SUPPLEMENTAL DRAINAGE REPORT

FOR

MONARCH LANDING 3RD ADDITION
Wichita, Kansas

JUNE 2011

Additional Information

Drainage Patterns

A portion of the Monarch Landing 3rd Addition, Basin D, drains to the East into 159th Street. The storm water flows from the pond in Monarch Landing 3rd Basin D and into the storm sewer system along 159th Street, Appendix A. This stormwater sewer system has an inlet in the vicinity of the outlet of the Monarch Landing 3rd Basin D pond. The inlet has an opening in the back to allow sheet flow to drain directly into the SWS system without draining into 159th Street. The storm sewer system continues along Keystone Parkway and flows into detention ponds in the Cornerstone Commercial Addition. This SWS system is not sized to convey a 100-year design flow from the pond or from areas off site. The limiting factor of this storm water sewer system is a 42" RCP at 0.10% slope that can convey 32.2 cfs, Appendix B. This flow rate is the maximum flow rate the storm sewer system can handle. Any runoff that cannot be conveyed by the storm water system will flow through Keystone Parkway to the ponds. The capacity within the right-of-way of Keystone Parkway is 230 cfs, Appendix C. The capacity of the storm water system is approximately 262.2 cfs through Keystone Parkway and the storm water sewer system.

Since the SWS system cannot handle 100-year design flows, any stormwater from Monarch Landing 3rd that cannot flow directly into the SWS system will flow into 159th Street. Any flows from Monarch Landing 3rd above 17.9 cfs, or a 5-year design storm will flow into 159th Street.

The peak 100-year storm water runoff from Monarch Landing 3rd Addition is 51.5 cfs, Appendix D. An offsite area to the north also flows to 159th Street with a peak 100-year flow rate of 52.0 cfs. This runoff flows to the storm sewer system along 159th Street. Any flow that can not be handled by the storm sewer system flows into 159th Street where it ponds before overtopping the crown in the roadway and flowing through Keystone Parkway. Runoff from Cornerstone Commercial Addition to the street and storm water sewer system has a 100-year peak flow rate of 104 cfs. These three contributing drainage areas combine to give a peak 100-year flow rate of 211 cfs flowing through Keystone Parkway storm water sewer system and street right-of-way. The 100-year peak flow rate of 211 cfs flowing through Keystone Parkway is less than the 262 cfs capacity of Keystone Parkway and storm water sewer system. Run off flowing through Keystone Parkway will be contained within public right-of-way during the 100-year design event.

Table 1.1 Pre- and Post- Project Comparison.

Basin	1-Yr	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Basin A Pre-Project Flow	23.2	34.9	54.6	68.0	88.4	118.3
Basin A Post-Project Flow	24.5	31.3	42.2	54.2	74.9	101.2
Basin D Pre-Project Flow	10.4	15.7	24.4	30.3	39.5	52.9
Basin D Post-Project Flow	2.5	8.7	21.1	28.7	38.8	51.5
Pre-Project to 159th	20.4	30.8	48.2	60.1	78.2	104.4
Post-Project to 159th	11.6	19.7	42.9	58.5	77.7	103.5
Pre-Project to Cornerstone Pond	57.2	77.7	111.0	133.1	166.7	214.9
Post-Project to Cornerstone Pond	49.3	65.1	90.3	115.4	158.6	211.4

Stormwater Quality Management

Stormwater Quality Volume has been calculated using a spreadsheet, Appendix E. The water quality volume was calculated to be 0.2 acre-feet for the portion of the site in Basin A and 0.6 for the portion of the site in Basin D. The stormwater quality management will be provided in an enhanced swale for Basin A and a detention pond in Basin D. Specifications are shown in Tables 1.2 and 1.3. Location and details of the storm water management facilities are shown in the Drainage and Utility Plan, Appendix F.

Table 1.2. Proposed Conditions Basin A2 Information.

Basin	1-Yr	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Peak Flow In (cfs)	7.6	10.3	14.6	17.5	21.7	27.7
Peak Flow Out (cfs)	0.6	2.3	9.1	13.2	17.8	21.5
Water Surface Elevation (ft)	1368.0	1368.3	1368.5	1368.6	1368.7	1369.0
Volume of Detention (ac-ft)	0.5	0.6	0.7	0.8	0.8	1.0
Normal Pool Elevation (ft)	1365.5					
Outlet Structure	4" Circular Outlet at 1365.5 and a 4'x4' riser structure at 1368.2 with a 24" RCP					

Table 1.3. Proposed Conditions Basin D Information.

Basin	1-Yr	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Peak Flow In (cfs)	13.2	18.2	26.4	31.9	40.0	51.6
Peak Flow Out (cfs)	1.2	8.5	20.6	28.0	37.2	49.4
Water Surface Elevation (ft)	1365.7	1366.1	1366.4	1366.6	1366.8	1367.0
Volume of Detention (ac-ft)	0.9	1.0	1.1	1.1	1.2	1.3
Normal Pool Elevation (ft)	1362.0					
Outlet Structure	5" Circular Outlet at 1362.0 and a 4'x4' riser structure at 1365.8 with a 30" RCP					

Stormwater Quantity Management

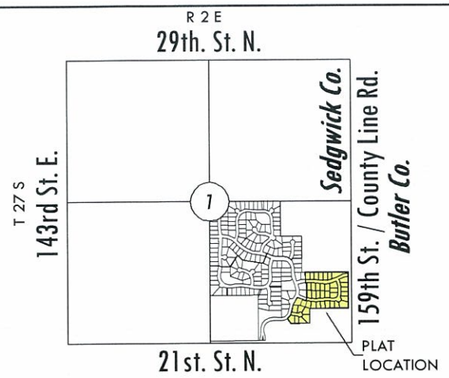
Stormwater Quantity and Channel Protection Volume has been calculated using a spreadsheet, Appendix G. The Channel Protection Volume was calculated to be 0.3 acre-feet for the portion of the site in Basin A and 0.8 acre-feet of detention for the portion of the site in Basin D. The stormwater quality management will be provided in the enhanced swale and the detention pond in each basin. Specifications are shown in Table 1.3.

Stormwater Sewer System

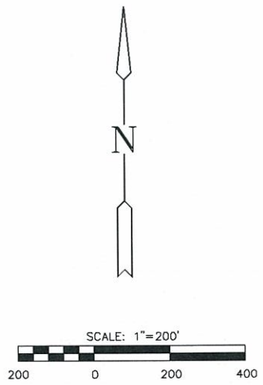
The SWS system has been designed for a 2-year design event. Sizes are shown on the drainage and utility plan, Appendix F. Pipe sizing calculations were done in Hydraflow Storm Sewers, Appendix H.

Appendix A

Offsite Conditions Drawing

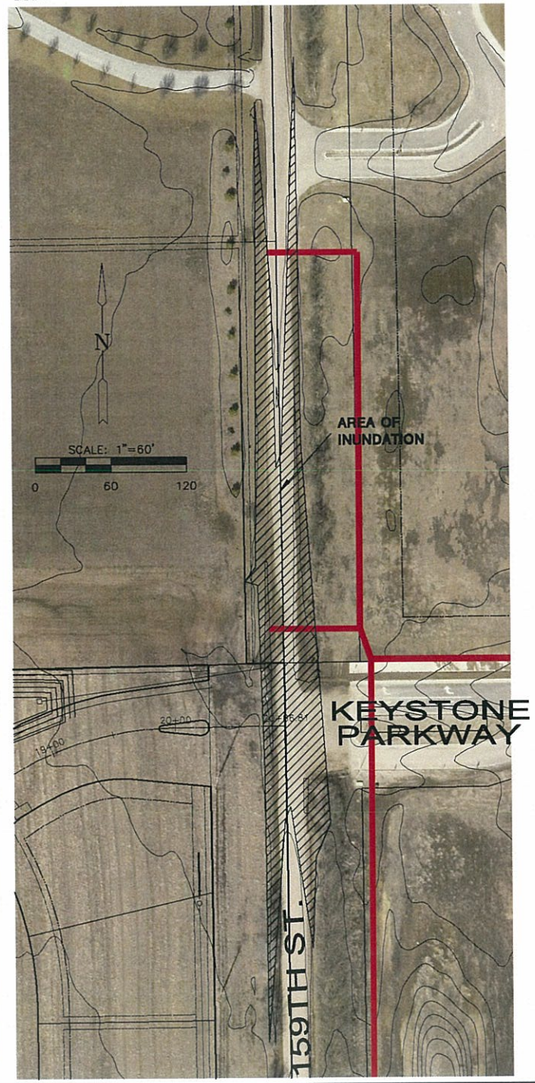


VICINITY MAP



LEGEND

- CONIFEROUS TREE
- DECIDUOUS TREE
- SIGN
- POWER POLE
- ELECTRIC BOX
- LIGHT POLE
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- SECTION CORNER
- BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE
- DRAINAGE SUB BASIN
- DRAINAGE BASIN
- FLOW ARROW
- A17 - AREA FOR SWS SIZING



MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

MONARCH LANDING

MONARCH LANDING 3RD ADDITION
WICHITA, KANSAS

OFFSITE CONDITIONS

DATE: MAY 2011
REVISED:

DESIGN BY: KLA
DRAWN BY: CMJ
CHECKED BY: GJA

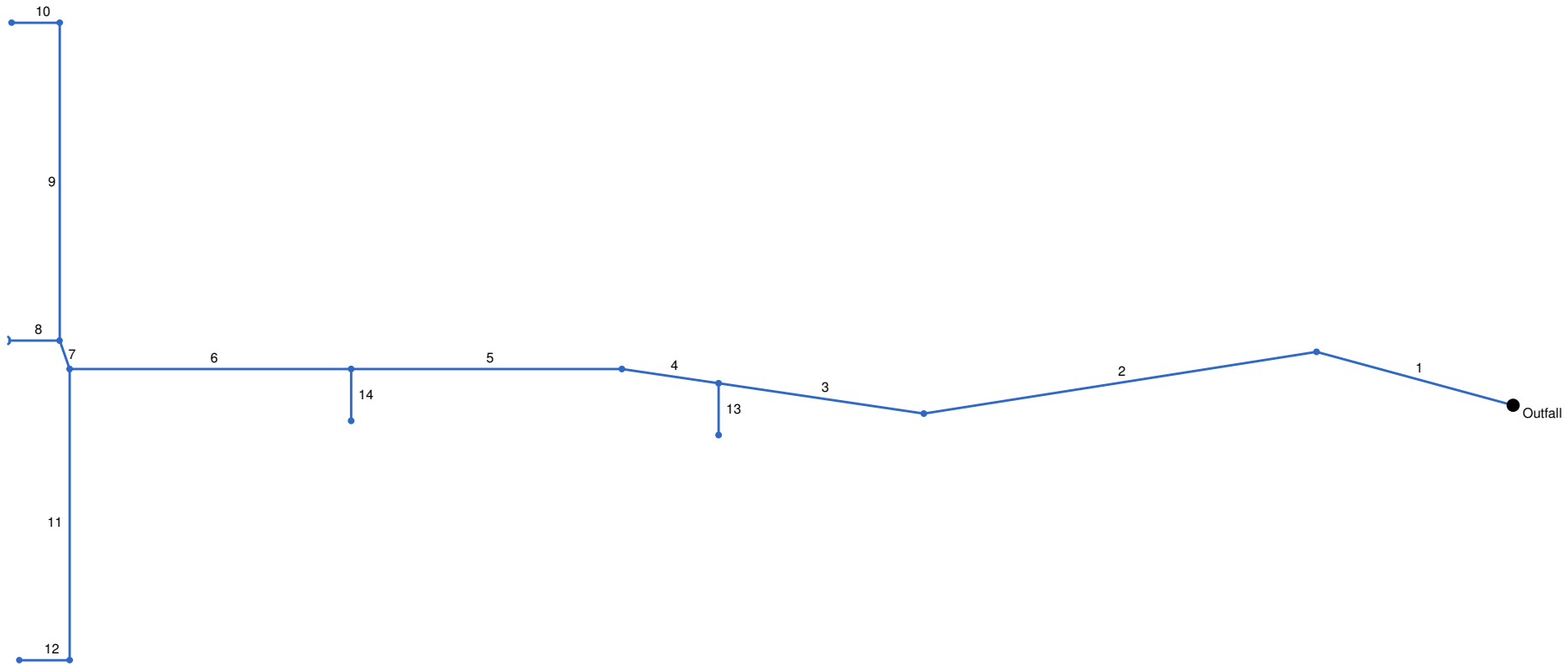
SHEET NUMBER: 1

J:\Civil\06201\dwg\3RD\DRNG\06201_offsite cond.dwg

Appendix B

Cornerstone Hydraflow Storm Sewers Calculations

Hydraflow Storm Sewers Extension for AutoCAD® Civil 3D® 2009 Plan



Project File: 159th SWS 5-10.stm	Number of lines: 14	Date: 07-01-2010

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line shape	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	191.900	-164.871	MH	0.00	0.00	0.00	0.0	1342.17	3.80	1349.47	42	Cir	0.013	0.46	1357.30	
2	1	374.300	-24.028	MH	0.00	0.00	0.00	0.0	1349.67	0.24	1350.57	42	Cir	0.013	0.35	1360.00	
3	2	195.200	17.274	Curb	0.00	0.70	0.80	4.9	1350.79	0.10	1350.99	42	Cir	0.013	1.50	1358.91	
4	3	91.900	0.000	MH	0.00	0.00	0.00	0.0	1351.19	0.24	1351.41	42	Cir	0.013	0.18	1359.80	
5	4	255.000	-8.376	Curb	0.00	2.30	0.80	7.2	1351.61	0.10	1351.87	42	Cir	0.013	1.50	1359.53	
6	5	265.200	0.000	MH	0.00	0.00	0.00	0.0	1352.42	1.67	1356.85	36	Cir	0.013	1.00	1363.80	
7	6	28.500	70.698	Curb	0.00	2.90	0.80	7.2	1357.38	0.21	1357.44	30	Cir	0.013	1.94	1363.19	
8	7	47.200	-70.698	Hdwl	0.00	0.15	0.73	13.9	1357.54	0.19	1357.63	30	Cir	0.013	1.00	1363.19	
9	7	299.500	19.306	Curb	0.00	1.10	0.80	14.4	1357.54	0.30	1358.44	18	Cir	0.013	1.50	1362.85	
10	9	45.200	-90.004	Curb	0.00	0.15	0.71	17.5	1358.71	0.38	1358.88	15	Cir	0.013	1.00	1362.85	
11	6	274.200	-89.994	Curb	0.00	4.50	0.80	19.3	1358.46	0.30	1359.28	18	Cir	0.013	1.50	1364.51	
12	11	47.300	89.994	Curb	0.00	0.50	0.80	14.8	1359.55	0.38	1359.73	15	Cir	0.013	1.00	1364.51	
13	3	48.800	-98.376	Curb	0.00	3.00	0.80	7.1	1353.43	1.23	1354.03	15	Cir	0.013	1.00	1358.91	
14	5	48.800	-90.000	Curb	0.00	7.30	0.80	10.9	1353.50	1.17	1354.07	24	Cir	0.013	1.00	1359.52	

Project File: 159th SWS 5-10.stm | Number of lines: 14 | Date: 07-01-2010

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
1		66.27	42	Cir	191.900	1342.17	1349.47	3.804	1347.50	1351.96	0.58	1351.96	End	Manhole
2		67.53	42	Cir	374.300	1349.67	1350.57	0.240	1353.17*	1354.86*	0.27	1355.13	1	Manhole
3		68.19	42	Cir	195.200	1350.79	1350.99	0.102	1355.13*	1356.02*	1.17	1357.19	2	Curb-Horiz
4		57.33	42	Cir	91.900	1351.19	1351.41	0.239	1357.19*	1357.49*	0.10	1357.59	3	Manhole
5		58.19	42	Cir	255.000	1351.61	1351.87	0.102	1357.59*	1358.45*	0.85	1359.30	4	Curb-Horiz
6		29.26	36	Cir	265.200	1352.42	1356.85	1.670	1359.30	1359.78	0.27	1360.05	5	Manhole
7		13.53	30	Cir	28.500	1357.38	1357.44	0.210	1360.05*	1360.08*	0.23	1360.31	6	Curb-Horiz
8		0.53	30	Cir	47.200	1357.54	1357.63	0.191	1360.31*	1360.31*	0.00	1360.31	7	OpenHeadwall
9		4.10	18	Cir	299.500	1357.54	1358.44	0.300	1360.31*	1360.76*	0.13	1360.89	7	Curb-Horiz
10		0.46	15	Cir	45.200	1358.71	1358.88	0.376	1360.89*	1360.89*	0.00	1360.89	9	Curb-Horiz
11		16.69	18	Cir	274.200	1358.46	1359.28	0.299	1360.05*	1366.98*	2.08	1369.06	6	Curb-Horiz
12		1.87	15	Cir	47.300	1359.55	1359.73	0.380	1369.06*	1369.10*	0.04	1369.13	11	Curb-Horiz
13		14.45	15	Cir	48.800	1353.43	1354.03	1.229	1357.19*	1359.64*	2.16	1361.80	3	Curb-Horiz
14		30.77	24	Cir	48.800	1353.50	1354.07	1.168	1359.30*	1360.20*	1.49	1361.69	5	Curb-Horiz

Project File: 159th SWS 5-10.stm

Number of lines: 14

Run Date: 07-01-2010

NOTES: Return period = 5 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	191.900	0.00	22.60	0.00	0.00	18.06	0.0	25.1	3.7	66.27	196.2	7.97	42	3.80	1342.17	1349.47	1347.50	1351.96	1346.00	1357.30	
2	1	374.300	0.00	22.60	0.00	0.00	18.06	0.0	24.2	3.7	67.53	49.33	7.02	42	0.24	1349.67	1350.57	1353.17	1354.86	1357.30	1360.00	
3	2	195.200	0.70	22.60	0.80	0.56	18.06	4.9	23.7	3.8	68.19	32.20	7.09	42	0.10	1350.79	1350.99	1355.13	1356.02	1360.00	1358.91	
4	3	91.900	0.00	18.90	0.00	0.00	15.10	0.0	23.5	3.8	57.33	49.24	5.96	42	0.24	1351.19	1351.41	1357.19	1357.49	1358.91	1359.80	
5	4	255.000	2.30	18.90	0.80	1.84	15.10	7.2	22.8	3.9	58.19	32.13	6.05	42	0.10	1351.61	1351.87	1357.59	1358.45	1359.80	1359.53	
6	5	265.200	0.00	9.30	0.00	0.00	7.42	0.0	21.7	3.9	29.26	86.20	4.15	36	1.67	1352.42	1356.85	1359.30	1359.78	1359.53	1363.80	
7	6	28.500	2.90	4.30	0.80	2.32	3.42	7.2	21.6	4.0	13.53	18.81	2.76	30	0.21	1357.38	1357.44	1360.05	1360.08	1363.80	1363.19	
8	7	47.200	0.15	0.15	0.73	0.11	0.11	13.9	13.9	4.8	0.53	17.91	0.11	30	0.19	1357.54	1357.63	1360.31	1360.31	1363.19	1363.19	
9	7	299.500	1.10	1.25	0.80	0.88	0.99	14.4	19.5	4.2	4.10	5.76	2.32	18	0.30	1357.54	1358.44	1360.31	1360.76	1363.19	1362.85	
10	9	45.200	0.15	0.15	0.71	0.11	0.11	17.5	17.5	4.4	0.46	3.96	0.38	15	0.38	1358.71	1358.88	1360.89	1360.89	1362.85	1362.85	
11	6	274.200	4.50	5.00	0.80	3.60	4.00	19.3	19.3	4.2	16.69	5.74	9.44	18	0.30	1358.46	1359.28	1360.05	1366.98	1363.80	1364.51	
12	11	47.300	0.50	0.50	0.80	0.40	0.40	14.8	14.8	4.7	1.87	3.98	1.53	15	0.38	1359.55	1359.73	1369.06	1369.10	1364.51	1364.51	
13	3	48.800	3.00	3.00	0.80	2.40	2.40	7.1	7.1	6.0	14.45	7.16	11.78	15	1.23	1353.43	1354.03	1357.19	1359.64	1358.91	1358.91	
14	5	48.800	7.30	7.30	0.80	5.84	5.84	10.9	10.9	5.3	30.77	24.44	9.80	24	1.17	1353.50	1354.07	1359.30	1360.20	1359.53	1359.52	

Project File: 159th SWS 5-10.stm

Number of lines: 14

Run Date: 07-01-2010

NOTES: Intensity = 64.67 / (Inlet time + 13.40) ^ 0.79; Return period = 5 Yrs. ; c = cir e = ellip b = box

Appendix C

Hydraflow Express

Channel Report

Hydraflow Express Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. Thursday, Jul 1 2010

Keystone Parkway

User-defined

Invert Elev (ft)	= 9.38
Slope (%)	= 1.10
N-Value	= Composite

Calculations

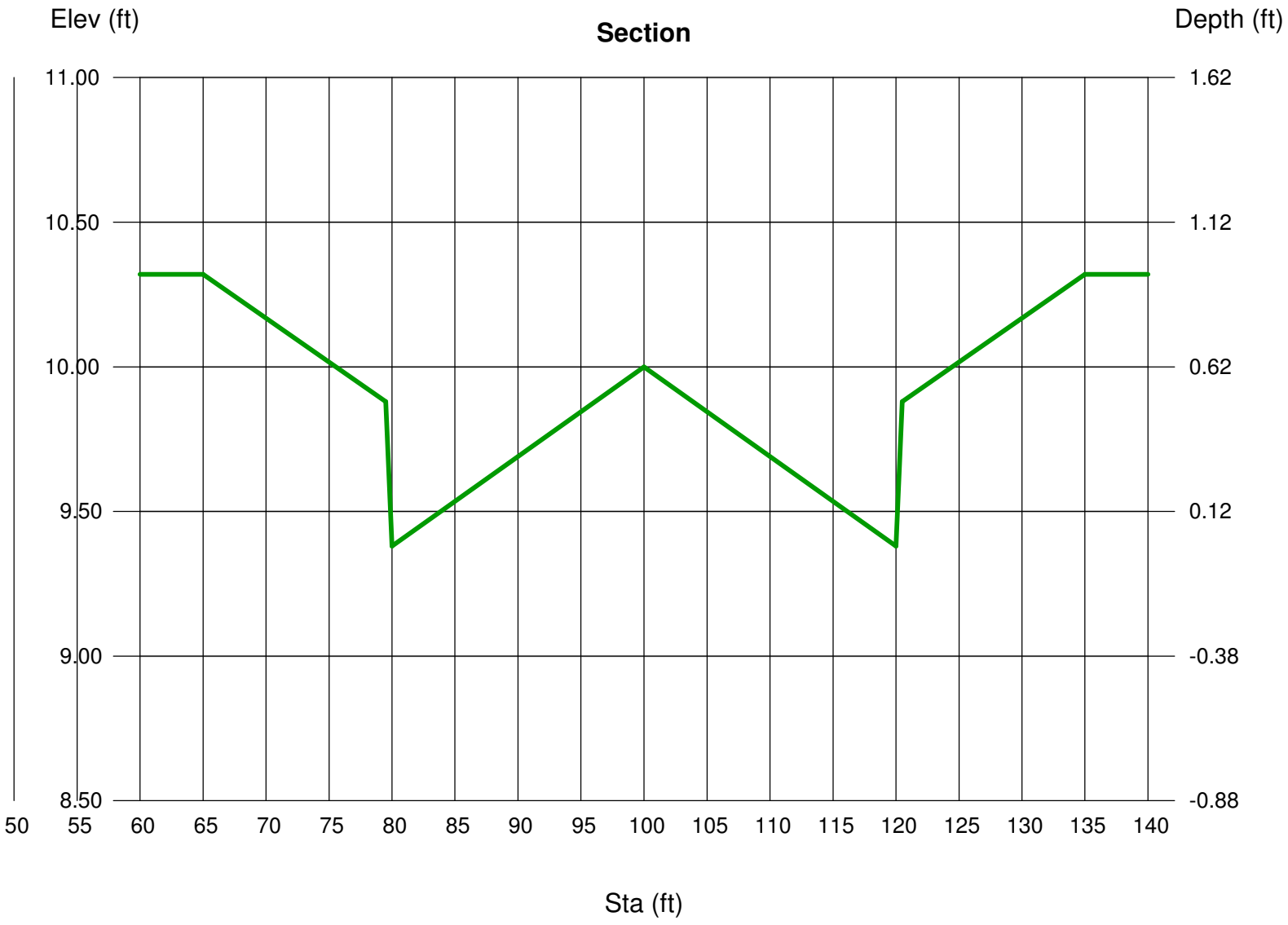
Compute by:	Q vs Depth
No. Increments	= 50

Highlighted

Depth (ft)	= 0.94
Q (cfs)	= 230.34
Area (sqft)	= 32.27
Velocity (ft/s)	= 7.14
Wetted Perim (ft)	= 70.45
Crit Depth, Yc (ft)	= 0.94
Top Width (ft)	= 70.00
EGL (ft)	= 1.73

(Sta, El, n)-(Sta, El, n)...

(65.00, 10.32)-(79.50, 9.88, 0.013)-(80.00, 9.38, 0.013)-(100.00, 10.00, 0.013)-(120.00, 9.38, 0.013)-(120.50, 9.88, 0.013)-(135.00, 10.32, 0.013)



Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.02	0.006	0.012	0.53	1.27	0.01	1.25	0.02
0.04	0.040	0.047	0.84	2.53	0.02	2.50	0.05
0.06	0.117	0.106	1.10	3.80	0.04	3.75	0.08
0.08	0.251	0.188	1.34	5.07	0.06	5.00	0.10
0.09	0.455	0.294	1.55	6.33	0.09	6.25	0.13
0.11	0.741	0.423	1.75	7.60	0.11	7.50	0.16
0.13	1.117	0.576	1.94	8.87	0.13	8.75	0.19
0.15	1.595	0.752	2.12	10.13	0.15	10.00	0.22
0.17	2.184	0.952	2.29	11.40	0.18	11.25	0.25
0.19	2.893	1.175	2.46	12.67	0.20	12.51	0.28
0.21	3.730	1.422	2.62	13.93	0.22	13.76	0.31
0.23	4.704	1.693	2.78	15.20	0.24	15.01	0.35
0.24	5.823	1.987	2.93	16.47	0.27	16.26	0.38
0.26	7.096	2.304	3.08	17.73	0.29	17.51	0.41
0.28	8.529	2.645	3.22	19.00	0.31	18.76	0.44
0.30	10.13	3.009	3.37	20.27	0.34	20.01	0.48
0.32	11.91	3.397	3.51	21.53	0.36	21.26	0.51
0.34	13.87	3.809	3.64	22.80	0.39	22.51	0.54
0.36	16.02	4.243	3.78	24.07	0.41	23.76	0.58
0.38	18.37	4.702	3.91	25.33	0.43	25.01	0.61
0.39	20.92	5.184	4.04	26.60	0.46	26.26	0.65
0.41	23.69	5.689	4.16	27.87	0.48	27.51	0.68
0.43	26.67	6.218	4.29	29.13	0.51	28.76	0.72

Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.45	29.87	6.771	4.41	30.40	0.53	30.01	0.75
0.47	33.31	7.347	4.53	31.67	0.56	31.26	0.79
0.49	36.98	7.946	4.65	32.93	0.59	32.51	0.83
0.51	40.54	8.571	4.73	34.68	0.61	34.25	0.86
0.53	43.88	9.238	4.75	37.13	0.63	36.70	0.88
0.55	47.60	9.951	4.78	39.59	0.65	39.15	0.90
0.56	51.69	10.71	4.83	42.04	0.67	41.61	0.93
0.58	56.16	11.52	4.88	44.49	0.69	44.06	0.95
0.60	61.03	12.37	4.94	46.95	0.71	46.51	0.98
0.62	66.32	13.26	5.00	49.37	0.73	48.94	1.01
0.64	73.05	14.20	5.15	50.61	0.75	50.17	1.05
0.66	80.12	15.15	5.29	51.85	0.78	51.41	1.09
0.68	87.54	16.13	5.43	53.09	0.80	52.65	1.13
0.70	95.31	17.13	5.56	54.33	0.83	53.89	1.18
0.71	103.4	18.16	5.70	55.57	0.86	55.13	1.22
0.73	111.9	19.20	5.83	56.81	0.88	56.37	1.26
0.75	120.8	20.27	5.96	58.05	0.91	57.61	1.30
0.77	130.0	21.37	6.08	59.29	0.93	58.85	1.35
0.79	139.6	22.49	6.21	60.53	0.94	60.09	1.39
0.81	149.6	23.63	6.33	61.77	0.94	61.33	1.43
0.83	159.9	24.79	6.45	63.01	0.94	62.57	1.47
0.85	170.7	25.98	6.57	64.25	0.94	63.80	1.52
0.86	181.8	27.19	6.69	65.49	0.94	65.04	1.56

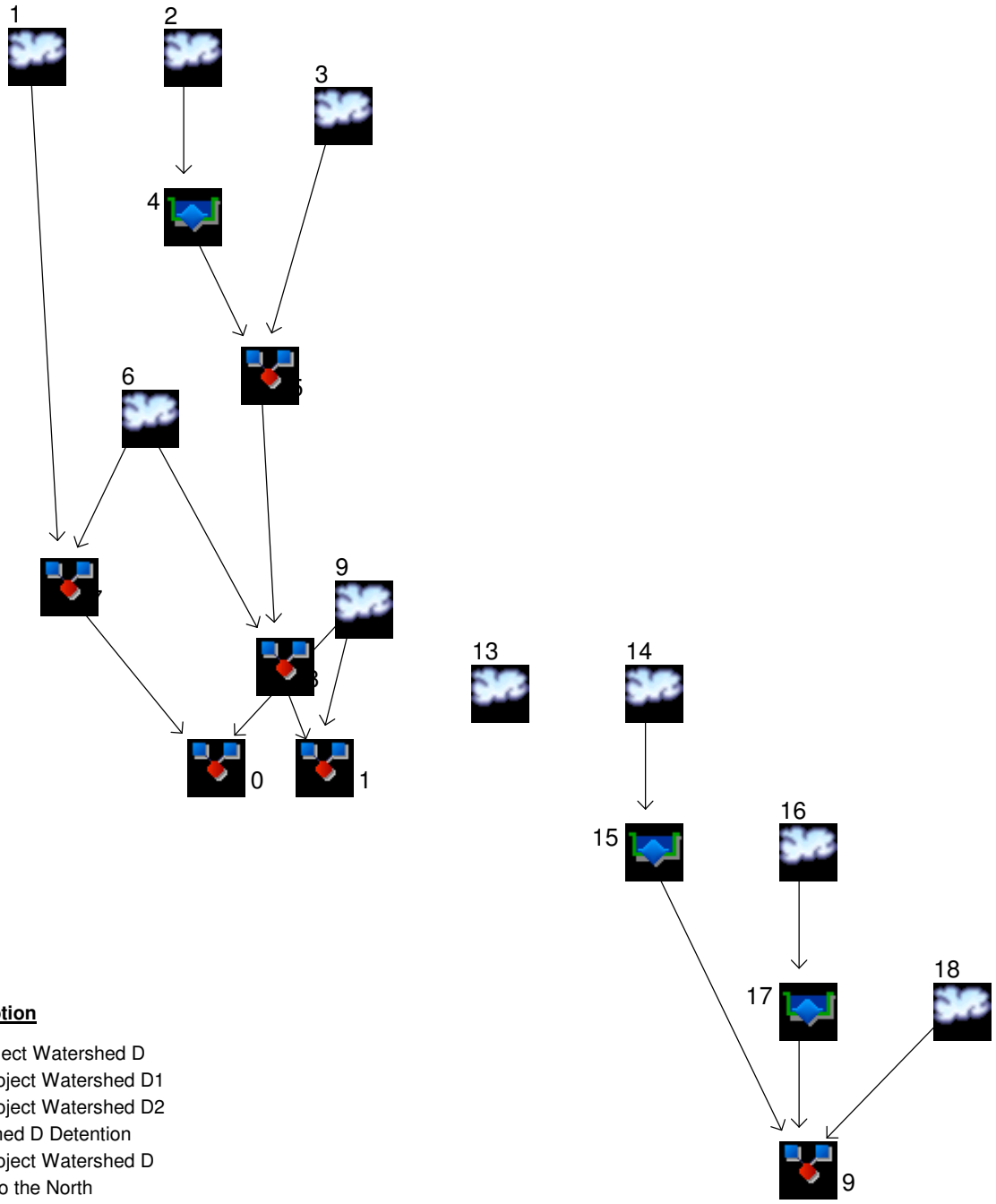
Depth	Q	Area	Veloc	Wp	Yc	TopWidth	Energy
(ft)	(cfs)	(sqft)	(ft/s)	(ft)	(ft)	(ft)	(ft)
0.88	193.3	28.43	6.80	66.73	0.94	66.28	1.60
0.90	205.2	29.68	6.91	67.97	0.94	67.52	1.65
0.92	217.6	30.97	7.03	69.21	0.94	68.76	1.69
0.94	230.3	32.27	7.14	70.45	0.94	70.00	1.73

Appendix D

Hydraflow Hydrographs

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066



Legend

Hyd.	Origin	Description
1	SCS Runoff	Pre-Project Watershed D
2	SCS Runoff	Post-Project Watershed D1
3	SCS Runoff	Post-Project Watershed D2
4	Reservoir	Watershed D Detention
5	Combine	Post-Project Watershed D
6	SCS Runoff	Offsite to the North
7	Combine	Pre-Project to 159th
8	Combine	Post-Project to 159th
9	SCS Runoff	Cornerstone Commercial
10	Combine	Pre-To Cornerstone Pond
11	Combine	Post-To Cornerstone Pond
13	SCS Runoff	Pre-Project Watershed A
14	SCS Runoff	Post-Project Watershed A1
15	Reservoir	Exist Wtrshed A1 Det
16	SCS Runoff	Post-Project Watershed A2
17	Reservoir	Watershed A2 Detention
18	SCS Runoff	Post-Project Watershed A3
19	Combine	Post-Project Watershed A

Hydrograph Return Period Recap

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	------	10.44	15.65	-------	24.38	30.30	39.50	-------	52.87	Pre-Project Watershed D
2	SCS Runoff	------	13.17	18.22	-------	26.43	31.85	39.99	-------	51.57	Post-Project Watershed D1
3	SCS Runoff	------	1.905	2.637	-------	3.810	4.582	5.740	-------	7.386	Post-Project Watershed D2
4	Reservoir	2	1.228	9.227	-------	21.35	29.13	38.76	-------	49.92	Watershed D Detention
5	Combine	3, 4	2.516	9.507	-------	21.89	29.88	40.41	-------	52.01	Post-Project Watershed D
6	SCS Runoff	------	10.22	15.34	-------	23.92	29.79	38.87	-------	52.02	Offsite to the North
7	Combine	1, 6	20.43	30.80	-------	48.24	60.09	78.20	-------	104.41	Pre-Project to 159th
8	Combine	5, 6,	11.59	20.53	-------	45.04	59.62	79.27	-------	104.03	Post-Project to 159th
9	SCS Runoff	------	40.12	51.36	-------	68.88	80.27	97.28	-------	121.44	Cornerstone Commercial
10	Combine	7, 9	57.18	77.67	-------	110.95	133.12	166.67	-------	214.90	Pre-To Cornerstone Pond
11	Combine	8, 9,	49.29	65.10	-------	90.32	118.36	162.14	-------	213.10	Post-To Cornerstone Pond
13	SCS Runoff	------	23.22	34.92	-------	54.62	67.99	88.43	-------	118.34	Pre-Project Watershed A
14	SCS Runoff	------	15.46	21.63	-------	31.61	38.29	48.35	-------	62.70	Post-Project Watershed A1
15	Reservoir	14	1.042	1.928	-------	9.736	16.49	27.16	-------	38.75	Exist Wtrshed A1 Det
16	SCS Runoff	------	7.592	10.31	-------	14.63	17.46	21.70	-------	27.72	Post-Project Watershed A2
17	Reservoir	16	0.610	2.304	-------	9.103	13.17	17.79	-------	21.54	Watershed A2 Detention
18	SCS Runoff	------	23.99	30.73	-------	41.25	48.09	58.29	-------	72.78	Post-Project Watershed A3
19	Combine	15, 17, 18	24.47	31.34	-------	42.15	54.16	74.91	-------	101.08	Post-Project Watershed A

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

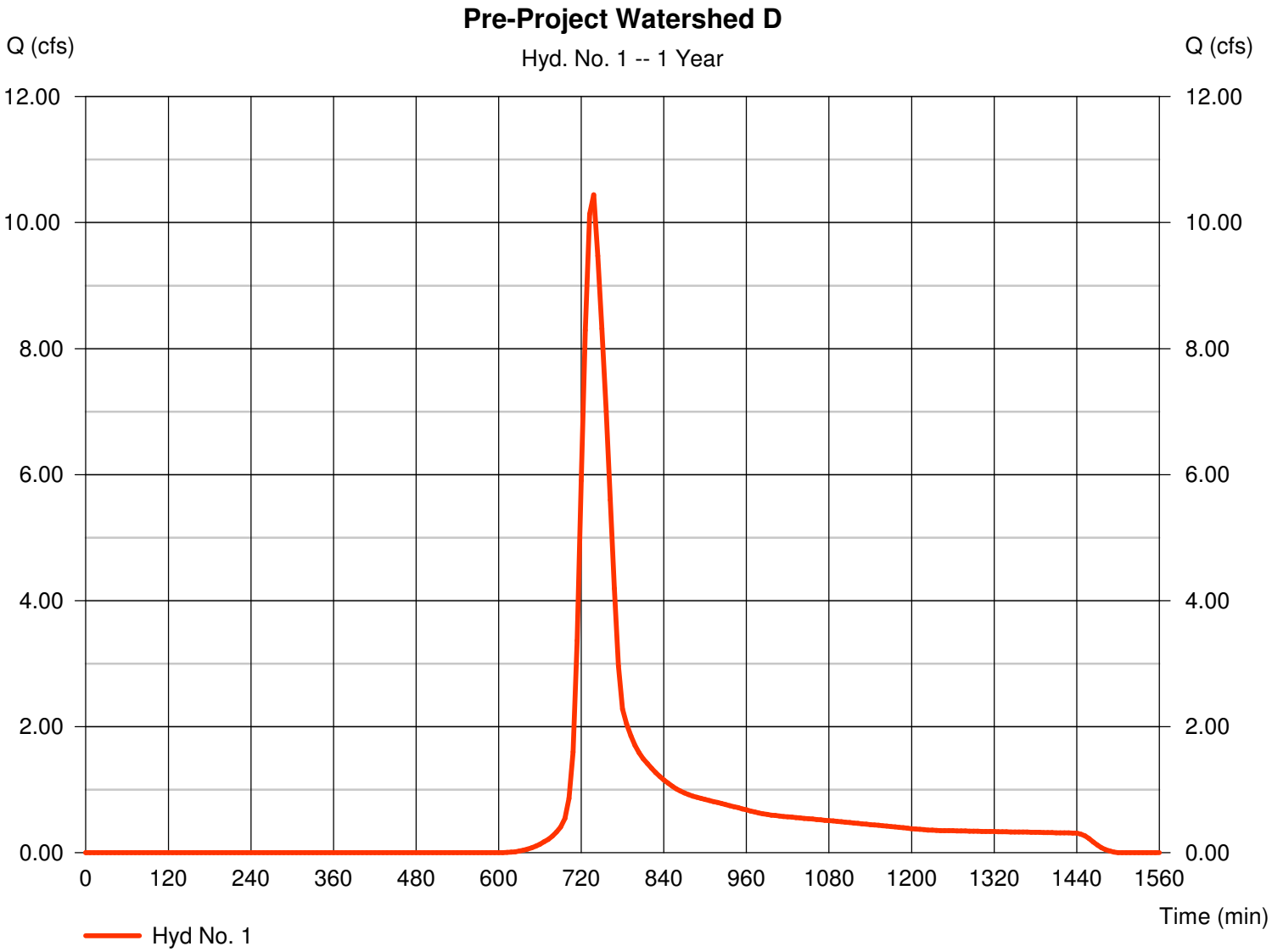
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	10.44	6	738	1.239	------	------	------	Pre-Project Watershed D
2	SCS Runoff	13.17	6	738	1.520	------	------	------	Post-Project Watershed D1
3	SCS Runoff	1.905	6	720	0.135	------	------	------	Post-Project Watershed D2
4	Reservoir	1.228	6	840	1.520	2	1365.71	0.850	Watershed D Detention
5	Combine	2.516	6	720	1.654	3, 4	------	------	Post-Project Watershed D
6	SCS Runoff	10.22	6	744	1.361	------	------	------	Offsite to the North
7	Combine	20.43	6	738	2.600	1, 6	------	------	Pre-Project to 159th
8	Combine	11.59	6	744	3.016	5, 6,	------	------	Post-Project to 159th
9	SCS Runoff	40.12	6	726	3.833	------	------	------	Cornerstone Commercial
10	Combine	57.18	6	732	6.432	7, 9	------	------	Pre-To Cornerstone Pond
11	Combine	49.29	6	726	6.848	8, 9,	------	------	Post-To Cornerstone Pond
13	SCS Runoff	23.22	6	750	3.591	------	------	------	Pre-Project Watershed A
14	SCS Runoff	15.46	6	750	2.313	------	------	------	Post-Project Watershed A1
15	Reservoir	1.042	6	990	2.152	14	1367.36	1.57	Exist Wtrshed A1 Det
16	SCS Runoff	7.592	6	732	0.876	------	------	------	Post-Project Watershed A2
17	Reservoir	0.610	6	858	0.875	16	1367.95	0.512	Watershed A2 Detention
18	SCS Runoff	23.99	6	732	2.829	------	------	------	Post-Project Watershed A3
19	Combine	24.47	6	732	5.856	15, 17, 18	------	------	Post-Project Watershed A

Hydrograph Report

Hyd. No. 1

Pre-Project Watershed D

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.44 cfs
Storm frequency	=	1 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	1.239 acft
Drainage area	=	13.080 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.20 min
Total precip.	=	2.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

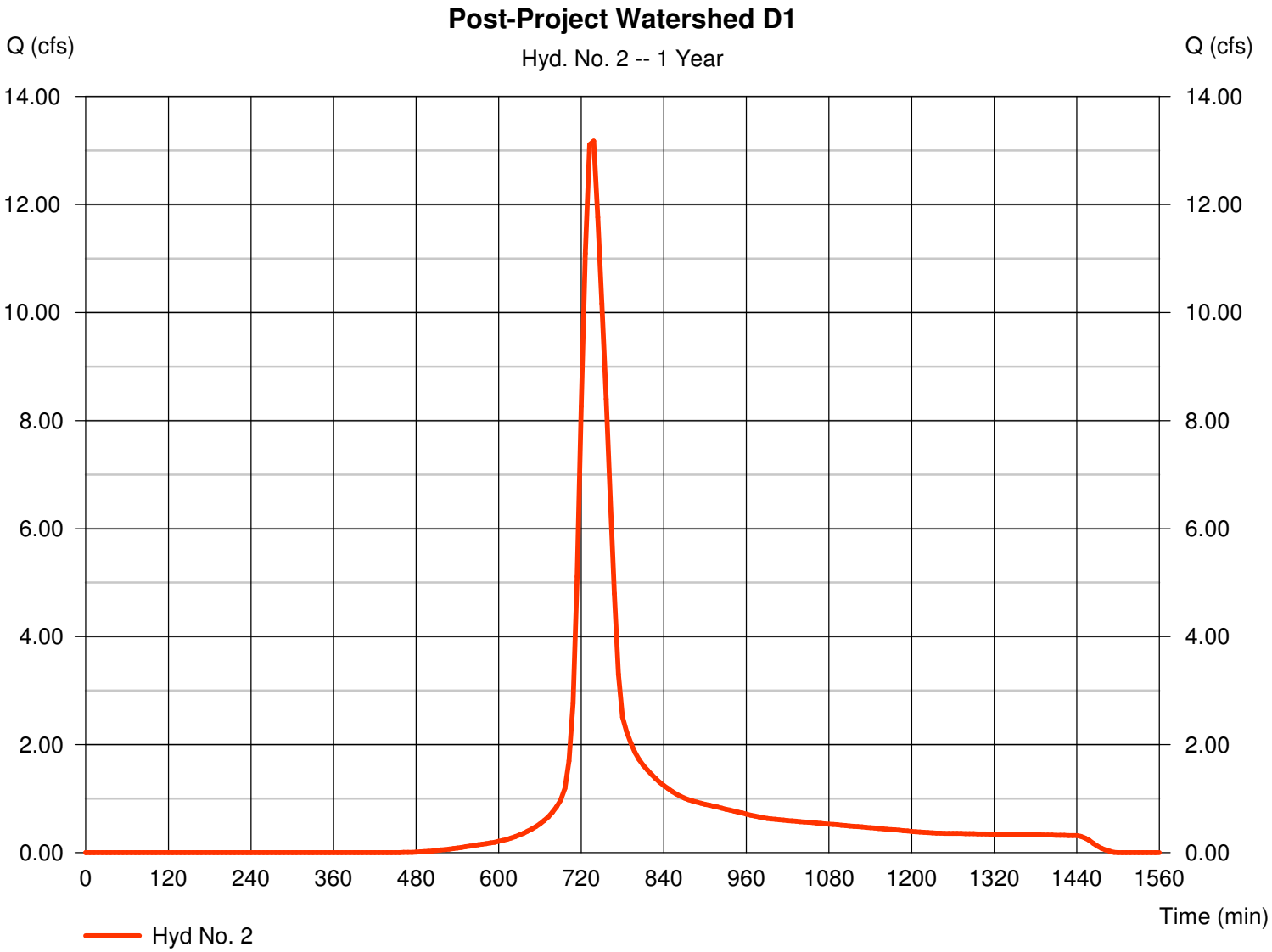


Hydrograph Report

Hyd. No. 2

Post-Project Watershed D1

Hydrograph type	=	SCS Runoff	Peak discharge	=	13.17 cfs
Storm frequency	=	1 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	1.520 acft
Drainage area	=	11.300 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	36.80 min
Total precip.	=	2.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

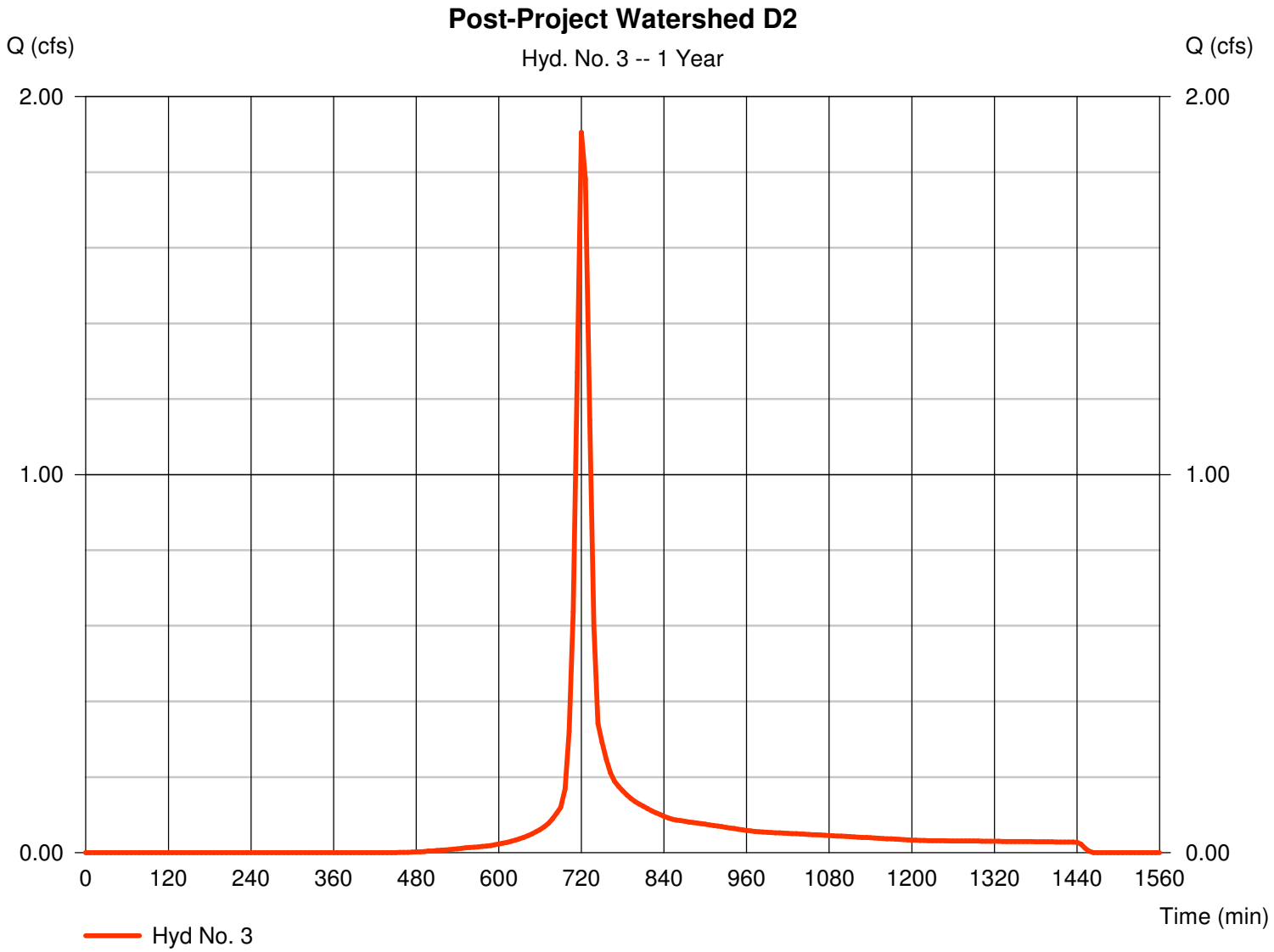


Hydrograph Report

Hyd. No. 3

Post-Project Watershed D2

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.905 cfs
Storm frequency	=	1 yrs	Time to peak	=	720 min
Time interval	=	6 min	Hyd. volume	=	0.135 acft
Drainage area	=	1.100 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	2.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



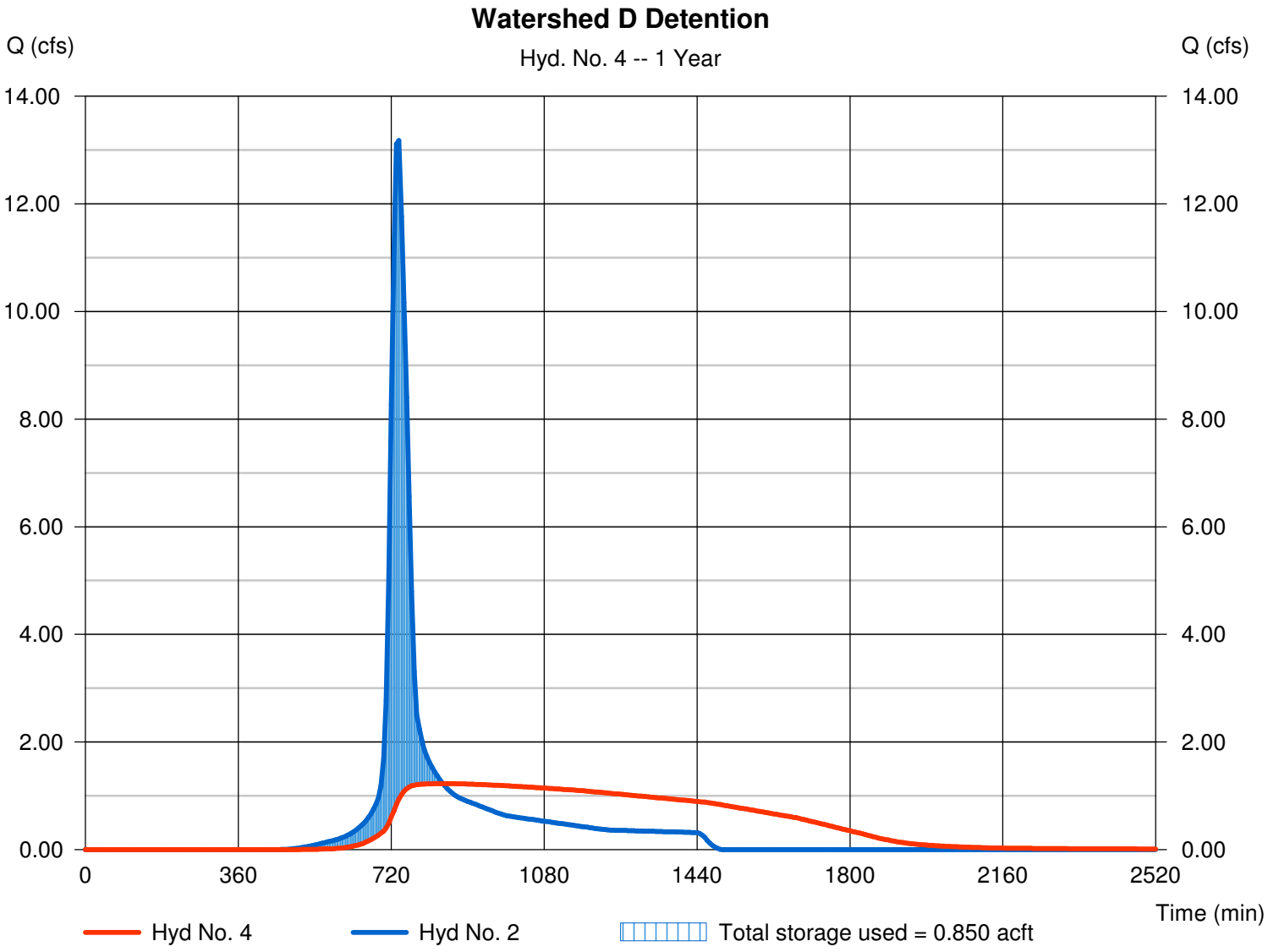
Hydrograph Report

Hyd. No. 4

Watershed D Detention

Hydrograph type	=	Reservoir	Peak discharge	=	1.228 cfs
Storm frequency	=	1 yrs	Time to peak	=	840 min
Time interval	=	6 min	Hyd. volume	=	1.520 acft
Inflow hyd. No.	=	2 - Post-Project Watershed D1	Max. Elevation	=	1365.71 ft
Reservoir name	=	Watershed D Detention	Max. Storage	=	0.850 acft

Storage Indication method used.



Pond No. 1 - Watershed D Detention

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1362.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1362.00	5,000	0.000	0.000
1.00	1363.00	8,475	0.153	0.153
2.00	1364.00	10,381	0.216	0.369
3.00	1365.00	12,420	0.261	0.630
4.00	1366.00	14,593	0.310	0.940
5.00	1367.00	16,000	0.351	1.291

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	5.00	0.00	0.00
Span (in)	= 30.00	5.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1359.00	1362.00	0.00	0.00
Length (ft)	= 180.00	1.00	0.00	0.00
Slope (%)	= 0.40	0.40	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 1365.80	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

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

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	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	0.000	1362.00	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.10	0.015	1362.10	24.52 oc	0.03 ic	---	---	0.00	---	---	---	---	---	0.028
0.20	0.031	1362.20	24.52 oc	0.10 ic	---	---	0.00	---	---	---	---	---	0.100
0.30	0.046	1362.30	24.52 oc	0.20 ic	---	---	0.00	---	---	---	---	---	0.198
0.40	0.061	1362.40	24.52 oc	0.29 ic	---	---	0.00	---	---	---	---	---	0.290
0.50	0.076	1362.50	24.52 oc	0.35 ic	---	---	0.00	---	---	---	---	---	0.355
0.60	0.092	1362.60	24.52 oc	0.41 ic	---	---	0.00	---	---	---	---	---	0.411
0.70	0.107	1362.70	24.52 oc	0.46 ic	---	---	0.00	---	---	---	---	---	0.460
0.80	0.122	1362.80	24.52 oc	0.50 ic	---	---	0.00	---	---	---	---	---	0.505
0.90	0.138	1362.90	24.52 oc	0.55 ic	---	---	0.00	---	---	---	---	---	0.546
1.00	0.153	1363.00	24.52 oc	0.58 ic	---	---	0.00	---	---	---	---	---	0.584
1.10	0.175	1363.10	24.52 oc	0.62 ic	---	---	0.00	---	---	---	---	---	0.620
1.20	0.196	1363.20	24.52 oc	0.65 ic	---	---	0.00	---	---	---	---	---	0.654
1.30	0.218	1363.30	24.52 oc	0.69 ic	---	---	0.00	---	---	---	---	---	0.686
1.40	0.239	1363.40	24.52 oc	0.72 ic	---	---	0.00	---	---	---	---	---	0.717
1.50	0.261	1363.50	24.52 oc	0.75 ic	---	---	0.00	---	---	---	---	---	0.746
1.60	0.283	1363.60	24.52 oc	0.77 ic	---	---	0.00	---	---	---	---	---	0.774
1.70	0.304	1363.70	24.52 oc	0.80 ic	---	---	0.00	---	---	---	---	---	0.802
1.80	0.326	1363.80	24.52 oc	0.83 ic	---	---	0.00	---	---	---	---	---	0.828
1.90	0.347	1363.90	24.52 oc	0.85 ic	---	---	0.00	---	---	---	---	---	0.854
2.00	0.369	1364.00	24.52 oc	0.88 ic	---	---	0.00	---	---	---	---	---	0.879
2.10	0.395	1364.10	24.52 oc	0.90 ic	---	---	0.00	---	---	---	---	---	0.903
2.20	0.421	1364.20	24.52 oc	0.93 ic	---	---	0.00	---	---	---	---	---	0.926
2.30	0.447	1364.30	24.52 oc	0.95 ic	---	---	0.00	---	---	---	---	---	0.949
2.40	0.473	1364.40	24.52 oc	0.97 ic	---	---	0.00	---	---	---	---	---	0.972
2.50	0.500	1364.50	24.52 oc	0.99 ic	---	---	0.00	---	---	---	---	---	0.994
2.60	0.526	1364.60	24.52 oc	1.02 ic	---	---	0.00	---	---	---	---	---	1.015
2.70	0.552	1364.70	24.52 oc	1.04 ic	---	---	0.00	---	---	---	---	---	1.036
2.80	0.578	1364.80	24.52 oc	1.06 ic	---	---	0.00	---	---	---	---	---	1.057
2.90	0.604	1364.90	24.52 oc	1.08 ic	---	---	0.00	---	---	---	---	---	1.077
3.00	0.630	1365.00	24.52 oc	1.10 ic	---	---	0.00	---	---	---	---	---	1.097
3.10	0.661	1365.10	24.52 oc	1.12 ic	---	---	0.00	---	---	---	---	---	1.116
3.20	0.692	1365.20	24.52 oc	1.14 ic	---	---	0.00	---	---	---	---	---	1.135
3.30	0.723	1365.30	24.52 oc	1.15 ic	---	---	0.00	---	---	---	---	---	1.154
3.40	0.754	1365.40	24.52 oc	1.17 ic	---	---	0.00	---	---	---	---	---	1.173
3.50	0.785	1365.50	24.52 oc	1.19 ic	---	---	0.00	---	---	---	---	---	1.191
3.60	0.816	1365.60	24.52 oc	1.21 ic	---	---	0.00	---	---	---	---	---	1.209
3.70	0.847	1365.70	24.52 oc	1.23 ic	---	---	0.00	---	---	---	---	---	1.227

Continues on next page...

