Stormwater Management Calculations
Peak Flow Attenuation

GENERAL NOTES

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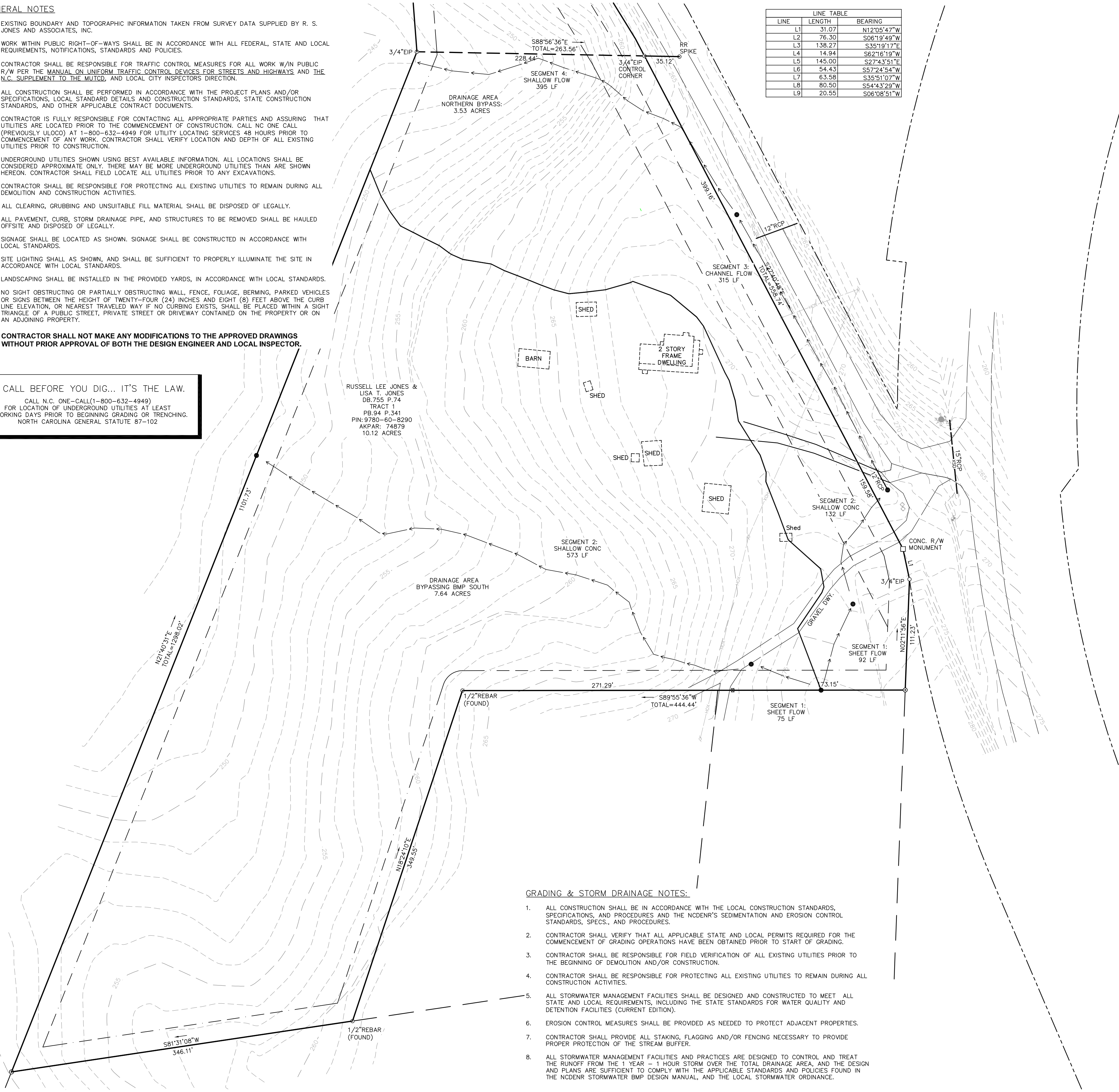
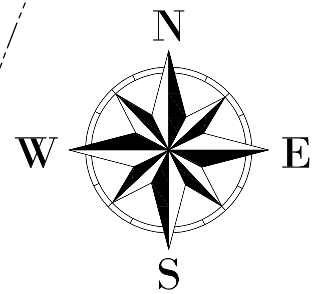
CALL N.C. ONE–CALL(1–800–632–4949)
FOR LOCATION OF UNDERGROUND UTILITIES AT LEAST
2 WORKING DAYS PRIOR TO BEGINNING GRADING OR TRENCHING.
NORTH CAROLINA GENERAL STATUTE 87–102

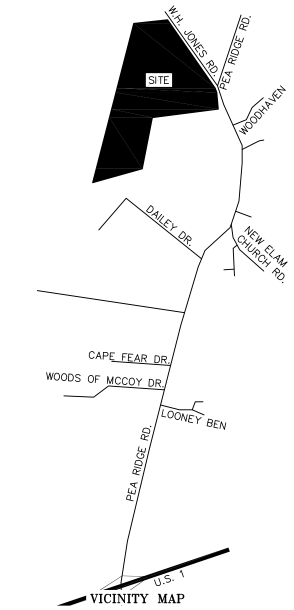
LINE TABLE		
LINE	LENGTH	BEARING
L1	31.07	N12°05'47"W
L2	76.30	S06°19'49"W
L3	138.27	S35°19'17"E
L4	14.94	S62°16'19"W
L5	145.00	S27°43'51"E
L6	54.43	S57°24'54"W
L7	63.58	S35°51'07"W
L8	80.50	S54°43'29"W
L9	20.55	S06°08'51"W





GRID NORTH
NAD 83(2011)

IMPERVIOUS SURFACE SUMMARY	
TOTAL TRACT ACREAGE	11.17 ACRES
IMPERVIOUS COVERAGE ALLOWED	24% (116,775 SF)
PROPOSED BUILDING AREA	95,071 SF
PROPOSED DRIVE AREA	1,650 SF
PROPOSED OUTDOOR STORAGE	17,240 SF
EX. DRIVE TO ADJACENT PARCEL	2,814 SF
TOTAL PROPOSED IMPERVIOUS AREA	116,775 SF



VICINITY MAP

LEGEND

	NEW	EXISTING
PROPERTY LINE		
EASEMENT		
SETBACK		
RIGHT–OF–WAY		
CENTERLINES		
CURB & GUTTER		
EDGE OF PAVEMENT		
SIDEWALK		
CREEK		
STRUCTURE NO.	1	
CATCH BASIN		
YARD INLET		
STORM DRAINAGE JUNCTION BOX		
CURB INLET		
SANITARY SEWER MANHOLE		
SANITARY SEWER CLEANOUT	C.O. SS	C.O. XSS
METER BOX		
VALVE		
FIRE HYDRANT		
FIRE DEPARTMENT CONNECTION		
LIGHT POLE	LP	
UTILITY POLE AND GUY WIRE	PP	PP
CABLE TV LINE	TV	XTV
ELECTRIC	E	XE
FIBER OPTIC CABLE	FO	XFO
GAS LINE	G	XG
OVERHEAD UTILITY LINE	OH	XOH
SANITARY SEWER	SS	XSS
STORM DRAIN PIPE	SD	XSD
TELEPHONE	T	XT
WATER LINE	W	XW
GRADE CONTOUR	400	400
FINISHED GRADE SPOT ELEVATION	356.44	356.44
CLEARING LIMIT/TREE LINE		
LIMITS OF DISTURBANCE		
DITCH OR SWALE FLOWLINE		
TREE PROTECTION FENCE		
SILT FENCE	SF	
FENCE	X	X
RIP RAP APRON		
CHECK DAM		
SEDIMENT FENCE OUTLET		
INLET PROTECTION		
WHEELCHAIR RAMP	WCR	
ELECTRICAL TRANSFORMER	T	

EIP EXISTING IRON PIPE
EIR EXISTING IRON ROD
NIR NEW IRON ROD
NS PK NAIL SET
CP COMPUTED POINT R/W

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

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Phone: (919) 563-9041
Fax: (919) 304-3234
E-Mail: Phil.Koch@EarthCentric.com

PRELIMINARY
NOT FOR
CONSTRUCTION

PRINCIPAL ENGINEER
PHIL KOCH - NCPE #22634

EXTRA GARAGE III
CHATHAM COUNTY, NORTH CAROLINA

EXHIBIT:
PRE–DEVELOPMENT AREAS

REV.	DATE	DESCRIPTION	BY

DATE:	JANUARY XX, 2014
HORIZONTAL SCALE:	1" = 50'
VERTICAL SCALE:	N/A
PROJECT MANAGER:	CPK
DRAWN BY:	CPK
PROJECT NO:	13-029
DRAWING NAME:	13-029 PRELIM

SHEET NO.
X1.0
PRELIMINARY

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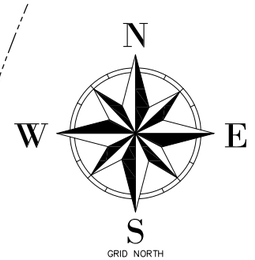

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NAD 83(2011)

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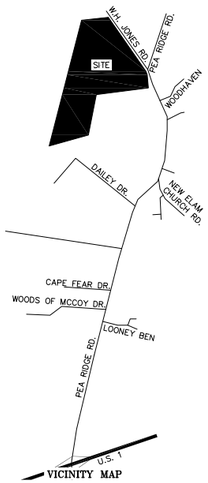

VICINITY MAP

LEGEND

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SETBACK		
RIGHT-OF-WAY		
CENTERLINES		
CURB & GUTTER		
EDGE OF PAVEMENT		
SIDEWALK		
CREEK		
STRUCTURE NO.	(1)	
CATCH BASIN	■	□
YARD INLET	⊠	□
STORM DRAINAGE JUNCTION BOX	Ⓓ	◌
CURB INLET		
SANITARY SEWER MANHOLE	Ⓢ	Ⓢ
SANITARY SEWER CLEANOUT	SS C.O.	XSS C.O.
METER BOX		
VALVE	⊗	⊗
FIRE HYDRANT		
FIRE DEPARTMENT CONNECTION		
LIGHT POLE	LP	
UTILITY POLE AND GUY WIRE	PP	PP
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EIP	EXISTING IRON PIPE
EIR	EXISTING IRON ROD
NIR	NEW IRON ROD
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EXTRA GARAGE III

CHATHAM COUNTY, NORTH CAROLINA

EXHIBIT:
POST-DEVELOPMENT AREAS

REV.	DATE	DESCRIPTION	BY

DATE:	JANUARY XX, 2014
HORIZONTAL SCALE:	1" = 50'
VERTICAL SCALE:	N/A
PROJECT MANAGER:	CPK
DRAWN BY:	CPK
PROJECT NO:	13-029
DRAWING NAME:	13-029 PRELIM

SHEET NO.

X1.1

PRELIMINARY

C:\Projects\13-029\13-029 Drawings\Prelim\13-029 Prelim.dwg, X1.1 POST, 1/2/2014 10:09:54 AM

Hydraflow Table of Contents

13-029 Prelim.gpw

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2013 by Autodesk, Inc. v10 Thursday, 01 / 2 / 2014

10 - Year

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	------	6.476	10.42	-------	16.90	22.46	-------	-------	-------	PRE-SOUTH
2	SCS Runoff	------	2.352	3.840	-------	6.302	8.402	-------	-------	-------	PRE-NORTH
3	Combine	1, 2	8.573	13.85	-------	22.70	30.24	-------	-------	-------	TOTAL PREDEV
5	SCS Runoff	------	9.765	12.49	-------	16.50	19.66	-------	-------	-------	POST - BMP
6	SCS Runoff	------	3.896	6.266	-------	10.17	13.51	-------	-------	-------	POST-BYP SOUTH
7	Combine	5, 6	13.66	18.75	-------	26.67	33.15	-------	-------	-------	POST-SOUTH
8	SCS Runoff	------	1.726	2.817	-------	4.624	6.165	-------	-------	-------	POST-NORTH
9	Combine	7, 8	15.15	21.27	-------	30.92	38.88	-------	-------	-------	POST-NO BMP
15	SCS Runoff	------	9.765	12.49	-------	16.50	19.66	-------	-------	-------	POST - BMP
16	Reservoir	15	0.346	0.628	-------	1.530	5.191	-------	-------	-------	BMP ROUTING
17	SCS Runoff	------	3.896	6.266	-------	10.17	13.51	-------	-------	-------	POST-BYP SOUTH
18	Combine	16, 17	3.973	6.358	-------	10.49	14.11	-------	-------	-------	POST-SOUTH w/BMP
19	SCS Runoff	------	1.726	2.817	-------	4.624	6.165	-------	-------	-------	POST-NORTH
20	Combine	18, 19	5.521	8.907	-------	14.76	19.85	-------	-------	-------	POST DEV w/BMP

Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	6.476	1	723	19,422	------	------	------	PRE-SOUTH
2	SCS Runoff	2.352	1	728	8,955	------	------	------	PRE-NORTH
3	Combine	8.573	1	724	28,377	1, 2	------	------	TOTAL PREDEV
5	SCS Runoff	9.765	1	723	28,129	------	------	------	POST - BMP
6	SCS Runoff	3.896	1	723	11,684	------	------	------	POST-BYP SOUTH
7	Combine	13.66	1	723	39,813	5, 6	------	------	POST-SOUTH
8	SCS Runoff	1.726	1	728	6,570	------	------	------	POST-NORTH
9	Combine	15.15	1	723	46,383	7, 8	------	------	POST-NO BMP
15	SCS Runoff	9.765	1	723	28,129	------	------	------	POST - BMP
16	Reservoir	0.346	1	889	19,520	15	249.65	64,329	BMP ROUTING
17	SCS Runoff	3.896	1	723	11,684	------	------	------	POST-BYP SOUTH
18	Combine	3.973	1	723	31,204	16, 17	------	------	POST-SOUTH w/BMP
19	SCS Runoff	1.726	1	728	6,570	------	------	------	POST-NORTH
20	Combine	5.521	1	724	37,774	18, 19	------	------	POST DEV w/BMP

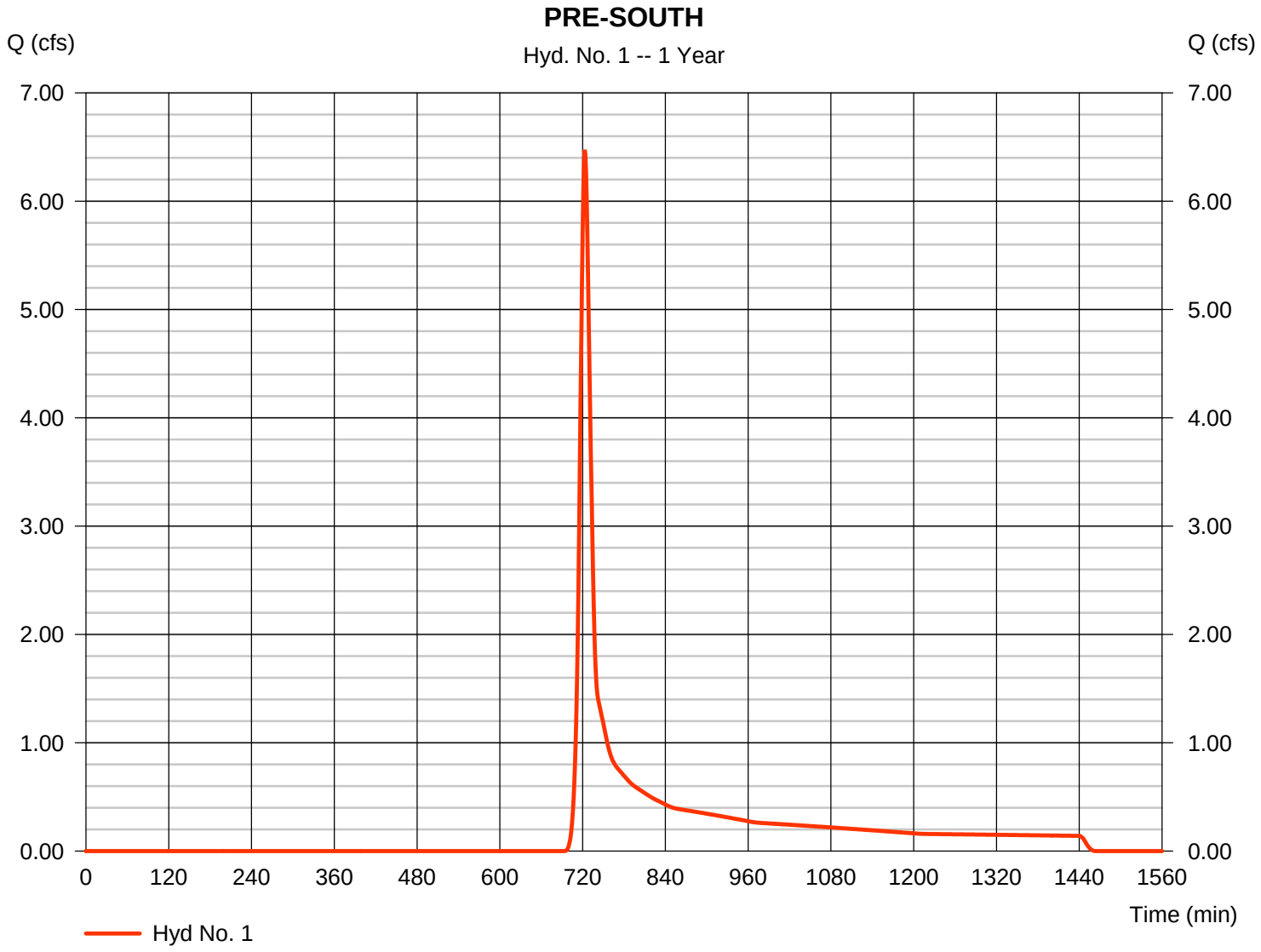
Hydrograph Report

Hyd. No. 1

PRE-SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.476 cfs
Storm frequency	=	1 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	19,422 cuft
Drainage area	=	7.730 ac	Curve number	=	70*
Basin Slope	=	4.3 %	Hydraulic length	=	648 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.100 x 98) + (0.230 x 74) + (7.400 x 70)] / 7.730



TR55 Tc Worksheet

Hyd. No. 1

PRE-SOUTH

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 75.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.57		0.00		0.00		
Land slope (%)	= 5.33		0.00		0.00		
Travel Time (min)	**= 10.91**	**+**	**0.00**	**+**	**0.00**	**=**	**10.91**
Shallow Concentrated Flow							
Flow length (ft)	= 573.00		0.00		0.00		
Watercourse slope (%)	= 4.23		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.32		0.00		0.00		
Travel Time (min)	**= 2.88**	**+**	**0.00**	**+**	**0.00**	**=**	**2.88**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

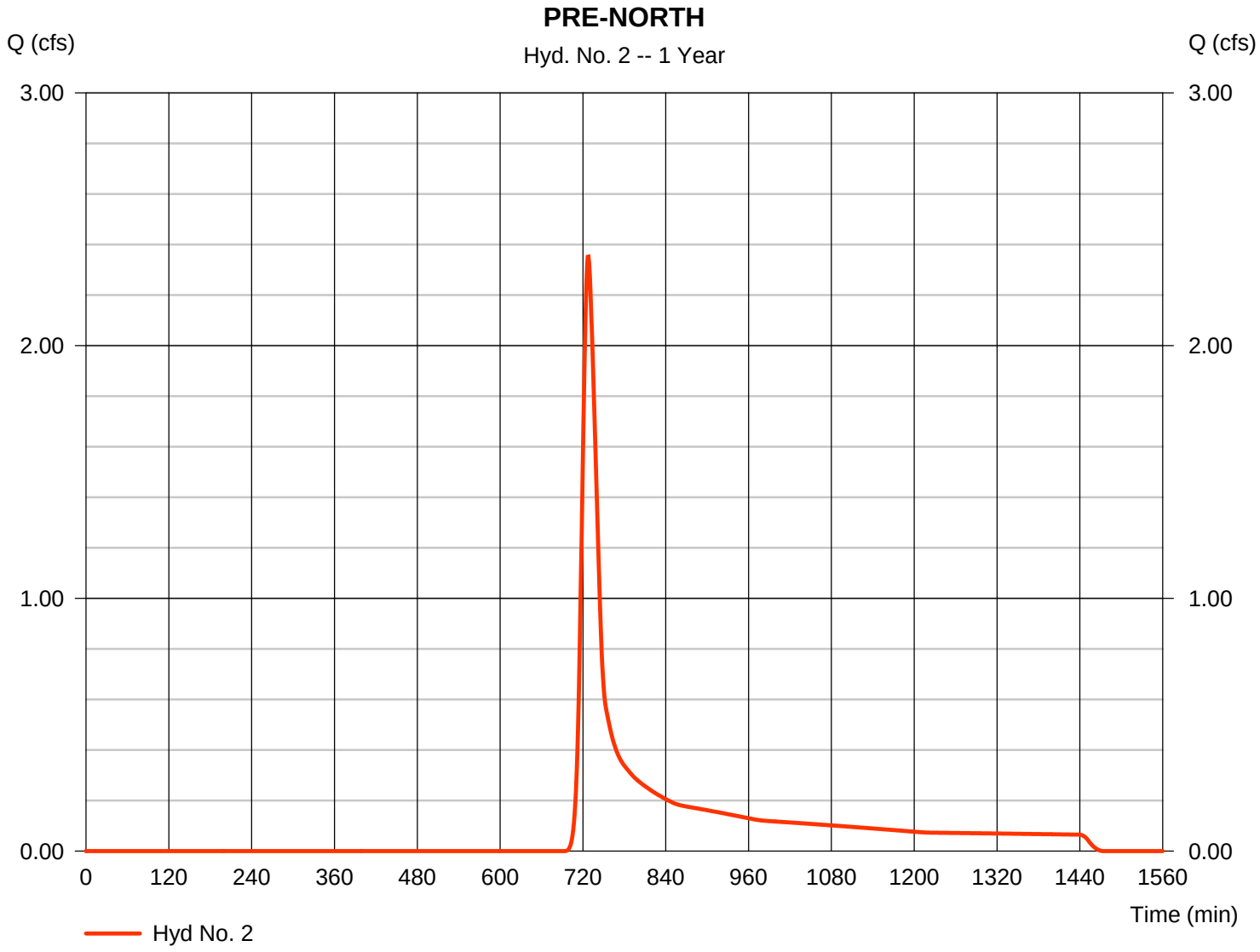
Total Travel Time, Tc ..... 13.80 min

Hydrograph Report

Hyd. No. 2

PRE-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.352 cfs
Storm frequency	=	1 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	8,955 cuft
Drainage area	=	3.530 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 2

PRE-NORTH

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 92.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.57		0.00		0.00		
Land slope (%)	= 2.72		0.00		0.00		
Travel Time (min)	**= 16.82**	**+**	**0.00**	**+**	**0.00**	**=**	**16.82**
Shallow Concentrated Flow							
Flow length (ft)	= 132.00		395.00		0.00		
Watercourse slope (%)	= 2.84		4.94		0.00		
Surface description	= Unpaved		Unpaved		Paved		
Average velocity (ft/s)	=2.72		3.59		0.00		
Travel Time (min)	**= 0.81**	**+**	**1.84**	**+**	**0.00**	**=**	**2.64**
Channel Flow							
X sectional flow area (sqft)	= 4.50		0.00		0.00		
Wetted perimeter (ft)	= 7.80		0.00		0.00		
Channel slope (%)	= 1.59		0.00		0.00		
Manning's n-value	= 0.040		0.015		0.015		
Velocity (ft/s)	=3.25						
			0.00				
					0.00		
Flow length (ft)	({0})315.0		0.0		0.0		
Travel Time (min)	**= 1.62**	**+**	**0.00**	**+**	**0.00**	**=**	**1.62**

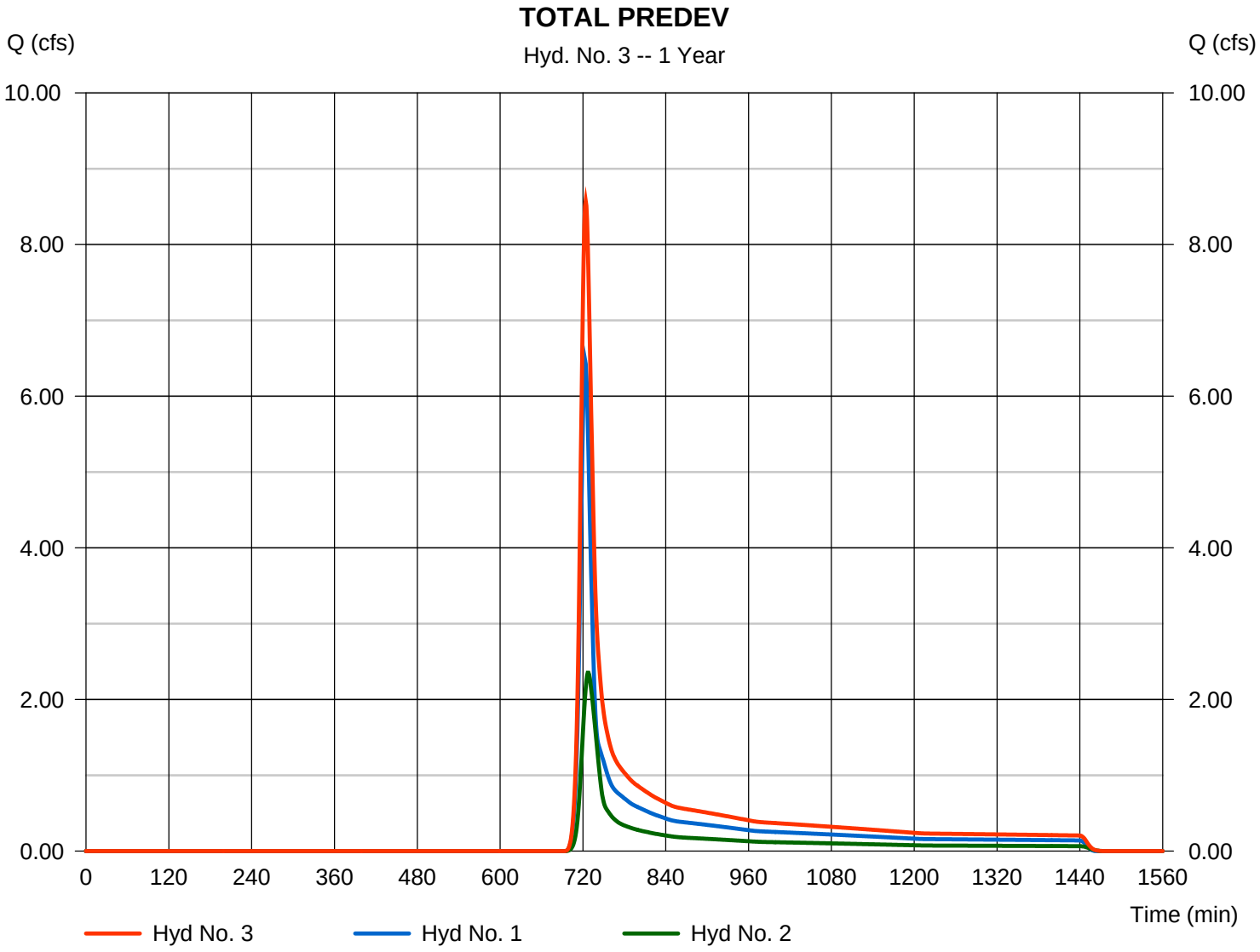
Total Travel Time, Tc ..... 21.10 min

Hydrograph Report

Hyd. No. 3

TOTAL PREDEV

Hydrograph type	= Combine	Peak discharge	= 8.573 cfs
Storm frequency	= 1 yrs	Time to peak	= 724 min
Time interval	= 1 min	Hyd. volume	= 28,377 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 11.260 ac



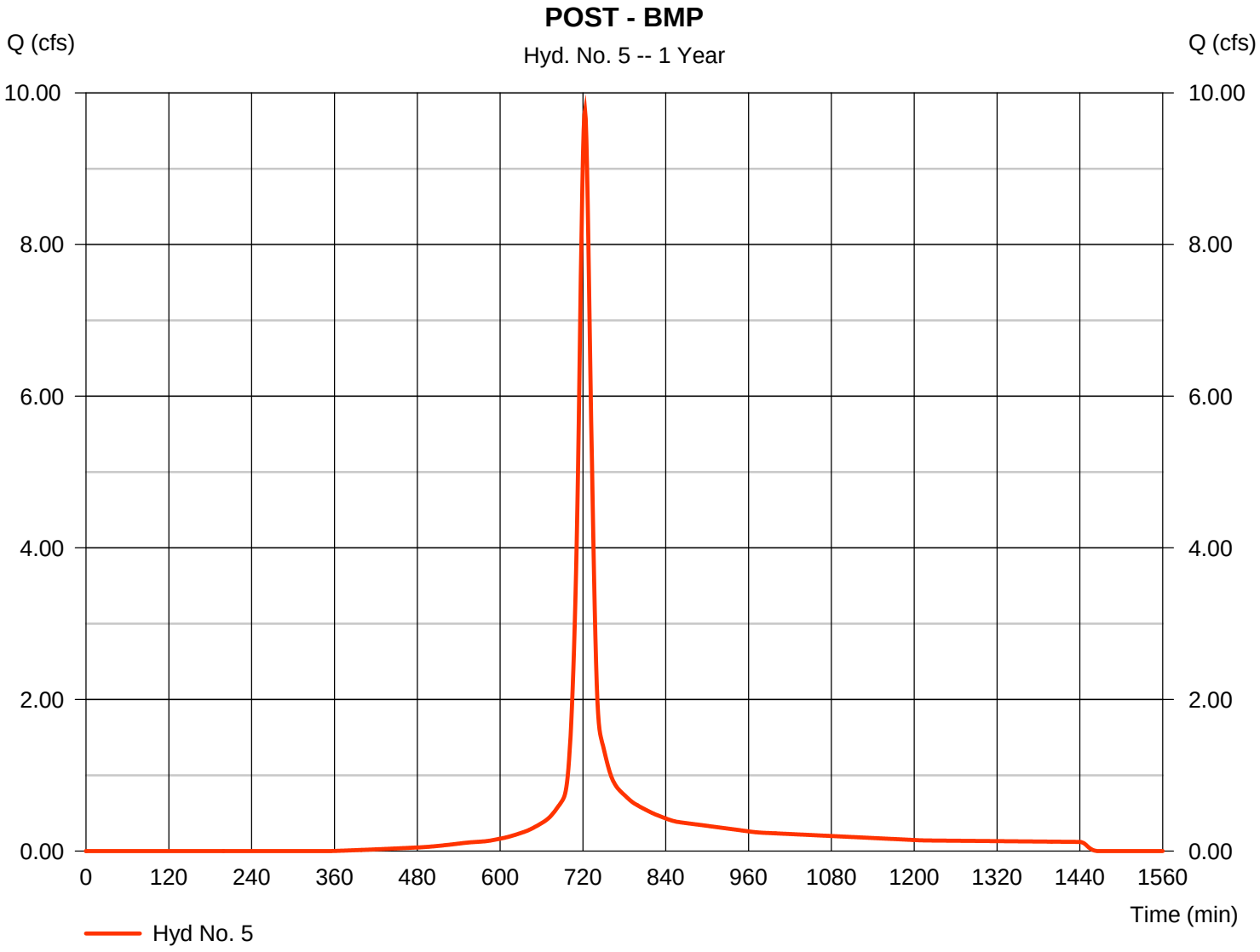
Hydrograph Report

Hyd. No. 5

POST - BMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.765 cfs
Storm frequency	=	1 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	28,129 cuft
Drainage area	=	3.930 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.00 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.680 x 98) + (1.250 x 74)] / 3.930



