Hesketh

Civil & Traffic Engineers • Surveyors • Planners • Landscape Architects

F. A. Hesketh & Associates, Inc.

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MEMORANDUM

To: **Tom Grimaldi, P.E.** **Date**: March 28, 2024

From: Guy Hesketh. P.E.

Subject: **East Granby Meadows Redevelopment**
Hydrologic Analysis
Our File: **22082**

Tom:

Please find attached our hydrologic analysis of the re-development proposal for the East Granby Meadows portion of the Bramble Bush/East Granby Meadows parcel on East Street. As you are aware, K SFR East Granby Owner, LLC, the owner, is proposing to redevelop the East Granby Meadows portion and combine the development into the Bramble Brook portion. The East Granby Meadows portion will include modification from the original mix of duplex and single units to now include only single units (48 units total). The East Granby Meadows portion will be interconnected to the Bramble Bush Village portion to the north via a paved drive. East Granby Meadows will share the common amenities with Bramble Bush Village, including the clubhouse with outdoor pool and gathering amenities and the maintenance building. A separate mail kiosk is proposed to serve only the tenants in East Granby Village. The original development included a total of 46 dwelling units in 40 buildings (34 single-family and 6 duplexes), private roadways, dedicated open space areas, and two stormwater detention ponds that were designed to handle stormwater runoff from the East Granby Village development. Much of the infrastructure has been constructed, including stormwater drainage systems, the stormwater management basins, electric and communications infrastructure, sanitary sewer mains and laterals, and water service mains and laterals.

The re-development proposal would include replacing the 46 dwelling units originally approved with 48 single-family units. The previously proposed easements for electric and

MEMORANDUM

water service would be maintained. Sanitary sewers would be private, however, an easement for the sanitary sewer main that traverses the parcel along East Road would be granted in favor of the Town of East Granby WPCA, as this length of sewer also serves adjacent, off-site users. Currently there is a 70-foot easement in favor of CL&P. This easement would remain in place. New natural gas service is also proposed and it is anticipated a utility easement would be granted to Eversource Gas.

The proposed buildings would utilize the existing utility infrastructure, with new service connections. The existing storm drain systems would also be utilized to serve the development. One length of storm sewer would be replaced to facilitate changes in building layout that conflict with the existing length of storm drain pipe. Revisions to the size and shape of one of the existing stormwater detention basins is proposed to facilitate changes in building layout and to account for the modest increase in impervious area proposed and to account for changes in rainfall intensity rates resulting from the use of current NOAA Atlas 14 rainfall data versus the rainfall data used in the original modeling. Modeling shows that the other basin is adequately designed and will not require modification. Presented herein are a discussion of the methodologies utilized in design of the stormwater management basins and results of the hydrologic modeling utilized in design of the stormwater management basins.

History:

The original development (East Granby Meadows) was approved in 2009. The subdivision application included a 14-page plan set prepared by EcoDesign, LLC from Avon, CT. Other application materials included a drainage report, also prepared by EcoDesign, LLC, entitled " PRE-AND POST DEVELOPMENT STORMWATER ANALYSIS AND ROADWAY DRAINAGE DESIGN REPORT, THE EAST GRANBY VILLAGE, ELDERLY Zone DEVELOPMENT, Dated August 2006 and Revised September 2006. Copies of the 77-page report are on file in the East Granby Planning Department.

The drainage report showed analysis of both existing and proposed conditions using the SCS Methodology (TR-55) of peak flow analysis using the Hydraflow Hydrographs software. The analysis modeled both the pre-development (2006) existing conditions and proposed condition analysis, including inflow and outflow of stormwater through two stormwater detention basins proposed to serve the East Granby Meadows development. Weighted Curve Numbers (CN) were based on soil groups and ground cover characteristics. No reference to rainfall distribution data is provided in the report. It is assumed that published CT DOT rainfall data was used in the analysis.

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Methodology:

We re-ran the hydrologic analysis, also using the SCS Methodology in the Hydraflow Hydrographs program to compare pre- and post-conditions peak rates and volumes. As you are aware, the site has been partially constructed since 2011 and left in a state of partial completion. This being the case, we referred to the previous study in order to establish a baseline for determining existing condition peak flows (2008 pre-developed condition). For the existing condition, we utilized the overall watershed and sub-watershed limits and hydrologic characteristics used in the previous study, which included analysis of peak flows to the western boundary of the site (Sanborn Brook). The original rainfall distribution data, however, was not used in our model. We used recent rainfall data obtained from NOAA Atlas 14 Data from online sources.

It should be noted that in the original study, no hydrologic modeling was completed for the eastern portion of the site that flows to East Street. The record plans indicate that historically (pre 2008), runoff from an approximate 3.17-acre undeveloped portion of the East Granby Meadows parcel flowed south, along the west side of East Street and into a catch basin and cross culvert that traverses East Street just south of the parcel's southern border. This cross culvert drains into a drainage feature on the east side of East Street and flows east. This drainage system is separate from the town's stormwater collection system in East Street which incidentally, discharges to the same drainage feature on the east side of East Street. The previously-approved record development plans also indicate that post-developed condition runoff (3.84 Ac.) was directed to this same catch basin and cross culvert for subsequent discharge east of East Street. The previously-approved designs incorporates collection swales, catch basins, and culverts that collect post-condition developed areas on this eastern portion of the development parcel and direct it to the same East Street cross culvert and direct it away from the town's storm drain system in East Street. The current revised design does the same. It incorporates collection swales, catch basins, and culverts that collect post-condition developed areas (3.87 Ac.) on the eastern portion of the development parcel and direct it to the same East Street cross culvert, thus maintaining the original design intent, in overall drainage area and watershed characteristics. It is therefore assumed, that the drainage infrastructure that conveys the site runoff from the eastern portion of the site to the cross culvert at East Street is adequately designed.

For the proposed site condition, the revised developed-condition parameters were modeled. Weighted Curve Numbers (CN) were based on soil groups and ground cover characteristics of the revised proposed condition. This included routing some on-site-generated runoff through one of the two on-site water quality (detention) basins proposed

MEMORANDUM

for the East Granby Meadows development. One basin, Water Quality Basin #4 is proposed to be reconfigured to facilitate revisions in the building layout and to increase storage volume to provide for one foot of free-board above the 100-year storm levels and to account for the modest net increase in impervious area and the more intense NOAA Atlas 14 rainfall data. Like the revised existing-conditions model, rainfall distribution data was obtained from recent NOAA Atlas 14 Data from online sources.

Results of analysis are summarized below:

Control point CP-N – DeGrays Brook

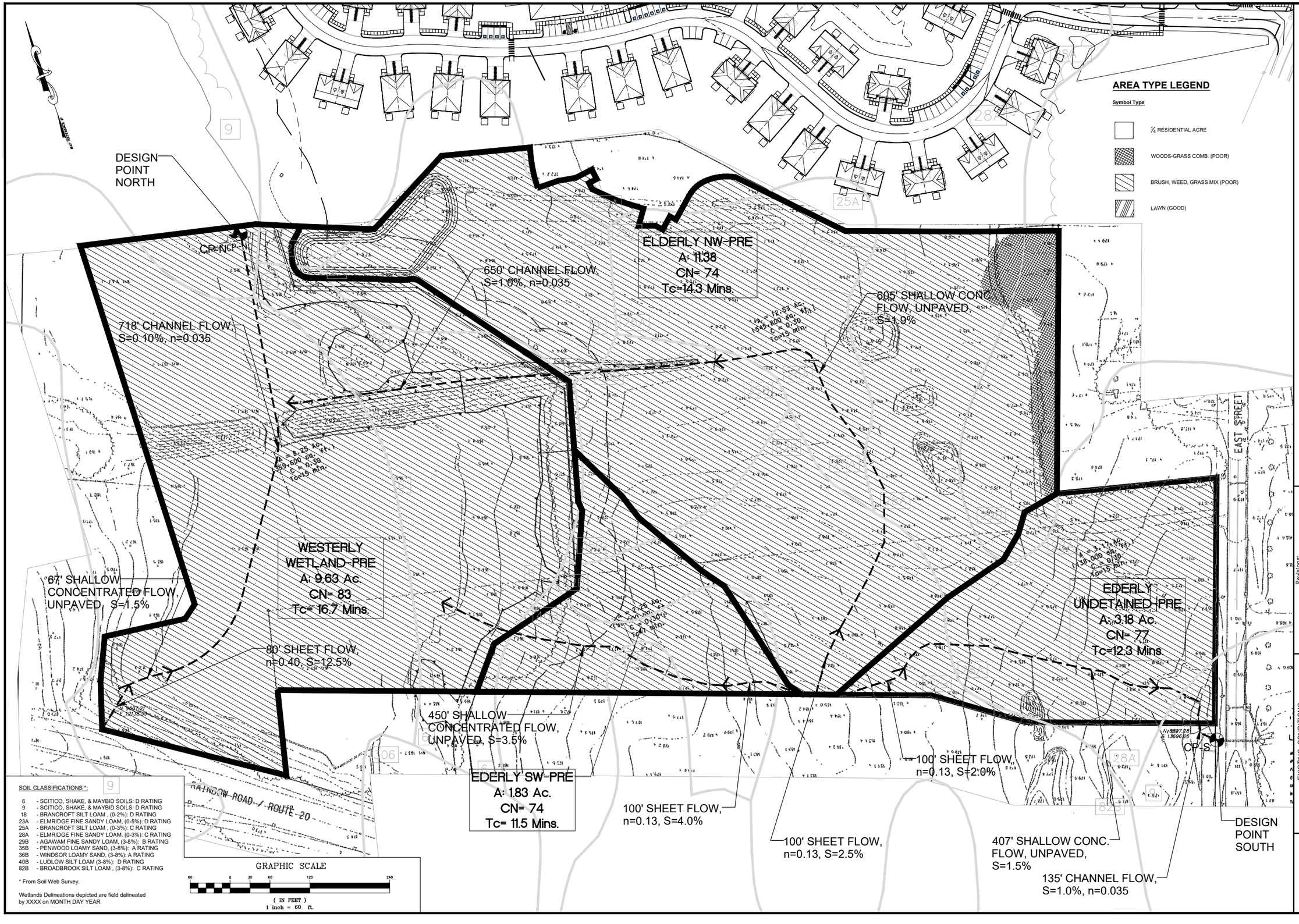
Return Period	Pre-Development Peak Rate of Discharge (CFS)	Post-Developed Peak Rate of Discharge (CFS)
2-Yr	26	15
5-Yr	44	24
10-Yr	59	34
25-Yr	81	47
50-Yr	97	55
100-Yr	115	64

The analysis indicates that there is no increase in peak rate of flow from the proposed re-development to the receiving watershed to the west of the development parcel. The analysis also shows that for the 100-year storm event, a minimum of one foot of freeboard is maintained in the modeled detention basins.

Input and output data is attached.

Attachment 1

Watershed Area Maps



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No.	Date	Description

Revisions:

EXISTING CONDITIONS
WATERSHED AREA MAP
PREPARED FOR
KSFR EAST GRANBY OWNER, LLC
BRAMBLE BUSH CIRCLE
EAST GRANBY, CONNECTICUT

Date: 03-22-2024 | Drawn by: DRT | Job no: 22082
Scale: 1" = 60' | Checked by: GAH | Sheet no: 1 OF 1

DA-1

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DESIGN POINT NORTH

CP-N

WQB #2

WQB #4

WQB #5

718' CHANNEL FLOW, S=1.0%, n=0.035

67' SHALLOW CONCENTRATED FLOW, UNPAVED, S=1.5%

80' SHEET FLOW, n=0.40, S=12.5%

N: 8507.21
E: 12138.55

WESTERLY WETLAND-POST
A: 9.63 Ac.
CN=83
Tc= 16.7 Mins.

746' CHANNEL FLOW, S=2.00%

ELDERLY NW-POST
A: 9.66 Ac.
CN= 77
Tc=18.7 Mins.

142' SHALLOW CONC. FLOW, UNPAVED, S=1.5%

100' SHEET FLOW, n=0.24, S=1.5%

ELDERLY SW-POST
A: 2.38 Ac.
CN=80
Tc= 8.0 Mins.

ELDERLY UNDETAINED-POST
A: 3.84 Ac.
CN=80
Tc=16.7 Mins.

195' CHANNEL FLOW, S=2.0%

36' SHEET FLOW, n=0.24, S=1.5%

91' SHEET FLOW, n=0.24, S=2.5%

79' SHALLOW CONC. FLOW, UNPAVED, S=2.5%

231' SHALLOW CONCENTRATED FLOW, UNPAVED S=1.75%

627' CHANNEL FLOW, S=0.50%

N: 8897.28
E: 13696.26

CP-S

DESIGN POINT SOUTH

AREA TYPE LEGEND

Symbol Type

- ¼ RESIDENTIAL ACRE
- WOODS-GRASS COMB. (POOR)
- BRUSH, WEED, GRASS MIX (POOR)
- LAWN (GOOD)

SOIL CLASSIFICATIONS *:

6	- SCITICO, SHAKE, & MAYBID SOILS: D RATING
9	- SCITICO, SHAKE, & MAYBID SOILS: D RATING
18	- BRANCROFT SILT LOAM , (0-2%): D RATING
23A	- ELMRIDGE FINE SANDY LOAM, (0-5%): D RATING
25A	- BRANCROFT SILT LOAM , (0-3%): C RATING
28A	- ELMRIDGE FINE SANDY LOAM, (0-3%): C RATING
29B	- AGAWAM FINE SANDY LOAM, (3-8%): B RATING
35B	- PENWOOD LOAMY SAND, (3-8%): A RATING
36B	- WINDSOR LOAMY SAND, (3-8%): A RATING
40B	- LUDLOW SILT LOAM (3-8%): D RATING
82B	- BROADBROOK SILT LOAM , (3-8%): C RATING

* From Soil Web Survey.

Wetlands Delineations depicted are field delineated by XXXX on MONTH DAY YEAR

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)
1 inch = 60 ft.

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Revisions:

No.	Date	Description

PROPOSED CONDITIONS
WATERSHED AREA MAP
PREPARED FOR
KSFR EAST GRANBY OWNER, LLC
OLD DEERFIELD CIRCLE
BRIARWOOD CIRCLE
EAST GRANBY, CONNECTICUT

Date: 03-22-2024 | Drawn by: DRT | Job no: 22082
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DA-2

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Attachment 2

NOAA Atlas 14 Precipitation Data

NOAA Atlas 14, Volume 10, Version 3
Location name: East Granby, Connecticut, USA*
Latitude: 41.9415°, Longitude: -72.7178°
Elevation: 174 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

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	**0.348** (0.267-0.453)	**0.417** (0.319-0.543)	**0.530** (0.404-0.692)	**0.623** (0.473-0.819)	**0.751** (0.553-1.03)	**0.848** (0.613-1.19)	**0.949** (0.668-1.38)	**1.06** (0.712-1.59)	**1.22** (0.791-1.89)	**1.36** (0.858-2.14)
10-min	**0.493** (0.378-0.641)	**0.591** (0.452-0.769)	**0.750** (0.572-0.980)	**0.882** (0.669-1.16)	**1.06** (0.784-1.46)	**1.20** (0.869-1.69)	**1.34** (0.947-1.96)	**1.50** (1.01-2.25)	**1.73** (1.12-2.68)	**1.92** (1.22-3.03)
15-min	**0.580** (0.444-0.755)	**0.695** (0.532-0.904)	**0.882** (0.673-1.15)	**1.04** (0.787-1.36)	**1.25** (0.922-1.72)	**1.41** (1.02-1.98)	**1.58** (1.11-2.30)	**1.77** (1.19-2.64)	**2.04** (1.32-3.16)	**2.26** (1.43-3.57)
30-min	**0.779** (0.597-1.01)	**0.939** (0.718-1.22)	**1.20** (0.914-1.57)	**1.42** (1.07-1.86)	**1.71** (1.26-2.35)	**1.94** (1.40-2.72)	**2.17** (1.53-3.16)	**2.43** (1.63-3.63)	**2.80** (1.81-4.34)	**3.10** (1.96-4.90)
60-min	**0.979** (0.749-1.27)	**1.18** (0.905-1.54)	**1.52** (1.16-1.98)	**1.79** (1.36-2.36)	**2.17** (1.60-2.98)	**2.46** (1.78-3.45)	**2.76** (1.94-4.02)	**3.09** (2.07-4.62)	**3.56** (2.30-5.52)	**3.95** (2.50-6.24)
2-hr	**1.26** (0.973-1.63)	**1.52** (1.17-1.96)	**1.94** (1.48-2.51)	**2.28** (1.74-2.98)	**2.76** (2.05-3.77)	**3.11** (2.27-4.36)	**3.49** (2.48-5.09)	**3.93** (2.64-5.84)	**4.58** (2.97-7.05)	**5.12** (3.25-8.05)
3-hr	**1.46** (1.12-1.87)	**1.75** (1.35-2.25)	**2.23** (1.72-2.88)	**2.63** (2.02-3.42)	**3.18** (2.37-4.34)	**3.59** (2.63-5.02)	**4.03** (2.88-5.87)	**4.55** (3.07-6.74)	**5.34** (3.47-8.19)	**6.01** (3.82-9.41)
6-hr	**1.82** (1.42-2.33)	**2.21** (1.72-2.83)	**2.84** (2.20-3.65)	**3.37** (2.60-4.35)	**4.09** (3.07-5.56)	**4.62** (3.41-6.45)	**5.20** (3.76-7.58)	**5.92** (4.00-8.72)	**7.02** (4.58-10.7)	**7.98** (5.09-12.4)
12-hr	**2.23** (1.75-2.83)	**2.74** (2.15-3.49)	**3.58** (2.80-4.57)	**4.28** (3.32-5.50)	**5.24** (3.96-7.10)	**5.95** (4.42-8.27)	**6.72** (4.90-9.79)	**7.70** (5.22-11.3)	**9.23** (6.04-14.0)	**10.6** (6.76-16.4)
24-hr	**2.58** (2.04-3.26)	**3.24** (2.55-4.09)	**4.30** (3.38-5.46)	**5.19** (4.05-6.62)	**6.41** (4.88-8.65)	**7.30** (5.47-10.1)	**8.29** (6.10-12.1)	**9.57** (6.52-13.9)	**11.6** (7.62-17.5)	**13.4** (8.63-20.7)
2-day	**2.88** (2.28-3.60)	**3.66** (2.90-4.59)	**4.94** (3.90-6.21)	**6.00** (4.71-7.59)	**7.46** (5.72-10.0)	**8.51** (6.44-11.8)	**9.70** (7.22-14.2)	**11.3** (7.72-16.4)	**13.9** (9.17-20.9)	**16.3** (10.5-24.9)
3-day	**3.14** (2.50-3.92)	**4.00** (3.18-4.99)	**5.40** (4.29-6.78)	**6.57** (5.18-8.29)	**8.18** (6.30-11.0)	**9.34** (7.09-12.9)	**10.7** (7.96-15.5)	**12.4** (8.51-18.0)	**15.4** (10.1-23.0)	**18.1** (11.7-27.5)
4-day	**3.39** (2.71-4.21)	**4.31** (3.44-5.37)	**5.82** (4.63-7.28)	**7.07** (5.59-8.89)	**8.79** (6.80-11.8)	**10.0** (7.64-13.8)	**11.5** (8.57-16.6)	**13.4** (9.16-19.2)	**16.6** (10.9-24.7)	**19.4** (12.5-29.5)
7-day	**4.08** (3.28-5.04)	**5.13** (4.12-6.36)	**6.86** (5.48-8.52)	**8.29** (6.59-10.4)	**10.3** (7.96-13.6)	**11.7** (8.92-16.0)	**13.3** (9.96-19.1)	**15.5** (10.6-22.1)	**19.0** (12.6-28.2)	**22.2** (14.4-33.6)
10-day	**4.76** (3.84-5.87)	**5.88** (4.74-7.26)	**7.72** (6.19-9.56)	**9.24** (7.37-11.5)	**11.3** (8.81-15.0)	**12.9** (9.82-17.5)	**14.6** (10.9-20.8)	**16.8** (11.6-24.0)	**20.5** (13.6-30.4)	**23.8** (15.5-35.9)
20-day	**6.88** (5.59-8.43)	**8.06** (6.54-9.88)	**9.99** (8.07-12.3)	**11.6** (9.30-14.3)	**13.8** (10.8-18.0)	**15.4** (11.8-20.6)	**17.2** (12.8-24.1)	**19.4** (13.5-27.5)	**23.0** (15.3-33.7)	**26.0** (16.9-39.0)
30-day	**8.68** (7.08-10.6)	**9.88** (8.05-12.1)	**11.8** (9.60-14.5)	**13.5** (10.9-16.6)	**15.7** (12.3-20.3)	**17.4** (13.3-23.0)	**19.2** (14.2-26.4)	**21.3** (14.8-30.0)	**24.5** (16.4-35.7)	**27.2** (17.7-40.6)
45-day	**10.9** (8.96-13.3)	**12.2** (9.96-14.8)	**14.2** (11.6-17.3)	**15.9** (12.8-19.5)	**18.2** (14.2-23.3)	**19.9** (15.2-26.1)	**21.7** (16.0-29.5)	**23.7** (16.6-33.2)	**26.4** (17.7-38.3)	**28.5** (18.6-42.4)
60-day	**12.8** (10.5-15.6)	**14.1** (11.6-17.1)	**16.2** (13.3-19.8)	**18.0** (14.6-22.0)	**20.4** (15.9-25.9)	**22.3** (17.0-28.9)	**24.1** (17.6-32.2)	**25.9** (18.2-36.1)	**28.1** (18.9-40.8)	**29.8** (19.5-44.2)

[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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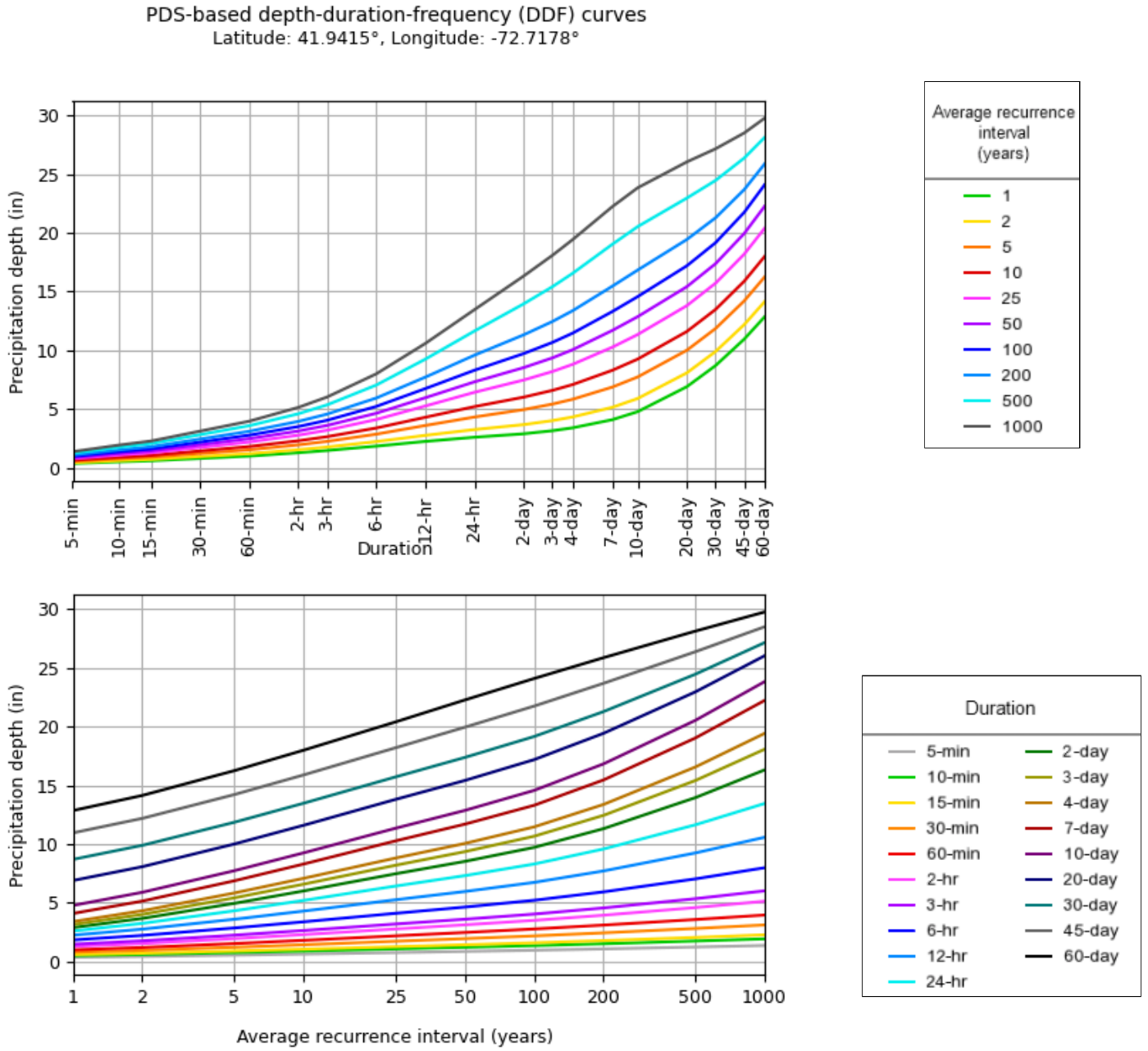
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Thu Mar 28 12:26:59 2024

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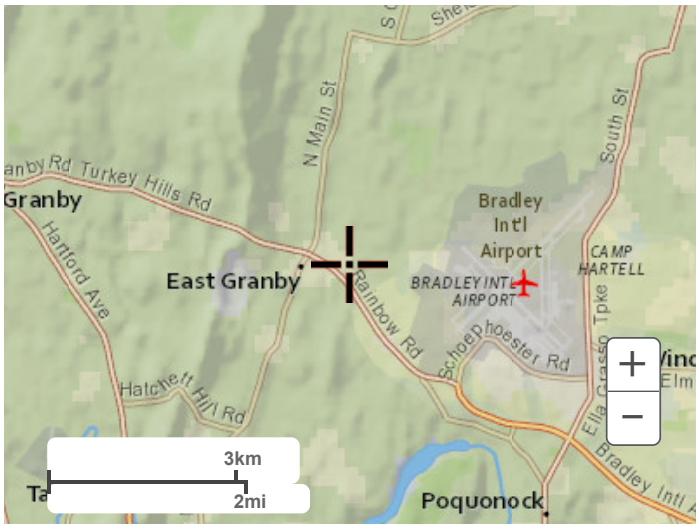
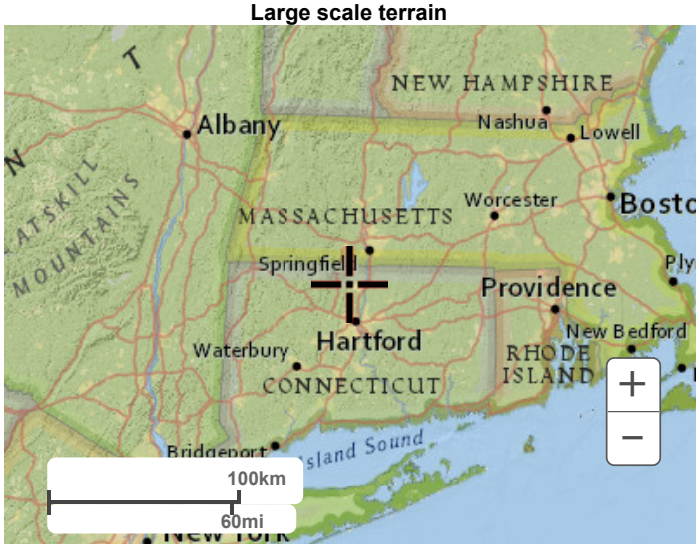
Maps & aerials

Small scale terrain



Large scale terrain



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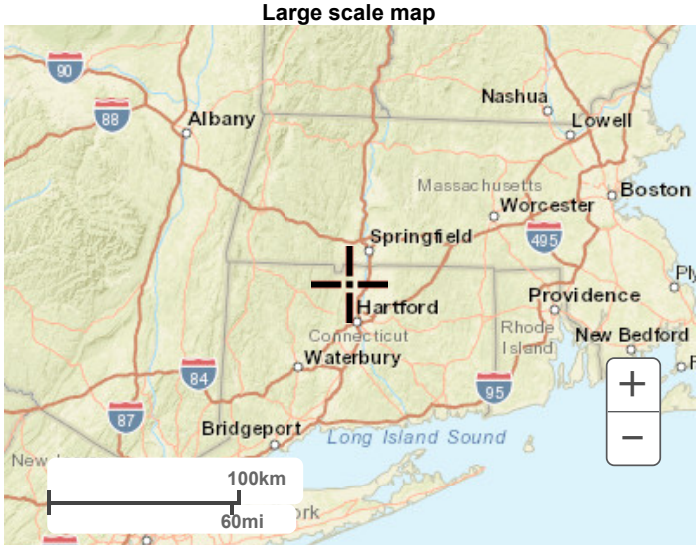
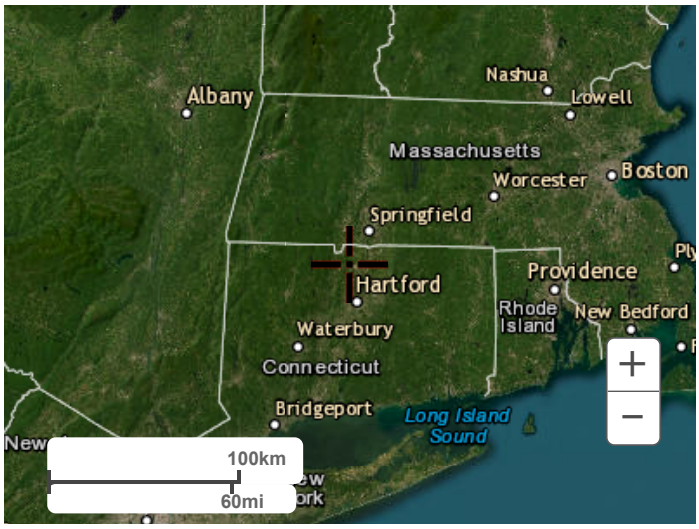


Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

NOAA Atlas 14, Volume 10, Version 3
Location name: East Granby, Connecticut, USA*
Latitude: 41.9415°, Longitude: -72.7178°
Elevation: 174 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.18** (3.20-5.44)	**5.00** (3.83-6.52)	**6.36** (4.85-8.30)	**7.48** (5.68-9.83)	**9.01** (6.64-12.4)	**10.2** (7.36-14.3)	**11.4** (8.02-16.6)	**12.7** (8.54-19.0)	**14.7** (9.49-22.7)	**16.3** (10.3-25.7)
10-min	**2.96** (2.27-3.85)	**3.55** (2.71-4.61)	**4.50** (3.43-5.88)	**5.29** (4.01-6.96)	**6.38** (4.70-8.77)	**7.21** (5.21-10.1)	**8.06** (5.68-11.8)	**9.02** (6.05-13.5)	**10.4** (6.73-16.1)	**11.5** (7.29-18.2)
15-min	**2.32** (1.78-3.02)	**2.78** (2.13-3.62)	**3.53** (2.69-4.61)	**4.15** (3.15-5.46)	**5.00** (3.69-6.88)	**5.65** (4.08-7.93)	**6.32** (4.46-9.22)	**7.08** (4.74-10.6)	**8.16** (5.28-12.6)	**9.03** (5.72-14.3)
30-min	**1.56** (1.19-2.03)	**1.88** (1.44-2.44)	**2.40** (1.83-3.13)	**2.83** (2.15-3.72)	**3.42** (2.52-4.70)	**3.87** (2.80-5.44)	**4.34** (3.06-6.32)	**4.86** (3.26-7.26)	**5.60** (3.63-8.67)	**6.21** (3.93-9.81)
60-min	**0.979** (0.749-1.27)	**1.18** (0.905-1.54)	**1.52** (1.16-1.98)	**1.79** (1.36-2.36)	**2.17** (1.60-2.98)	**2.46** (1.78-3.45)	**2.76** (1.94-4.02)	**3.09** (2.07-4.62)	**3.56** (2.30-5.52)	**3.95** (2.50-6.24)
2-hr	**0.631** (0.486-0.816)	**0.759** (0.584-0.981)	**0.967** (0.742-1.26)	**1.14** (0.870-1.49)	**1.38** (1.02-1.89)	**1.56** (1.13-2.18)	**1.75** (1.24-2.54)	**1.97** (1.32-2.92)	**2.29** (1.49-3.52)	**2.56** (1.63-4.02)
3-hr	**0.484** (0.374-0.623)	**0.582** (0.450-0.750)	**0.742** (0.572-0.960)	**0.875** (0.670-1.14)	**1.06** (0.789-1.44)	**1.19** (0.874-1.67)	**1.34** (0.959-1.96)	**1.52** (1.02-2.24)	**1.78** (1.16-2.73)	**2.00** (1.27-3.13)
6-hr	**0.304** (0.237-0.389)	**0.369** (0.287-0.472)	**0.474** (0.368-0.609)	**0.562** (0.433-0.726)	**0.683** (0.512-0.929)	**0.772** (0.569-1.08)	**0.869** (0.627-1.27)	**0.988** (0.668-1.46)	**1.17** (0.764-1.79)	**1.33** (0.849-2.07)
12-hr	**0.185** (0.145-0.234)	**0.227** (0.178-0.289)	**0.297** (0.232-0.379)	**0.355** (0.275-0.456)	**0.435** (0.329-0.589)	**0.493** (0.367-0.686)	**0.558** (0.406-0.812)	**0.639** (0.433-0.935)	**0.766** (0.501-1.16)	**0.877** (0.561-1.36)
24-hr	**0.107** (0.084-0.135)	**0.134** (0.106-0.170)	**0.179** (0.140-0.227)	**0.216** (0.168-0.275)	**0.267** (0.203-0.360)	**0.304** (0.227-0.421)	**0.345** (0.253-0.502)	**0.398** (0.271-0.580)	**0.484** (0.317-0.731)	**0.560** (0.359-0.861)
2-day	**0.059** (0.047-0.075)	**0.076** (0.060-0.095)	**0.102** (0.081-0.129)	**0.124** (0.098-0.158)	**0.155** (0.119-0.208)	**0.177** (0.134-0.245)	**0.202** (0.150-0.294)	**0.235** (0.160-0.341)	**0.290** (0.190-0.435)	**0.339** (0.218-0.519)
3-day	**0.043** (0.034-0.054)	**0.055** (0.044-0.069)	**0.075** (0.059-0.094)	**0.091** (0.072-0.115)	**0.113** (0.087-0.152)	**0.129** (0.098-0.179)	**0.148** (0.110-0.215)	**0.172** (0.118-0.249)	**0.213** (0.140-0.319)	**0.250** (0.161-0.382)
4-day	**0.035** (0.028-0.043)	**0.044** (0.035-0.055)	**0.060** (0.048-0.075)	**0.073** (0.058-0.092)	**0.091** (0.070-0.122)	**0.104** (0.079-0.144)	**0.119** (0.089-0.173)	**0.139** (0.095-0.200)	**0.172** (0.113-0.257)	**0.202** (0.130-0.307)
7-day	**0.024** (0.019-0.030)	**0.030** (0.024-0.037)	**0.040** (0.032-0.050)	**0.049** (0.039-0.061)	**0.061** (0.047-0.081)	**0.069** (0.053-0.095)	**0.079** (0.059-0.113)	**0.091** (0.063-0.131)	**0.113** (0.074-0.168)	**0.132** (0.085-0.200)
10-day	**0.019** (0.015-0.024)	**0.024** (0.019-0.030)	**0.032** (0.025-0.039)	**0.038** (0.030-0.047)	**0.047** (0.036-0.062)	**0.053** (0.040-0.072)	**0.060** (0.045-0.086)	**0.070** (0.048-0.100)	**0.085** (0.056-0.126)	**0.099** (0.064-0.149)
20-day	**0.014** (0.011-0.017)	**0.016** (0.013-0.020)	**0.020** (0.016-0.025)	**0.024** (0.019-0.029)	**0.028** (0.022-0.037)	**0.032** (0.024-0.042)	**0.035** (0.026-0.050)	**0.040** (0.028-0.057)	**0.047** (0.031-0.070)	**0.054** (0.035-0.081)
30-day	**0.012** (0.009-0.014)	**0.013** (0.011-0.016)	**0.016** (0.013-0.020)	**0.018** (0.015-0.023)	**0.021** (0.017-0.028)	**0.024** (0.018-0.031)	**0.026** (0.019-0.036)	**0.029** (0.020-0.041)	**0.033** (0.022-0.049)	**0.037** (0.024-0.056)
45-day	**0.010** (0.008-0.012)	**0.011** (0.009-0.013)	**0.013** (0.010-0.016)	**0.014** (0.011-0.018)	**0.016** (0.013-0.021)	**0.018** (0.014-0.024)	**0.020** (0.014-0.027)	**0.021** (0.015-0.030)	**0.024** (0.016-0.035)	**0.026** (0.017-0.039)
60-day	**0.008** (0.007-0.010)	**0.009** (0.008-0.011)	**0.011** (0.009-0.013)	**0.012** (0.010-0.015)	**0.014** (0.011-0.017)	**0.015** (0.011-0.020)	**0.016** (0.012-0.022)	**0.017** (0.012-0.025)	**0.019** (0.013-0.028)	**0.020** (0.013-0.030)

[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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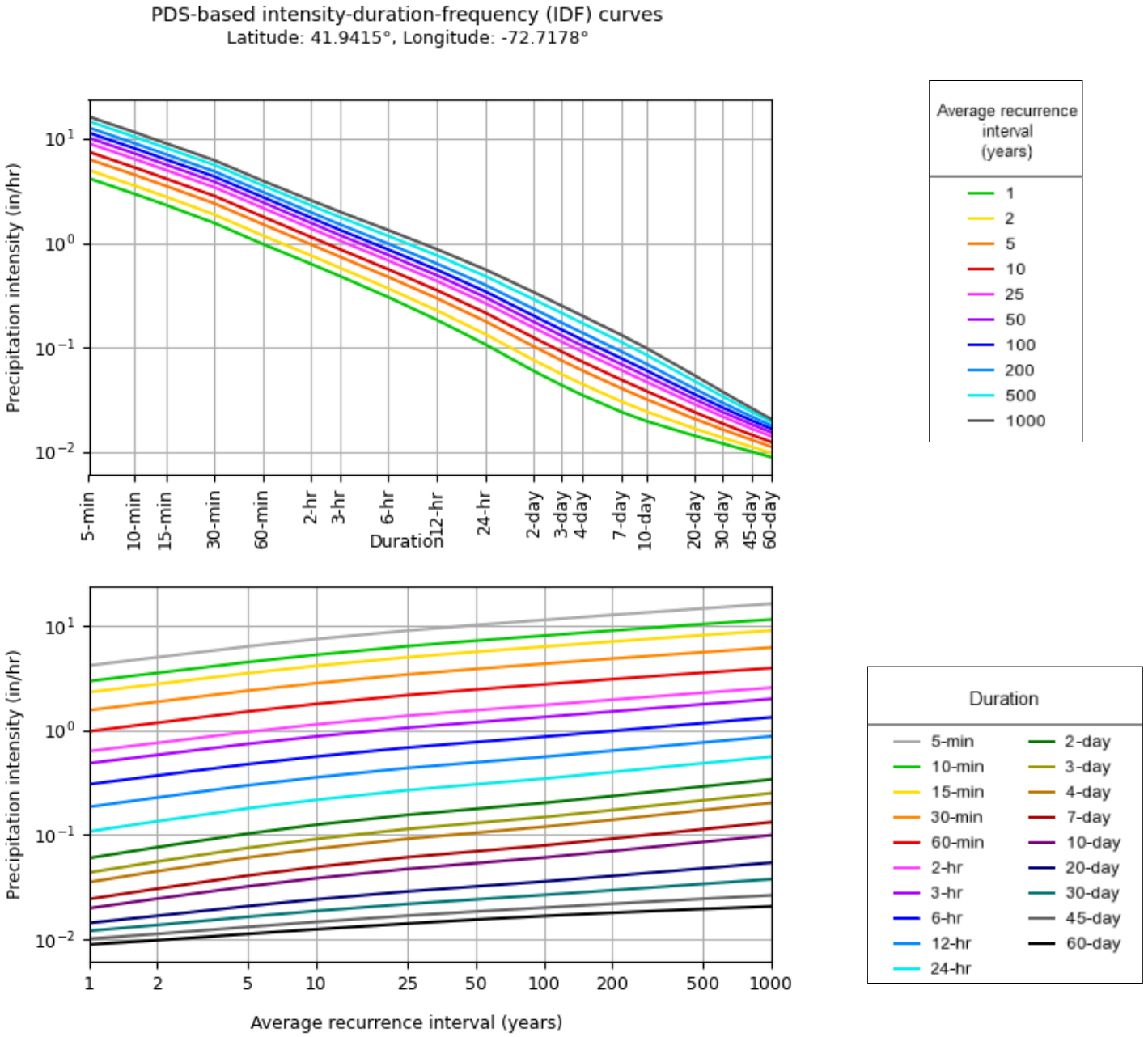
PF graphical



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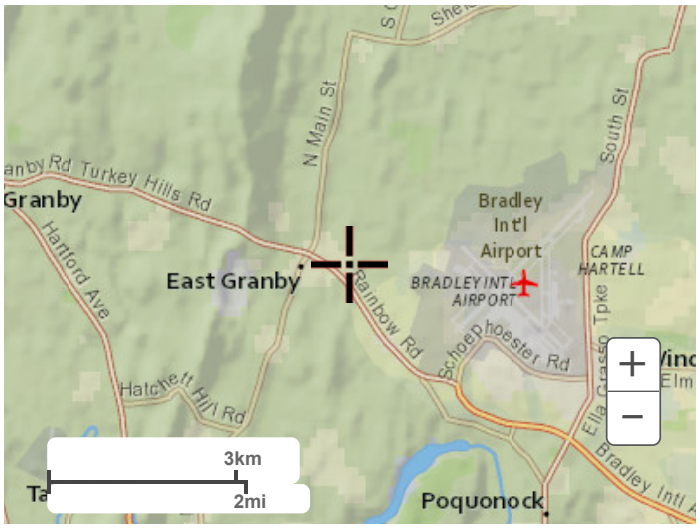
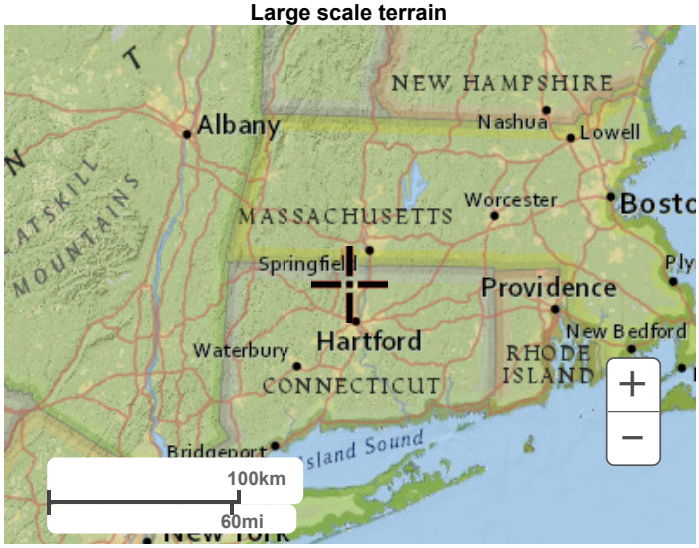
Maps & aerials

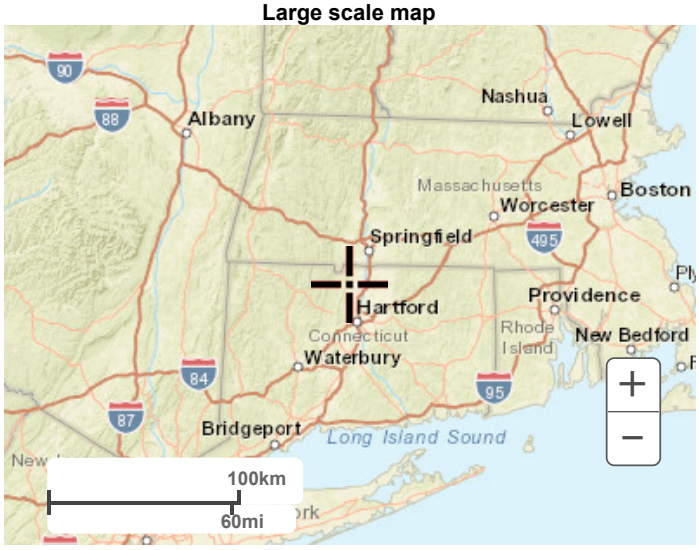
Small scale terrain



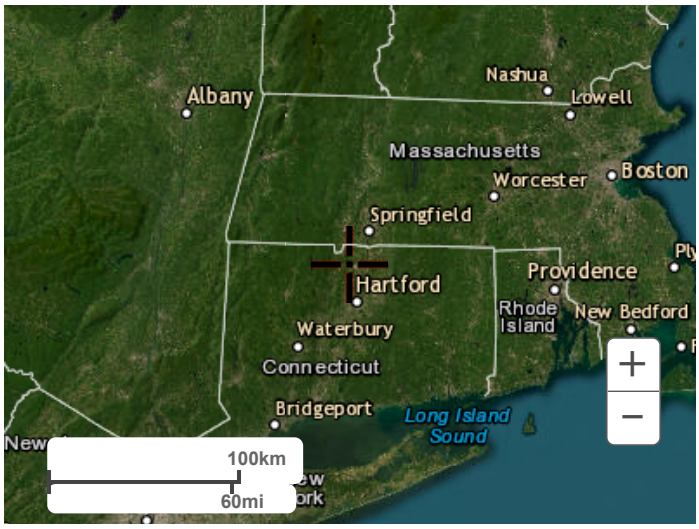
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Attachment 3

Site Soil Data

Soil Map—State of Connecticut, Western Part
(East Granby Meadows)

Map Scale: 1:3,000 if printed on B landscape (17" x 11") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

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

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

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

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

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

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

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

Date(s) aerial images were photographed: Jun 14, 2022—Oct 6, 2022

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
6	Wilbraham and Menlo soils, 0 to 8 percent slopes, extremely stony	3.2	12.4%
9	Scitico, Shaker, and Maybid soils, 0 to 3 percent slopes	2.8	10.7%
18	Catden and Freetown soils, 0 to 2 percent slopes	5.7	21.9%
23A	Sudbury sandy loam, 0 to 5 percent slopes	0.0	0.0%
25A	Brancroft silt loam, 0 to 3 percent slopes	2.4	9.0%
28A	Elmridge fine sandy loam, 0 to 3 percent slopes	5.9	22.4%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	0.7	2.9%
35B	Penwood loamy sand, 3 to 8 percent slopes	1.7	6.6%
36B	Windsor loamy sand, 3 to 8 percent slopes	0.1	0.3%
40B	Ludlow silt loam, 3 to 8 percent slopes	0.8	3.2%
82B	Broadbrook silt loam, 3 to 8 percent slopes	2.8	10.6%
Totals for Area of Interest		**26.2**	**100.0%**

State of Connecticut, Western Part

6—Wilbraham and Menlo soils, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2wh25
Elevation: 0 to 790 feet
Mean annual precipitation: 36 to 53 inches
Mean annual air temperature: 41 to 54 degrees F
Frost-free period: 140 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Wilbraham, extremely stony, and similar soils: 60 percent
Menlo, extremely stony, and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wilbraham, Extremely Stony

Setting

Landform: Depressions, drainageways, hills, drumlins, ground moraines
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Red coarse-loamy lodgment till derived from basalt and/or sandstone and shale

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
Ap - 2 to 10 inches: silt loam
Bw1 - 10 to 21 inches: silt loam
Bw2 - 21 to 27 inches: silt loam
Cd - 27 to 63 inches: gravelly loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 16 to 35 inches to densic material
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C/D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: Yes

Description of Menlo, Extremely Stony

Setting

Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from basalt and/or sandstone and shale

Typical profile

Oa - 0 to 5 inches: highly decomposed plant material
A - 5 to 16 inches: mucky silt loam
Bg1 - 16 to 22 inches: flaggy very fine sandy loam
Bg2 - 22 to 27 inches: flaggy fine sandy loam
Cd1 - 27 to 40 inches: fine sandy loam
Cd2 - 40 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 20 to 36 inches to densic material
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C/D
Ecological site: F144AY041MA - Very Wet Till Depressions
Hydric soil rating: Yes

Minor Components

Ludlow

Percent of map unit: 5 percent
Landform: Drumlins, hills
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Concave
Across-slope shape: Linear

Hydric soil rating: No

Watchaug

Percent of map unit: 5 percent
Landform: Hills, ground moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Data Source Information

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

State of Connecticut

9—Scitico, Shaker, and Maybid soils

Map Unit Setting

National map unit symbol: 9lrq
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 50 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Scitico and similar soils: 40 percent
Shaker and similar soils: 30 percent
Maybid and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Scitico

Setting

Landform: Terraces, drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 8 inches: silt loam
Eg - 8 to 11 inches: silt loam
Bg1 - 11 to 18 inches: silty clay loam
Bg2 - 18 to 30 inches: silty clay loam
Bg3 - 30 to 38 inches: silty clay
Cg1 - 38 to 52 inches: silty clay loam
Cg2 - 52 to 65 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 11.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: D
Ecological site: F145XY004CT - Wet Lake Plain
Hydric soil rating: Yes

Description of Shaker

Setting

Landform: Terraces, drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy eolian deposits over clayey glaciolacustrine deposits

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
Ap - 2 to 6 inches: fine sandy loam
Bg - 6 to 20 inches: sandy loam
Bw - 20 to 30 inches: sandy loam
2C - 30 to 65 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: F144AY019NH - Wet Lake Plain
Hydric soil rating: Yes

Description of Maybid

Setting

Landform: Terraces, drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Clayey glaciolacustrine deposits

Typical profile

A - 0 to 9 inches: silt loam
Bg1 - 9 to 18 inches: silty clay loam
Bg2 - 18 to 26 inches: silty clay loam
Cg1 - 26 to 36 inches: silty clay loam
Cg2 - 36 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Available water supply, 0 to 60 inches: High (about 11.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: C/D
Ecological site: F145XY003CT - Very Wet Inland Lake Plain
Hydric soil rating: Yes

Minor Components

Brancroft

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Elmridge

Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, sand or gravel substratum

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, red parent material

Percent of map unit: 2 percent

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

State of Connecticut, Western Part

18—Catden and Freetown soils, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t2r2
Elevation: 0 to 1,390 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Catden and similar soils: 45 percent
Freetown and similar soils: 35 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Catden

Setting

Landform: Swamps, marshes, kettles, depressions, depressions, fens, bogs, depressions
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed herbaceous organic material and/or highly decomposed woody organic material

Typical profile

Oa1 - 0 to 2 inches: muck
Oa2 - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very high (about 26.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: B/D
Ecological site: F144AY042NY - Semi-Rich Organic Wetlands
Hydric soil rating: Yes

Description of Freetown

Setting

Landform: Kettles, swamps, bogs, depressions, marshes, depressions
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material

Typical profile

Oe - 0 to 2 inches: mucky peat
Oa - 2 to 79 inches: muck

Properties and qualities

Slope: 0 to 2 percent
Surface area covered with cobbles, stones or boulders: 0.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 26.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Natchaug

Percent of map unit: 7 percent
Landform: Depressions, depressions, depressions
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman

Percent of map unit: 6 percent
Landform: Depressions, drainageways
Landform position (three-dimensional): Base slope
Down-slope shape: Concave

Across-slope shape: Concave
Hydric soil rating: Yes

Timakwa

Percent of map unit: 5 percent
Landform: Depressions
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 2 percent
Landform: Outwash terraces, outwash deltas, drainageways, depressions
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

State of Connecticut, Western Part

23A—Sudbury sandy loam, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 9lkv
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sudbury and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sudbury

Setting

Landform: Outwash plains, terraces
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 5 inches: sandy loam
Bw1 - 5 to 17 inches: gravelly sandy loam
Bw2 - 17 to 25 inches: sandy loam
2C - 25 to 60 inches: stratified gravel to sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 17 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A/D
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent
Landform: Kames, outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Agawam

Percent of map unit: 5 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ninigret

Percent of map unit: 5 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Tisbury

Percent of map unit: 3 percent
Landform: Outwash plains, terraces
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Walpole

Percent of map unit: 2 percent
Landform: Depressions on terraces, drainageways on terraces
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

State of Connecticut

25A—Brancroft silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9ll6
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 52 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Brancroft and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Brancroft

Setting

Landform: Terraces
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Fine-silty glaciolacustrine deposits

Typical profile

Ap - 0 to 6 inches: silt loam
Bw1 - 6 to 17 inches: silt loam
Bw2 - 17 to 22 inches: silty clay loam
Bw3 - 22 to 32 inches: silt loam
C1 - 32 to 43 inches: silty clay loam
C2 - 43 to 66 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.57 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F145XY006CT - Semi-Rich Moist Lake Plain
Hydric soil rating: No

Minor Components

Berlin
Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Elmridge
Percent of map unit: 5 percent
Landform: Terraces
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Maybid
Percent of map unit: 3 percent
Landform: Terraces, drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Unnamed, sand or gravel substratum
Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, till substratum
Percent of map unit: 2 percent
Hydric soil rating: No

Scitico
Percent of map unit: 2 percent
Landform: Terraces, drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Belgrade
Percent of map unit: 1 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

State of Connecticut

28A—Elmridge fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 9lm0
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Elmridge and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Elmridge

Setting

Landform: Terraces
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy eolian sands over clayey glaciolacustrine deposits

Typical profile

Ap - 0 to 6 inches: fine sandy loam
Bw1 - 6 to 10 inches: fine sandy loam
Bw2 - 10 to 18 inches: fine sandy loam
Bw3 - 18 to 25 inches: sandy loam
2C - 25 to 65 inches: silty clay

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Moderate (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F145XY006CT - Semi-Rich Moist Lake Plain

Hydric soil rating: No

Minor Components

Brancroft
Percent of map unit: 4 percent
Landform: Terraces
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Belgrade
Percent of map unit: 4 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, red parent material
Percent of map unit: 2 percent
Hydric soil rating: No

Sudbury
Percent of map unit: 2 percent
Landform: Terraces, outwash plains
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Shaker
Percent of map unit: 2 percent
Landform: Terraces, drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Ninigret
Percent of map unit: 2 percent
Landform: Terraces, outwash plains
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Scitico
Percent of map unit: 2 percent
Landform: Terraces, drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Berlin
Percent of map unit: 1 percent
Landform: Terraces
Down-slope shape: Linear
Across-slope shape: Linear

Hydric soil rating: No

Maybid

Percent of map unit: 1 percent
Landform: Terraces, drainageways, depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

State of Connecticut

29B—Agawam fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqx
Elevation: 0 to 820 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Agawam and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Agawam

Setting

Landform: Outwash plains, kames, kame terraces, outwash terraces, moraines
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Crest, side slope, riser, tread, rise, dip
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite

Typical profile

Ap - 0 to 11 inches: fine sandy loam
Bw1 - 11 to 16 inches: fine sandy loam
Bw2 - 16 to 26 inches: fine sandy loam
2C1 - 26 to 45 inches: loamy fine sand
2C2 - 45 to 55 inches: loamy fine sand
2C3 - 55 to 65 inches: loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 35 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, crest, side slope, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Merrimac

Percent of map unit: 3 percent
Landform: Outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Crest, side slope, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 2 percent
Landform: Dunes, outwash plains, deltas, outwash terraces
Landform position (three-dimensional): Tread, riser
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear

Hydric soil rating: No

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 22, Sep 12, 2022

State of Connecticut, Western Part

35B—Penwood loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9ln1
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Penwood and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Penwood

Setting

Landform: Outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits derived from sandstone and shale

Typical profile

Ap - 0 to 8 inches: loamy sand
Bw1 - 8 to 18 inches: loamy sand
Bw2 - 18 to 30 inches: sand
C - 30 to 60 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 99.62 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Branford

Percent of map unit: 5 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Manchester

Percent of map unit: 5 percent
Landform: Eskers, kames, outwash plains, terraces
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Hartford

Percent of map unit: 5 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Ellington

Percent of map unit: 3 percent
Landform: Outwash plains, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, gravelly substratum

Percent of map unit: 2 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

State of Connecticut, Western Part

36B—Windsor loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svkf
Elevation: 0 to 1,210 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Windsor and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Windsor

Setting

Landform: Outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loose sandy glaciofluvial deposits derived from granite and/or schist and/or gneiss

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand
C - 25 to 65 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A

Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Minor Components

Hinckley
Percent of map unit: 10 percent
Landform: Eskers
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F145XY008MA - Dry Outwash
Hydric soil rating: No

Deerfield, loamy sand
Percent of map unit: 5 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

Data Source Information

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

State of Connecticut, Western Part

40B—Ludlow silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9lnj
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ludlow and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ludlow

Setting

Landform: Drumlins, hills
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from basalt and/or sandstone and shale

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 20 inches: silt loam
Bw2 - 20 to 26 inches: silt loam
Cd - 26 to 65 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C/D
Ecological site: F145XY014CT - Moist Dense Till Uplands
Hydric soil rating: No

Minor Components

Wethersfield
Percent of map unit: 5 percent
Landform: Drumlins, hills
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Wilbraham
Percent of map unit: 5 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Watchaug
Percent of map unit: 3 percent
Landform: Hills, till plains
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Cheshire
Percent of map unit: 3 percent
Landform: Hills, till plains
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Menlo
Percent of map unit: 2 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Yalesville
Percent of map unit: 1 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Unnamed, stony surface
Percent of map unit: 1 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

State of Connecticut, Western Part

82B—Broadbrook silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 9lr3
Elevation: 0 to 1,200 feet
Mean annual precipitation: 40 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Broadbrook and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Broadbrook

Setting

Landform: Drumlins, hills, till plains
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Eolian deposits over coarse-loamy lodgment till derived from gneiss and/or schist and/or sandstone and/or basalt

Typical profile

Ap - 0 to 8 inches: silt loam
Bw1 - 8 to 14 inches: silt loam
Bw2 - 14 to 25 inches: silt loam
2Cd - 25 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F145XY012CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Rainbow

Percent of map unit: 5 percent
Landform: Drumlins, hills
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Wethersfield

Percent of map unit: 5 percent
Landform: Drumlins, hills
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Holyoke

Percent of map unit: 3 percent
Landform: Hills, ridges
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Wilbraham

Percent of map unit: 3 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Narragansett

Percent of map unit: 2 percent
Landform: Hills, till plains
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Menlo

Percent of map unit: 2 percent
Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: State of Connecticut, Western Part
Survey Area Data: Version 1, Sep 15, 2023

Attachment 4

Weighted Curve Number Calculations

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2/]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic condition	A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods—grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

1 Average runoff condition, and $I_a = 0.2S$.

2 *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

3 *Poor*: <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

4 Actual curve number is less than 30; use CN = 30 for runoff computations.

5 CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

6 *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

Runoff Curve Numbers

Project:	Krown Point: East Granby Meadow - East Granby	By:	DRT	Date:	3/28/2024
Location:	East Granby, CT.	Checked:	GAH	Date:	

Check one Present ☒ Developed ☐ ELDERLY-NW-PRE

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)	CN	Area ☒ acres ☐ mi^2 ☐ %	Product of CN x area
A	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	48	1.49	71.70
B	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	67	0.73	48.95
C	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	77	6.45	496.75
D	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	83	2.21	183.23
B	WOODS-GRASS COMB. (POOR)	73	0.36	26.59
C	WOODS-GRASS COMB. (POOR)	82	0.13	10.58
Use only one CN source per line		**Totals**	11.38	837.80