Watershed D Detention

Stage / Storage / Discharge Table

Stage ft	Storage acft	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
3.80	0.878	1365.80	24.52 oc	1.24 ic	---	---	0.00	---	---	---	---	---	1.244
3.90	0.909	1365.90	24.52 oc	1.26 ic	---	---	1.68	---	---	---	---	---	2.946
4.00	0.940	1366.00	24.52 oc	1.28 ic	---	---	4.76	---	---	---	---	---	6.042
4.10	0.975	1366.10	24.52 oc	1.30 ic	---	---	8.75	---	---	---	---	---	10.05
4.20	1.010	1366.20	24.52 oc	1.31 ic	---	---	13.47	---	---	---	---	---	14.79
4.30	1.045	1366.30	24.52 oc	1.33 ic	---	---	18.84	---	---	---	---	---	20.17
4.40	1.080	1366.40	26.11 oc	1.34 ic	---	---	24.76	---	---	---	---	---	26.10
4.50	1.116	1366.50	32.44 oc	1.24 ic	---	---	31.20	---	---	---	---	---	32.44
4.60	1.151	1366.60	39.20 oc	1.08 ic	---	---	38.12	---	---	---	---	---	39.20
4.70	1.186	1366.70	46.31 oc	0.82 ic	---	---	45.48	---	---	---	---	---	46.31
4.80	1.221	1366.80	51.01 oc	0.56 ic	---	---	50.44 s	---	---	---	---	---	51.00
4.90	1.256	1366.90	52.40 oc	0.49 ic	---	---	51.91 s	---	---	---	---	---	52.39
5.00	1.291	1367.00	53.42 oc	0.43 ic	---	---	52.99 s	---	---	---	---	---	53.42

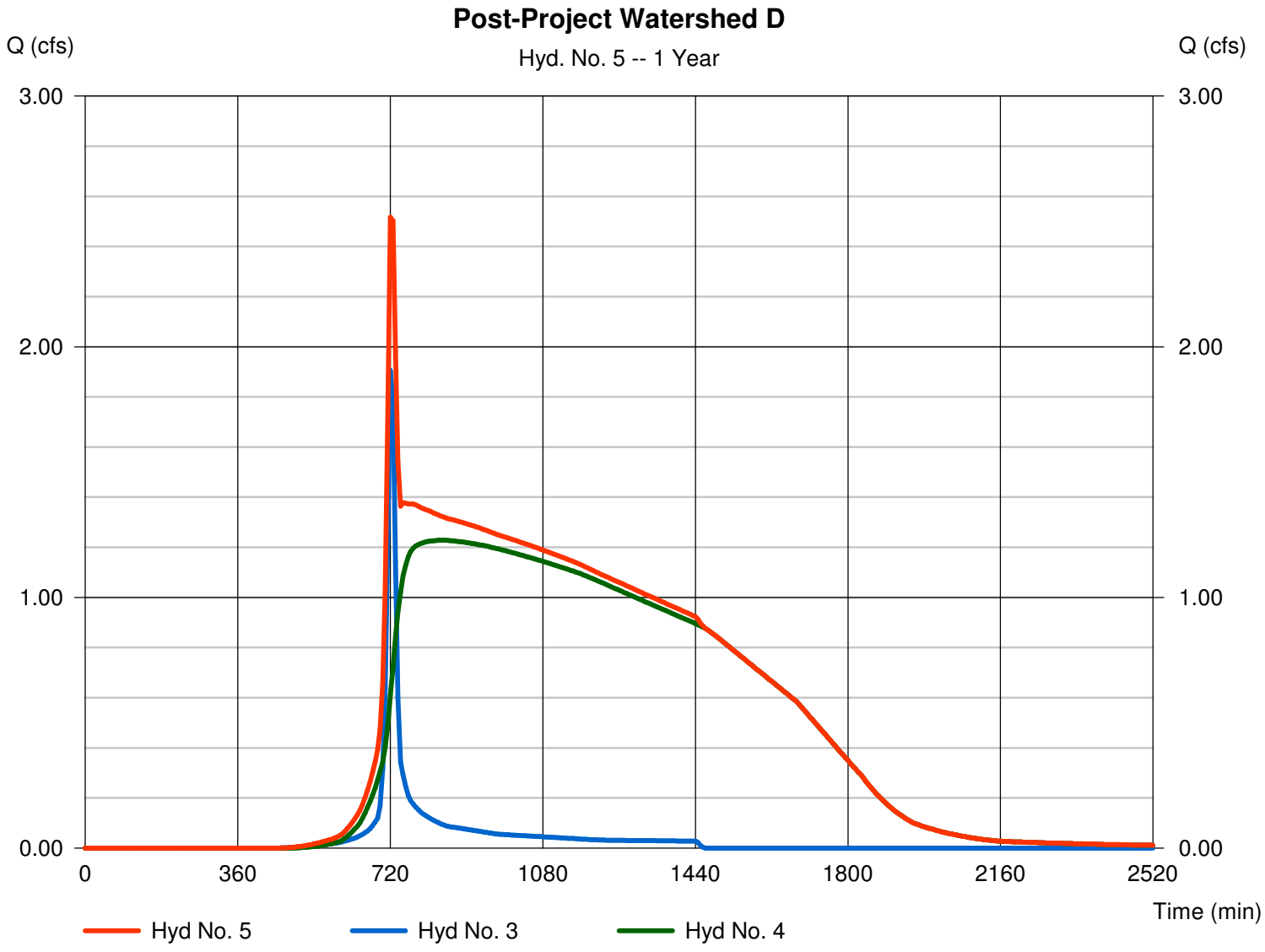
...End

Hydrograph Report

Hyd. No. 5

Post-Project Watershed D

Hydrograph type	= Combine	Peak discharge	= 2.516 cfs
Storm frequency	= 1 yrs	Time to peak	= 720 min
Time interval	= 6 min	Hyd. volume	= 1.654 acft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 1.100 ac

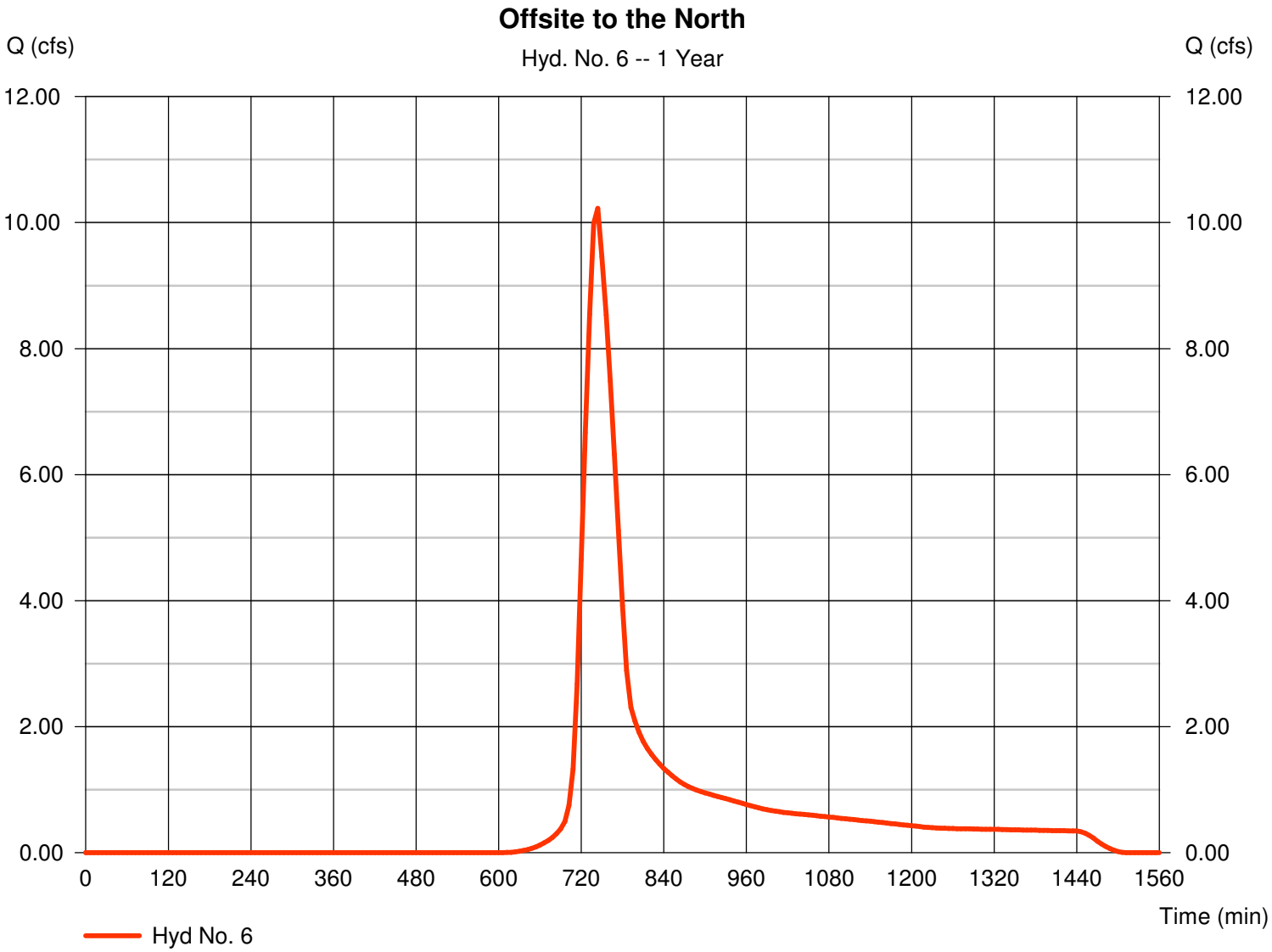


Hydrograph Report

Hyd. No. 6

Offsite to the North

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.22 cfs
Storm frequency	=	1 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	1.361 acft
Drainage area	=	15.200 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.30 min
Total precip.	=	2.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

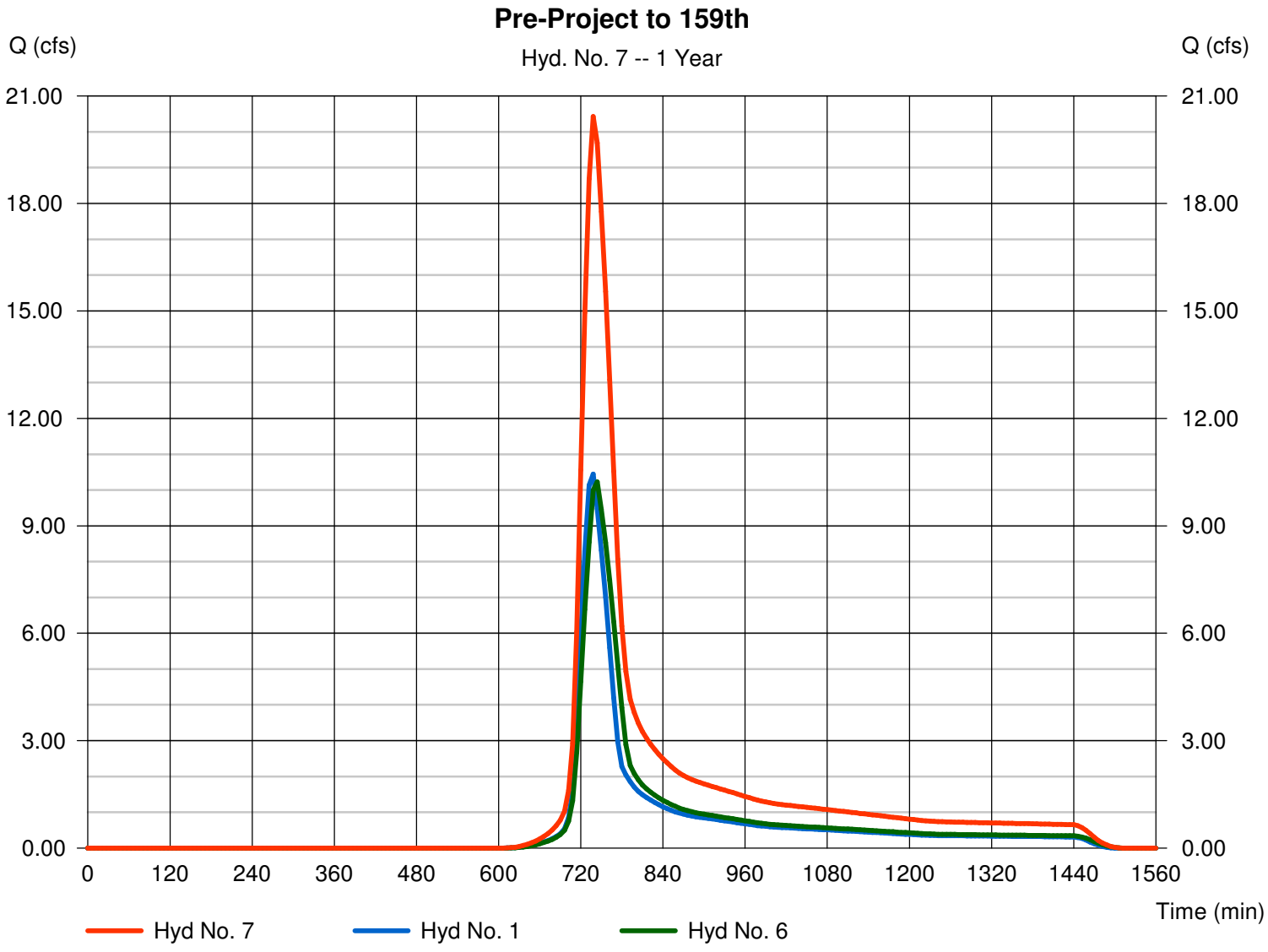


Hydrograph Report

Hyd. No. 7

Pre-Project to 159th

Hydrograph type	= Combine	Peak discharge	= 20.43 cfs
Storm frequency	= 1 yrs	Time to peak	= 738 min
Time interval	= 6 min	Hyd. volume	= 2.600 acft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 28.280 ac

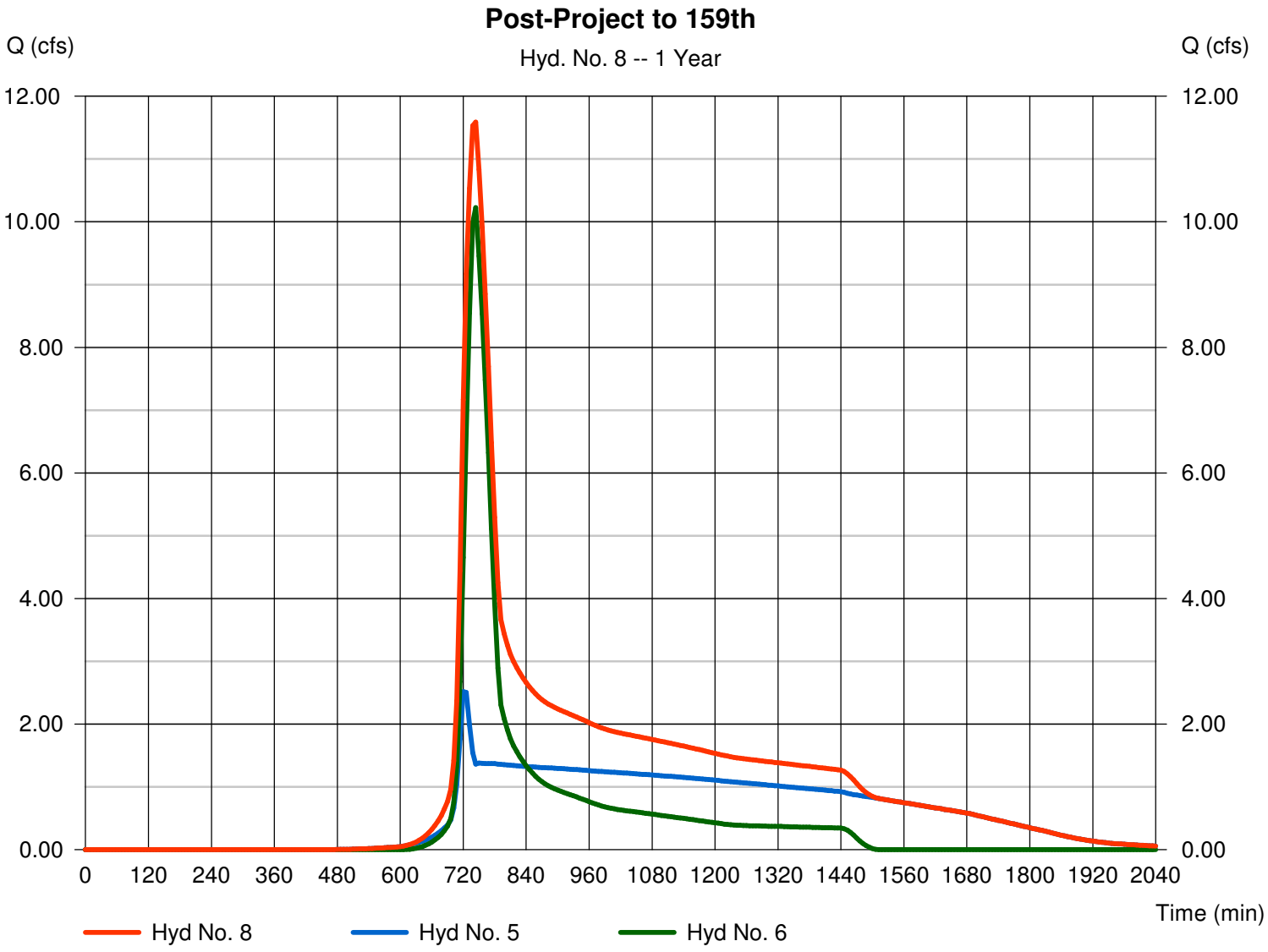


Hydrograph Report

Hyd. No. 8

Post-Project to 159th

Hydrograph type	= Combine	Peak discharge	= 11.59 cfs
Storm frequency	= 1 yrs	Time to peak	= 744 min
Time interval	= 6 min	Hyd. volume	= 3.016 acft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 15.200 ac

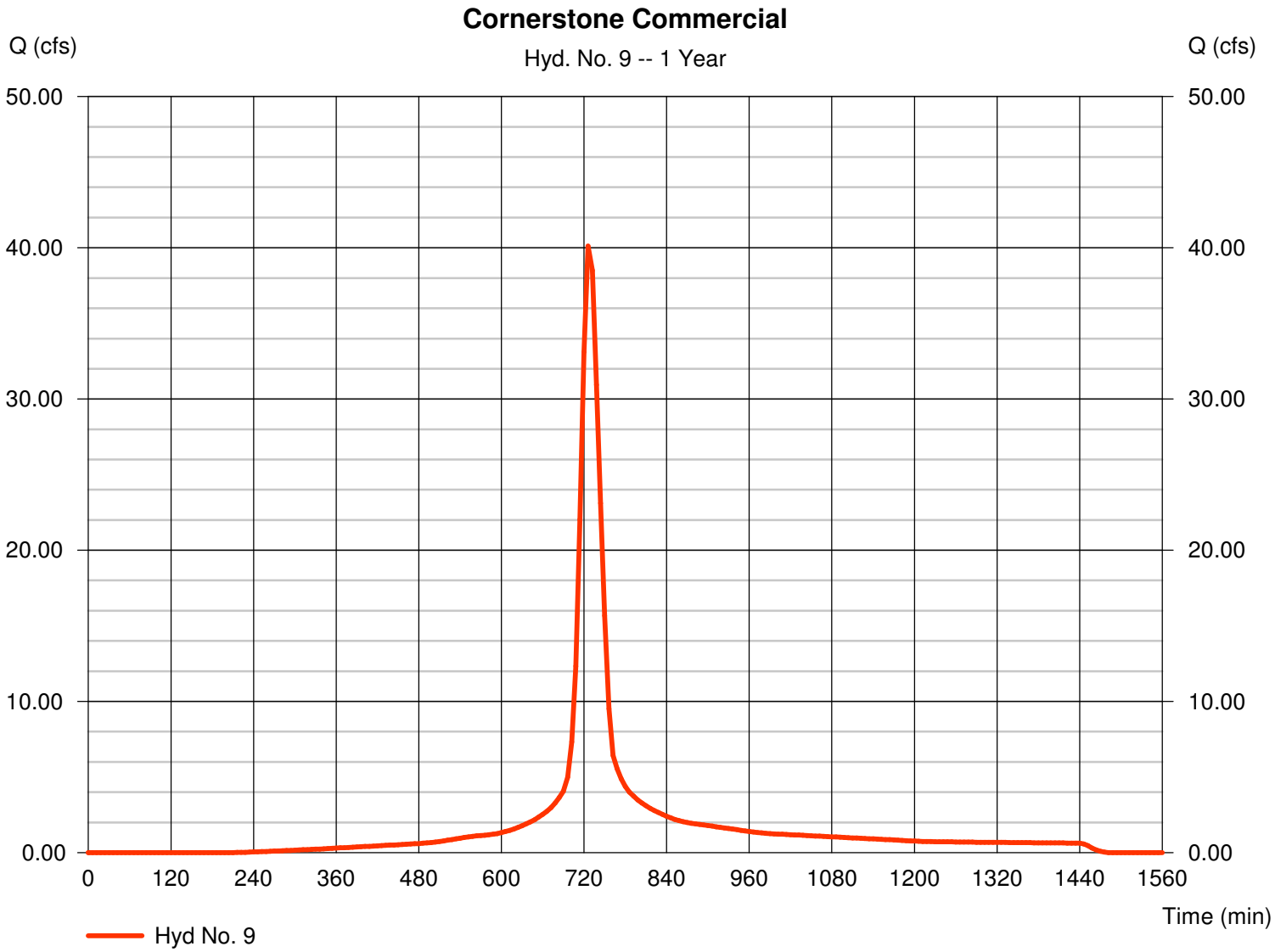


Hydrograph Report

Hyd. No. 9

Cornerstone Commercial

Hydrograph type	=	SCS Runoff	Peak discharge	=	40.12 cfs
Storm frequency	=	1 yrs	Time to peak	=	726 min
Time interval	=	6 min	Hyd. volume	=	3.833 acft
Drainage area	=	20.400 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	21.90 min
Total precip.	=	2.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

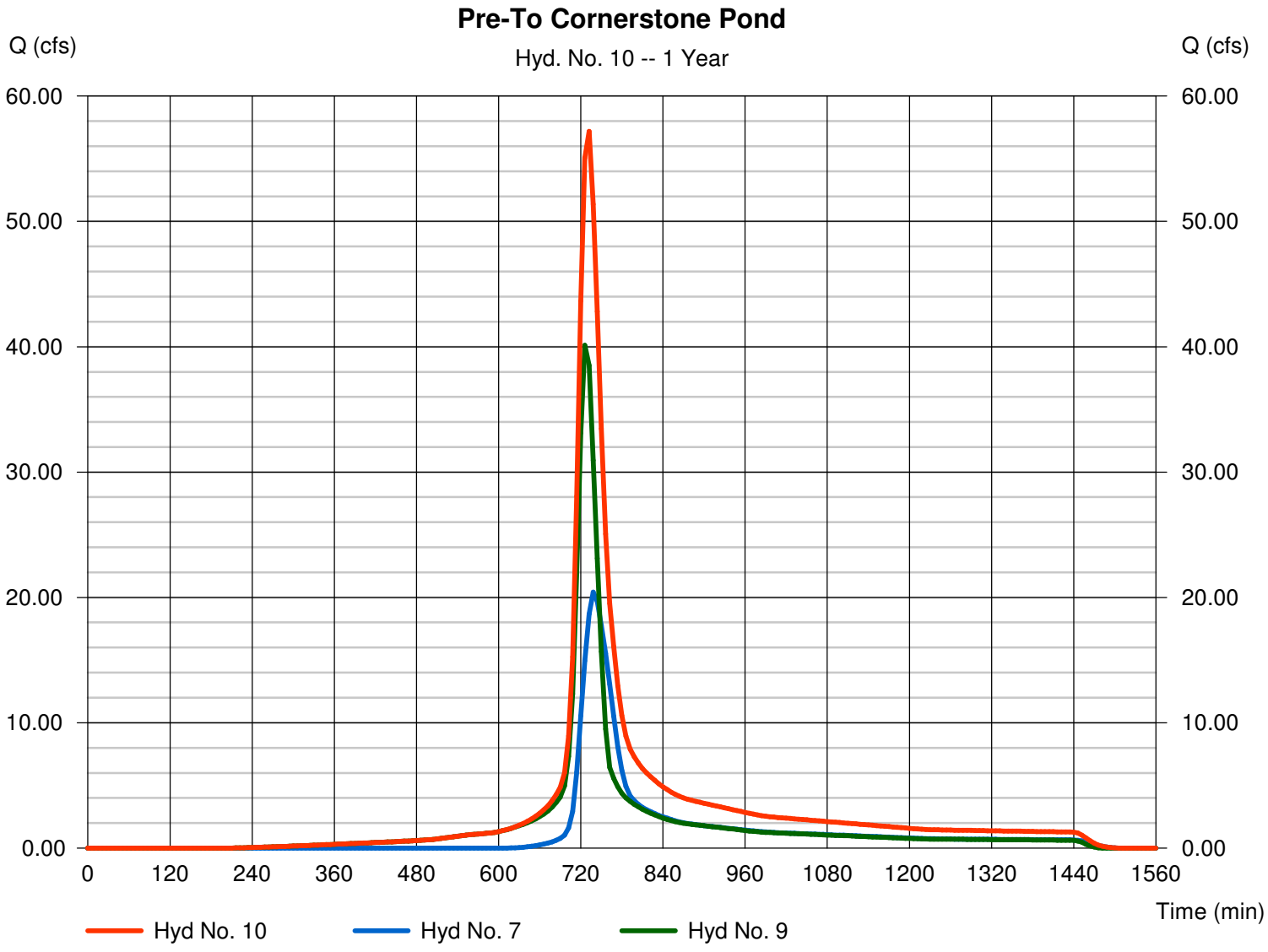


Hydrograph Report

Hyd. No. 10

Pre-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 57.18 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 6.432 acft
Inflow hyds.	= 7, 9	Contrib. drain. area	= 20.400 ac

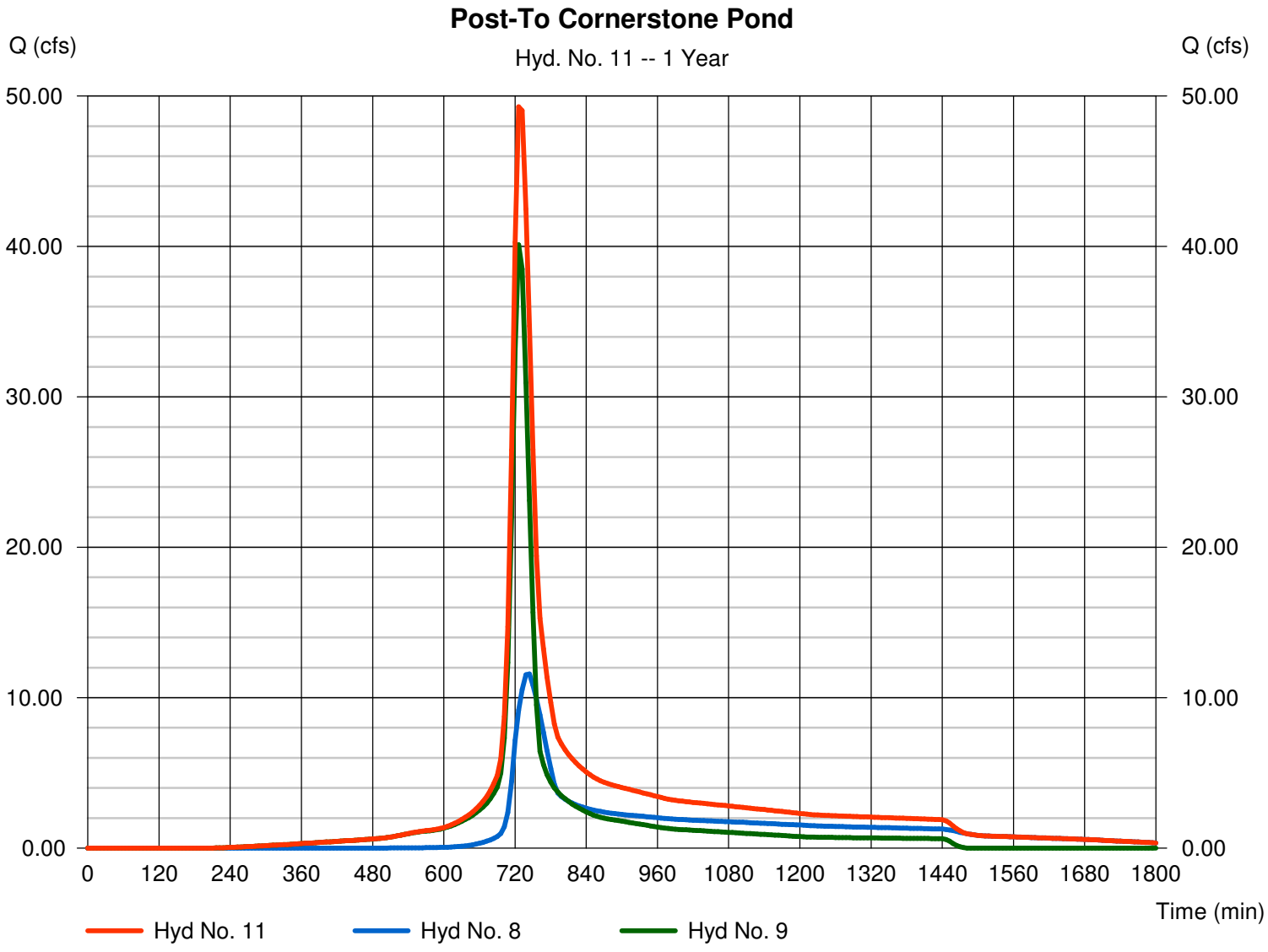


Hydrograph Report

Hyd. No. 11

Post-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 49.29 cfs
Storm frequency	= 1 yrs	Time to peak	= 726 min
Time interval	= 6 min	Hyd. volume	= 6.848 acft
Inflow hyds.	= 8, 9	Contrib. drain. area	= 20.400 ac

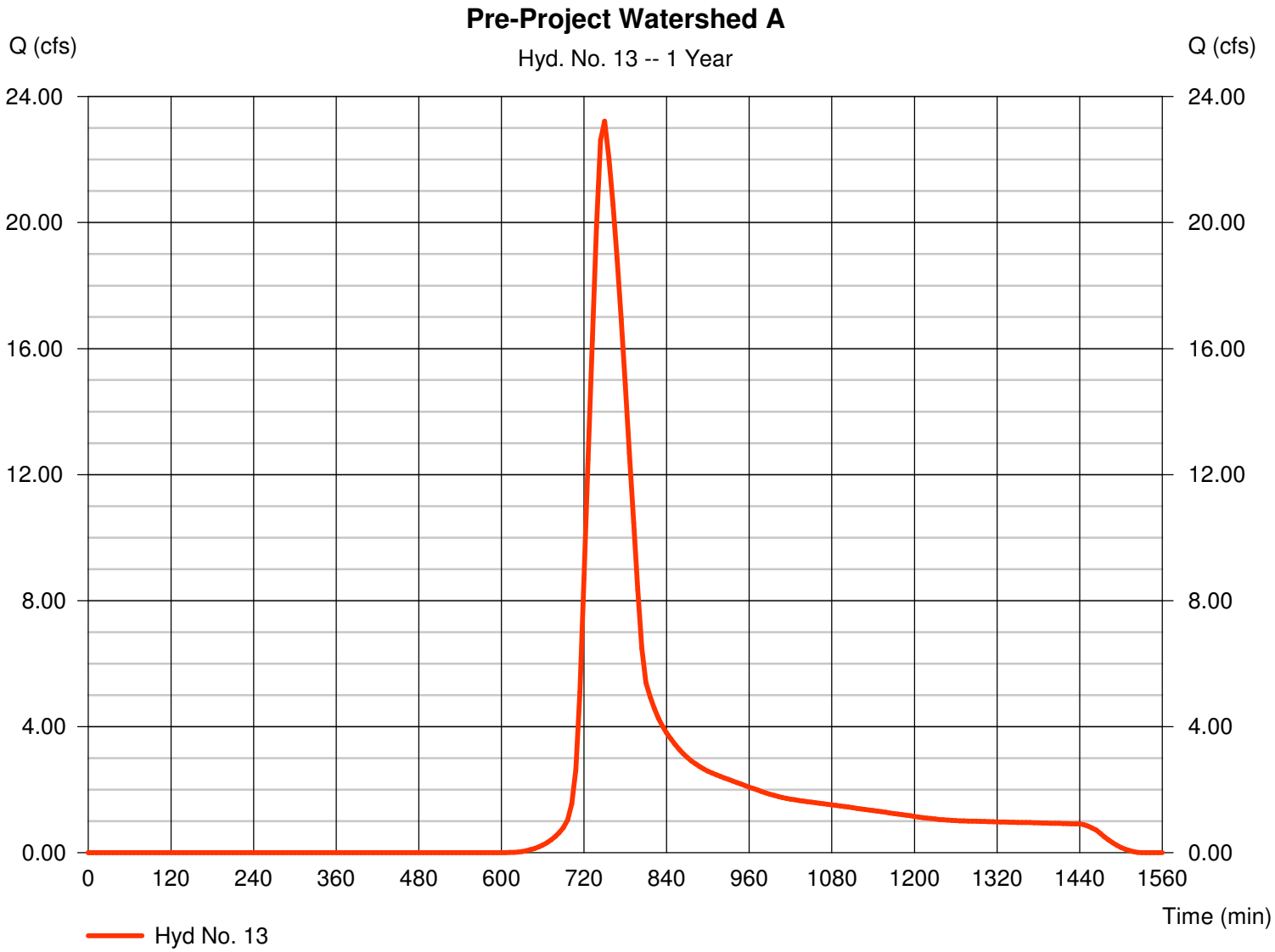


Hydrograph Report

Hyd. No. 13

Pre-Project Watershed A

Hydrograph type	=	SCS Runoff	Peak discharge	=	23.22 cfs
Storm frequency	=	1 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	3.591 acft
Drainage area	=	39.100 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	54.60 min
Total precip.	=	2.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

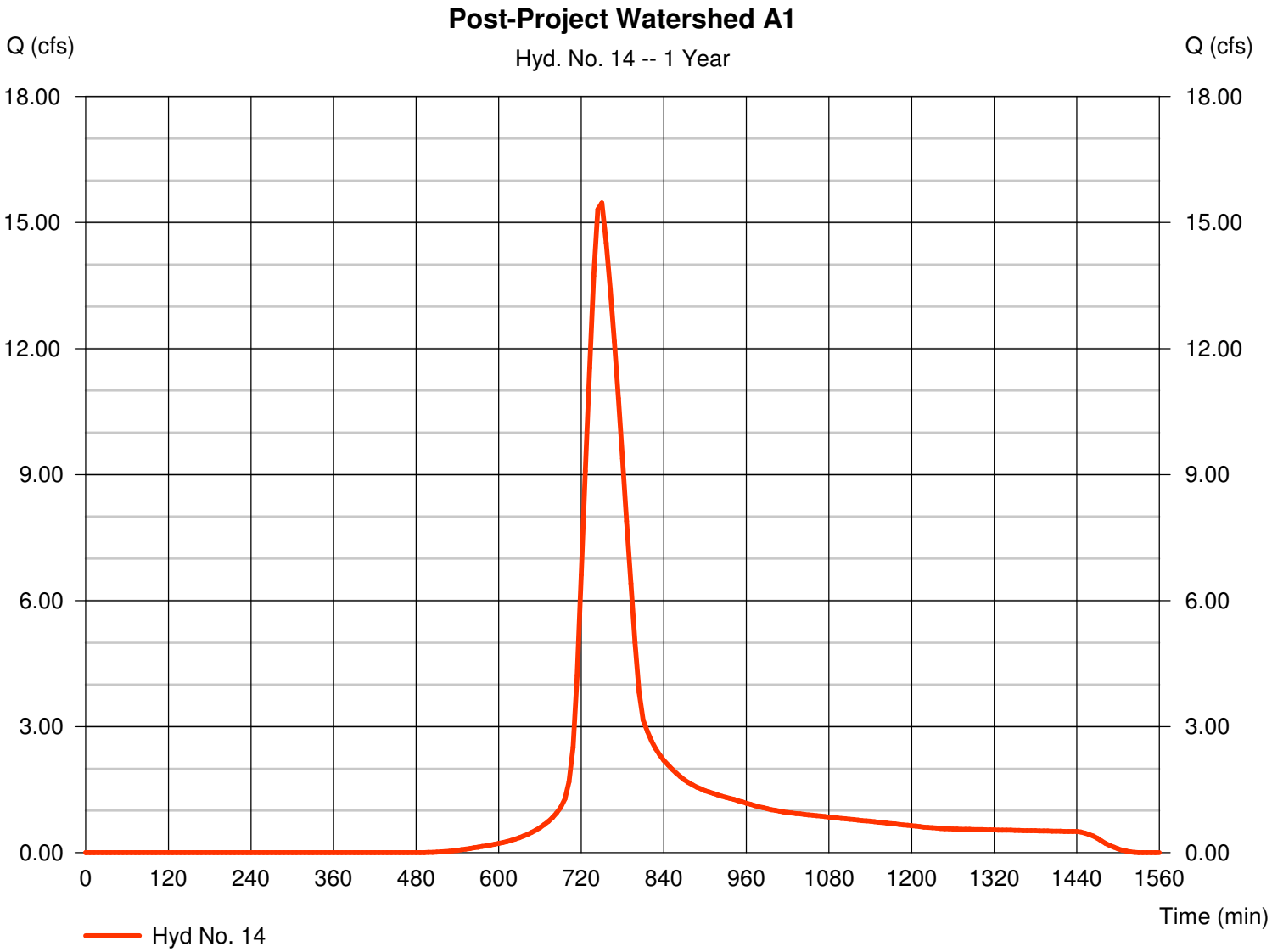


Hydrograph Report

Hyd. No. 14

Post-Project Watershed A1

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.46 cfs
Storm frequency	=	1 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	2.313 acft
Drainage area	=	18.600 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	55.80 min
Total precip.	=	2.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



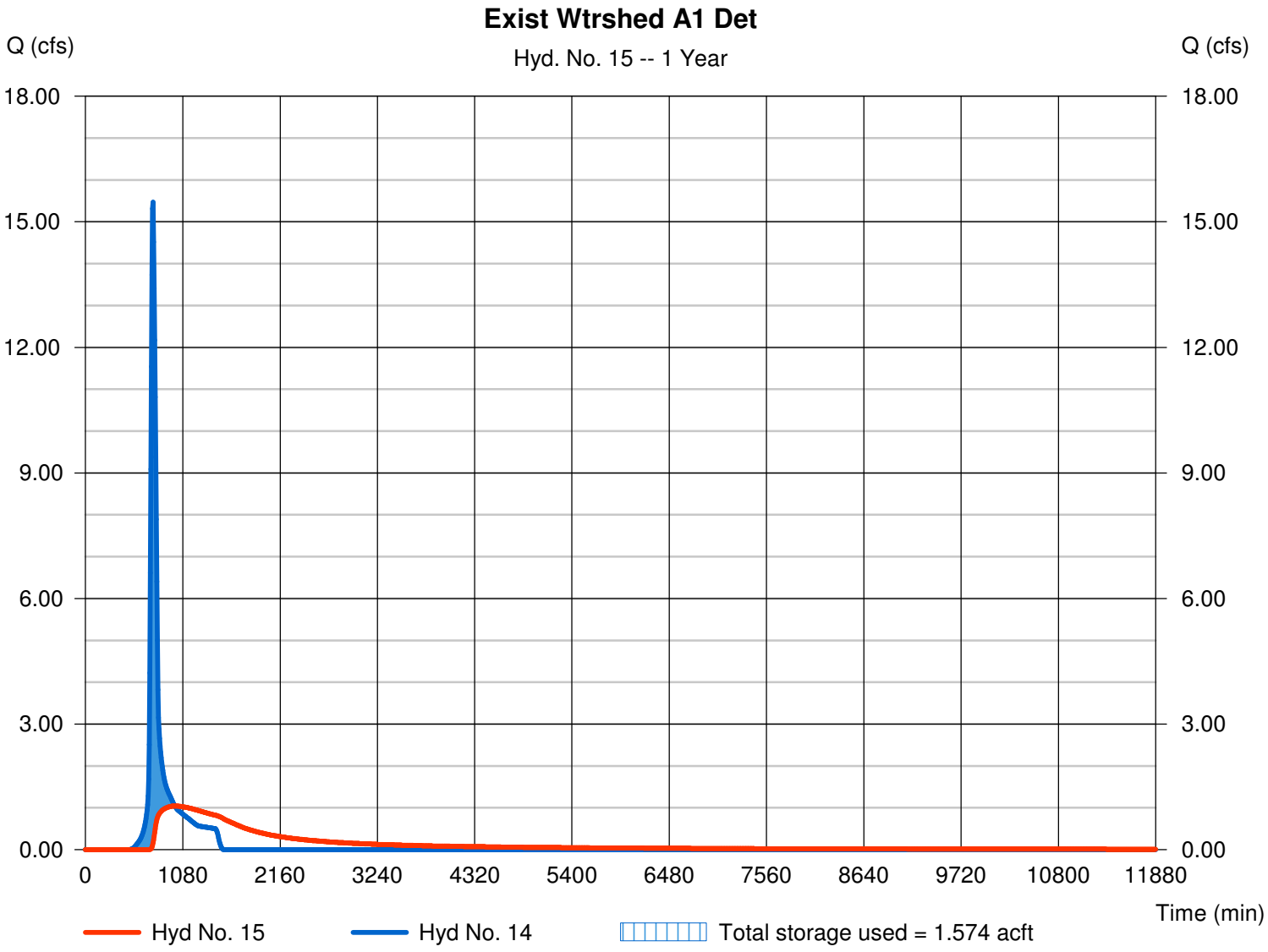
Hydrograph Report

Hyd. No. 15

Exist Wtrshed A1 Det

Hydrograph type	=	Reservoir	Peak discharge	=	1.042 cfs
Storm frequency	=	1 yrs	Time to peak	=	990 min
Time interval	=	6 min	Hyd. volume	=	2.152 acft
Inflow hyd. No.	=	14 - Post-Project Watershed A1	Max. Elevation	=	1367.36 ft
Reservoir name	=	Existing Detention Pond	Max. Storage	=	1.574 acft

Storage Indication method used.



Pond No. 2 - Existing Detention Pond

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1365.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1365.50	31,608	0.000	0.000
0.50	1366.00	33,332	0.373	0.373
1.50	1367.00	40,392	0.845	1.217
2.50	1368.00	47,273	1.005	2.223
3.50	1369.00	55,038	1.173	3.396
4.50	1370.00	71,886	1.452	4.848

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	0.00	0.00	0.00
Span (in)	= 24.00	0.00	0.00	0.00
No. Barrels	= 2	0	0	0
Invert El. (ft)	= 1365.50	0.00	0.00	0.00
Length (ft)	= 115.00	0.00	0.00	0.00
Slope (%)	= 0.24	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 6.00	0.00	0.00	0.00
Crest El. (ft)	= 1367.90	1365.50	0.00	0.00
Weir Coeff.	= 3.33	0.22	3.33	3.33
Weir Type	= Rect	10 degV	---	---
Multi-Stage	= Yes	No	No	No

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

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	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	0.000	1365.50	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.05	0.037	1365.55	0.00	---	---	---	0.00	0.00	---	---	---	---	0.000
0.10	0.075	1365.60	0.00	---	---	---	0.00	0.00	---	---	---	---	0.001
0.15	0.112	1365.65	0.00	---	---	---	0.00	0.00	---	---	---	---	0.002
0.20	0.149	1365.70	0.00	---	---	---	0.00	0.00	---	---	---	---	0.004
0.25	0.186	1365.75	0.00	---	---	---	0.00	0.01	---	---	---	---	0.007
0.30	0.224	1365.80	0.00	---	---	---	0.00	0.01	---	---	---	---	0.011
0.35	0.261	1365.85	0.00	---	---	---	0.00	0.02	---	---	---	---	0.016
0.40	0.298	1365.90	0.00	---	---	---	0.00	0.02	---	---	---	---	0.023
0.45	0.335	1365.95	0.00	---	---	---	0.00	0.03	---	---	---	---	0.030
0.50	0.373	1366.00	0.00	---	---	---	0.00	0.04	---	---	---	---	0.039
0.60	0.457	1366.10	0.00	---	---	---	0.00	0.06	---	---	---	---	0.062
0.70	0.542	1366.20	0.00	---	---	---	0.00	0.09	---	---	---	---	0.091
0.80	0.626	1366.30	0.00	---	---	---	0.00	0.13	---	---	---	---	0.127
0.90	0.711	1366.40	0.00	---	---	---	0.00	0.17	---	---	---	---	0.171
1.00	0.795	1366.50	0.00	---	---	---	0.00	0.22	---	---	---	---	0.222
1.10	0.880	1366.60	0.00	---	---	---	0.00	0.28	---	---	---	---	0.282
1.20	0.964	1366.70	0.00	---	---	---	0.00	0.35	---	---	---	---	0.350
1.30	1.049	1366.80	0.00	---	---	---	0.00	0.43	---	---	---	---	0.428
1.40	1.133	1366.90	0.00	---	---	---	0.00	0.51	---	---	---	---	0.515
1.50	1.217	1367.00	0.00	---	---	---	0.00	0.61	---	---	---	---	0.612
1.60	1.318	1367.10	0.00	---	---	---	0.00	0.72	---	---	---	---	0.719
1.70	1.419	1367.20	0.00	---	---	---	0.00	0.84	---	---	---	---	0.836
1.80	1.519	1367.30	0.00	---	---	---	0.00	0.96	---	---	---	---	0.965
1.90	1.620	1367.40	0.00	---	---	---	0.00	1.10	---	---	---	---	1.105
2.00	1.720	1367.50	0.00	---	---	---	0.00	1.26	---	---	---	---	1.256
2.10	1.821	1367.60	0.00	---	---	---	0.00	1.42	---	---	---	---	1.418
2.20	1.921	1367.70	0.00	---	---	---	0.00	1.59	---	---	---	---	1.593
2.30	2.022	1367.80	0.00	---	---	---	0.00	1.78	---	---	---	---	1.781
2.40	2.122	1367.90	0.00	---	---	---	0.00	1.98	---	---	---	---	1.981
2.50	2.223	1368.00	0.67 oc	---	---	---	0.63	2.19	---	---	---	---	2.825
2.60	2.340	1368.10	1.84 oc	---	---	---	1.79	2.42	---	---	---	---	4.206
2.70	2.457	1368.20	3.29 oc	---	---	---	3.28	2.66	---	---	---	---	5.941
2.80	2.575	1368.30	5.13 oc	---	---	---	5.05	2.91	---	---	---	---	7.965
2.90	2.692	1368.40	7.22 oc	---	---	---	7.06	3.18	---	---	---	---	10.24
3.00	2.809	1368.50	9.37 oc	---	---	---	9.28	3.46	---	---	---	---	12.74
3.10	2.926	1368.60	11.72 oc	---	---	---	11.70	3.76	---	---	---	---	15.45
3.20	3.044	1368.70	14.32 oc	---	---	---	14.29	4.07	---	---	---	---	18.36

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Existing Detention Pond

Stage / Storage / Discharge Table

Stage ft	Storage acft	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
3.30	3.161	1368.80	17.06 oc	---	---	---	17.05	4.39	---	---	---	---	21.44
3.40	3.278	1368.90	19.97 oc	---	---	---	19.97	4.73	---	---	---	---	24.70
3.50	3.396	1369.00	23.05 oc	---	---	---	23.05	5.09	---	---	---	---	28.14
3.60	3.541	1369.10	26.02 oc	---	---	---	26.02 s	5.46	---	---	---	---	31.47
3.70	3.686	1369.20	28.56 oc	---	---	---	28.56 s	5.85	---	---	---	---	34.41
3.80	3.831	1369.30	30.89 oc	---	---	---	30.89 s	6.25	---	---	---	---	37.14
3.90	3.977	1369.40	33.04 oc	---	---	---	33.04 s	6.67	---	---	---	---	39.71
4.00	4.122	1369.50	35.04 oc	---	---	---	35.04 s	7.10	---	---	---	---	42.15
4.10	4.267	1369.60	36.91 oc	---	---	---	36.90 s	7.56	---	---	---	---	44.46
4.20	4.412	1369.70	38.64 oc	---	---	---	38.64 s	8.02	---	---	---	---	46.67
4.30	4.558	1369.80	40.28 oc	---	---	---	40.28 s	8.51	---	---	---	---	48.79
4.40	4.703	1369.90	41.81 oc	---	---	---	41.81 s	9.01	---	---	---	---	50.82
4.50	4.848	1370.00	43.26 oc	---	---	---	43.26 s	9.54	---	---	---	---	52.80

...End

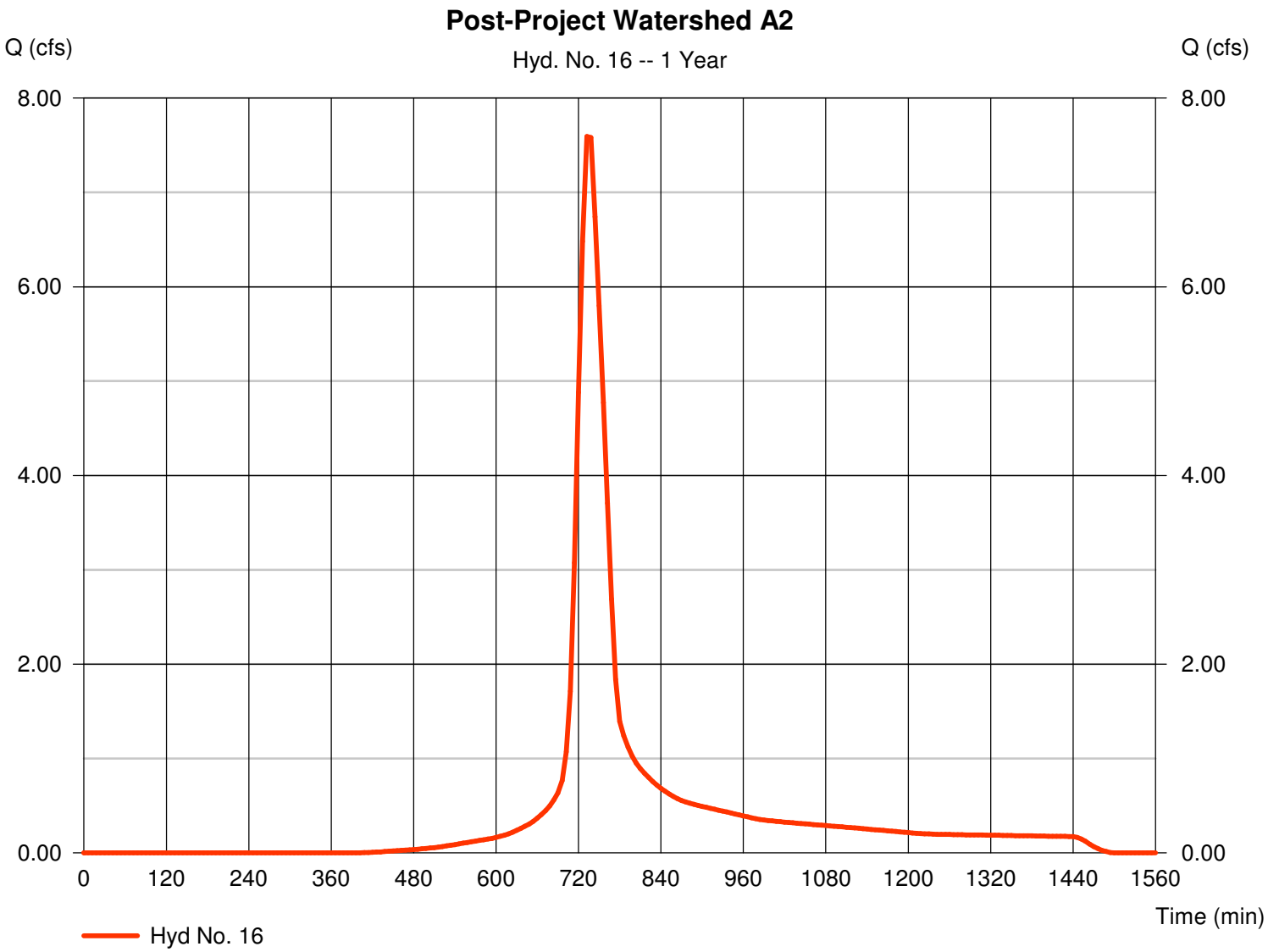
Hydrograph Report

Hyd. No. 16

Post-Project Watershed A2

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.592 cfs
Storm frequency	=	1 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	0.876 acft
Drainage area	=	5.900 ac	Curve number	=	89.1*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	2.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(4.000 x 86) + (1.900 x 80)] / 5.900



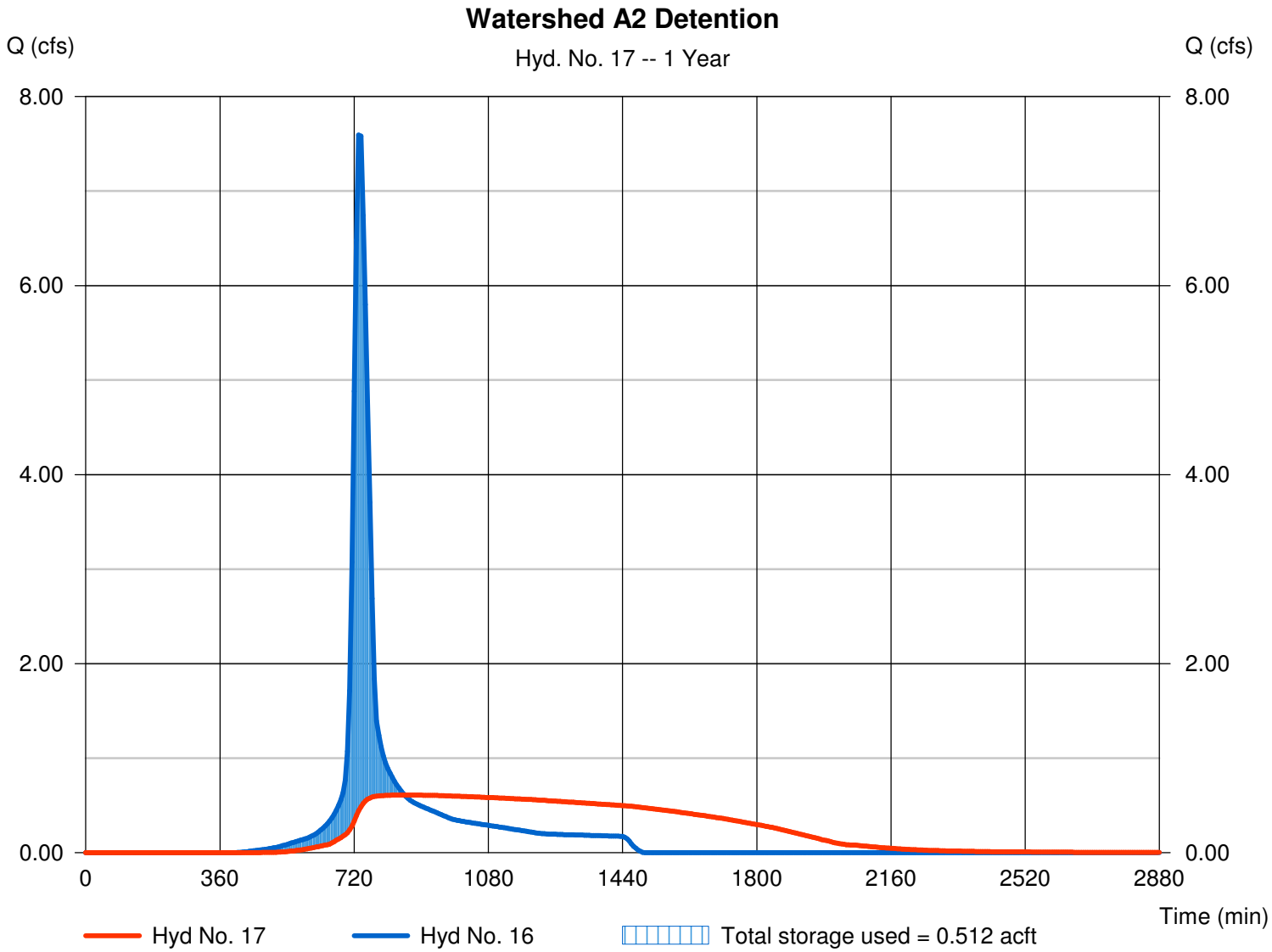
Hydrograph Report

Hyd. No. 17

Watershed A2 Detention

Hydrograph type	=	Reservoir	Peak discharge	=	0.610 cfs
Storm frequency	=	1 yrs	Time to peak	=	858 min
Time interval	=	6 min	Hyd. volume	=	0.875 acft
Inflow hyd. No.	=	16 - Post-Project Watershed A2	Max. Elevation	=	1367.95 ft
Reservoir name	=	Watershed A2 Detention	Max. Storage	=	0.512 acft

Storage Indication method used.



Pond No. 3 - Watershed A2 Detention

Pond Data

Trapezoid - Bottom L x W = 650.0 x 4.0 ft, Side slope = 4.00:1, Bottom elev. = 1365.50 ft, Depth = 3.50 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1365.50	2,600	0.000	0.000
0.35	1365.85	4,439	0.028	0.028
0.70	1366.20	6,294	0.043	0.071
1.05	1366.55	8,164	0.058	0.129
1.40	1366.90	10,050	0.073	0.203
1.75	1367.25	11,952	0.088	0.291
2.10	1367.60	13,869	0.104	0.395
2.45	1367.95	15,803	0.119	0.514
2.80	1368.30	17,751	0.135	0.649
3.15	1368.65	19,716	0.151	0.799
3.50	1369.00	21,696	0.166	0.966

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 24.00	4.00	0.00	0.00
Span (in)	= 24.00	4.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 1365.50	1365.50	0.00	0.00
Length (ft)	= 50.00	10.00	0.00	0.00
Slope (%)	= 0.20	0.40	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	0.00	0.00	0.00
Crest El. (ft)	= 1368.20	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

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

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage acft	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	0.000	1365.50	0.00	0.00	---	---	0.00	---	---	---	---	---	0.000
0.04	0.003	1365.54	0.00	0.00 oc	---	---	0.00	---	---	---	---	---	0.003
0.07	0.006	1365.57	0.00	0.01 oc	---	---	0.00	---	---	---	---	---	0.010
0.11	0.008	1365.61	0.00	0.02 oc	---	---	0.00	---	---	---	---	---	0.020
0.14	0.011	1365.64	0.00	0.03 oc	---	---	0.00	---	---	---	---	---	0.032
0.18	0.014	1365.68	0.00	0.04 oc	---	---	0.00	---	---	---	---	---	0.045
0.21	0.017	1365.71	0.00	0.06 oc	---	---	0.00	---	---	---	---	---	0.058
0.25	0.020	1365.75	0.00	0.07 oc	---	---	0.00	---	---	---	---	---	0.069
0.28	0.023	1365.78	0.00	0.08 oc	---	---	0.00	---	---	---	---	---	0.079
0.32	0.025	1365.82	0.00	0.08 oc	---	---	0.00	---	---	---	---	---	0.085
0.35	0.028	1365.85	0.00	0.10 oc	---	---	0.00	---	---	---	---	---	0.099
0.39	0.033	1365.89	0.00	0.13 oc	---	---	0.00	---	---	---	---	---	0.126
0.42	0.037	1365.92	0.00	0.15 oc	---	---	0.00	---	---	---	---	---	0.148
0.46	0.041	1365.96	0.00	0.17 oc	---	---	0.00	---	---	---	---	---	0.167
0.49	0.046	1365.99	0.00	0.18 oc	---	---	0.00	---	---	---	---	---	0.184
0.53	0.050	1366.03	0.00	0.20 oc	---	---	0.00	---	---	---	---	---	0.200
0.56	0.054	1366.06	0.00	0.21 oc	---	---	0.00	---	---	---	---	---	0.215
0.60	0.058	1366.10	0.00	0.23 oc	---	---	0.00	---	---	---	---	---	0.228
0.63	0.063	1366.13	0.00	0.24 oc	---	---	0.00	---	---	---	---	---	0.241
0.67	0.067	1366.17	0.00	0.25 oc	---	---	0.00	---	---	---	---	---	0.254
0.70	0.071	1366.20	0.00	0.27 oc	---	---	0.00	---	---	---	---	---	0.265
0.74	0.077	1366.24	0.00	0.28 oc	---	---	0.00	---	---	---	---	---	0.276
0.77	0.083	1366.27	0.00	0.29 oc	---	---	0.00	---	---	---	---	---	0.287
0.80	0.089	1366.31	0.00	0.30 oc	---	---	0.00	---	---	---	---	---	0.297
0.84	0.095	1366.34	0.00	0.31 oc	---	---	0.00	---	---	---	---	---	0.307
0.87	0.100	1366.38	0.00	0.32 oc	---	---	0.00	---	---	---	---	---	0.317
0.91	0.106	1366.41	0.00	0.33 oc	---	---	0.00	---	---	---	---	---	0.327
0.94	0.112	1366.45	0.00	0.34 oc	---	---	0.00	---	---	---	---	---	0.336
0.98	0.118	1366.48	0.00	0.34 oc	---	---	0.00	---	---	---	---	---	0.345
1.02	0.124	1366.52	0.00	0.35 oc	---	---	0.00	---	---	---	---	---	0.353
1.05	0.129	1366.55	0.00	0.36 oc	---	---	0.00	---	---	---	---	---	0.362
1.09	0.137	1366.59	0.00	0.37 oc	---	---	0.00	---	---	---	---	---	0.370
1.12	0.144	1366.62	0.00	0.38 oc	---	---	0.00	---	---	---	---	---	0.378

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Watershed A2 Detention

Stage / Storage / Discharge Table

Stage ft	Storage acft	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
1.16	0.151	1366.66	0.00	0.39 oc	---	---	0.00	---	---	---	---	---	0.386
1.19	0.159	1366.69	0.00	0.39 oc	---	---	0.00	---	---	---	---	---	0.394
1.23	0.166	1366.73	0.00	0.40 oc	---	---	0.00	---	---	---	---	---	0.401
1.26	0.173	1366.76	0.00	0.41 oc	---	---	0.00	---	---	---	---	---	0.409
1.30	0.181	1366.80	0.00	0.42 oc	---	---	0.00	---	---	---	---	---	0.416
1.33	0.188	1366.83	0.00	0.42 oc	---	---	0.00	---	---	---	---	---	0.423
1.37	0.195	1366.87	0.00	0.43 oc	---	---	0.00	---	---	---	---	---	0.431
1.40	0.203	1366.90	0.00	0.44 oc	---	---	0.00	---	---	---	---	---	0.437
1.44	0.211	1366.94	0.00	0.44 oc	---	---	0.00	---	---	---	---	---	0.444
1.47	0.220	1366.97	0.00	0.45 oc	---	---	0.00	---	---	---	---	---	0.451
1.51	0.229	1367.01	0.00	0.46 oc	---	---	0.00	---	---	---	---	---	0.458
1.54	0.238	1367.04	0.00	0.46 oc	---	---	0.00	---	---	---	---	---	0.464
1.58	0.247	1367.08	0.00	0.47 oc	---	---	0.00	---	---	---	---	---	0.471
1.61	0.256	1367.11	0.00	0.48 oc	---	---	0.00	---	---	---	---	---	0.477
1.65	0.264	1367.15	0.00	0.48 oc	---	---	0.00	---	---	---	---	---	0.484
1.68	0.273	1367.18	0.00	0.49 oc	---	---	0.00	---	---	---	---	---	0.490
1.72	0.282	1367.22	0.00	0.50 oc	---	---	0.00	---	---	---	---	---	0.496
1.75	0.291	1367.25	0.00	0.50 oc	---	---	0.00	---	---	---	---	---	0.502
1.79	0.301	1367.29	0.00	0.51 oc	---	---	0.00	---	---	---	---	---	0.508
1.82	0.312	1367.32	0.00	0.51 oc	---	---	0.00	---	---	---	---	---	0.514
1.86	0.322	1367.36	0.00	0.52 oc	---	---	0.00	---	---	---	---	---	0.520
1.89	0.332	1367.39	0.00	0.53 oc	---	---	0.00	---	---	---	---	---	0.525
1.93	0.343	1367.43	0.00	0.53 oc	---	---	0.00	---	---	---	---	---	0.531
1.96	0.353	1367.46	0.00	0.54 oc	---	---	0.00	---	---	---	---	---	0.537
2.00	0.364	1367.50	0.00	0.54 oc	---	---	0.00	---	---	---	---	---	0.542
2.03	0.374	1367.53	0.00	0.55 oc	---	---	0.00	---	---	---	---	---	0.548
2.07	0.384	1367.57	0.00	0.55 oc	---	---	0.00	---	---	---	---	---	0.554
2.10	0.395	1367.60	0.00	0.56 oc	---	---	0.00	---	---	---	---	---	0.559
2.14	0.407	1367.64	0.00	0.56 oc	---	---	0.00	---	---	---	---	---	0.564
2.17	0.419	1367.67	0.00	0.57 oc	---	---	0.00	---	---	---	---	---	0.570
2.21	0.430	1367.71	0.00	0.57 oc	---	---	0.00	---	---	---	---	---	0.575
2.24	0.442	1367.74	0.00	0.58 oc	---	---	0.00	---	---	---	---	---	0.580
2.28	0.454	1367.78	0.00	0.59 oc	---	---	0.00	---	---	---	---	---	0.585
2.31	0.466	1367.81	0.00	0.59 oc	---	---	0.00	---	---	---	---	---	0.591
2.35	0.478	1367.85	0.00	0.60 oc	---	---	0.00	---	---	---	---	---	0.596
2.38	0.490	1367.88	0.00	0.60 oc	---	---	0.00	---	---	---	---	---	0.601
2.42	0.502	1367.92	0.00	0.61 oc	---	---	0.00	---	---	---	---	---	0.606
2.45	0.514	1367.95	0.00	0.61 oc	---	---	0.00	---	---	---	---	---	0.611
2.49	0.527	1367.99	0.00	0.62 oc	---	---	0.00	---	---	---	---	---	0.616
2.52	0.541	1368.02	0.00	0.62 oc	---	---	0.00	---	---	---	---	---	0.621
2.56	0.554	1368.06	0.00	0.63 oc	---	---	0.00	---	---	---	---	---	0.625
2.59	0.568	1368.09	0.00	0.63 oc	---	---	0.00	---	---	---	---	---	0.630
2.63	0.581	1368.13	0.00	0.63 oc	---	---	0.00	---	---	---	---	---	0.635
2.66	0.595	1368.16	0.00	0.64 oc	---	---	0.00	---	---	---	---	---	0.640
2.70	0.608	1368.20	0.00	0.64 oc	---	---	0.00	---	---	---	---	---	0.644
2.73	0.622	1368.23	0.30 oc	0.65 oc	---	---	0.28	---	---	---	---	---	0.930
2.77	0.635	1368.27	0.91 oc	0.65 oc	---	---	0.89	---	---	---	---	---	1.543
2.80	0.649	1368.30	1.69 oc	0.66 oc	---	---	1.69	---	---	---	---	---	2.346
2.84	0.664	1368.34	2.68 oc	0.66 oc	---	---	2.65	---	---	---	---	---	3.310
2.87	0.679	1368.37	3.79 oc	0.67 oc	---	---	3.74	---	---	---	---	---	4.408
2.91	0.694	1368.41	4.97 oc	0.67 oc	---	---	4.95	---	---	---	---	---	5.625
2.94	0.709	1368.44	6.28 oc	0.68 oc	---	---	6.27	---	---	---	---	---	6.950
2.98	0.724	1368.48	7.69 oc	0.68 oc	---	---	7.69	---	---	---	---	---	8.376
3.01	0.739	1368.51	9.21 oc	0.69 oc	---	---	9.21	---	---	---	---	---	9.895
3.05	0.754	1368.55	10.81 oc	0.69 oc	---	---	10.81	---	---	---	---	---	11.50
3.08	0.769	1368.58	12.50 oc	0.69 oc	---	---	12.50	---	---	---	---	---	13.19
3.12	0.784	1368.62	14.27 oc	0.70 oc	---	---	14.27	---	---	---	---	---	14.96
3.15	0.799	1368.65	15.91 oc	0.70 oc	---	---	15.91 s	---	---	---	---	---	16.61
3.19	0.816	1368.69	16.83 oc	0.71 oc	---	---	16.83 s	---	---	---	---	---	17.54
3.22	0.832	1368.72	17.55 oc	0.71 oc	---	---	17.55 s	---	---	---	---	---	18.26
3.26	0.849	1368.76	18.16 oc	0.72 oc	---	---	18.16 s	---	---	---	---	---	18.88
3.29	0.866	1368.79	18.70 oc	0.72 oc	---	---	18.70 s	---	---	---	---	---	19.42
3.33	0.882	1368.83	19.18 oc	0.72 oc	---	---	19.18 s	---	---	---	---	---	19.91
3.36	0.899	1368.86	19.62 oc	0.73 oc	---	---	19.62 s	---	---	---	---	---	20.35
3.40	0.916	1368.90	20.02 oc	0.73 oc	---	---	20.02 s	---	---	---	---	---	20.75
3.43	0.932	1368.93	20.40 oc	0.74 oc	---	---	20.40 s	---	---	---	---	---	21.13
3.47	0.949	1368.97	20.76 oc	0.74 oc	---	---	20.76 s	---	---	---	---	---	21.50
3.50	0.966	1369.00	21.09 oc	0.74 oc	---	---	21.09 s	---	---	---	---	---	21.83

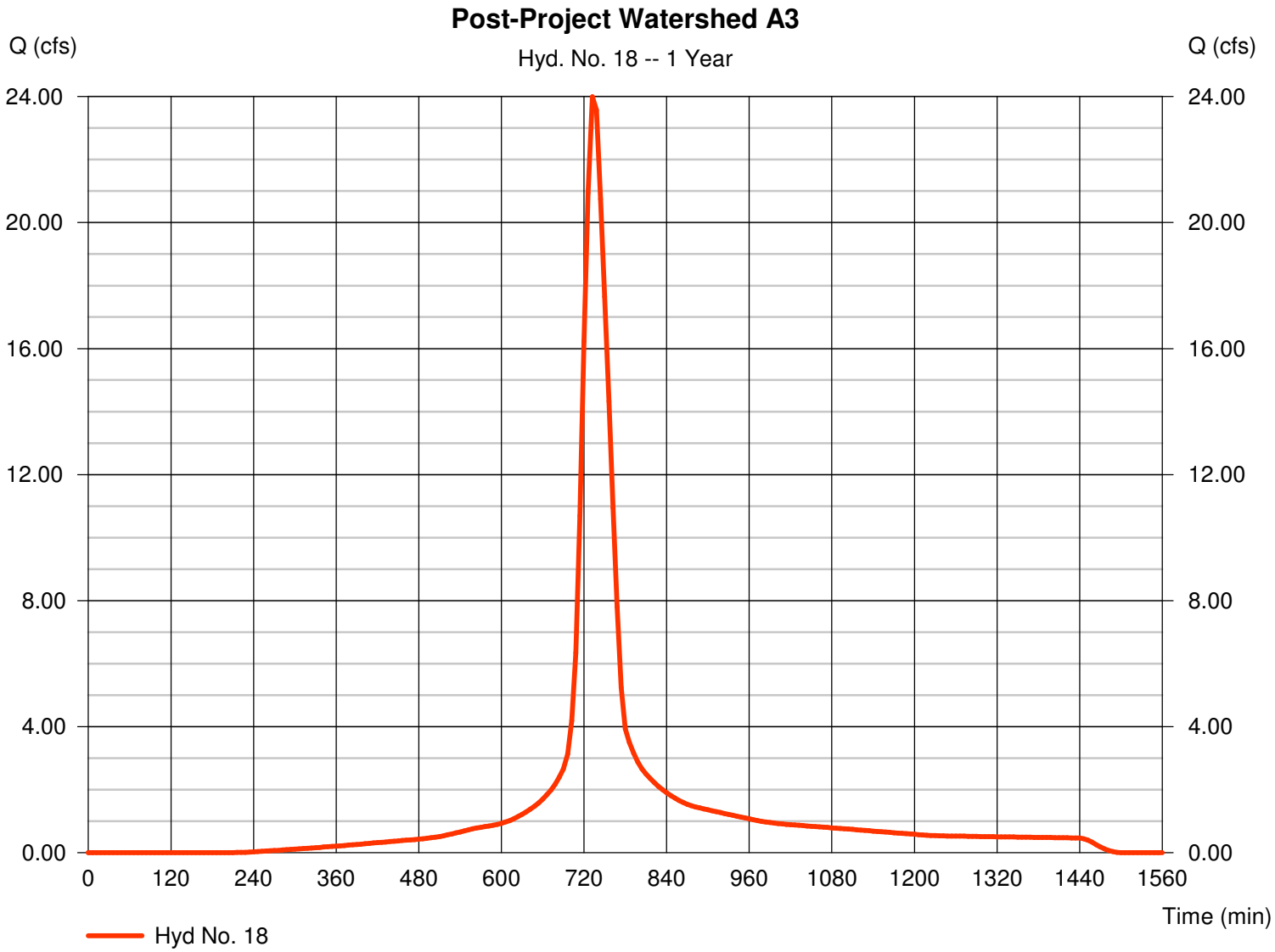
...End

Hydrograph Report

Hyd. No. 18

Post-Project Watershed A3

Hydrograph type	=	SCS Runoff	Peak discharge	=	23.99 cfs
Storm frequency	=	1 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	2.829 acft
Drainage area	=	14.600 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	2.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