TR55 Tc Worksheet

Hyd. No. 5

POST - BMP

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.57		0.00		0.00		
Land slope (%)	= 6.50		0.00		0.00		
Travel Time (min)	**= 12.69**	**+**	**0.00**	**+**	**0.00**	**=**	**12.69**
Shallow Concentrated Flow							
Flow length (ft)	= 99.00		0.00		0.00		
Watercourse slope (%)	= 4.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.42		0.00		0.00		
Travel Time (min)	**= 0.48**	**+**	**0.00**	**+**	**0.00**	**=**	**0.48**
Channel Flow							
X sectional flow area (sqft)	= 1.23		0.00		0.00		
Wetted perimeter (ft)	= 4.71		0.00		0.00		
Channel slope (%)	= 0.50		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=2.86						
			0.00				
					0.00		
Flow length (ft)	({0})483.0		0.0		0.0		
Travel Time (min)	**= 2.82**	**+**	**0.00**	**+**	**0.00**	**=**	**2.82**

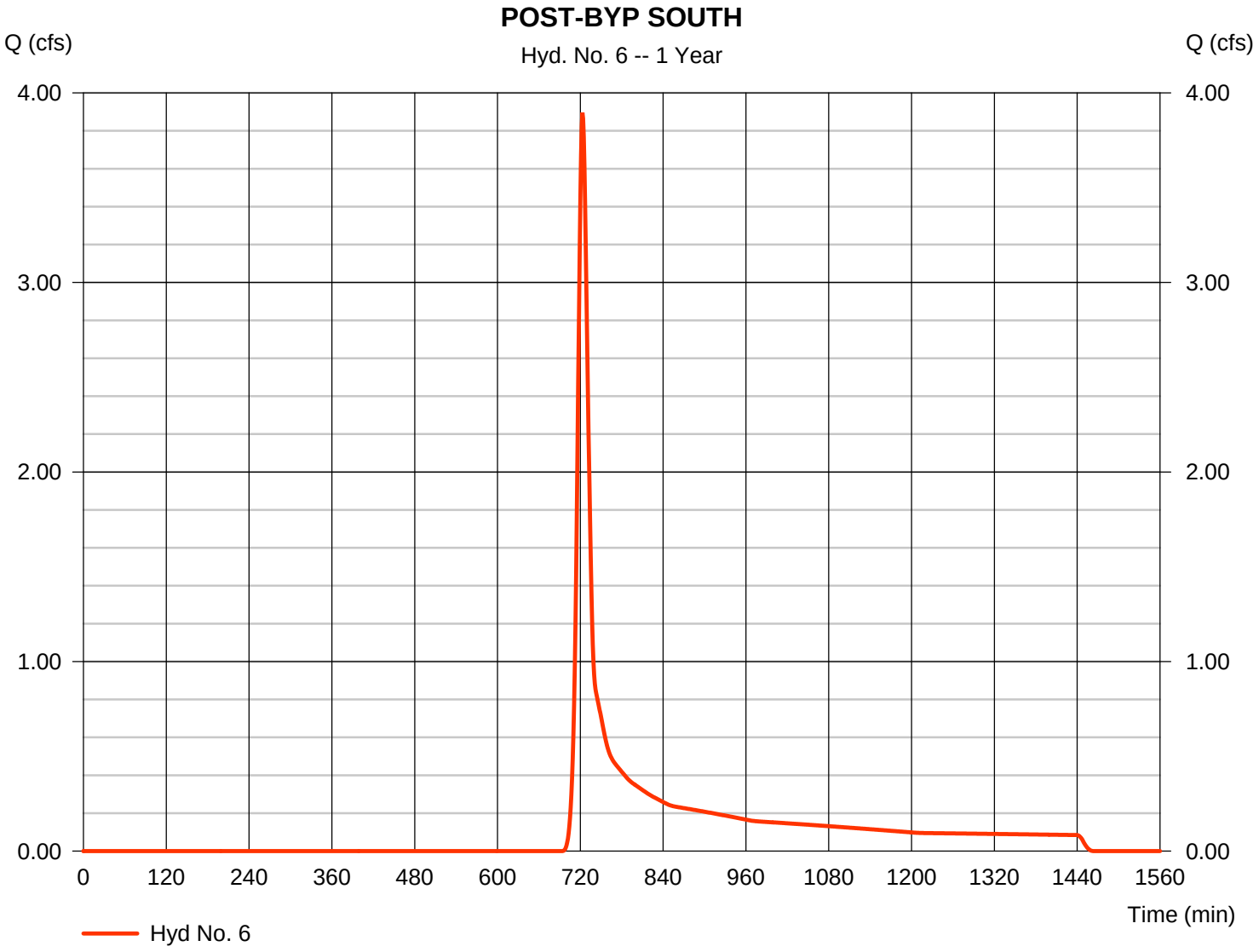
Total Travel Time, Tc ..... 16.00 min

Hydrograph Report

Hyd. No. 6

POST-BYP SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.896 cfs
Storm frequency	=	1 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	11,684 cuft
Drainage area	=	4.650 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.30 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 6

POST-BYP SOUTH

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 75.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.57		0.00		0.00		
Land slope (%)	= 5.33		0.00		0.00		
Travel Time (min)	**= 10.91**	**+**	**0.00**	**+**	**0.00**	**=**	**10.91**
Shallow Concentrated Flow							
Flow length (ft)	= 642.00		0.00		0.00		
Watercourse slope (%)	= 3.82		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.15		0.00		0.00		
Travel Time (min)	**= 3.39**	**+**	**0.00**	**+**	**0.00**	**=**	**3.39**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

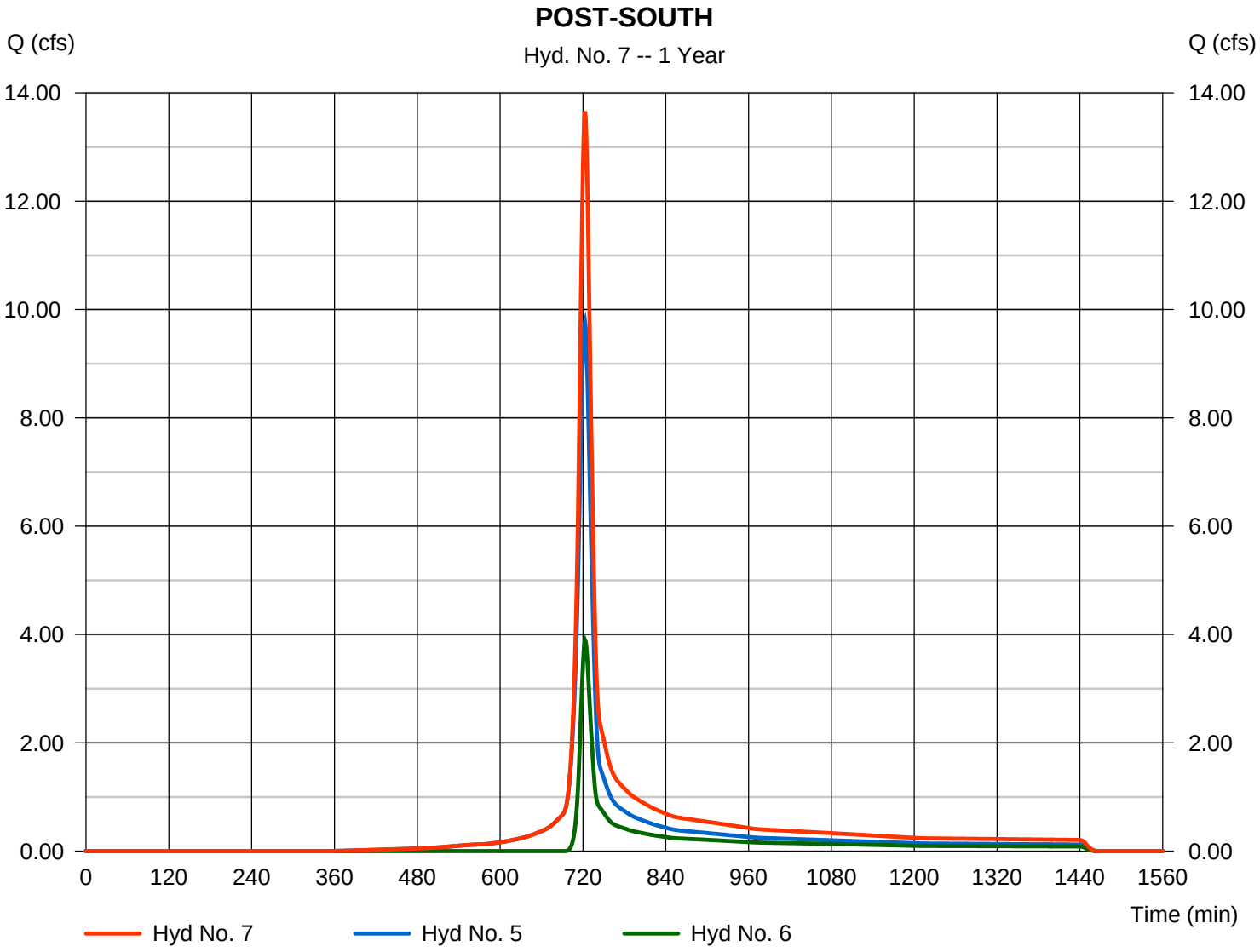
Total Travel Time, Tc ..... 14.30 min

Hydrograph Report

Hyd. No. 7

POST-SOUTH

Hydrograph type	= Combine	Peak discharge	= 13.66 cfs
Storm frequency	= 1 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 39,813 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 8.580 ac

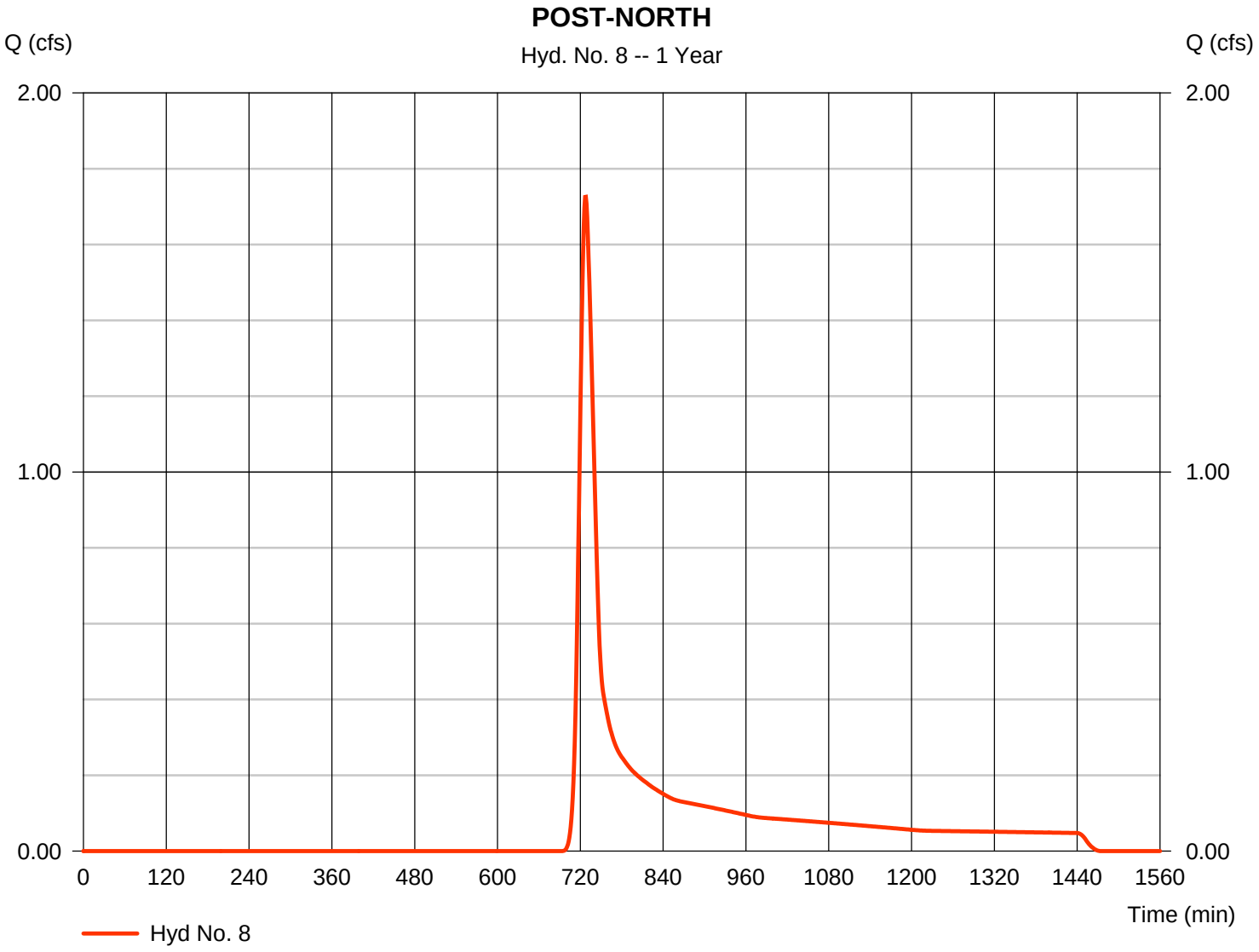


Hydrograph Report

Hyd. No. 8

POST-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.726 cfs
Storm frequency	=	1 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	6,570 cuft
Drainage area	=	2.590 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 8

POST-NORTH

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 92.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.57		0.00		0.00		
Land slope (%)	= 2.72		0.00		0.00		
Travel Time (min)	**= 16.82**	**+**	**0.00**	**+**	**0.00**	**=**	**16.82**
Shallow Concentrated Flow							
Flow length (ft)	= 132.00		273.00		0.00		
Watercourse slope (%)	= 2.84		6.78		0.00		
Surface description	= Unpaved		Unpaved		Paved		
Average velocity (ft/s)	=2.72		4.20		0.00		
Travel Time (min)	**= 0.81**	**+**	**1.08**	**+**	**0.00**	**=**	**1.89**
Channel Flow							
X sectional flow area (sqft)	= 4.50		0.00		0.00		
Wetted perimeter (ft)	= 7.80		0.00		0.00		
Channel slope (%)	= 1.45		0.00		0.00		
Manning's n-value	= 0.040		0.015		0.015		
Velocity (ft/s)	=3.10						
			0.00				
					0.00		
Flow length (ft)	({0})449.0		0.0		0.0		
Travel Time (min)	**= 2.41**	**+**	**0.00**	**+**	**0.00**	**=**	**2.41**

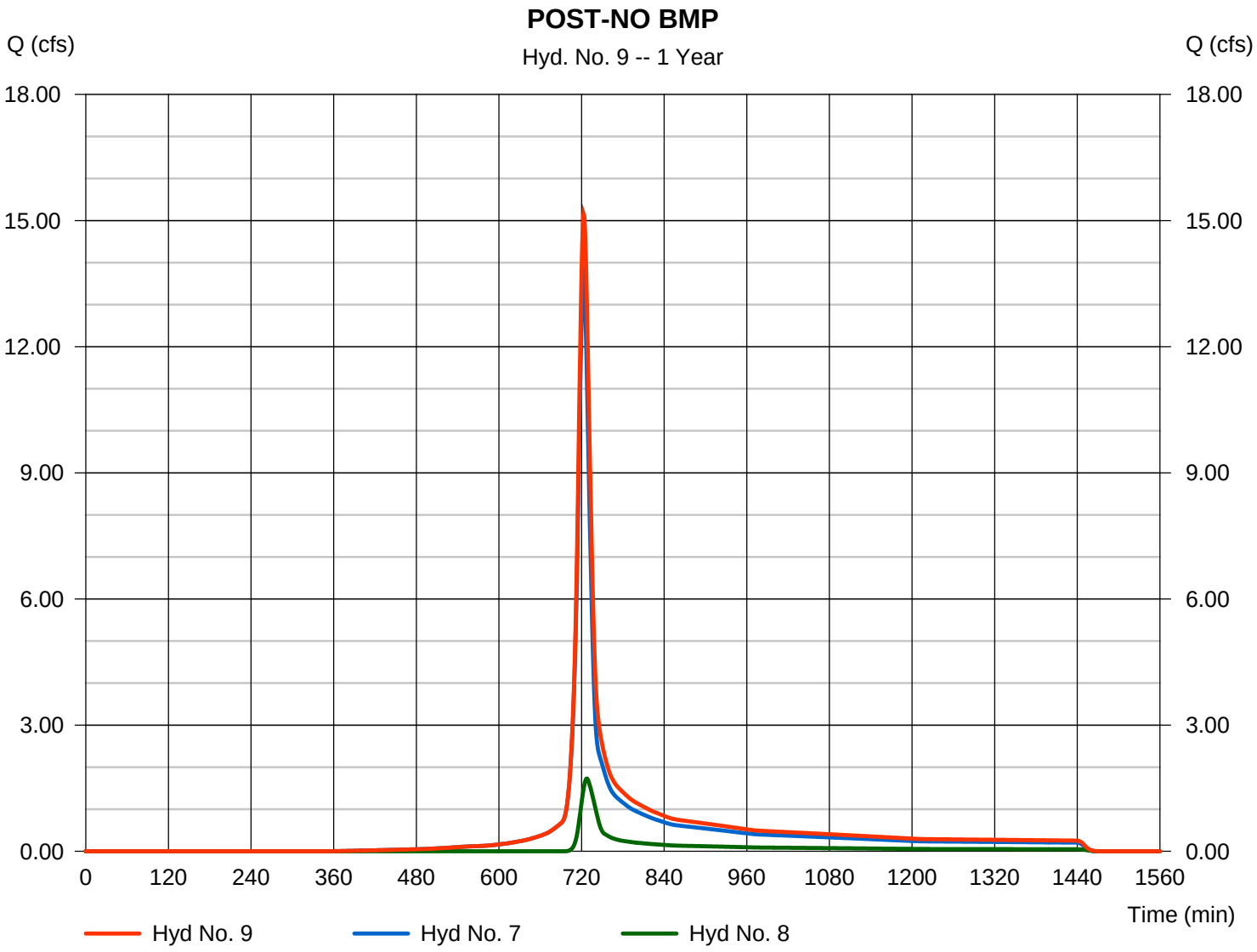
Total Travel Time, Tc ..... 21.10 min

Hydrograph Report

Hyd. No. 9

POST-NO BMP

Hydrograph type	= Combine	Peak discharge	= 15.15 cfs
Storm frequency	= 1 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 46,383 cuft
Inflow hyds.	= 7, 8	Contrib. drain. area	= 2.590 ac



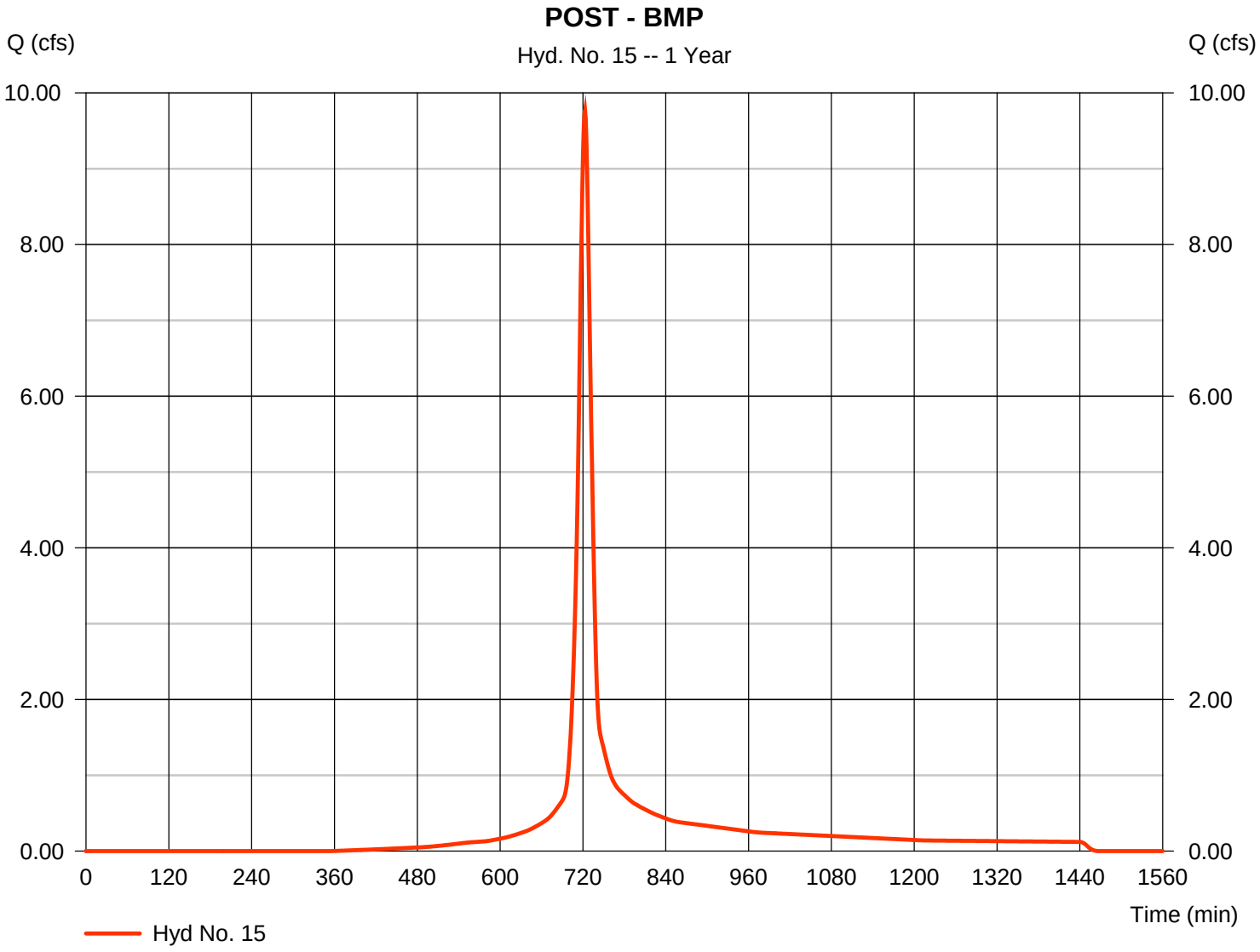
Hydrograph Report

Hyd. No. 15

POST - BMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.765 cfs
Storm frequency	=	1 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	28,129 cuft
Drainage area	=	3.930 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.00 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.680 x 98) + (1.250 x 74)] / 3.930



TR55 Tc Worksheet

Hyd. No. 15

POST - BMP

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.57		0.00		0.00		
Land slope (%)	= 6.50		0.00		0.00		
Travel Time (min)	**= 12.69**	**+**	**0.00**	**+**	**0.00**	**=**	**12.69**
Shallow Concentrated Flow							
Flow length (ft)	= 99.00		0.00		0.00		
Watercourse slope (%)	= 4.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.42		0.00		0.00		
Travel Time (min)	**= 0.48**	**+**	**0.00**	**+**	**0.00**	**=**	**0.48**
Channel Flow							
X sectional flow area (sqft)	= 1.23		0.00		0.00		
Wetted perimeter (ft)	= 4.71		0.00		0.00		
Channel slope (%)	= 0.50		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=2.86						
			0.00				
					0.00		
Flow length (ft)	({0})483.0		0.0		0.0		
Travel Time (min)	**= 2.82**	**+**	**0.00**	**+**	**0.00**	**=**	**2.82**

Total Travel Time, Tc ..... 16.00 min

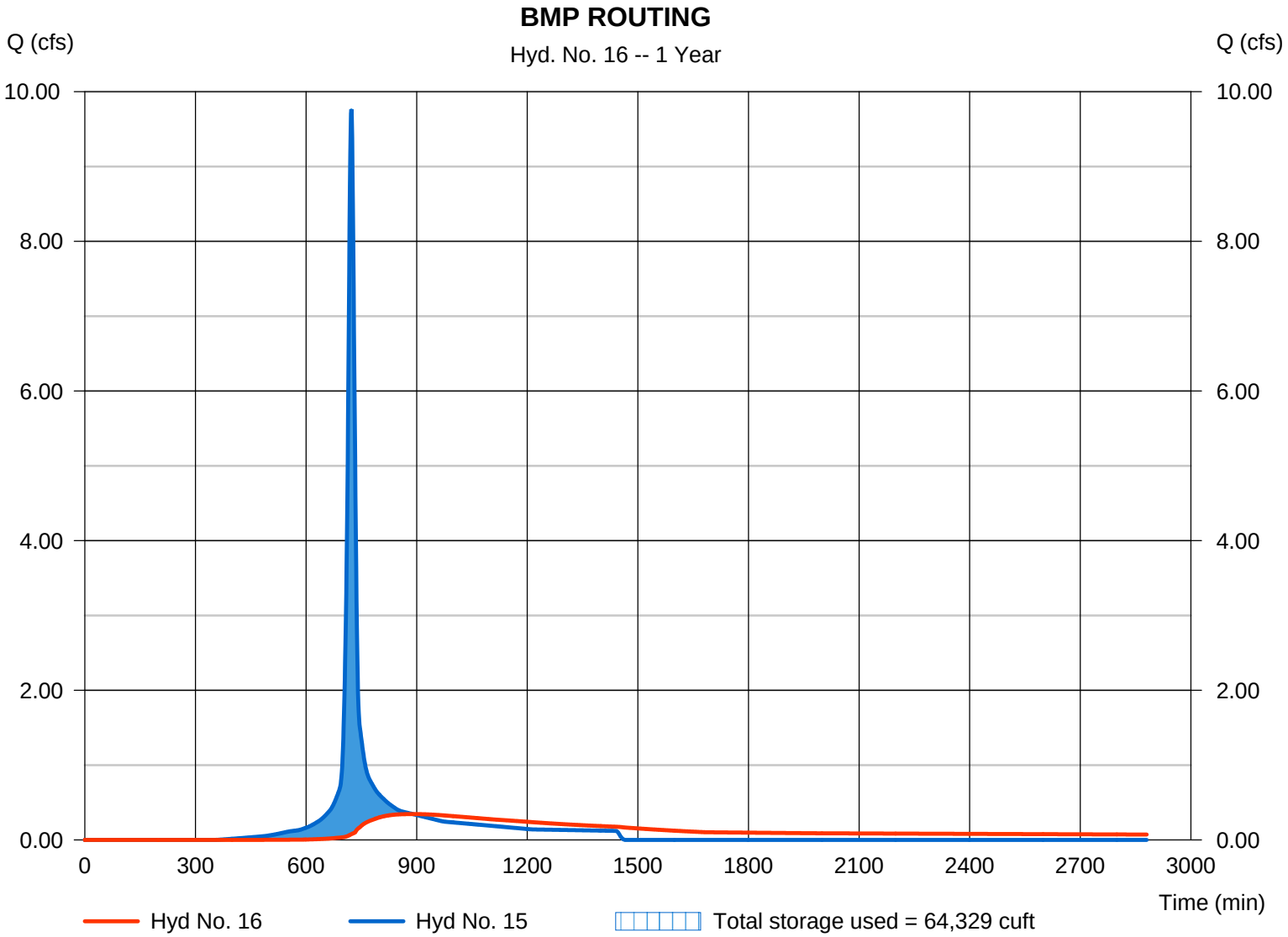
Hydrograph Report

Hyd. No. 16

BMP ROUTING

Hydrograph type	=	Reservoir	Peak discharge	=	0.346 cfs
Storm frequency	=	1 yrs	Time to peak	=	889 min
Time interval	=	1 min	Hyd. volume	=	19,520 cuft
Inflow hyd. No.	=	15 - POST - BMP	Max. Elevation	=	249.65 ft
Reservoir name	=	WET POND	Max. Storage	=	64,329 cuft

Storage Indication method used. Wet pond routing start elevation = 248.50 ft.