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{837.80}{11.38} =$ 73.64 **Use CN** **74**

Runoff Curve Numbers

Project:	Krown Point: East Granby Meadow - East Granby	By:	DRT	Date:	3/28/2024
Location:	East Granby, CT.	Checked:	GAH	Date:	

Check one Present ☒ Developed ☐ ELDERLY-SW-PRE

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)	CN	Area ☒ acres ☐ mi^2 ☐ %	Product of CN x area
A	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	48	0.39	18.62
C	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	77	0.41	31.71
D	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	83	1.03	85.64
Use only one CN source per line		**Totals**	1.83	135.97

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{135.97}{1.83} =$ 74.24 **Use CN** **74**

Runoff Curve Numbers

Project:	Krown Point: East Granby Meadow - East Granby	By:	DRT	Date:	3/28/2024
Location:	East Granby, CT.	Checked:	GAH	Date:	

Check one Present ☒ Developed ☐ ELDERLY-U.D.-PRE

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)	CN	Area ☒ acres ☐ mi^2 ☐ %	Product of CN x area
B	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	67	0.09	6.03
C	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	77	2.99	230.01
D	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	83	0.10	8.26
Use only one CN source per line		**Totals**	3.18	244.30

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{244.30}{3.18} =$ 76.90 **Use CN** **77**

Runoff Curve Numbers

Project:	Krown Point: East Granby Meadow - East Granby	By:	DRT	Date:	3/28/2024
Location:	East Granby, CT.	Checked:	GAH	Date:	

Check one Present ☒ Developed ☐ WESTERLY WETLAND - PRE

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)	CN	Area ☒ acres ☐ mi^2 ☐ %	Product of CN x area
D	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	83	9.63	799.27
Use only one CN source per line		**Totals**	9.63	799.27

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{799.27}{9.63} =$ 83.00 **Use CN** **83**

Runoff Curve Numbers

Project:	Krown Point: East Granby Meadow - East Granby	By:	DRT	Date:	3/28/2024
Location:	East Granby, CT.	Checked:	GAH	Date:	

Check one ☐ Present ☒ Developed ELDERLY-NW-POST

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)	CN	Area ☒ acres ☐ mi^2 ☐ %	Product of CN x area
A	RESIDENTIAL - 1/4 ACRE LOT	61	1.62	98.99
B	RESIDENTIAL - 1/4 ACRE LOT	75	0.38	28.69
C	RESIDENTIAL - 1/4 ACRE LOT	83	4.09	339.62
D	RESIDENTIAL - 1/4 ACRE LOT	87	1.19	103.40
B	WOODS-GRASS COMB. (POOR)	73	0.29	20.93
C	WOODS-GRASS COMB. (POOR)	82	0.12	9.57
A	LAWN (GOOD)	39	0.00	0.00
B	LAWN (GOOD)	61	0.18	11.28
C	LAWN (GOOD)	74	1.31	97.21
D	LAWN (GOOD)	80	0.77	61.97
Use only one CN source per line		**Totals**	9.96	771.65

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{771.65}{9.96} =$ 77.46 **Use CN** **77**

Runoff Curve Numbers

Project:	Krown Point: East Granby Meadow - East Granby	By:	DRT	Date:	3/28/2024
Location:	East Granby, CT.	Checked:	GAH	Date:	

Check one Present ☐ Developed ☒ ELDERLY-SW-POST

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)	CN	Area ☒ acres ☐ mi^2 ☐ %	Product of CN x area
A	RESIDENTIAL - 1/4 ACRE LOT	61	0.10	6.11
B	RESIDENTIAL - 1/4 ACRE LOT	75	0.00	0.00
C	RESIDENTIAL - 1/4 ACRE LOT	83	0.94	77.62
D	RESIDENTIAL - 1/4 ACRE LOT	87	0.41	35.55
A	LAWN (GOOD)	39	0.00	0.00
B	LAWN (GOOD)	61	0.16	9.67
C	LAWN (GOOD)	74	0.10	7.25
D	LAWN (GOOD)	80	0.68	54.11
Use only one CN source per line		**Totals**	2.38	190.31

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{190.31}{2.38} =$ 80.07 **Use CN** **80**

Runoff Curve Numbers

Project: Krown Point: East Granby Meadow - East Granby By: DRT Date: 3/28/2024

Location: East Granby, CT. Checked: GAH Date:

Check one Present ☐ Developed ☒ ELDERLY-U.D.-POST

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)	CN	Area ☒ acres ☐ mi^2 ☐ %	Product of CN x area
A	RESIDENTIAL - 1/4 ACRE LOT	61	0.00	0.00
B	RESIDENTIAL - 1/4 ACRE LOT	75	0.19	14.24
C	RESIDENTIAL - 1/4 ACRE LOT	83	2.47	204.68
D	RESIDENTIAL - 1/4 ACRE LOT	87	0.01	0.79
B	WOODS-GRASS COMB. (POOR)	73	0.08	5.66
C	WOODS-GRASS COMB. (POOR)	82	0.00	0.00
A	LAWN (GOOD)	39	0.00	0.00
B	LAWN (GOOD)	61	0.06	3.78
C	LAWN (GOOD)	74	0.95	70.24
D	LAWN (GOOD)	80	0.09	7.02
Use only one CN source per line		**Totals**	3.84	306.41

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{306.41}{3.84} =$ 79.77 **Use CN** **80**

Runoff Curve Numbers

Project:	Krown Point: East Granby Meadow - East Granby	By:	DRT	Date:	3/28/2024
Location:	East Granby, CT.	Checked:	GAH	Date:	

Check one Present [X] Developed [X] WESTERLY WETLAND - POST

1. Runoff curve number

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition;percent impervious; unconnected/connected impervious area ratio)	CN	Area [X] acres [ ] mi^2 [ ] %	Product of CN x area
D	BRUSH - BRUSH, WEED, GRASS MIX (POOR)	83	9.63	799.27
Use only one CN source per line		**Totals**	9.63	799.27

CN (weighted) = total product / total area = 799.27 / 9.63 = 83.00 **Use CN** **83**

Attachment 5

Hydrologic Analysis

Western Watershed

Hydraflow Table of Contents

EGM 2024-03-28.gpw

Hydraflow Hydrographs by Intelisolve v9.1

Thursday, Mar 28, 2024

Watershed Model Schematic

Legend

Hyd.	Origin	Description
1	SCS Runoff	ELDERLY NW-PRE
2	SCS Runoff	WESTERLY WETLAND-PRE
3	SCS Runoff	ELDERLY SW-PRE
4	SCS Runoff	ELDERLY U.D.-PRE
5	Combine	FLOW THRU WETLAND
6	Combine	TOTAL FLOW TO CP-N (PRE)
7	SCS Runoff	ELDERLY NW-POST
8	SCS Runoff	WESTERLY WETLAND-POST
9	SCS Runoff	ELDERLY SW-POST
10	SCS Runoff	ELDERLY U.D.-POST
11	Reservoir	ELDERLY-NW-DET.
12	Reservoir	ELDERLY-SW-DET.
13	Combine	TOTAL FLOW TO CP-N (POST)

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	10.55	-------	18.90	26.36	37.21	45.28	54.46	ELDERLY NW-PRE
2	SCS Runoff	-------	-------	14.03	-------	21.97	28.70	38.08	44.89	52.53	WESTERLY WETLAND-PRE
3	SCS Runoff	-------	-------	1.879	-------	3.366	4.699	6.628	8.061	9.691	ELDERLY SW-PRE
4	SCS Runoff	-------	-------	3.645	-------	6.213	8.463	11.67	14.03	16.71	ELDERLY U.D.-PRE
5	Combine	1, 2,	-------	24.57	-------	40.86	55.03	75.17	89.95	106.75	FLOW THRU WETLAND
6	Combine	3, 5	-------	26.38	-------	44.06	59.45	81.49	97.72	116.08	TOTAL FLOW TO CP-N (PRE)
7	SCS Runoff	-------	-------	9.878	-------	16.84	22.94	31.64	38.09	45.39	ELDERLY NW-POST
8	SCS Runoff	-------	-------	14.03	-------	21.97	28.70	38.08	44.89	52.53	WESTERLY WETLAND-POST
9	SCS Runoff	-------	-------	3.727	-------	6.052	8.047	10.86	12.92	15.25	ELDERLY SW-POST
10	SCS Runoff	-------	-------	4.839	-------	7.876	10.50	14.21	16.92	19.97	ELDERLY U.D.-POST
11	Reservoir	7	-------	2.273	-------	6.448	8.669	10.82	13.39	15.10	ELDERLY-NW-DET.
12	Reservoir	9	-------	1.537	-------	2.774	4.015	4.290	4.901	5.624	ELDERLY-SW-DET.
13	Combine	8, 11, 12	-------	16.34	-------	26.23	36.81	49.64	58.29	67.67	TOTAL FLOW TO CP-N (POST)

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

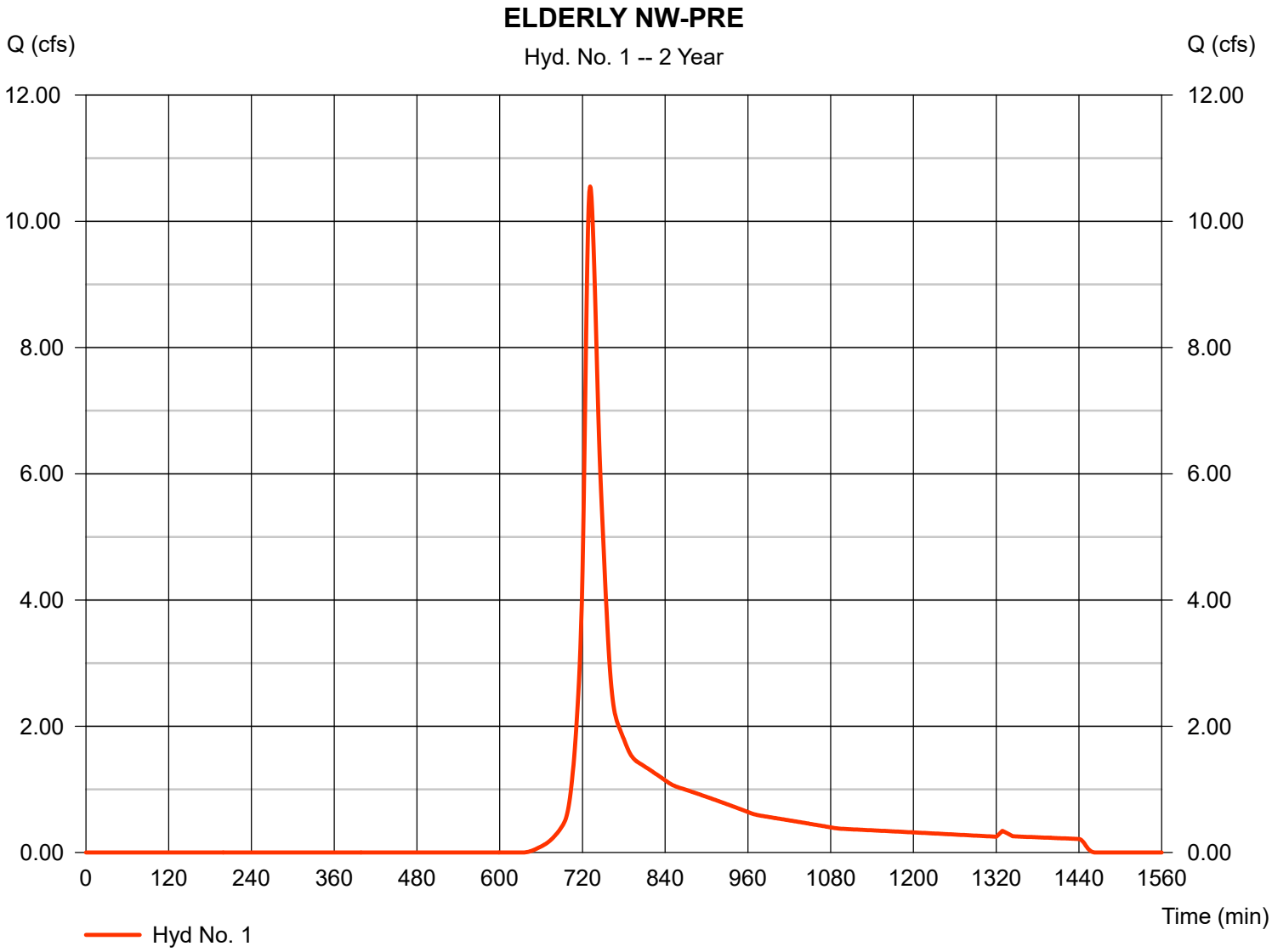
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	10.55	1	731	43,952	----	------	------	ELDERLY NW-PRE
2	SCS Runoff	14.03	1	732	58,119	----	------	------	WESTERLY WETLAND-PRE
3	SCS Runoff	1.879	1	729	7,194	----	------	------	ELDERLY SW-PRE
4	SCS Runoff	3.645	1	730	14,095	----	------	------	ELDERLY U.D.-PRE
5	Combine	24.57	1	731	102,071	1, 2,	------	------	FLOW THRU WETLAND
6	Combine	26.38	1	731	109,265	3, 5	------	------	TOTAL FLOW TO CP-N (PRE)
7	SCS Runoff	9.878	1	735	44,849	----	------	------	ELDERLY NW-POST
8	SCS Runoff	14.03	1	732	58,119	----	------	------	WESTERLY WETLAND-POST
9	SCS Runoff	3.727	1	726	12,069	----	------	------	ELDERLY SW-POST
10	SCS Runoff	4.839	1	732	20,221	----	------	------	ELDERLY U.D.-POST
11	Reservoir	2.273	1	771	44,792	7	166.30	17,860	ELDERLY-NW-DET.
12	Reservoir	1.537	1	742	12,059	9	167.24	2,893	ELDERLY-SW-DET.
13	Combine	16.34	1	732	114,970	8, 11, 12	------	------	TOTAL FLOW TO CP-N (POST)

Hydrograph Report

Hyd. No. 1

ELDERLY NW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.55 cfs
Storm frequency	=	2 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	43,952 cuft
Drainage area	=	11.380 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.30 min
Total precip.	=	3.24 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 1

ELDERLY NW-PRE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.130		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.34		0.00		0.00		
Land slope (%)	= 2.75		0.00		0.00		
Travel Time (min)	**= 7.53**	**+**	**0.00**	**+**	**0.00**	**=**	**7.53**
Shallow Concentrated Flow							
Flow length (ft)	= 605.00		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)	**= 4.53**	**+**	**0.00**	**+**	**0.00**	**=**	**4.53**
Channel Flow							
X sectional flow area (sqft)	= 5.00		0.00		0.00		
Wetted perimeter (ft)	= 4.00		0.00		0.00		
Channel slope (%)	= 1.00		0.00		0.00		
Manning's n-value	= 0.035		0.015		0.015		
Velocity (ft/s)	= 4.94		0.00		0.00		
Flow length (ft)	= 650.0		0.0		0.0		
Travel Time (min)	**= 2.19**	**+**	**0.00**	**+**	**0.00**	**=**	**2.19**

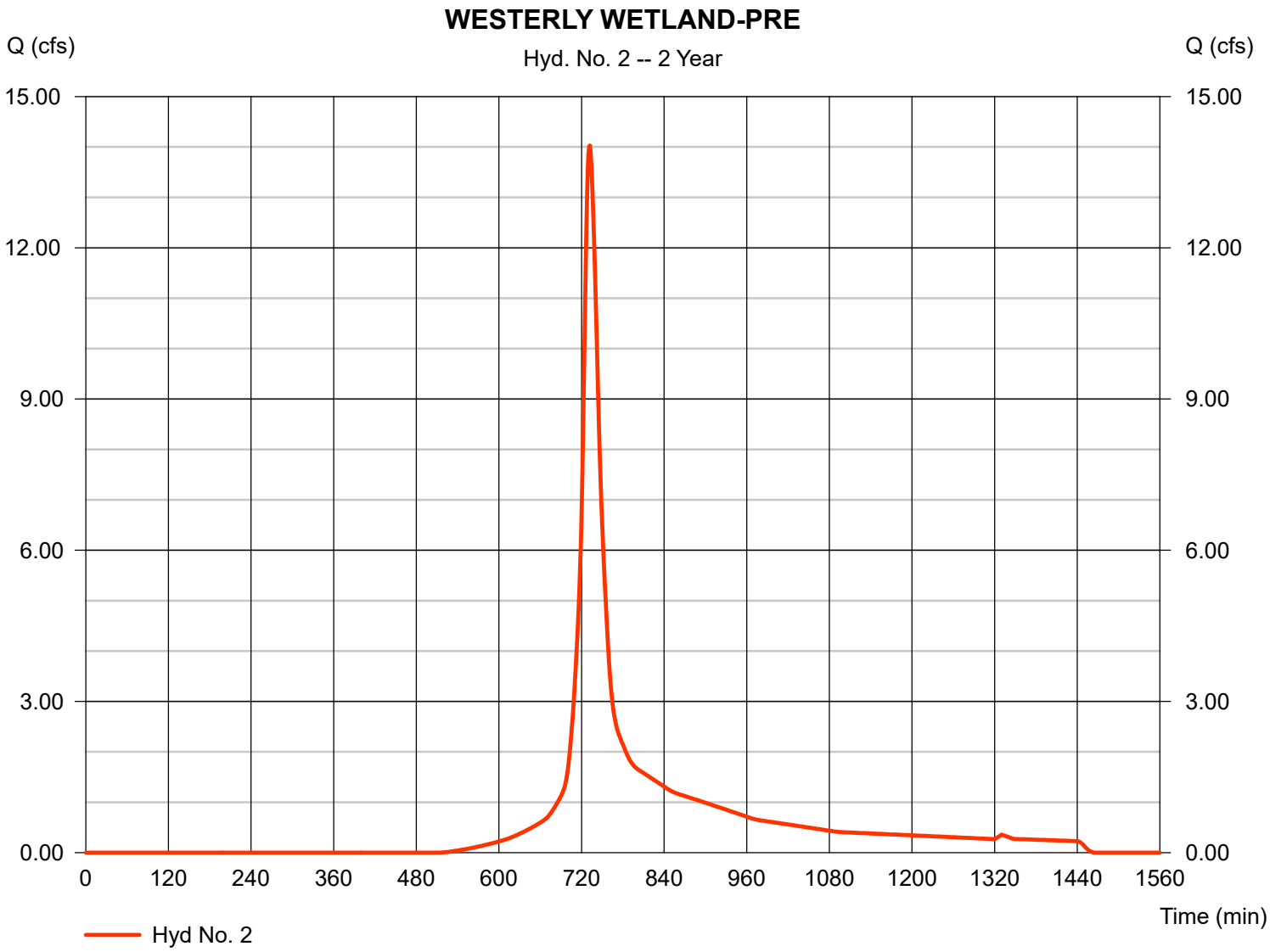
Total Travel Time, Tc ..... 14.30 min

Hydrograph Report

Hyd. No. 2

WESTERLY WETLAND-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.03 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	58,119 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	3.24 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 2

WESTERLY WETLAND-PRE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.400		0.011		0.011		
Flow length (ft)	= 80.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.34		0.00		0.00		
Land slope (%)	= 12.50		0.00		0.00		
Travel Time (min)	**= 8.45**	**+**	**0.00**	**+**	**0.00**	**=**	**8.45**
Shallow Concentrated Flow							
Flow length (ft)	= 67.00		0.00		0.00		
Watercourse slope (%)	= 1.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 1.98		0.00		0.00		
Travel Time (min)	**= 0.57**	**+**	**0.00**	**+**	**0.00**	**=**	**0.57**
Channel Flow							
X sectional flow area (sqft)	= 5.00		0.00		0.00		
Wetted perimeter (ft)	= 4.00		0.00		0.00		
Channel slope (%)	= 0.10		0.00		0.00		
Manning's n-value	= 0.035		0.015		0.015		
Velocity (ft/s)	= 1.56		0.00		0.00		
Flow length (ft)	= 718.0		0.0		0.0		
Travel Time (min)	**= 7.65**	**+**	**0.00**	**+**	**0.00**	**=**	**7.65**

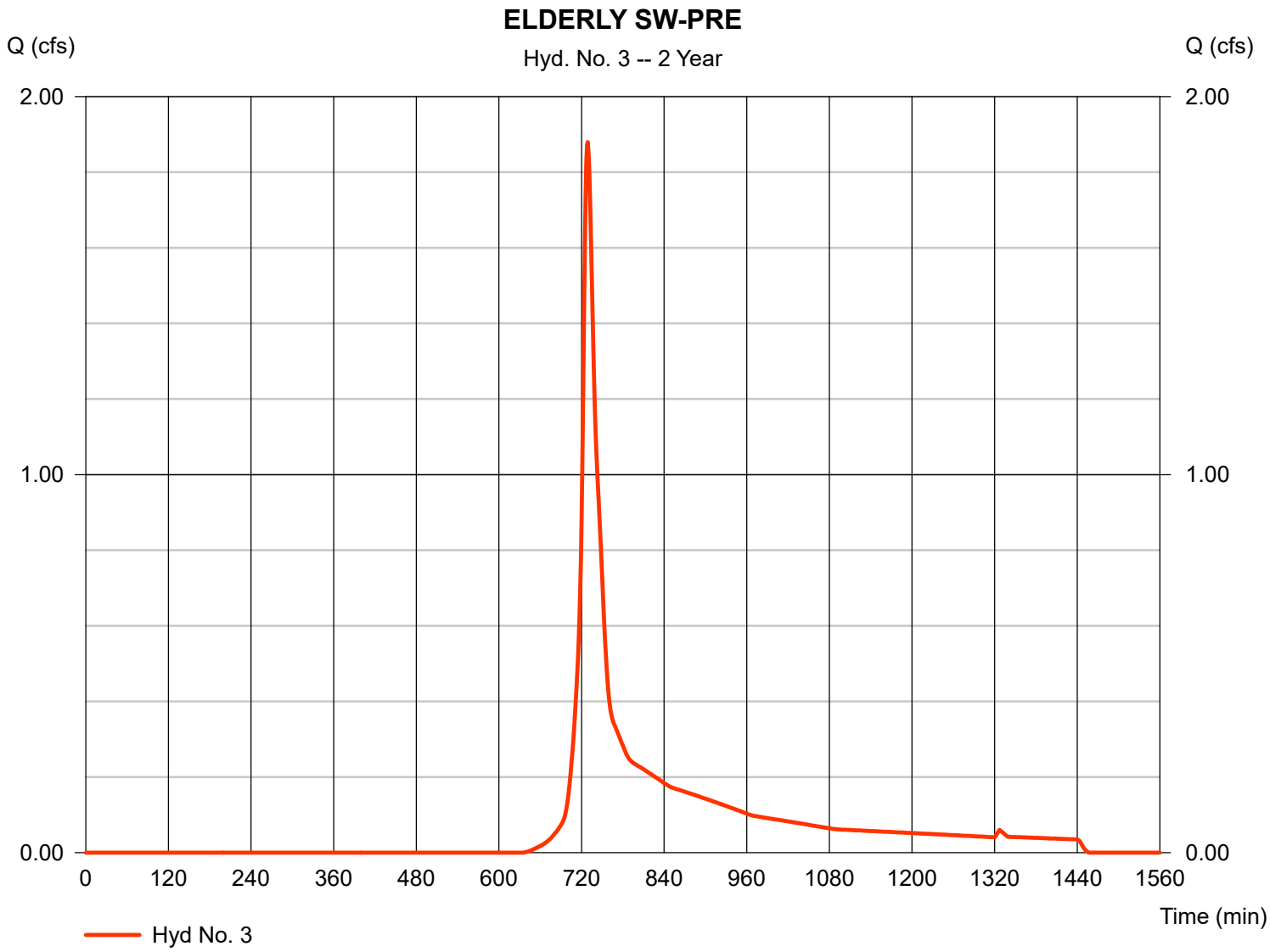
Total Travel Time, Tc ..... 16.70 min

Hydrograph Report

Hyd. No. 3

ELDERLY SW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	1.879 cfs
Storm frequency	=	2 yrs	Time to peak	=	729 min
Time interval	=	1 min	Hyd. volume	=	7,194 cuft
Drainage area	=	1.830 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.50 min
Total precip.	=	3.24 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 3

ELDERLY SW-PRE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.130		0.011		0.011		
Flow length (ft)	= 150.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.34		0.00		0.00		
Land slope (%)	= 4.00		0.00		0.00		
Travel Time (min)	**= 8.97**	**+**	**0.00**	**+**	**0.00**	**=**	**8.97**
Shallow Concentrated Flow							
Flow length (ft)	= 450.00		0.00		0.00		
Watercourse slope (%)	= 3.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 3.02		0.00		0.00		
Travel Time (min)	**= 2.48**	**+**	**0.00**	**+**	**0.00**	**=**	**2.48**
Channel Flow							
X sectional flow area (sqft)	= 0.00		0.00		0.00		
Wetted perimeter (ft)	= 0.00		0.00		0.00		
Channel slope (%)	= 0.00		0.00		0.00		
Manning's n-value	= 0.015		0.015		0.015		
Velocity (ft/s)	= 0.00		0.00		0.00		
Flow length (ft)	= 0.0		0.0		0.0		
Travel Time (min)	**= 0.00**	**+**	**0.00**	**+**	**0.00**	**=**	**0.00**

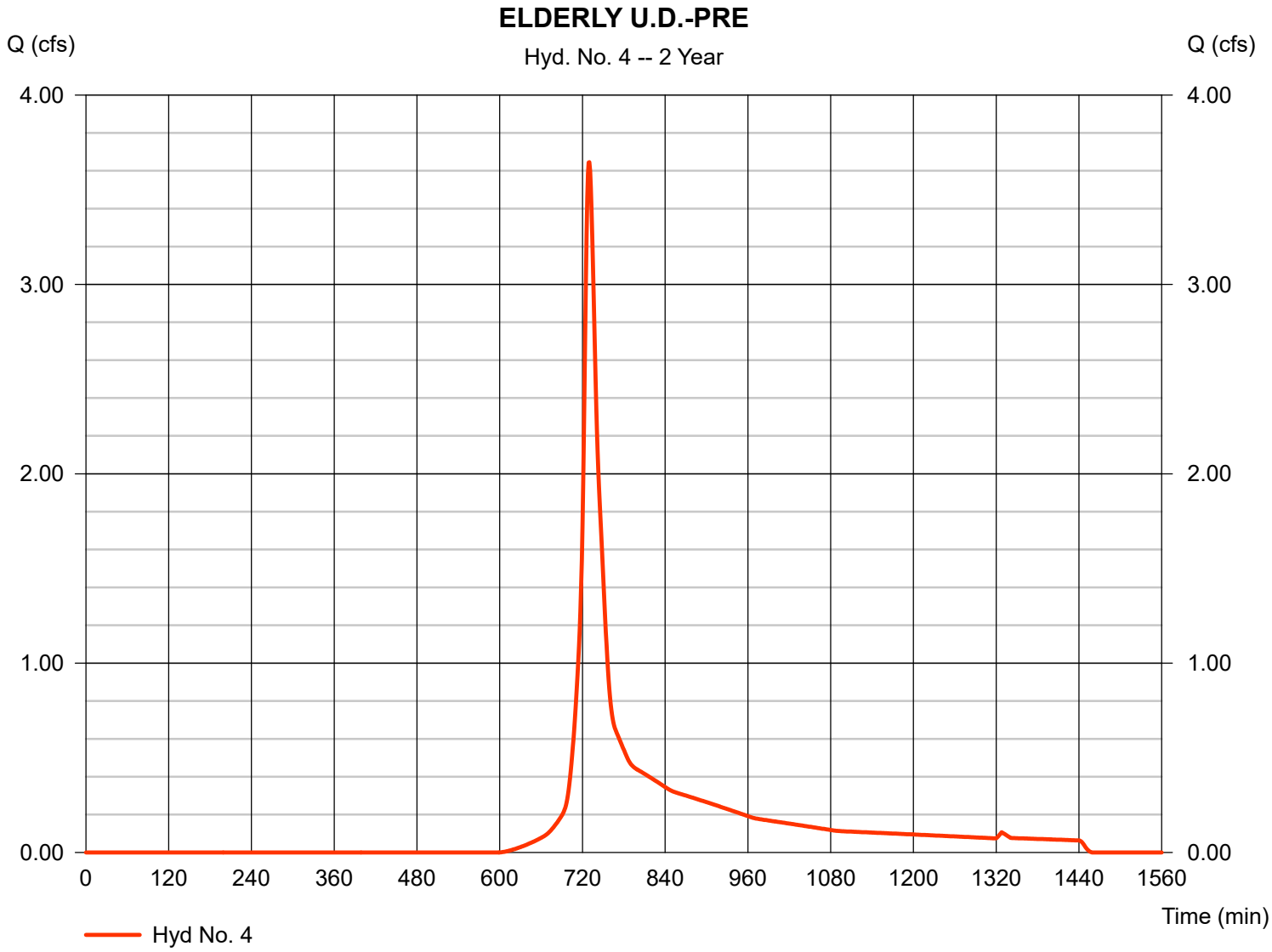
Total Travel Time, Tc ..... 11.50 min

Hydrograph Report

Hyd. No. 4

ELDERLY U.D.-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.645 cfs
Storm frequency	=	2 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	14,095 cuft
Drainage area	=	3.180 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	3.24 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 4

ELDERLY U.D.-PRE

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.130		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.34		0.00		0.00		
Land slope (%)	= 2.00		0.00		0.00		
Travel Time (min)	**= 8.55**	**+**	**0.00**	**+**	**0.00**	**=**	**8.55**
Shallow Concentrated Flow							
Flow length (ft)	= 407.00		0.00		0.00		
Watercourse slope (%)	= 1.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 1.98		0.00		0.00		
Travel Time (min)	**= 3.43**	**+**	**0.00**	**+**	**0.00**	**=**	**3.43**
Channel Flow							
X sectional flow area (sqft)	= 5.00		0.00		0.00		
Wetted perimeter (ft)	= 4.00		0.00		0.00		
Channel slope (%)	= 1.50		0.00		0.00		
Manning's n-value	= 0.025		0.015		0.015		
Velocity (ft/s)	= 8.48		0.00		0.00		
Flow length (ft)	= 135.0		0.0		0.0		
Travel Time (min)	**= 0.27**	**+**	**0.00**	**+**	**0.00**	**=**	**0.27**