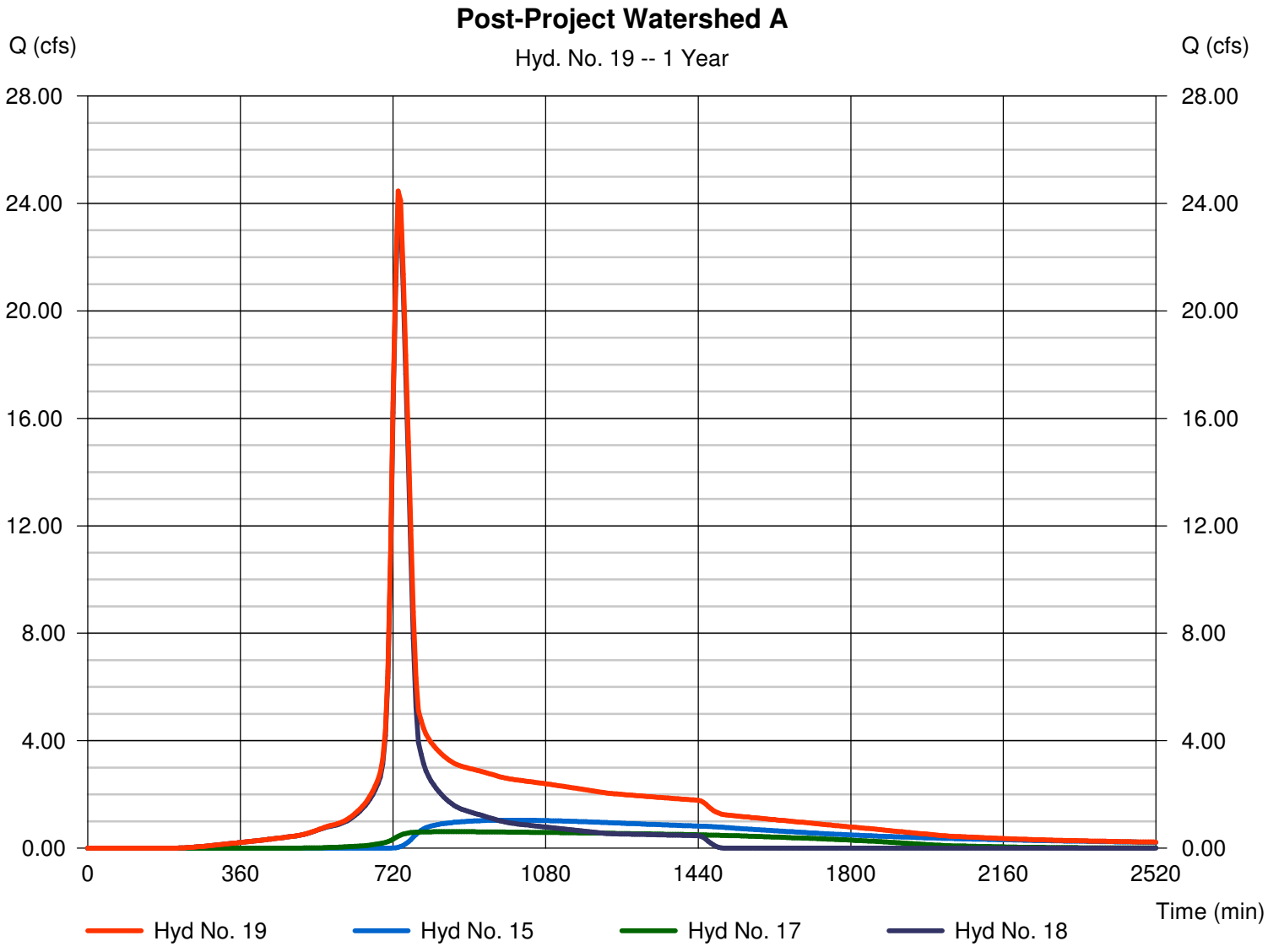


Hydrograph Report

Hyd. No. 19

Post-Project Watershed A

Hydrograph type	= Combine	Peak discharge	= 24.47 cfs
Storm frequency	= 1 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 5.856 acft
Inflow hyds.	= 15, 17, 18	Contrib. drain. area	= 14.600 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

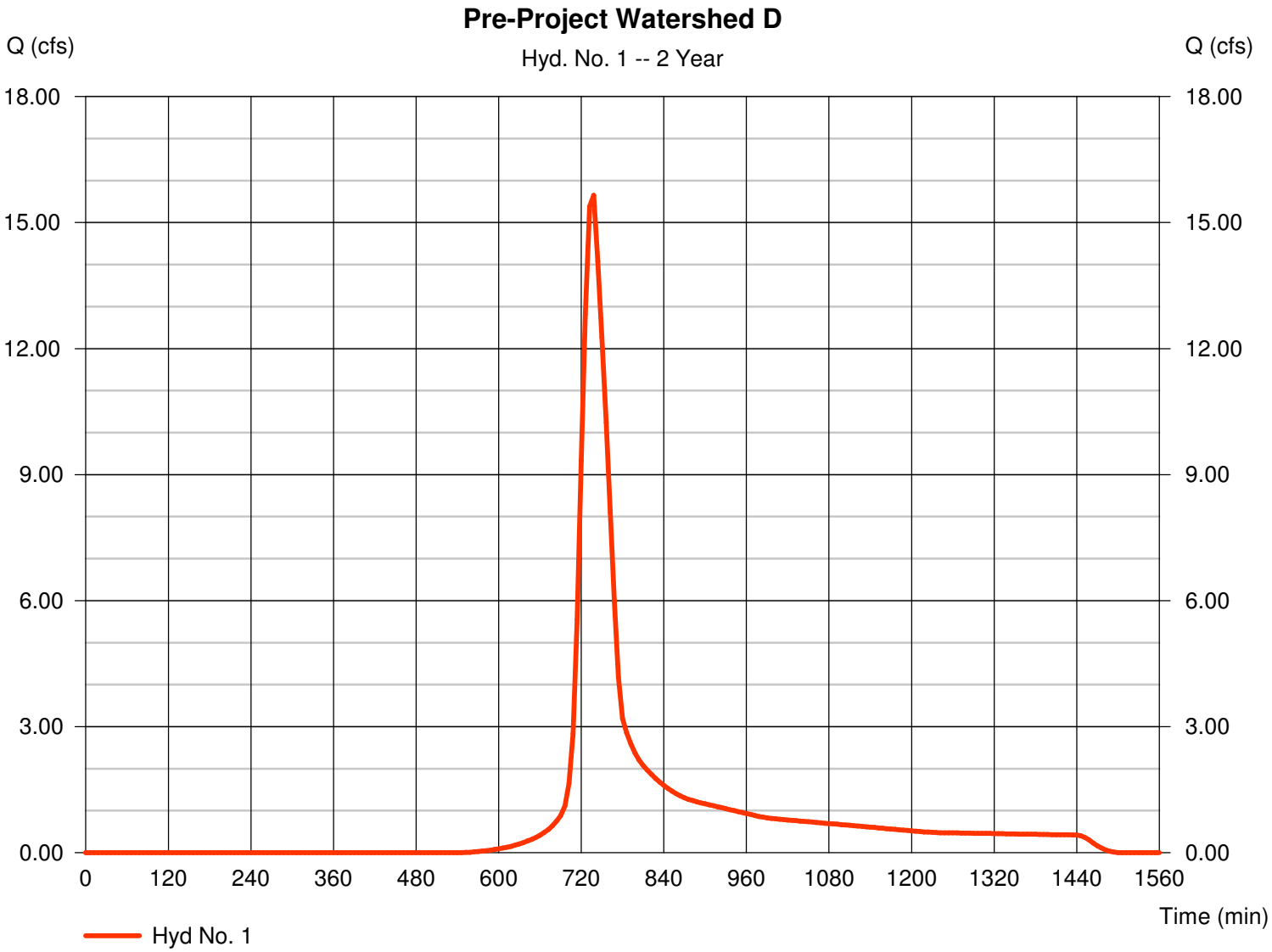
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	15.65	6	738	1.822	------	------	------	Pre-Project Watershed D
2	SCS Runoff	18.22	6	732	2.102	------	------	------	Post-Project Watershed D1
3	SCS Runoff	2.637	6	720	0.186	------	------	------	Post-Project Watershed D2
4	Reservoir	9.227	6	762	2.101	2	1366.08	0.968	Watershed D Detention
5	Combine	9.507	6	762	2.287	3, 4	------	------	Post-Project Watershed D
6	SCS Runoff	15.34	6	744	2.001	------	------	------	Offsite to the North
7	Combine	30.80	6	738	3.823	1, 6	------	------	Pre-Project to 159th
8	Combine	20.53	6	756	4.289	5, 6,	------	------	Post-Project to 159th
9	SCS Runoff	51.36	6	726	4.963	------	------	------	Cornerstone Commercial
10	Combine	77.67	6	732	8.786	7, 9	------	------	Pre-To Cornerstone Pond
11	Combine	65.10	6	726	9.252	8, 9,	------	------	Post-To Cornerstone Pond
13	SCS Runoff	34.92	6	750	5.280	------	------	------	Pre-Project Watershed A
14	SCS Runoff	21.63	6	750	3.225	------	------	------	Post-Project Watershed A1
15	Reservoir	1.928	6	900	3.063	14	1367.87	2.10	Exist Wtrshed A1 Det
16	SCS Runoff	10.31	6	732	1.190	------	------	------	Post-Project Watershed A2
17	Reservoir	2.304	6	774	1.189	16	1368.30	0.648	Watershed A2 Detention
18	SCS Runoff	30.73	6	732	3.663	------	------	------	Post-Project Watershed A3
19	Combine	31.34	6	732	7.915	15, 17, 18	------	------	Post-Project Watershed A

Hydrograph Report

Hyd. No. 1

Pre-Project Watershed D

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.65 cfs
Storm frequency	=	2 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	1.822 acft
Drainage area	=	13.080 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.20 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

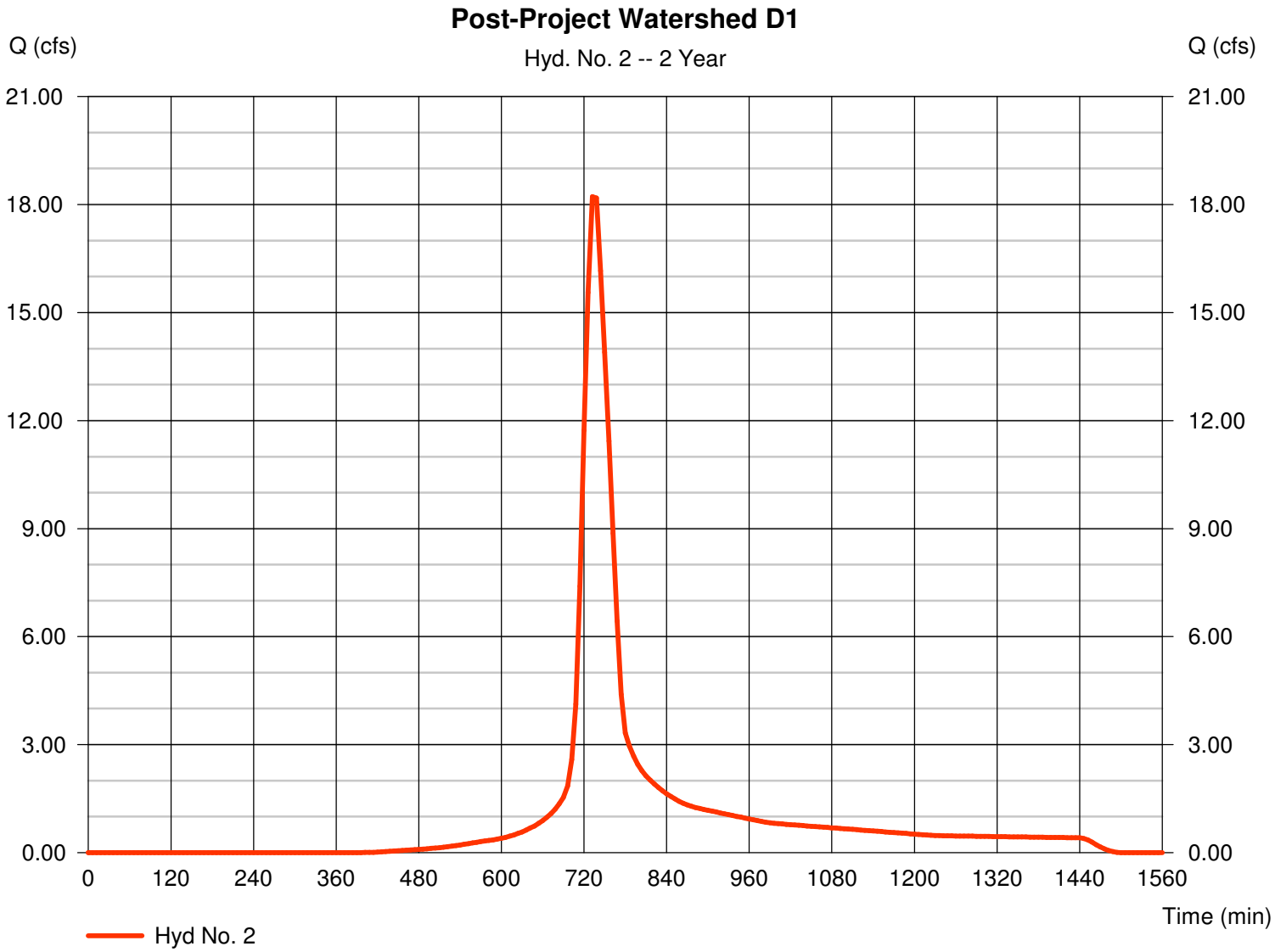


Hydrograph Report

Hyd. No. 2

Post-Project Watershed D1

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.22 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	2.102 acft
Drainage area	=	11.300 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	36.80 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

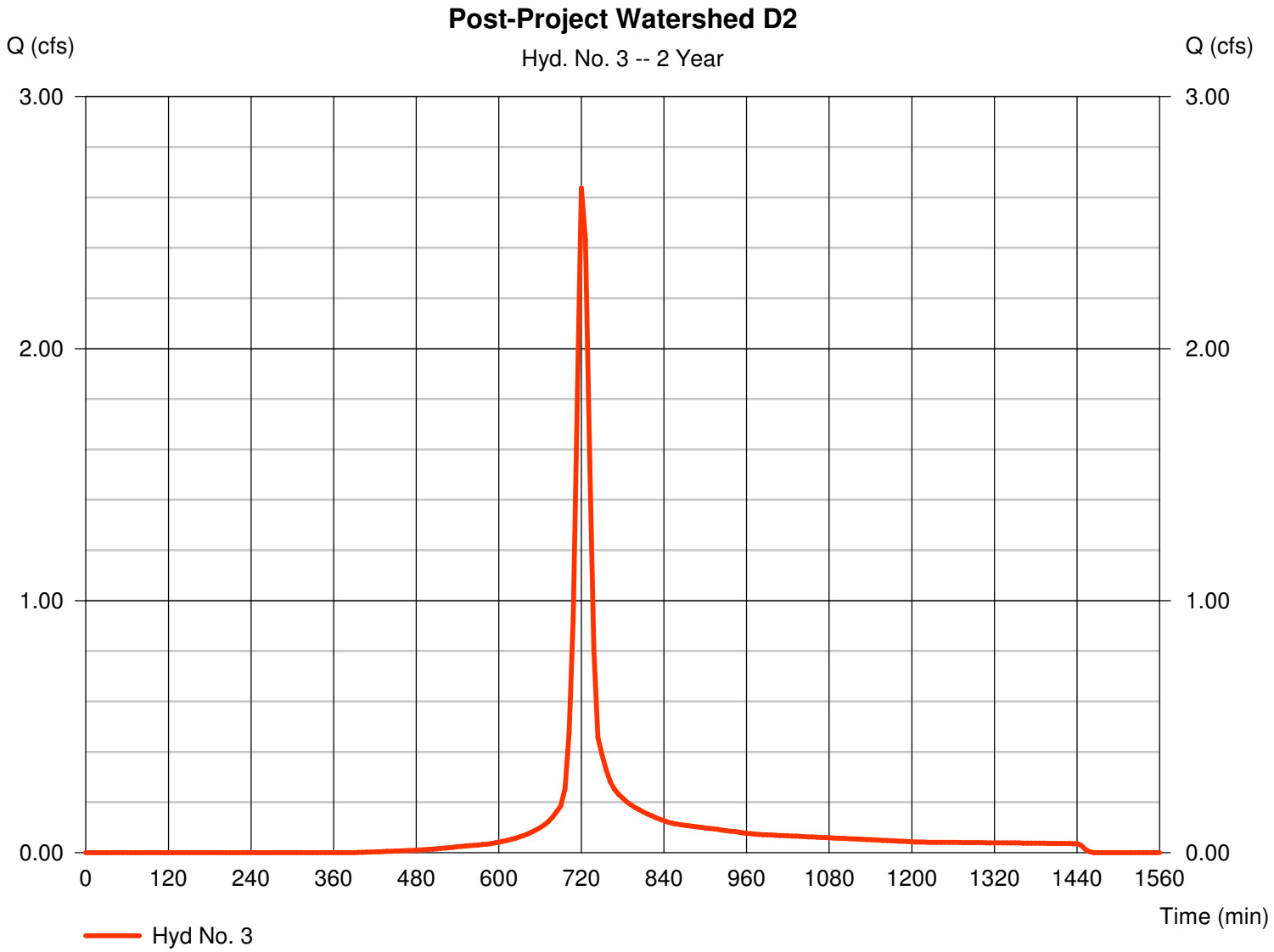


Hydrograph Report

Hyd. No. 3

Post-Project Watershed D2

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.637 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	6 min	Hyd. volume	=	0.186 acft
Drainage area	=	1.100 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



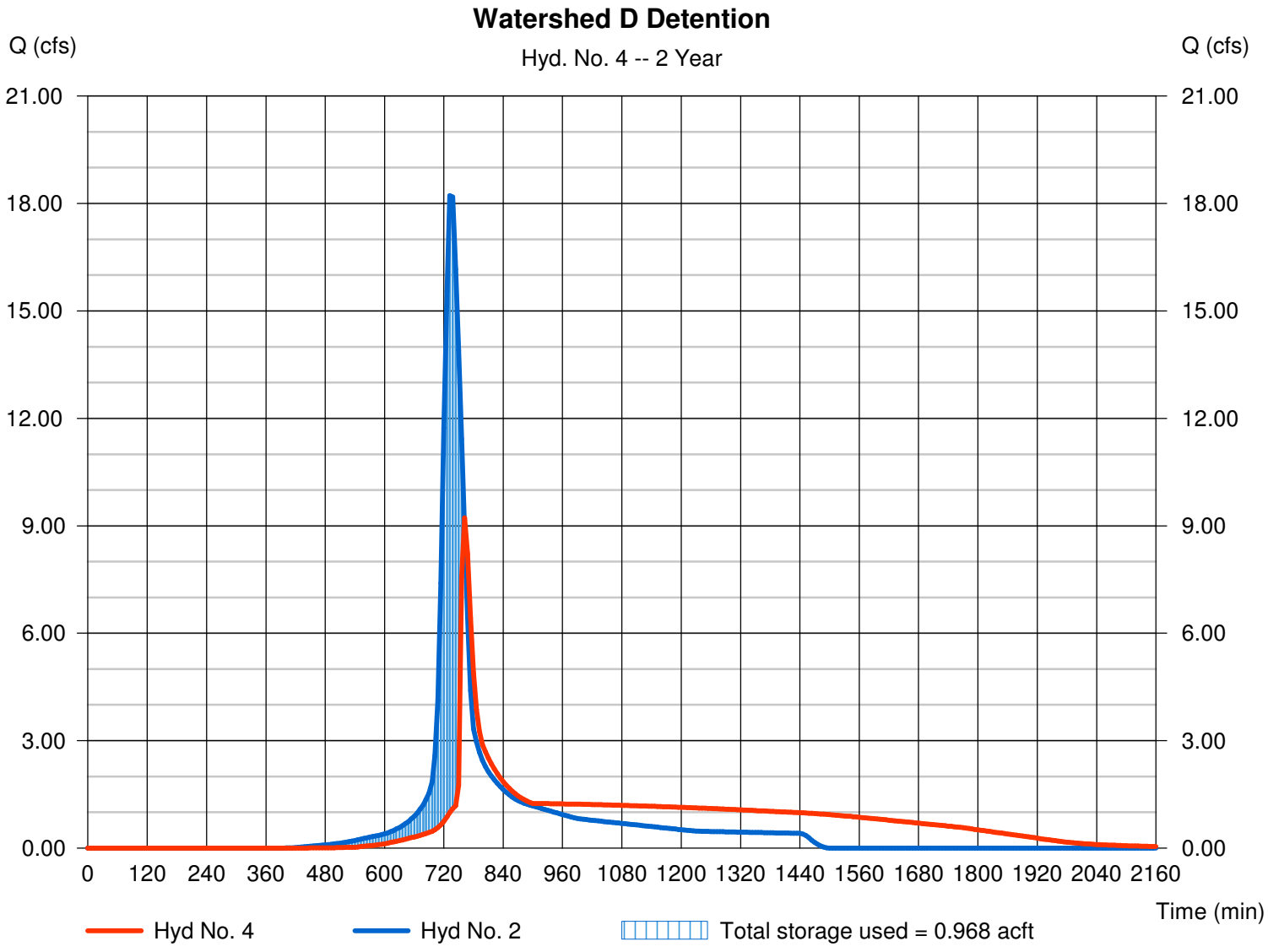
Hydrograph Report

Hyd. No. 4

Watershed D Detention

Hydrograph type	=	Reservoir	Peak discharge	=	9.227 cfs
Storm frequency	=	2 yrs	Time to peak	=	762 min
Time interval	=	6 min	Hyd. volume	=	2.101 acft
Inflow hyd. No.	=	2 - Post-Project Watershed D1	Max. Elevation	=	1366.08 ft
Reservoir name	=	Watershed D Detention	Max. Storage	=	0.968 acft

Storage Indication method used.

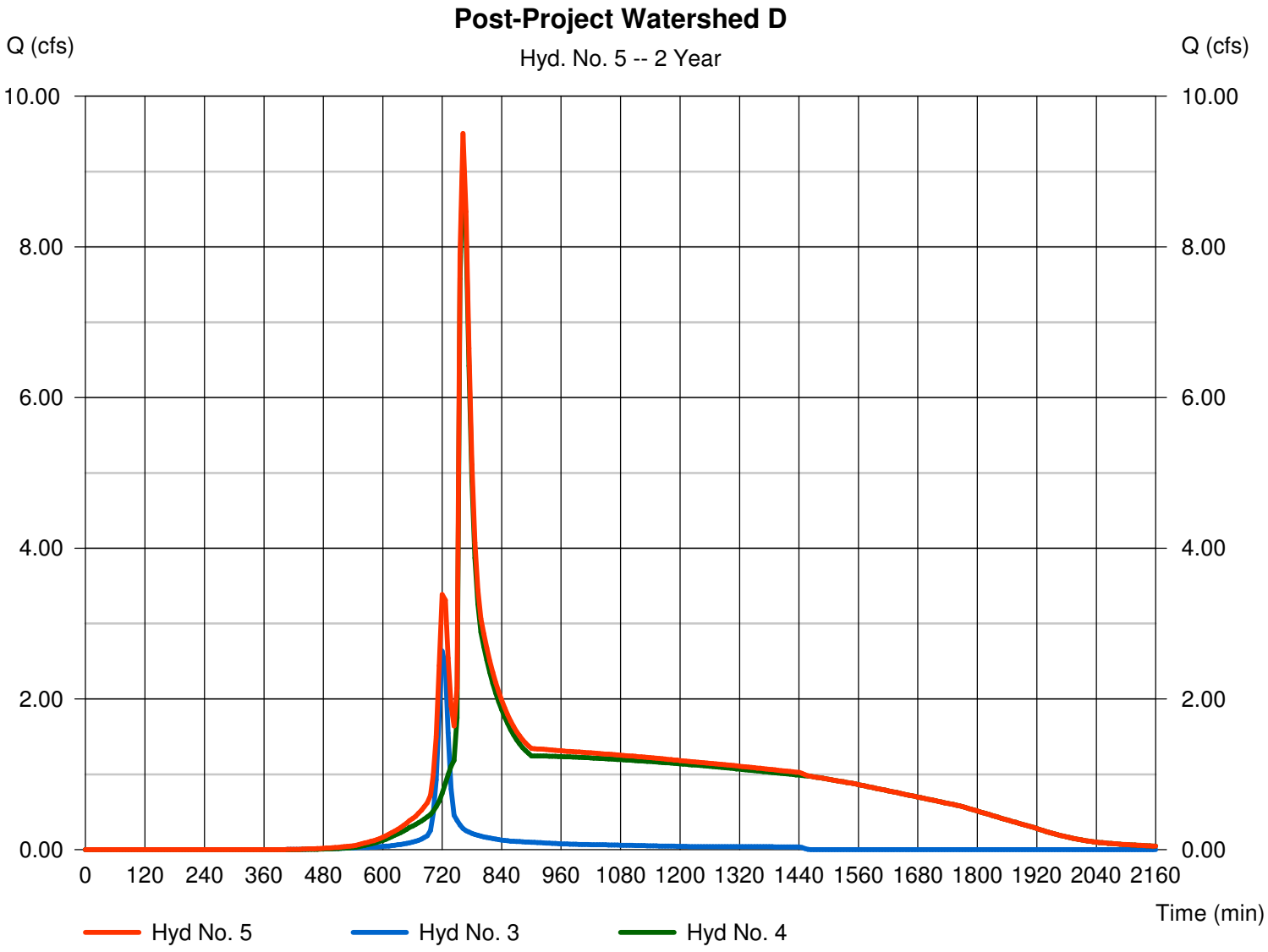


Hydrograph Report

Hyd. No. 5

Post-Project Watershed D

Hydrograph type	= Combine	Peak discharge	= 9.507 cfs
Storm frequency	= 2 yrs	Time to peak	= 762 min
Time interval	= 6 min	Hyd. volume	= 2.287 acft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 1.100 ac

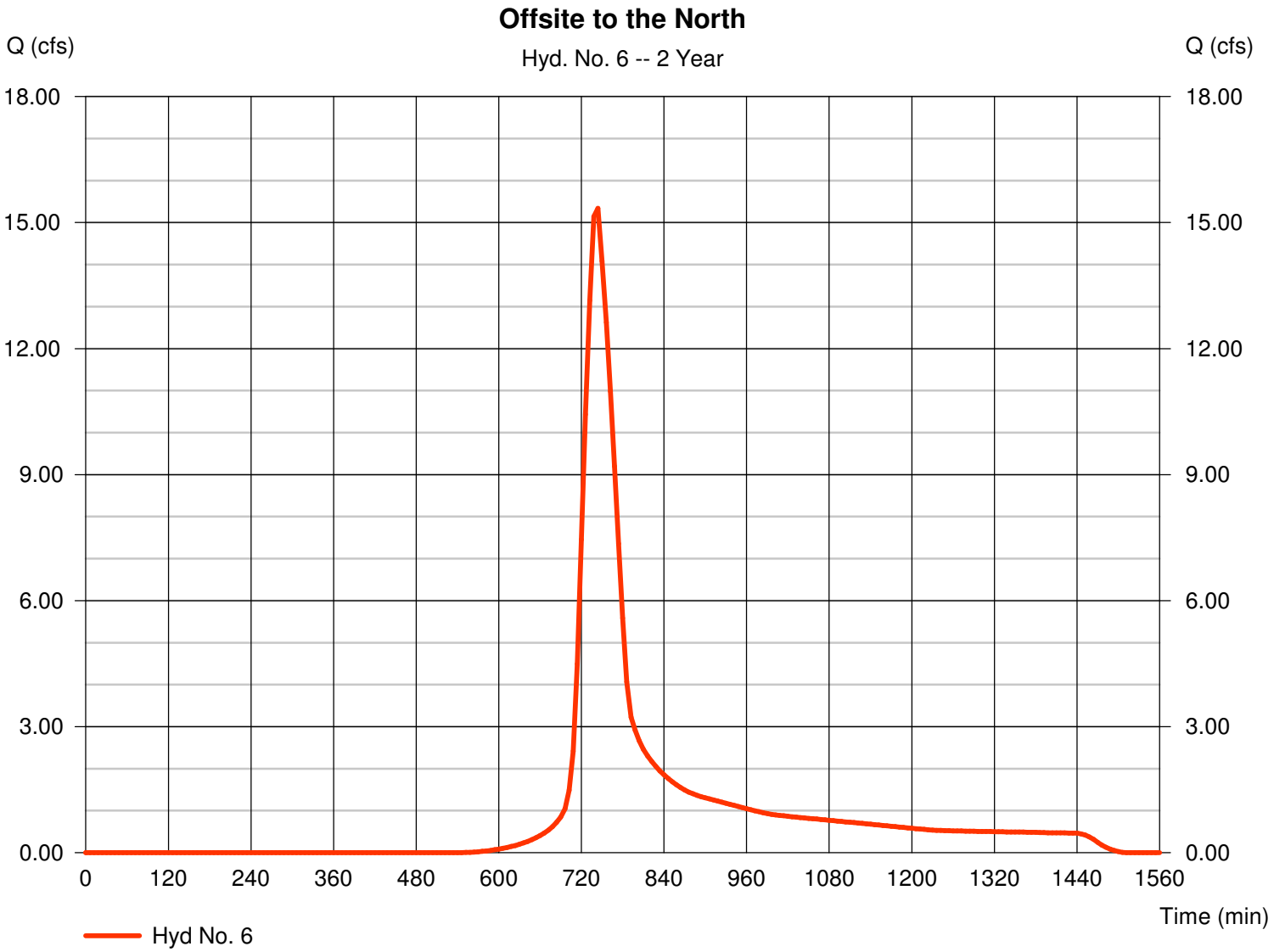


Hydrograph Report

Hyd. No. 6

Offsite to the North

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.34 cfs
Storm frequency	=	2 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	2.001 acft
Drainage area	=	15.200 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.30 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

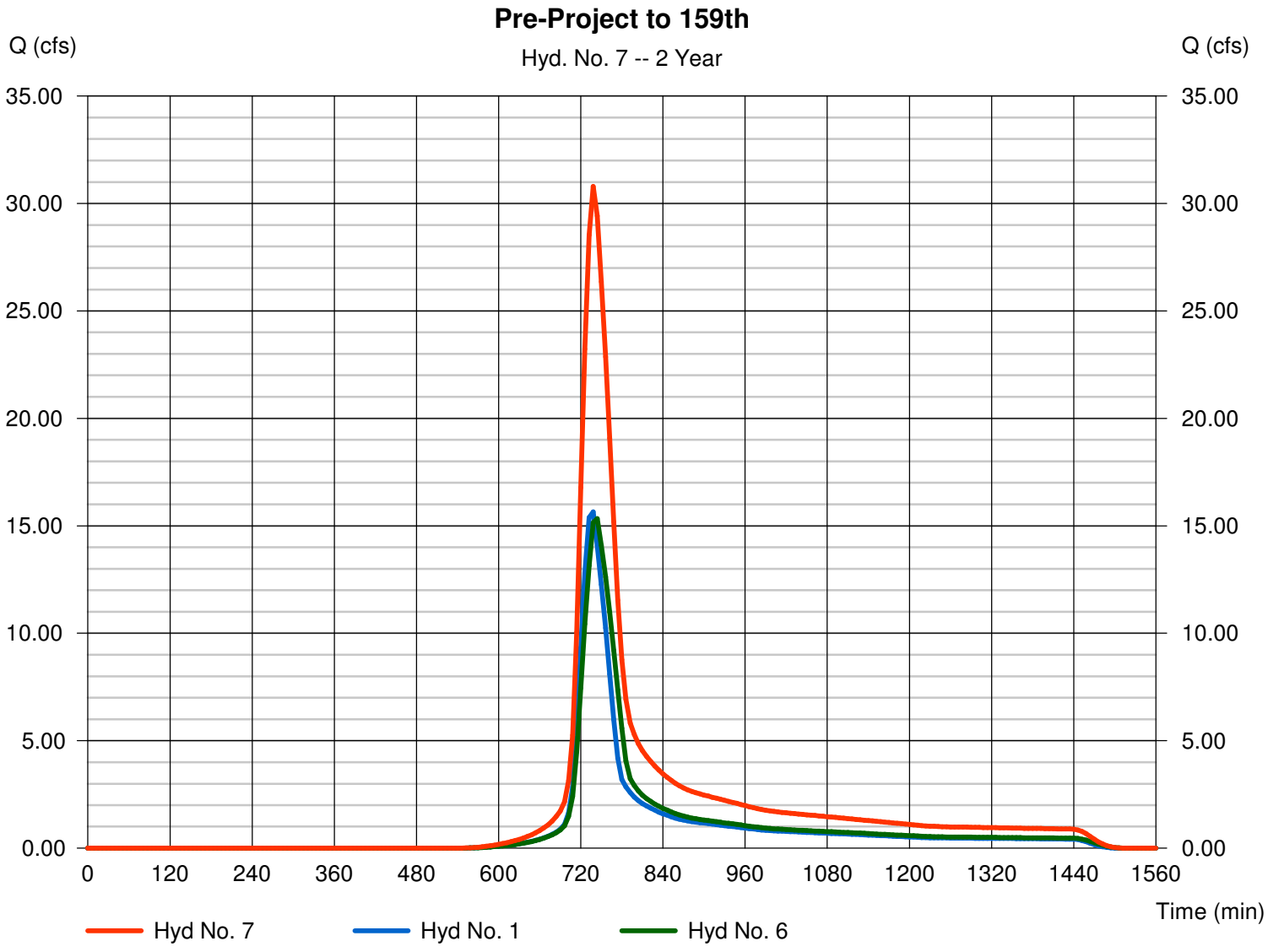


Hydrograph Report

Hyd. No. 7

Pre-Project to 159th

Hydrograph type	= Combine	Peak discharge	= 30.80 cfs
Storm frequency	= 2 yrs	Time to peak	= 738 min
Time interval	= 6 min	Hyd. volume	= 3.823 acft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 28.280 ac

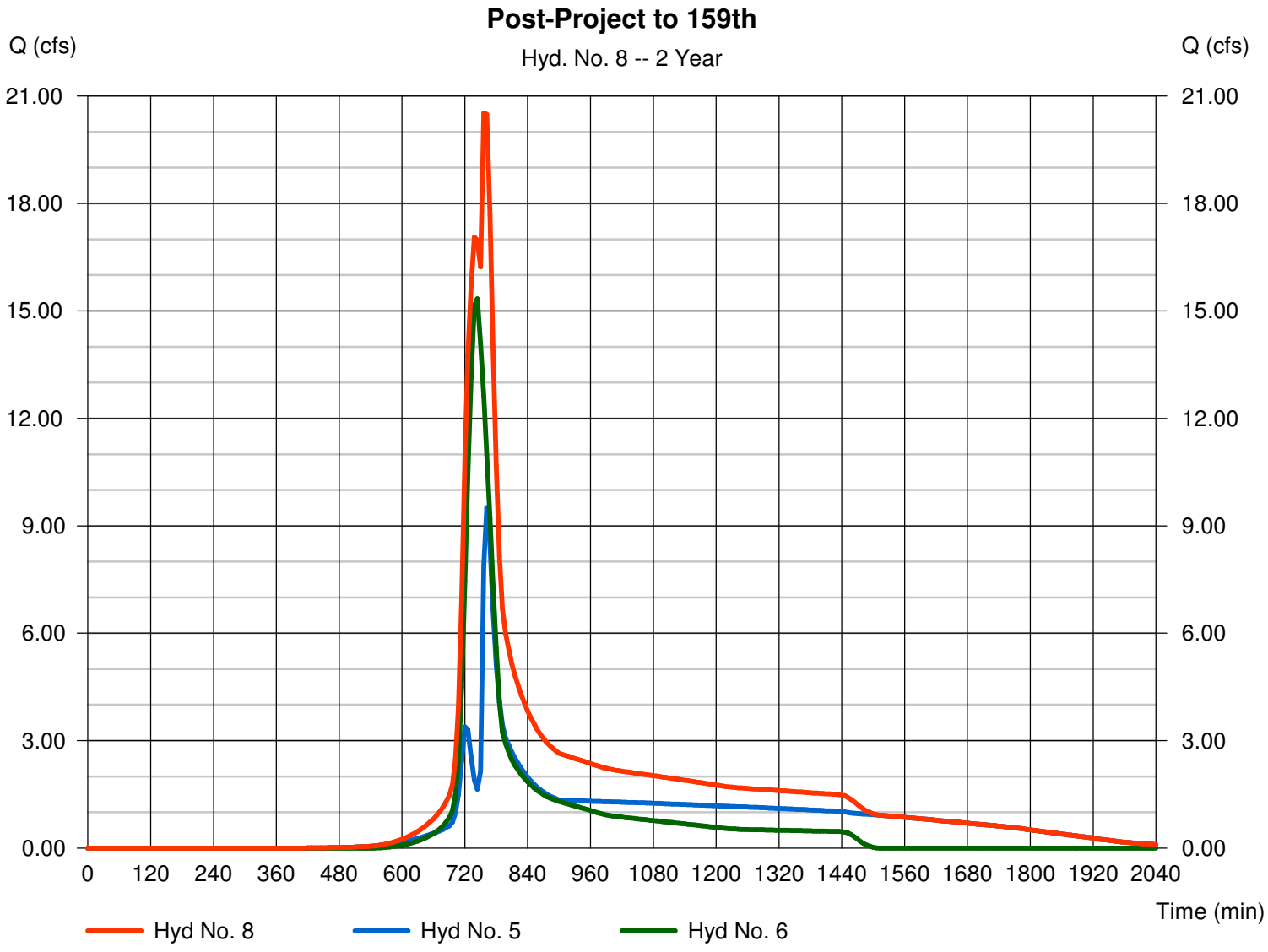


Hydrograph Report

Hyd. No. 8

Post-Project to 159th

Hydrograph type	= Combine	Peak discharge	= 20.53 cfs
Storm frequency	= 2 yrs	Time to peak	= 756 min
Time interval	= 6 min	Hyd. volume	= 4.289 acft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 15.200 ac

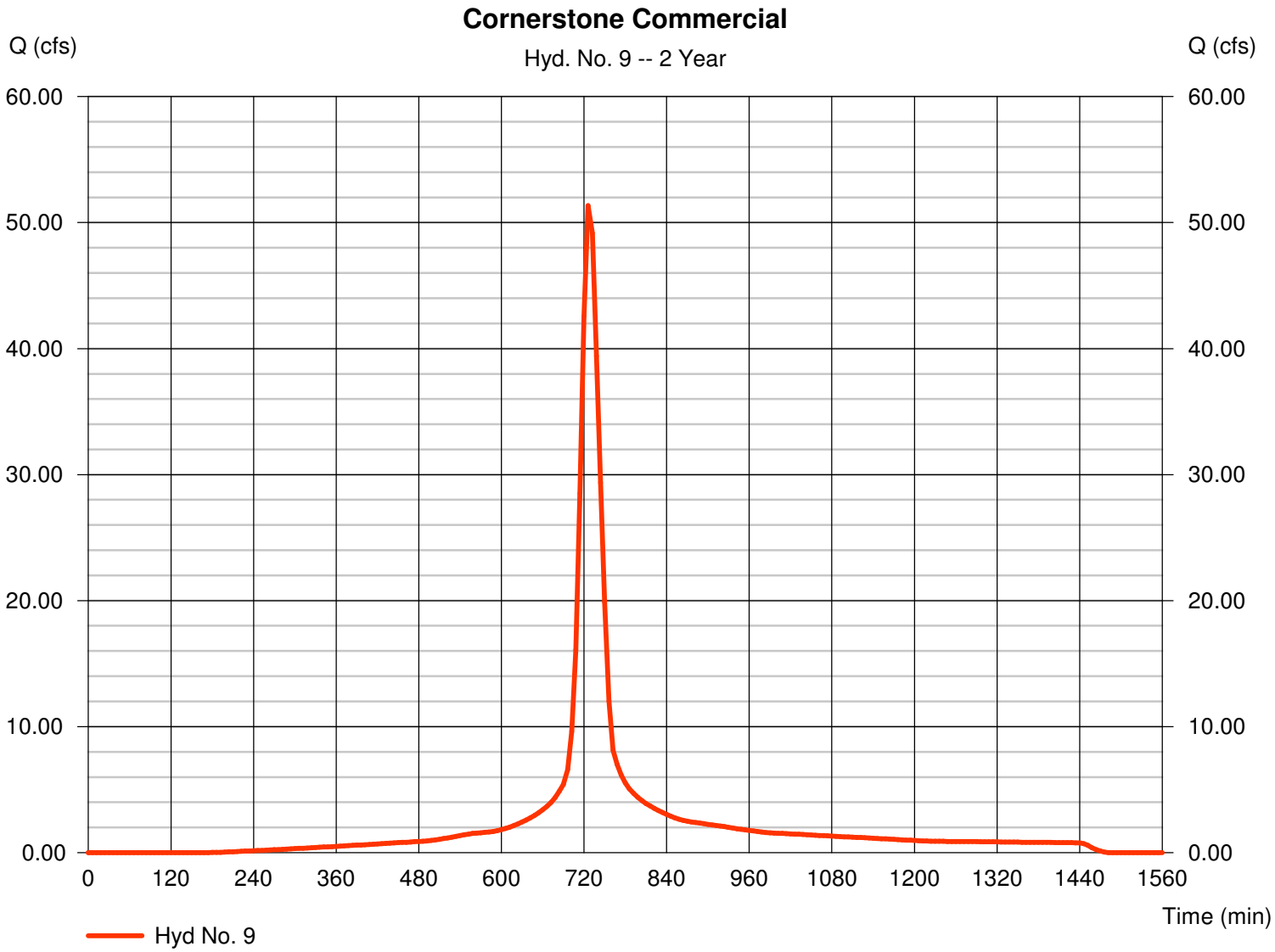


Hydrograph Report

Hyd. No. 9

Cornerstone Commercial

Hydrograph type	=	SCS Runoff	Peak discharge	=	51.36 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	6 min	Hyd. volume	=	4.963 acft
Drainage area	=	20.400 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	21.90 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

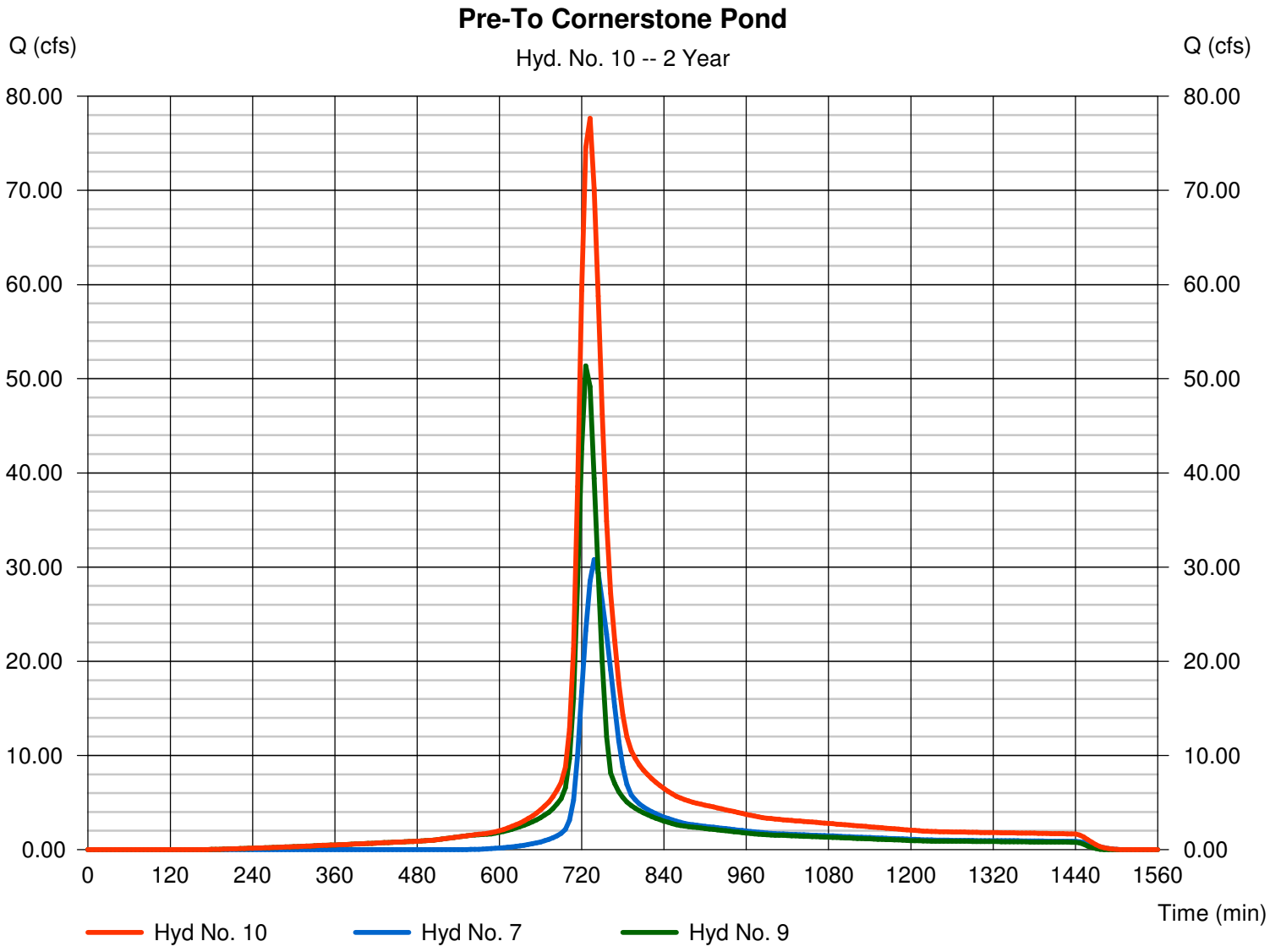


Hydrograph Report

Hyd. No. 10

Pre-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 77.67 cfs
Storm frequency	= 2 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 8.786 acft
Inflow hyds.	= 7, 9	Contrib. drain. area	= 20.400 ac

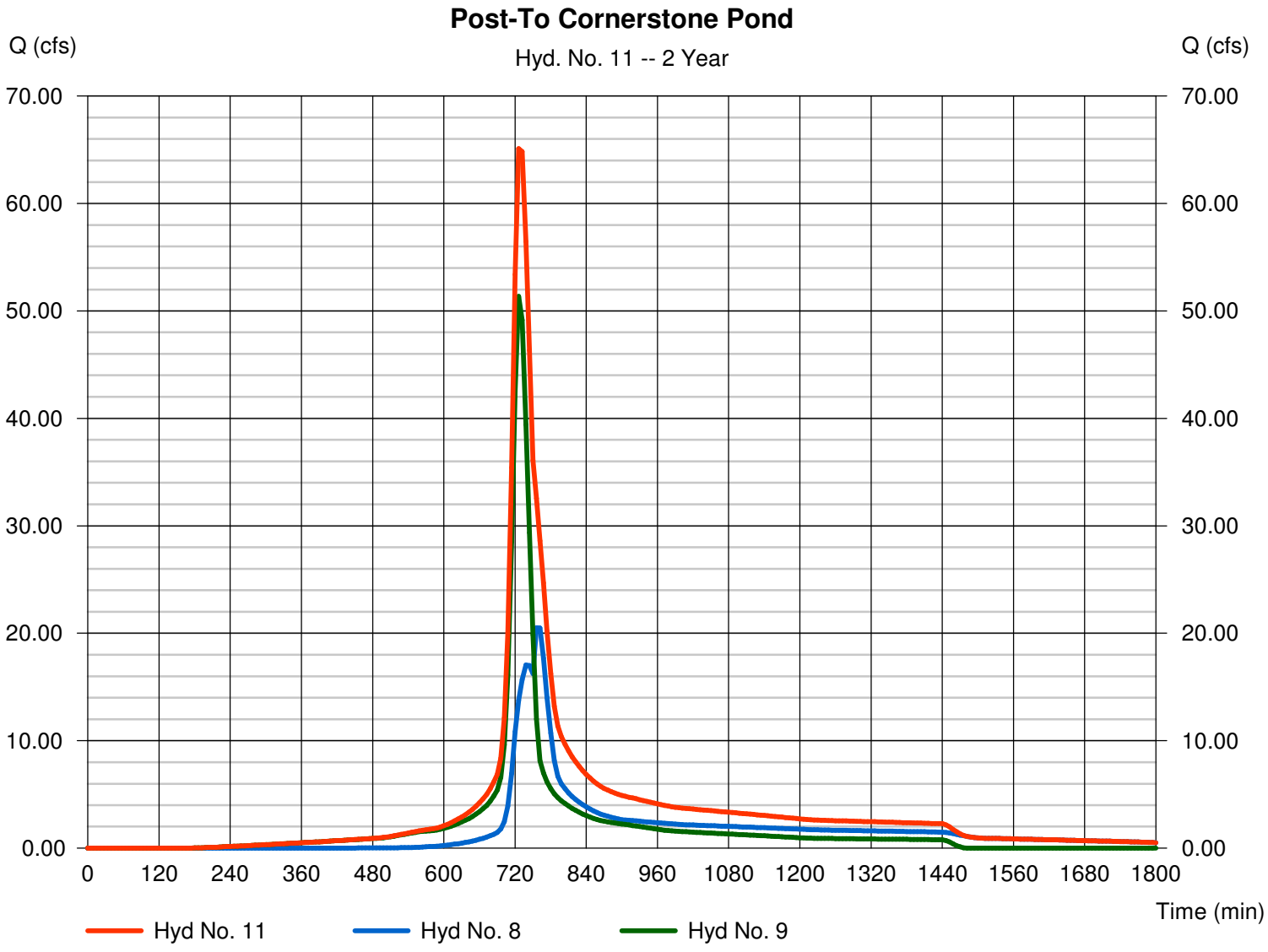


Hydrograph Report

Hyd. No. 11

Post-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 65.10 cfs
Storm frequency	= 2 yrs	Time to peak	= 726 min
Time interval	= 6 min	Hyd. volume	= 9.252 acft
Inflow hyds.	= 8, 9	Contrib. drain. area	= 20.400 ac

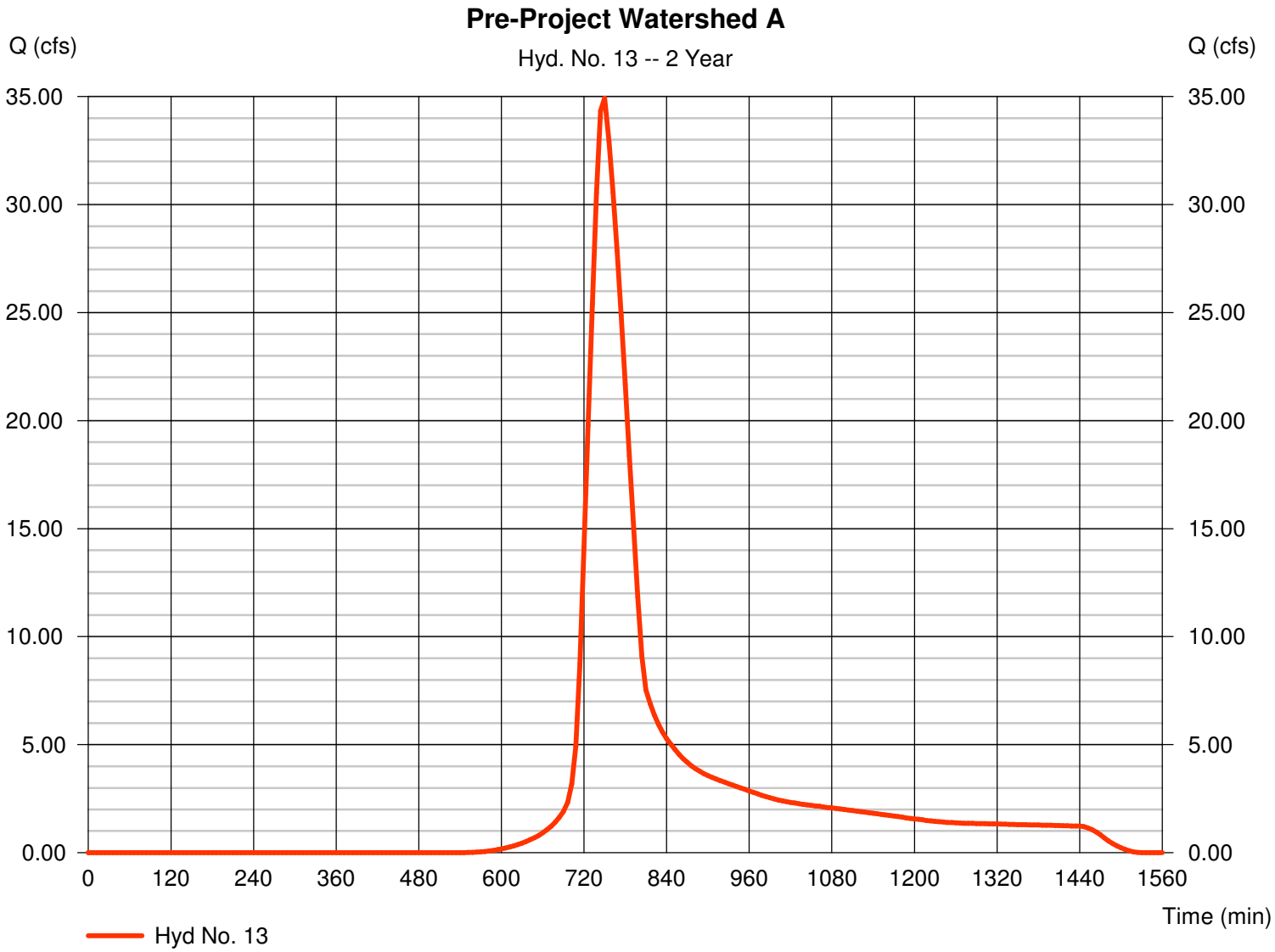


Hydrograph Report

Hyd. No. 13

Pre-Project Watershed A

Hydrograph type	=	SCS Runoff	Peak discharge	=	34.92 cfs
Storm frequency	=	2 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	5.280 acft
Drainage area	=	39.100 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	54.60 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

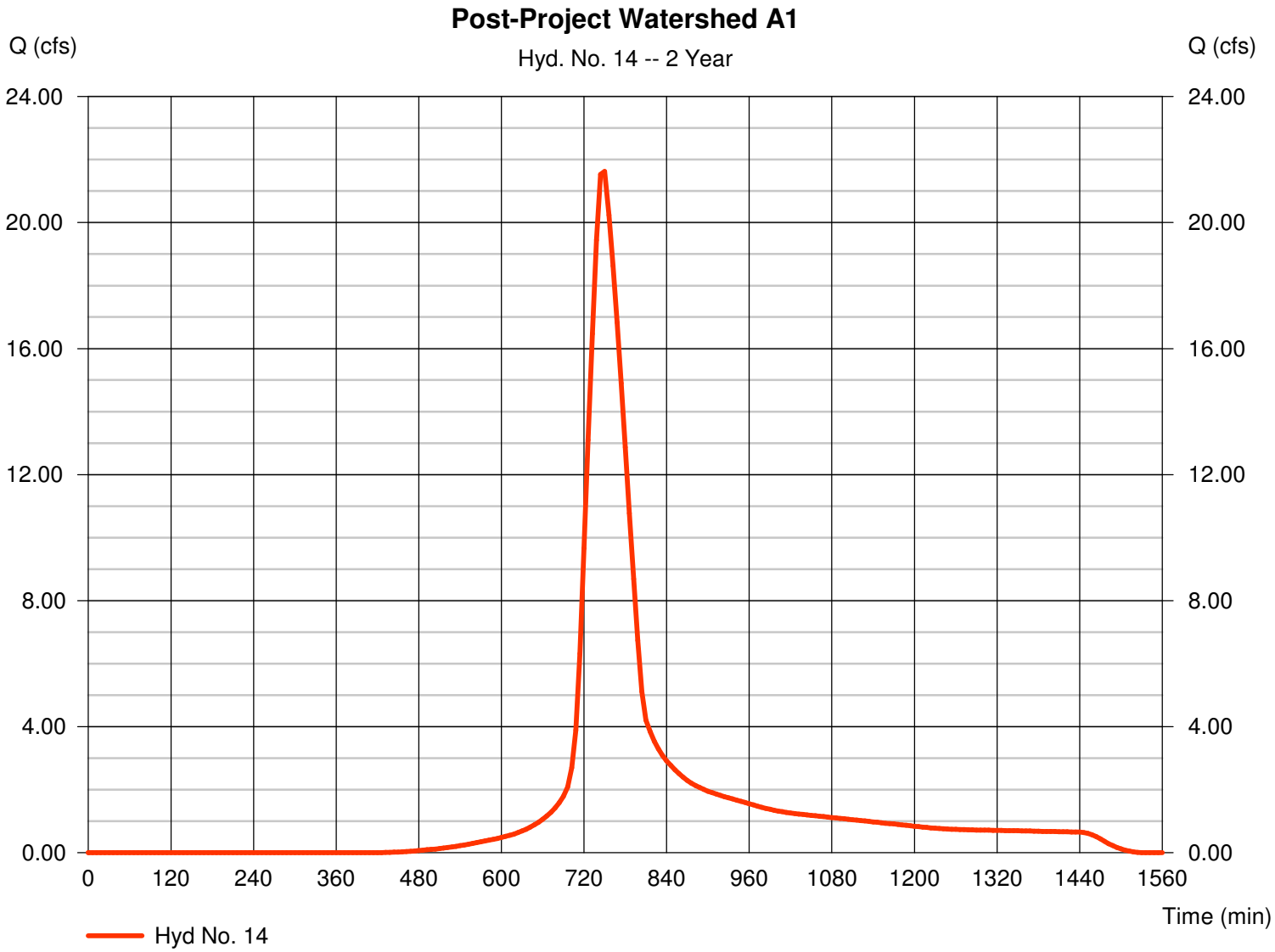


Hydrograph Report

Hyd. No. 14

Post-Project Watershed A1

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.63 cfs
Storm frequency	=	2 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	3.225 acft
Drainage area	=	18.600 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	55.80 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



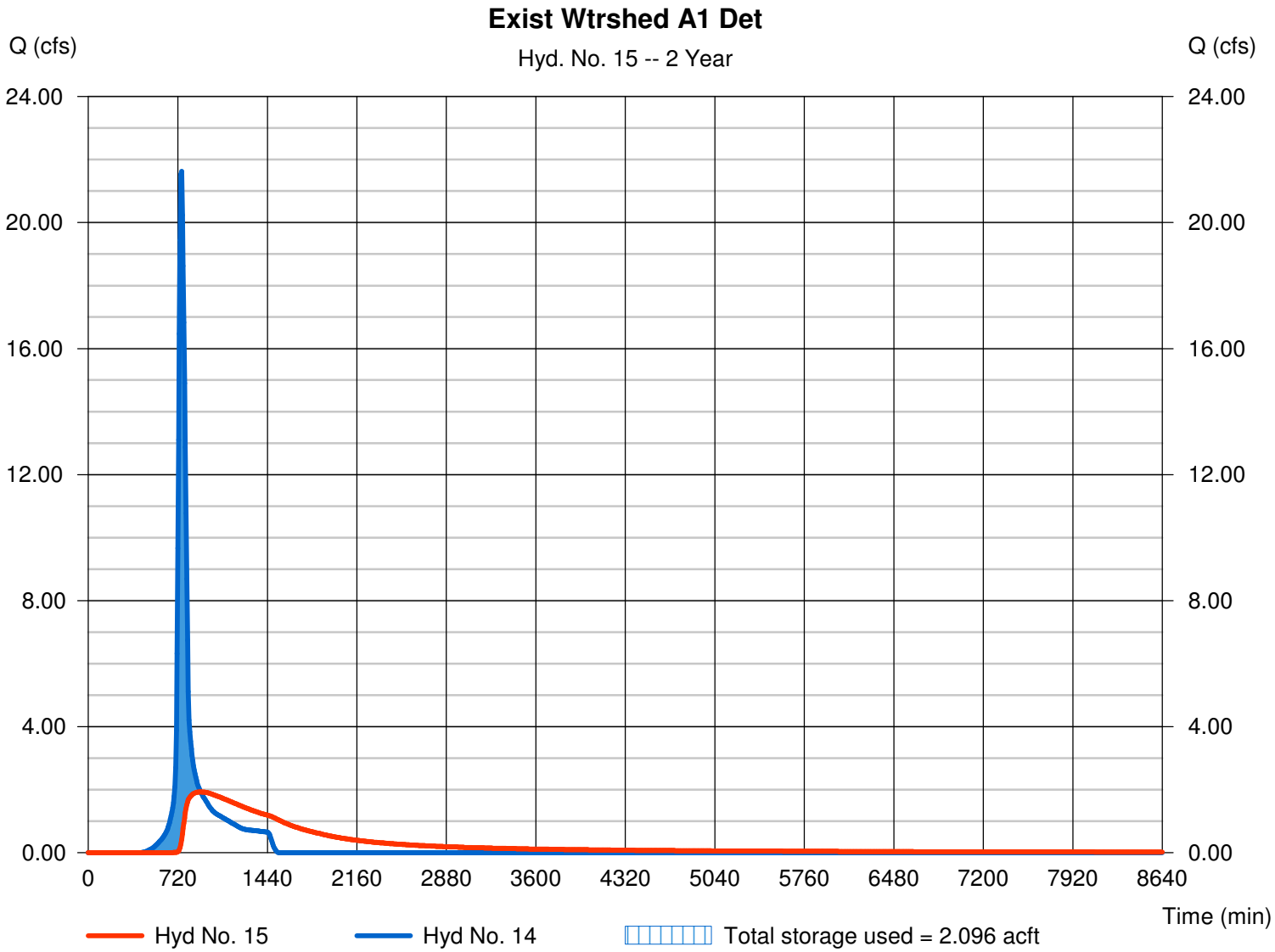
Hydrograph Report

Hyd. No. 15

Exist Wtrshed A1 Det

Hydrograph type	=	Reservoir	Peak discharge	=	1.928 cfs
Storm frequency	=	2 yrs	Time to peak	=	900 min
Time interval	=	6 min	Hyd. volume	=	3.063 acft
Inflow hyd. No.	=	14 - Post-Project Watershed A1	Max. Elevation	=	1367.87 ft
Reservoir name	=	Existing Detention Pond	Max. Storage	=	2.096 acft

Storage Indication method used.



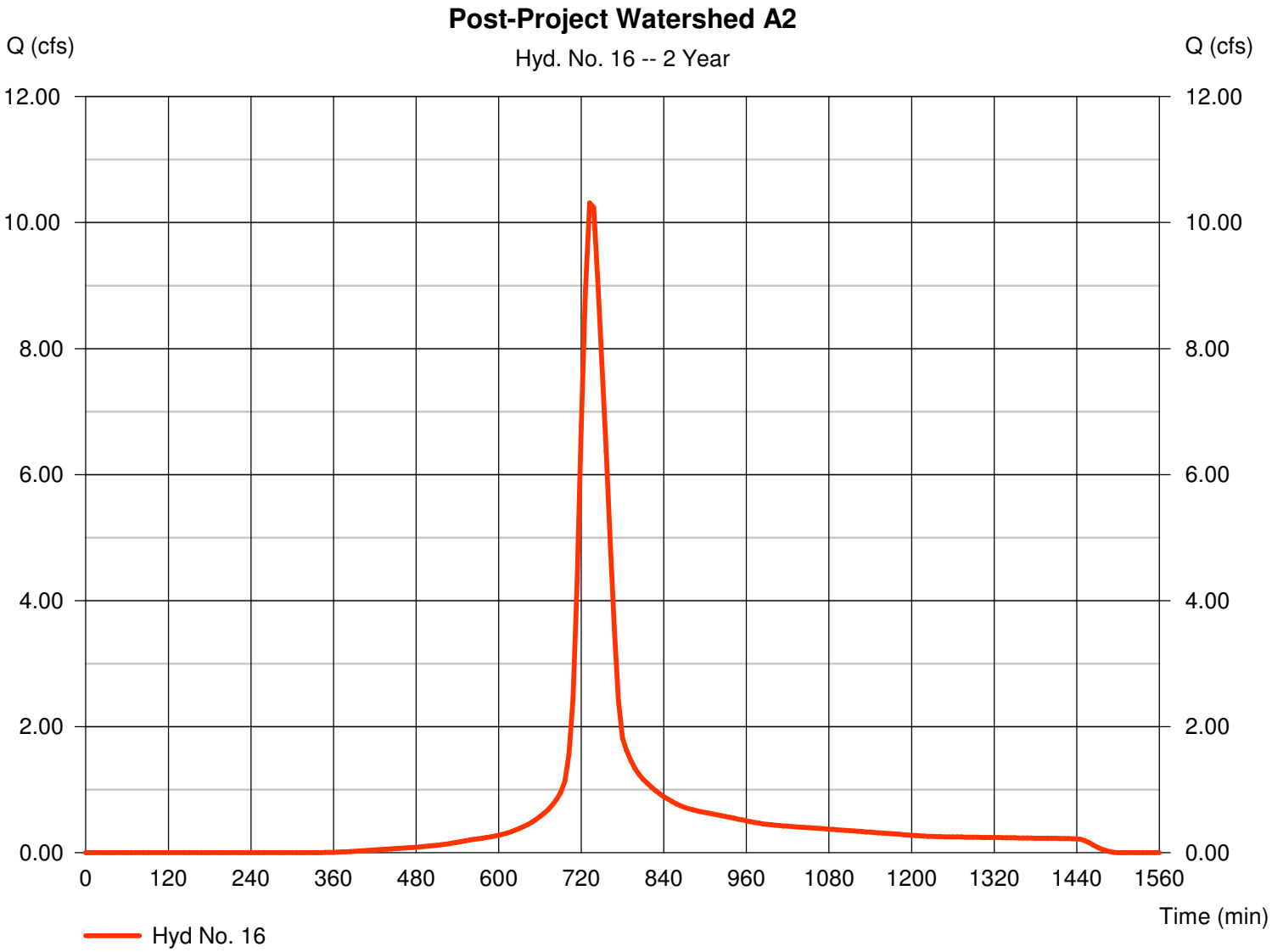
Hydrograph Report

Hyd. No. 16

Post-Project Watershed A2

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.31 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	1.190 acft
Drainage area	=	5.900 ac	Curve number	=	89.1*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(4.000 x 86) + (1.900 x 80)] / 5.900



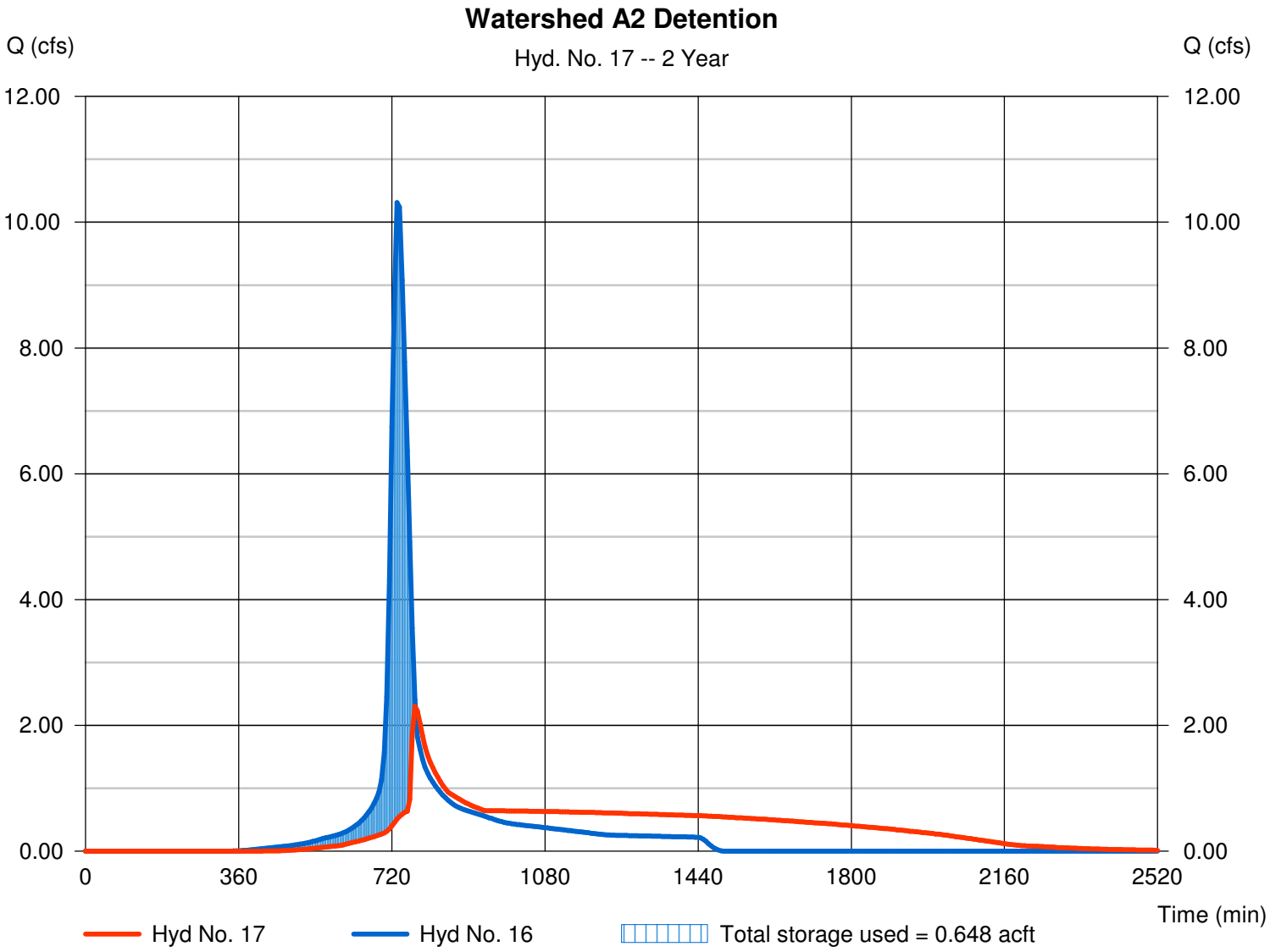
Hydrograph Report

Hyd. No. 17

Watershed A2 Detention

Hydrograph type	=	Reservoir	Peak discharge	=	2.304 cfs
Storm frequency	=	2 yrs	Time to peak	=	774 min
Time interval	=	6 min	Hyd. volume	=	1.189 acft
Inflow hyd. No.	=	16 - Post-Project Watershed A2	Max. Elevation	=	1368.30 ft
Reservoir name	=	Watershed A2 Detention	Max. Storage	=	0.648 acft

Storage Indication method used.