Pond Report

Pond No. 1 - WET POND

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 244.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	244.00	7,435	0	0
1.00	245.00	8,509	7,965	7,965
2.00	246.00	9,639	9,067	17,032
3.00	247.00	10,826	10,226	27,258
4.00	248.00	12,070	11,441	38,699
4.50	248.50	14,268	6,576	45,276
5.00	249.00	16,623	7,714	52,990
6.00	250.00	18,112	17,360	70,350
7.00	251.00	19,657	18,877	89,228
8.00	252.00	21,259	20,451	109,679
9.00	253.00	22,917	22,081	131,759

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	2.00	6.00	0.00
Span (in)	= 18.00	2.00	6.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 248.25	248.50	249.35	0.00
Length (ft)	= 48.00	0.00	0.00	0.00
Slope (%)	= 0.50	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	Yes	Yes	No

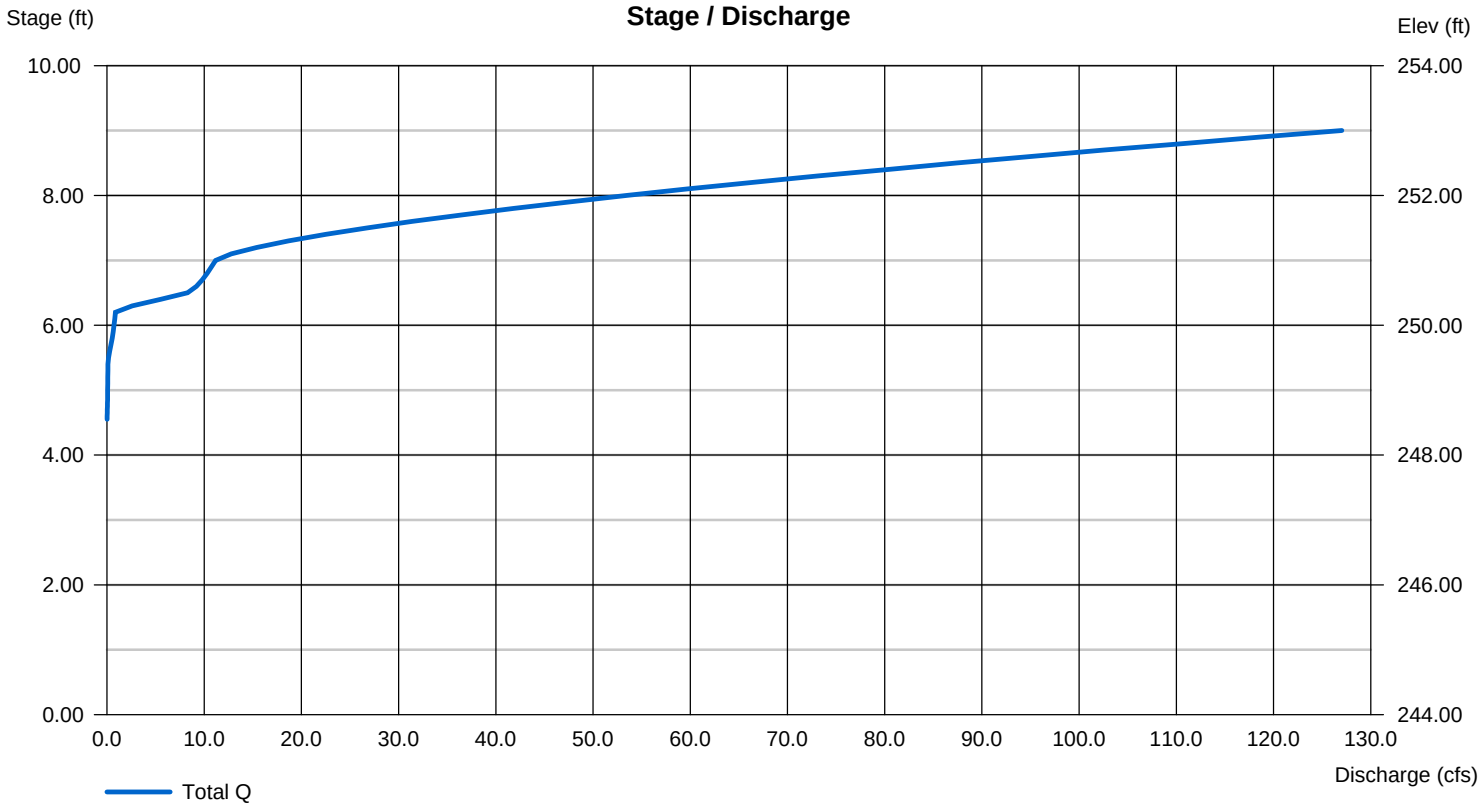
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 16.00	15.00	0.00	0.00
Crest El. (ft)	= 250.20	251.00	0.00	0.00
Weir Coeff.	= 3.33	2.60	3.33	3.33
Weir Type	= 1	Broad	---	---
Multi-Stage	= Yes	No	No	No

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

TW Elev. (ft) = 0.00

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

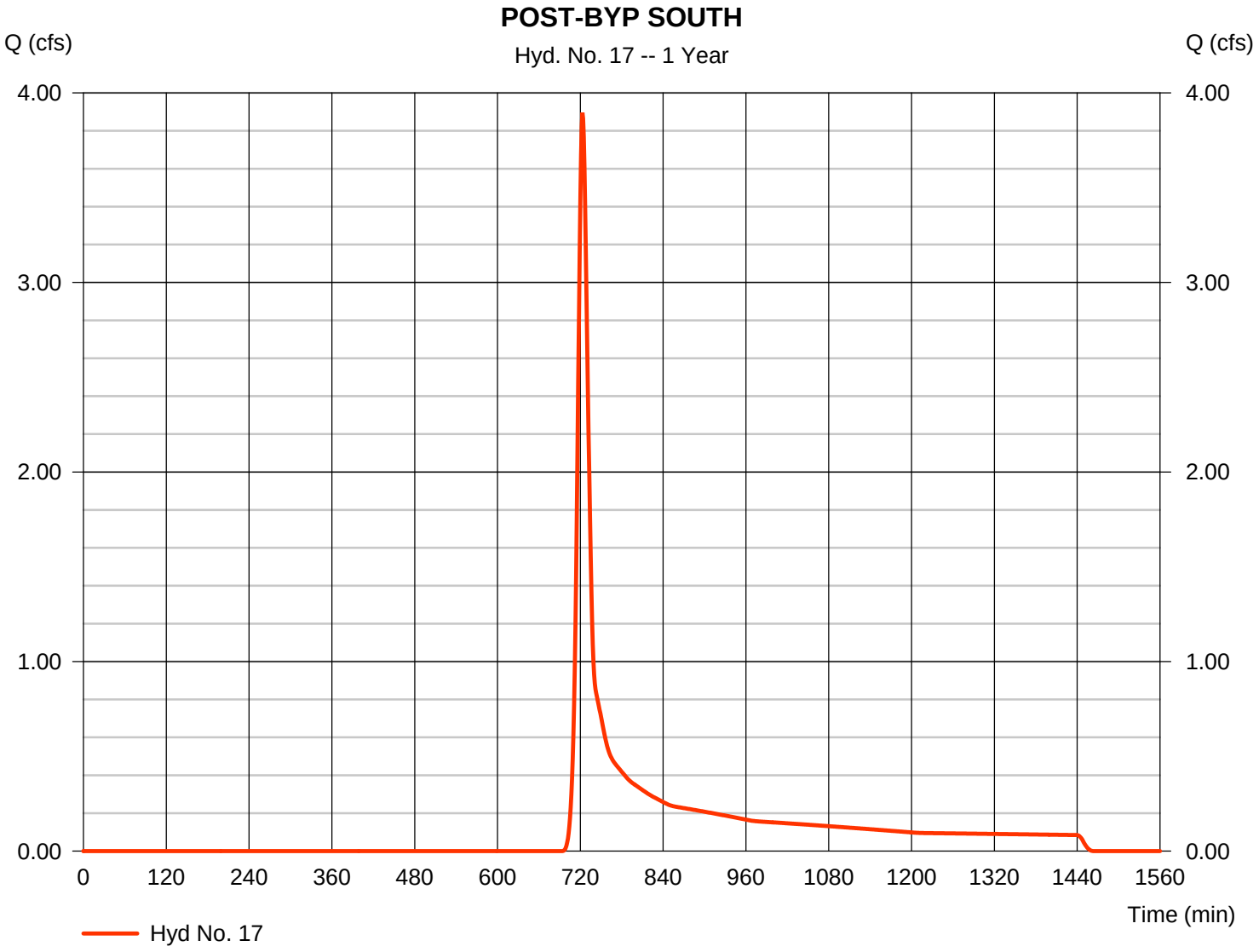


Hydrograph Report

Hyd. No. 17

POST-BYP SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.896 cfs
Storm frequency	=	1 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	11,684 cuft
Drainage area	=	4.650 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.20 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 17

POST-BYP SOUTH

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 75.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.57		0.00		0.00		
Land slope (%)	= 5.33		0.00		0.00		
Travel Time (min)	**= 10.91**	**+**	**0.00**	**+**	**0.00**	**=**	**10.91**
Shallow Concentrated Flow							
Flow length (ft)	= 628.00		0.00		0.00		
Watercourse slope (%)	= 3.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=3.19		0.00		0.00		
Travel Time (min)	**= 3.28**	**+**	**0.00**	**+**	**0.00**	**=**	**3.28**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	=0.00						
			0.00				
					0.00		
Flow length (ft)	({0})0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

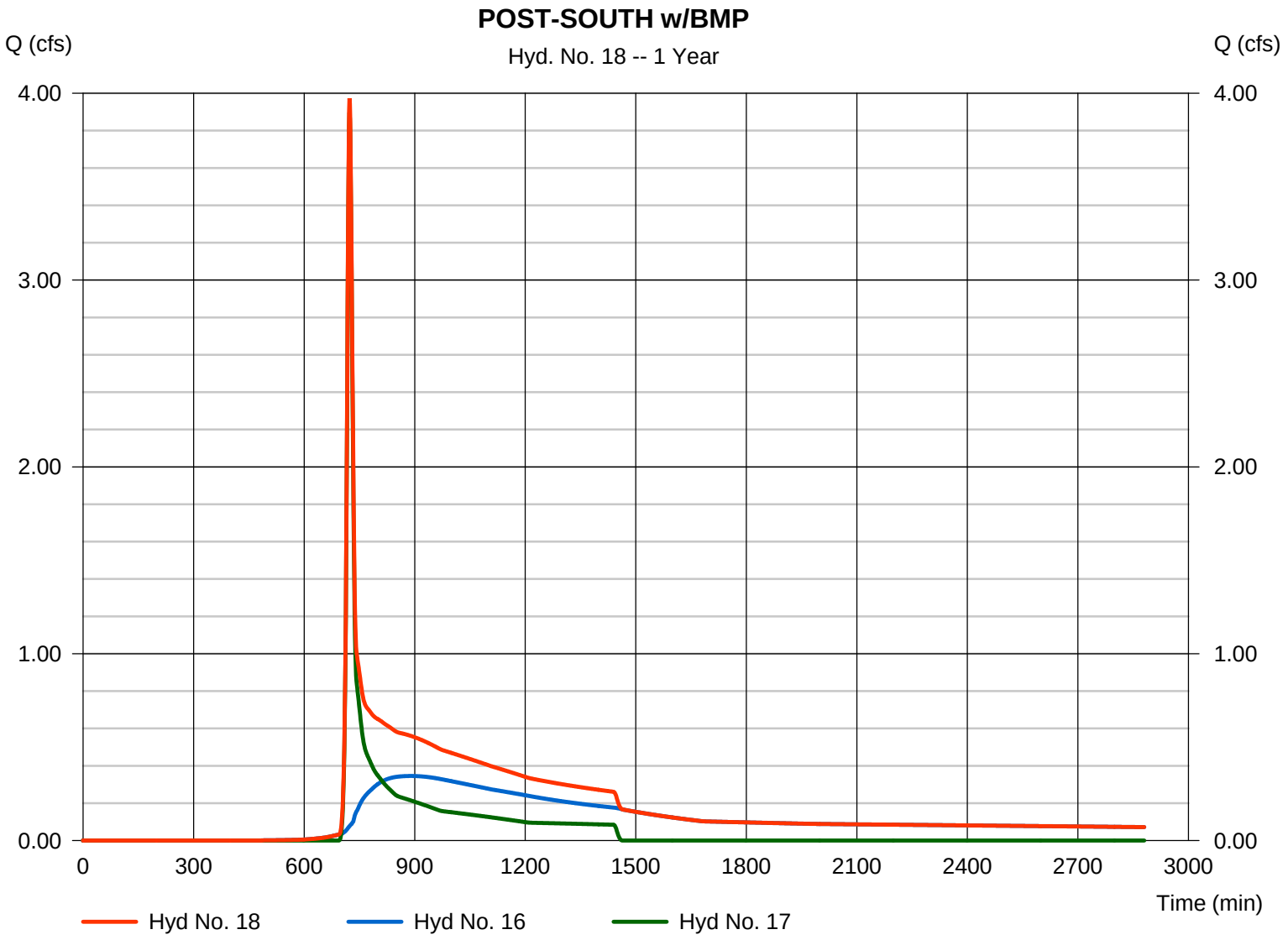
Total Travel Time, Tc ..... 14.20 min

Hydrograph Report

Hyd. No. 18

POST-SOUTH w/BMP

Hydrograph type	= Combine	Peak discharge	= 3.973 cfs
Storm frequency	= 1 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 31,204 cuft
Inflow hyds.	= 16, 17	Contrib. drain. area	= 4.650 ac

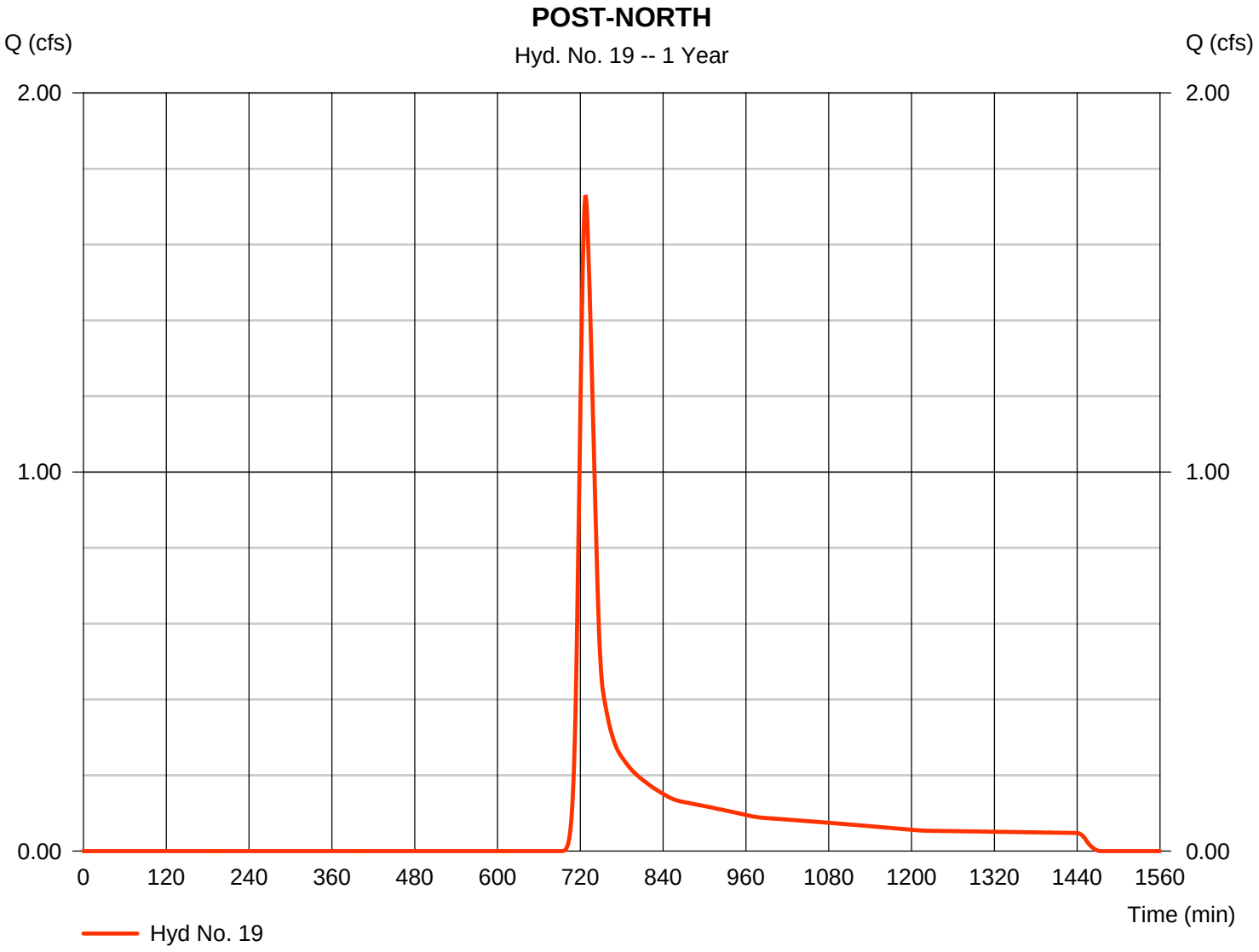


Hydrograph Report

Hyd. No. 19

POST-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.726 cfs
Storm frequency	=	1 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	6,570 cuft
Drainage area	=	2.590 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	2.96 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 19

POST-NORTH

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 92.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.57		0.00		0.00		
Land slope (%)	= 2.72		0.00		0.00		
Travel Time (min)	**= 16.82**	**+**	**0.00**	**+**	**0.00**	**=**	**16.82**
Shallow Concentrated Flow							
Flow length (ft)	= 132.00		273.00		0.00		
Watercourse slope (%)	= 2.84		6.78		0.00		
Surface description	= Unpaved		Unpaved		Paved		
Average velocity (ft/s)	=2.72		4.20		0.00		
Travel Time (min)	**= 0.81**	**+**	**1.08**	**+**	**0.00**	**=**	**1.89**
Channel Flow							
X sectional flow area (sqft)	= 4.50		0.00		0.00		
Wetted perimeter (ft)	= 7.80		0.00		0.00		
Channel slope (%)	= 1.45		0.00		0.00		
Manning's n-value	= 0.040		0.015		0.015		
Velocity (ft/s)	=3.10						
			0.00				
					0.00		
Flow length (ft)	({0})449.0		0.0		0.0		
Travel Time (min)	**= 2.41**	**+**	**0.00**	**+**	**0.00**	**=**	**2.41**

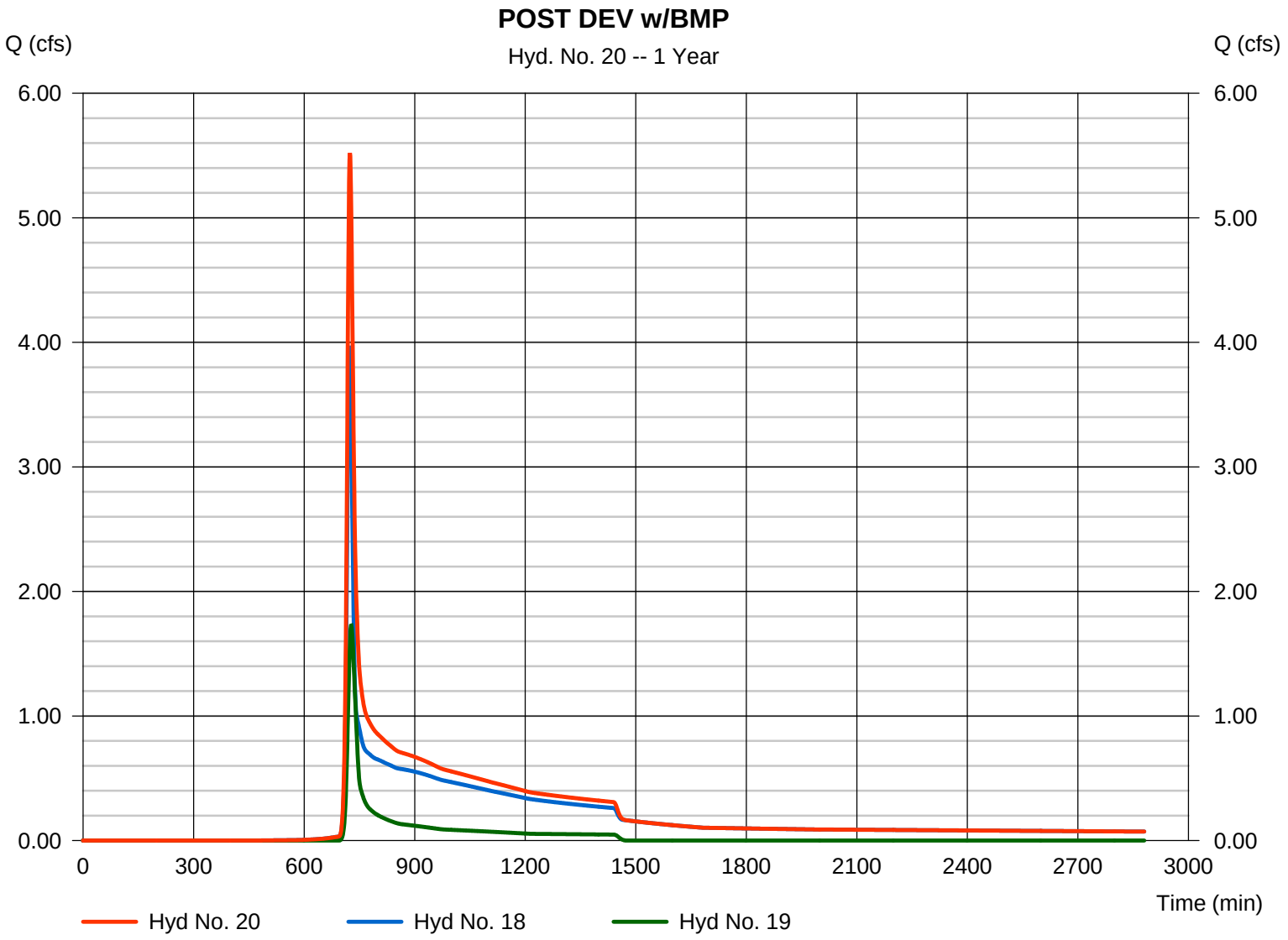
Total Travel Time, Tc ..... 21.10 min

Hydrograph Report

Hyd. No. 20

POST DEV w/BMP

Hydrograph type	= Combine	Peak discharge	= 5.521 cfs
Storm frequency	= 1 yrs	Time to peak	= 724 min
Time interval	= 1 min	Hyd. volume	= 37,774 cuft
Inflow hyds.	= 18, 19	Contrib. drain. area	= 2.590 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	10.42	1	723	29,507	------	------	------	PRE-SOUTH
2	SCS Runoff	3.840	1	727	13,604	------	------	------	PRE-NORTH
3	Combine	13.85	1	723	43,112	1, 2	------	------	TOTAL PREDEV
5	SCS Runoff	12.49	1	723	36,306	------	------	------	POST - BMP
6	SCS Runoff	6.266	1	723	17,750	------	------	------	POST-BYP SOUTH
7	Combine	18.75	1	723	54,056	5, 6	------	------	POST-SOUTH
8	SCS Runoff	2.817	1	727	9,982	------	------	------	POST-NORTH
9	Combine	21.27	1	723	64,038	7, 8	------	------	POST-NO BMP
15	SCS Runoff	12.49	1	723	36,306	------	------	------	POST - BMP
16	Reservoir	0.628	1	820	27,399	15	249.89	68,436	BMP ROUTING
17	SCS Runoff	6.266	1	723	17,750	------	------	------	POST-BYP SOUTH
18	Combine	6.358	1	723	45,149	16, 17	------	------	POST-SOUTH w/BMP
19	SCS Runoff	2.817	1	727	9,982	------	------	------	POST-NORTH
20	Combine	8.907	1	724	55,131	18, 19	------	------	POST DEV w/BMP

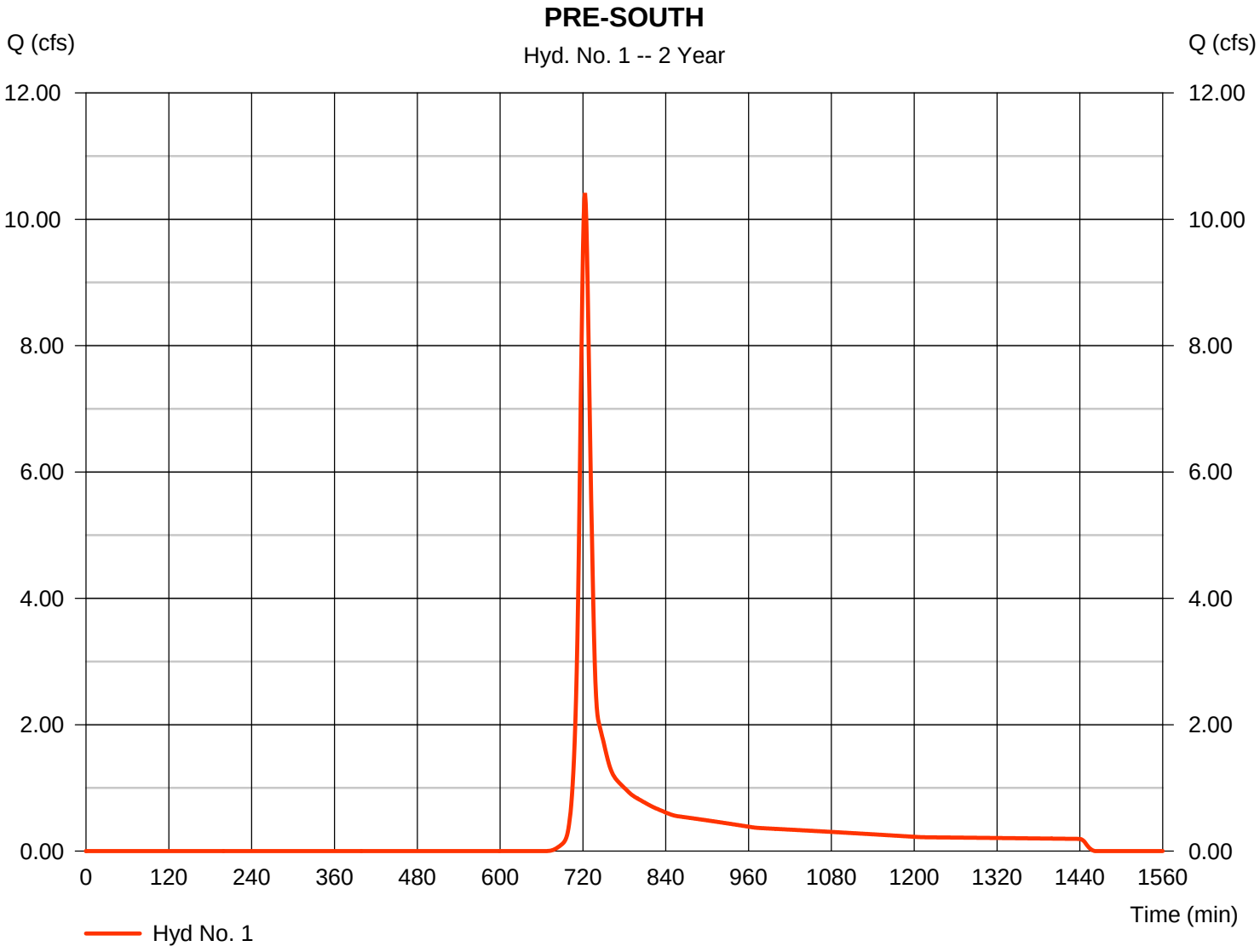
Hydrograph Report

Hyd. No. 1

PRE-SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.42 cfs
Storm frequency	=	2 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	29,507 cuft
Drainage area	=	7.730 ac	Curve number	=	70*
Basin Slope	=	4.3 %	Hydraulic length	=	648 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	3.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.100 x 98) + (0.230 x 74) + (7.400 x 70)] / 7.730

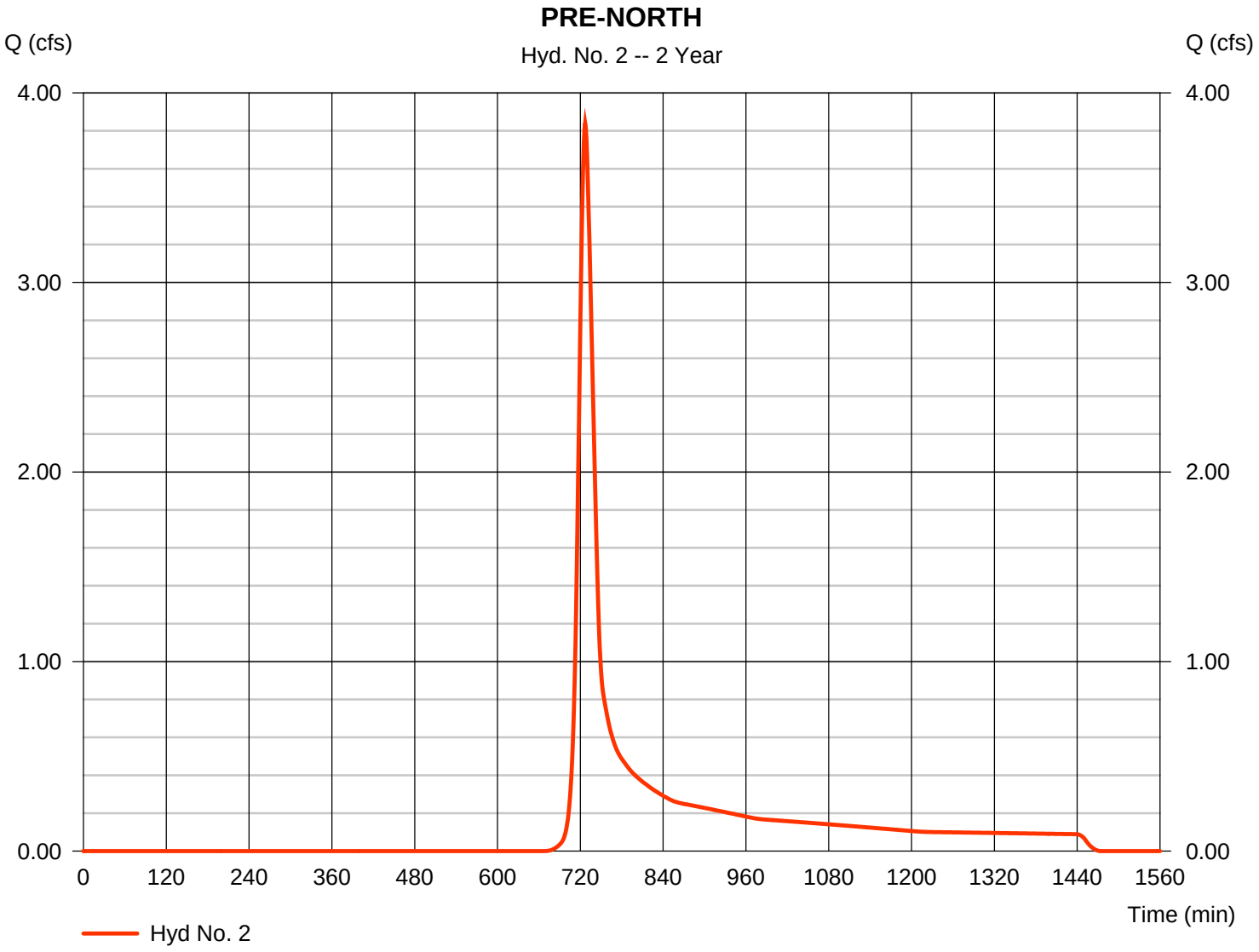


Hydrograph Report

Hyd. No. 2

PRE-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.840 cfs
Storm frequency	=	2 yrs	Time to peak	=	727 min
Time interval	=	1 min	Hyd. volume	=	13,604 cuft
Drainage area	=	3.530 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	3.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

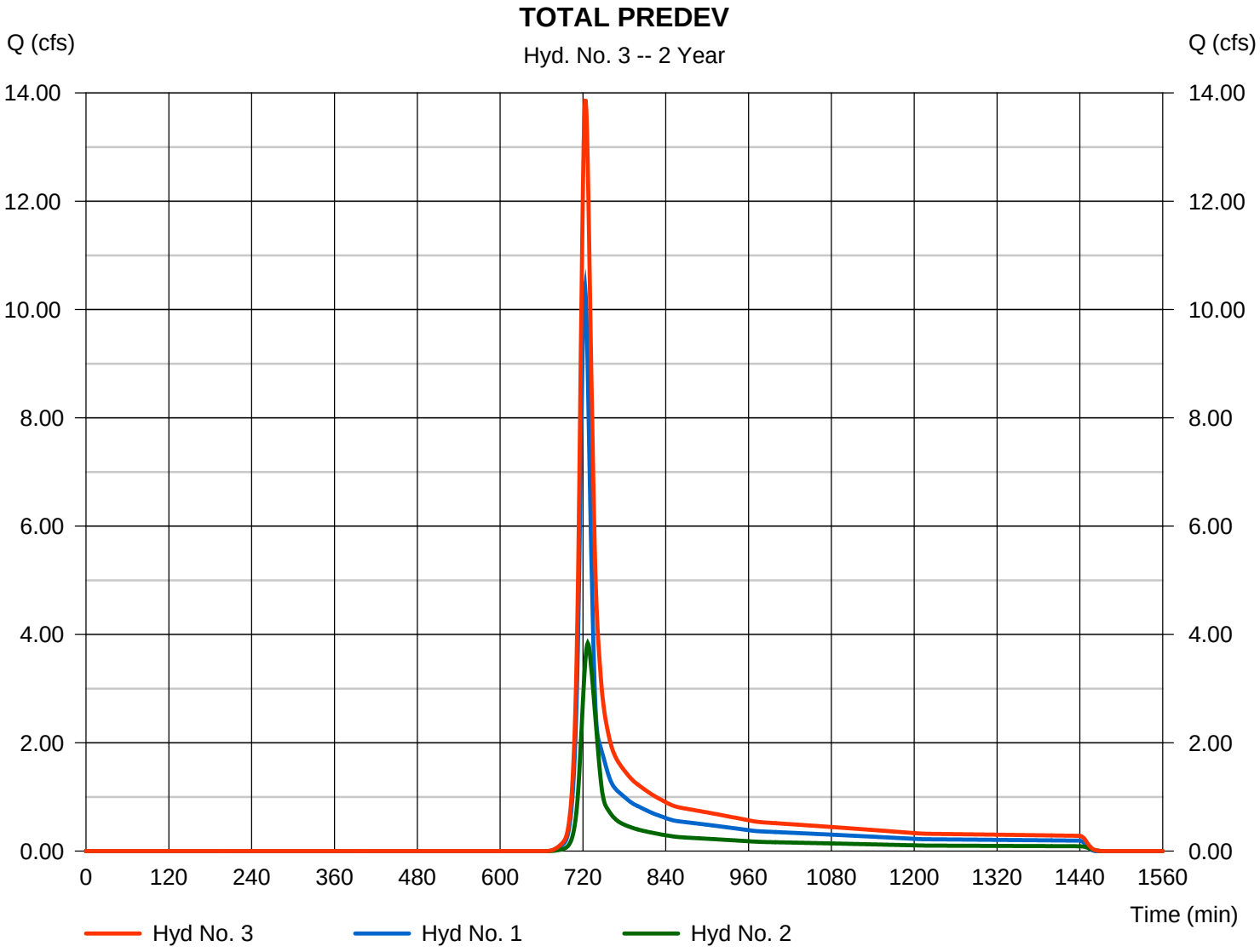


Hydrograph Report

Hyd. No. 3

TOTAL PREDEV

Hydrograph type	= Combine	Peak discharge	= 13.85 cfs
Storm frequency	= 2 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 43,112 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 11.260 ac



