Schaeffer Road

TETRA TECH, INC.

By: RH Date: 11/15/2016 Subject: Schaeffer Road
Checked By: JB Date: 11/17/2016 PCSM Design and Evaluation

PURPOSE:

The purpose of these calculations is to design a Post-Construction Stormwater Management (PCSM) Plan for the Schaeffer Road block valve site as part of the Sunoco Pipeline L.P. Pennsylvania Pipeline Project. The site is located within South Lebanon Township, Lebanon County, Pennsylvania. Permanent stormwater controls will be developed to satisfy PADEP requirements.

PCSM DESIGN REQUIREMENTS:

The PCSM design for this project follows the PA Department of Environmental Protection's (PADEP) Pennsylvania Stormwater Best Management Practices Manual (BMP Manual), December 2006; and the standard design criteria from PA Title 25, Chapter 102.8.(g)(2) and (3). The design criteria evaluated for the site are summarized below.

Act 167 Consistency

The Schaeffer Road block valve is located in Lebanon County, Pennsylvania. Although Lebanon County has not enacted an official Act 167 plan, they do have a Stormwater Ordinance. The Schaeffer Road block valve site is located in an area of Lebanon County that has rate release requirements. By designing in accordance with PADEP's Stormwater BMP Manual, the requirements outlined in Lebanon County's Stormwater Ordinance will be fulfilled.

Recommended Volume Control Guideline

Use of Control Guideline 1 is recommended where site conditions offer the opportunity to reduce the increase in runoff volume as follows:

- Do not increase the post-development total runoff volume for all storms equal to or less than the two-year/24-hour event;
- Existing (pre-development) non-forested pervious areas must be considered meadow (good condition) or its equivalent; and
- 20 percent of existing impervious area, when present, shall be considered meadow (good condition) or its equivalent.

This site will utilize an infiltration berm to manage the two-year/24-hour volume increase.

Recommended Peak Rate Control Guideline

The recommended control guideline for peak rate control is:

- Do not increase the peak rate of discharge for the 2-year through 100-year events (at minimum); as necessary, provide additional peak rate control as required by applicable and approved Act 167 plan.
- The Lebanon County Stormwater Ordinance requires that the following rate requirements be met:

Post Development Design	Pre Development Design
2 year	1 year
5 year	2 year
10 year	5 year
25 year	25 year
100 year	100 year

All of the rates for the storm events described have a post-development release rate that is less than the pre-development release rate. Therefore, the requirements of Lebanon County's Stormwater Ordinance have been met.

- The Lebanon County Stormwater Ordinance has recommended specific curve numbers for rate calculations. The rate calculations for this site were determined using the NCRS recommended curve numbers, which follows the requirements set for the in the PADEP manual.

This site will utilize an infiltration berm to manage the two-year through 100-year peak rate increases. This BMP will also help to increase the time of concentration for the drainage area encompassing the block valve.

Recommended Water Quality Control Guideline

Control Guideline 1 will provide water quality control and stream channel protection as well as flood control protection.

Infiltration

Infiltration rates for the PCSM BMPs have been determined from site infiltration testing conducted in accordance of the PA BMP Manual. Documentation for infiltration testing and design infiltration rates can be found in Attachment 5 of the Site Restoration/Post Construction Stormwater Management Plan. Infiltration test locations and recommended design rates are also labeled on the PCSM Plan Drawings in Attachment 6.

During the onsite infiltration tests, the depth to seasonal high groundwater and shallow bedrock or another confining layer were evaluated. The post-construction stormwater management facility for the site has been designed to maintain 2 feet of separation between the ponding elevation of the facility and the seasonal high water table and bedrock. Although the infiltration rates exceed 6 in/hr, an additional soil buffer in the form of soil amendment (which includes a mix of soil and compost), has been placed within the ponding area as a pre-treatment to increase the cation exchange capacity.

The post-construction stormwater management design will utilize onsite infiltration to meet Volume Control Guideline 1.

Loading Ratio

Loading ratios have been considered for the design of infiltration BMPs. In general, the following Loading Ratio guidelines are recommended:

- Maximum Impervious Loading Ratio of 5:1 relating impervious drainage area to infiltration area.

- Maximum Drainage Area Loading Ratio of 8:1 relating total drainage area to infiltration area.

The maximum impervious loading ratio of 5:1 has been met. The impervious loading ratio for the site is 4.5:1.

The maximum drainage area loading ratio of 8:1 has been met. The drainage area loading ratio for the site is 6.7:1.

Disturbed Area

To meet Standard Worksheet 10 guidelines, 90% of the disturbed area is contained by the proposed PCSM BMPs.

Karst Topography

The Schaeffer Road block valve is located within the vicinity of known depressions or sinkholes. Several design principles were incorporated to minimize the risk of sinkholes to the maximum extent practicable, including reducing the proposed impervious area to the maximum extent practicable.

Stormwater runoff from the site is being spread out over a relatively large area. The site will achieve a 4.5:1 impervious loading ratio by directing stormwater runoff into a long infiltration berm. The infiltration berm will avoid concentrating stormwater runoff and will encourage relatively shallow and broad ponding areas.

Additional post-construction inspection and maintenance will be required onsite as documented in the Sinkhole Repair Plan in Attachment 2. In areas of known karst terrain, stormwater BMPs shall be inspected at regular intervals of at least once every quarter for the first two years following installation and then at regular periods thereafter. Inspections shall also be made after every storm event greater than 1 inch during the establishment period. Inspections shall consist of an examination of any noticeable subsidence, surface depressions, or sinkholes. Inspections shall include an evaluation of all inlet and outlet structures and document any areas to be cleaned, maintained, or repaired.

Special Protection Watershed

The Schaeffer Road block valve site is not located within a special protection watershed, so antidegradation requirements do not apply.

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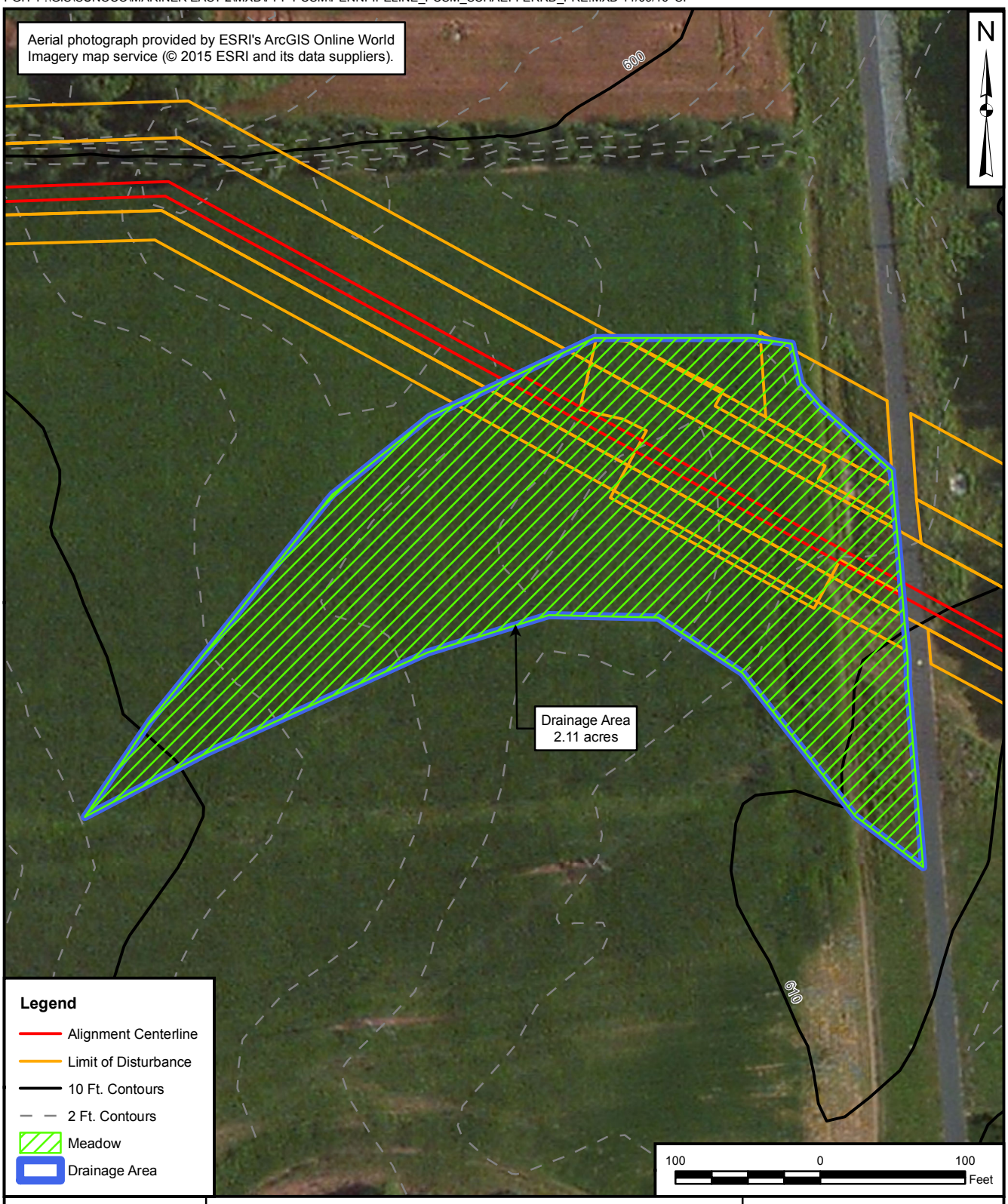

TETRA TECH

PRE-DEVELOPMENT DRAINAGE AREA MAP
SCHAEFFER ROAD
PENNSYLVANIA PIPELINE PROJECT
SUNOCO LOGISTICS, L.P.
LEBANON COUNTY, PENNSYLVANIA

DRAWN BY: J. HERNING 05/03/15
CHECKED BY: J. BRODY 11/09/16

APPROVED BY:

CONTRACT NUMBER: 112IC05958

FIGURE NUMBER	REV
1	0

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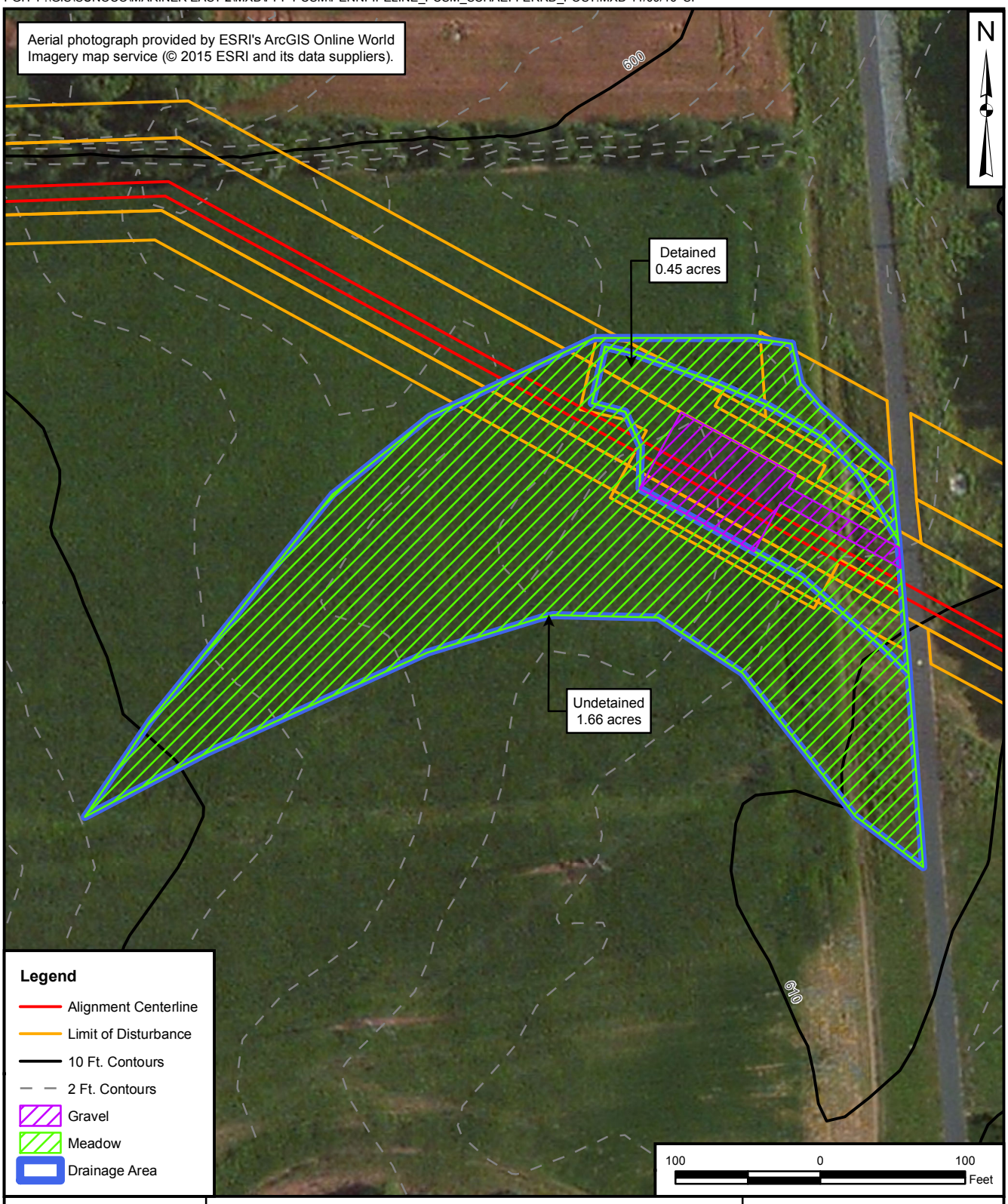

TETRA TECH

POST-DEVELOPMENT DRAINAGE AREA MAP
SCHAEFFER ROAD
PENNSYLVANIA PIPELINE PROJECT
SUNOCO LOGISTICS, L.P.
LEBANON COUNTY, PENNSYLVANIA

DRAWN BY: J. HERNING 05/03/15
CHECKED BY: J. BRODY 11/09/16

APPROVED BY:

CONTRACT NUMBER: 112IC05958

FIGURE NUMBER	REV
2	0

NOAA Atlas 14, Volume 2, Version 3
Location name: South Lebanon Twp, Pennsylvania, USA*
Latitude: 40.2894°, Longitude: -76.3755°
Elevation: 602.98 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.330** (0.299-0.364)	**0.392** (0.356-0.434)	**0.462** (0.418-0.512)	**0.512** (0.462-0.565)	**0.570** (0.513-0.628)	**0.612** (0.549-0.674)	**0.653** (0.584-0.719)	**0.693** (0.616-0.764)	**0.740** (0.653-0.816)	**0.775** (0.680-0.856)
10-min	**0.526** (0.476-0.581)	**0.626** (0.569-0.693)	**0.736** (0.666-0.815)	**0.813** (0.735-0.898)	**0.903** (0.812-0.995)	**0.968** (0.868-1.07)	**1.03** (0.922-1.14)	**1.09** (0.969-1.20)	**1.16** (1.02-1.28)	**1.21** (1.06-1.34)
15-min	**0.657** (0.594-0.725)	**0.785** (0.712-0.868)	**0.930** (0.841-1.03)	**1.03** (0.928-1.13)	**1.14** (1.03-1.26)	**1.22** (1.10-1.35)	**1.30** (1.17-1.44)	**1.37** (1.22-1.51)	**1.46** (1.29-1.61)	**1.51** (1.33-1.67)
30-min	**0.896** (0.811-0.990)	**1.08** (0.981-1.20)	**1.31** (1.19-1.46)	**1.48** (1.34-1.64)	**1.68** (1.51-1.85)	**1.83** (1.64-2.02)	**1.98** (1.77-2.18)	**2.12** (1.89-2.34)	**2.30** (2.03-2.54)	**2.44** (2.14-2.69)
60-min	**1.11** (1.01-1.23)	**1.35** (1.23-1.50)	**1.68** (1.52-1.86)	**1.92** (1.74-2.12)	**2.23** (2.01-2.46)	**2.48** (2.22-2.73)	**2.72** (2.43-3.00)	**2.96** (2.63-3.27)	**3.29** (2.90-3.63)	**3.54** (3.11-3.91)
2-hr	**1.32** (1.20-1.46)	**1.60** (1.45-1.77)	**2.01** (1.82-2.22)	**2.33** (2.11-2.58)	**2.79** (2.50-3.07)	**3.16** (2.83-3.48)	**3.56** (3.16-3.92)	**3.98** (3.51-4.39)	**4.58** (3.99-5.06)	**5.07** (4.38-5.62)
3-hr	**1.44** (1.30-1.60)	**1.74** (1.58-1.94)	**2.19** (1.98-2.44)	**2.55** (2.30-2.83)	**3.06** (2.74-3.38)	**3.47** (3.09-3.84)	**3.92** (3.47-4.33)	**4.38** (3.85-4.85)	**5.06** (4.39-5.60)	**5.61** (4.83-6.23)
6-hr	**1.78** (1.60-2.00)	**2.16** (1.94-2.42)	**2.71** (2.43-3.03)	**3.17** (2.83-3.53)	**3.83** (3.40-4.26)	**4.39** (3.88-4.87)	**5.00** (4.38-5.54)	**5.66** (4.92-6.27)	**6.64** (5.69-7.36)	**7.46** (6.31-8.29)
12-hr	**2.19** (1.97-2.47)	**2.65** (2.38-2.99)	**3.35** (3.00-3.77)	**3.94** (3.52-4.42)	**4.83** (4.27-5.39)	**5.59** (4.91-6.22)	**6.45** (5.61-7.17)	**7.40** (6.36-8.21)	**8.85** (7.45-9.79)	**10.1** (8.39-11.2)
24-hr	**2.53** (2.32-2.80)	**3.05** (2.80-3.37)	**3.87** (3.54-4.27)	**4.57** (4.17-5.03)	**5.62** (5.08-6.17)	**6.54** (5.87-7.17)	**7.56** (6.73-8.26)	**8.71** (7.66-9.49)	**10.4** (9.05-11.3)	**11.9** (10.2-12.9)
2-day	**2.94** (2.70-3.25)	**3.56** (3.26-3.92)	**4.51** (4.12-4.96)	**5.30** (4.84-5.83)	**6.48** (5.87-7.11)	**7.49** (6.74-8.20)	**8.60** (7.68-9.39)	**9.81** (8.69-10.7)	**11.6** (10.1-12.7)	**13.2** (11.4-14.4)
3-day	**3.12** (2.87-3.43)	**3.76** (3.46-4.13)	**4.75** (4.36-5.22)	**5.59** (5.11-6.12)	**6.82** (6.20-7.45)	**7.87** (7.11-8.59)	**9.02** (8.09-9.83)	**10.3** (9.15-11.2)	**12.2** (10.7-13.3)	**13.8** (12.0-15.0)
4-day	**3.29** (3.03-3.60)	**3.97** (3.66-4.35)	**5.00** (4.60-5.47)	**5.87** (5.38-6.41)	**7.15** (6.52-7.79)	**8.25** (7.48-8.98)	**9.45** (8.51-10.3)	**10.8** (9.62-11.7)	**12.8** (11.2-13.9)	**14.4** (12.6-15.7)
7-day	**3.87** (3.58-4.23)	**4.65** (4.30-5.08)	**5.80** (5.36-6.33)	**6.77** (6.24-7.37)	**8.20** (7.51-8.90)	**9.42** (8.59-10.2)	**10.8** (9.74-11.7)	**12.2** (11.0-13.2)	**14.4** (12.8-15.6)	**16.2** (14.2-17.6)
10-day	**4.45** (4.14-4.81)	**5.32** (4.96-5.76)	**6.56** (6.10-7.09)	**7.58** (7.03-8.17)	**9.04** (8.35-9.74)	**10.3** (9.43-11.0)	**11.6** (10.6-12.4)	**13.0** (11.8-13.9)	**15.0** (13.4-16.1)	**16.6** (14.8-17.9)
20-day	**6.05** (5.69-6.45)	**7.18** (6.76-7.66)	**8.61** (8.09-9.17)	**9.75** (9.14-10.4)	**11.3** (10.6-12.1)	**12.6** (11.8-13.4)	**13.9** (12.9-14.8)	**15.3** (14.1-16.3)	**17.2** (15.8-18.3)	**18.7** (17.0-20.0)
30-day	**7.52** (7.10-7.98)	**8.88** (8.38-9.42)	**10.4** (9.85-11.1)	**11.7** (11.0-12.4)	**13.4** (12.6-14.1)	**14.7** (13.8-15.6)	**16.0** (15.0-17.0)	**17.4** (16.2-18.5)	**19.3** (17.8-20.5)	**20.7** (19.0-22.0)
45-day	**9.48** (9.00-9.99)	**11.1** (10.6-11.7)	**12.9** (12.2-13.6)	**14.2** (13.5-15.0)	**16.0** (15.1-16.8)	**17.3** (16.4-18.2)	**18.6** (17.6-19.6)	**19.9** (18.7-20.9)	**21.5** (20.2-22.7)	**22.8** (21.3-24.1)
60-day	**11.4** (10.8-11.9)	**13.3** (12.7-14.0)	**15.3** (14.5-16.0)	**16.7** (15.9-17.6)	**18.6** (17.7-19.6)	**20.0** (19.0-21.1)	**21.4** (20.3-22.5)	**22.7** (21.4-23.9)	**24.4** (22.9-25.6)	**25.6** (24.0-27.0)

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

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

Please refer to NOAA Atlas 14 document for more information.

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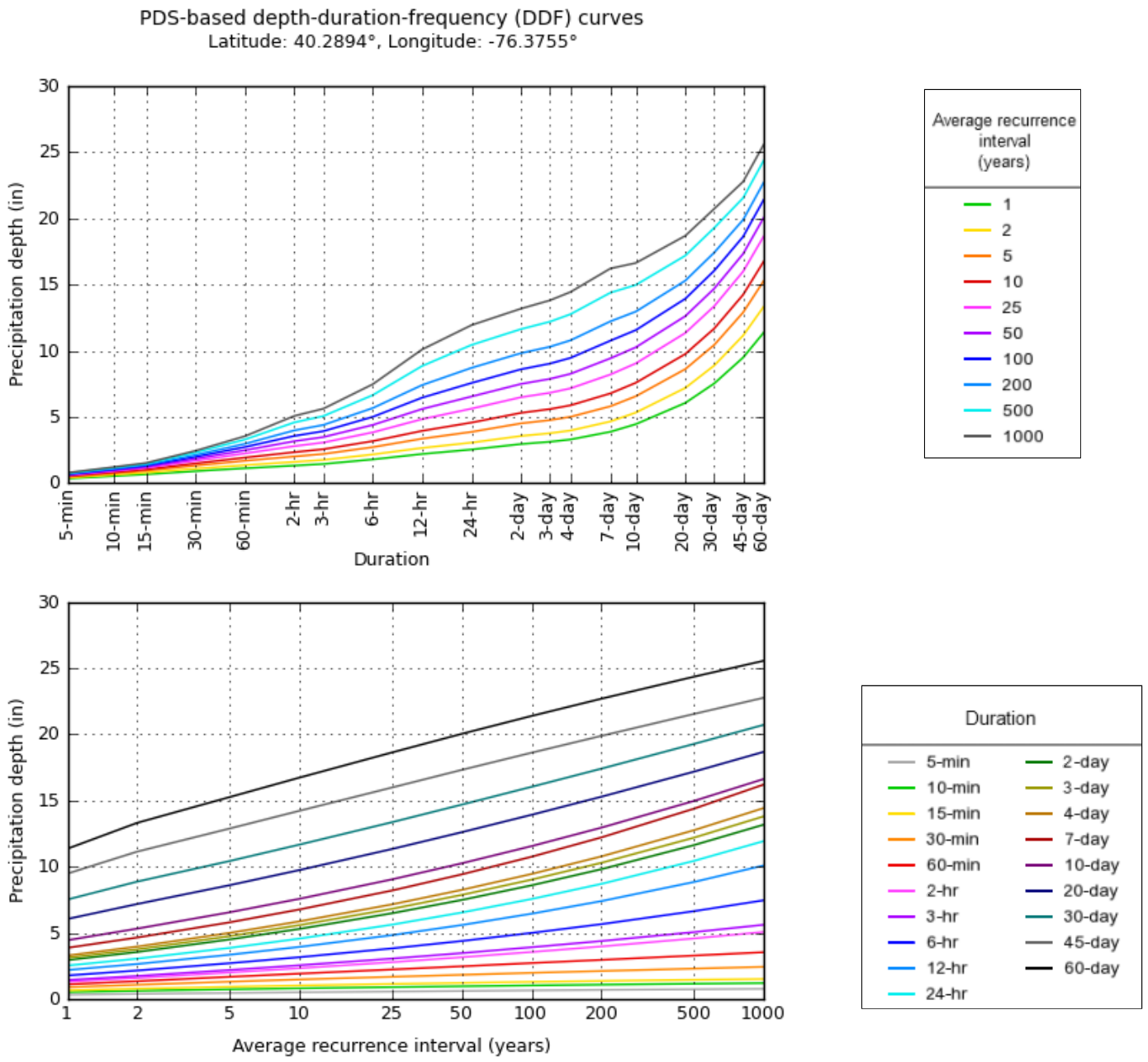
PF graphical



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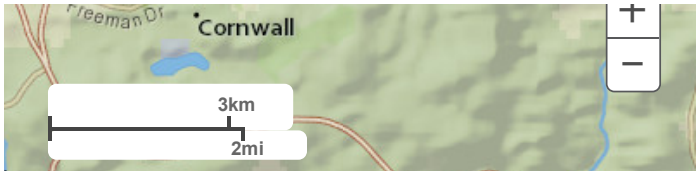
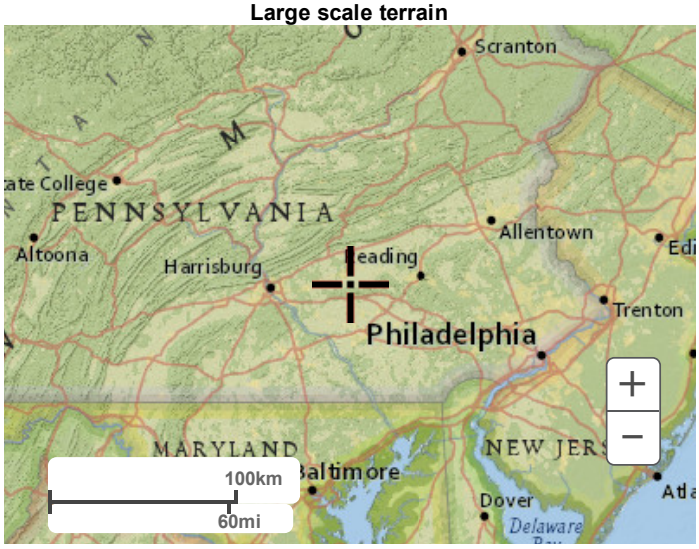
Maps & aerials

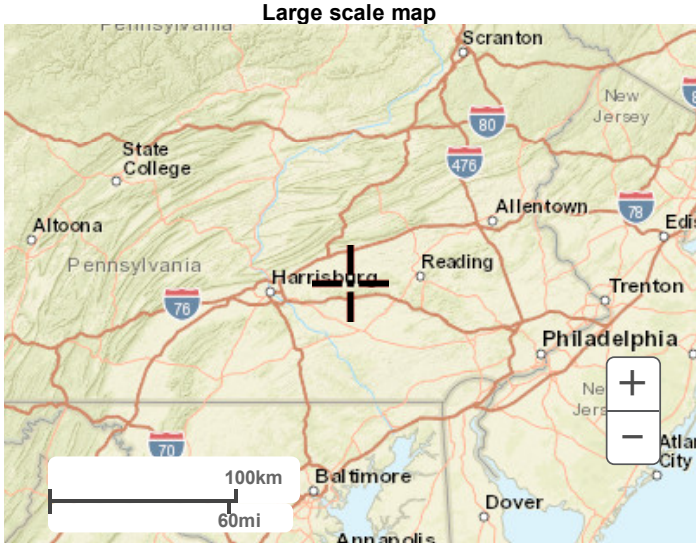
Small scale terrain



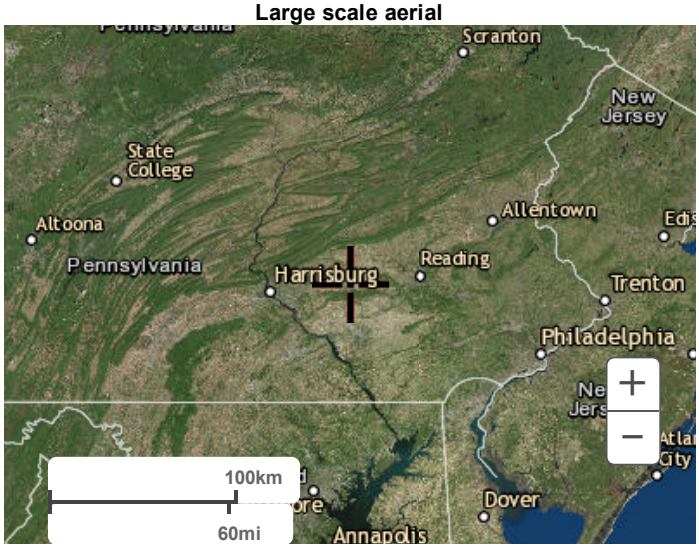
Large scale terrain



Large scale map



Large scale aerial



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WORKSHEET 1. GENERAL SITE INFORMATION

Date: November 11, 2016

Project Name: Schaeffer Road

Municipality: South Lebanon Township

County: Lebanon

Total Area (acres): 2.11

Major River Basin: Susquehanna River

Watershed: Swatara Creek

Sub Basin: Quittapahilla Creek

Nearest Surface Water to Receive Runoff: Tributary 09744 to Quittapahilla Creek

Chapter 93 - Designated Water Use: TSF

Impaired according to Chapter 303(d) list?	YES	X
	NO	

List Causes of Impairment:
Pathogens, Urban Runoff/Storm Sewers, Bank Modifications, Other Habitat Alterations

Is Project Subject to, or Part of:

Municipal Separate Storm Sewer System (MS4) Requirements	YES	X
	NO	
Existing or Planned drinking water supply?	YES	
	NO	X

If yes, distance from proposed discharge (miles): _____

Approved Act 167 Plan?	YES	X
	NO	
Existing River Conservation Plan?	YES	
	NO	X

Worksheet 2. Sensitive Natural Resources

INSTRUCTIONS

1. Provide Sensitive Resources Map according to non-structural BMP 5.4.1 in Chapter 5. This map should identify wetlands, woodlands, natural drainage ways, steep slopes, and other sensitive natural areas.

   See pre-development drainage area map

2. Summarize the existing extent of each sensitive resource in the Existing Sensitive Resources Table (below, using Acres). If none present, insert 0.

   0.00 acres

3. Summarize Total Protected Area as defined under BMPs in Chapter 5.

   0.00 acres

4. Do not count any area twice. For example, an area that is both a floodplain and a wetland may only be considered once.

EXISTING NATURAL SENSITIVE RESOURCE	MAPPED? Yes/no/n/a	TOTAL AREA (Ac.)	PROTECTED AREA (Ac.)
Waterbodies	N/A		
Floodplains	N/A		
Riparian Areas	N/A		
Wetlands	N/A		
Woodlands	N/A		
Natural Drainage Ways	N/A		
Steep Slopes, 15% - 25%	N/A		
Steep Slopes, over 25%	N/A		
Other:			
Other:			
TOTAL EXISTING:		**0.00**	**0.00**

Worksheet 3. Nonstructural BMP Credits

PROTECTED AREA

1.1 Area of Protected Sensitive/Special Value Features (see WS 2) 0.00 **Ac.**

1.2 Area of Riparian Forest Buffer Protection 0.00 **Ac.**

3.1 Area of Minimum Disturbance/Reduced Grading 0.00 **Ac**

TOTAL 0.00 **Ac**

Site Area	Minus	Protected Area	=	Stormwater Management Area
0.69	-	0	=	0.69

This is the area that requires stormwater management

VOLUME CREDITS

3.1 Minimum Soil Compaction (See Chapter 8, page 22 – SW BMP Manual)

Lawn _____ ft^2 x 1/4" x 1/12 = _____ ft^3

Meadow _____ ft^2 x 1/3" x 1/12 = _____ ft^3

3.3 Protect Existing Trees (See Chapter 8, page 23 – SW BMP Manual)

For Trees within 100 feet of impervious area:

Tree Canopy _____ ft^2 x 1/2" x 1/12 = _____ ft^3

5.1 Disconnect Roof Leaders to Vegetated Areas (See Chapter 8 page 25 – SW BMP Manual)

For runoff directed to areas protected under 5.8.1 and 5.8.2

Roof Area _____ ft^2 x 1/3" x 1/12 = _____ ft^3

For all other disconnected roof areas

Roof Area _____ ft^2 x 1/4" x 1/12 = _____ ft^3

5.2 Disconnect Non-Roof impervious to Vegetated Areas (See Chapter 8, page 26 – SW BMP Manual)

For Runoff directed to areas protected under 5.8.1 and 5.8.2

Impervious Area _____ ft^2 x 1/3" x 1/12 = _____ ft^3

For all other disconnected roof areas

Impervious Area _____ ft^2 x 1/4" x 1/12 = _____ ft^3

TOTAL NON-STRUCTURAL VOLUME CREDIT* _____ ft^3

**For use on Worksheet 5*

WORKSHEET 4. CHANGE IN RUNOFF VOLUME FOR 2-YR STORM EVENT

PROJECT: Schaeffer Road
Drainage Area: 2.11 acres
2-Year Rainfall: 3.05 in

Total Site Area: 0.69 acres
Protected Site Area: N/A acres
Managed Site Area: 0.69 acres

Existing Conditions

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia (0.2*S)	Q Runoff[1] (in)	Runoff Volume[3] (ft^3)
Impervious	-	0	0.00	98	0.20	0.04	2.82	0
Meadow	B	30,056	0.69	58	7.24	1.45	0.29	727
Woods	B	0	0.00	55	8.18	1.64	0.21	0
TOTAL:		**30,056**	**0.69**					**727**

Developed Conditions

Cover Type/Condition	Soil Type	Area (sf)	Area (ac)	CN	S	Ia (0.2*S)	Q Runoff[1] (in)	Runoff Volume[3] (ft^3)
Impervious - Gravel	B	6,534	0.15	85	1.76	0.35	1.63	888
Meadow	B	23,522	0.54	58	7.24	1.45	0.29	569
TOTAL:		**30,056**	**0.69**					**1,456**

2-Year Volume Increase (ft^3):	**730**

2-Year Volume Increase = Developed Conditions Runoff Volume - Existing Conditions Runoff Volume

1. Runoff (in) = Q = (P - 0.2S)2 / (P+ 0.8S) where
   P = 2-Year Rainfall (in)
   S = (1000/CN)-10

2. Runoff Volume (CF) = Q x Area x 1/12
   Q = Runoff (in)
   Area = Land use area (sq. ft.)

Note: Runoff Volume must be calculated for EACH land use type/condition and HSGI.
The use of a weighted CN value for volume calculations is not acceptable.

