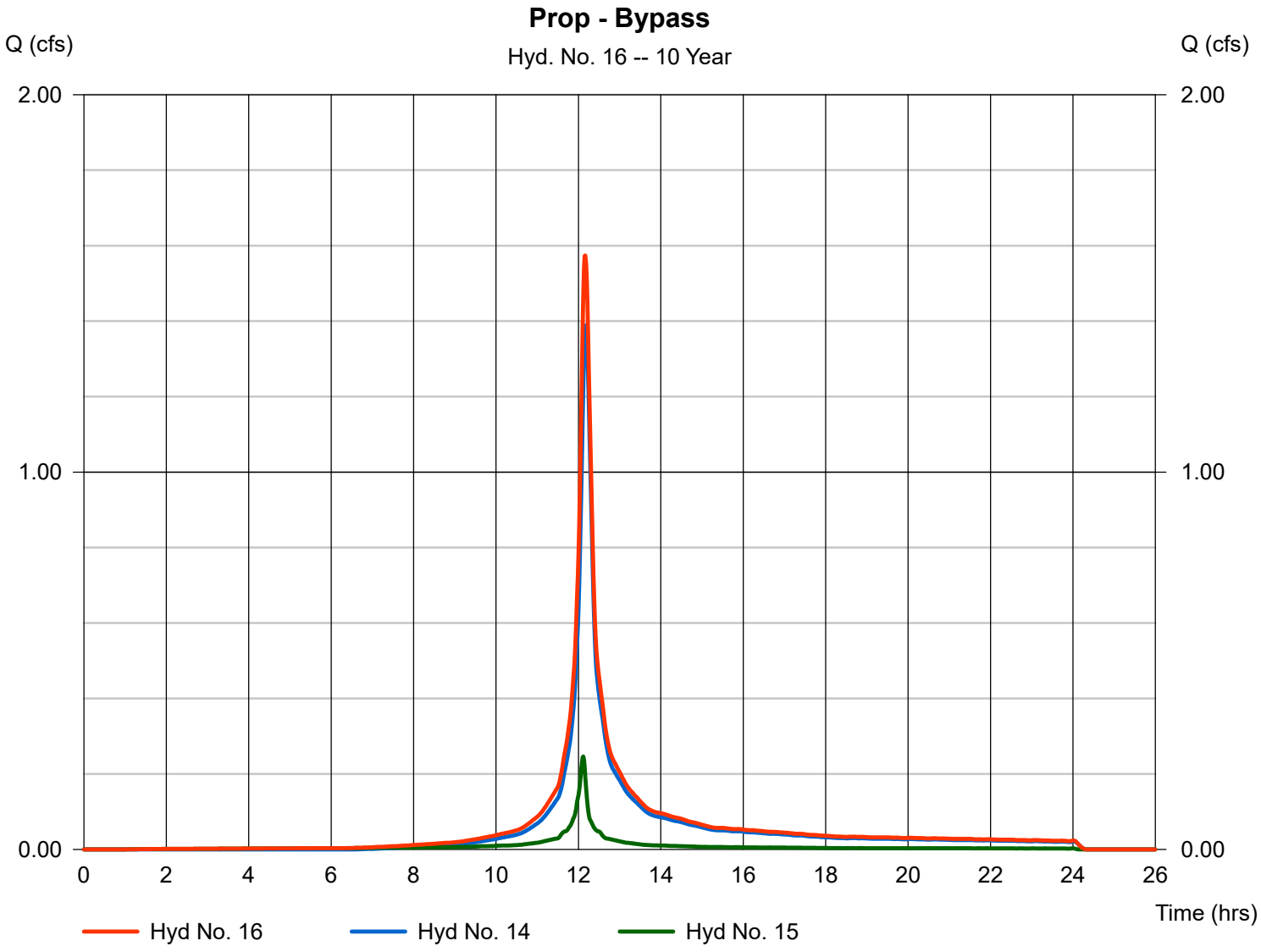


Hydrograph Report

Hyd. No. 16

Prop - Bypass

Hydrograph type	= Combine	Peak discharge	= 1.574 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.17 hrs
Time interval	= 1 min	Hyd. volume	= 5,617 cuft
Inflow hyds.	= 14, 15	Contrib. drain. area	= 0.468 ac

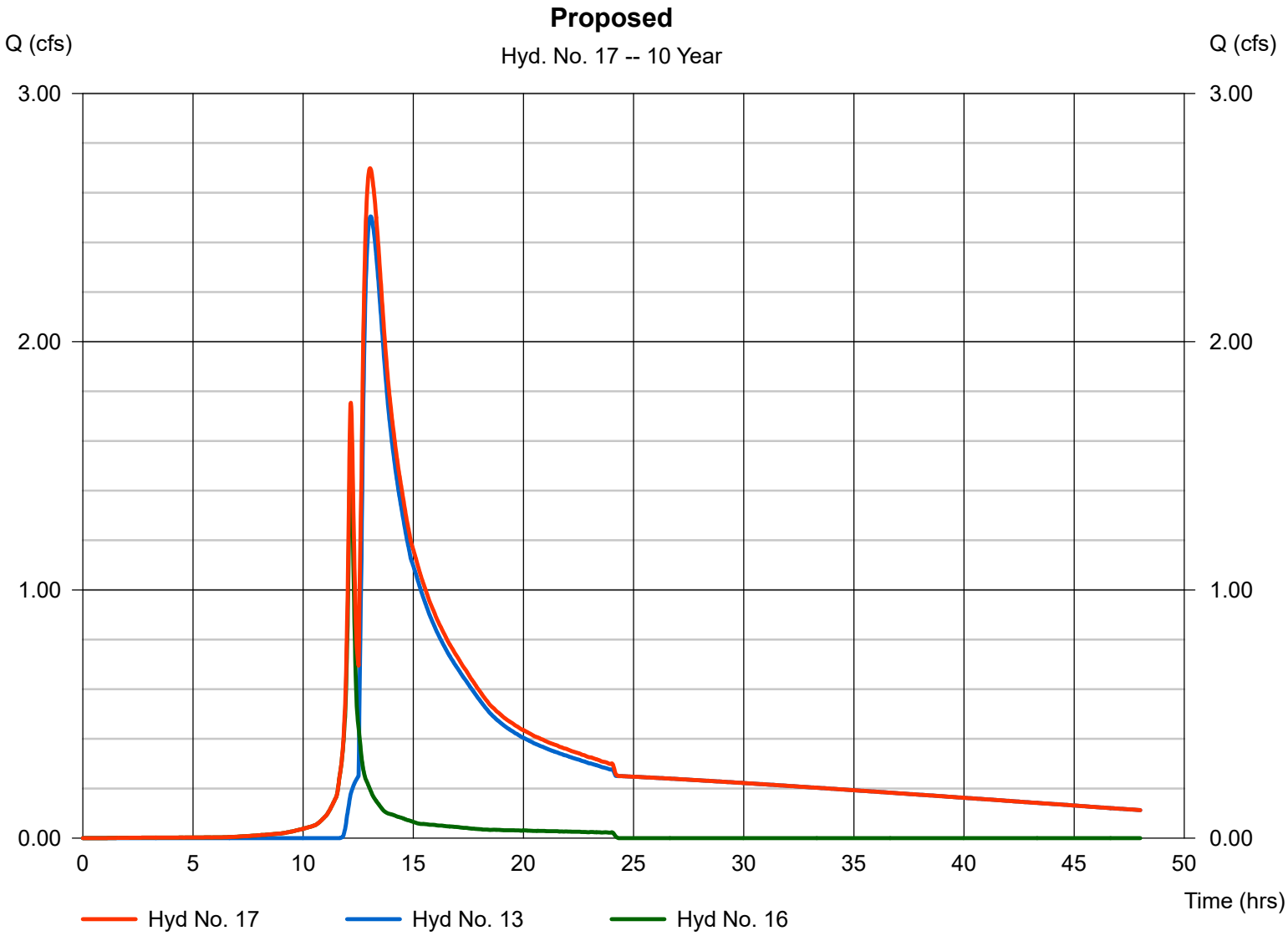


Hydrograph Report

Hyd. No. 17

Proposed

Hydrograph type	= Combine	Peak discharge	= 2.699 cfs
Storm frequency	= 10 yrs	Time to peak	= 13.03 hrs
Time interval	= 1 min	Hyd. volume	= 54,000 cuft
Inflow hyds.	= 13, 16	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	19.88	1	733	76,016	------	------	------	Existing
2	SCS Runoff	2.548	1	729	8,267	------	------	------	Prop - Basin 1 (Perv)
3	SCS Runoff	4.369	1	726	13,123	------	------	------	Prop - Basin 1 (Imp)
4	Combine	6.701	1	726	21,391	2, 3	------	------	Prop - Basin 1
5	Reservoir	4.928	1	728	18,485	4	76.88	8,040	Route 1
6	SCS Runoff	3.205	1	732	11,895	------	------	------	Prop - Basin 2 (Perv)
7	SCS Runoff	2.801	1	731	11,920	------	------	------	Prop - Basin 2 (Imp)
8	Combine	6.001	1	732	23,815	6, 7	------	------	Prop - Basin 2
9	Reservoir	2.699	1	745	21,506	8	74.29	10,291	Route 2
10	SCS Runoff	6.548	1	735	27,879	------	------	------	Prop - Basin 3 (Perv)
11	SCS Runoff	18.59	1	726	57,002	------	------	------	Prop - Basin 3 (Imp)
12	Combine	28.58	1	727	124,873	5, 9, 10, 11	------	------	Prop - Basin 3
13	Reservoir	13.80	1	743	107,168	12	69.91	46,361	Route 3
14	SCS Runoff	2.751	1	731	9,830	------	------	------	Prop - Bypass (Perv)
15	SCS Runoff	0.419	1	727	1,387	------	------	------	Prop - Bypass (Imp)
16	Combine	3.073	1	730	11,217	14, 15	------	------	Prop - Bypass
17	Combine	15.49	1	736	118,385	13, 16	------	------	Proposed

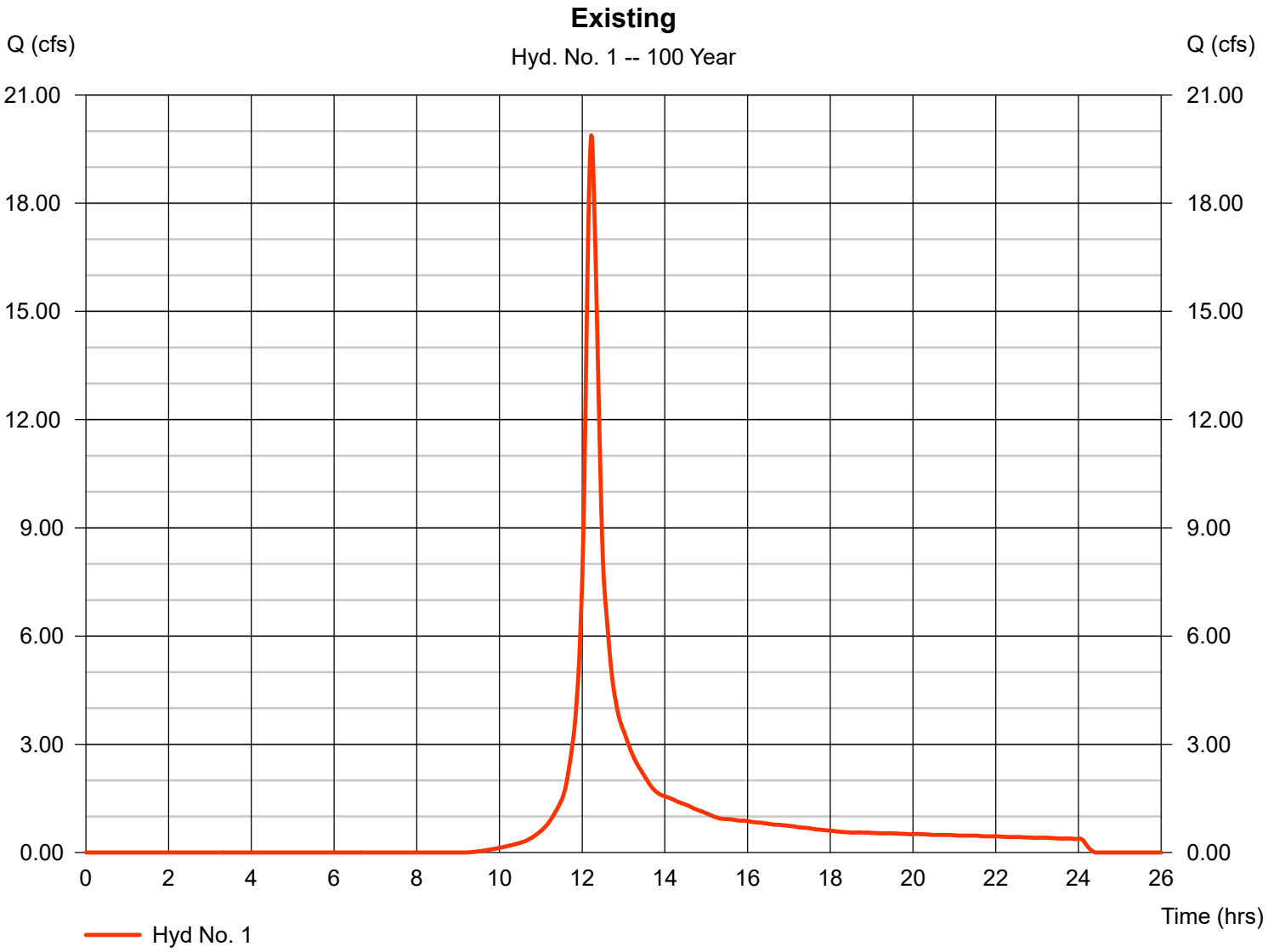
Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.88 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.22 hrs
Time interval	=	1 min	Hyd. volume	=	76,016 cuft
Drainage area	=	5.229 ac	Curve number	=	61*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.40 min
Total precip.	=	8.66 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(2.998 x 55) + (2.231 x 70)] / 5.229



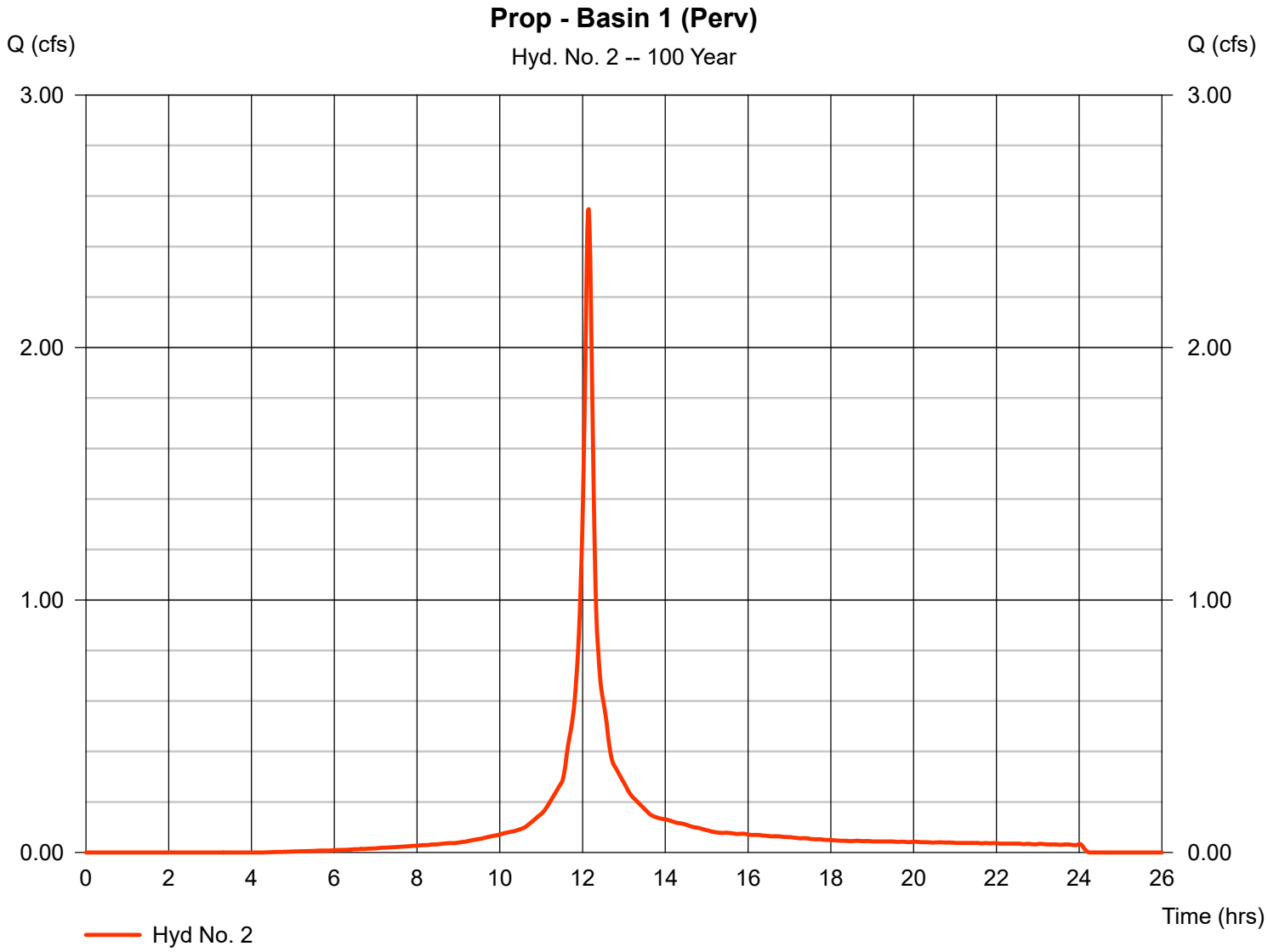
Hydrograph Report

Hyd. No. 2

Prop - Basin 1 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.548 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.15 hrs
Time interval	=	1 min	Hyd. volume	=	8,267 cuft
Drainage area	=	0.351 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.20 min
Total precip.	=	8.66 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.196 x 79) + (0.155 x 86)] / 0.351

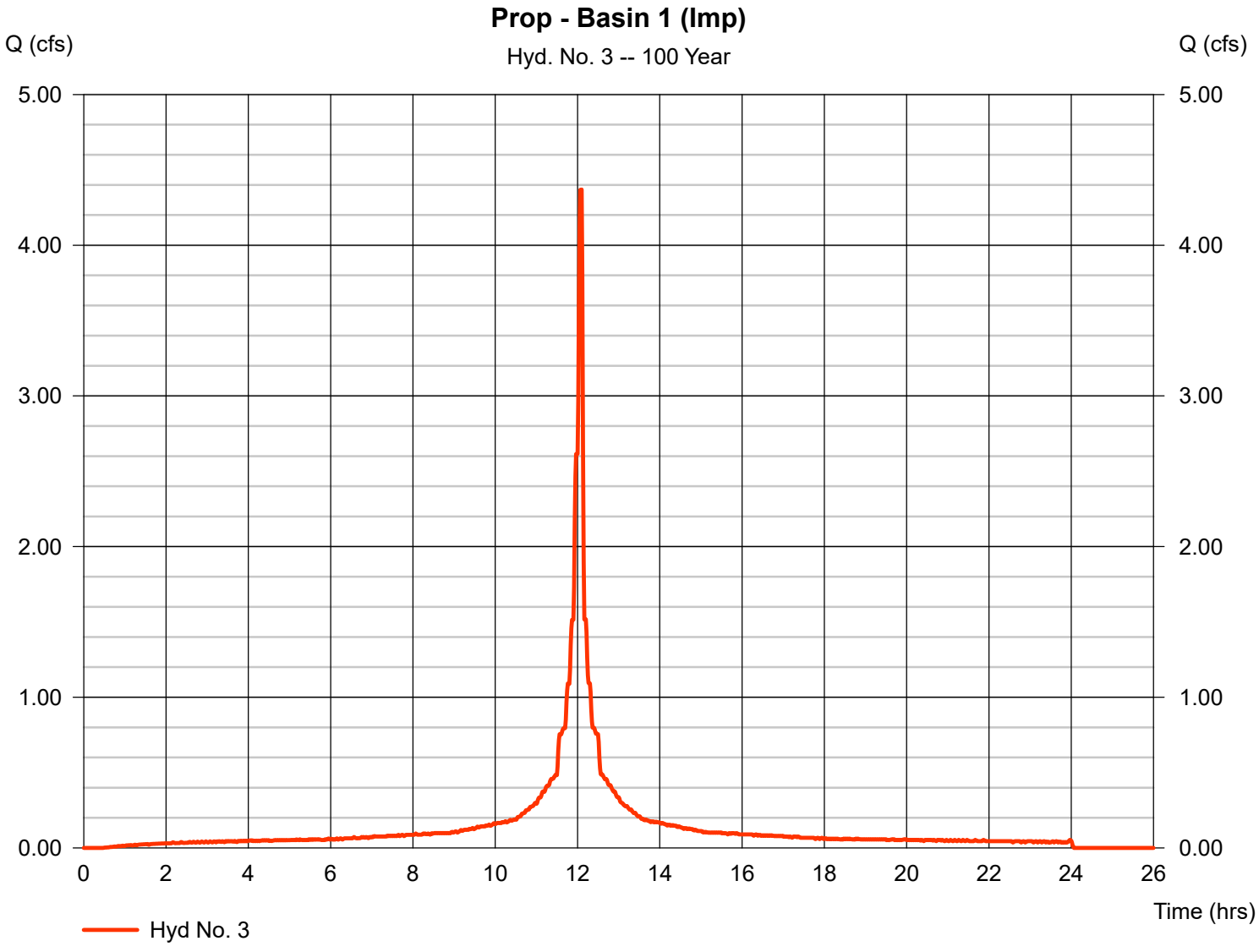


Hydrograph Report

Hyd. No. 3

Prop - Basin 1 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.369 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	13,123 cuft
Drainage area	=	0.458 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	1.60 min
Total precip.	=	8.66 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

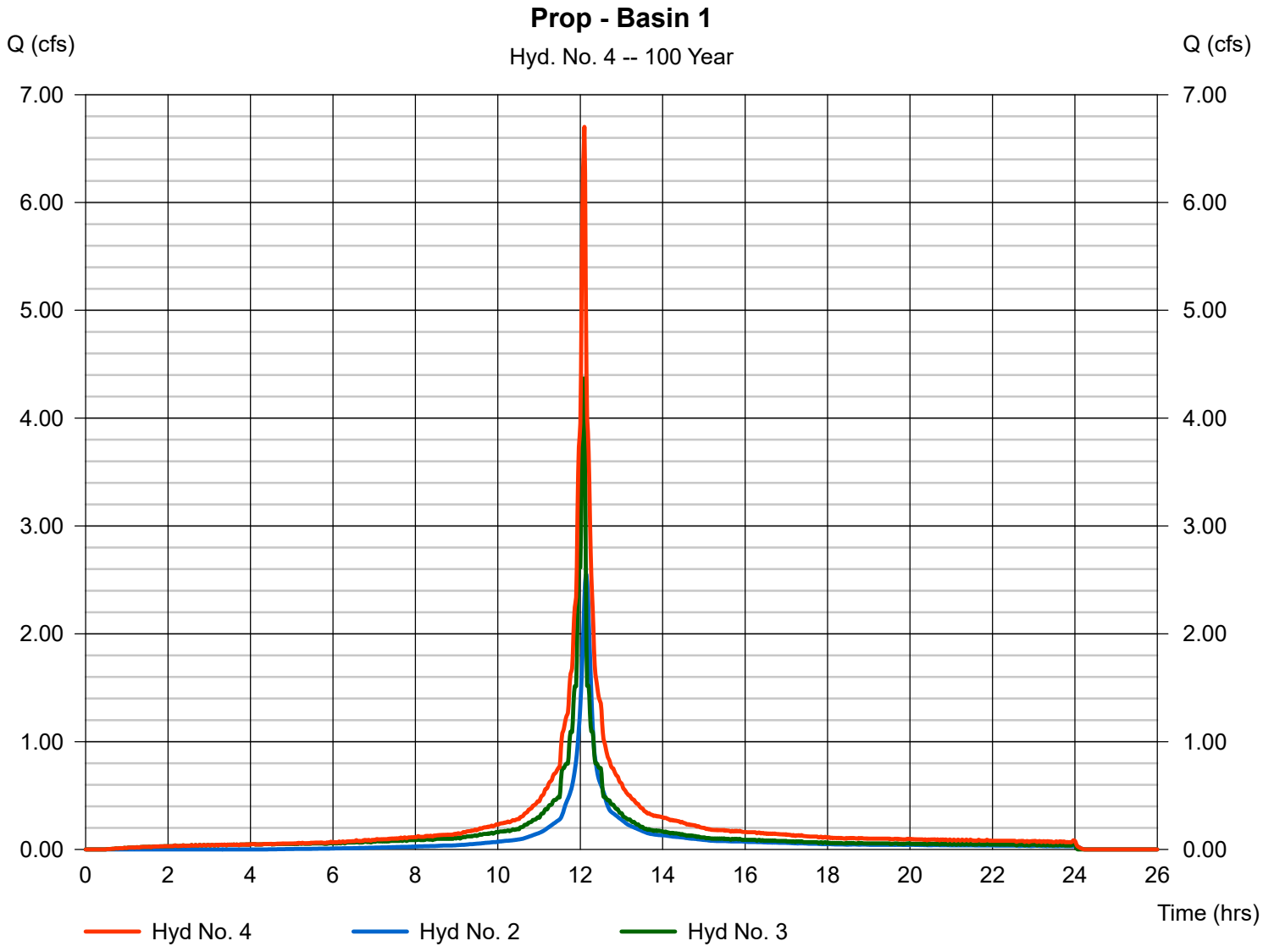


Hydrograph Report

Hyd. No. 4

Prop - Basin 1

Hydrograph type	= Combine	Peak discharge	= 6.701 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 21,391 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 0.809 ac



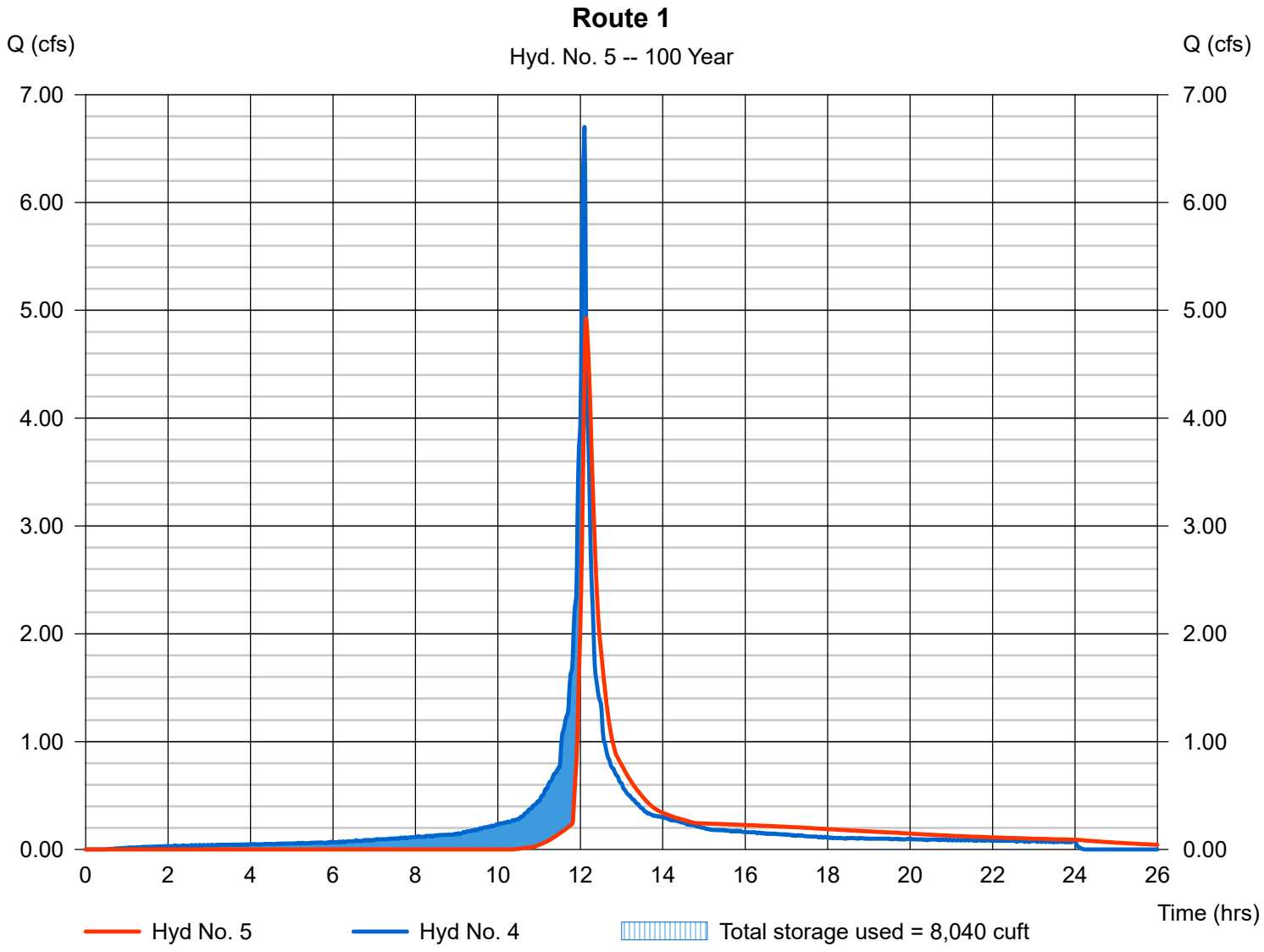
Hydrograph Report

Hyd. No. 5

Route 1

Hydrograph type	=	Reservoir	Peak discharge	=	4.928 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.13 hrs
Time interval	=	1 min	Hyd. volume	=	18,485 cuft
Inflow hyd. No.	=	4 - Prop - Basin 1	Max. Elevation	=	76.88 ft
Reservoir name	=	Basin 1	Max. Storage	=	8,040 cuft

Storage Indication method used.

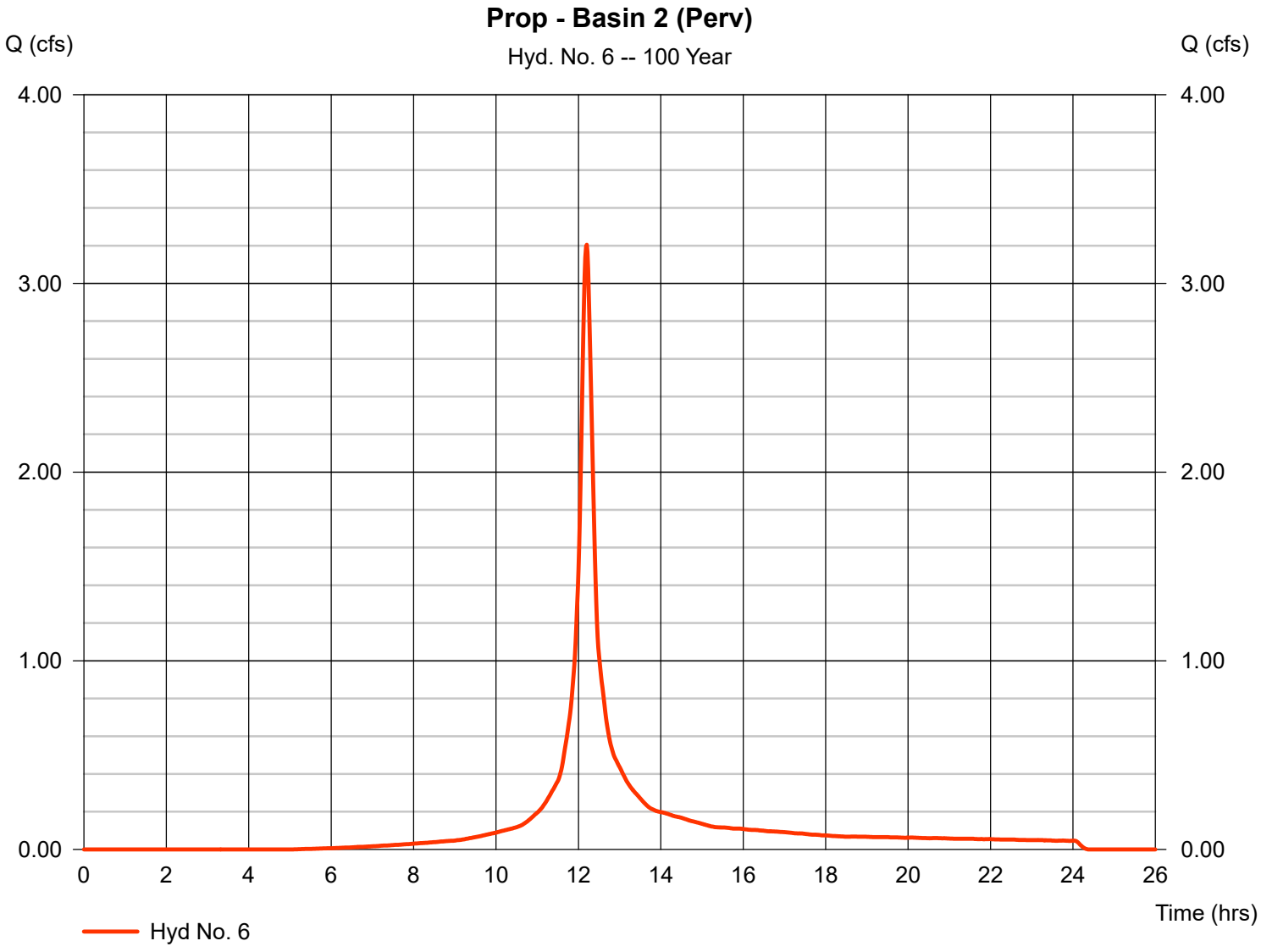


Hydrograph Report

Hyd. No. 6

Prop - Basin 2 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.205 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	1 min	Hyd. volume	=	11,895 cuft
Drainage area	=	0.535 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.10 min
Total precip.	=	8.66 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

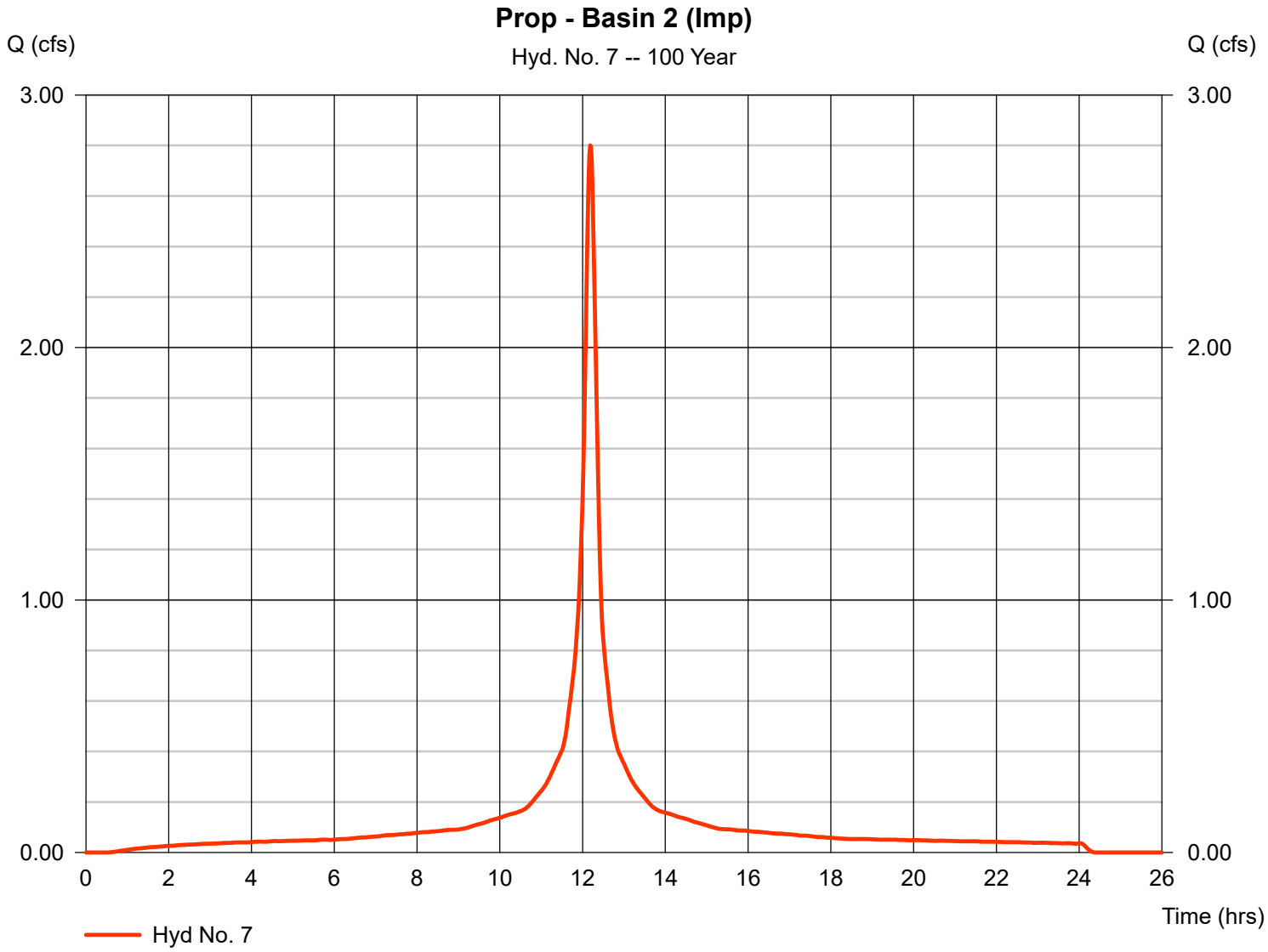


Hydrograph Report

Hyd. No. 7

Prop - Basin 2 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.801 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	11,920 cuft
Drainage area	=	0.390 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.70 min
Total precip.	=	8.66 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

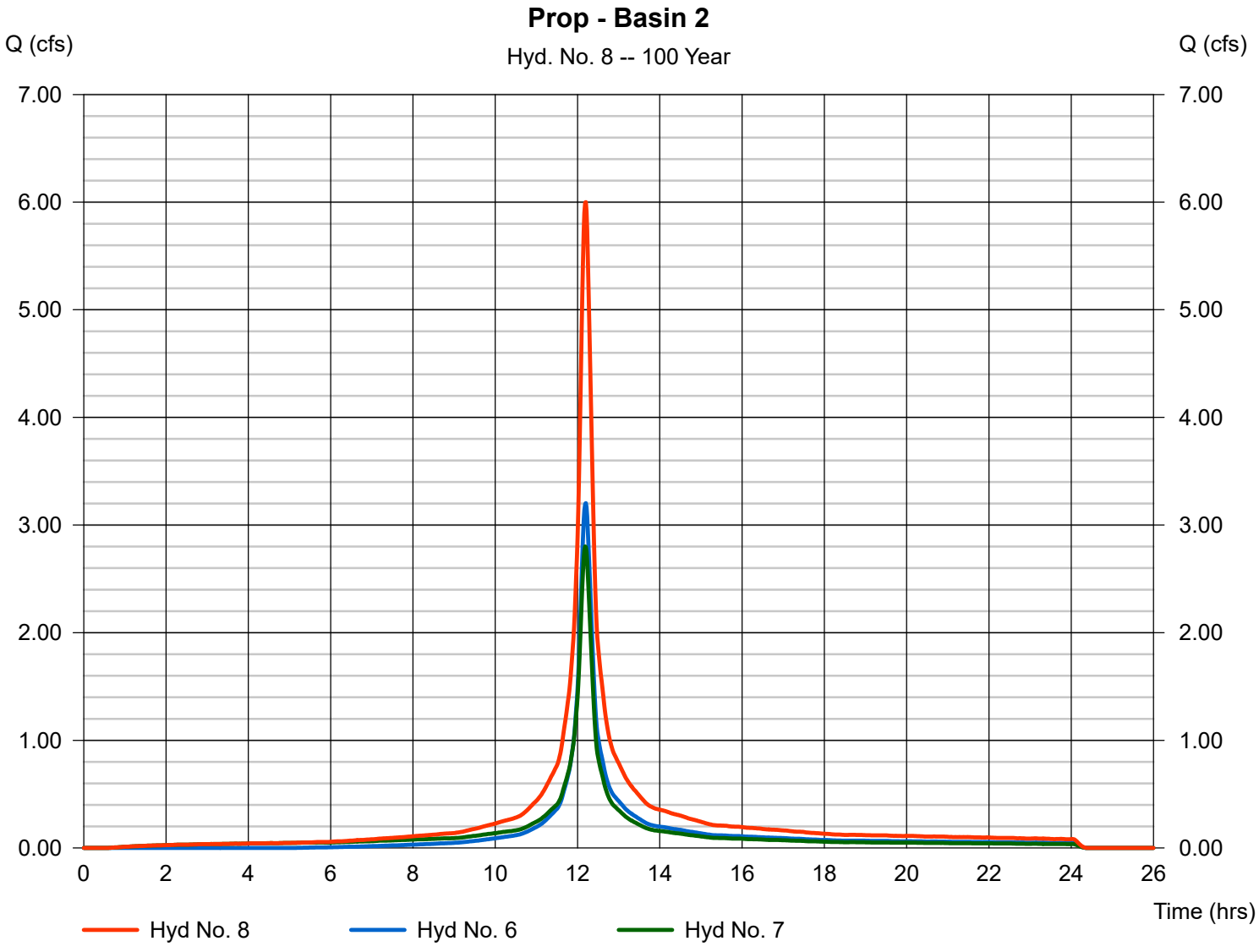


Hydrograph Report

Hyd. No. 8

Prop - Basin 2

Hydrograph type	= Combine	Peak discharge	= 6.001 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 1 min	Hyd. volume	= 23,815 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 0.925 ac



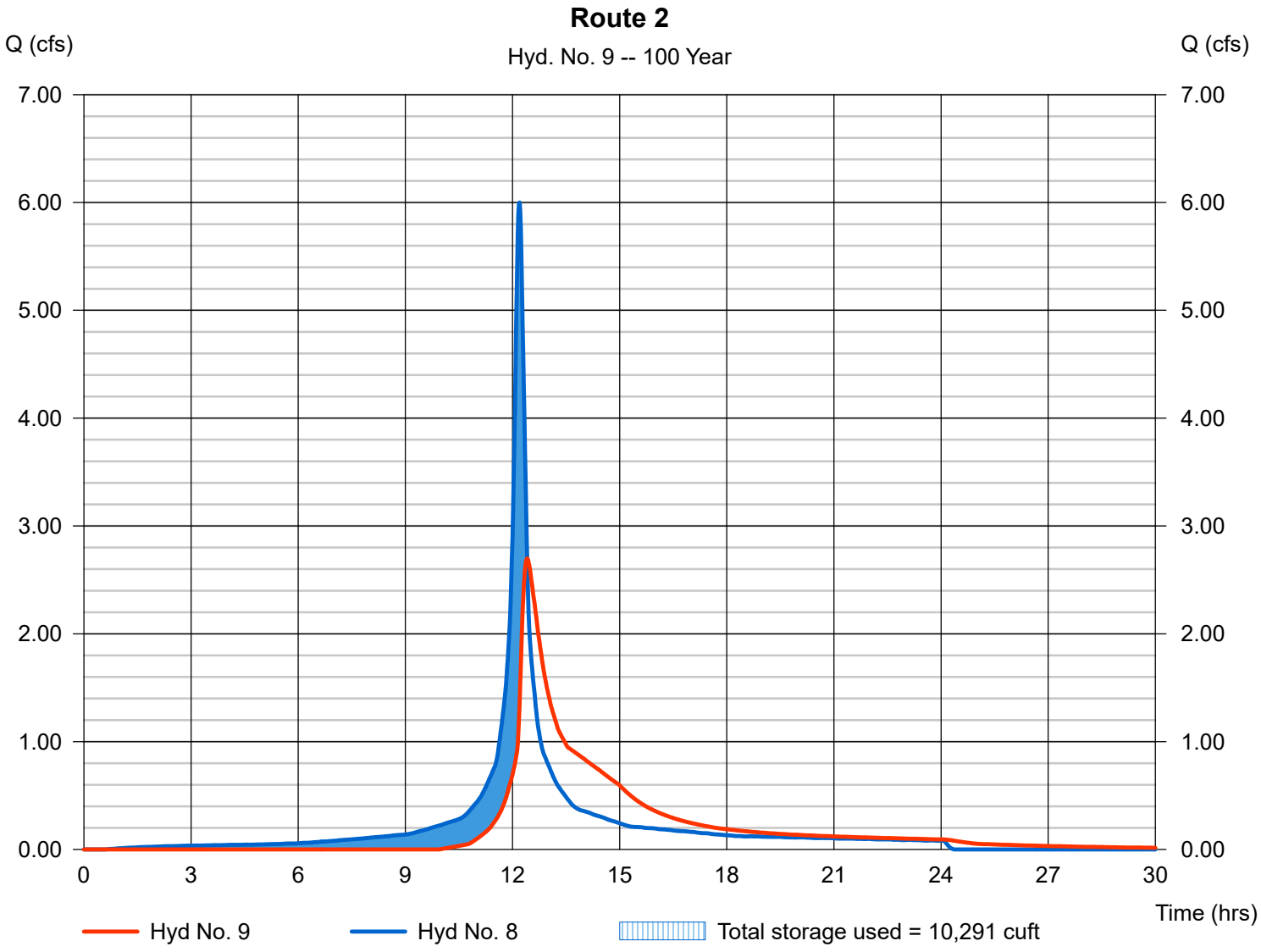
Hydrograph Report

Hyd. No. 9

Route 2

Hydrograph type	=	Reservoir	Peak discharge	=	2.699 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.42 hrs
Time interval	=	1 min	Hyd. volume	=	21,506 cuft
Inflow hyd. No.	=	8 - Prop - Basin 2	Max. Elevation	=	74.29 ft
Reservoir name	=	Basin 2	Max. Storage	=	10,291 cuft

Storage Indication method used.