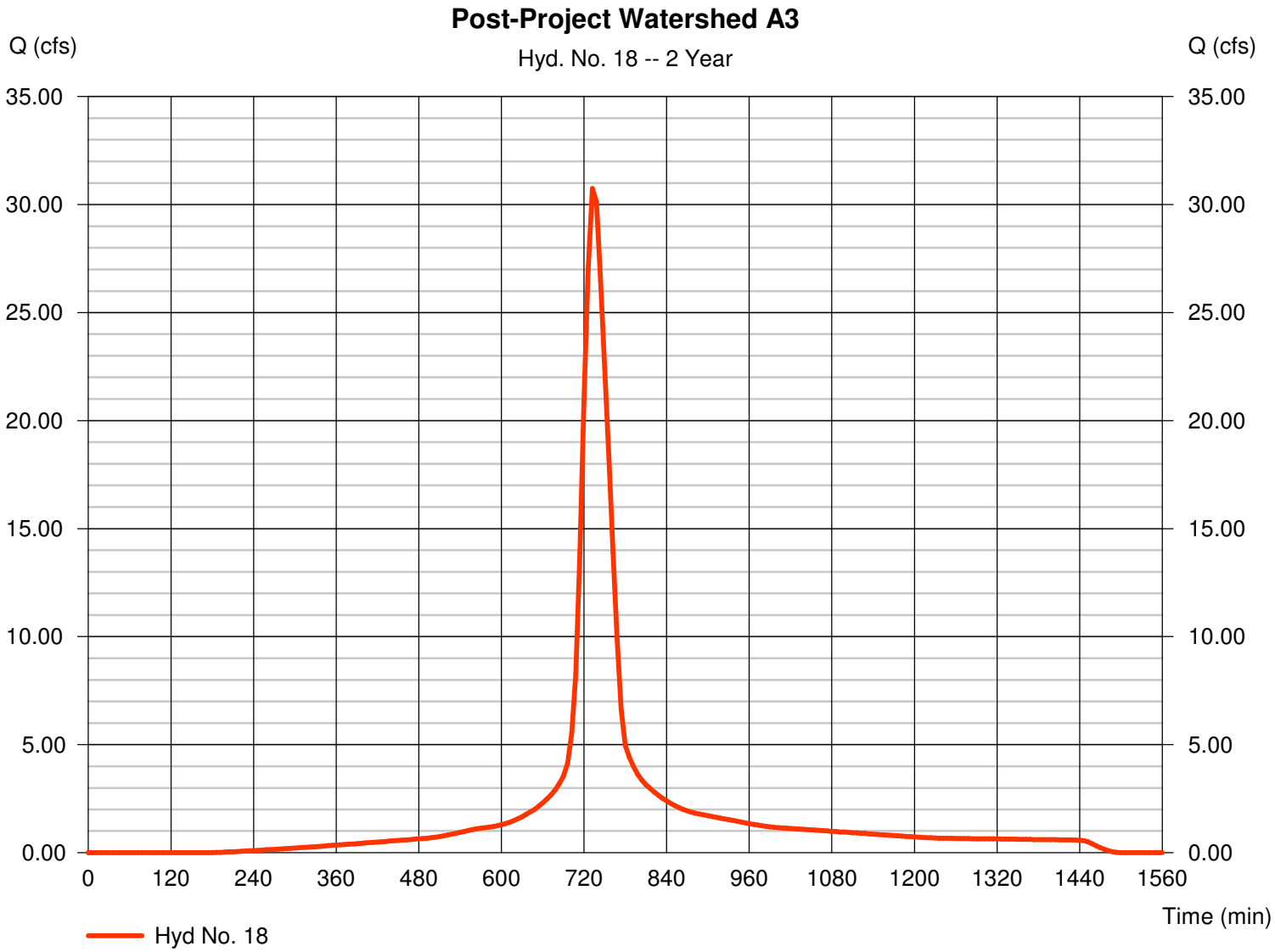


Hydrograph Report

Hyd. No. 18

Post-Project Watershed A3

Hydrograph type	=	SCS Runoff	Peak discharge	=	30.73 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	3.663 acft
Drainage area	=	14.600 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	3.48 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

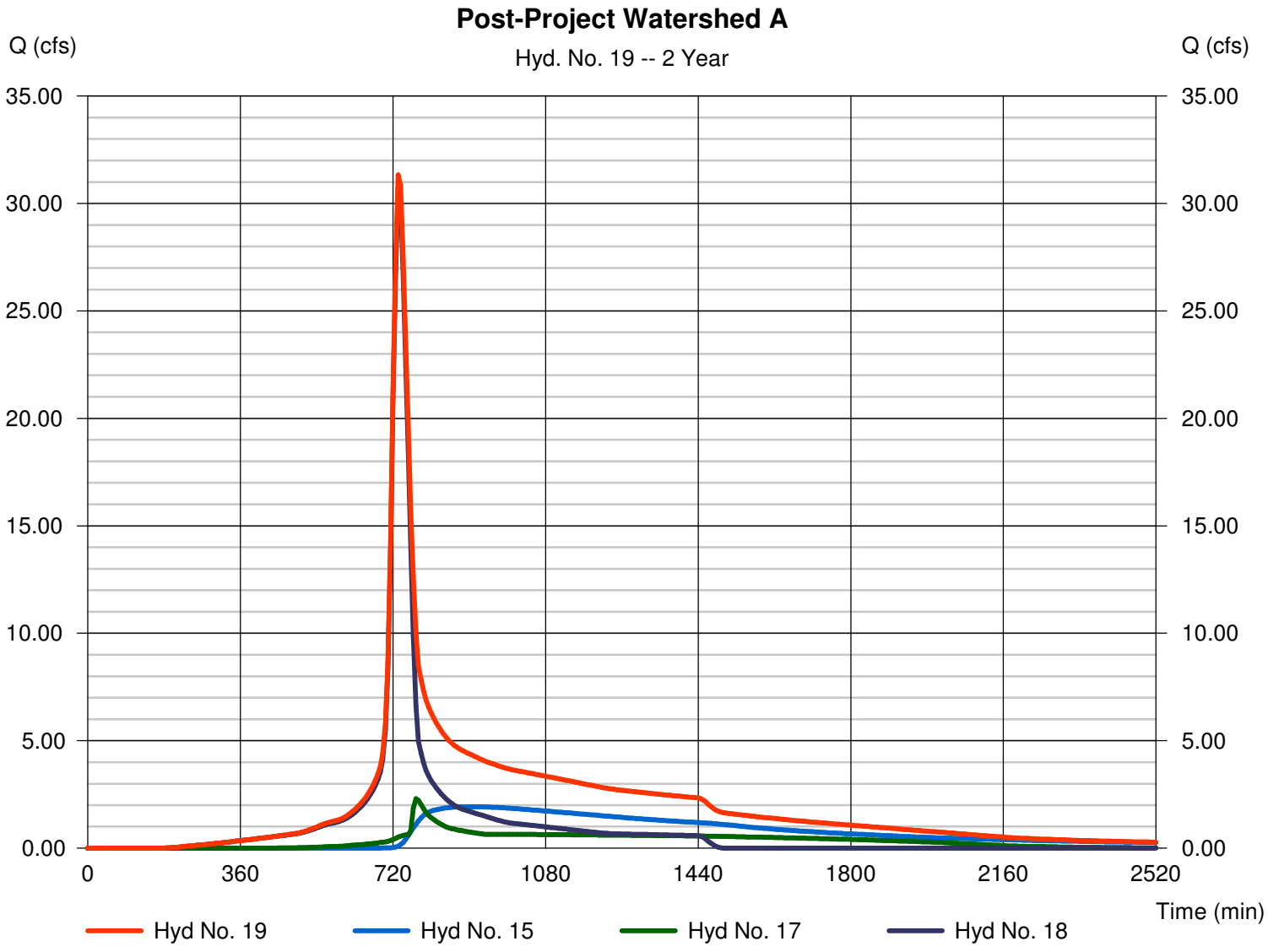


Hydrograph Report

Hyd. No. 19

Post-Project Watershed A

Hydrograph type	= Combine	Peak discharge	= 31.34 cfs
Storm frequency	= 2 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 7.915 acft
Inflow hyds.	= 15, 17, 18	Contrib. drain. area	= 14.600 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

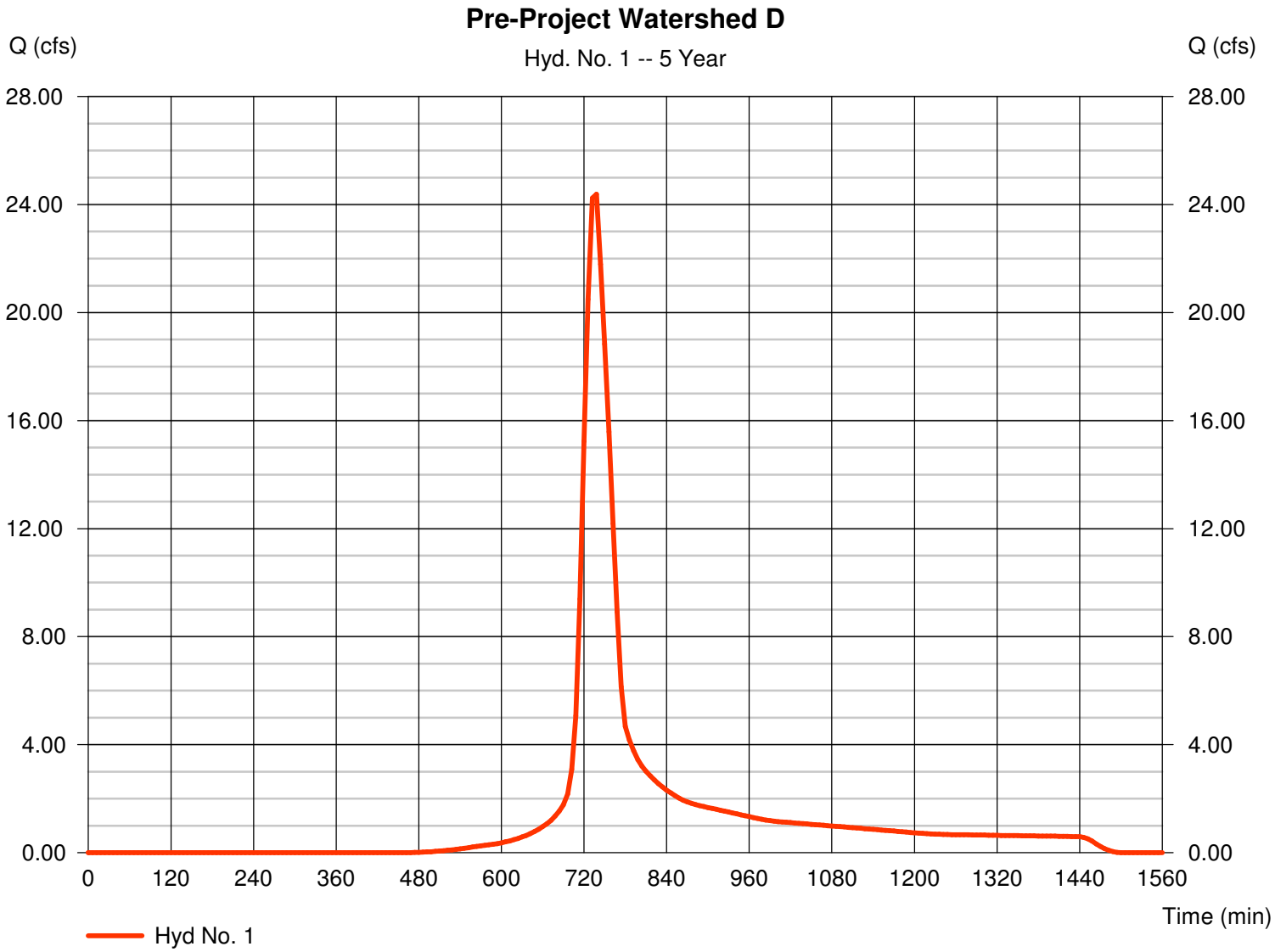
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	24.38	6	738	2.815	------	------	------	Pre-Project Watershed D
2	SCS Runoff	26.43	6	732	3.055	------	------	------	Post-Project Watershed D1
3	SCS Runoff	3.810	6	720	0.270	------	------	------	Post-Project Watershed D2
4	Reservoir	21.35	6	750	3.054	2	1366.34	1.05	Watershed D Detention
5	Combine	21.89	6	750	3.324	3, 4	------	------	Post-Project Watershed D
6	SCS Runoff	23.92	6	744	3.093	------	------	------	Offsite to the North
7	Combine	48.24	6	738	5.908	1, 6	------	------	Pre-Project to 159th
8	Combine	45.04	6	744	6.417	5, 6,	------	------	Post-Project to 159th
9	SCS Runoff	68.88	6	726	6.756	------	------	------	Cornerstone Commercial
10	Combine	110.95	6	732	12.664	7, 9	------	------	Pre-To Cornerstone Pond
11	Combine	90.32	6	726	13.173	8, 9,	------	------	Post-To Cornerstone Pond
13	SCS Runoff	54.62	6	750	8.160	------	------	------	Pre-Project Watershed A
14	SCS Runoff	31.61	6	744	4.726	------	------	------	Post-Project Watershed A1
15	Reservoir	9.736	6	798	4.564	14	1368.38	2.67	Exist Wtrshed A1 Det
16	SCS Runoff	14.63	6	732	1.700	------	------	------	Post-Project Watershed A2
17	Reservoir	9.103	6	756	1.699	16	1368.49	0.731	Watershed A2 Detention
18	SCS Runoff	41.25	6	732	4.986	------	------	------	Post-Project Watershed A3
19	Combine	42.15	6	732	11.249	15, 17, 18	------	------	Post-Project Watershed A

Hydrograph Report

Hyd. No. 1

Pre-Project Watershed D

Hydrograph type	=	SCS Runoff	Peak discharge	=	24.38 cfs
Storm frequency	=	5 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	2.815 acft
Drainage area	=	13.080 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.20 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

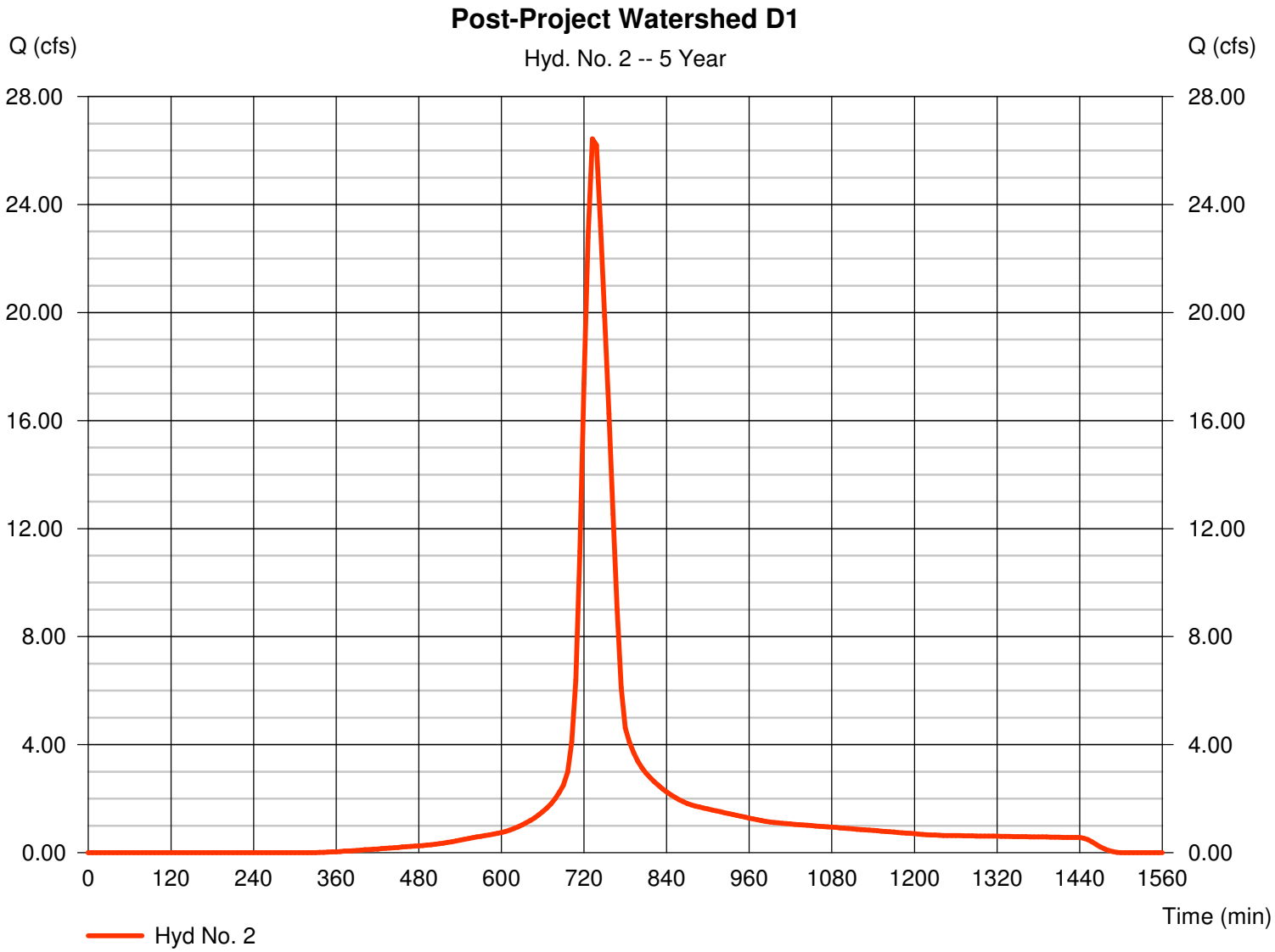


Hydrograph Report

Hyd. No. 2

Post-Project Watershed D1

Hydrograph type	=	SCS Runoff	Peak discharge	=	26.43 cfs
Storm frequency	=	5 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	3.055 acft
Drainage area	=	11.300 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	36.80 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

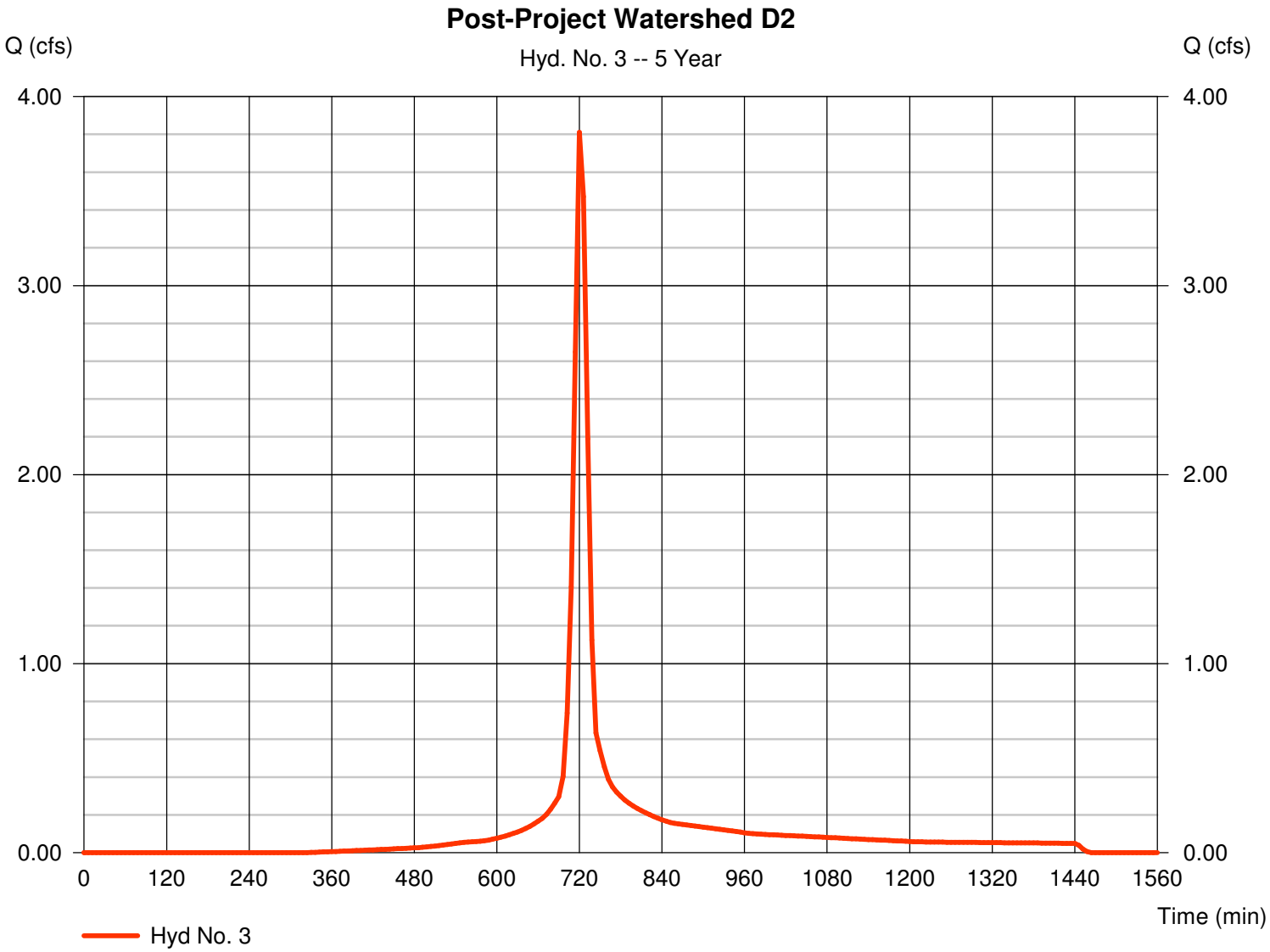


Hydrograph Report

Hyd. No. 3

Post-Project Watershed D2

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.810 cfs
Storm frequency	=	5 yrs	Time to peak	=	720 min
Time interval	=	6 min	Hyd. volume	=	0.270 acft
Drainage area	=	1.100 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



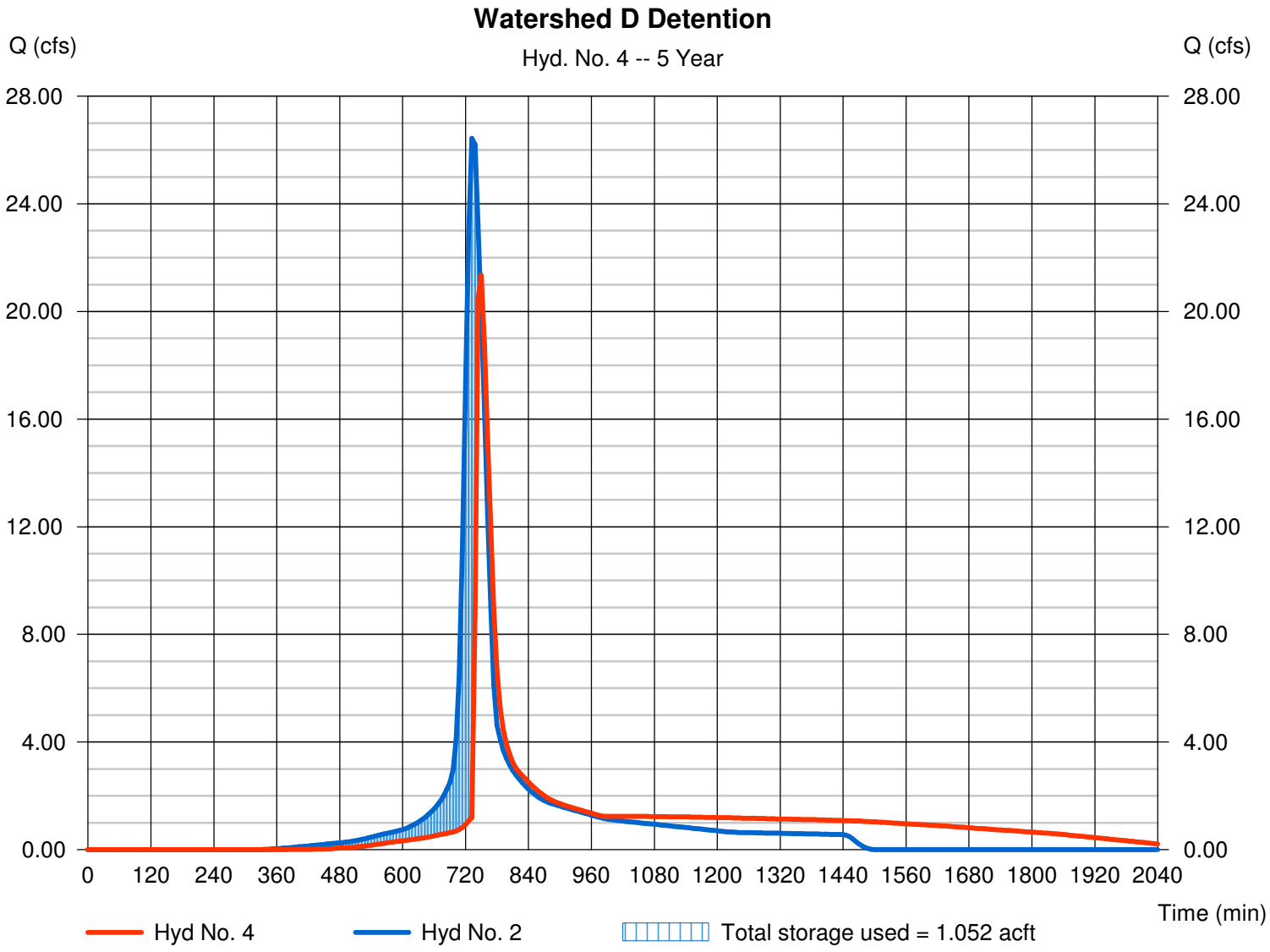
Hydrograph Report

Hyd. No. 4

Watershed D Detention

Hydrograph type	=	Reservoir	Peak discharge	=	21.35 cfs
Storm frequency	=	5 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	3.054 acft
Inflow hyd. No.	=	2 - Post-Project Watershed D1	Max. Elevation	=	1366.34 ft
Reservoir name	=	Watershed D Detention	Max. Storage	=	1.052 acft

Storage Indication method used.

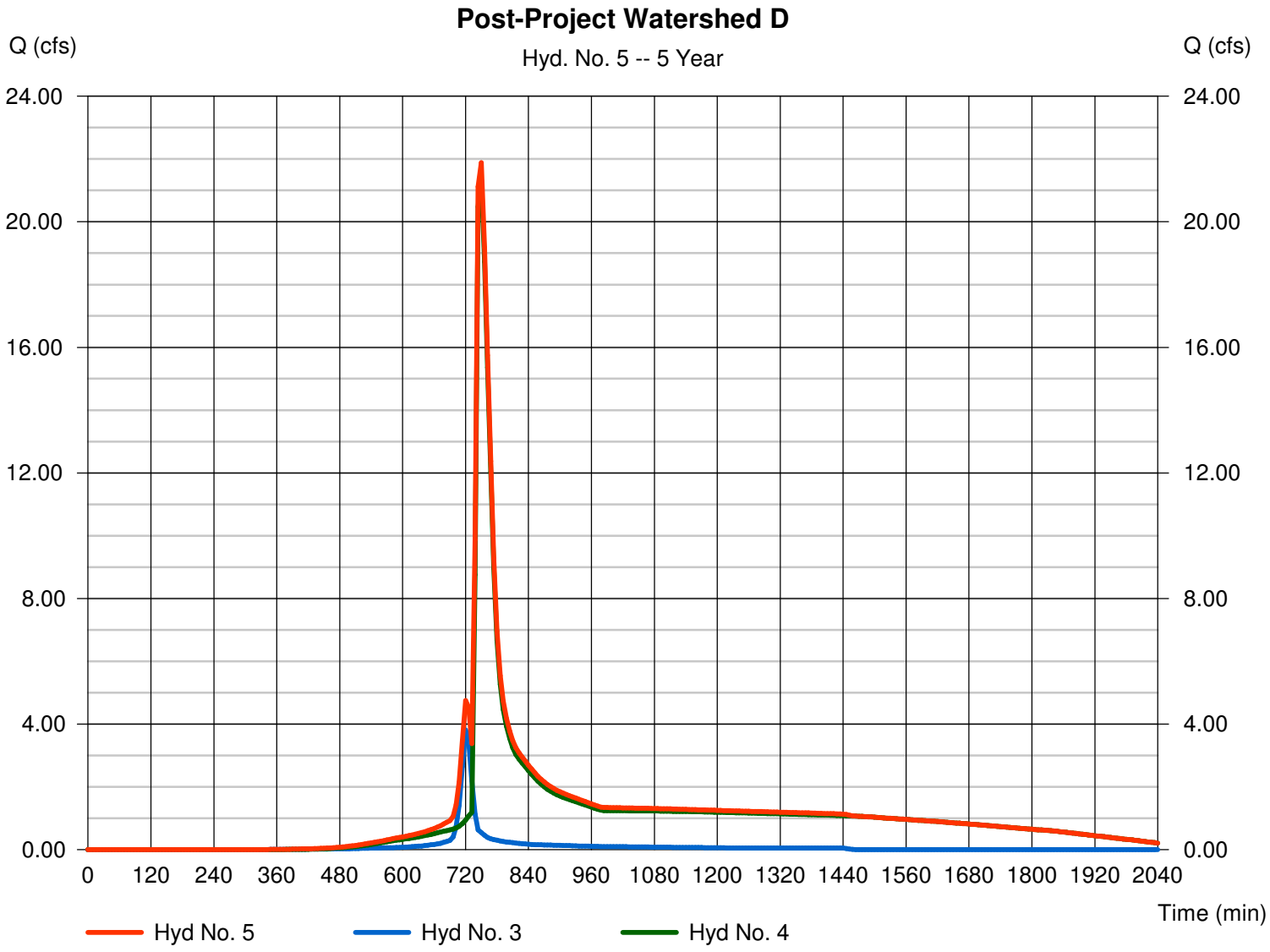


Hydrograph Report

Hyd. No. 5

Post-Project Watershed D

Hydrograph type	= Combine	Peak discharge	= 21.89 cfs
Storm frequency	= 5 yrs	Time to peak	= 750 min
Time interval	= 6 min	Hyd. volume	= 3.324 acft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 1.100 ac

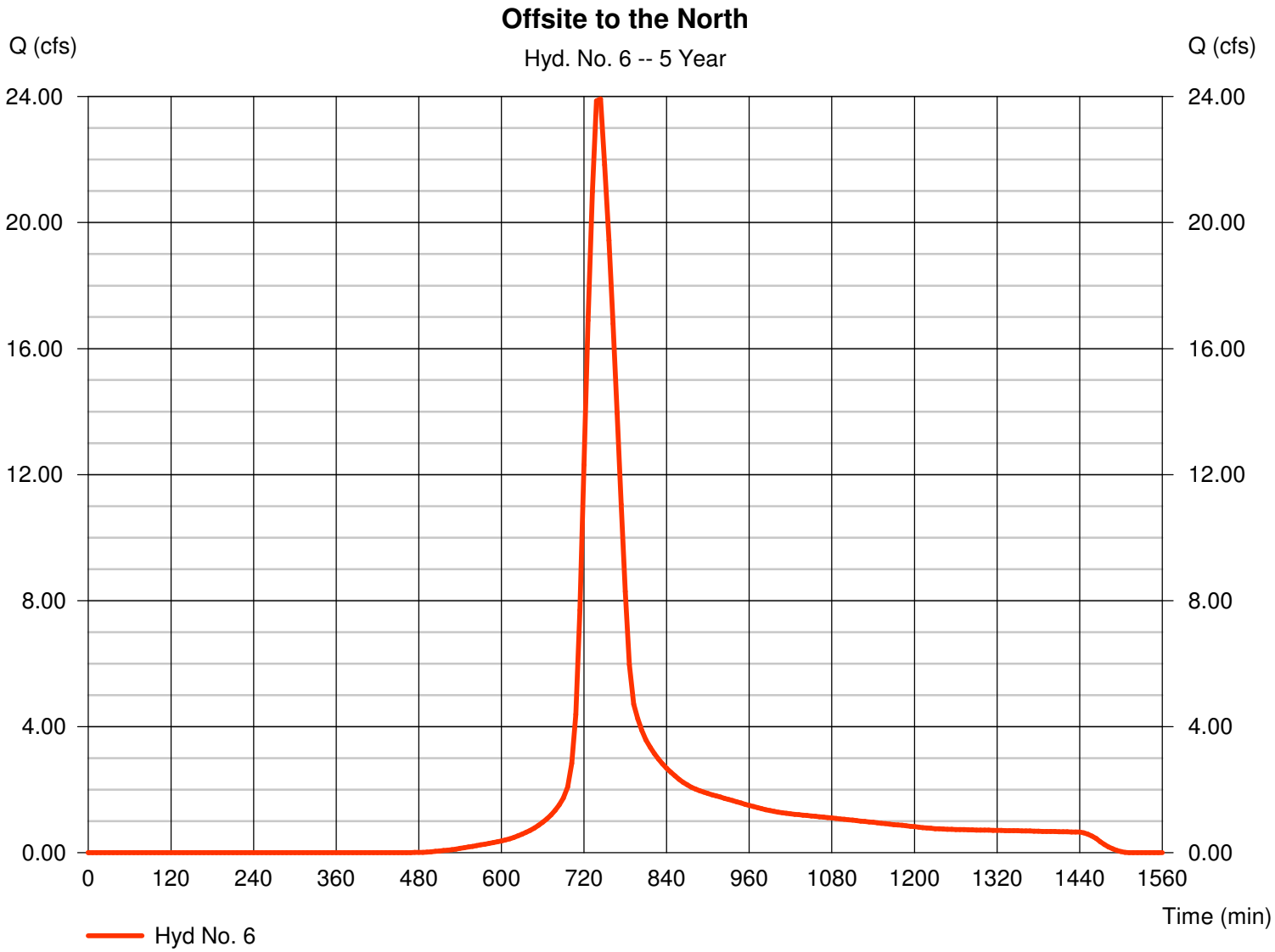


Hydrograph Report

Hyd. No. 6

Offsite to the North

Hydrograph type	=	SCS Runoff	Peak discharge	=	23.92 cfs
Storm frequency	=	5 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	3.093 acft
Drainage area	=	15.200 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.30 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

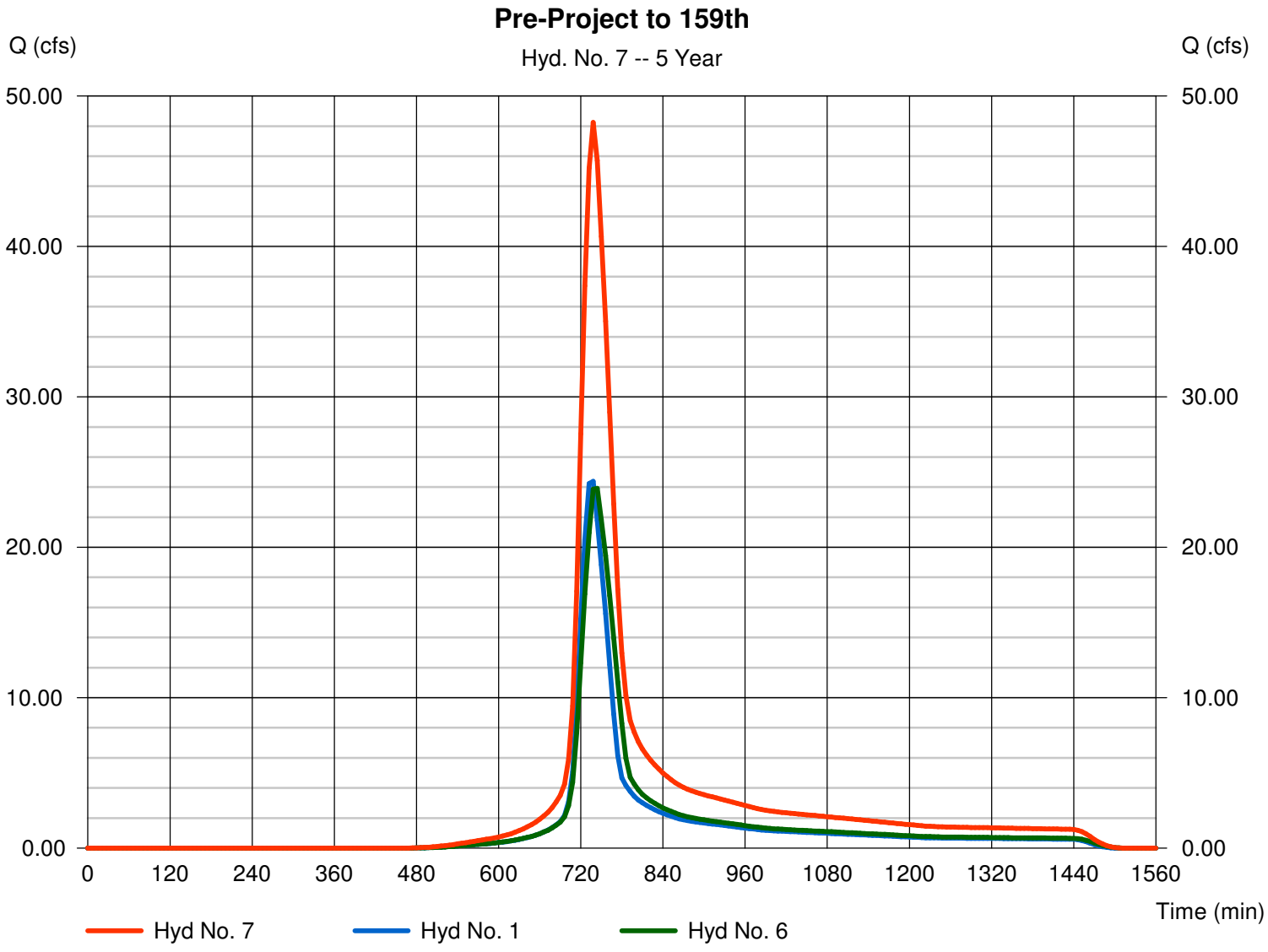


Hydrograph Report

Hyd. No. 7

Pre-Project to 159th

Hydrograph type	= Combine	Peak discharge	= 48.24 cfs
Storm frequency	= 5 yrs	Time to peak	= 738 min
Time interval	= 6 min	Hyd. volume	= 5.908 acft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 28.280 ac

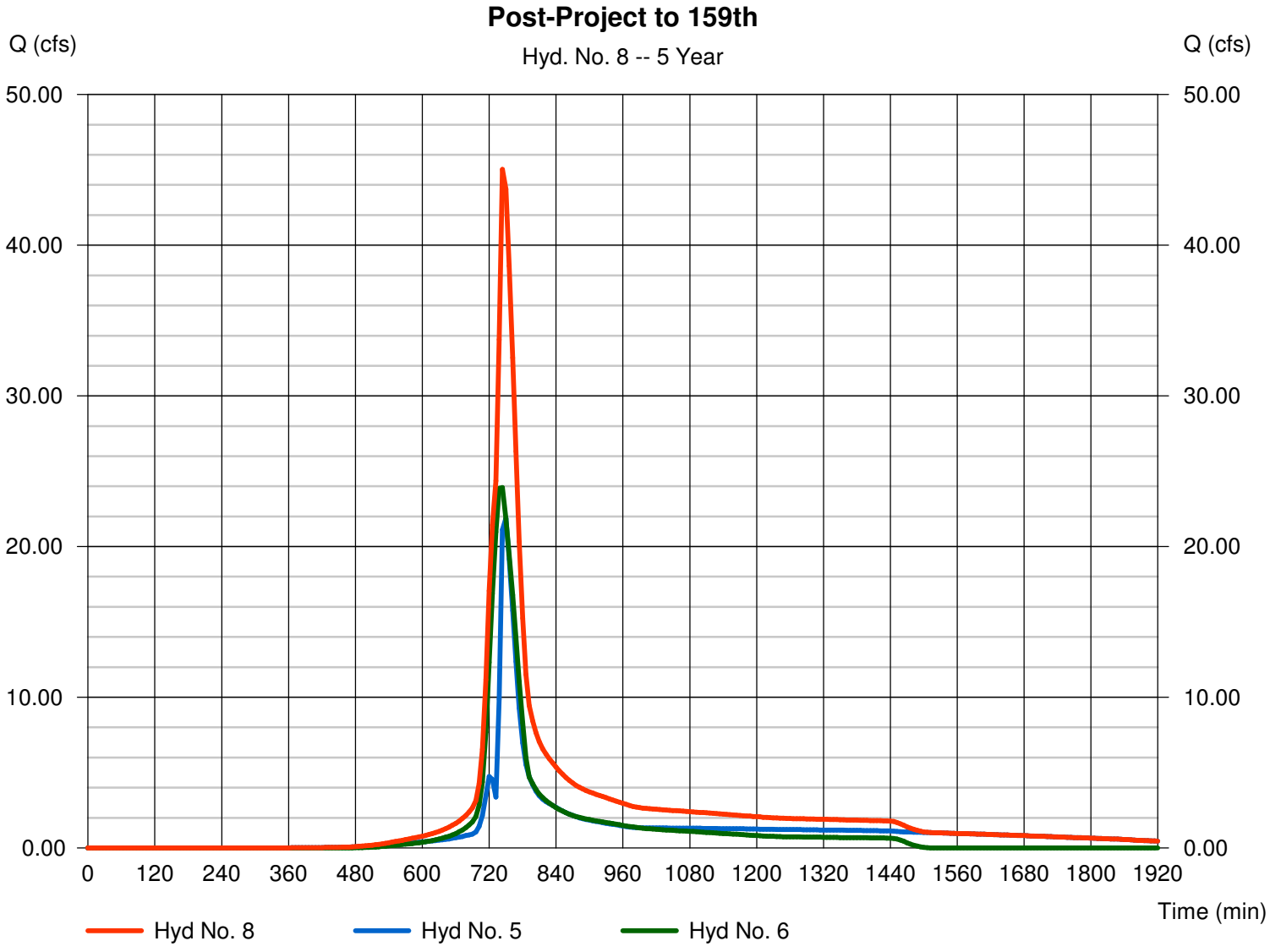


Hydrograph Report

Hyd. No. 8

Post-Project to 159th

Hydrograph type	= Combine	Peak discharge	= 45.04 cfs
Storm frequency	= 5 yrs	Time to peak	= 744 min
Time interval	= 6 min	Hyd. volume	= 6.417 acft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 15.200 ac

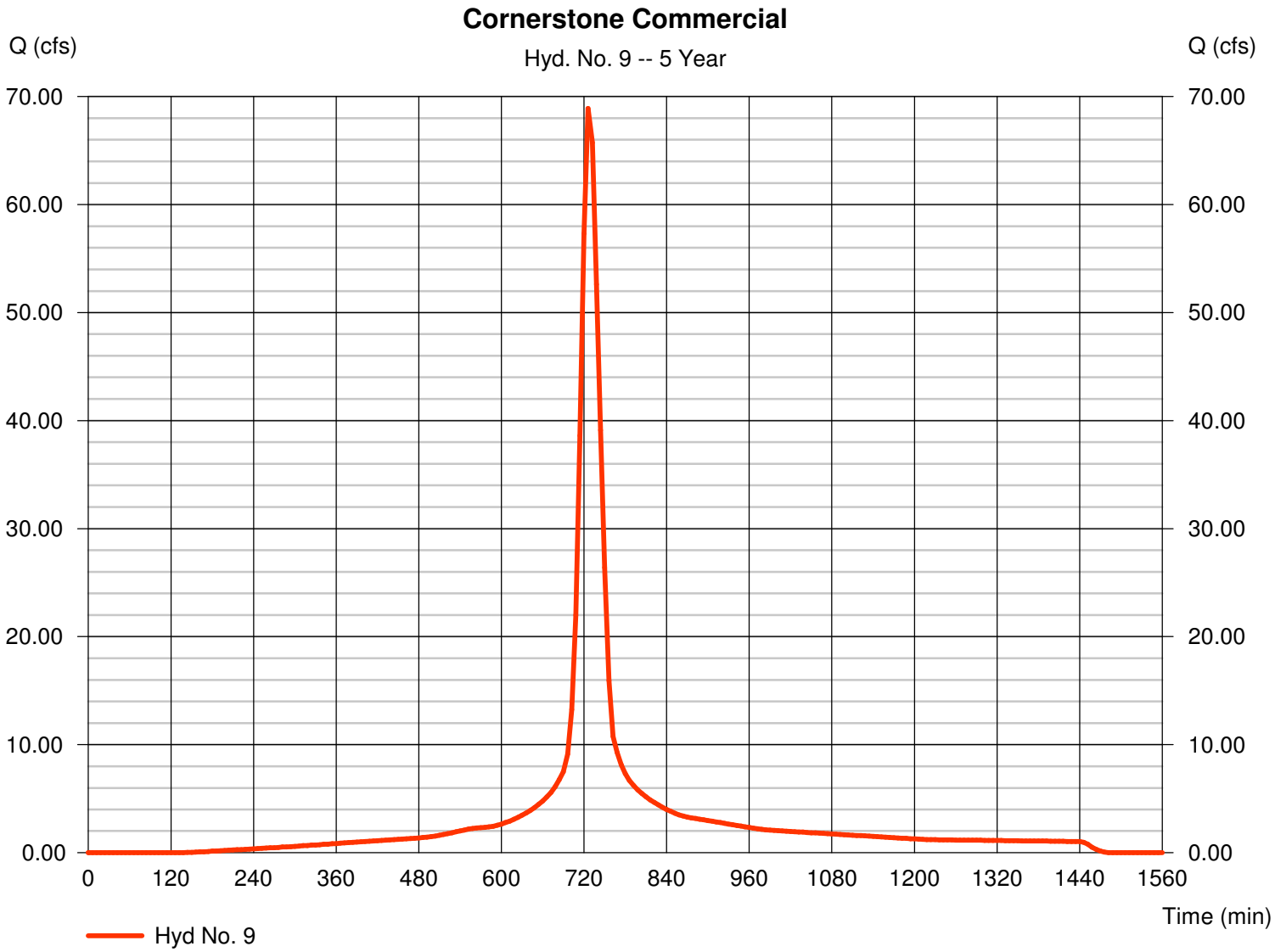


Hydrograph Report

Hyd. No. 9

Cornerstone Commercial

Hydrograph type	=	SCS Runoff	Peak discharge	=	68.88 cfs
Storm frequency	=	5 yrs	Time to peak	=	726 min
Time interval	=	6 min	Hyd. volume	=	6.756 acft
Drainage area	=	20.400 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	21.90 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

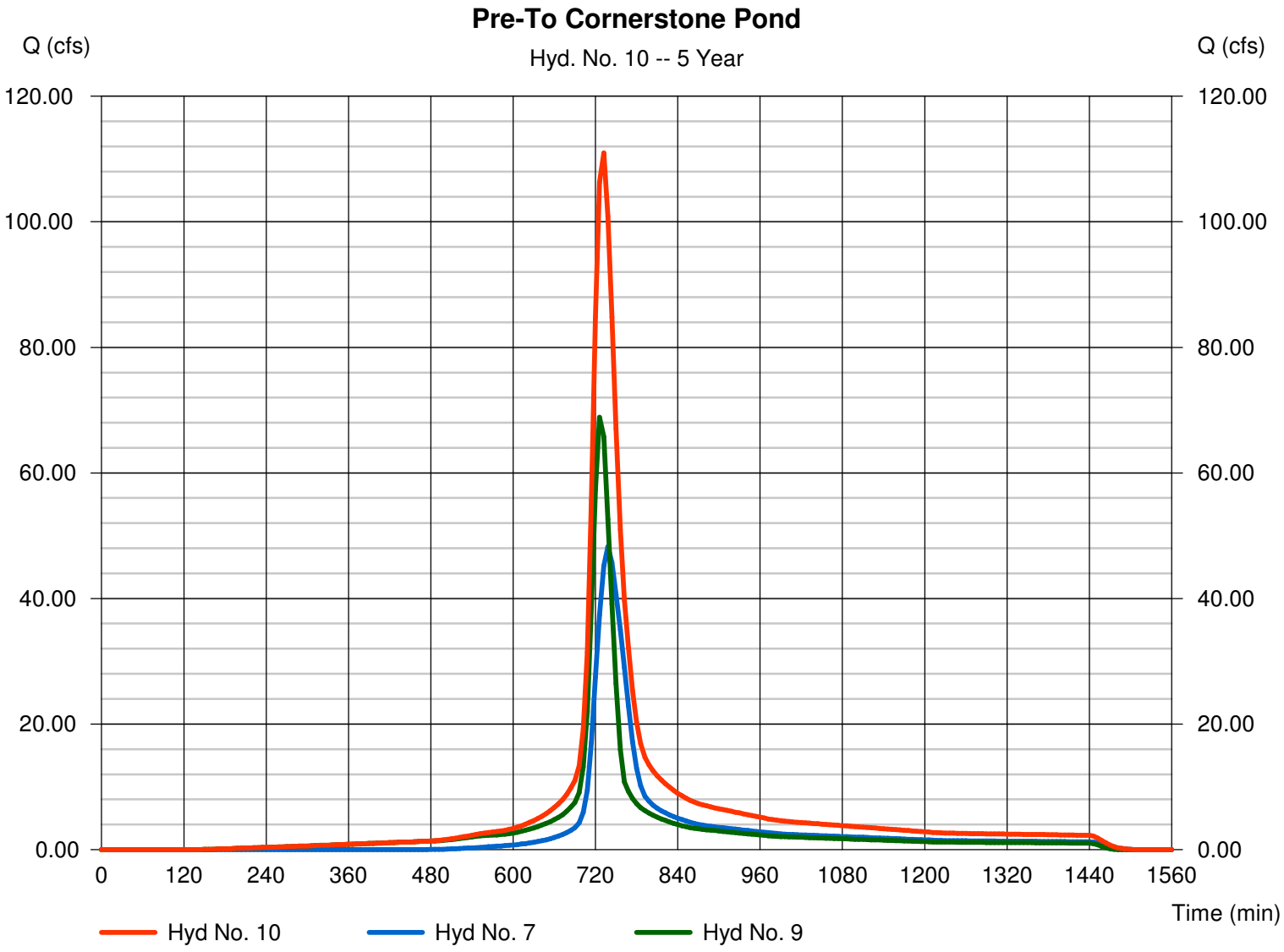


Hydrograph Report

Hyd. No. 10

Pre-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 110.95 cfs
Storm frequency	= 5 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 12.664 acft
Inflow hyds.	= 7, 9	Contrib. drain. area	= 20.400 ac

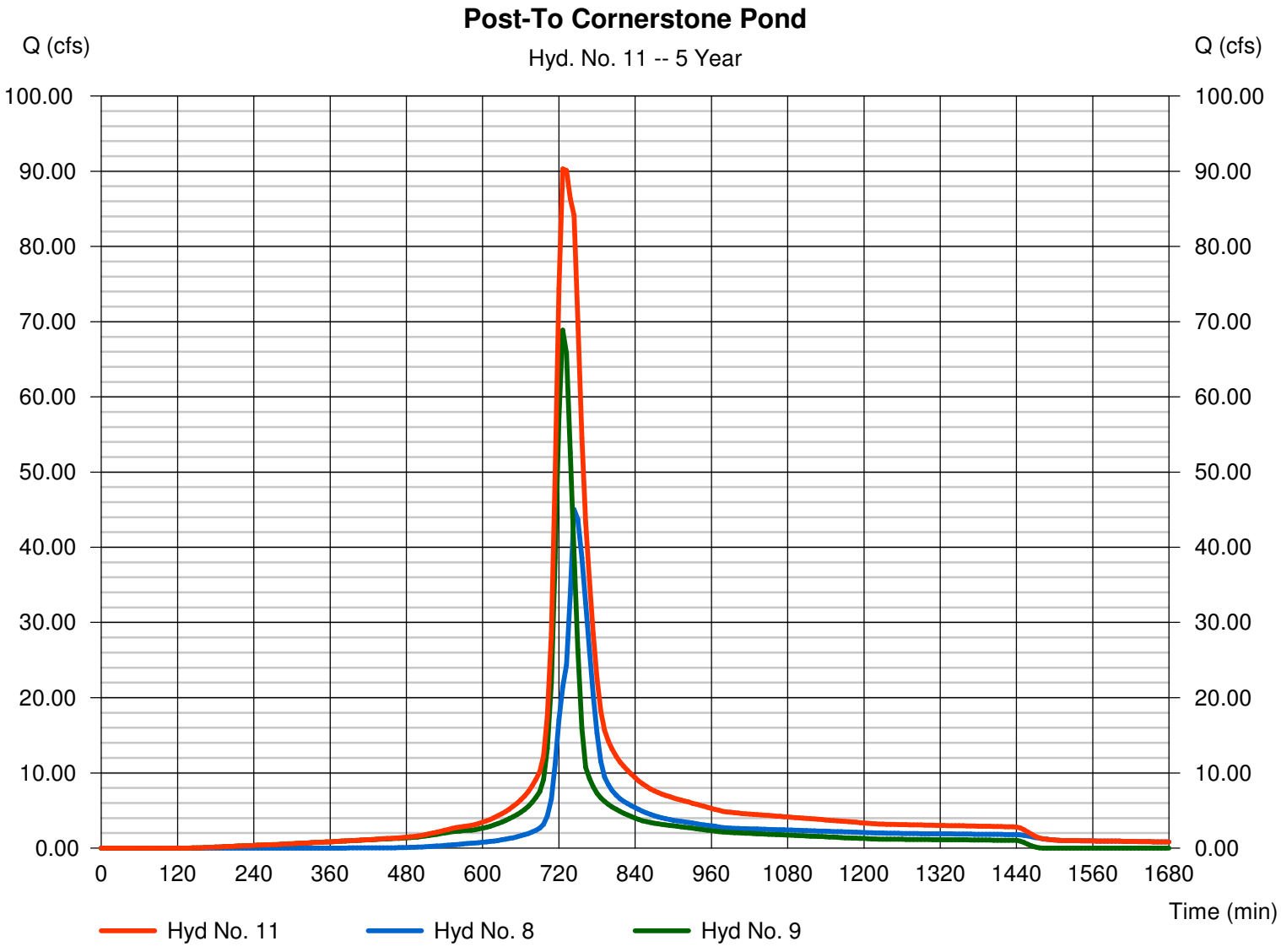


Hydrograph Report

Hyd. No. 11

Post-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 90.32 cfs
Storm frequency	= 5 yrs	Time to peak	= 726 min
Time interval	= 6 min	Hyd. volume	= 13.173 acft
Inflow hyds.	= 8, 9	Contrib. drain. area	= 20.400 ac

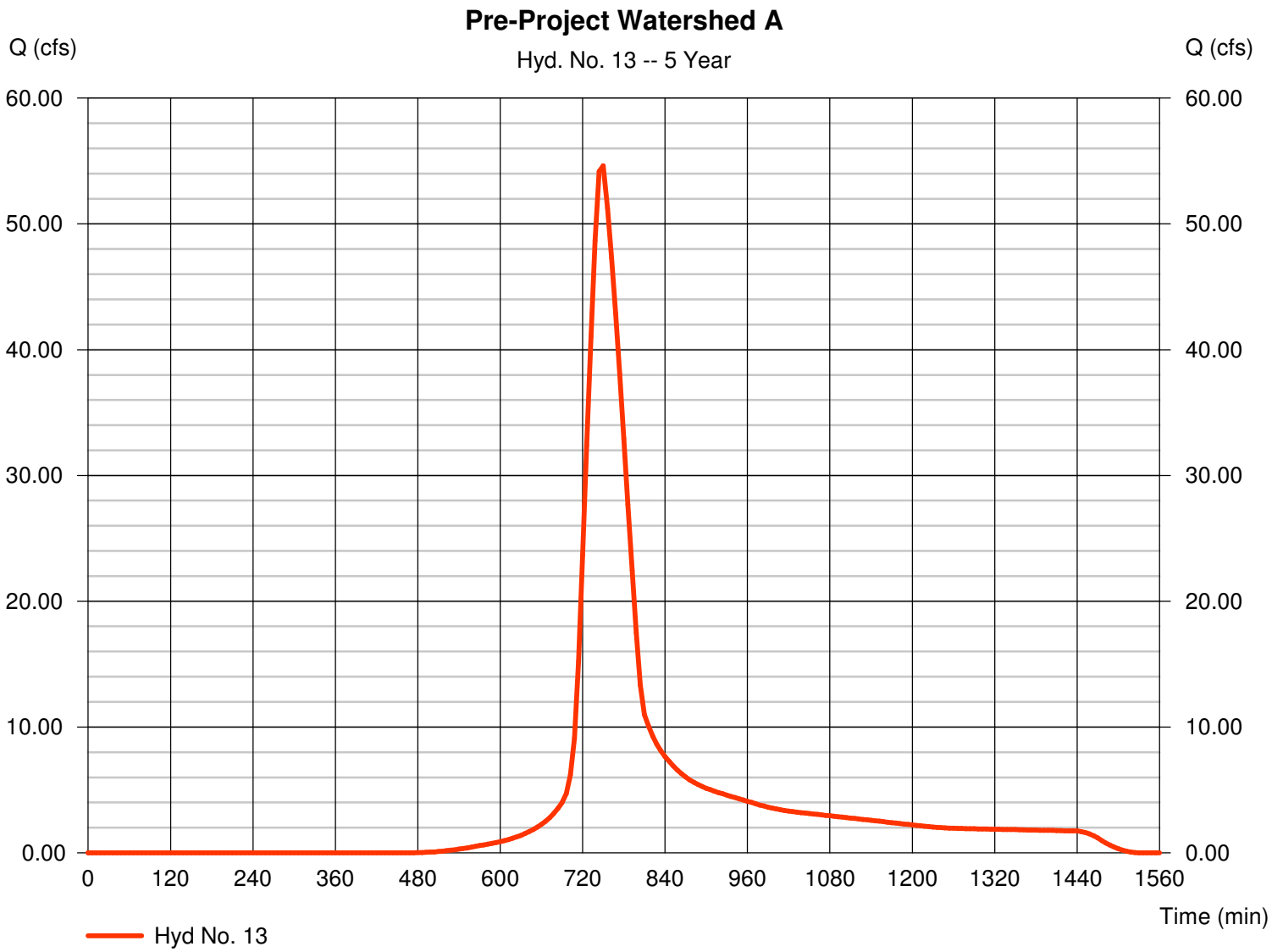


Hydrograph Report

Hyd. No. 13

Pre-Project Watershed A

Hydrograph type	=	SCS Runoff	Peak discharge	=	54.62 cfs
Storm frequency	=	5 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	8.160 acft
Drainage area	=	39.100 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	54.60 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

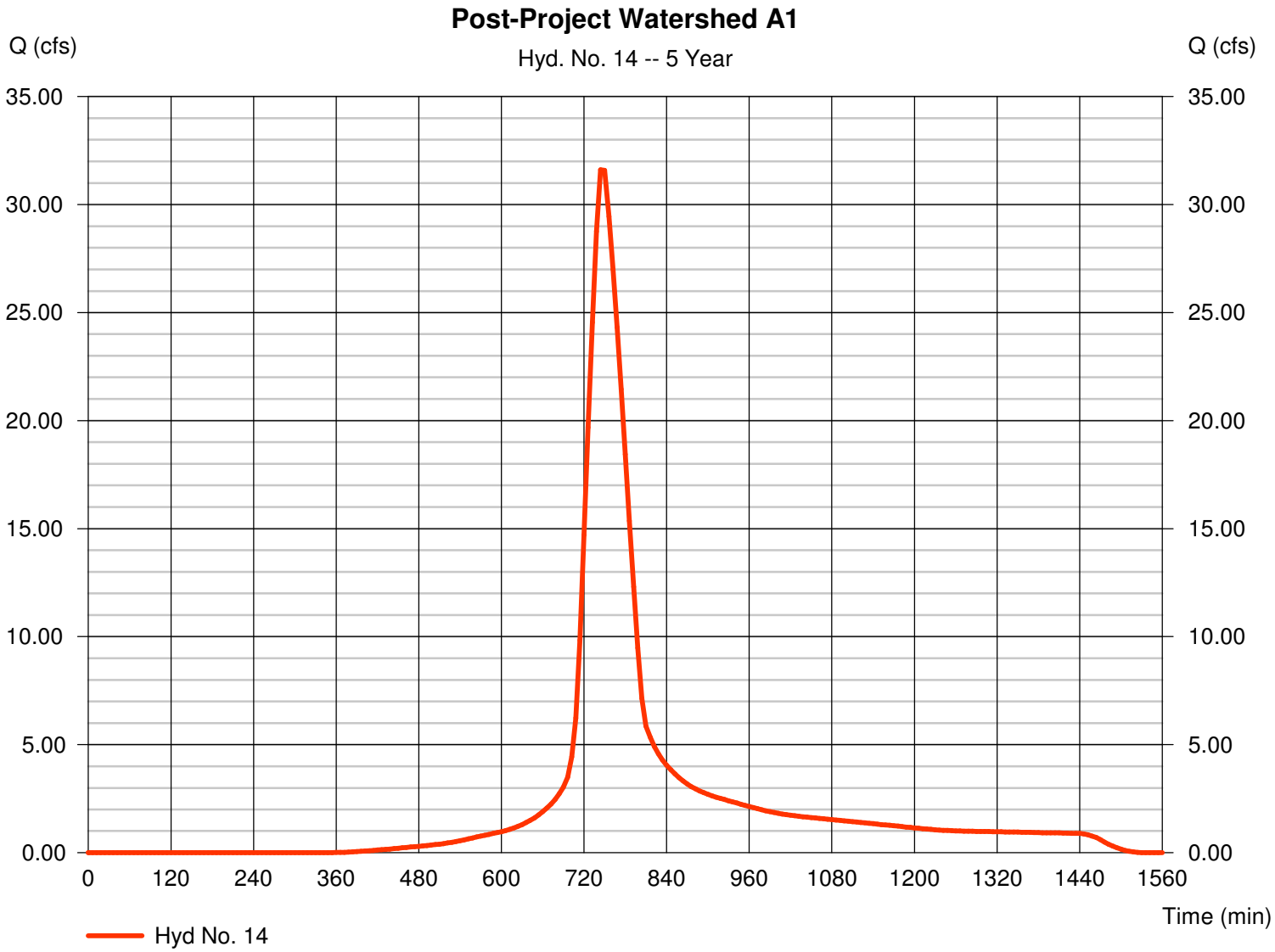


Hydrograph Report

Hyd. No. 14

Post-Project Watershed A1

Hydrograph type	=	SCS Runoff	Peak discharge	=	31.61 cfs
Storm frequency	=	5 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	4.726 acft
Drainage area	=	18.600 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	55.80 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



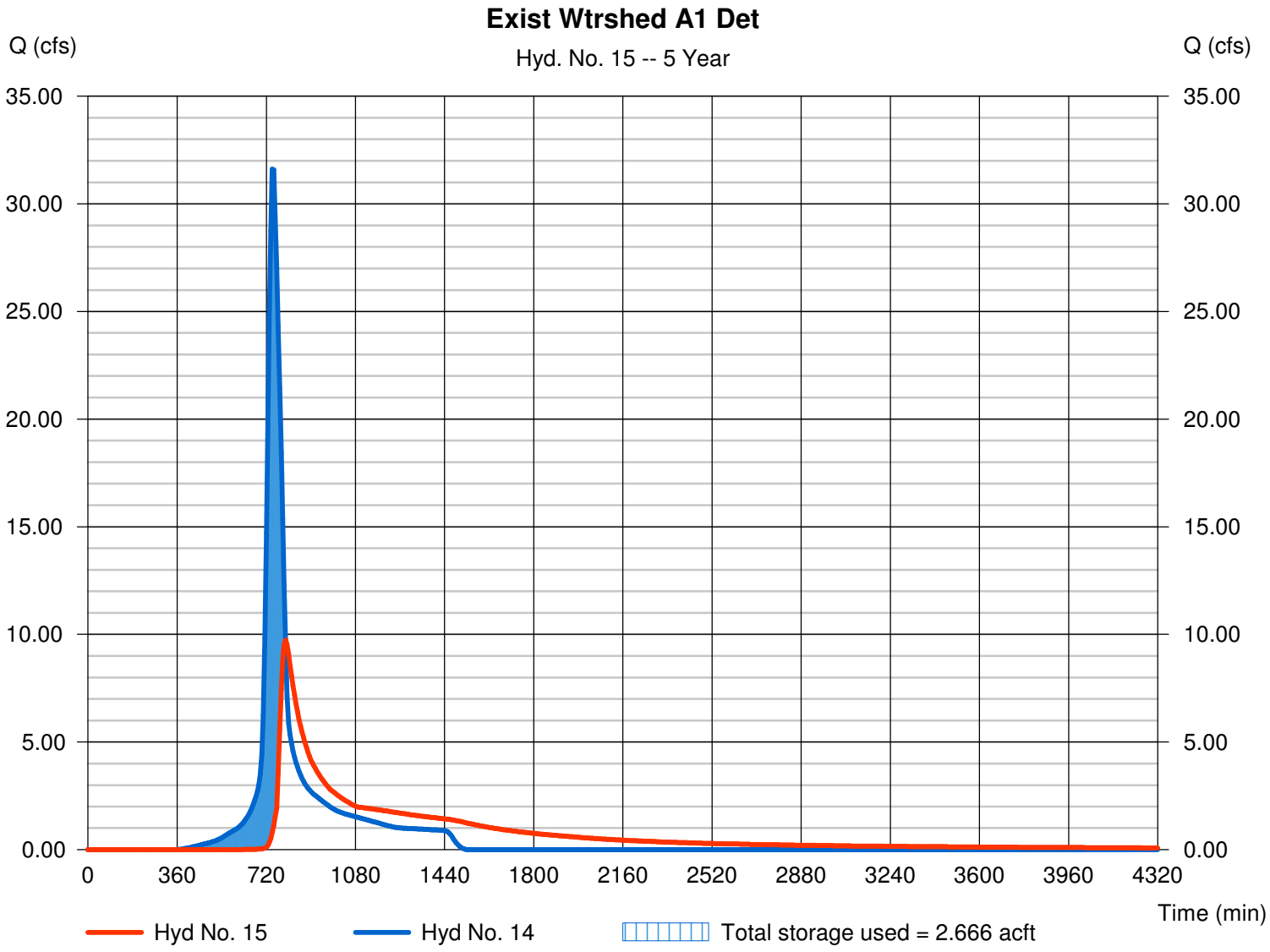
Hydrograph Report

Hyd. No. 15

Exist Wtrshed A1 Det

Hydrograph type	=	Reservoir	Peak discharge	=	9.736 cfs
Storm frequency	=	5 yrs	Time to peak	=	798 min
Time interval	=	6 min	Hyd. volume	=	4.564 acft
Inflow hyd. No.	=	14 - Post-Project Watershed A1	Max. Elevation	=	1368.38 ft
Reservoir name	=	Existing Detention Pond	Max. Storage	=	2.666 acft

Storage Indication method used.