Worksheet 5. Structural BMP Volume Credits

PROJECT: Schaeffer Road
SUB-BASIN:

Required Control Volume (ft^3) - *from Worksheet 4:* 730

Non-structural Volume Credit (ft^3) - *from Worksheet 3:* N/A
(maximum is 25% of required volume)

Structural Volume Reqmt (ft^3) 730
(Required Control Volume minus Non-structural Credit)

Proposed BMPs from PA Stormwater Best Management Practices Manual Chapter 6		Area (ft^2)	Volume Reduction Permanently Removed (ft^3)
6.4.1	Porous Pavement		
6.4.2	Infiltration Basin		
6.4.3	Infiltration Bed		
6.4.4	Infiltration Trench		
6.4.5	Rain Garden/Bioretention		
6.4.6	Dry Well/Seepage Pit		
6.4.7	Constructed Filter		
6.4.8	Vegetated Swale		
6.4.9	Vegetated Filter Strip		
6.4.10	Berm	2,500	1,713
6.5.1	Vegetated Roof		
6.5.2	Capture and Re-Use		
6.6.1	Constructed Wetlands		
6.6.2	Wet Pond/Retention Basin		
6.7.1	Riparian Buffer/Riparian Forest Buffer Restoration		
6.7.2	Landscape Restoration/Reforestation		
6.7.3	Soil Amendment		
6.8.1	Level Spreader		
6.8.2	Special Storage Areas		
Other:			

Total Structural Volume (ft^3): 1,713

Structural Volume Requirement (ft^3): 730

DIFFERENCE: -983

VOLUME CREDIT DETERMINATION

1 Detained area runoff volume from Hydraflow = 1,713 cf

2 Storage volume of the BMPs = 2,520 cf

3 Infiltrated volume within 72 hours after the 2-yr/24-hr event
(Infiltration Rate/12) x Infiltration Area x 72 hrs = 1,713 cf

Potential infiltrated volume = 68,445 cf. Since this is greater than the storage volume, only the storage volume can be used and assumed to infiltrate within 72 hours.

WORKSHEET 10. WATER QUALITY COMPLIANCE FOR NITRATE

Does the site design incorporate the following BMPs to address nitrate pollution? A summary "yes" rating is achieved if at least 2 Primary BMPs for nitrate are provided across the site or 4 secondary BMPs for nitrate are provided across the site (or the

PRIMARY BMPs FOR NITRATE:

	YES	NO
NS BMP 5.4.2 - Protect / Conserve / Enhance Riparian Buffers		
NS BMP 5.5.4 - Cluster Uses at Each Site		
NS BMP 5.6.1 - Minimize Total Disturbed Area	X	
NS BMP 5.6.3 - Re-Vegetate / Re-Forest Disturbed Areas (Native Species)	X	
NS BMP 5.9.1 - Street Sweeping / Vacuuming		
Structural BMP 6.7.1 - Riparian Buffer Restoration		
Structural BMP 6.7.2 - Landscape Restoration		

SECONDARY BMPs FOR NITRATE:

NS BMP 5.4.1 - Protect Sensitive / Special Value Features		
NS BMP 5.4.3 - Protect / Utilize Natural Drainage Features		
NS BMP 5.6.2 - Minimize Soil Compaction	X	
Structural BMP 6.4.5 - Rain Garden / Bioretention		
Structural BMP 6.4.8 - Vegetated Swale		
Structural BMP 6.4.9 - Vegetated Filter Strip		
Structural BMP 6.6.1 - Constructed Wetland		
Structural BMP 6.7.1 - Riparian Buffer Restoration		
Structural BMP 6.7.2 - Landscape Restoration		
Structural BMP 6.7.3 - Soils Amendment/Restoration	X	

TIME OF CONCENTRATION ADJUSTMENT

POST CONSTRUCTION TC TO BMP (DETAINED TC) BEFORE ADJUSTMENT 9.1 MIN

STRUCTURAL VOLUME PROVIDED BY BMP 1,713 CF - 2 YEAR/24-HR STORM ONLY
2520 CF - FOR ALL OTHER REMAINING STORM EVENTS

RATES OF RUNOFF TO THE BMP (FROM HYDRAFLOW REPORT)

Storm Event	Q (CFS)
2 YR/24 HR	0.744
10 YR/24 HR	1.560
50 YR/24 HR	2.763
100 YR/24 HR	3.363

ADDITIONAL RESIDENCE TIME (MIN) = (STRUCTURAL VOLUME PROVIDED BY BMP / RATE OF RUNOFF TO BMP) / 60

Storm Event	Q (CFS)	Additional Residence Time (min.)
2 YR/24 HR	0.744	38.374
10 YR/24 HR	1.560	26.923
50 YR/24 HR	2.763	15.201
100 YR/24 HR	3.363	12.489

ADJUSTED TC = POST CONSTRUCTION TC TO BMP BEFORE ADJUSTMENT + ADDITIONAL RESIDENCE TIME

Storm Event	Q (CFS)	Additional Residence Time (min.)	Adjusted Time of Concentration (min.)
2 YR/24 HR	0.744	38.374	47.474
10 YR/24 HR	1.560	26.923	36.023
50 YR/24 HR	2.763	15.201	24.301
100 YR/24 HR	3.363	12.489	21.589

INFILTRATION BERM DEWATERING CALCULATION SITE NAME: SCHAEFFER

STORAGE VOLUME	2,520	CF	
DESIGN INFILTRATION RATE	3.9	IN/HR	BASED ON IT-A AND IT-0B
INFILTRATION AREA	2,925	SF	

DEWATERING TIME = STORAGE VOLUME / ((DESIGN INFILTRATION RATE /12) * INFILTRATION AREA)

DEWATERING TIME = 2.7 HOURS

Underdrain Discharge Report

Label	Solve For	Friction Method	Roughness Coefficient
Underdrain	Full Flow Capacity	Manning Formula	0.012

Channel Slope (ft/ft)	Normal Depth (ft)	Diameter (ft)	Discharge (ft³/s)
0.00500	0.33	0.33	0.15

Flow Area (ft²)	Wetted Perimeter (ft)	Hydraulic Radius (ft)	Top Width (ft)
0.09	1.05	0.08	0.00

Critical Depth (ft)	Percent Full (%)	Critical Slope (ft/ft)	Velocity (ft/s)
0.21	100.0	0.00897	1.67

Velocity Head (ft)	Specific Energy (ft)	Froude Number	Maximum Discharge (ft³/s)
0.04	0.38	0.00	0.16

Discharge Full (ft³/s)	Slope Full (ft/ft)	Flow Type	Notes
0.15	0.00500	SubCritical	

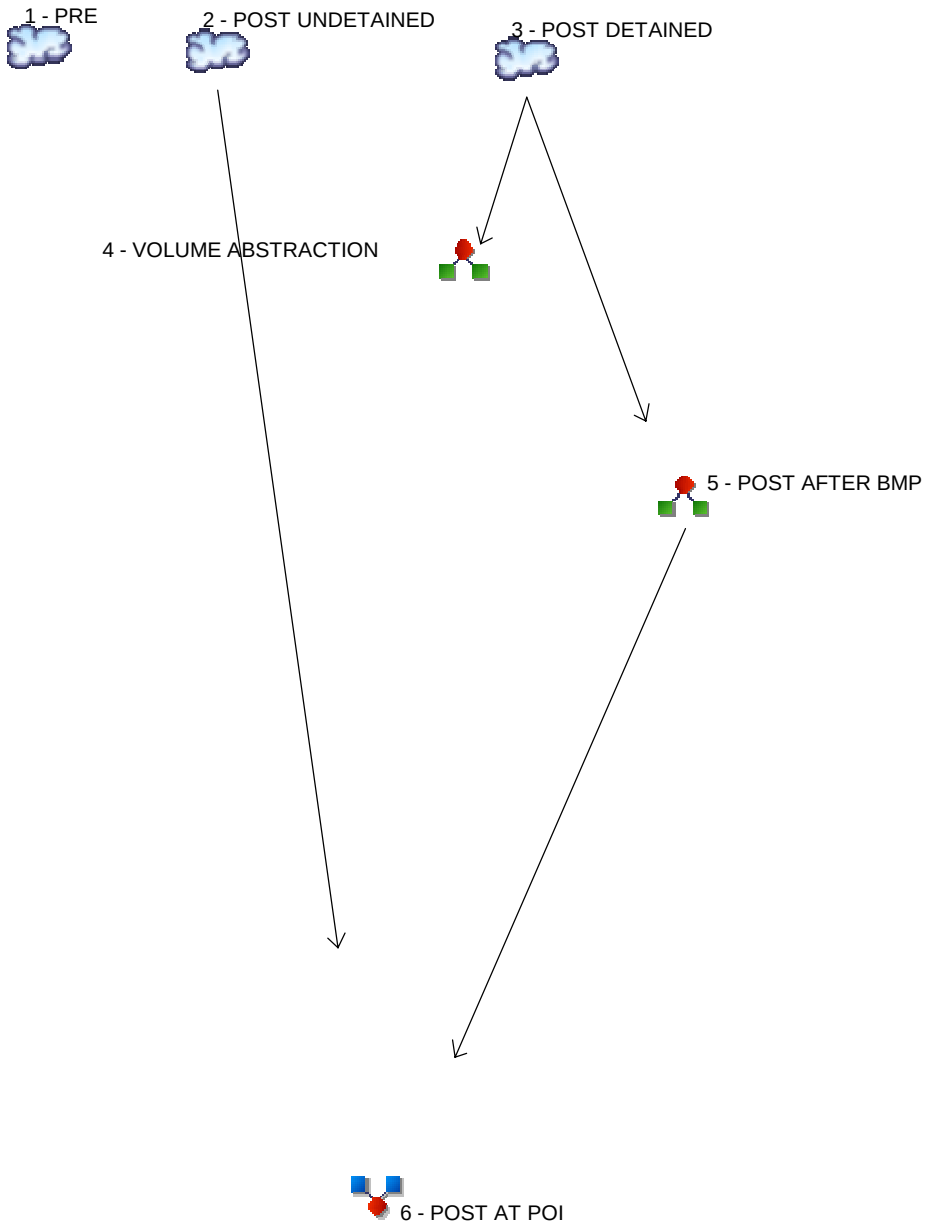
Messages

Underdrain Discharge Report

Messages

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4



Legend

Hyd.	Origin	Description
1	SCS Runoff	PRE
2	SCS Runoff	POST UNDETAINED
3	SCS Runoff	POST DETAINED
4	Diversion1	VOLUME ABSTRACTION
5	Diversion2	POST AFTER BMP
6	Combine	POST AT POI

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	------	-------	0.448	-------	-------	2.499	-------	6.205	8.378	PRE
2	SCS Runoff	------	-------	0.352	-------	-------	1.966	-------	4.882	6.592	POST UNDETAINED
3	SCS Runoff	------	-------	0.744	-------	-------	1.560	-------	2.736	3.363	POST DETAINED
4	Diversion1	3	-------	0.744	-------	-------	1.560	-------	2.736	3.363	VOLUME ABSTRACTION
5	Diversion2	3	-------	0.000	-------	-------	0.058	-------	2.326	3.300	POST AFTER BMP
6	Combine	2, 5	-------	0.352	-------	-------	1.966	-------	7.208	9.835	POST AT POI

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.448	2	724	2,291	------	------	------	PRE
2	SCS Runoff	0.352	2	724	1,803	------	------	------	POST UNDETAINED
3	SCS Runoff	0.744	2	720	1,713	------	------	------	POST DETAINED
4	Diversion1	0.744	2	720	1,713	3	------	------	VOLUME ABSTRACTION
5	Diversion2	0.000	2	n/a	0	3	------	------	POST AFTER BMP
6	Combine	0.352	2	724	1,803	2, 5	------	------	POST AT POI

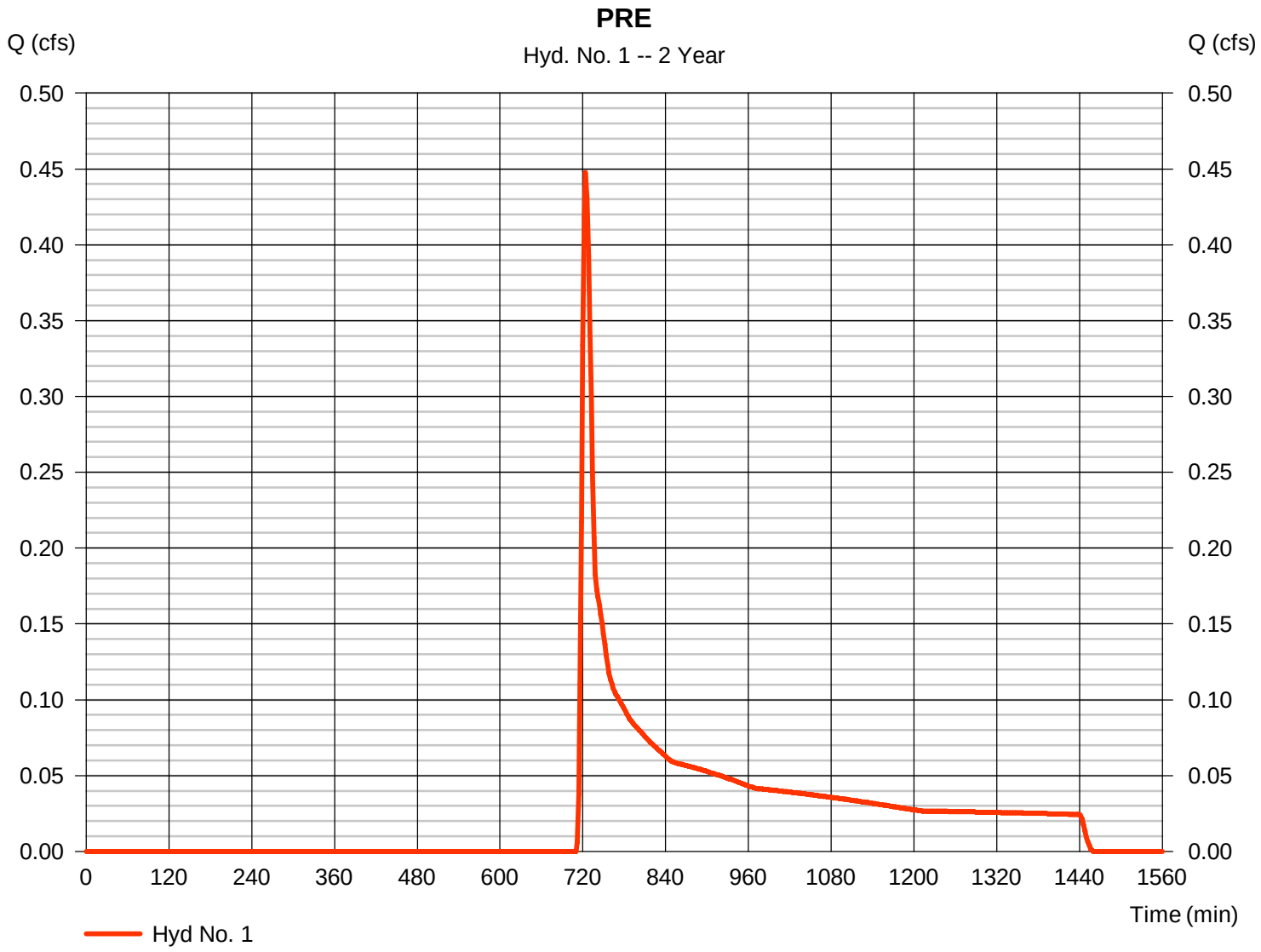
Hydrograph Report

Hyd. No. 1

PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.448 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	2,291 cuft
Drainage area	=	2.110 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	3.05 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.110 x 58)] / 2.110



TR55 Tc Worksheet

Hyd. No. 1

PRE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.40**	**+**	**0.00**	**+**	**0.00**	**=**	**8.40**
Shallow Concentrated Flow							
Flow length (ft)	= 631.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 4.73**	**+**	**0.00**	**+**	**0.00**	**=**	**4.73**
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 ..... 13.10 min

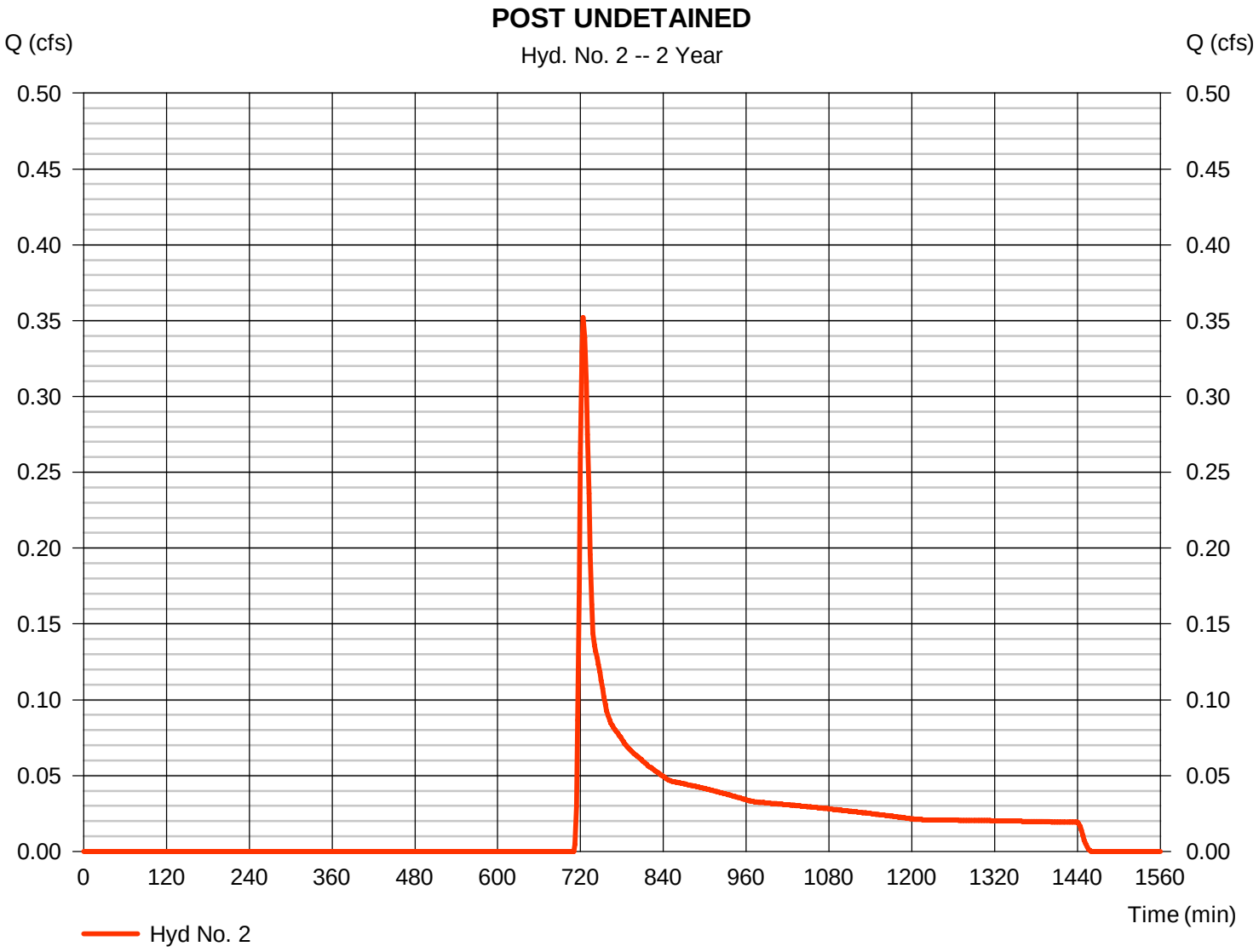
Hydrograph Report

Hyd. No. 2

POST UNDETAINED

Hydrograph type	= SCS Runoff	Peak discharge	= 0.352 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,803 cuft
Drainage area	= 1.660 ac	Curve number	= 58*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.10 min
Total precip.	= 3.05 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.660 x 58)] / 1.660



TR55 Tc Worksheet

Hyd. No. 2

POST UNDETAINED

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.40**	**+**	**0.00**	**+**	**0.00**	**=**	**8.40**
Shallow Concentrated Flow							
Flow length (ft)	= 631.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 4.73**	**+**	**0.00**	**+**	**0.00**	**=**	**4.73**
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 ..... 13.10 min

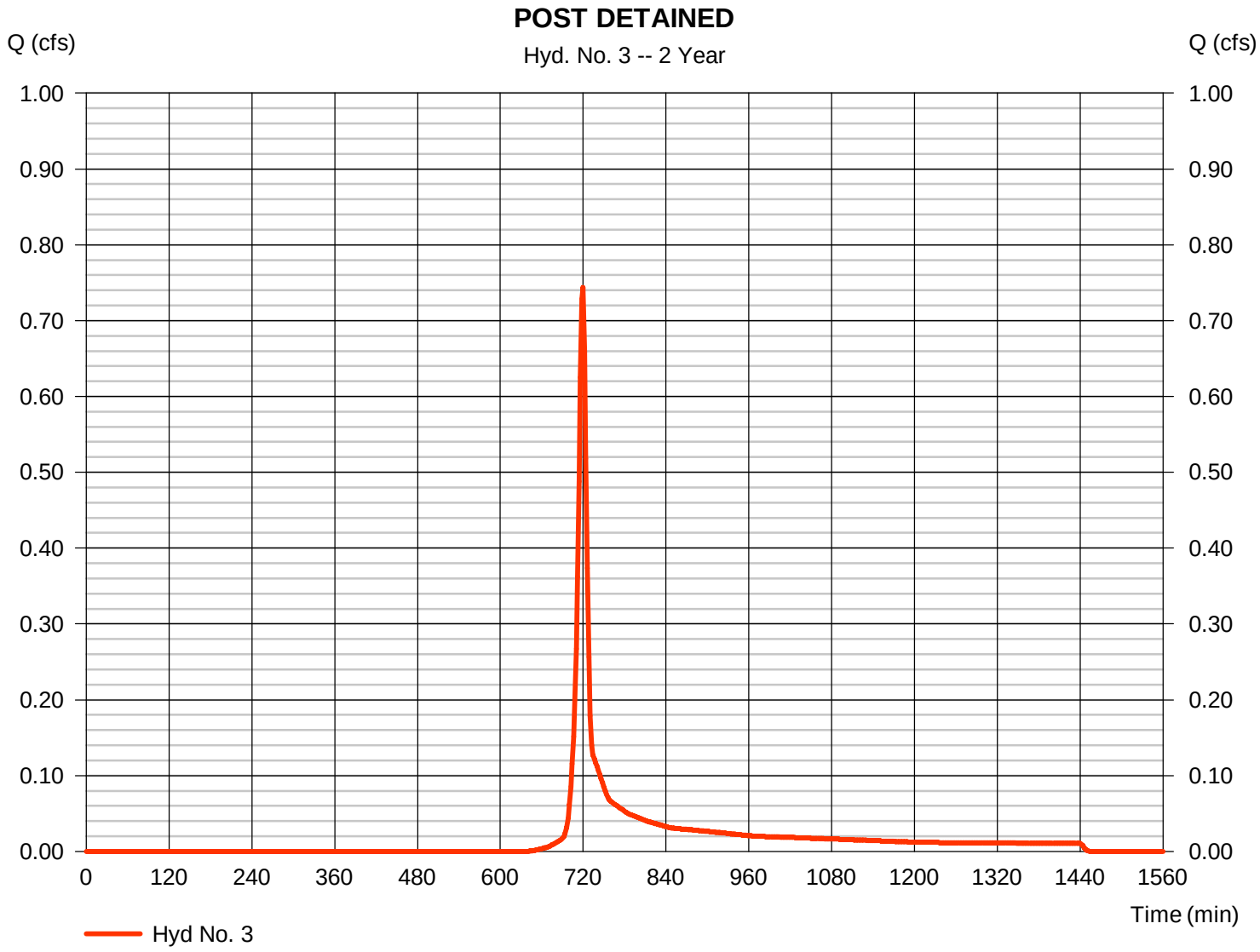
Hydrograph Report

Hyd. No. 3

POST DETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.744 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	1,713 cuft
Drainage area	=	0.450 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.10 min
Total precip.	=	3.05 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.300 x 85) + (0.150 x 58)] / 0.450



TR55 Tc Worksheet

Hyd. No. 3

POST DETAINED

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 4.00		0.00		0.00		
Travel Time (min)	**= 6.36**	**+**	**0.00**	**+**	**0.00**	**=**	**6.36**
Shallow Concentrated Flow							
Flow length (ft)	= 89.00		16.00		0.00		
Watercourse slope (%)	= 2.20		1.30		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.39		2.32		0.00		
Travel Time (min)	**= 0.62**	**+**	**0.12**	**+**	**0.00**	**=**	**0.73**
Channel Flow							
X sectional flow area (sqft)	= 0.09		0.00		0.00		
Wetted perimeter (ft)	= 1.05		0.00		0.00		
Channel slope (%)	= 0.50		0.00		0.00		
Manning's n-value	= 0.012		0.015		0.015		
Velocity (ft/s)	=1.69						
			0.00				
					0.00		
Flow length (ft)	({0})200.0		0.0		0.0		
Travel Time (min)	**= 1.97**	**+**	**0.00**	**+**	**0.00**	**=**	**1.97**

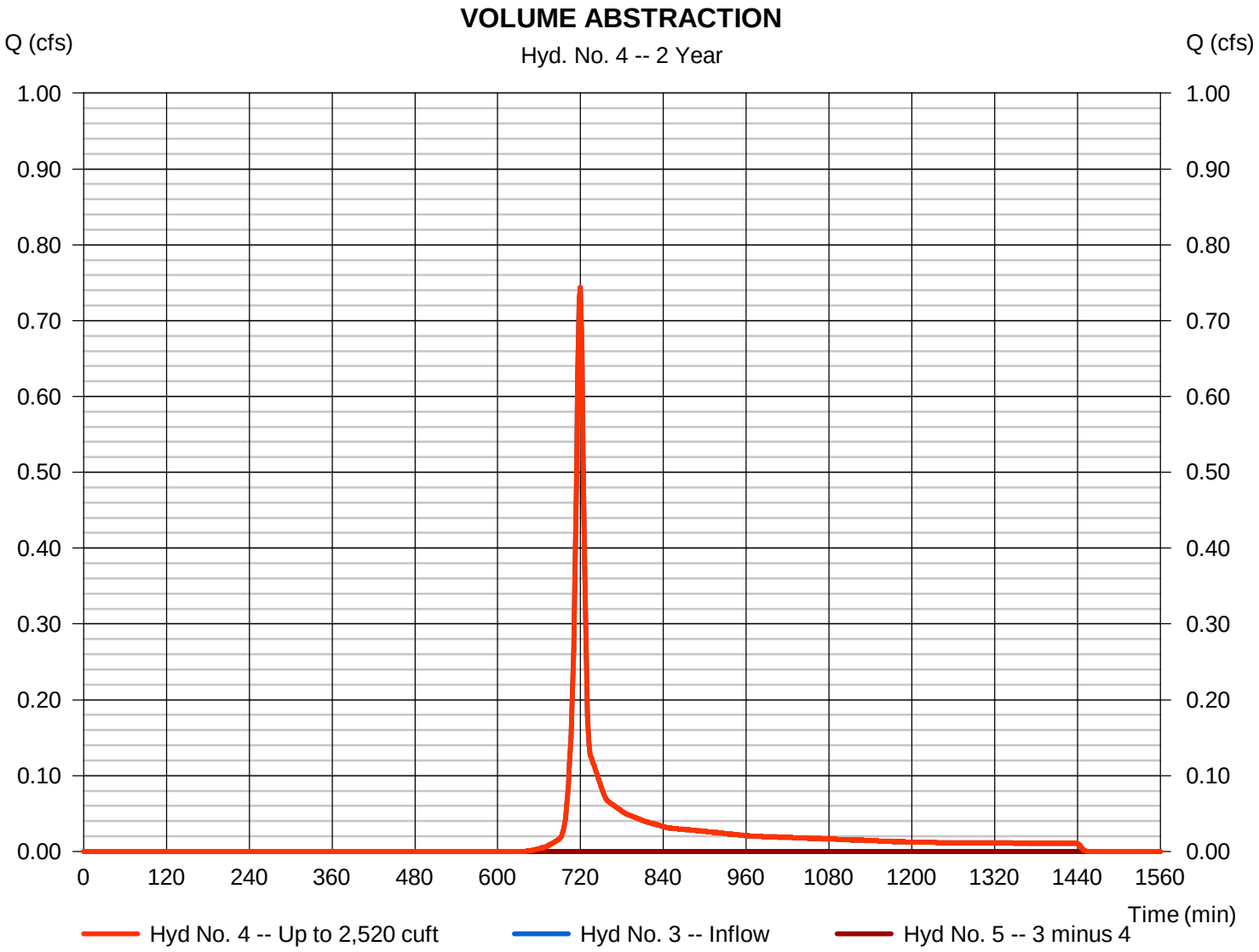
Total Travel Time, Tc ..... 9.10 min

Hydrograph Report

Hyd. No. 4

VOLUME ABSTRACTION

Hydrograph type	= Diversion1	Peak discharge	= 0.744 cfs
Storm frequency	= 2 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 1,713 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 5
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

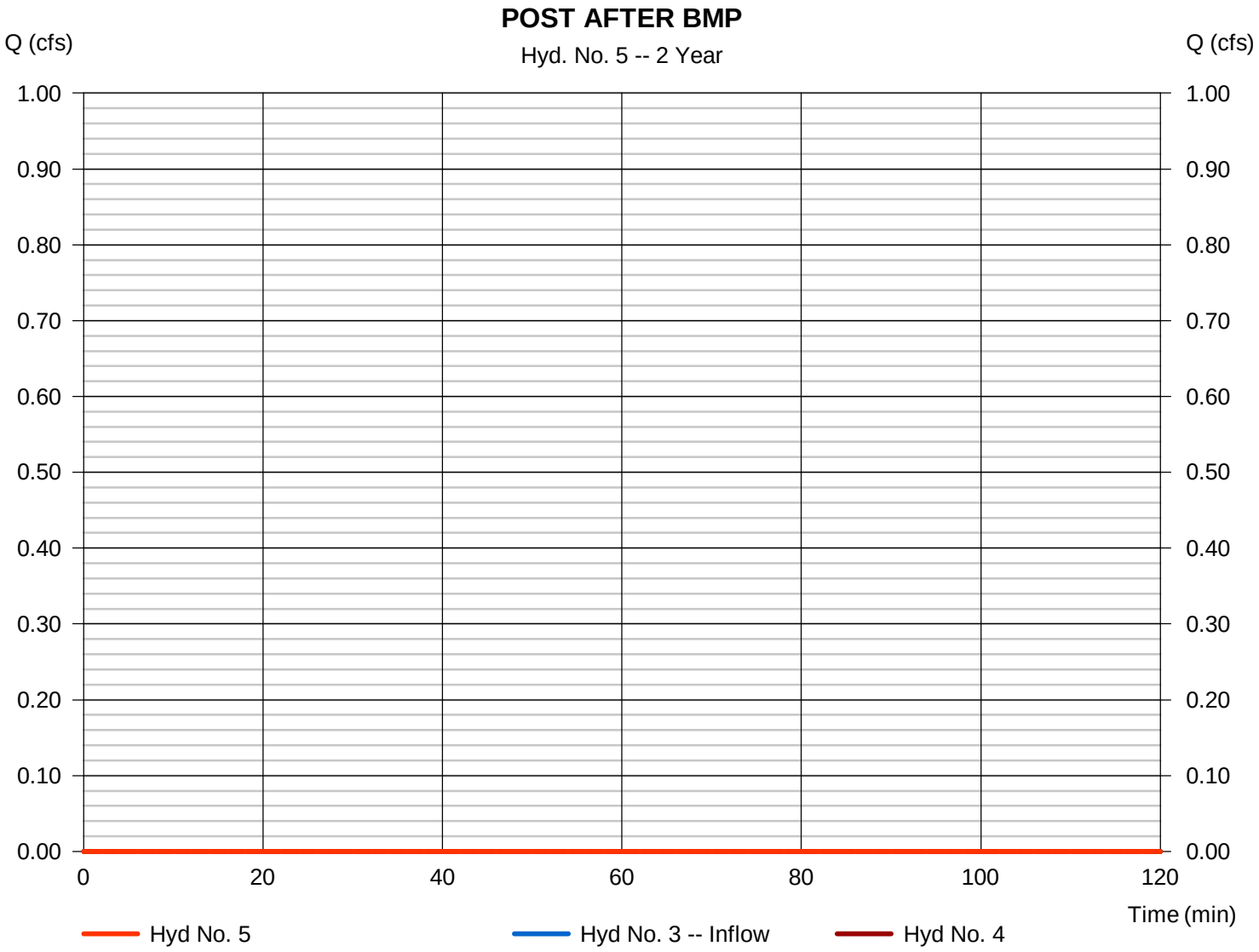


Hydrograph Report

Hyd. No. 5

POST AFTER BMP

Hydrograph type	= Diversion2	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 4
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