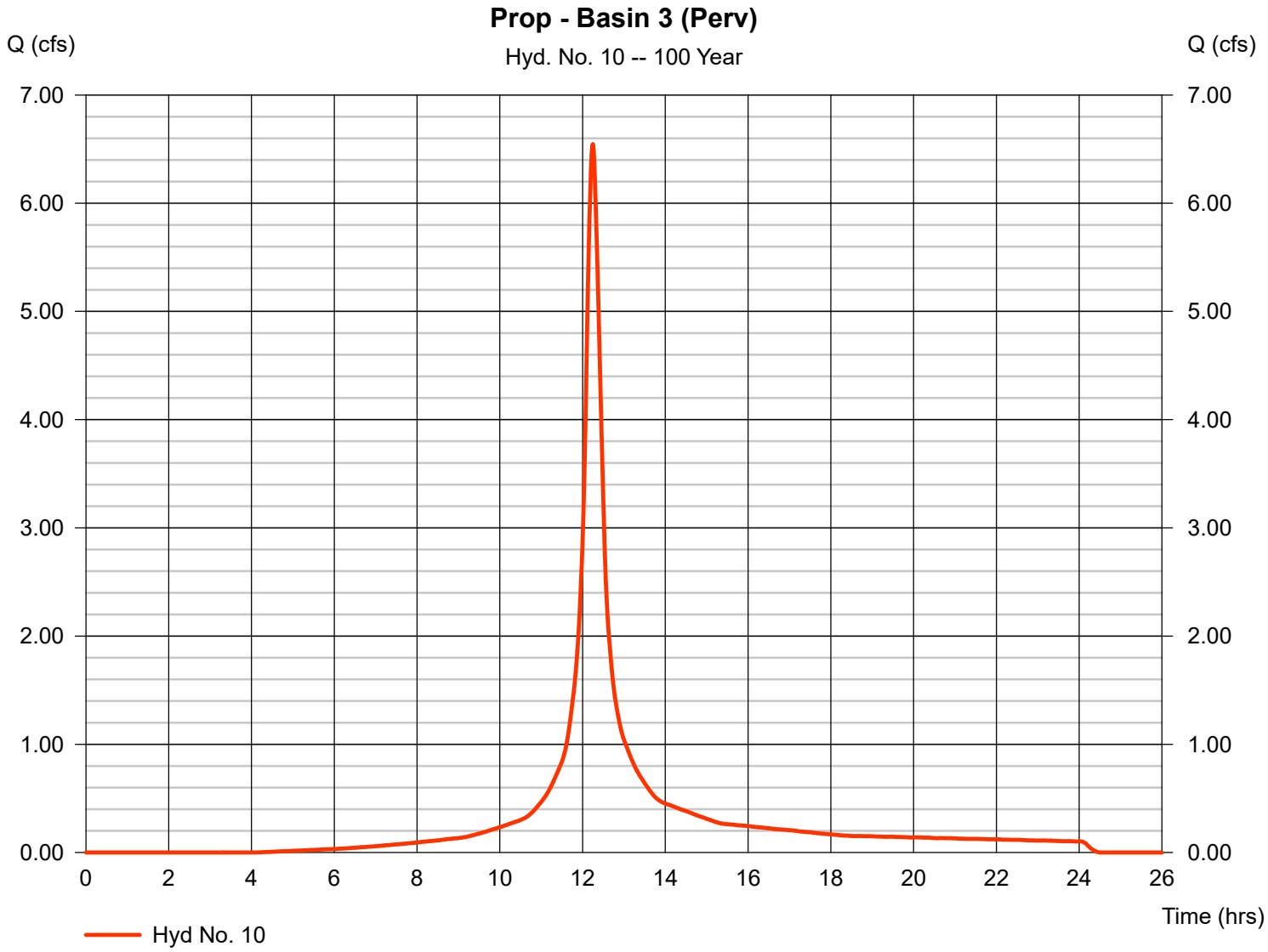
Hydrograph Report

Hyd. No. 10

Prop - Basin 3 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.548 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.25 hrs
Time interval	=	1 min	Hyd. volume	=	27,879 cuft
Drainage area	=	1.162 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.00 min
Total precip.	=	8.66 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.456 x 79) + (0.706 x 86)] / 1.162

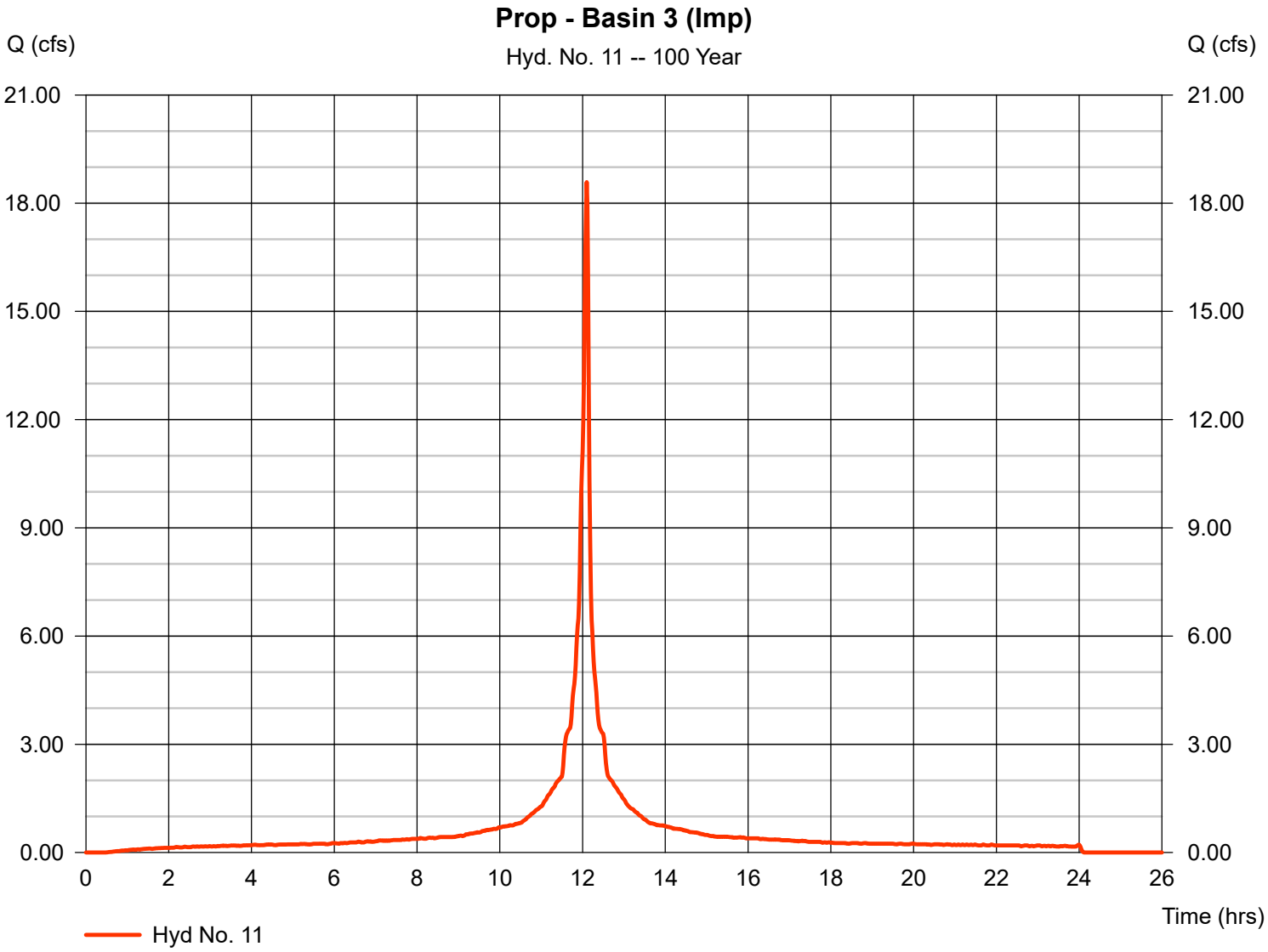


Hydrograph Report

Hyd. No. 11

Prop - Basin 3 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.59 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	57,002 cuft
Drainage area	=	1.865 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	3.90 min
Total precip.	=	8.66 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

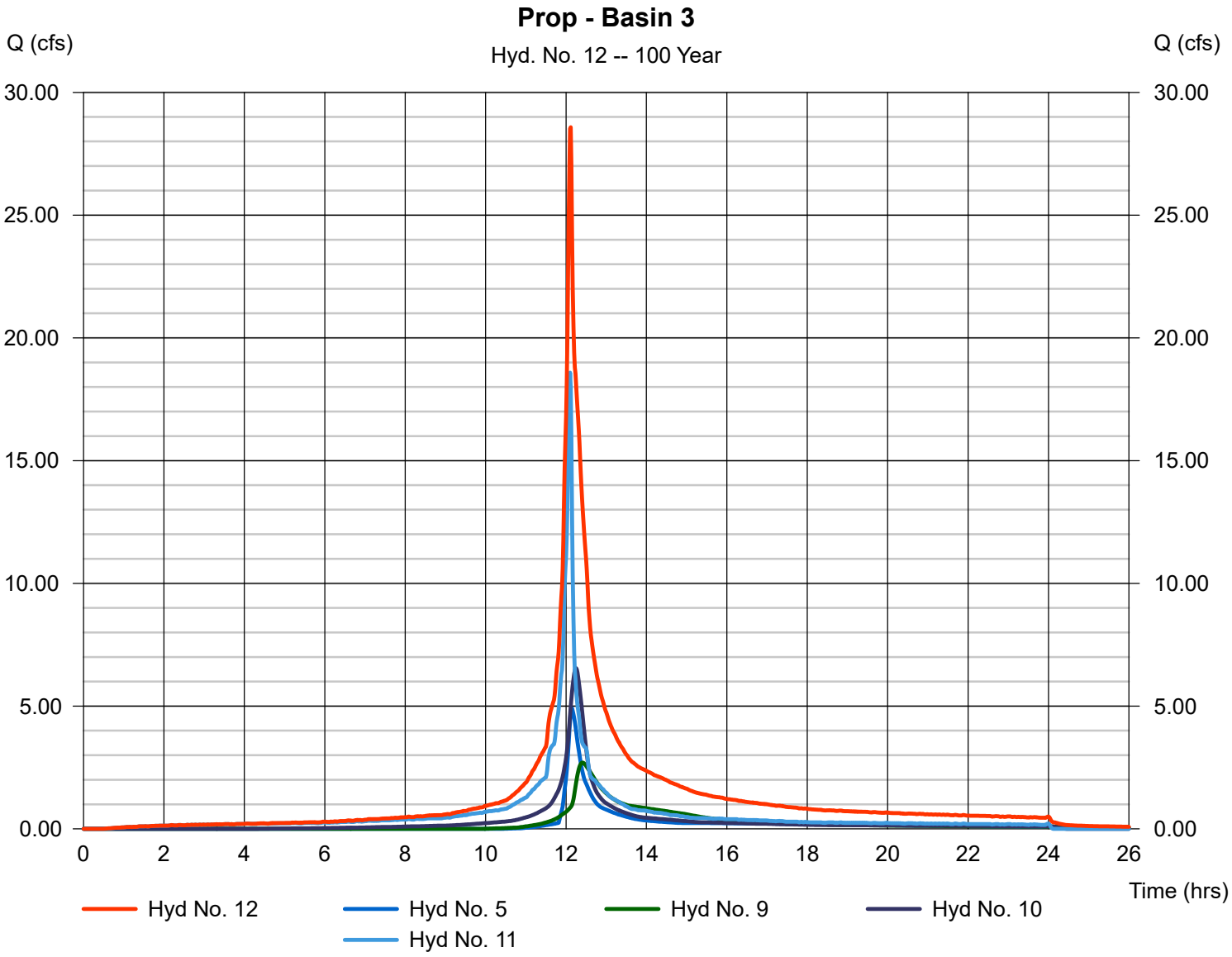


Hydrograph Report

Hyd. No. 12

Prop - Basin 3

Hydrograph type	= Combine	Peak discharge	= 28.58 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.12 hrs
Time interval	= 1 min	Hyd. volume	= 124,873 cuft
Inflow hyds.	= 5, 9, 10, 11	Contrib. drain. area	= 3.027 ac



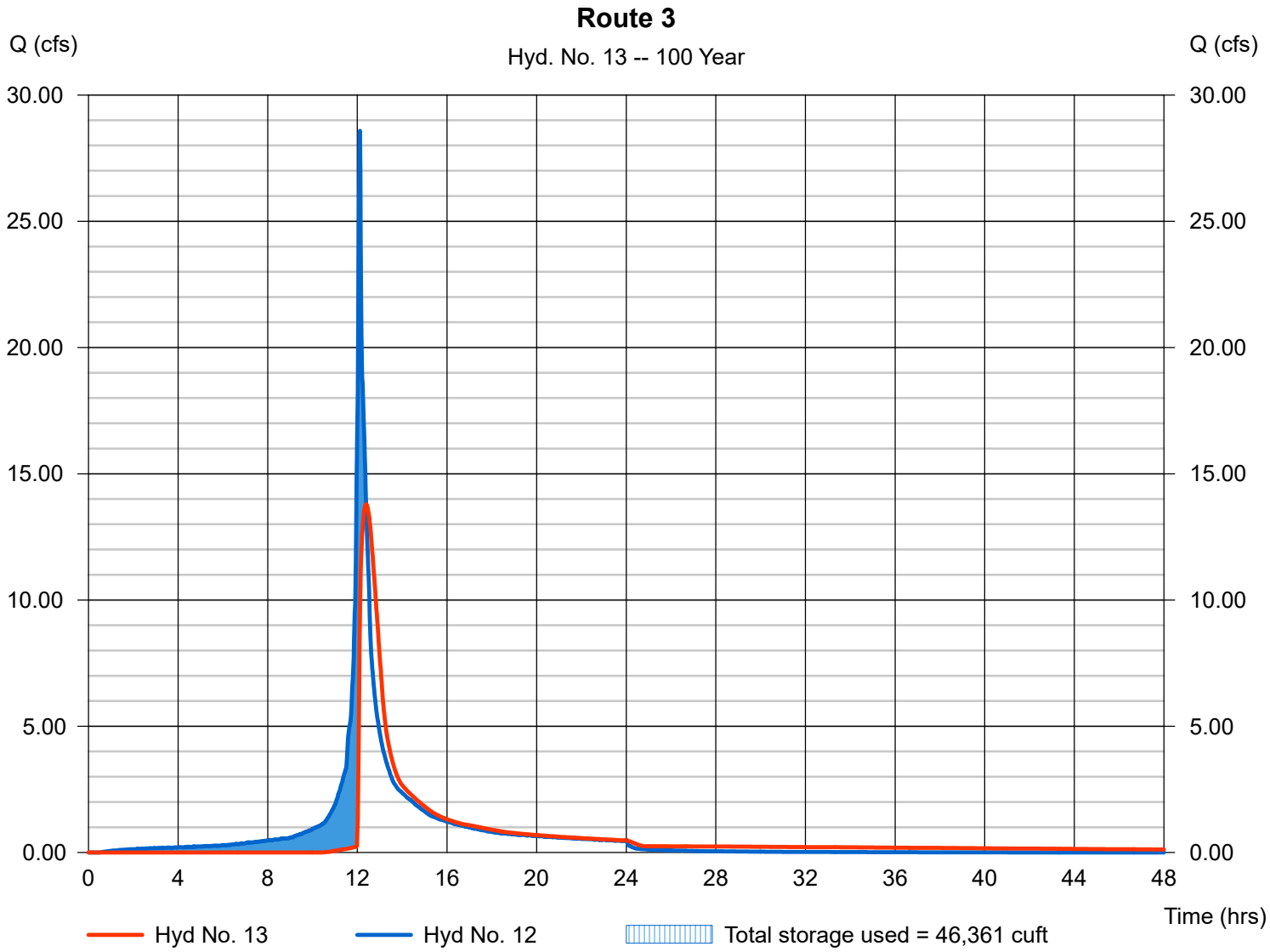
Hydrograph Report

Hyd. No. 13

Route 3

Hydrograph type	=	Reservoir	Peak discharge	=	13.80 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.38 hrs
Time interval	=	1 min	Hyd. volume	=	107,168 cuft
Inflow hyd. No.	=	12 - Prop - Basin 3	Max. Elevation	=	69.91 ft
Reservoir name	=	Basin 3	Max. Storage	=	46,361 cuft

Storage Indication method used.



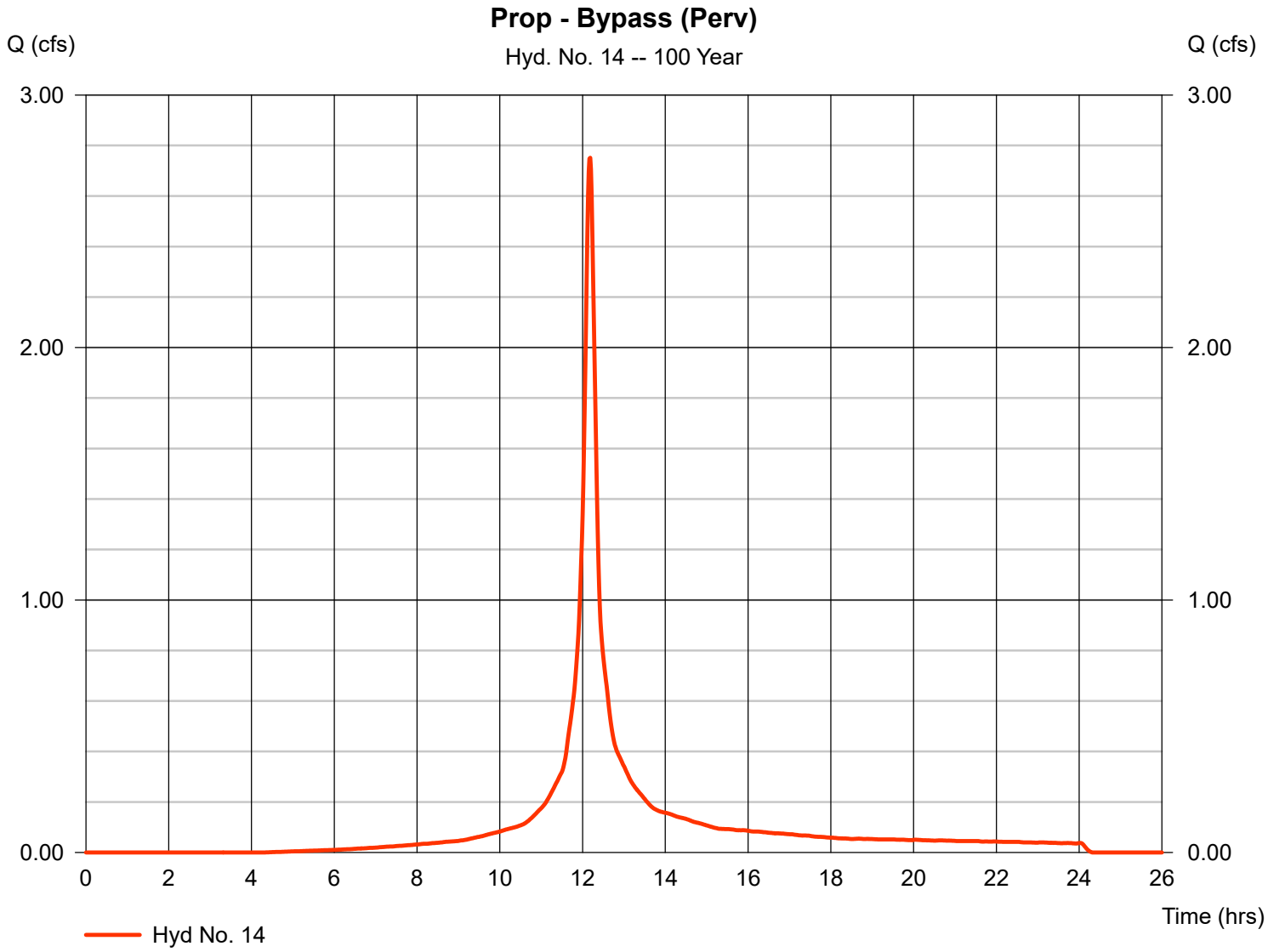
Hydrograph Report

Hyd. No. 14

Prop - Bypass (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.751 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	9,830 cuft
Drainage area	=	0.424 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.80 min
Total precip.	=	8.66 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.214 x 79) + (0.210 x 86)] / 0.424

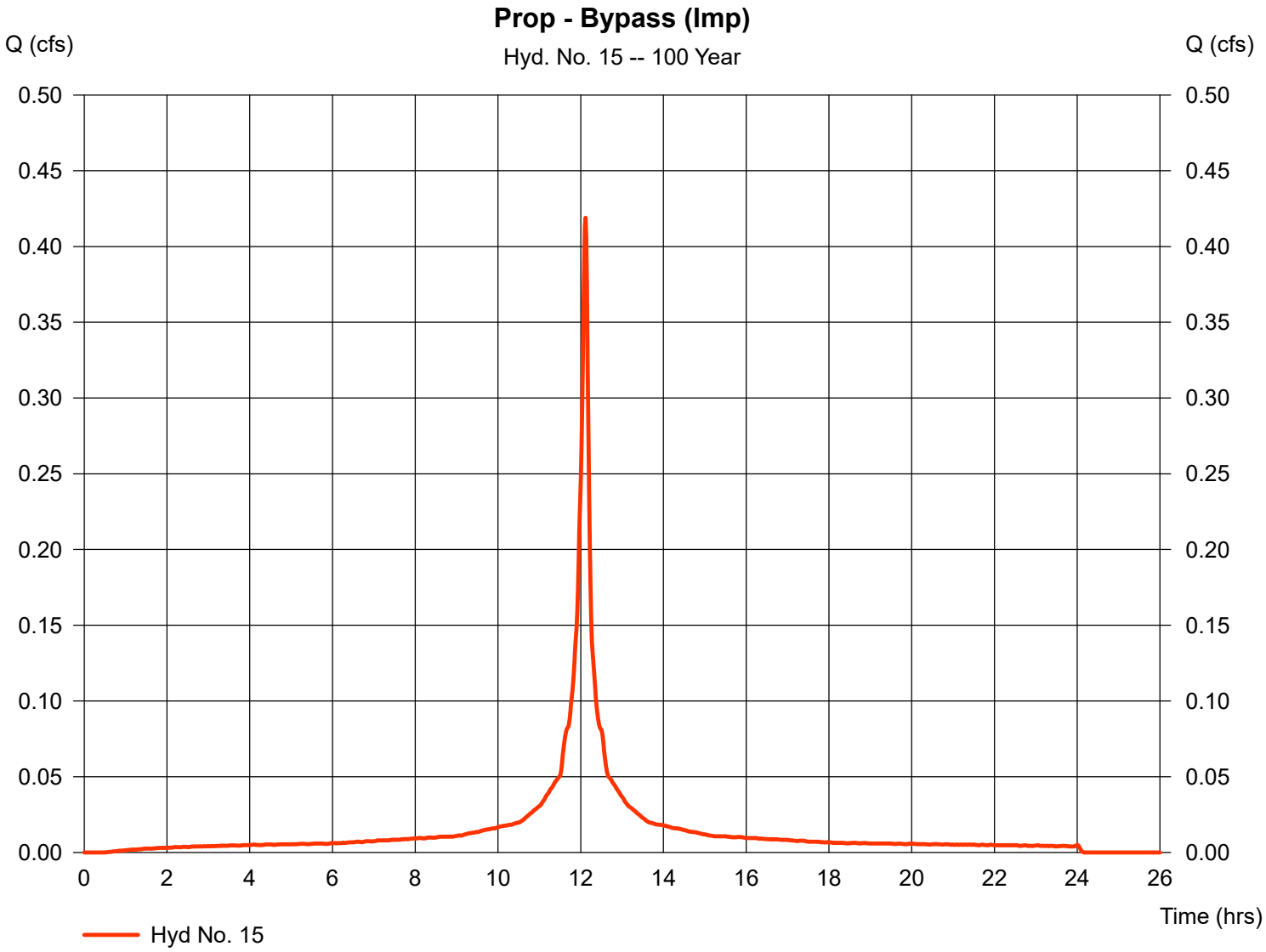


Hydrograph Report

Hyd. No. 15

Prop - Bypass (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.419 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.12 hrs
Time interval	=	1 min	Hyd. volume	=	1,387 cuft
Drainage area	=	0.044 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.50 min
Total precip.	=	8.66 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

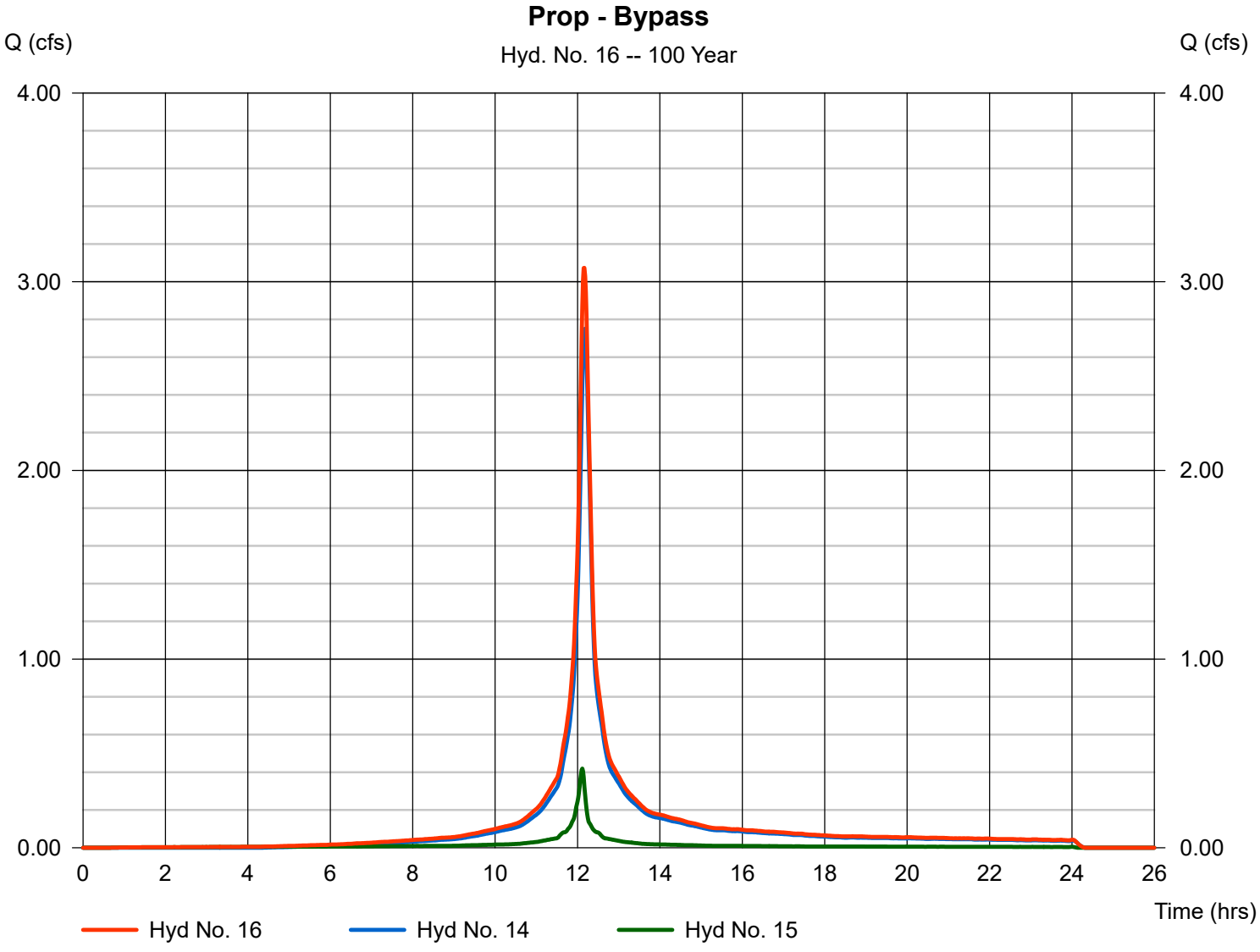


Hydrograph Report

Hyd. No. 16

Prop - Bypass

Hydrograph type	= Combine	Peak discharge	= 3.073 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.17 hrs
Time interval	= 1 min	Hyd. volume	= 11,217 cuft
Inflow hyds.	= 14, 15	Contrib. drain. area	= 0.468 ac

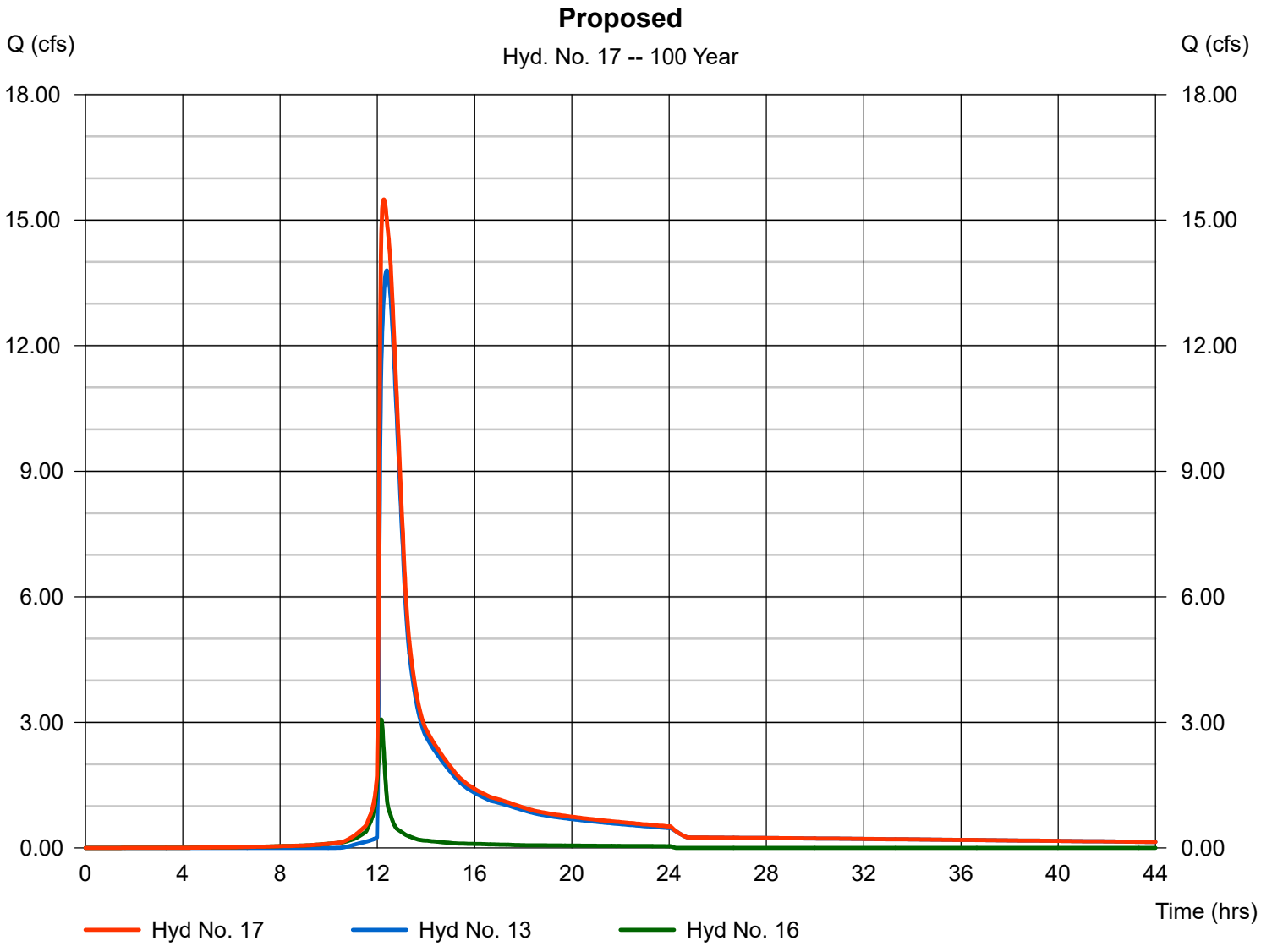


Hydrograph Report

Hyd. No. 17

Proposed

Hydrograph type	= Combine	Peak discharge	= 15.49 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.27 hrs
Time interval	= 1 min	Hyd. volume	= 118,385 cuft
Inflow hyds.	= 13, 16	Contrib. drain. area	= 0.000 ac



Hydraflow Table of Contents Future Rainfall

2 - Year

10 - Year

100 - Year

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	3.019	1	735	14,080	------	------	------	Existing
2	SCS Runoff	0.847	1	729	2,634	------	------	------	Prop - Basin 1 (Perv)
3	SCS Runoff	1.925	1	726	5,620	------	------	------	Prop - Basin 1 (Imp)
4	Combine	2.681	1	726	8,253	2, 3	------	------	Prop - Basin 1
5	Reservoir	0.206	1	792	5,353	4	76.41	5,253	Route 1
6	SCS Runoff	0.982	1	732	3,563	------	------	------	Prop - Basin 2 (Perv)
7	SCS Runoff	1.232	1	731	5,104	------	------	------	Prop - Basin 2 (Imp)
8	Combine	2.213	1	732	8,667	6, 7	------	------	Prop - Basin 2
9	Reservoir	0.442	1	763	6,357	8	73.62	4,754	Route 2
10	SCS Runoff	2.205	1	735	9,060	------	------	------	Prop - Basin 3 (Perv)
11	SCS Runoff	8.186	1	726	24,409	------	------	------	Prop - Basin 3 (Imp)
12	Combine	9.730	1	726	45,179	5, 9, 10, 11	------	------	Prop - Basin 3
13	Reservoir	0.463	1	1007	28,069	12	69.02	32,042	Route 3
14	SCS Runoff	0.911	1	731	3,132	------	------	------	Prop - Bypass (Perv)
15	SCS Runoff	0.184	1	727	594	------	------	------	Prop - Bypass (Imp)
16	Combine	1.047	1	730	3,725	14, 15	------	------	Prop - Bypass
17	Combine	1.138	1	730	31,794	13, 16	------	------	Proposed

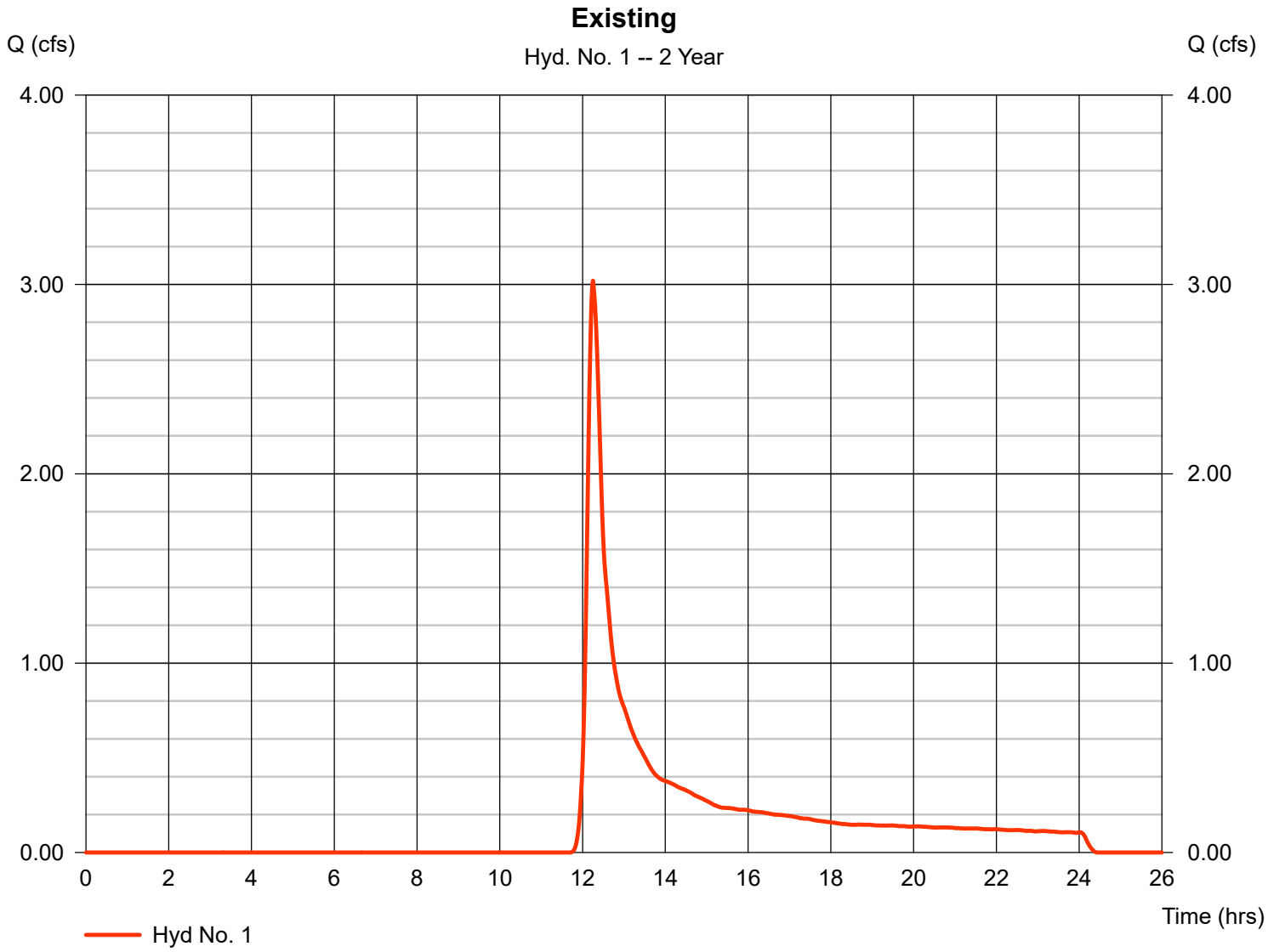
Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.019 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.25 hrs
Time interval	=	1 min	Hyd. volume	=	14,080 cuft
Drainage area	=	5.229 ac	Curve number	=	61*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.40 min
Total precip.	=	3.84 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(2.998 x 55) + (2.231 x 70)] / 5.229



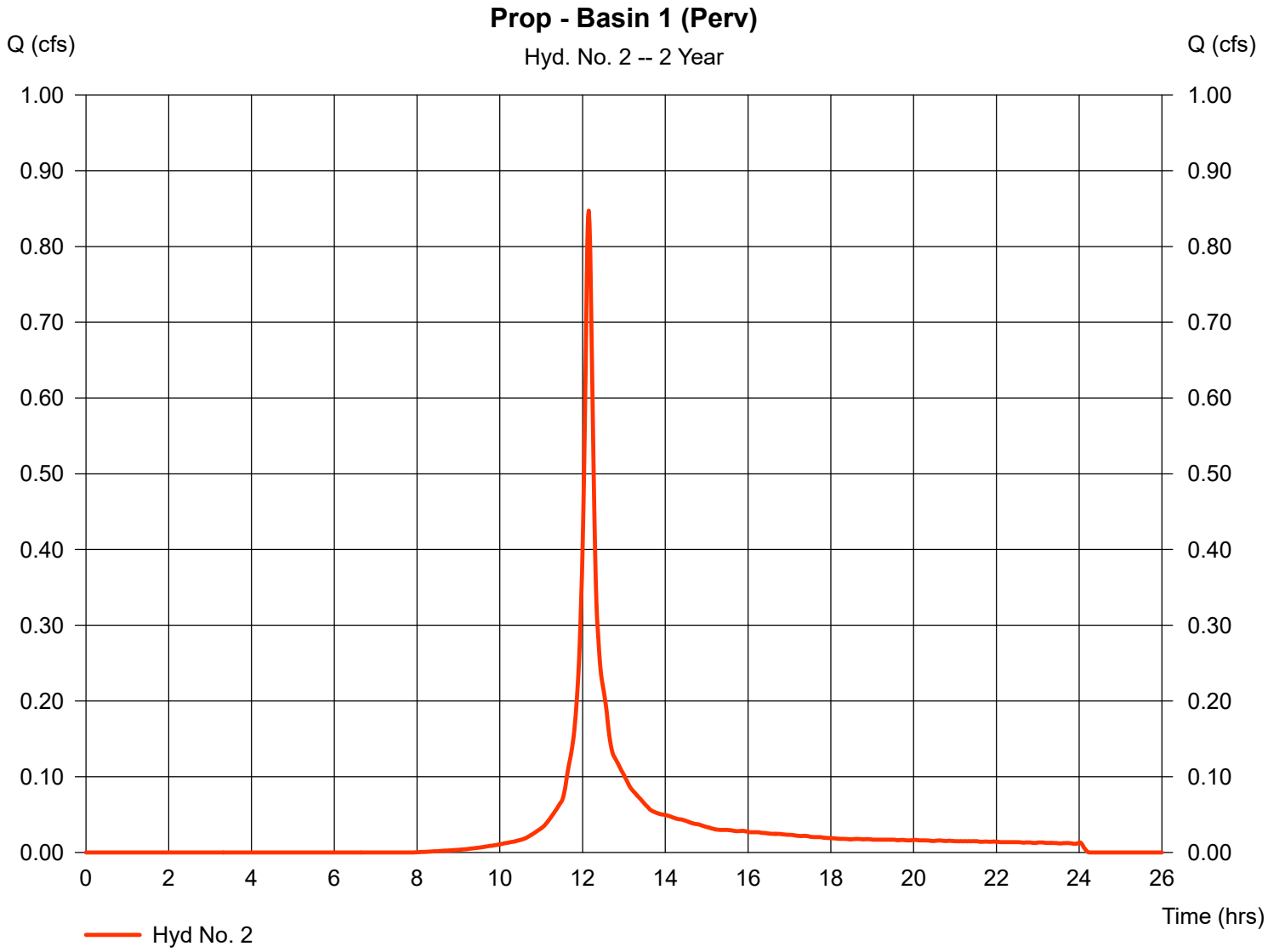
Hydrograph Report

Hyd. No. 2

Prop - Basin 1 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.847 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.15 hrs
Time interval	=	1 min	Hyd. volume	=	2,634 cuft
Drainage area	=	0.351 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.20 min
Total precip.	=	3.84 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.196 x 79) + (0.155 x 86)] / 0.351