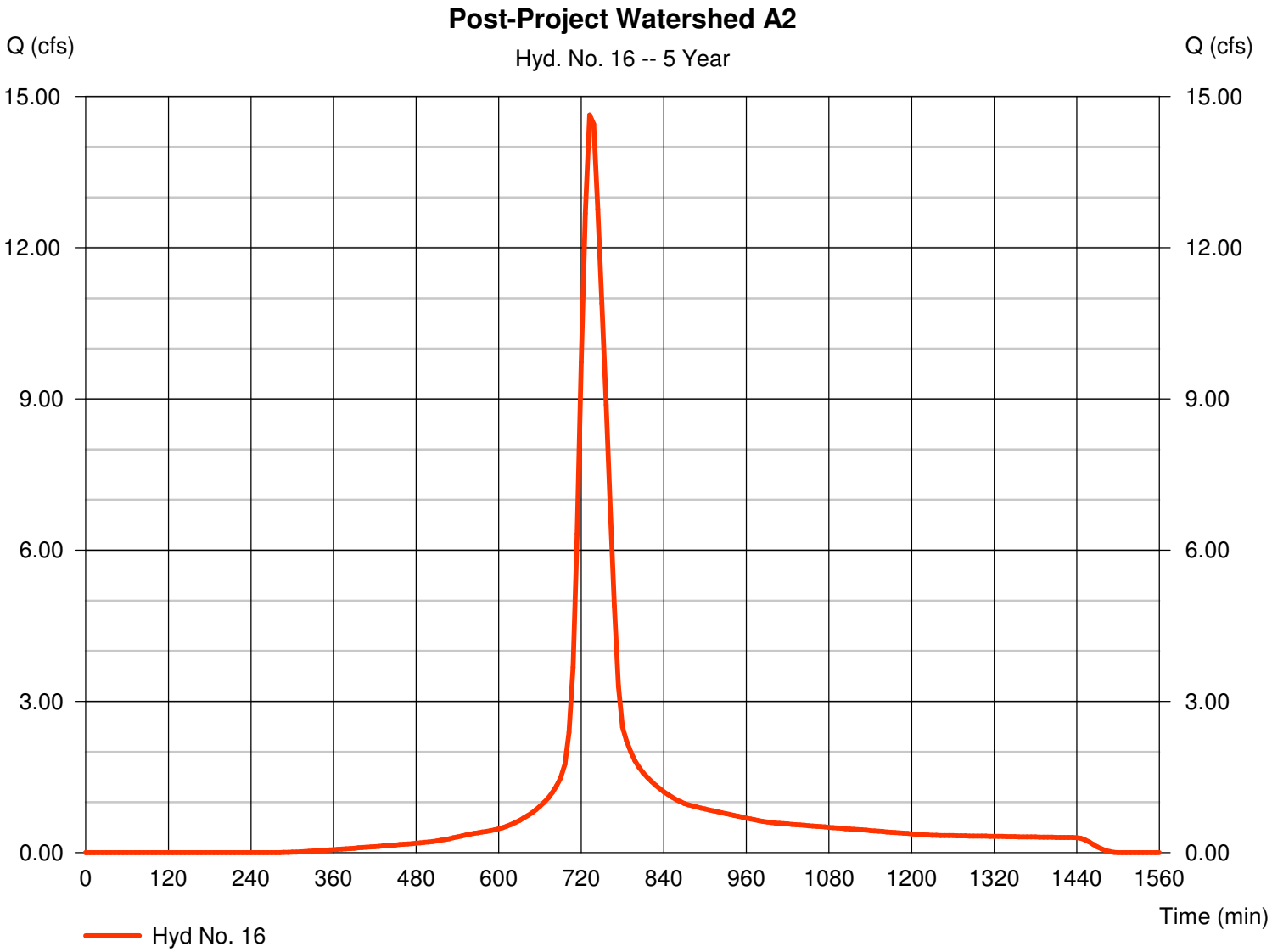
Hydrograph Report

Hyd. No. 16

Post-Project Watershed A2

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.63 cfs
Storm frequency	=	5 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	1.700 acft
Drainage area	=	5.900 ac	Curve number	=	89.1*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(4.000 x 86) + (1.900 x 80)] / 5.900



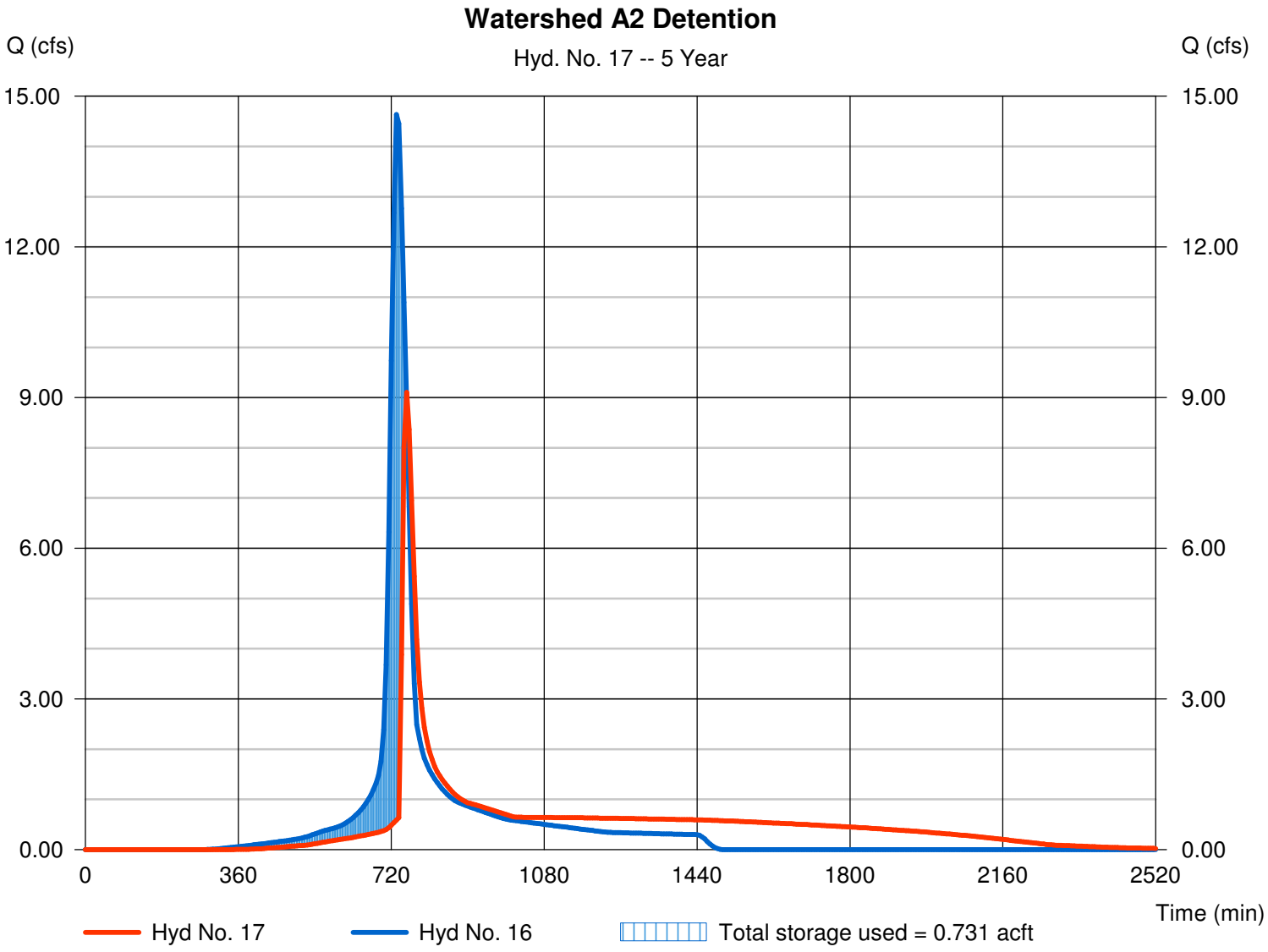
Hydrograph Report

Hyd. No. 17

Watershed A2 Detention

Hydrograph type	=	Reservoir	Peak discharge	=	9.103 cfs
Storm frequency	=	5 yrs	Time to peak	=	756 min
Time interval	=	6 min	Hyd. volume	=	1.699 acft
Inflow hyd. No.	=	16 - Post-Project Watershed A2	Max. Elevation	=	1368.49 ft
Reservoir name	=	Watershed A2 Detention	Max. Storage	=	0.731 acft

Storage Indication method used.

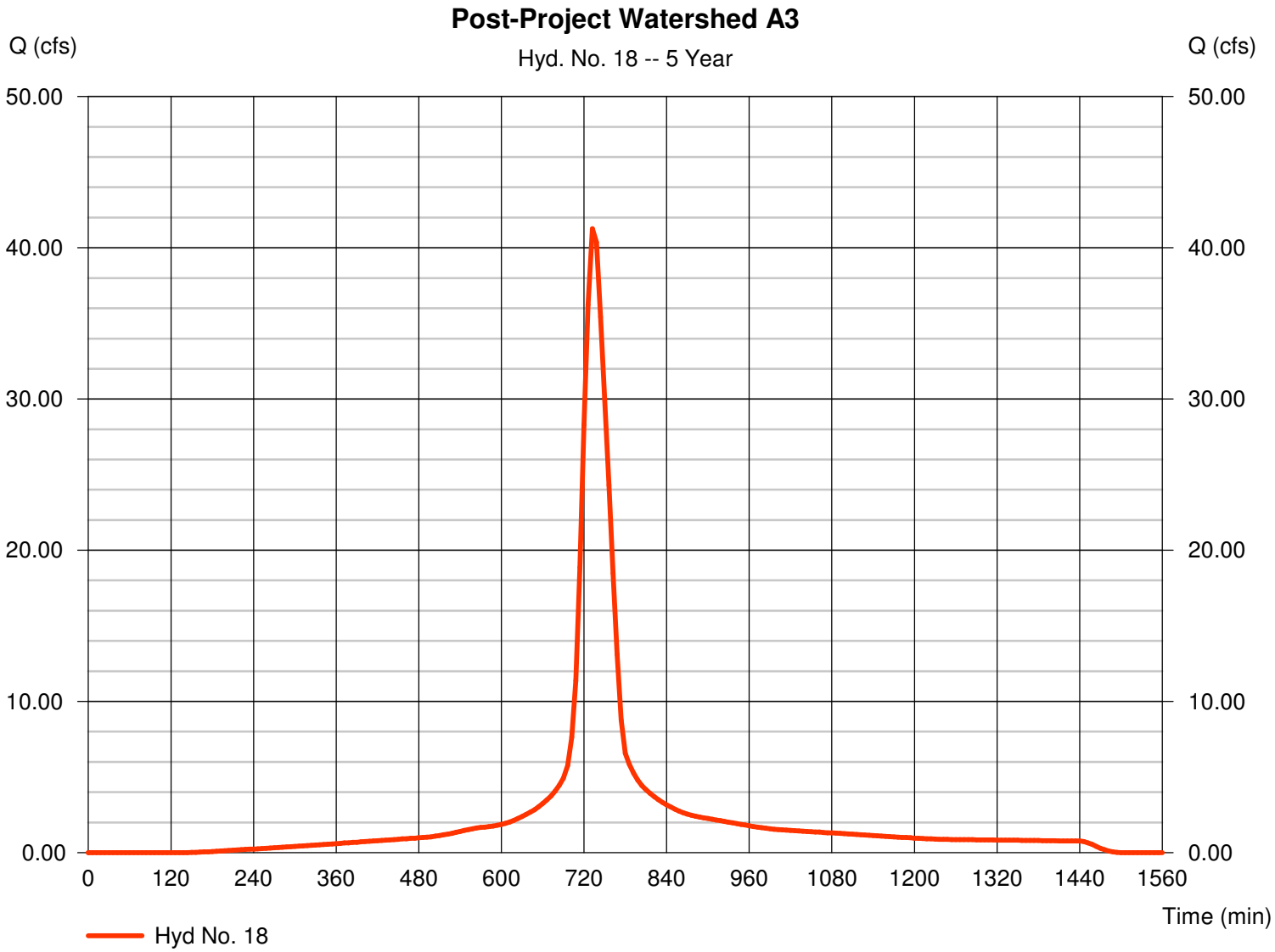


Hydrograph Report

Hyd. No. 18

Post-Project Watershed A3

Hydrograph type	=	SCS Runoff	Peak discharge	=	41.25 cfs
Storm frequency	=	5 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	4.986 acft
Drainage area	=	14.600 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	4.55 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

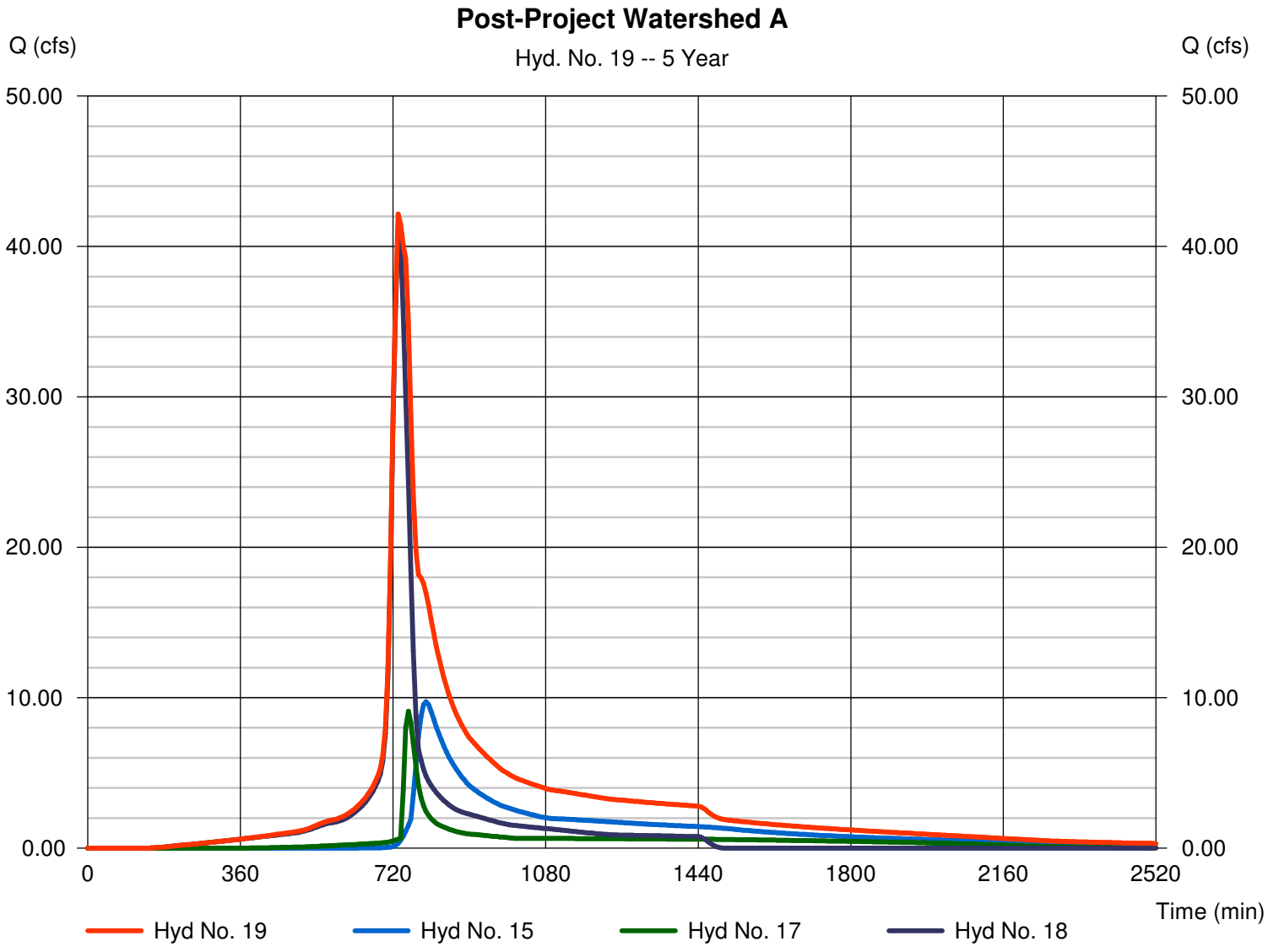


Hydrograph Report

Hyd. No. 19

Post-Project Watershed A

Hydrograph type	= Combine	Peak discharge	= 42.15 cfs
Storm frequency	= 5 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 11.249 acft
Inflow hyds.	= 15, 17, 18	Contrib. drain. area	= 14.600 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

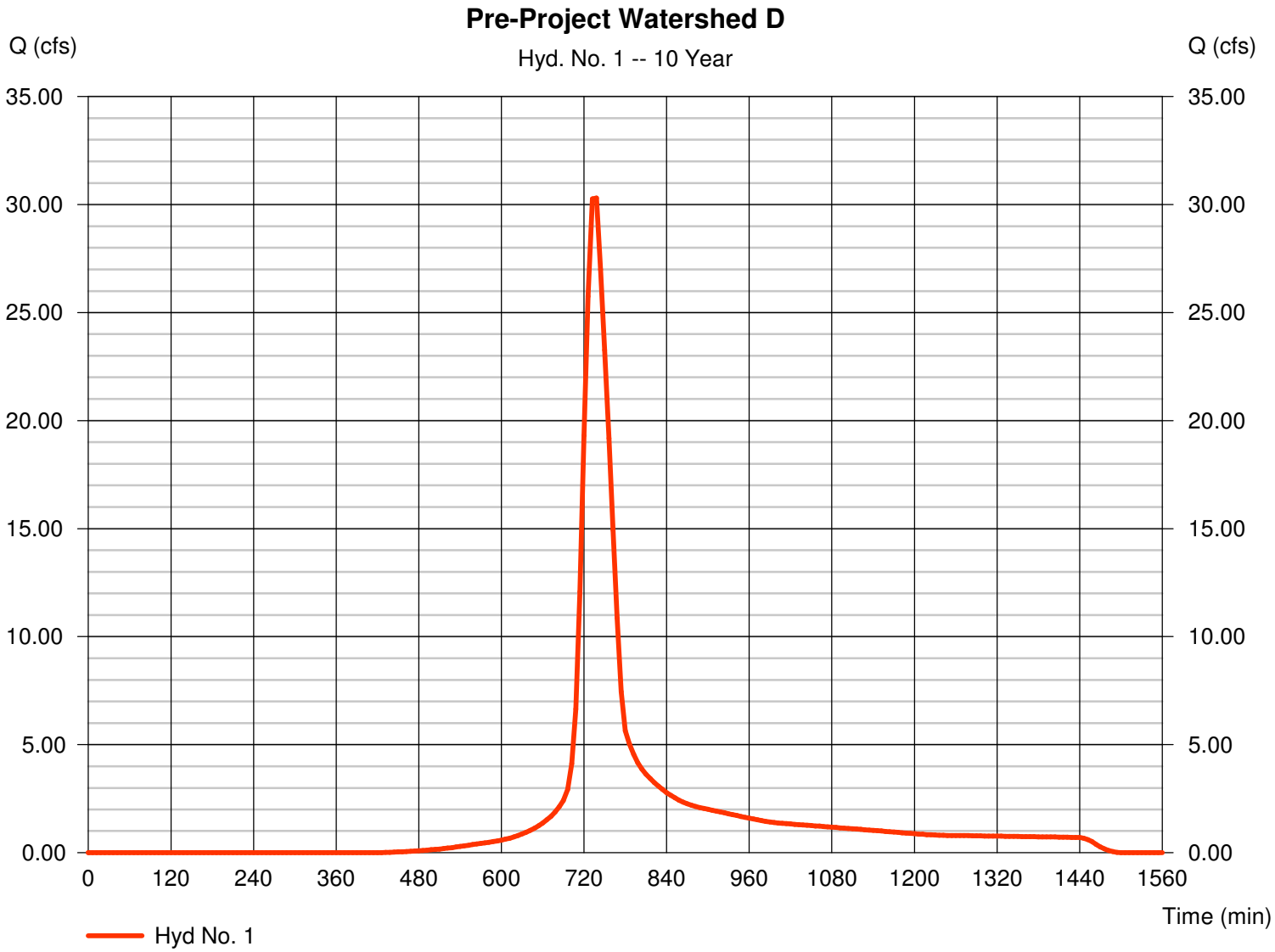
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	30.30	6	738	3.498	------	------	------	Pre-Project Watershed D
2	SCS Runoff	31.85	6	732	3.693	------	------	------	Post-Project Watershed D1
3	SCS Runoff	4.582	6	720	0.327	------	------	------	Post-Project Watershed D2
4	Reservoir	29.13	6	744	3.693	2	1366.46	1.10	Watershed D Detention
5	Combine	29.88	6	744	4.020	3, 4	------	------	Post-Project Watershed D
6	SCS Runoff	29.79	6	738	3.843	------	------	------	Offsite to the North
7	Combine	60.09	6	738	7.342	1, 6	------	------	Pre-Project to 159th
8	Combine	59.62	6	744	7.863	5, 6,	------	------	Post-Project to 159th
9	SCS Runoff	80.27	6	726	7.934	------	------	------	Cornerstone Commercial
10	Combine	133.12	6	732	15.276	7, 9	------	------	Pre-To Cornerstone Pond
11	Combine	118.36	6	738	15.797	8, 9,	------	------	Post-To Cornerstone Pond
13	SCS Runoff	67.99	6	750	10.140	------	------	------	Pre-Project Watershed A
14	SCS Runoff	38.29	6	744	5.736	------	------	------	Post-Project Watershed A1
15	Reservoir	16.49	6	792	5.573	14	1368.64	2.97	Exist Wtrshed A1 Det
16	SCS Runoff	17.46	6	732	2.039	------	------	------	Post-Project Watershed A2
17	Reservoir	13.17	6	750	2.038	16	1368.58	0.769	Watershed A2 Detention
18	SCS Runoff	48.09	6	732	5.856	------	------	------	Post-Project Watershed A3
19	Combine	54.16	6	744	13.468	15, 17, 18	------	------	Post-Project Watershed A

Hydrograph Report

Hyd. No. 1

Pre-Project Watershed D

Hydrograph type	=	SCS Runoff	Peak discharge	=	30.30 cfs
Storm frequency	=	10 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	3.498 acft
Drainage area	=	13.080 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.20 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

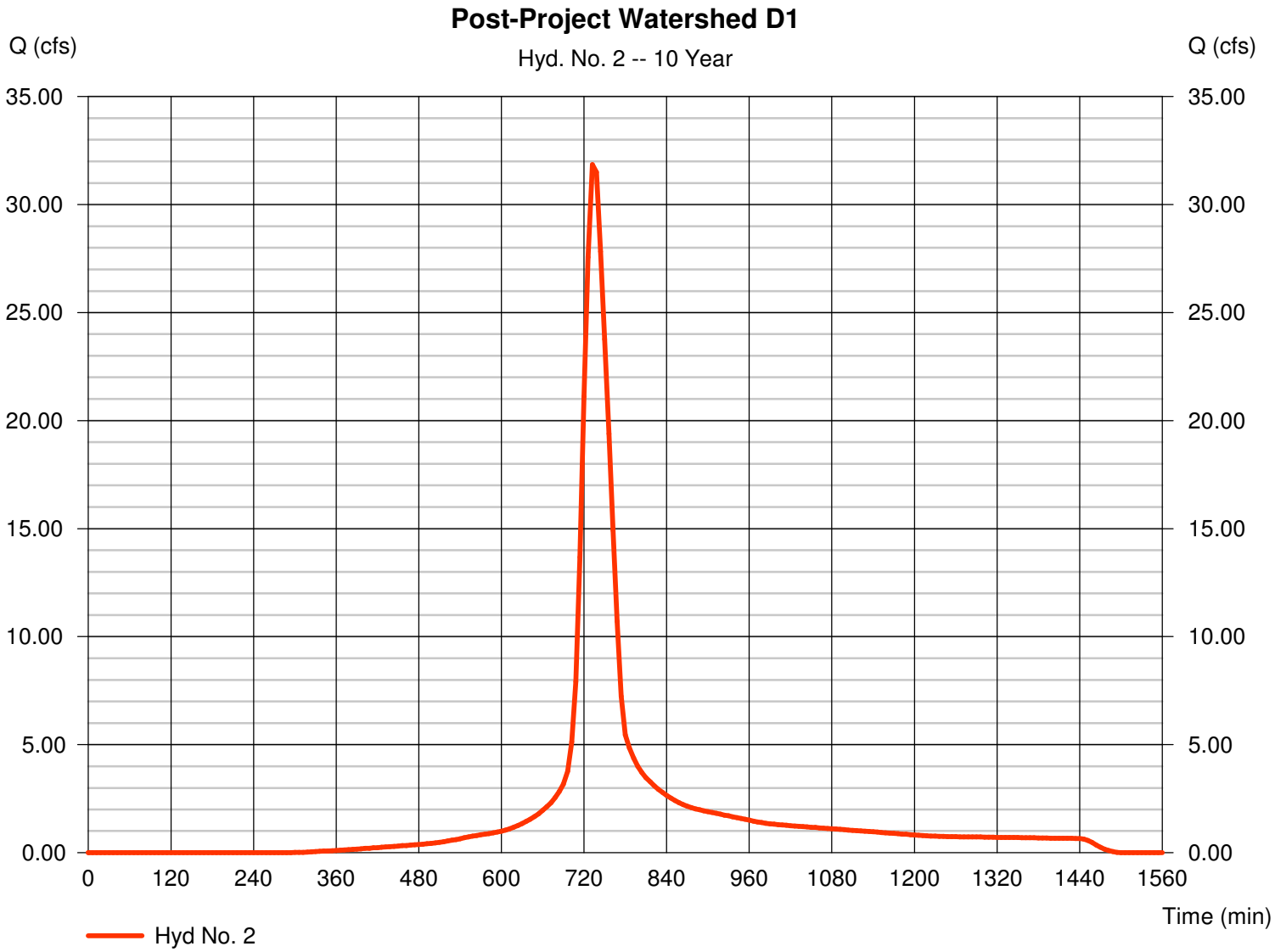


Hydrograph Report

Hyd. No. 2

Post-Project Watershed D1

Hydrograph type	=	SCS Runoff	Peak discharge	=	31.85 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	3.693 acft
Drainage area	=	11.300 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	36.80 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

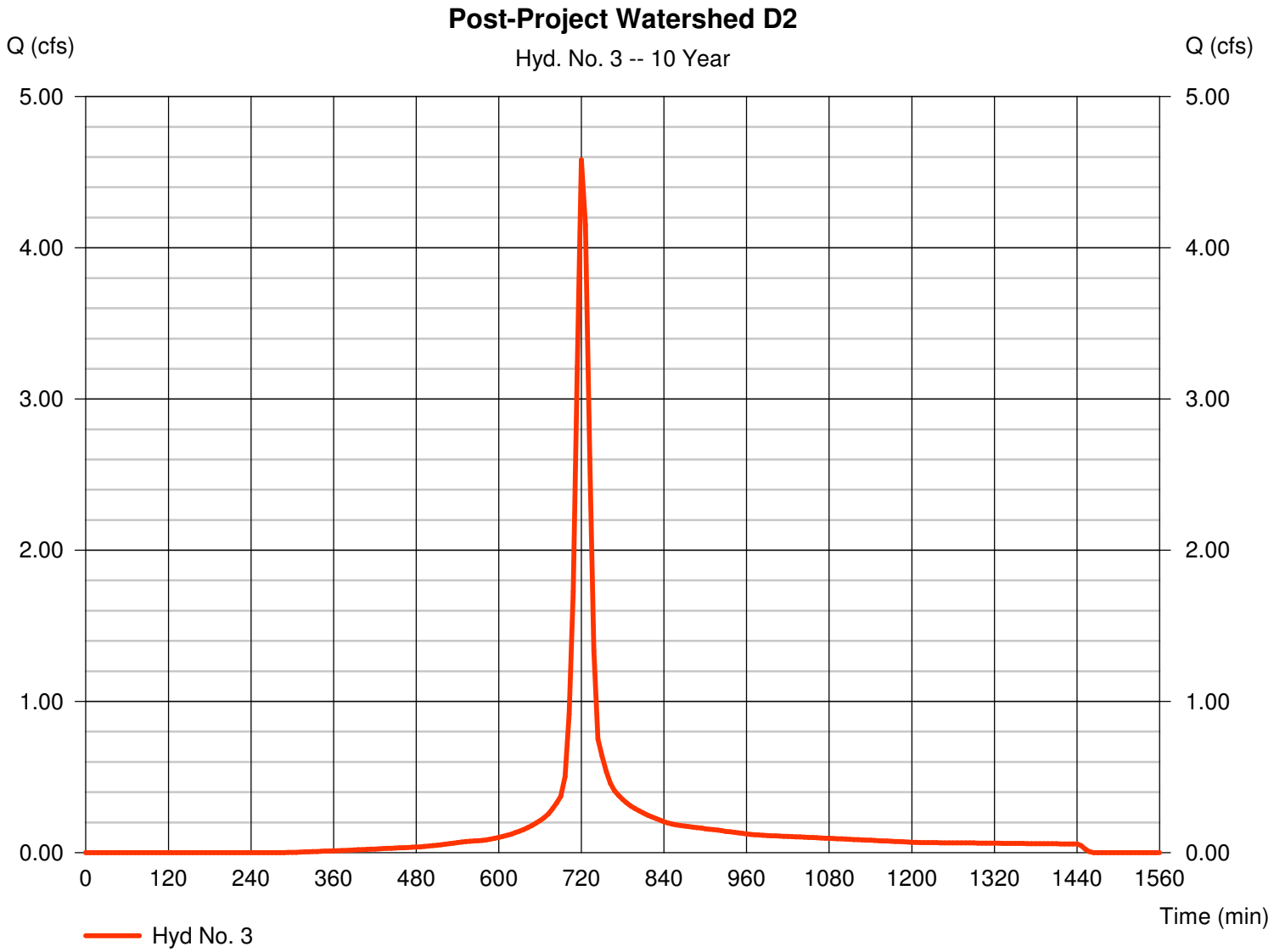


Hydrograph Report

Hyd. No. 3

Post-Project Watershed D2

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.582 cfs
Storm frequency	=	10 yrs	Time to peak	=	720 min
Time interval	=	6 min	Hyd. volume	=	0.327 acft
Drainage area	=	1.100 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



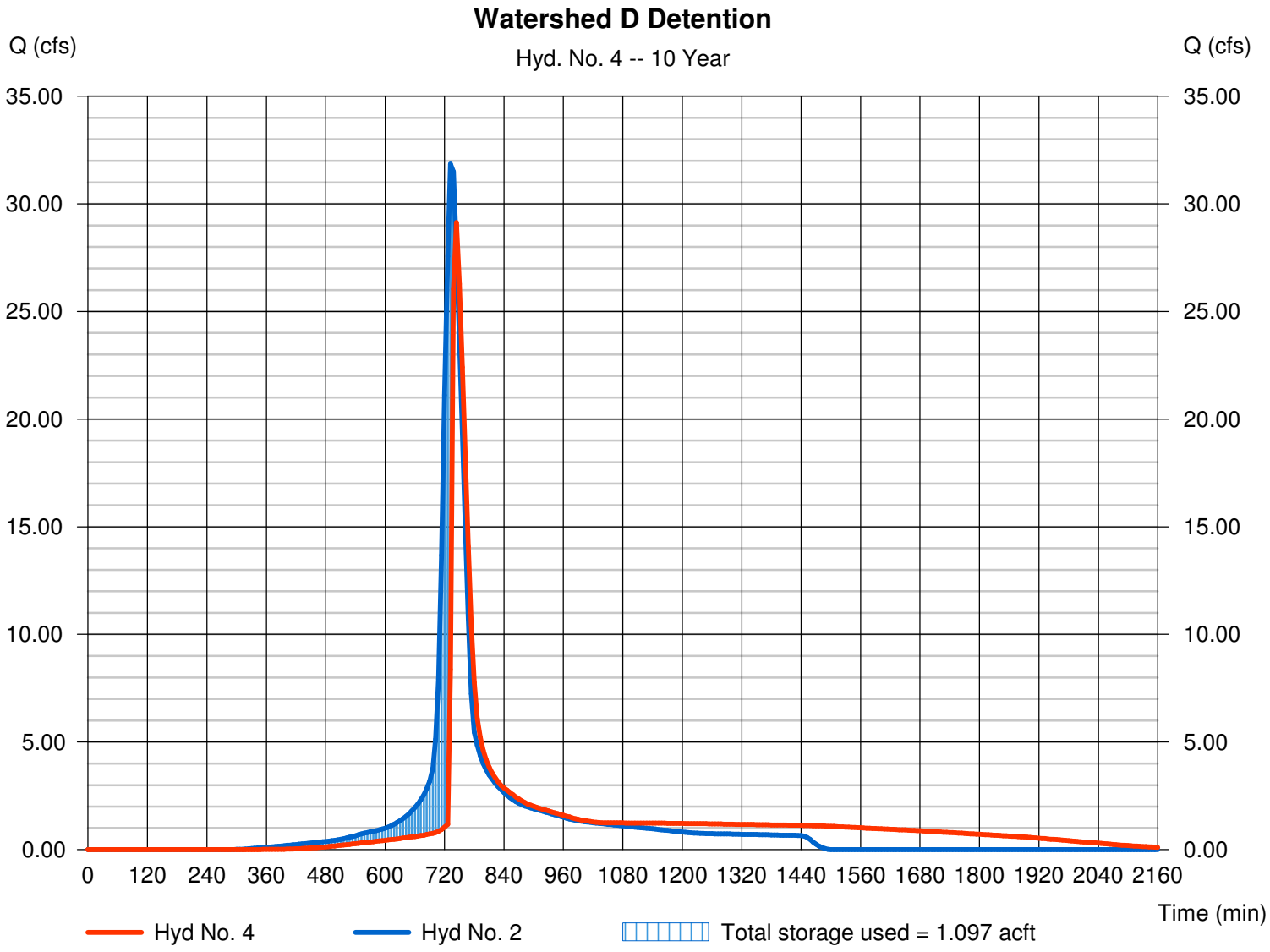
Hydrograph Report

Hyd. No. 4

Watershed D Detention

Hydrograph type	=	Reservoir	Peak discharge	=	29.13 cfs
Storm frequency	=	10 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	3.693 acft
Inflow hyd. No.	=	2 - Post-Project Watershed D1	Max. Elevation	=	1366.46 ft
Reservoir name	=	Watershed D Detention	Max. Storage	=	1.097 acft

Storage Indication method used.

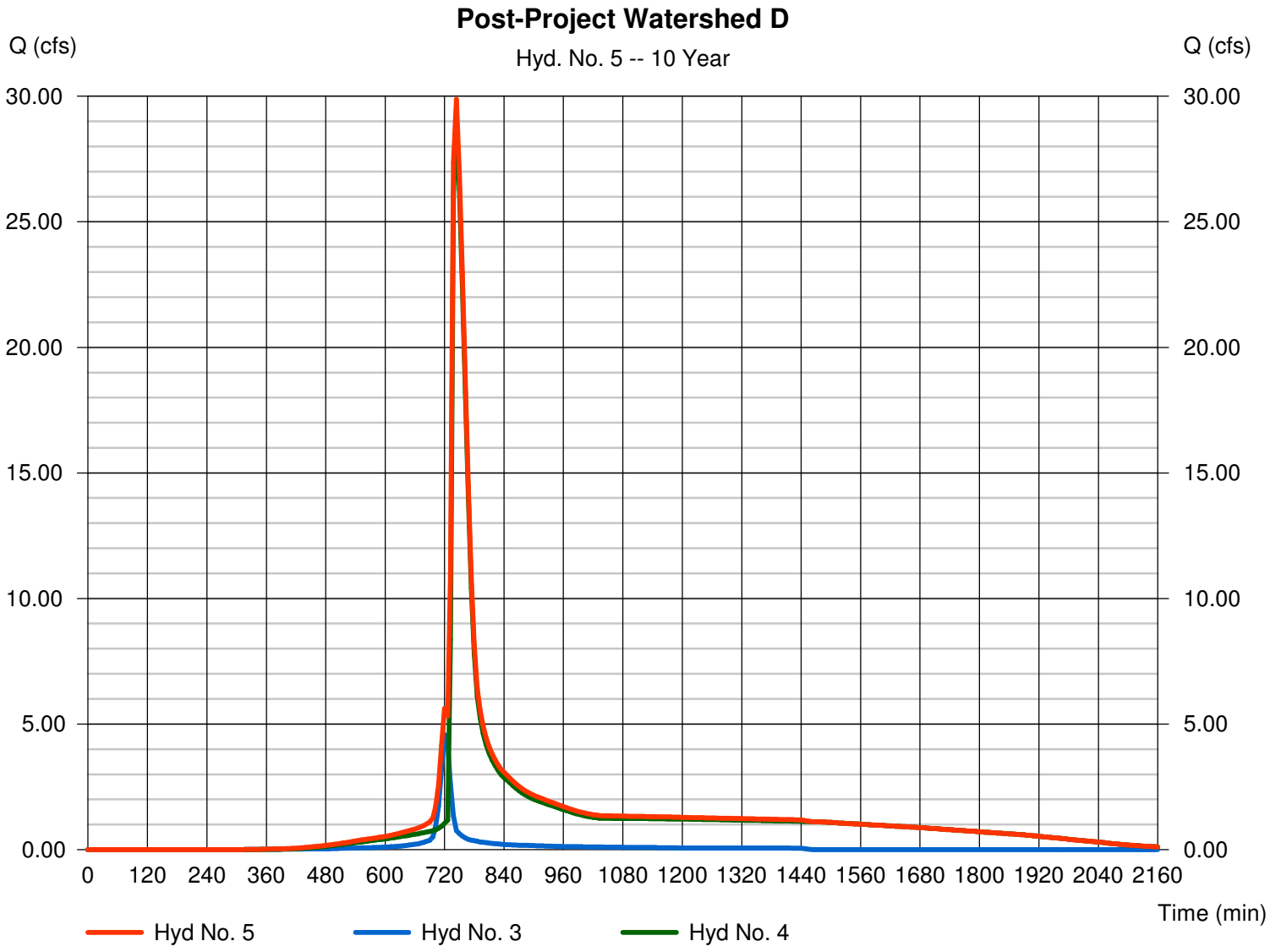


Hydrograph Report

Hyd. No. 5

Post-Project Watershed D

Hydrograph type	= Combine	Peak discharge	= 29.88 cfs
Storm frequency	= 10 yrs	Time to peak	= 744 min
Time interval	= 6 min	Hyd. volume	= 4.020 acft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 1.100 ac

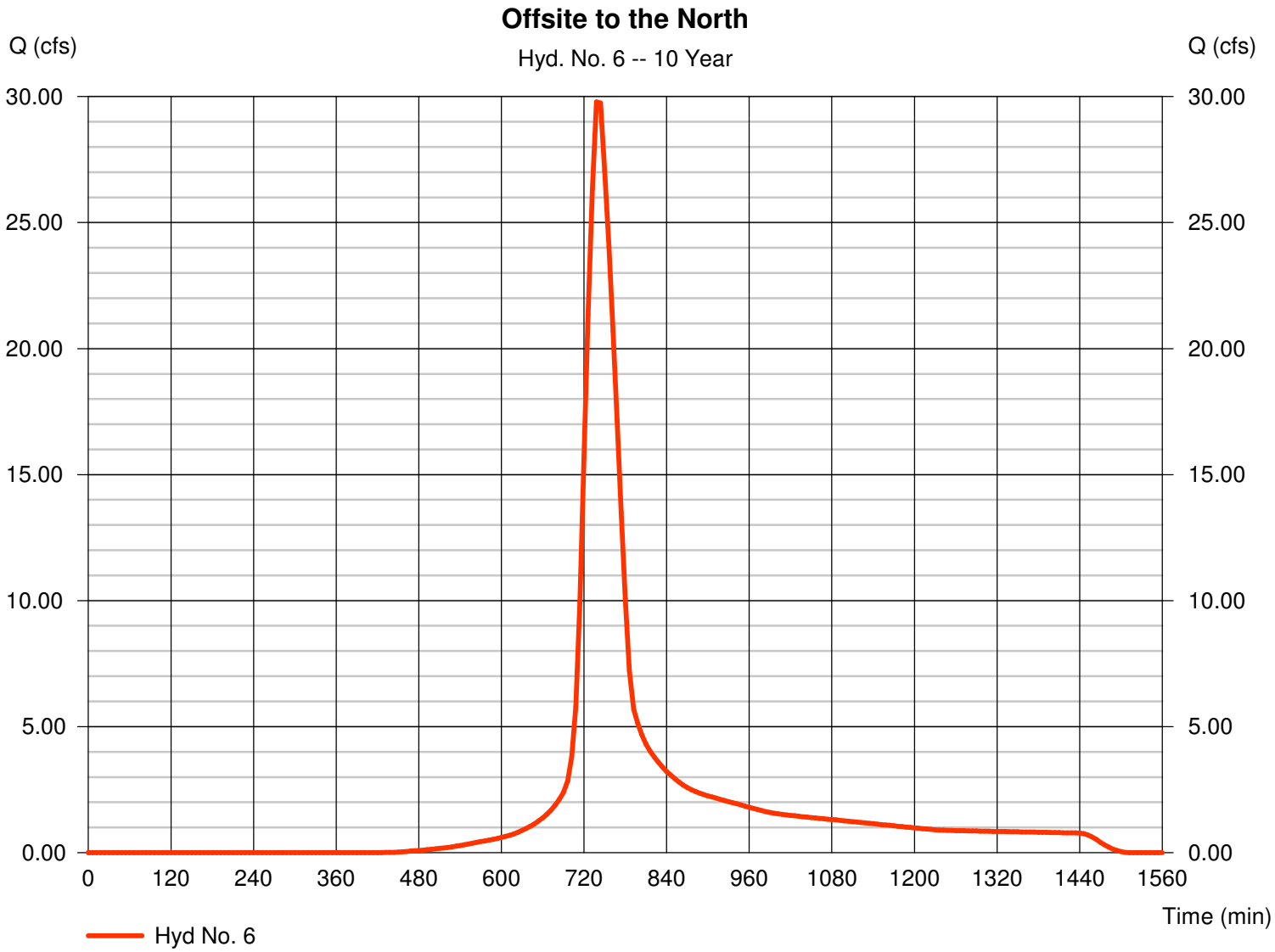


Hydrograph Report

Hyd. No. 6

Offsite to the North

Hydrograph type	=	SCS Runoff	Peak discharge	=	29.79 cfs
Storm frequency	=	10 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	3.843 acft
Drainage area	=	15.200 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.30 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

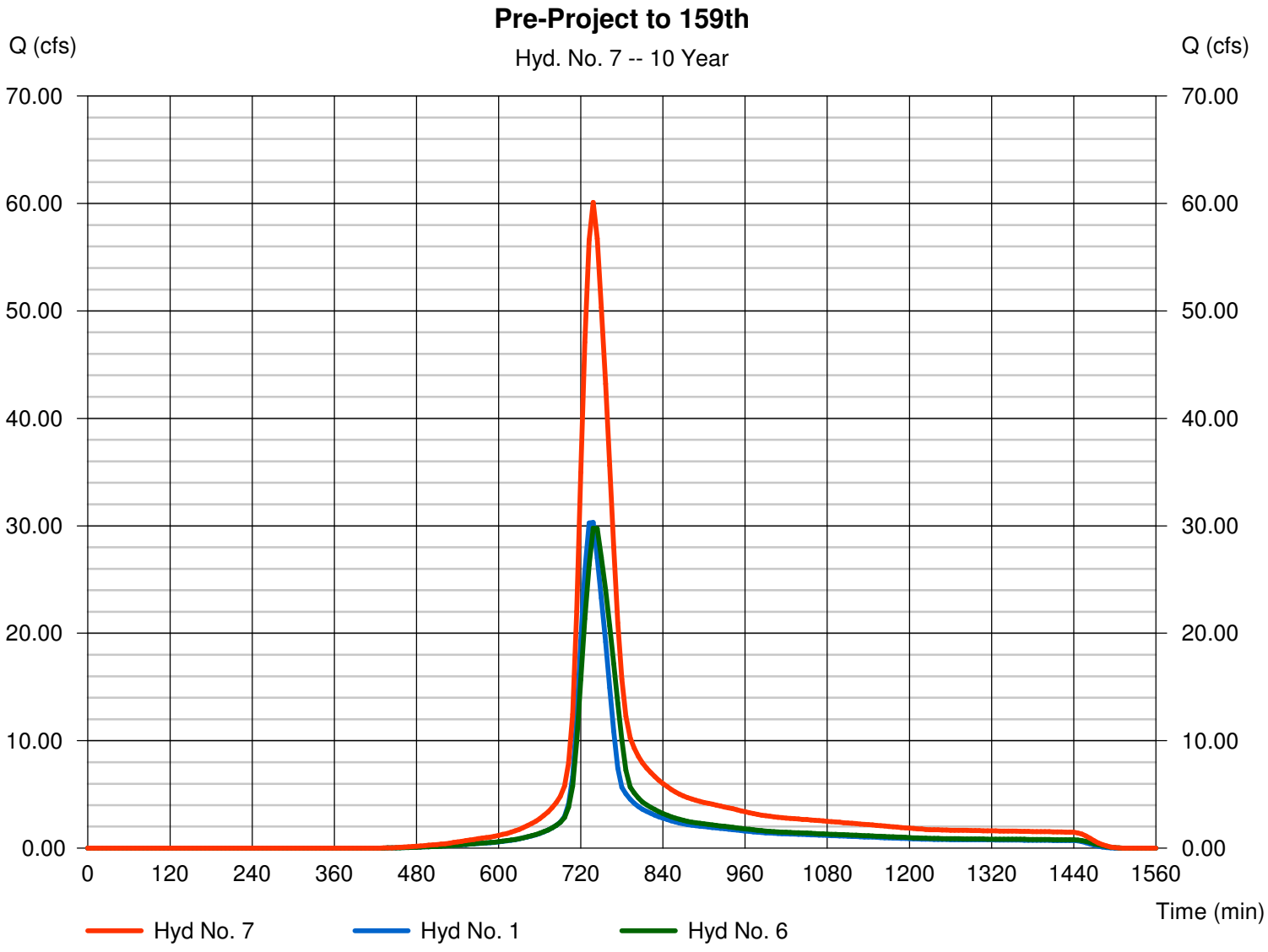


Hydrograph Report

Hyd. No. 7

Pre-Project to 159th

Hydrograph type	= Combine	Peak discharge	= 60.09 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 6 min	Hyd. volume	= 7.342 acft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 28.280 ac

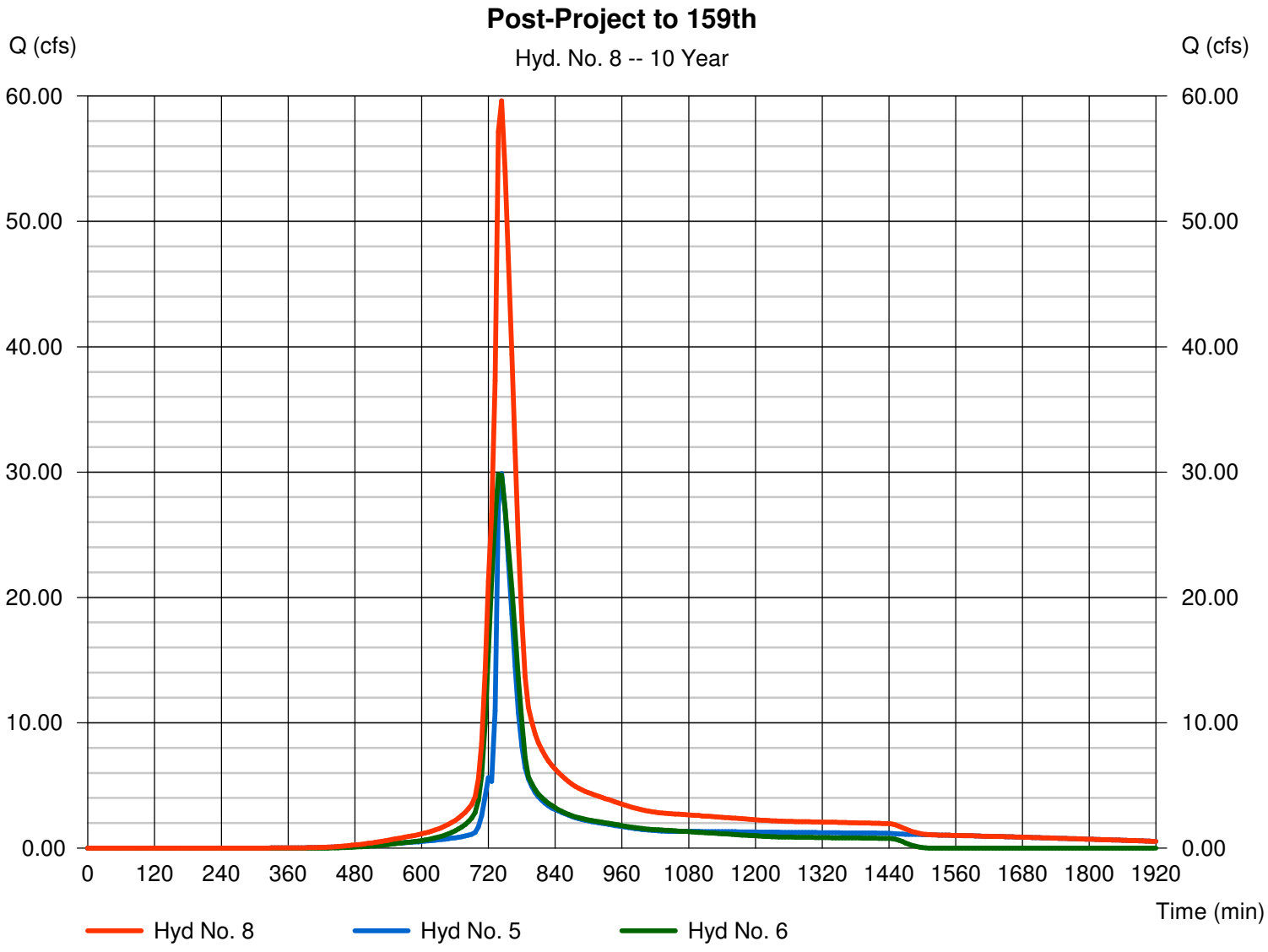


Hydrograph Report

Hyd. No. 8

Post-Project to 159th

Hydrograph type	= Combine	Peak discharge	= 59.62 cfs
Storm frequency	= 10 yrs	Time to peak	= 744 min
Time interval	= 6 min	Hyd. volume	= 7.863 acft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 15.200 ac

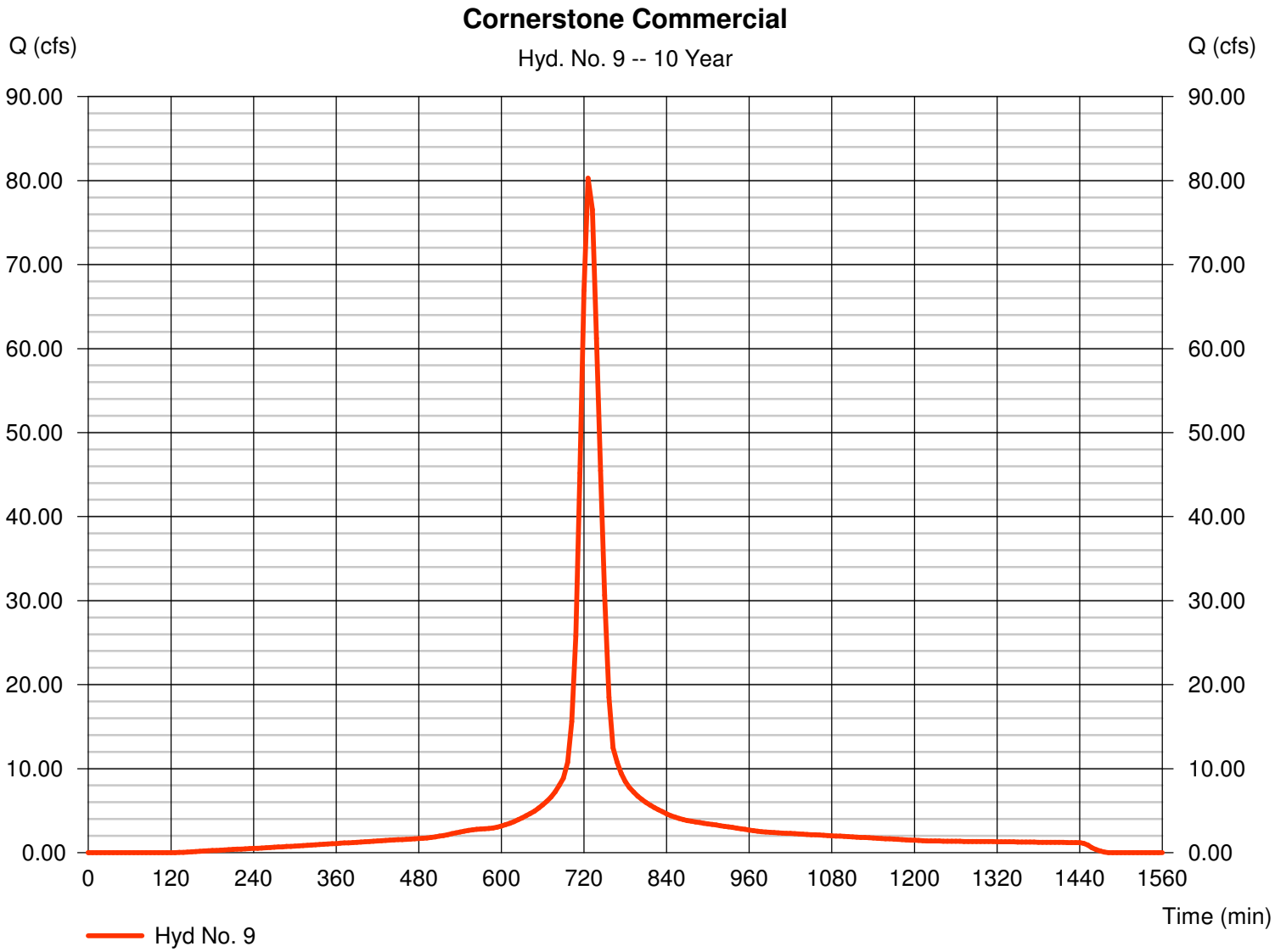


Hydrograph Report

Hyd. No. 9

Cornerstone Commercial

Hydrograph type	=	SCS Runoff	Peak discharge	=	80.27 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	6 min	Hyd. volume	=	7.934 acft
Drainage area	=	20.400 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	21.90 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

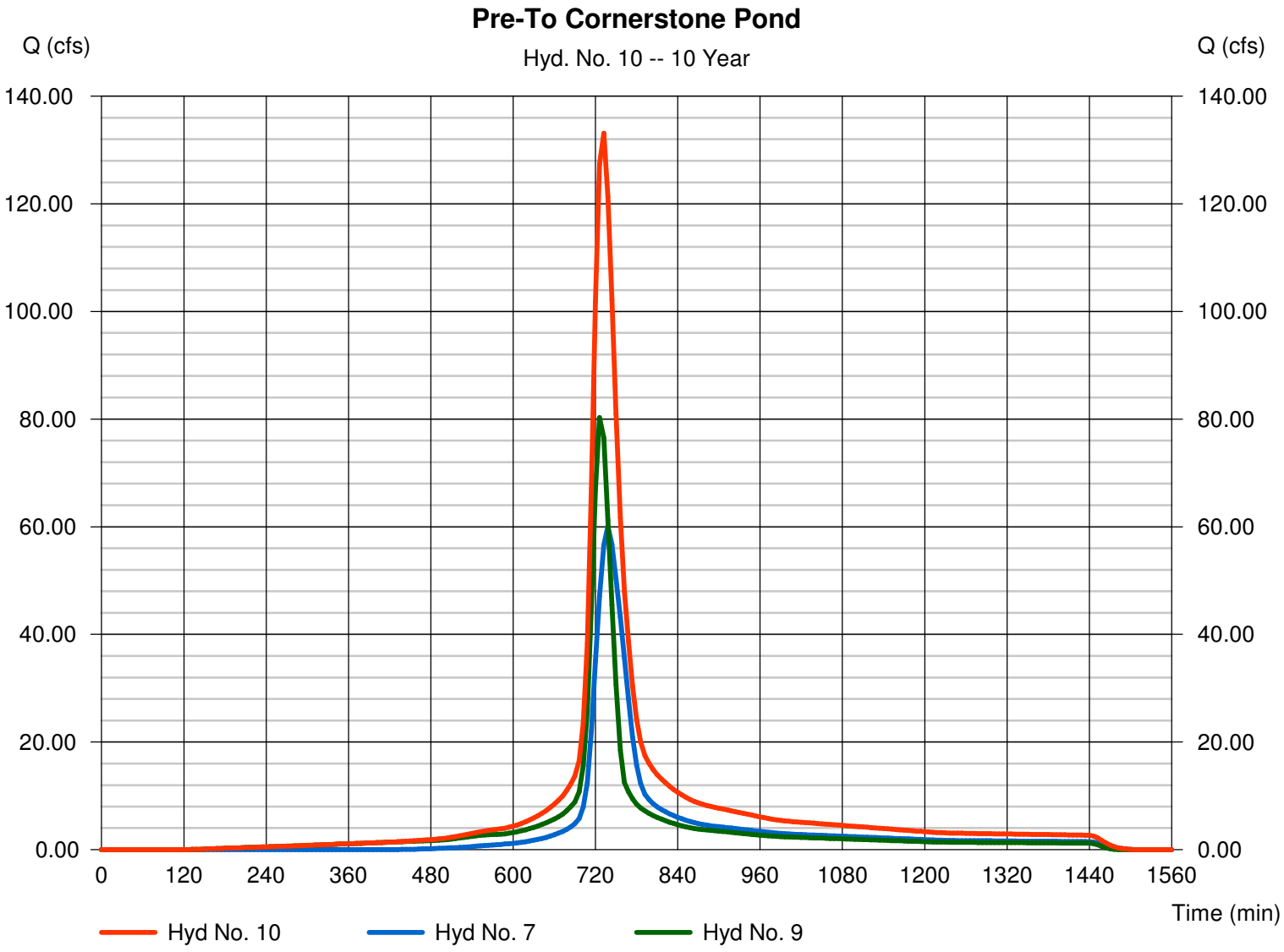


Hydrograph Report

Hyd. No. 10

Pre-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 133.12 cfs
Storm frequency	= 10 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 15.276 acft
Inflow hyds.	= 7, 9	Contrib. drain. area	= 20.400 ac

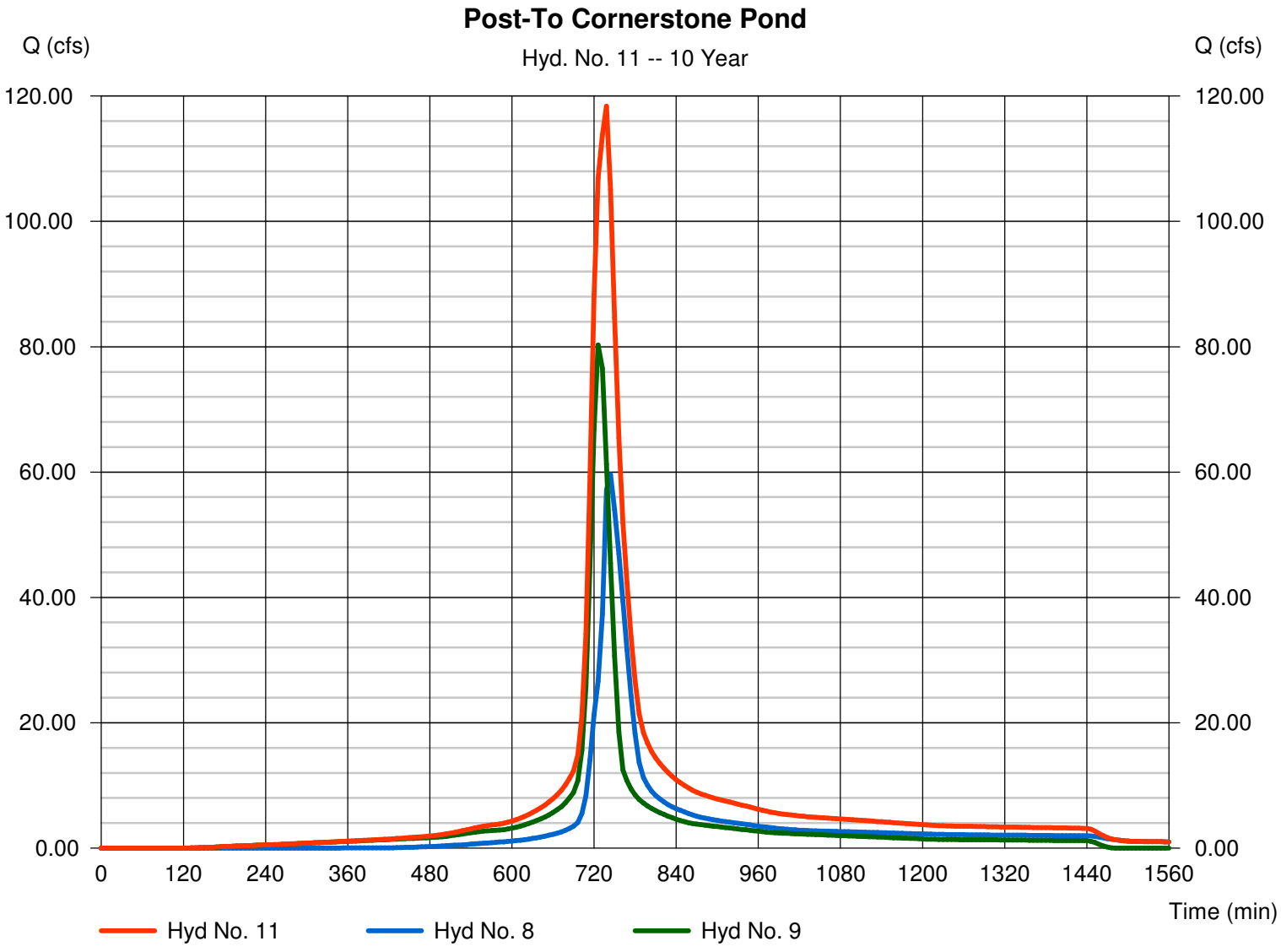


Hydrograph Report

Hyd. No. 11

Post-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 118.36 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 6 min	Hyd. volume	= 15.797 acft
Inflow hyds.	= 8, 9	Contrib. drain. area	= 20.400 ac

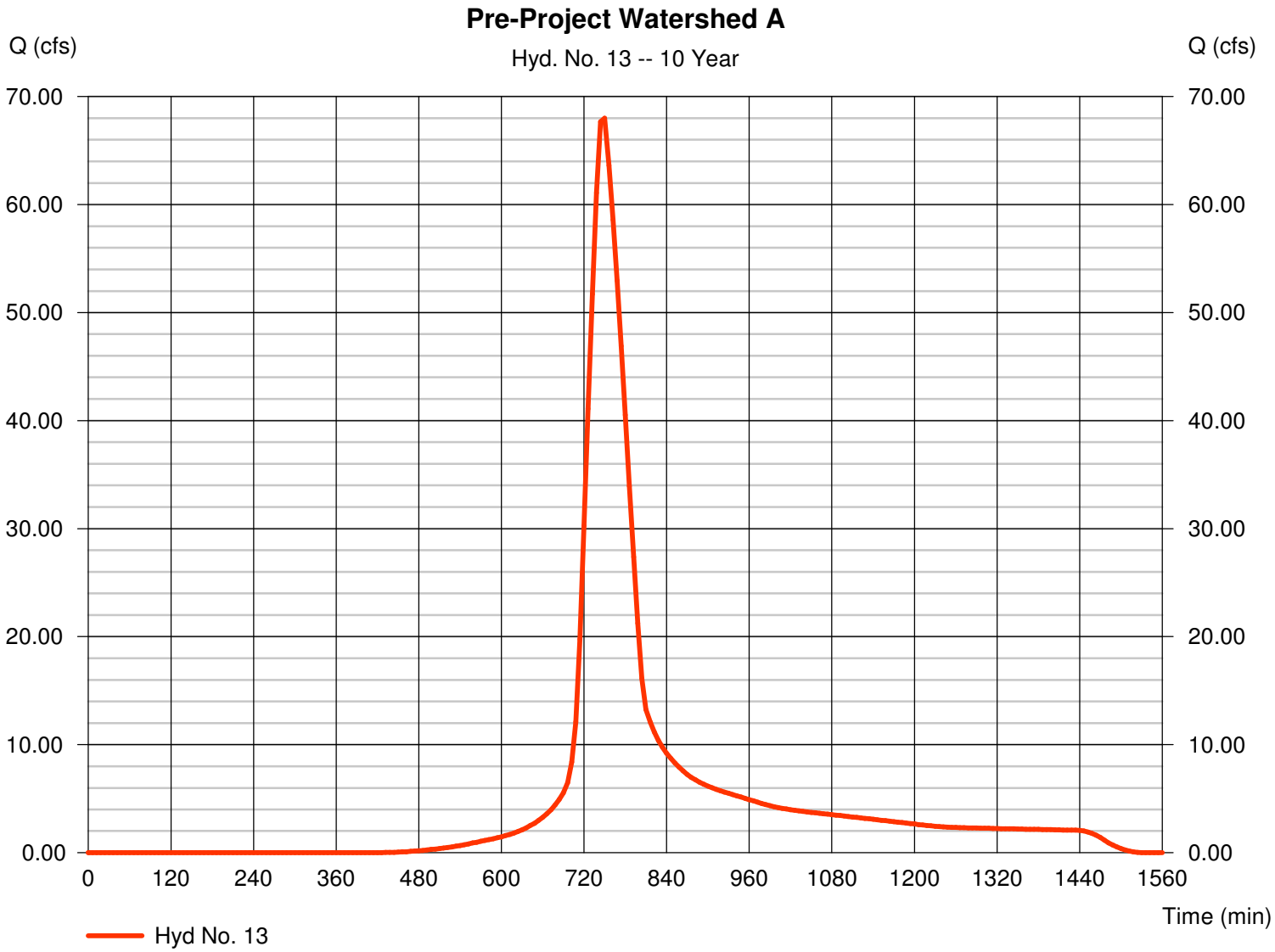


Hydrograph Report

Hyd. No. 13

Pre-Project Watershed A

Hydrograph type	=	SCS Runoff	Peak discharge	=	67.99 cfs
Storm frequency	=	10 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	10.140 acft
Drainage area	=	39.100 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	54.60 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

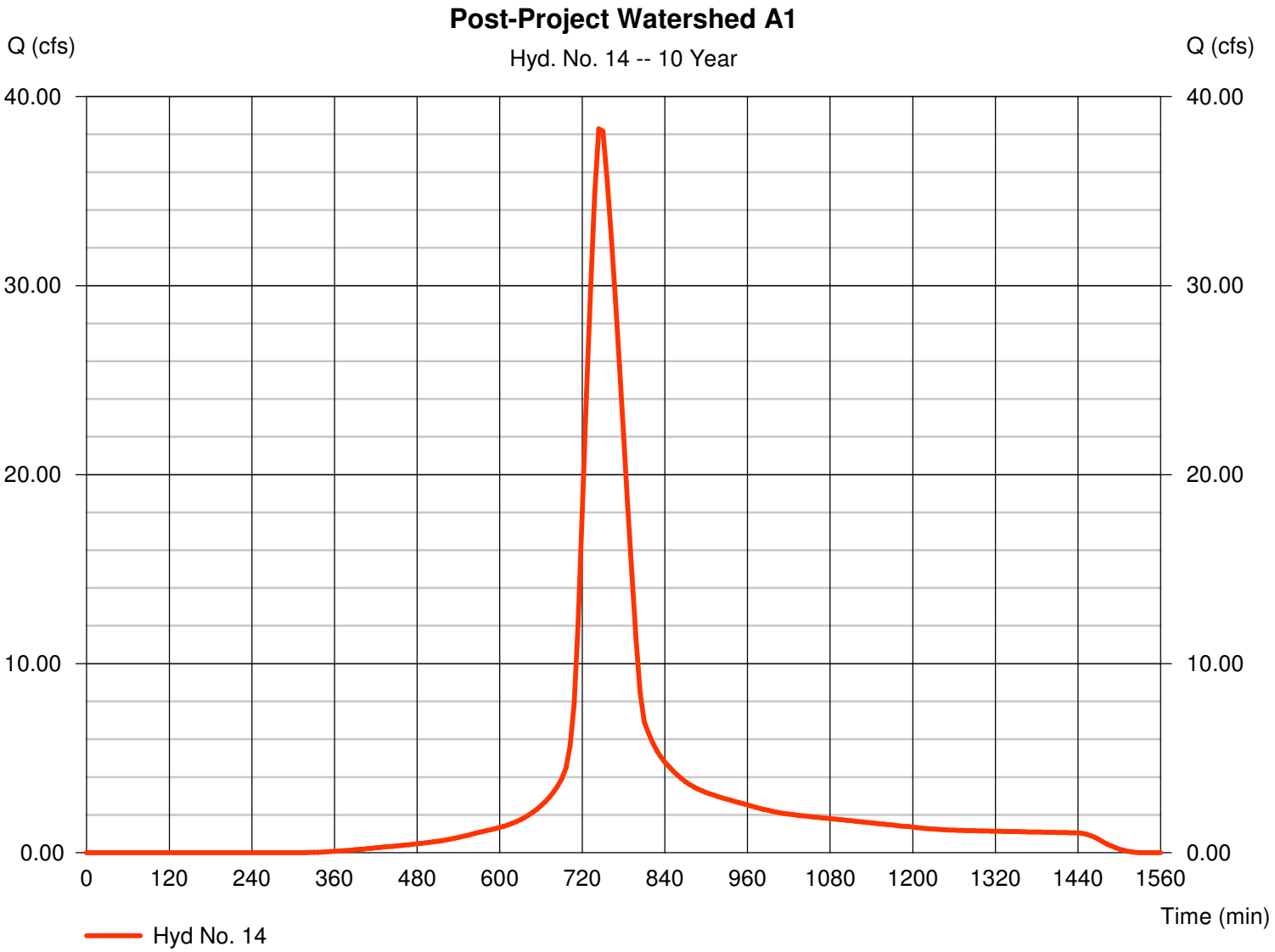


Hydrograph Report

Hyd. No. 14

Post-Project Watershed A1

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.29 cfs
Storm frequency	=	10 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	5.736 acft
Drainage area	=	18.600 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	55.80 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



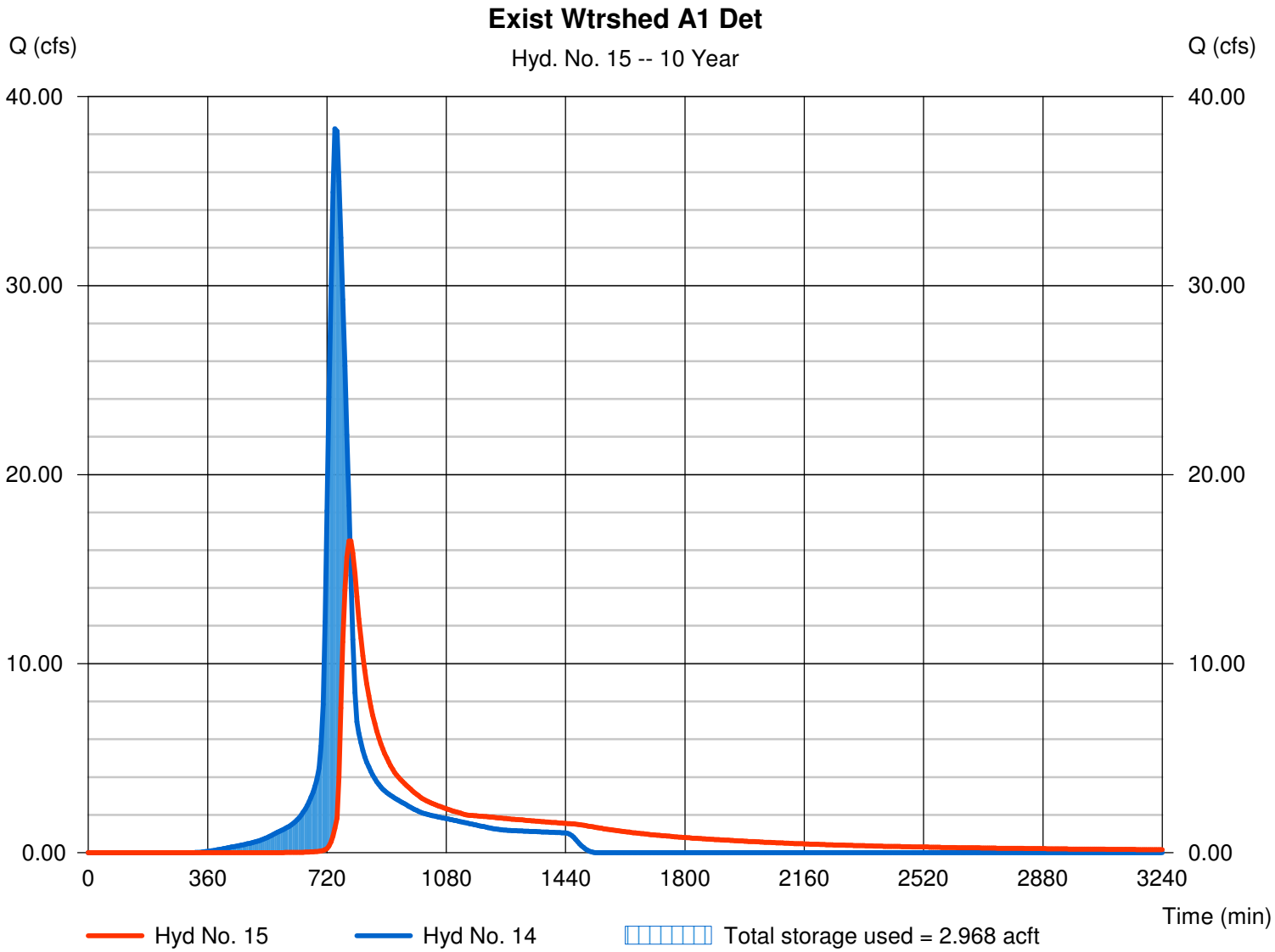
Hydrograph Report

Hyd. No. 15

Exist Wtrshed A1 Det

Hydrograph type	=	Reservoir	Peak discharge	=	16.49 cfs
Storm frequency	=	10 yrs	Time to peak	=	792 min
Time interval	=	6 min	Hyd. volume	=	5.573 acft
Inflow hyd. No.	=	14 - Post-Project Watershed A1	Max. Elevation	=	1368.64 ft
Reservoir name	=	Existing Detention Pond	Max. Storage	=	2.968 acft

Storage Indication method used.