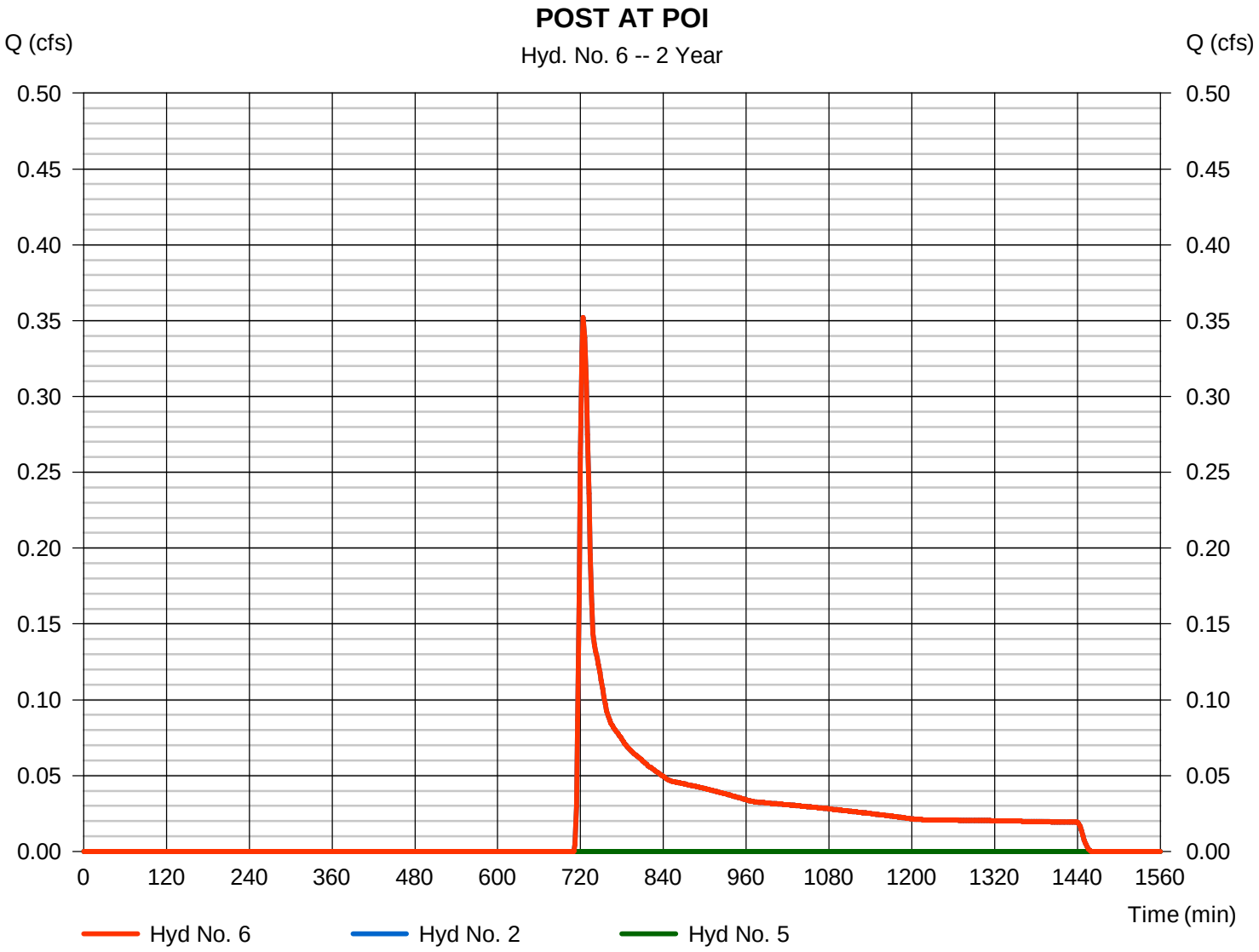


Hydrograph Report

Hyd. No. 6

POST AT POI

Hydrograph type	=	Combine	Peak discharge	=	0.352 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,803 cuft
Inflow hyds.	=	2, 5	Contrib. drain. area	=	1.660 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

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	2.499	2	722	7,427	------	------	------	PRE
2	SCS Runoff	1.966	2	722	5,843	------	------	------	POST UNDETAINED
3	SCS Runoff	1.560	2	718	3,571	------	------	------	POST DETAINED
4	Diversion1	1.560	2	718	2,523	3	------	------	VOLUME ABSTRACTION
5	Diversion2	0.058	2	846	1,047	3	------	------	POST AFTER BMP
6	Combine	1.966	2	722	6,891	2, 5	------	------	POST AT POI

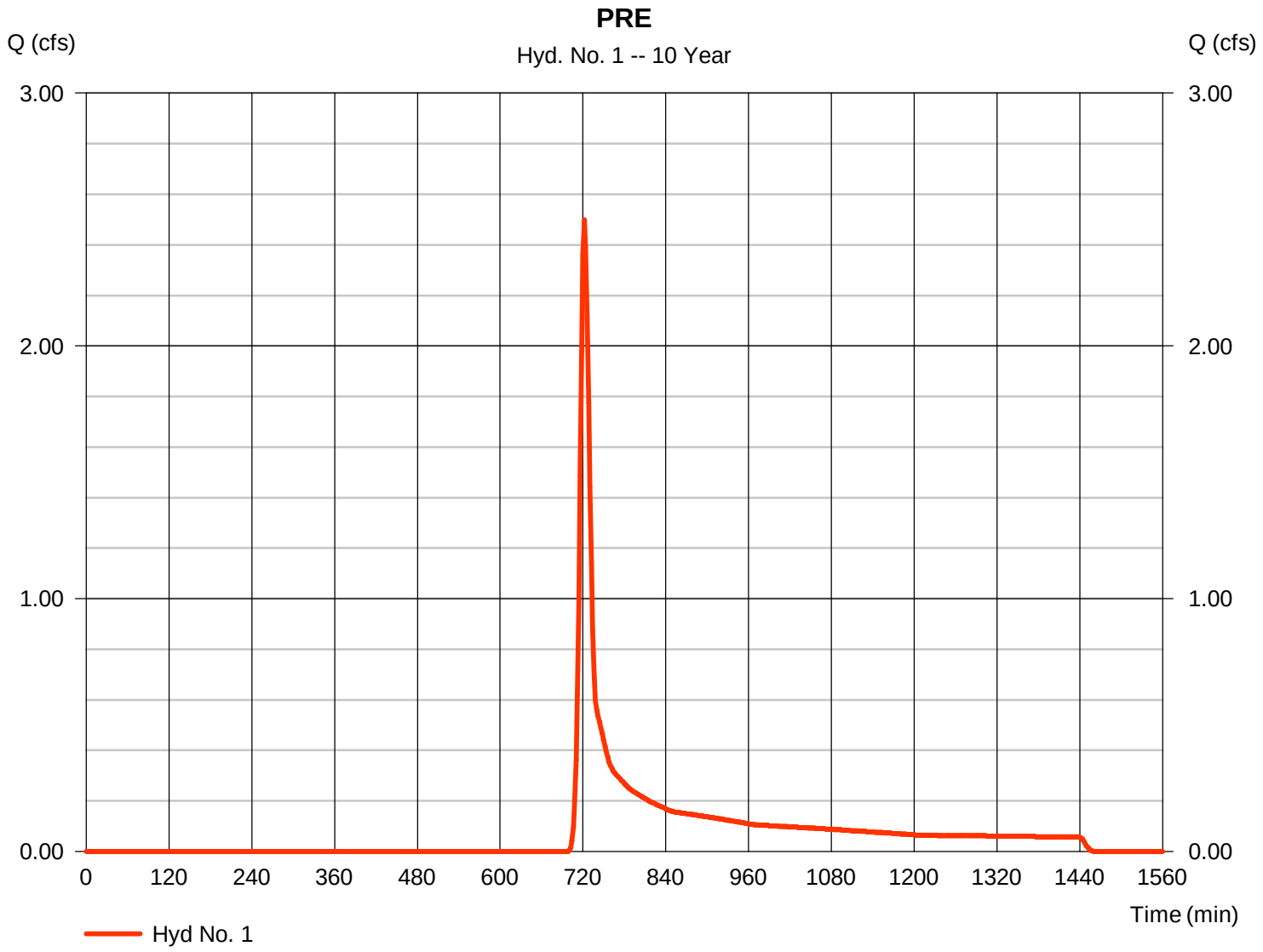
Hydrograph Report

Hyd. No. 1

PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.499 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	7,427 cuft
Drainage area	=	2.110 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	4.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.110 x 58)] / 2.110



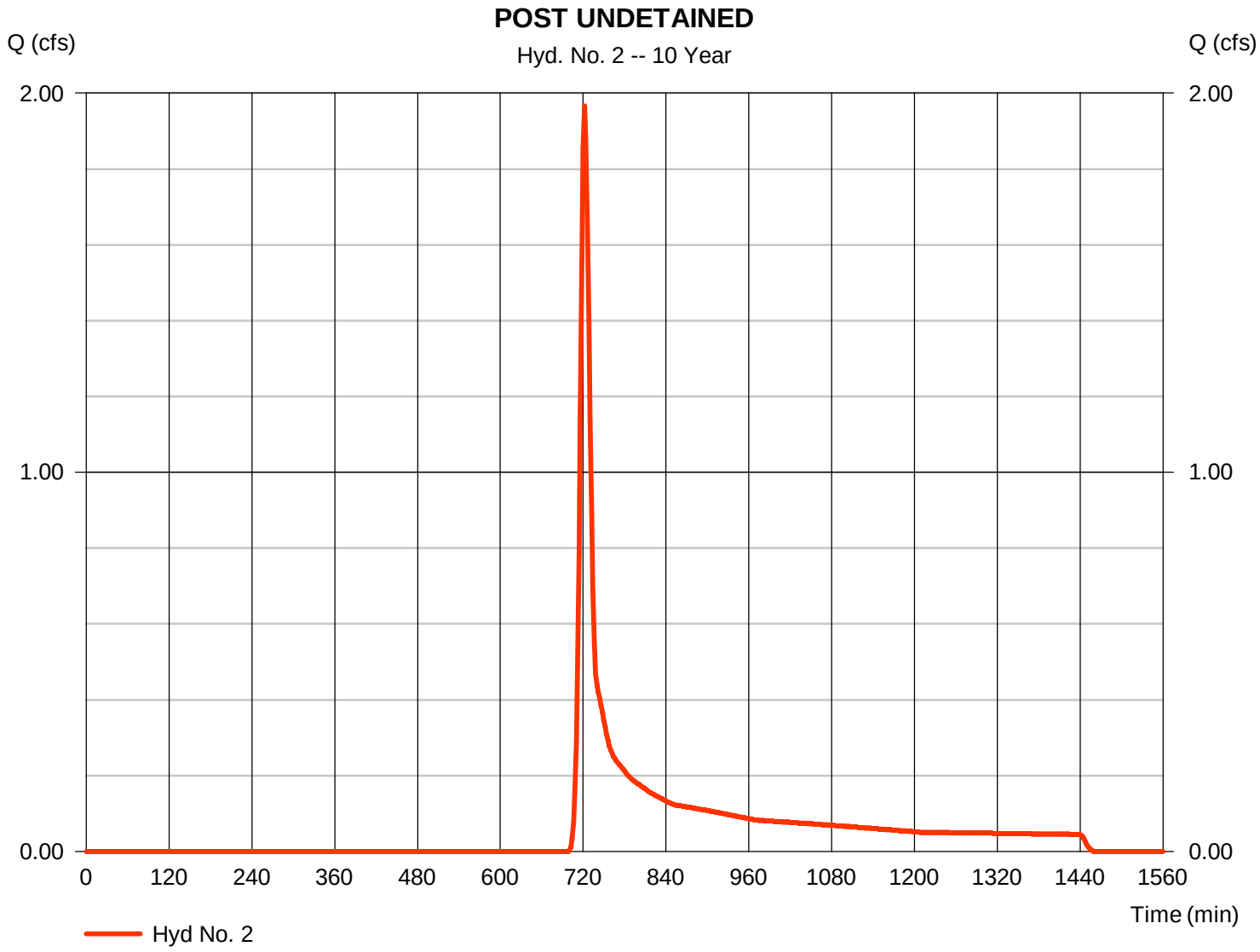
Hydrograph Report

Hyd. No. 2

POST UNDETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.966 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	5,843 cuft
Drainage area	=	1.660 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	4.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.660 x 58)] / 1.660



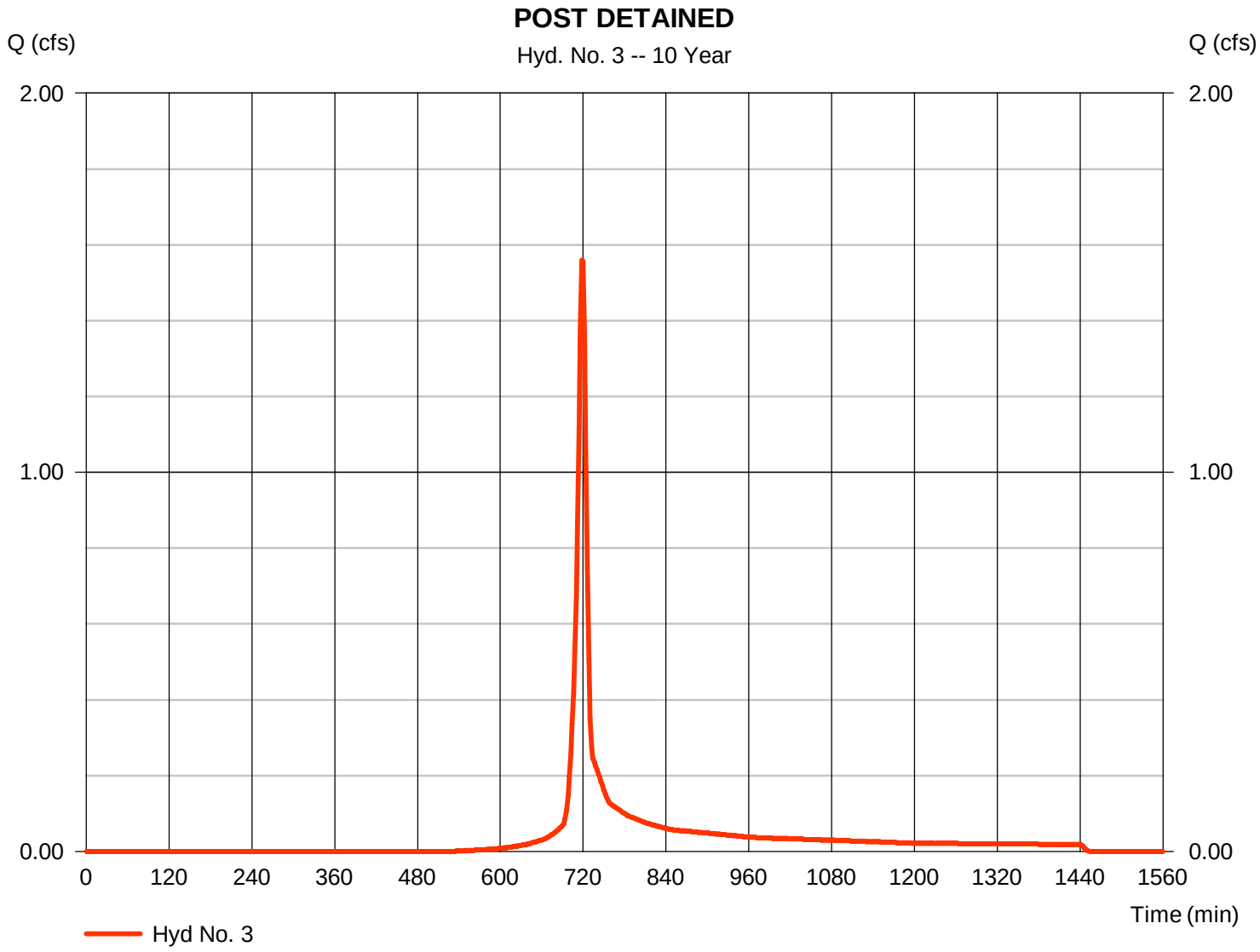
Hydrograph Report

Hyd. No. 3

POST DETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.560 cfs
Storm frequency	=	10 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	3,571 cuft
Drainage area	=	0.450 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.10 min
Total precip.	=	4.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.300 x 85) + (0.150 x 58)] / 0.450

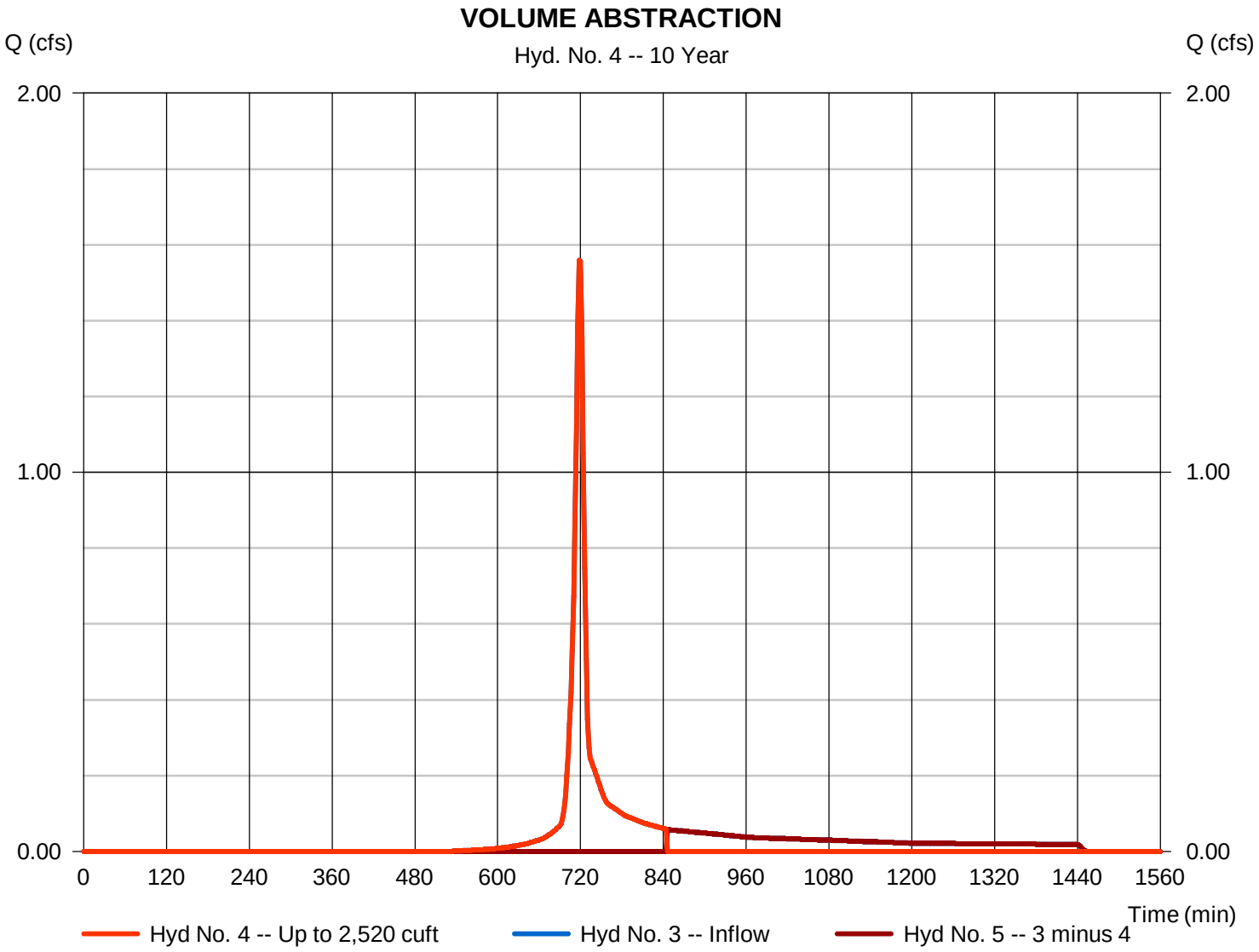


Hydrograph Report

Hyd. No. 4

VOLUME ABSTRACTION

Hydrograph type	= Diversion1	Peak discharge	= 1.560 cfs
Storm frequency	= 10 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 2,523 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 5
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

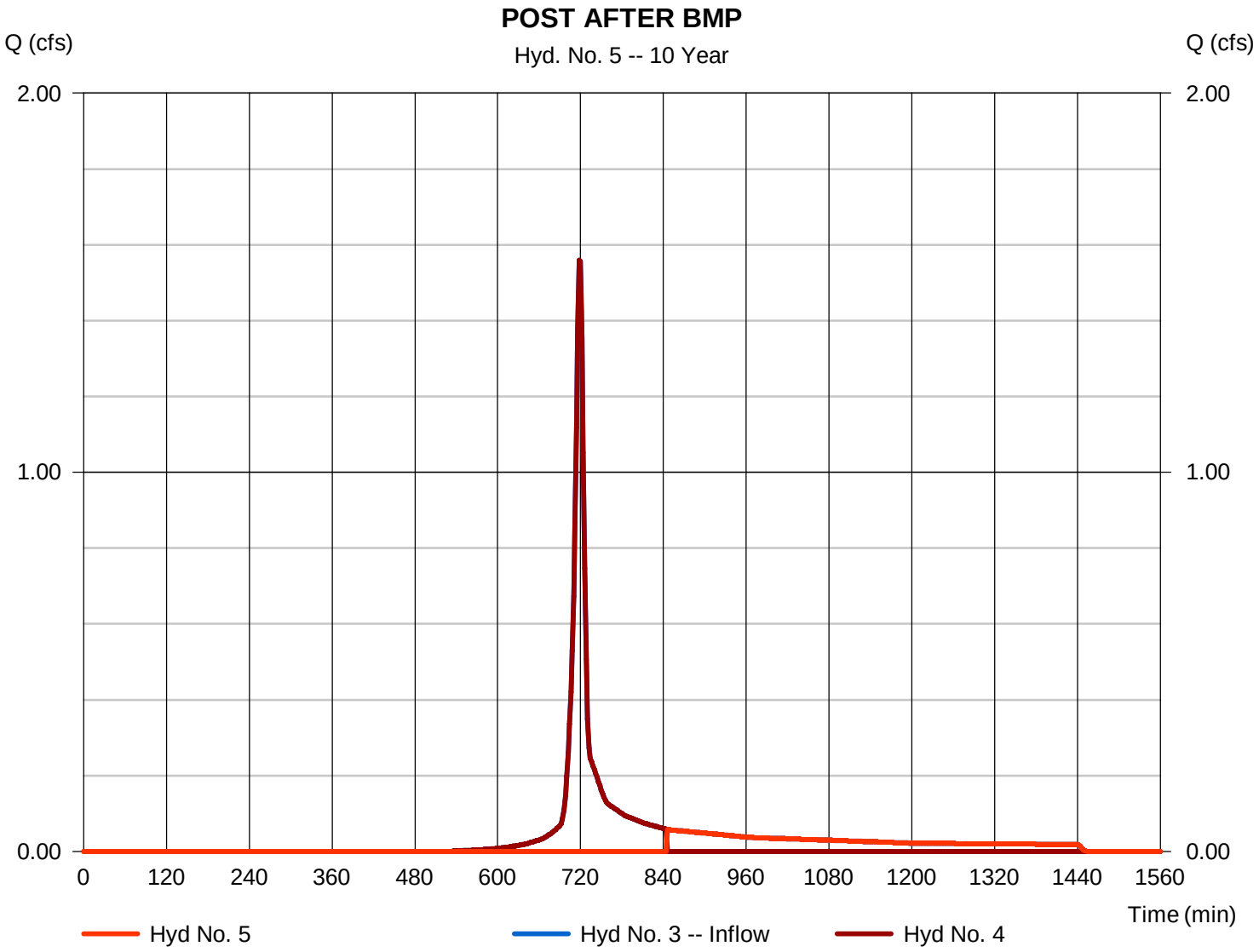


Hydrograph Report

Hyd. No. 5

POST AFTER BMP

Hydrograph type	= Diversion2	Peak discharge	= 0.058 cfs
Storm frequency	= 10 yrs	Time to peak	= 846 min
Time interval	= 2 min	Hyd. volume	= 1,047 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 4
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

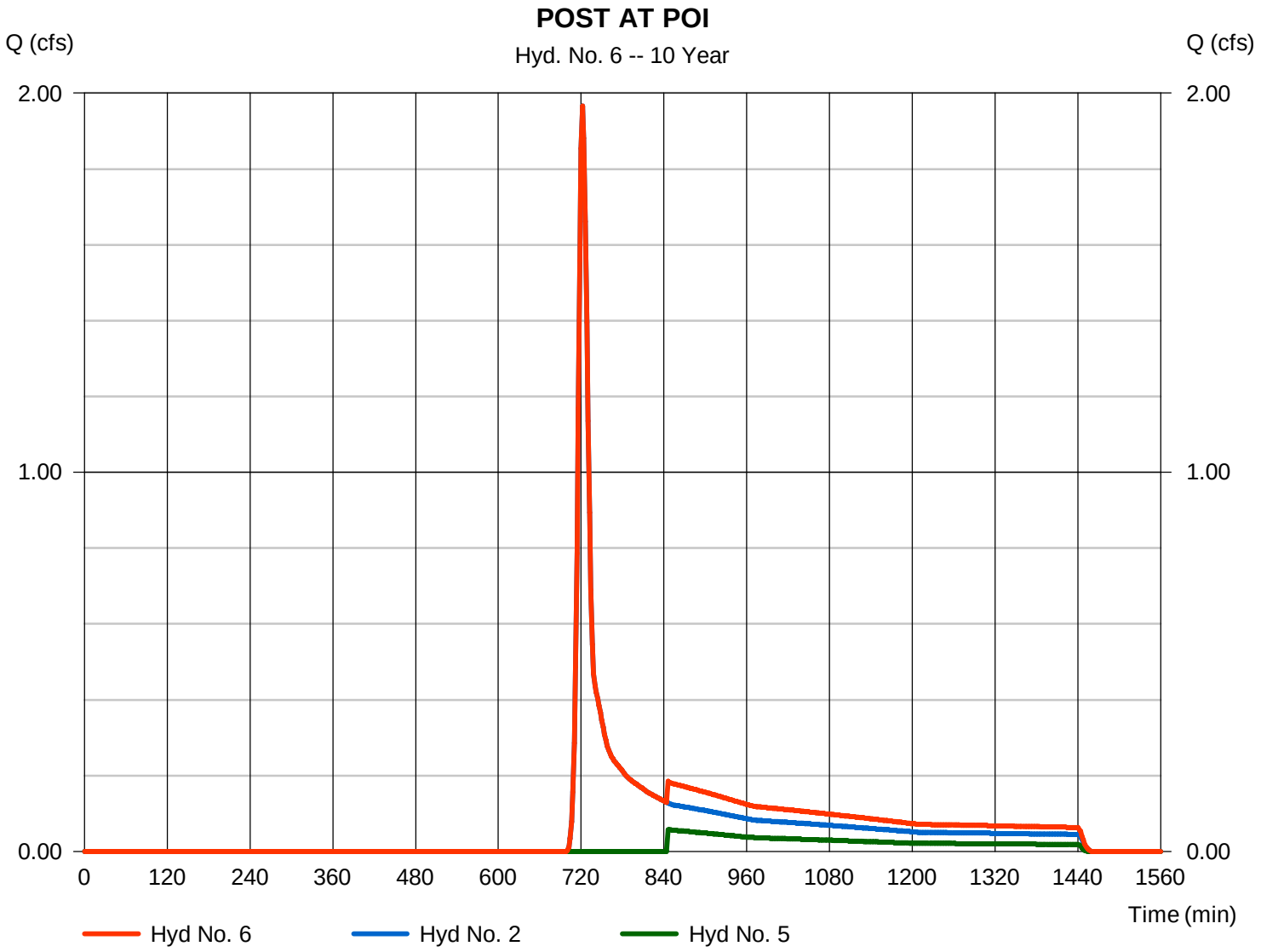


Hydrograph Report

Hyd. No. 6

POST AT POI

Hydrograph type	=	Combine	Peak discharge	=	1.966 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	6,891 cuft
Inflow hyds.	=	2, 5	Contrib. drain. area	=	1.660 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

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	6.205	2	722	16,604	------	------	------	PRE
2	SCS Runoff	4.882	2	722	13,063	------	------	------	POST UNDETAINED
3	SCS Runoff	2.736	2	718	6,290	------	------	------	POST DETAINED
4	Diversion1	2.736	2	718	2,570	3	------	------	VOLUME ABSTRACTION
5	Diversion2	2.326	2	722	3,720	3	------	------	POST AFTER BMP
6	Combine	7.208	2	722	16,783	2, 5	------	------	POST AT POI

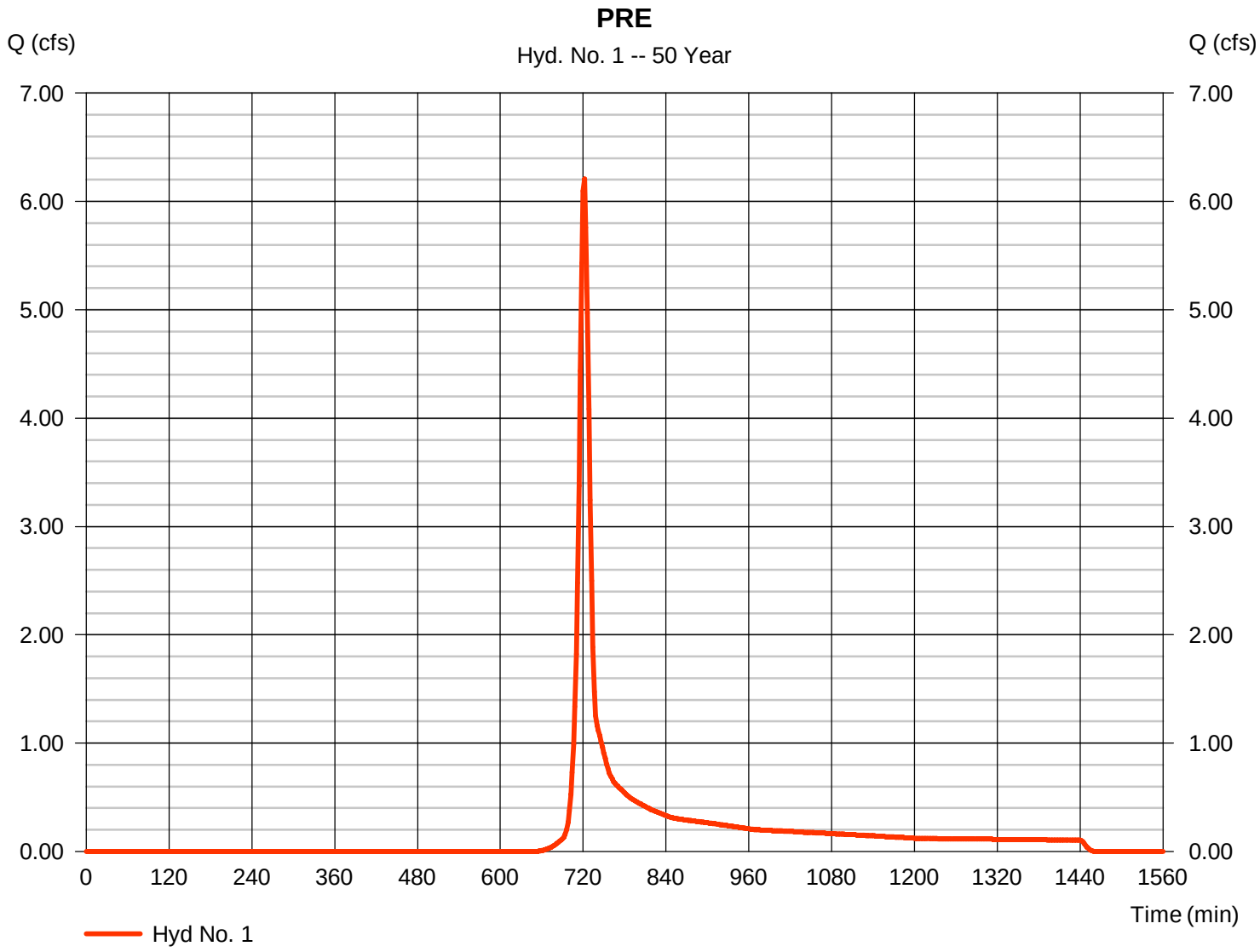
Hydrograph Report

Hyd. No. 1

PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.205 cfs
Storm frequency	=	50 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	16,604 cuft
Drainage area	=	2.110 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	6.54 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.110 x 58)] / 2.110