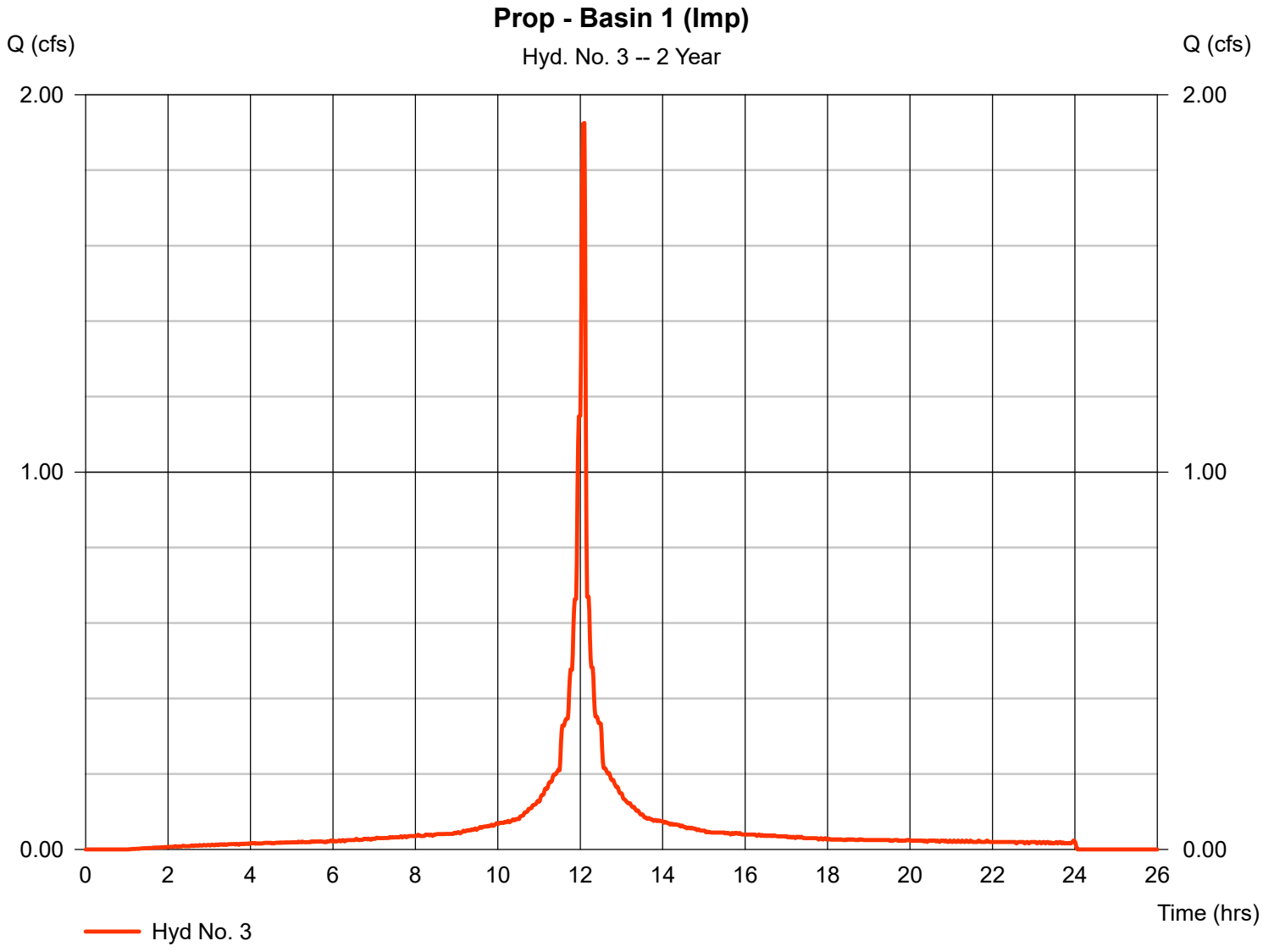


Hydrograph Report

Hyd. No. 3

Prop - Basin 1 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.925 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	5,620 cuft
Drainage area	=	0.458 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	1.60 min
Total precip.	=	3.84 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

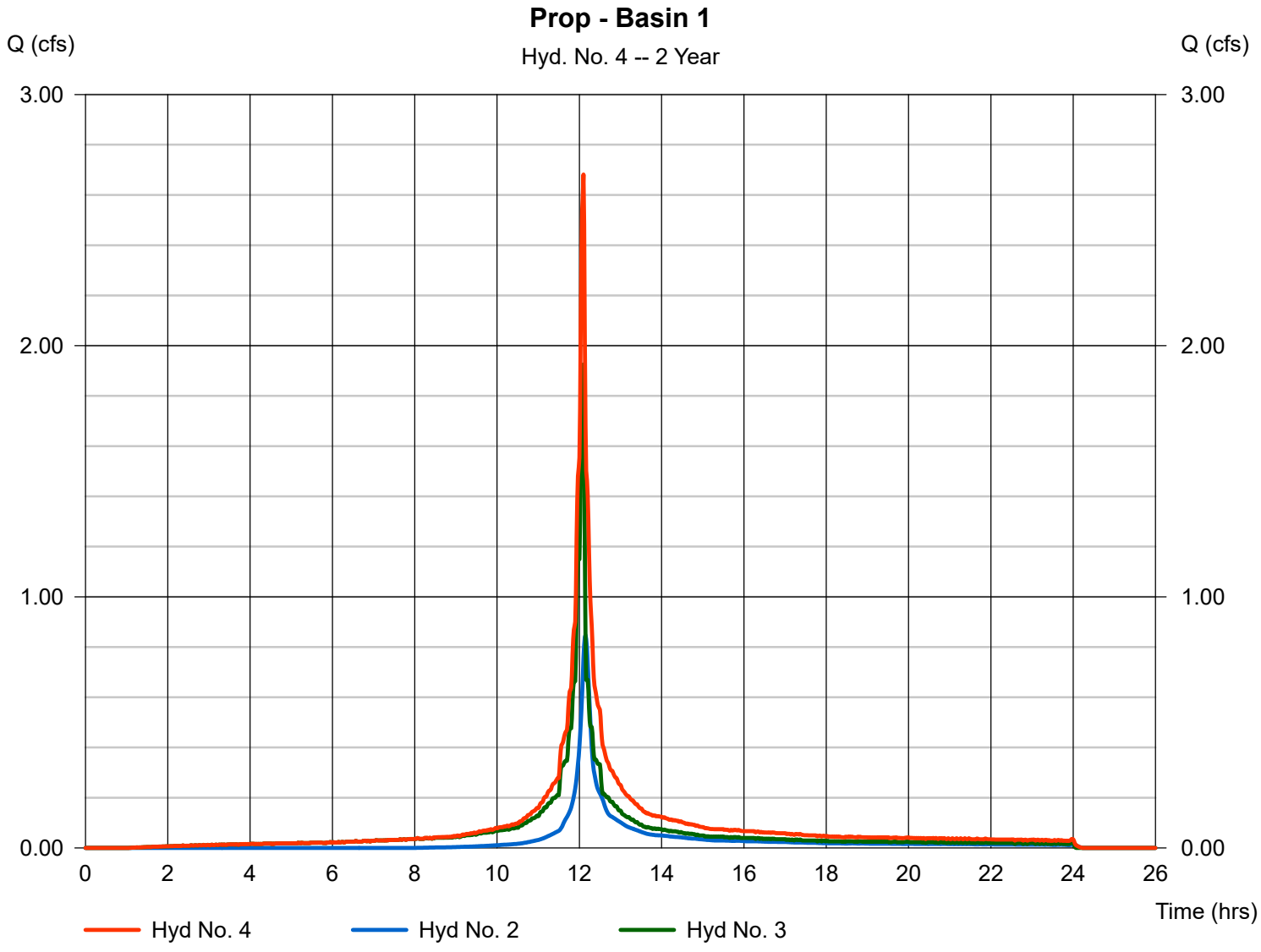


Hydrograph Report

Hyd. No. 4

Prop - Basin 1

Hydrograph type	= Combine	Peak discharge	= 2.681 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 8,253 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 0.809 ac



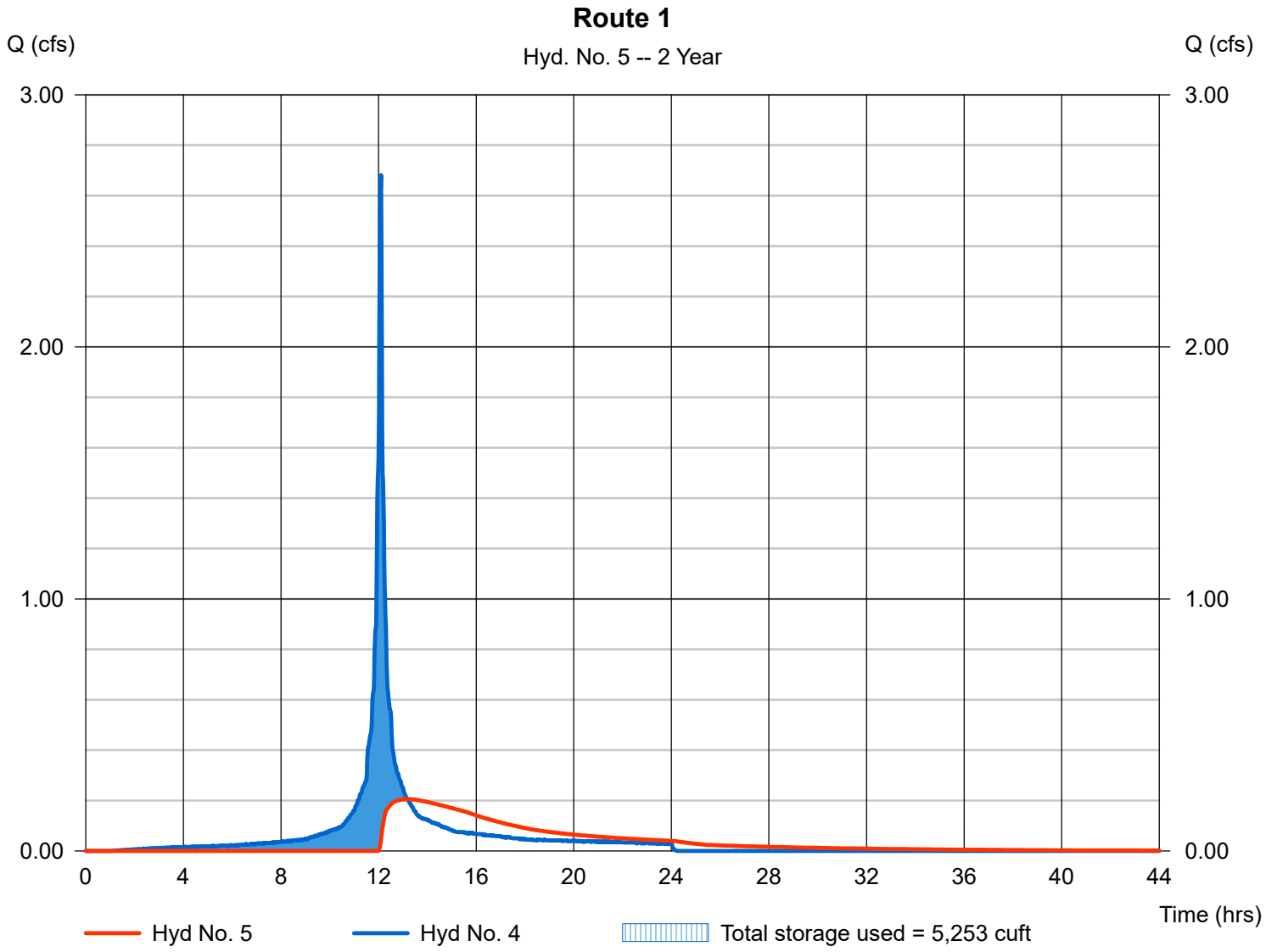
Hydrograph Report

Hyd. No. 5

Route 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.206 cfs
Storm frequency	=	2 yrs	Time to peak	=	13.20 hrs
Time interval	=	1 min	Hyd. volume	=	5,353 cuft
Inflow hyd. No.	=	4 - Prop - Basin 1	Max. Elevation	=	76.41 ft
Reservoir name	=	Basin 1	Max. Storage	=	5,253 cuft

Storage Indication method used.

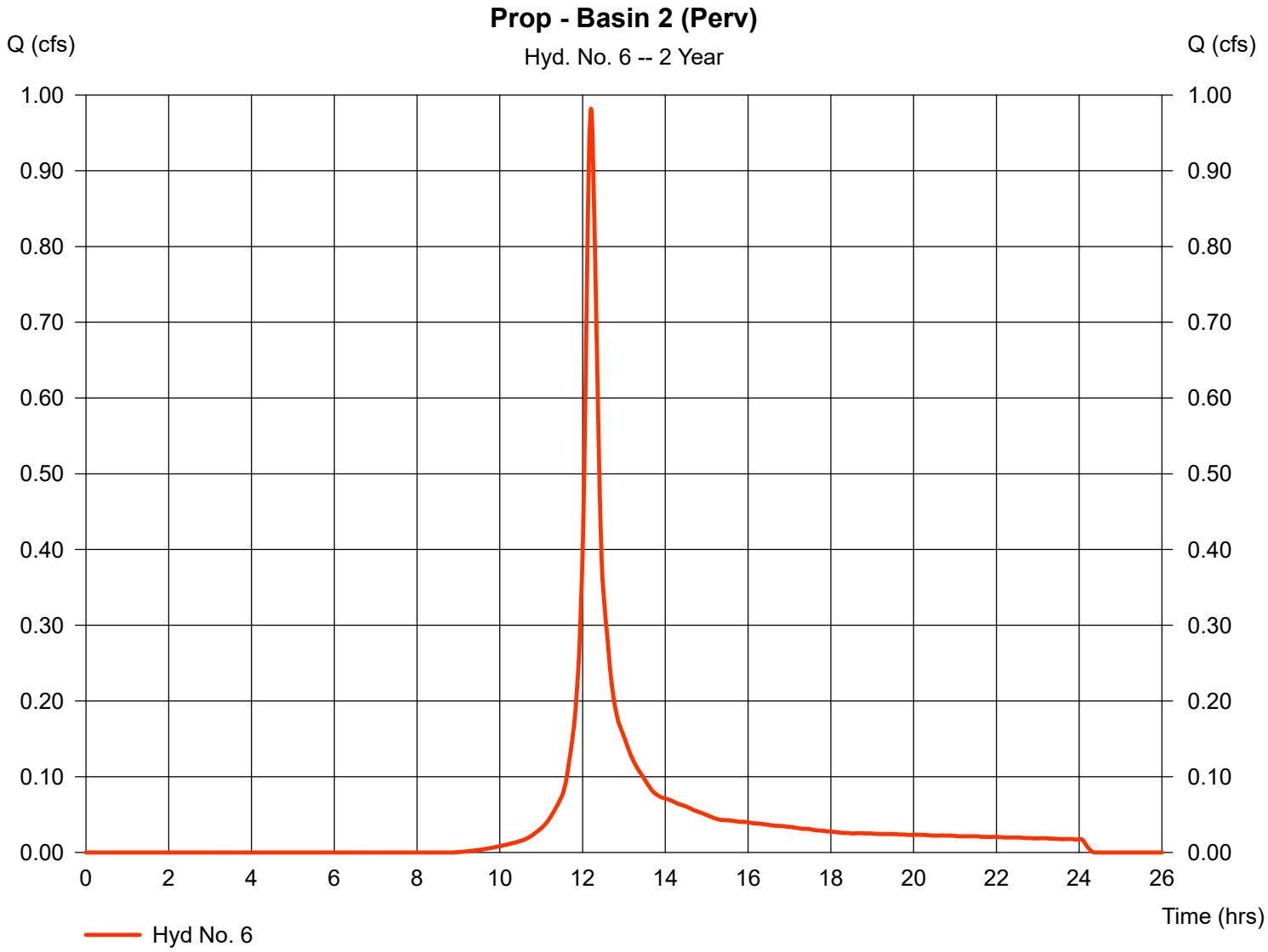


Hydrograph Report

Hyd. No. 6

Prop - Basin 2 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.982 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.20 hrs
Time interval	=	1 min	Hyd. volume	=	3,563 cuft
Drainage area	=	0.535 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.10 min
Total precip.	=	3.84 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

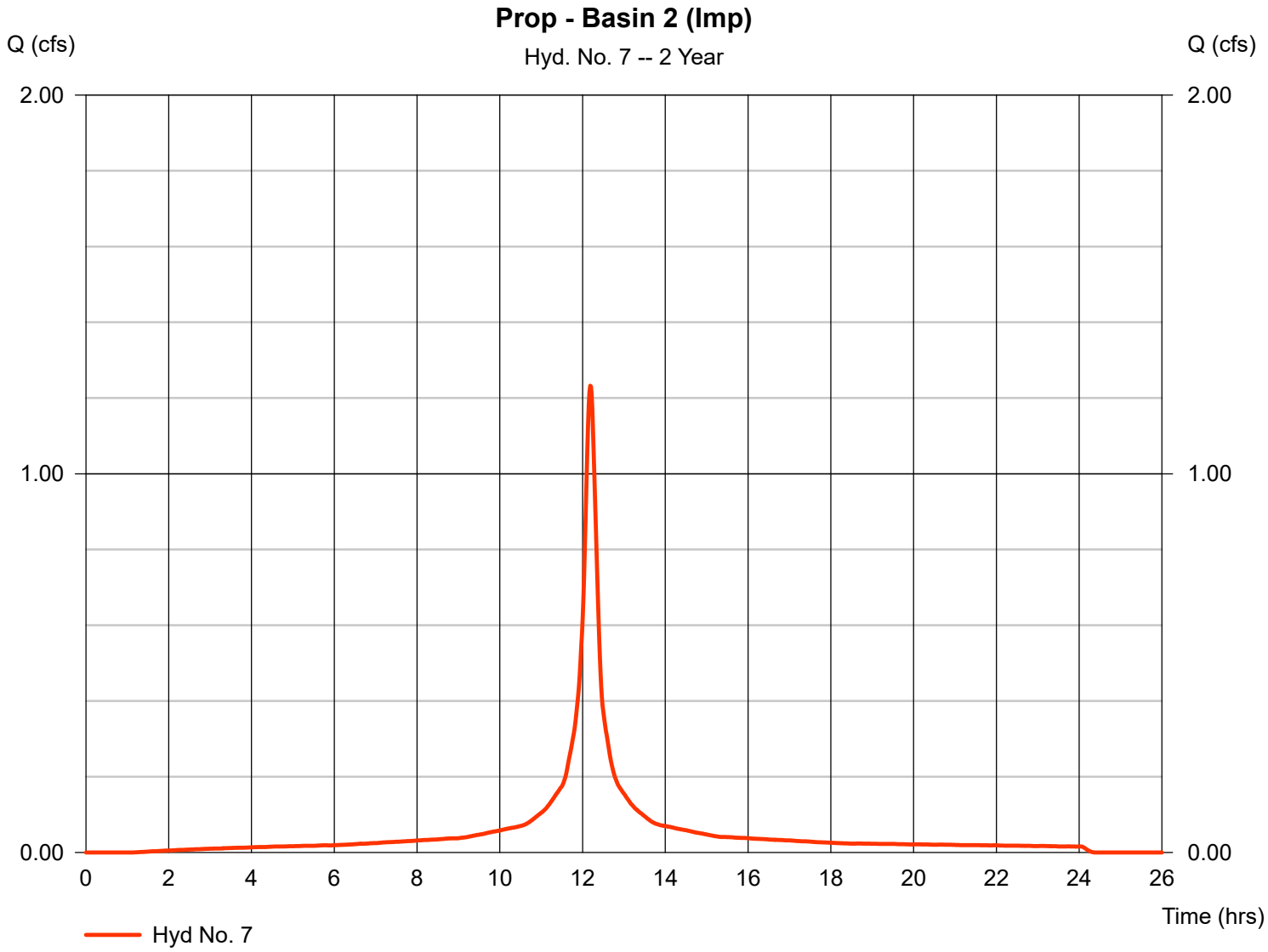


Hydrograph Report

Hyd. No. 7

Prop - Basin 2 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.232 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	5,104 cuft
Drainage area	=	0.390 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.70 min
Total precip.	=	3.84 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

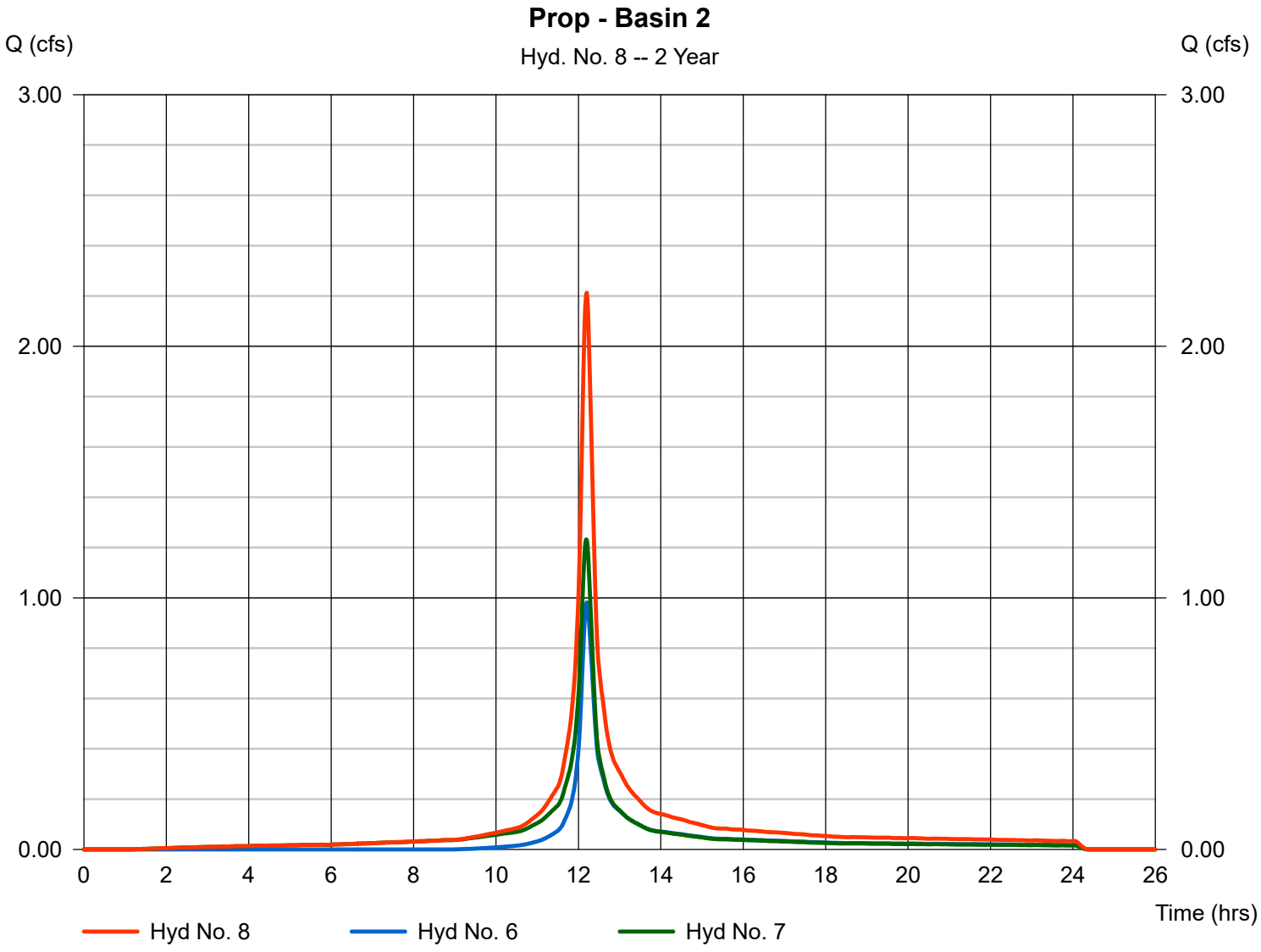


Hydrograph Report

Hyd. No. 8

Prop - Basin 2

Hydrograph type	= Combine	Peak discharge	= 2.213 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.20 hrs
Time interval	= 1 min	Hyd. volume	= 8,667 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 0.925 ac



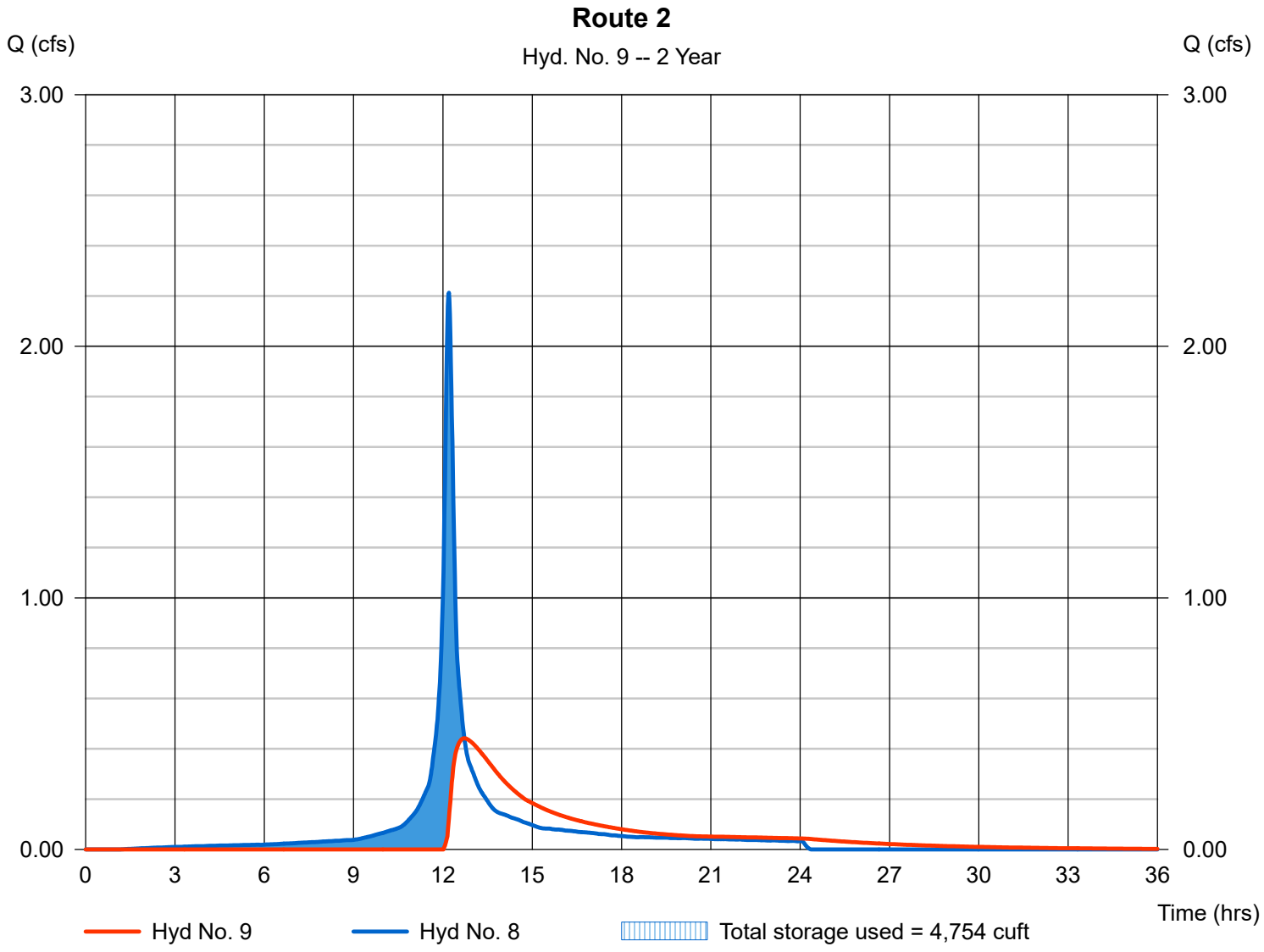
Hydrograph Report

Hyd. No. 9

Route 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.442 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.72 hrs
Time interval	=	1 min	Hyd. volume	=	6,357 cuft
Inflow hyd. No.	=	8 - Prop - Basin 2	Max. Elevation	=	73.62 ft
Reservoir name	=	Basin 2	Max. Storage	=	4,754 cuft

Storage Indication method used.



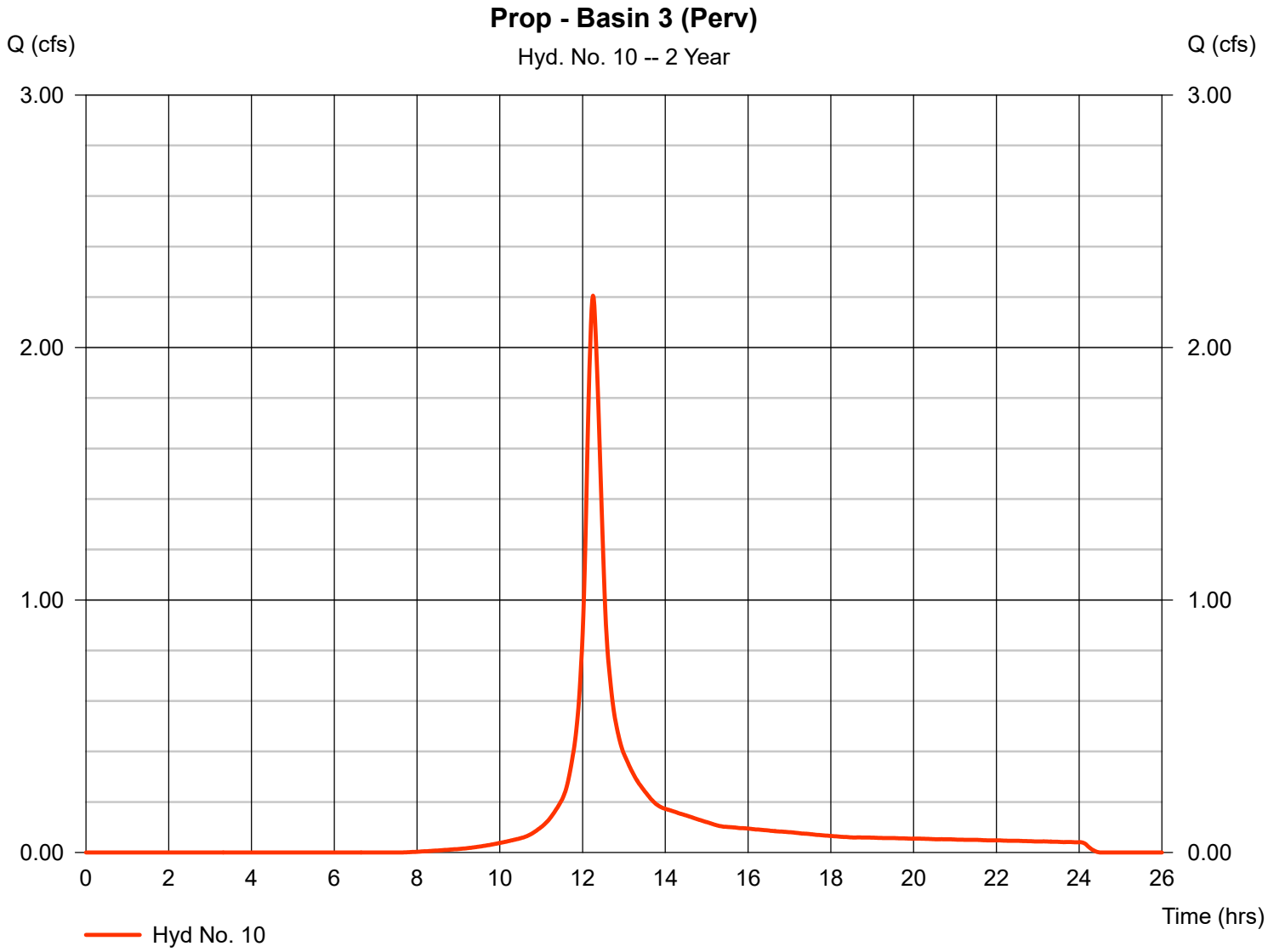
Hydrograph Report

Hyd. No. 10

Prop - Basin 3 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.205 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.25 hrs
Time interval	=	1 min	Hyd. volume	=	9,060 cuft
Drainage area	=	1.162 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.00 min
Total precip.	=	3.84 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.456 x 79) + (0.706 x 86)] / 1.162

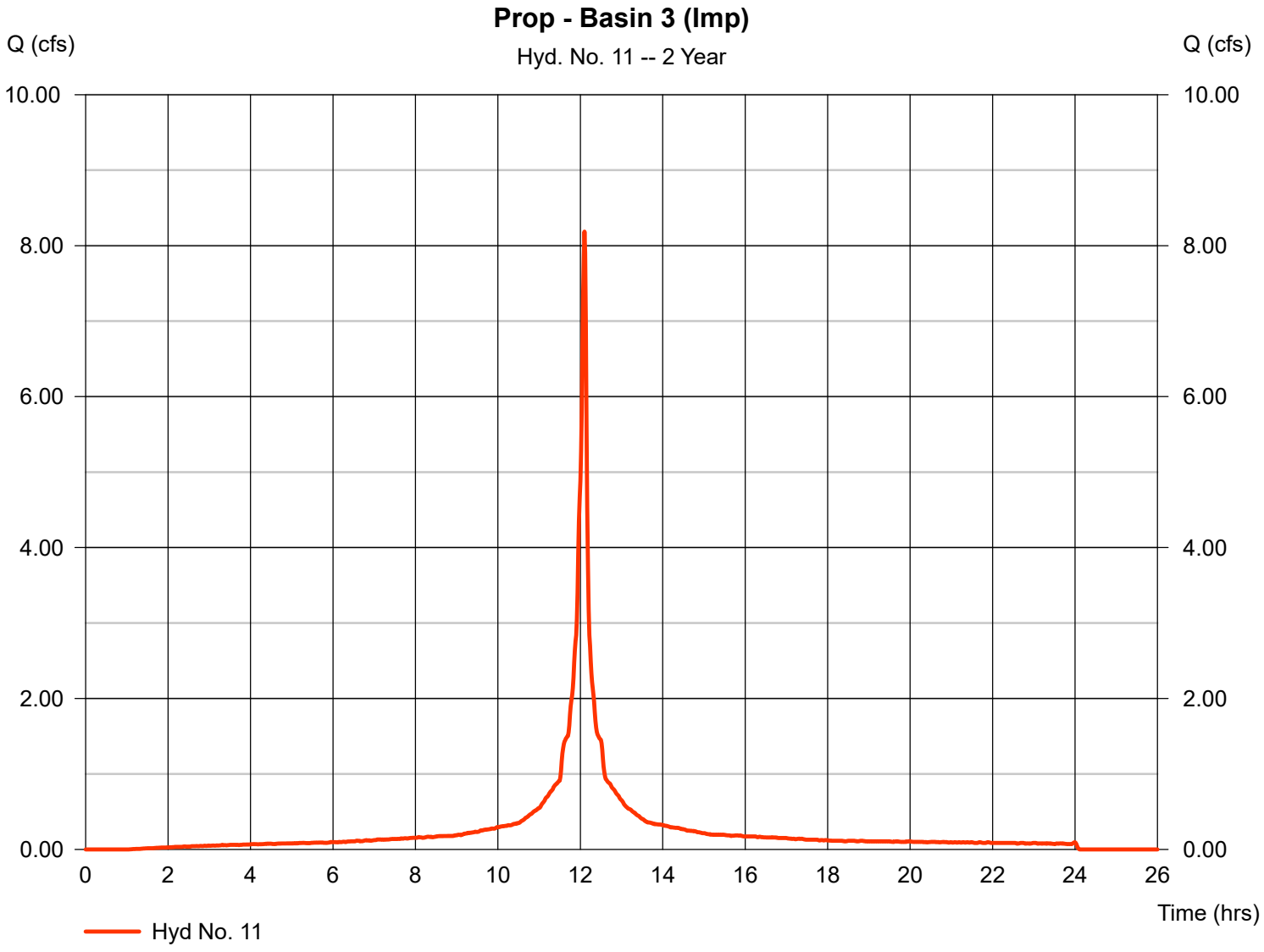


Hydrograph Report

Hyd. No. 11

Prop - Basin 3 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.186 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	24,409 cuft
Drainage area	=	1.865 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	3.90 min
Total precip.	=	3.84 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

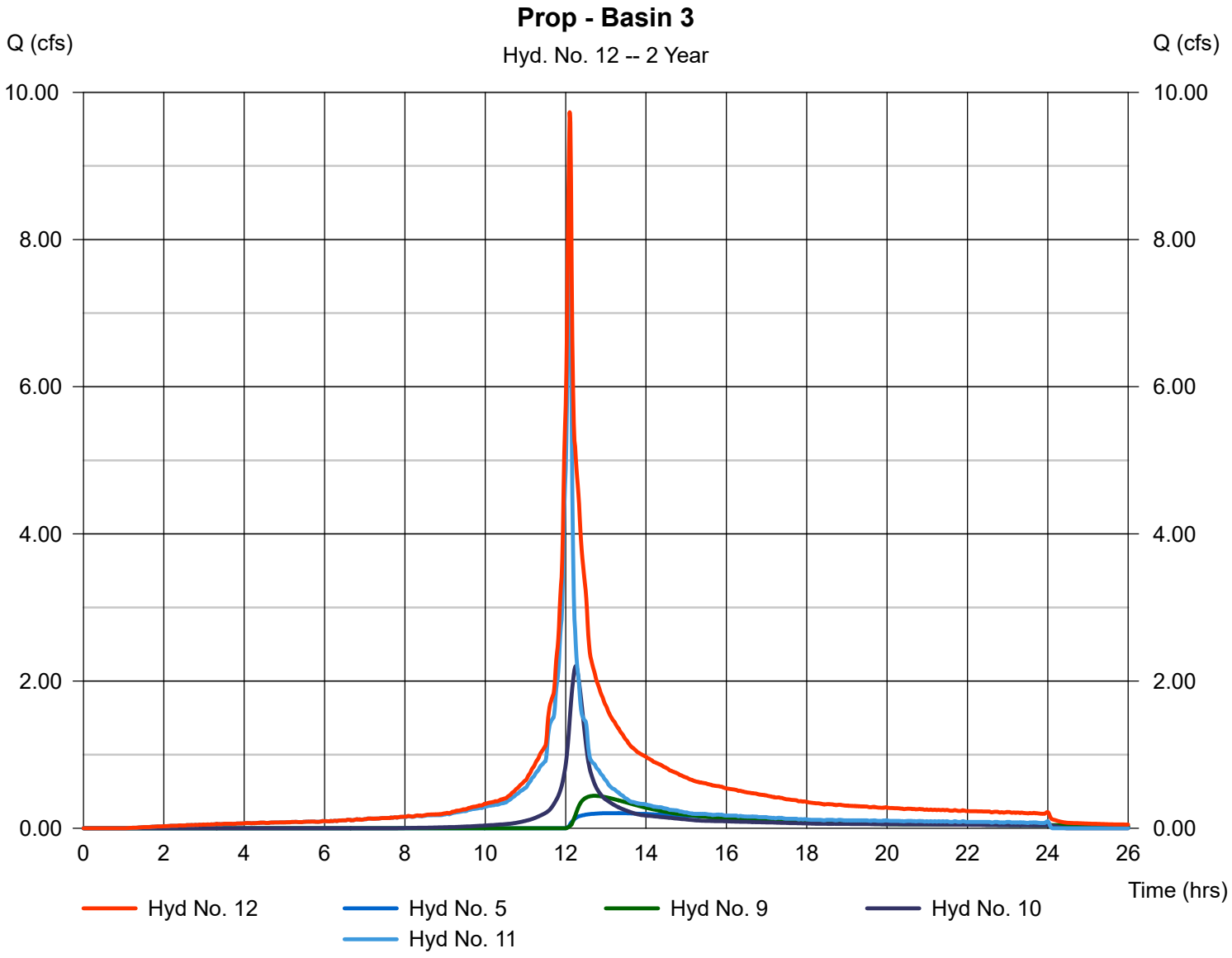


Hydrograph Report

Hyd. No. 12

Prop - Basin 3

Hydrograph type	= Combine	Peak discharge	= 9.730 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 45,179 cuft
Inflow hyds.	= 5, 9, 10, 11	Contrib. drain. area	= 3.027 ac



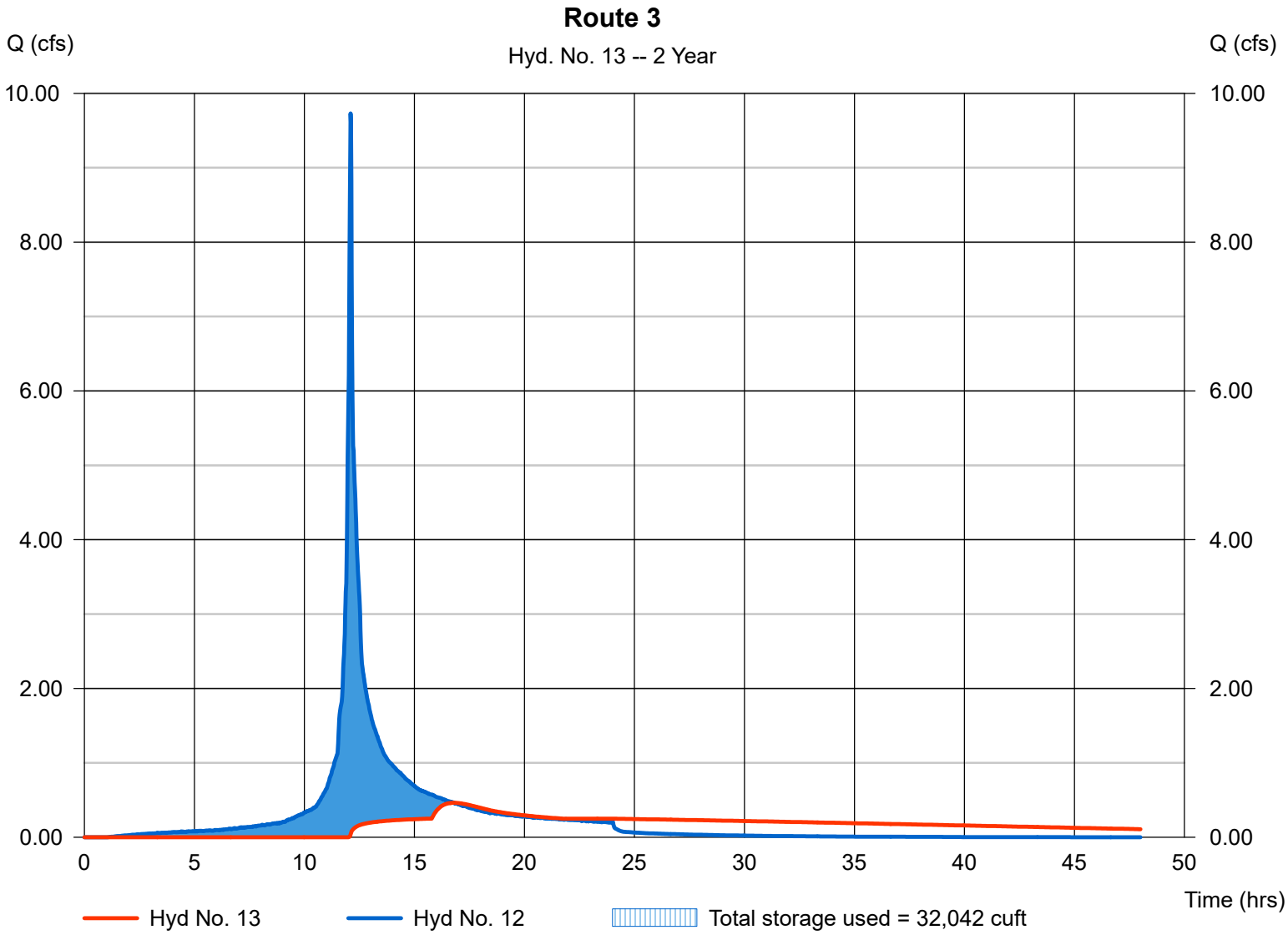
Hydrograph Report

Hyd. No. 13

Route 3

Hydrograph type	=	Reservoir	Peak discharge	=	0.463 cfs
Storm frequency	=	2 yrs	Time to peak	=	16.78 hrs
Time interval	=	1 min	Hyd. volume	=	28,069 cuft
Inflow hyd. No.	=	12 - Prop - Basin 3	Max. Elevation	=	69.02 ft
Reservoir name	=	Basin 3	Max. Storage	=	32,042 cuft

Storage Indication method used.