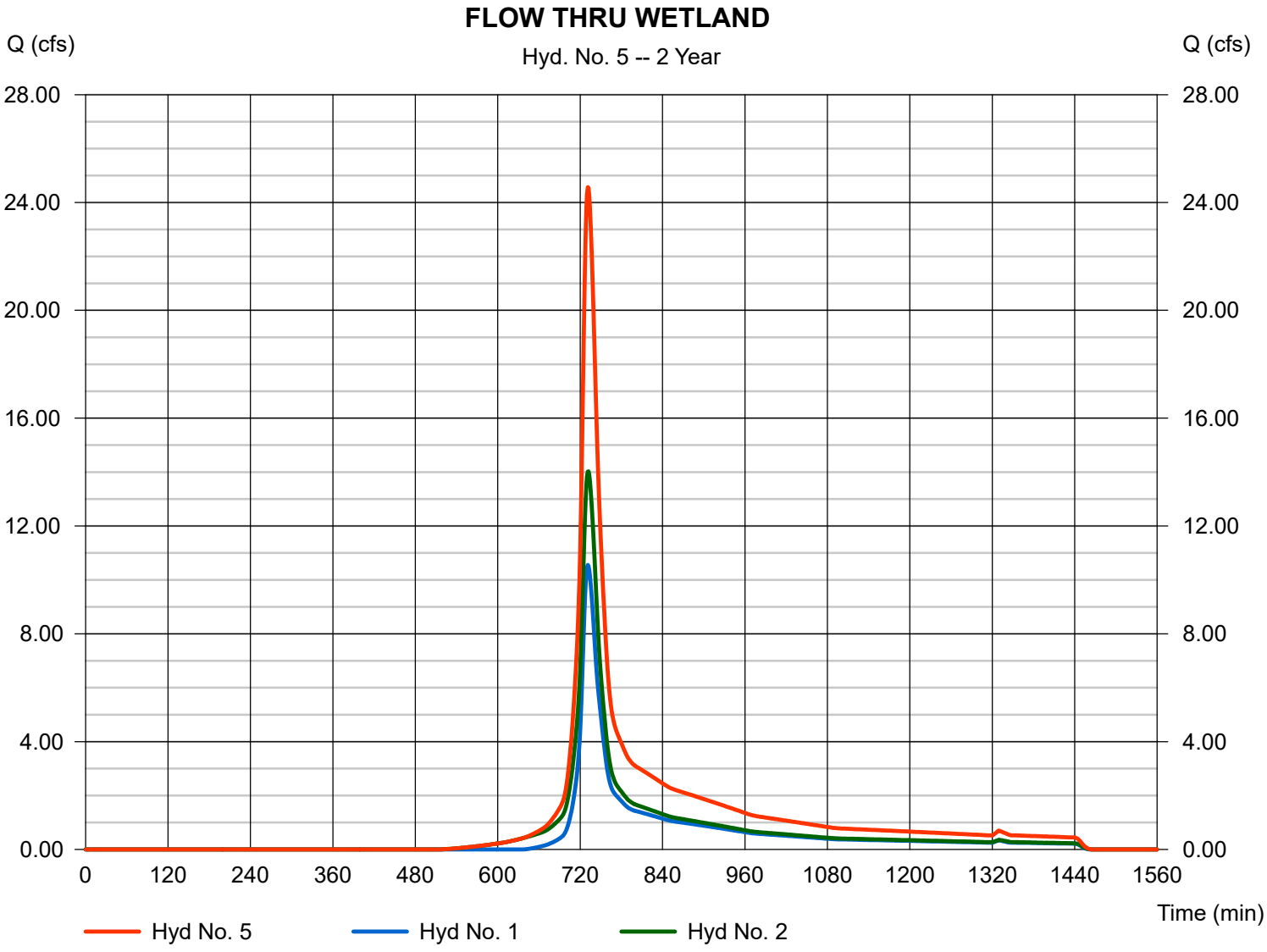
Total Travel Time, Tc ..... 12.30 min

Hydrograph Report

Hyd. No. 5

FLOW THRU WETLAND

Hydrograph type	= Combine	Peak discharge	= 24.57 cfs
Storm frequency	= 2 yrs	Time to peak	= 731 min
Time interval	= 1 min	Hyd. volume	= 102,071 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 21.010 ac

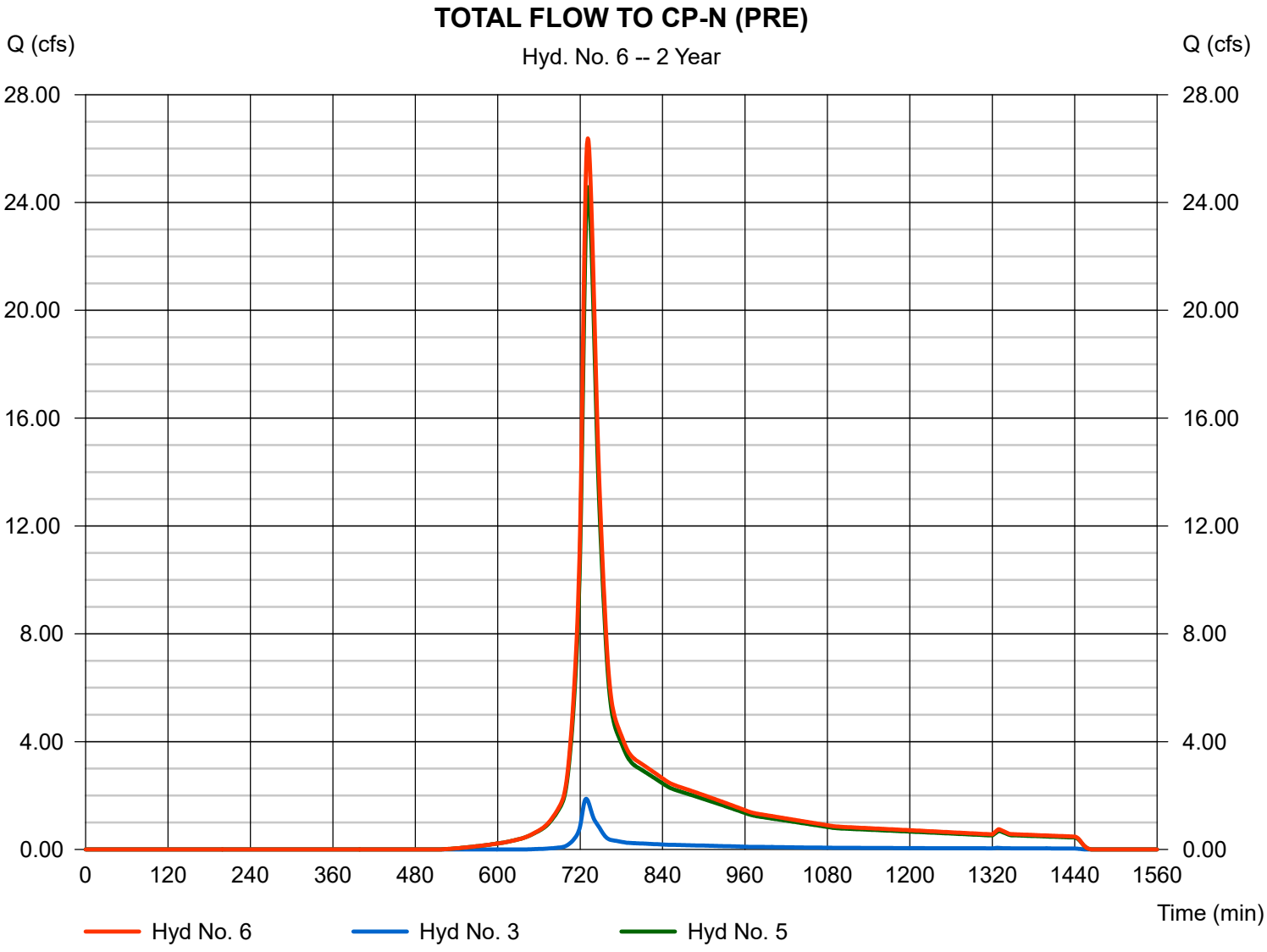


Hydrograph Report

Hyd. No. 6

TOTAL FLOW TO CP-N (PRE)

Hydrograph type	= Combine	Peak discharge	= 26.38 cfs
Storm frequency	= 2 yrs	Time to peak	= 731 min
Time interval	= 1 min	Hyd. volume	= 109,265 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 1.830 ac

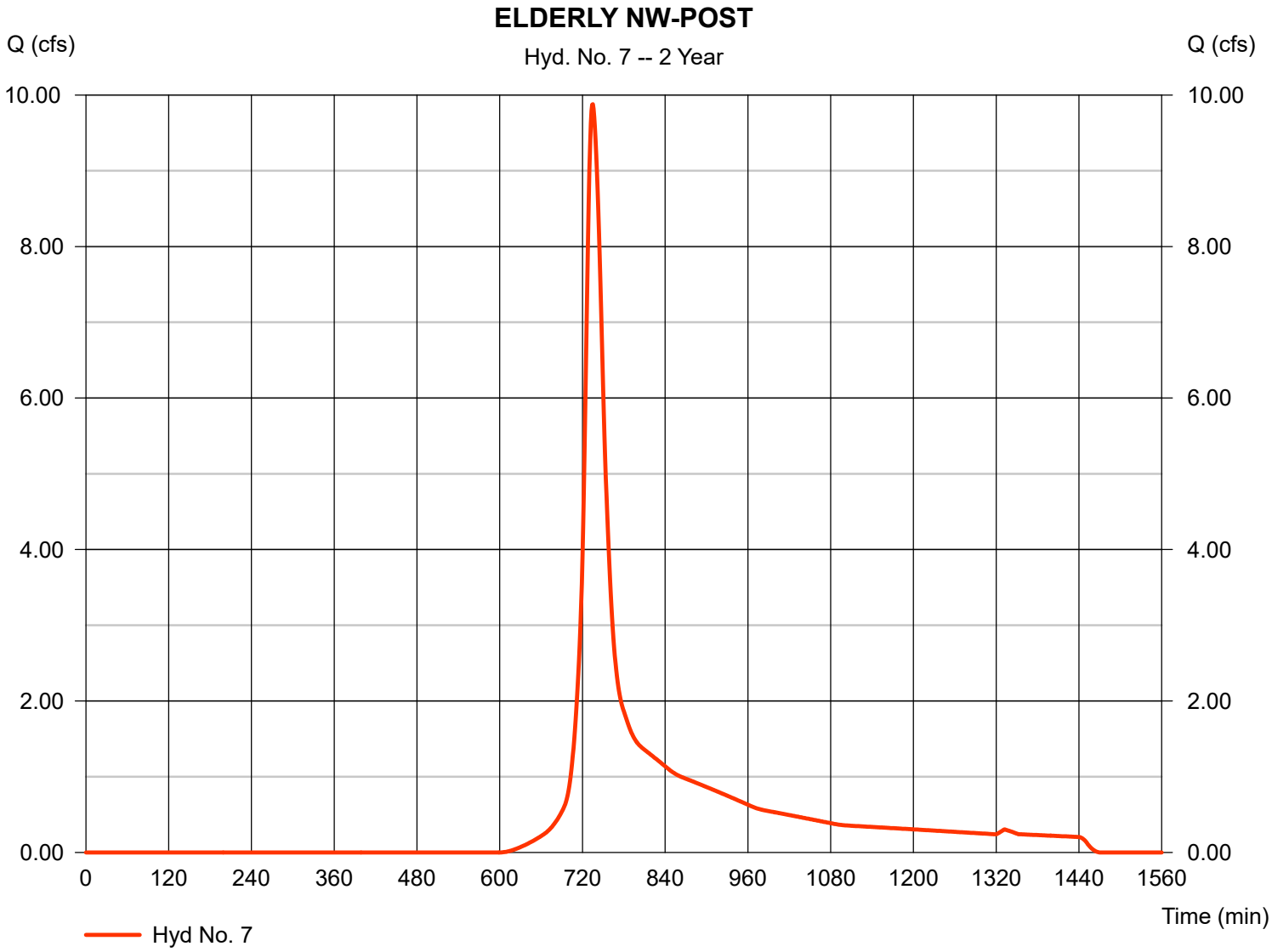


Hydrograph Report

Hyd. No. 7

ELDERLY NW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.878 cfs
Storm frequency	=	2 yrs	Time to peak	=	735 min
Time interval	=	1 min	Hyd. volume	=	44,849 cuft
Drainage area	=	9.960 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.70 min
Total precip.	=	3.24 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 7

ELDERLY NW-POST

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 100.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.34		0.00		0.00		
Land slope (%)	= 1.50		0.00		0.00		
Travel Time (min)	**= 15.67**	**+**	**0.00**	**+**	**0.00**	**=**	**15.67**
Shallow Concentrated Flow							
Flow length (ft)	= 142.00		0.00		0.00		
Watercourse slope (%)	= 1.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 1.98		0.00		0.00		
Travel Time (min)	**= 1.20**	**+**	**0.00**	**+**	**0.00**	**=**	**1.20**
Channel Flow							
X sectional flow area (sqft)	= 0.79		0.00		0.00		
Wetted perimeter (ft)	= 3.14		0.00		0.00		
Channel slope (%)	= 2.00		0.00		0.00		
Manning's n-value	= 0.012		0.015		0.015		
Velocity (ft/s)	= 6.94		0.00		0.00		
Flow length (ft)	= 746.0		0.0		0.0		
Travel Time (min)	**= 1.79**	**+**	**0.00**	**+**	**0.00**	**=**	**1.79**

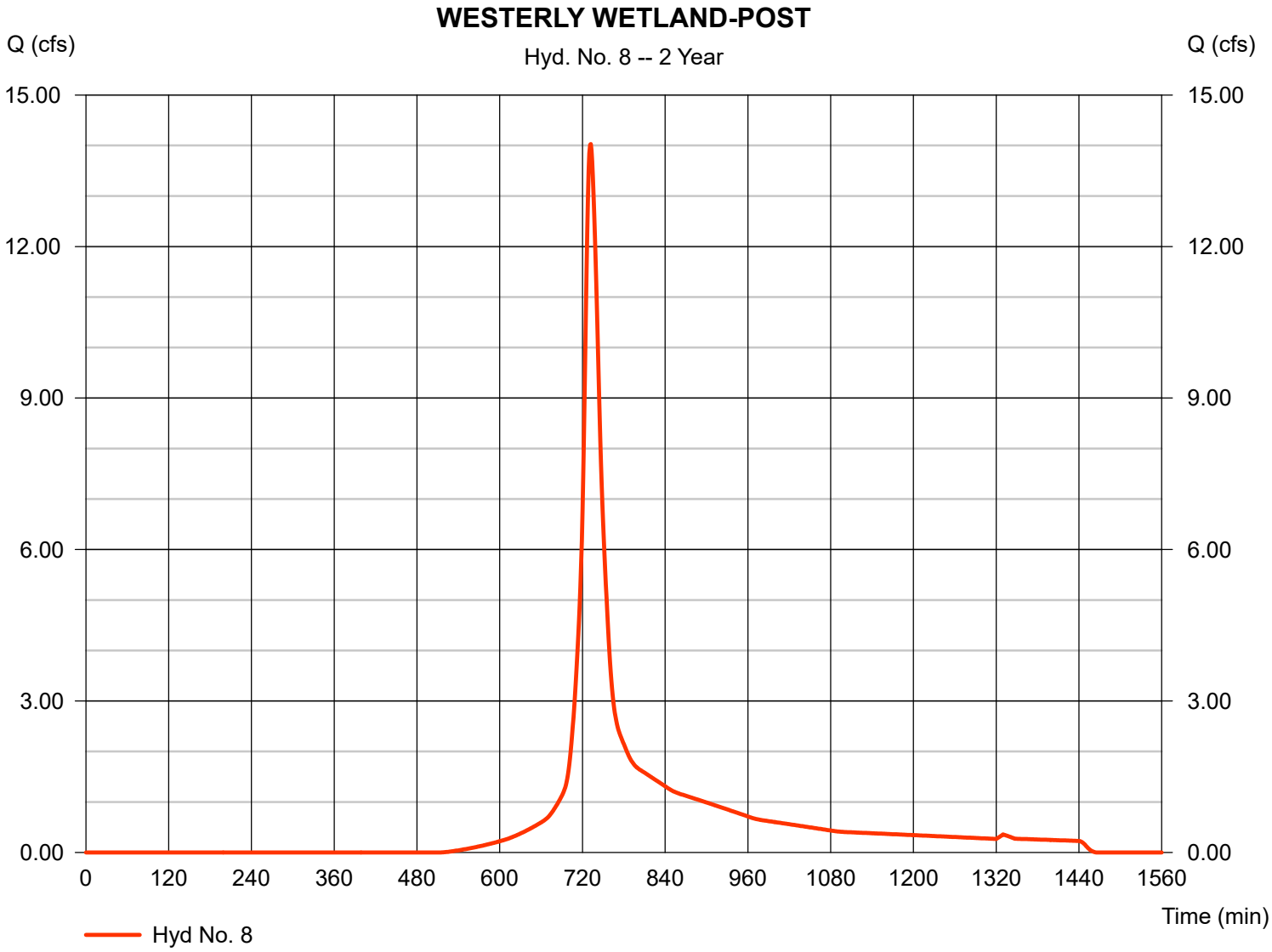
Total Travel Time, Tc ..... 18.70 min

Hydrograph Report

Hyd. No. 8

WESTERLY WETLAND-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.03 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	58,119 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	3.24 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 8

WESTERLY WETLAND-POST

Description	A	B	C	Totals
Sheet Flow				
Manning's n-value	= 0.400	0.011	0.011	
Flow length (ft)	= 80.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.34	0.00	0.00	
Land slope (%)	= 12.50	0.00	0.00	
Travel Time (min)	**= 8.45**	**+ 0.00**	**+ 0.00**	**= 8.45**
Shallow Concentrated Flow				
Flow length (ft)	= 67.00	0.00	0.00	
Watercourse slope (%)	= 1.50	0.00	0.00	
Surface description	= Unpaved	Paved	Paved	
Average velocity (ft/s)	= 1.98	0.00	0.00	
Travel Time (min)	**= 0.57**	**+ 0.00**	**+ 0.00**	**= 0.57**
Channel Flow				
X sectional flow area (sqft)	= 5.00	0.00	0.00	
Wetted perimeter (ft)	= 4.00	0.00	0.00	
Channel slope (%)	= 0.10	0.00	0.00	
Manning's n-value	= 0.035	0.015	0.015	
Velocity (ft/s)	= 1.56	0.00	0.00	
Flow length (ft)	= 718.0	0.0	0.0	
Travel Time (min)	**= 7.65**	**+ 0.00**	**+ 0.00**	**= 7.65**

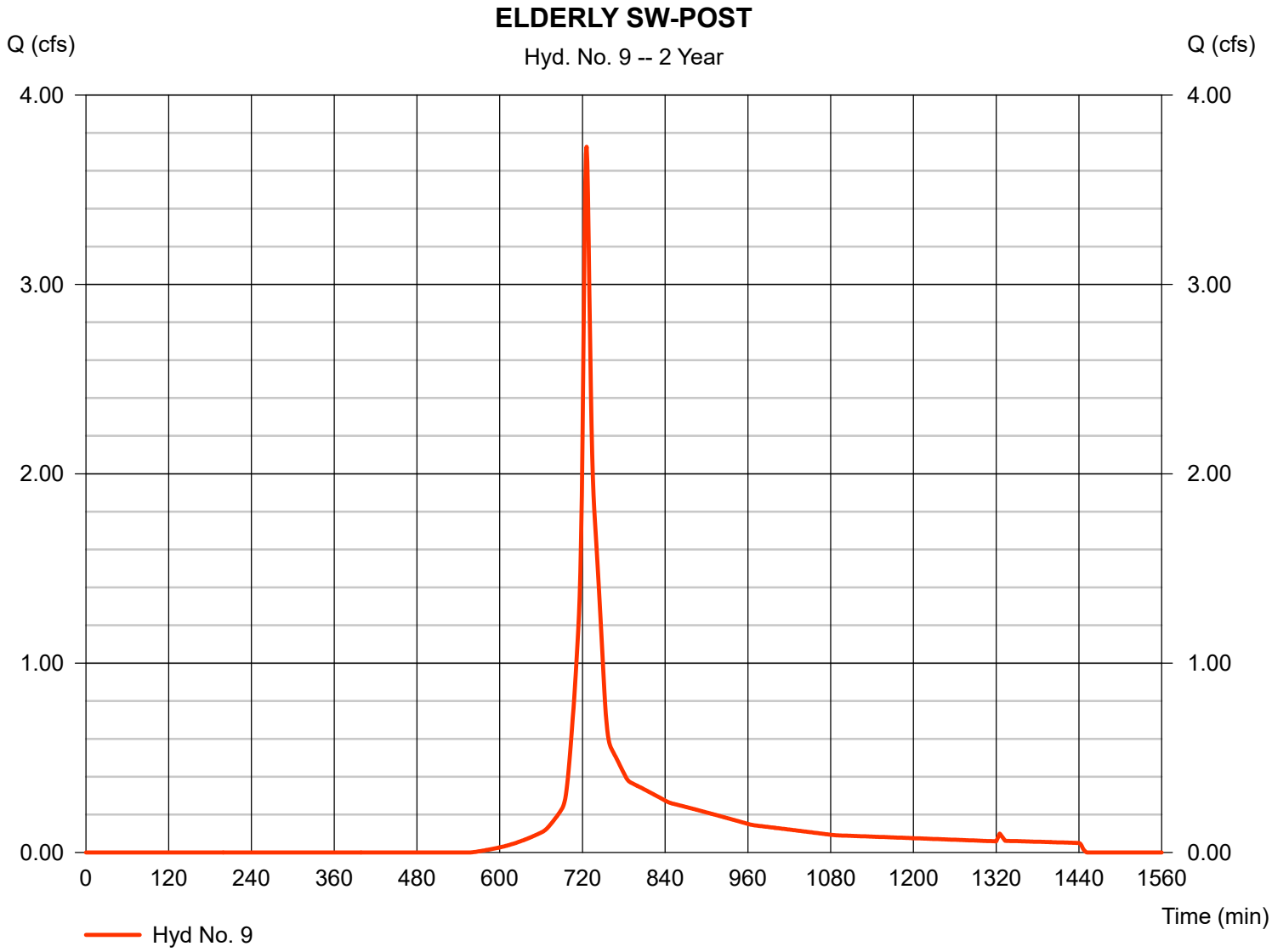
Total Travel Time, Tc ..... 16.70 min

Hydrograph Report

Hyd. No. 9

ELDERLY SW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.727 cfs
Storm frequency	=	2 yrs	Time to peak	=	726 min
Time interval	=	1 min	Hyd. volume	=	12,069 cuft
Drainage area	=	2.380 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.00 min
Total precip.	=	3.24 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 9

ELDERLY SW-POST

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 36.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.34		0.00		0.00		
Land slope (%)	= 1.50		0.00		0.00		
Travel Time (min)	**= 6.92**	**+**	**0.00**	**+**	**0.00**	**=**	**6.92**
Shallow Concentrated Flow							
Flow length (ft)	= 79.00		0.00		0.00		
Watercourse slope (%)	= 2.50		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 2.55		0.00		0.00		
Travel Time (min)	**= 0.52**	**+**	**0.00**	**+**	**0.00**	**=**	**0.52**
Channel Flow							
X sectional flow area (sqft)	= 1.50		0.00		0.00		
Wetted perimeter (ft)	= 2.50		0.00		0.00		
Channel slope (%)	= 2.00		0.00		0.00		
Manning's n-value	= 0.025		0.015		0.015		
Velocity (ft/s)	= 5.99		0.00		0.00		
Flow length (ft)	= 195.0		0.0		0.0		
Travel Time (min)	**= 0.54**	**+**	**0.00**	**+**	**0.00**	**=**	**0.54**

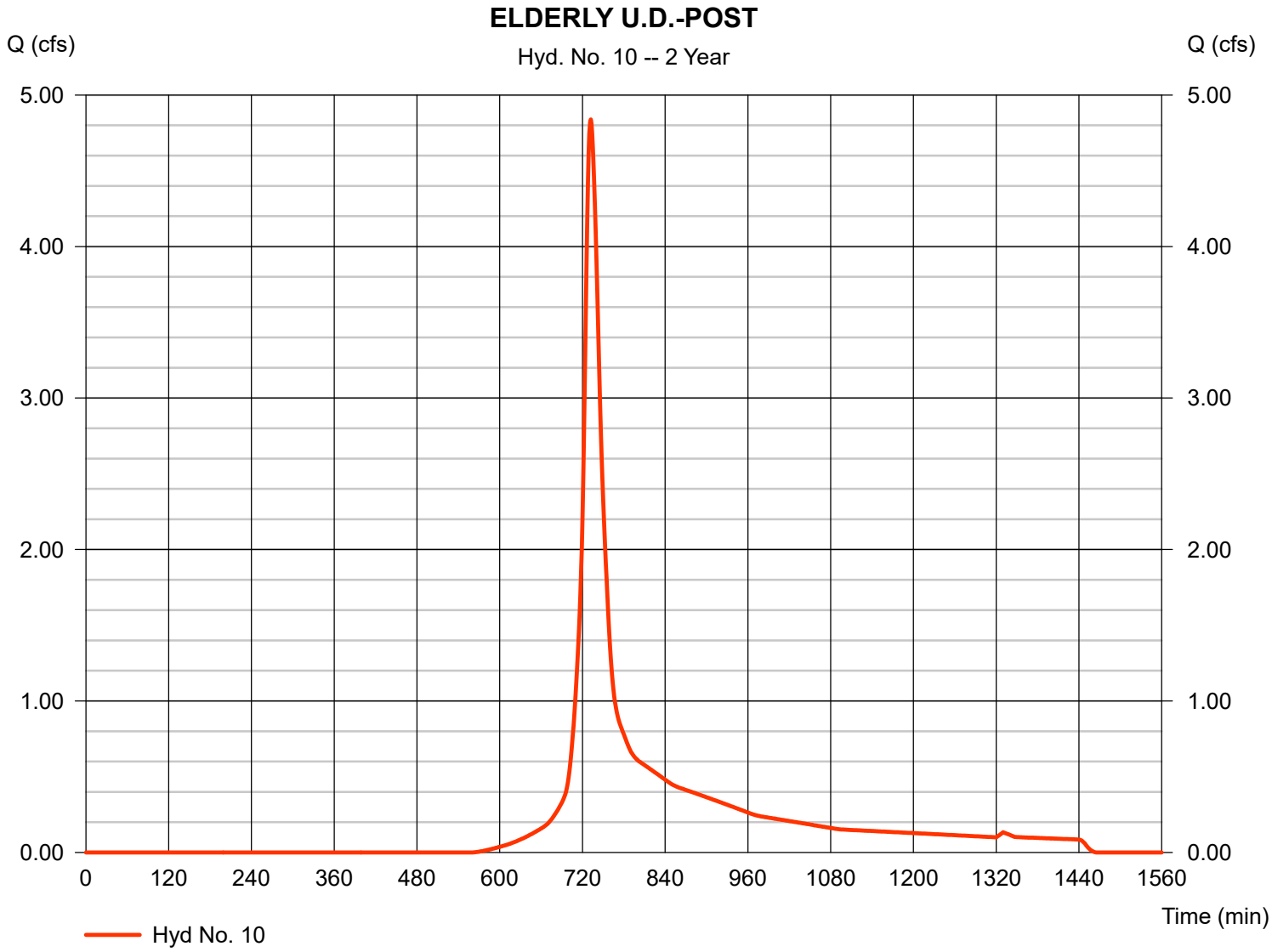
Total Travel Time, Tc ..... 8.00 min

Hydrograph Report

Hyd. No. 10

ELDERLY U.D.-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.839 cfs
Storm frequency	=	2 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	20,221 cuft
Drainage area	=	3.840 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	3.24 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



TR55 Tc Worksheet

Hyd. No. 10

ELDERLY U.D.-POST

Description	A		B		C		Totals
Sheet Flow							
Manning's n-value	= 0.240		0.011		0.011		
Flow length (ft)	= 91.0		0.0		0.0		
Two-year 24-hr precip. (in)	= 3.34		3.22		0.00		
Land slope (%)	= 2.50		0.00		0.00		
Travel Time (min)	**= 11.85**	**+**	**0.00**	**+**	**0.00**	**=**	**11.85**
Shallow Concentrated Flow							
Flow length (ft)	= 231.00		0.00		0.00		
Watercourse slope (%)	= 1.75		0.00		0.00		
Surface description	= Unpaved		Paved		Paved		
Average velocity (ft/s)	= 2.13		0.00		0.00		
Travel Time (min)	**= 1.80**	**+**	**0.00**	**+**	**0.00**	**=**	**1.80**
Channel Flow							
X sectional flow area (sqft)	= 0.79		0.00		0.00		
Wetted perimeter (ft)	= 3.14		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)	= 3.47		0.00		0.00		
Flow length (ft)	= 627.0		0.0		0.0		
Travel Time (min)	**= 3.01**	**+**	**0.00**	**+**	**0.00**	**=**	**3.01**

Total Travel Time, Tc ..... 16.70 min

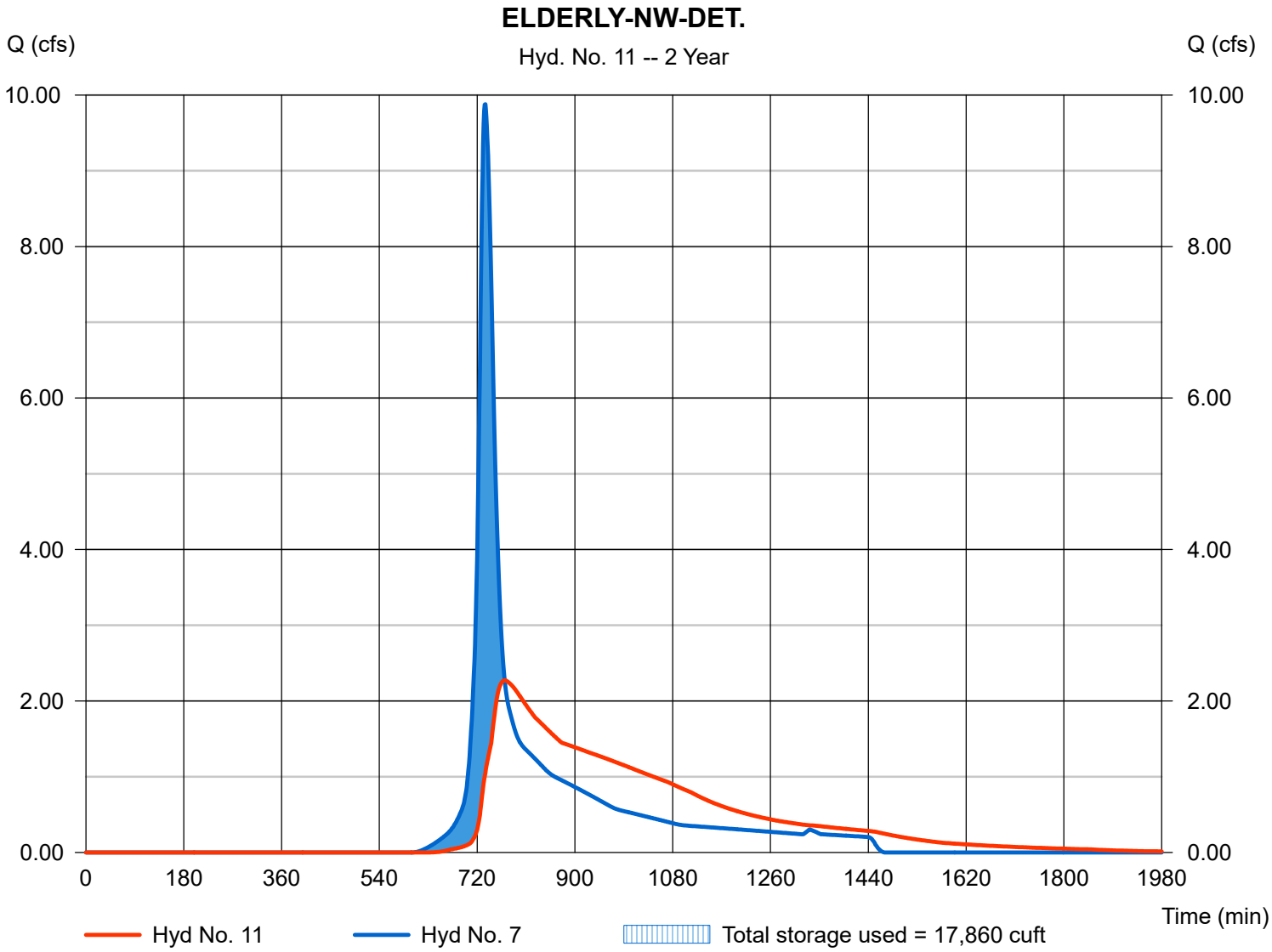
Hydrograph Report

Hyd. No. 11

ELDERLY-NW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	2.273 cfs
Storm frequency	=	2 yrs	Time to peak	=	771 min
Time interval	=	1 min	Hyd. volume	=	44,792 cuft
Inflow hyd. No.	=	7 - ELDERLY NW-POST	Max. Elevation	=	166.30 ft
Reservoir name	=	WQB#4 (ELDERLY-NW-POST)	Max. Storage	=	17,860 cuft

Storage Indication method used.