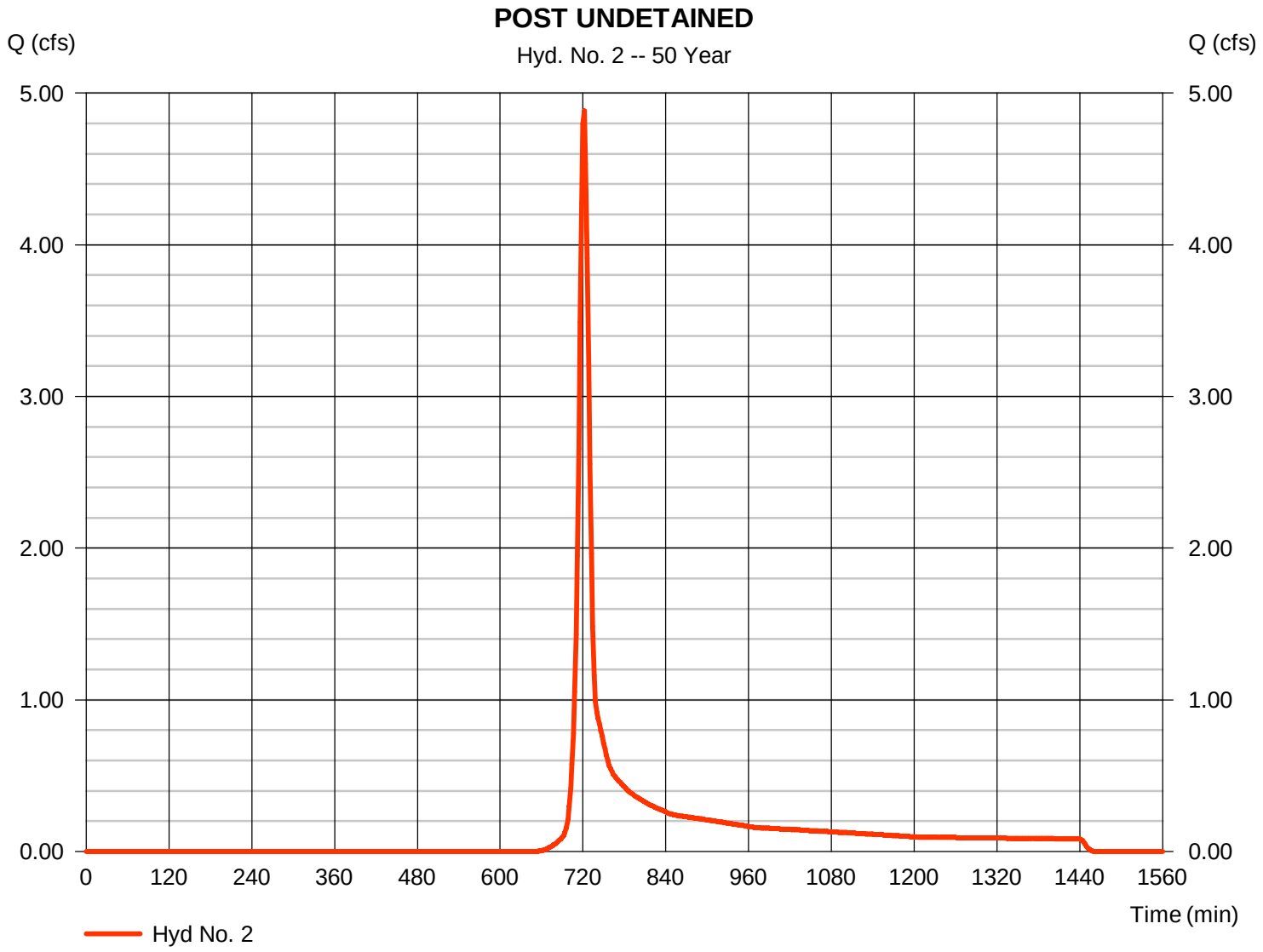
Hydrograph Report

Hyd. No. 2

POST UNDETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.882 cfs
Storm frequency	=	50 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	13,063 cuft
Drainage area	=	1.660 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	6.54 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.660 x 58)] / 1.660



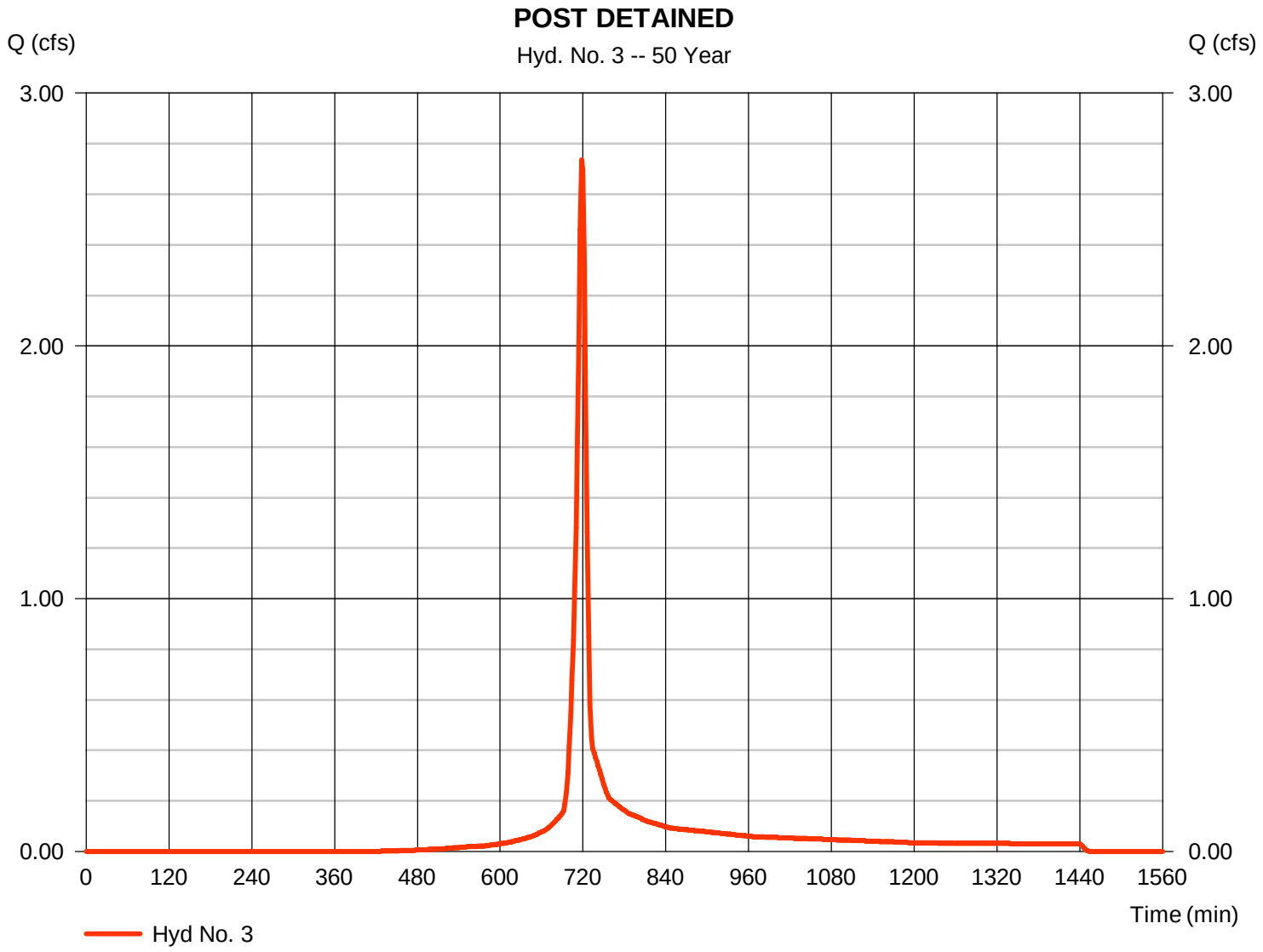
Hydrograph Report

Hyd. No. 3

POST DETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.736 cfs
Storm frequency	=	50 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	6,290 cuft
Drainage area	=	0.450 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.10 min
Total precip.	=	6.54 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.300 x 85) + (0.150 x 58)] / 0.450

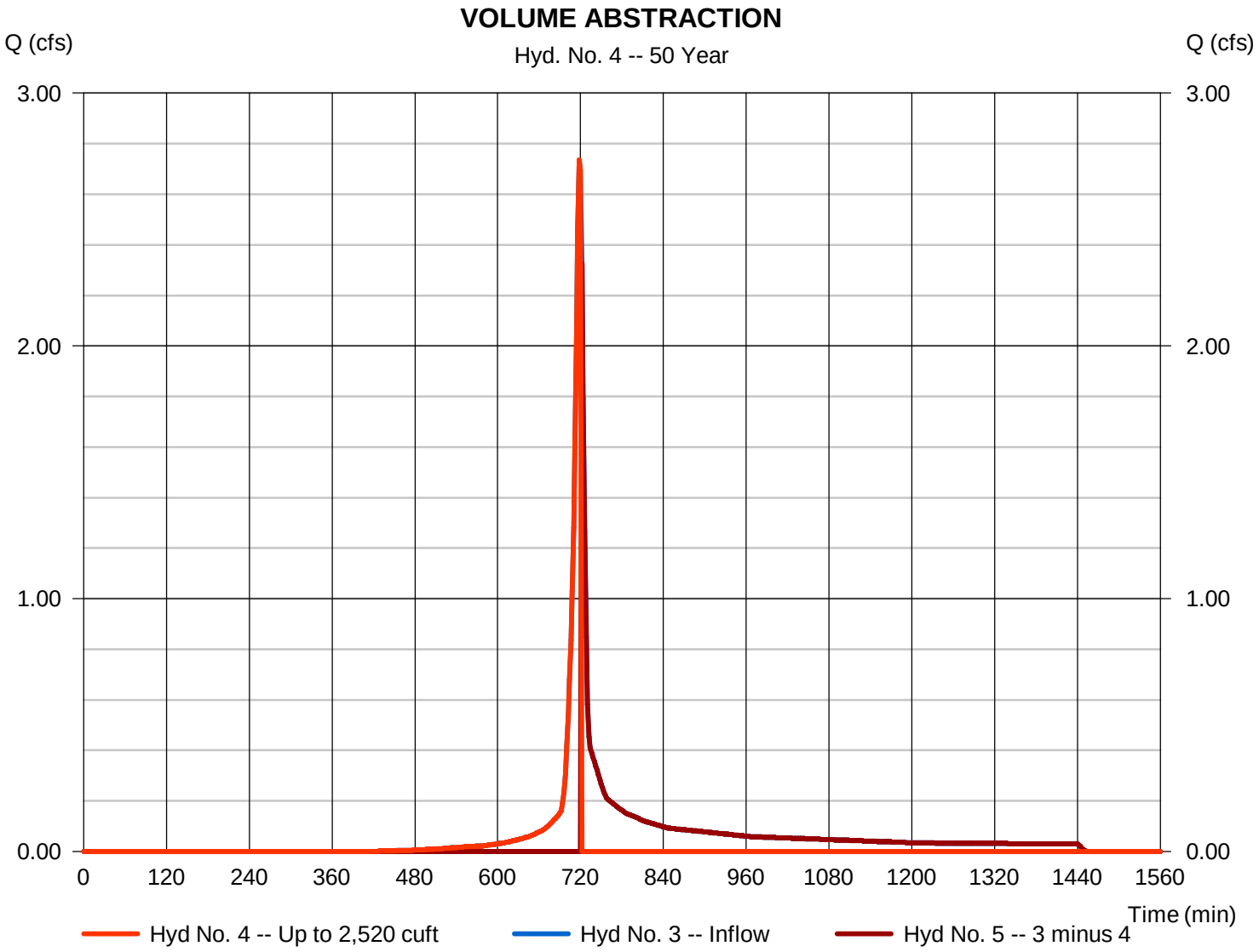


Hydrograph Report

Hyd. No. 4

VOLUME ABSTRACTION

Hydrograph type	= Diversion1	Peak discharge	= 2.736 cfs
Storm frequency	= 50 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 2,570 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 5
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

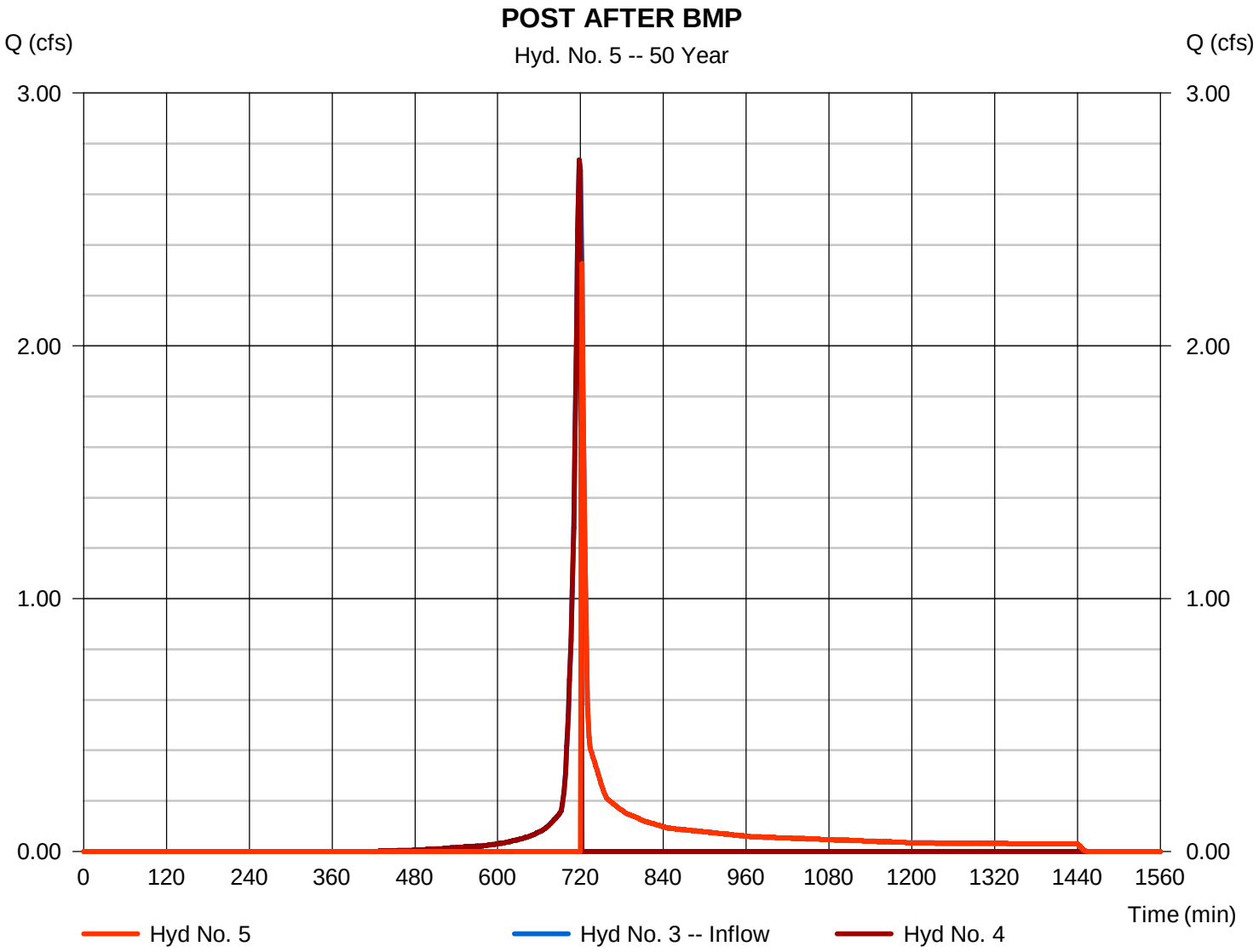


Hydrograph Report

Hyd. No. 5

POST AFTER BMP

Hydrograph type	= Diversion2	Peak discharge	= 2.326 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 3,720 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 4
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

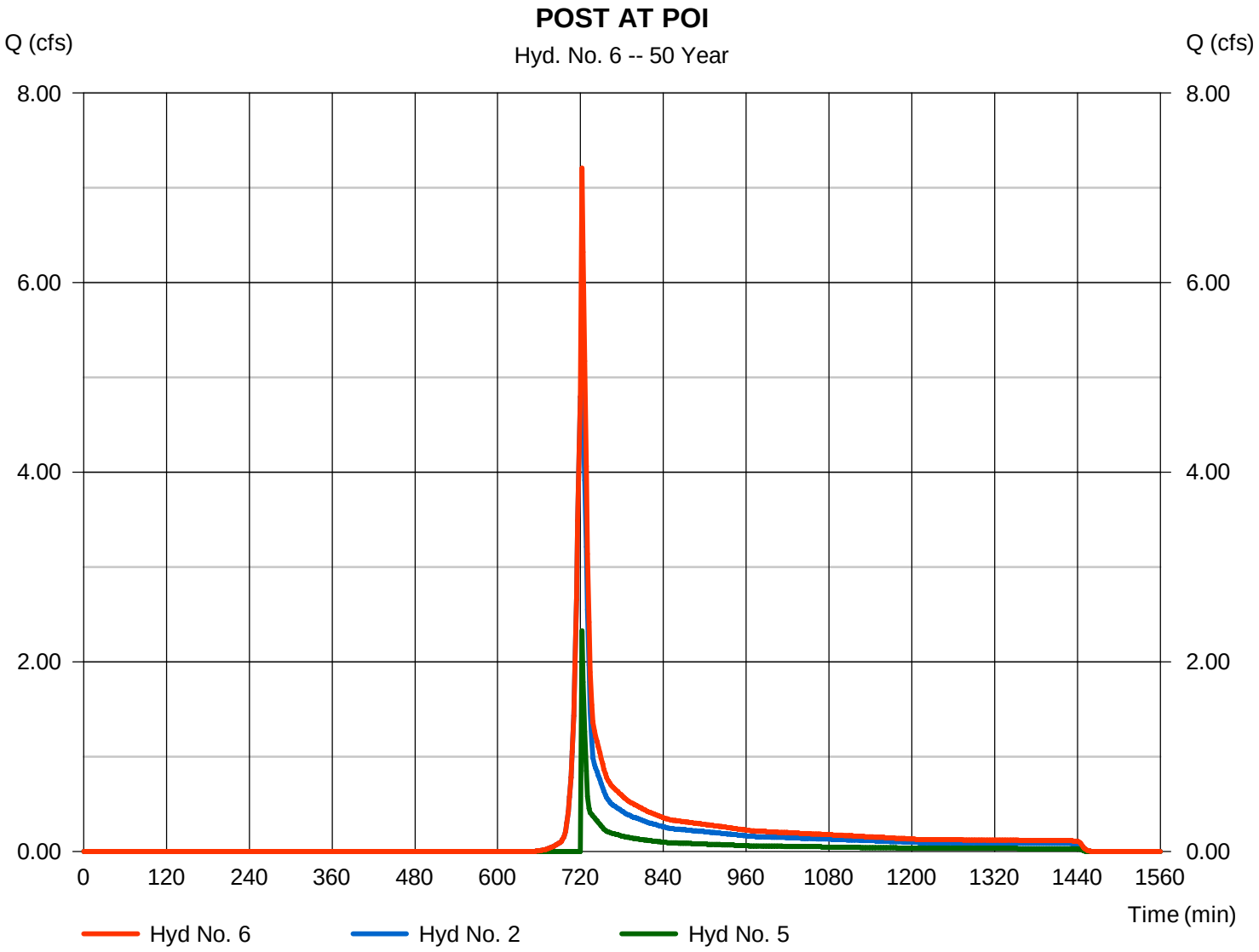


Hydrograph Report

Hyd. No. 6

POST AT POI

Hydrograph type	=	Combine	Peak discharge	=	7.208 cfs
Storm frequency	=	50 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	16,783 cuft
Inflow hyds.	=	2, 5	Contrib. drain. area	=	1.660 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

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	8.378	2	722	22,095	------	------	------	PRE
2	SCS Runoff	6.592	2	722	17,383	------	------	------	POST UNDETAINED
3	SCS Runoff	3.363	2	718	7,774	------	------	------	POST DETAINED
4	Diversion1	3.363	2	718	2,914	3	------	------	VOLUME ABSTRACTION
5	Diversion2	3.300	2	720	4,861	3	------	------	POST AFTER BMP
6	Combine	9.835	2	720	22,244	2, 5	------	------	POST AT POI

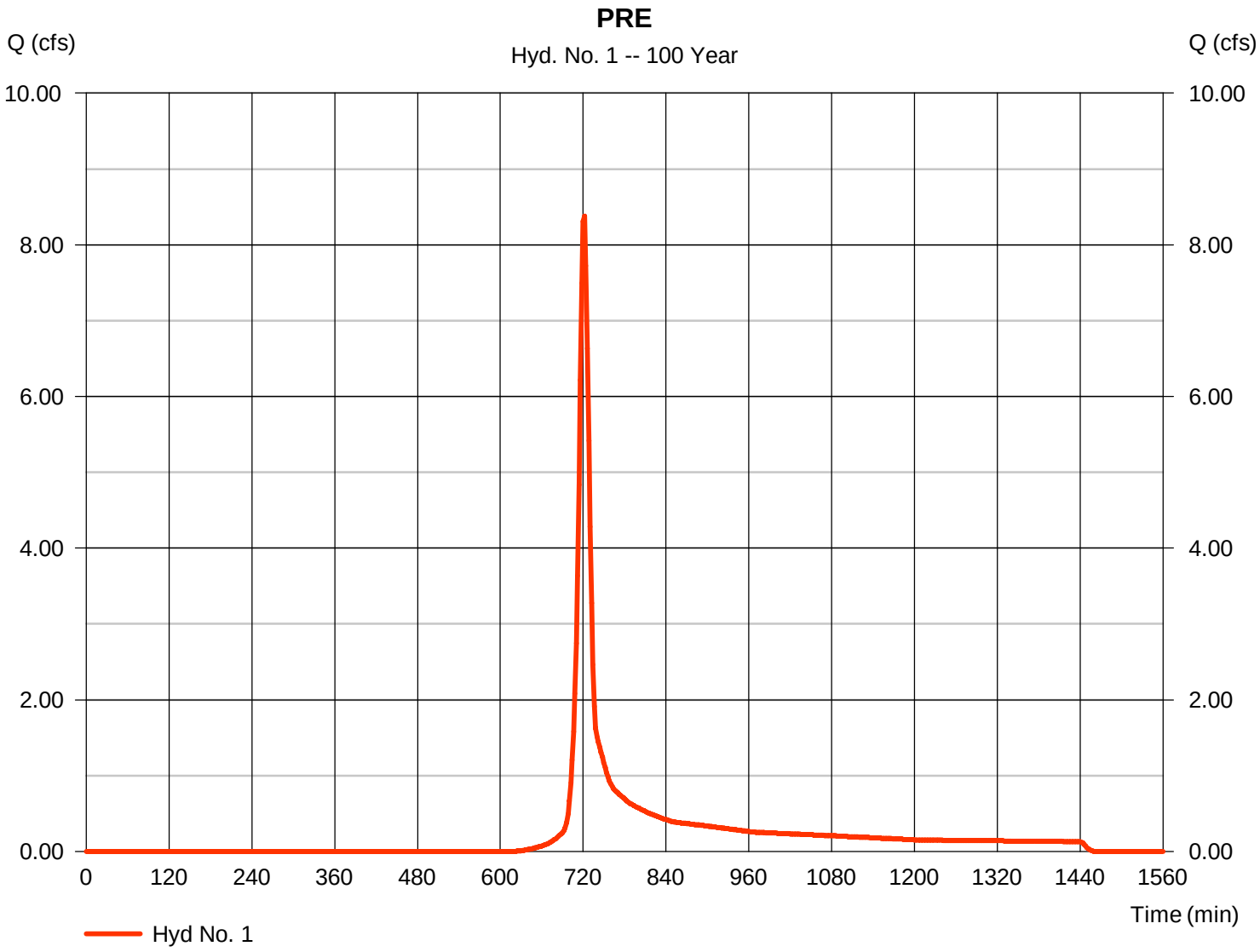
Hydrograph Report

Hyd. No. 1

PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.378 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	22,095 cuft
Drainage area	=	2.110 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	7.56 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.110 x 58)] / 2.110



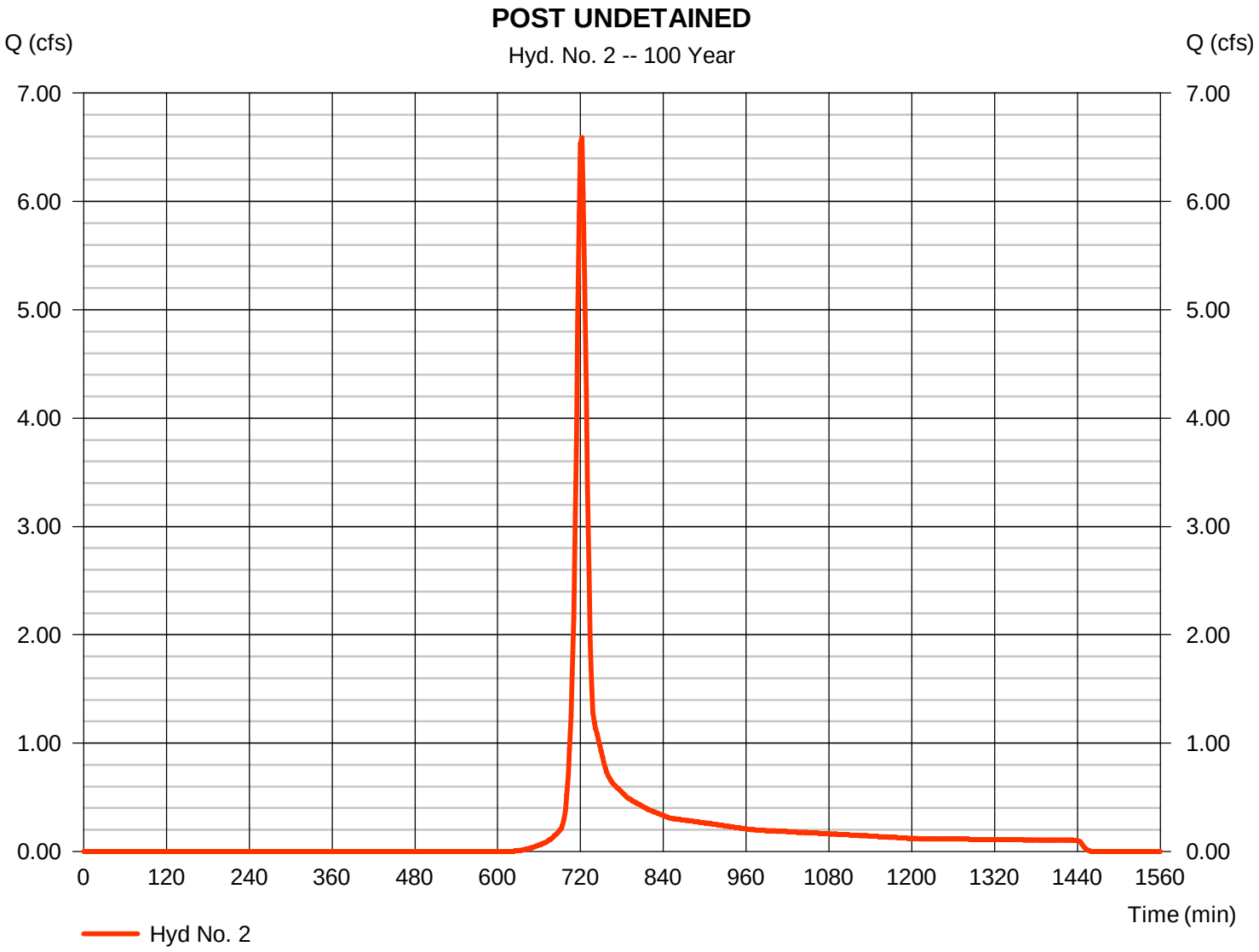
Hydrograph Report

Hyd. No. 2

POST UNDETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.592 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	17,383 cuft
Drainage area	=	1.660 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	7.56 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.660 x 58)] / 1.660



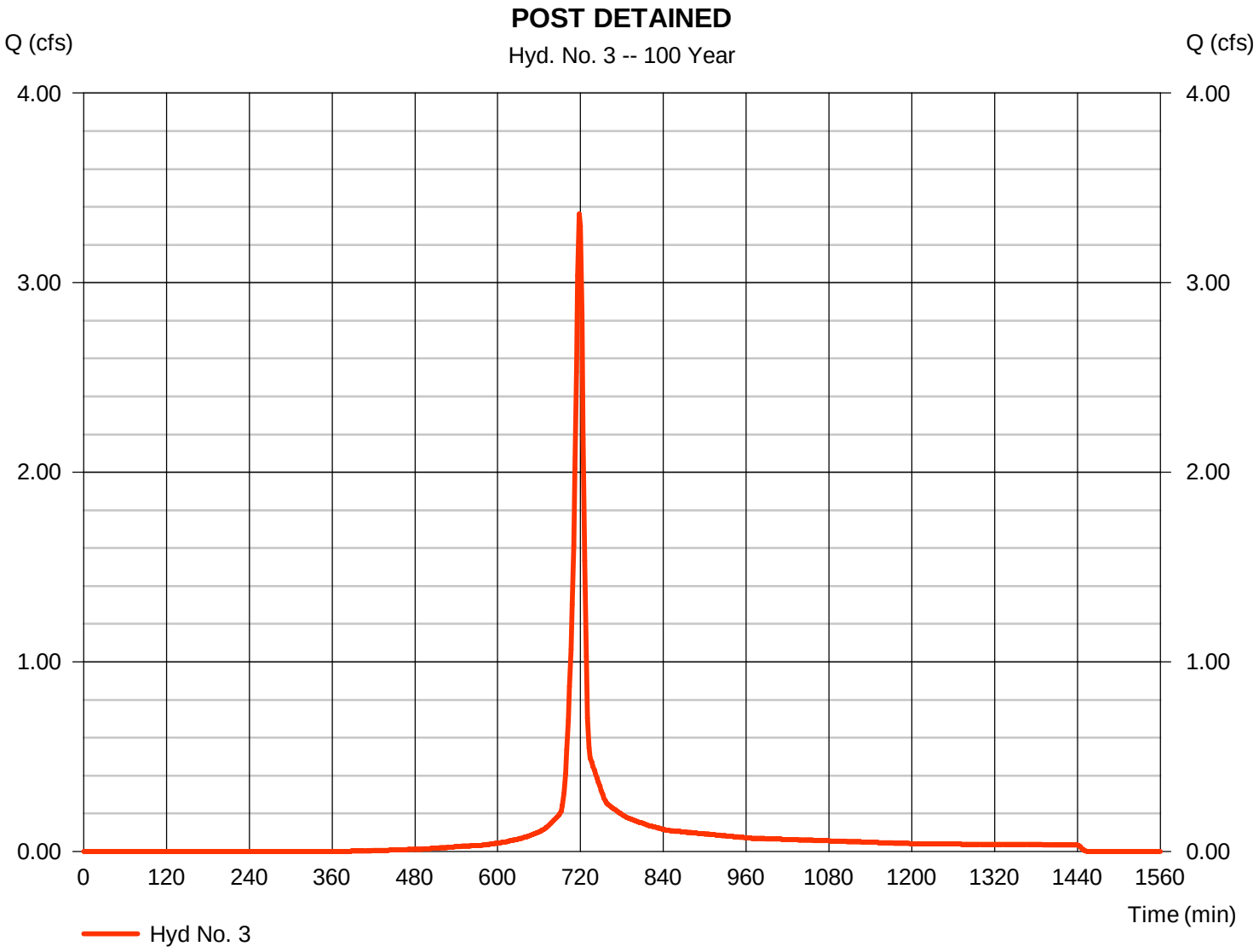
Hydrograph Report

Hyd. No. 3

POST DETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.363 cfs
Storm frequency	=	100 yrs	Time to peak	=	718 min
Time interval	=	2 min	Hyd. volume	=	7,774 cuft
Drainage area	=	0.450 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	9.10 min
Total precip.	=	7.56 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.300 x 85) + (0.150 x 58)] / 0.450

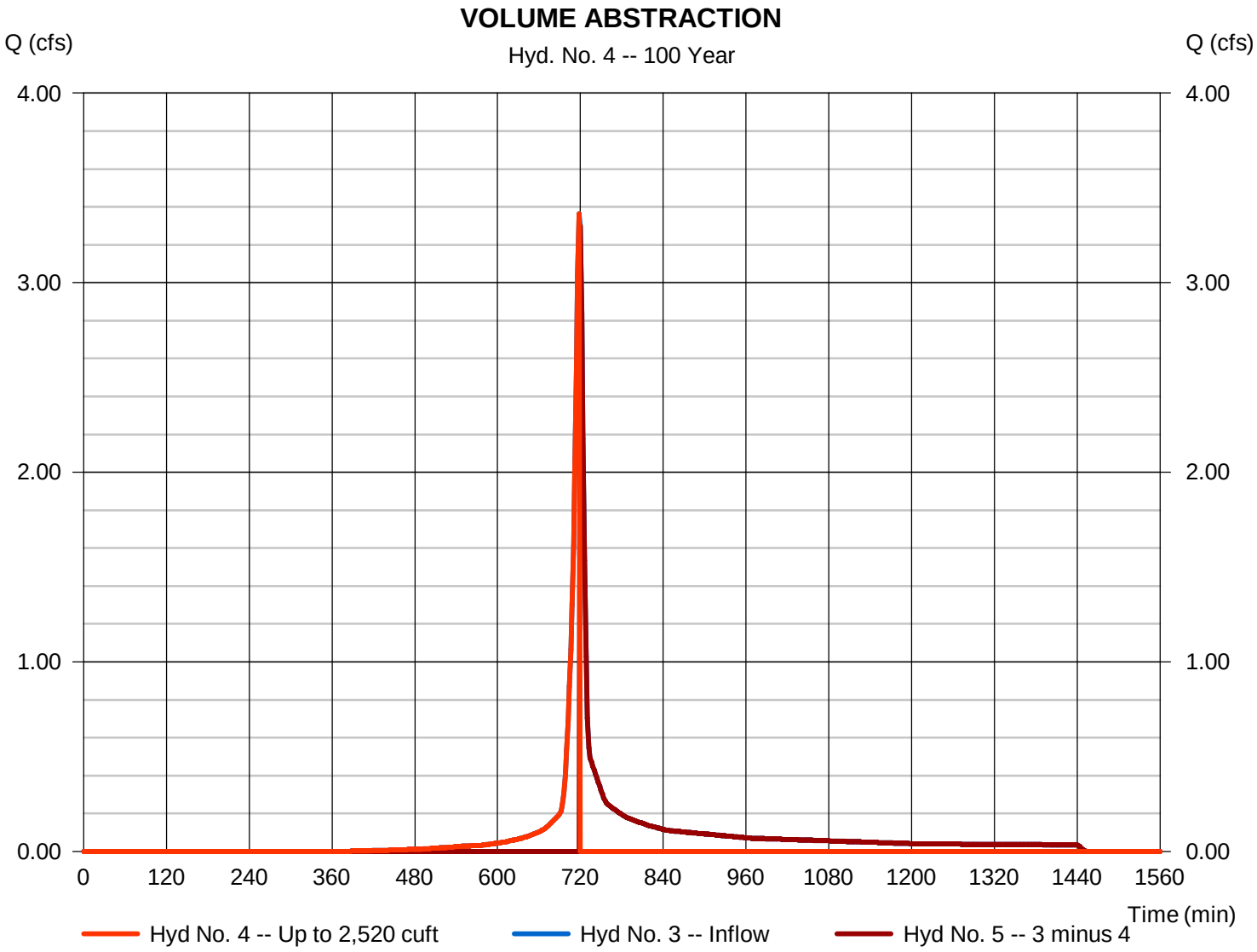


Hydrograph Report

Hyd. No. 4

VOLUME ABSTRACTION

Hydrograph type	= Diversion1	Peak discharge	= 3.363 cfs
Storm frequency	= 100 yrs	Time to peak	= 718 min
Time interval	= 2 min	Hyd. volume	= 2,914 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 5
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