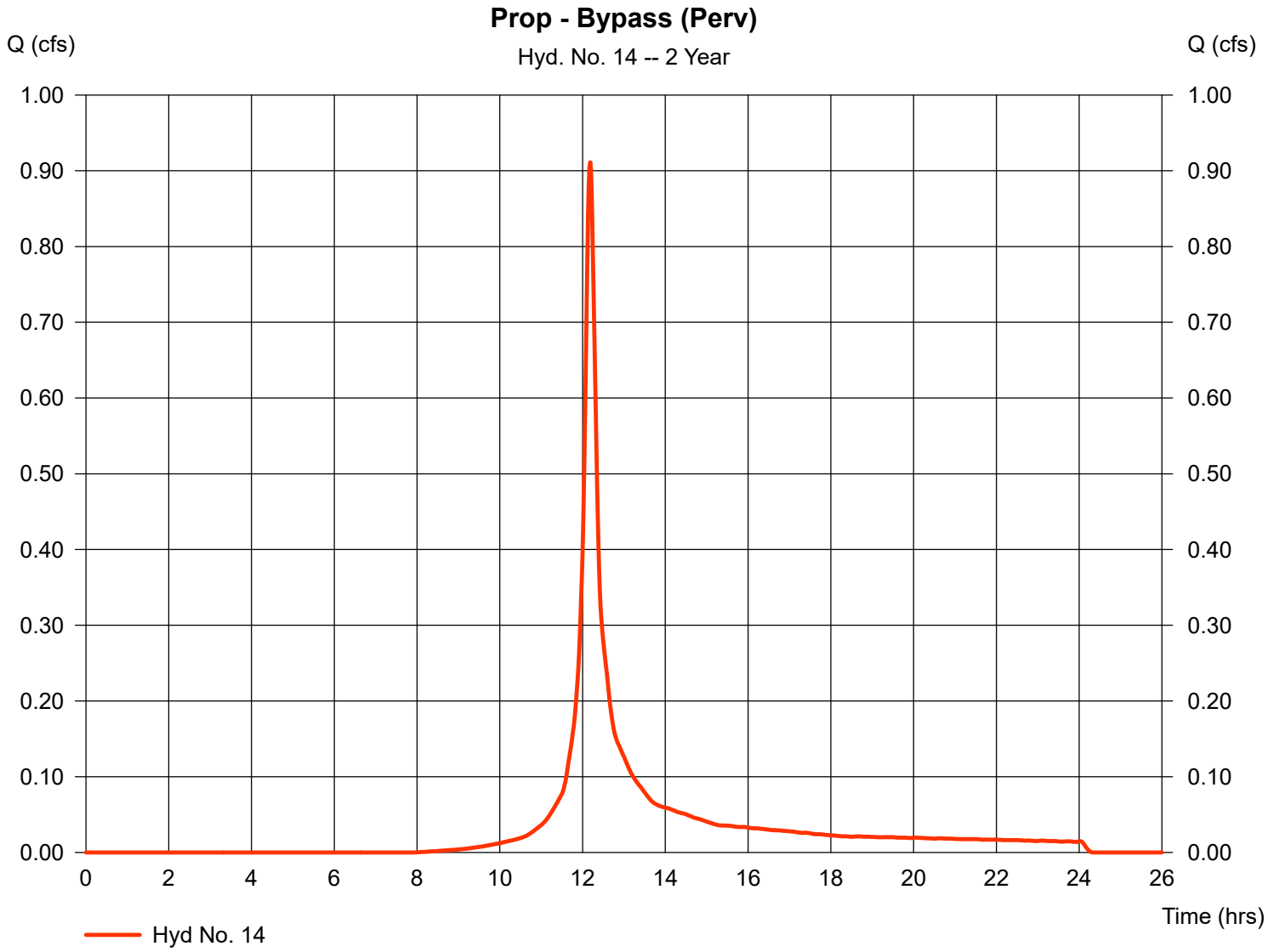
Hydrograph Report

Hyd. No. 14

Prop - Bypass (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.911 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	3,132 cuft
Drainage area	=	0.424 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.80 min
Total precip.	=	3.84 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.214 x 79) + (0.210 x 86)] / 0.424

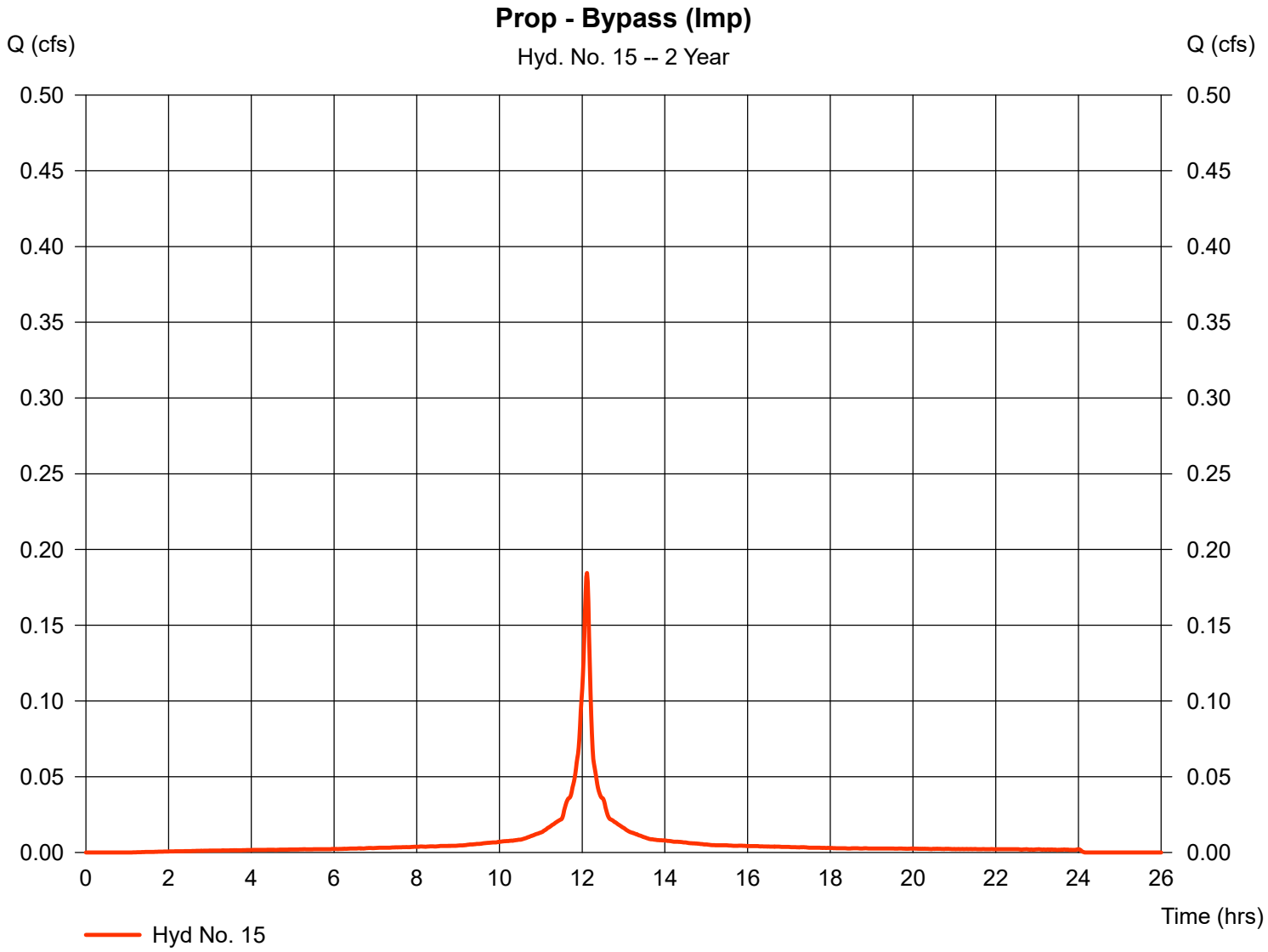


Hydrograph Report

Hyd. No. 15

Prop - Bypass (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.184 cfs
Storm frequency	=	2 yrs	Time to peak	=	12.12 hrs
Time interval	=	1 min	Hyd. volume	=	594 cuft
Drainage area	=	0.044 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.50 min
Total precip.	=	3.84 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

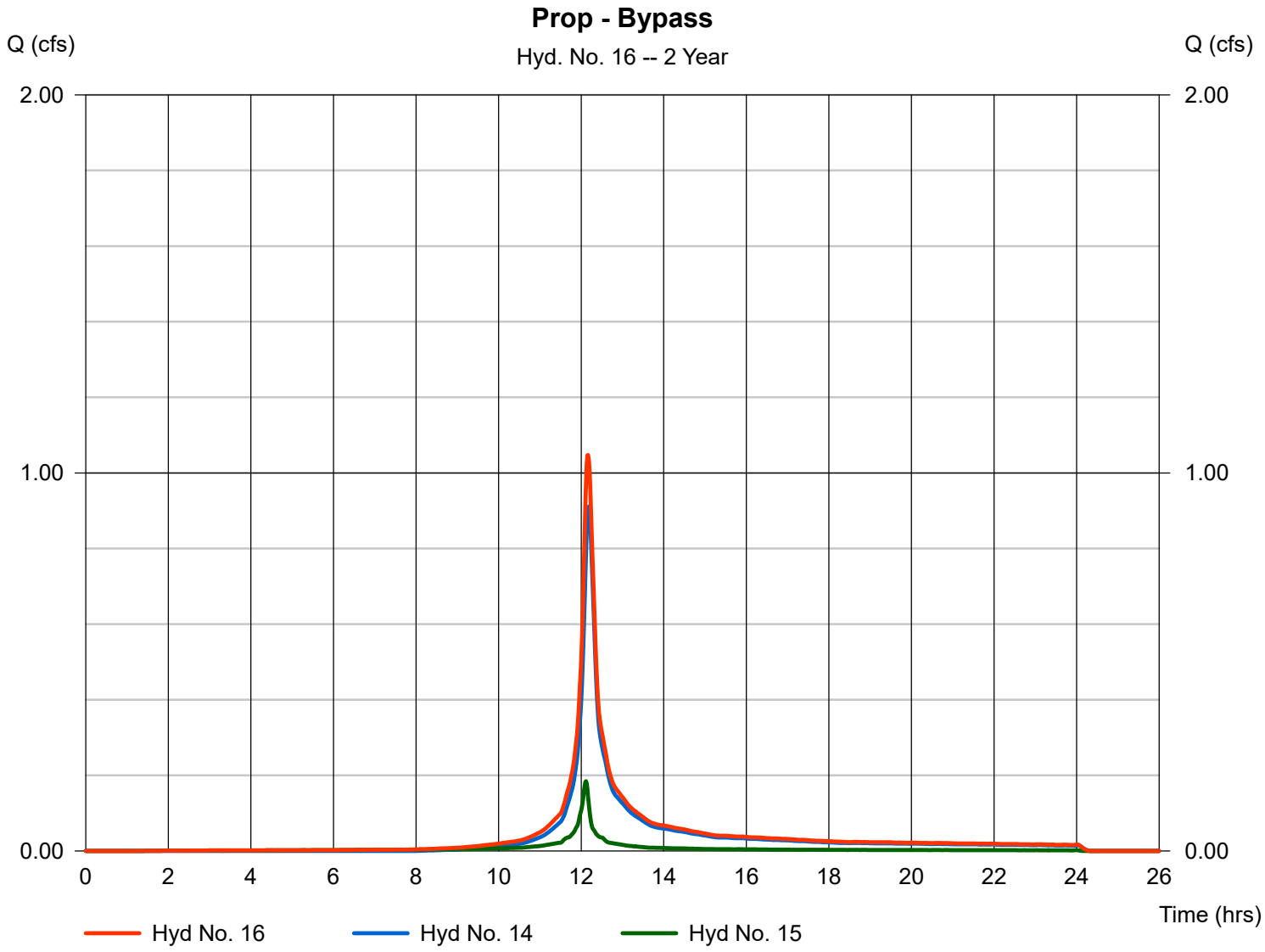


Hydrograph Report

Hyd. No. 16

Prop - Bypass

Hydrograph type	= Combine	Peak discharge	= 1.047 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 1 min	Hyd. volume	= 3,725 cuft
Inflow hyds.	= 14, 15	Contrib. drain. area	= 0.468 ac

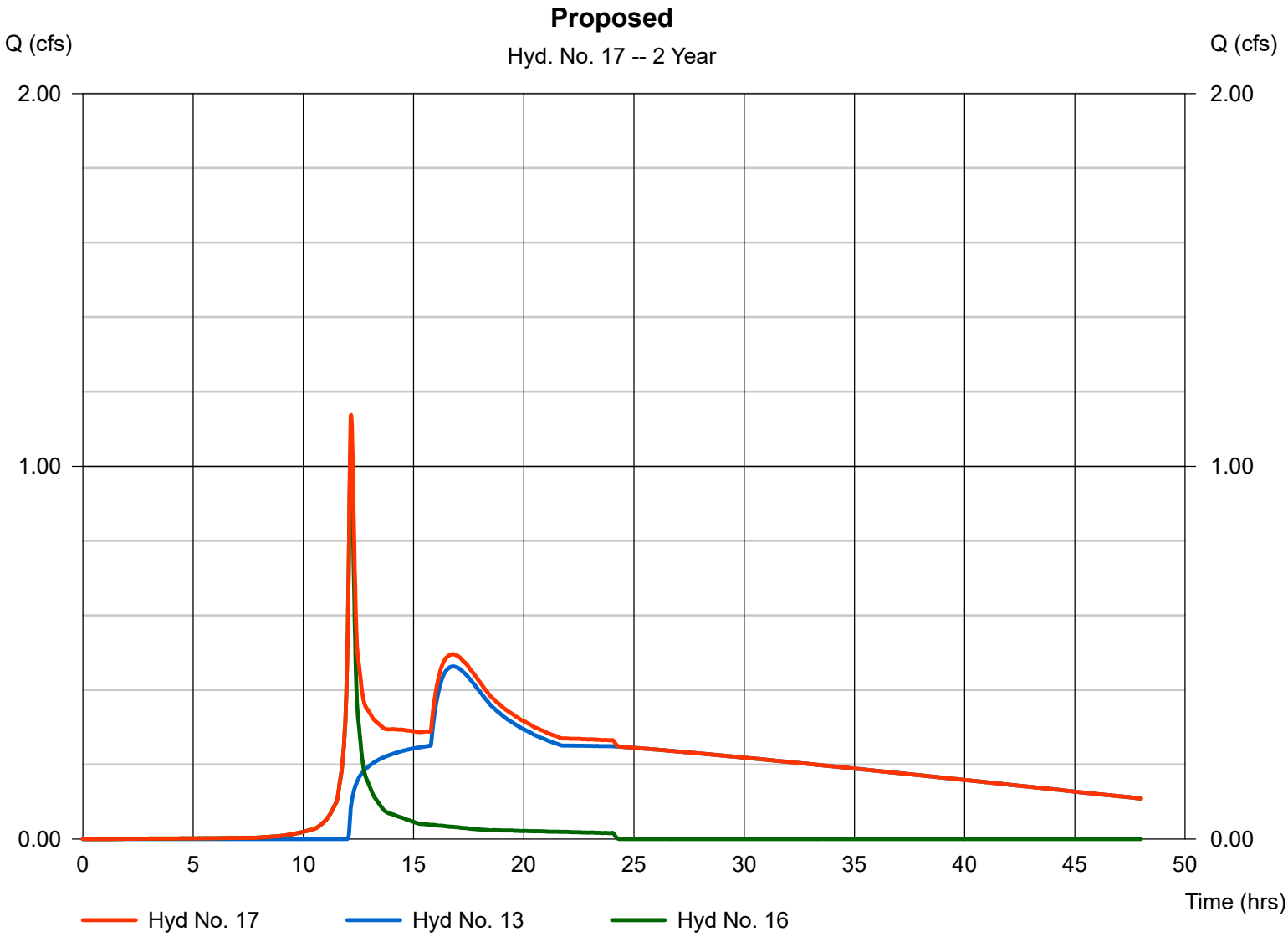


Hydrograph Report

Hyd. No. 17

Proposed

Hydrograph type	= Combine	Peak discharge	= 1.138 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.17 hrs
Time interval	= 1 min	Hyd. volume	= 31,794 cuft
Inflow hyds.	= 13, 16	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	9.272	1	734	36,754	------	------	------	Existing
2	SCS Runoff	1.555	1	729	4,916	------	------	------	Prop - Basin 1 (Perv)
3	SCS Runoff	2.951	1	726	8,763	------	------	------	Prop - Basin 1 (Imp)
4	Combine	4.360	1	726	13,679	2, 3	------	------	Prop - Basin 1
5	Reservoir	1.772	1	735	10,778	4	76.68	6,839	Route 1
6	SCS Runoff	1.896	1	732	6,904	------	------	------	Prop - Basin 2 (Perv)
7	SCS Runoff	1.891	1	731	7,959	------	------	------	Prop - Basin 2 (Imp)
8	Combine	3.784	1	732	14,863	6, 7	------	------	Prop - Basin 2
9	Reservoir	0.932	1	757	12,553	8	73.98	7,523	Route 2
10	SCS Runoff	4.015	1	735	16,710	------	------	------	Prop - Basin 3 (Perv)
11	SCS Runoff	12.55	1	726	38,061	------	------	------	Prop - Basin 3 (Imp)
12	Combine	16.38	1	727	78,102	5, 9, 10, 11	------	------	Prop - Basin 3
13	Reservoir	4.754	1	756	60,644	12	69.30	36,486	Route 3
14	SCS Runoff	1.676	1	731	5,846	------	------	------	Prop - Bypass (Perv)
15	SCS Runoff	0.283	1	727	926	------	------	------	Prop - Bypass (Imp)
16	Combine	1.890	1	730	6,772	14, 15	------	------	Prop - Bypass
17	Combine	5.204	1	755	67,416	13, 16	------	------	Proposed

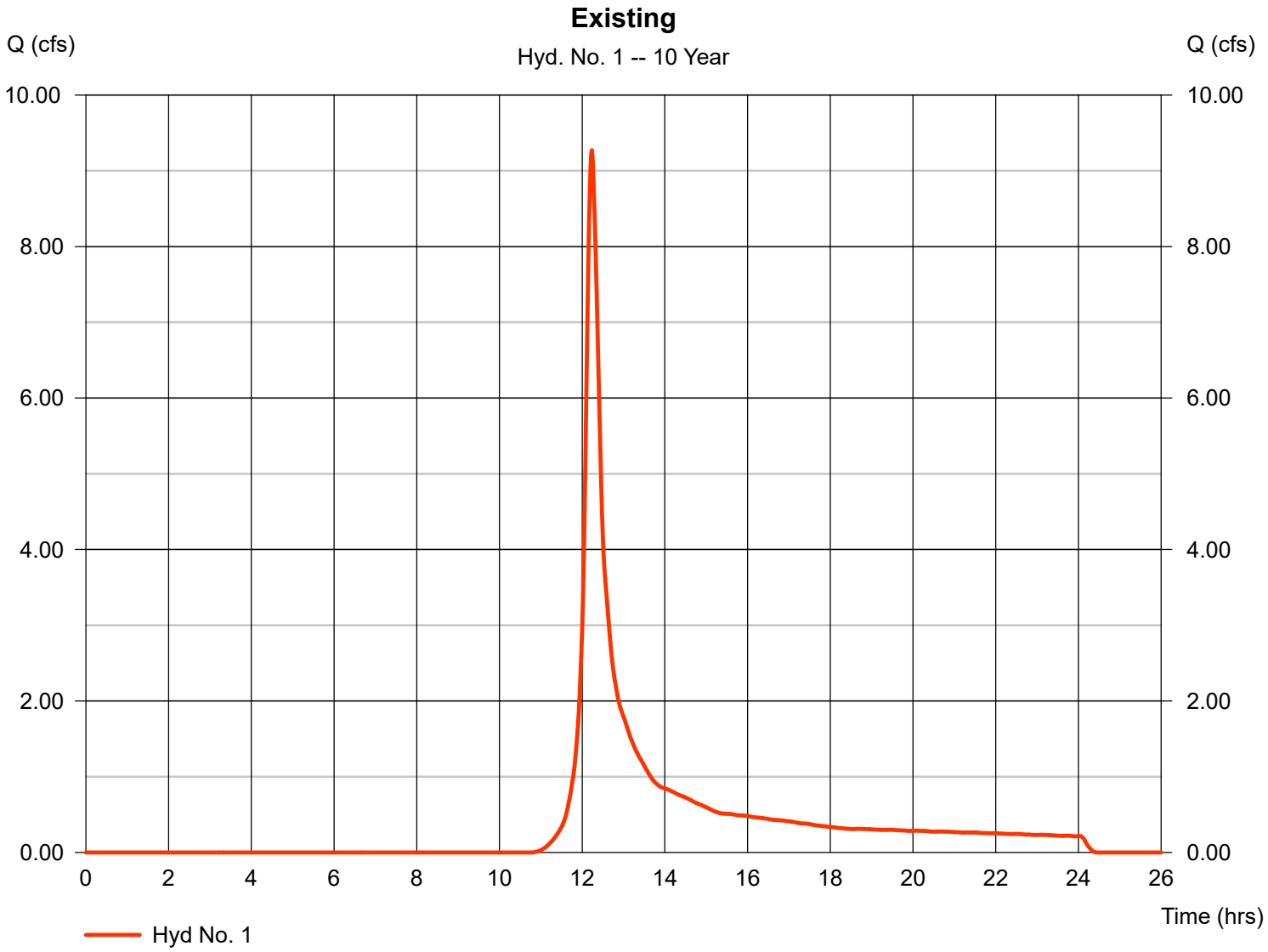
Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.272 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.23 hrs
Time interval	=	1 min	Hyd. volume	=	36,754 cuft
Drainage area	=	5.229 ac	Curve number	=	61*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.40 min
Total precip.	=	5.86 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(2.998 x 55) + (2.231 x 70)] / 5.229



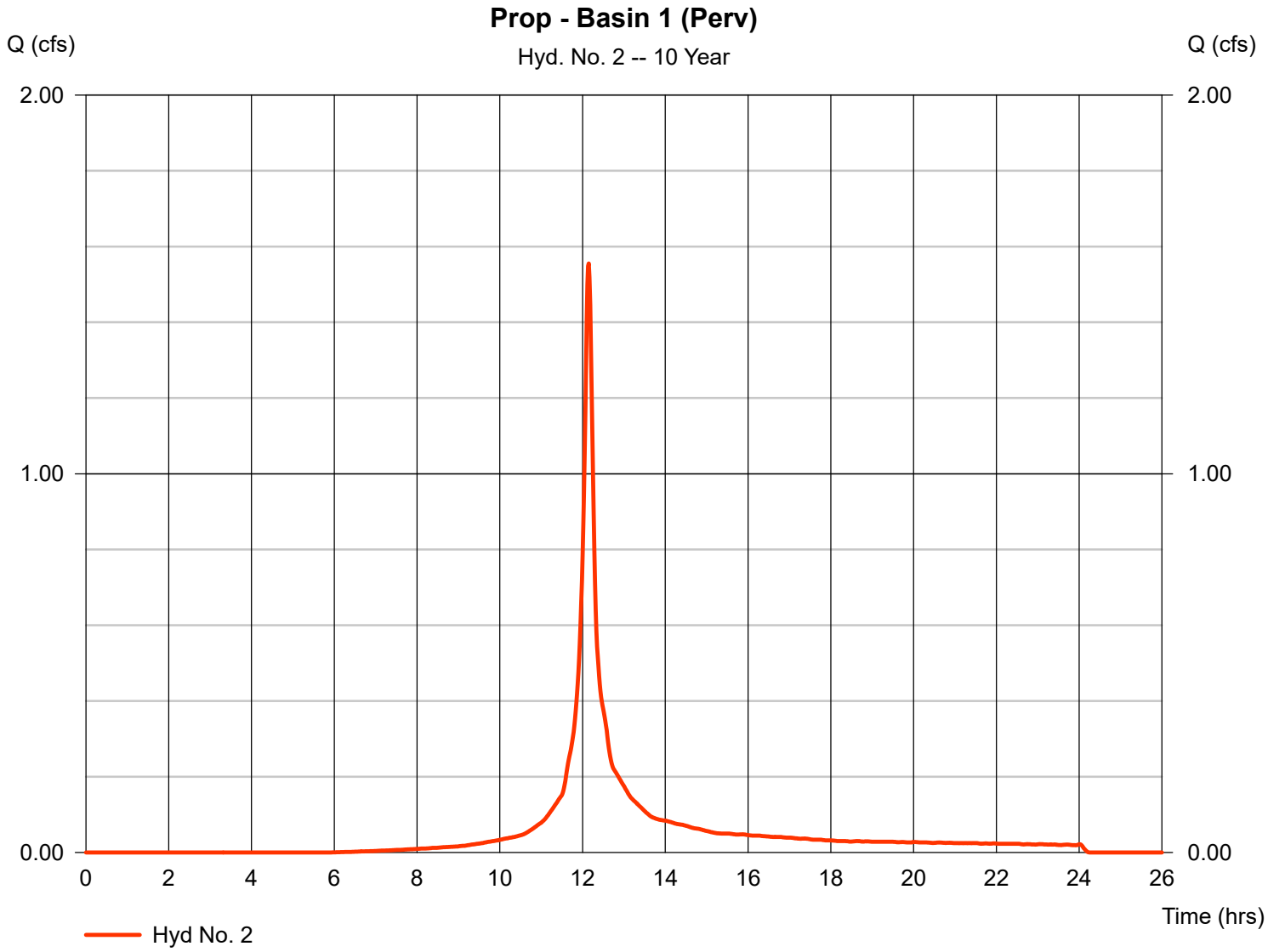
Hydrograph Report

Hyd. No. 2

Prop - Basin 1 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.555 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.15 hrs
Time interval	=	1 min	Hyd. volume	=	4,916 cuft
Drainage area	=	0.351 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.20 min
Total precip.	=	5.86 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.196 x 79) + (0.155 x 86)] / 0.351

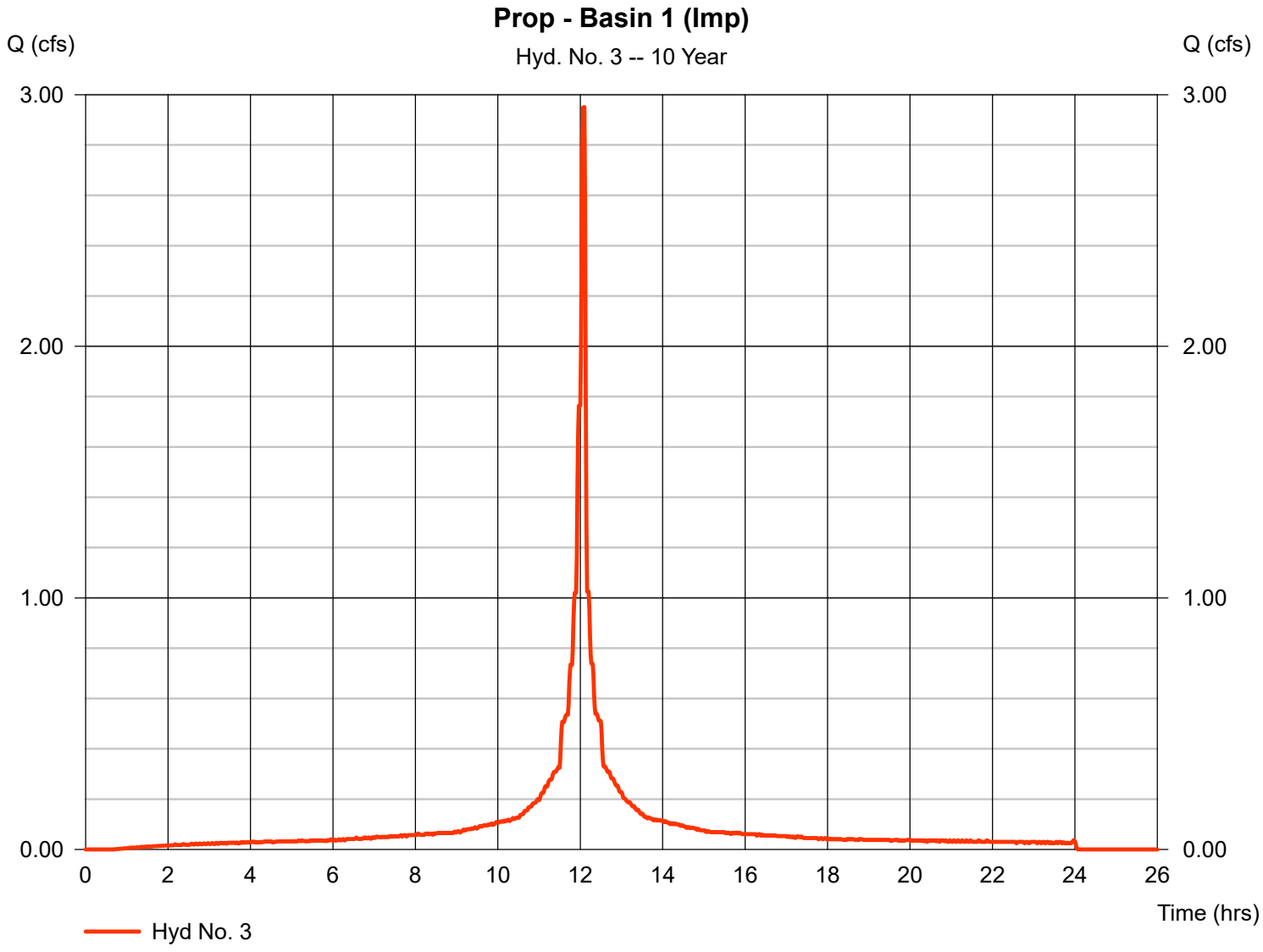


Hydrograph Report

Hyd. No. 3

Prop - Basin 1 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.951 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	8,763 cuft
Drainage area	=	0.458 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	1.60 min
Total precip.	=	5.86 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

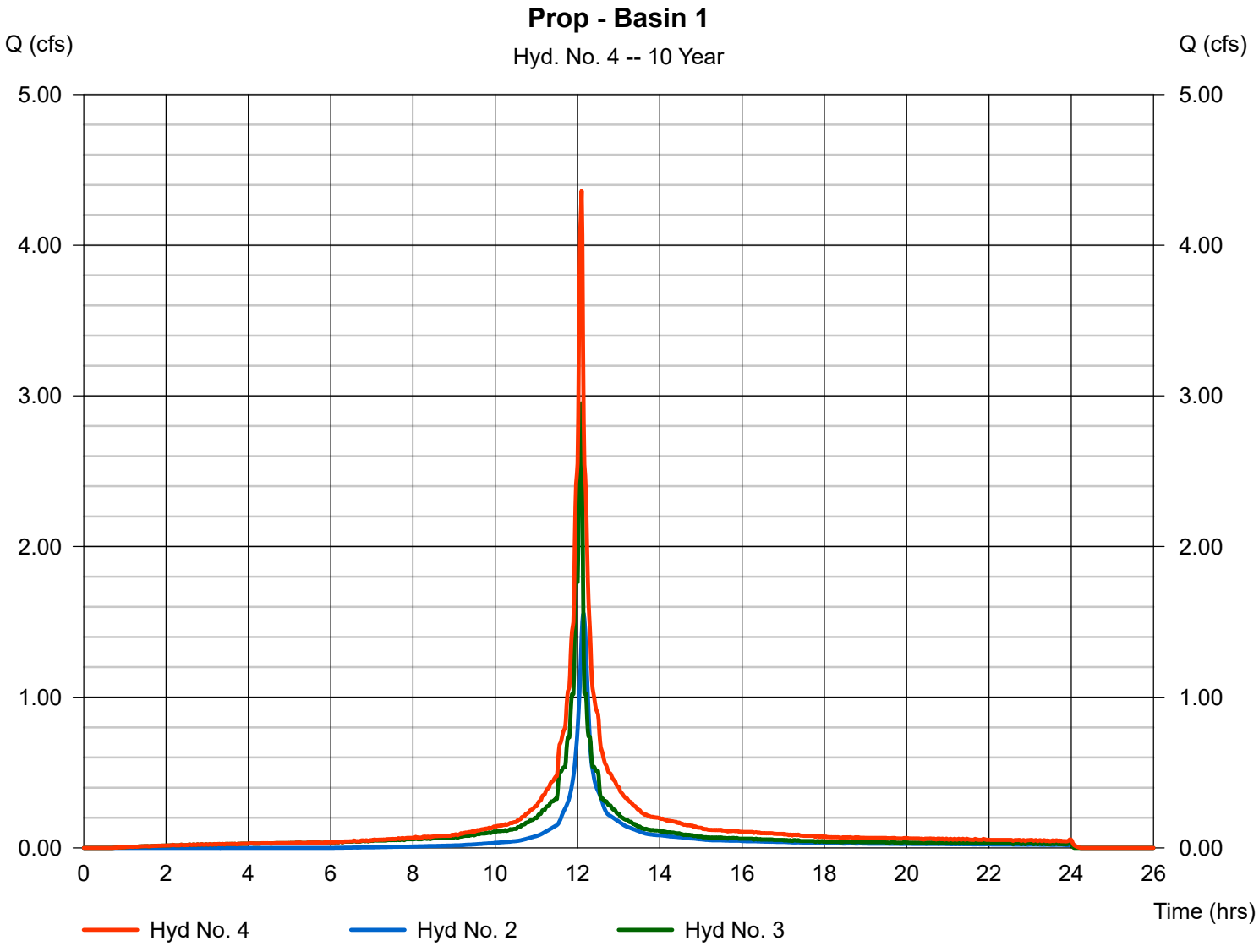


Hydrograph Report

Hyd. No. 4

Prop - Basin 1

Hydrograph type	= Combine	Peak discharge	= 4.360 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 13,679 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 0.809 ac



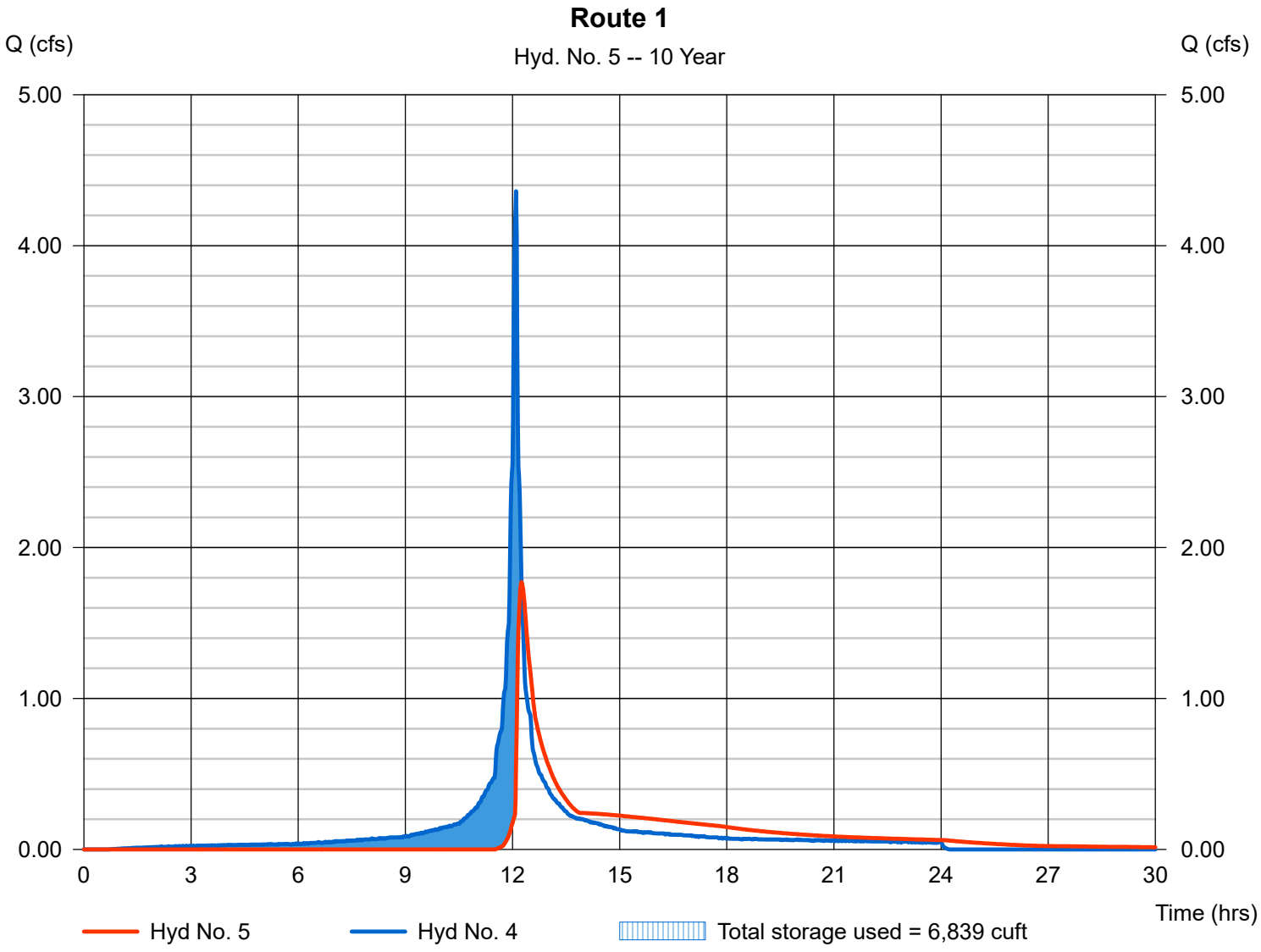
Hydrograph Report

Hyd. No. 5

Route 1

Hydrograph type	=	Reservoir	Peak discharge	=	1.772 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.25 hrs
Time interval	=	1 min	Hyd. volume	=	10,778 cuft
Inflow hyd. No.	=	4 - Prop - Basin 1	Max. Elevation	=	76.68 ft
Reservoir name	=	Basin 1	Max. Storage	=	6,839 cuft

Storage Indication method used.