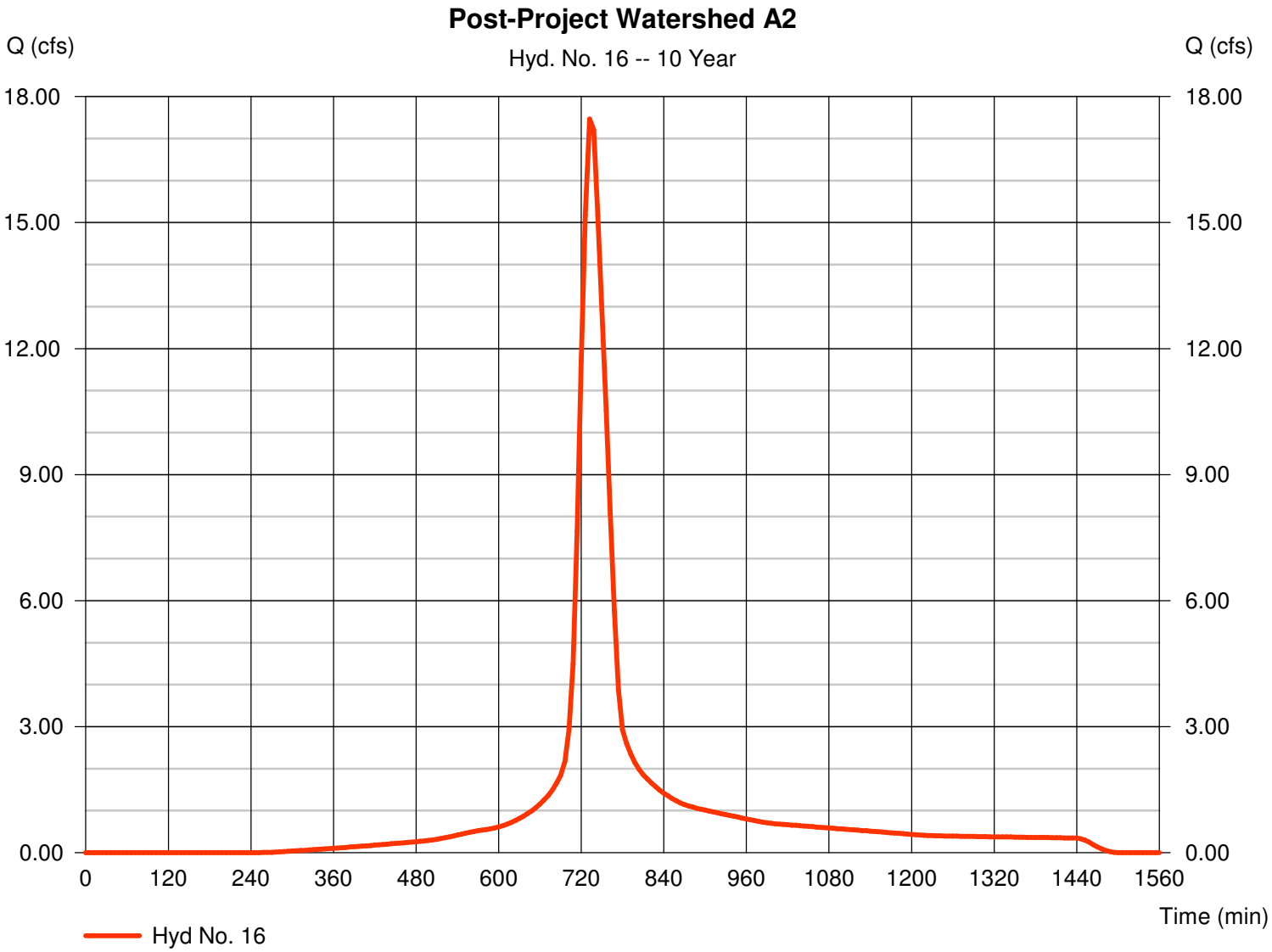
Hydrograph Report

Hyd. No. 16

Post-Project Watershed A2

Hydrograph type	=	SCS Runoff	Peak discharge	=	17.46 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	2.039 acft
Drainage area	=	5.900 ac	Curve number	=	89.1*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(4.000 x 86) + (1.900 x 80)] / 5.900



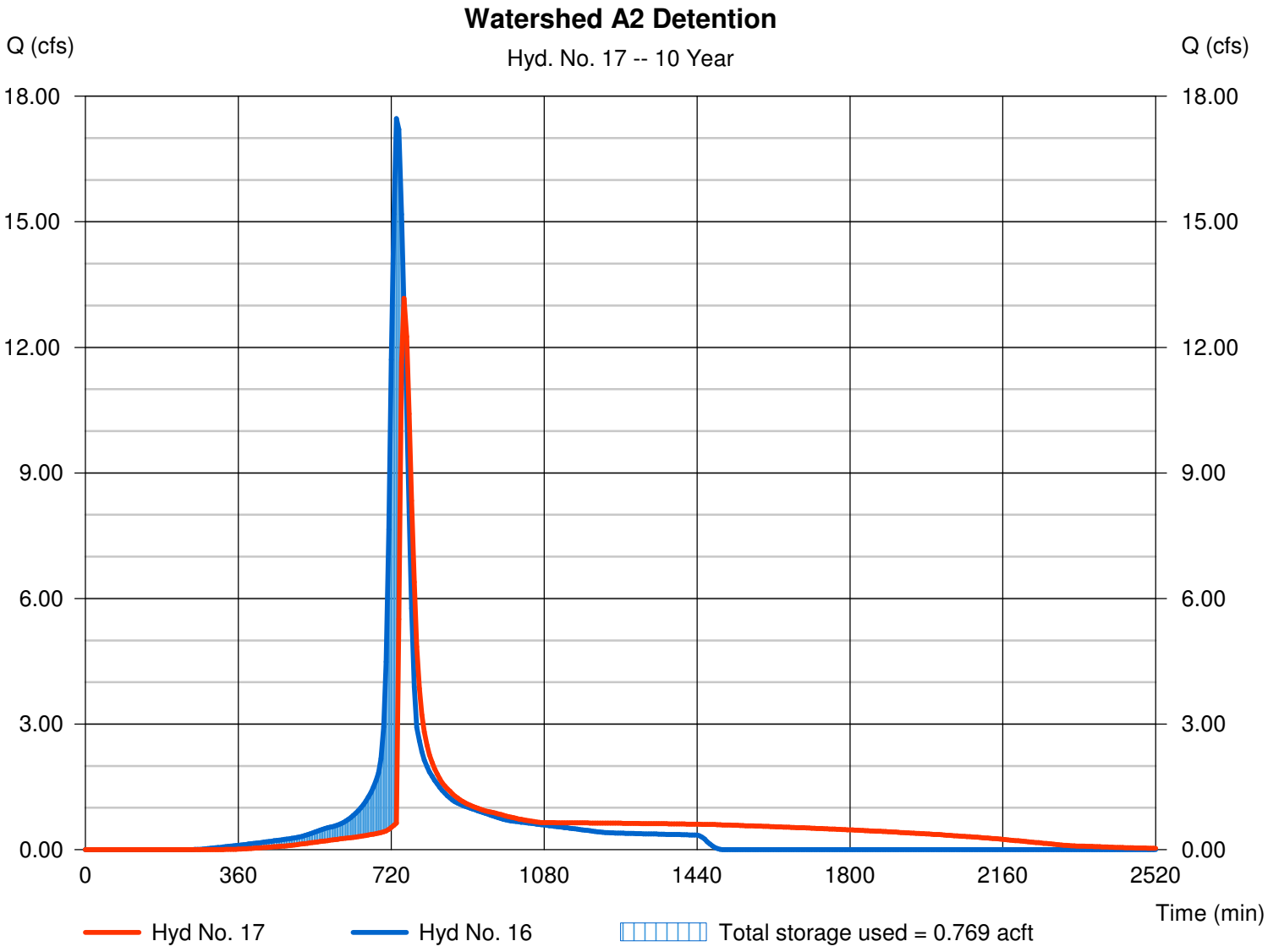
Hydrograph Report

Hyd. No. 17

Watershed A2 Detention

Hydrograph type	=	Reservoir	Peak discharge	=	13.17 cfs
Storm frequency	=	10 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	2.038 acft
Inflow hyd. No.	=	16 - Post-Project Watershed A2	Max. Elevation	=	1368.58 ft
Reservoir name	=	Watershed A2 Detention	Max. Storage	=	0.769 acft

Storage Indication method used.

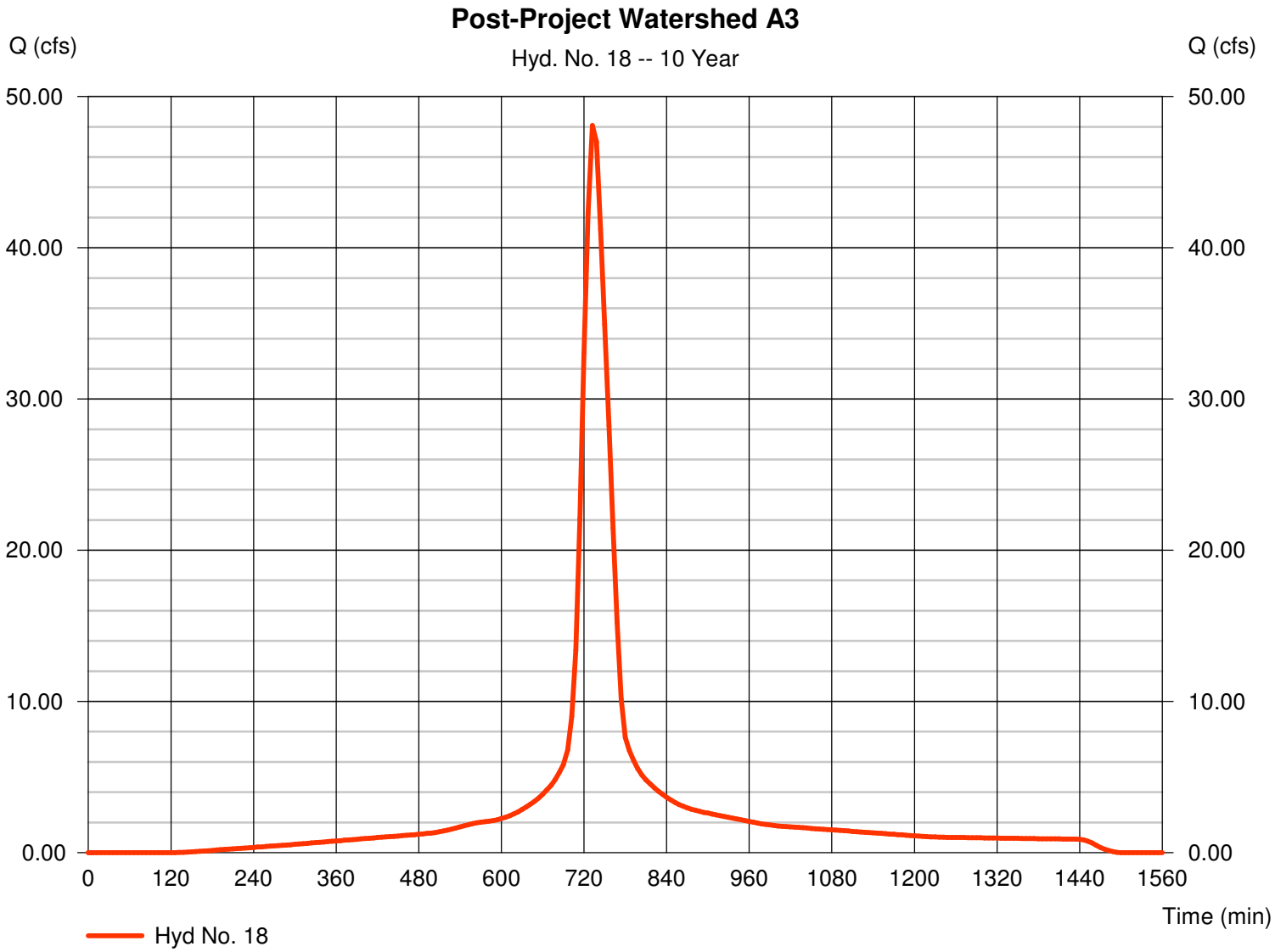


Hydrograph Report

Hyd. No. 18

Post-Project Watershed A3

Hydrograph type	=	SCS Runoff	Peak discharge	=	48.09 cfs
Storm frequency	=	10 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	5.856 acft
Drainage area	=	14.600 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	5.25 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

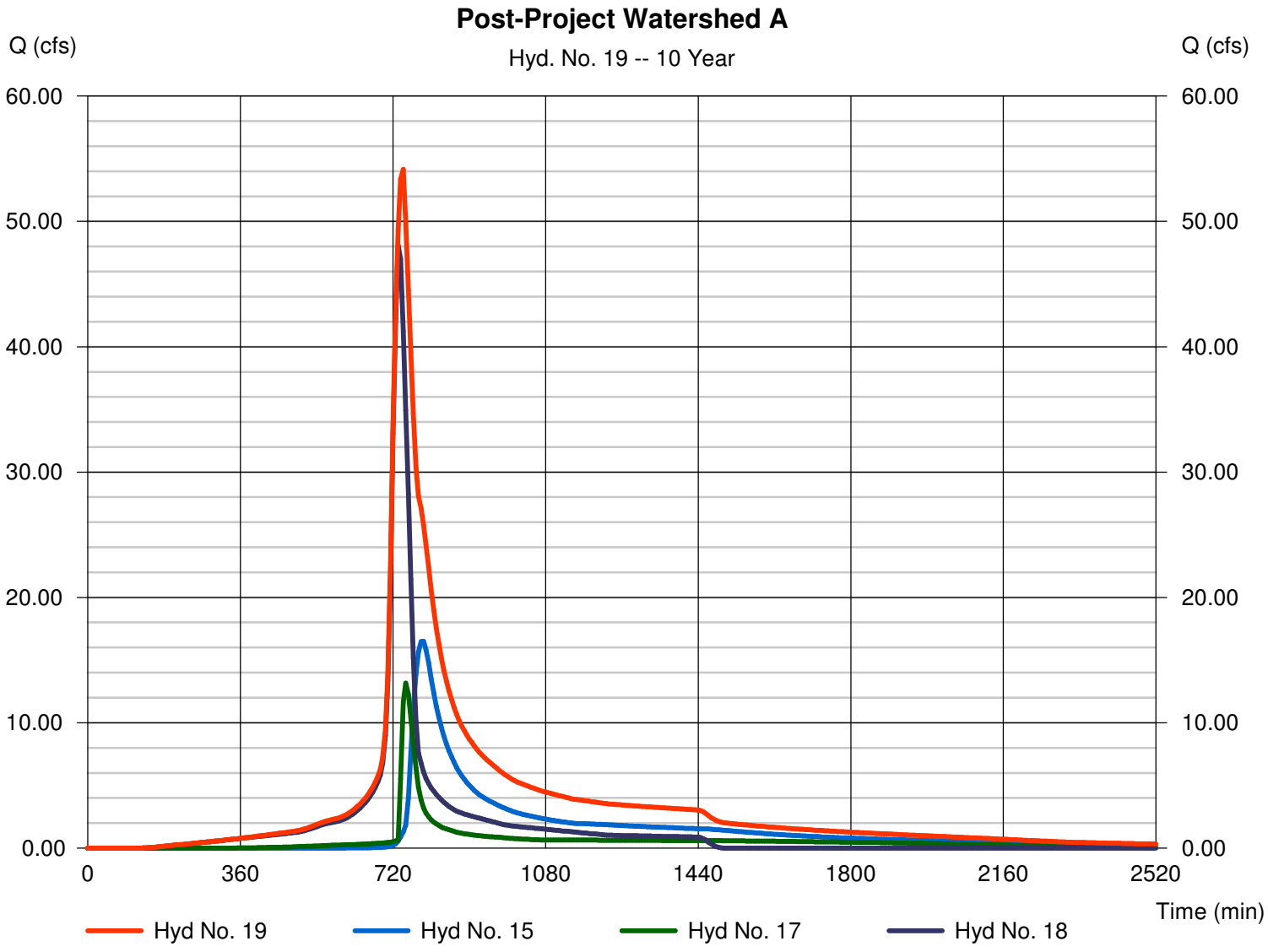


Hydrograph Report

Hyd. No. 19

Post-Project Watershed A

Hydrograph type	= Combine	Peak discharge	= 54.16 cfs
Storm frequency	= 10 yrs	Time to peak	= 744 min
Time interval	= 6 min	Hyd. volume	= 13.468 acft
Inflow hyds.	= 15, 17, 18	Contrib. drain. area	= 14.600 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

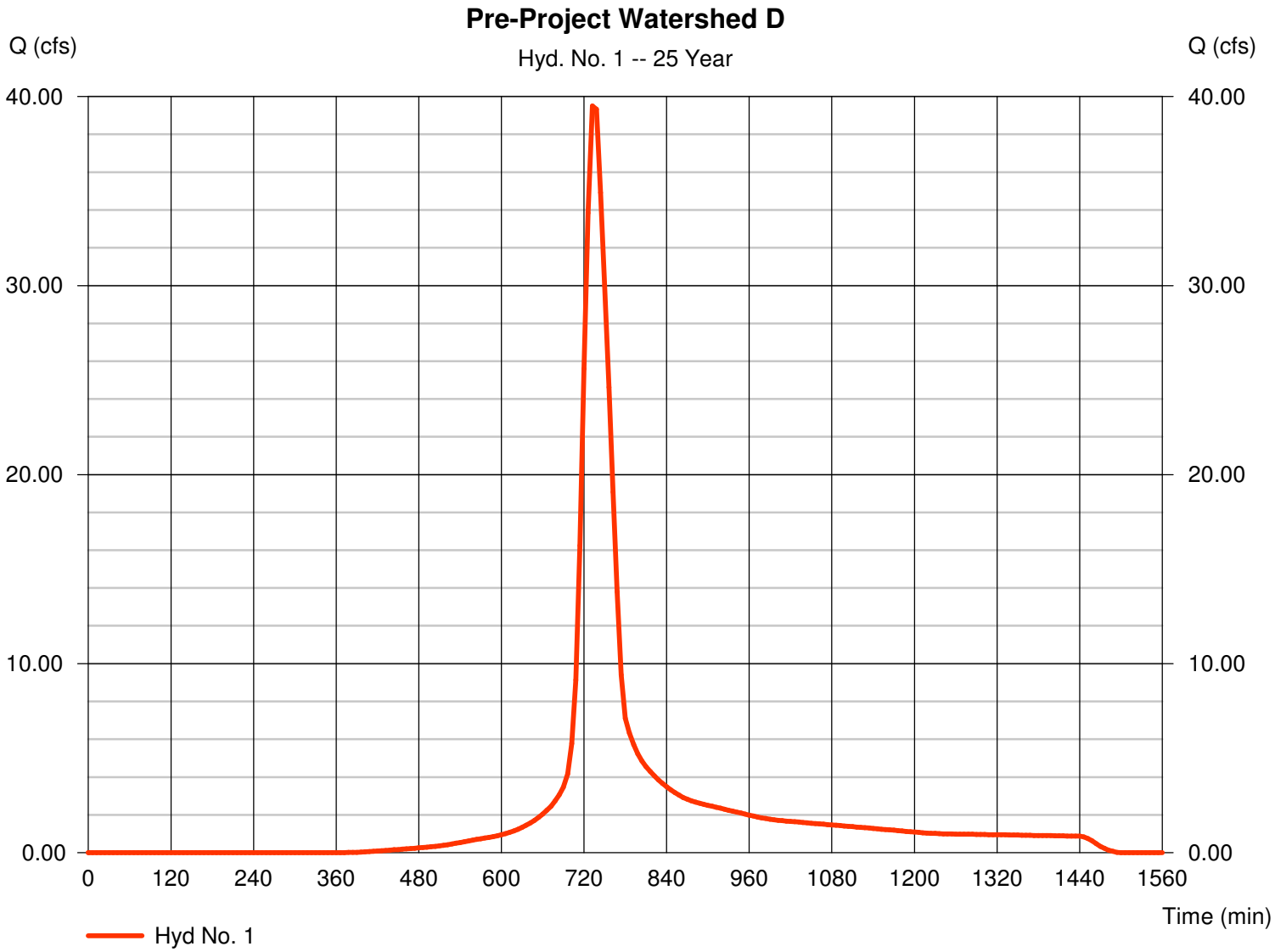
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	39.50	6	732	4.556	------	------	------	Pre-Project Watershed D
2	SCS Runoff	39.99	6	732	4.666	------	------	------	Post-Project Watershed D1
3	SCS Runoff	5.740	6	720	0.413	------	------	------	Post-Project Watershed D2
4	Reservoir	38.76	6	738	4.665	2	1366.60	1.15	Watershed D Detention
5	Combine	40.41	6	738	5.078	3, 4	------	------	Post-Project Watershed D
6	SCS Runoff	38.87	6	738	5.005	------	------	------	Offsite to the North
7	Combine	78.20	6	738	9.561	1, 6	------	------	Pre-Project to 159th
8	Combine	79.27	6	738	10.084	5, 6,	------	------	Post-Project to 159th
9	SCS Runoff	97.28	6	726	9.706	------	------	------	Cornerstone Commercial
10	Combine	166.67	6	732	19.268	7, 9	------	------	Pre-To Cornerstone Pond
11	Combine	162.14	6	732	19.790	8, 9,	------	------	Post-To Cornerstone Pond
13	SCS Runoff	88.43	6	750	13.206	------	------	------	Pre-Project Watershed A
14	SCS Runoff	48.35	6	744	7.277	------	------	------	Post-Project Watershed A1
15	Reservoir	27.16	6	780	7.114	14	1368.97	3.36	Exist Wtrshed A1 Det
16	SCS Runoff	21.70	6	732	2.554	------	------	------	Post-Project Watershed A2
17	Reservoir	17.79	6	744	2.553	16	1368.71	0.822	Watershed A2 Detention
18	SCS Runoff	58.29	6	732	7.164	------	------	------	Post-Project Watershed A3
19	Combine	74.91	6	738	16.831	15, 17, 18	------	------	Post-Project Watershed A

Hydrograph Report

Hyd. No. 1

Pre-Project Watershed D

Hydrograph type	=	SCS Runoff	Peak discharge	=	39.50 cfs
Storm frequency	=	25 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	4.556 acft
Drainage area	=	13.080 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.20 min
Total precip.	=	6.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

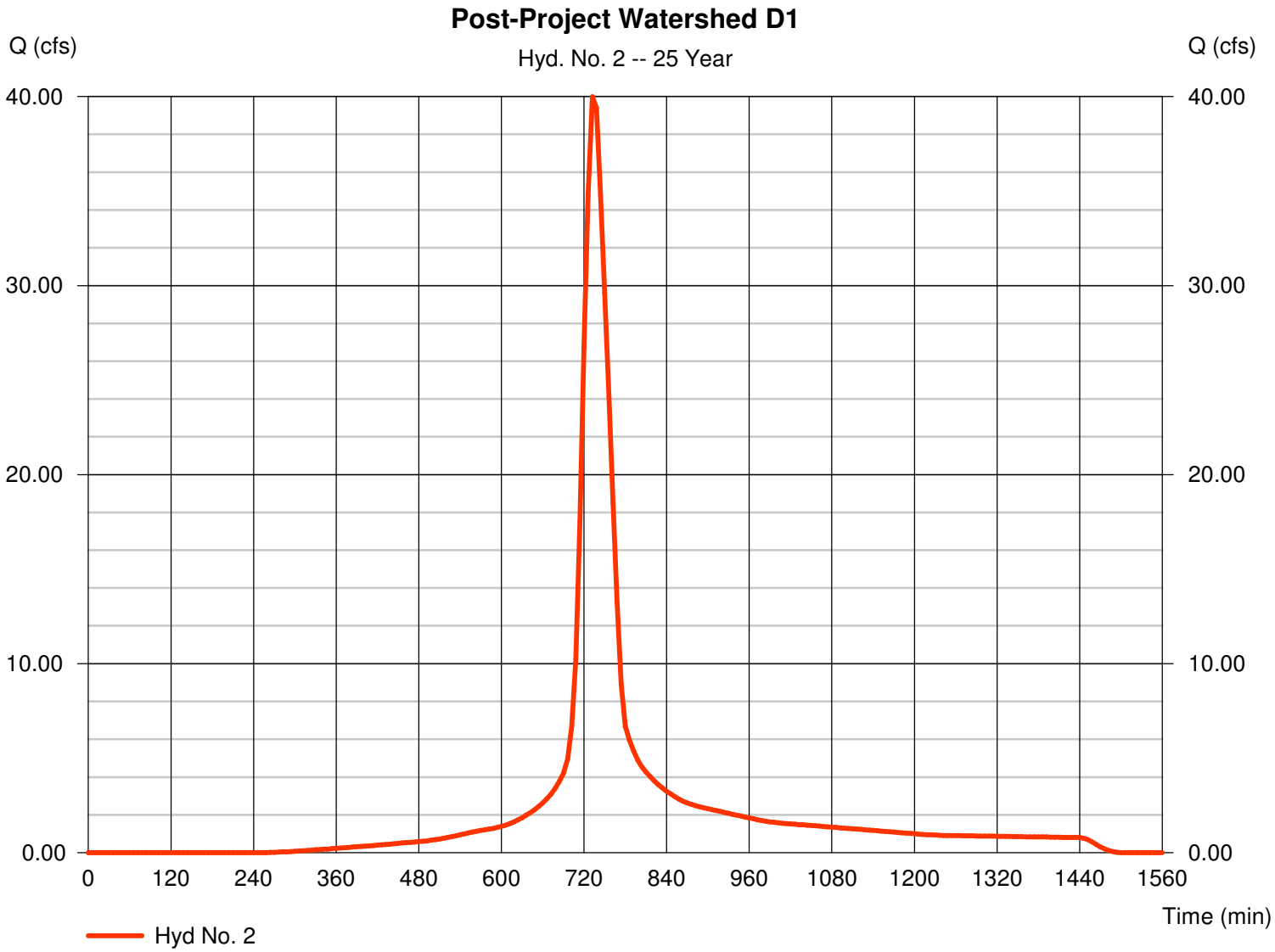


Hydrograph Report

Hyd. No. 2

Post-Project Watershed D1

Hydrograph type	=	SCS Runoff	Peak discharge	=	39.99 cfs
Storm frequency	=	25 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	4.666 acft
Drainage area	=	11.300 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	36.80 min
Total precip.	=	6.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

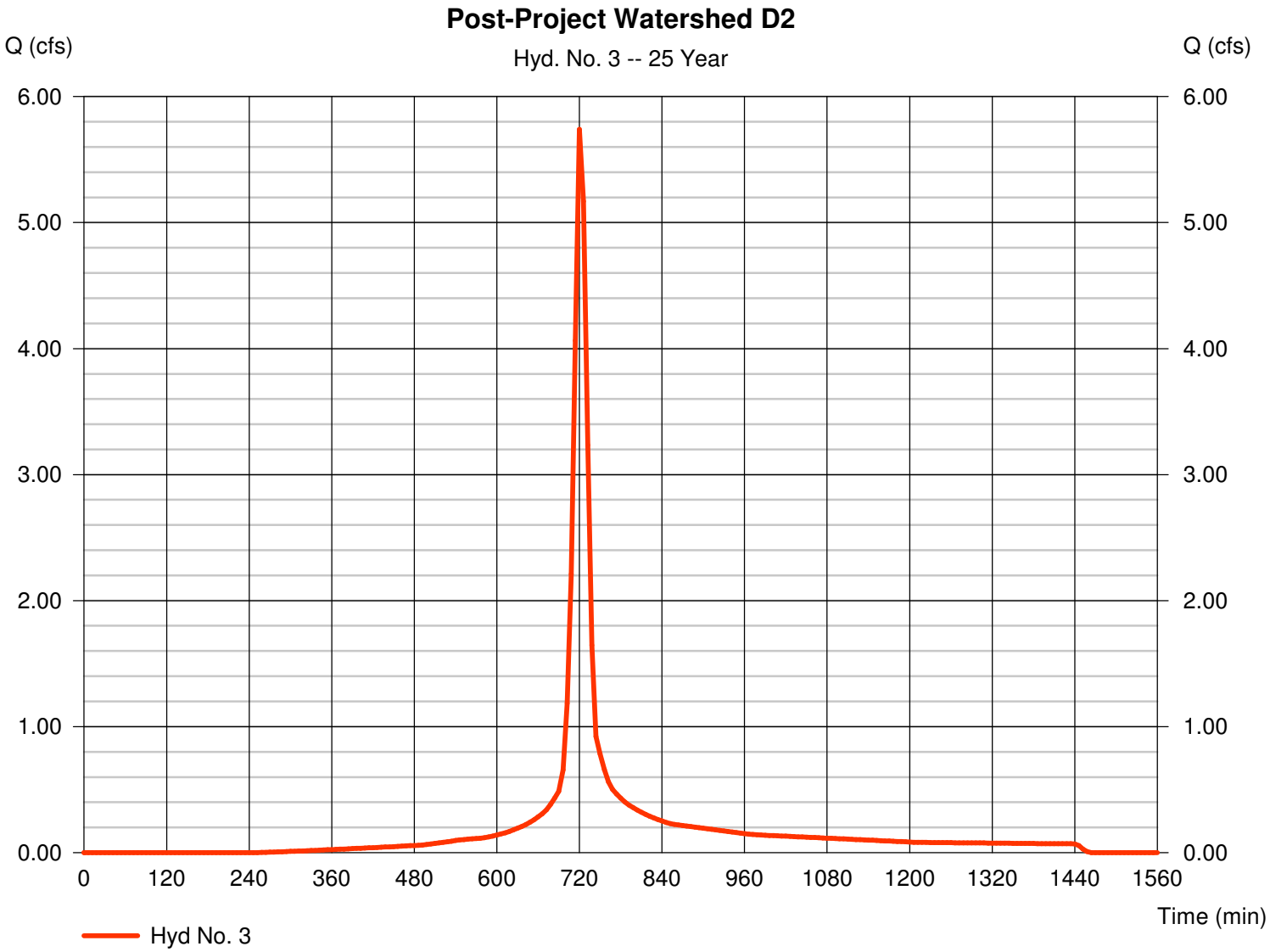


Hydrograph Report

Hyd. No. 3

Post-Project Watershed D2

Hydrograph type	=	SCS Runoff	Peak discharge	=	5.740 cfs
Storm frequency	=	25 yrs	Time to peak	=	720 min
Time interval	=	6 min	Hyd. volume	=	0.413 acft
Drainage area	=	1.100 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	6.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



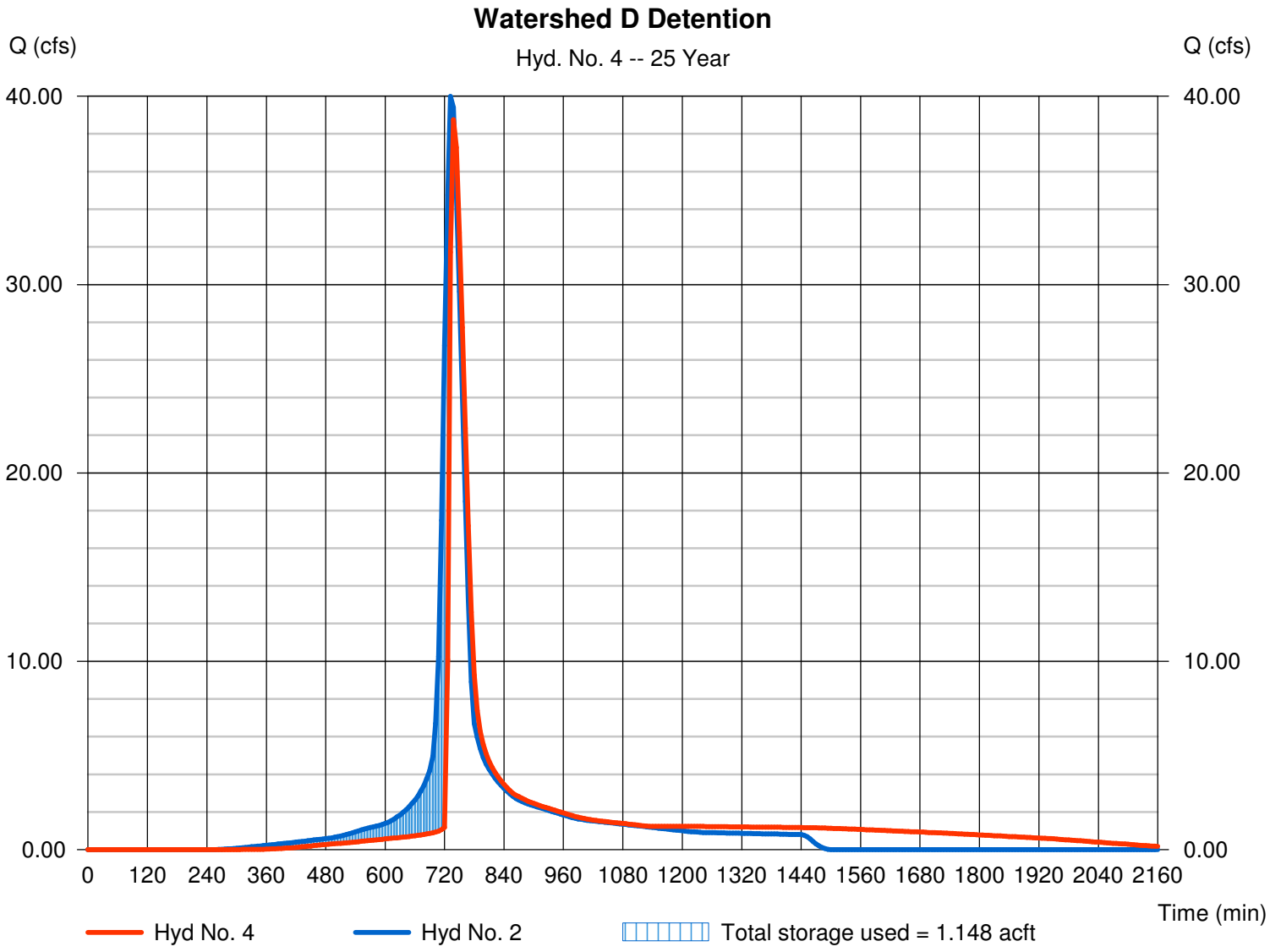
Hydrograph Report

Hyd. No. 4

Watershed D Detention

Hydrograph type	=	Reservoir	Peak discharge	=	38.76 cfs
Storm frequency	=	25 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	4.665 acft
Inflow hyd. No.	=	2 - Post-Project Watershed D1	Max. Elevation	=	1366.60 ft
Reservoir name	=	Watershed D Detention	Max. Storage	=	1.148 acft

Storage Indication method used.

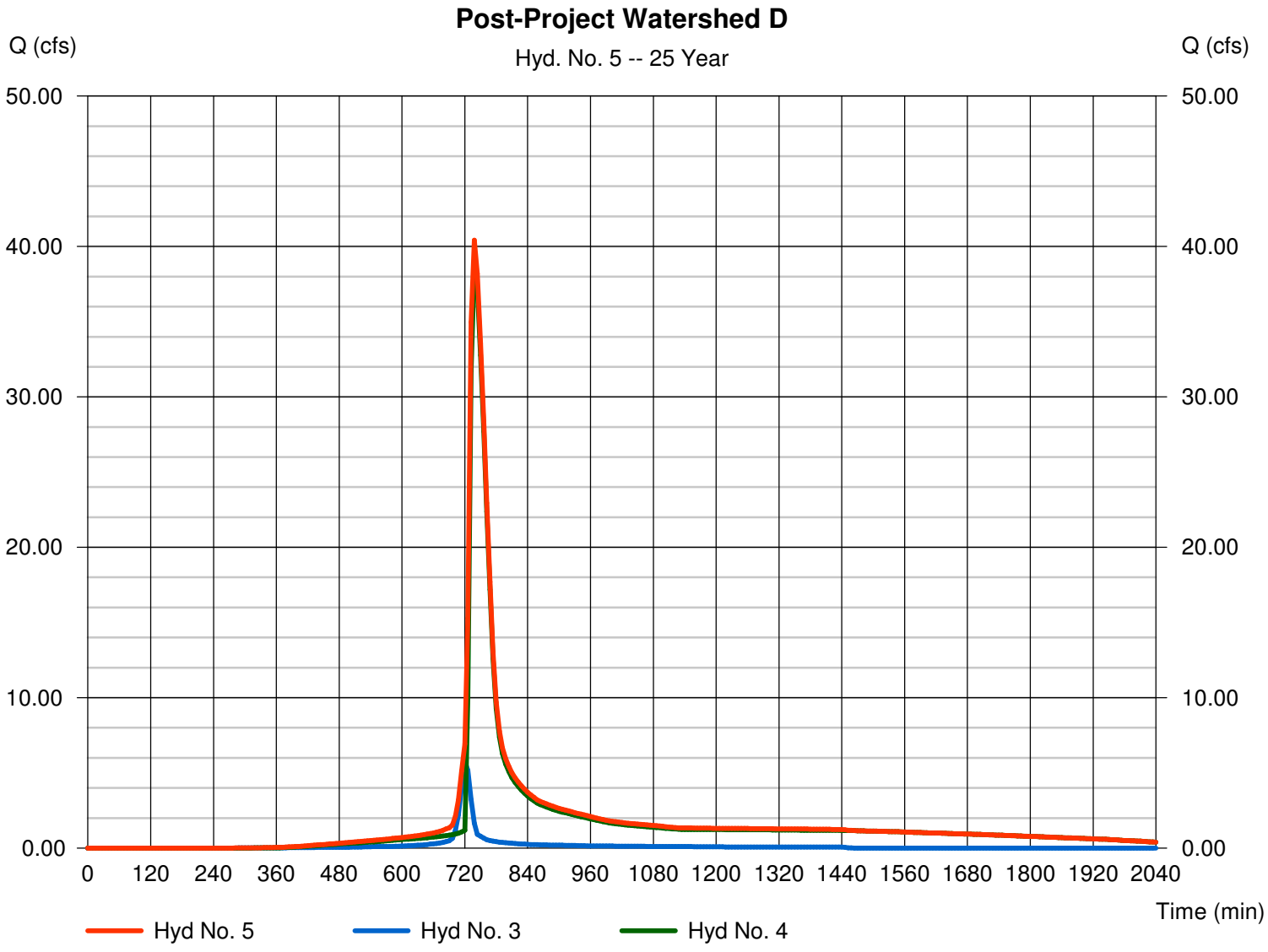


Hydrograph Report

Hyd. No. 5

Post-Project Watershed D

Hydrograph type	= Combine	Peak discharge	= 40.41 cfs
Storm frequency	= 25 yrs	Time to peak	= 738 min
Time interval	= 6 min	Hyd. volume	= 5.078 acft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 1.100 ac

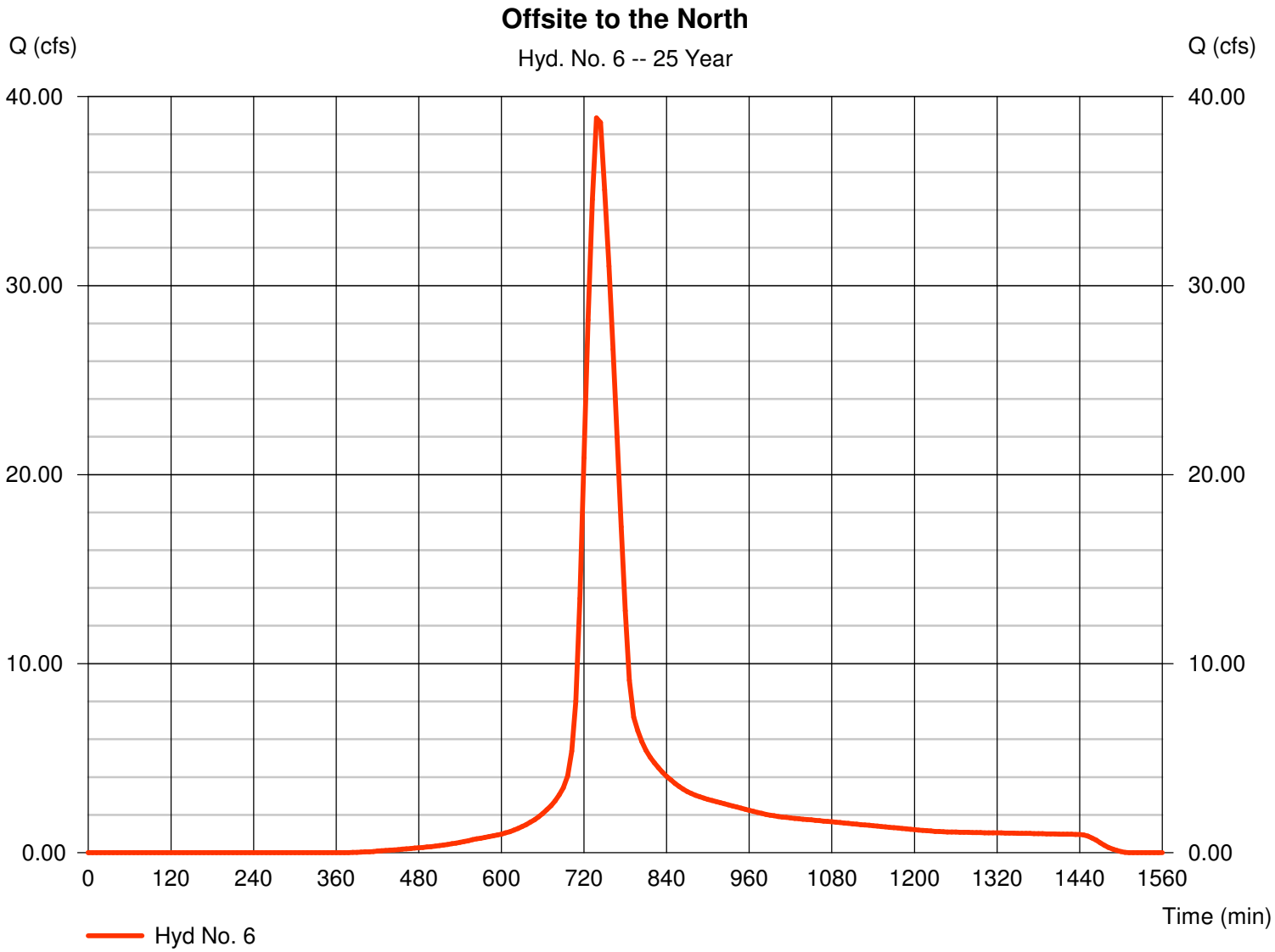


Hydrograph Report

Hyd. No. 6

Offsite to the North

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.87 cfs
Storm frequency	=	25 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	5.005 acft
Drainage area	=	15.200 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.30 min
Total precip.	=	6.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

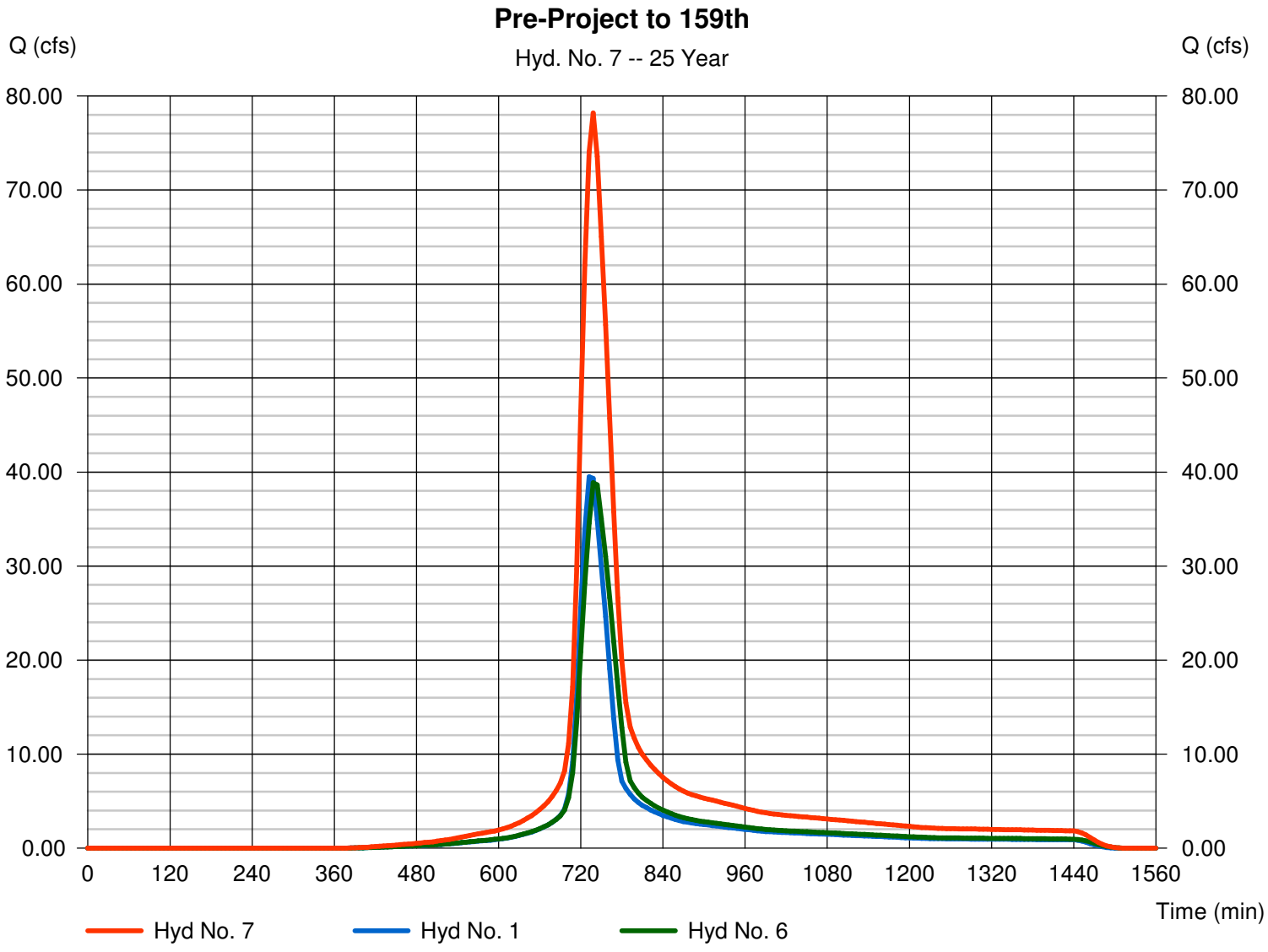


Hydrograph Report

Hyd. No. 7

Pre-Project to 159th

Hydrograph type	= Combine	Peak discharge	= 78.20 cfs
Storm frequency	= 25 yrs	Time to peak	= 738 min
Time interval	= 6 min	Hyd. volume	= 9.561 acft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 28.280 ac

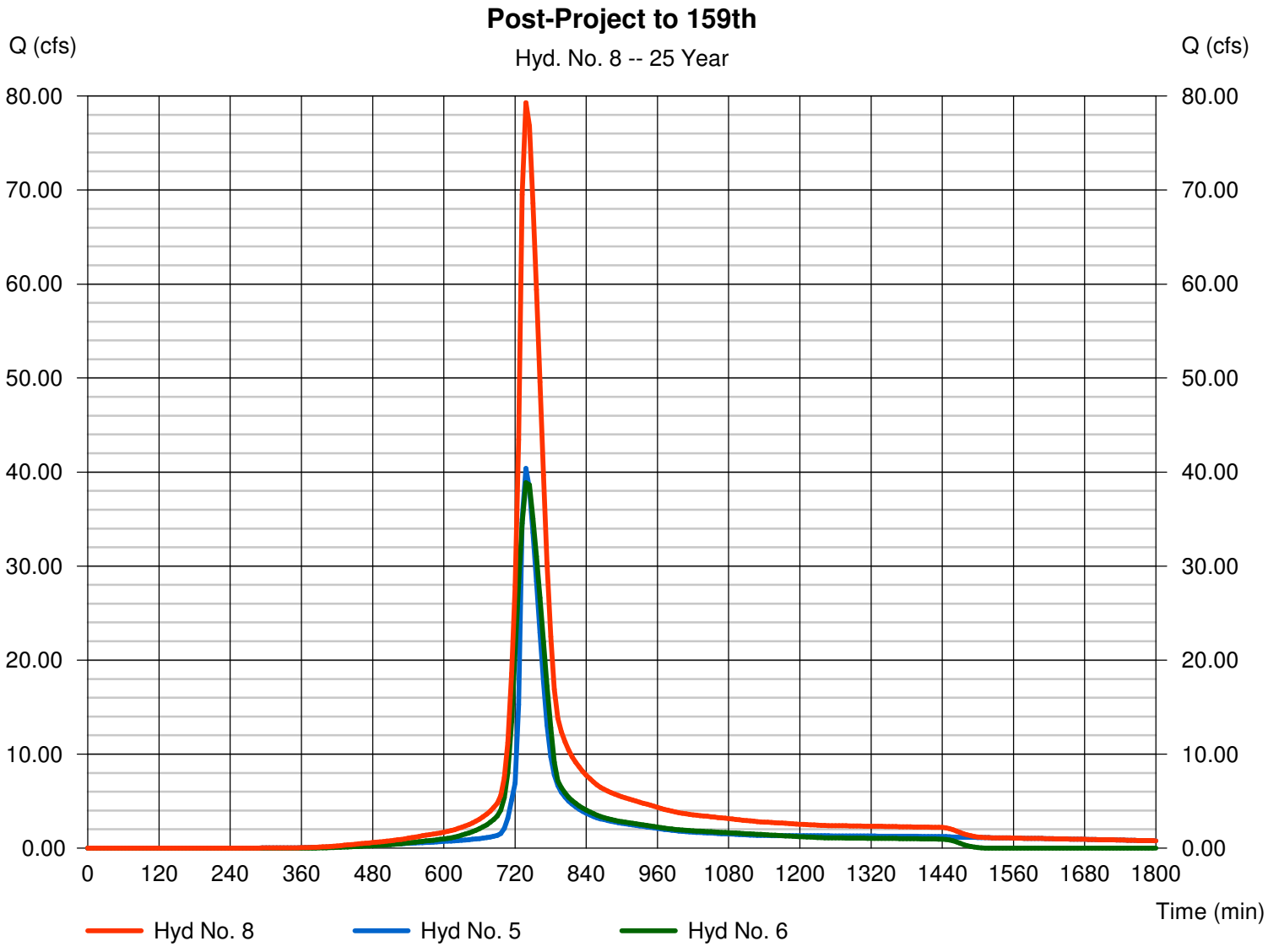


Hydrograph Report

Hyd. No. 8

Post-Project to 159th

Hydrograph type	=	Combine	Peak discharge	=	79.27 cfs
Storm frequency	=	25 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	10.084 acft
Inflow hyds.	=	5, 6	Contrib. drain. area	=	15.200 ac

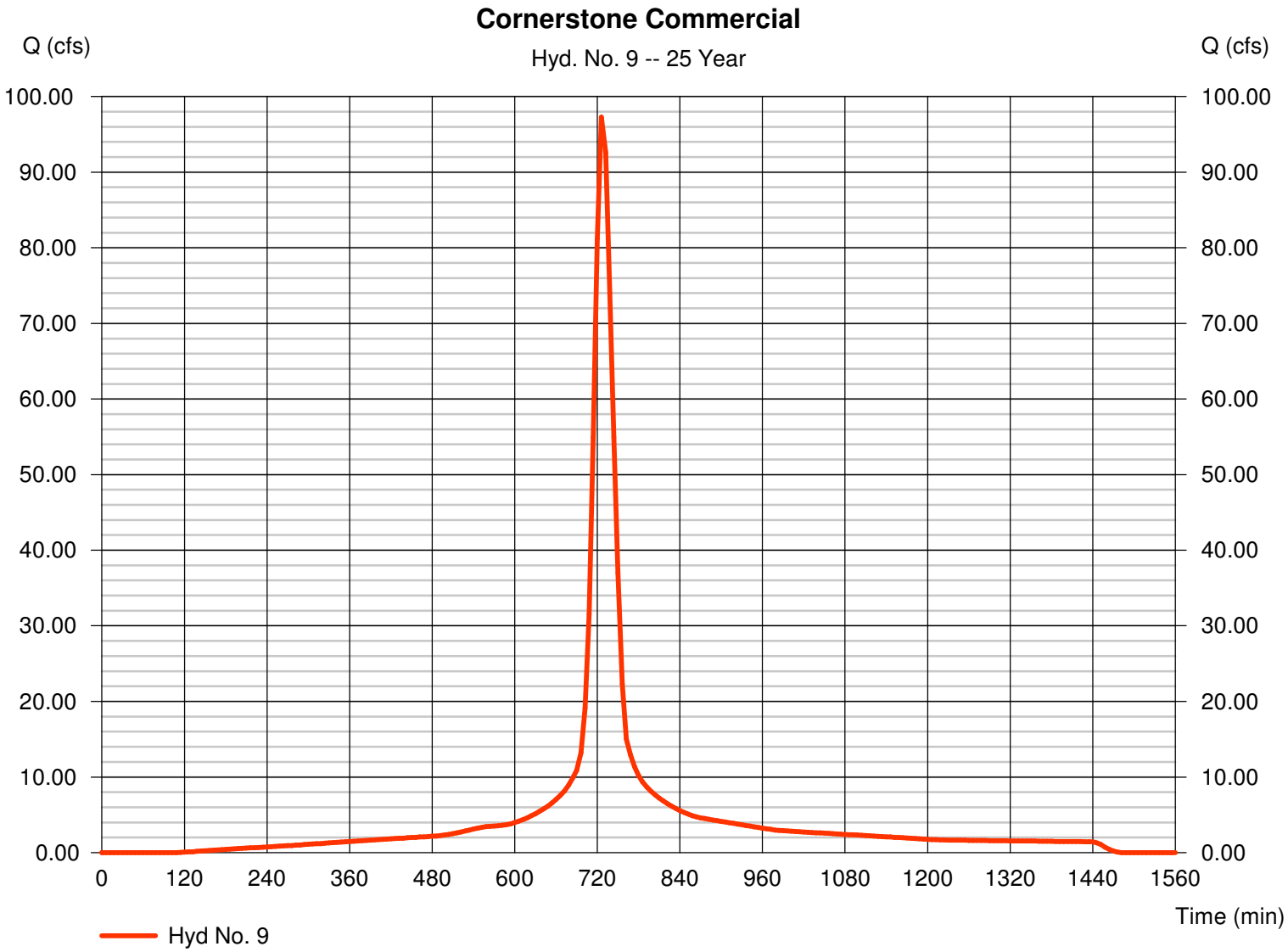


Hydrograph Report

Hyd. No. 9

Cornerstone Commercial

Hydrograph type	=	SCS Runoff	Peak discharge	=	97.28 cfs
Storm frequency	=	25 yrs	Time to peak	=	726 min
Time interval	=	6 min	Hyd. volume	=	9.706 acft
Drainage area	=	20.400 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	21.90 min
Total precip.	=	6.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

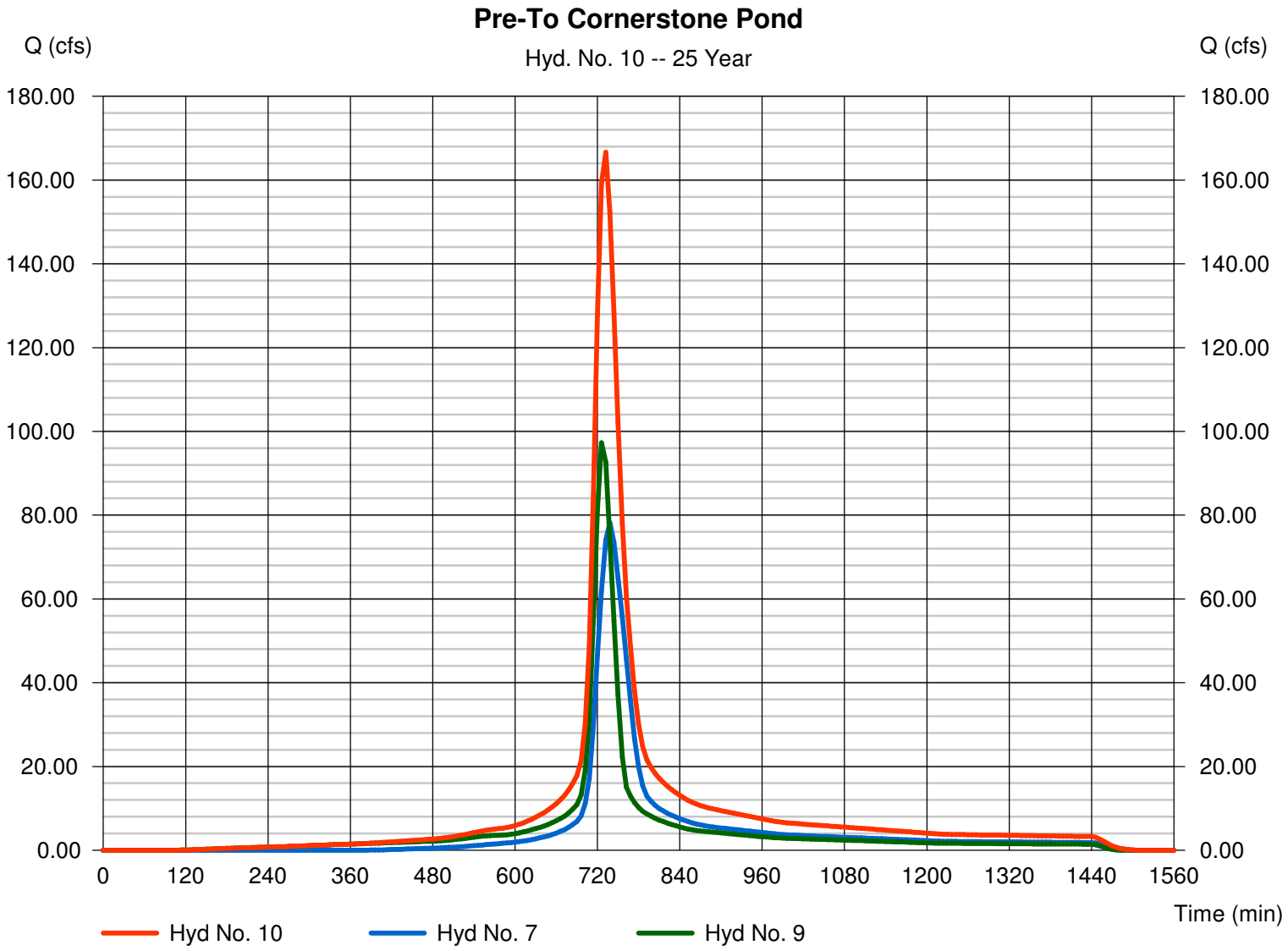


Hydrograph Report

Hyd. No. 10

Pre-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 166.67 cfs
Storm frequency	= 25 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 19.268 acft
Inflow hyds.	= 7, 9	Contrib. drain. area	= 20.400 ac