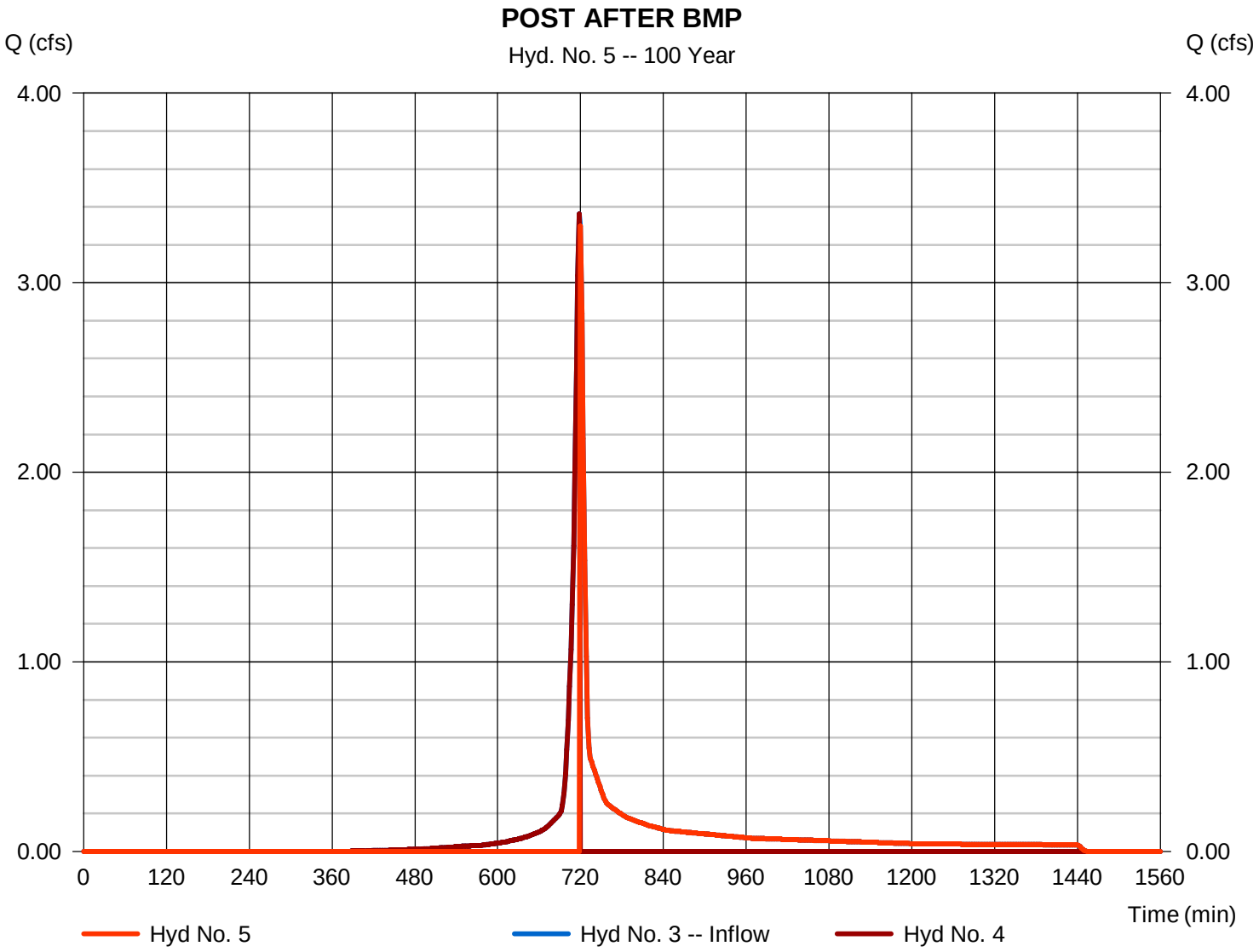


Hydrograph Report

Hyd. No. 5

POST AFTER BMP

Hydrograph type	= Diversion2	Peak discharge	= 3.300 cfs
Storm frequency	= 100 yrs	Time to peak	= 720 min
Time interval	= 2 min	Hyd. volume	= 4,861 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 4
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

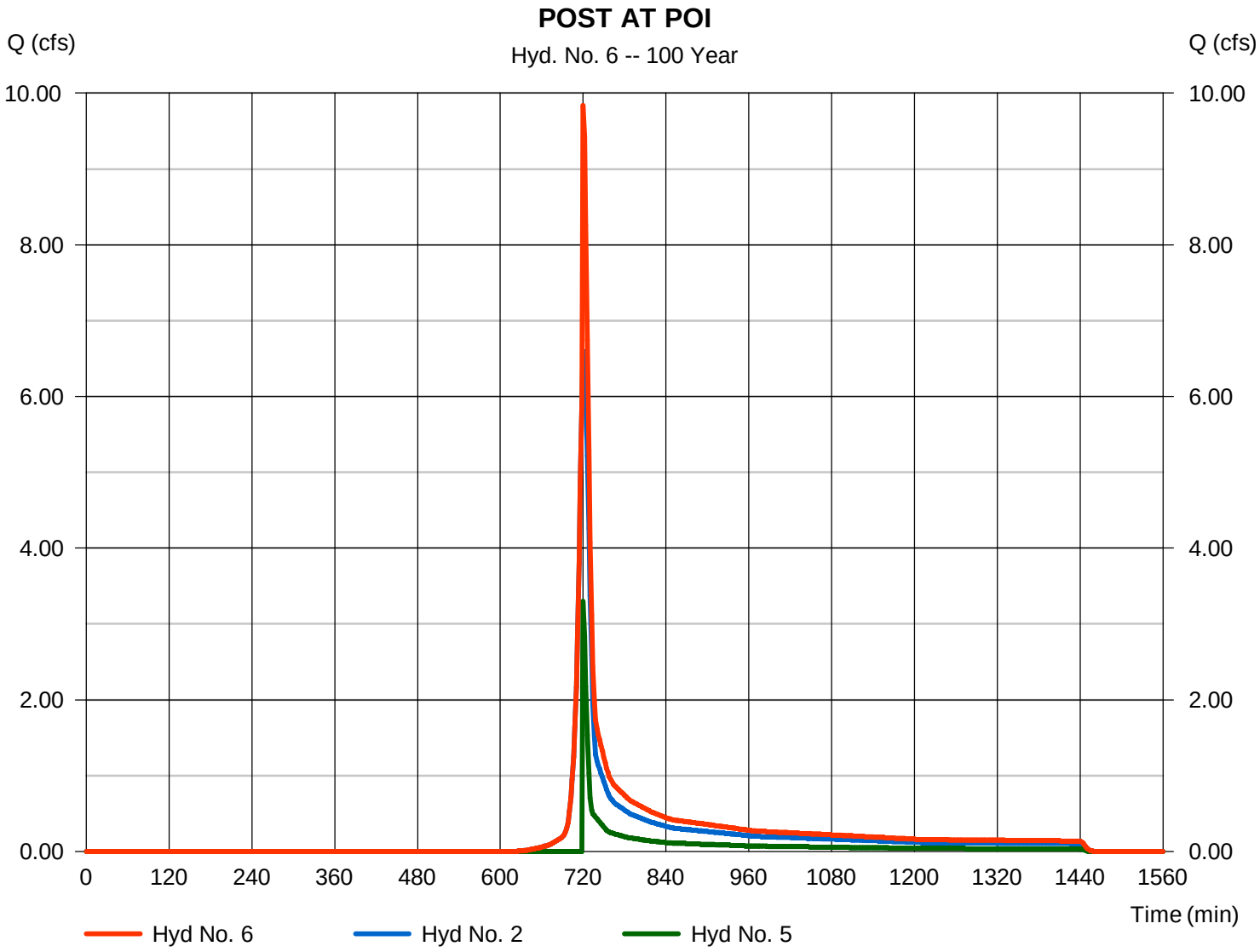


Hydrograph Report

Hyd. No. 6

POST AT POI

Hydrograph type	=	Combine	Peak discharge	=	9.835 cfs
Storm frequency	=	100 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	22,244 cuft
Inflow hyds.	=	2, 5	Contrib. drain. area	=	1.660 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	52.5846	12.7000	0.9001	--------
2	59.4970	12.7000	0.8832	--------
3	0.0000	0.0000	0.0000	--------
5	56.2308	11.8000	0.8214	--------
10	58.6750	11.8000	0.8001	--------
25	51.8954	10.5000	0.7395	--------
50	45.1449	9.2000	0.6848	--------
100	43.0569	8.6000	0.6532	--------

File name: Schaeffer Road IDF.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	3.96	3.16	2.65	2.28	2.00	1.79	1.62	1.48	1.37	1.27	1.18	1.11
2	4.70	3.77	3.17	2.73	2.41	2.16	1.96	1.79	1.66	1.54	1.44	1.35
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.54	4.47	3.77	3.28	2.91	2.62	2.39	2.20	2.04	1.90	1.78	1.68
10	6.14	4.98	4.22	3.68	3.28	2.96	2.70	2.49	2.32	2.16	2.03	1.92
25	6.84	5.56	4.73	4.14	3.70	3.36	3.08	2.85	2.66	2.50	2.35	2.23
50	7.34	5.97	5.09	4.48	4.02	3.66	3.37	3.13	2.93	2.76	2.61	2.48
100	7.83	6.38	5.46	4.82	4.34	3.96	3.66	3.41	3.20	3.01	2.86	2.72

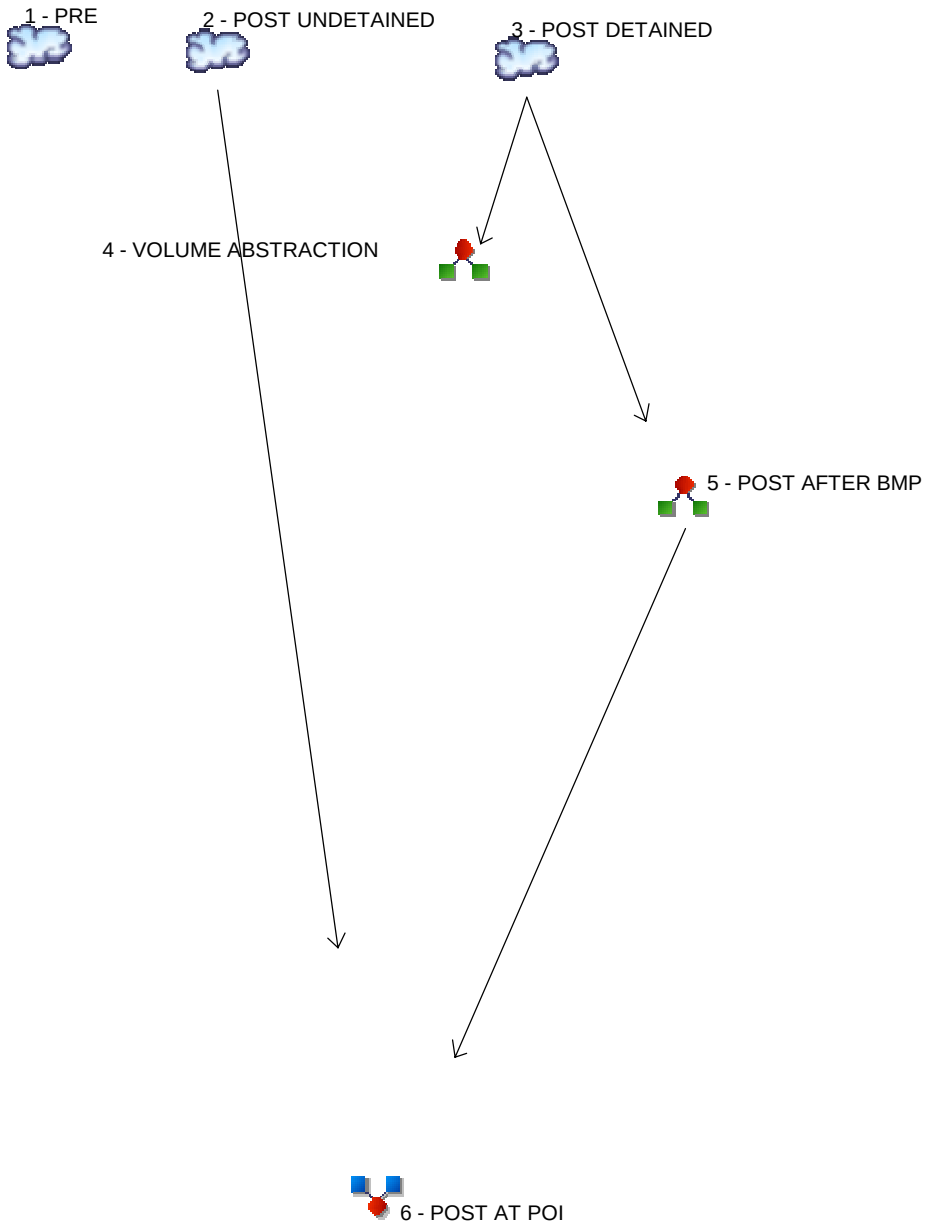
Tc = time in minutes. Values may exceed 60.

P-2\PPP\02 SCRO\07 PCSM\Attach 4 Stormwater Calcs\Schaeffer Road\Hydraflow Rev 1\Schaeffer Road Precip.pc

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.53	3.05	0.00	3.87	4.57	5.62	6.54	7.56
SCS 6-Hr	1.78	2.16	0.00	2.71	3.17	3.83	4.39	5.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4



Legend

Hyd.	Origin	Description
1	SCS Runoff	PRE
2	SCS Runoff	POST UNDETAINED
3	SCS Runoff	POST DETAINED
4	Diversion1	VOLUME ABSTRACTION
5	Diversion2	POST AFTER BMP
6	Combine	POST AT POI

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

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	------	-------	0.448	-------	-------	-------	-------	-------	-------	PRE
2	SCS Runoff	------	-------	0.352	-------	-------	-------	-------	-------	-------	POST UNDETAINED
3	SCS Runoff	------	-------	0.283	-------	-------	-------	-------	-------	-------	POST DETAINED
4	Diversion1	3	-------	0.283	-------	-------	-------	-------	-------	-------	VOLUME ABSTRACTION
5	Diversion2	3	-------	0.000	-------	-------	-------	-------	-------	-------	POST AFTER BMP
6	Combine	2, 5	-------	0.352	-------	-------	-------	-------	-------	-------	POST AT POI

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	0.448	2	724	2,291	------	------	------	PRE
2	SCS Runoff	0.352	2	724	1,803	------	------	------	POST UNDETAINED
3	SCS Runoff	0.283	2	744	1,713	------	------	------	POST DETAINED
4	Diversion1	0.283	2	744	1,713	3	------	------	VOLUME ABSTRACTION
5	Diversion2	0.000	2	n/a	0	3	------	------	POST AFTER BMP
6	Combine	0.352	2	724	1,803	2, 5	------	------	POST AT POI

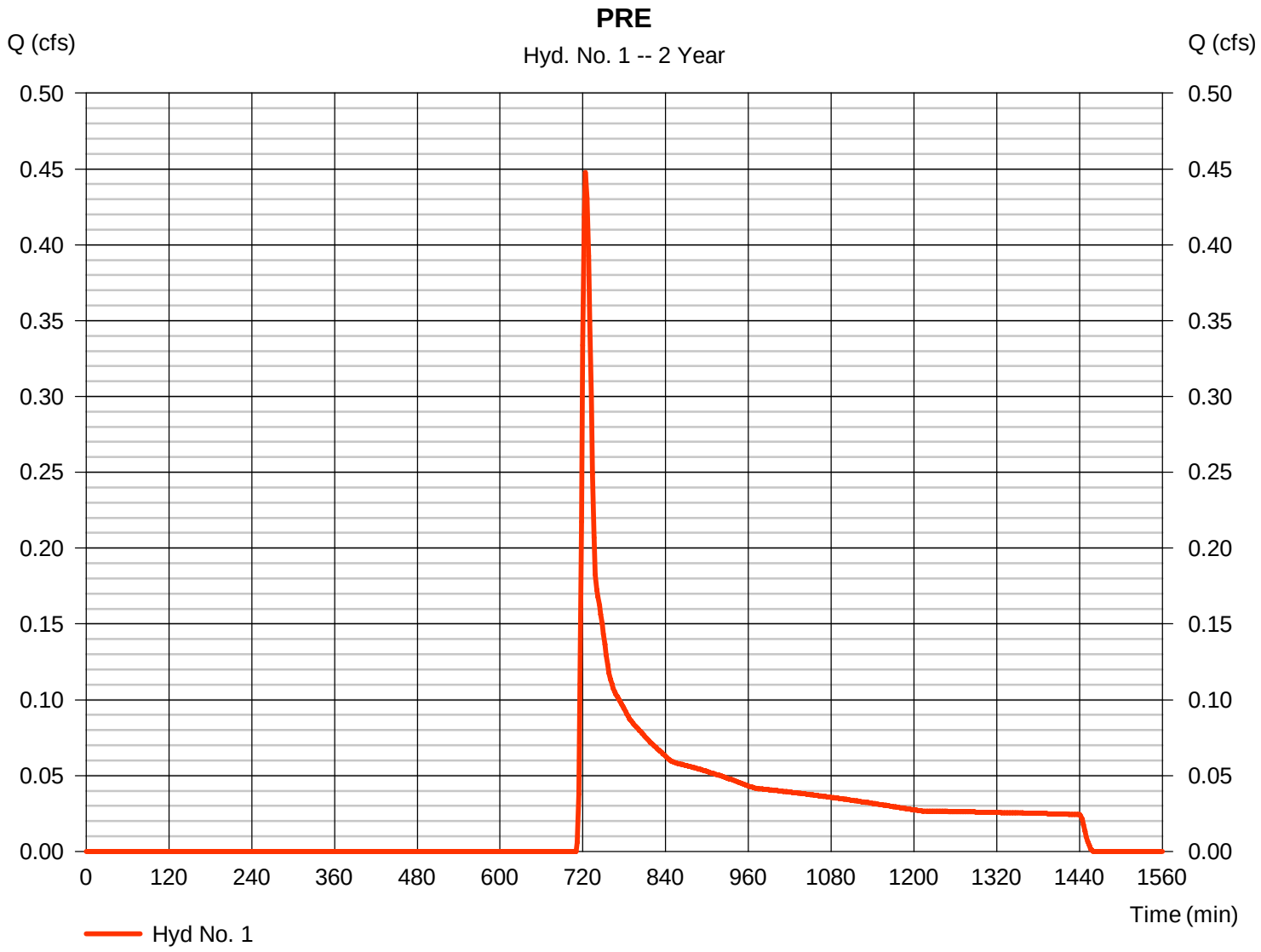
Hydrograph Report

Hyd. No. 1

PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.448 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	2,291 cuft
Drainage area	=	2.110 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	3.05 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.110 x 58)] / 2.110



TR55 Tc Worksheet

Hyd. No. 1

PRE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.40**	**+**	**0.00**	**+**	**0.00**	**=**	**8.40**
Shallow Concentrated Flow							
Flow length (ft)	= 631.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 4.73**	**+**	**0.00**	**+**	**0.00**	**=**	**4.73**
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 ..... 13.10 min

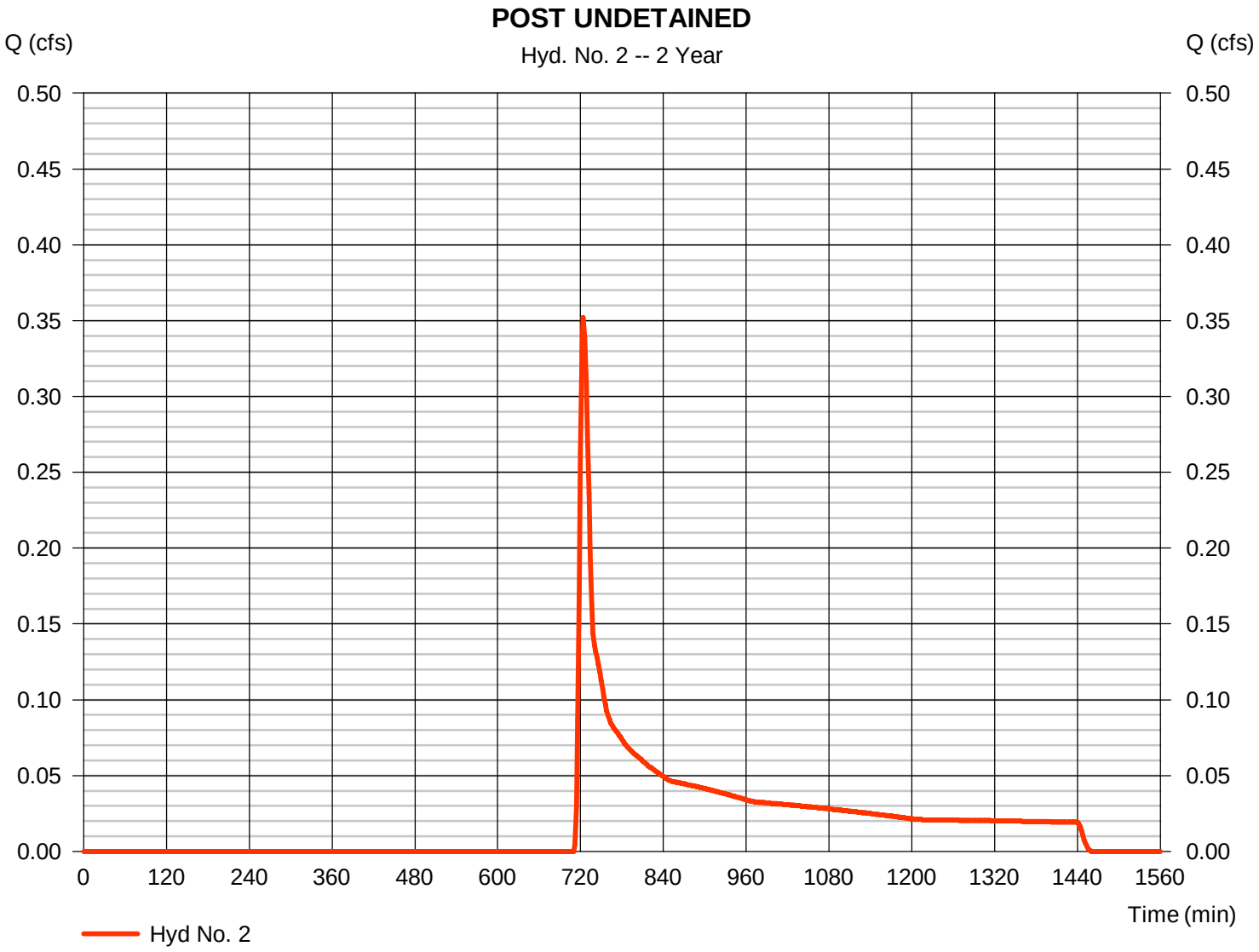
Hydrograph Report

Hyd. No. 2

POST UNDETAINED

Hydrograph type	= SCS Runoff	Peak discharge	= 0.352 cfs
Storm frequency	= 2 yrs	Time to peak	= 724 min
Time interval	= 2 min	Hyd. volume	= 1,803 cuft
Drainage area	= 1.660 ac	Curve number	= 58*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.10 min
Total precip.	= 3.05 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.660 x 58)] / 1.660



TR55 Tc Worksheet

Hyd. No. 2

POST UNDETAINED

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.40**	**+**	**0.00**	**+**	**0.00**	**=**	**8.40**
Shallow Concentrated Flow							
Flow length (ft)	= 631.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 4.73**	**+**	**0.00**	**+**	**0.00**	**=**	**4.73**
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 ..... 13.10 min

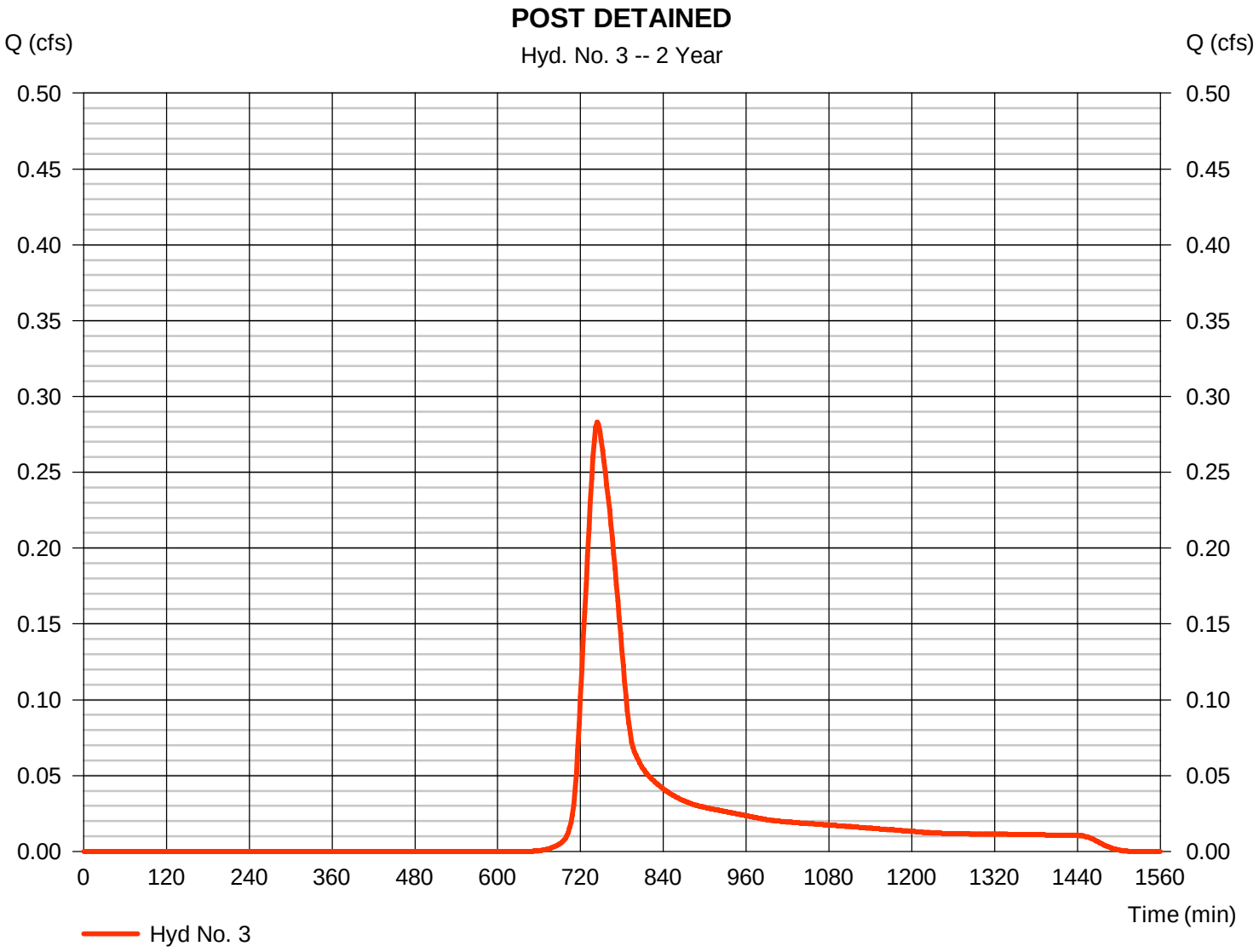
Hydrograph Report

Hyd. No. 3

POST DETAINED

Hydrograph type	= SCS Runoff	Peak discharge	= 0.283 cfs
Storm frequency	= 2 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 1,713 cuft
Drainage area	= 0.450 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 47.50 min
Total precip.	= 3.05 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.300 x 85) + (0.150 x 58)] / 0.450

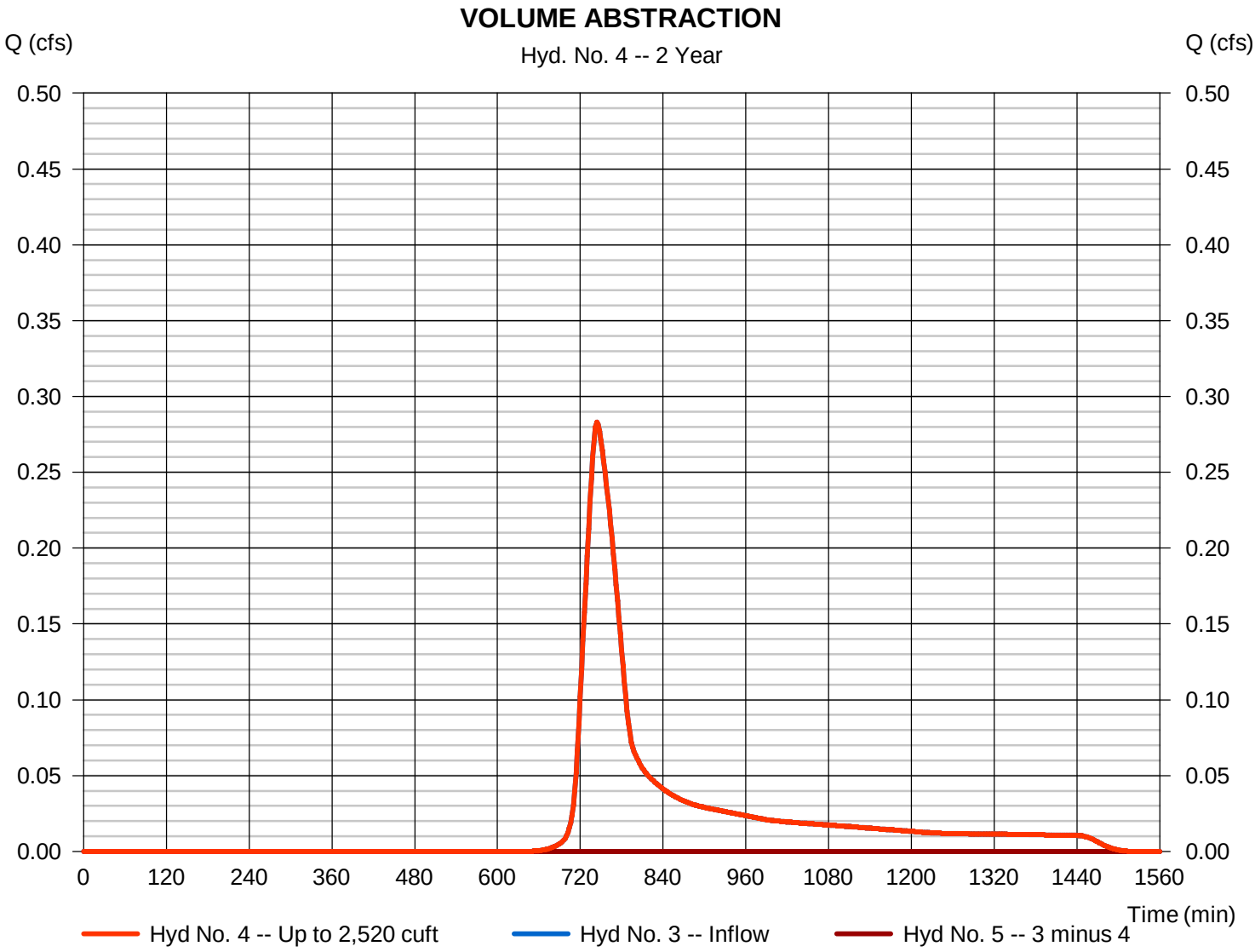


Hydrograph Report

Hyd. No. 4

VOLUME ABSTRACTION

Hydrograph type	= Diversion1	Peak discharge	= 0.283 cfs
Storm frequency	= 2 yrs	Time to peak	= 744 min
Time interval	= 2 min	Hyd. volume	= 1,713 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 5
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

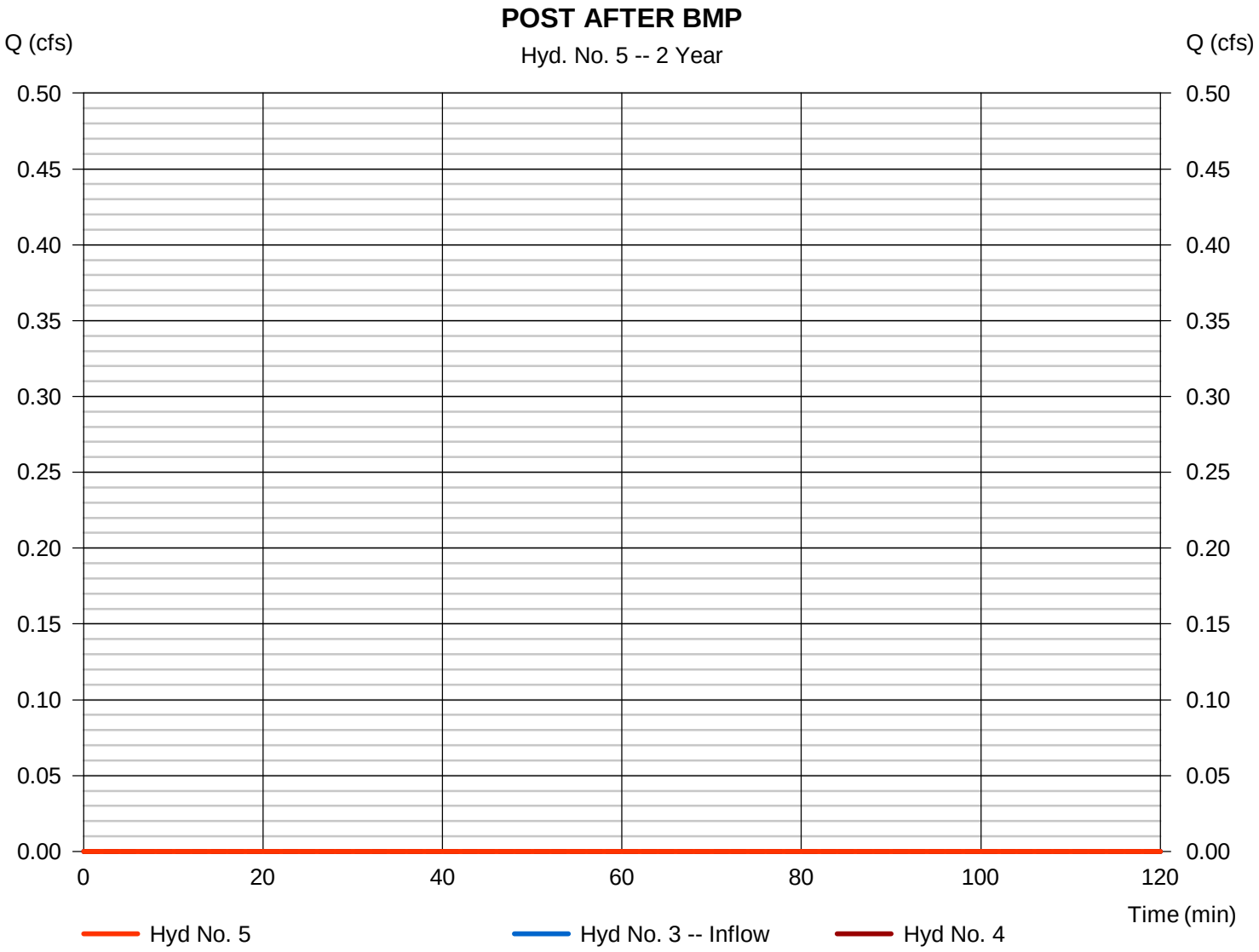


Hydrograph Report

Hyd. No. 5

POST AFTER BMP

Hydrograph type	= Diversion2	Peak discharge	= 0.000 cfs
Storm frequency	= 2 yrs	Time to peak	= n/a
Time interval	= 2 min	Hyd. volume	= 0 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 4
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