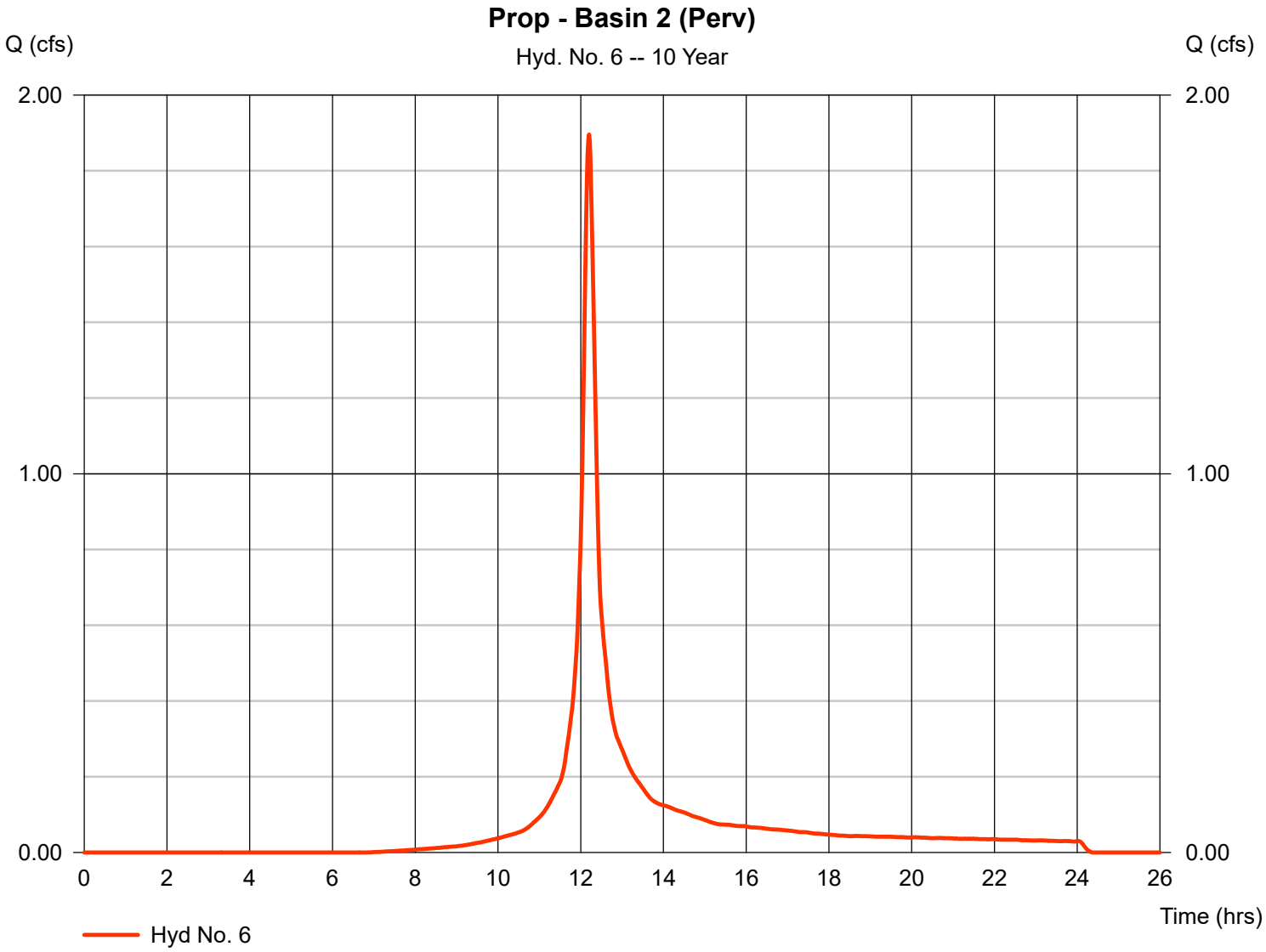


Hydrograph Report

Hyd. No. 6

Prop - Basin 2 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.896 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.20 hrs
Time interval	=	1 min	Hyd. volume	=	6,904 cuft
Drainage area	=	0.535 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.10 min
Total precip.	=	5.86 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

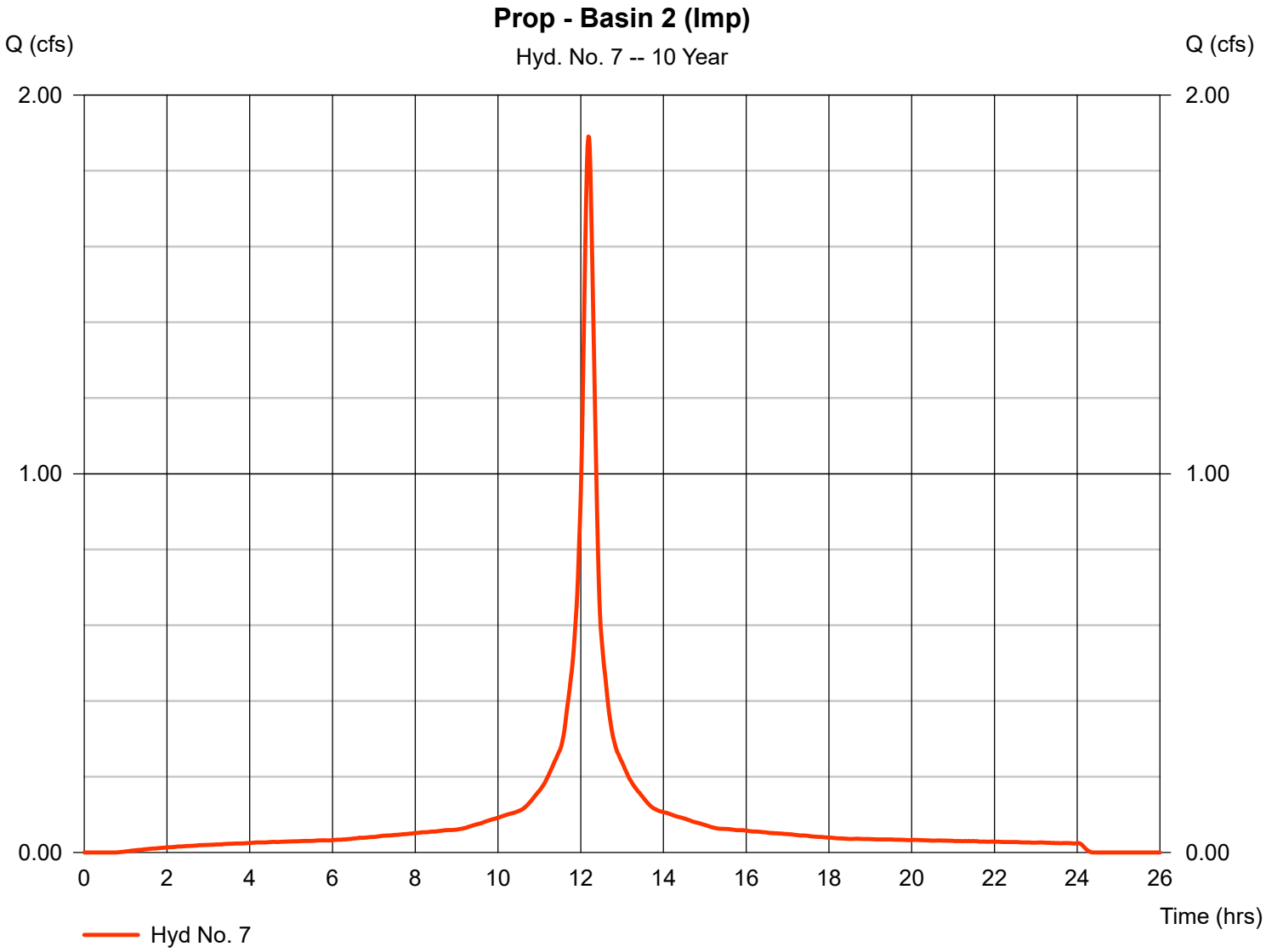


Hydrograph Report

Hyd. No. 7

Prop - Basin 2 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.891 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	7,959 cuft
Drainage area	=	0.390 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.70 min
Total precip.	=	5.86 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

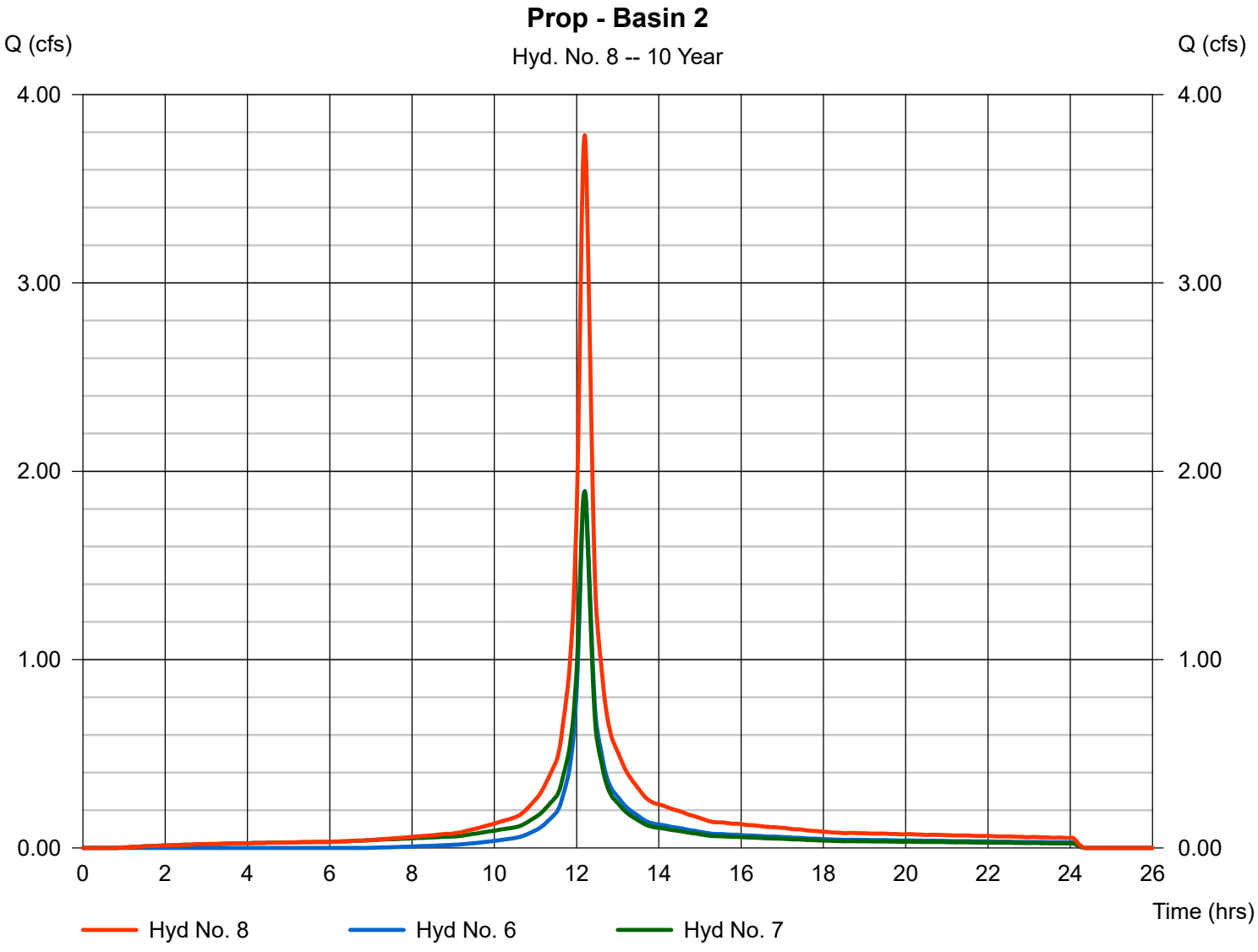


Hydrograph Report

Hyd. No. 8

Prop - Basin 2

Hydrograph type	= Combine	Peak discharge	= 3.784 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.20 hrs
Time interval	= 1 min	Hyd. volume	= 14,863 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 0.925 ac



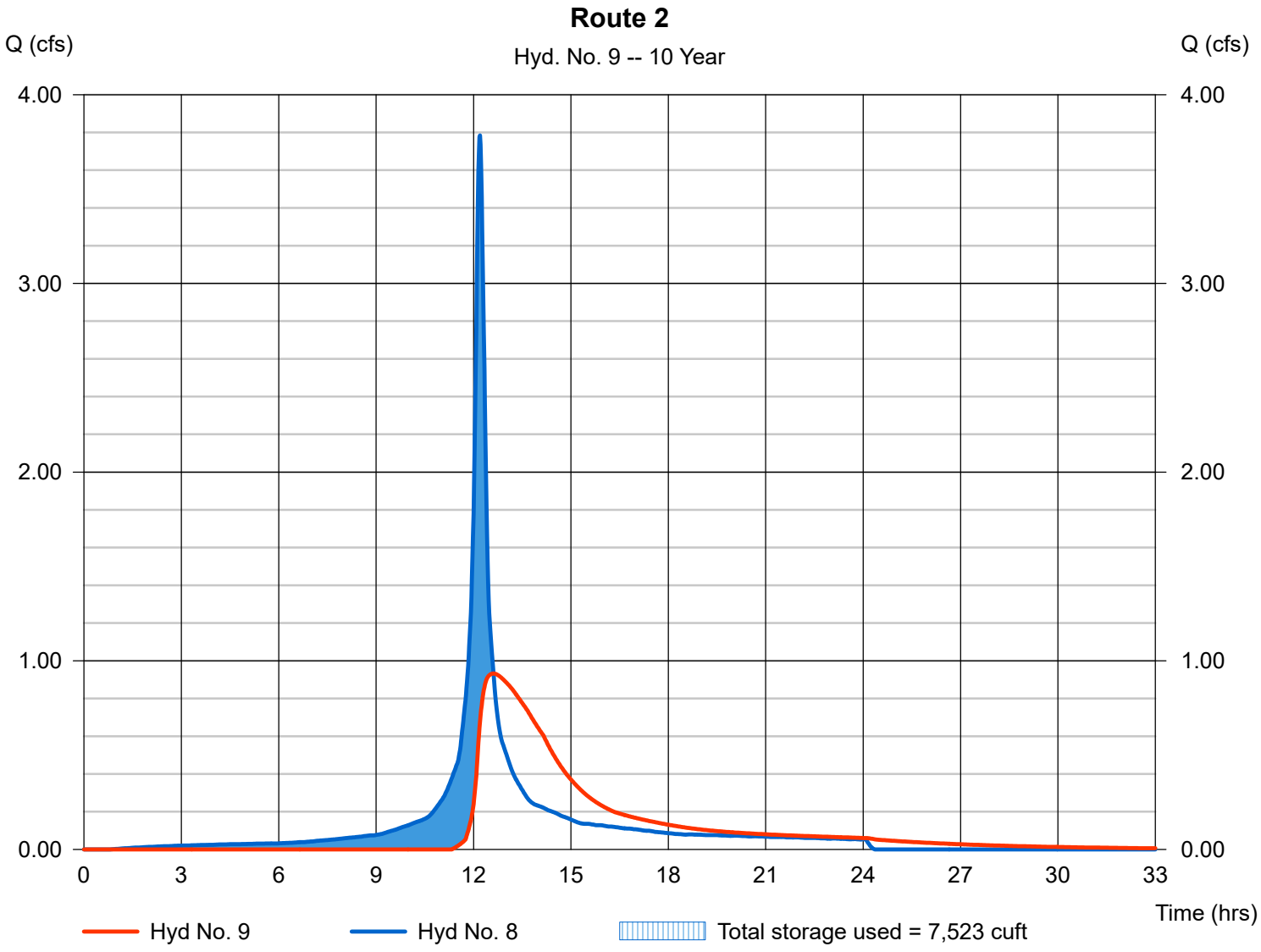
Hydrograph Report

Hyd. No. 9

Route 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.932 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.62 hrs
Time interval	=	1 min	Hyd. volume	=	12,553 cuft
Inflow hyd. No.	=	8 - Prop - Basin 2	Max. Elevation	=	73.98 ft
Reservoir name	=	Basin 2	Max. Storage	=	7,523 cuft

Storage Indication method used.



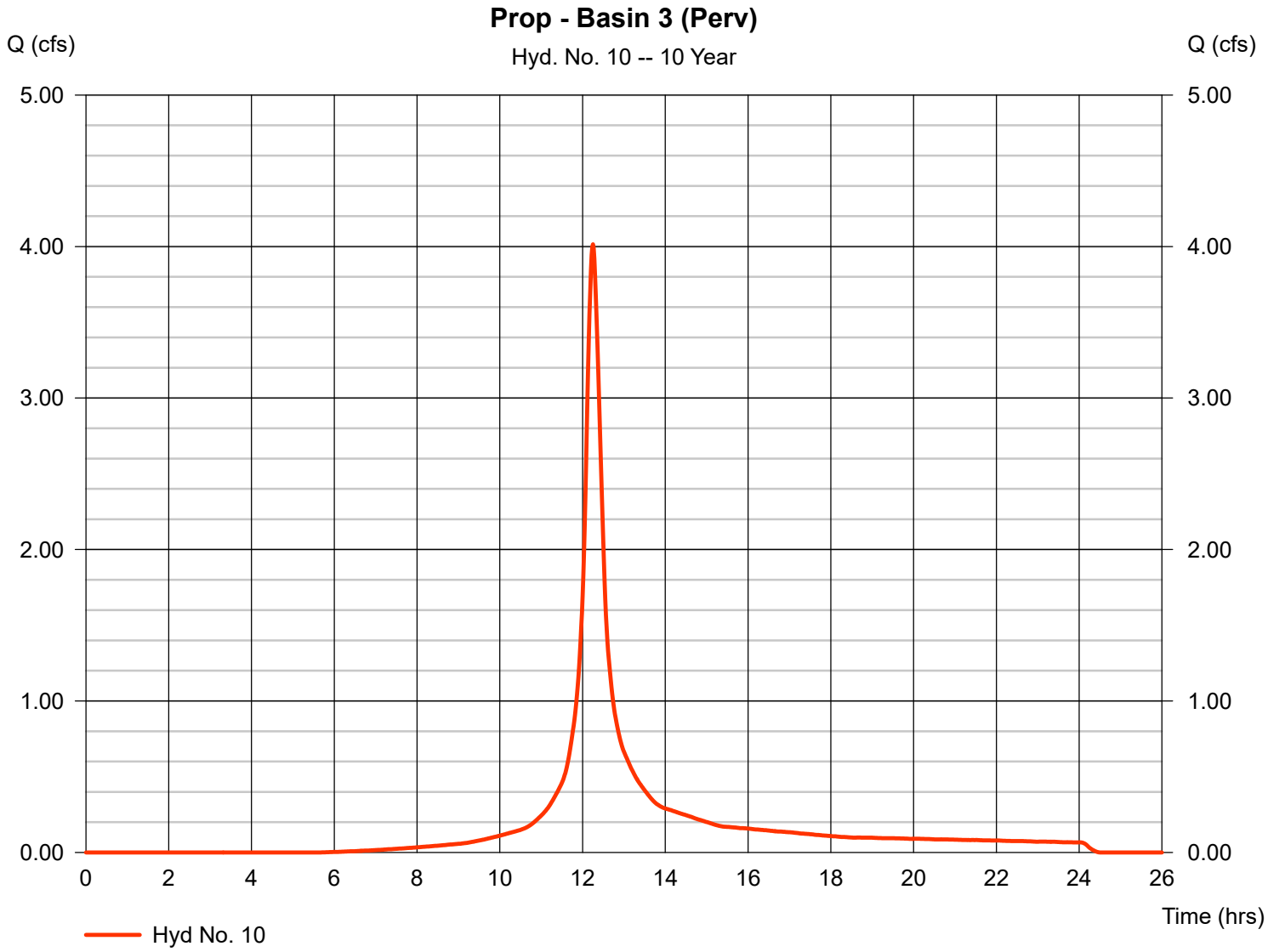
Hydrograph Report

Hyd. No. 10

Prop - Basin 3 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.015 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.25 hrs
Time interval	=	1 min	Hyd. volume	=	16,710 cuft
Drainage area	=	1.162 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.00 min
Total precip.	=	5.86 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.456 x 79) + (0.706 x 86)] / 1.162

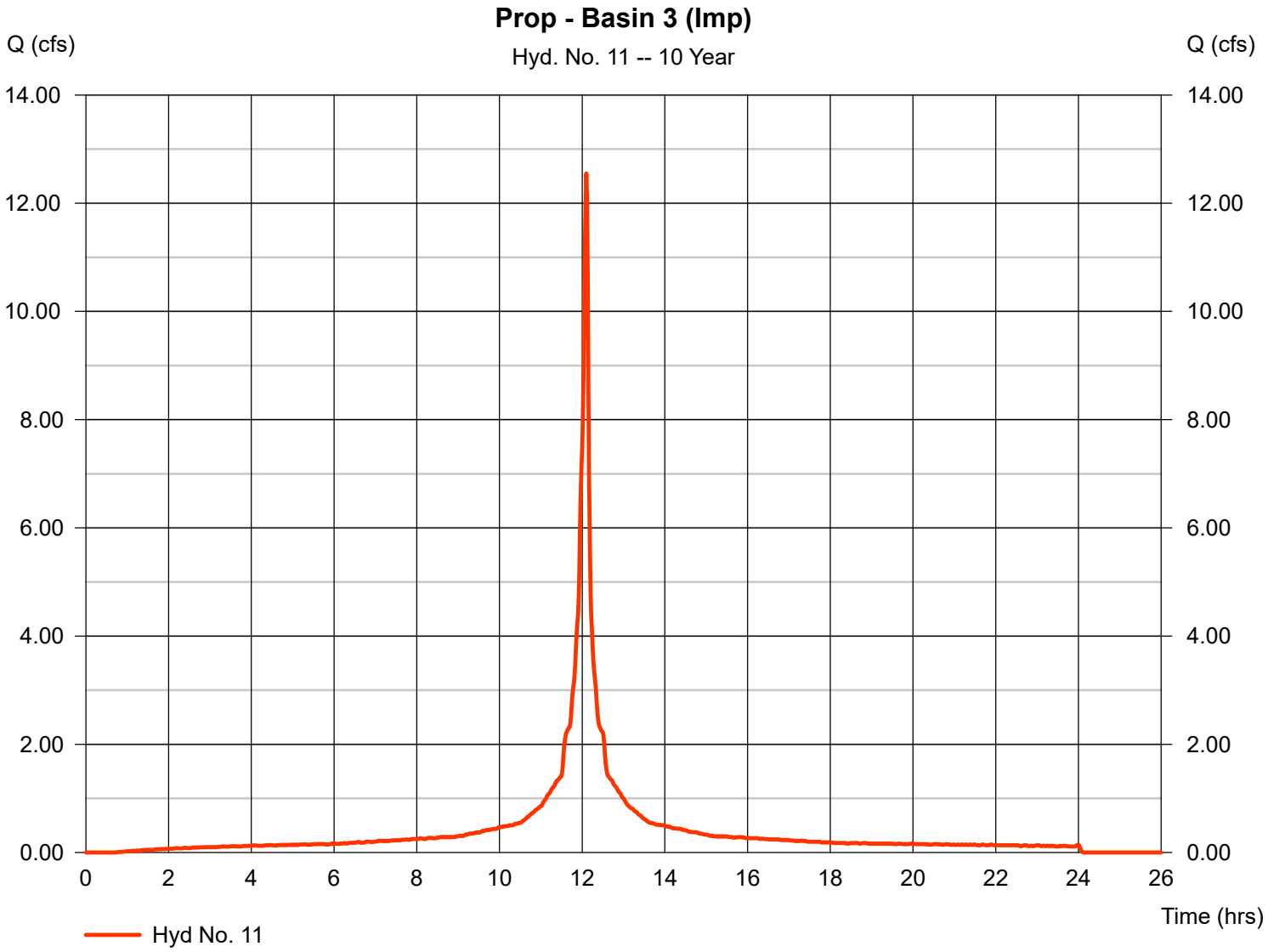


Hydrograph Report

Hyd. No. 11

Prop - Basin 3 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.55 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	38,061 cuft
Drainage area	=	1.865 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	3.90 min
Total precip.	=	5.86 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

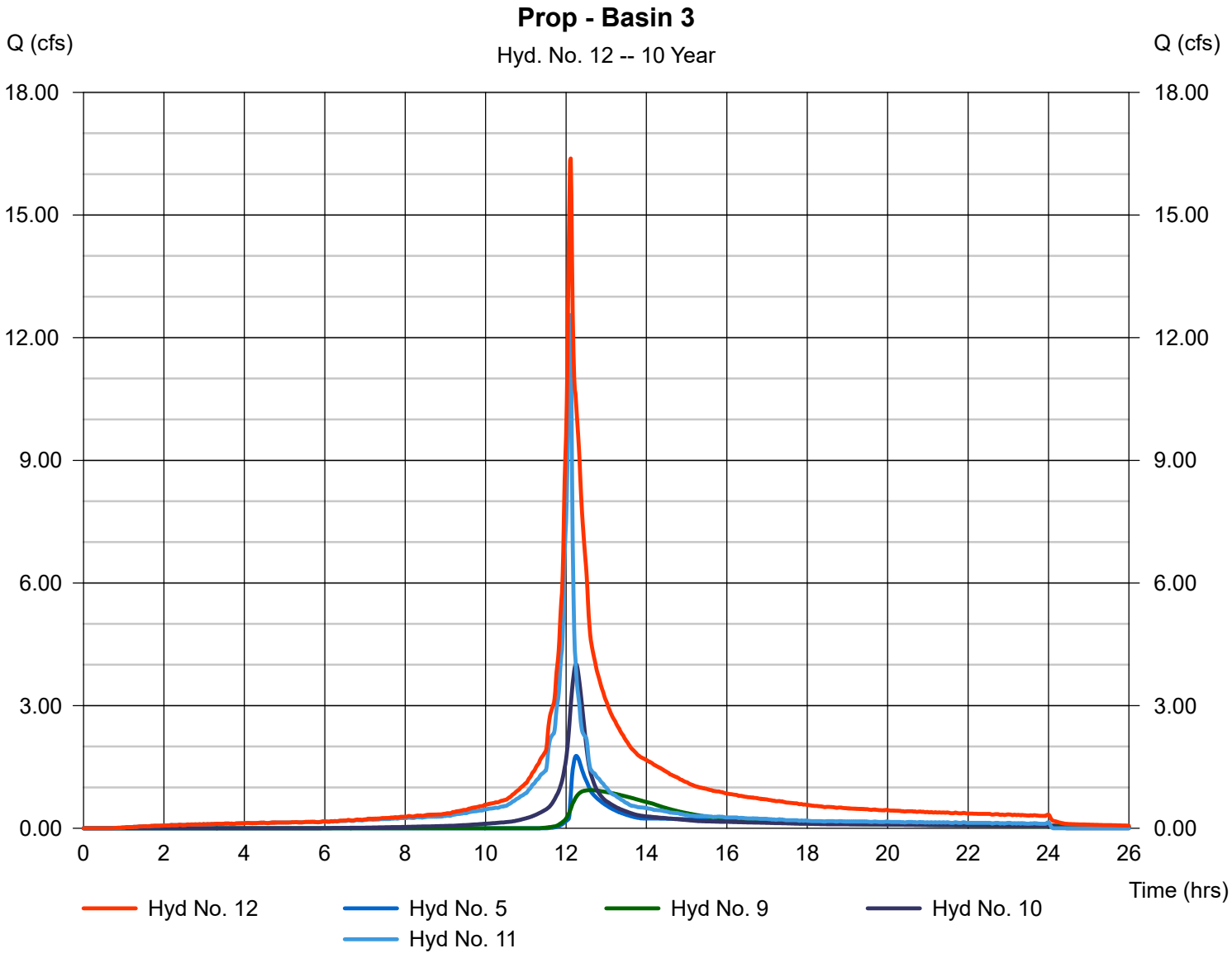


Hydrograph Report

Hyd. No. 12

Prop - Basin 3

Hydrograph type	= Combine	Peak discharge	= 16.38 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.12 hrs
Time interval	= 1 min	Hyd. volume	= 78,102 cuft
Inflow hyds.	= 5, 9, 10, 11	Contrib. drain. area	= 3.027 ac



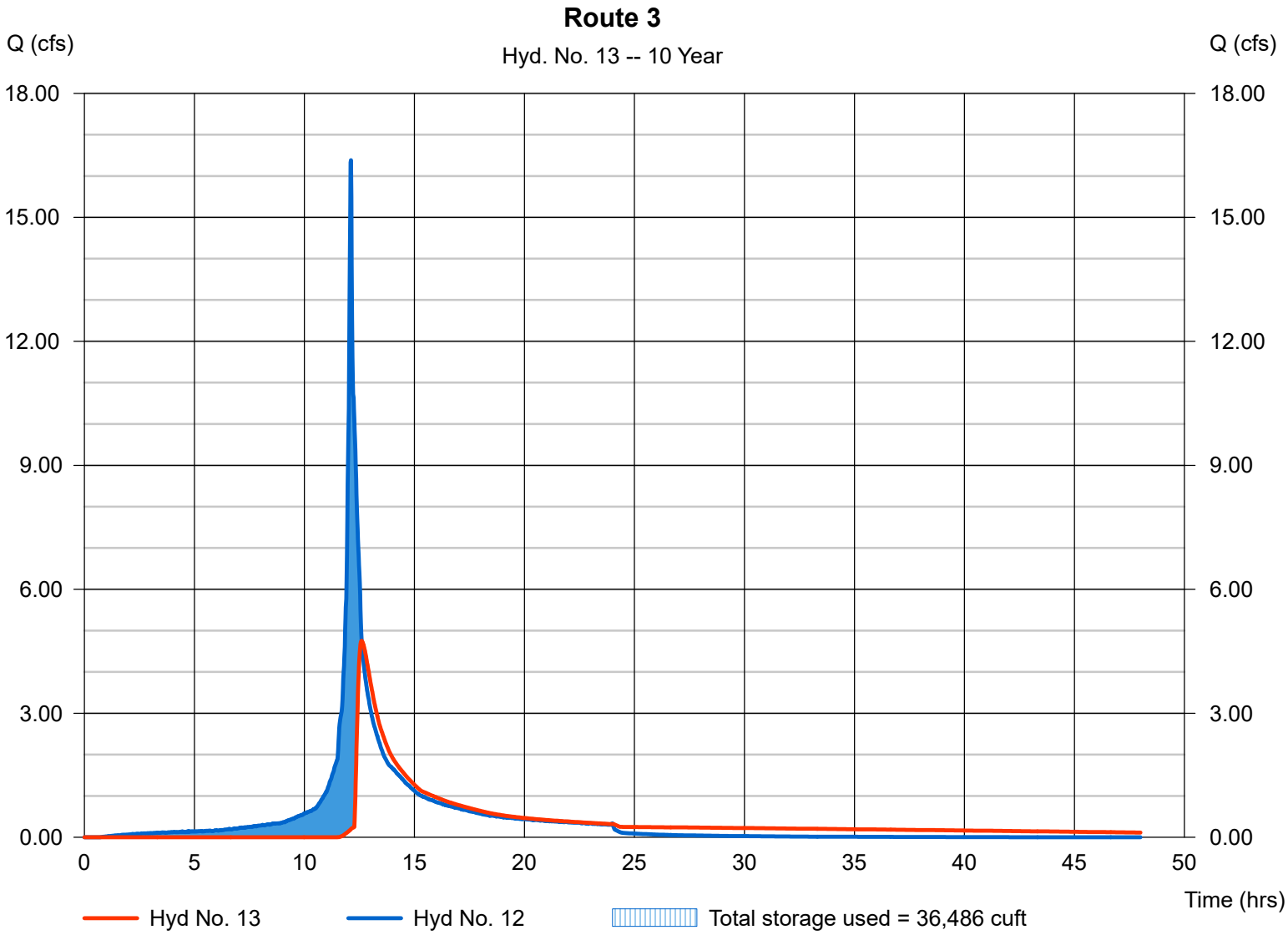
Hydrograph Report

Hyd. No. 13

Route 3

Hydrograph type	=	Reservoir	Peak discharge	=	4.754 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.60 hrs
Time interval	=	1 min	Hyd. volume	=	60,644 cuft
Inflow hyd. No.	=	12 - Prop - Basin 3	Max. Elevation	=	69.30 ft
Reservoir name	=	Basin 3	Max. Storage	=	36,486 cuft

Storage Indication method used.



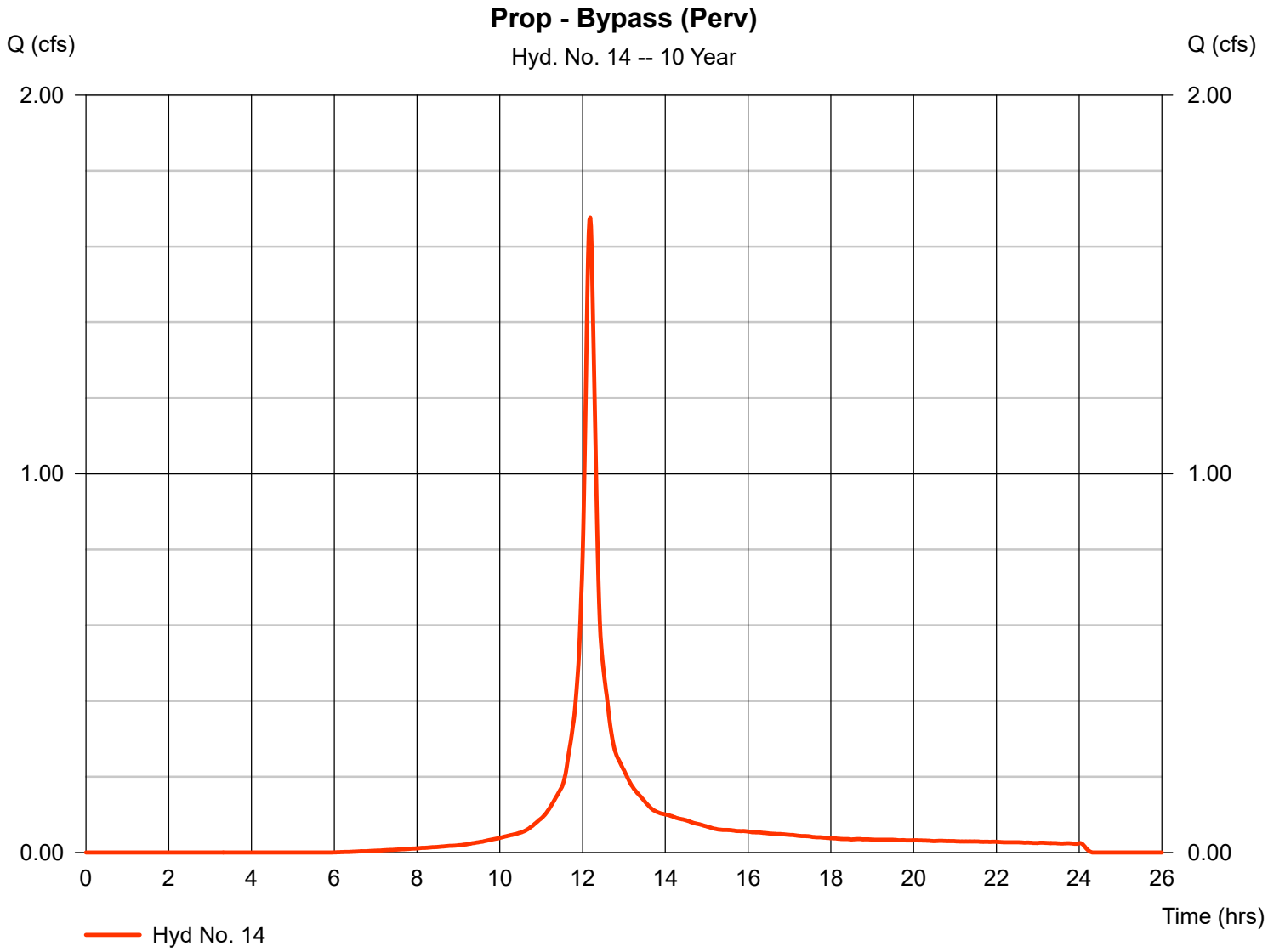
Hydrograph Report

Hyd. No. 14

Prop - Bypass (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.676 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	5,846 cuft
Drainage area	=	0.424 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.80 min
Total precip.	=	5.86 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.214 x 79) + (0.210 x 86)] / 0.424

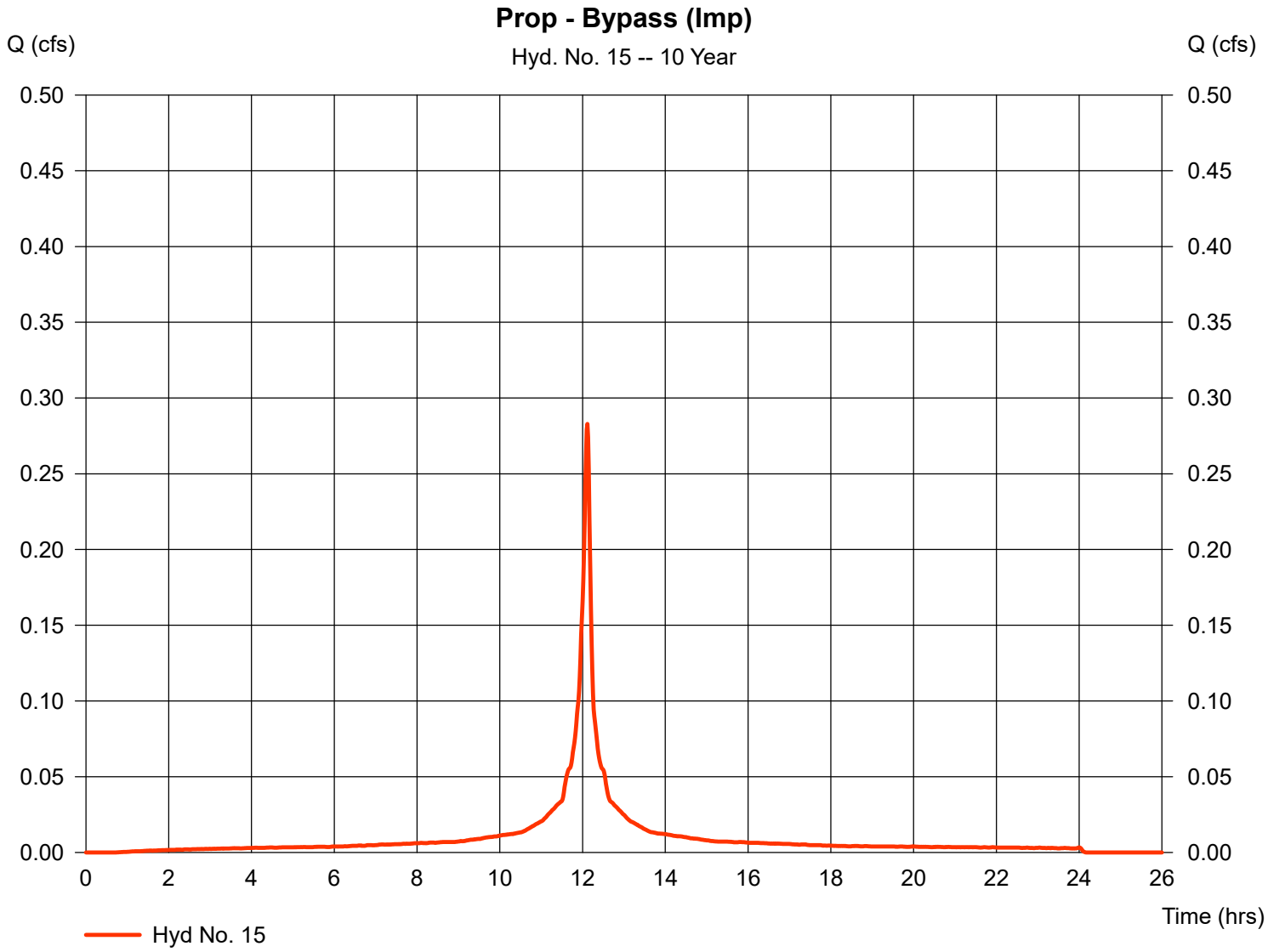


Hydrograph Report

Hyd. No. 15

Prop - Bypass (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.283 cfs
Storm frequency	=	10 yrs	Time to peak	=	12.12 hrs
Time interval	=	1 min	Hyd. volume	=	926 cuft
Drainage area	=	0.044 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.50 min
Total precip.	=	5.86 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

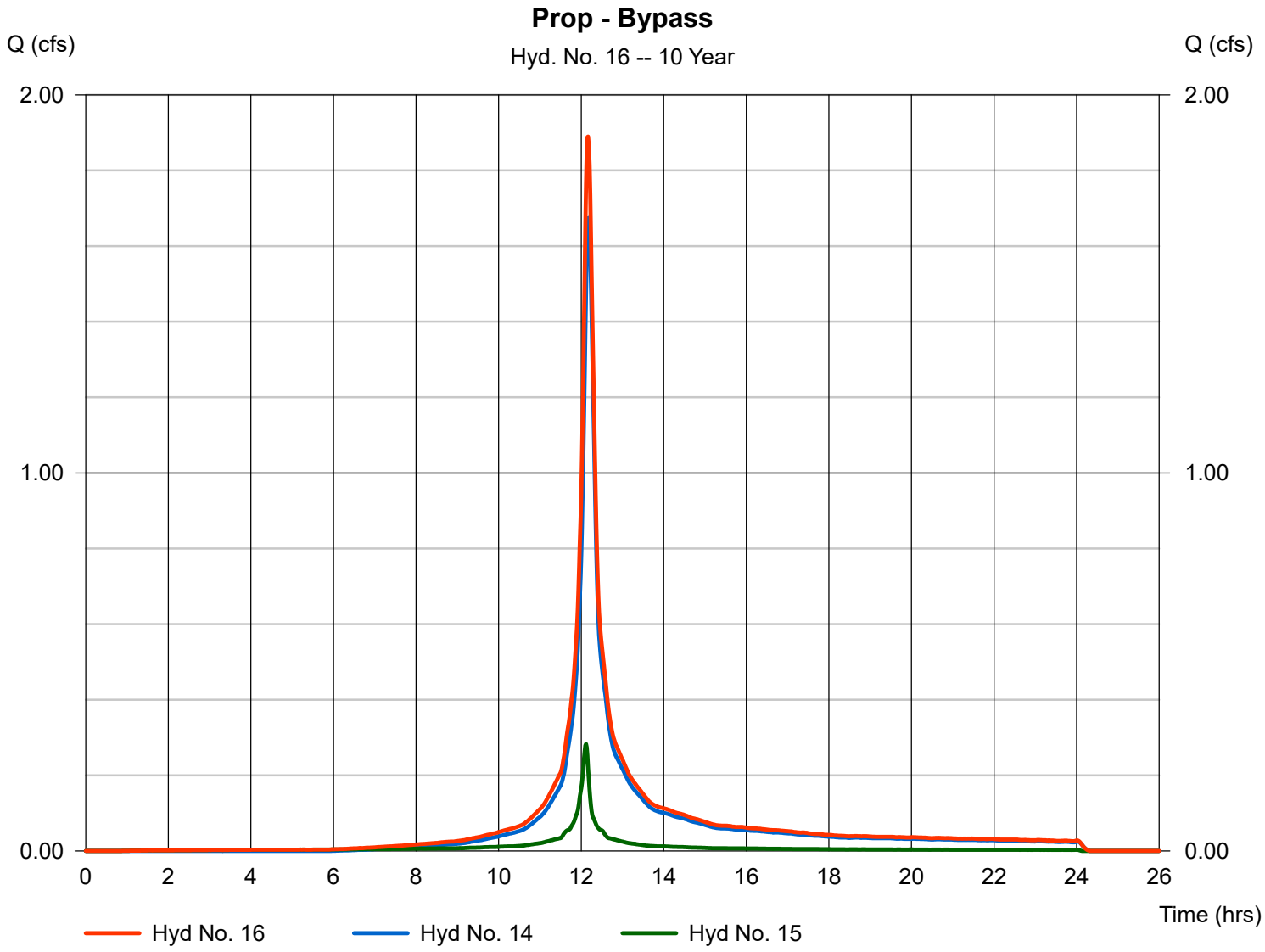


Hydrograph Report

Hyd. No. 16

Prop - Bypass

Hydrograph type	= Combine	Peak discharge	= 1.890 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.17 hrs
Time interval	= 1 min	Hyd. volume	= 6,772 cuft
Inflow hyds.	= 14, 15	Contrib. drain. area	= 0.468 ac

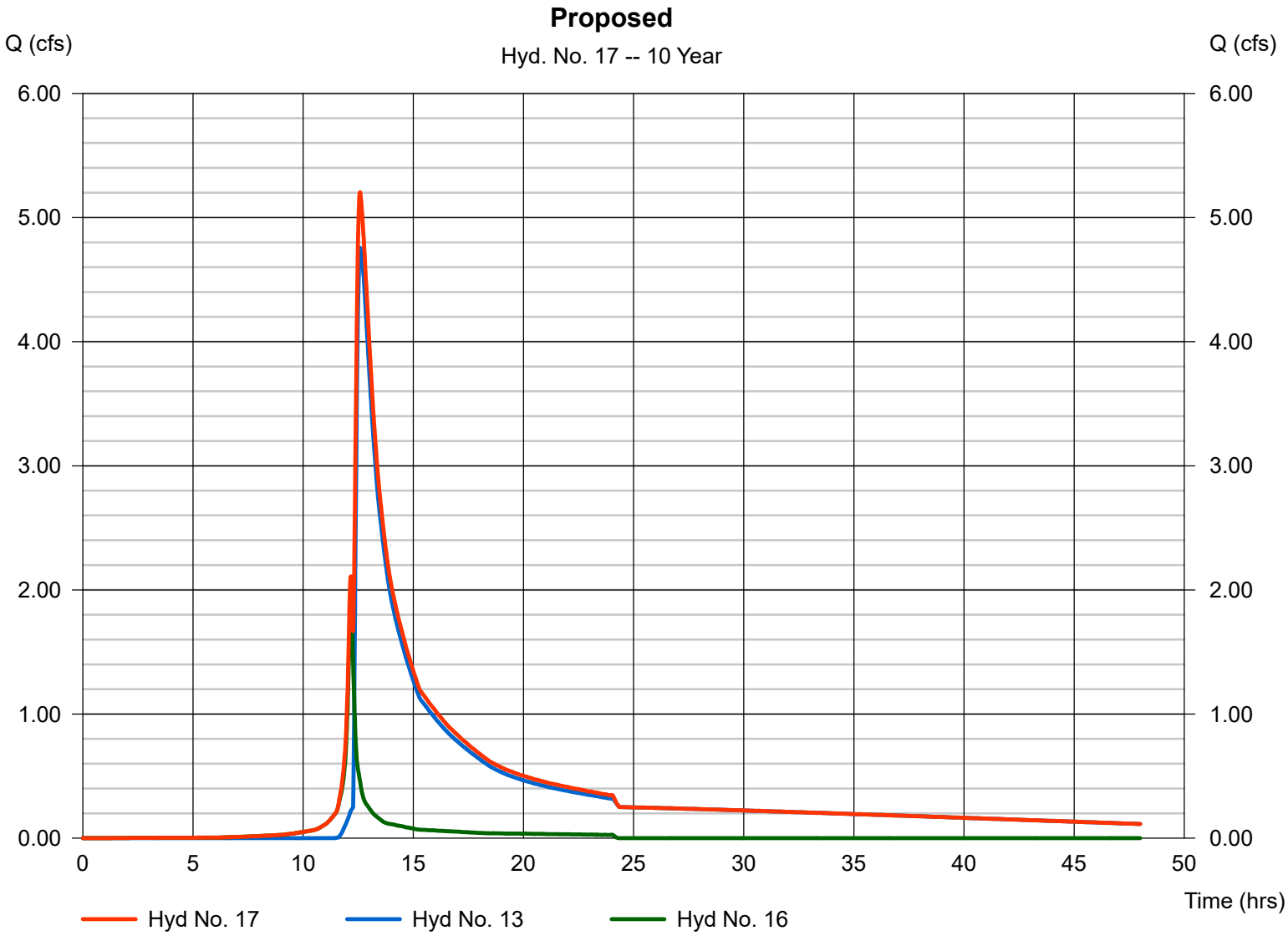


Hydrograph Report

Hyd. No. 17

Proposed

Hydrograph type	= Combine	Peak discharge	= 5.204 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.58 hrs
Time interval	= 1 min	Hyd. volume	= 67,416 cuft
Inflow hyds.	= 13, 16	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	31.01	1	733	118,070	------	------	------	Existing
2	SCS Runoff	3.489	1	728	11,549	------	------	------	Prop - Basin 1 (Perv)
3	SCS Runoff	5.720	1	726	17,283	------	------	------	Prop - Basin 1 (Imp)
4	Combine	8.928	1	726	28,832	2, 3	------	------	Prop - Basin 1
5	Reservoir	7.044	1	728	25,924	4	76.99	8,685	Route 1
6	SCS Runoff	4.455	1	732	16,828	------	------	------	Prop - Basin 2 (Perv)
7	SCS Runoff	3.667	1	731	15,698	------	------	------	Prop - Basin 2 (Imp)
8	Combine	8.116	1	732	32,527	6, 7	------	------	Prop - Basin 2
9	Reservoir	4.684	1	742	30,217	8	74.50	12,151	Route 2
10	SCS Runoff	8.946	1	735	38,788	------	------	------	Prop - Basin 3 (Perv)
11	SCS Runoff	24.34	1	726	75,070	------	------	------	Prop - Basin 3 (Imp)
12	Combine	38.98	1	727	169,999	5, 9, 10, 11	------	------	Prop - Basin 3
13	Reservoir	21.73	1	741	152,108	12	70.49	55,769	Route 3
14	SCS Runoff	3.770	1	730	13,733	------	------	------	Prop - Bypass (Perv)
15	SCS Runoff	0.549	1	727	1,826	------	------	------	Prop - Bypass (Imp)
16	Combine	4.196	1	729	15,559	14, 15	------	------	Prop - Bypass
17	Combine	24.32	1	736	167,667	13, 16	------	------	Proposed