Pond No. 1 - WQB#4 (ELDERLY-NW-POST)

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 164.89 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	164.89	25	0	0
0.11	165.00	10,999	423	423
1.11	166.00	14,220	12,574	12,997
2.11	167.00	17,787	15,969	28,966
3.11	168.00	23,323	20,491	49,456
4.11	169.00	34,581	28,765	78,221

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 18.00	8.00	12.00	0.00
Span (in)	= 18.00	8.00	24.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 164.87	164.89	166.06	0.00
Length (ft)	= 35.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .012	.010	.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)	= 7.33	Inactive	0.00	0.00
Crest El. (ft)	= 168.02	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

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

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	164.89	0.00	0.00	0.00	---	0.00	---	---	---	---	---	0.00
0.11	423	165.00	0.04 ic	0.04 ic	0.00	---	0.00	---	---	---	---	---	0.04
1.11	12,997	166.00	1.32 ic	1.32 ic	0.00	---	0.00	---	---	---	---	---	1.32
2.11	28,966	167.00	7.22 oc	1.13 ic	6.09 ic	---	0.00	---	---	---	---	---	7.22
3.11	49,456	168.00	10.49 ic	1.56 ic	8.93 ic	---	0.00	---	---	---	---	---	10.49
4.11	78,221	169.00	15.39 ic	0.55 ic	3.15 ic	---	11.68 s	---	---	---	---	---	15.39

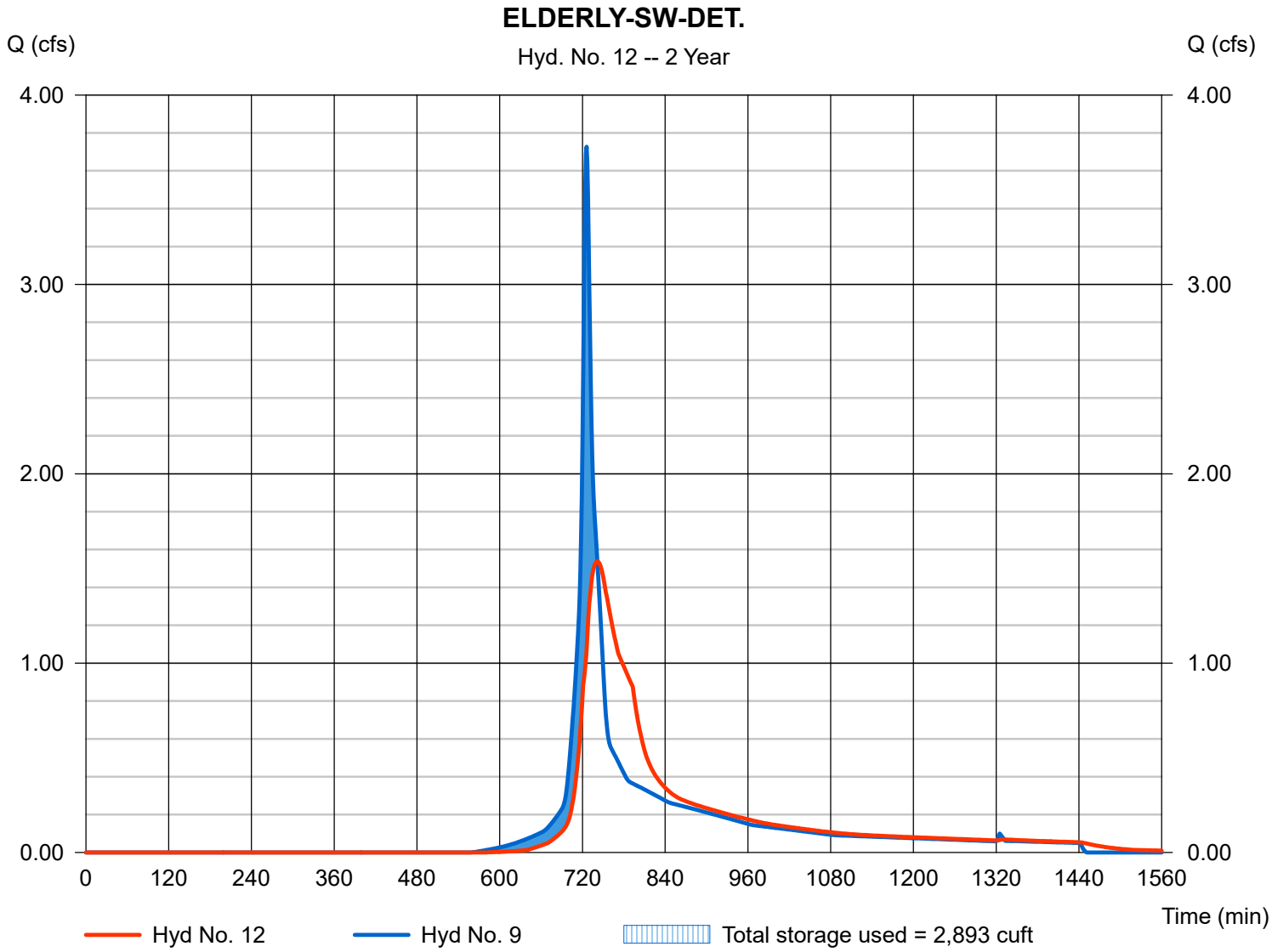
Hydrograph Report

Hyd. No. 12

ELDERLY-SW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	1.537 cfs
Storm frequency	=	2 yrs	Time to peak	=	742 min
Time interval	=	1 min	Hyd. volume	=	12,059 cuft
Inflow hyd. No.	=	9 - ELDERLY SW-POST	Max. Elevation	=	167.24 ft
Reservoir name	=	WQB#5 (ELDERLY-SW-POST)	Max. Storage	=	2,893 cuft

Storage Indication method used.



Pond No. 2 - WQB#5 (ELDERLY-SW-POST)

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 166.40 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	166.40	00	0	0
0.60	167.00	6,188	1,237	1,237
1.60	168.00	7,890	7,021	8,259
2.60	169.00	9,646	8,752	17,011
3.60	170.00	11,588	10,601	27,612

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	8.00	12.00	0.00
Span (in)	= 15.00	8.00	24.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 166.24	166.40	167.07	0.00
Length (ft)	= 44.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .012	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	Yes	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 7.33	Inactive	0.00	0.00
Crest El. (ft)	= 168.97	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	---	---	---
Multi-Stage	= Yes	No	No	No

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

TW Elev. (ft) = 0.00

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

Stage / Storage / Discharge Table

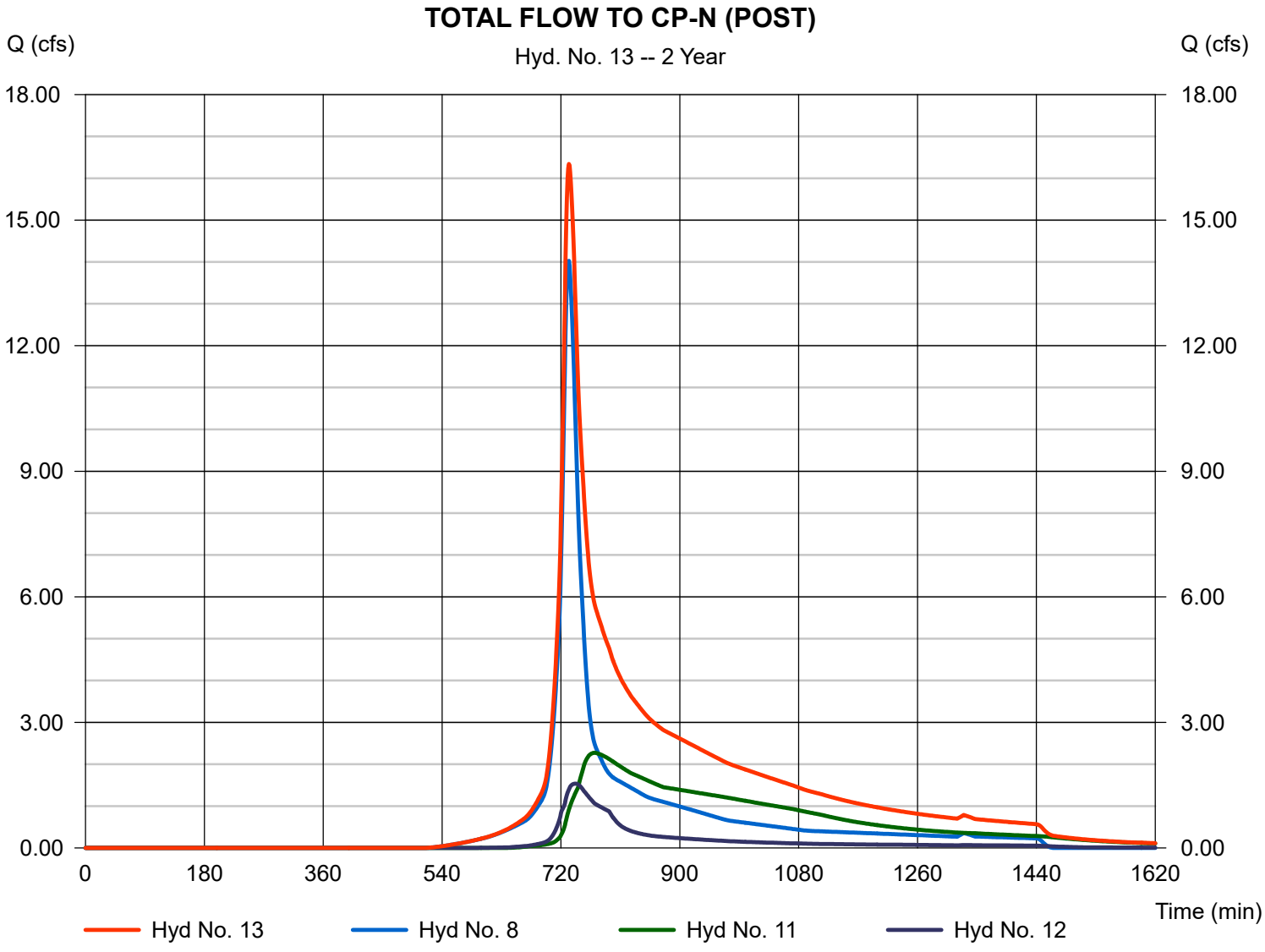
Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	166.40	0.00	0.00	0.00	---	0.00	---	---	---	---	---	0.00
0.60	1,237	167.00	0.90 ic	0.88 ic	0.00	---	0.00	---	---	---	---	---	0.88
1.60	8,259	168.00	3.92 oc	0.62 ic	3.30 ic	---	0.00	---	---	---	---	---	3.92
2.60	17,011	169.00	6.88 oc	1.00 ic	5.75 ic	---	0.13	---	---	---	---	---	6.88
3.60	27,612	170.00	10.08 oc	0.31 ic	1.77 ic	---	7.99 s	---	---	---	---	---	10.07

Hydrograph Report

Hyd. No. 13

TOTAL FLOW TO CP-N (POST)

Hydrograph type	= Combine	Peak discharge	= 16.34 cfs
Storm frequency	= 2 yrs	Time to peak	= 732 min
Time interval	= 1 min	Hyd. volume	= 114,970 cuft
Inflow hyds.	= 8, 11, 12	Contrib. drain. area	= 9.630 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

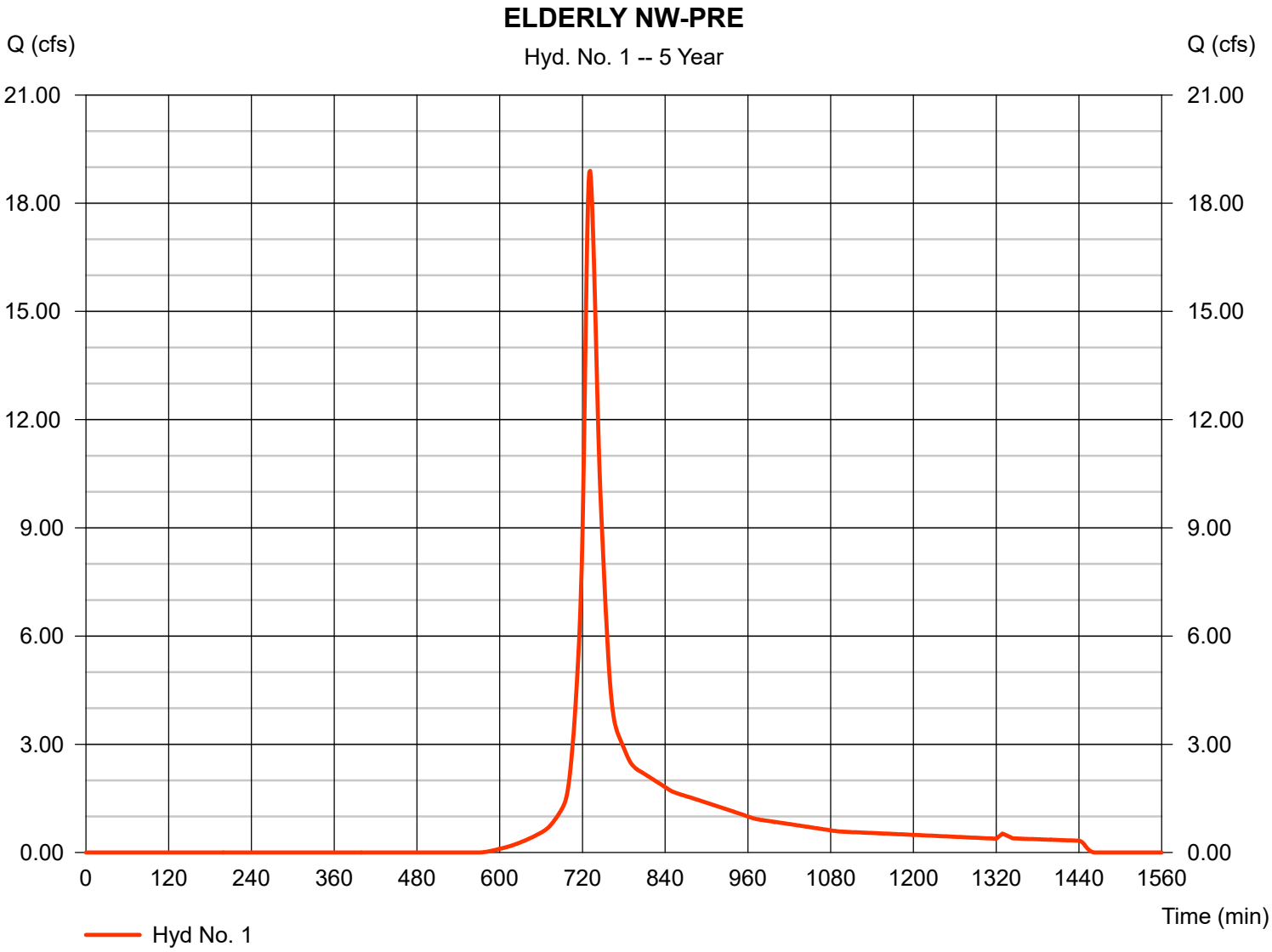
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	18.90	1	731	75,802	----	------	------	ELDERLY NW-PRE
2	SCS Runoff	21.97	1	731	90,828	----	------	------	WESTERLY WETLAND-PRE
3	SCS Runoff	3.366	1	728	12,407	----	------	------	ELDERLY SW-PRE
4	SCS Runoff	6.213	1	729	23,469	----	------	------	ELDERLY U.D.-PRE
5	Combine	40.86	1	731	166,630	1, 2,	------	------	FLOW THRU WETLAND
6	Combine	44.06	1	731	179,037	3, 5	------	------	TOTAL FLOW TO CP-N (PRE)
7	SCS Runoff	16.84	1	734	74,673	----	------	------	ELDERLY NW-POST
8	SCS Runoff	21.97	1	731	90,828	----	------	------	WESTERLY WETLAND-POST
9	SCS Runoff	6.052	1	726	19,449	----	------	------	ELDERLY SW-POST
10	SCS Runoff	7.876	1	731	32,587	----	------	------	ELDERLY U.D.-POST
11	Reservoir	6.448	1	758	74,615	7	166.91	27,480	ELDERLY-NW-DET.
12	Reservoir	2.774	1	738	19,440	9	167.47	4,536	ELDERLY-SW-DET.
13	Combine	26.23	1	733	184,883	8, 11, 12	------	------	TOTAL FLOW TO CP-N (POST)

Hydrograph Report

Hyd. No. 1

ELDERLY NW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	18.90 cfs
Storm frequency	=	5 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	75,802 cuft
Drainage area	=	11.380 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.30 min
Total precip.	=	4.32 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

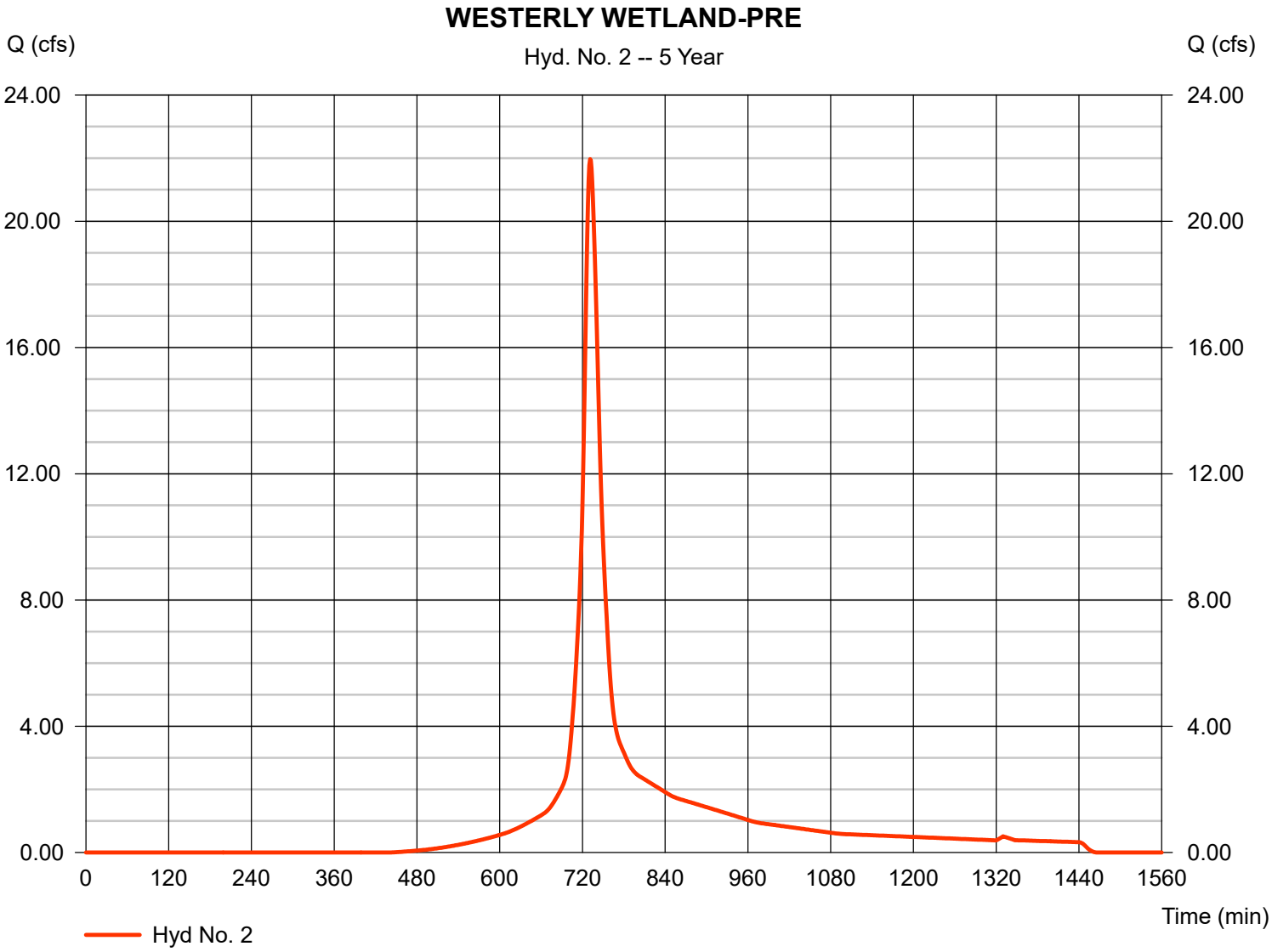


Hydrograph Report

Hyd. No. 2

WESTERLY WETLAND-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.97 cfs
Storm frequency	=	5 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	90,828 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	4.32 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

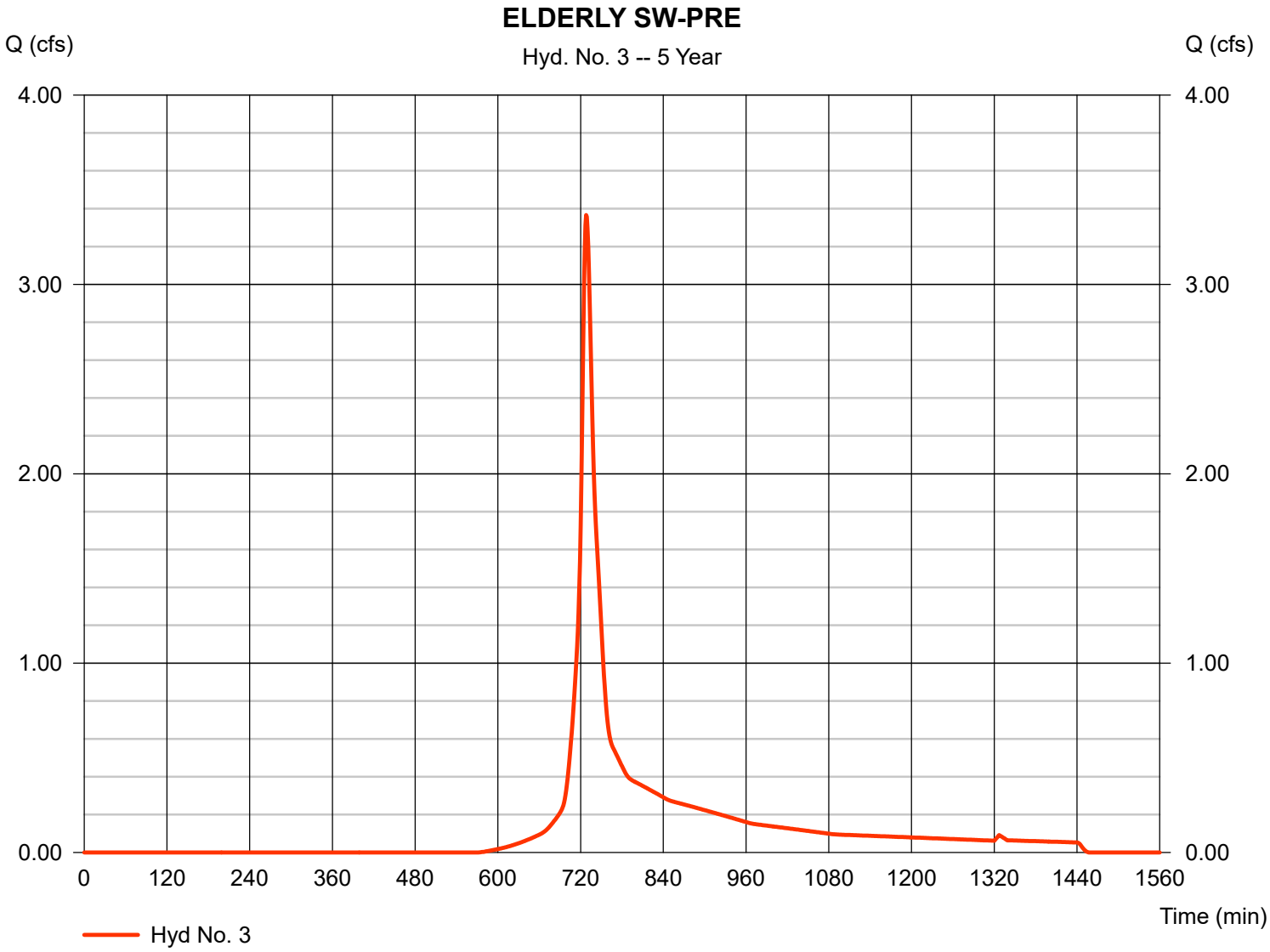


Hydrograph Report

Hyd. No. 3

ELDERLY SW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	3.366 cfs
Storm frequency	=	5 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	12,407 cuft
Drainage area	=	1.830 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.50 min
Total precip.	=	4.32 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