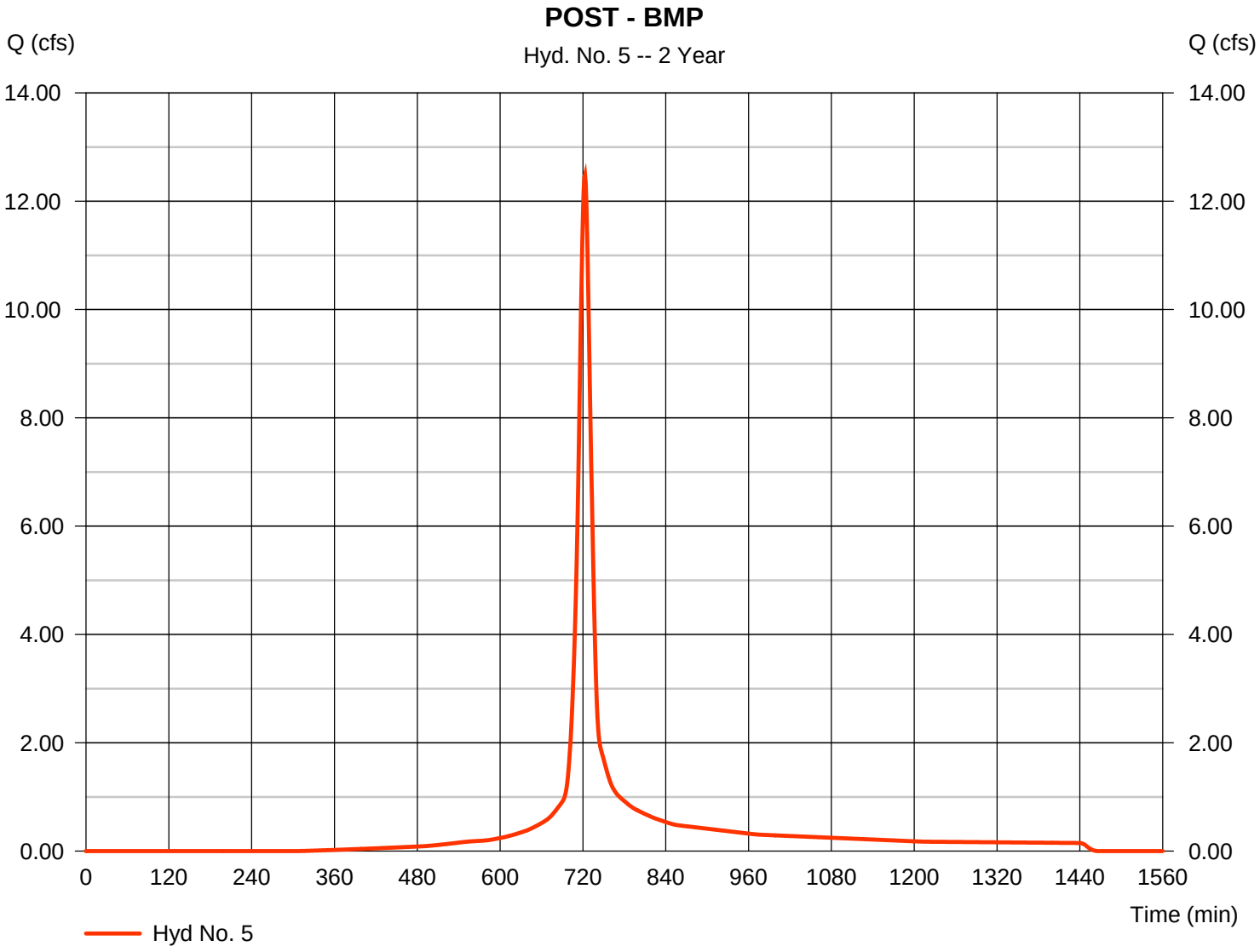
Hydrograph Report

Hyd. No. 5

POST - BMP

Hydrograph type	= SCS Runoff	Peak discharge	= 12.49 cfs
Storm frequency	= 2 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 36,306 cuft
Drainage area	= 3.930 ac	Curve number	= 90*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 16.00 min
Total precip.	= 3.57 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(2.680 x 98) + (1.250 x 74)] / 3.930

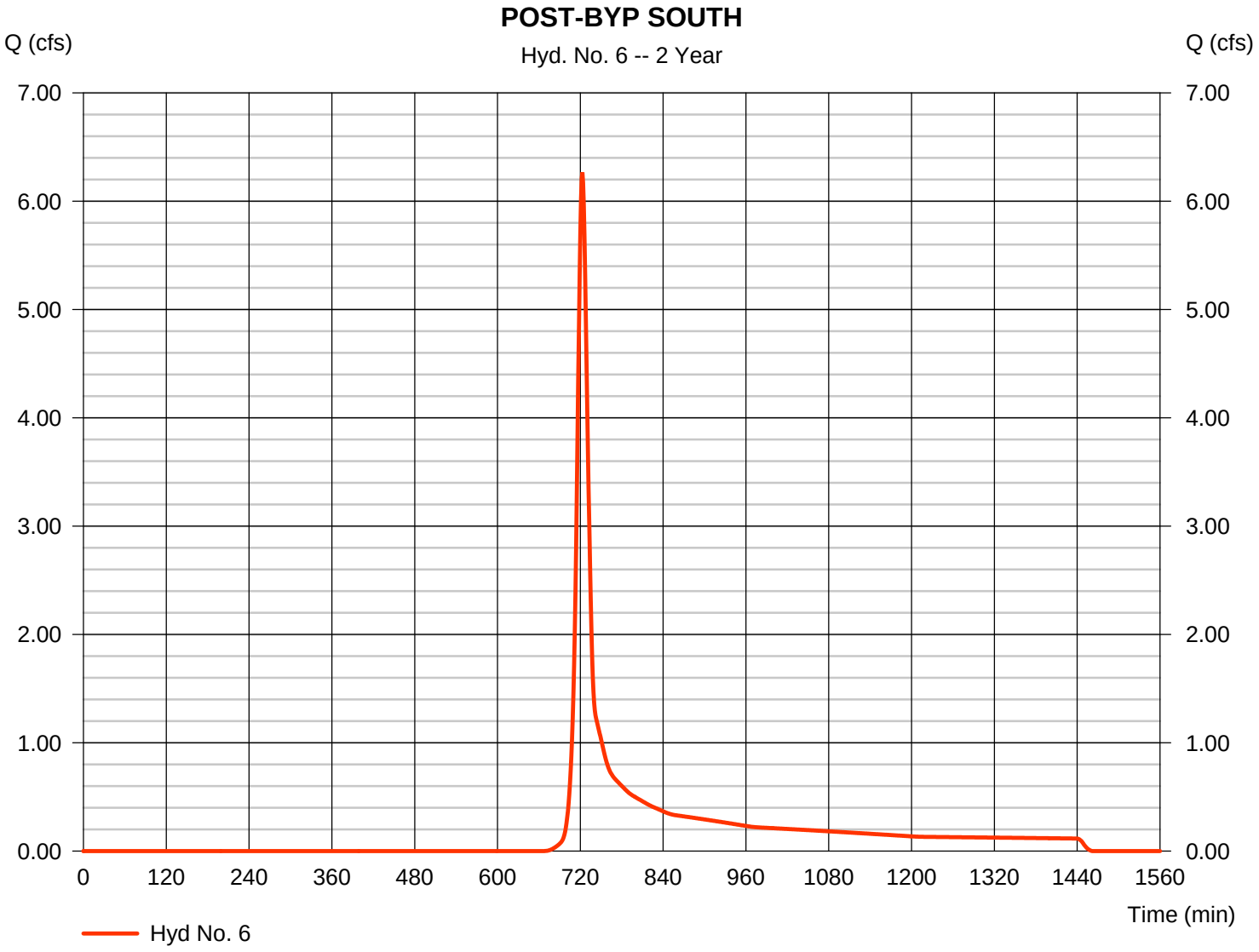


Hydrograph Report

Hyd. No. 6

POST-BYP SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.266 cfs
Storm frequency	=	2 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	17,750 cuft
Drainage area	=	4.650 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.30 min
Total precip.	=	3.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

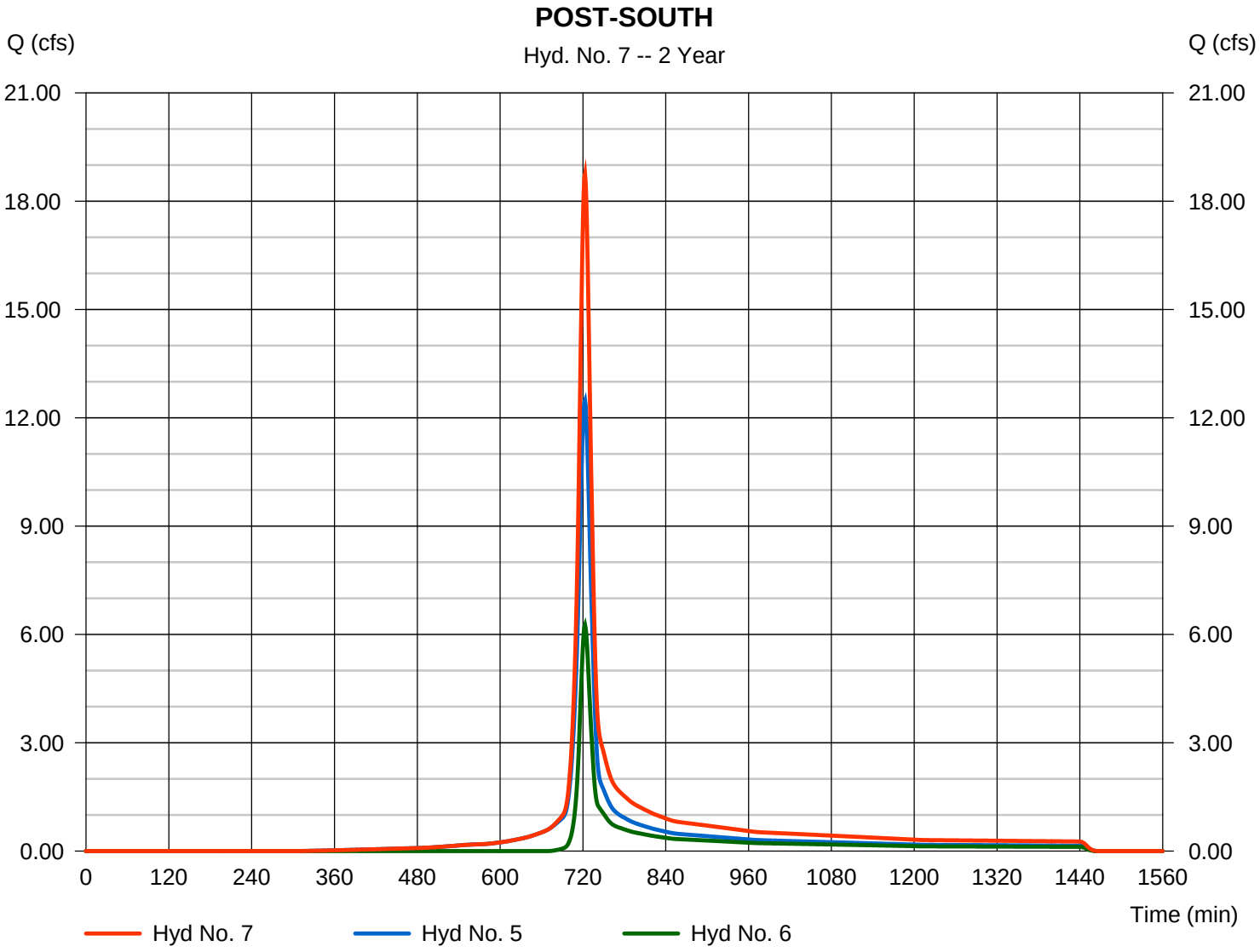


Hydrograph Report

Hyd. No. 7

POST-SOUTH

Hydrograph type	= Combine	Peak discharge	= 18.75 cfs
Storm frequency	= 2 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 54,056 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 8.580 ac

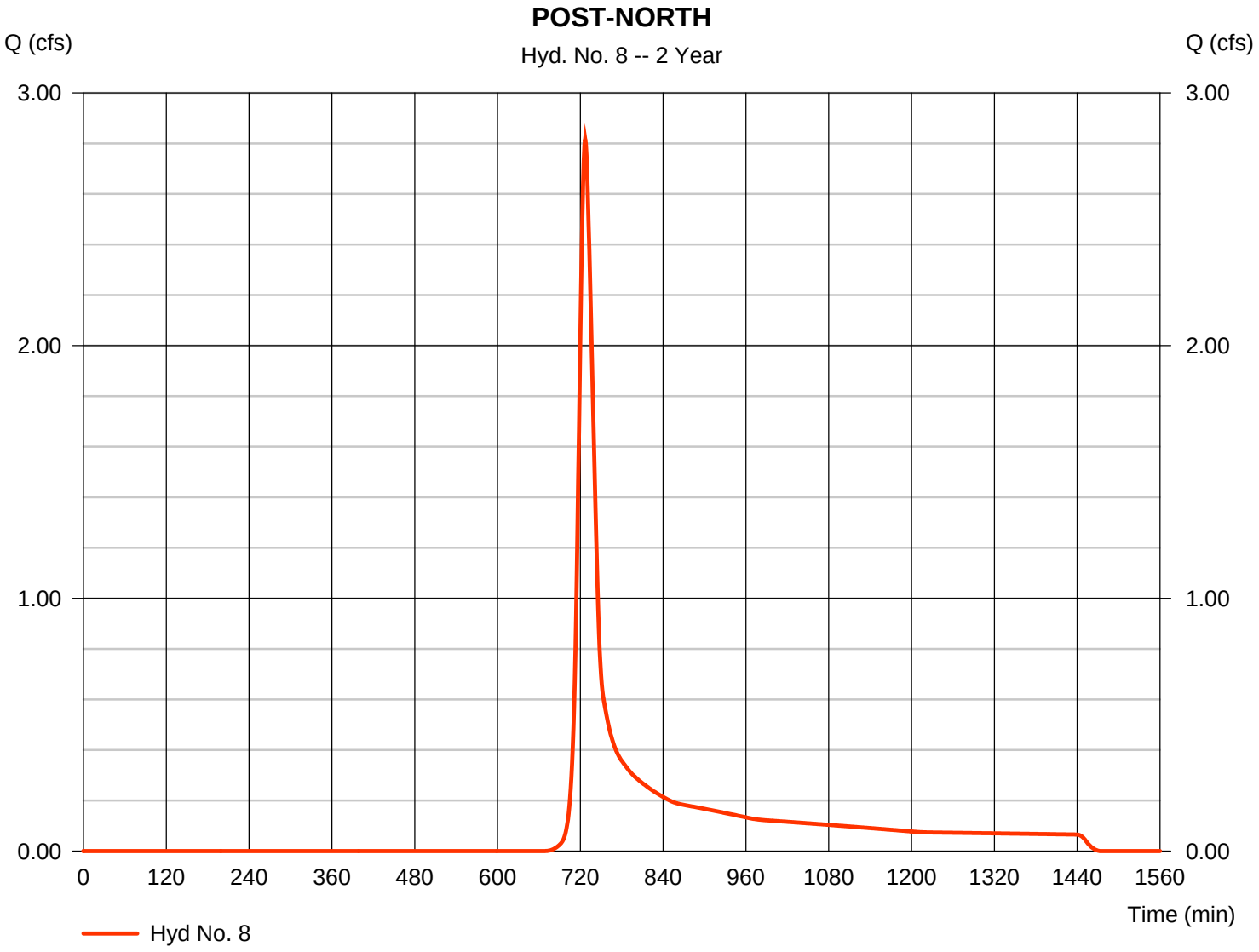


Hydrograph Report

Hyd. No. 8

POST-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.817 cfs
Storm frequency	=	2 yrs	Time to peak	=	727 min
Time interval	=	1 min	Hyd. volume	=	9,982 cuft
Drainage area	=	2.590 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	3.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

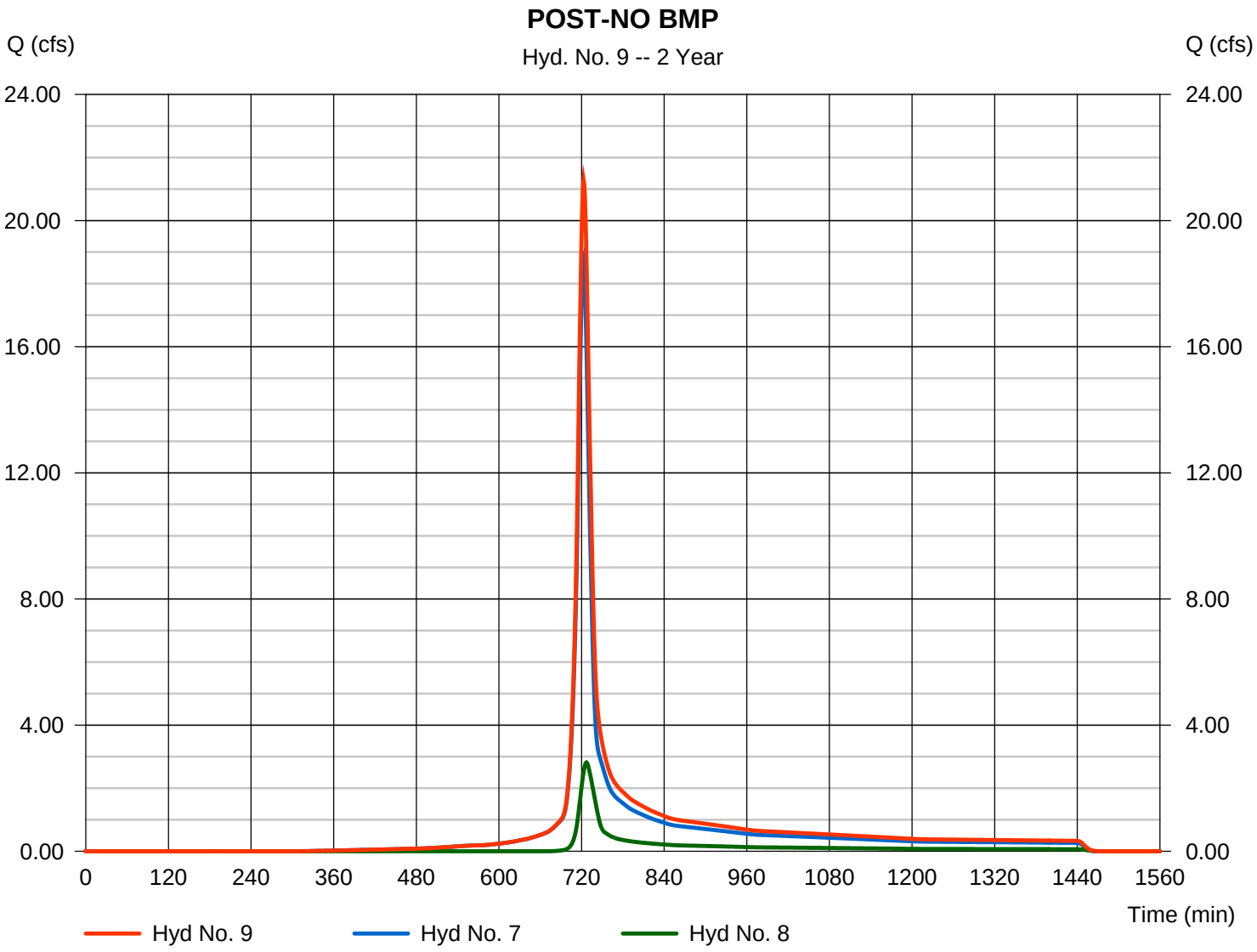


Hydrograph Report

Hyd. No. 9

POST-NO BMP

Hydrograph type	=	Combine	Peak discharge	=	21.27 cfs
Storm frequency	=	2 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	64,038 cuft
Inflow hyds.	=	7, 8	Contrib. drain. area	=	2.590 ac



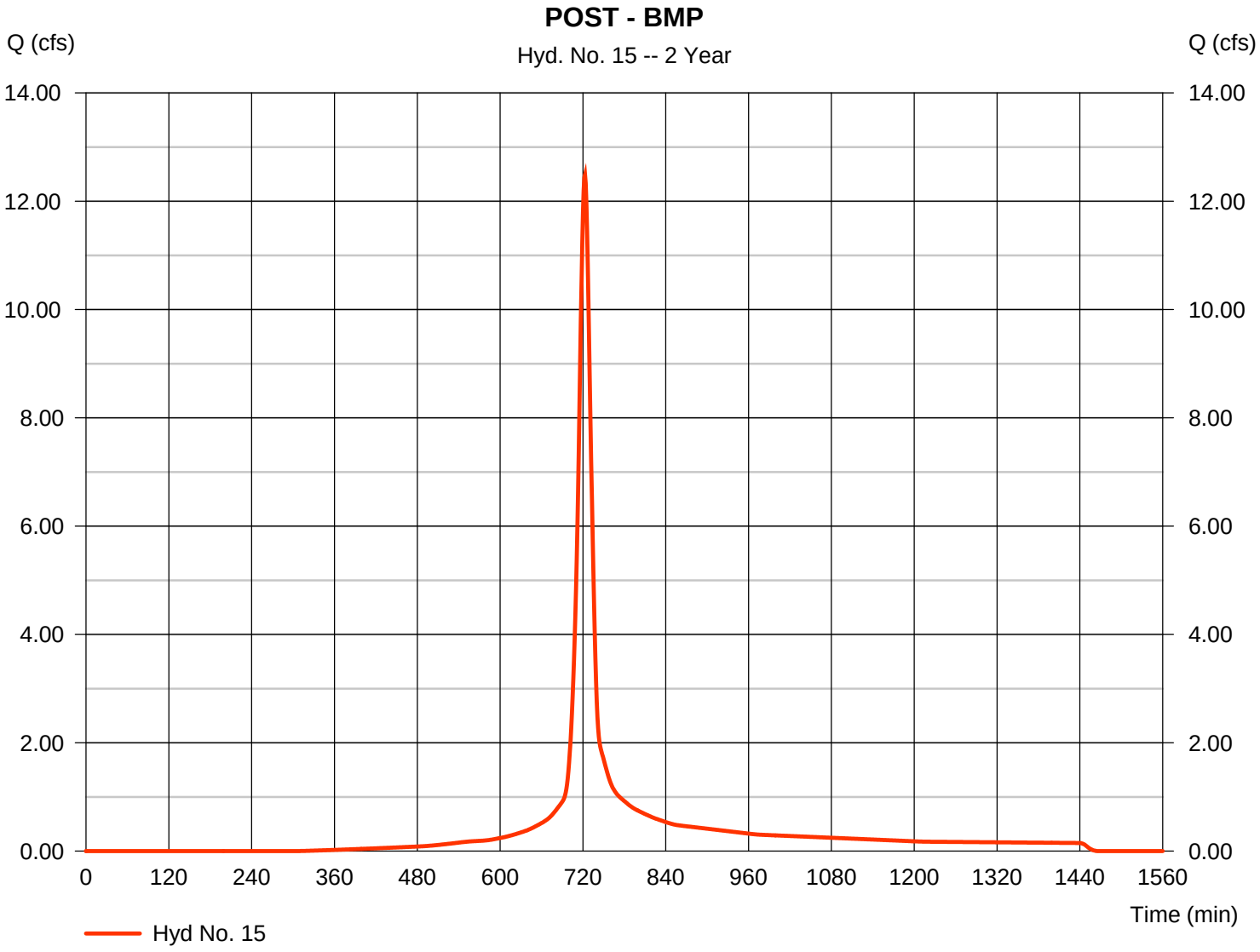
Hydrograph Report

Hyd. No. 15

POST - BMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.49 cfs
Storm frequency	=	2 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	36,306 cuft
Drainage area	=	3.930 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.00 min
Total precip.	=	3.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.680 x 98) + (1.250 x 74)] / 3.930



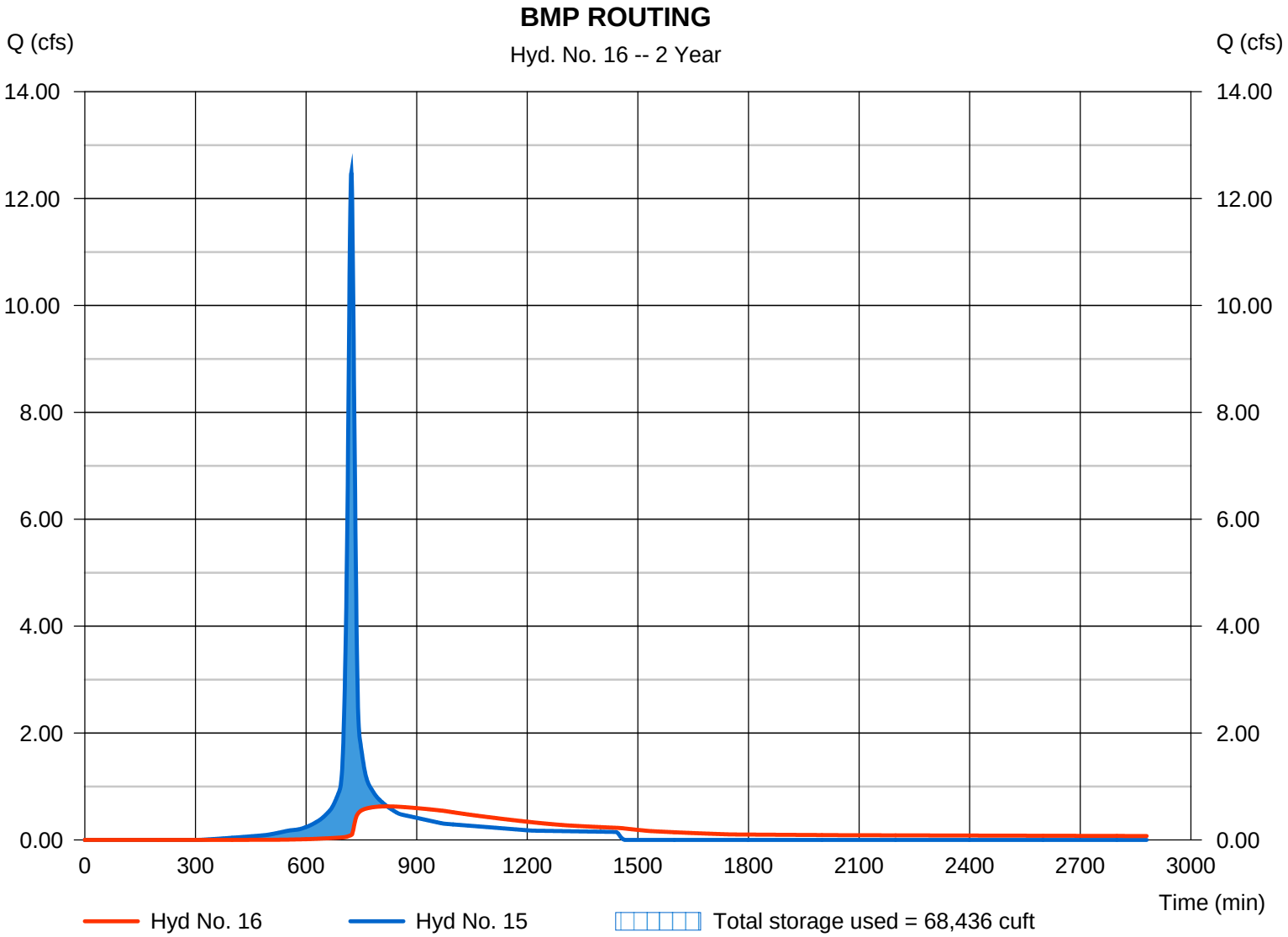
Hydrograph Report

Hyd. No. 16

BMP ROUTING

Hydrograph type	=	Reservoir	Peak discharge	=	0.628 cfs
Storm frequency	=	2 yrs	Time to peak	=	820 min
Time interval	=	1 min	Hyd. volume	=	27,399 cuft
Inflow hyd. No.	=	15 - POST - BMP	Max. Elevation	=	249.89 ft
Reservoir name	=	WET POND	Max. Storage	=	68,436 cuft

Storage Indication method used. Wet pond routing start elevation = 248.50 ft.