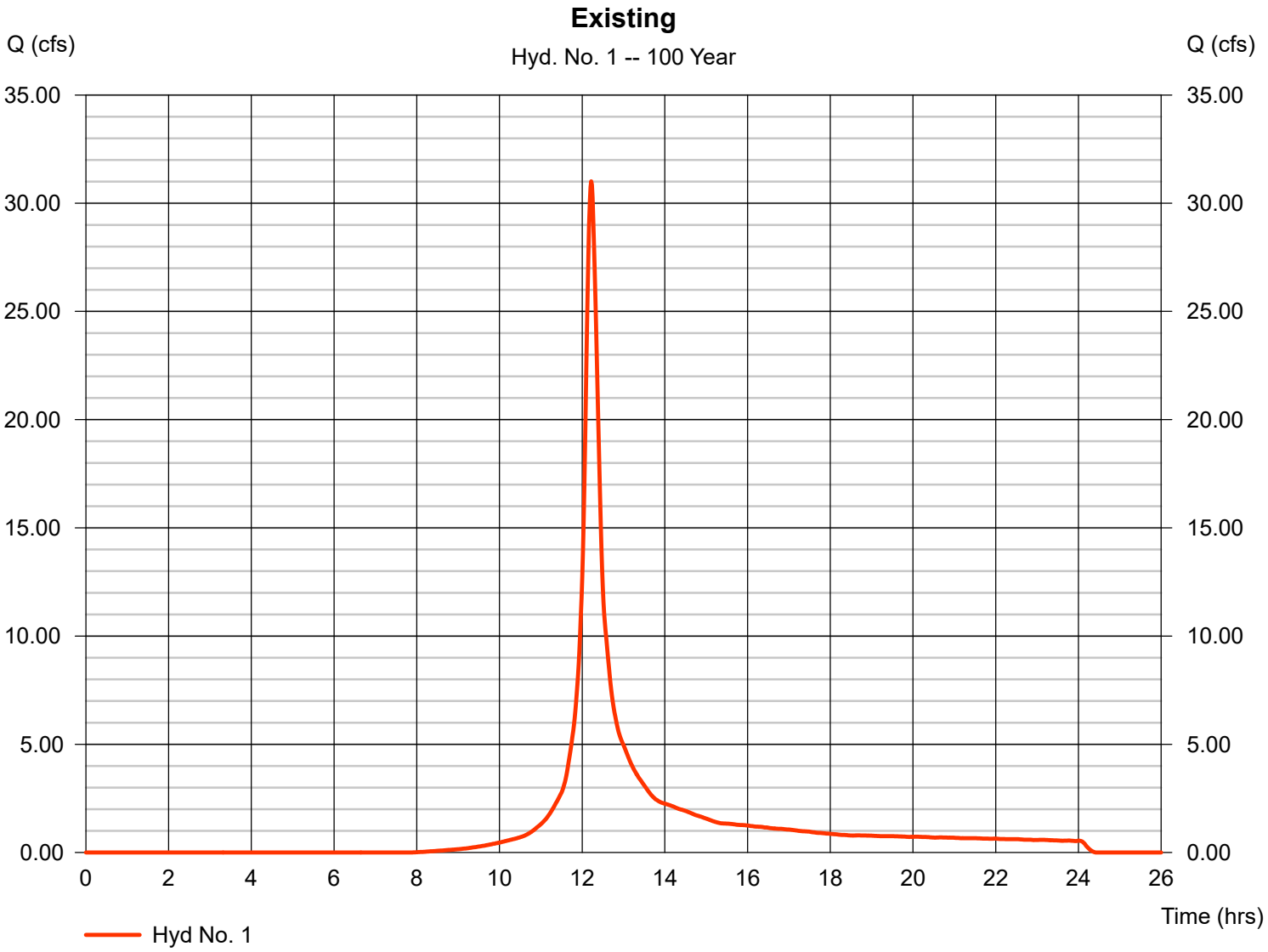
Hydrograph Report

Hyd. No. 1

Existing

Hydrograph type	=	SCS Runoff	Peak discharge	=	31.01 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.22 hrs
Time interval	=	1 min	Hyd. volume	=	118,070 cuft
Drainage area	=	5.229 ac	Curve number	=	61*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.40 min
Total precip.	=	11.33 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(2.998 x 55) + (2.231 x 70)] / 5.229



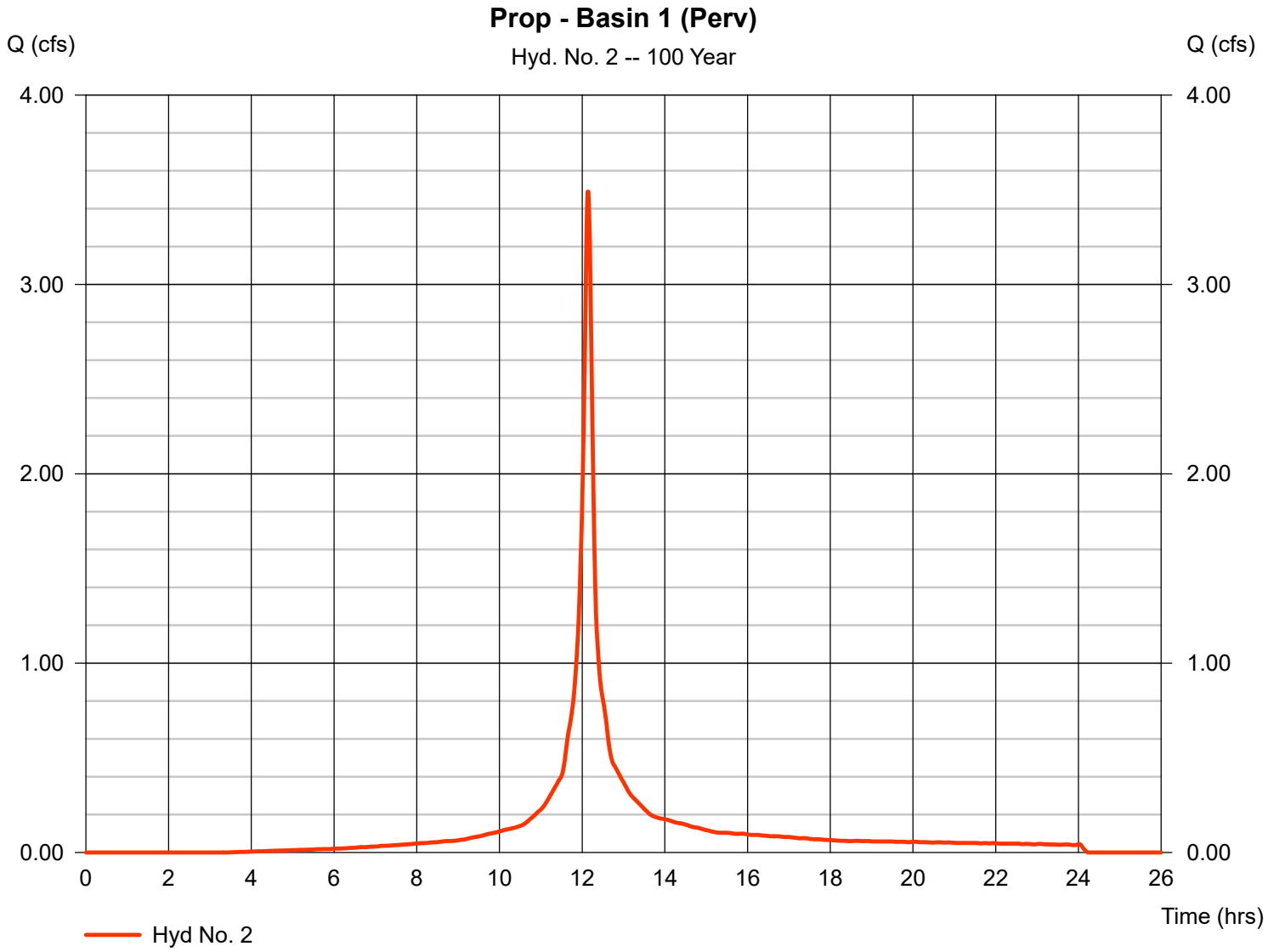
Hydrograph Report

Hyd. No. 2

Prop - Basin 1 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.489 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.13 hrs
Time interval	=	1 min	Hyd. volume	=	11,549 cuft
Drainage area	=	0.351 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.20 min
Total precip.	=	11.33 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.196 x 79) + (0.155 x 86)] / 0.351

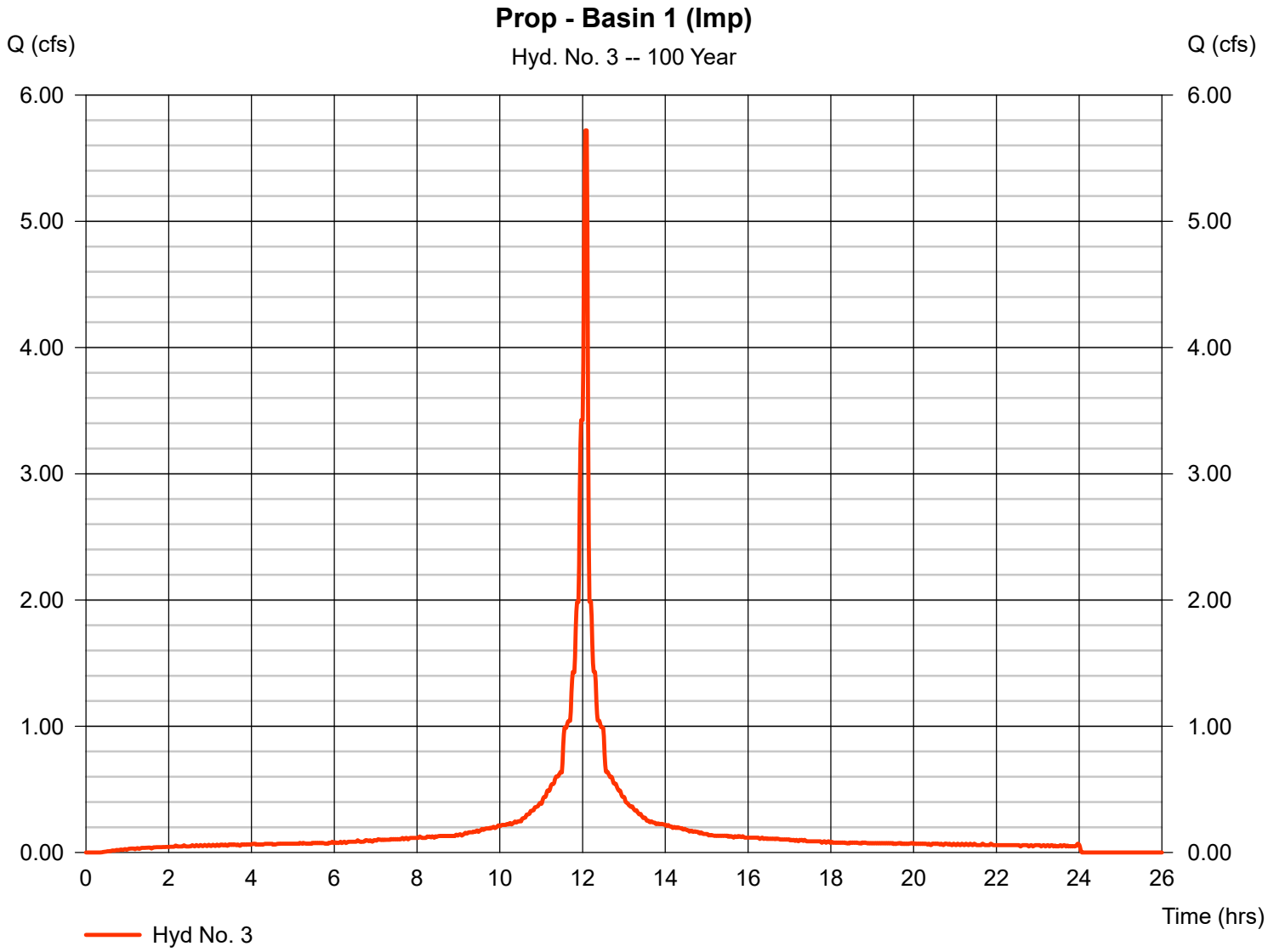


Hydrograph Report

Hyd. No. 3

Prop - Basin 1 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.720 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	17,283 cuft
Drainage area	=	0.458 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	1.60 min
Total precip.	=	11.33 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

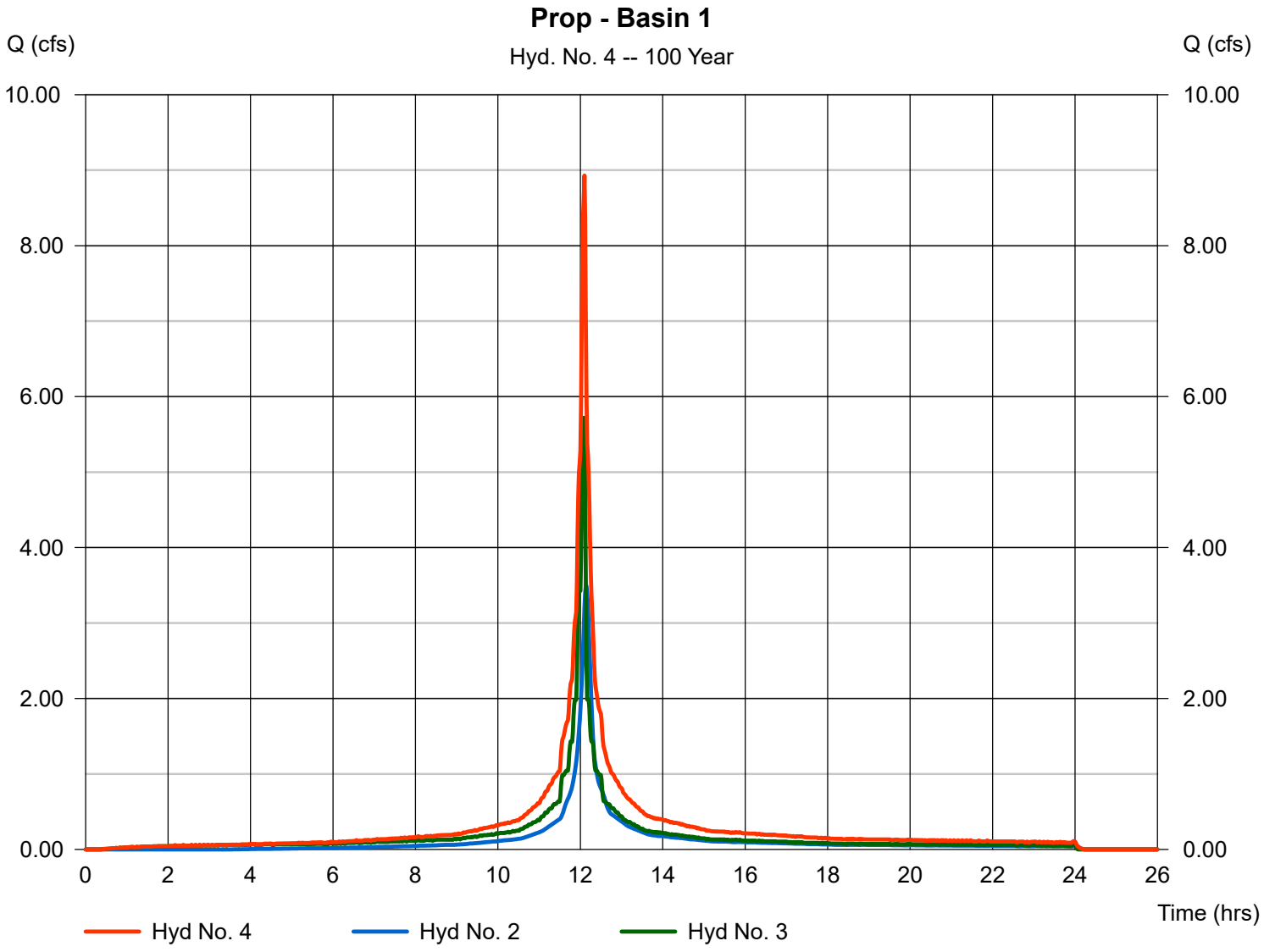


Hydrograph Report

Hyd. No. 4

Prop - Basin 1

Hydrograph type	= Combine	Peak discharge	= 8.928 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.10 hrs
Time interval	= 1 min	Hyd. volume	= 28,832 cuft
Inflow hyds.	= 2, 3	Contrib. drain. area	= 0.809 ac



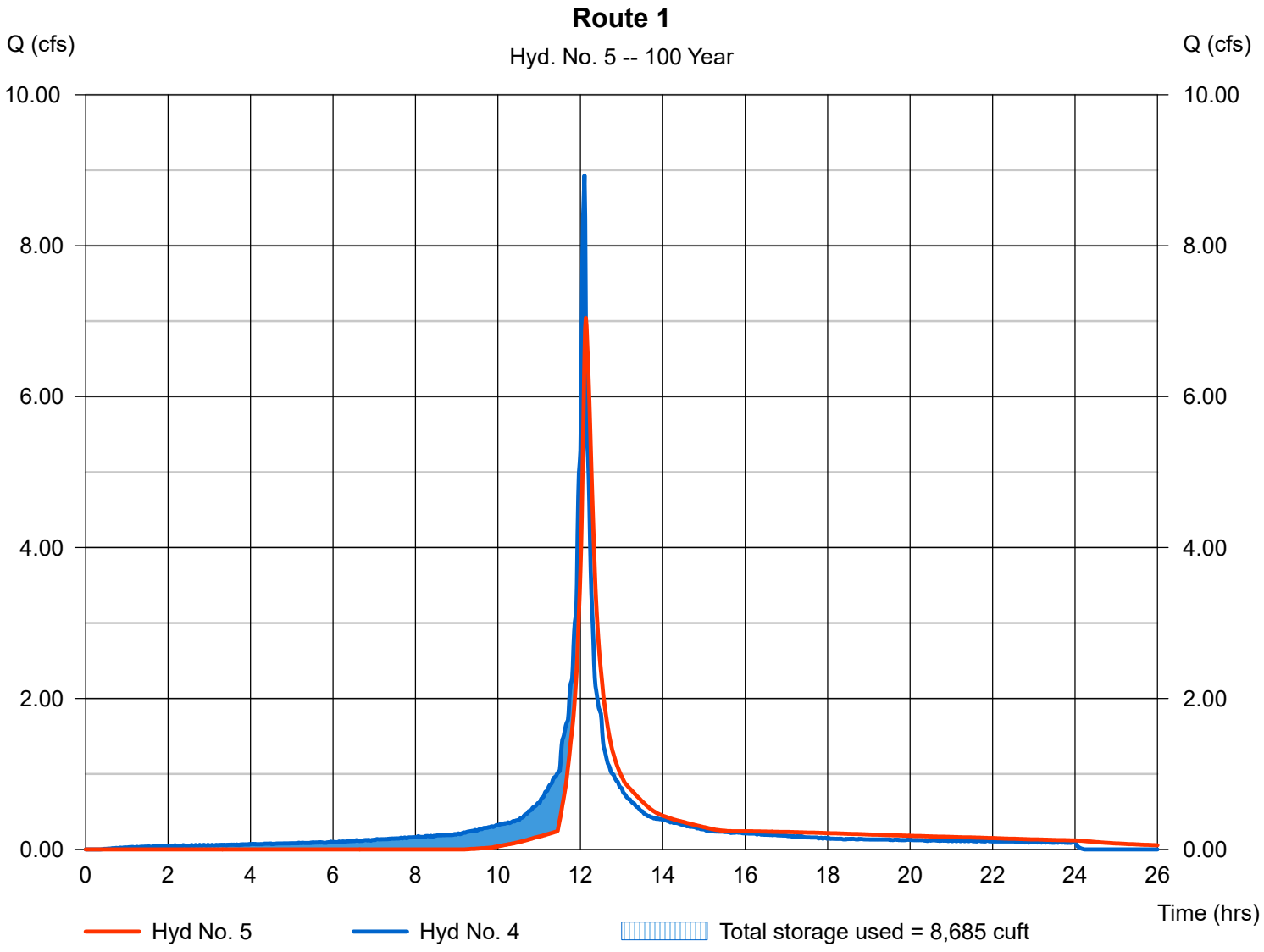
Hydrograph Report

Hyd. No. 5

Route 1

Hydrograph type	=	Reservoir	Peak discharge	=	7.044 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.13 hrs
Time interval	=	1 min	Hyd. volume	=	25,924 cuft
Inflow hyd. No.	=	4 - Prop - Basin 1	Max. Elevation	=	76.99 ft
Reservoir name	=	Basin 1	Max. Storage	=	8,685 cuft

Storage Indication method used.

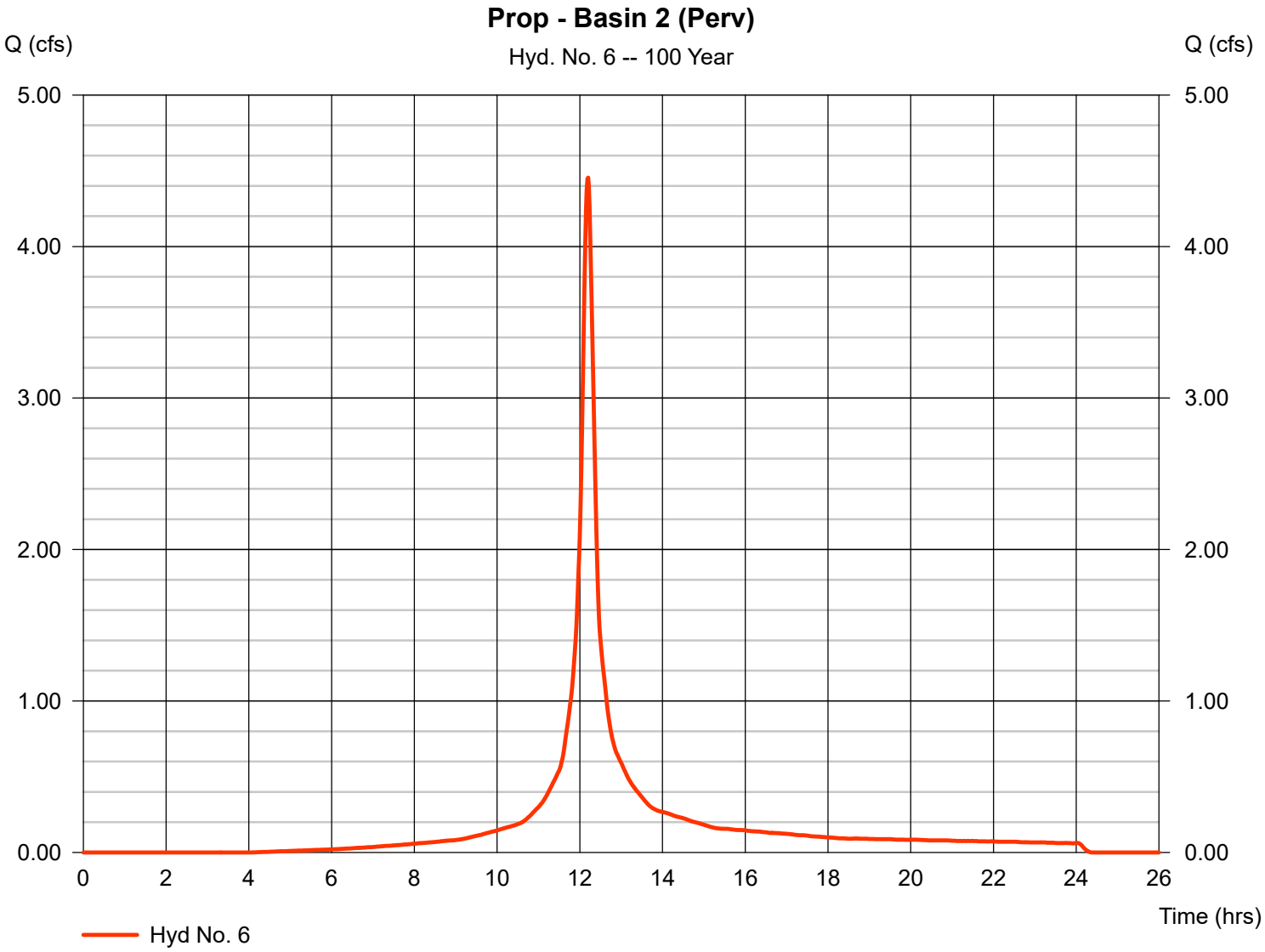


Hydrograph Report

Hyd. No. 6

Prop - Basin 2 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.455 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.20 hrs
Time interval	=	1 min	Hyd. volume	=	16,828 cuft
Drainage area	=	0.535 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.10 min
Total precip.	=	11.33 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

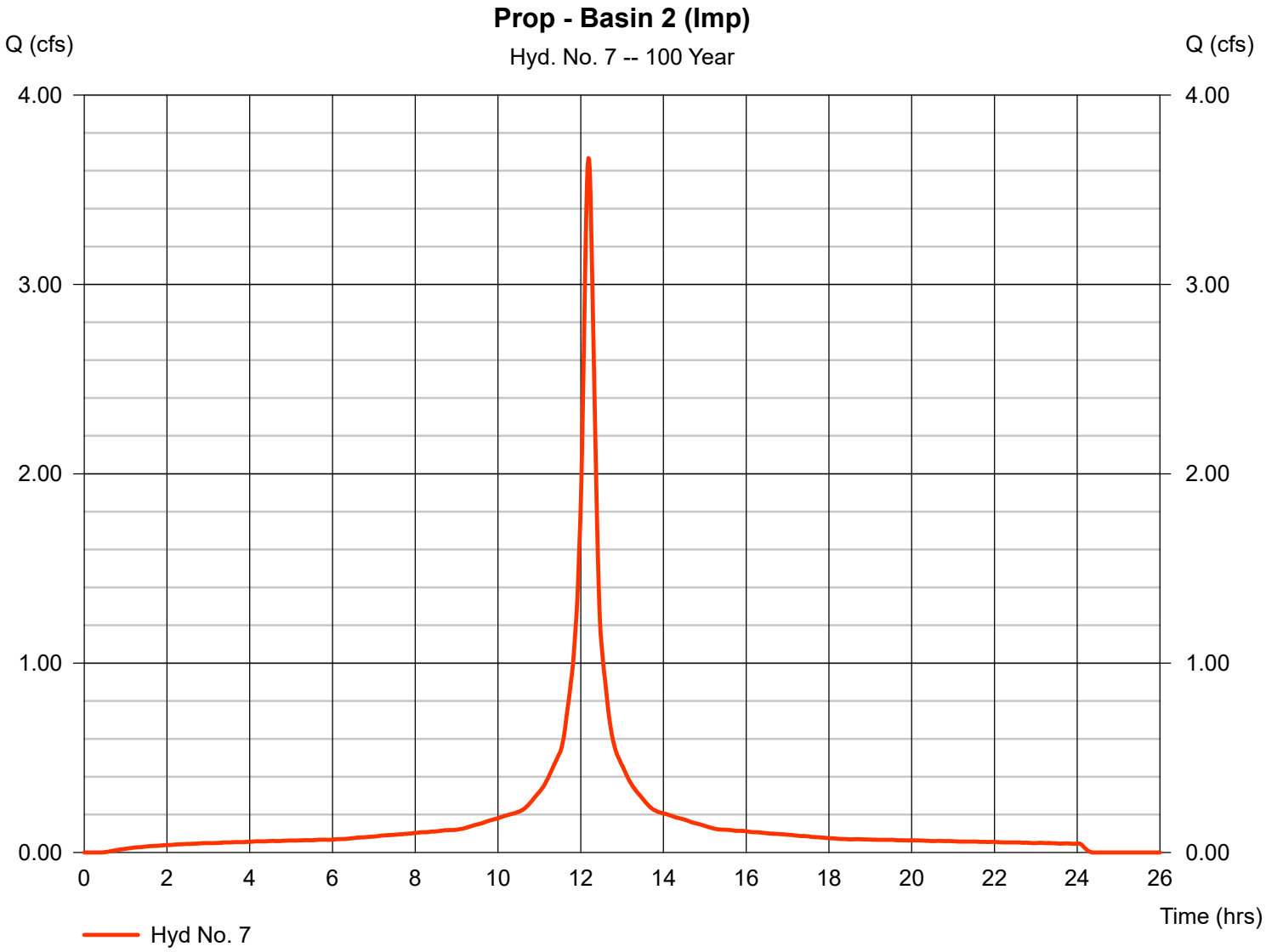


Hydrograph Report

Hyd. No. 7

Prop - Basin 2 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.667 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.18 hrs
Time interval	=	1 min	Hyd. volume	=	15,698 cuft
Drainage area	=	0.390 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.70 min
Total precip.	=	11.33 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

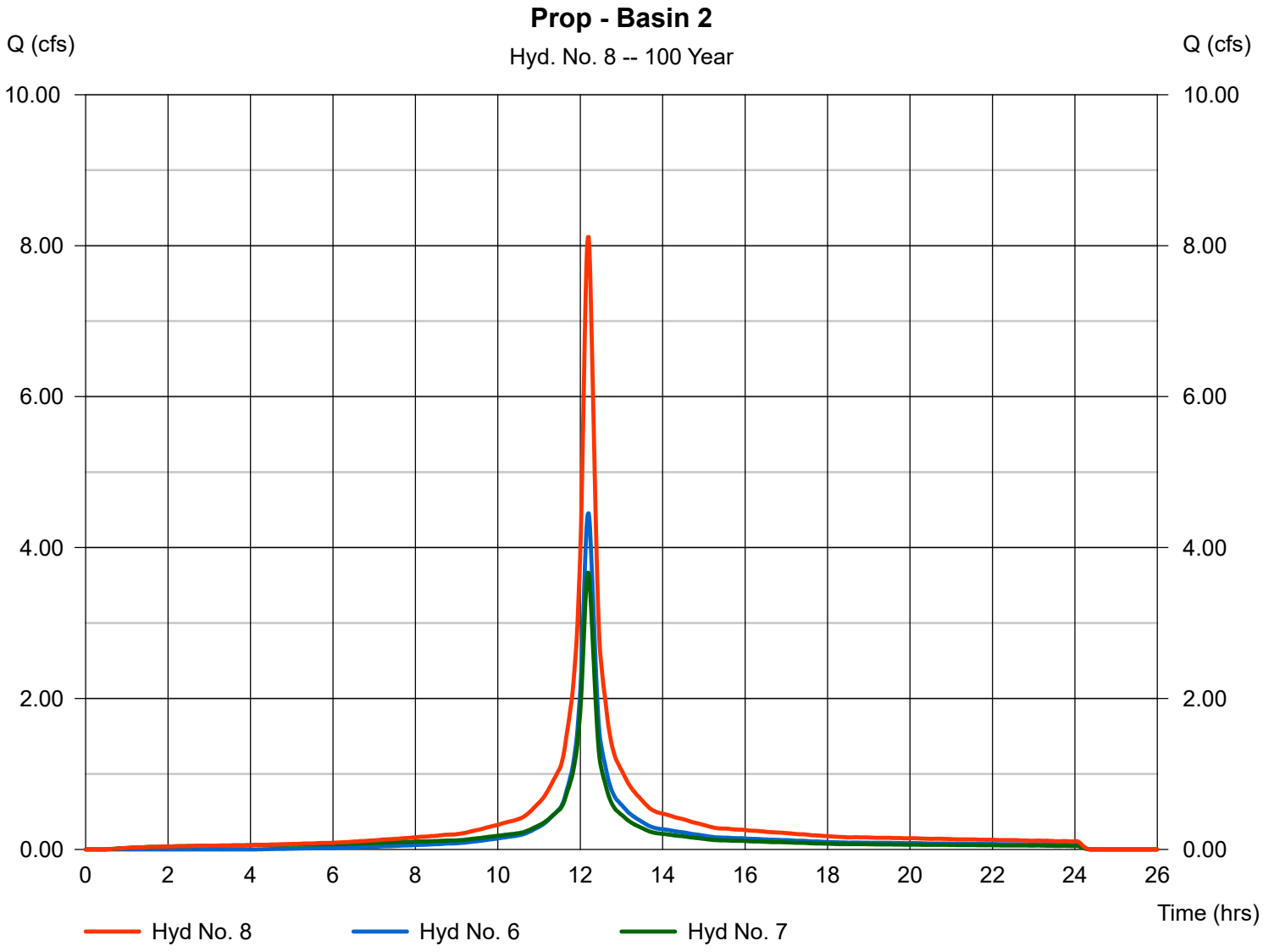


Hydrograph Report

Hyd. No. 8

Prop - Basin 2

Hydrograph type	= Combine	Peak discharge	= 8.116 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.20 hrs
Time interval	= 1 min	Hyd. volume	= 32,527 cuft
Inflow hyds.	= 6, 7	Contrib. drain. area	= 0.925 ac



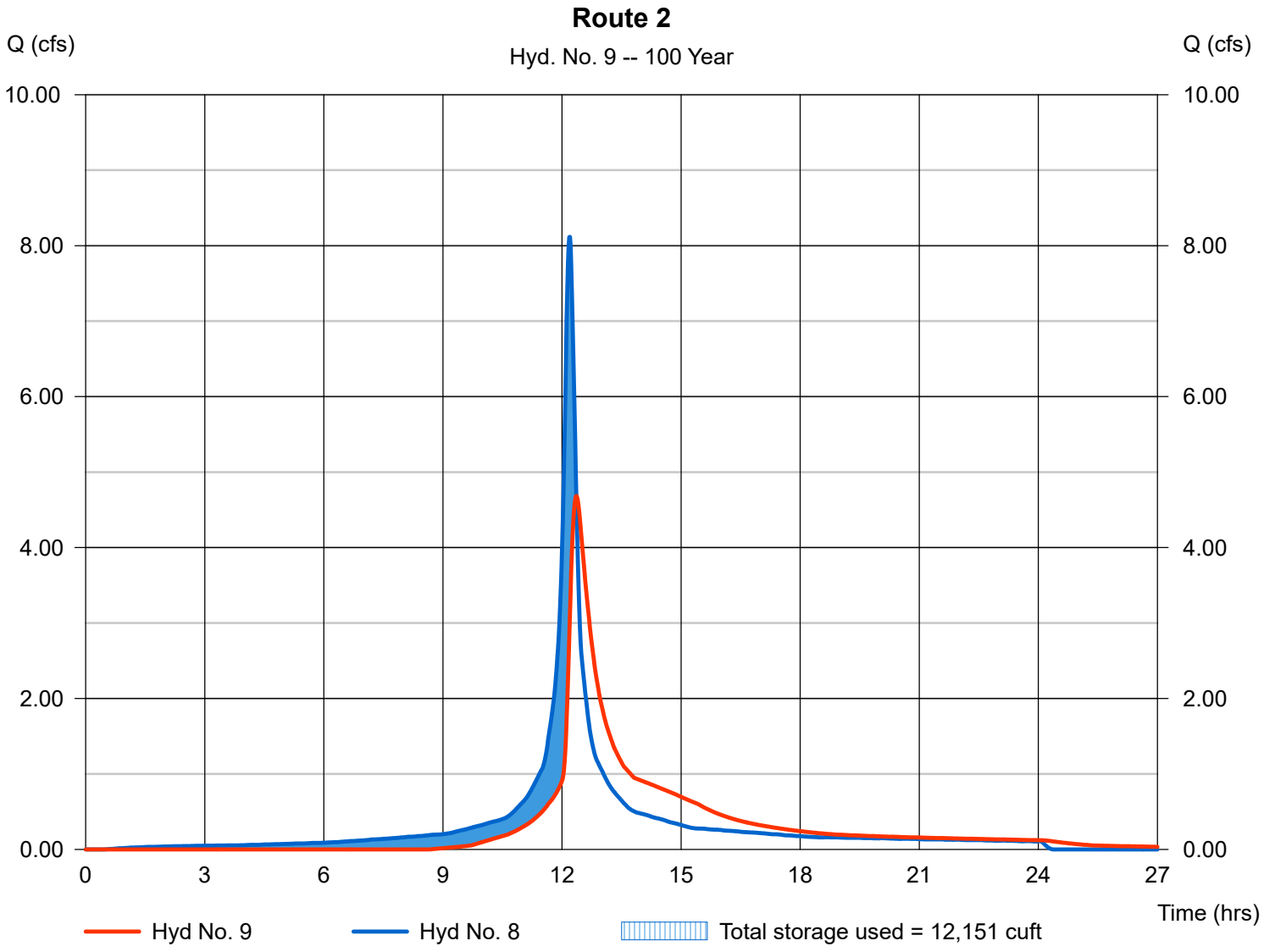
Hydrograph Report

Hyd. No. 9

Route 2

Hydrograph type	=	Reservoir	Peak discharge	=	4.684 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.37 hrs
Time interval	=	1 min	Hyd. volume	=	30,217 cuft
Inflow hyd. No.	=	8 - Prop - Basin 2	Max. Elevation	=	74.50 ft
Reservoir name	=	Basin 2	Max. Storage	=	12,151 cuft

Storage Indication method used.