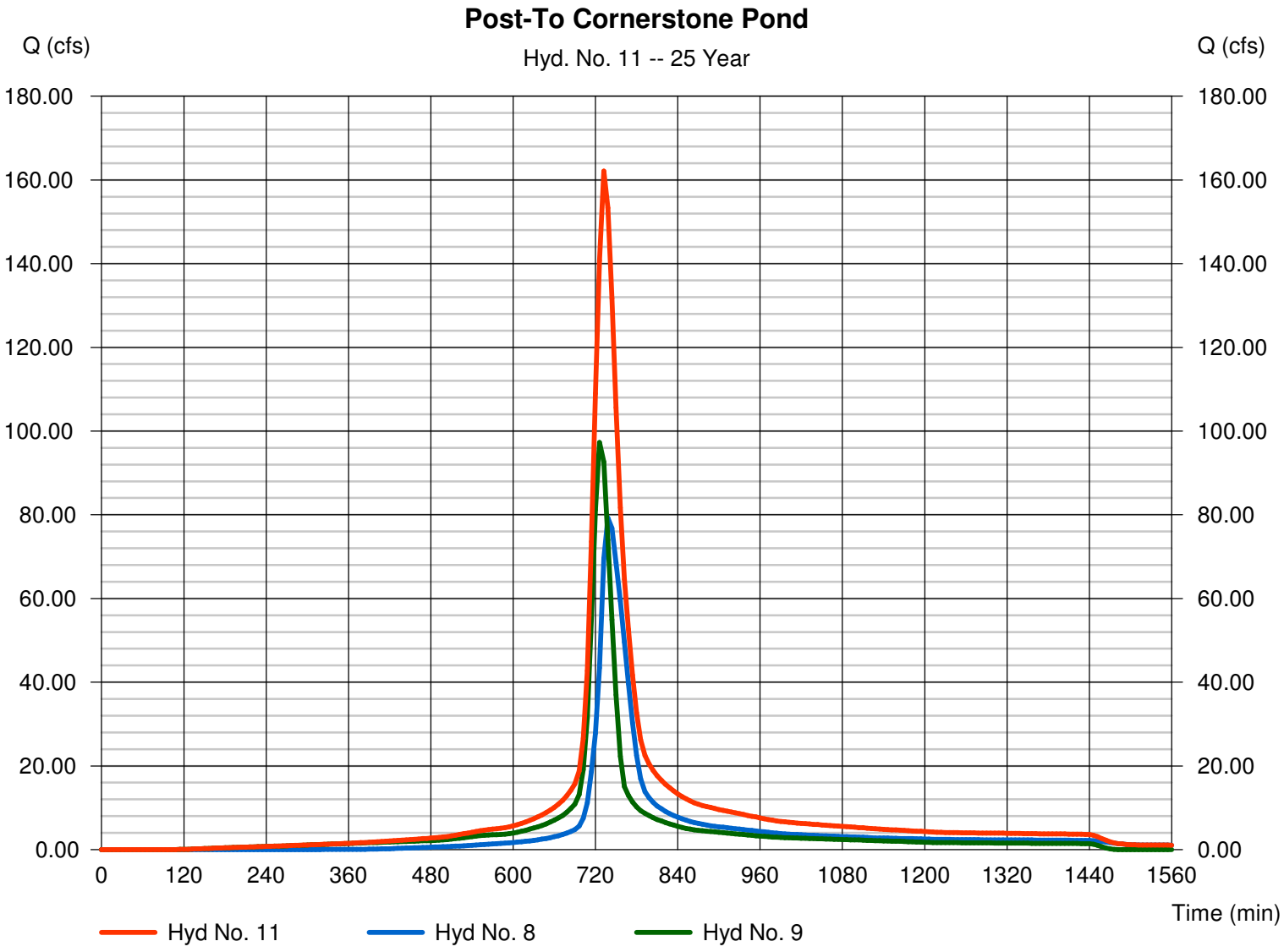


Hydrograph Report

Hyd. No. 11

Post-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 162.14 cfs
Storm frequency	= 25 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 19.790 acft
Inflow hyds.	= 8, 9	Contrib. drain. area	= 20.400 ac

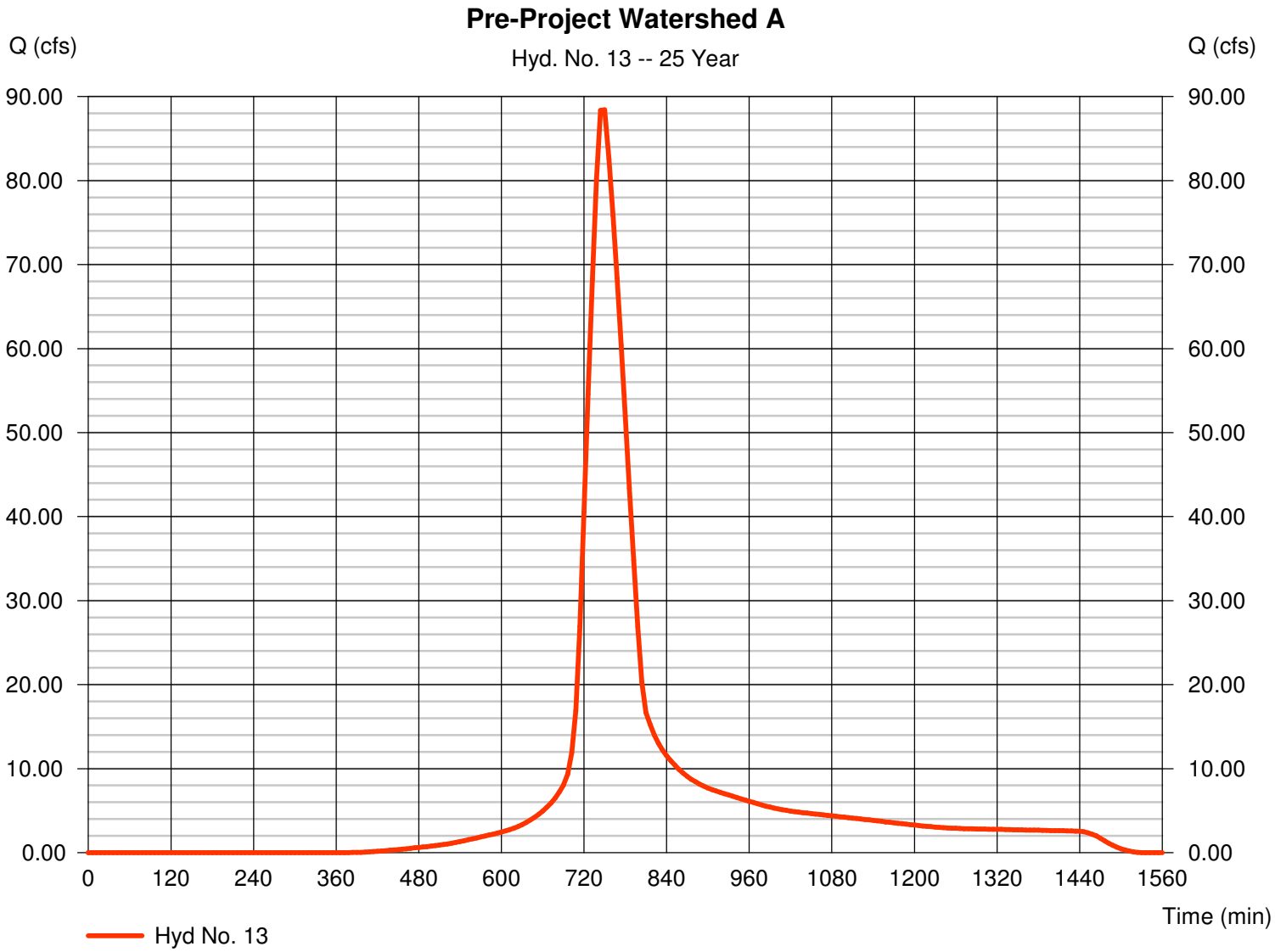


Hydrograph Report

Hyd. No. 13

Pre-Project Watershed A

Hydrograph type	=	SCS Runoff	Peak discharge	=	88.43 cfs
Storm frequency	=	25 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	13.206 acft
Drainage area	=	39.100 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	54.60 min
Total precip.	=	6.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

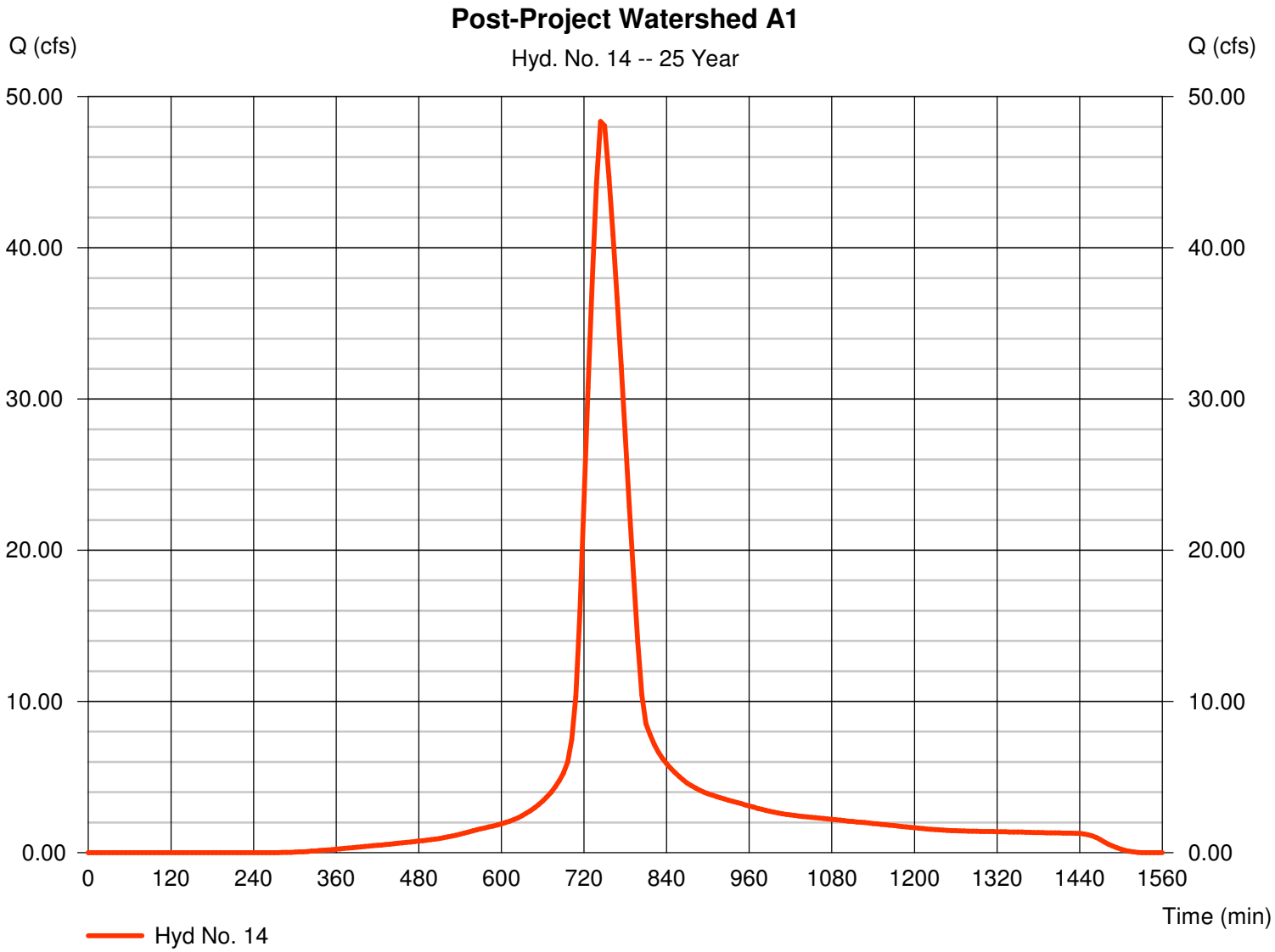


Hydrograph Report

Hyd. No. 14

Post-Project Watershed A1

Hydrograph type	=	SCS Runoff	Peak discharge	=	48.35 cfs
Storm frequency	=	25 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	7.277 acft
Drainage area	=	18.600 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	55.80 min
Total precip.	=	6.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



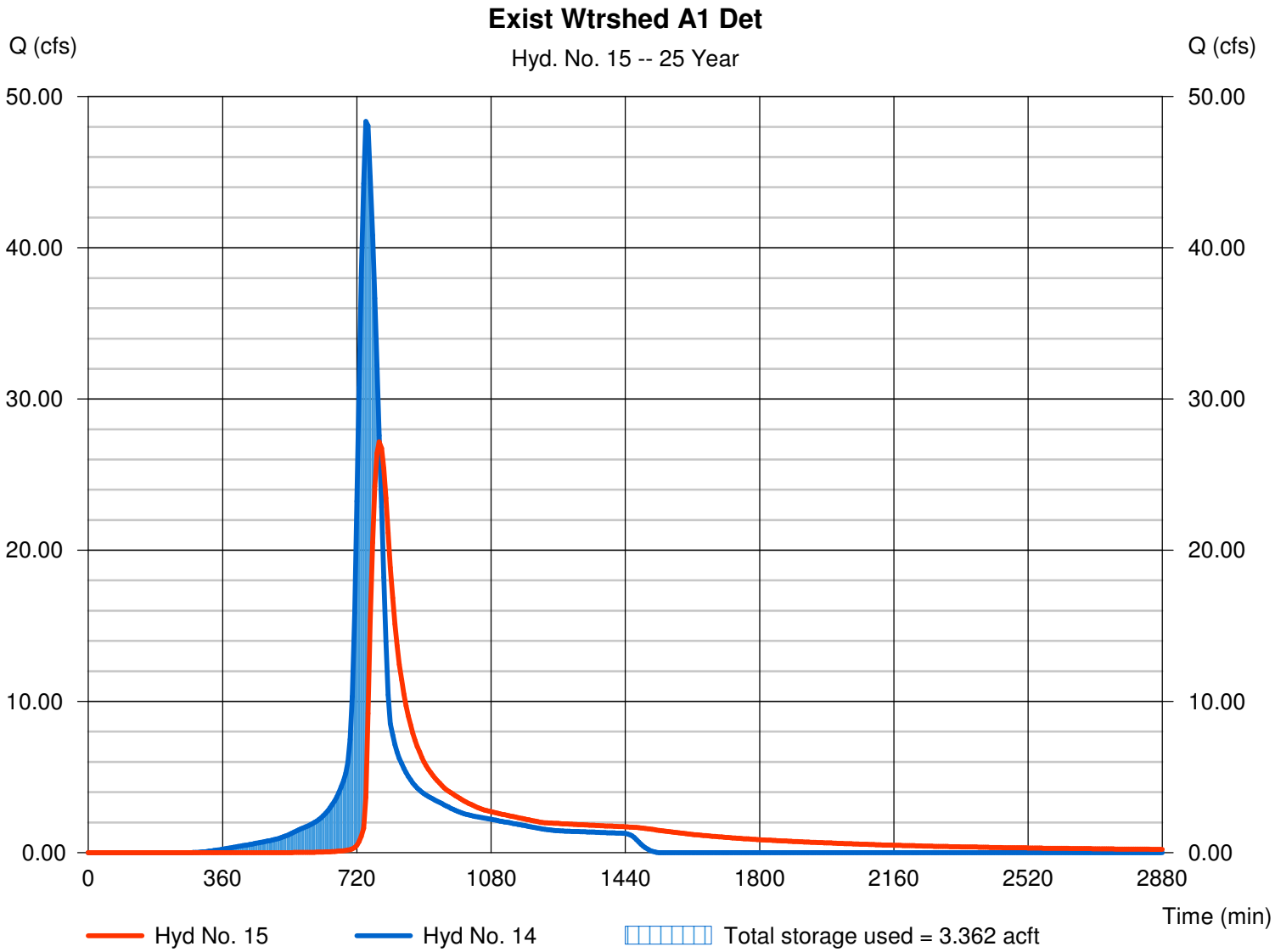
Hydrograph Report

Hyd. No. 15

Exist Wtrshed A1 Det

Hydrograph type	=	Reservoir	Peak discharge	=	27.16 cfs
Storm frequency	=	25 yrs	Time to peak	=	780 min
Time interval	=	6 min	Hyd. volume	=	7.114 acft
Inflow hyd. No.	=	14 - Post-Project Watershed A1	Max. Elevation	=	1368.97 ft
Reservoir name	=	Existing Detention Pond	Max. Storage	=	3.362 acft

Storage Indication method used.



Hydrograph Report

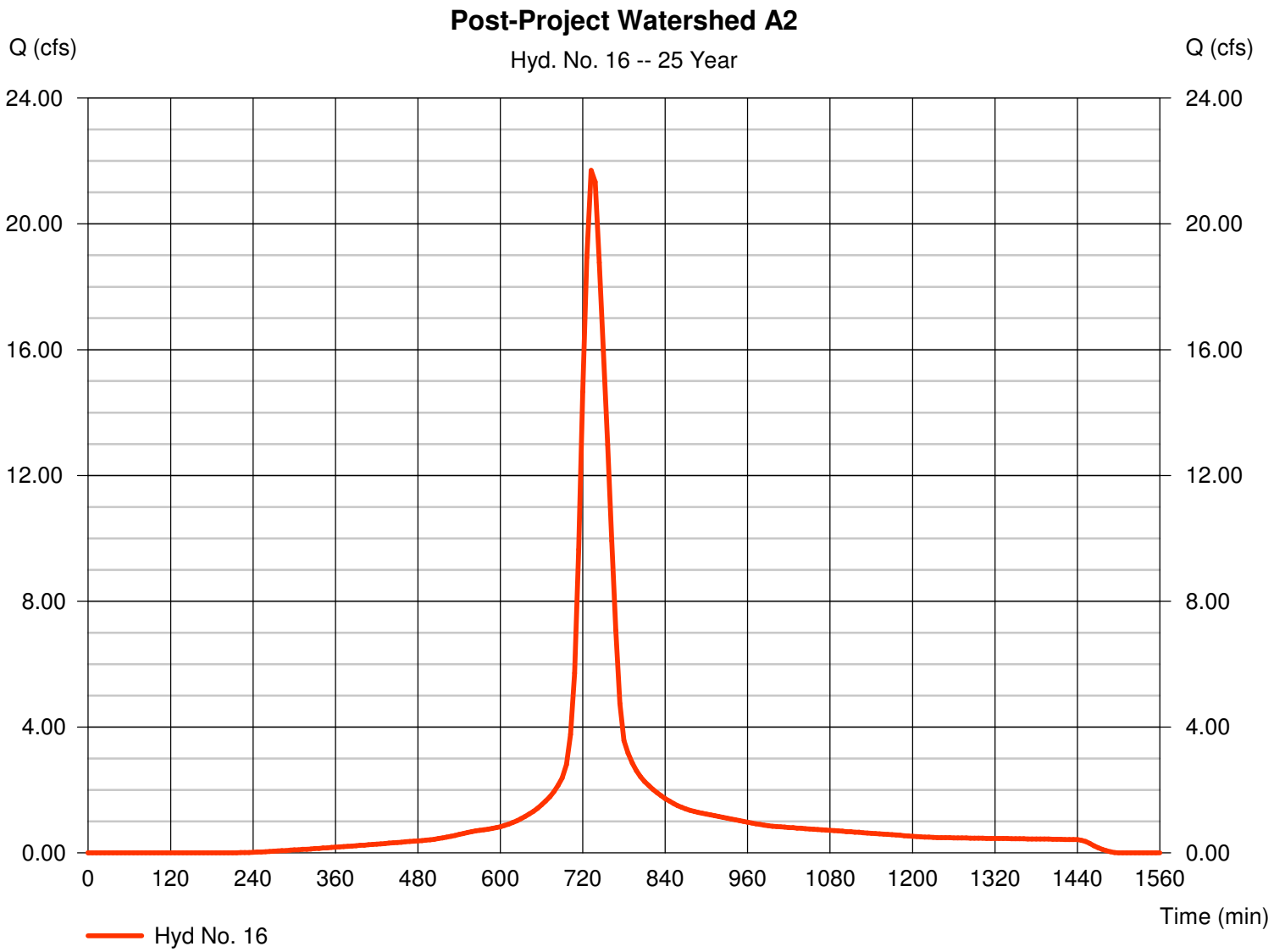
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, May 27, 2011

Hyd. No. 16

Post-Project Watershed A2

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.70 cfs
Storm frequency	=	25 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	2.554 acft
Drainage area	=	5.900 ac	Curve number	=	89.1*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	6.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(4.000 x 86) + (1.900 x 80)] / 5.900



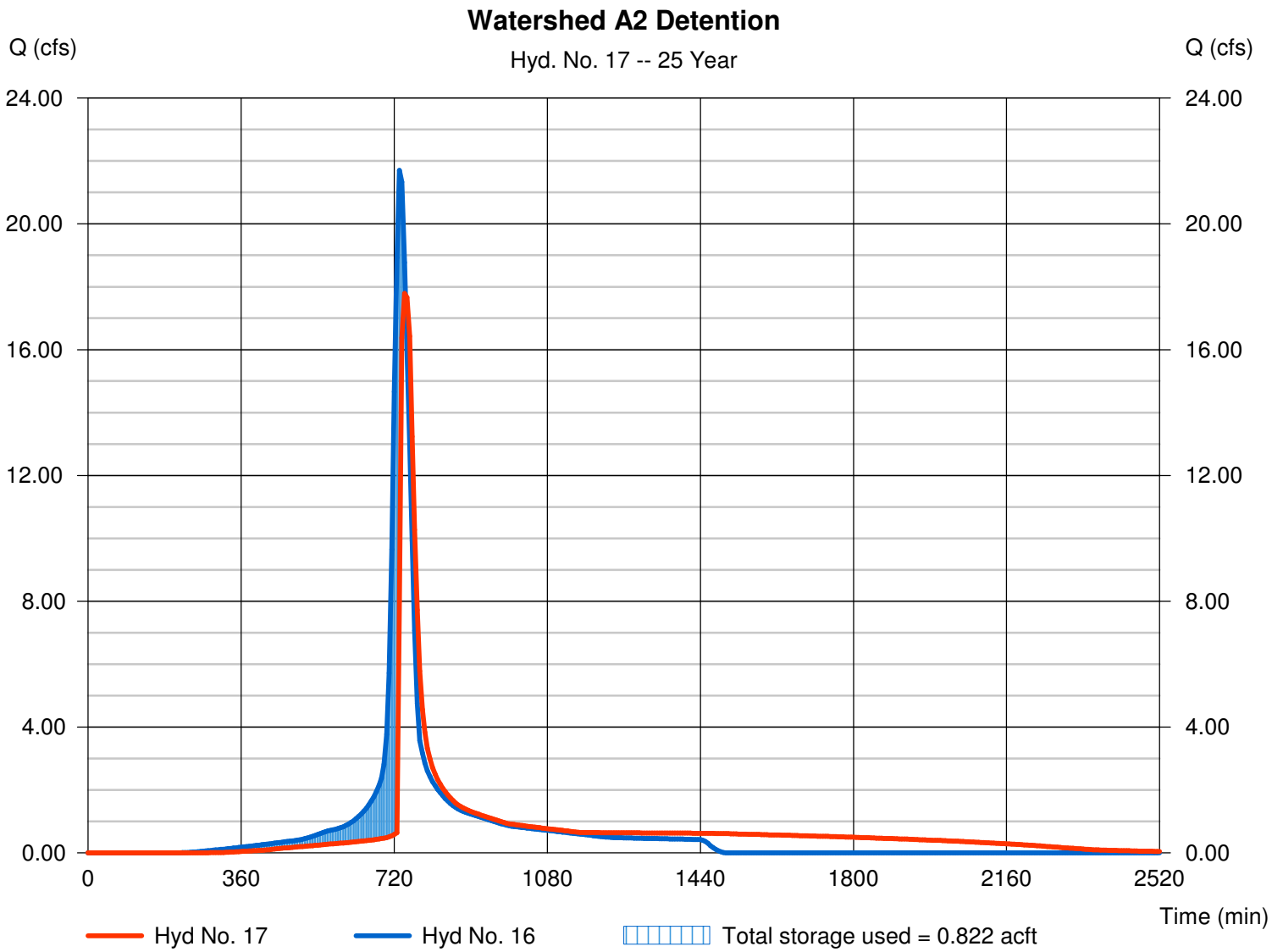
Hydrograph Report

Hyd. No. 17

Watershed A2 Detention

Hydrograph type	=	Reservoir	Peak discharge	=	17.79 cfs
Storm frequency	=	25 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	2.553 acft
Inflow hyd. No.	=	16 - Post-Project Watershed A2	Max. Elevation	=	1368.71 ft
Reservoir name	=	Watershed A2 Detention	Max. Storage	=	0.822 acft

Storage Indication method used.

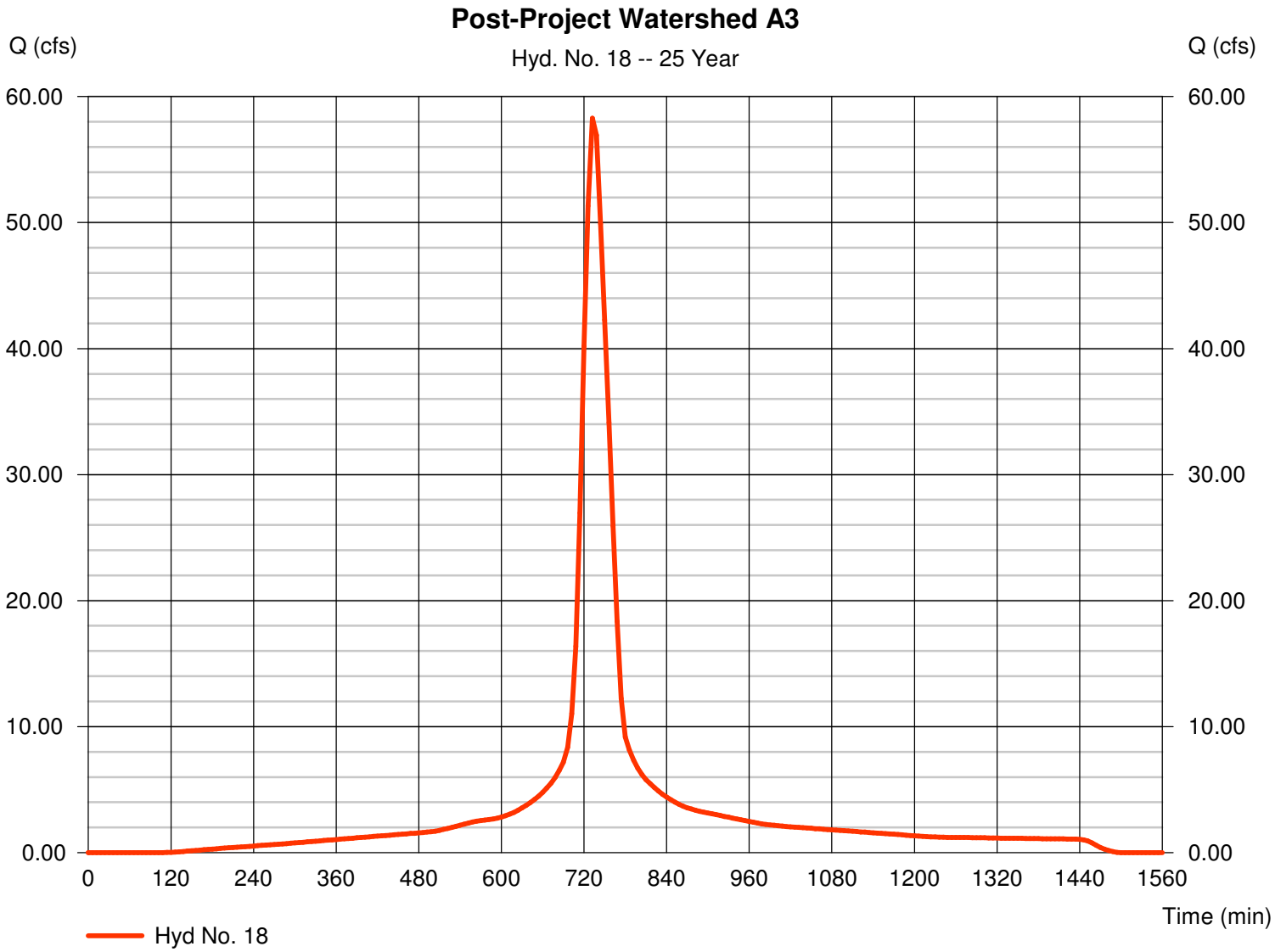


Hydrograph Report

Hyd. No. 18

Post-Project Watershed A3

Hydrograph type	=	SCS Runoff	Peak discharge	=	58.29 cfs
Storm frequency	=	25 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	7.164 acft
Drainage area	=	14.600 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	6.30 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



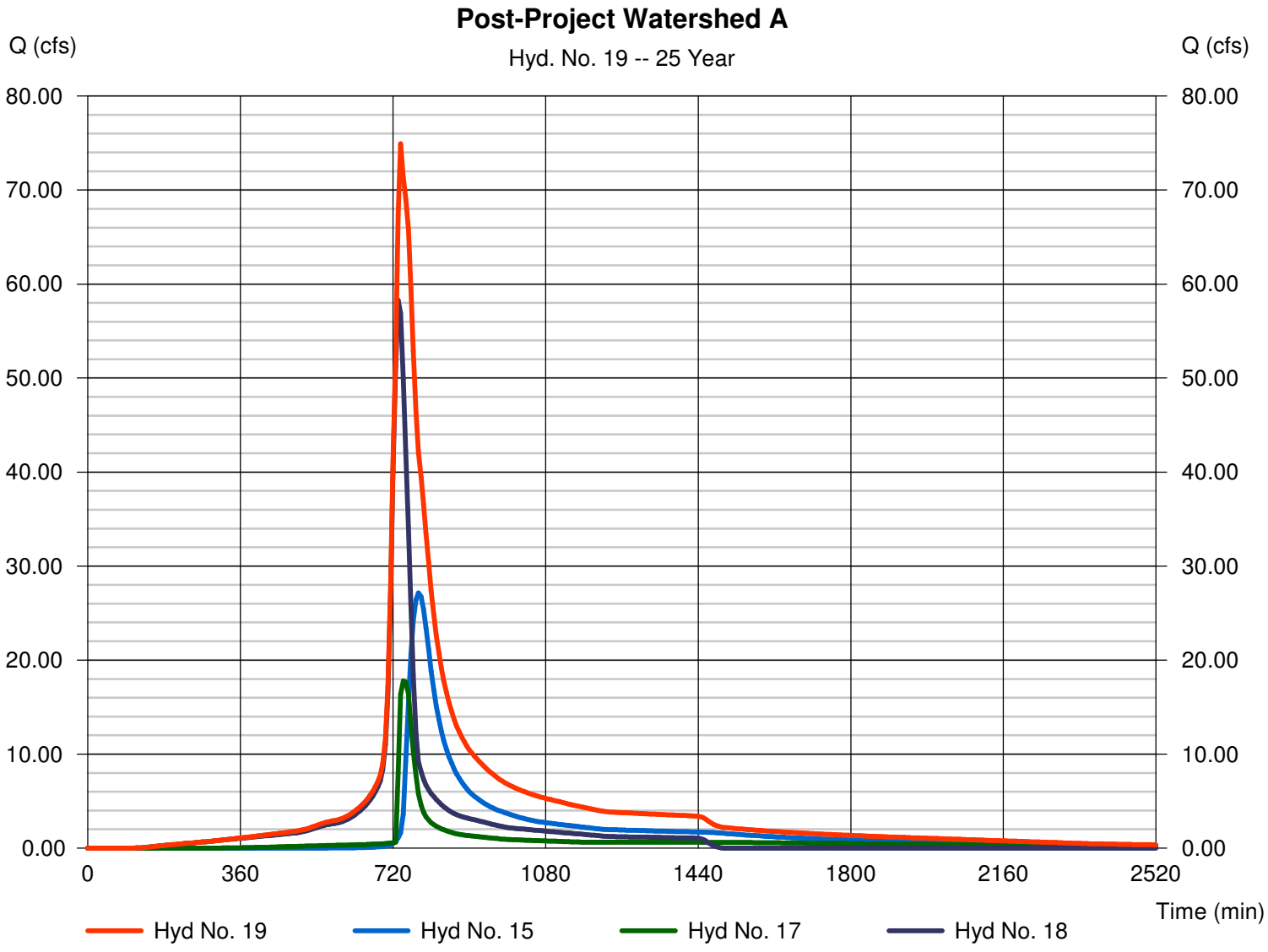
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, May 27, 2011

Hyd. No. 19

Post-Project Watershed A

Hydrograph type	= Combine	Peak discharge	= 74.91 cfs
Storm frequency	= 25 yrs	Time to peak	= 738 min
Time interval	= 6 min	Hyd. volume	= 16.831 acft
Inflow hyds.	= 15, 17, 18	Contrib. drain. area	= 14.600 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066

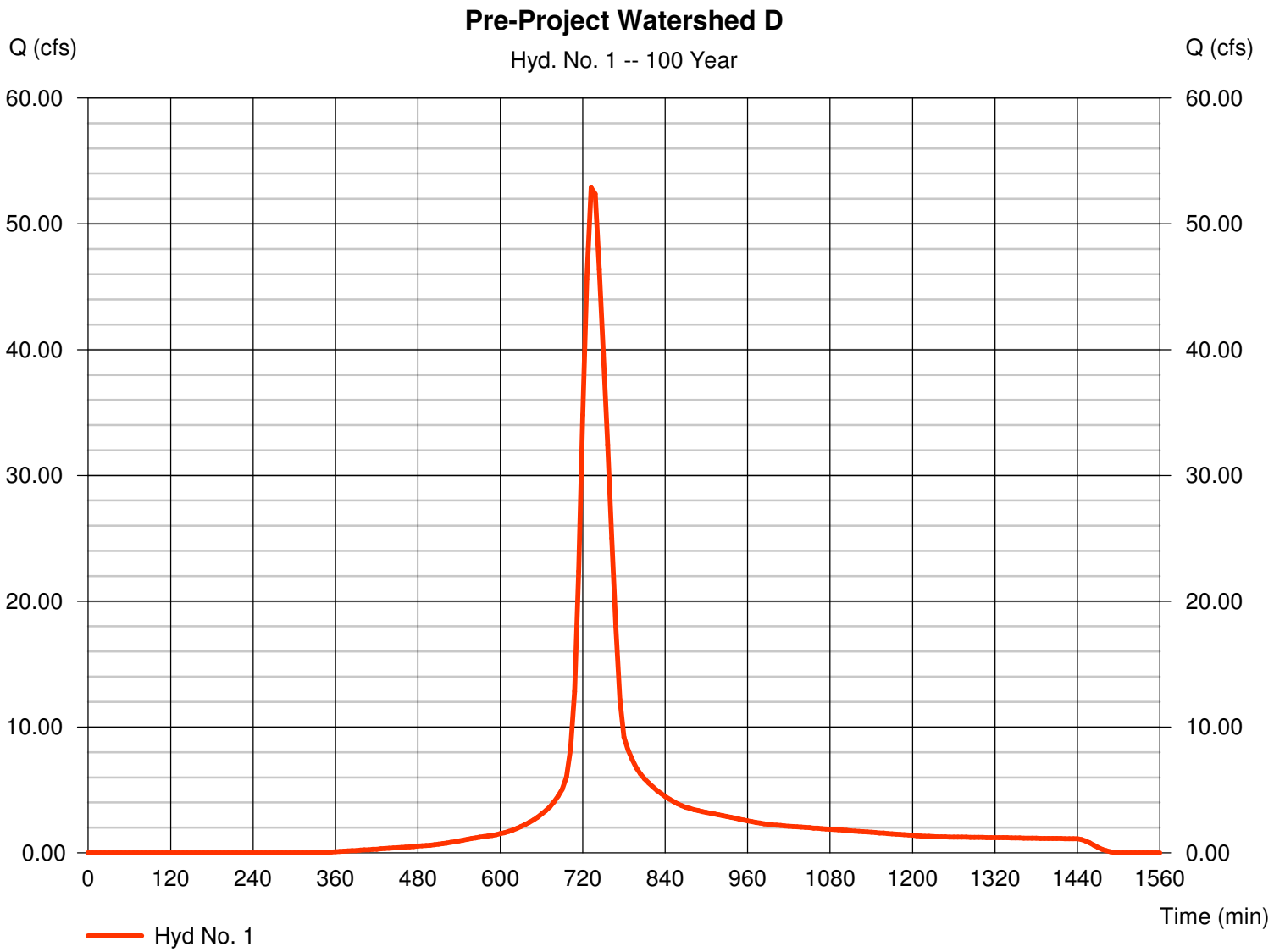
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	SCS Runoff	52.87	6	732	6.112	------	------	------	Pre-Project Watershed D
2	SCS Runoff	51.57	6	732	6.074	------	------	------	Post-Project Watershed D1
3	SCS Runoff	7.386	6	720	0.538	------	------	------	Post-Project Watershed D2
4	Reservoir	49.92	6	738	6.074	2	1366.79	1.21	Watershed D Detention
5	Combine	52.01	6	738	6.611	3, 4	------	------	Post-Project Watershed D
6	SCS Runoff	52.02	6	738	6.716	------	------	------	Offsite to the North
7	Combine	104.41	6	738	12.828	1, 6	------	------	Pre-Project to 159th
8	Combine	104.03	6	738	13.327	5, 6,	------	------	Post-Project to 159th
9	SCS Runoff	121.44	6	726	12.244	------	------	------	Cornerstone Commercial
10	Combine	214.90	6	732	25.072	7, 9	------	------	Pre-To Cornerstone Pond
11	Combine	213.10	6	732	25.571	8, 9,	------	------	Post-To Cornerstone Pond
13	SCS Runoff	118.34	6	744	17.718	------	------	------	Pre-Project Watershed A
14	SCS Runoff	62.70	6	744	9.513	------	------	------	Post-Project Watershed A1
15	Reservoir	38.75	6	774	9.350	14	1369.37	3.92	Exist Wtrshed A1 Det
16	SCS Runoff	27.72	6	732	3.297	------	------	------	Post-Project Watershed A2
17	Reservoir	21.54	6	750	3.296	16	1368.98	0.951	Watershed A2 Detention
18	SCS Runoff	72.78	6	732	9.036	------	------	------	Post-Project Watershed A3
19	Combine	101.08	6	744	21.682	15, 17, 18	------	------	Post-Project Watershed A

Hydrograph Report

Hyd. No. 1

Pre-Project Watershed D

Hydrograph type	=	SCS Runoff	Peak discharge	=	52.87 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	6.112 acft
Drainage area	=	13.080 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	39.20 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

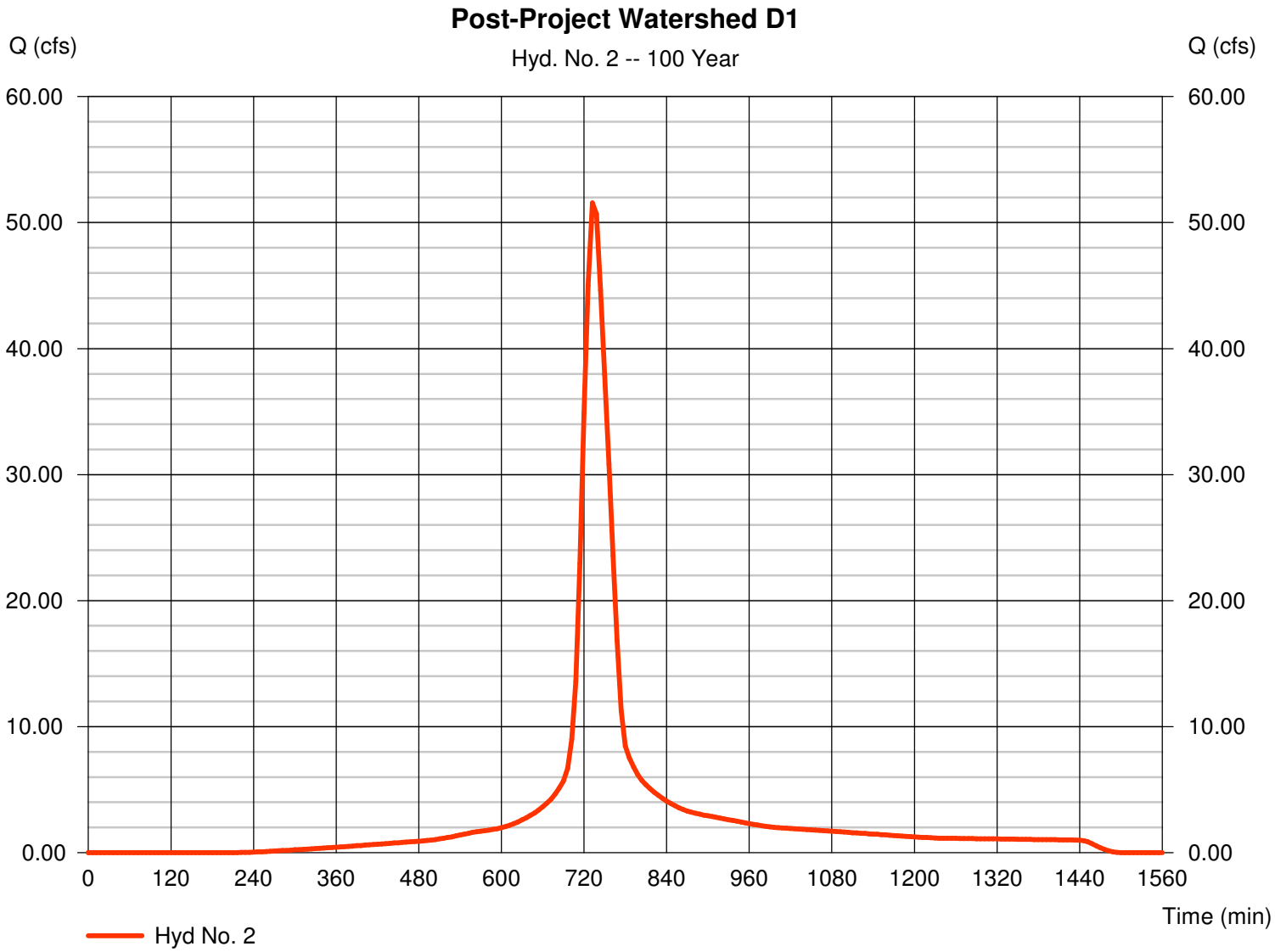


Hydrograph Report

Hyd. No. 2

Post-Project Watershed D1

Hydrograph type	=	SCS Runoff	Peak discharge	=	51.57 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	6.074 acft
Drainage area	=	11.300 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	36.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

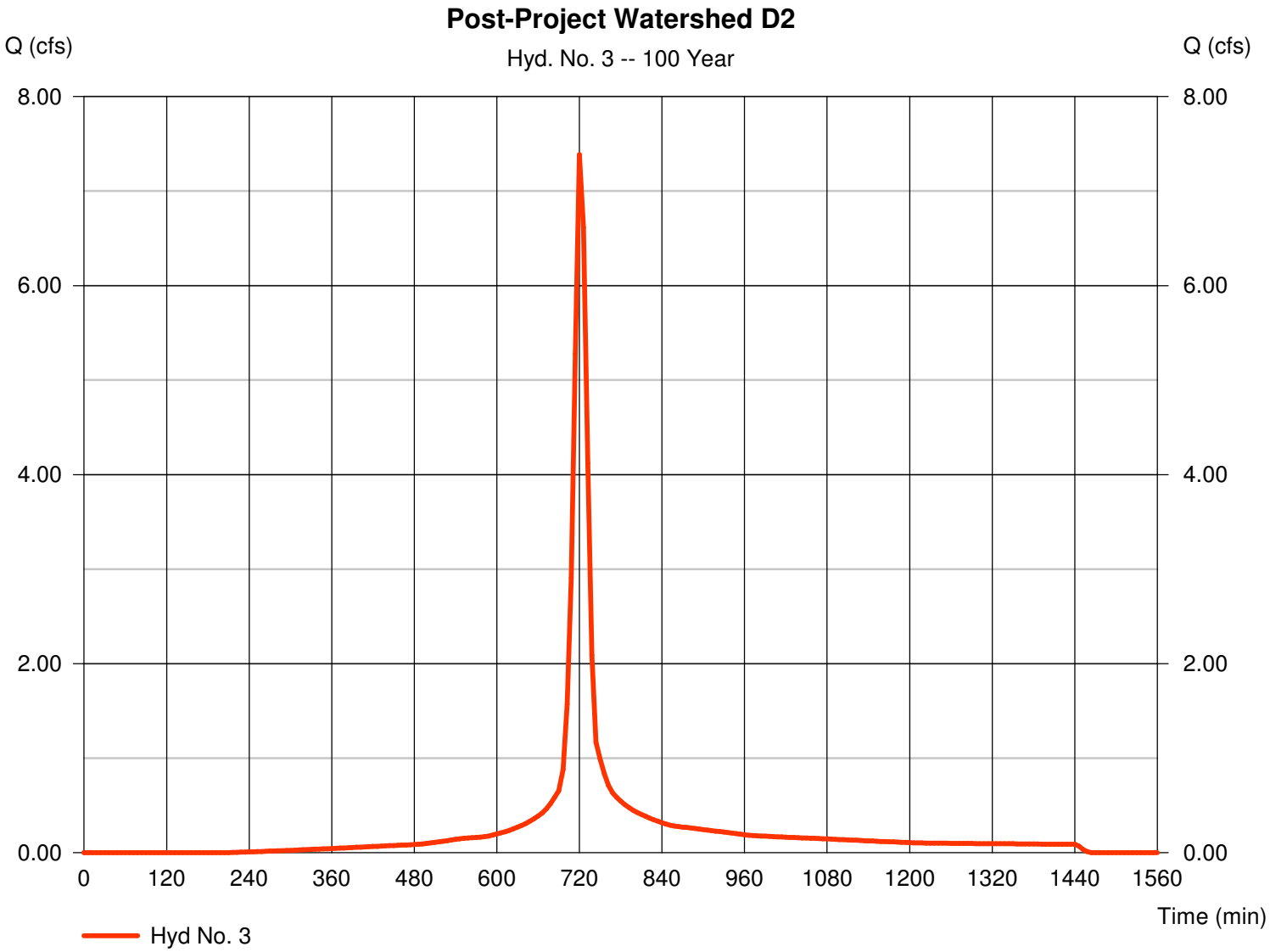


Hydrograph Report

Hyd. No. 3

Post-Project Watershed D2

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.386 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	6 min	Hyd. volume	=	0.538 acft
Drainage area	=	1.100 ac	Curve number	=	87
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	15.00 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



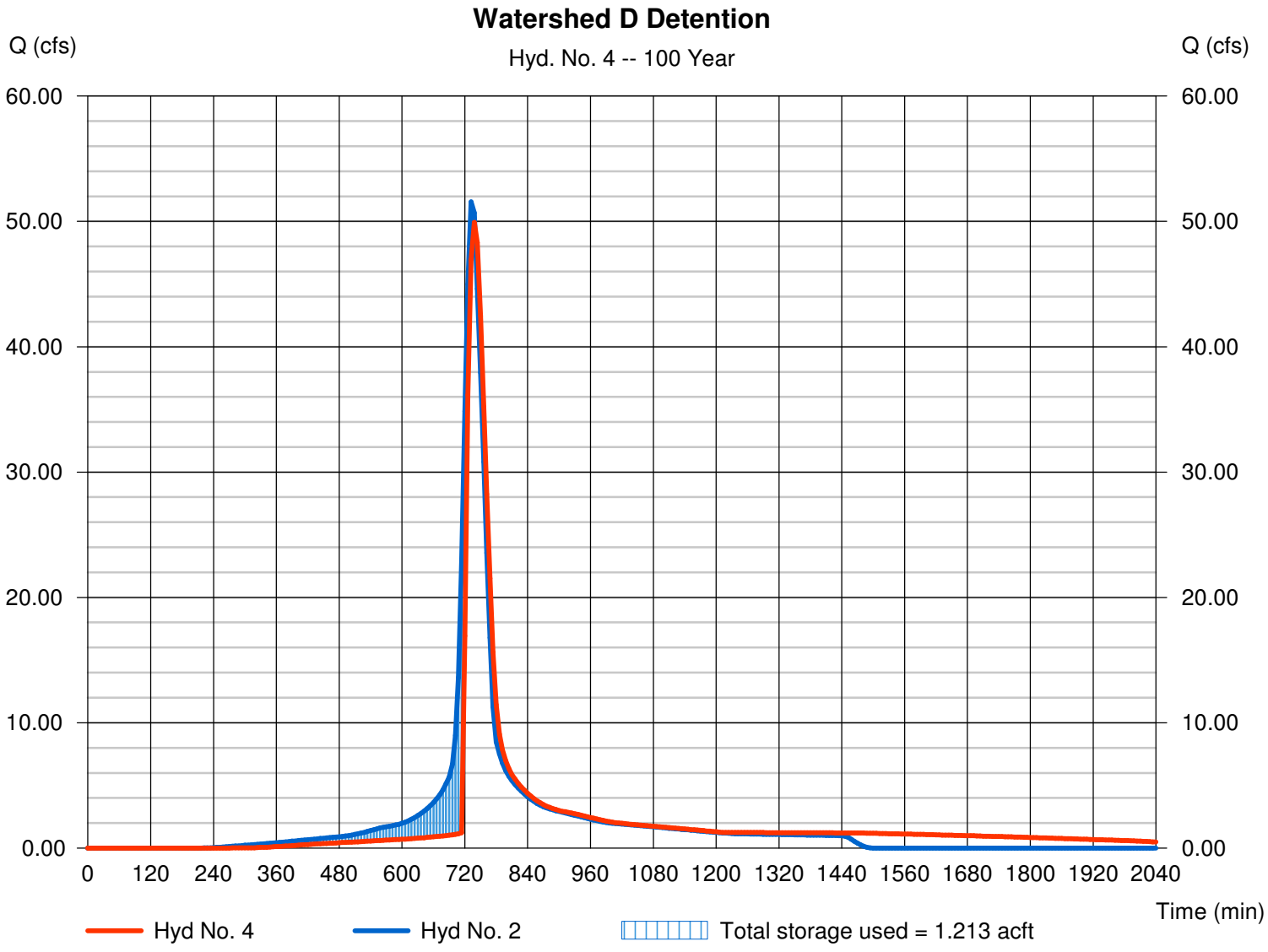
Hydrograph Report

Hyd. No. 4

Watershed D Detention

Hydrograph type	=	Reservoir	Peak discharge	=	49.92 cfs
Storm frequency	=	100 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	6.074 acft
Inflow hyd. No.	=	2 - Post-Project Watershed D1	Max. Elevation	=	1366.79 ft
Reservoir name	=	Watershed D Detention	Max. Storage	=	1.213 acft

Storage Indication method used.

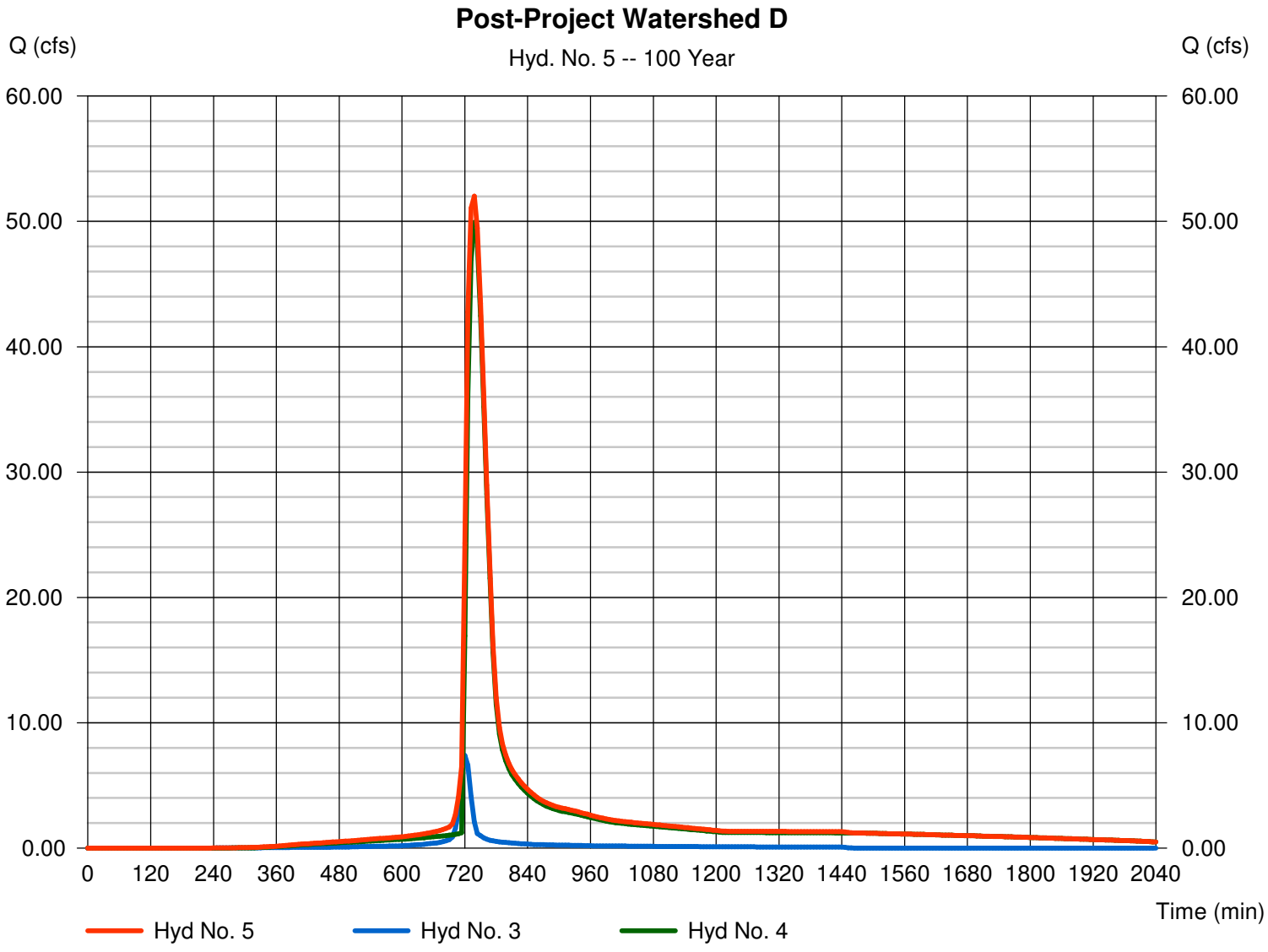


Hydrograph Report

Hyd. No. 5

Post-Project Watershed D

Hydrograph type	= Combine	Peak discharge	= 52.01 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 6 min	Hyd. volume	= 6.611 acft
Inflow hyds.	= 3, 4	Contrib. drain. area	= 1.100 ac

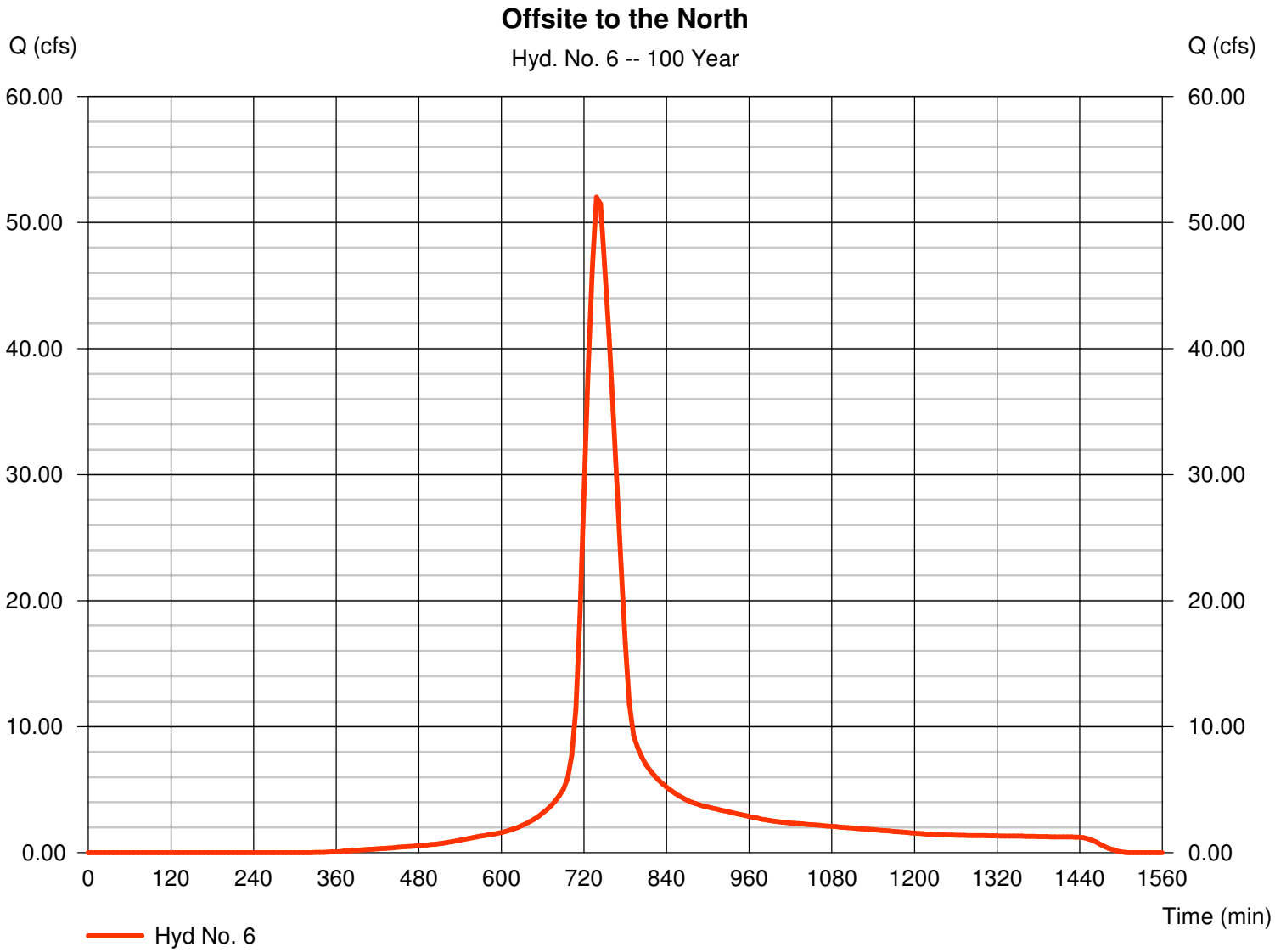


Hydrograph Report

Hyd. No. 6

Offsite to the North

Hydrograph type	=	SCS Runoff	Peak discharge	=	52.02 cfs
Storm frequency	=	100 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	6.716 acft
Drainage area	=	15.200 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	43.30 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

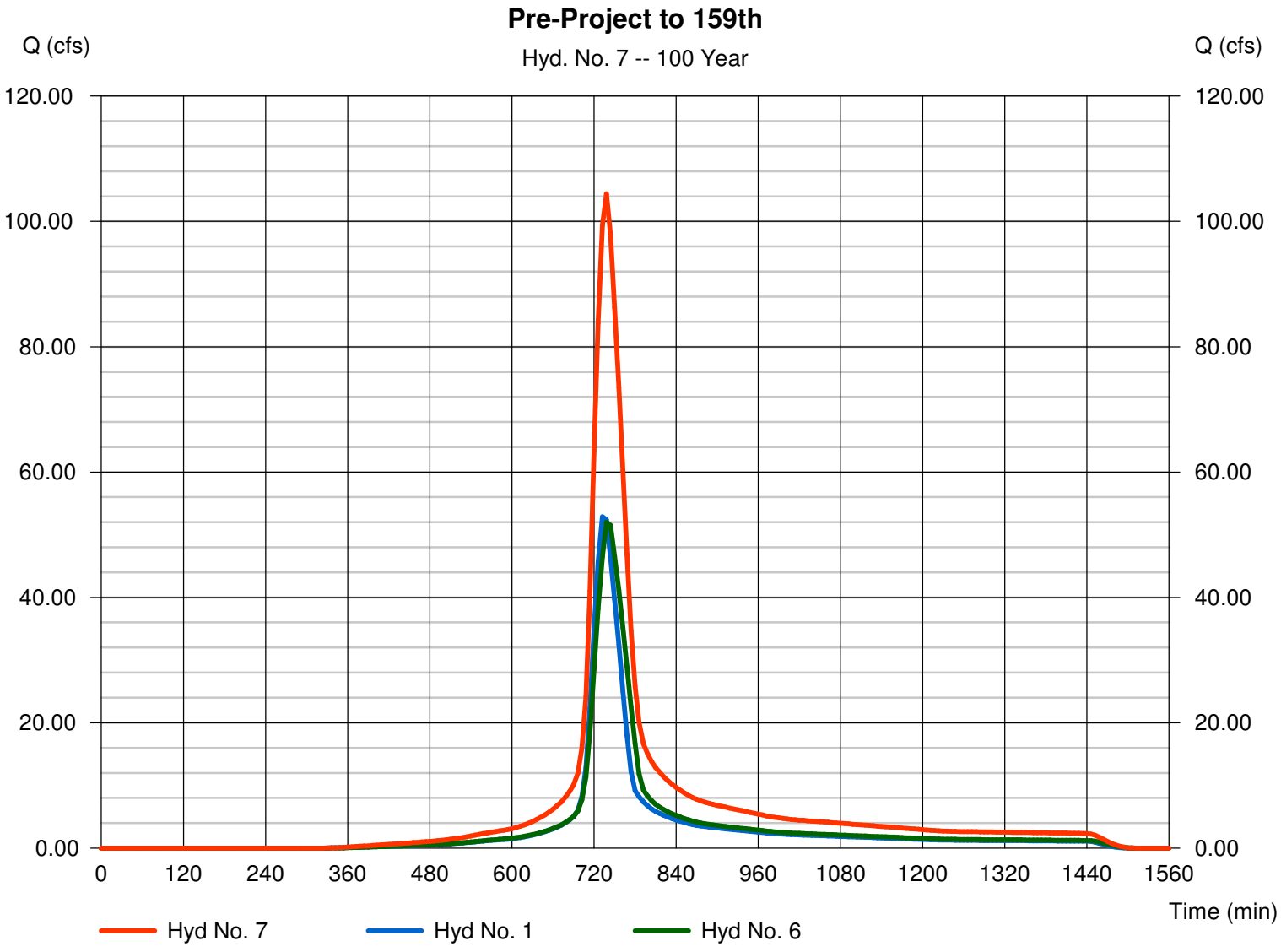


Hydrograph Report

Hyd. No. 7

Pre-Project to 159th

Hydrograph type	= Combine	Peak discharge	= 104.41 cfs
Storm frequency	= 100 yrs	Time to peak	= 738 min
Time interval	= 6 min	Hyd. volume	= 12.828 acft
Inflow hyds.	= 1, 6	Contrib. drain. area	= 28.280 ac

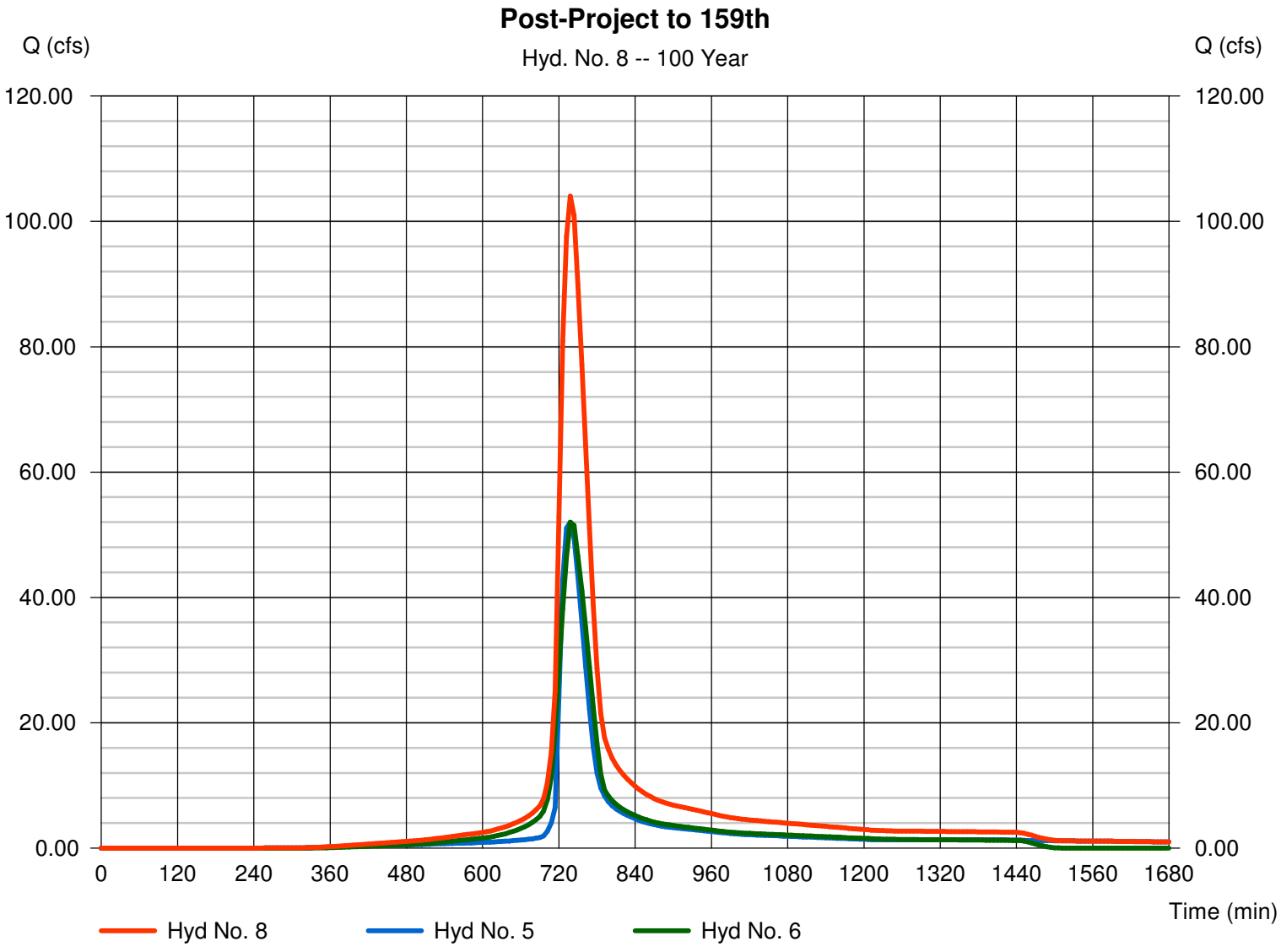


Hydrograph Report

Hyd. No. 8

Post-Project to 159th

Hydrograph type	=	Combine	Peak discharge	=	104.03 cfs
Storm frequency	=	100 yrs	Time to peak	=	738 min
Time interval	=	6 min	Hyd. volume	=	13.327 acft
Inflow hyds.	=	5, 6	Contrib. drain. area	=	15.200 ac