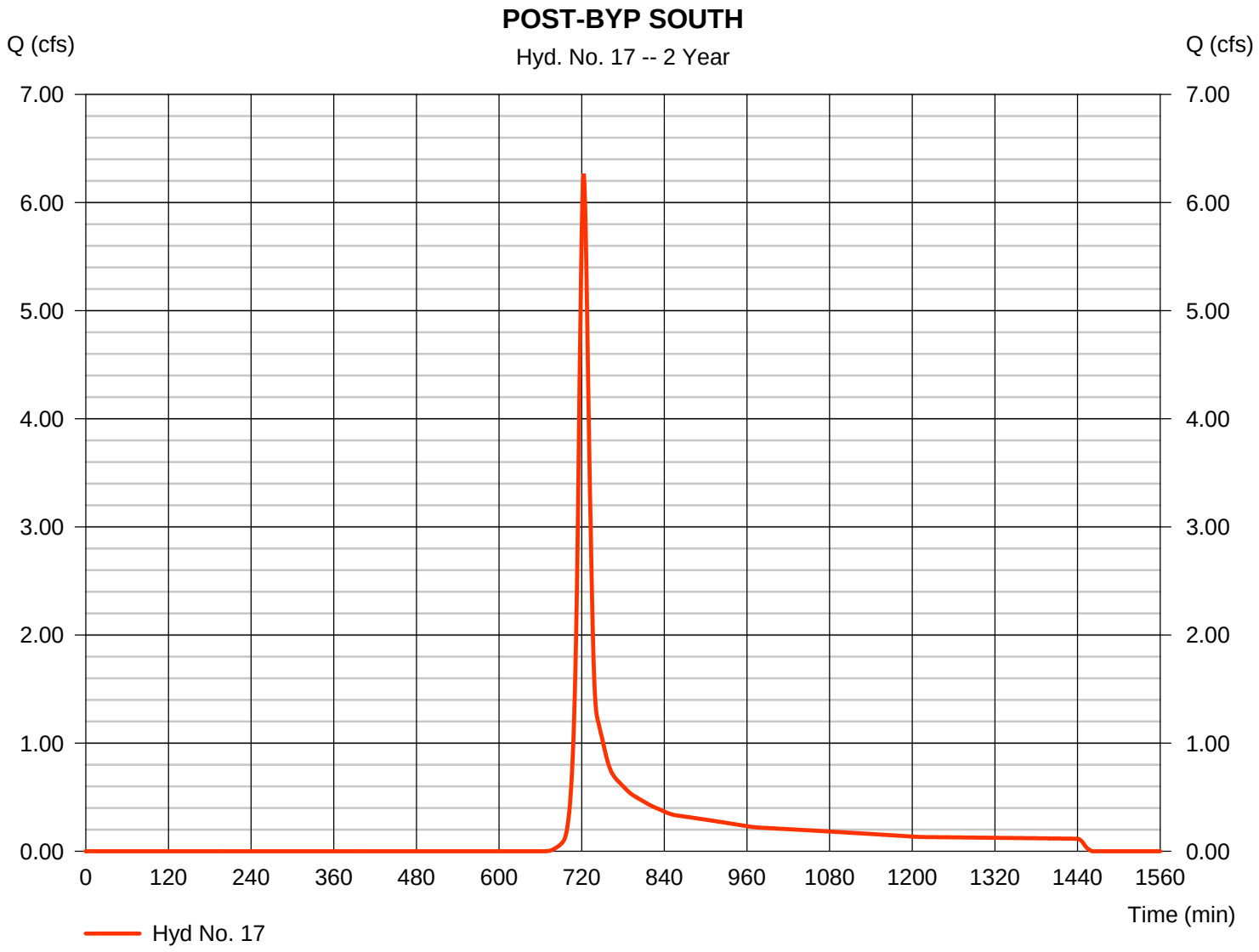


Hydrograph Report

Hyd. No. 17

POST-BYP SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.266 cfs
Storm frequency	=	2 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	17,750 cuft
Drainage area	=	4.650 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.20 min
Total precip.	=	3.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

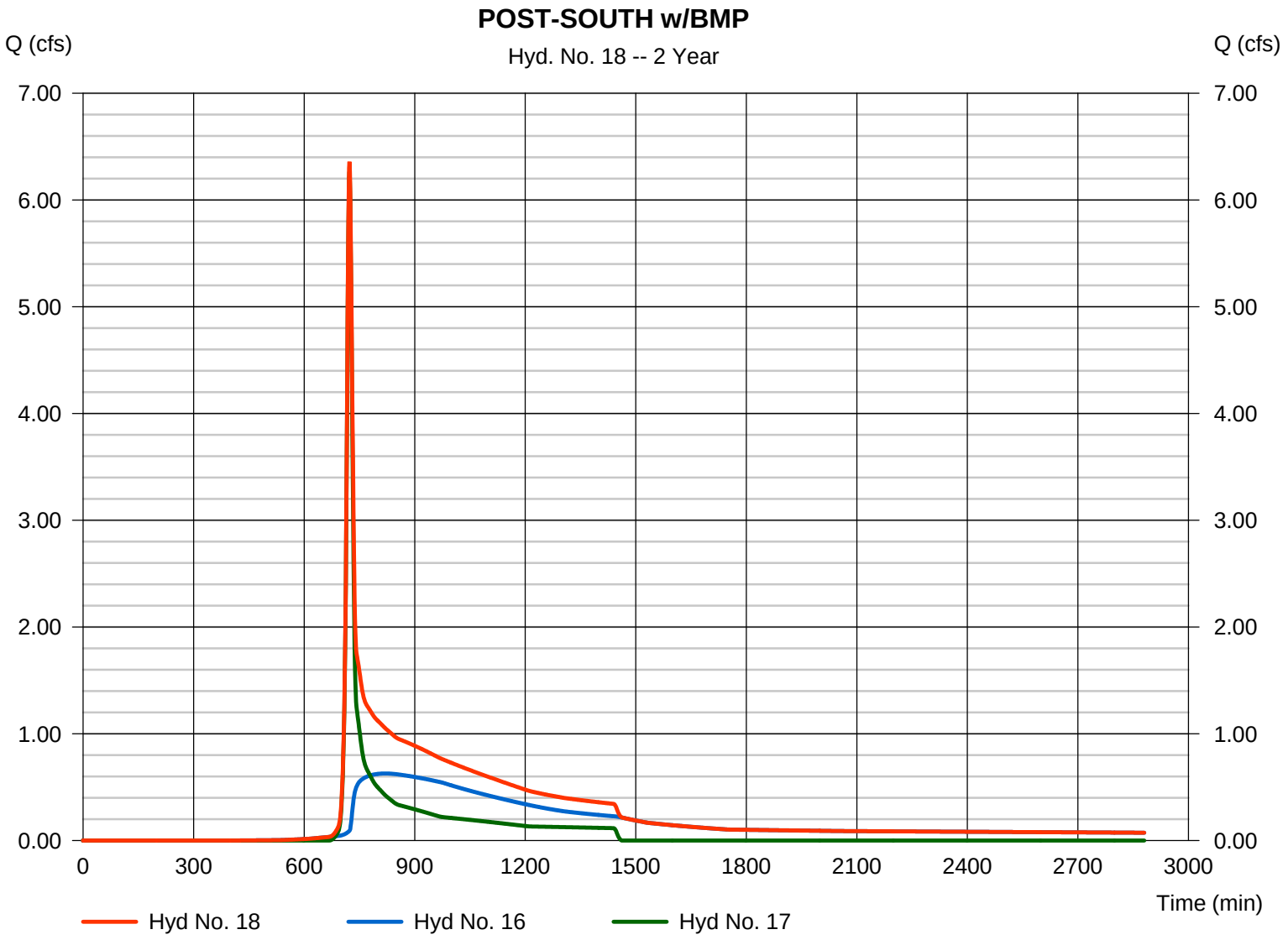


Hydrograph Report

Hyd. No. 18

POST-SOUTH w/BMP

Hydrograph type	= Combine	Peak discharge	= 6.358 cfs
Storm frequency	= 2 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 45,149 cuft
Inflow hyds.	= 16, 17	Contrib. drain. area	= 4.650 ac

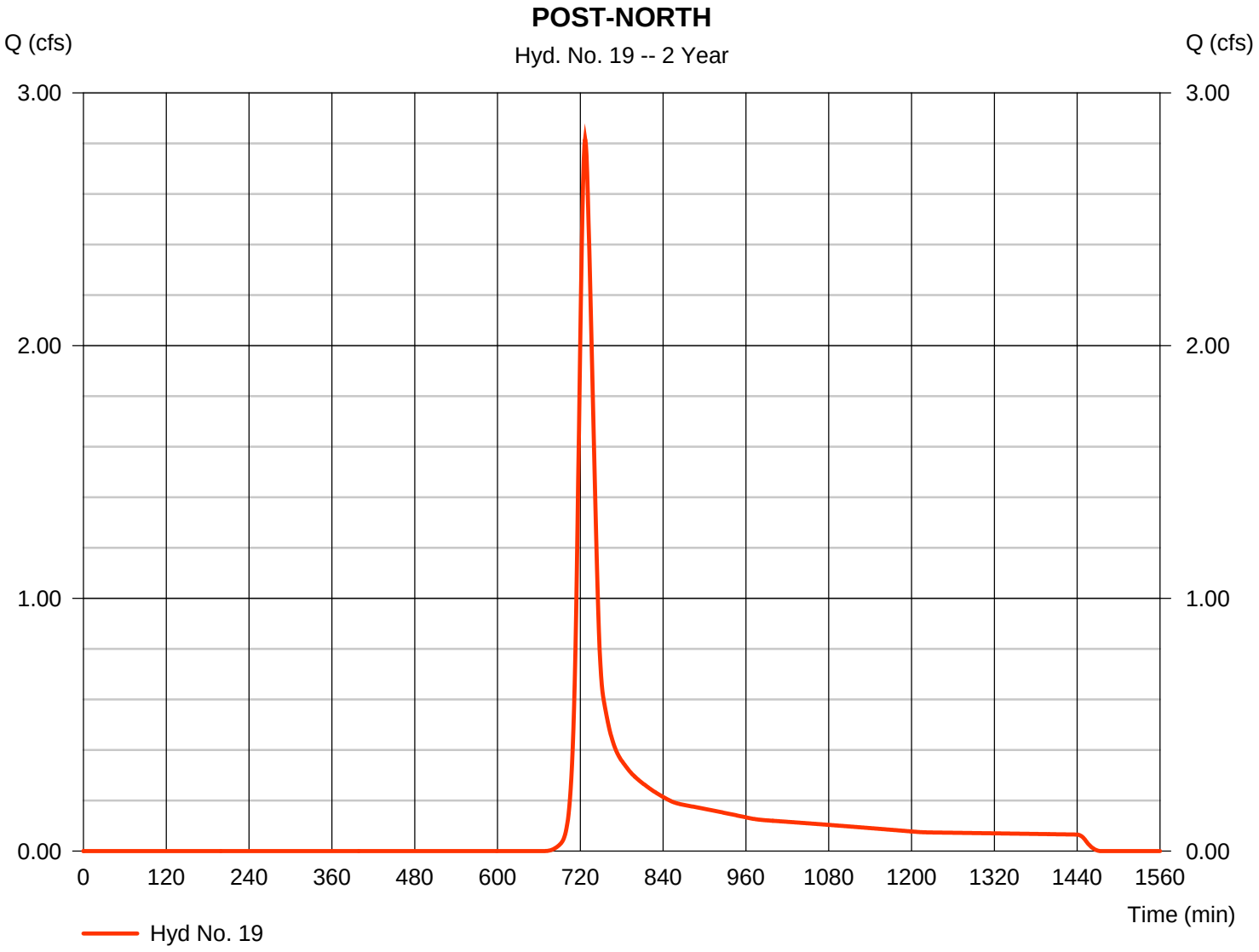


Hydrograph Report

Hyd. No. 19

POST-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.817 cfs
Storm frequency	=	2 yrs	Time to peak	=	727 min
Time interval	=	1 min	Hyd. volume	=	9,982 cuft
Drainage area	=	2.590 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	3.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

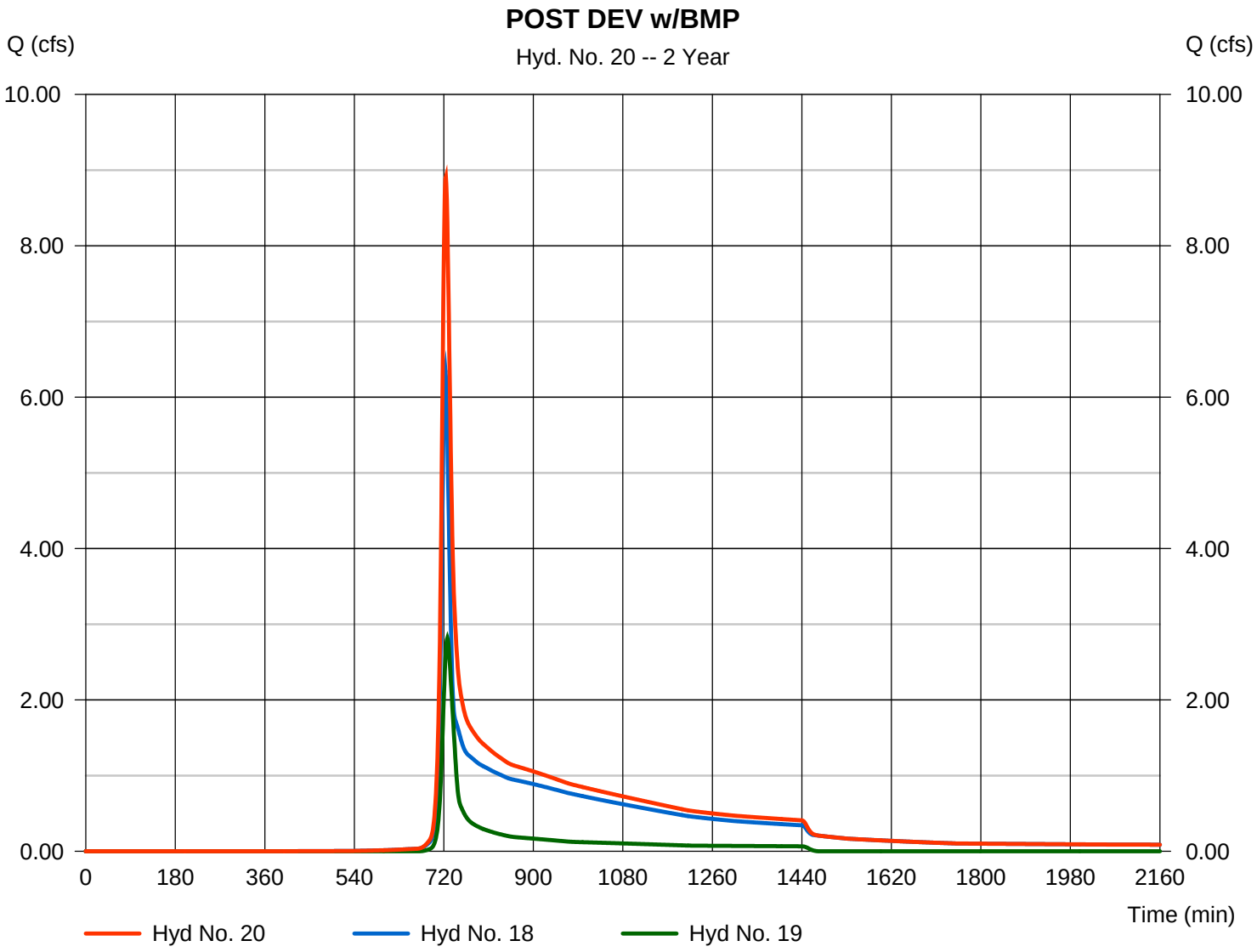


Hydrograph Report

Hyd. No. 20

POST DEV w/BMP

Hydrograph type	= Combine	Peak discharge	= 8.907 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 1 min	Hyd. volume	= 55,131 cuft
Inflow hyds.	= 18, 19	Contrib. drain. area	= 2.590 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	16.90	1	723	46,370	------	------	------	PRE-SOUTH
2	SCS Runoff	6.302	1	727	21,379	------	------	------	PRE-NORTH
3	Combine	22.70	1	723	67,749	1, 2	------	------	TOTAL PREDEV
5	SCS Runoff	16.50	1	723	48,634	------	------	------	POST - BMP
6	SCS Runoff	10.17	1	723	27,894	------	------	------	POST-BYP SOUTH
7	Combine	26.67	1	723	76,528	5, 6	------	------	POST-SOUTH
8	SCS Runoff	4.624	1	727	15,686	------	------	------	POST-NORTH
9	Combine	30.92	1	723	92,215	7, 8	------	------	POST-NO BMP
15	SCS Runoff	16.50	1	723	48,634	------	------	------	POST - BMP
16	Reservoir	1.530	1	763	39,376	15	250.24	74,855	BMP ROUTING
17	SCS Runoff	10.17	1	723	27,894	------	------	------	POST-BYP SOUTH
18	Combine	10.49	1	723	67,270	16, 17	------	------	POST-SOUTH w/BMP
19	SCS Runoff	4.624	1	727	15,686	------	------	------	POST-NORTH
20	Combine	14.76	1	724	82,956	18, 19	------	------	POST DEV w/BMP

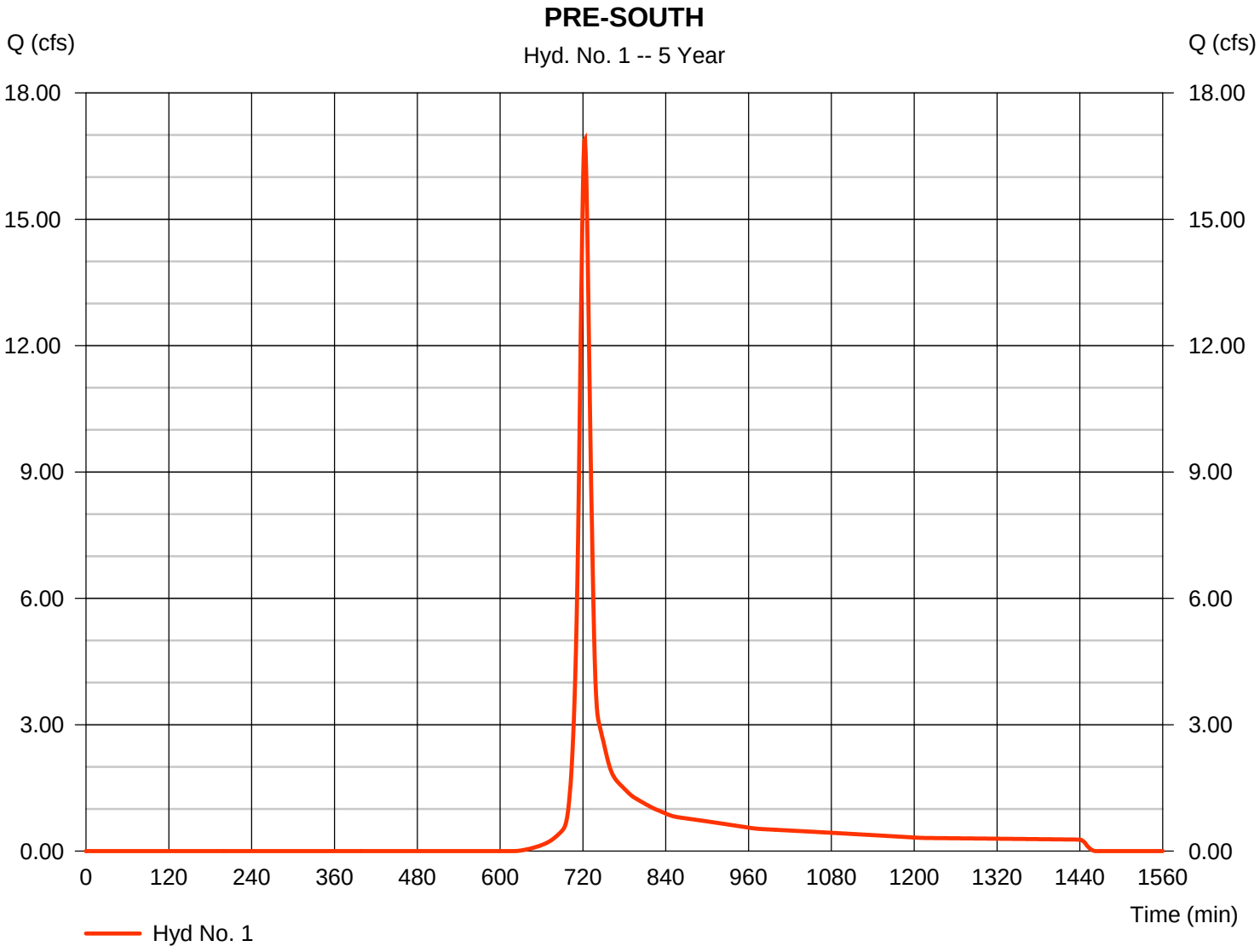
Hydrograph Report

Hyd. No. 1

PRE-SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.90 cfs
Storm frequency	=	5 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	46,370 cuft
Drainage area	=	7.730 ac	Curve number	=	70*
Basin Slope	=	4.3 %	Hydraulic length	=	648 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	4.47 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.100 x 98) + (0.230 x 74) + (7.400 x 70)] / 7.730

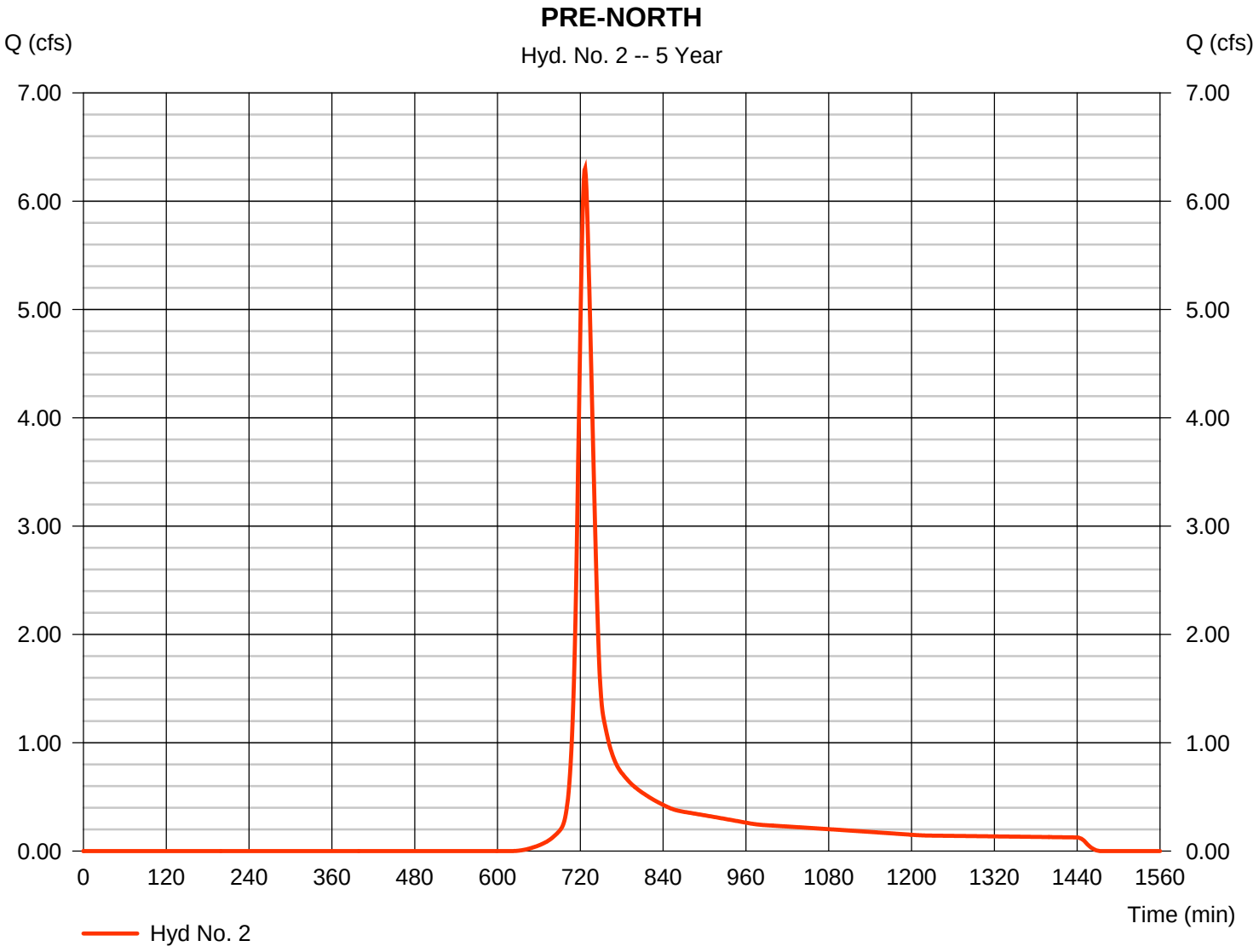


Hydrograph Report

Hyd. No. 2

PRE-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.302 cfs
Storm frequency	=	5 yrs	Time to peak	=	727 min
Time interval	=	1 min	Hyd. volume	=	21,379 cuft
Drainage area	=	3.530 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	4.47 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

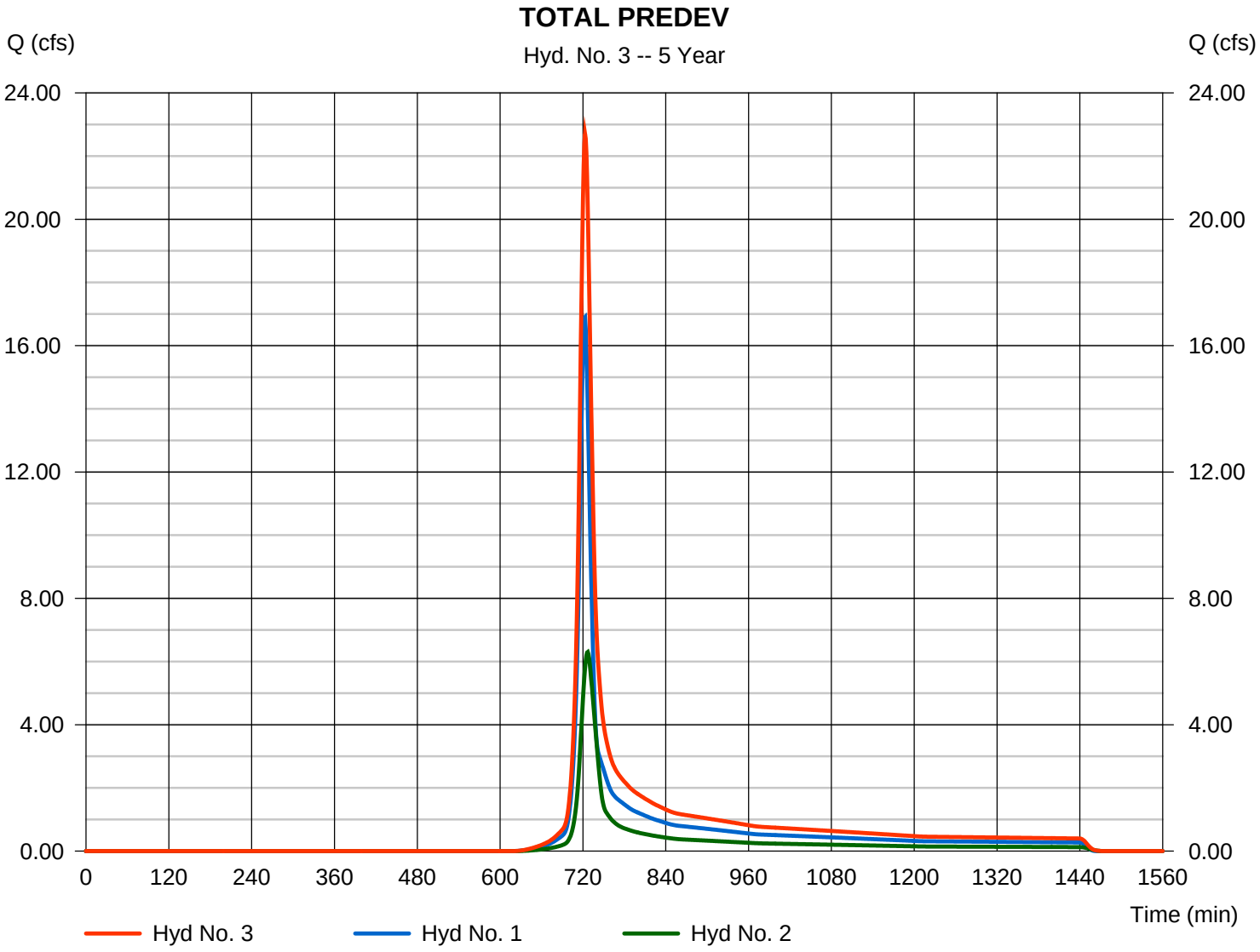


Hydrograph Report

Hyd. No. 3

TOTAL PREDEV

Hydrograph type	= Combine	Peak discharge	= 22.70 cfs
Storm frequency	= 5 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 67,749 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 11.260 ac



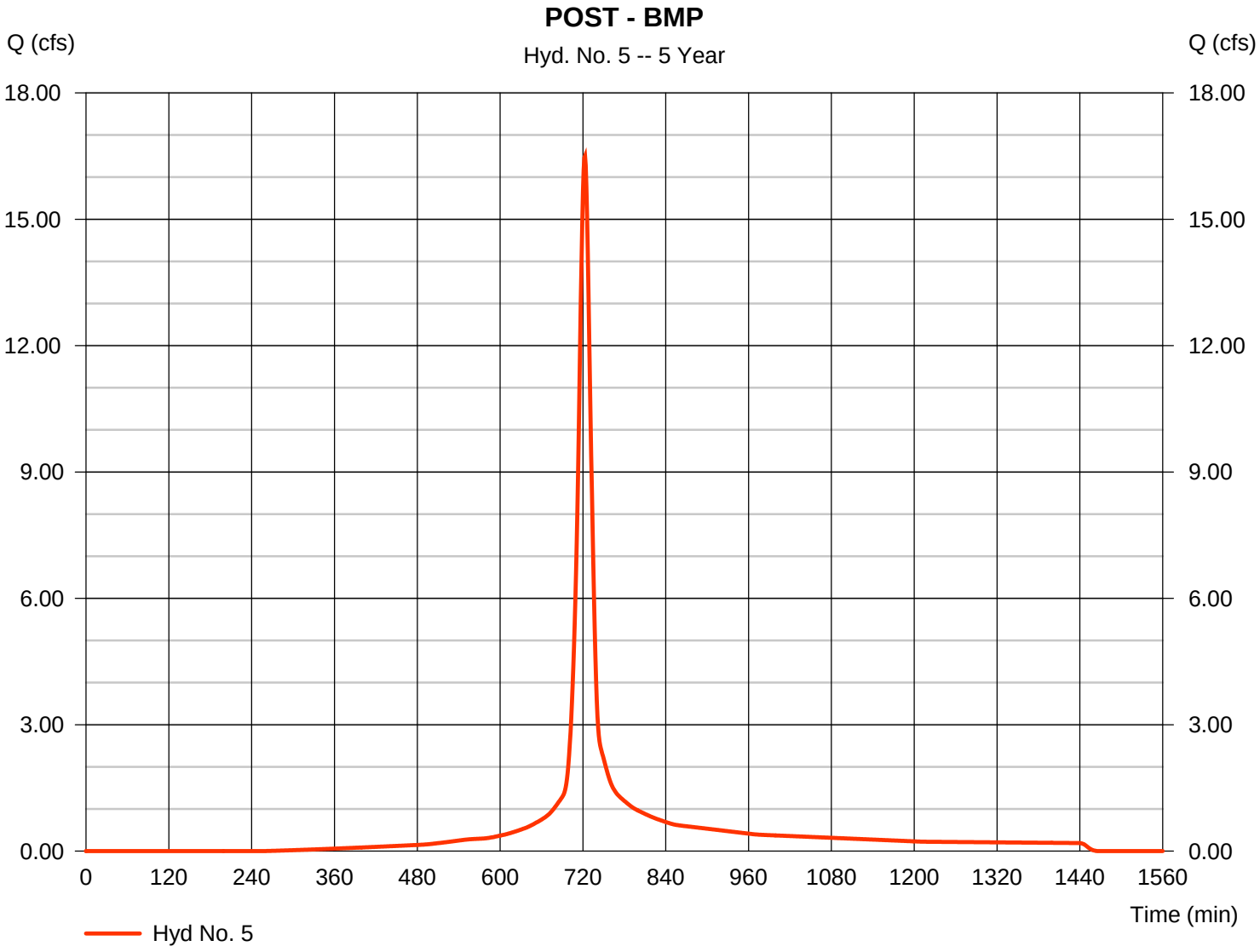
Hydrograph Report

Hyd. No. 5

POST - BMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.50 cfs
Storm frequency	=	5 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	48,634 cuft
Drainage area	=	3.930 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.00 min
Total precip.	=	4.47 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.680 x 98) + (1.250 x 74)] / 3.930