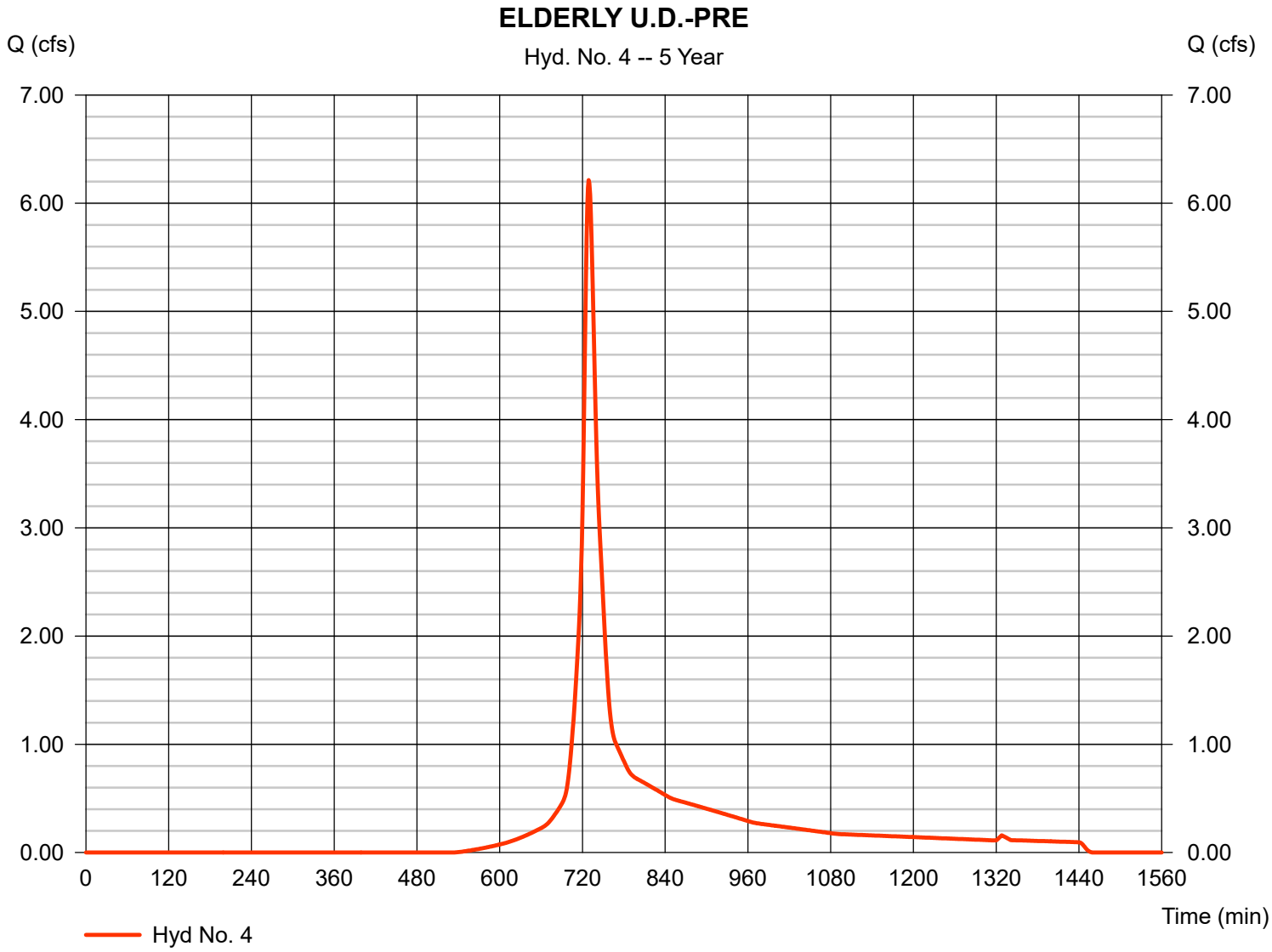


Hydrograph Report

Hyd. No. 4

ELDERLY U.D.-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.213 cfs
Storm frequency	=	5 yrs	Time to peak	=	729 min
Time interval	=	1 min	Hyd. volume	=	23,469 cuft
Drainage area	=	3.180 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	4.32 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

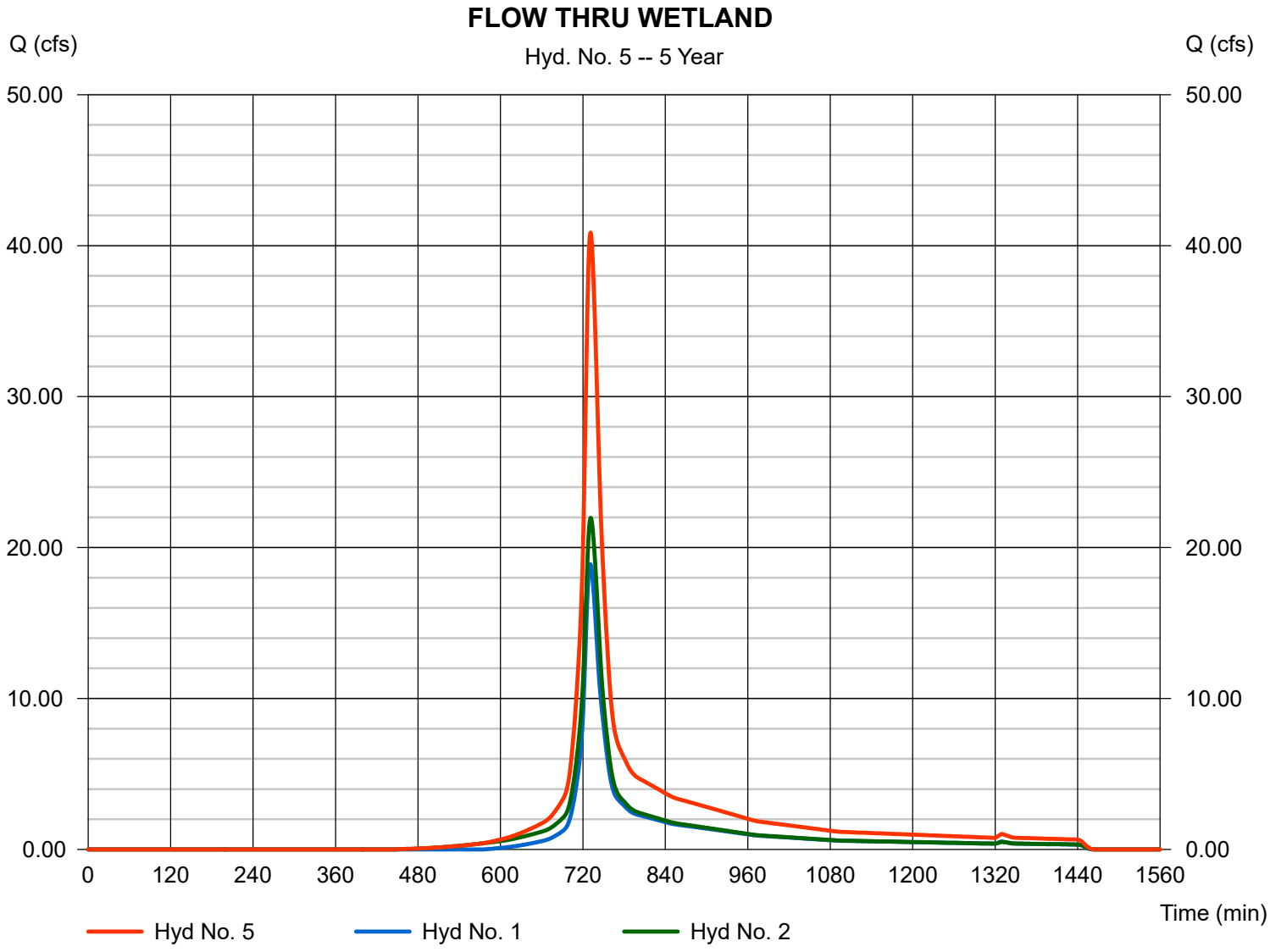


Hydrograph Report

Hyd. No. 5

FLOW THRU WETLAND

Hydrograph type	= Combine	Peak discharge	= 40.86 cfs
Storm frequency	= 5 yrs	Time to peak	= 731 min
Time interval	= 1 min	Hyd. volume	= 166,630 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 21.010 ac

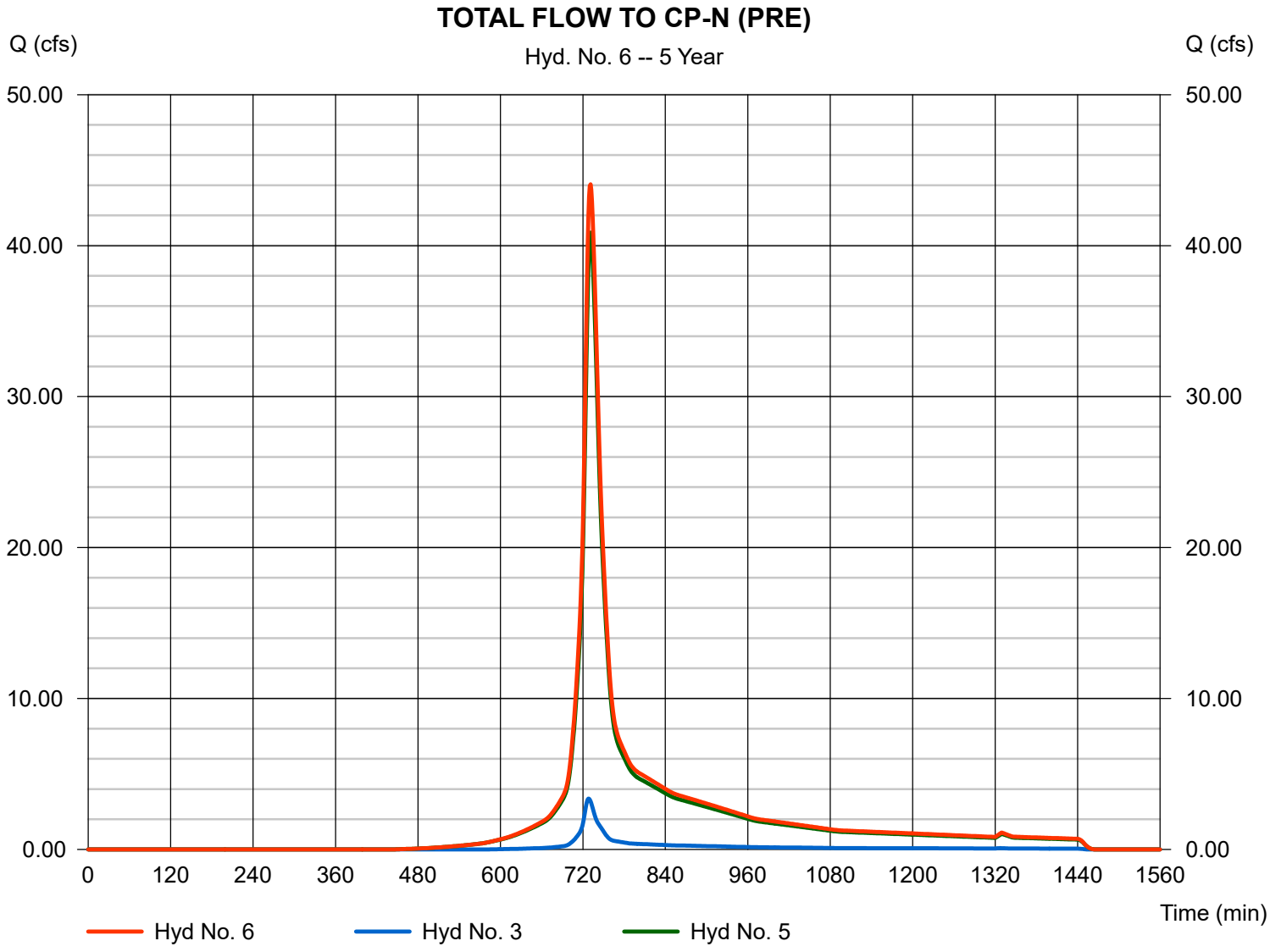


Hydrograph Report

Hyd. No. 6

TOTAL FLOW TO CP-N (PRE)

Hydrograph type	= Combine	Peak discharge	= 44.06 cfs
Storm frequency	= 5 yrs	Time to peak	= 731 min
Time interval	= 1 min	Hyd. volume	= 179,037 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 1.830 ac

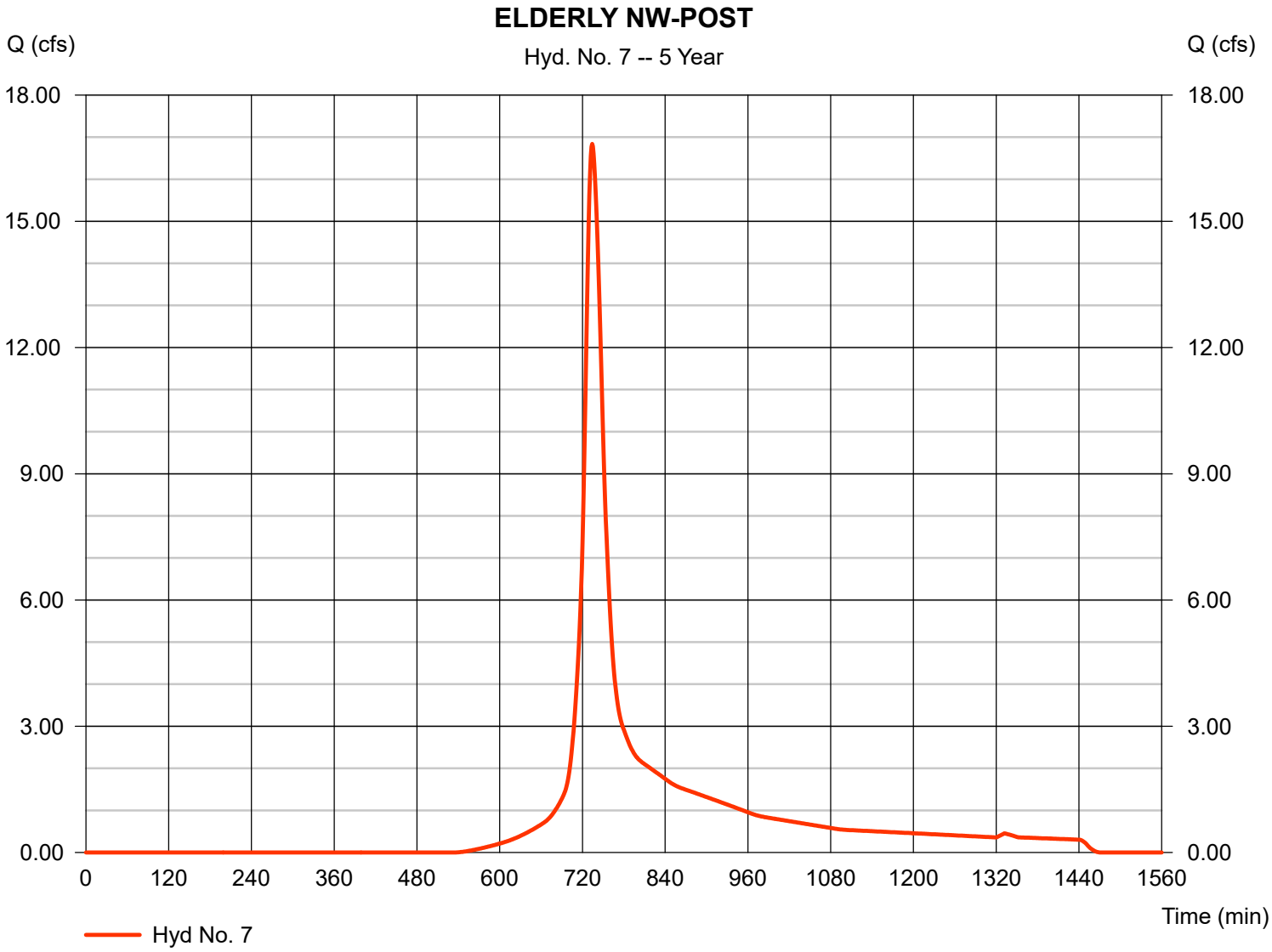


Hydrograph Report

Hyd. No. 7

ELDERLY NW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.84 cfs
Storm frequency	=	5 yrs	Time to peak	=	734 min
Time interval	=	1 min	Hyd. volume	=	74,673 cuft
Drainage area	=	9.960 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.70 min
Total precip.	=	4.32 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

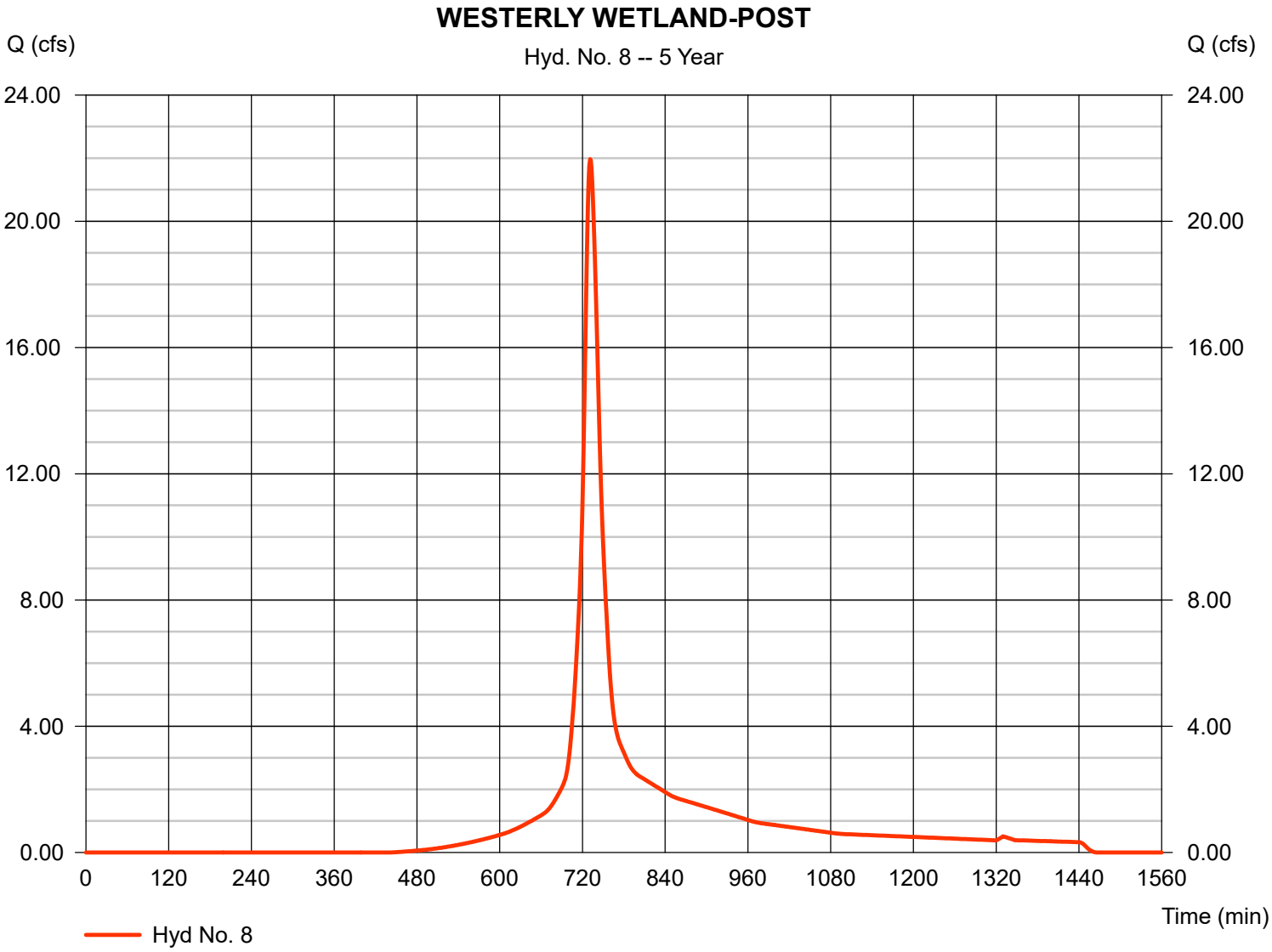


Hydrograph Report

Hyd. No. 8

WESTERLY WETLAND-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	21.97 cfs
Storm frequency	=	5 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	90,828 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	4.32 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

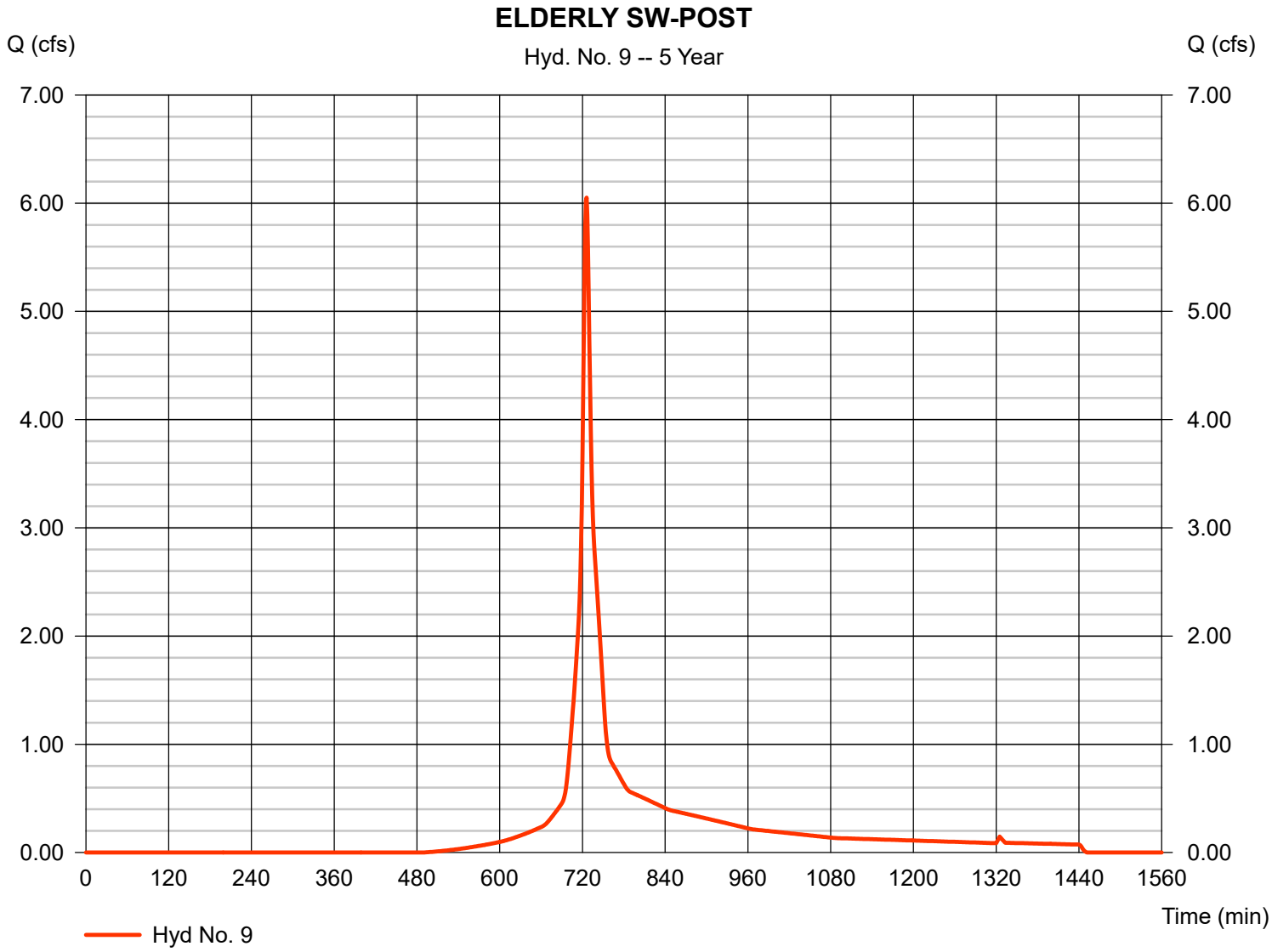


Hydrograph Report

Hyd. No. 9

ELDERLY SW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.052 cfs
Storm frequency	=	5 yrs	Time to peak	=	726 min
Time interval	=	1 min	Hyd. volume	=	19,449 cuft
Drainage area	=	2.380 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.00 min
Total precip.	=	4.32 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

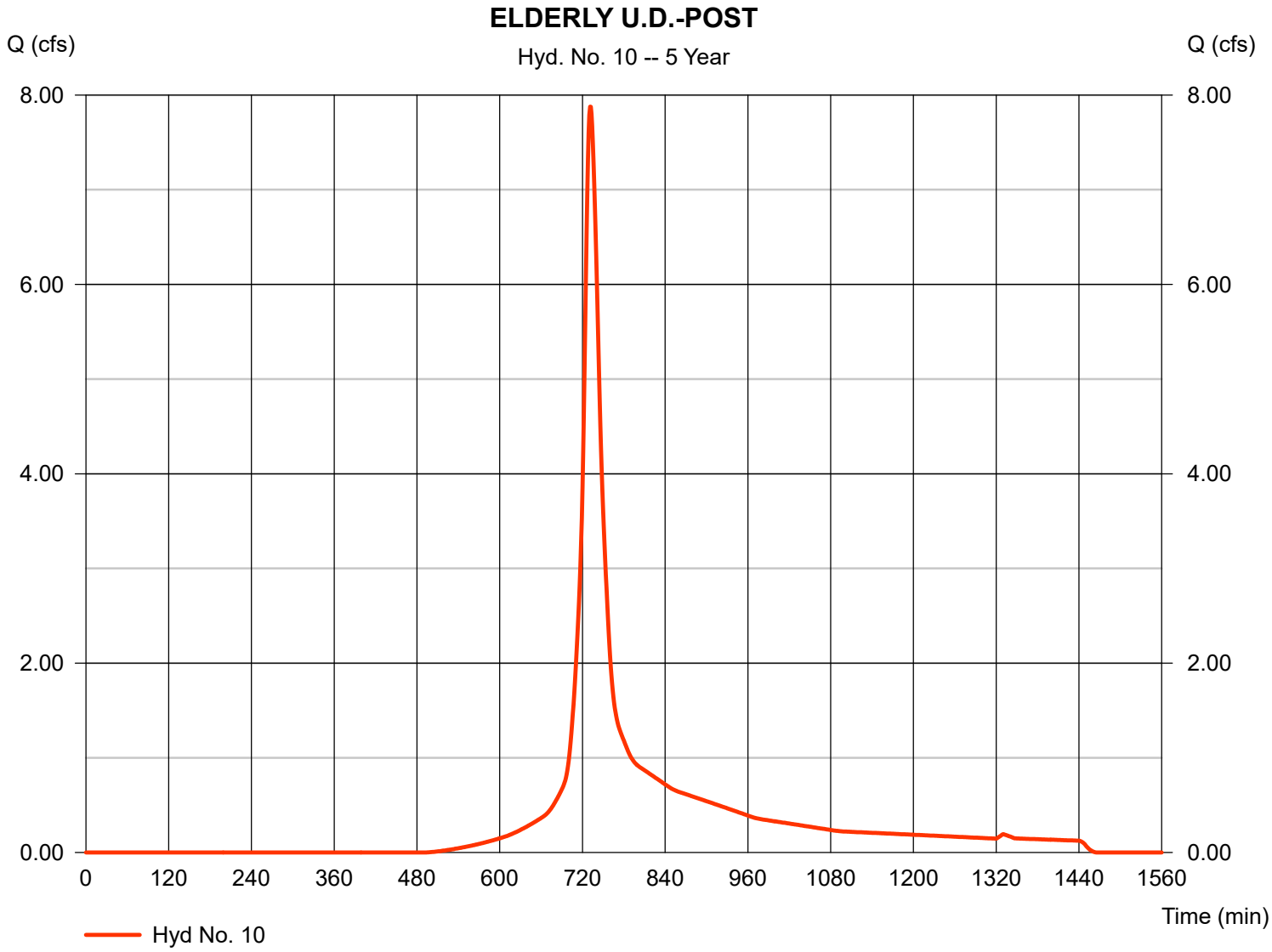


Hydrograph Report

Hyd. No. 10

ELDERLY U.D.-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	7.876 cfs
Storm frequency	=	5 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	32,587 cuft
Drainage area	=	3.840 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	4.32 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



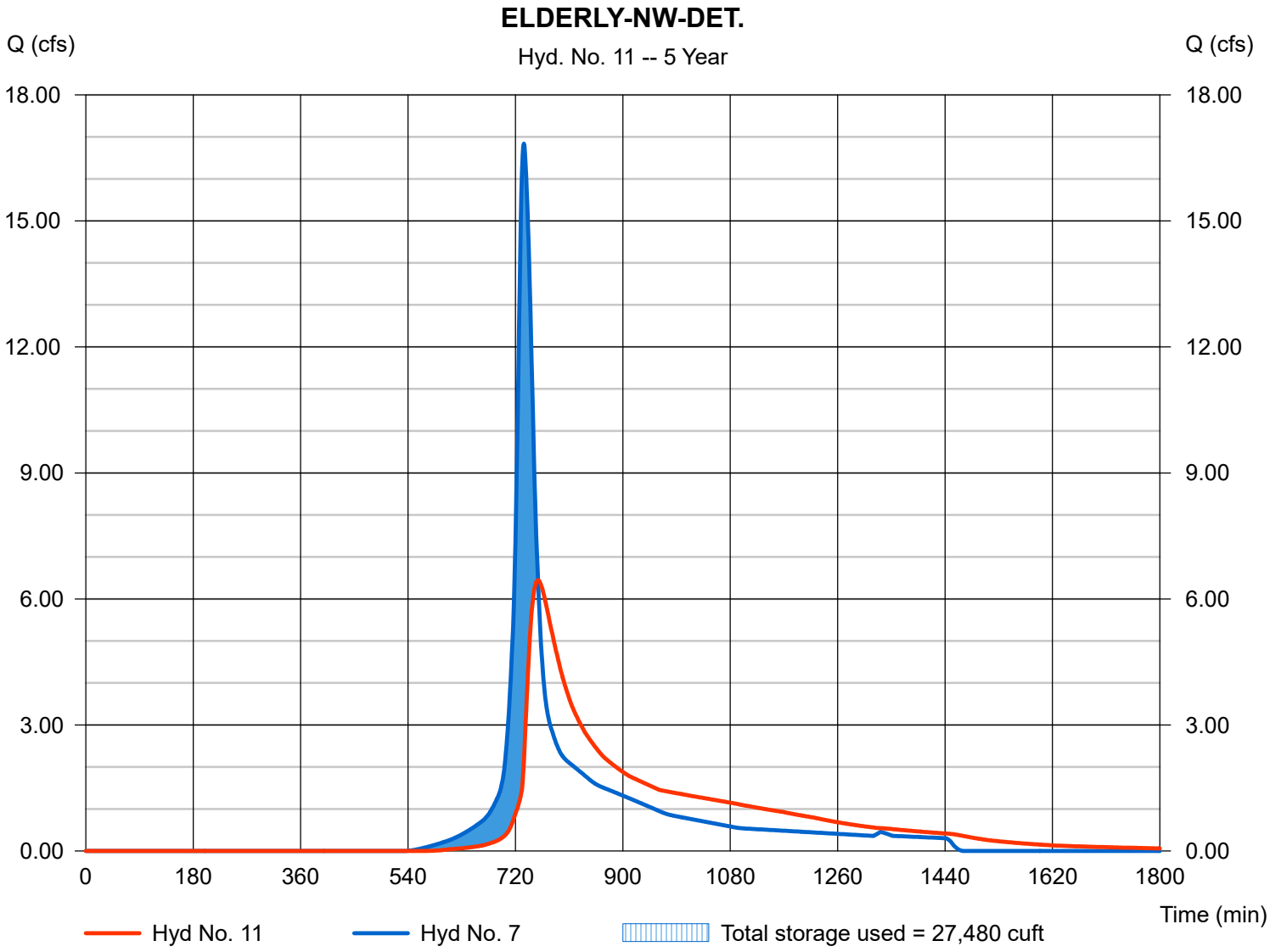
Hydrograph Report

Hyd. No. 11

ELDERLY-NW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	6.448 cfs
Storm frequency	=	5 yrs	Time to peak	=	758 min
Time interval	=	1 min	Hyd. volume	=	74,615 cuft
Inflow hyd. No.	=	7 - ELDERLY NW-POST	Max. Elevation	=	166.91 ft
Reservoir name	=	WQB#4 (ELDERLY-NW-POST)	Max. Storage	=	27,480 cuft

Storage Indication method used.