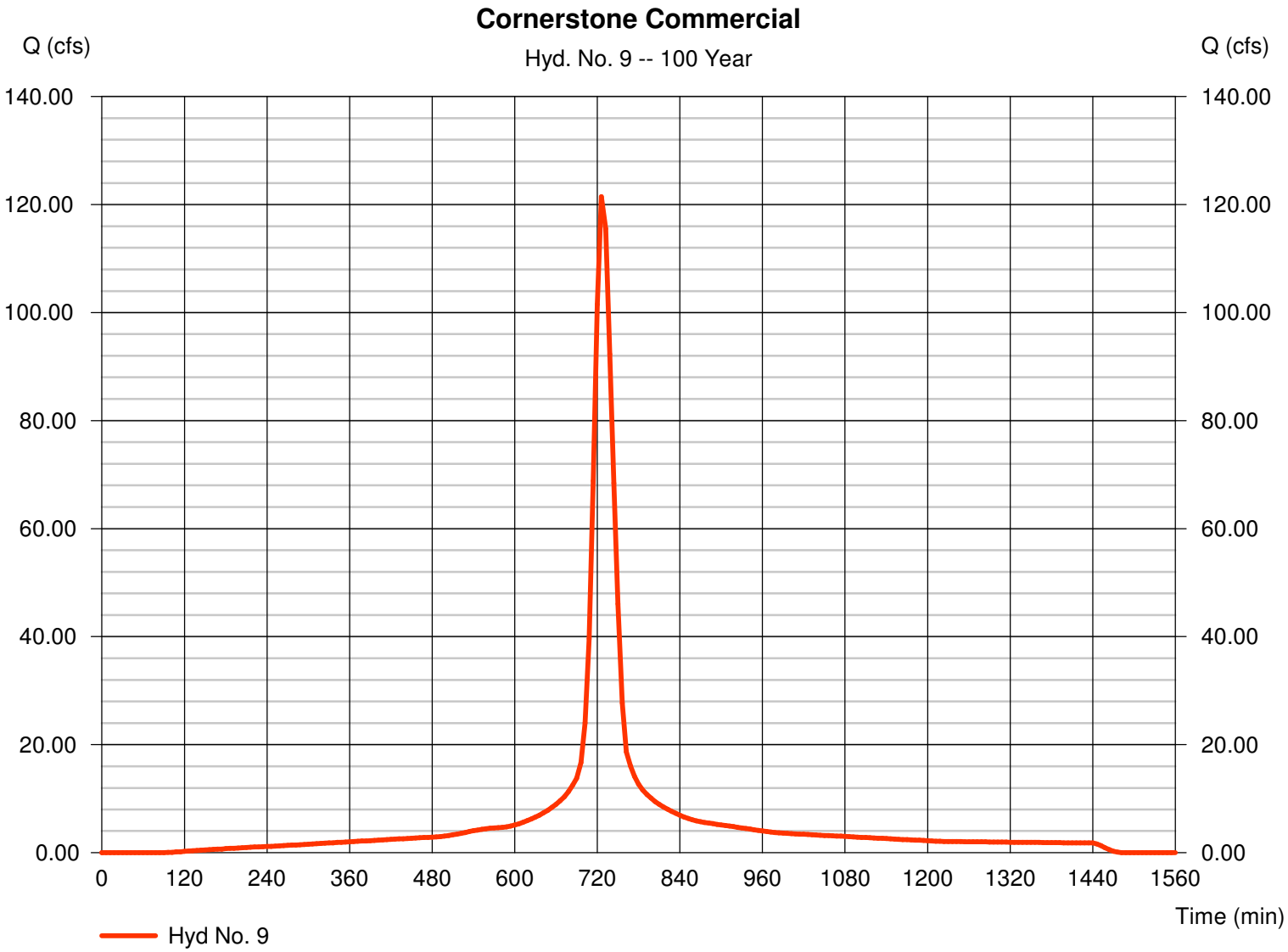


Hydrograph Report

Hyd. No. 9

Cornerstone Commercial

Hydrograph type	=	SCS Runoff	Peak discharge	=	121.44 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	6 min	Hyd. volume	=	12.244 acft
Drainage area	=	20.400 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	21.90 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

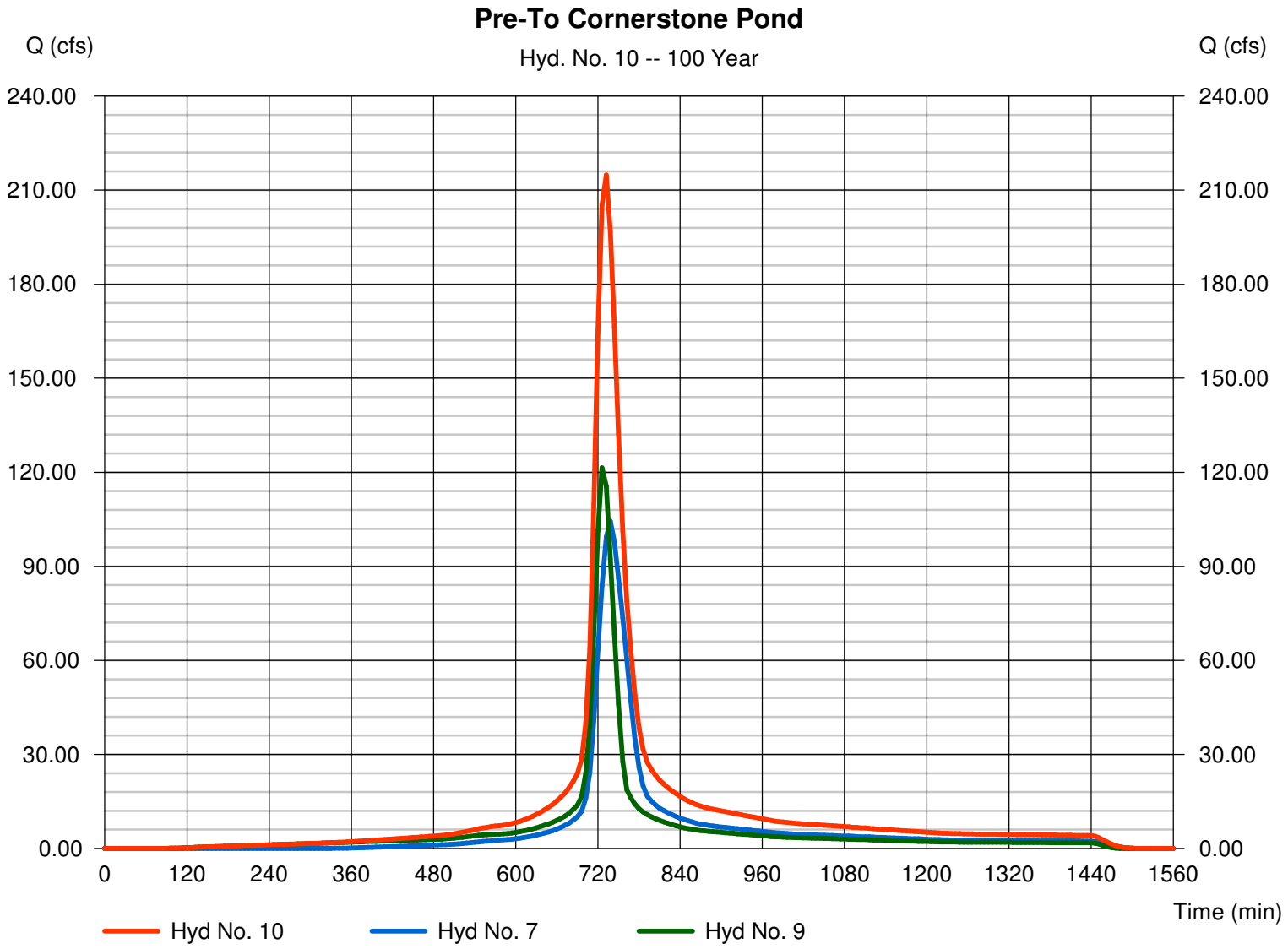


Hydrograph Report

Hyd. No. 10

Pre-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 214.90 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 25.072 acft
Inflow hyds.	= 7, 9	Contrib. drain. area	= 20.400 ac

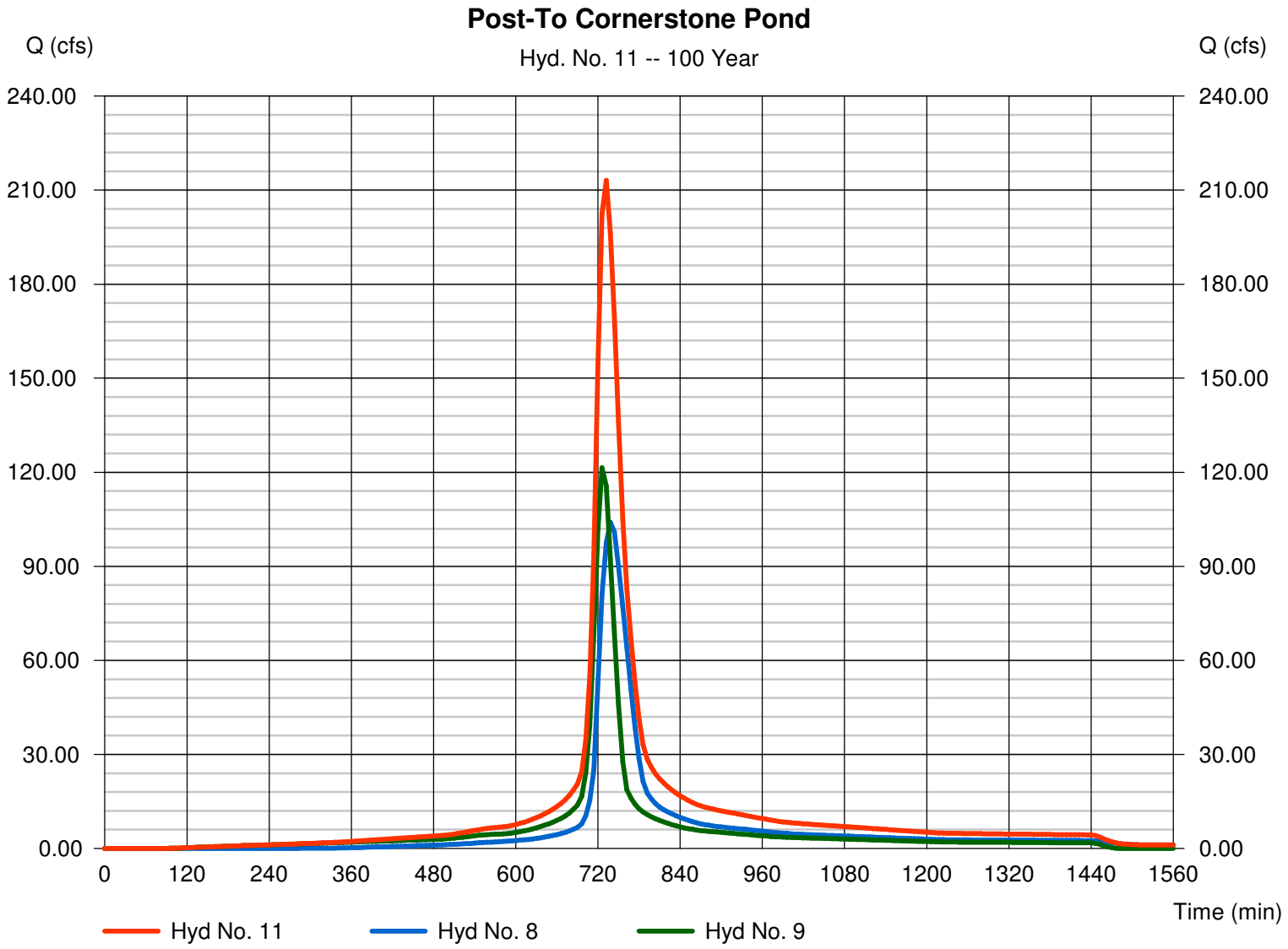


Hydrograph Report

Hyd. No. 11

Post-To Cornerstone Pond

Hydrograph type	= Combine	Peak discharge	= 213.10 cfs
Storm frequency	= 100 yrs	Time to peak	= 732 min
Time interval	= 6 min	Hyd. volume	= 25.571 acft
Inflow hyds.	= 8, 9	Contrib. drain. area	= 20.400 ac

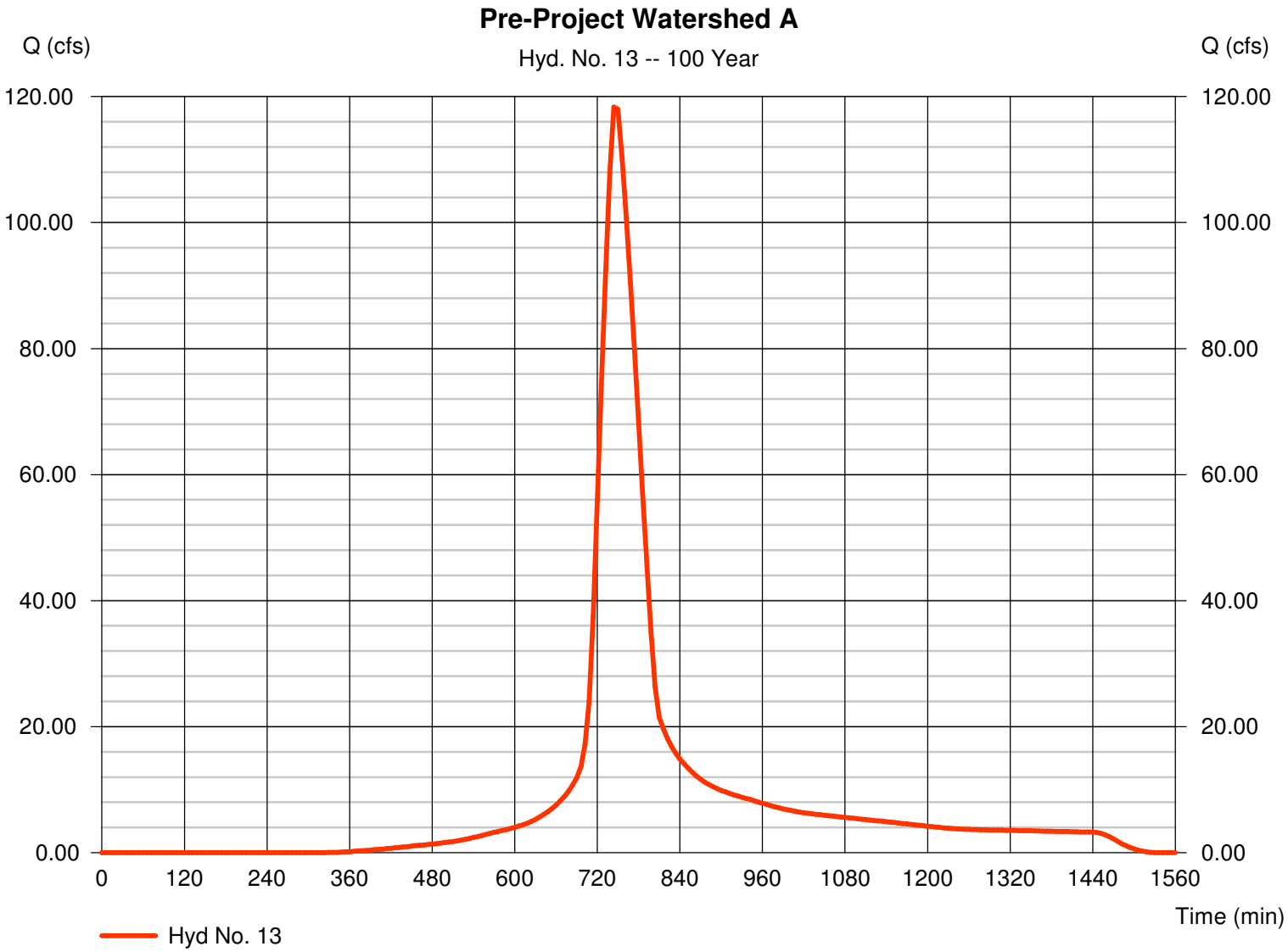


Hydrograph Report

Hyd. No. 13

Pre-Project Watershed A

Hydrograph type	=	SCS Runoff	Peak discharge	=	118.34 cfs
Storm frequency	=	100 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	17.718 acft
Drainage area	=	39.100 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	54.60 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

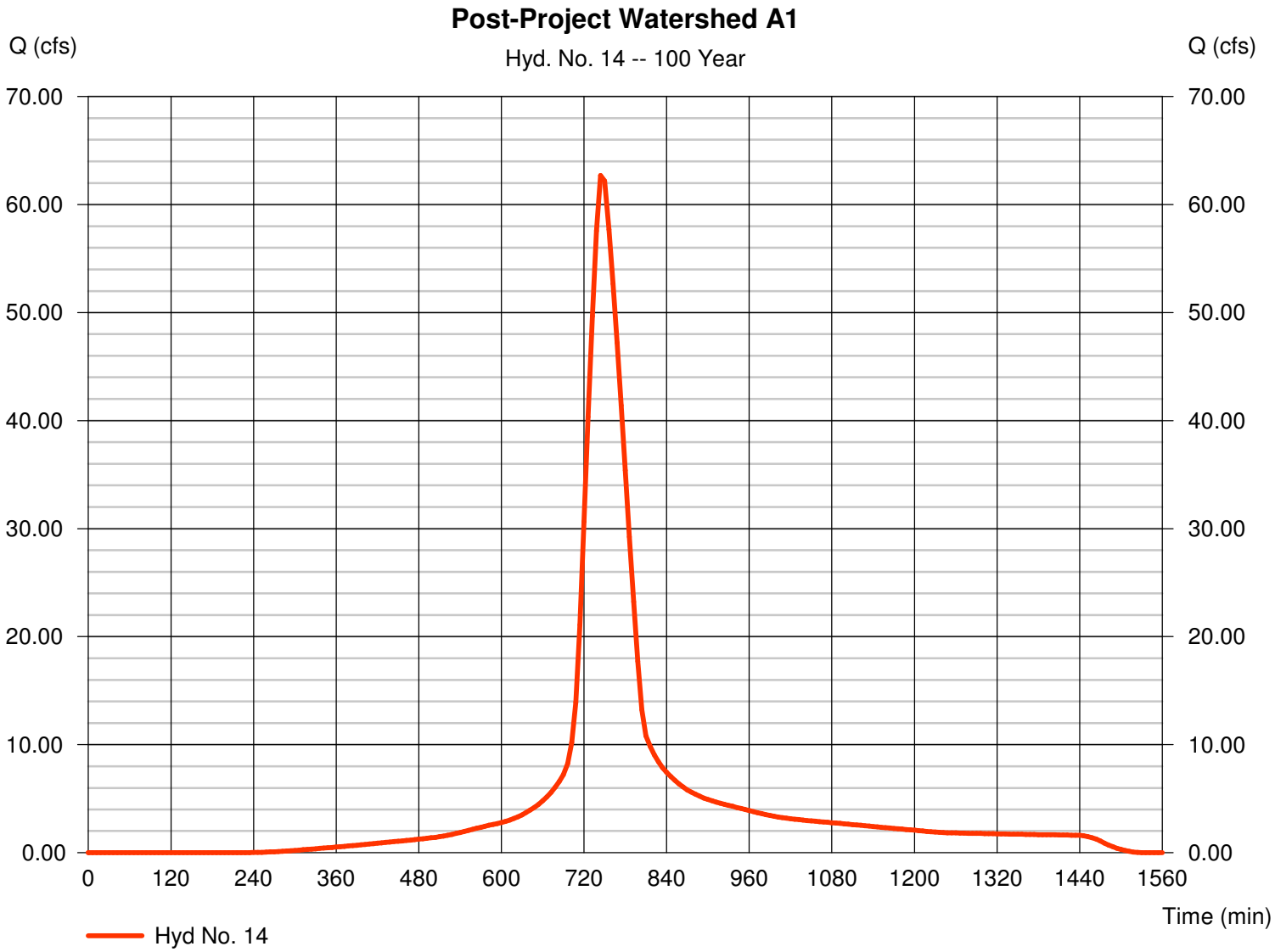


Hydrograph Report

Hyd. No. 14

Post-Project Watershed A1

Hydrograph type	=	SCS Runoff	Peak discharge	=	62.70 cfs
Storm frequency	=	100 yrs	Time to peak	=	744 min
Time interval	=	6 min	Hyd. volume	=	9.513 acft
Drainage area	=	18.600 ac	Curve number	=	86
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	55.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



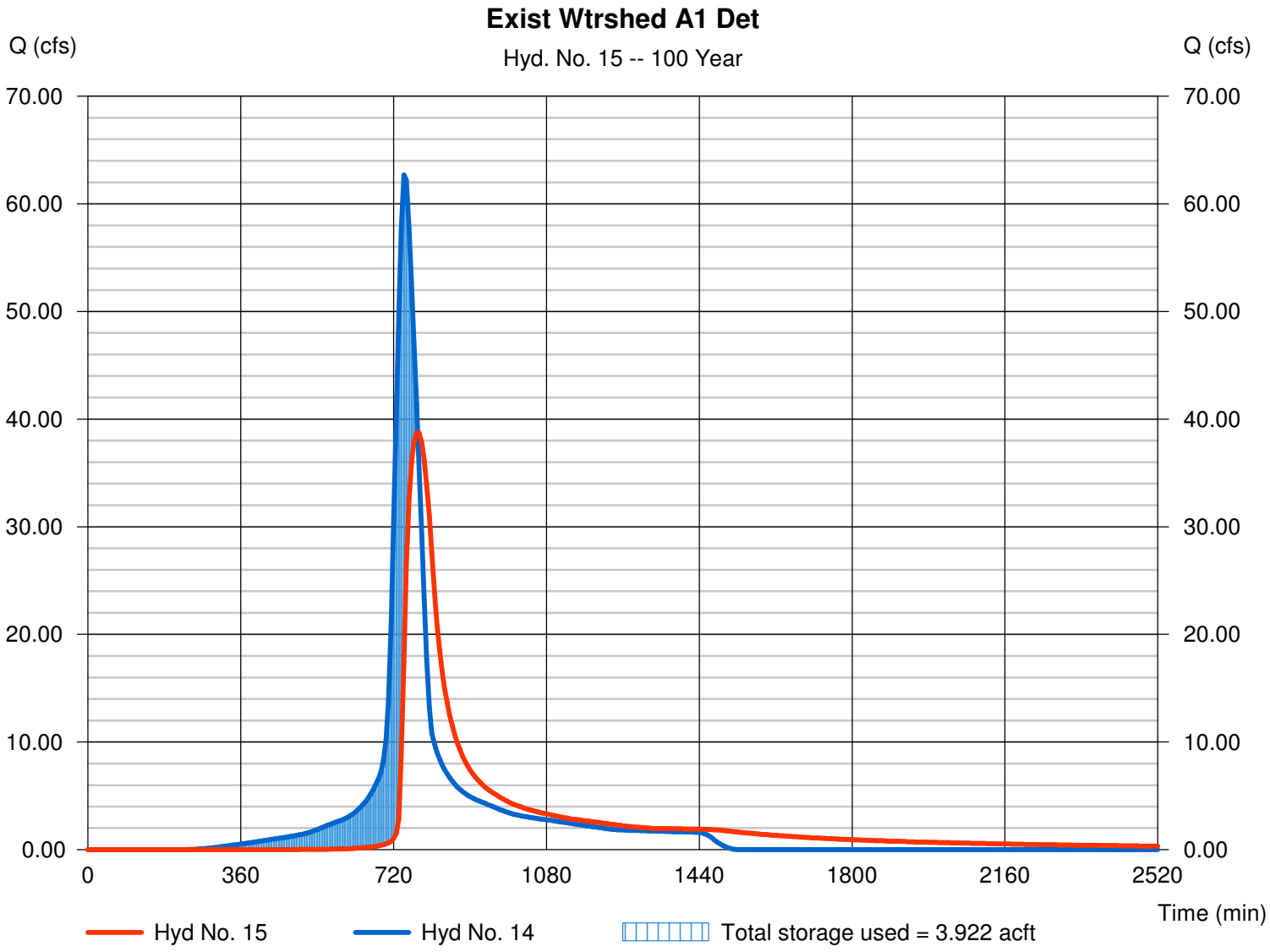
Hydrograph Report

Hyd. No. 15

Exist Wtrshed A1 Det

Hydrograph type	=	Reservoir	Peak discharge	=	38.75 cfs
Storm frequency	=	100 yrs	Time to peak	=	774 min
Time interval	=	6 min	Hyd. volume	=	9.350 acft
Inflow hyd. No.	=	14 - Post-Project Watershed A1	Max. Elevation	=	1369.37 ft
Reservoir name	=	Existing Detention Pond	Max. Storage	=	3.922 acft

Storage Indication method used.



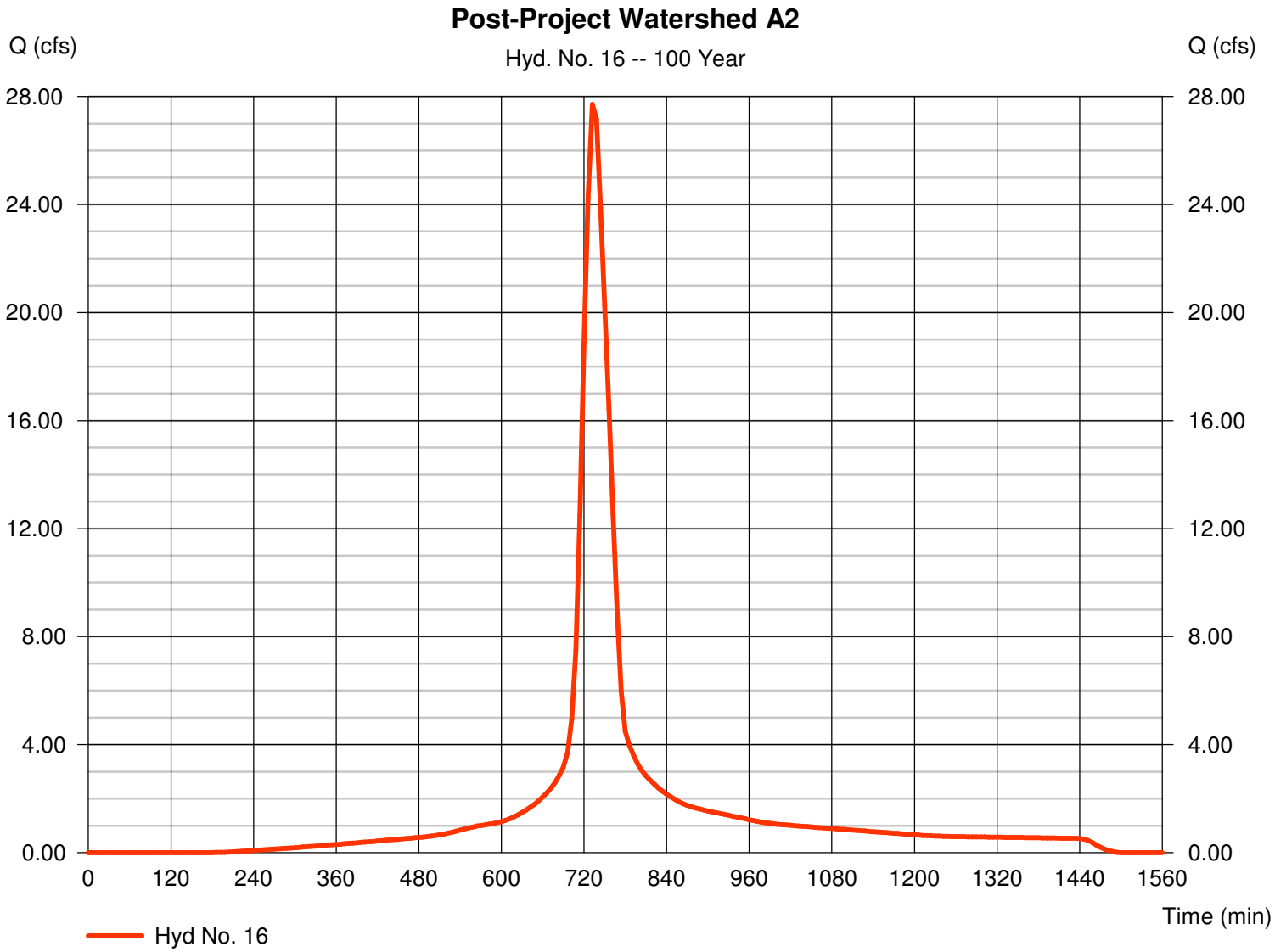
Hydrograph Report

Hyd. No. 16

Post-Project Watershed A2

Hydrograph type	=	SCS Runoff	Peak discharge	=	27.72 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	3.297 acft
Drainage area	=	5.900 ac	Curve number	=	89.1*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(4.000 x 86) + (1.900 x 80)] / 5.900



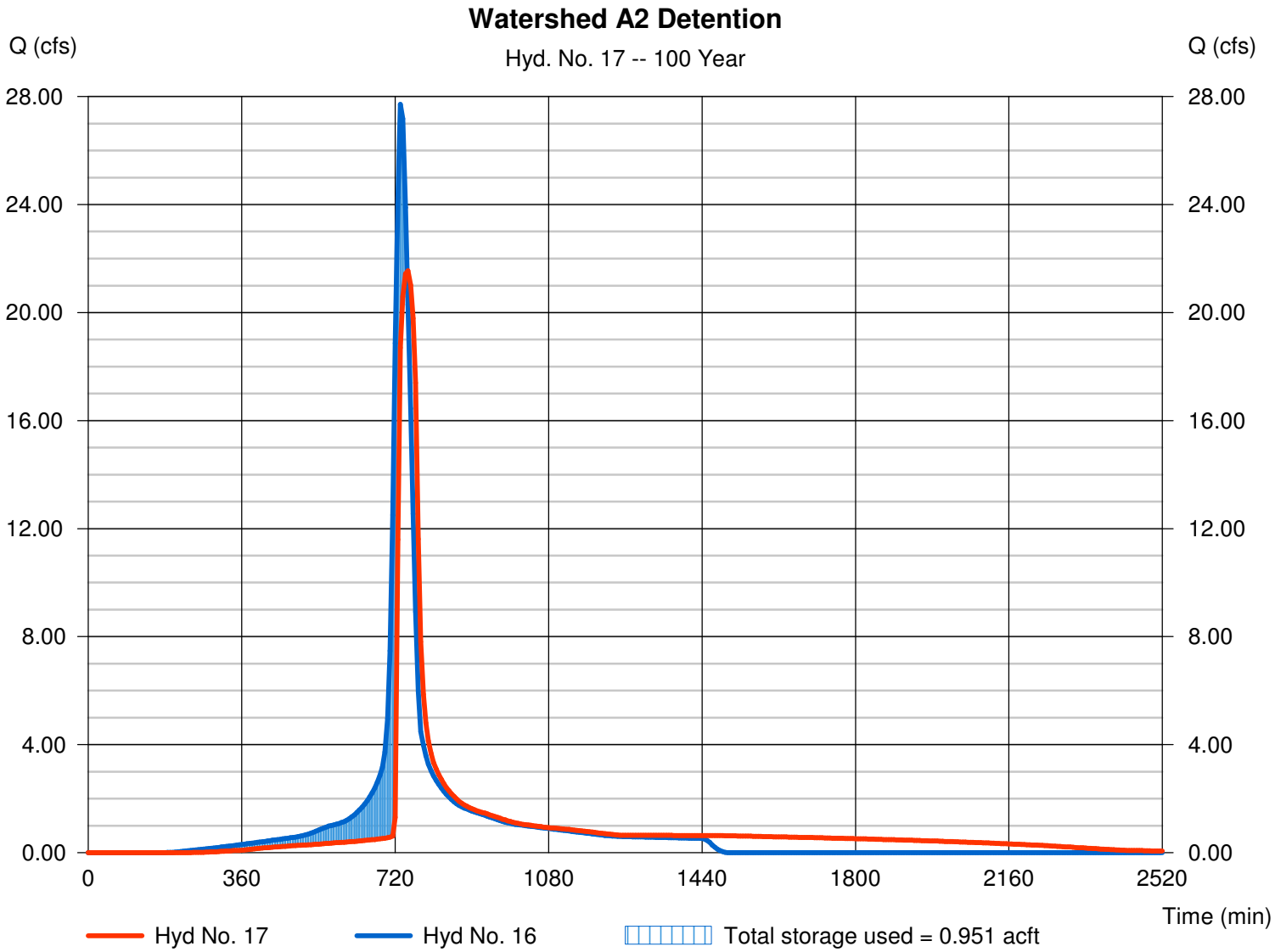
Hydrograph Report

Hyd. No. 17

Watershed A2 Detention

Hydrograph type	=	Reservoir	Peak discharge	=	21.54 cfs
Storm frequency	=	100 yrs	Time to peak	=	750 min
Time interval	=	6 min	Hyd. volume	=	3.296 acft
Inflow hyd. No.	=	16 - Post-Project Watershed A2	Max. Elevation	=	1368.98 ft
Reservoir name	=	Watershed A2 Detention	Max. Storage	=	0.951 acft

Storage Indication method used.

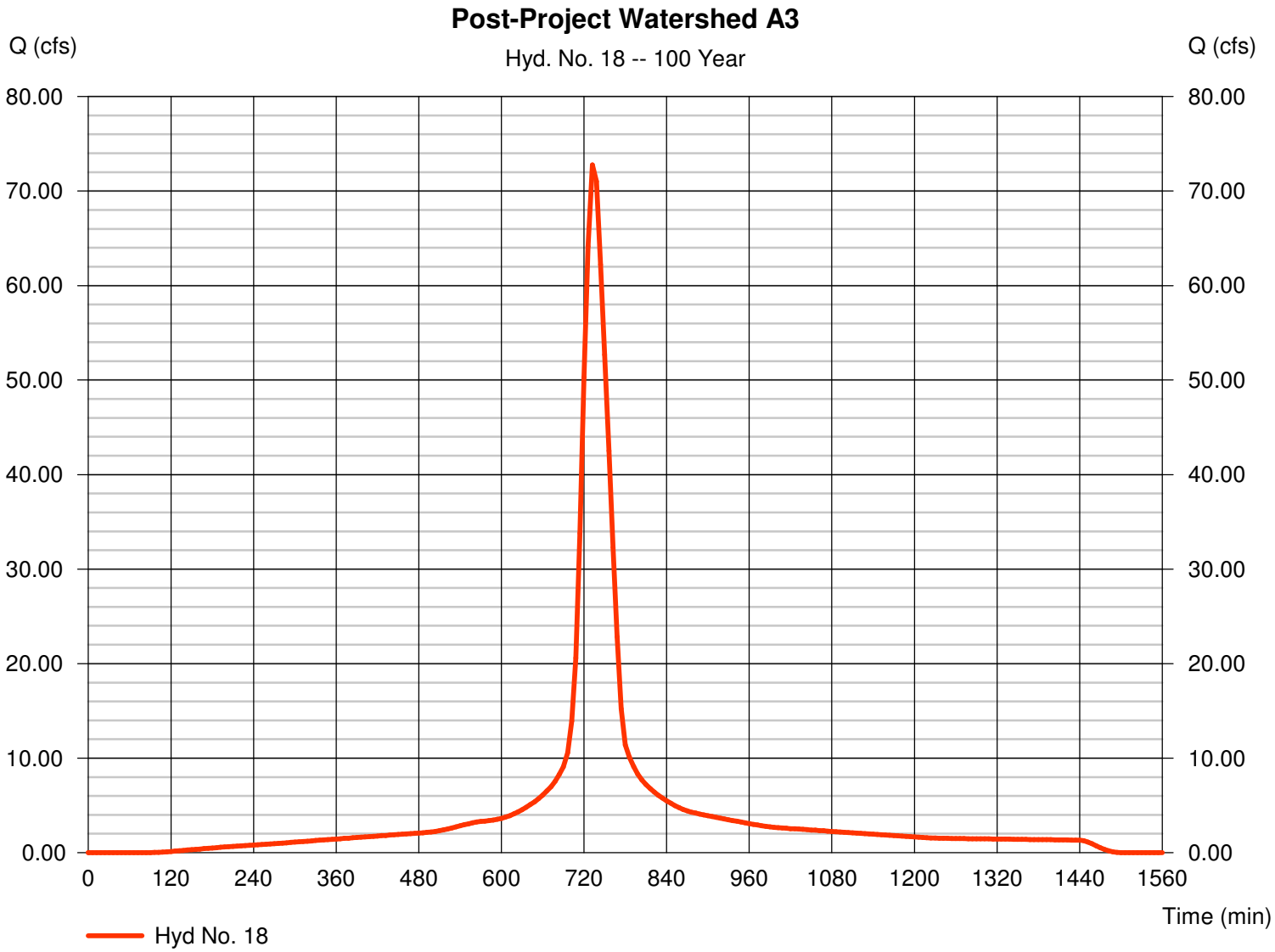


Hydrograph Report

Hyd. No. 18

Post-Project Watershed A3

Hydrograph type	=	SCS Runoff	Peak discharge	=	72.78 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	6 min	Hyd. volume	=	9.036 acft
Drainage area	=	14.600 ac	Curve number	=	95
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	32.80 min
Total precip.	=	7.80 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

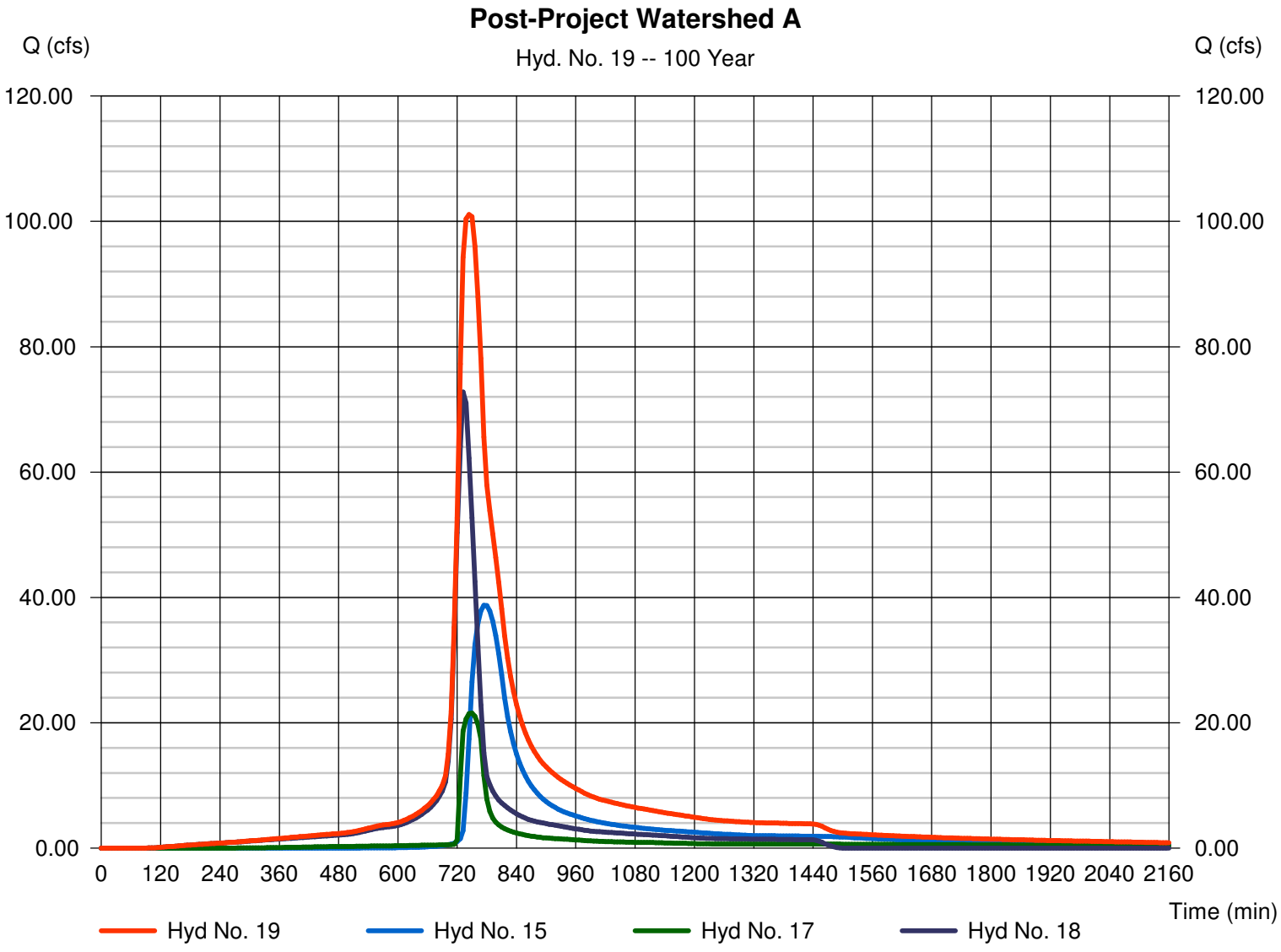


Hydrograph Report

Hyd. No. 19

Post-Project Watershed A

Hydrograph type	= Combine	Peak discharge	= 101.08 cfs
Storm frequency	= 100 yrs	Time to peak	= 744 min
Time interval	= 6 min	Hyd. volume	= 21.682 acft
Inflow hyds.	= 15, 17, 18	Contrib. drain. area	= 14.600 ac



Appendix E

Water Quality Calculations

Basin D

	Hydrologic Soil Group			
Land Use	**A**	**B**	**C**	**D**
Undisturbed	0.02	0.03	0.04	0.05
Disturbed Pervious	0.15	0.2	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

Table from pg 4-44

P = 1.2 Per pg. 4-43

Land Use	Average % Impervious	Area (ac)	Impervious Area (ac)	Disturbed Pervious (ac)
Commercial & Business	85%			
Industrial	72%			
Residential 1/8 acre or less	65%			
1/4 acre	38%			
1/3 acre	30%	12.4	3.72	8.68
1/2 acre	25%			
1 acre	20%			
2 acres	12%			
Disturbed Pervious	0%			
Total	**30%**		**3.7**	**8.7**

Site Information

Area impervious	3.7	ac	
Area disturbed pervious	8.7	ac	
Area undisturbed		ac	
Total Area	12.4	ac	
HSG	D		
R_v =	0.46		Eq 4-24, pg 4-43
WQ_v =	0.57	ac - ft	Eq 4-25, pg 4-44
Q_{wv} =	0.55	in	Eq 4-26, Pg 4-44

HSG = Hydrologic Soil Group
WQ_v = water quality protection volume (acre-feet)
P = rainfall depth (in)
R_v = volumetric runoff coefficient
Q_{wv} = water quality protection volume (inches)

Basin A2

	Hydrologic Soil Group			
Land Use	**A**	**B**	**C**	**D**
Undisturbed	0.02	0.03	0.04	0.05
Disturbed Pervious	0.15	0.2	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

Table from pg 4-44

P = 1.2 Per pg. 4-43

Land Use	Average % Impervious	Area (ac)	Impervious Area (ac)	Disturbed Pervious (ac)
Commercial & Business	85%			
Industrial	72%			
Residential 1/8 acre or less	65%			
1/4 acre	38%			
1/3 acre	30%	4	1.2	2.8
1/2 acre	25%			
1 acre	20%			
2 acres	12%			
Disturbed Pervious	0%			
Total	**30%**		**1.2**	**2.8**

Site Information

Area impervious	1.2	ac	
Area disturbed pervious	2.8	ac	
Area undisturbed		ac	
Total Area	4	ac	
HSG	D		
R_v =	0.46		Eq 4-24, pg 4-43
WQ_v =	0.18	ac - ft	Eq 4-25, pg 4-44
Q_{wv} =	0.55	in	Eq 4-26, Pg 4-44

HSG = Hydrologic Soil Group
WQ_v = water quality protection volume (acre-feet)
P = rainfall depth (in)
R_v = volumetric runoff coefficient
Q_{wv} = water quality protection volume (inches)

Appendix F

Drainage and Utility Plan

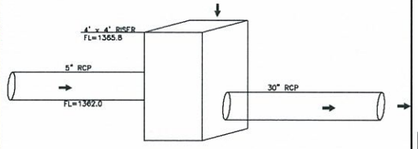
LEGEND

- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SECTION CORNER
- BM - BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UGE - UNDERGROUND ELEC.
- OHE - OVERHEAD ELECTRIC
- FOC - FIBER OPTIC CABLE
- DRAINAGE SUB BASIN
- DRAINAGE BASIN
- FLOW ARROW
- A17 - AREA FOR SWS SIZING

N

SCALE: 1"=60'

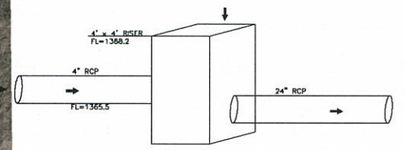
0 60 120



POND OUTLET STRUCTURE

POND ELEVATION
1 YEAR=1365.7
2 YEAR=1366.1
5 YEAR=1366.4
10 YEAR=1366.6
25 YEAR=1366.8
100 YEAR=1367.0

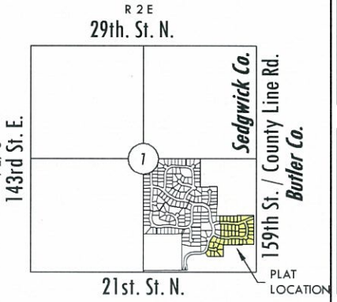
STORAGE
1 YEAR=0.9 AC
2 YEAR=1.0 AC
5 YEAR=1.1 AC
10 YEAR=1.1 AC
25 YEAR=1.2 AC
100 YEAR=1.3 AC
OUTLET: 5" CIRCULAR AT 1362.0
AND A 4'X4' RISER AT 1365.8
WITH A 30" RCP



SWALE OUTLET STRUCTURE

ENHANCED SWALE A2 ELEVATION
1 YEAR=1369.0
2 YEAR=1369.3
5 YEAR=1369.5
10 YEAR=1369.6
25 YEAR=1369.7
100 YEAR=1369.9

STORAGE
1 YEAR=0.5 AC
2 YEAR=0.6 AC
5 YEAR=0.7 AC
10 YEAR=0.8 AC
25 YEAR=0.8 AC
100 YEAR=1.0 AC
OUTLET: 4" CIRCULAR AT 1365.5
AND A 4'X4' RISER AT 1368.2
WITH A 24" RCP



VICINITY MAP

J:\Civil\06201\dwg\3RD\DRNG\06201_DUP.dwg

MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

MONARCH LANDING

MONARCH LANDING 3RD ADDITION
WICHITA, KANSAS

DRAINAGE & UTILITY PLAN

DATE: MARCH 2010
REVISED:
DESIGN BY: KLA
DRAWN BY: CMJ
CHECKED BY: GJA
SHEET NUMBER: 1

Appendix G

Water Quantity Calculations

Channel Protection Calculations

Basin D

P =	2.80	in		
R_v =	0.46			From WQv Tab
A =	12.40	ac		Site Area
FP =	1.00			From Table 4-10
Q_{wv} =	1.29	in	$P*R_v$	pg 4-44
CN =	83.01			pg 4-45
S =	2.05			pg 4-46
I_a =	0.41	in		pg 4-46
I_a/P =	0.15			
Tc=	16.80	min.		From other calculations
Tc=	0.28	hours		
q_u =	450	cfs/mi^2/in		From Figure 4-6, pg 4-24 need tc
Q_{wq} =	11.23	cfs	q_u*A*Q_{wv}	pg. 4-47
Q =	1.29	in		pg 4-26
Q_p =	11.23	cfs	$q_u*A*Q*F_p$	equation 4-18; pg 4-22
q_o/q_i =	0.04			From Figure 4-17
V_s/V_r =	0.63			From Figure 4-18 or equation on pg 4-51
$V_s = CP_v$ =	**0.83**	**ac-ft**		pg 4-52

P =	Rainfall Depth (in)
Rv =	volumetric runoff coefficient
A =	Area (acres)
FP =	Pond and Swamp Adjustment Factors
Qwv =	water quality protection volume (inches)
CN	Curve Number
S	pg 4-4
Ia	pg 4-4
qu =	Unit peak discharge
Qwq =	water quality peak flow (cfs)
Q	Excess Rainfall Depth (in)
Qp =	Peak Discharge (cfs)
qo/qi =	Ratio of Outflow to Inflow
Vs/Vr =	Ration of Storage Volume to Runoff Volume

Channel Protection Calculations

Basin A2

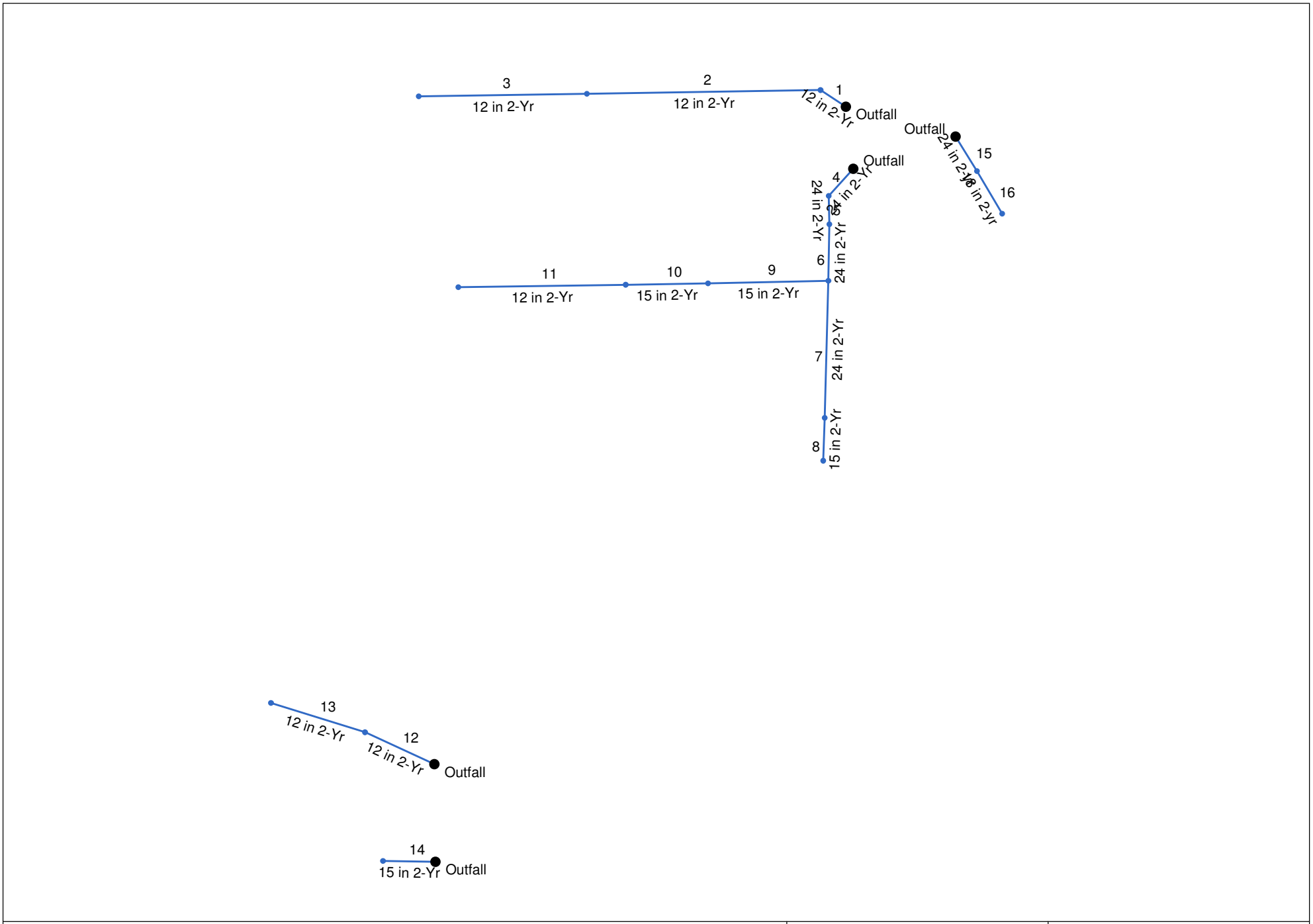
P =	2.80	in		
R_v =	0.51			From WQv Tab
A =	4.00	ac		Site Area
FP =	1.00			From Table 4-10
Q_{wv} =	1.43	in	$P*R_v$	pg 4-44
CN =	85.09			pg 4-45
S =	1.75			pg 4-46
I_a =	0.35	in		pg 4-46
I_a/P =	0.13			
Tc=	13.60	min.		From other calculations
Tc=	0.23	hours		
q_u =	750	$cfs/mi^2/in$		From Figure 4-6, pg 4-24 need tc
Q_{wq} =	6.69	cfs	q_u*A*Q_{wv}	pg. 4-47
Q =	1.43	in		pg 4-26
Q_p =	6.69	cfs	$q_u*A*Q*F_p$	equation 4-18; pg 4-22
q_o/q_i =	0.03			From Figure 4-17
V_s/V_r =	0.64			From Figure 4-18 or equation on pg 4-51
$V_s = CP_v$ =	**0.30**	**ac-ft**		pg 4-52

P =	Rainfall Depth (in)
Rv =	volumetric runoff coefficient
A =	Area (acres)
FP =	Pond and Swamp Adjustment Factors
Qwv =	water quality protection volume (inches)
CN	Curve Number
S	pg 4-4
Ia	pg 4-4
qu =	Unit peak discharge
Qwq =	water quality peak flow (cfs)
Q	Excess Rainfall Depth (in)
Qp =	Peak Discharge (cfs)
qo/qi =	Ratio of Outflow to Inflow
Vs/Vr =	Ration of Storage Volume to Runoff Volume

Appendix H

Monarch Landing 3rd Hydraflow Storm Sewers Calculations

Monarch Landing 3rd



Project File: ML3 SWS 5-27-11.stm	Number of lines: 16	Date: 05-27-2011

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	30.709	0.80	1.70	0.59	0.47	1.00	15.0	17.3	3.6	3.61	2.23	4.60	12	0.39	1362.50	1362.62	1366.10	1366.42	1365.00	1368.00	12 in 2-Yr
2	1	237.182	0.40	0.90	0.59	0.24	0.53	15.0	15.9	3.7	1.99	2.25	2.53	12	0.40	1362.55	1363.50	1366.95	1367.69	1368.00	1370.00	12 in 2-Yr
3	2	170.595	0.50	0.50	0.59	0.30	0.30	15.0	15.0	3.8	1.14	2.25	1.45	12	0.40	1363.40	1364.08	1367.81	1367.98	1370.00	1373.00	12 in 2-Yr
4	End	37.000	1.30	7.00	0.59	0.77	4.13	15.0	17.6	3.6	14.76	14.87	4.70	24	0.43	1362.00	1362.16	1366.10	1366.26	1365.00	1368.00	24 in 2-Yr
5	4	28.937	0.20	5.70	0.59	0.12	3.36	15.0	17.4	3.6	12.07	26.26	3.84	24	1.35	1362.85	1363.24	1366.62	1366.70	1368.00	1372.00	24 in 2-Yr
6	5	57.399	0.20	5.50	0.59	0.12	3.25	15.0	17.1	3.6	11.75	14.32	3.74	24	0.40	1363.60	1363.83	1366.83	1366.99	1372.00	1369.00	24 in 2-Yr
7	6	139.000	1.50	3.60	0.59	0.89	2.12	15.0	15.2	3.8	8.11	6.67	4.59	18	0.40	1364.40	1364.96	1367.31	1368.14	1369.00	1370.00	24 in 2-Yr
8	7	43.581	2.10	2.10	0.59	1.24	1.24	15.0	15.0	3.8	4.77	4.03	3.89	15	0.39	1364.60	1364.77	1368.40	1368.64	1370.00	1370.00	15 in 2-Yr
9	6	122.281	0.50	1.70	0.59	0.30	1.00	15.0	16.4	3.7	3.70	4.21	3.02	15	0.43	1363.70	1364.22	1367.39	1367.79	1369.00	1370.00	15 in 2-Yr
10	9	83.511	0.60	1.20	0.59	0.35	0.71	15.0	15.9	3.7	2.65	4.18	2.16	15	0.42	1365.15	1365.50	1367.93	1368.07	1370.00	1370.00	15 in 2-Yr
11	10	169.872	0.60	0.60	0.59	0.35	0.35	15.0	15.0	3.8	1.36	2.25	1.73	12	0.40	1365.90	1366.58	1368.13	1368.38	1370.00	1370.70	12 in 2-Yr
12	End	77.294	0.40	0.80	0.59	0.24	0.47	15.0	15.6	3.8	1.79	2.53	2.27	12	0.50	1366.20	1366.59	1369.00	1369.20	1370.30	1369.40	12 in 2-Yr
13	12	100.000	0.40	0.40	0.59	0.24	0.24	15.0	15.0	3.8	0.91	2.39	1.16	12	0.45	1366.70	1367.15	1369.30	1369.36	1369.40	1369.40	12 in 2-Yr
14	End	53.214	1.30	1.30	0.59	0.77	0.77	15.0	15.0	3.8	2.95	4.77	4.10	15	0.54	1365.90	1366.19	1366.59	1366.92	1370.00	1370.00	15 in 2-Yr
15	End	41.248	1.30	3.90	0.59	0.77	2.30	15.0	15.3	3.8	8.78	14.52	2.80	24	0.41	1360.00	1360.17	1366.10	1366.16	0.00	1366.70	24 in 2-yr
16	15	50.271	2.60	2.60	0.59	1.53	1.53	15.0	15.0	3.8	5.90	6.62	3.34	18	0.40	1360.30	1360.50	1366.22	1366.38	1366.70	1366.70	18 in 2-yr

Monarch Landing 3rd

Number of lines: 16

Run Date: 05-27-2011

NOTES: Intensity = 76.31 / (Inlet time + 14.30) ^ 0.88; Return period = 2 Yrs. ; c = cir e = ellip b = box

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.	Junction Type
1	12 in 2-Yr	3.61	12	Cir	30.709	1362.50	1362.62	0.391	1366.10*	1366.42*	0.31	1366.72	End	DropGrate
2	12 in 2-Yr	1.99	12	Cir	237.182	1362.55	1363.50	0.401	1366.95*	1367.69*	0.05	1367.74	1	DropGrate
3	12 in 2-Yr	1.14	12	Cir	170.595	1363.40	1364.08	0.399	1367.81*	1367.98*	0.03	1368.01	2	DropGrate
4	24 in 2-Yr	14.76	24	Cir	37.000	1362.00	1362.16	0.433	1366.10*	1366.26*	0.25	1366.51	End	Manhole
5	24 in 2-Yr	12.07	24	Cir	28.937	1362.85	1363.24	1.348	1366.62*	1366.70*	0.11	1366.82	4	DropGrate
6	24 in 2-Yr	11.75	24	Cir	57.399	1363.60	1363.83	0.401	1366.83*	1366.99*	0.33	1367.31	5	DropGrate
7	24 in 2-Yr	8.11	18	Cir	139.000	1364.40	1364.96	0.403	1367.31*	1368.14*	0.16	1368.31	6	Curb-Horiz
8	15 in 2-Yr	4.77	15	Cir	43.581	1364.60	1364.77	0.390	1368.40*	1368.64*	0.23	1368.87	7	Curb-Horiz
9	15 in 2-Yr	3.70	15	Cir	122.281	1363.70	1364.22	0.425	1367.39*	1367.79*	0.07	1367.86	6	DropGrate
10	15 in 2-Yr	2.65	15	Cir	83.511	1365.15	1365.50	0.419	1367.93*	1368.07*	0.04	1368.11	9	DropGrate
11	12 in 2-Yr	1.36	12	Cir	169.872	1365.90	1366.58	0.400	1368.13*	1368.38*	0.05	1368.43	10	DropGrate
12	12 in 2-Yr	1.79	12	Cir	77.294	1366.20	1366.59	0.505	1369.00*	1369.20*	0.04	1369.24	End	DropGrate
13	12 in 2-Yr	0.91	12	Cir	100.000	1366.70	1367.15	0.450	1369.30*	1369.36*	0.02	1369.38	12	DropGrate
14	15 in 2-Yr	2.95	15	Cir	53.214	1365.90	1366.19	0.545	1366.59	1366.92	n/a	1367.19 i	End	Curb-Horiz
15	24 in 2-yr	8.78	24	Cir	41.248	1360.00	1360.17	0.412	1366.10*	1366.16*	0.06	1366.22	End	Curb-Horiz
16	18 in 2-yr	5.90	18	Cir	50.271	1360.30	1360.50	0.398	1366.22*	1366.38*	0.17	1366.56	15	Curb-Horiz

Monarch Landing 3rd | Number of lines: 16 | Run Date: 05-27-2011

NOTES: Return period = 2 Yrs. ; *Surcharged (HGL above crown). ; i - Inlet control.

Storm Sewer Inventory Report

Line No.	Alignment				Flow Data				Physical Data								Line ID
	Dnstr line No.	Line length (ft)	Defl angle (deg)	Junc type	Known Q (cfs)	Drng area (ac)	Runoff coeff (C)	Inlet time (min)	Invert El Dn (ft)	Line slope (%)	Invert El Up (ft)	Line size (in)	Line shape	N value (n)	J-loss coeff (K)	Inlet/ Rim El (ft)	
1	End	30.709	-146.425	DrGrt	0.00	0.80	0.59	15.0	1362.50	0.39	1362.62	12	Cir	0.013	0.93	1368.00	12 in 2-Yr
2	1	237.182	-34.502	DrGrt	0.00	0.40	0.59	15.0	1362.55	0.40	1363.50	12	Cir	0.013	0.50	1370.00	12 in 2-Yr
3	2	170.595	0.092	DrGrt	0.00	0.50	0.59	15.0	1363.40	0.40	1364.08	12	Cir	0.013	1.00	1373.00	12 in 2-Yr
4	End	37.000	132.117	MH	0.00	1.30	0.59	15.0	1362.00	0.43	1362.16	24	Cir	0.013	0.73	1368.00	24 in 2-Yr
5	4	28.937	-43.481	DrGrt	0.00	0.20	0.59	15.0	1362.85	1.35	1363.24	24	Cir	0.013	0.50	1372.00	24 in 2-Yr
6	5	57.399	2.331	DrGrt	0.00	0.20	0.59	15.0	1363.60	0.40	1363.83	24	Cir	0.013	1.50	1369.00	24 in 2-Yr
7	6	139.000	0.614	Curb	0.00	1.50	0.59	15.0	1364.40	0.40	1364.96	18	Cir	0.013	0.50	1370.00	24 in 2-Yr
8	7	43.581	0.258	Curb	0.00	2.10	0.59	15.0	1364.60	0.39	1364.77	15	Cir	0.013	1.00	1370.00	15 in 2-Yr
9	6	122.281	87.877	DrGrt	0.00	0.50	0.59	15.0	1363.70	0.43	1364.22	15	Cir	0.013	0.50	1370.00	15 in 2-Yr
10	9	83.511	0.148	DrGrt	0.00	0.60	0.59	15.0	1365.15	0.42	1365.50	15	Cir	0.013	0.50	1370.00	15 in 2-Yr
11	10	169.872	0.166	DrGrt	0.00	0.60	0.59	15.0	1365.90	0.40	1366.58	12	Cir	0.013	1.00	1370.70	12 in 2-Yr
12	End	77.294	-155.354	DrGrt	0.00	0.40	0.59	15.0	1366.20	0.50	1366.59	12	Cir	0.013	0.50	1369.40	12 in 2-Yr
13	12	100.000	-7.349	DrGrt	0.00	0.40	0.59	15.0	1366.70	0.45	1367.15	12	Cir	0.013	1.00	1369.40	12 in 2-Yr
14	End	53.214	-179.087	Curb	0.00	1.30	0.59	15.0	1365.90	0.54	1366.19	15	Cir	0.013	1.00	1370.00	15 in 2-Yr
15	End	41.248	58.381	Curb	0.00	1.30	0.59	15.0	1360.00	0.41	1360.17	24	Cir	0.013	0.50	1366.70	24 in 2-yr
16	15	50.271	0.973	Curb	0.00	2.60	0.59	15.0	1360.30	0.40	1360.50	18	Cir	0.013	1.00	1366.70	18 in 2-yr

Monarch Landing 3rd | Number of lines: 16 | Date: 05-27-2011

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q byp (cfs)	Junc type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp line No
							Ht (in)	L (ft)	area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1		1.82	0.00	1.82	0.00	DrGrt	0.0	0.00	3.50	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.18	19.88	0.18	19.88	0.0	Off
2		0.91	0.00	0.91	0.00	DrGrt	0.0	0.00	3.50	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.11	13.26	0.11	13.26	0.0	Off
3		1.14	0.00	1.14	0.00	DrGrt	0.0	0.00	3.50	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.13	15.07	0.13	15.07	0.0	Off
4		2.95	0.00	0.00	2.95	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
5		0.45	0.00	0.45	0.00	DrGrt	0.0	0.00	3.50	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	9.09	0.07	9.09	0.0	Off
6		0.45	0.00	0.45	0.00	DrGrt	0.0	0.00	3.50	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.07	9.09	0.07	9.09	0.0	Off
7		3.41	0.00	3.41	0.00	Curb	6.0	5.00	0.00	0.00	0.00	Sag	2.00	0.031	0.031	0.000	0.31	9.93	0.47	9.93	2.0	Off
8		4.77	0.00	4.77	0.00	Curb	6.0	5.00	0.00	0.00	0.00	Sag	2.00	0.031	0.031	0.000	0.39	12.44	0.55	12.44	2.0	Off
9		1.14	0.00	1.14	0.00	DrGrt	0.0	0.00	3.50	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.13	15.07	0.13	15.07	0.0	Off
10		1.36	0.00	1.36	0.00	DrGrt	0.0	0.00	3.50	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.15	16.76	0.15	16.76	0.0	Off
11		1.36	0.00	1.36	0.00	DrGrt	0.0	0.00	3.50	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.15	16.76	0.15	16.76	0.0	Off
12		0.91	0.00	0.91	0.00	DrGrt	0.0	0.00	3.50	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.11	13.26	0.11	13.26	0.0	Off
13		0.91	0.00	0.91	0.00	DrGrt	0.0	0.00	3.50	2.00	2.00	Sag	2.00	0.020	0.020	0.000	0.11	13.26	0.11	13.26	0.0	Off
14		2.95	0.00	2.95	0.00	Curb	6.0	5.00	0.00	0.00	0.00	Sag	2.00	0.031	0.031	0.000	0.28	9.02	0.45	9.02	2.0	Off
15		2.95	0.00	2.95	0.00	Curb	6.0	5.00	0.00	0.00	0.00	Sag	2.00	0.031	0.020	0.000	0.30	13.98	0.45	13.98	2.0	Off
16		5.90	0.00	5.90	0.00	Curb	6.0	5.00	0.00	0.00	0.00	Sag	2.00	0.031	0.020	0.000	0.47	22.24	0.61	22.24	2.0	Off

Monarch Landing 3rd | Number of lines: 16 | Run Date: 05-27-2011

NOTES: Inlet N-Values = 0.016 ; Intensity = 76.31 / (Inlet time + 14.30) ^ 0.88; Return period = 2 Yrs. ; * Indicates Known Q added. All curb inlets are Horiz throat.