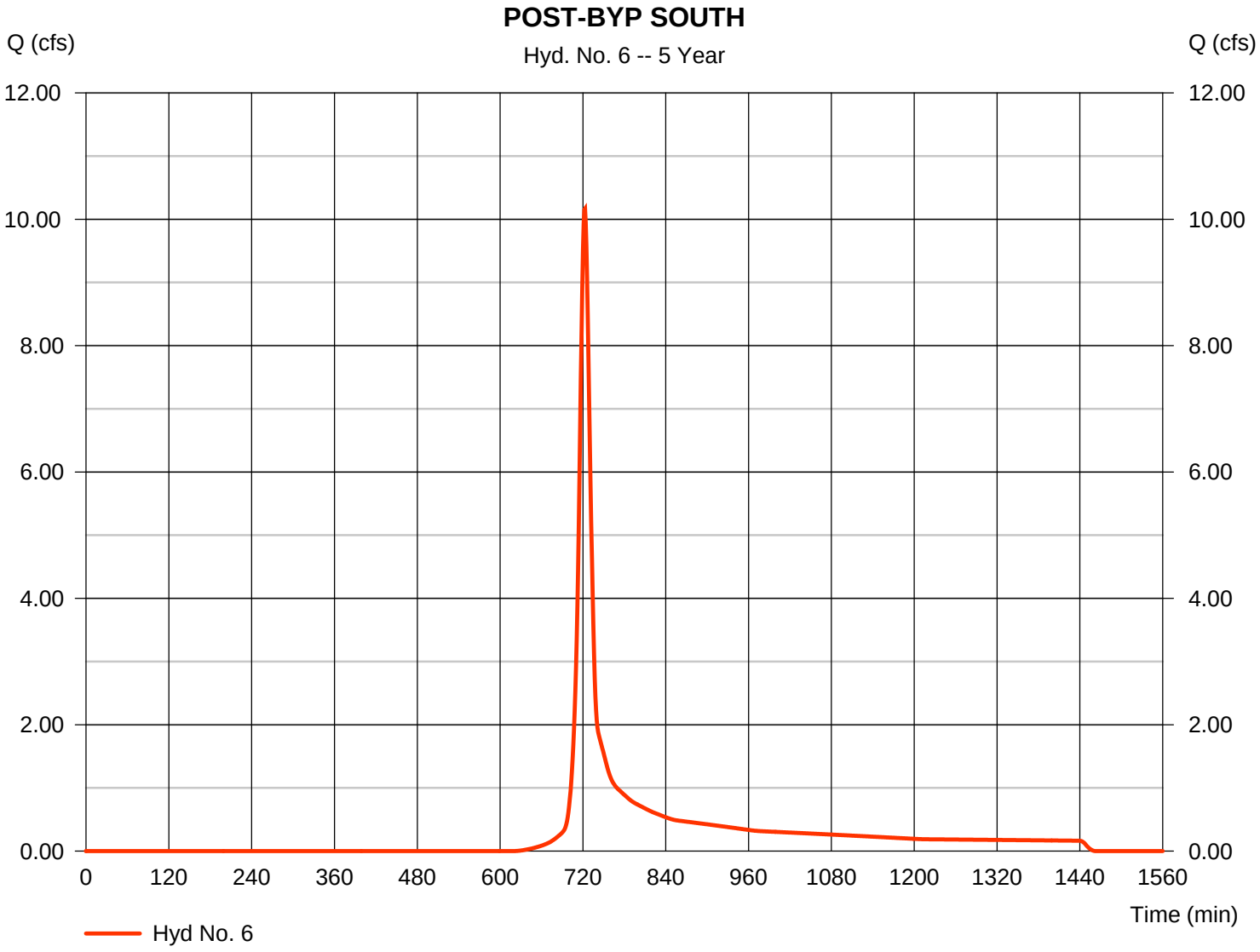


Hydrograph Report

Hyd. No. 6

POST-BYP SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.17 cfs
Storm frequency	=	5 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	27,894 cuft
Drainage area	=	4.650 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.30 min
Total precip.	=	4.47 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

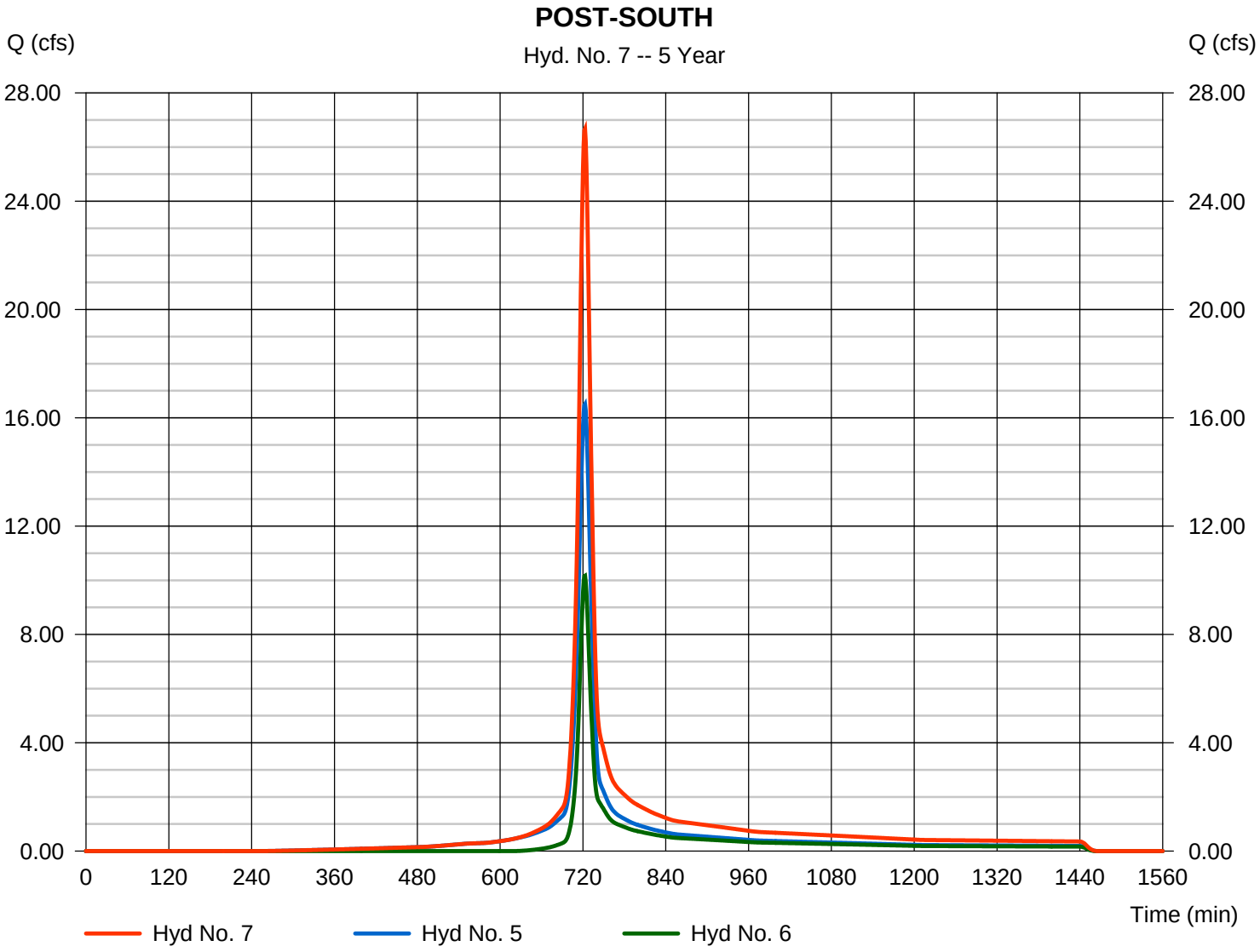


Hydrograph Report

Hyd. No. 7

POST-SOUTH

Hydrograph type	= Combine	Peak discharge	= 26.67 cfs
Storm frequency	= 5 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 76,528 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 8.580 ac

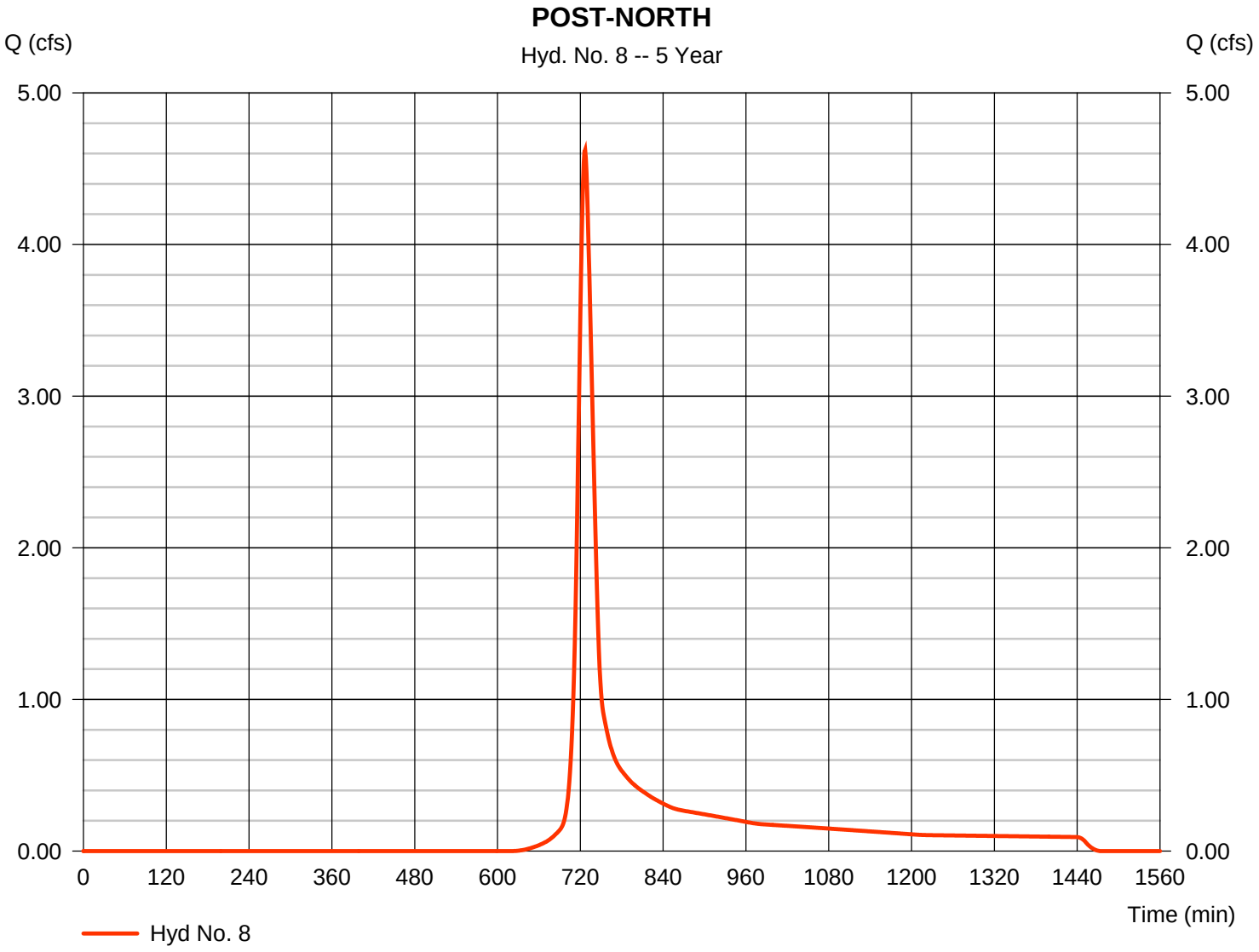


Hydrograph Report

Hyd. No. 8

POST-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.624 cfs
Storm frequency	=	5 yrs	Time to peak	=	727 min
Time interval	=	1 min	Hyd. volume	=	15,686 cuft
Drainage area	=	2.590 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	4.47 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

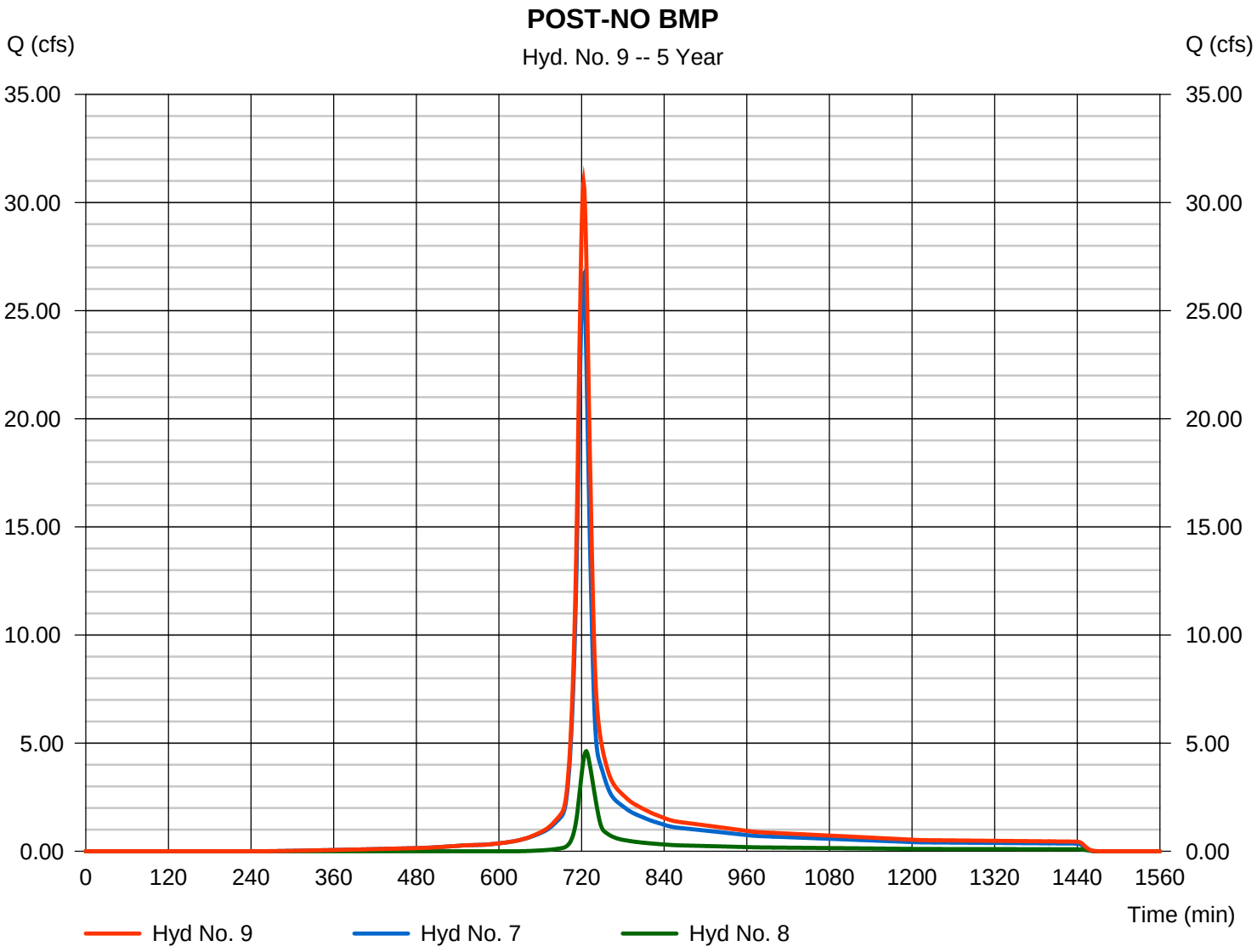


Hydrograph Report

Hyd. No. 9

POST-NO BMP

Hydrograph type	= Combine	Peak discharge	= 30.92 cfs
Storm frequency	= 5 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 92,215 cuft
Inflow hyds.	= 7, 8	Contrib. drain. area	= 2.590 ac



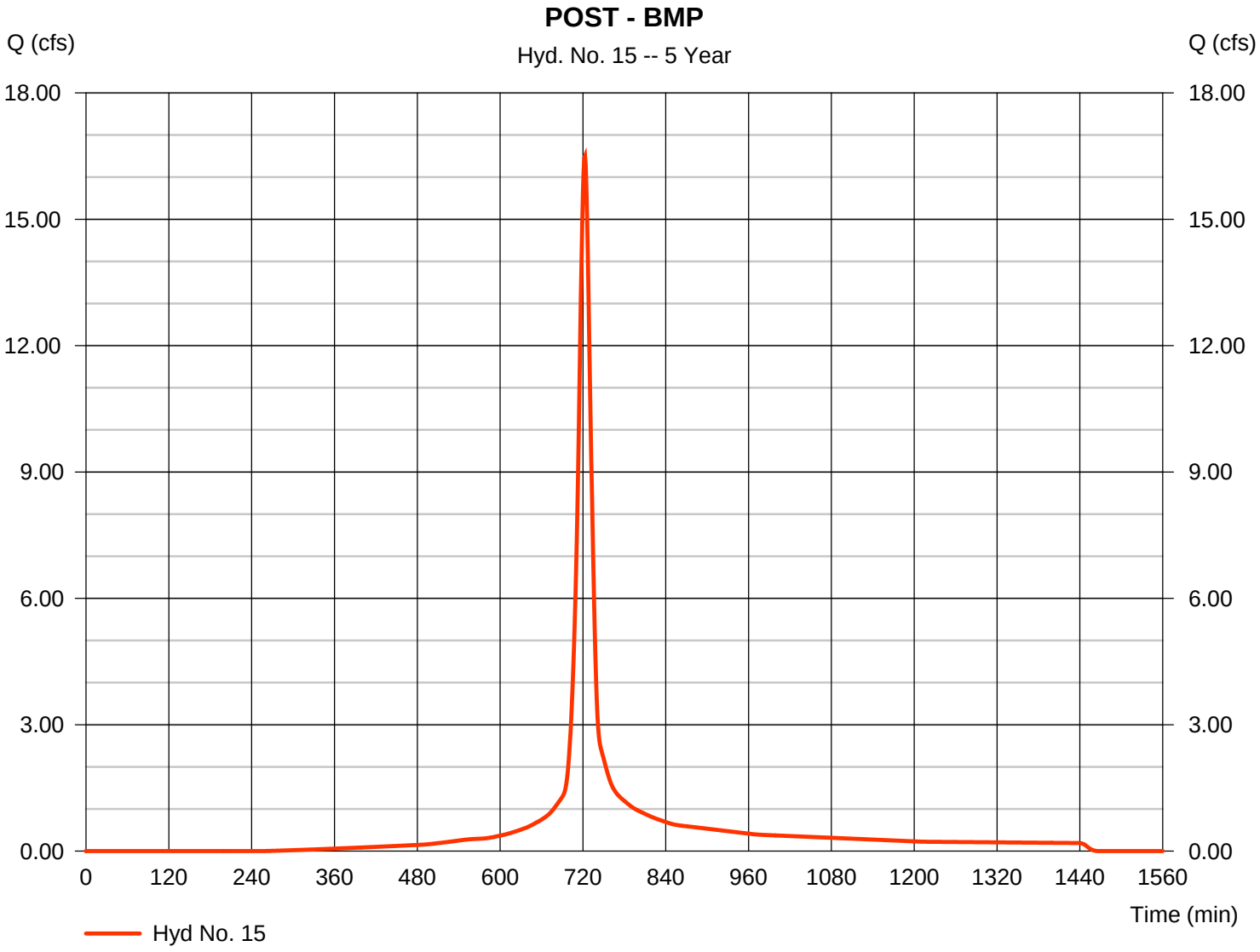
Hydrograph Report

Hyd. No. 15

POST - BMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.50 cfs
Storm frequency	=	5 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	48,634 cuft
Drainage area	=	3.930 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.00 min
Total precip.	=	4.47 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.680 x 98) + (1.250 x 74)] / 3.930



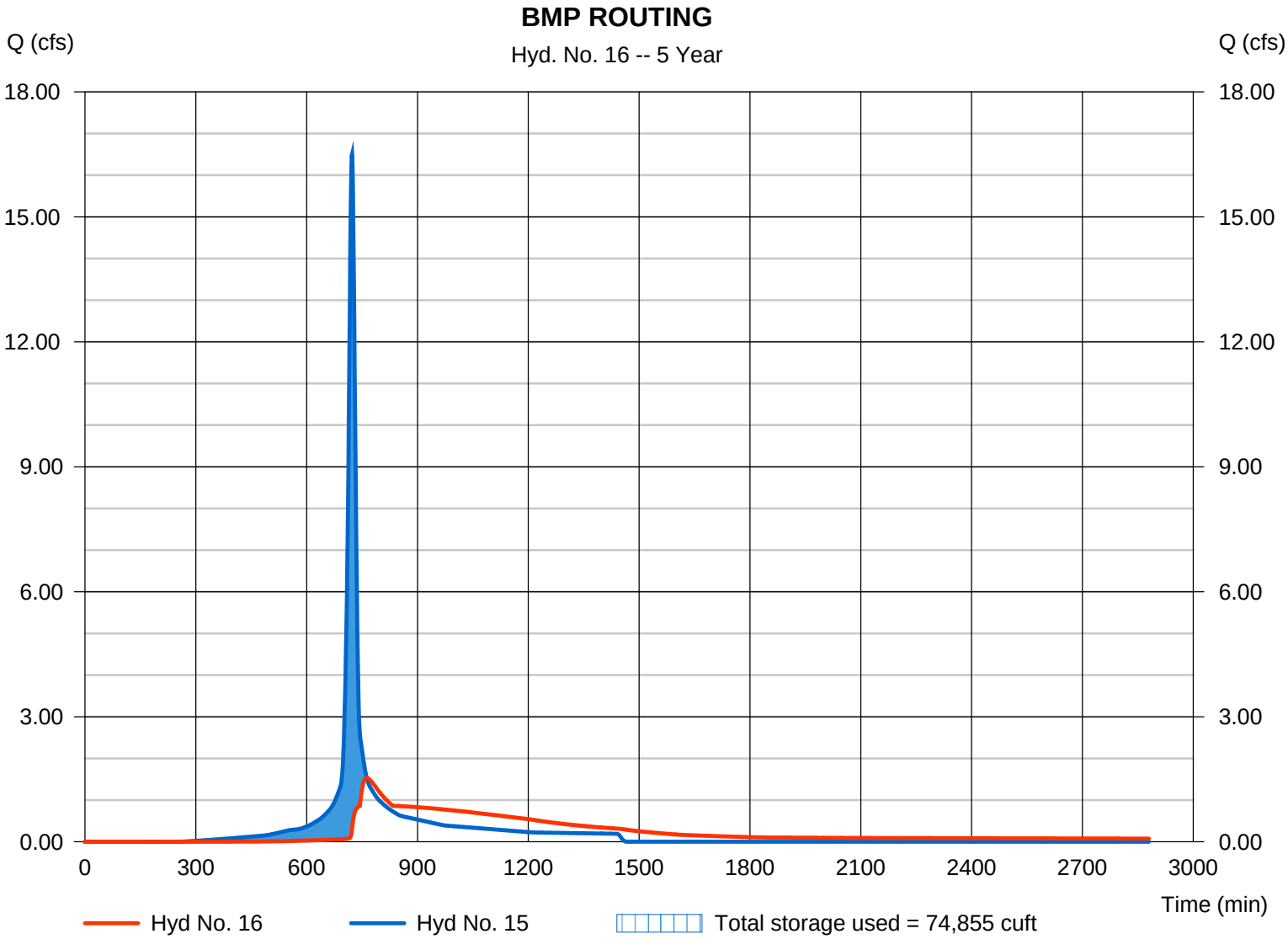
Hydrograph Report

Hyd. No. 16

BMP ROUTING

Hydrograph type	= Reservoir	Peak discharge	= 1.530 cfs
Storm frequency	= 5 yrs	Time to peak	= 763 min
Time interval	= 1 min	Hyd. volume	= 39,376 cuft
Inflow hyd. No.	= 15 - POST - BMP	Max. Elevation	= 250.24 ft
Reservoir name	= WET POND	Max. Storage	= 74,855 cuft

Storage Indication method used. Wet pond routing start elevation = 248.50 ft.

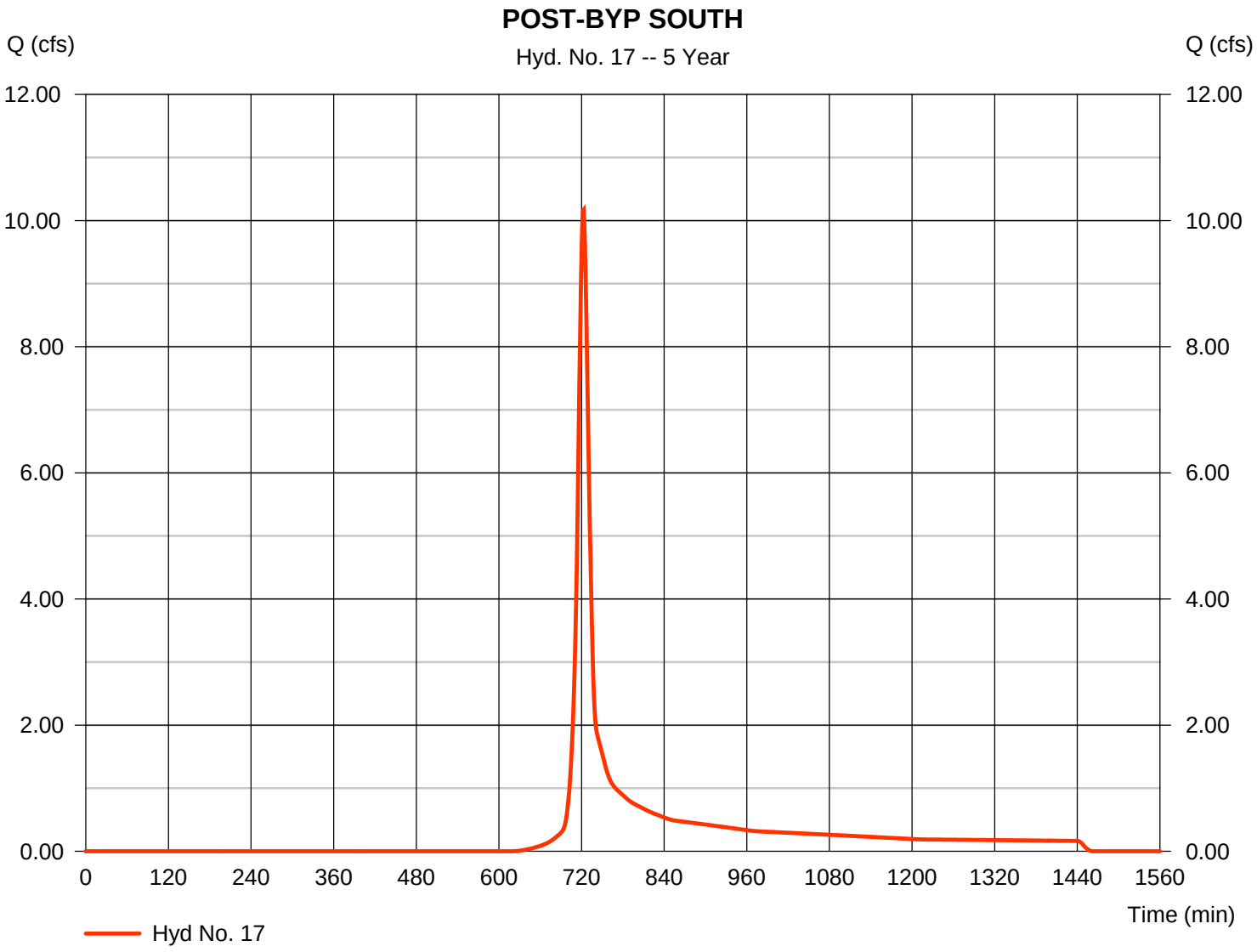


Hydrograph Report

Hyd. No. 17

POST-BYP SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.17 cfs
Storm frequency	=	5 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	27,894 cuft
Drainage area	=	4.650 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.20 min
Total precip.	=	4.47 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

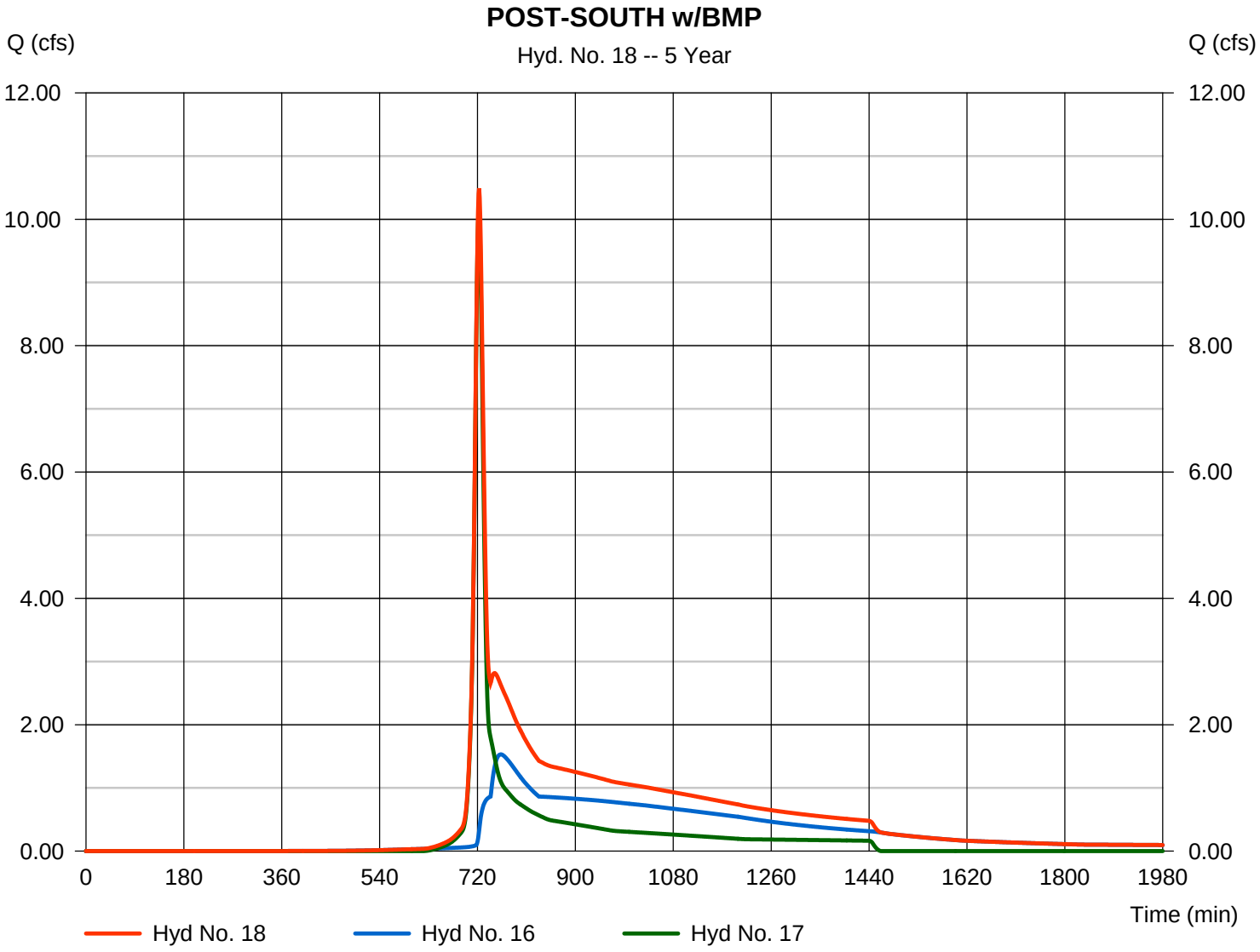


Hydrograph Report

Hyd. No. 18

POST-SOUTH w/BMP

Hydrograph type	= Combine	Peak discharge	= 10.49 cfs
Storm frequency	= 5 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 67,270 cuft
Inflow hyds.	= 16, 17	Contrib. drain. area	= 4.650 ac