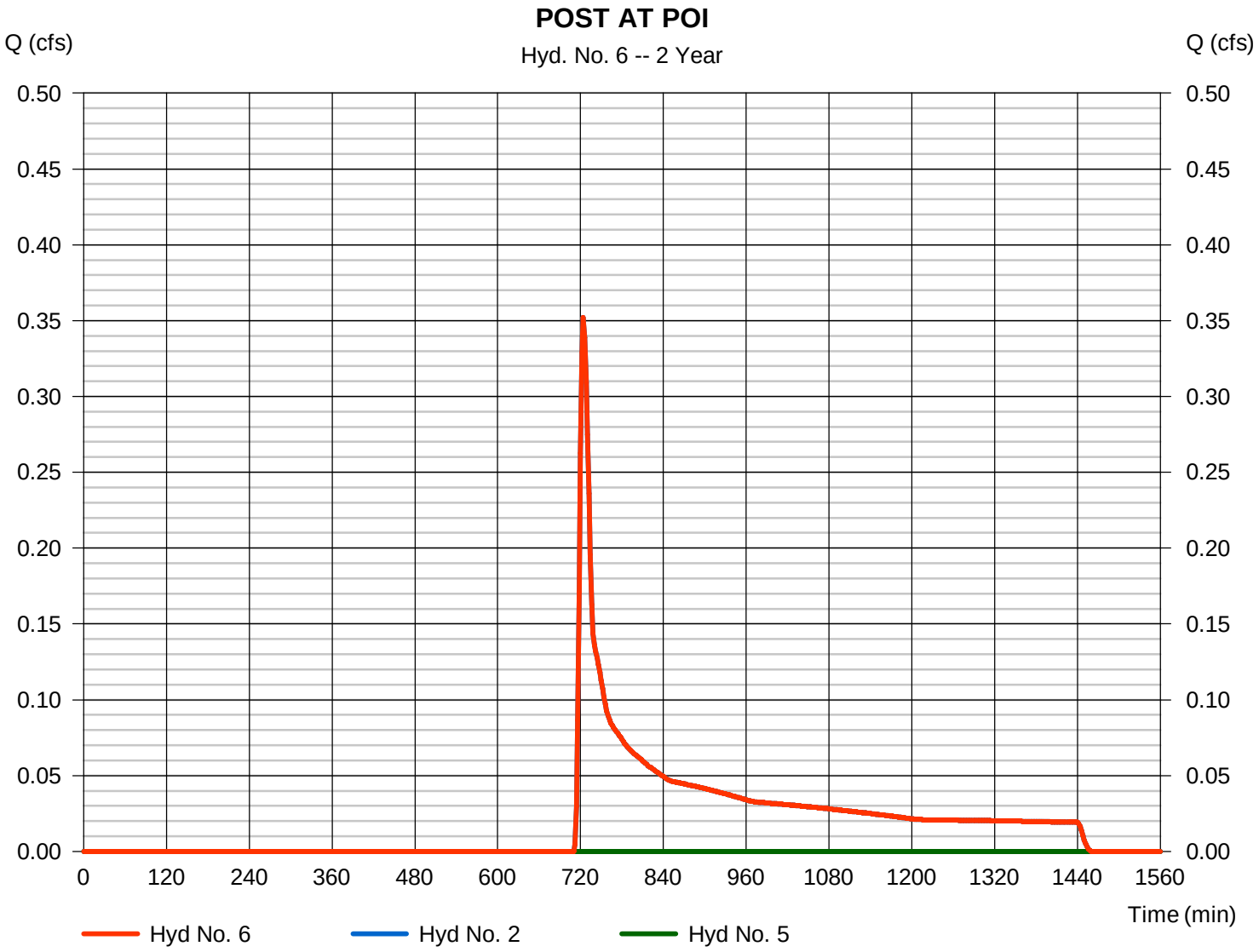


Hydrograph Report

Hyd. No. 6

POST AT POI

Hydrograph type	=	Combine	Peak discharge	=	0.352 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	2 min	Hyd. volume	=	1,803 cuft
Inflow hyds.	=	2, 5	Contrib. drain. area	=	1.660 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	52.5846	12.7000	0.9001	--------
2	59.4970	12.7000	0.8832	--------
3	0.0000	0.0000	0.0000	--------
5	56.2308	11.8000	0.8214	--------
10	58.6750	11.8000	0.8001	--------
25	51.8954	10.5000	0.7395	--------
50	45.1449	9.2000	0.6848	--------
100	43.0569	8.6000	0.6532	--------

File name: Schaeffer Road IDF.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	3.96	3.16	2.65	2.28	2.00	1.79	1.62	1.48	1.37	1.27	1.18	1.11
2	4.70	3.77	3.17	2.73	2.41	2.16	1.96	1.79	1.66	1.54	1.44	1.35
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.54	4.47	3.77	3.28	2.91	2.62	2.39	2.20	2.04	1.90	1.78	1.68
10	6.14	4.98	4.22	3.68	3.28	2.96	2.70	2.49	2.32	2.16	2.03	1.92
25	6.84	5.56	4.73	4.14	3.70	3.36	3.08	2.85	2.66	2.50	2.35	2.23
50	7.34	5.97	5.09	4.48	4.02	3.66	3.37	3.13	2.93	2.76	2.61	2.48
100	7.83	6.38	5.46	4.82	4.34	3.96	3.66	3.41	3.20	3.01	2.86	2.72

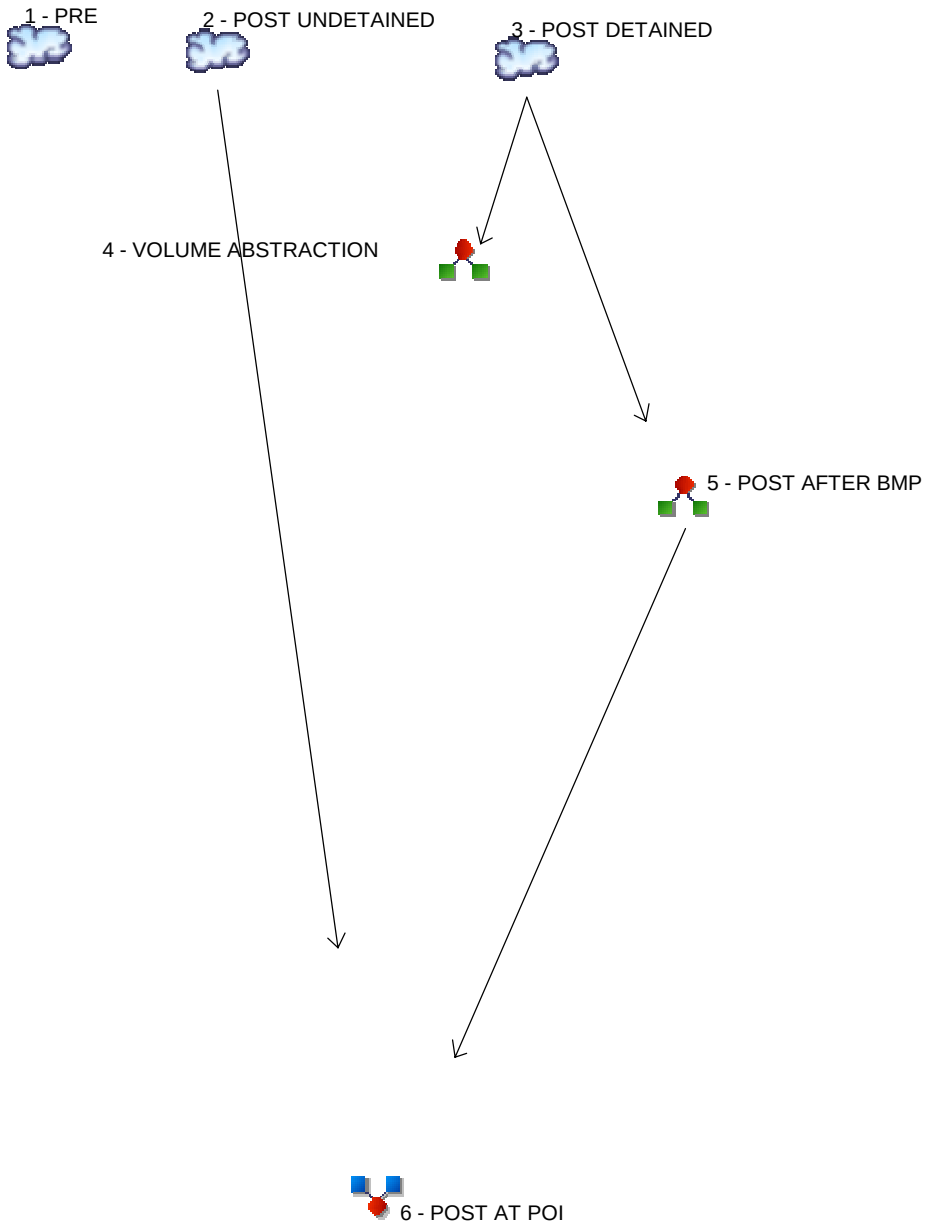
Tc = time in minutes. Values may exceed 60.

P-2\PPP\02 SCRO\07 PCSM\Attach 4 Stormwater Calcs\Schaeffer Road\Hydraflow Rev 1\Schaeffer Road Precip.pc

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.53	3.05	0.00	3.87	4.57	5.62	6.54	7.56
SCS 6-Hr	1.78	2.16	0.00	2.71	3.17	3.83	4.39	5.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4



Legend

Hyd.	Origin	Description
1	SCS Runoff	PRE
2	SCS Runoff	POST UNDETAINED
3	SCS Runoff	POST DETAINED
4	Diversion1	VOLUME ABSTRACTION
5	Diversion2	POST AFTER BMP
6	Combine	POST AT POI

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

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	------	-------	-------	-------	-------	2.499	-------	-------	-------	PRE
2	SCS Runoff	------	-------	-------	-------	-------	1.966	-------	-------	-------	POST UNDETAINED
3	SCS Runoff	------	-------	-------	-------	-------	0.771	-------	-------	-------	POST DETAINED
4	Diversion1	3	-------	-------	-------	-------	0.771	-------	-------	-------	VOLUME ABSTRACTION
5	Diversion2	3	-------	-------	-------	-------	0.056	-------	-------	-------	POST AFTER BMP
6	Combine	2, 5	-------	-------	-------	-------	1.966	-------	-------	-------	POST AT POI

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

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	2.499	2	722	7,427	------	------	------	PRE
2	SCS Runoff	1.966	2	722	5,843	------	------	------	POST UNDETAINED
3	SCS Runoff	0.771	2	736	3,530	------	------	------	POST DETAINED
4	Diversion1	0.771	2	736	2,523	3	------	------	VOLUME ABSTRACTION
5	Diversion2	0.056	2	874	1,007	3	------	------	POST AFTER BMP
6	Combine	1.966	2	722	6,851	2, 5	------	------	POST AT POI

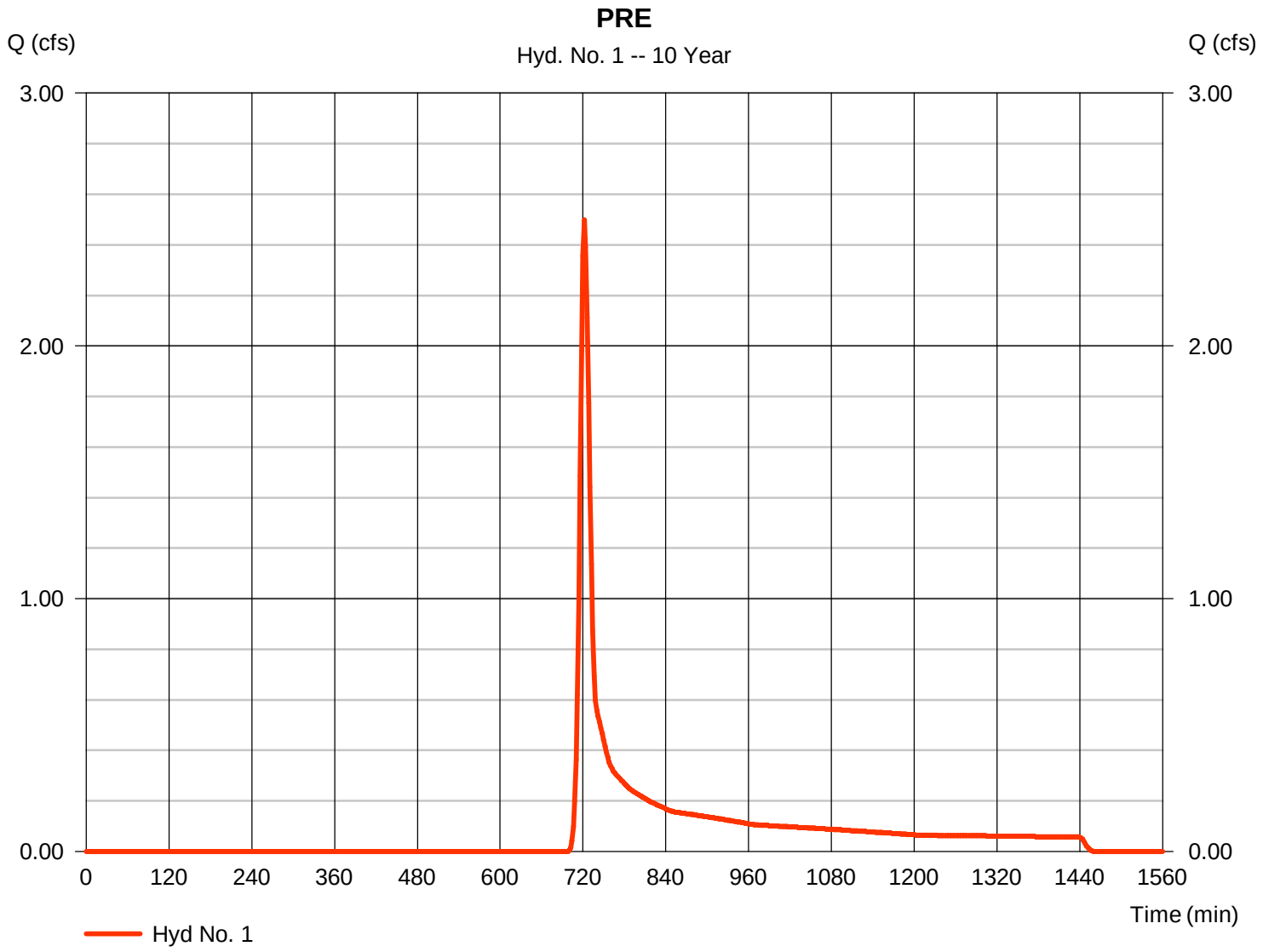
Hydrograph Report

Hyd. No. 1

PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.499 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	7,427 cuft
Drainage area	=	2.110 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	4.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.110 x 58)] / 2.110



TR55 Tc Worksheet

Hyd. No. 1

PRE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.40**	**+**	**0.00**	**+**	**0.00**	**=**	**8.40**
Shallow Concentrated Flow							
Flow length (ft)	= 631.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 4.73**	**+**	**0.00**	**+**	**0.00**	**=**	**4.73**
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 ..... 13.10 min

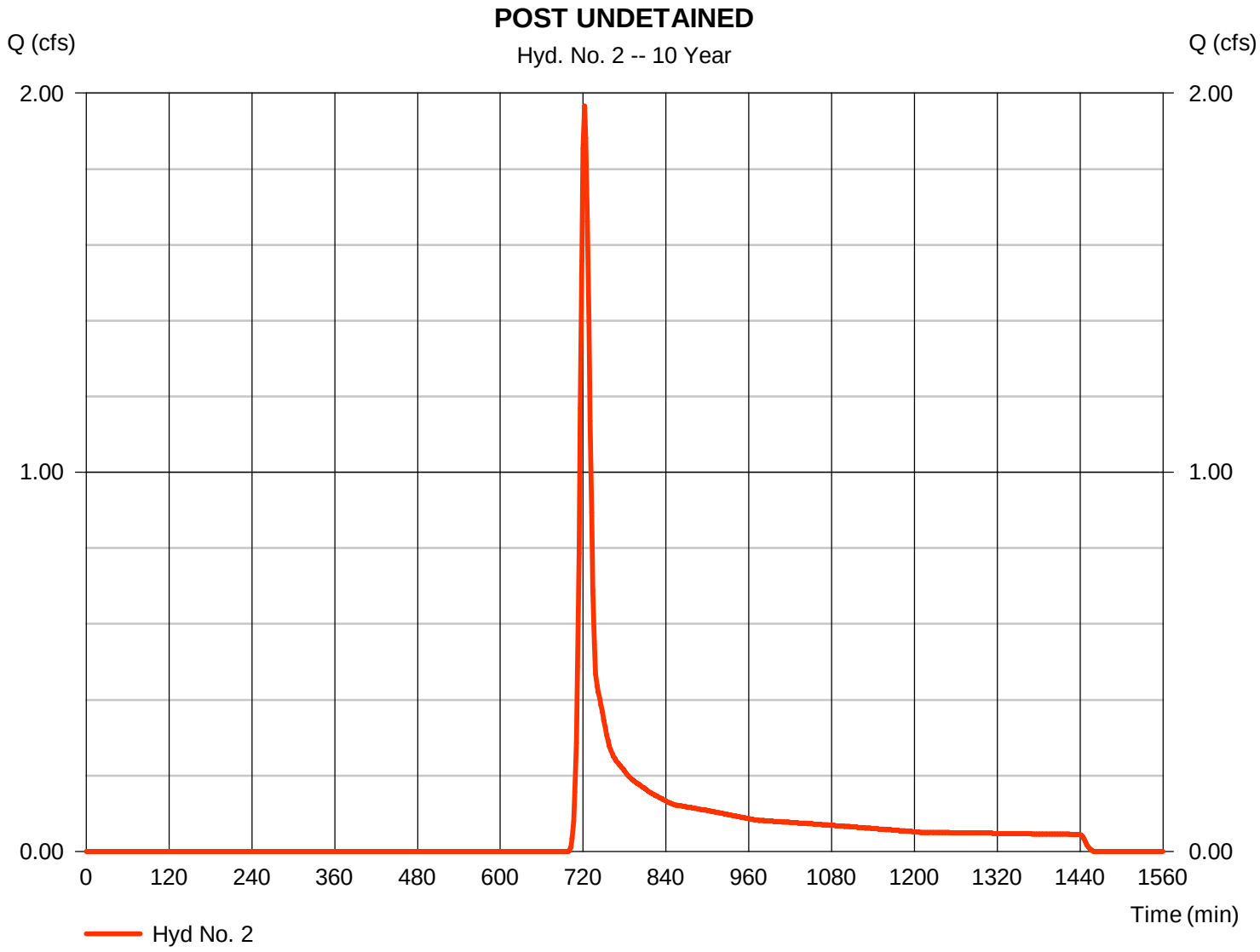
Hydrograph Report

Hyd. No. 2

POST UNDETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.966 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	5,843 cuft
Drainage area	=	1.660 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	4.57 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.660 x 58)] / 1.660



TR55 Tc Worksheet

Hyd. No. 2

POST UNDETAINED

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.40**	**+**	**0.00**	**+**	**0.00**	**=**	**8.40**
Shallow Concentrated Flow							
Flow length (ft)	= 631.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 4.73**	**+**	**0.00**	**+**	**0.00**	**=**	**4.73**
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 ..... 13.10 min

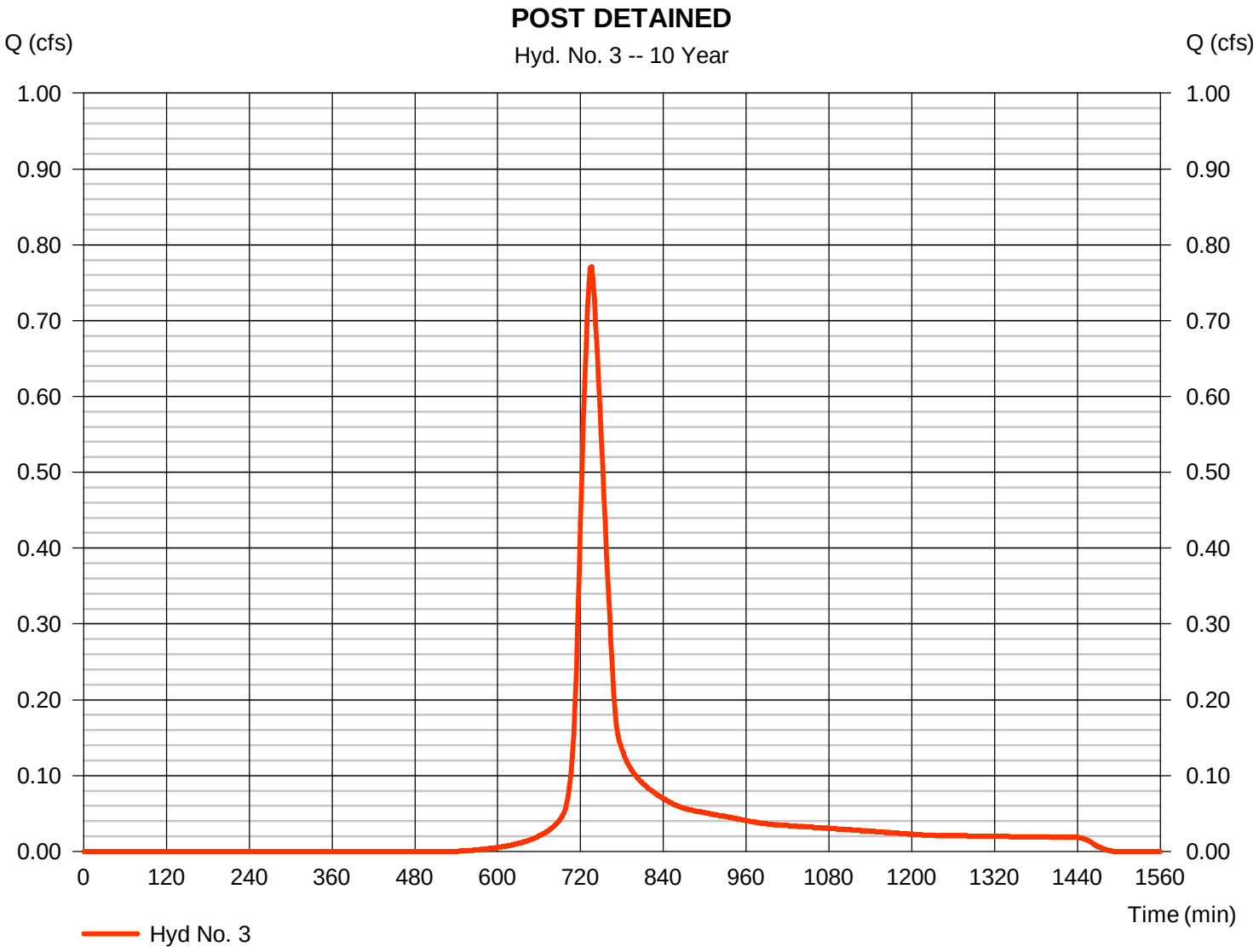
Hydrograph Report

Hyd. No. 3

POST DETAINED

Hydrograph type	= SCS Runoff	Peak discharge	= 0.771 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 3,530 cuft
Drainage area	= 0.450 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 36.00 min
Total precip.	= 4.57 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.300 x 85) + (0.150 x 58)] / 0.450

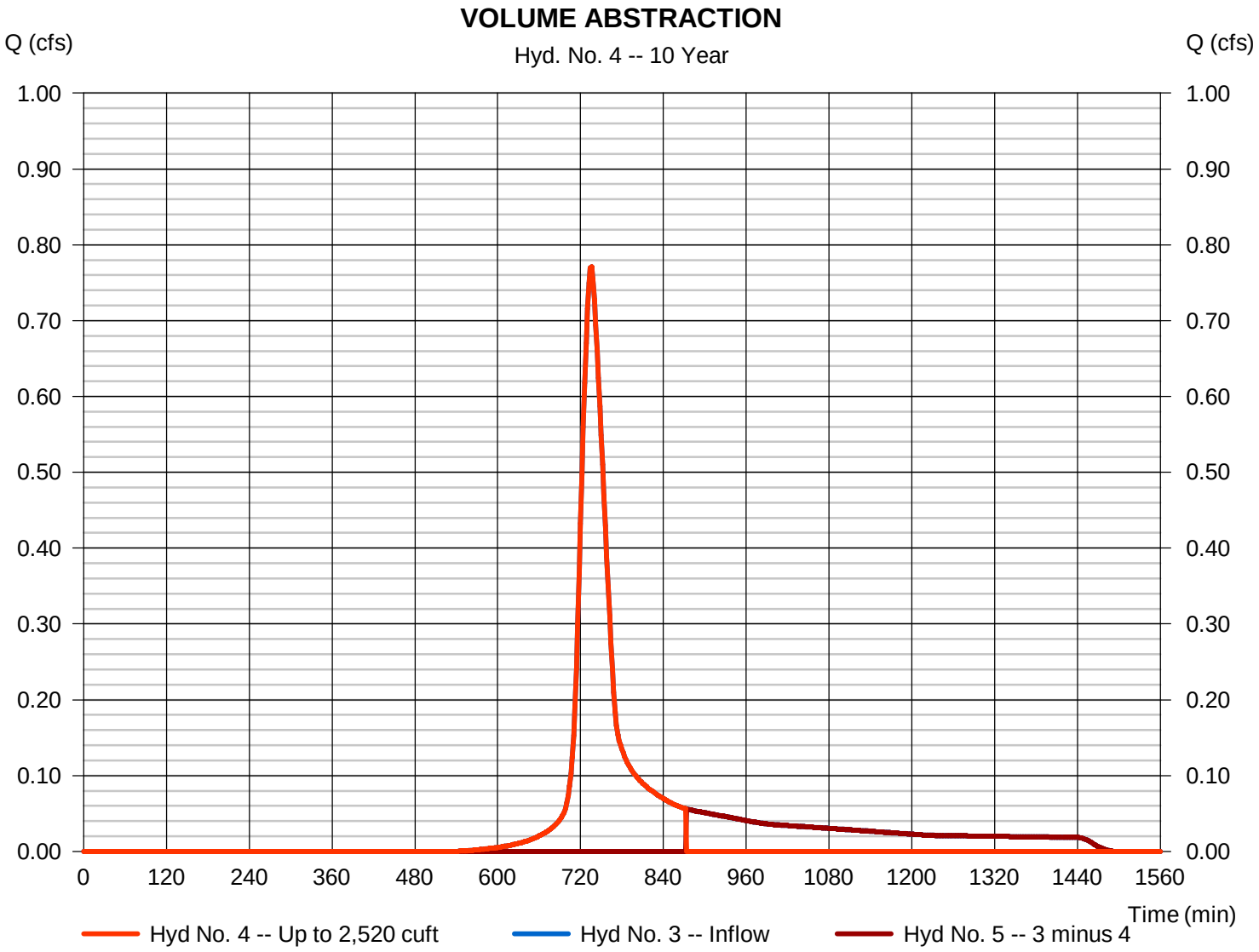


Hydrograph Report

Hyd. No. 4

VOLUME ABSTRACTION

Hydrograph type	= Diversion1	Peak discharge	= 0.771 cfs
Storm frequency	= 10 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 2,523 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 5
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

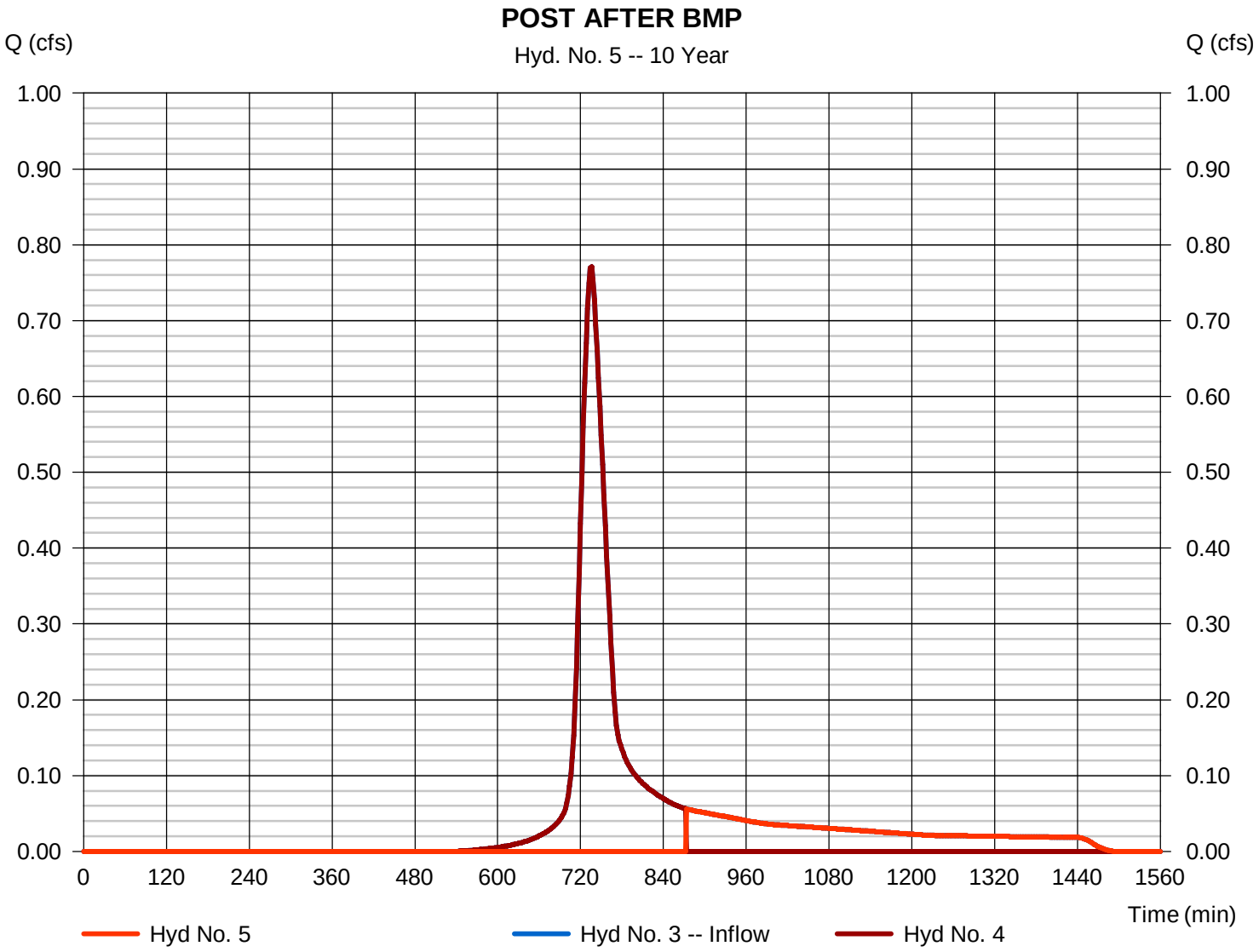


Hydrograph Report

Hyd. No. 5

POST AFTER BMP

Hydrograph type	= Diversion2	Peak discharge	= 0.056 cfs
Storm frequency	= 10 yrs	Time to peak	= 874 min
Time interval	= 2 min	Hyd. volume	= 1,007 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 4
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