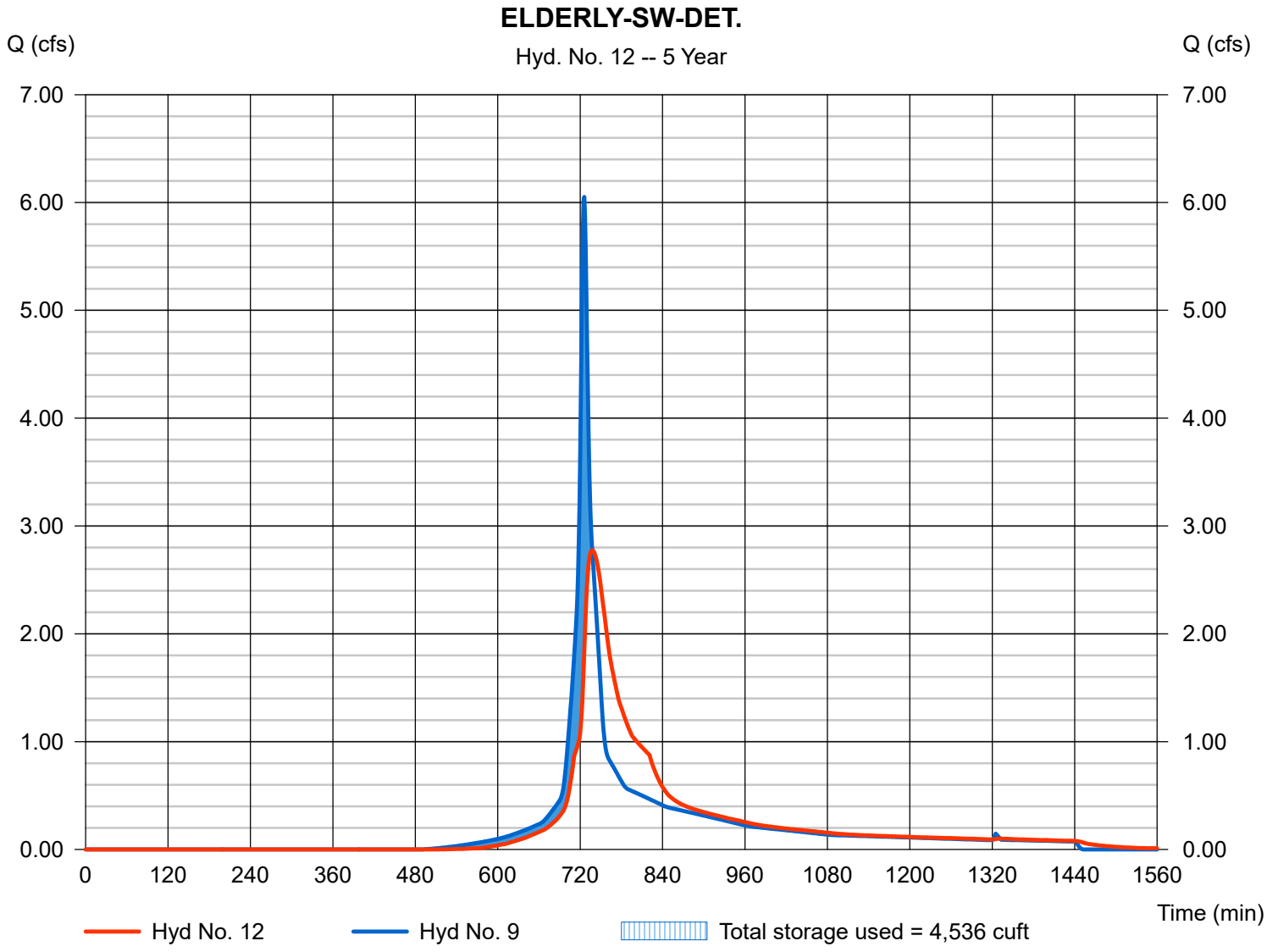
Hydrograph Report

Hyd. No. 12

ELDERLY-SW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	2.774 cfs
Storm frequency	=	5 yrs	Time to peak	=	738 min
Time interval	=	1 min	Hyd. volume	=	19,440 cuft
Inflow hyd. No.	=	9 - ELDERLY SW-POST	Max. Elevation	=	167.47 ft
Reservoir name	=	WQB#5 (ELDERLY-SW-POST)	Max. Storage	=	4,536 cuft

Storage Indication method used.

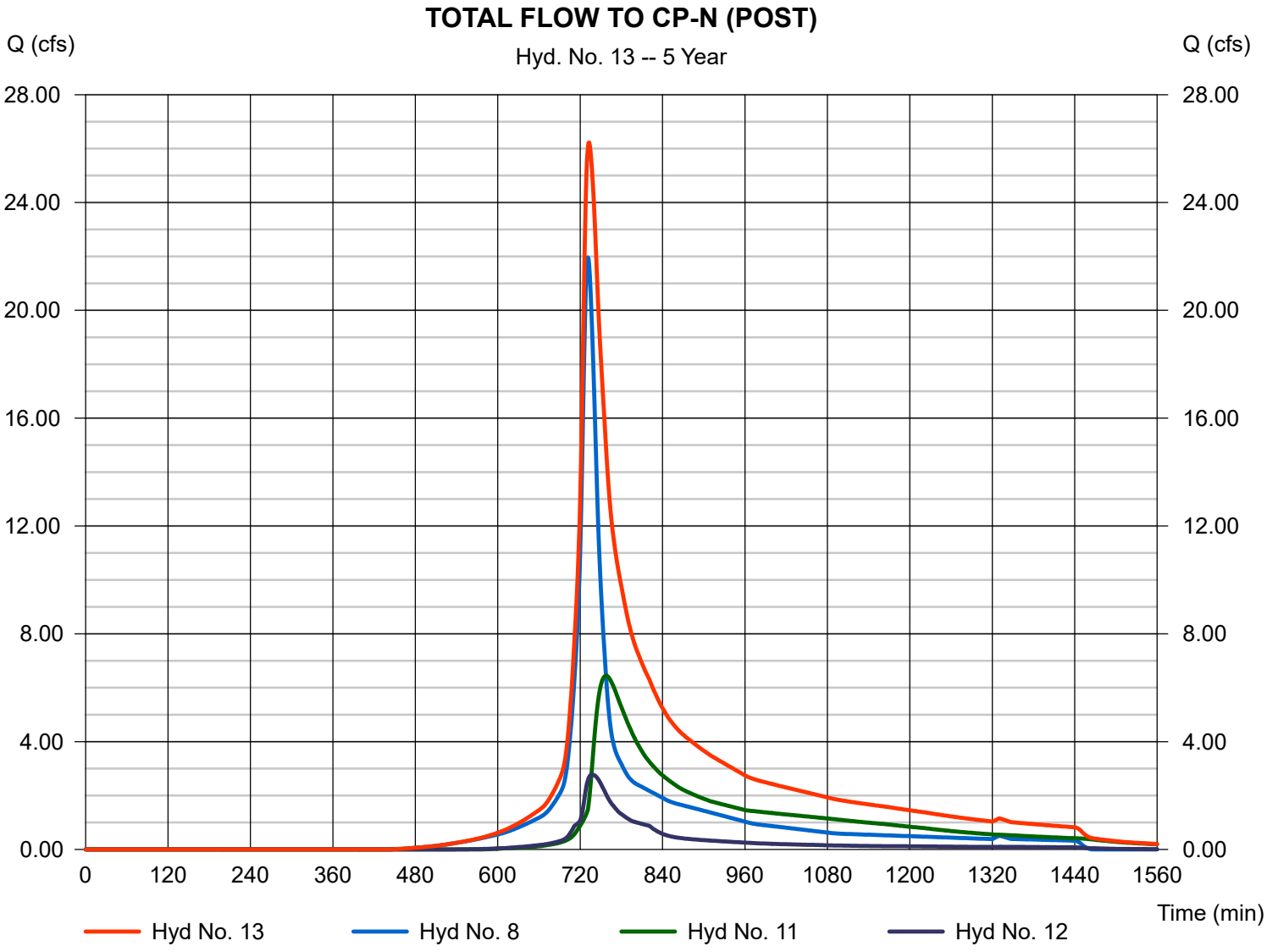


Hydrograph Report

Hyd. No. 13

TOTAL FLOW TO CP-N (POST)

Hydrograph type	=	Combine	Peak discharge	=	26.23 cfs
Storm frequency	=	5 yrs	Time to peak	=	733 min
Time interval	=	1 min	Hyd. volume	=	184,883 cuft
Inflow hyds.	=	8, 11, 12	Contrib. drain. area	=	9.630 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

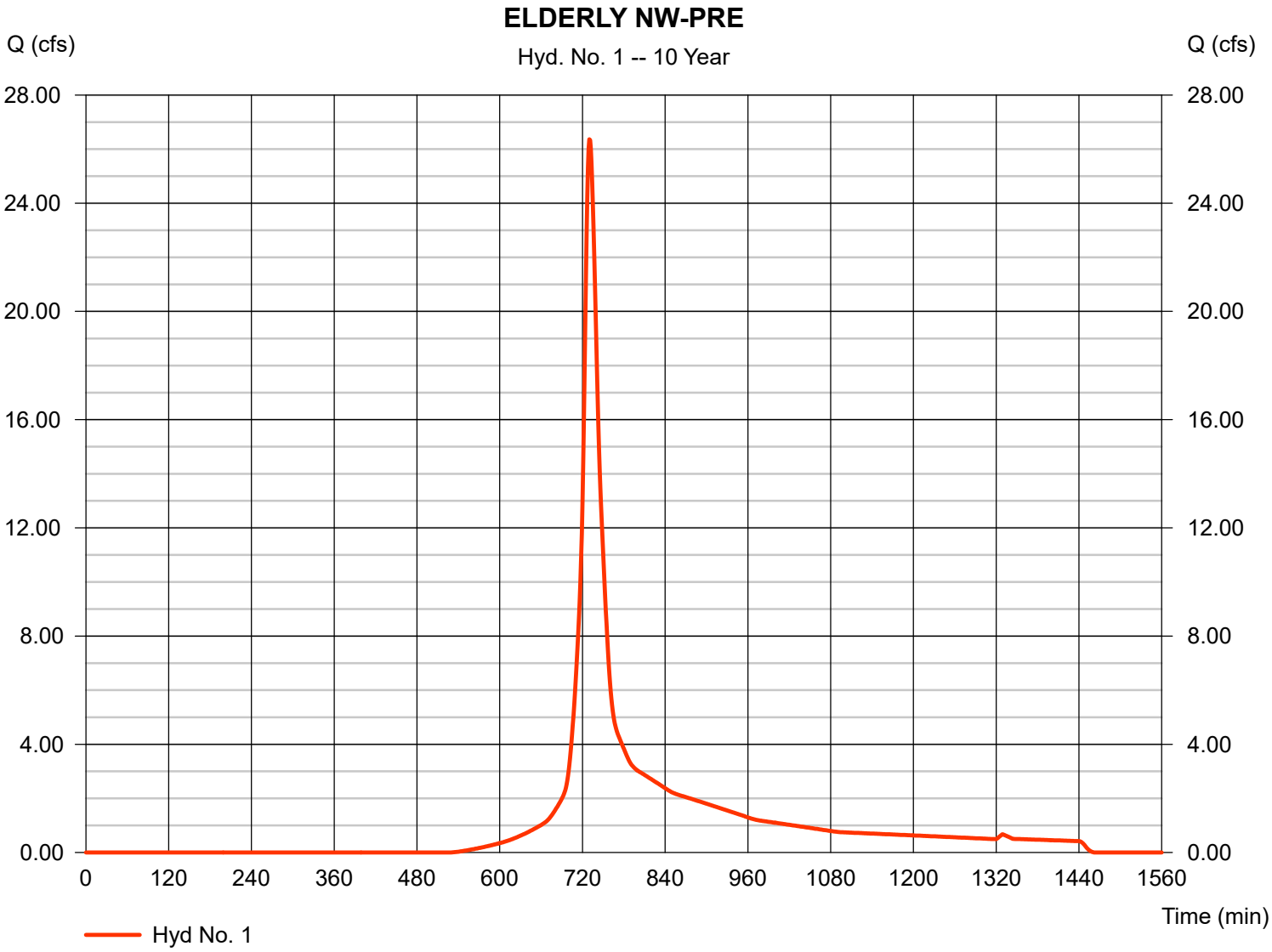
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	26.36	1	730	104,632	----	------	------	ELDERLY NW-PRE
2	SCS Runoff	28.70	1	731	119,091	----	------	------	WESTERLY WETLAND-PRE
3	SCS Runoff	4.699	1	728	17,126	----	------	------	ELDERLY SW-PRE
4	SCS Runoff	8.463	1	729	31,812	----	------	------	ELDERLY U.D.-PRE
5	Combine	55.03	1	731	223,722	1, 2,	------	------	FLOW THRU WETLAND
6	Combine	59.45	1	731	240,848	3, 5	------	------	TOTAL FLOW TO CP-N (PRE)
7	SCS Runoff	22.94	1	734	101,220	----	------	------	ELDERLY NW-POST
8	SCS Runoff	28.70	1	731	119,091	----	------	------	WESTERLY WETLAND-POST
9	SCS Runoff	8.047	1	726	25,918	----	------	------	ELDERLY SW-POST
10	SCS Runoff	10.50	1	731	43,425	----	------	------	ELDERLY U.D.-POST
11	Reservoir	8.669	1	757	101,163	7	167.37	36,550	ELDERLY-NW-DET.
12	Reservoir	4.015	1	735	25,908	9	167.66	5,845	ELDERLY-SW-DET.
13	Combine	36.81	1	733	246,161	8, 11, 12	------	------	TOTAL FLOW TO CP-N (POST)

Hydrograph Report

Hyd. No. 1

ELDERLY NW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	26.36 cfs
Storm frequency	=	10 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	104,632 cuft
Drainage area	=	11.380 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.30 min
Total precip.	=	5.21 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

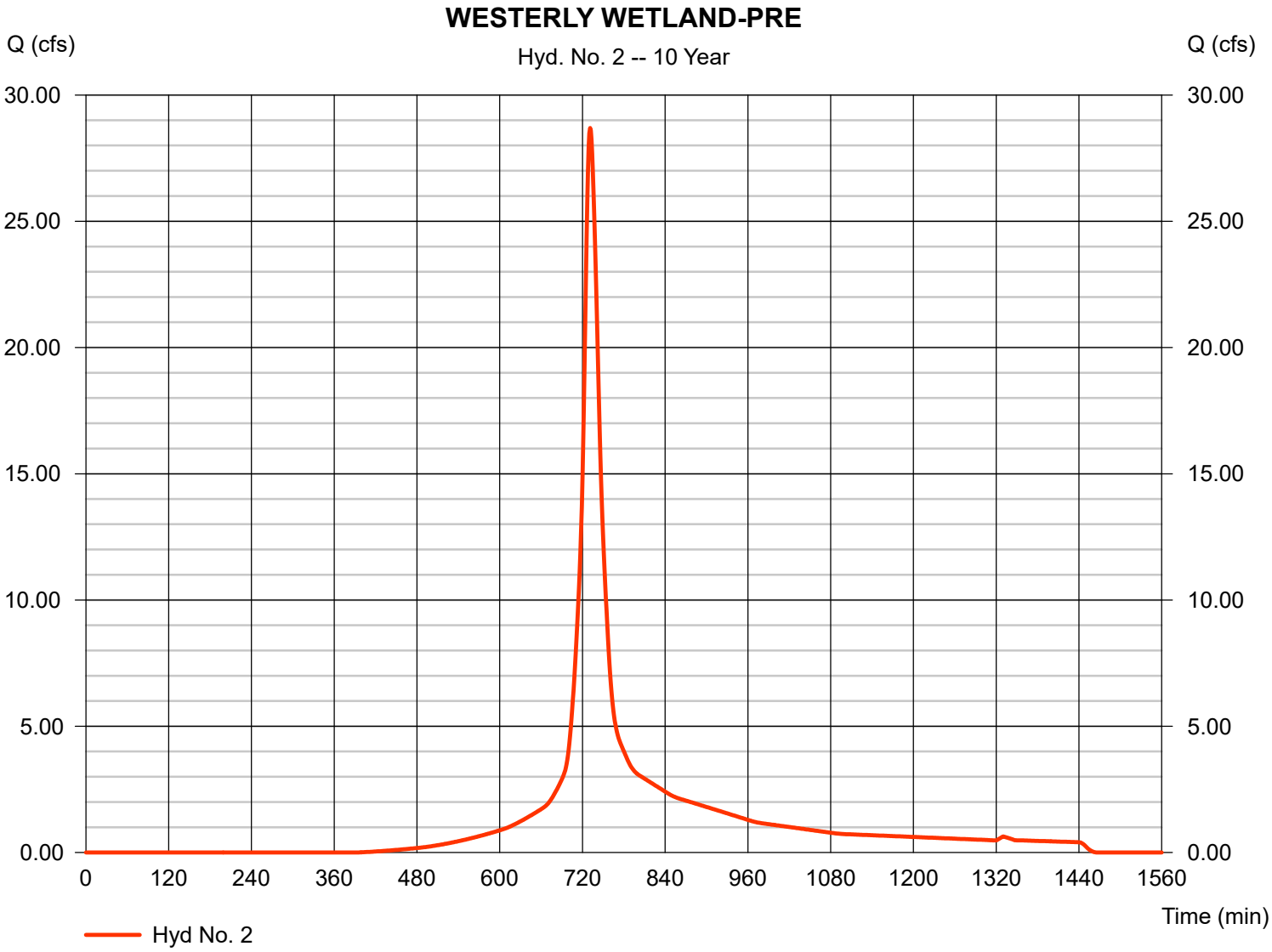


Hydrograph Report

Hyd. No. 2

WESTERLY WETLAND-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	28.70 cfs
Storm frequency	=	10 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	119,091 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	5.21 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

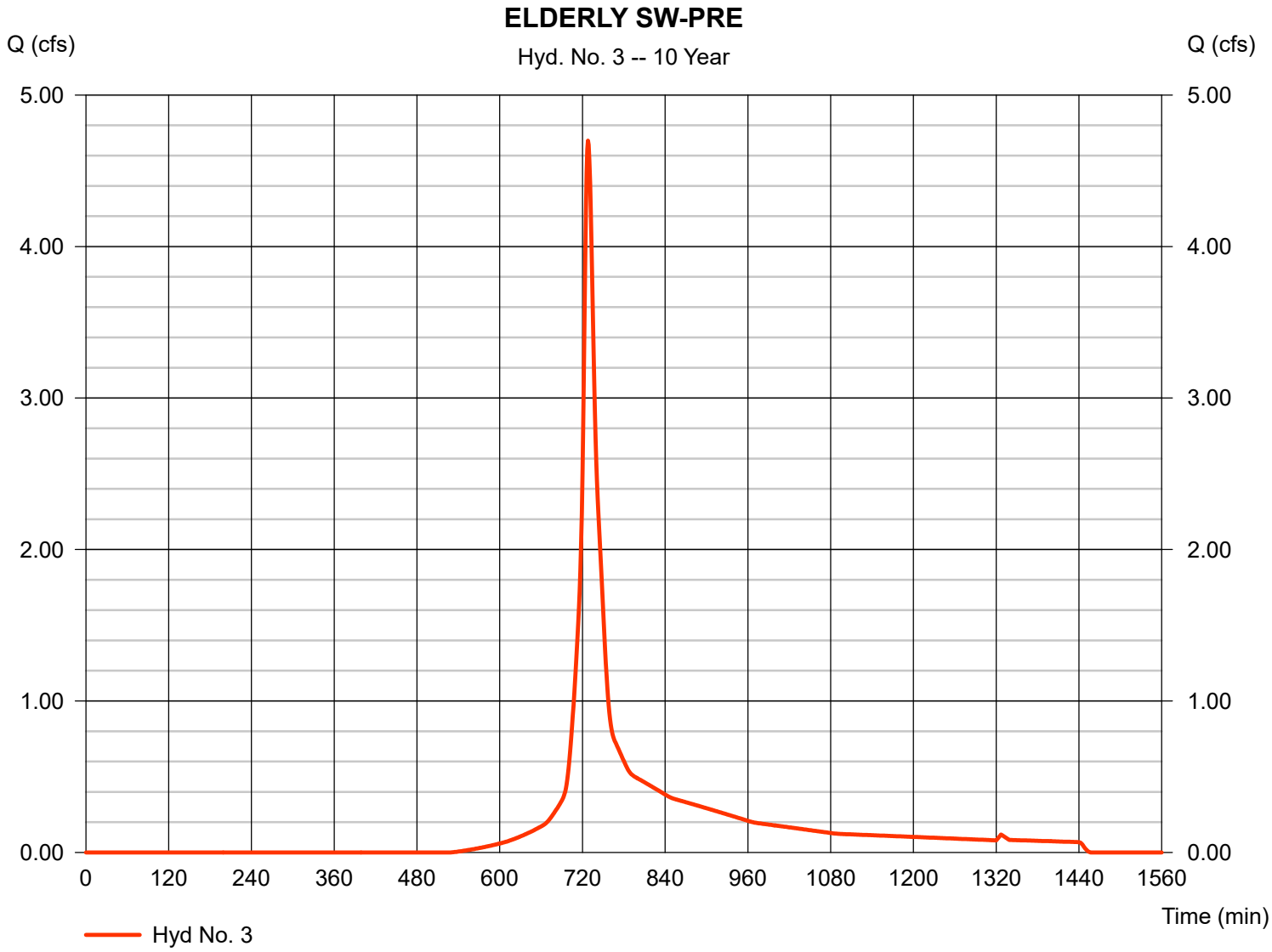


Hydrograph Report

Hyd. No. 3

ELDERLY SW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	4.699 cfs
Storm frequency	=	10 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	17,126 cuft
Drainage area	=	1.830 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.50 min
Total precip.	=	5.21 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

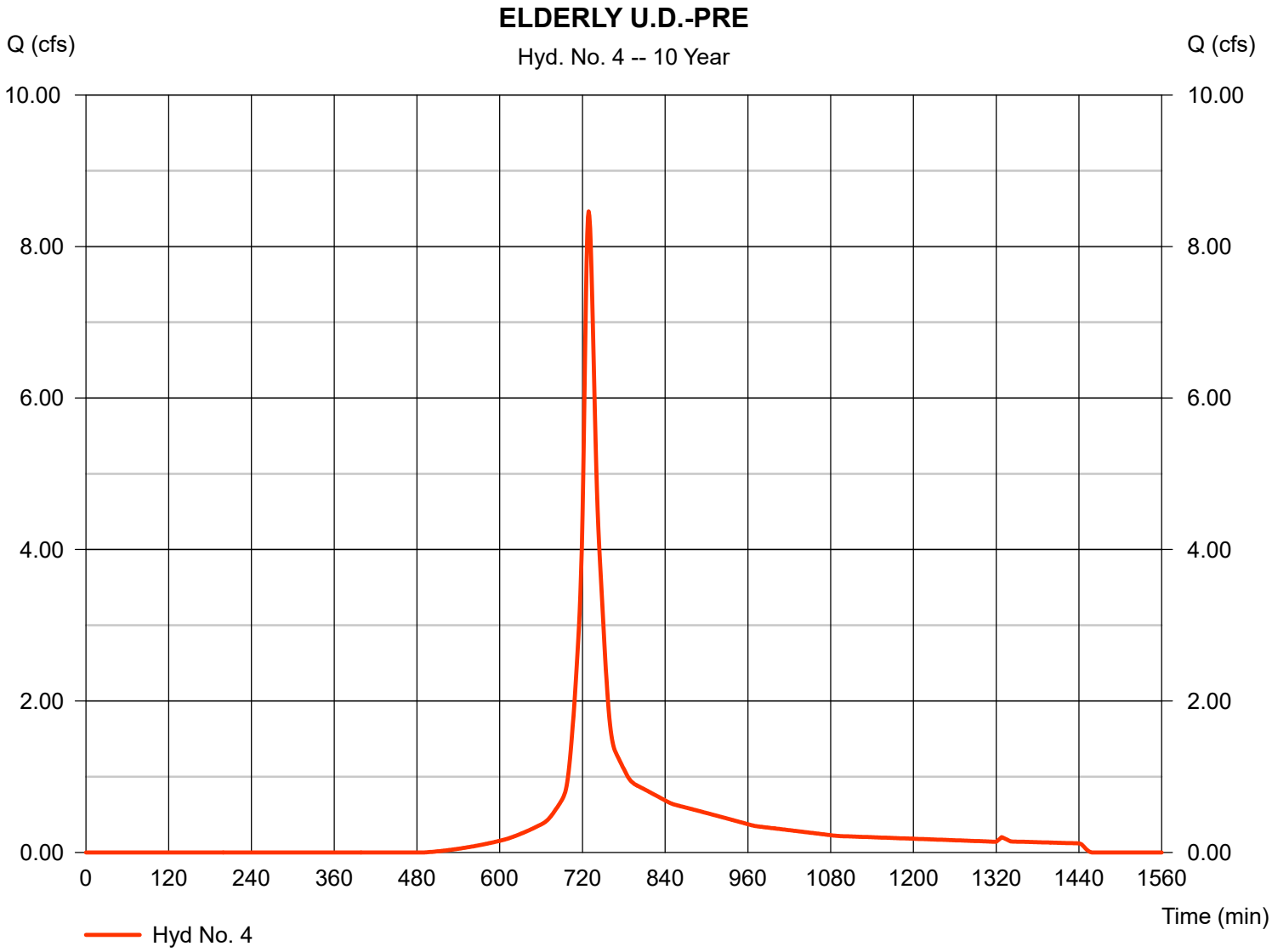


Hydrograph Report

Hyd. No. 4

ELDERLY U.D.-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.463 cfs
Storm frequency	=	10 yrs	Time to peak	=	729 min
Time interval	=	1 min	Hyd. volume	=	31,812 cuft
Drainage area	=	3.180 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	5.21 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

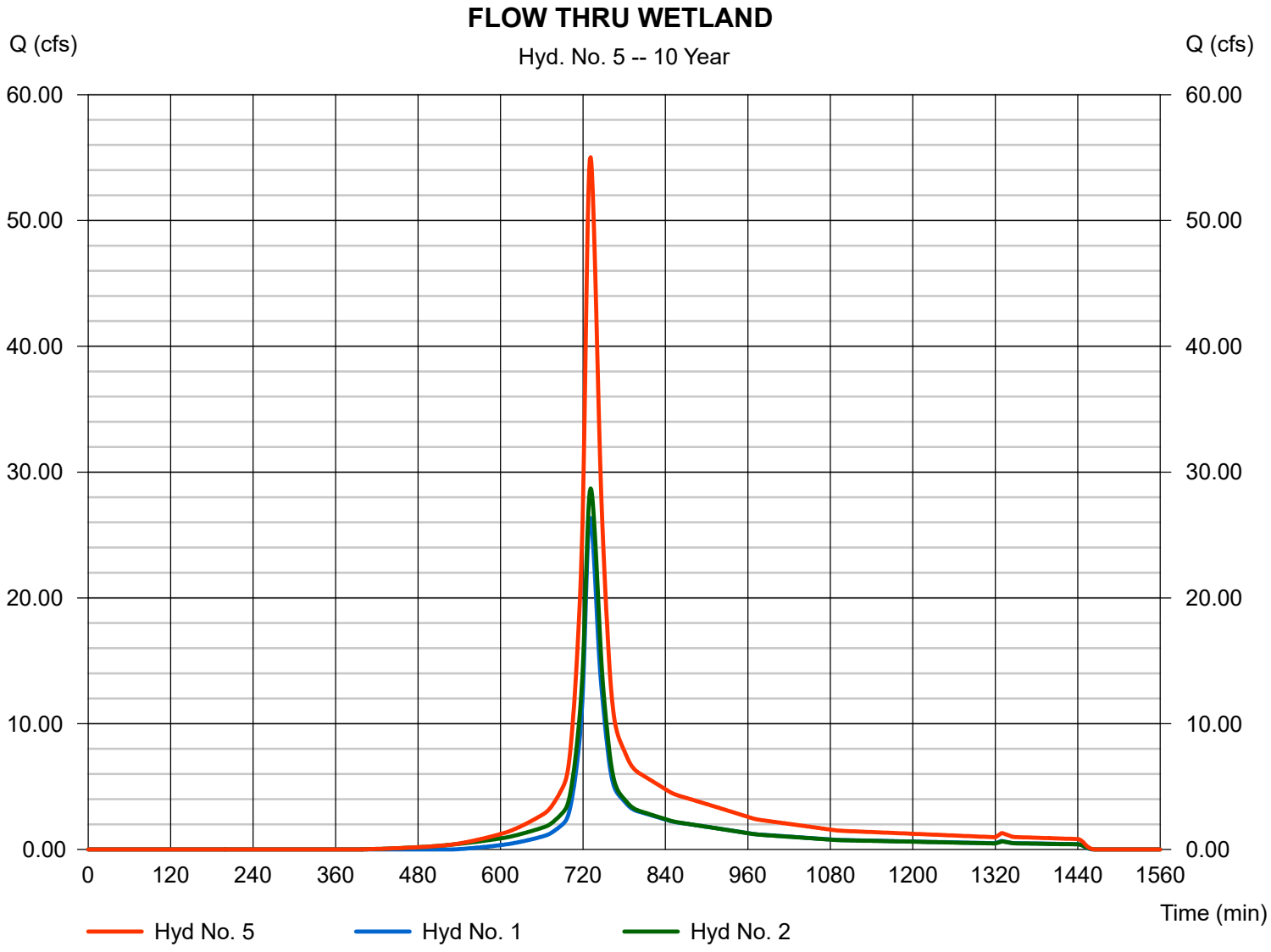


Hydrograph Report

Hyd. No. 5

FLOW THRU WETLAND

Hydrograph type	= Combine	Peak discharge	= 55.03 cfs
Storm frequency	= 10 yrs	Time to peak	= 731 min
Time interval	= 1 min	Hyd. volume	= 223,722 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 21.010 ac