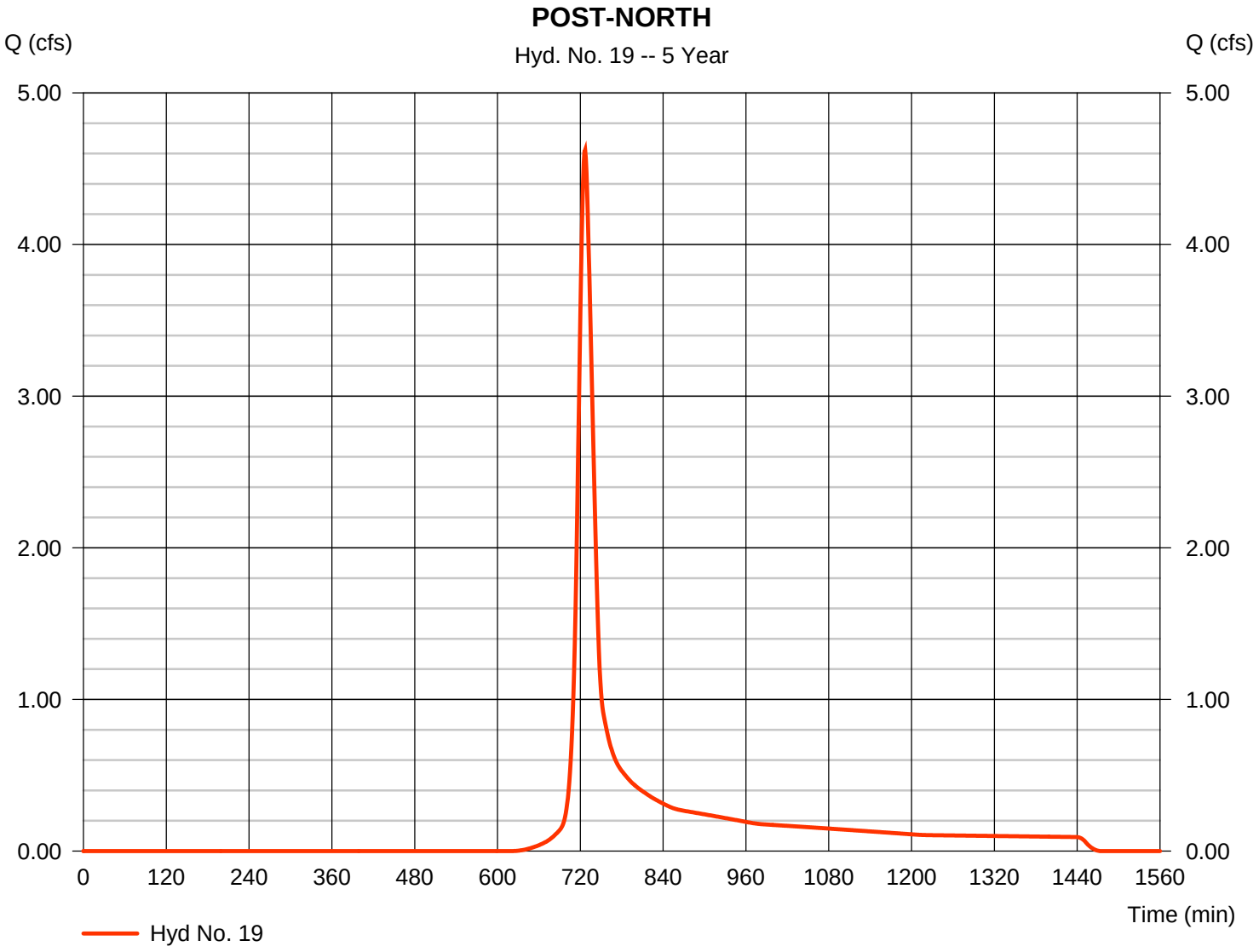


Hydrograph Report

Hyd. No. 19

POST-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.624 cfs
Storm frequency	=	5 yrs	Time to peak	=	727 min
Time interval	=	1 min	Hyd. volume	=	15,686 cuft
Drainage area	=	2.590 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	4.47 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

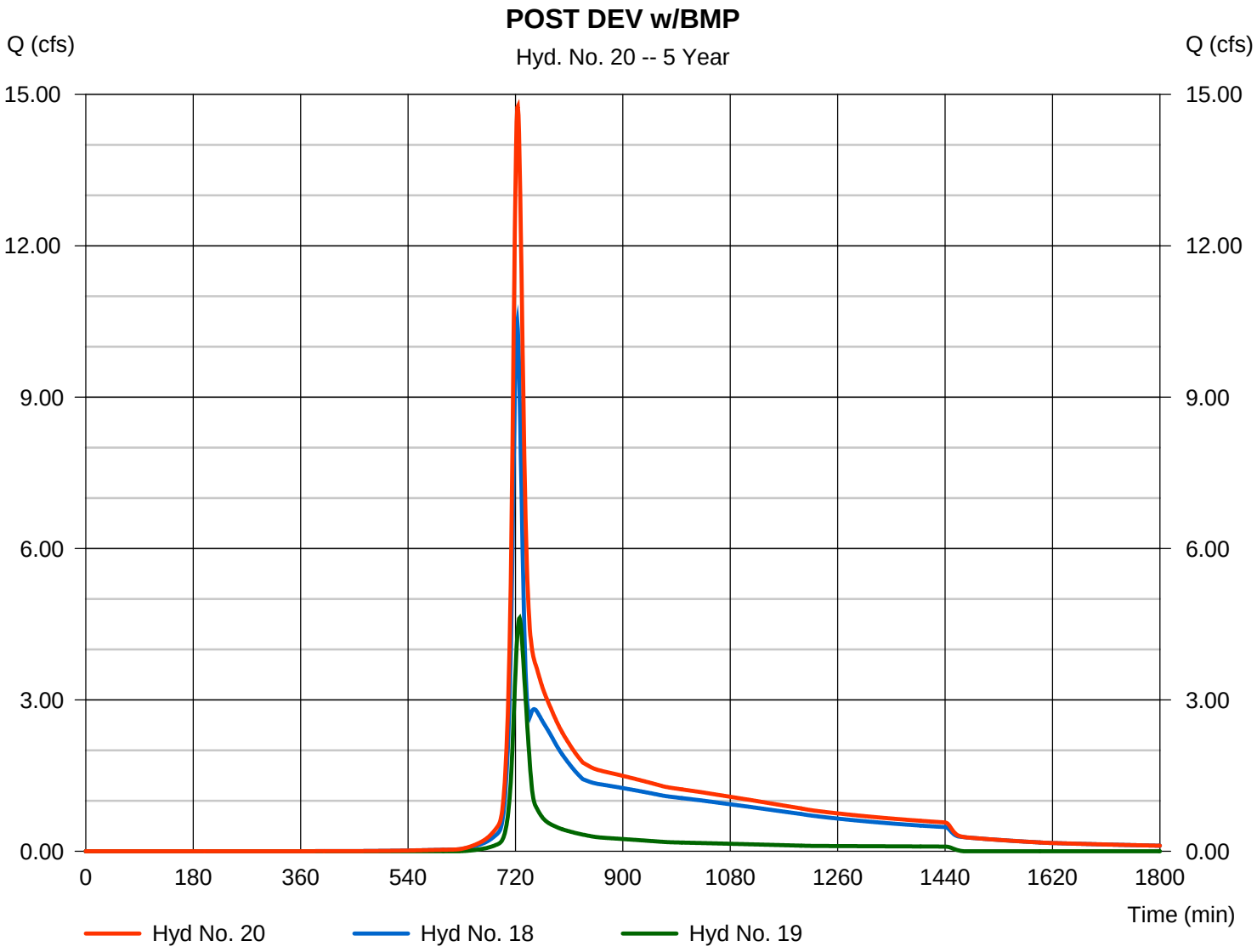


Hydrograph Report

Hyd. No. 20

POST DEV w/BMP

Hydrograph type	= Combine	Peak discharge	= 14.76 cfs
Storm frequency	= 5 yrs	Time to peak	= 724 min
Time interval	= 1 min	Hyd. volume	= 82,956 cuft
Inflow hyds.	= 18, 19	Contrib. drain. area	= 2.590 ac



Hydrograph Summary Report

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

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	22.46	1	722	60,911	------	------	------	PRE-SOUTH
2	SCS Runoff	8.402	1	727	28,083	------	------	------	PRE-NORTH
3	Combine	30.24	1	723	88,994	1, 2	------	------	TOTAL PREDEV
5	SCS Runoff	19.66	1	723	58,500	------	------	------	POST - BMP
6	SCS Runoff	13.51	1	722	36,641	------	------	------	POST-BYP SOUTH
7	Combine	33.15	1	723	95,142	5, 6	------	------	POST-SOUTH
8	SCS Runoff	6.165	1	727	20,605	------	------	------	POST-NORTH
9	Combine	38.88	1	723	115,747	7, 8	------	------	POST-NO BMP
15	SCS Runoff	19.66	1	723	58,500	------	------	------	POST - BMP
16	Reservoir	5.191	1	738	49,107	15	250.39	77,684	BMP ROUTING
17	SCS Runoff	13.51	1	722	36,641	------	------	------	POST-BYP SOUTH
18	Combine	14.11	1	723	85,748	16, 17	------	------	POST-SOUTH w/BMP
19	SCS Runoff	6.165	1	727	20,605	------	------	------	POST-NORTH
20	Combine	19.85	1	723	106,353	18, 19	------	------	POST DEV w/BMP

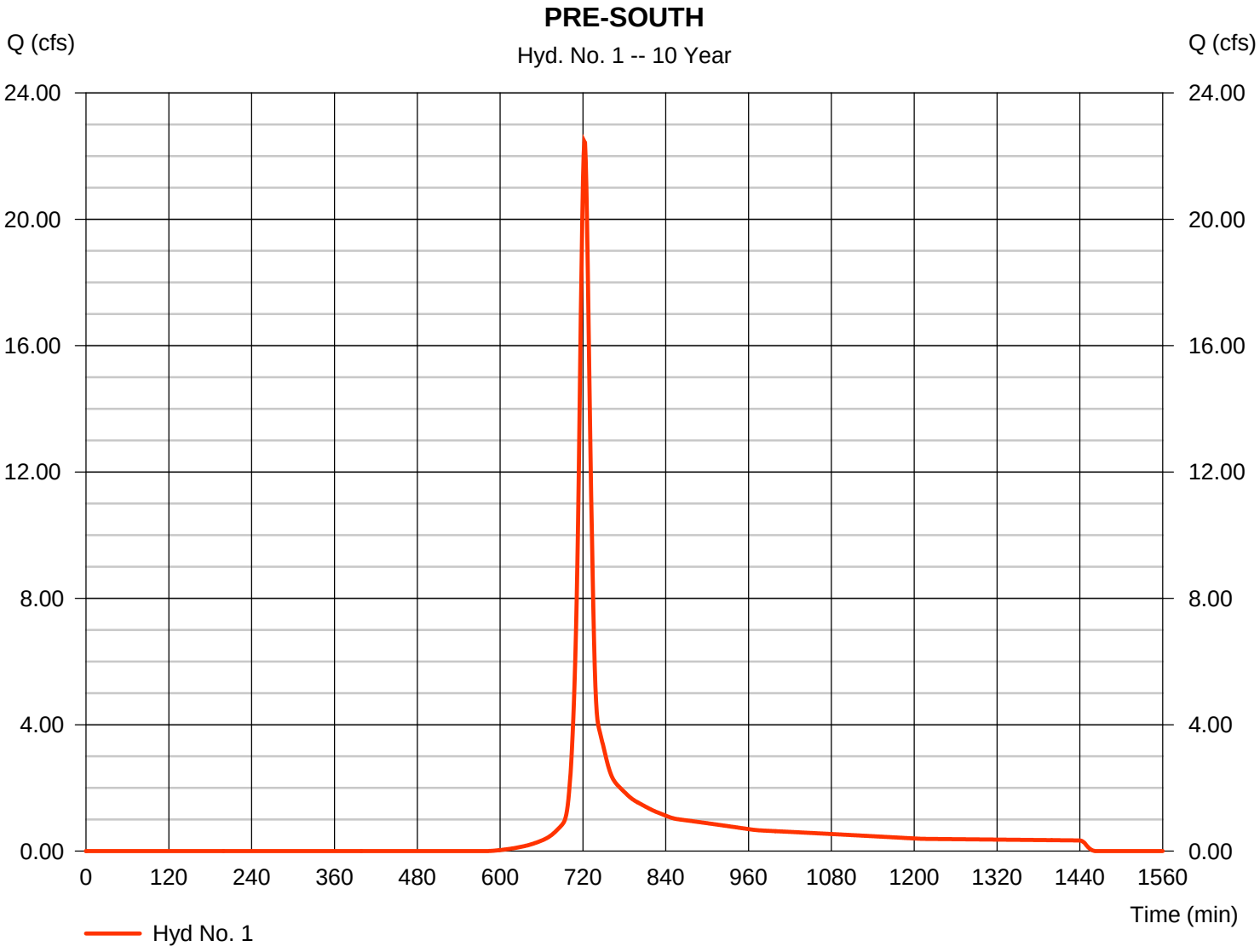
Hydrograph Report

Hyd. No. 1

PRE-SOUTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	22.46 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	1 min	Hyd. volume	=	60,911 cuft
Drainage area	=	7.730 ac	Curve number	=	70*
Basin Slope	=	4.3 %	Hydraulic length	=	648 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.80 min
Total precip.	=	5.18 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.100 x 98) + (0.230 x 74) + (7.400 x 70)] / 7.730

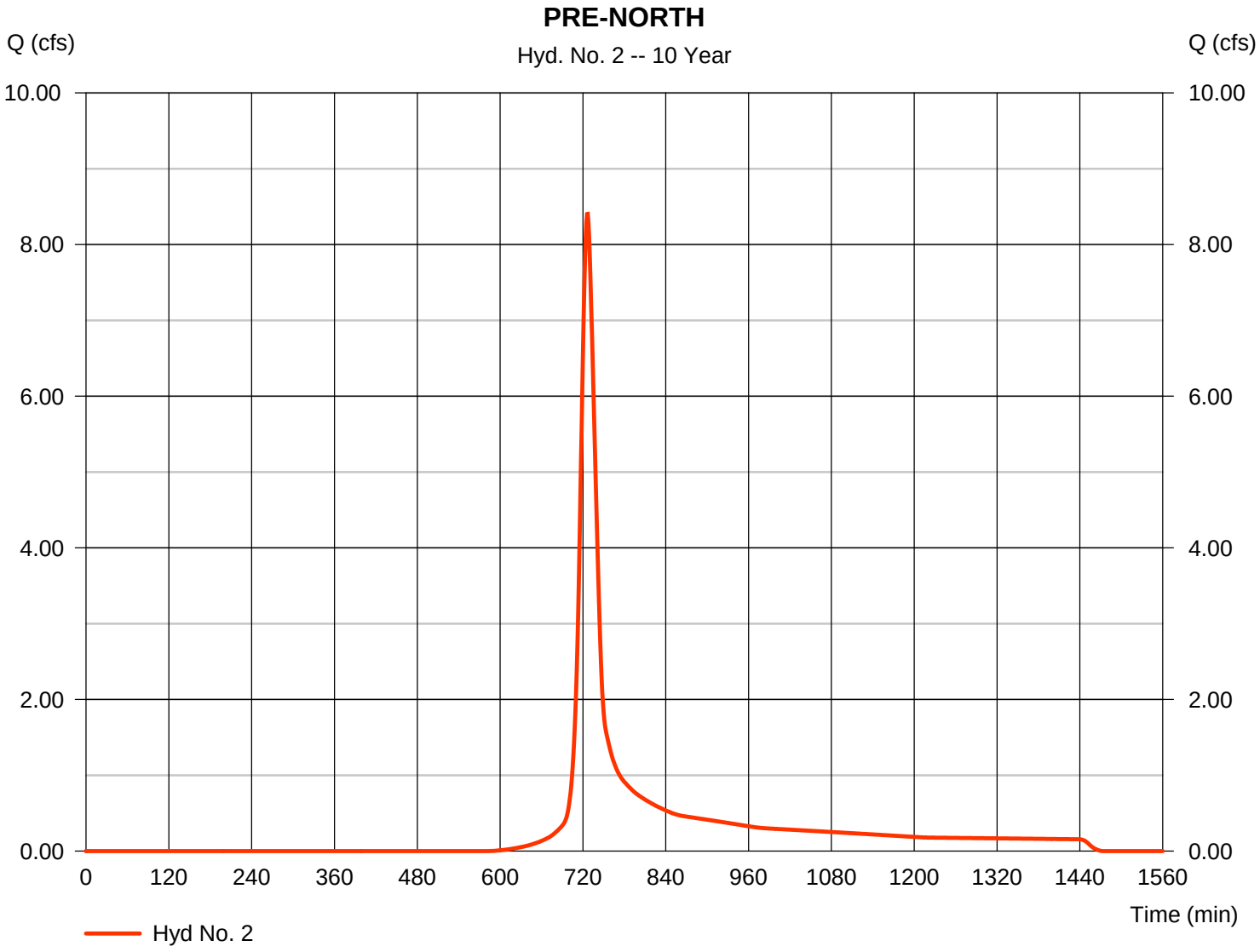


Hydrograph Report

Hyd. No. 2

PRE-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.402 cfs
Storm frequency	=	10 yrs	Time to peak	=	727 min
Time interval	=	1 min	Hyd. volume	=	28,083 cuft
Drainage area	=	3.530 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	5.18 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

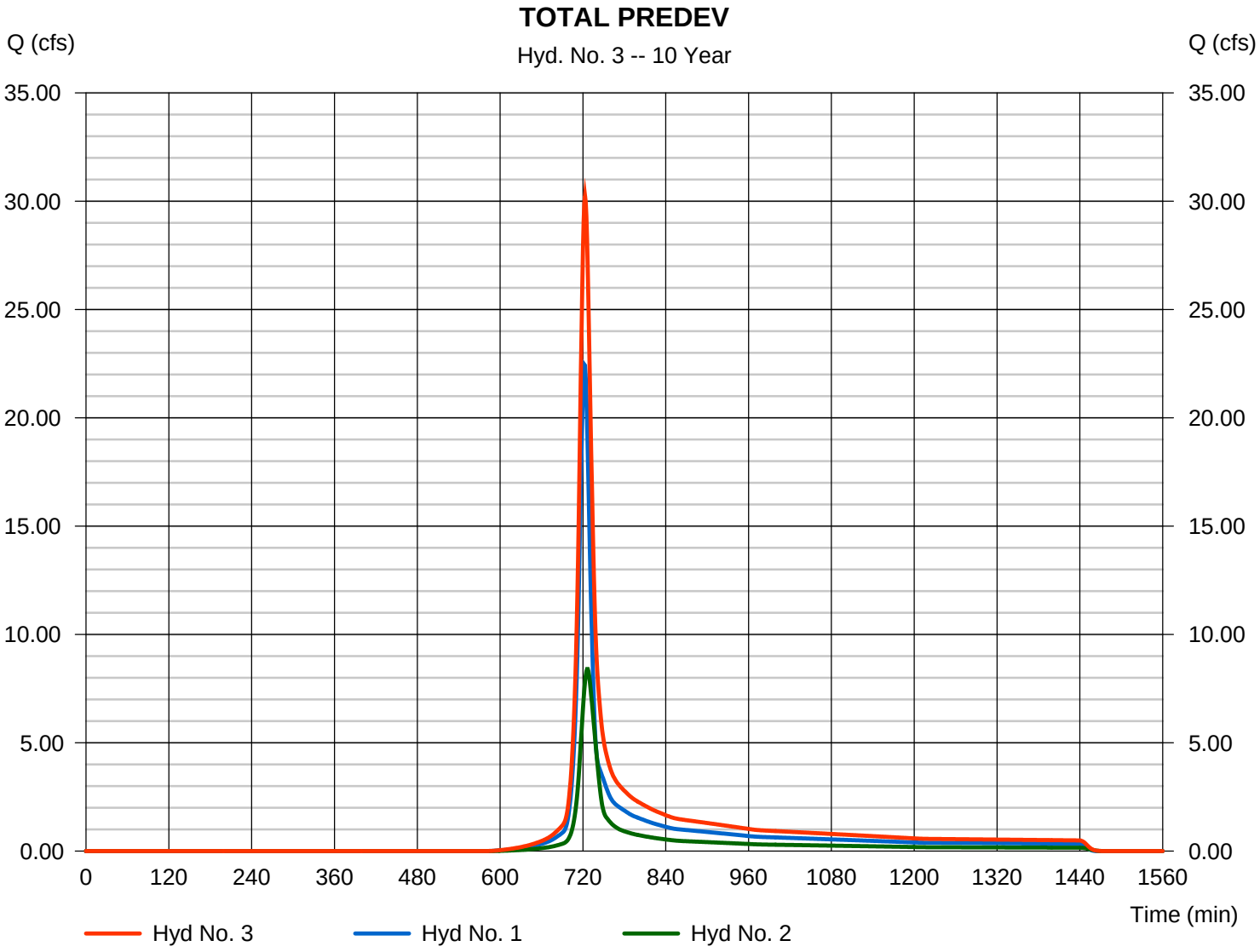


Hydrograph Report

Hyd. No. 3

TOTAL PREDEV

Hydrograph type	= Combine	Peak discharge	= 30.24 cfs
Storm frequency	= 10 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 88,994 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 11.260 ac



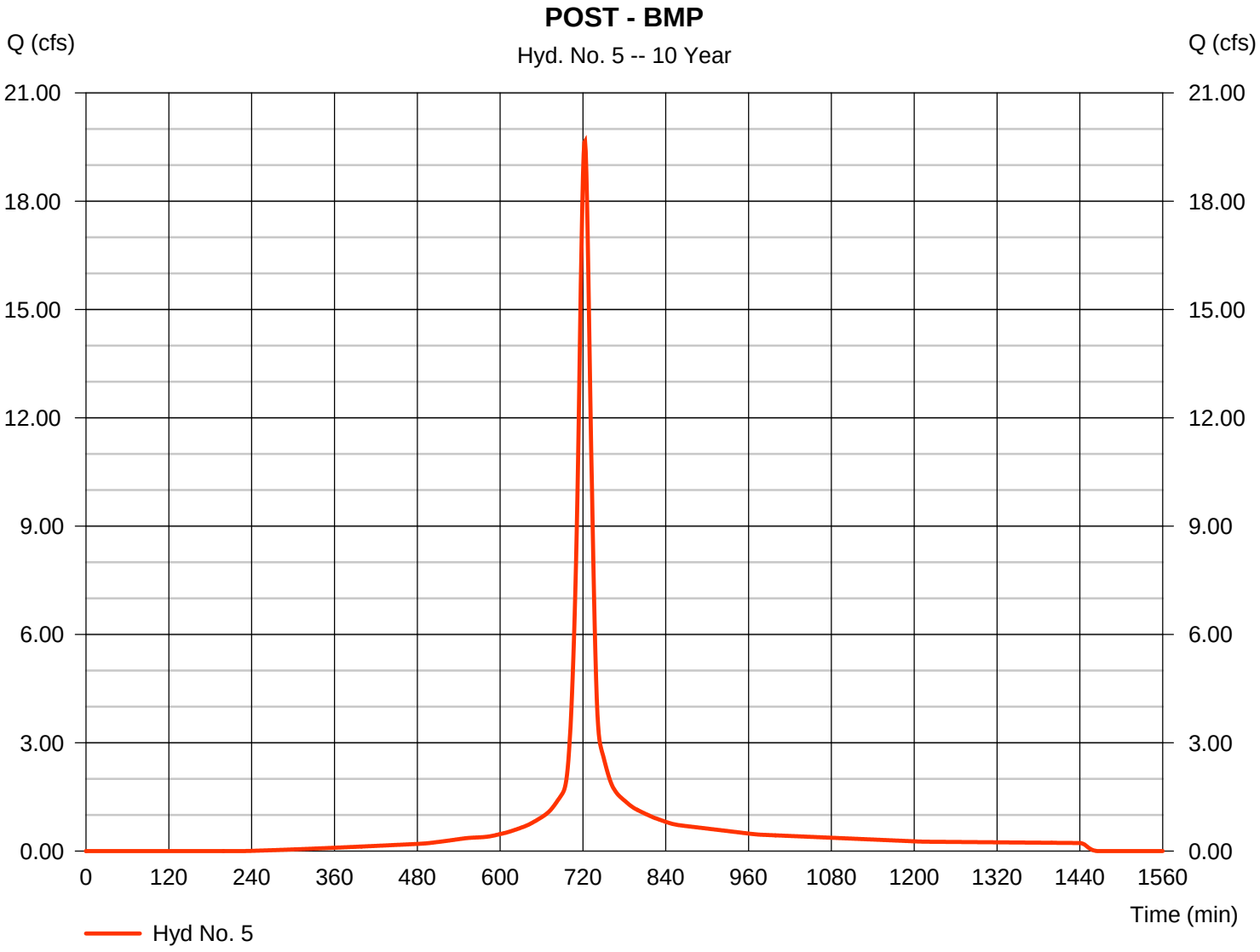
Hydrograph Report

Hyd. No. 5

POST - BMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.66 cfs
Storm frequency	=	10 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	58,500 cuft
Drainage area	=	3.930 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.00 min
Total precip.	=	5.18 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.680 x 98) + (1.250 x 74)] / 3.930

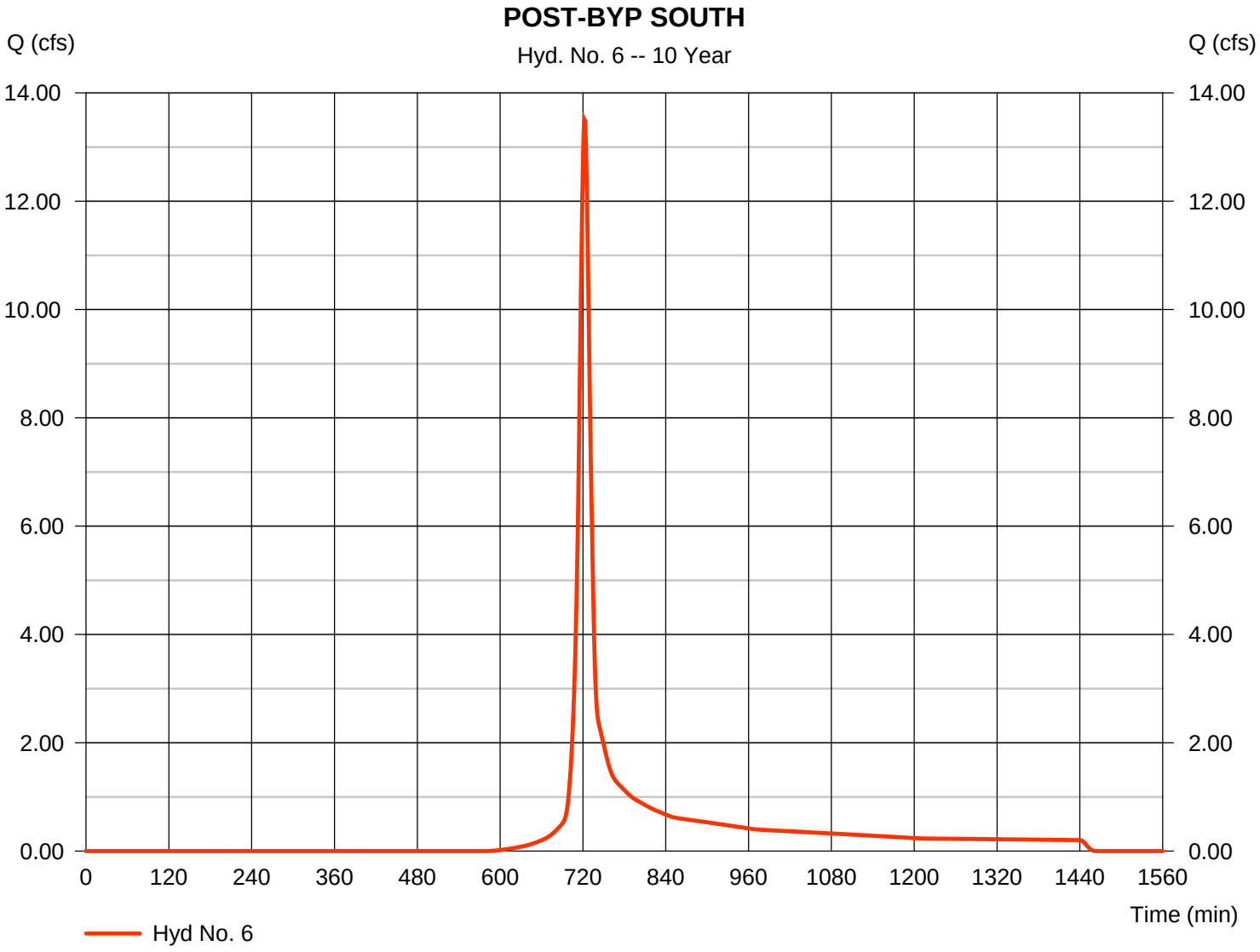


Hydrograph Report

Hyd. No. 6

POST-BYP SOUTH

Hydrograph type	= SCS Runoff	Peak discharge	= 13.51 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 1 min	Hyd. volume	= 36,641 cuft
Drainage area	= 4.650 ac	Curve number	= 70
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.30 min
Total precip.	= 5.18 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