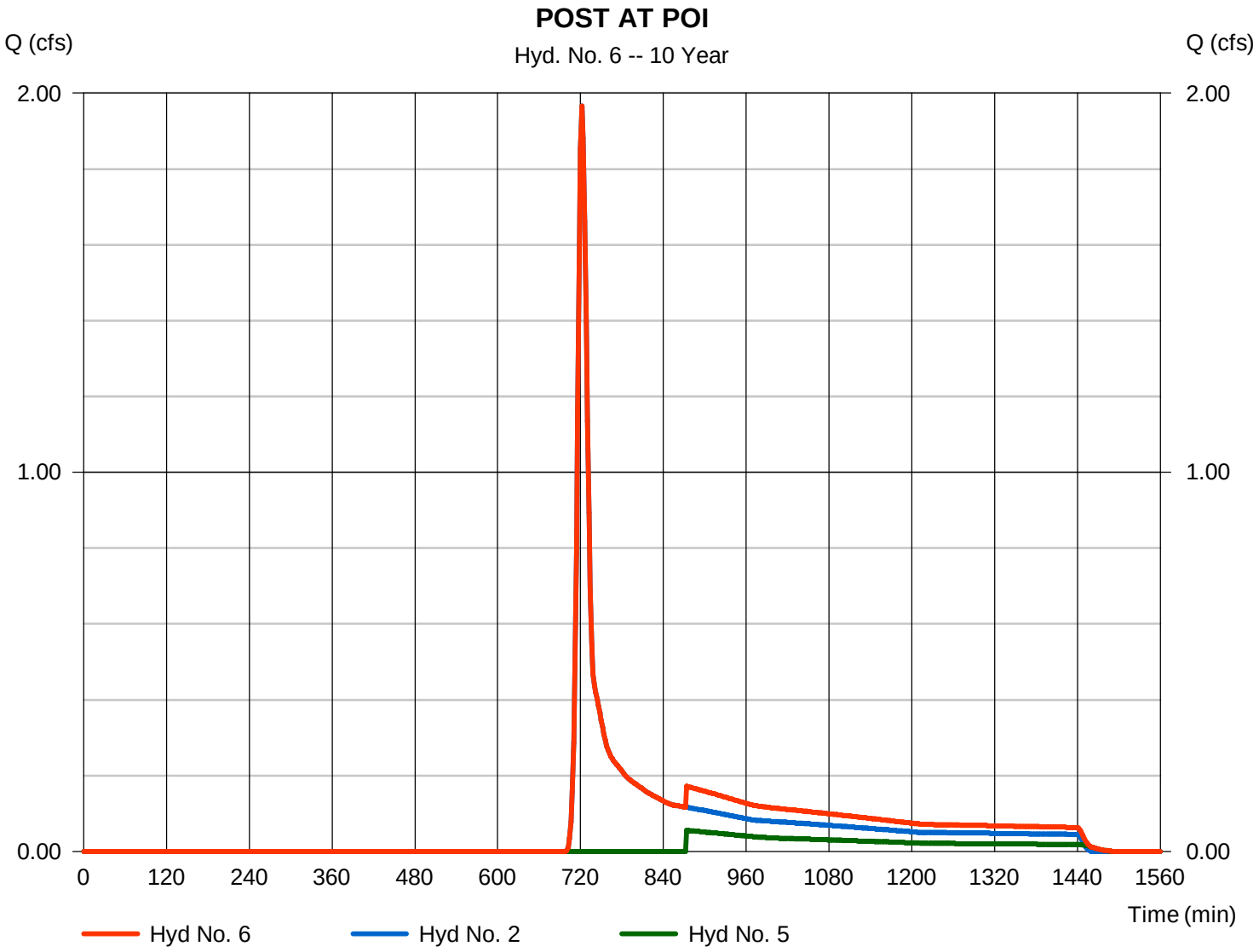


Hydrograph Report

Hyd. No. 6

POST AT POI

Hydrograph type	=	Combine	Peak discharge	=	1.966 cfs
Storm frequency	=	10 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	6,851 cuft
Inflow hyds.	=	2, 5	Contrib. drain. area	=	1.660 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	52.5846	12.7000	0.9001	--------
2	59.4970	12.7000	0.8832	--------
3	0.0000	0.0000	0.0000	--------
5	56.2308	11.8000	0.8214	--------
10	58.6750	11.8000	0.8001	--------
25	51.8954	10.5000	0.7395	--------
50	45.1449	9.2000	0.6848	--------
100	43.0569	8.6000	0.6532	--------

File name: Schaeffer Road IDF.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	3.96	3.16	2.65	2.28	2.00	1.79	1.62	1.48	1.37	1.27	1.18	1.11
2	4.70	3.77	3.17	2.73	2.41	2.16	1.96	1.79	1.66	1.54	1.44	1.35
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.54	4.47	3.77	3.28	2.91	2.62	2.39	2.20	2.04	1.90	1.78	1.68
10	6.14	4.98	4.22	3.68	3.28	2.96	2.70	2.49	2.32	2.16	2.03	1.92
25	6.84	5.56	4.73	4.14	3.70	3.36	3.08	2.85	2.66	2.50	2.35	2.23
50	7.34	5.97	5.09	4.48	4.02	3.66	3.37	3.13	2.93	2.76	2.61	2.48
100	7.83	6.38	5.46	4.82	4.34	3.96	3.66	3.41	3.20	3.01	2.86	2.72

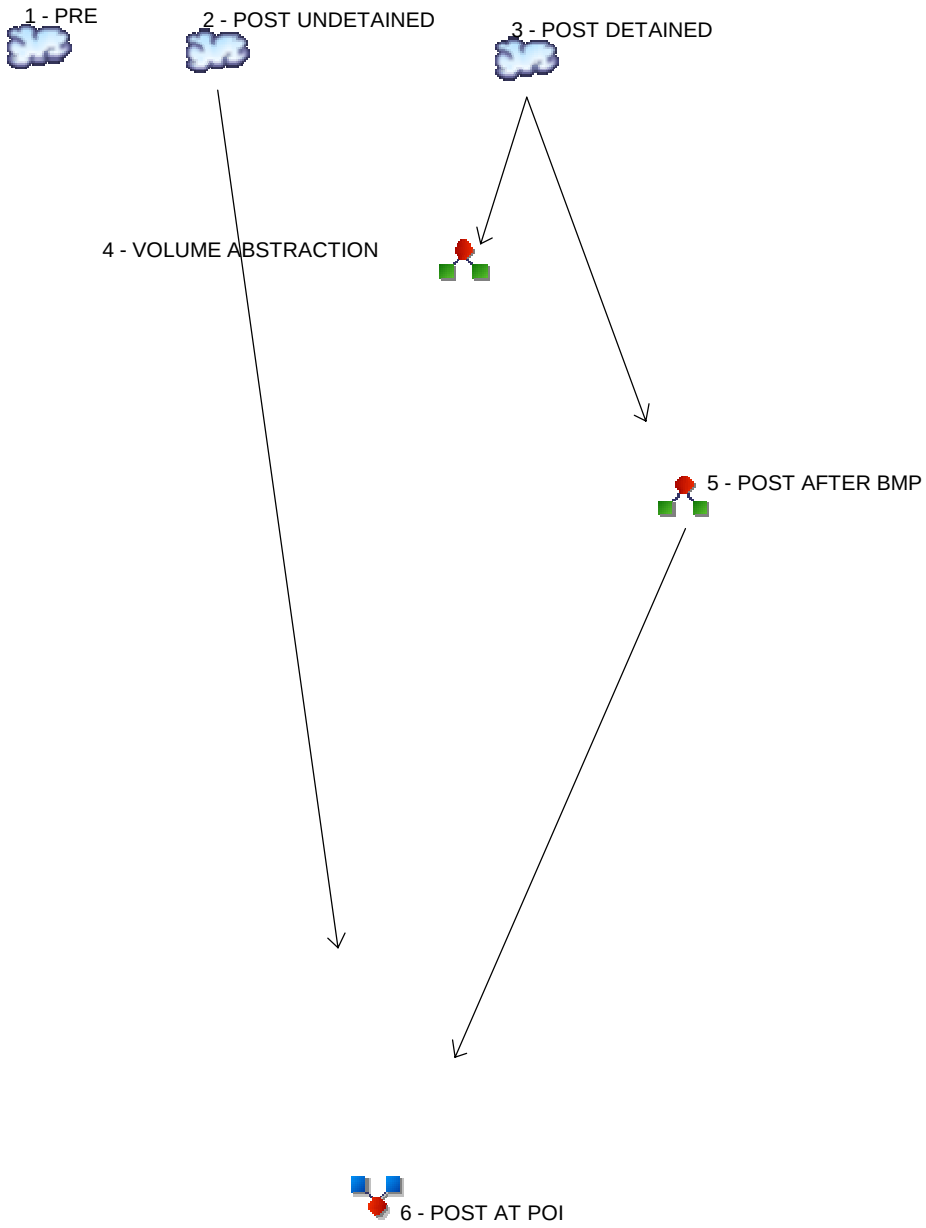
Tc = time in minutes. Values may exceed 60.

P-2\PPP\02 SCRO\07 PCSM\Attach 4 Stormwater Calcs\Schaeffer Road\Hydraflow Rev 1\Schaeffer Road Precip.pc

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.53	3.05	0.00	3.87	4.57	5.62	6.54	7.56
SCS 6-Hr	1.78	2.16	0.00	2.71	3.17	3.83	4.39	5.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4



Legend

Hyd.	Origin	Description
1	SCS Runoff	PRE
2	SCS Runoff	POST UNDETAINED
3	SCS Runoff	POST DETAINED
4	Diversion1	VOLUME ABSTRACTION
5	Diversion2	POST AFTER BMP
6	Combine	POST AT POI

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

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	------	-------	-------	-------	-------	-------	-------	6.205	-------	PRE
2	SCS Runoff	------	-------	-------	-------	-------	-------	-------	4.882	-------	POST UNDETAINED
3	SCS Runoff	------	-------	-------	-------	-------	-------	-------	1.688	-------	POST DETAINED
4	Diversion1	3	-------	-------	-------	-------	-------	-------	1.688	-------	VOLUME ABSTRACTION
5	Diversion2	3	-------	-------	-------	-------	-------	-------	1.371	-------	POST AFTER BMP
6	Combine	2, 5	-------	-------	-------	-------	-------	-------	4.882	-------	POST AT POI

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

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	6.205	2	722	16,604	------	------	------	PRE
2	SCS Runoff	4.882	2	722	13,063	------	------	------	POST UNDETAINED
3	SCS Runoff	1.688	2	728	6,191	------	------	------	POST DETAINED
4	Diversion1	1.688	2	728	2,572	3	------	------	VOLUME ABSTRACTION
5	Diversion2	1.371	2	736	3,619	3	------	------	POST AFTER BMP
6	Combine	4.882	2	722	16,682	2, 5	------	------	POST AT POI

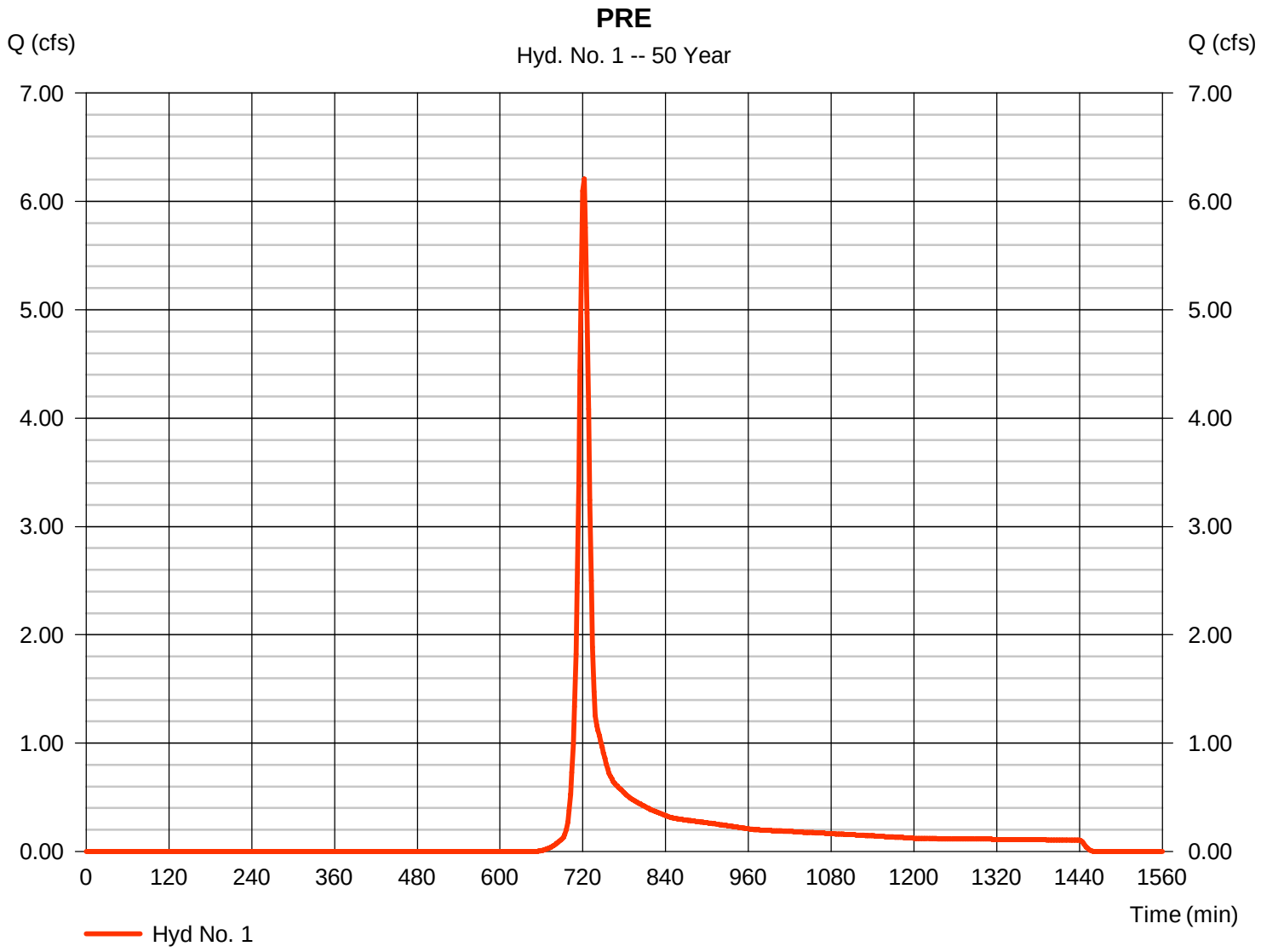
Hydrograph Report

Hyd. No. 1

PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.205 cfs
Storm frequency	=	50 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	16,604 cuft
Drainage area	=	2.110 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	6.54 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.110 x 58)] / 2.110



TR55 Tc Worksheet

Hyd. No. 1

PRE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.40**	**+**	**0.00**	**+**	**0.00**	**=**	**8.40**
Shallow Concentrated Flow							
Flow length (ft)	= 631.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 4.73**	**+**	**0.00**	**+**	**0.00**	**=**	**4.73**
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 ..... 13.10 min

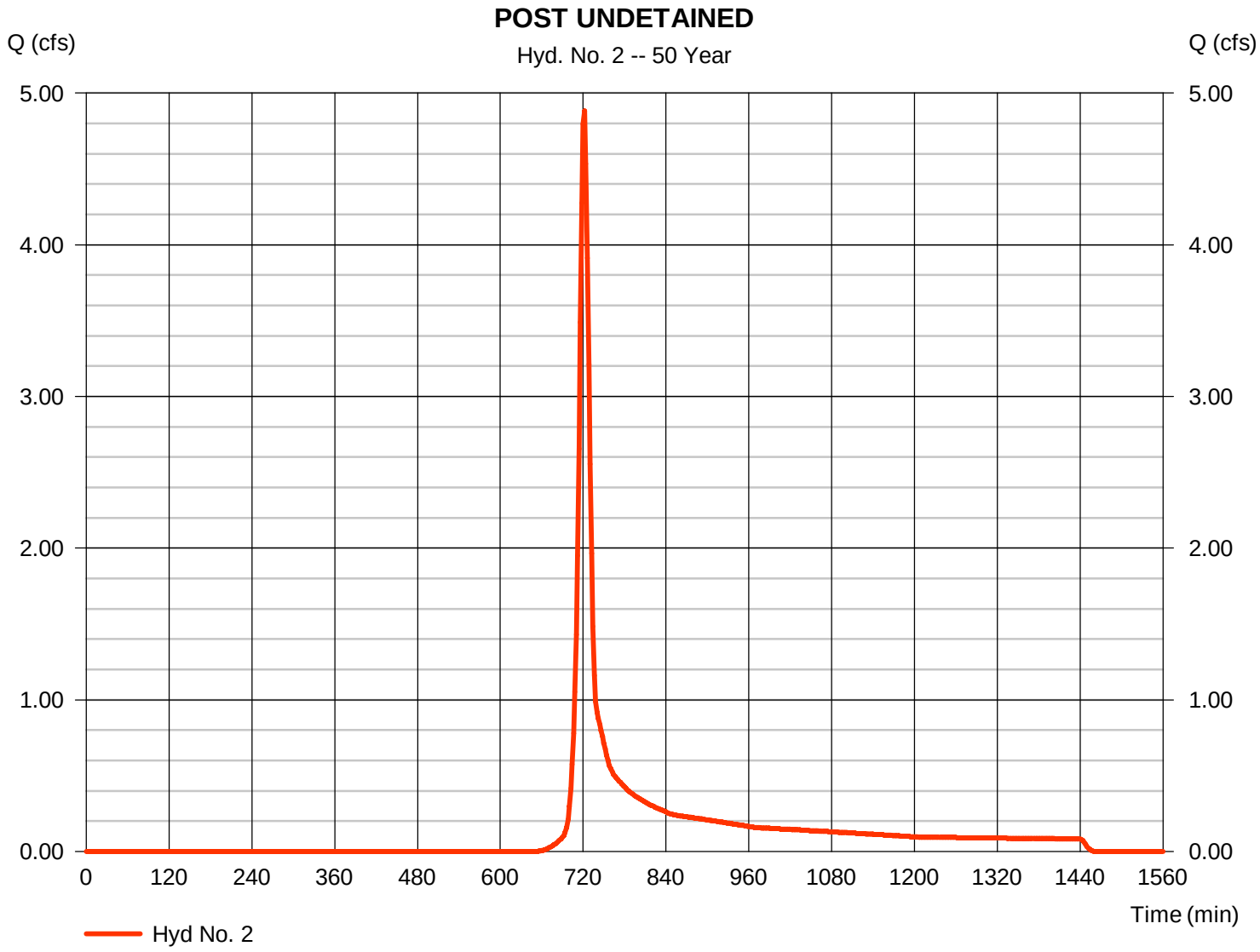
Hydrograph Report

Hyd. No. 2

POST UNDETAINED

Hydrograph type	= SCS Runoff	Peak discharge	= 4.882 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 13,063 cuft
Drainage area	= 1.660 ac	Curve number	= 58*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= TR55	Time of conc. (Tc)	= 13.10 min
Total precip.	= 6.54 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(1.660 x 58)] / 1.660



TR55 Tc Worksheet

Hyd. No. 2

POST UNDETAINED

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.40**	**+**	**0.00**	**+**	**0.00**	**=**	**8.40**
Shallow Concentrated Flow							
Flow length (ft)	= 631.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 4.73**	**+**	**0.00**	**+**	**0.00**	**=**	**4.73**
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 ..... 13.10 min

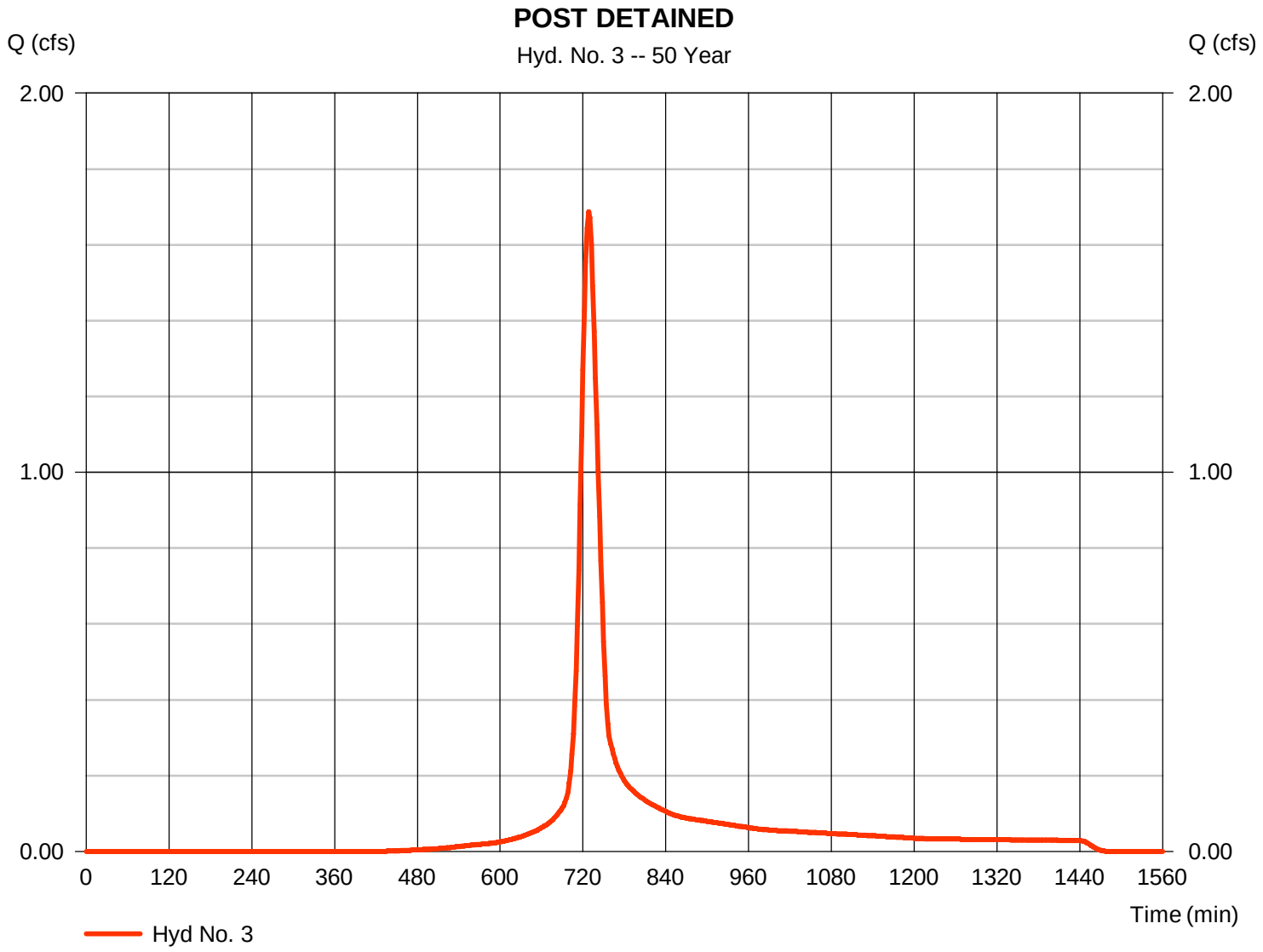
Hydrograph Report

Hyd. No. 3

POST DETAINED

Hydrograph type	= SCS Runoff	Peak discharge	= 1.688 cfs
Storm frequency	= 50 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 6,191 cuft
Drainage area	= 0.450 ac	Curve number	= 76*
Basin Slope	= 0.0 %	Hydraulic length	= 0 ft
Tc method	= User	Time of conc. (Tc)	= 24.30 min
Total precip.	= 6.54 in	Distribution	= Type II
Storm duration	= 24 hrs	Shape factor	= 484

* Composite (Area/CN) = [(0.300 x 85) + (0.150 x 58)] / 0.450

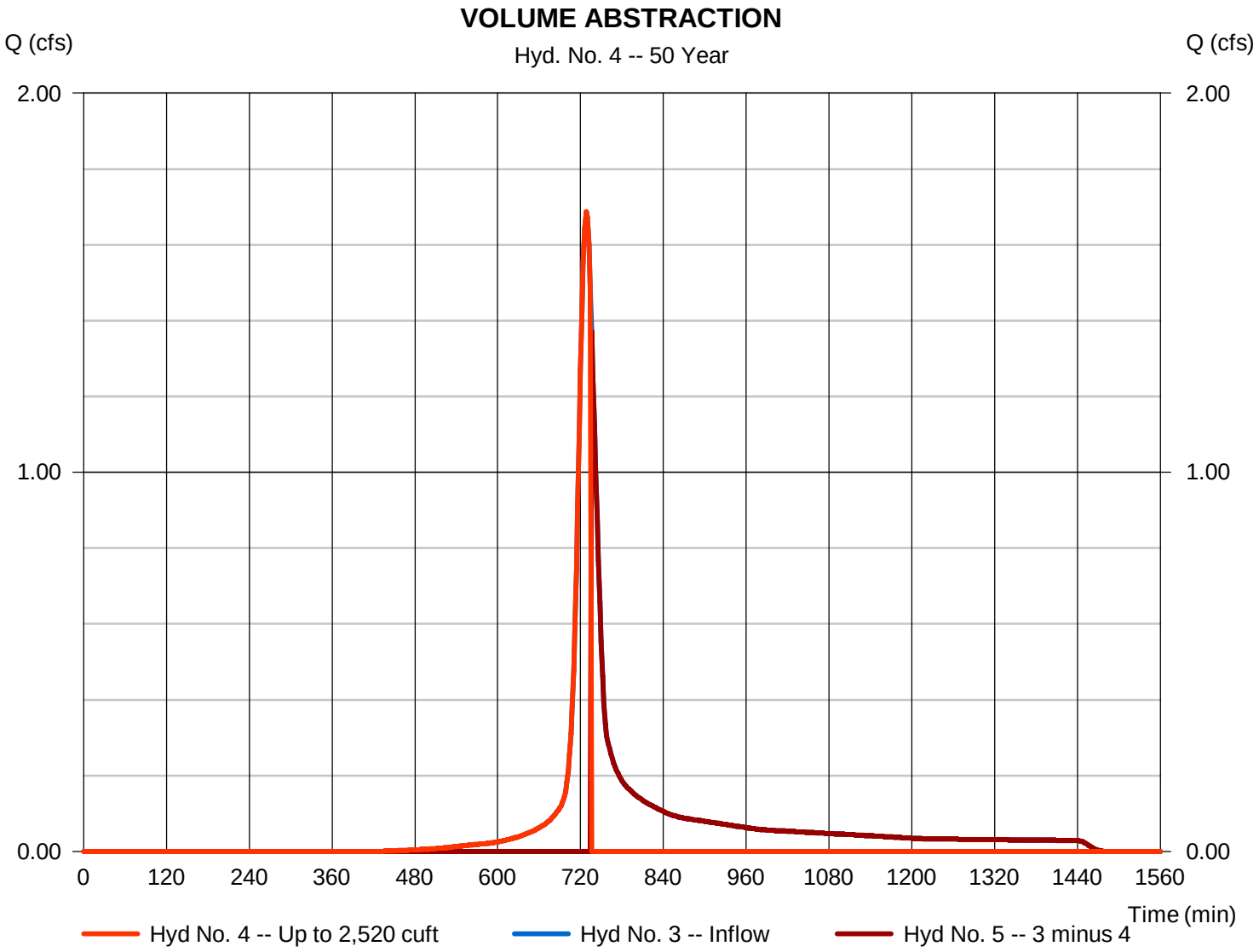


Hydrograph Report

Hyd. No. 4

VOLUME ABSTRACTION

Hydrograph type	= Diversion1	Peak discharge	= 1.688 cfs
Storm frequency	= 50 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 2,572 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 5
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

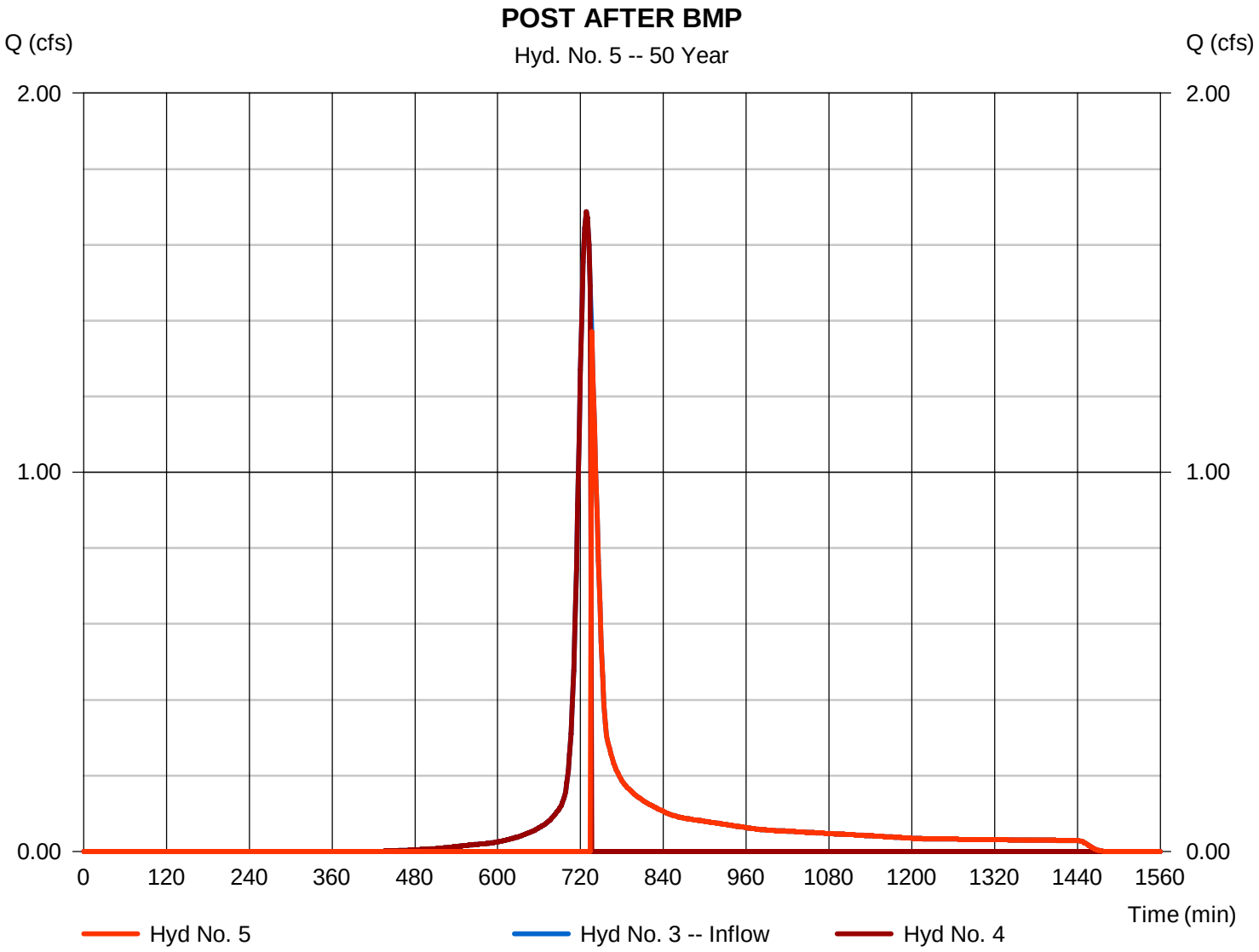


Hydrograph Report

Hyd. No. 5

POST AFTER BMP

Hydrograph type	= Diversion2	Peak discharge	= 1.371 cfs
Storm frequency	= 50 yrs	Time to peak	= 736 min
Time interval	= 2 min	Hyd. volume	= 3,619 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 4
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

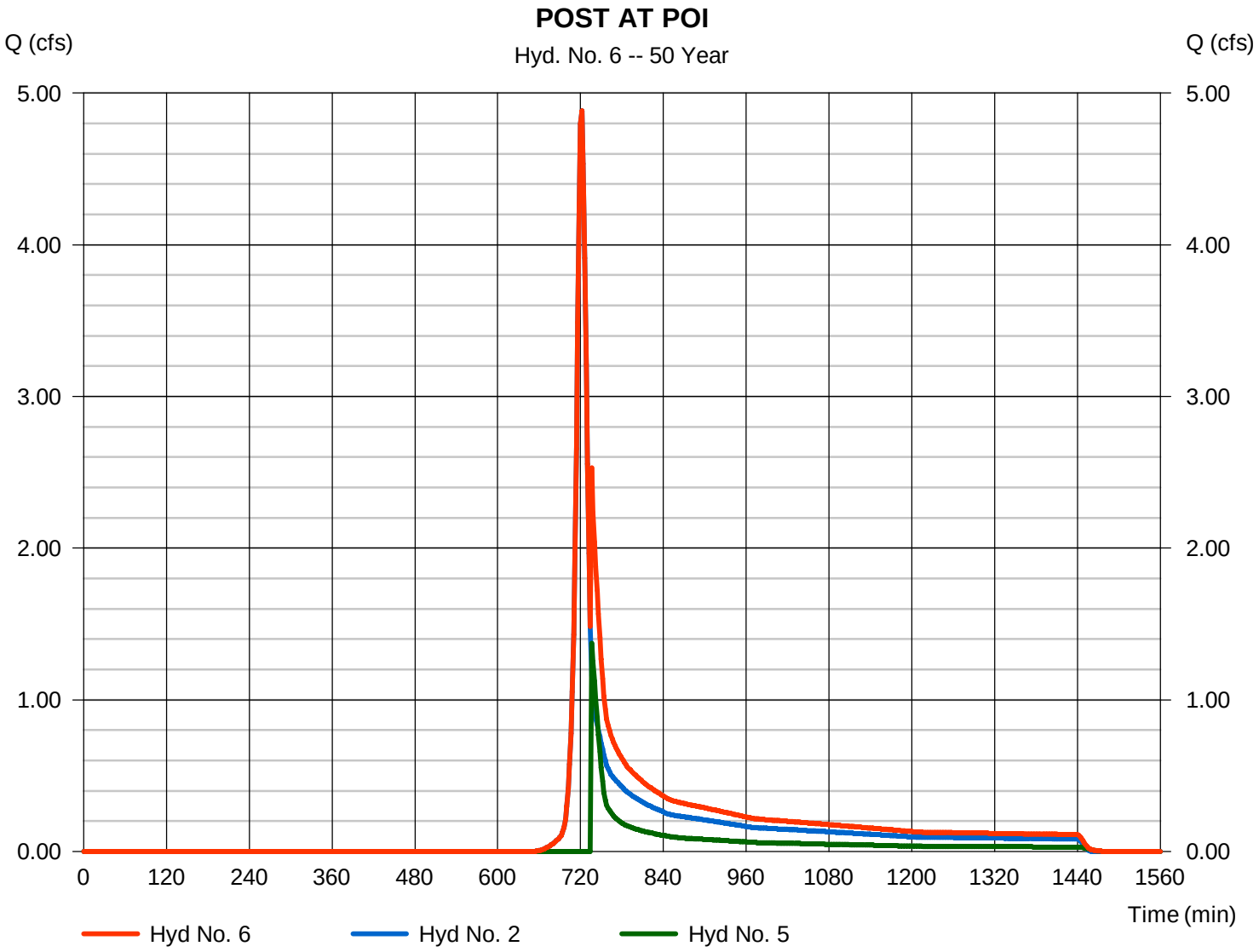


Hydrograph Report

Hyd. No. 6

POST AT POI

Hydrograph type	= Combine	Peak discharge	= 4.882 cfs
Storm frequency	= 50 yrs	Time to peak	= 722 min
Time interval	= 2 min	Hyd. volume	= 16,682 cuft
Inflow hyds.	= 2, 5	Contrib. drain. area	= 1.660 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	52.5846	12.7000	0.9001	--------
2	59.4970	12.7000	0.8832	--------
3	0.0000	0.0000	0.0000	--------
5	56.2308	11.8000	0.8214	--------
10	58.6750	11.8000	0.8001	--------
25	51.8954	10.5000	0.7395	--------
50	45.1449	9.2000	0.6848	--------
100	43.0569	8.6000	0.6532	--------