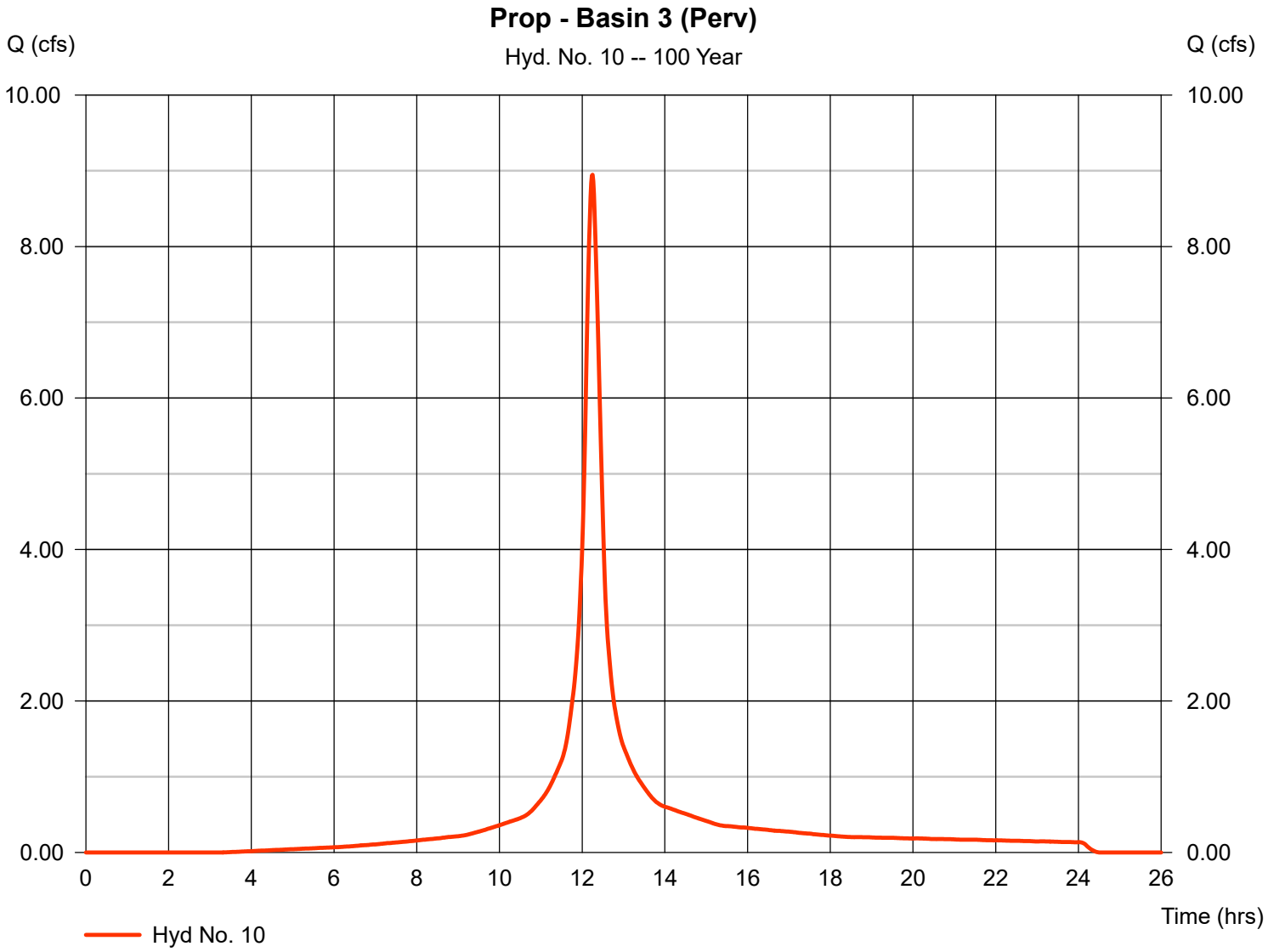
Hydrograph Report

Hyd. No. 10

Prop - Basin 3 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.946 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.25 hrs
Time interval	=	1 min	Hyd. volume	=	38,788 cuft
Drainage area	=	1.162 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.00 min
Total precip.	=	11.33 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.456 x 79) + (0.706 x 86)] / 1.162

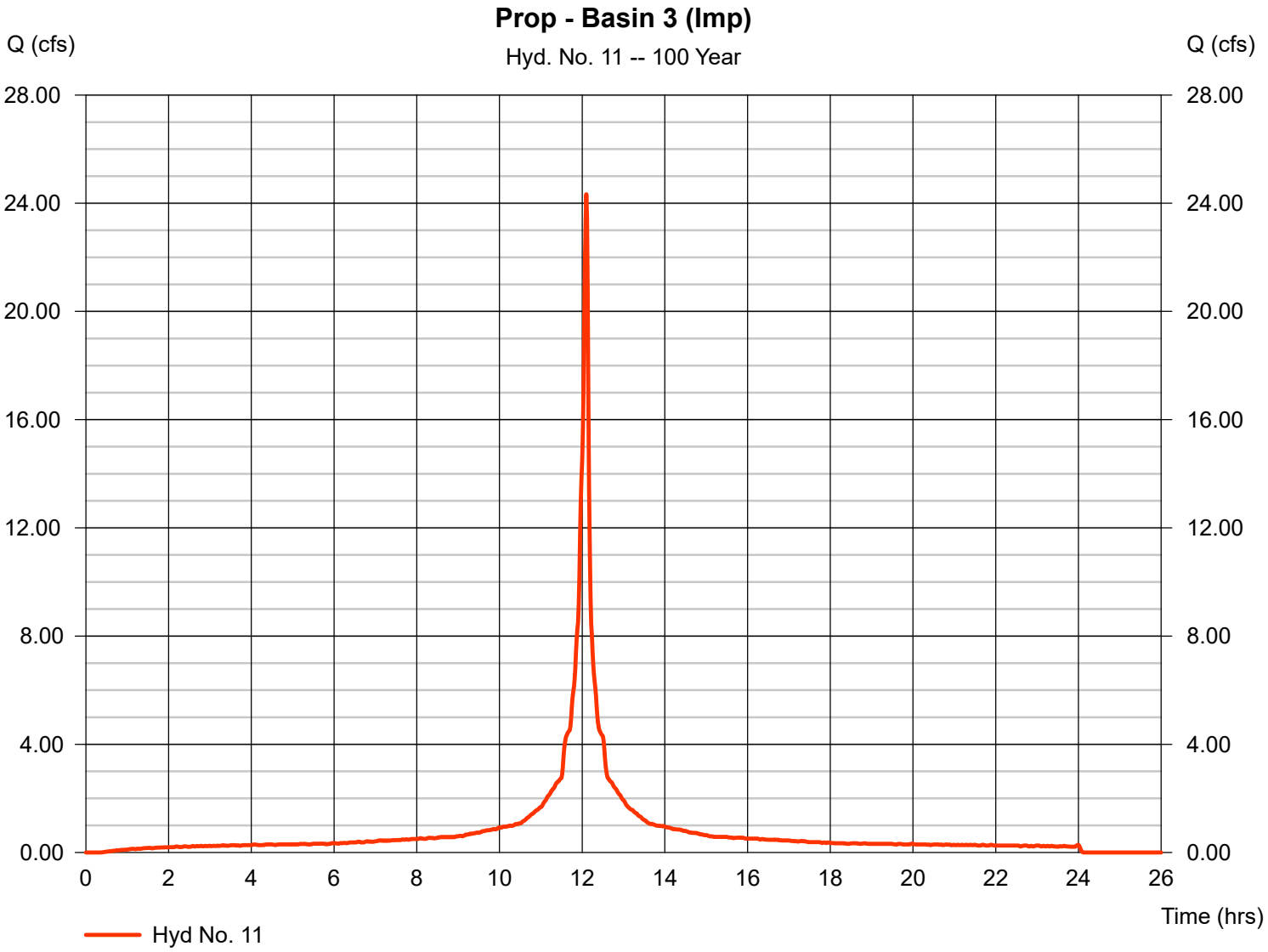


Hydrograph Report

Hyd. No. 11

Prop - Basin 3 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	24.34 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.10 hrs
Time interval	=	1 min	Hyd. volume	=	75,070 cuft
Drainage area	=	1.865 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	3.90 min
Total precip.	=	11.33 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

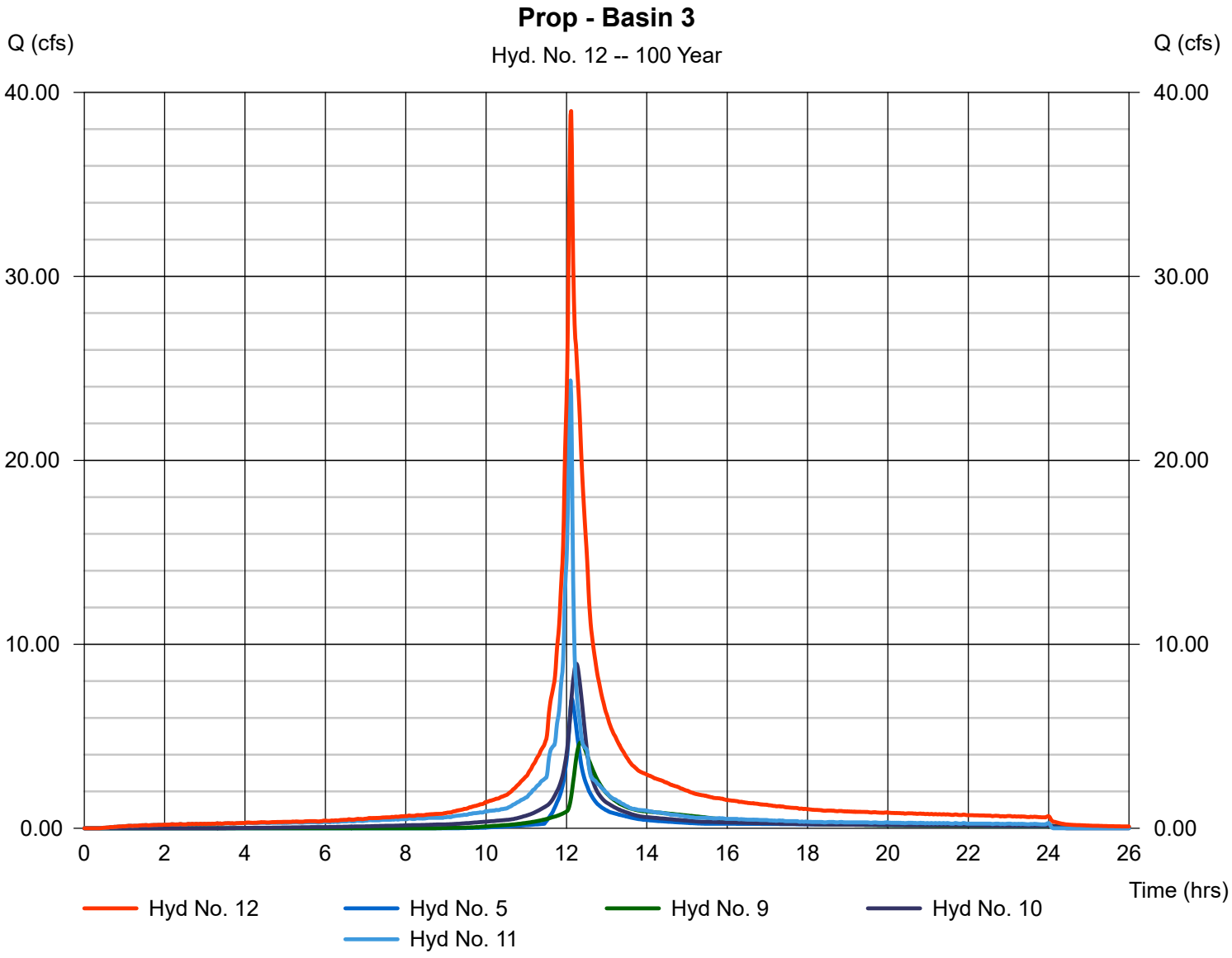


Hydrograph Report

Hyd. No. 12

Prop - Basin 3

Hydrograph type	= Combine	Peak discharge	= 38.98 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.12 hrs
Time interval	= 1 min	Hyd. volume	= 169,999 cuft
Inflow hyds.	= 5, 9, 10, 11	Contrib. drain. area	= 3.027 ac



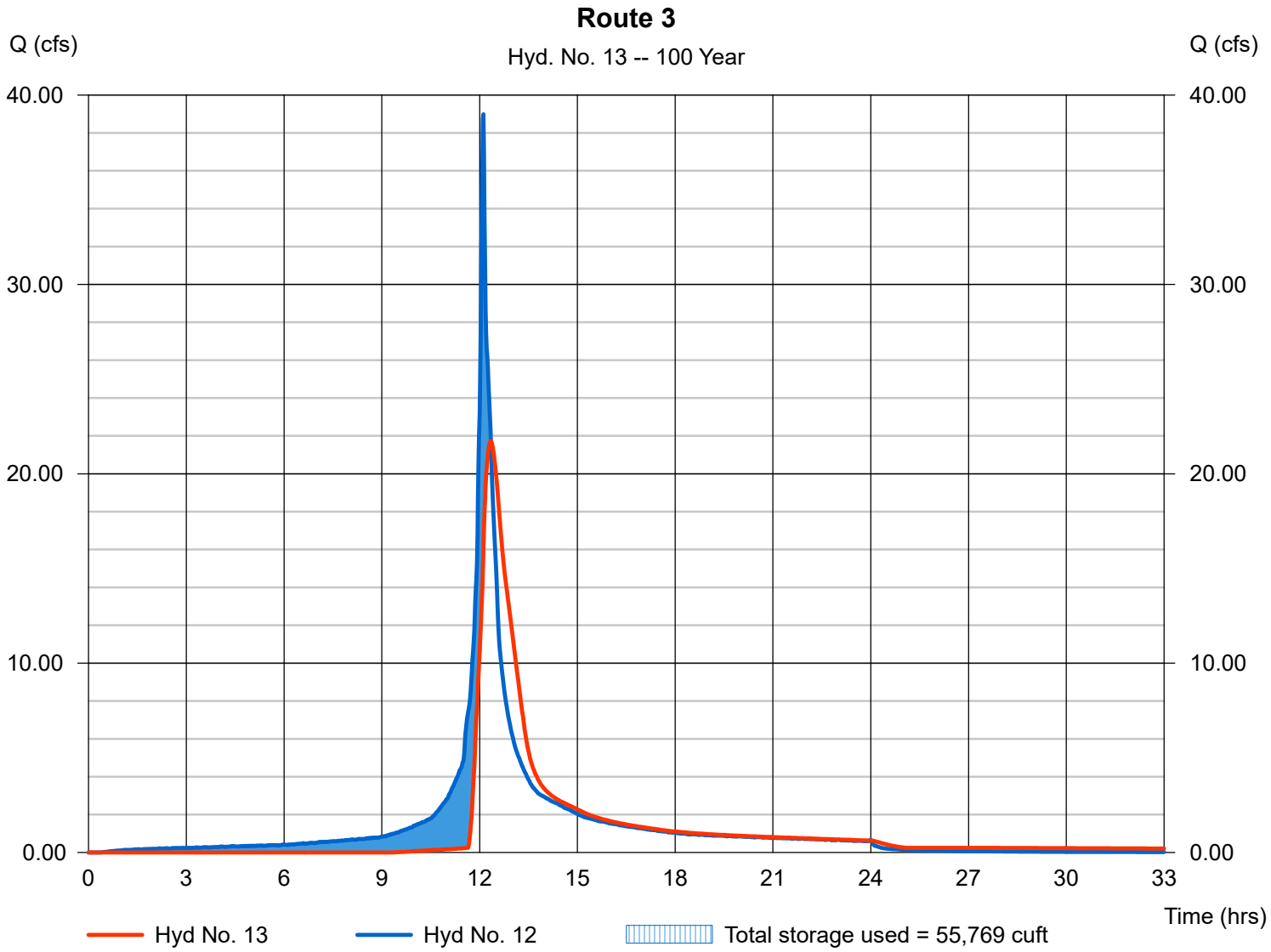
Hydrograph Report

Hyd. No. 13

Route 3

Hydrograph type	=	Reservoir	Peak discharge	=	21.73 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.35 hrs
Time interval	=	1 min	Hyd. volume	=	152,108 cuft
Inflow hyd. No.	=	12 - Prop - Basin 3	Max. Elevation	=	70.49 ft
Reservoir name	=	Basin 3	Max. Storage	=	55,769 cuft

Storage Indication method used.



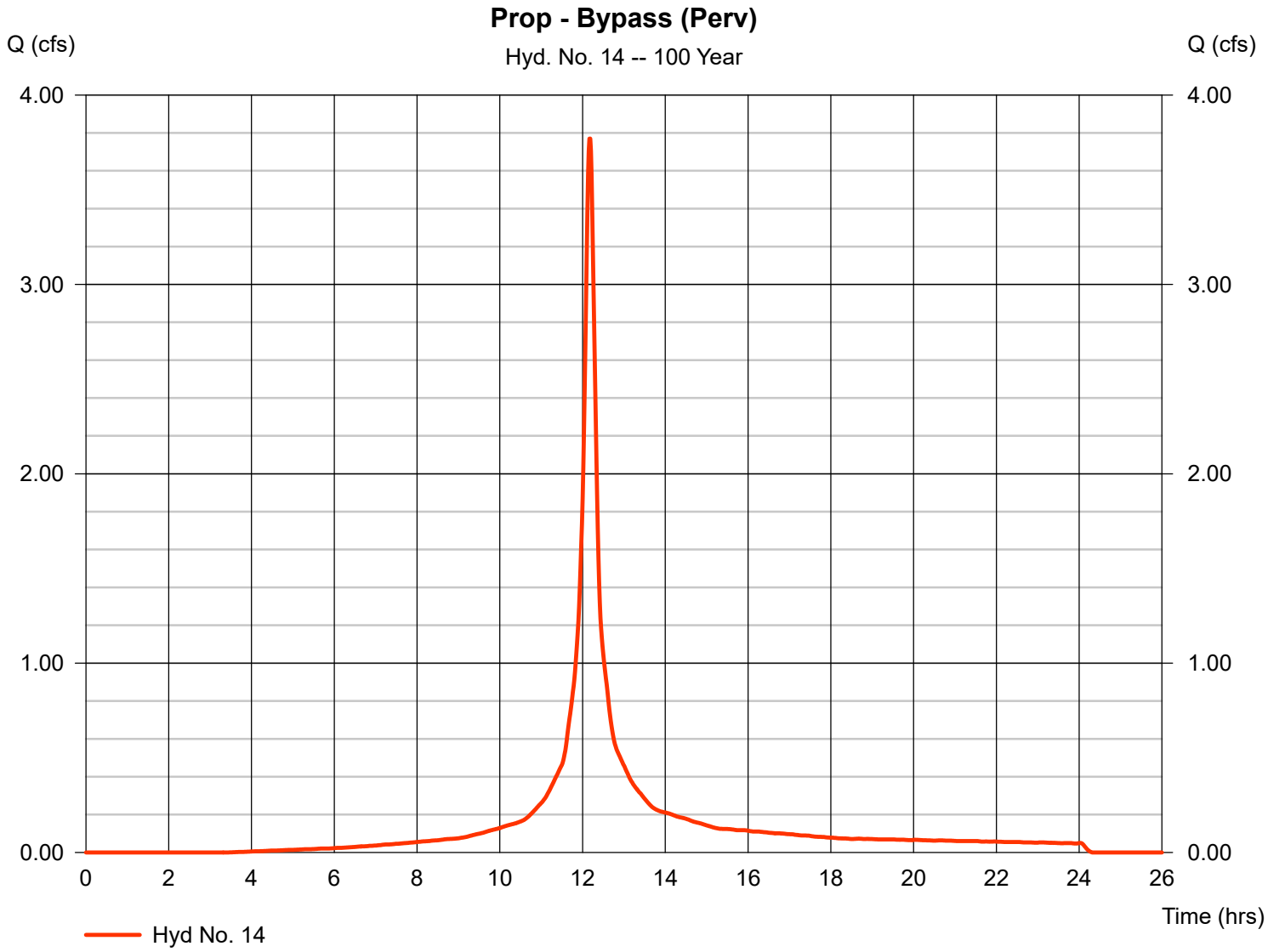
Hydrograph Report

Hyd. No. 14

Prop - Bypass (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.770 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.17 hrs
Time interval	=	1 min	Hyd. volume	=	13,733 cuft
Drainage area	=	0.424 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.80 min
Total precip.	=	11.33 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.214 x 79) + (0.210 x 86)] / 0.424

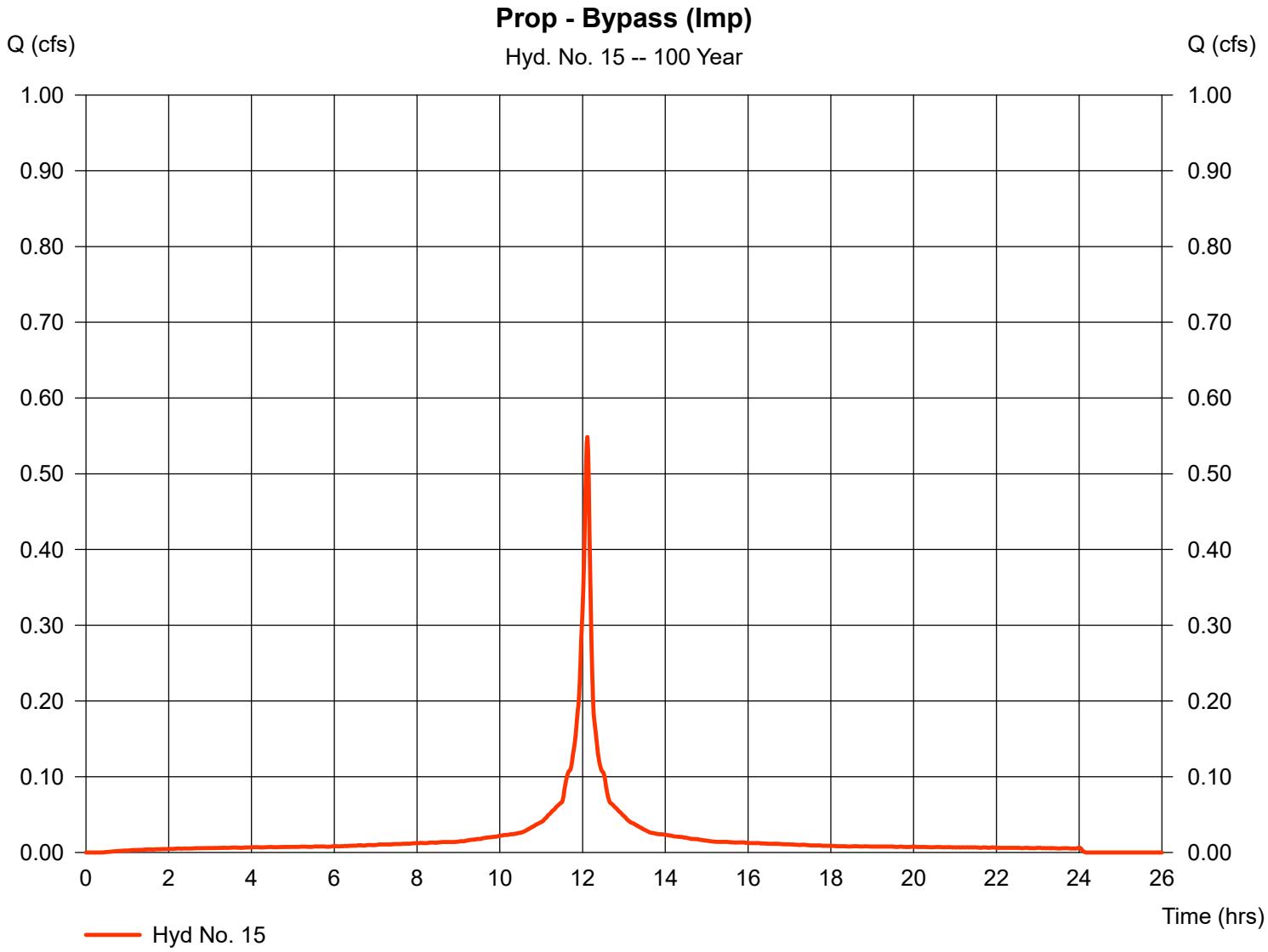


Hydrograph Report

Hyd. No. 15

Prop - Bypass (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.549 cfs
Storm frequency	=	100 yrs	Time to peak	=	12.12 hrs
Time interval	=	1 min	Hyd. volume	=	1,826 cuft
Drainage area	=	0.044 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	6.50 min
Total precip.	=	11.33 in	Distribution	=	Custom
Storm duration	=	NOAA_C.cds	Shape factor	=	484

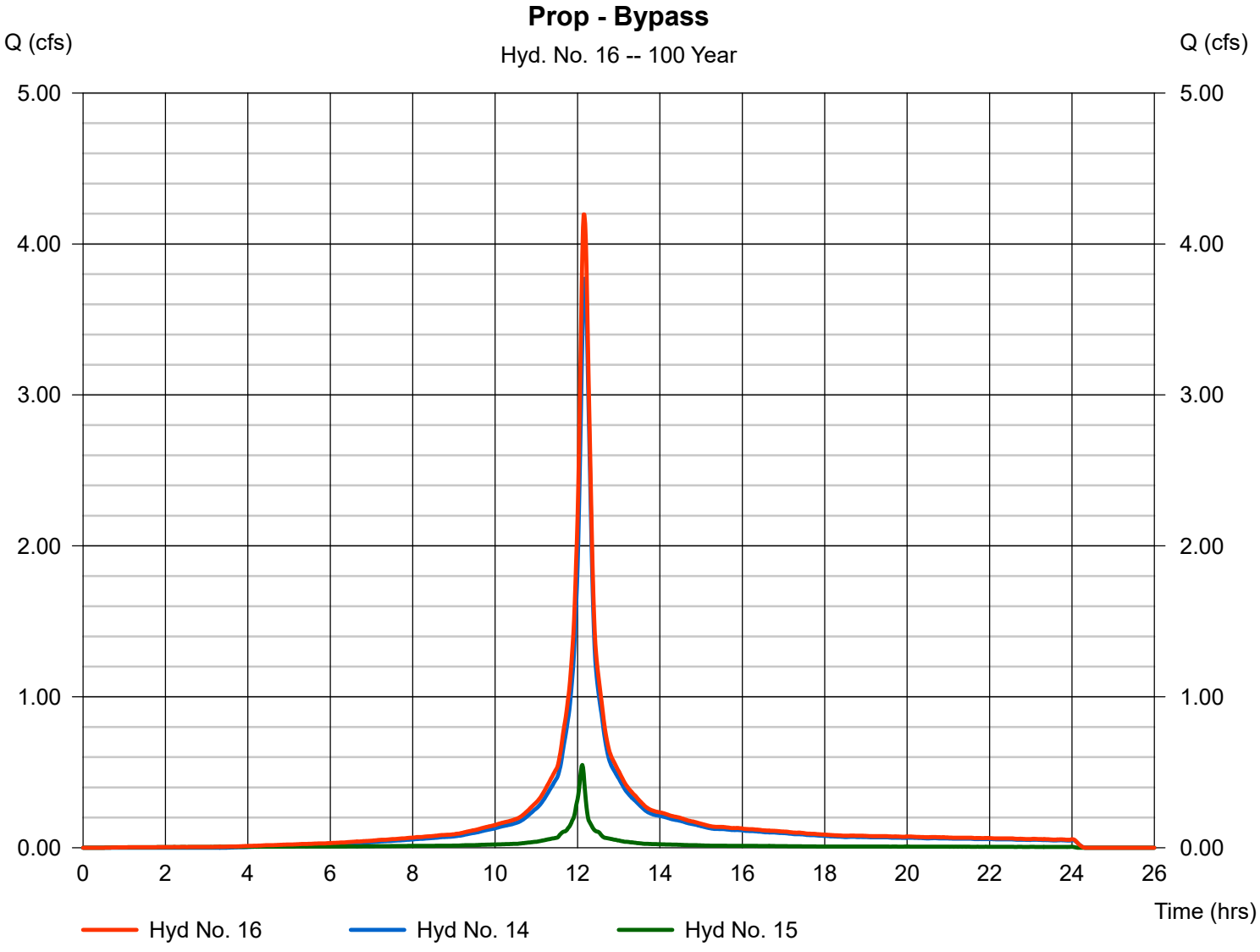


Hydrograph Report

Hyd. No. 16

Prop - Bypass

Hydrograph type	= Combine	Peak discharge	= 4.196 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.15 hrs
Time interval	= 1 min	Hyd. volume	= 15,559 cuft
Inflow hyds.	= 14, 15	Contrib. drain. area	= 0.468 ac

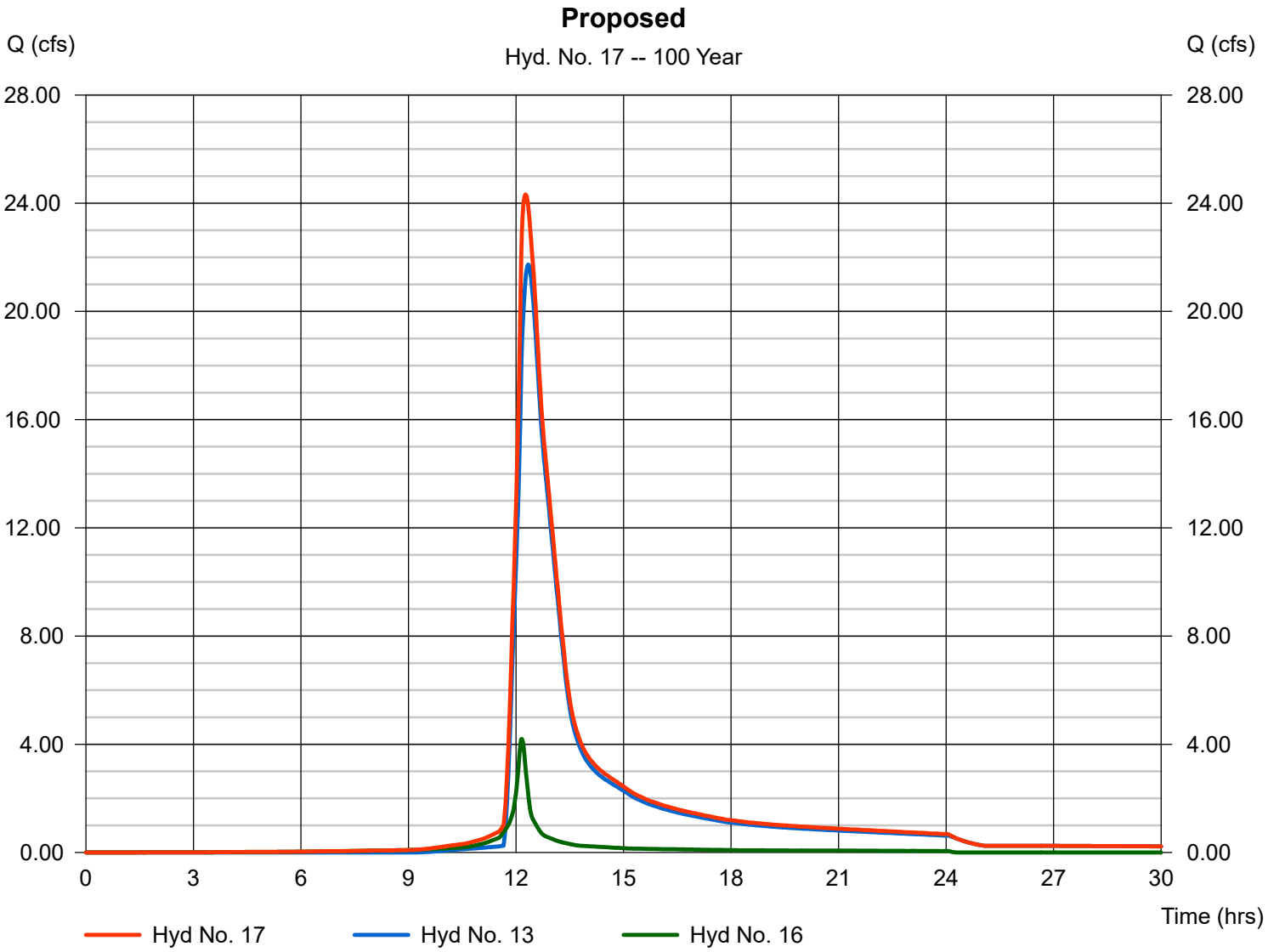


Hydrograph Report

Hyd. No. 17

Proposed

Hydrograph type	= Combine	Peak discharge	= 24.32 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.27 hrs
Time interval	= 1 min	Hyd. volume	= 167,667 cuft
Inflow hyds.	= 13, 16	Contrib. drain. area	= 0.000 ac



Hydraflow Table of Contents Water Quality

21-210-wq.gpw

Hydraflow Hydrographs by Intelisolve v9.25

Wednesday, Apr 16, 2025

1 - Year

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.25

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.198	1	70	278	------	------	------	Prop - Treated 1 (Perv)
2	SCS Runoff	1.323	1	65	1,613	------	------	------	Prop - Treated 1 (Imp)
3	Combine	1.433	1	65	1,891	1, 2	------	------	Prop - Treated 1
4	Reservoir	0.000	1	n/a	0	3	75.83	1,891	Route 1
5	SCS Runoff	0.159	1	76	297	------	------	------	Prop - Treated 2 (Perv)
6	SCS Runoff	0.906	1	70	1,465	------	------	------	Prop - Treated 2 (Imp)
7	Combine	1.036	1	71	1,761	5, 6	------	------	Prop - Treated 2
8	Reservoir	0.000	1	n/a	0	7	73.23	1,761	Route 2
9	SCS Runoff	0.511	1	78	1,031	------	------	------	Prop - Treated 3 (Perv)
10	SCS Runoff	5.690	1	65	7,004	------	------	------	Prop - Treated 3 (Imp)
11	Combine	5.814	1	65	8,035	4, 8, 9, 10	------	------	Prop - Treated 3
12	Reservoir	0.000	1	n/a	0	11	67.51	8,035	Route 3

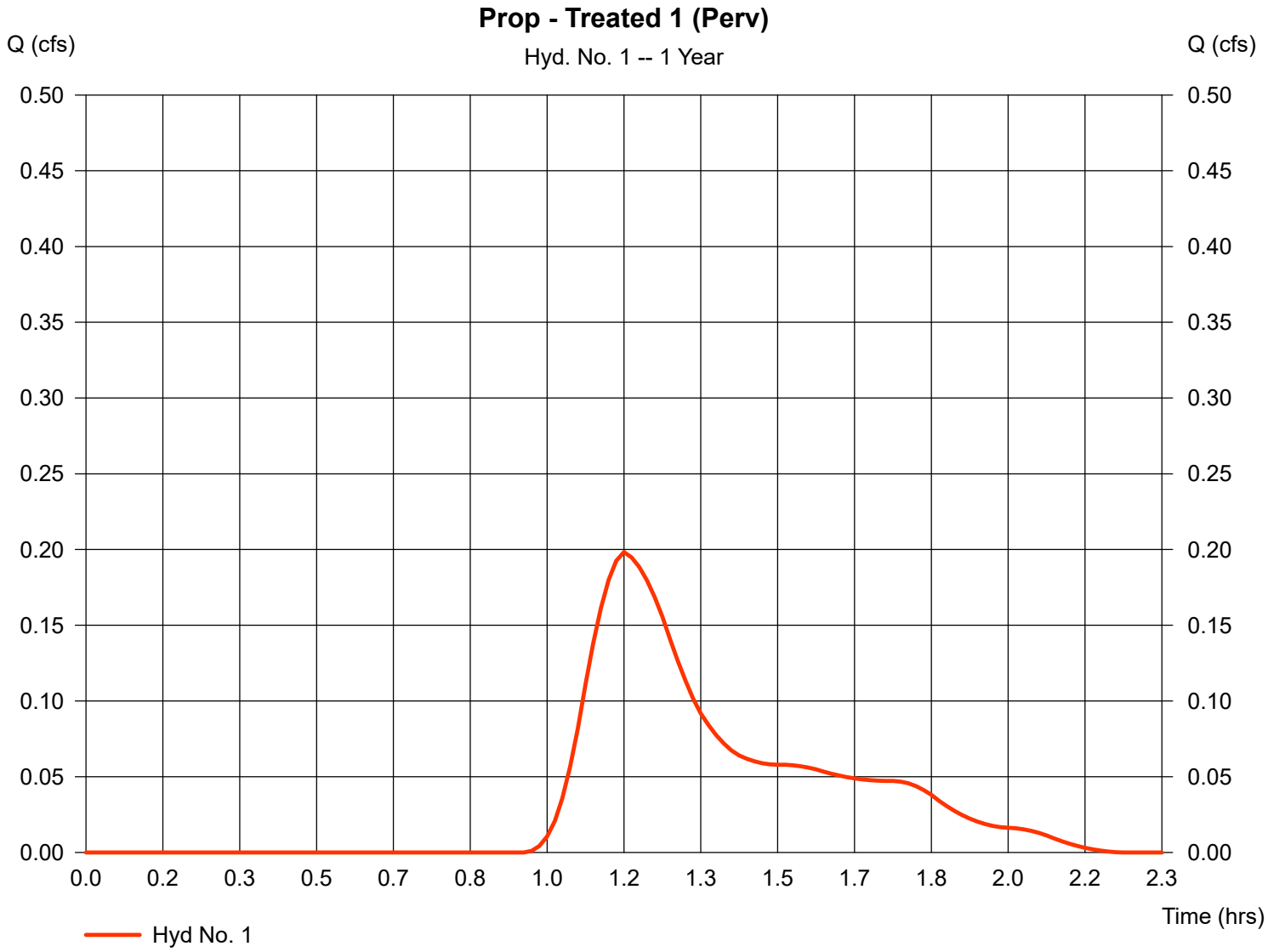
Hydrograph Report

Hyd. No. 1

Prop - Treated 1 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.198 cfs
Storm frequency	=	1 yrs	Time to peak	=	1.17 hrs
Time interval	=	1 min	Hyd. volume	=	278 cuft
Drainage area	=	0.351 ac	Curve number	=	82*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.20 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	NJWaterQuality.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.196 x 79) + (0.155 x 86)] / 0.351

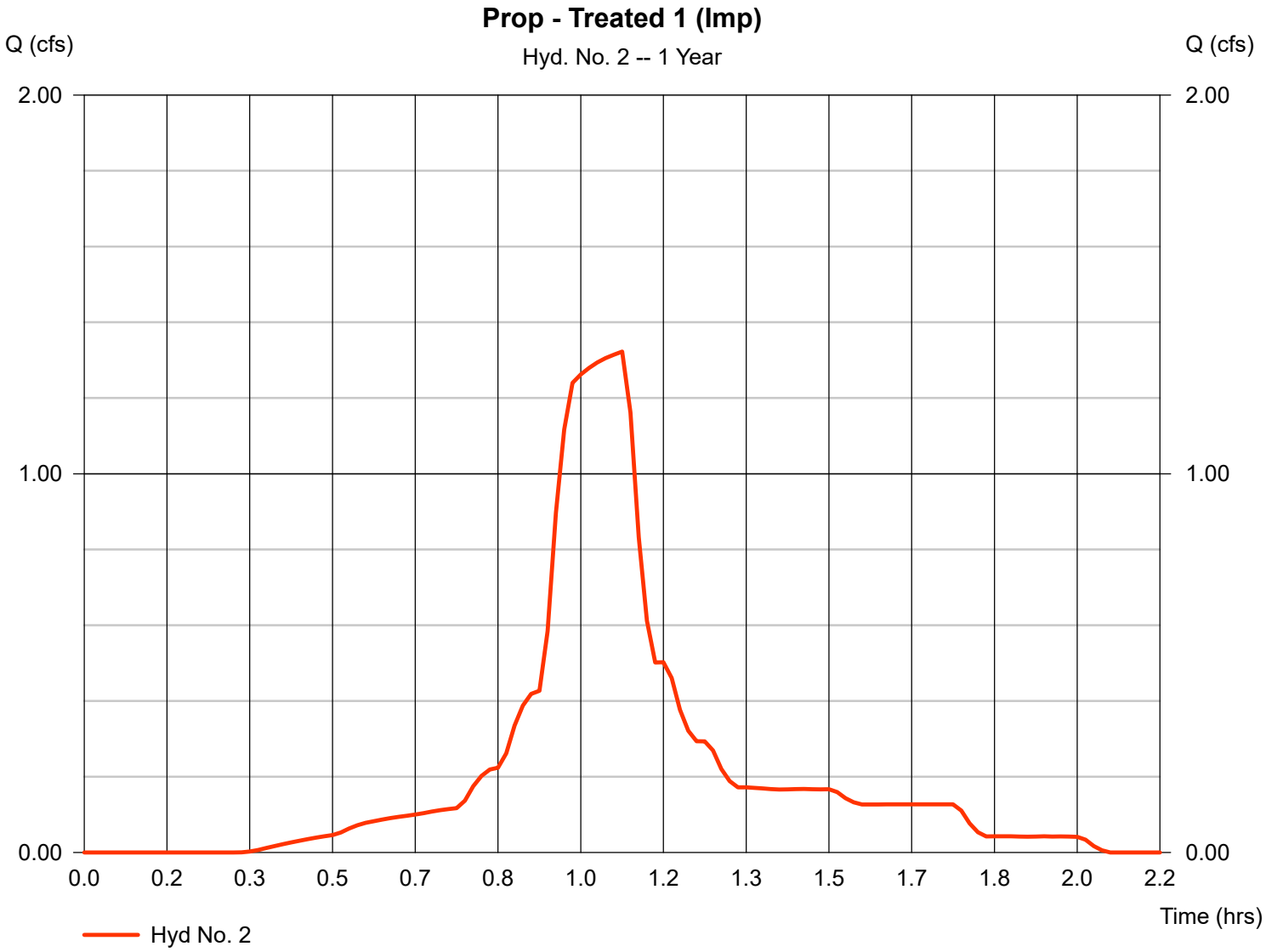


Hydrograph Report

Hyd. No. 2

Prop - Treated 1 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.323 cfs
Storm frequency	=	1 yrs	Time to peak	=	1.08 hrs
Time interval	=	1 min	Hyd. volume	=	1,613 cuft
Drainage area	=	0.458 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	1.60 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	NJWaterQuality.cds	Shape factor	=	484

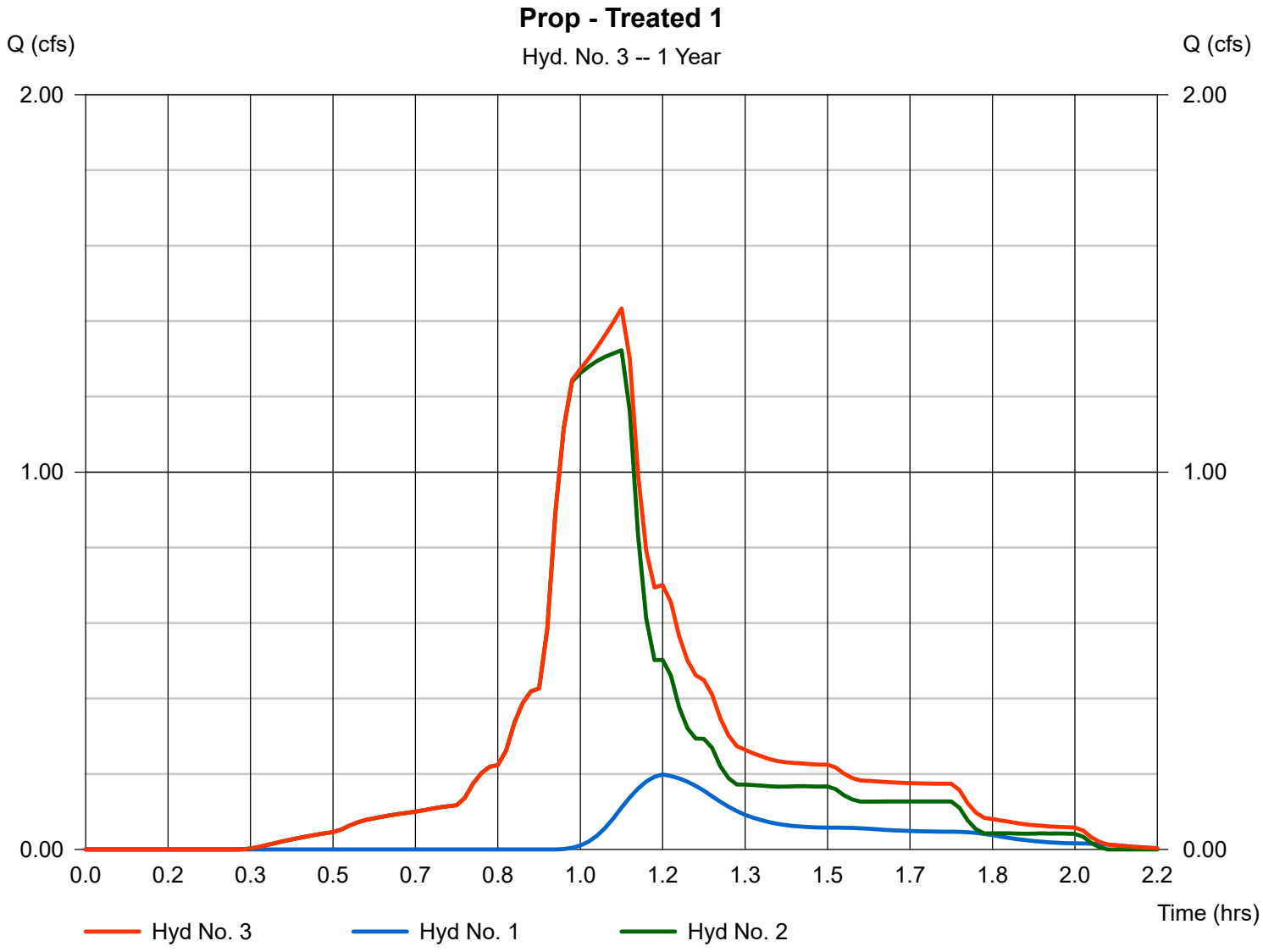


Hydrograph Report

Hyd. No. 3

Prop - Treated 1

Hydrograph type	= Combine	Peak discharge	= 1.433 cfs
Storm frequency	= 1 yrs	Time to peak	= 1.08 hrs
Time interval	= 1 min	Hyd. volume	= 1,891 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 0.809 ac



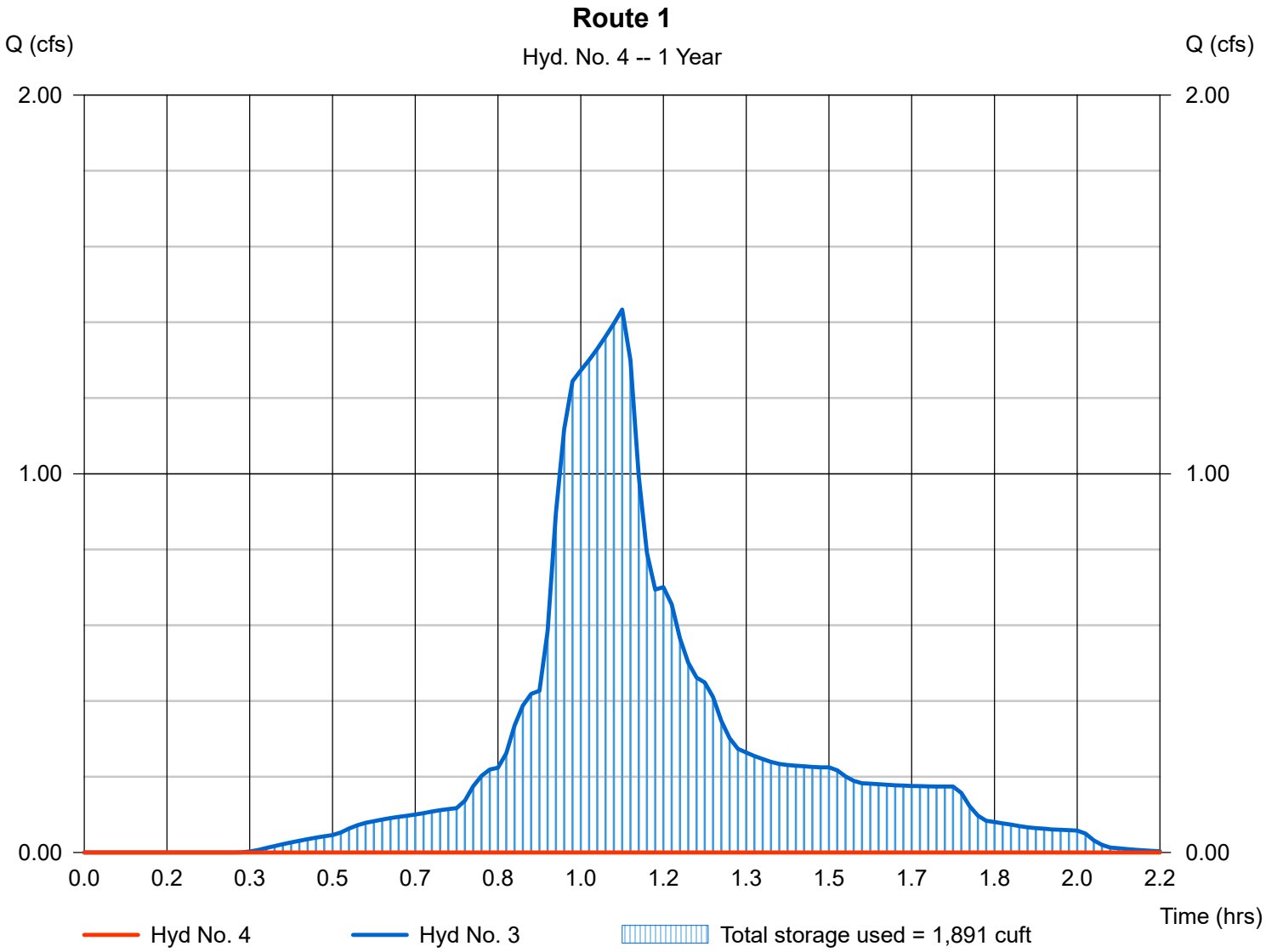
Hydrograph Report

Hyd. No. 4

Route 1

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	3 - Prop - Treated 1	Max. Elevation	=	75.83 ft
Reservoir name	=	Basin 1	Max. Storage	=	1,891 cuft

Storage Indication method used.