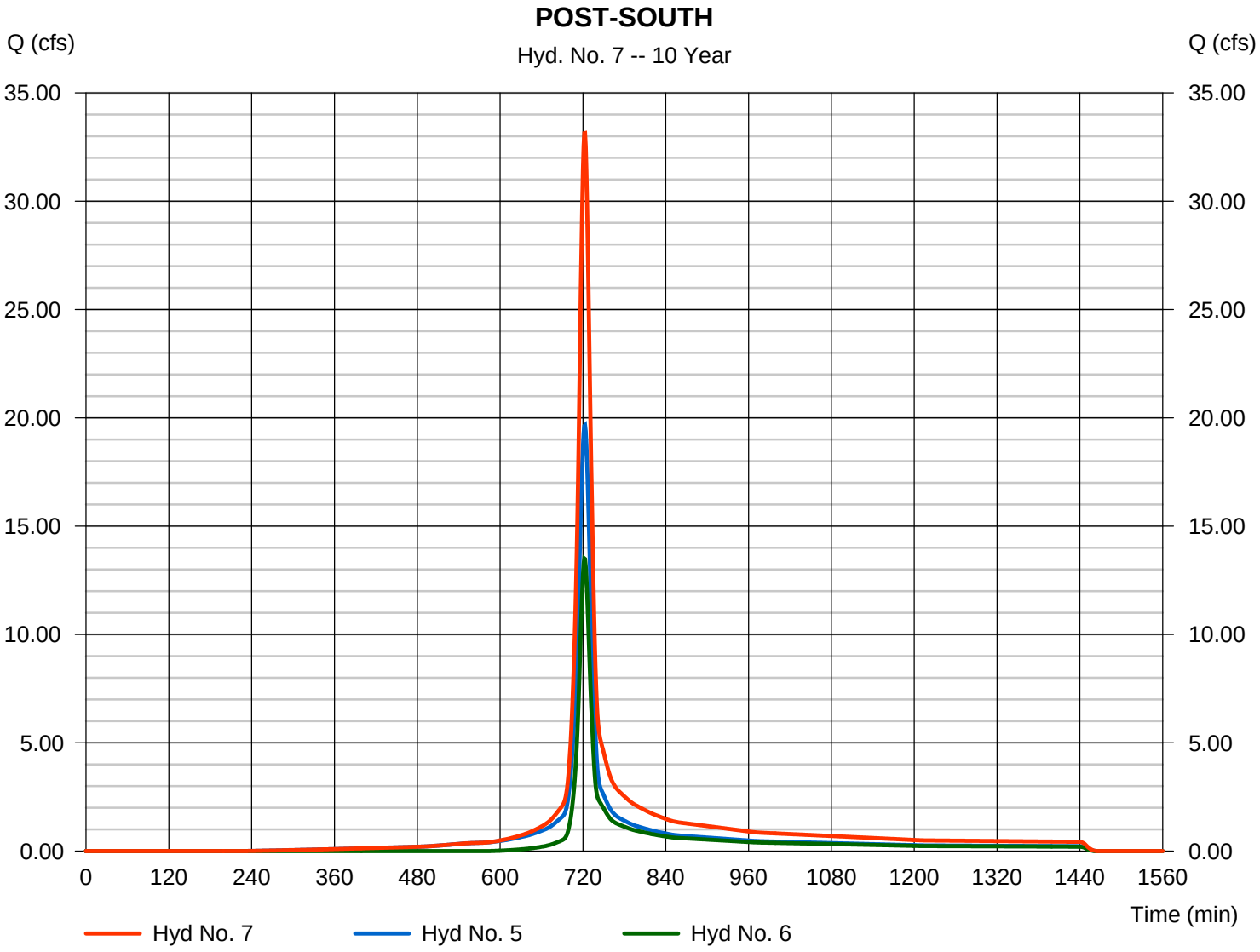


Hydrograph Report

Hyd. No. 7

POST-SOUTH

Hydrograph type	= Combine	Peak discharge	= 33.15 cfs
Storm frequency	= 10 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 95,142 cuft
Inflow hyds.	= 5, 6	Contrib. drain. area	= 8.580 ac

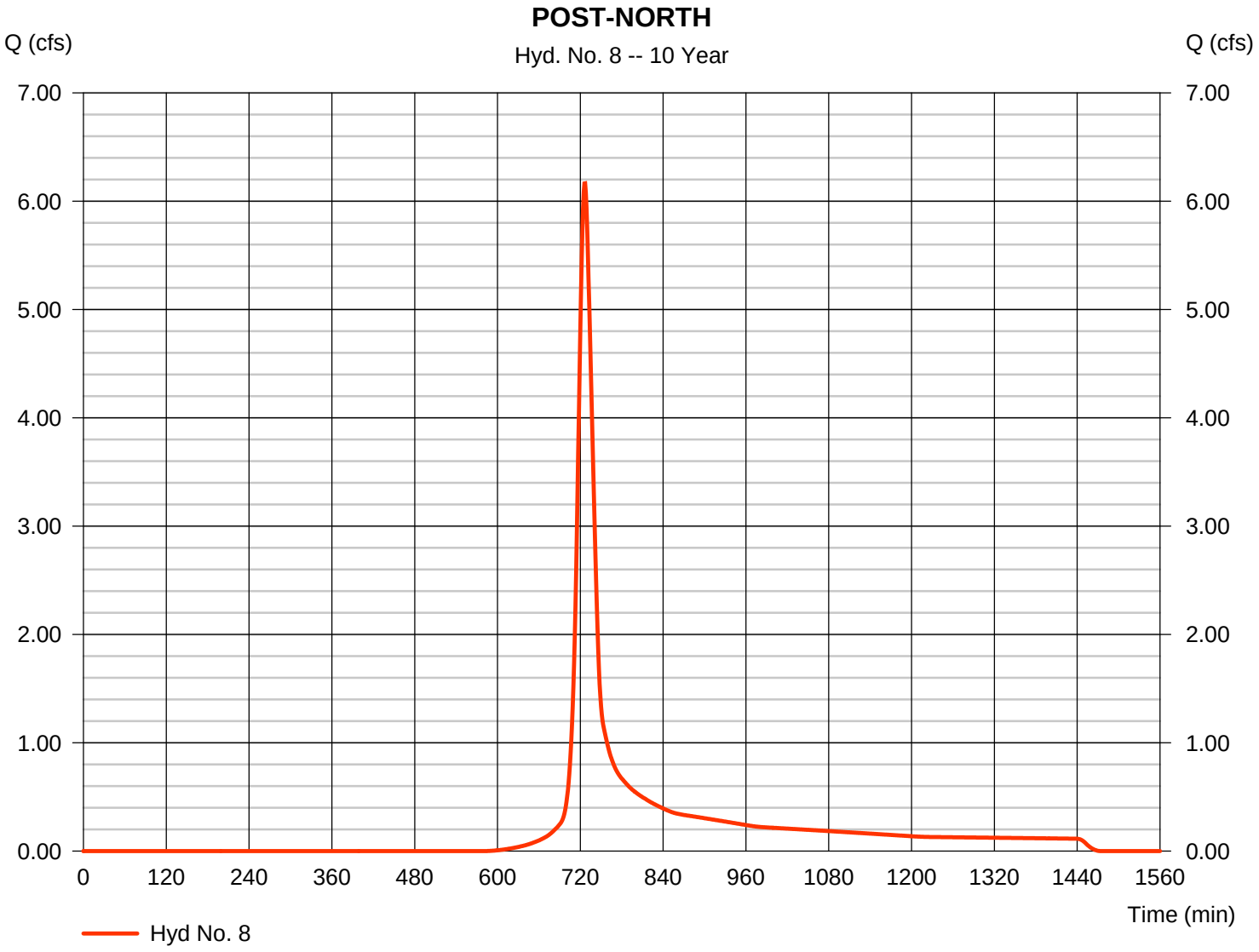


Hydrograph Report

Hyd. No. 8

POST-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.165 cfs
Storm frequency	=	10 yrs	Time to peak	=	727 min
Time interval	=	1 min	Hyd. volume	=	20,605 cuft
Drainage area	=	2.590 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	5.18 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

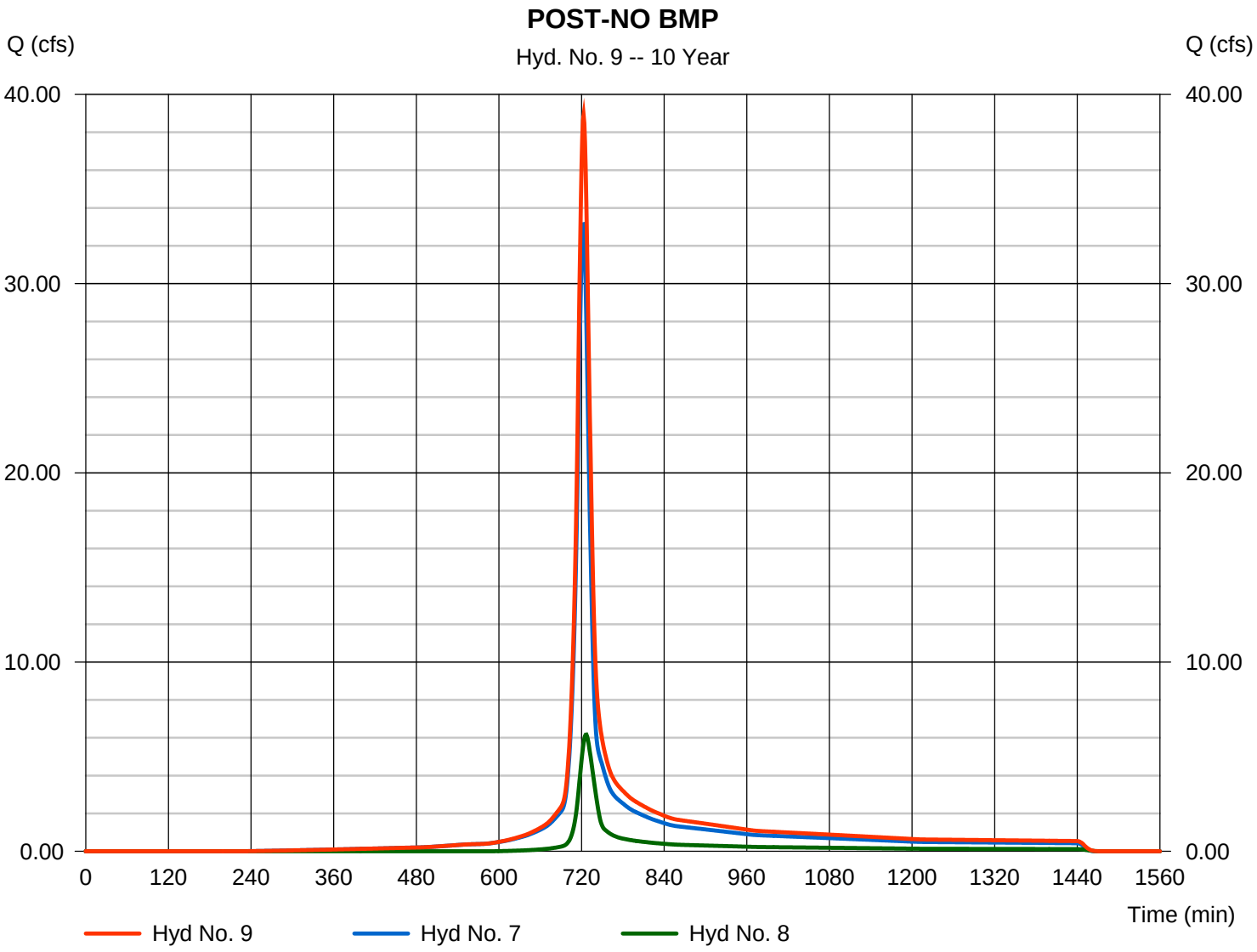


Hydrograph Report

Hyd. No. 9

POST-NO BMP

Hydrograph type	=	Combine	Peak discharge	=	38.88 cfs
Storm frequency	=	10 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	115,747 cuft
Inflow hyds.	=	7, 8	Contrib. drain. area	=	2.590 ac



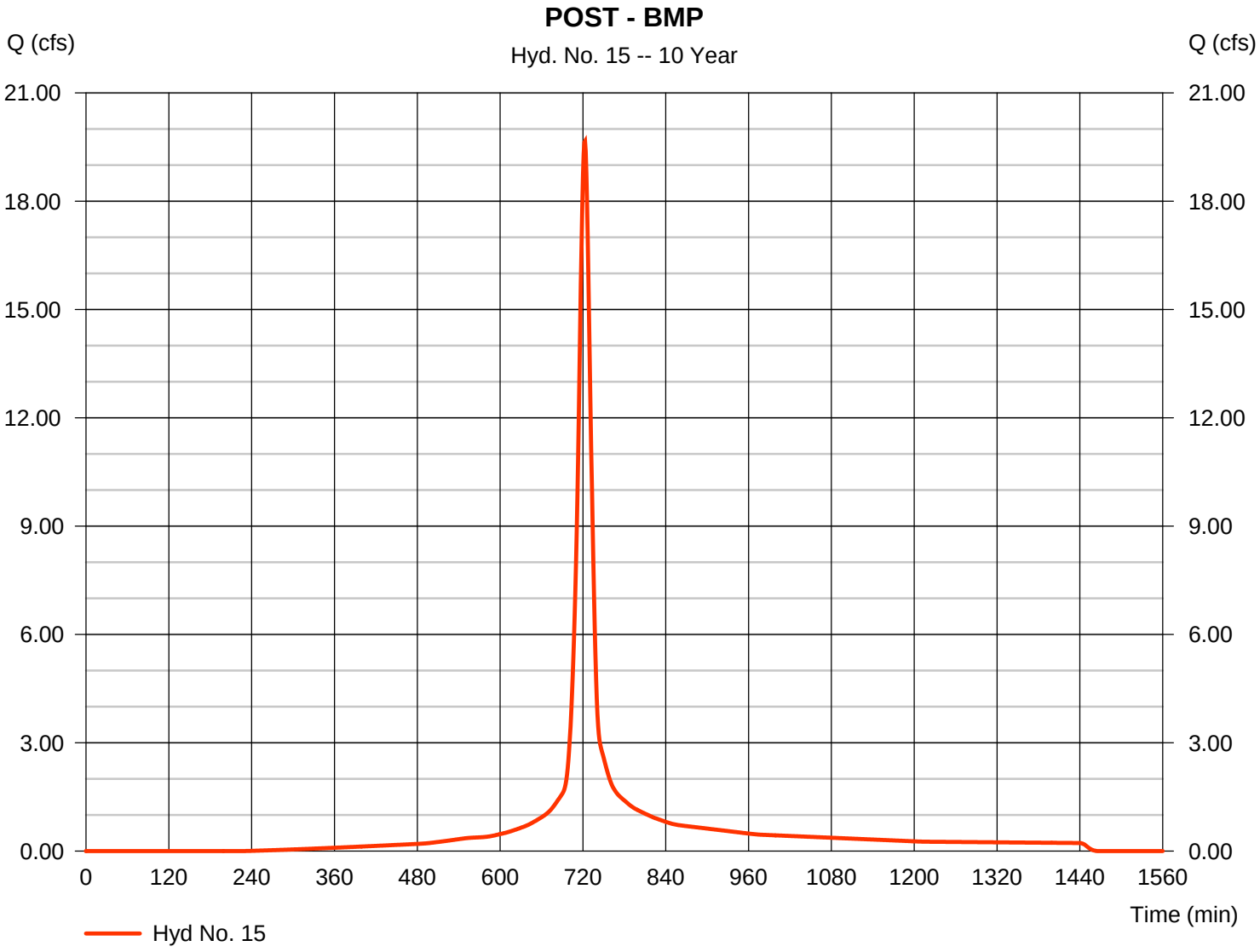
Hydrograph Report

Hyd. No. 15

POST - BMP

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.66 cfs
Storm frequency	=	10 yrs	Time to peak	=	723 min
Time interval	=	1 min	Hyd. volume	=	58,500 cuft
Drainage area	=	3.930 ac	Curve number	=	90*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.00 min
Total precip.	=	5.18 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.680 x 98) + (1.250 x 74)] / 3.930



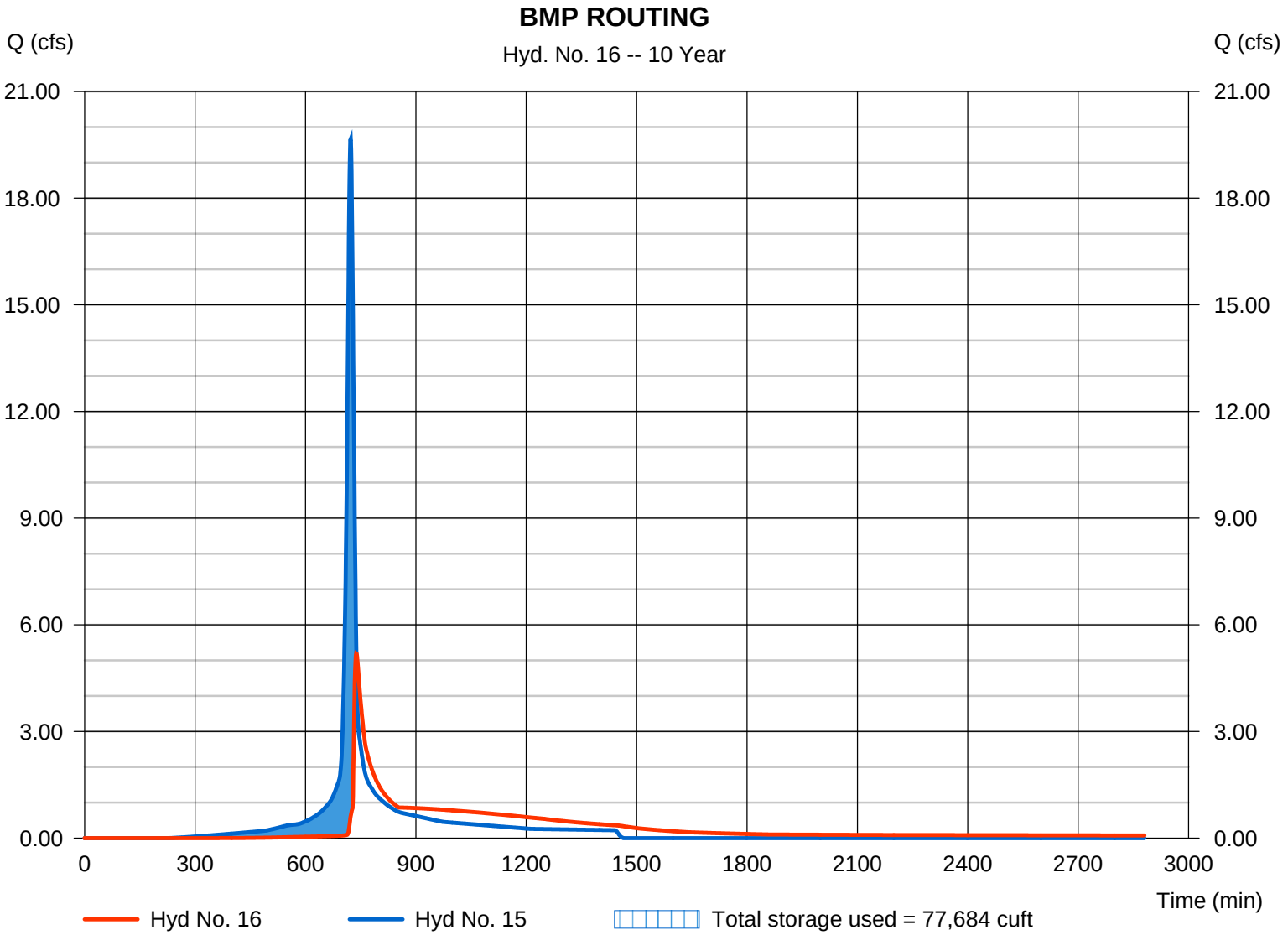
Hydrograph Report

Hyd. No. 16

BMP ROUTING

Hydrograph type	= Reservoir	Peak discharge	= 5.191 cfs
Storm frequency	= 10 yrs	Time to peak	= 738 min
Time interval	= 1 min	Hyd. volume	= 49,107 cuft
Inflow hyd. No.	= 15 - POST - BMP	Max. Elevation	= 250.39 ft
Reservoir name	= WET POND	Max. Storage	= 77,684 cuft

Storage Indication method used. Wet pond routing start elevation = 248.50 ft.

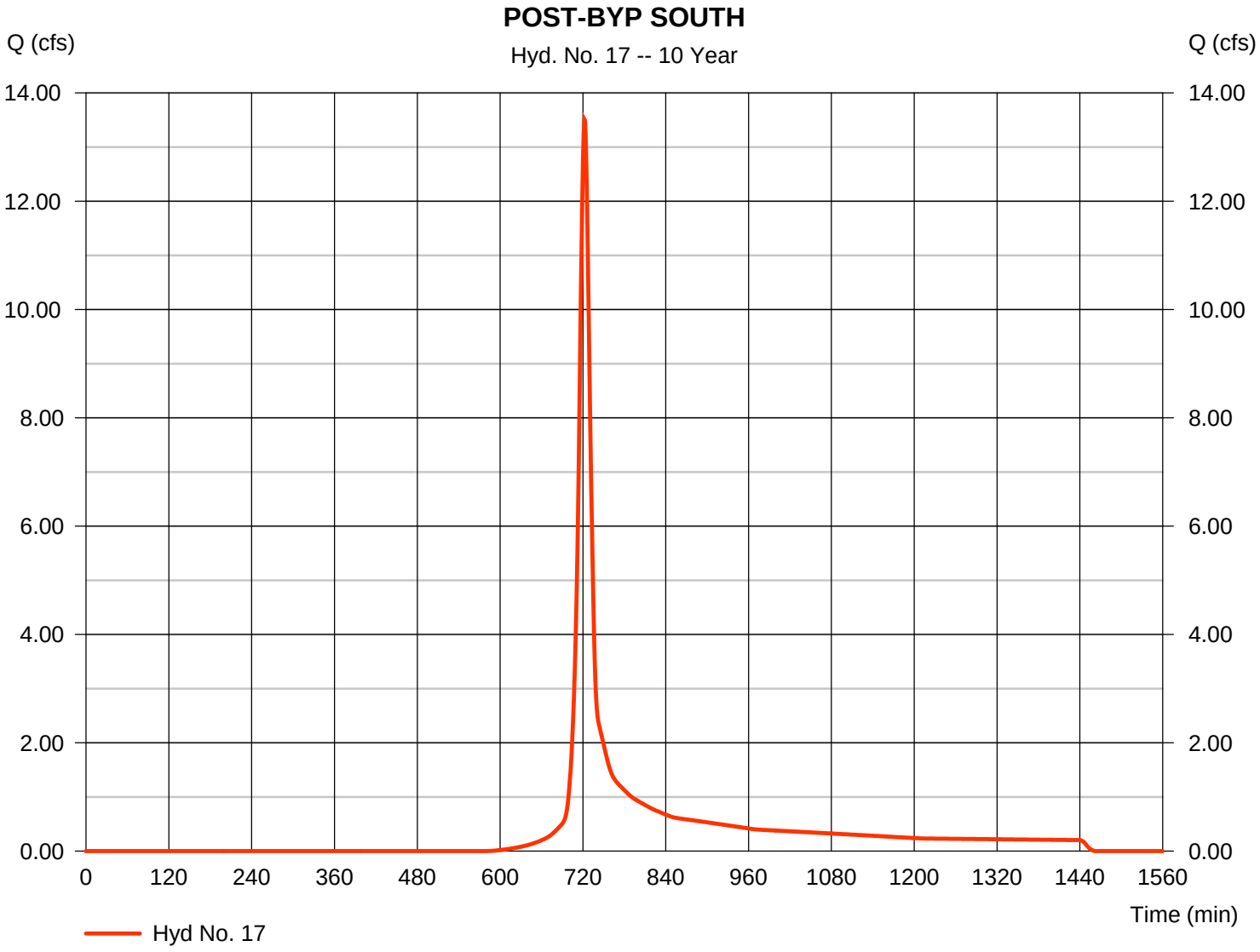


Hydrograph Report

Hyd. No. 17

POST-BYP SOUTH

Hydrograph type	= SCS Runoff	Peak discharge	= 13.51 cfs
Storm frequency	= 10 yrs	Time to peak	= 722 min
Time interval	= 1 min	Hyd. volume	= 36,641 cuft
Drainage area	= 4.650 ac	Curve number	= 70
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 14.20 min
Total precip.	= 5.18 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

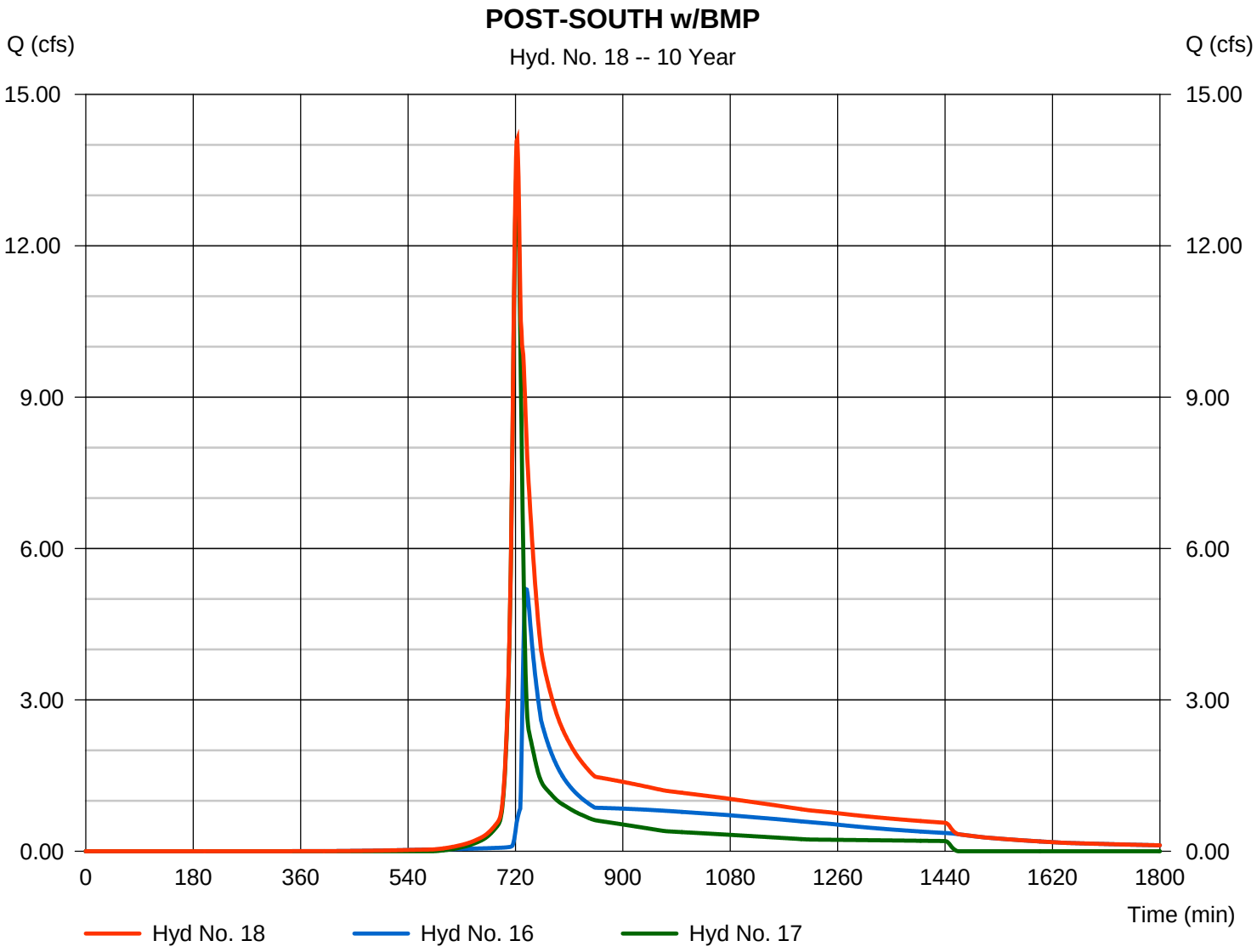


Hydrograph Report

Hyd. No. 18

POST-SOUTH w/BMP

Hydrograph type	= Combine	Peak discharge	= 14.11 cfs
Storm frequency	= 10 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 85,748 cuft
Inflow hyds.	= 16, 17	Contrib. drain. area	= 4.650 ac

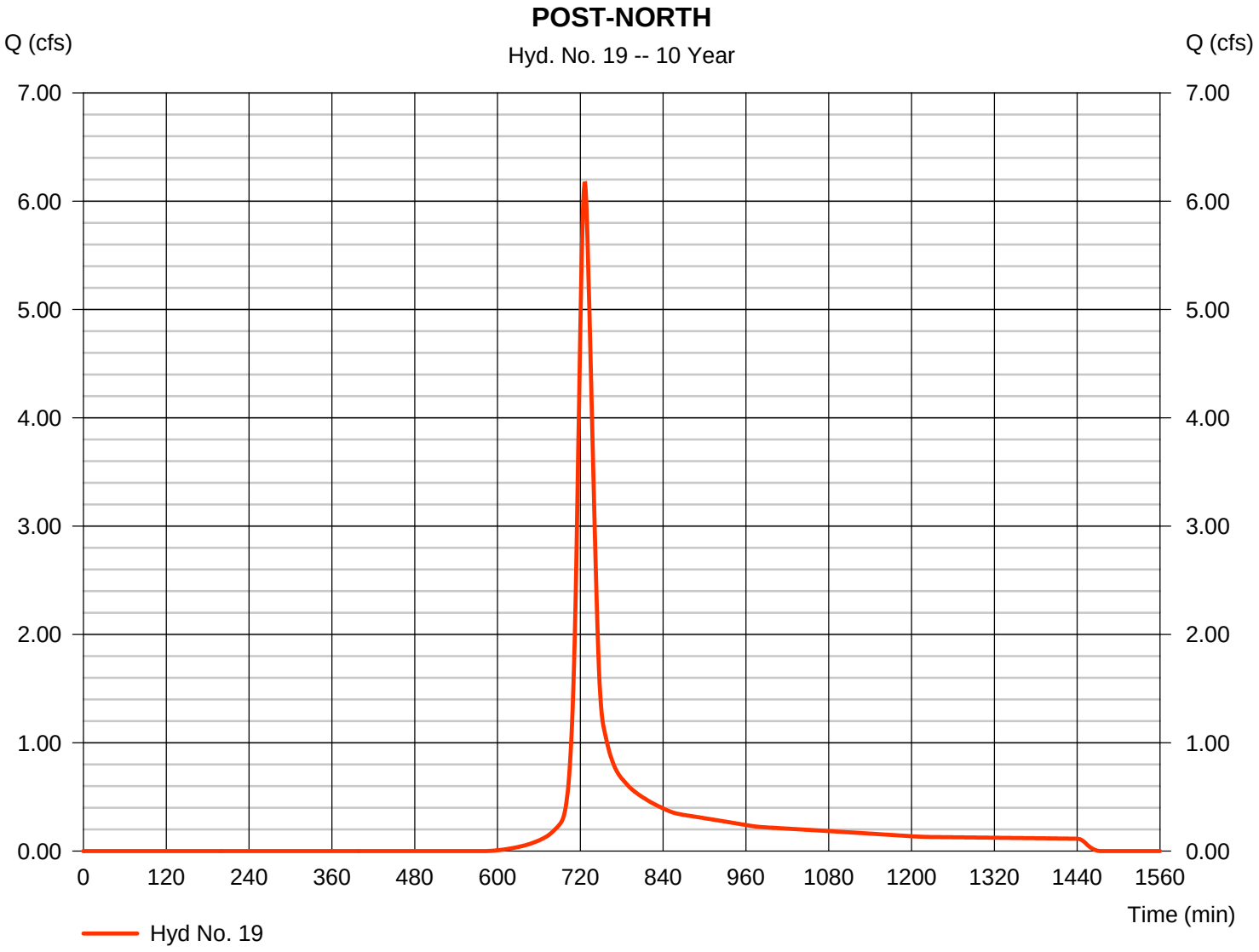


Hydrograph Report

Hyd. No. 19

POST-NORTH

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.165 cfs
Storm frequency	=	10 yrs	Time to peak	=	727 min
Time interval	=	1 min	Hyd. volume	=	20,605 cuft
Drainage area	=	2.590 ac	Curve number	=	70
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	21.10 min
Total precip.	=	5.18 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

Hyd. No. 20

POST DEV w/BMP

Hydrograph type	= Combine	Peak discharge	= 19.85 cfs
Storm frequency	= 10 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 106,353 cuft
Inflow hyds.	= 18, 19	Contrib. drain. area	= 2.590 ac