File name: Schaeffer Road IDF.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	3.96	3.16	2.65	2.28	2.00	1.79	1.62	1.48	1.37	1.27	1.18	1.11
2	4.70	3.77	3.17	2.73	2.41	2.16	1.96	1.79	1.66	1.54	1.44	1.35
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.54	4.47	3.77	3.28	2.91	2.62	2.39	2.20	2.04	1.90	1.78	1.68
10	6.14	4.98	4.22	3.68	3.28	2.96	2.70	2.49	2.32	2.16	2.03	1.92
25	6.84	5.56	4.73	4.14	3.70	3.36	3.08	2.85	2.66	2.50	2.35	2.23
50	7.34	5.97	5.09	4.48	4.02	3.66	3.37	3.13	2.93	2.76	2.61	2.48
100	7.83	6.38	5.46	4.82	4.34	3.96	3.66	3.41	3.20	3.01	2.86	2.72

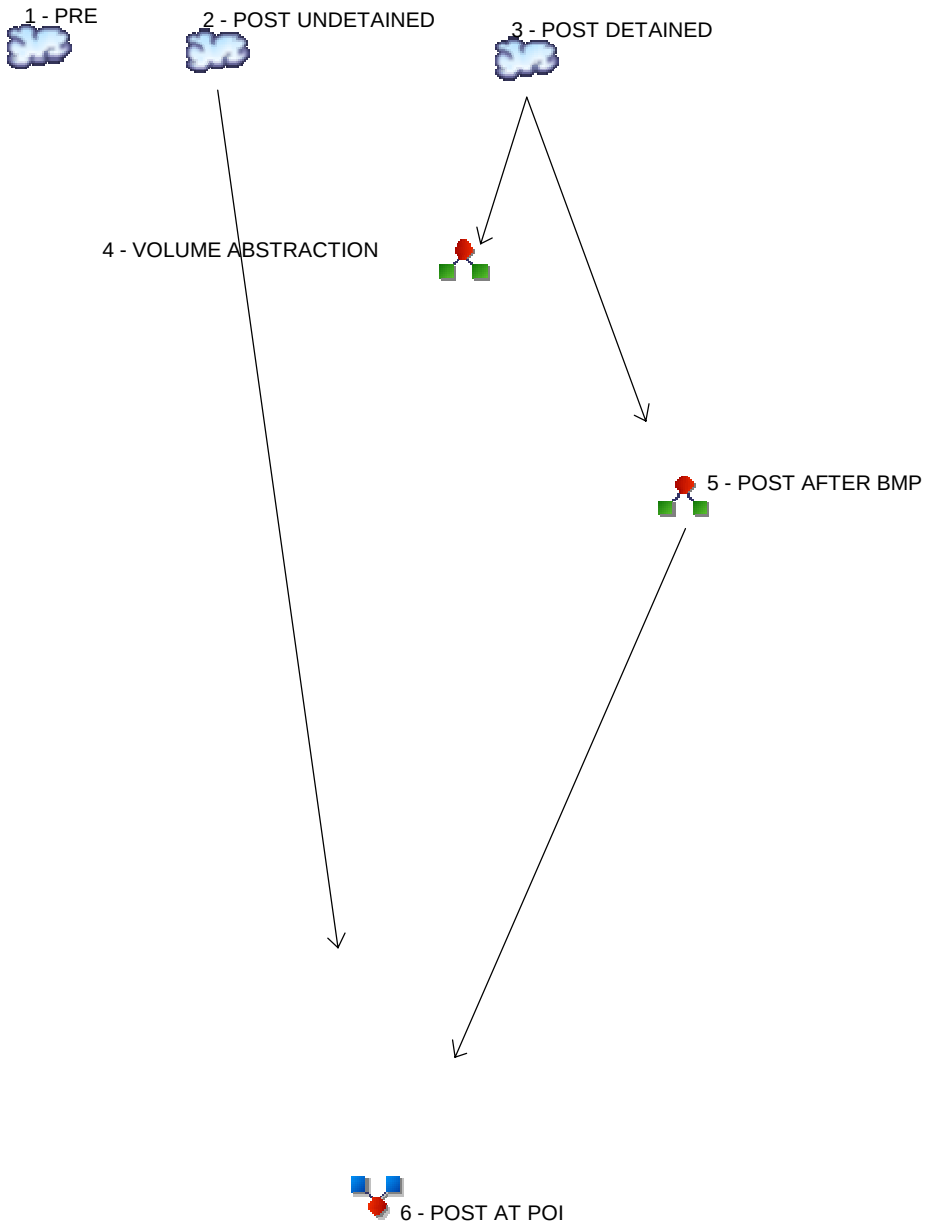
Tc = time in minutes. Values may exceed 60.

P-2\PPP\02 SCRO\07 PCSM\Attach 4 Stormwater Calcs\Schaeffer Road\Hydraflow Rev 1\Schaeffer Road Precip.pc

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.53	3.05	0.00	3.87	4.57	5.62	6.54	7.56
SCS 6-Hr	1.78	2.16	0.00	2.71	3.17	3.83	4.39	5.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Watershed Model Schematic

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4



Legend

Hyd.	Origin	Description
1	SCS Runoff	PRE
2	SCS Runoff	POST UNDETAINED
3	SCS Runoff	POST DETAINED
4	Diversion1	VOLUME ABSTRACTION
5	Diversion2	POST AFTER BMP
6	Combine	POST AT POI

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	------	-------	-------	-------	-------	-------	-------	-------	8.378	PRE
2	SCS Runoff	------	-------	-------	-------	-------	-------	-------	-------	6.592	POST UNDETAINED
3	SCS Runoff	------	-------	-------	-------	-------	-------	-------	-------	2.288	POST DETAINED
4	Diversion1	3	-------	-------	-------	-------	-------	-------	-------	2.288	VOLUME ABSTRACTION
5	Diversion2	3	-------	-------	-------	-------	-------	-------	-------	2.262	POST AFTER BMP
6	Combine	2, 5	-------	-------	-------	-------	-------	-------	-------	6.592	POST AT POI

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2015 by Autodesk, Inc. v10.4

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	8.378	2	722	22,095	------	------	------	PRE
2	SCS Runoff	6.592	2	722	17,383	------	------	------	POST UNDETAINED
3	SCS Runoff	2.288	2	726	7,913	------	------	------	POST DETAINED
4	Diversion1	2.288	2	726	2,684	3	------	------	VOLUME ABSTRACTION
5	Diversion2	2.262	2	728	5,229	3	------	------	POST AFTER BMP
6	Combine	6.592	2	722	22,612	2, 5	------	------	POST AT POI

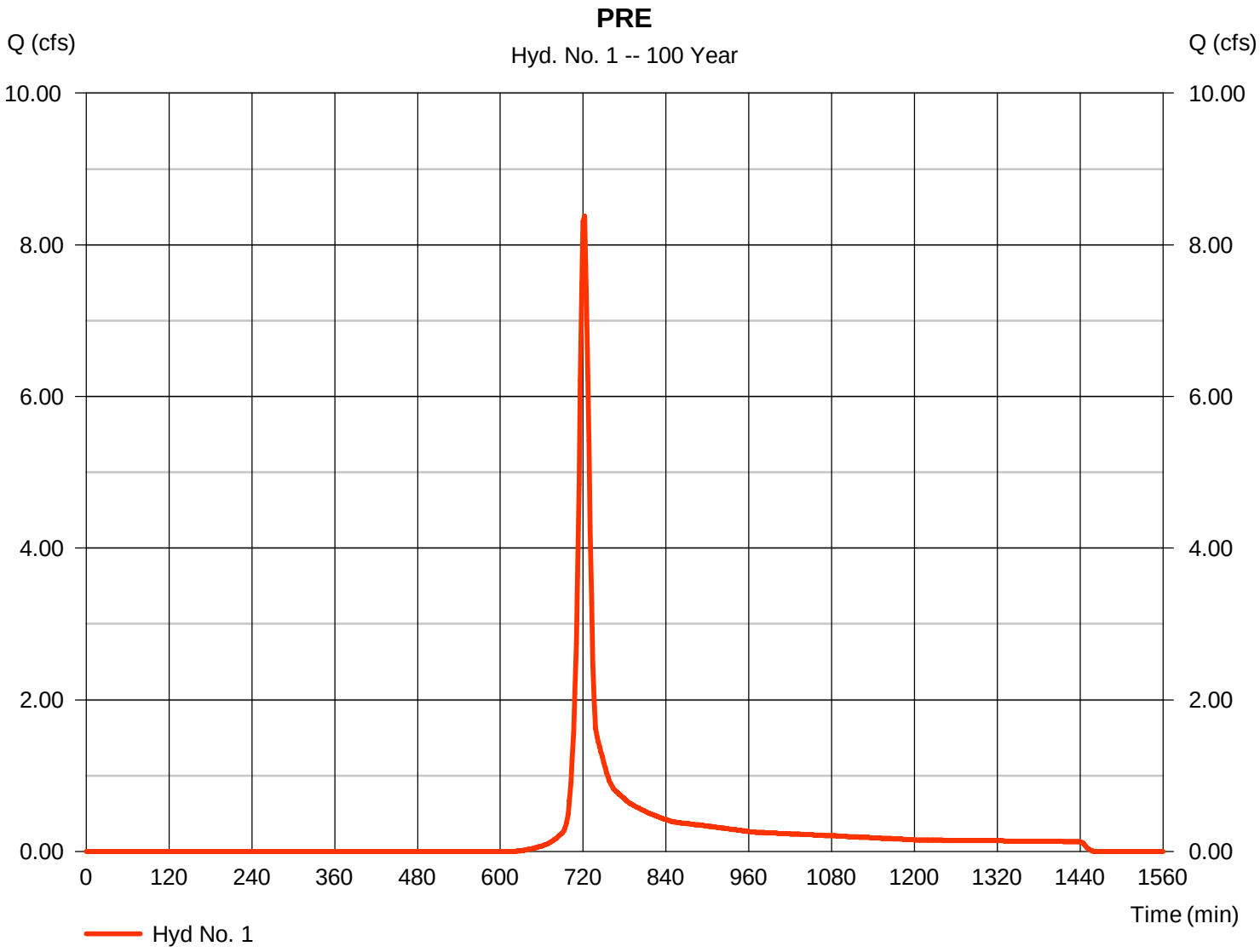
Hydrograph Report

Hyd. No. 1

PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.378 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	22,095 cuft
Drainage area	=	2.110 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	7.56 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(2.110 x 58)] / 2.110



TR55 Tc Worksheet

Hyd. No. 1

PRE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.40**	**+**	**0.00**	**+**	**0.00**	**=**	**8.40**
Shallow Concentrated Flow							
Flow length (ft)	= 631.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 4.73**	**+**	**0.00**	**+**	**0.00**	**=**	**4.73**
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 ..... 13.10 min

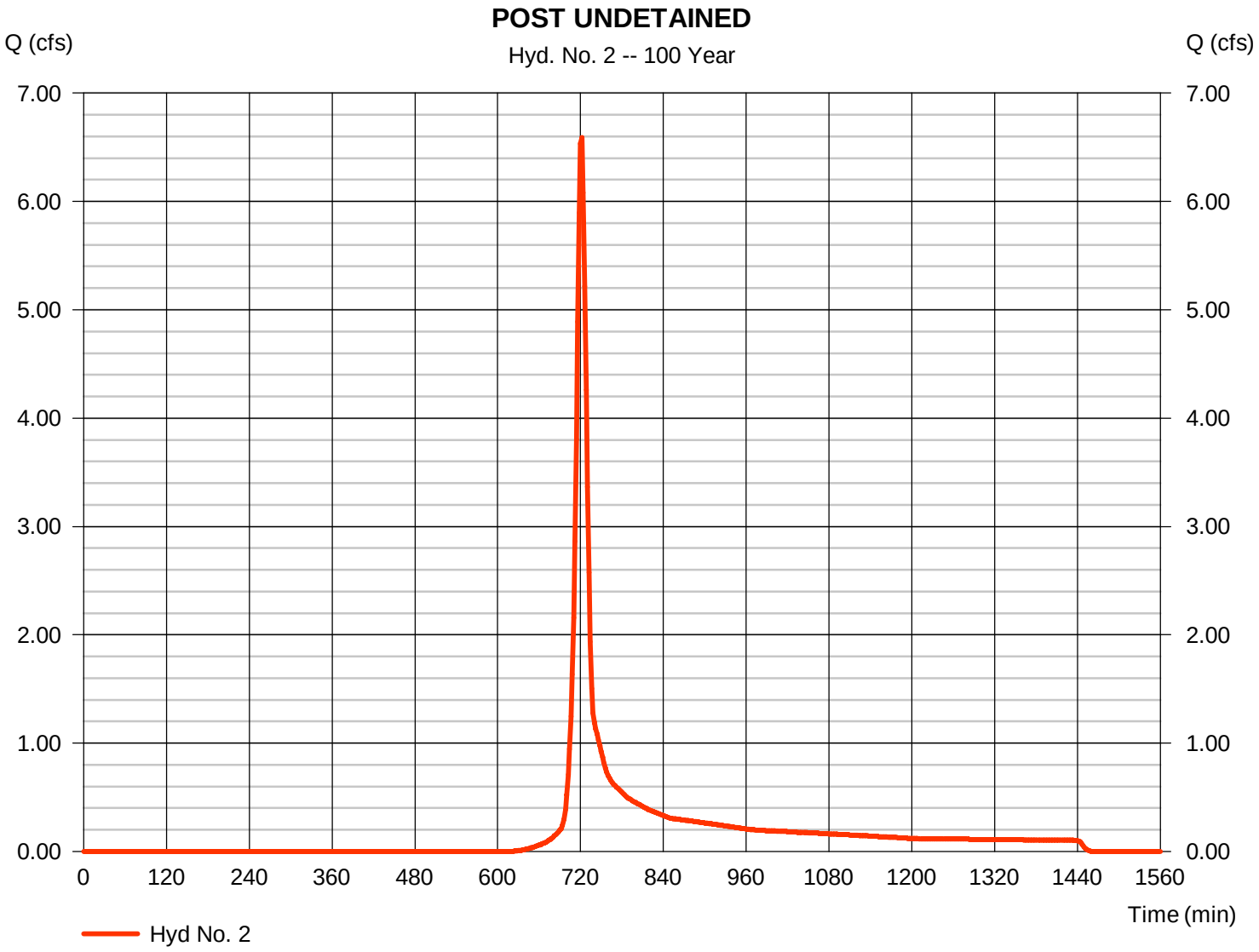
Hydrograph Report

Hyd. No. 2

POST UNDETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.592 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	17,383 cuft
Drainage area	=	1.660 ac	Curve number	=	58*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	13.10 min
Total precip.	=	7.56 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(1.660 x 58)] / 1.660



TR55 Tc Worksheet

Hyd. No. 2

POST UNDETAINED

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 50.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.05		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.40**	**+**	**0.00**	**+**	**0.00**	**=**	**8.40**
Shallow Concentrated Flow							
Flow length (ft)	= 631.00		0.00		0.00		
Watercourse slope (%)	= 1.90		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	=2.22		0.00		0.00		
Travel Time (min)	**= 4.73**	**+**	**0.00**	**+**	**0.00**	**=**	**4.73**
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 ..... 13.10 min

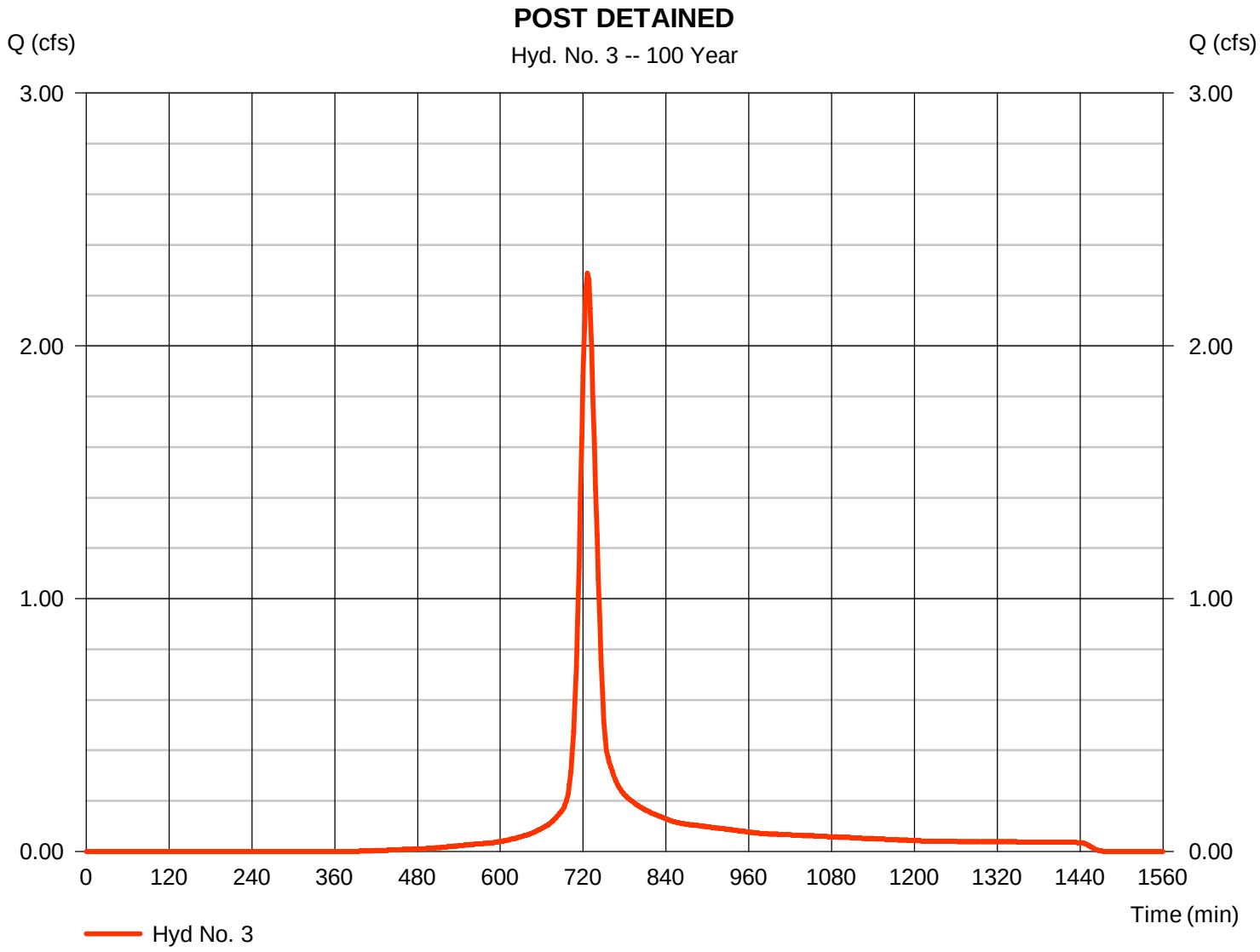
Hydrograph Report

Hyd. No. 3

POST DETAINED

Hydrograph type	=	SCS Runoff	Peak discharge	=	2.288 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	2 min	Hyd. volume	=	7,913 cuft
Drainage area	=	0.450 ac	Curve number	=	76*
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	User	Time of conc. (Tc)	=	21.60 min
Total precip.	=	7.56 in	Distribution	=	Type II
Storm duration	=	24 hrs	Shape factor	=	484

* Composite (Area/CN) = [(0.300 x 85) + (0.150 x 58)] / 0.450

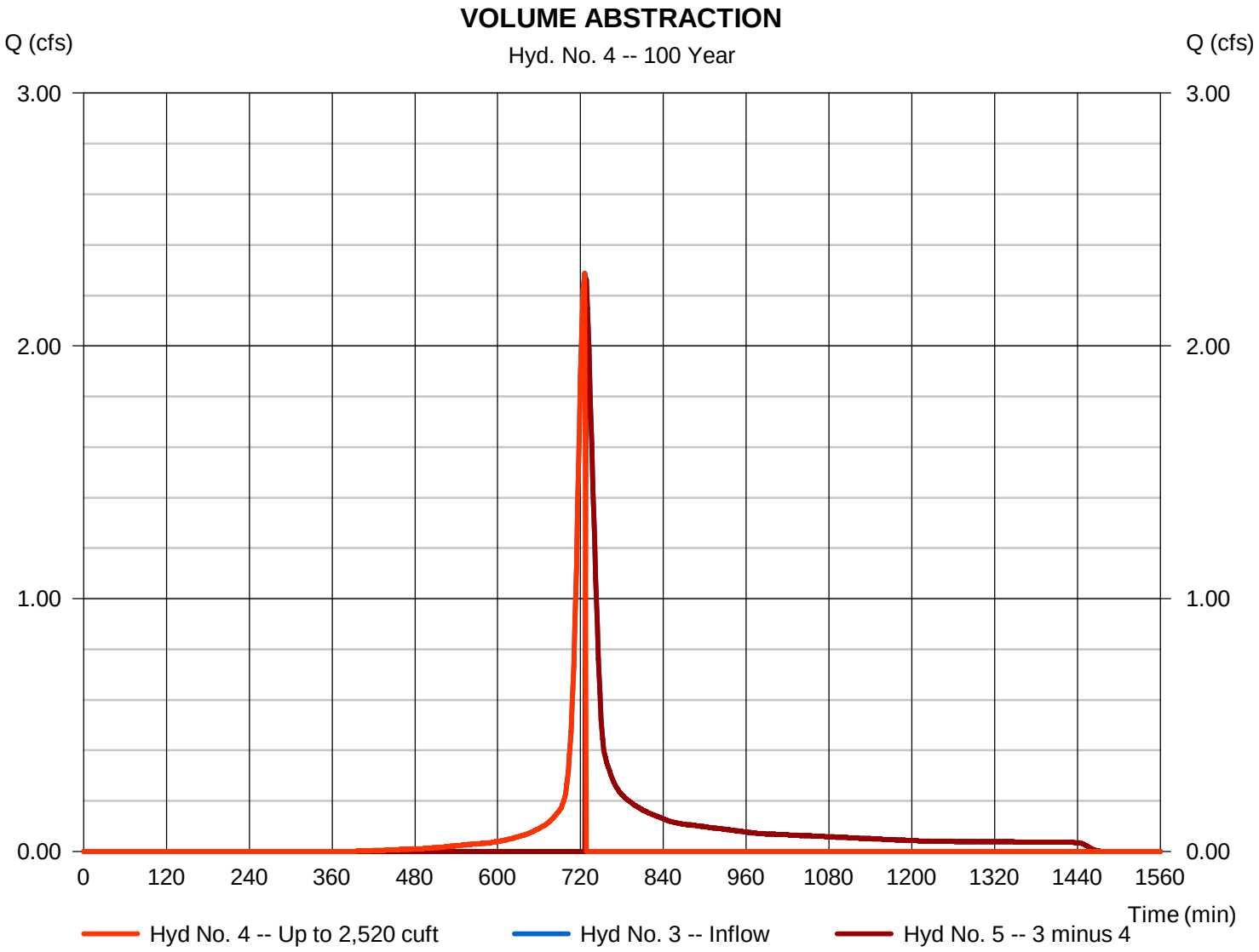


Hydrograph Report

Hyd. No. 4

VOLUME ABSTRACTION

Hydrograph type	= Diversion1	Peak discharge	= 2.288 cfs
Storm frequency	= 100 yrs	Time to peak	= 726 min
Time interval	= 2 min	Hyd. volume	= 2,684 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 5
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

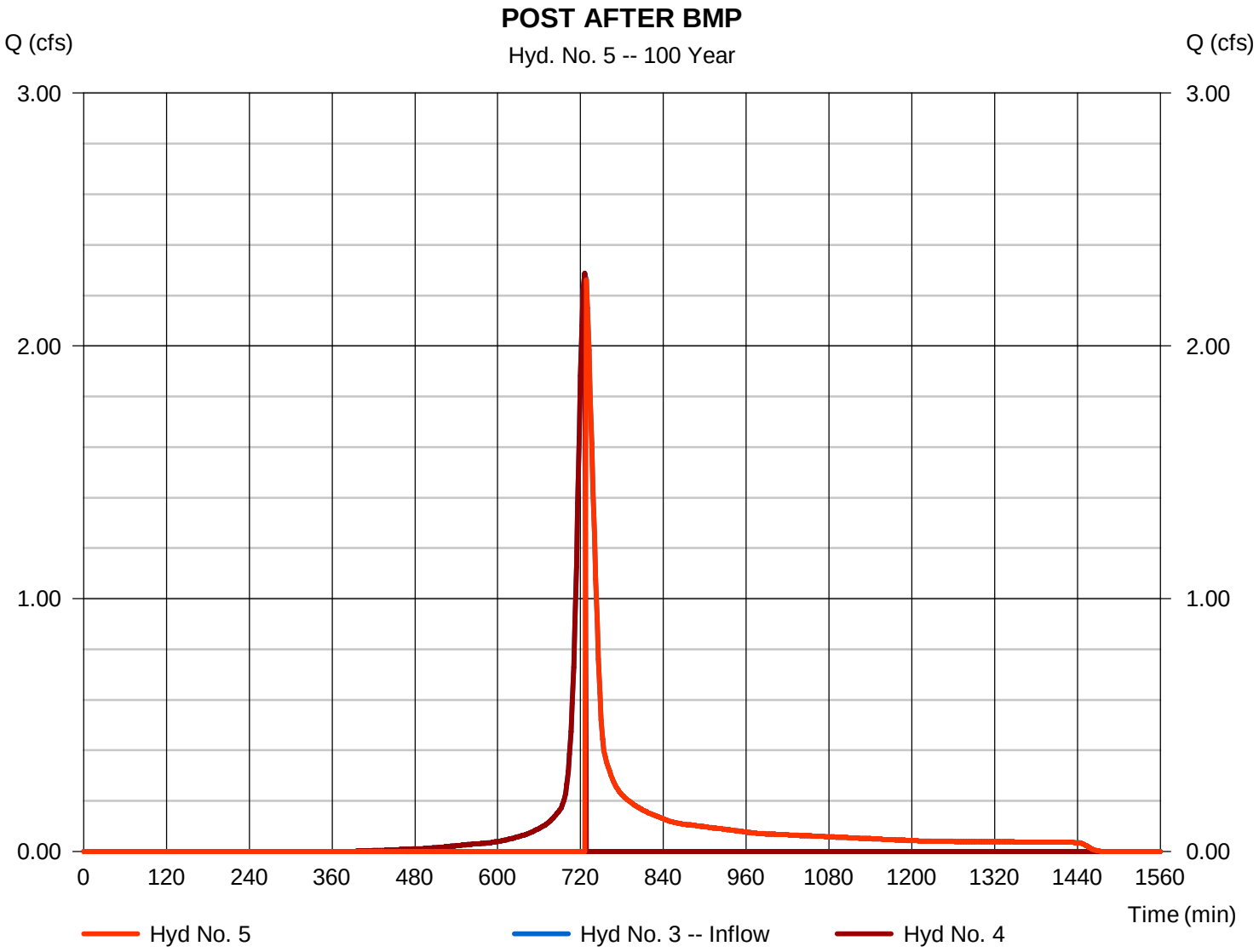


Hydrograph Report

Hyd. No. 5

POST AFTER BMP

Hydrograph type	= Diversion2	Peak discharge	= 2.262 cfs
Storm frequency	= 100 yrs	Time to peak	= 728 min
Time interval	= 2 min	Hyd. volume	= 5,229 cuft
Inflow hydrograph	= 3 - POST DETAINED	2nd diverted hyd.	= 4
Diversion method	= First Flush Volume	Volume Up To	= 2,520 cuft

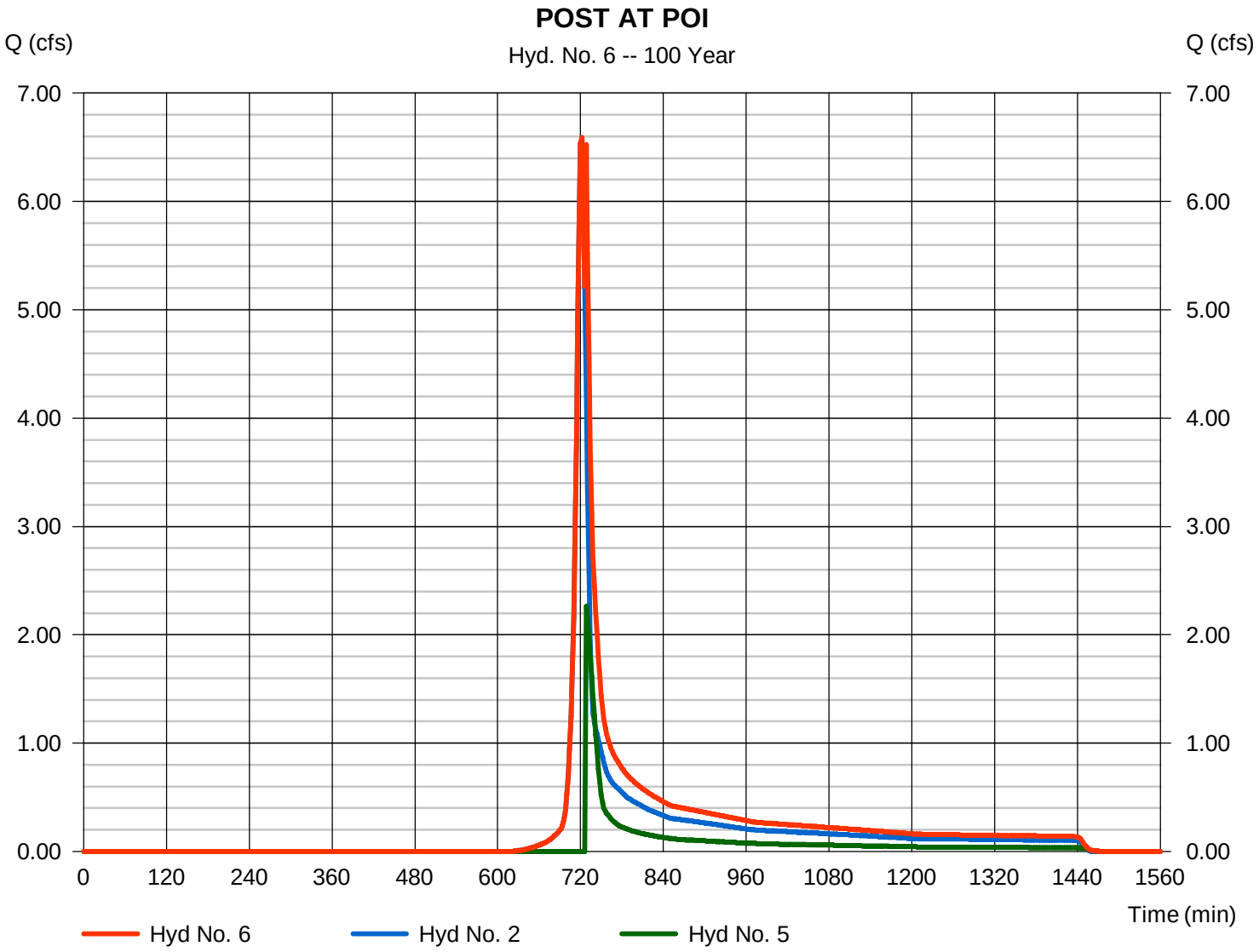


Hydrograph Report

Hyd. No. 6

POST AT POI

Hydrograph type	=	Combine	Peak discharge	=	6.592 cfs
Storm frequency	=	100 yrs	Time to peak	=	722 min
Time interval	=	2 min	Hyd. volume	=	22,612 cuft
Inflow hyds.	=	2, 5	Contrib. drain. area	=	1.660 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	52.5846	12.7000	0.9001	--------
2	59.4970	12.7000	0.8832	--------
3	0.0000	0.0000	0.0000	--------
5	56.2308	11.8000	0.8214	--------
10	58.6750	11.8000	0.8001	--------
25	51.8954	10.5000	0.7395	--------
50	45.1449	9.2000	0.6848	--------
100	43.0569	8.6000	0.6532	--------

File name: Schaeffer Road IDF.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	3.96	3.16	2.65	2.28	2.00	1.79	1.62	1.48	1.37	1.27	1.18	1.11
2	4.70	3.77	3.17	2.73	2.41	2.16	1.96	1.79	1.66	1.54	1.44	1.35
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	5.54	4.47	3.77	3.28	2.91	2.62	2.39	2.20	2.04	1.90	1.78	1.68
10	6.14	4.98	4.22	3.68	3.28	2.96	2.70	2.49	2.32	2.16	2.03	1.92
25	6.84	5.56	4.73	4.14	3.70	3.36	3.08	2.85	2.66	2.50	2.35	2.23
50	7.34	5.97	5.09	4.48	4.02	3.66	3.37	3.13	2.93	2.76	2.61	2.48
100	7.83	6.38	5.46	4.82	4.34	3.96	3.66	3.41	3.20	3.01	2.86	2.72

Tc = time in minutes. Values may exceed 60.

P-2\PPP\02 SCRO\07 PCSM\Attach 4 Stormwater Calcs\Schaeffer Road\Hydraflow Rev 1\Schaeffer Road Precip.pc

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.53	3.05	0.00	3.87	4.57	5.62	6.54	7.56
SCS 6-Hr	1.78	2.16	0.00	2.71	3.17	3.83	4.39	5.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00