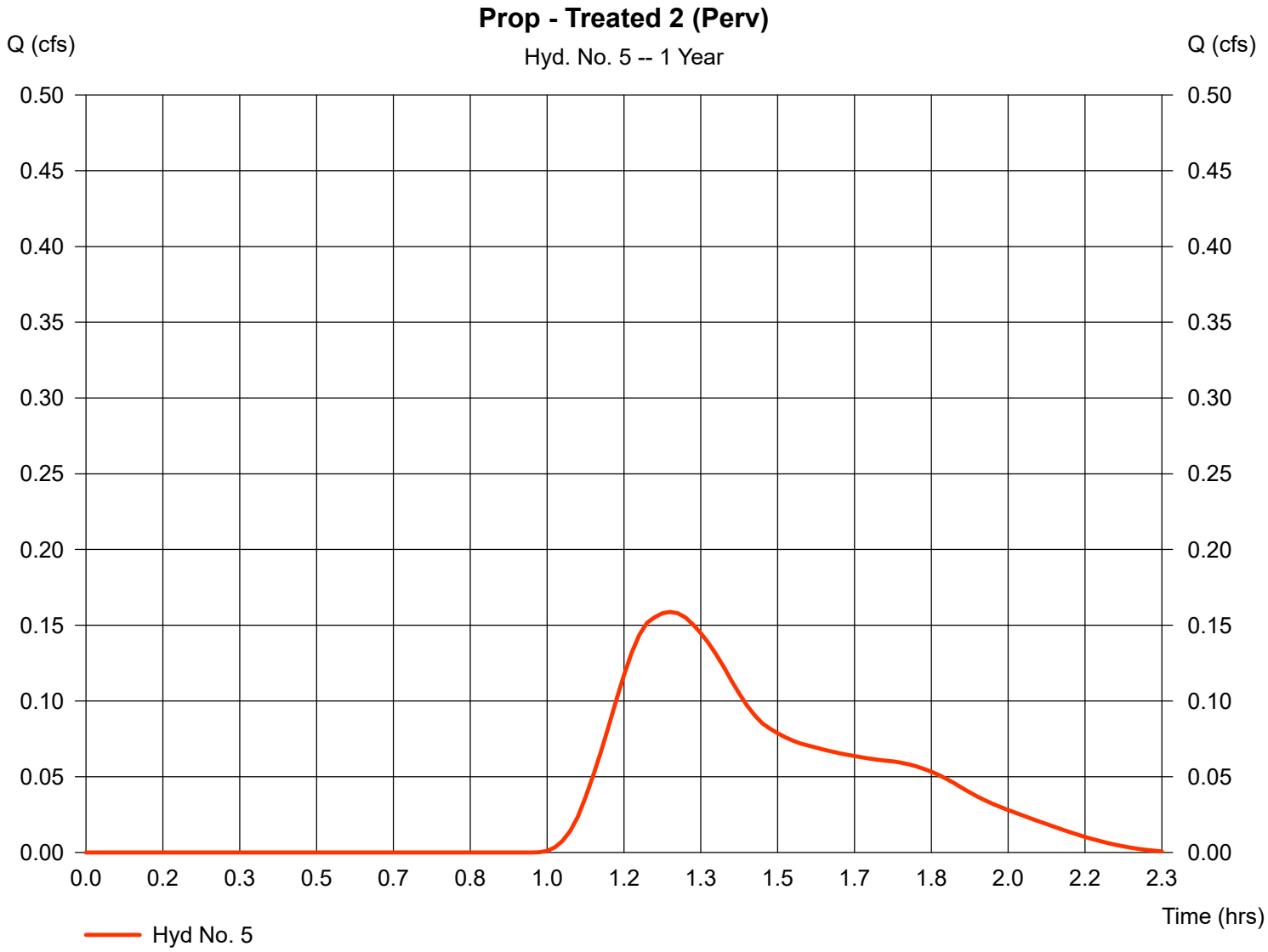


Hydrograph Report

Hyd. No. 5

Prop - Treated 2 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.159 cfs
Storm frequency	=	1 yrs	Time to peak	=	1.27 hrs
Time interval	=	1 min	Hyd. volume	=	297 cuft
Drainage area	=	0.535 ac	Curve number	=	79
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.10 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	NJWaterQuality.cds	Shape factor	=	484

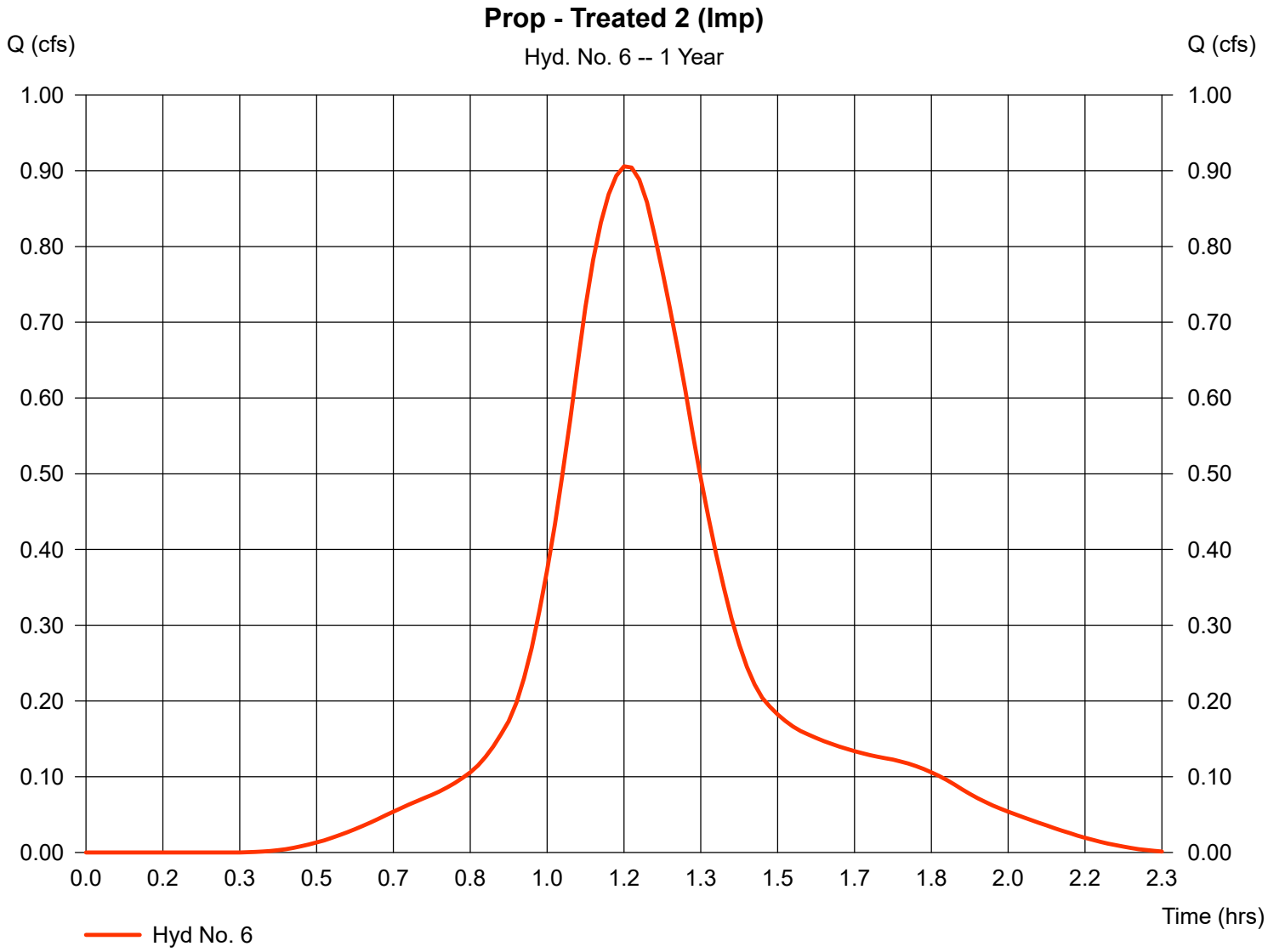


Hydrograph Report

Hyd. No. 6

Prop - Treated 2 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.906 cfs
Storm frequency	=	1 yrs	Time to peak	=	1.17 hrs
Time interval	=	1 min	Hyd. volume	=	1,465 cuft
Drainage area	=	0.390 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.70 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	NJWaterQuality.cds	Shape factor	=	484

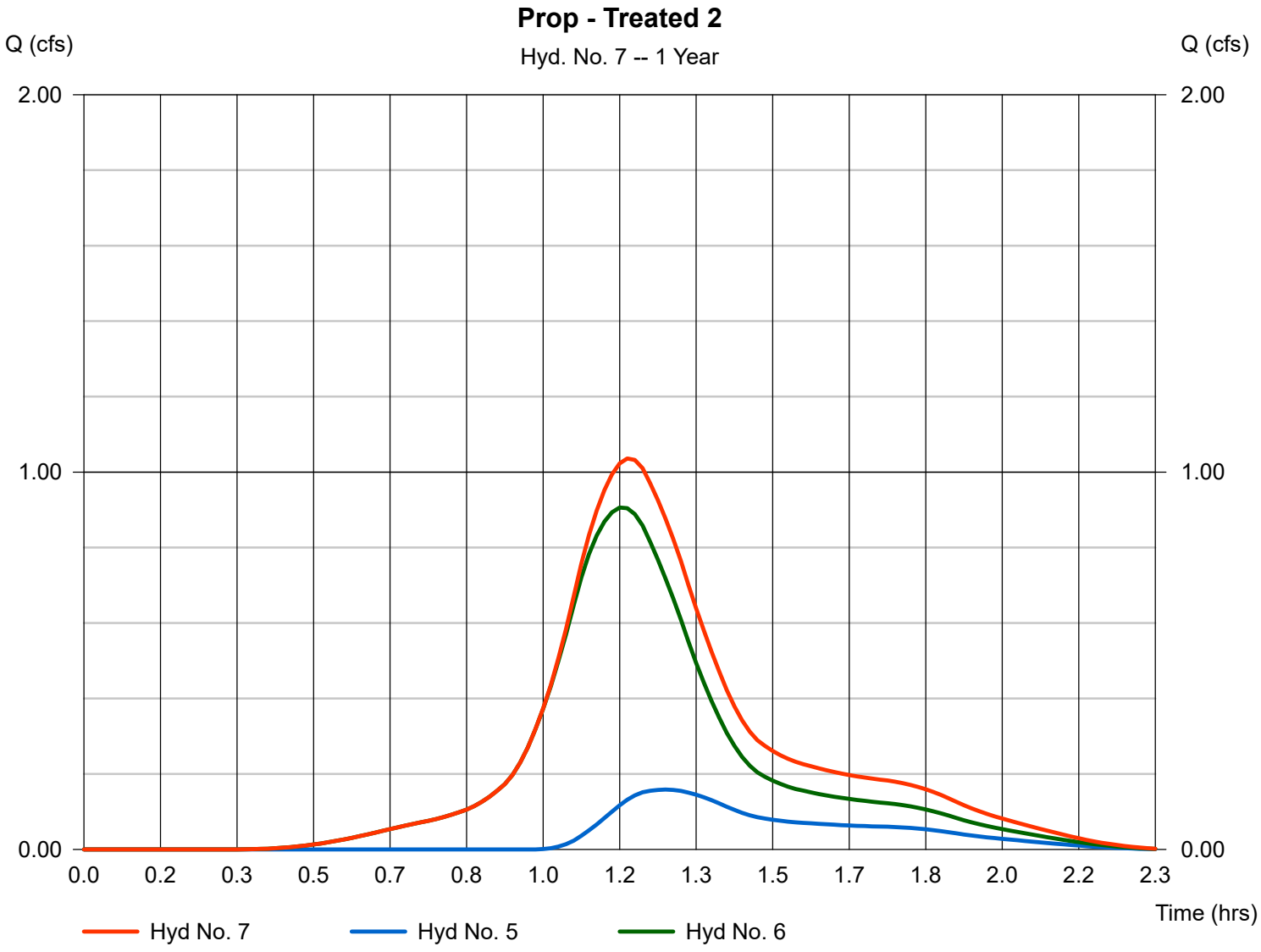


Hydrograph Report

Hyd. No. 7

Prop - Treated 2

Hydrograph type	= Combine	Peak discharge	= 1.036 cfs
Storm frequency	= 1 yrs	Time to peak	= 1.18 hrs
Time interval	= 1 min	Hyd. volume	= 1,761 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 0.925 ac



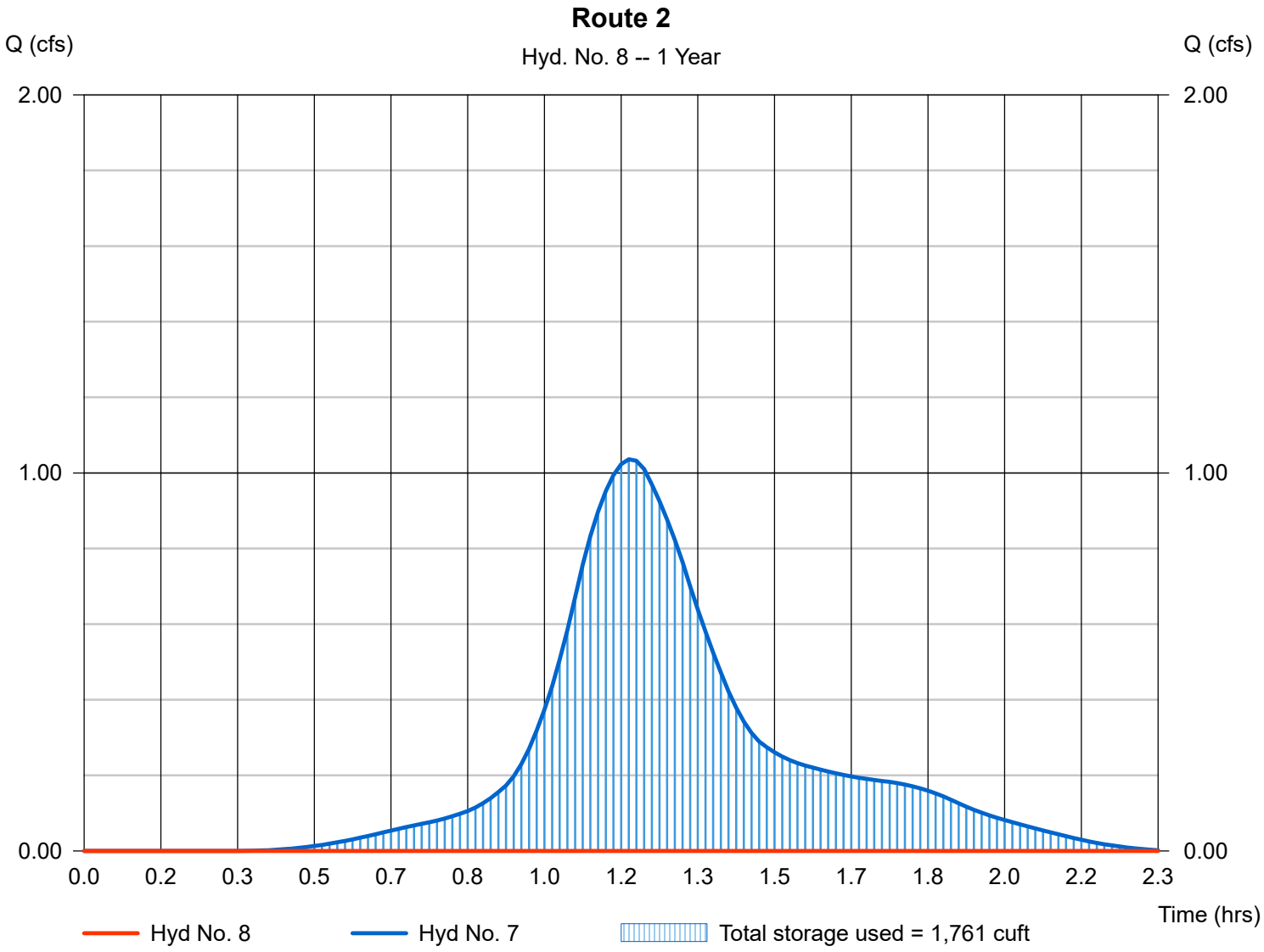
Hydrograph Report

Hyd. No. 8

Route 2

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	7 - Prop - Treated 2	Max. Elevation	=	73.23 ft
Reservoir name	=	Basin 2	Max. Storage	=	1,761 cuft

Storage Indication method used.



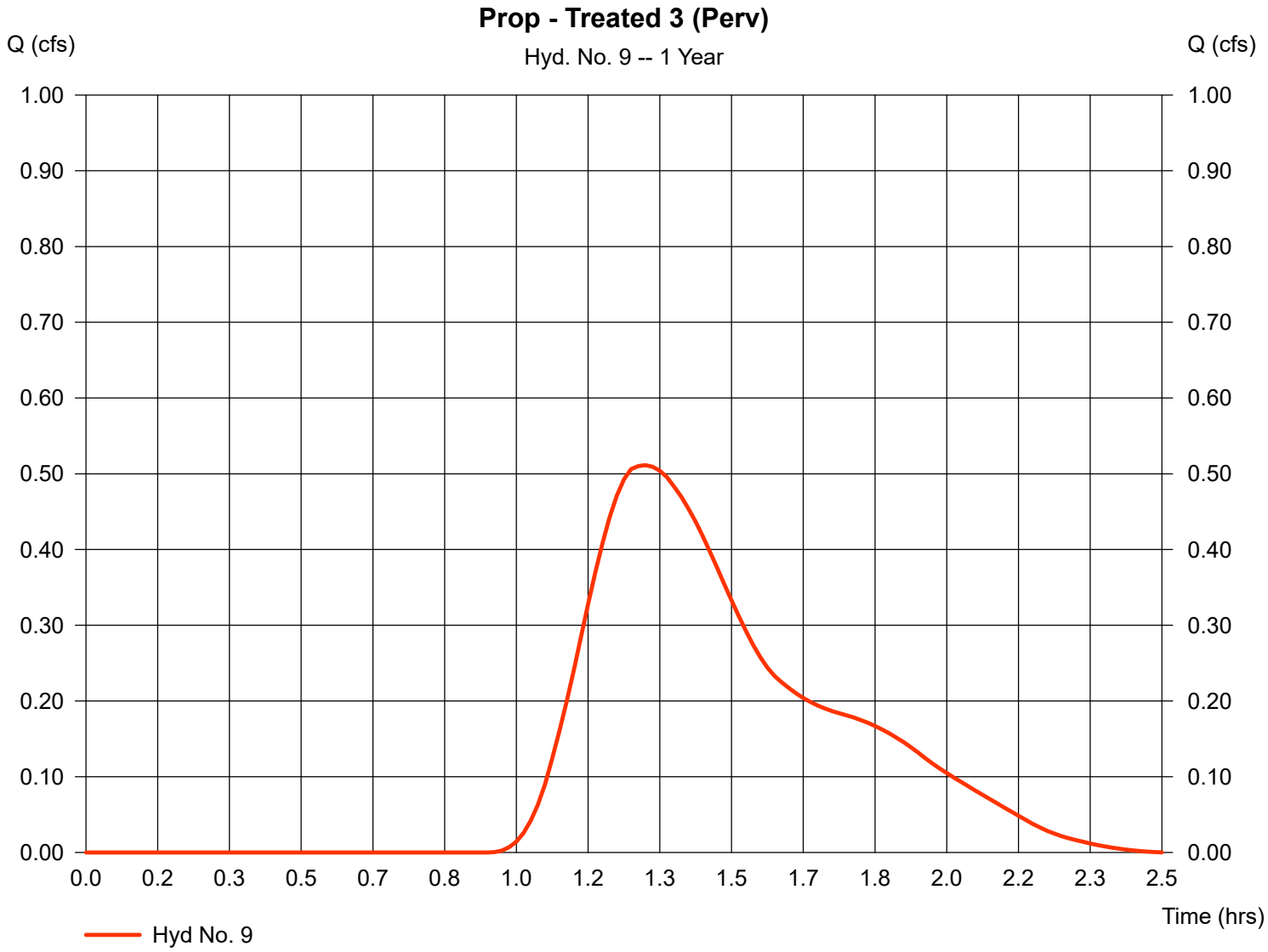
Hydrograph Report

Hyd. No. 9

Prop - Treated 3 (Perv)

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.511 cfs
Storm frequency	=	1 yrs	Time to peak	=	1.30 hrs
Time interval	=	1 min	Hyd. volume	=	1,031 cuft
Drainage area	=	1.162 ac	Curve number	=	83*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	19.00 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	NJWaterQuality.cds	Shape factor	=	484

* Composite (Area/CN) = [(0.456 x 79) + (0.706 x 86)] / 1.162

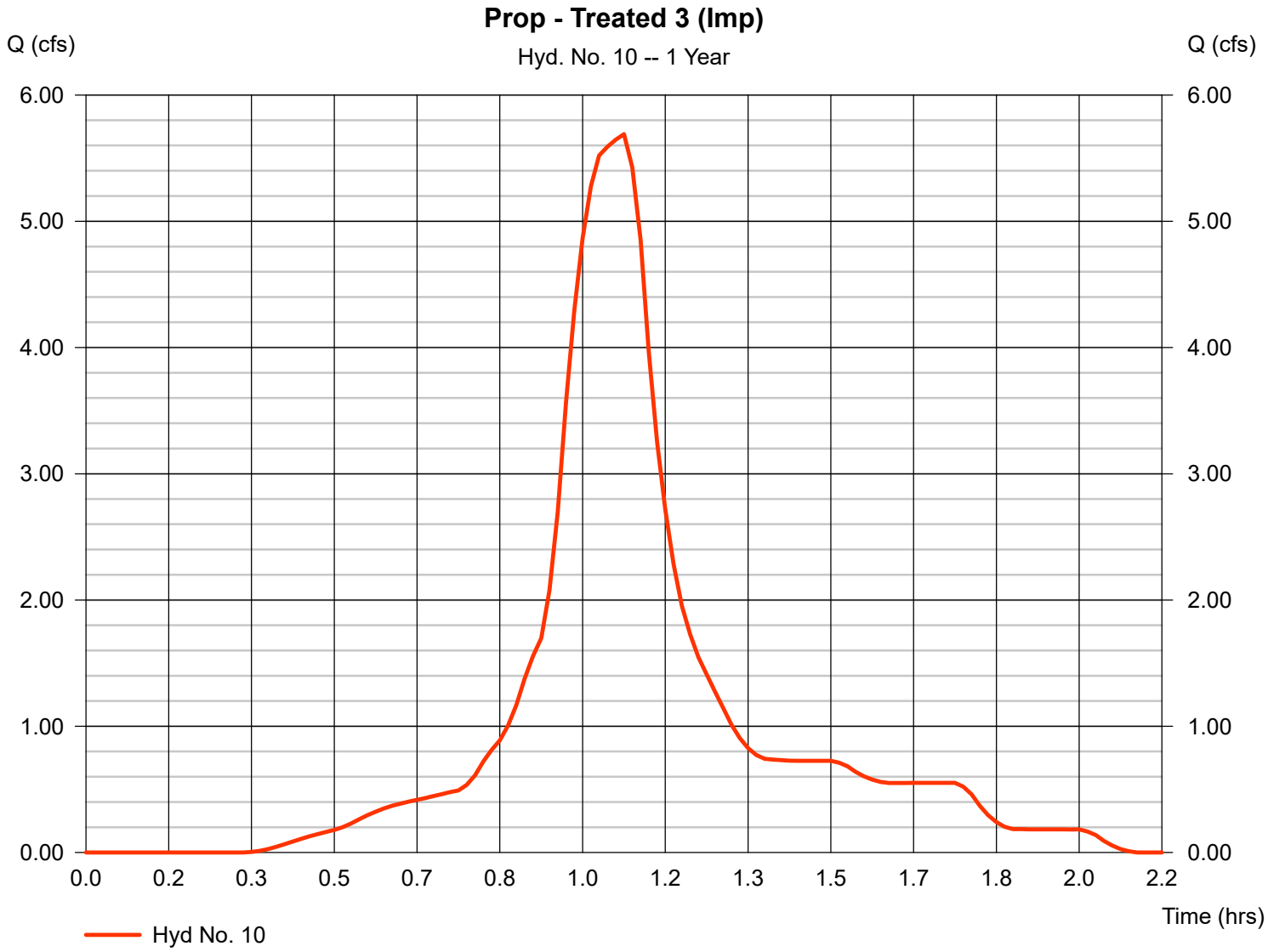


Hydrograph Report

Hyd. No. 10

Prop - Treated 3 (Imp)

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.690 cfs
Storm frequency	=	1 yrs	Time to peak	=	1.08 hrs
Time interval	=	1 min	Hyd. volume	=	7,004 cuft
Drainage area	=	1.865 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	3.90 min
Total precip.	=	1.25 in	Distribution	=	Custom
Storm duration	=	NJWaterQuality.cds	Shape factor	=	484

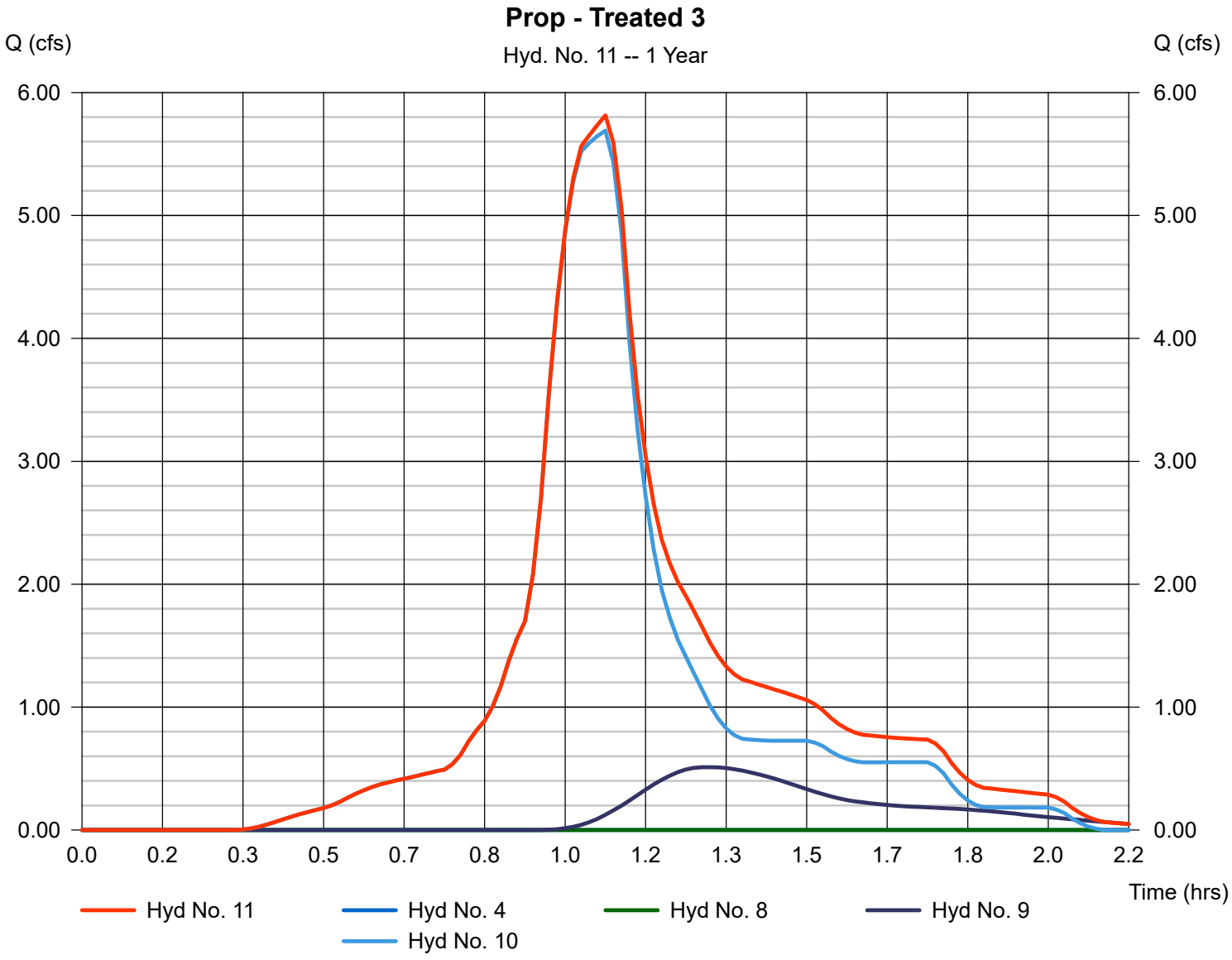


Hydrograph Report

Hyd. No. 11

Prop - Treated 3

Hydrograph type	= Combine	Peak discharge	= 5.814 cfs
Storm frequency	= 1 yrs	Time to peak	= 1.08 hrs
Time interval	= 1 min	Hyd. volume	= 8,035 cuft
Inflow hyds.	= 4, 8, 9, 10	Contrib. drain. area	= 3.027 ac



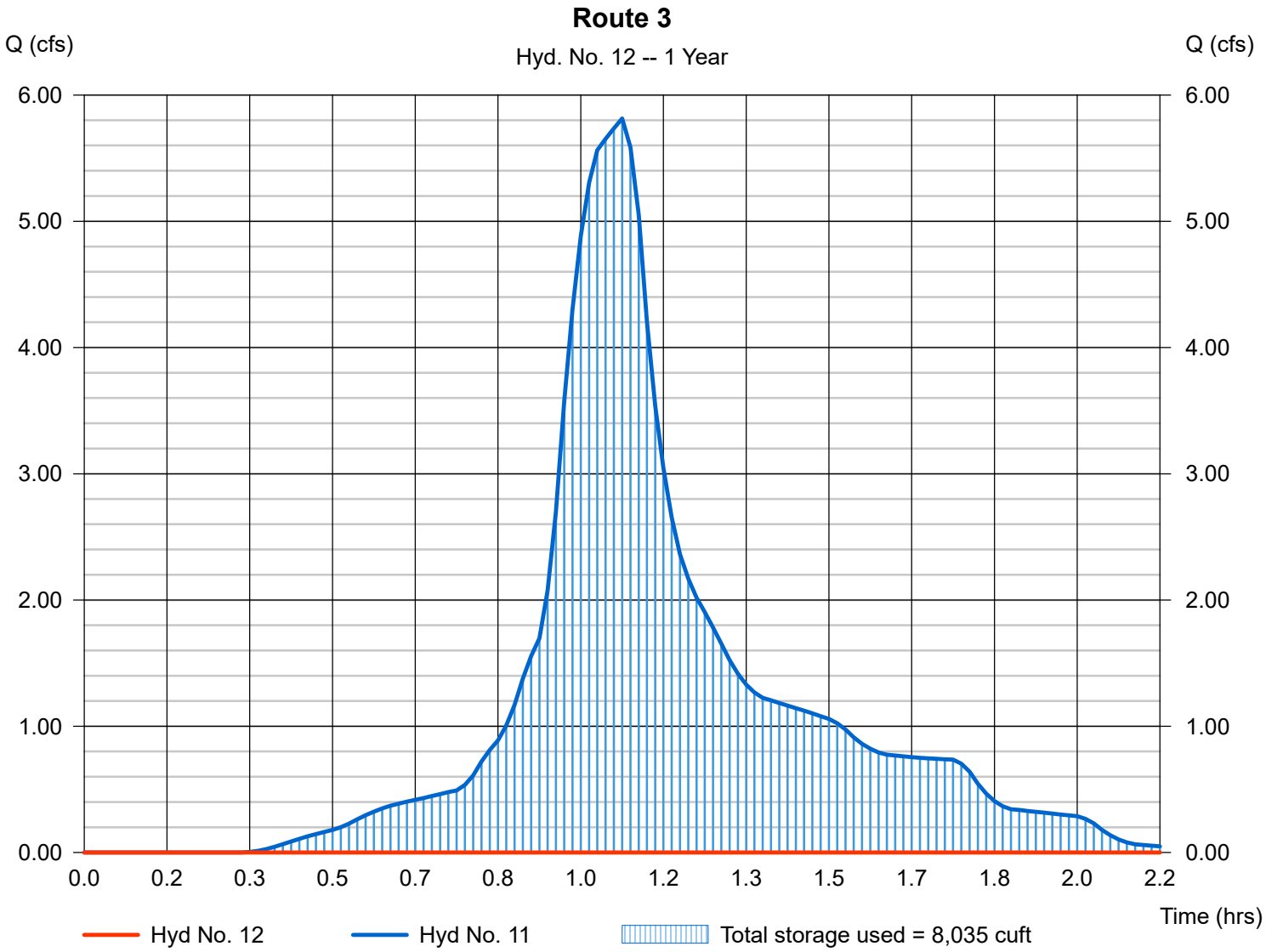
Hydrograph Report

Hyd. No. 12

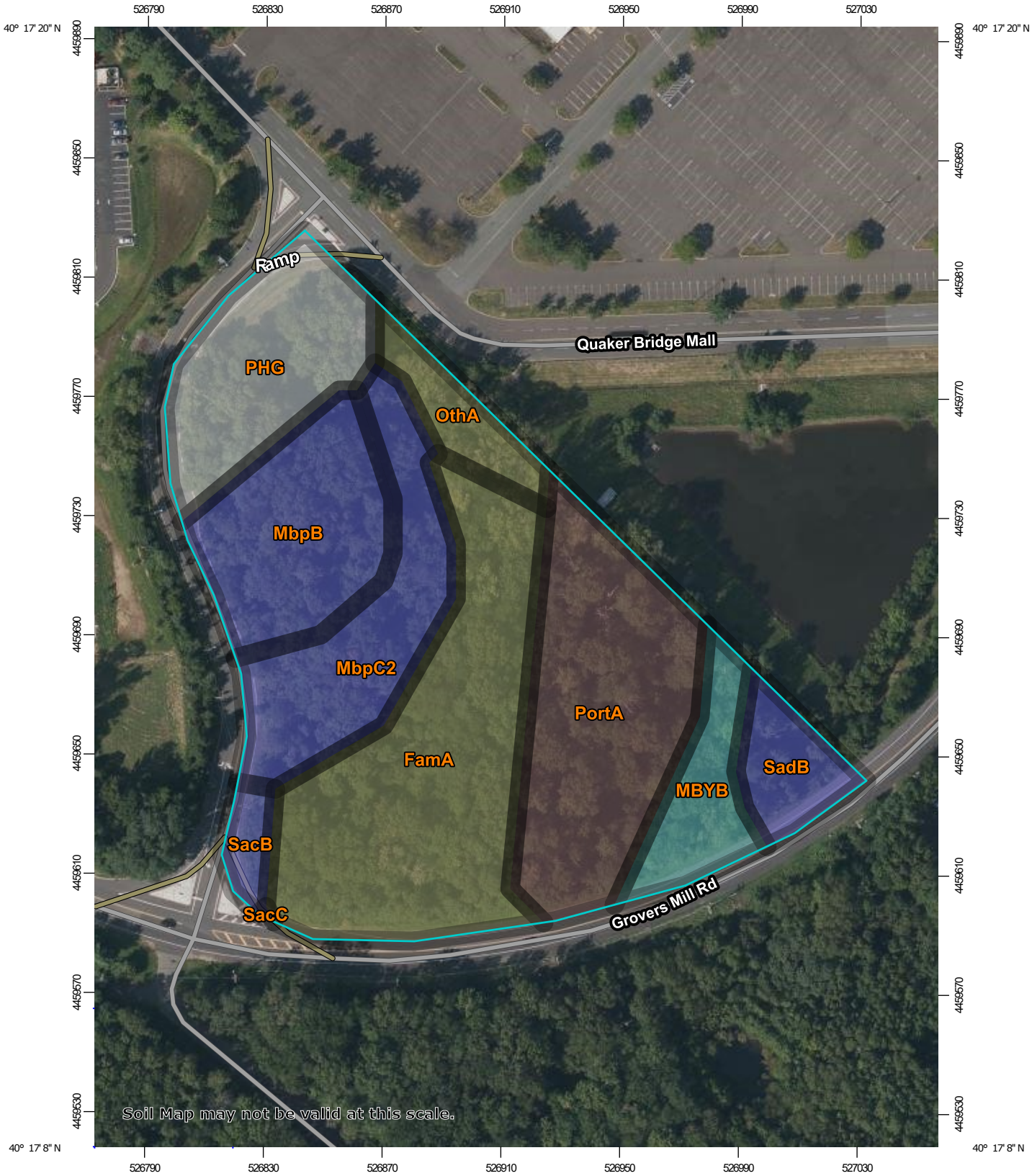
Route 3

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	1 yrs	Time to peak	=	n/a
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	11 - Prop - Treated 3	Max. Elevation	=	67.51 ft
Reservoir name	=	Basin 3	Max. Storage	=	8,035 cuft

Storage Indication method used.



Hydrologic Soil Group—Mercer County, New Jersey
(Soil Boundary Map)



Map Scale: 1:1,830 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mercer County, New Jersey
Survey Area Data: Version 17, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 6, 2020—Sep 21, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
FamA	Fallsington sandy loams, 0 to 2 percent slopes, northern coastal plain	C/D	2.1	26.3%
MbpB	Matapeake loam, 2 to 5 percent slopes	B	1.0	12.6%
MbpC2	Matapeake loam, 5 to 10 percent slopes, eroded	B	1.0	12.9%
MBYB	Mattapex and Bertie loams, 0 to 5 percent slopes	C	0.5	6.1%
OthA	Othello silt loams, 0 to 2 percent slopes, northern coastal plain	C/D	0.3	4.1%
PHG	Pits, sand and gravel		0.9	11.9%
PortA	Portsmouth variant silt loam, 0 to 2 percent slopes	B/D	1.6	19.9%
SacB	Sassafras sandy loam, 2 to 5 percent slopes, Northern Coastal Plain	B	0.1	1.8%
SacC	Sassafras sandy loam, 5 to 10 percent slopes, Northern Coastal Plain	B	0.0	0.0%
SadB	Sassafras gravelly sandy loam, 2 to 5 percent slopes	B	0.3	4.3%
Totals for Area of Interest			**7.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

DM1: EXISTING DRAINAGE AREA MAP

OthA

PHG

MbpB

MbpC2

FamA

SadB

MBYB

PortA

SacB

Tc PATH (TYP)

EXISTING DRAINAGE AREA
5.229 ACRES

TAX BLOCK 4201.01
LOT 33.03
Area=298.614 Sq. Ft. | 6.855 Acres
"Wooded Lot"
"No Buildings"

LOT 36
LOT 3.01
LOT 32.03
LOT 32.02
LOT 33.01
LOT 33.02

DETENSION BASIN
Block Building
Approximate Tree Line
Chain Link Fence
Wetlands
Upland
Chord
Edge of Pavement
Slope Easement
Concrete Curb
Drainage Easement
Approximate Location of Drainage Easement

20' WIDE SANITARY SEWER EASEMENT
20' Wide Sanitary Sewer Easement
50' TRANSITION AREA
50' DRAINAGE EASEMENT
20' WIDE EASEMENT

MALL ACCESS ROAD (50' WIDE)
GROVERS MILL ROAD (66' WIDE)
CR 638

SAN MANHOLE RIM=81.62 INV IN=62.5 (NW) INV IN=62.0 (NW) INV OUT=61.9 (SSE)
SAN MANHOLE RIM=83.65 INV=77.2
SAN MANHOLE RIM=70.11 INV IN=59.5 INV OUT=59.4
SAN MANHOLE RIM=71.30 INV IN=56.7 INV OUT=55.5
SAN MANHOLE RIM=68.89 INV IN=58.1 INV OUT=58.1
SAN MANHOLE RIM=70.60 INV IN=60.4 INV OUT=60.3
SAN MANHOLE RIM=71.08 INV IN=59.9 INV OUT=59.8
SAN MANHOLE RIM=72.40 INV IN=65.2 INV OUT=63.8
P.S. MANHOLE RIM=71.43
P.S. MANHOLE RIM=66.50

STORM INLET GR=84.51
STORM INLET GR=81.57 INV IN=78.9 INV OUT=76.6
STORM INLET GR=81.48 INV IN=76.4 (15") INV IN=76.5 (18") INV OUT=76.3
STORM INLET GR=78.56 INV IN=72.9 INV OUT=72.7
STORM INLET GR=76.26 INV IN=70.8 INV OUT=70.7
STORM INLET
STORM INLET GR=73.67 INV IN=68.0 INV OUT=67.7
STORM INLET GR=68.7 INV OUT=63.5
STORM INLET GR=69.27 INV IN=63.3 (21") INV IN=63.3 (15") INV OUT=63.2
STORM INLET GR=71.84 INV IN=67.7 INV OUT=66.8
STORM INLET GR=70.07 INV IN=66.3 (21") INV IN=61.8 (36") INV OUT=61.8
STORM INLET GR=71.94 INV IN=61.5 INV OUT=61.5
STORM INLET GR=69.65 INV IN=61.8 (30") INV IN=64.2 (36") INV OUT=61.8
STORM INLET GR=68.91 INV IN=62.4 INV OUT=62.4
STORM INLET GR=68.88 INV IN=62.6 (30") INV IN=65.0 (15") INV OUT=62.5
STORM INLET GR=70.81 INV OUT=67.6
STORM INLET GR=68.91 INV IN=62.6 INV OUT=62.6

F.E.S. INV=64.4
F.E.S. INV=61.4

CONC. CHANNEL INV OUT=67.7

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

DM2: PROPOSED DRAINAGE AREA MAP

PROPOSED DRAINAGE AREA BASIN 1: 0.809 AC

PROPOSED DRAINAGE AREA BYPASS: 0.468 AC

PROPOSED DRAINAGE AREA BASIN 2: 0.925 AC

PROPOSED DRAINAGE AREA BASIN 3: 3.027 AC

PROPOSED DRAINAGE AREA BYPASS: 0.468 AC

Tc PATH (TYP)

STREET "A"

MALL ACCESS ROAD

(50' WIDE)

MILL ROAD

(66' WIDE)

GROVERS

CR 638

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

1 inch = 30 ft.

DM3: INLET DRAINAGE AREA MAP

TD#3
0.097 AC

DI#1
0.118 AC

DMH#2
0.103 AC
(PUMPED)

DI#8
0.077 AC

DI#9
0.402 AC

DI#10
0.180 AC

DI#11
0.088 AC

TD#2
0.071 AC

DI#7
0.540 AC

DI#2
0.187 AC

DI#3
0.207 AC

DI#4
0.083 AC

DI#5
0.146 AC

DI#6
0.117 AC

PHG

DrhA

SadB

MBYB

PorA

MbpB

MbpC2

9365

MALL ACCESS ROAD (50' WIDE)

MILL ROAD (66' WIDE)

GROVERS

CR 638

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.