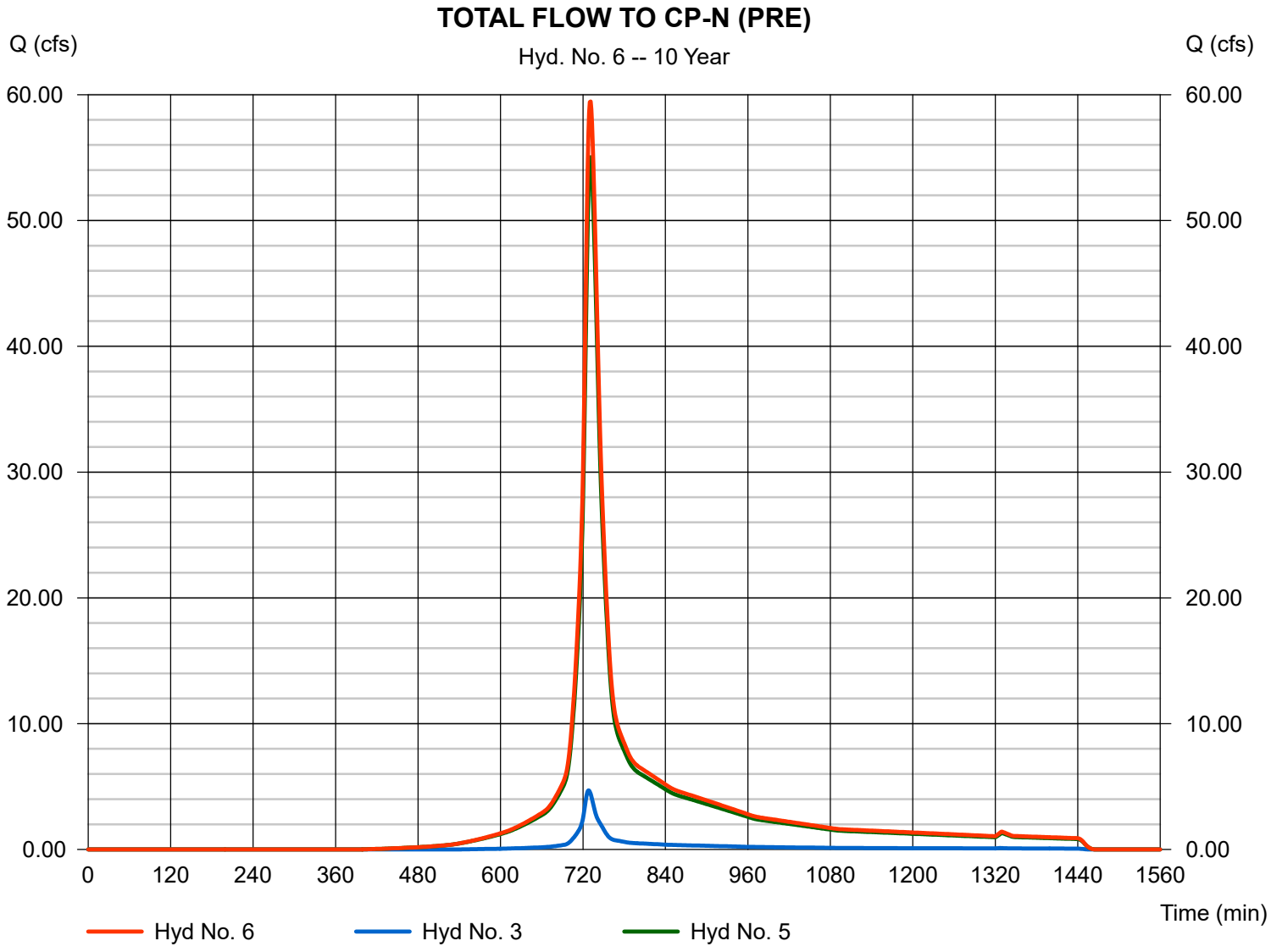


Hydrograph Report

Hyd. No. 6

TOTAL FLOW TO CP-N (PRE)

Hydrograph type	= Combine	Peak discharge	= 59.45 cfs
Storm frequency	= 10 yrs	Time to peak	= 731 min
Time interval	= 1 min	Hyd. volume	= 240,848 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 1.830 ac

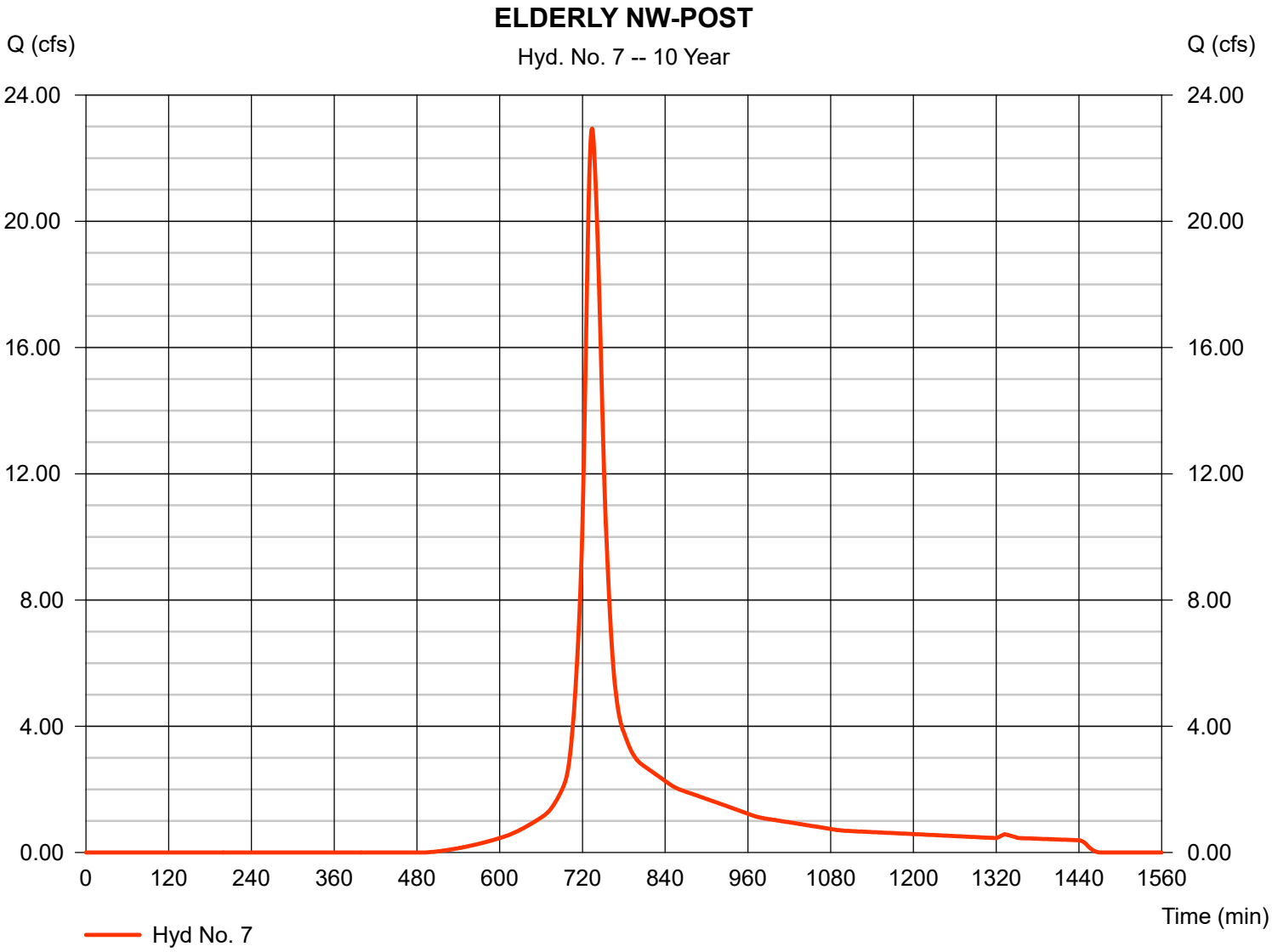


Hydrograph Report

Hyd. No. 7

ELDERLY NW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	22.94 cfs
Storm frequency	=	10 yrs	Time to peak	=	734 min
Time interval	=	1 min	Hyd. volume	=	101,220 cuft
Drainage area	=	9.960 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.70 min
Total precip.	=	5.21 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

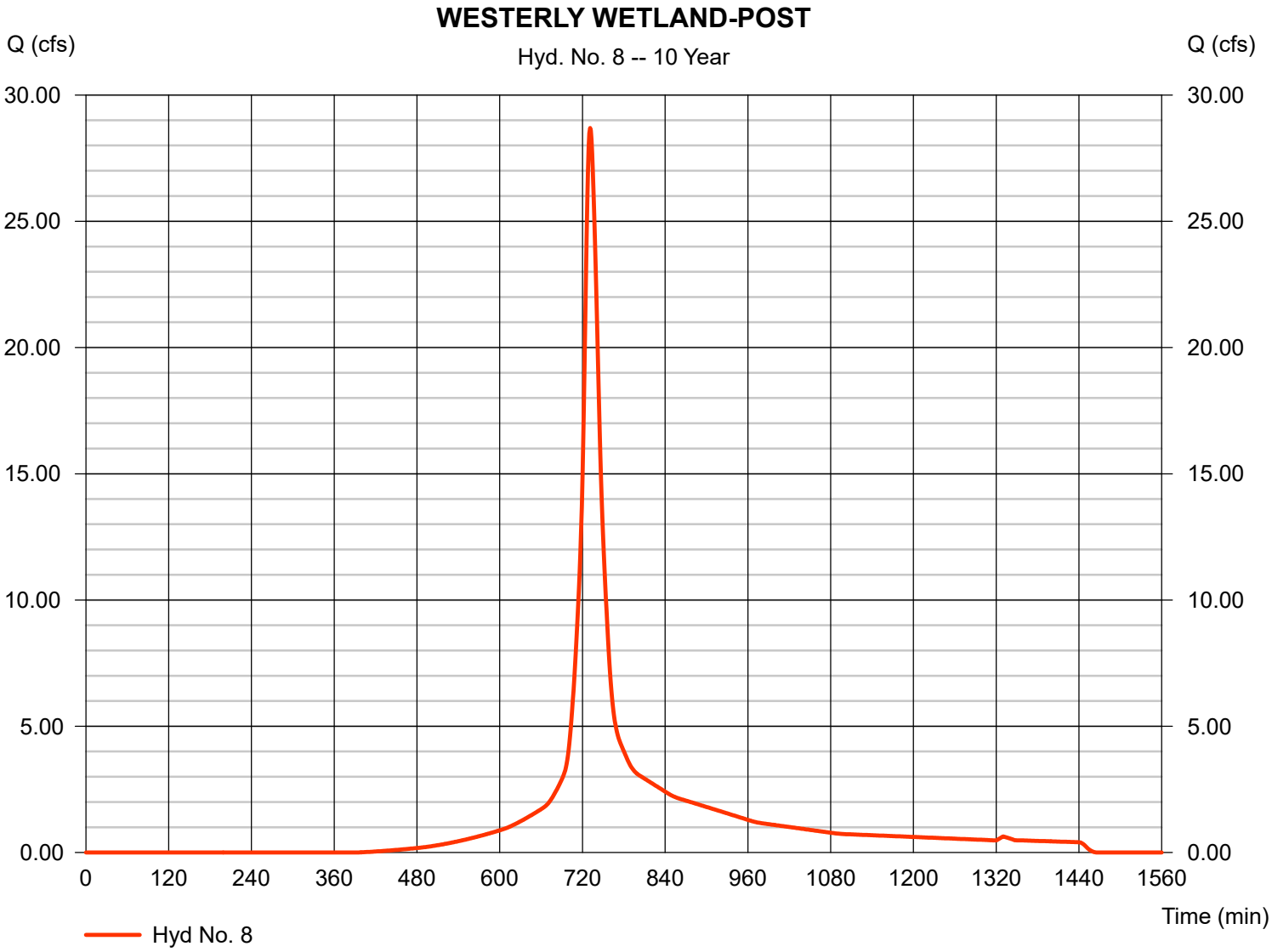


Hydrograph Report

Hyd. No. 8

WESTERLY WETLAND-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	28.70 cfs
Storm frequency	=	10 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	119,091 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	5.21 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

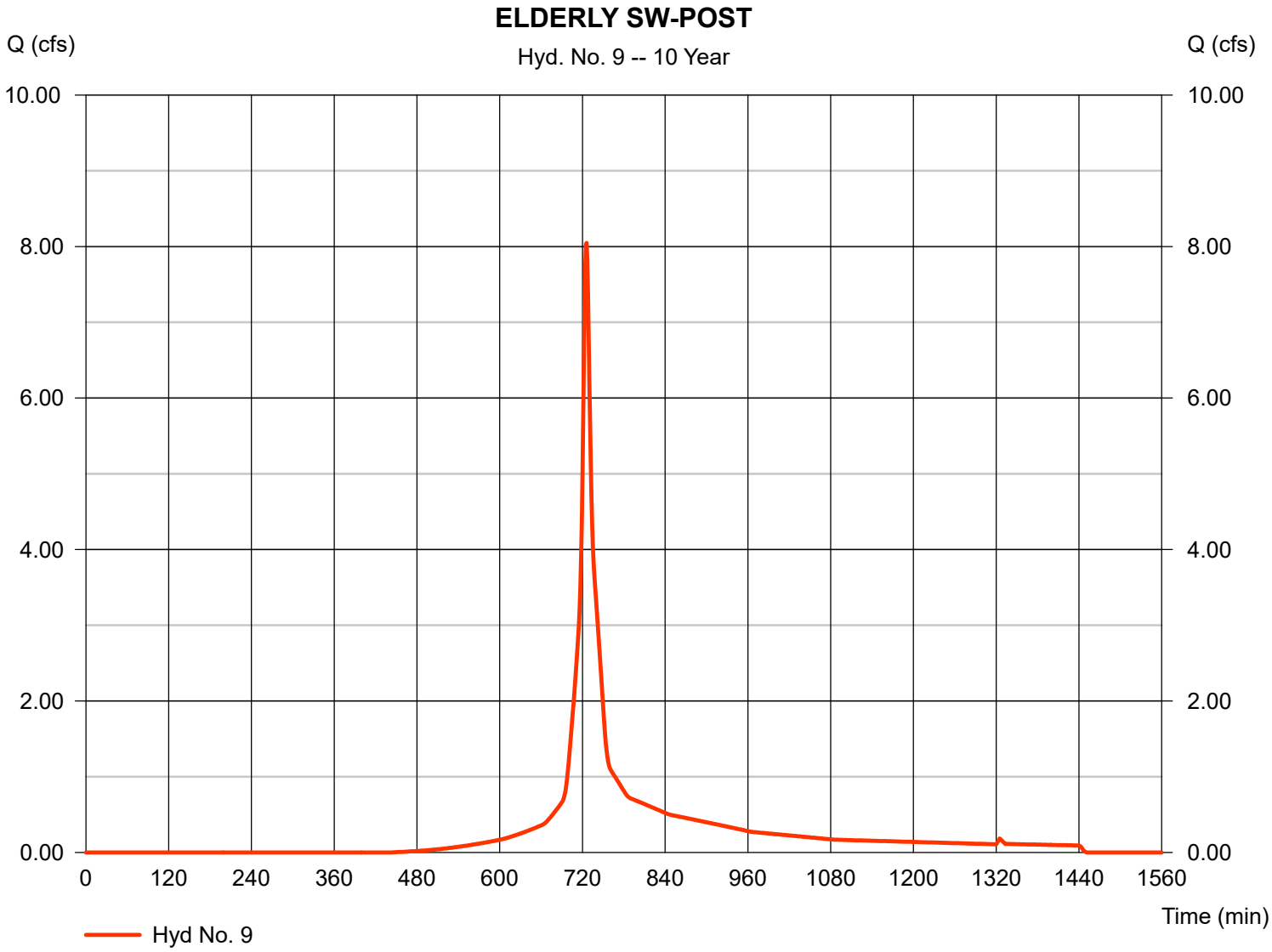


Hydrograph Report

Hyd. No. 9

ELDERLY SW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.047 cfs
Storm frequency	=	10 yrs	Time to peak	=	726 min
Time interval	=	1 min	Hyd. volume	=	25,918 cuft
Drainage area	=	2.380 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.00 min
Total precip.	=	5.21 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

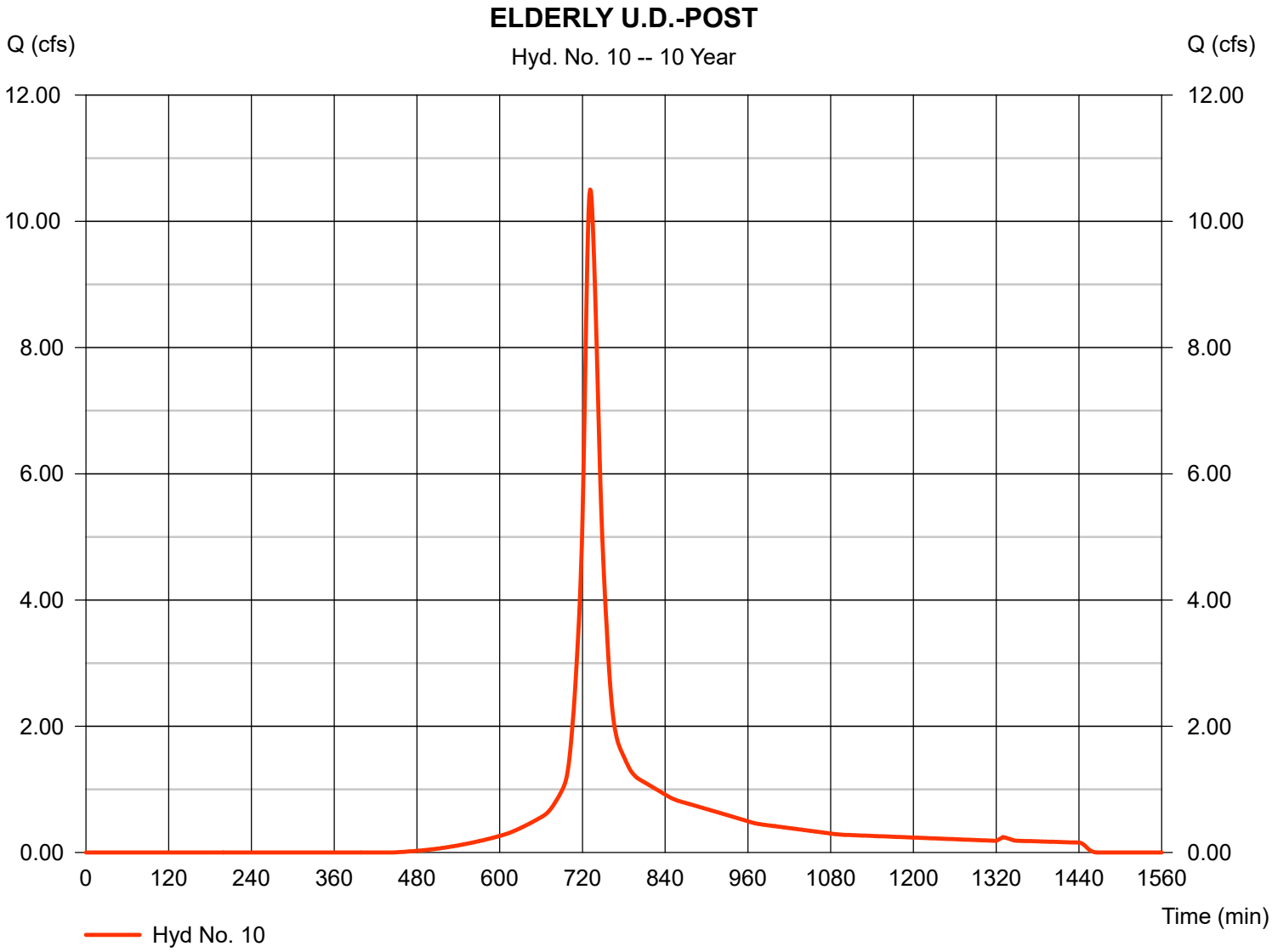


Hydrograph Report

Hyd. No. 10

ELDERLY U.D.-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.50 cfs
Storm frequency	=	10 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	43,425 cuft
Drainage area	=	3.840 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	5.21 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



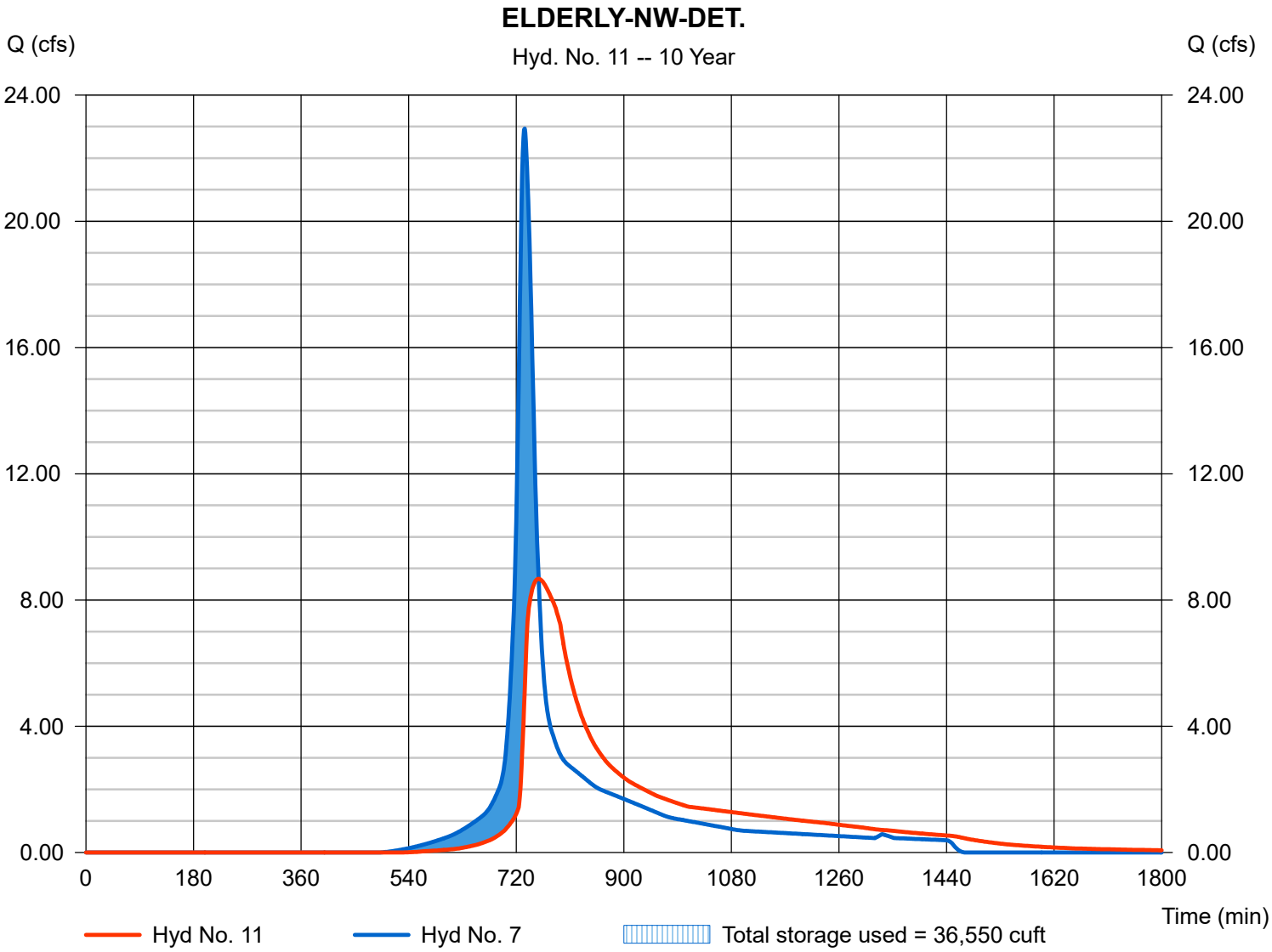
Hydrograph Report

Hyd. No. 11

ELDERLY-NW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	8.669 cfs
Storm frequency	=	10 yrs	Time to peak	=	757 min
Time interval	=	1 min	Hyd. volume	=	101,163 cuft
Inflow hyd. No.	=	7 - ELDERLY NW-POST	Max. Elevation	=	167.37 ft
Reservoir name	=	WQB#4 (ELDERLY-NW-POST)	Max. Storage	=	36,550 cuft

Storage Indication method used.



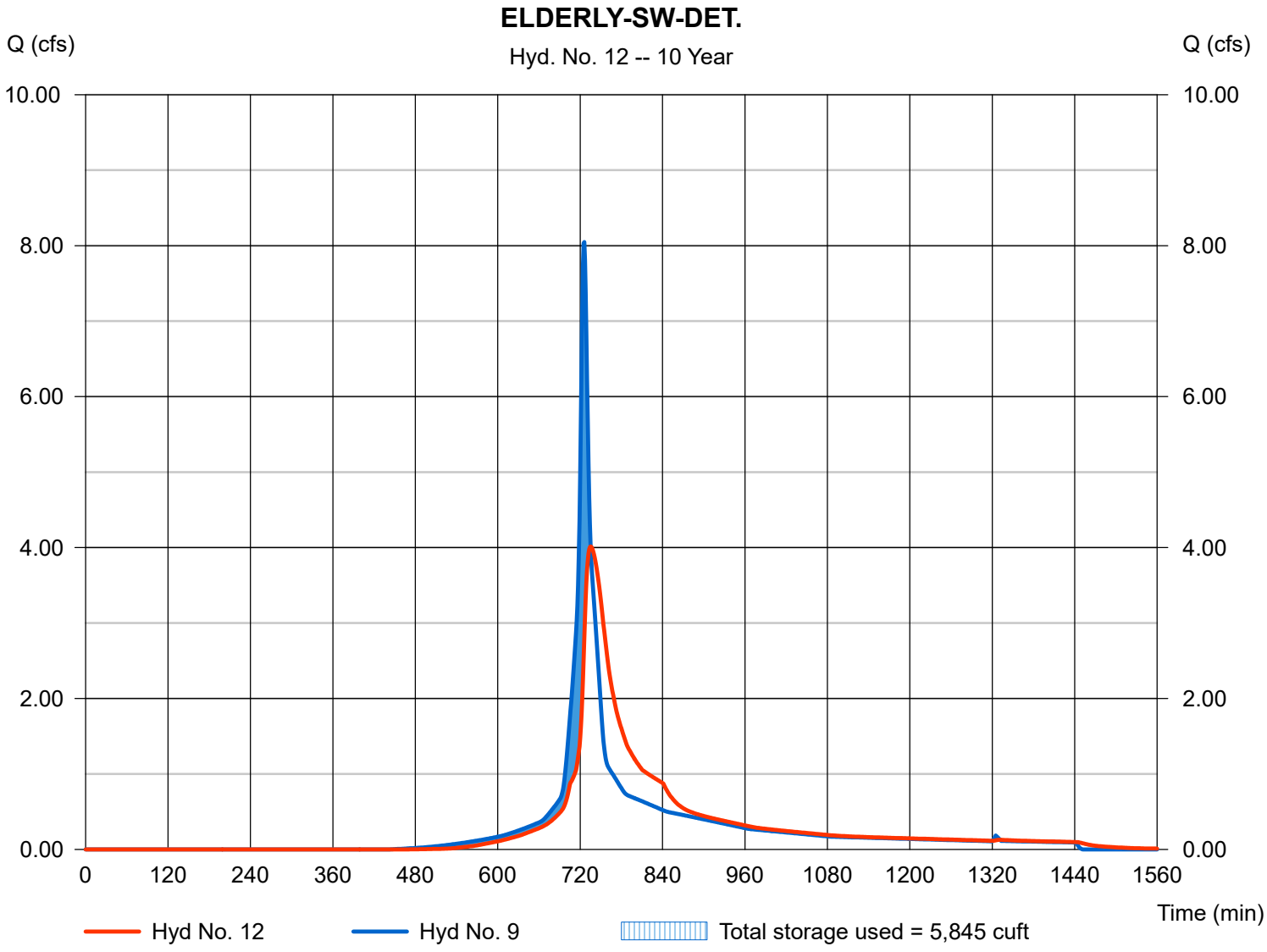
Hydrograph Report

Hyd. No. 12

ELDERLY-SW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	4.015 cfs
Storm frequency	=	10 yrs	Time to peak	=	735 min
Time interval	=	1 min	Hyd. volume	=	25,908 cuft
Inflow hyd. No.	=	9 - ELDERLY SW-POST	Max. Elevation	=	167.66 ft
Reservoir name	=	WQB#5 (ELDERLY-SW-POST)	Max. Storage	=	5,845 cuft

Storage Indication method used.

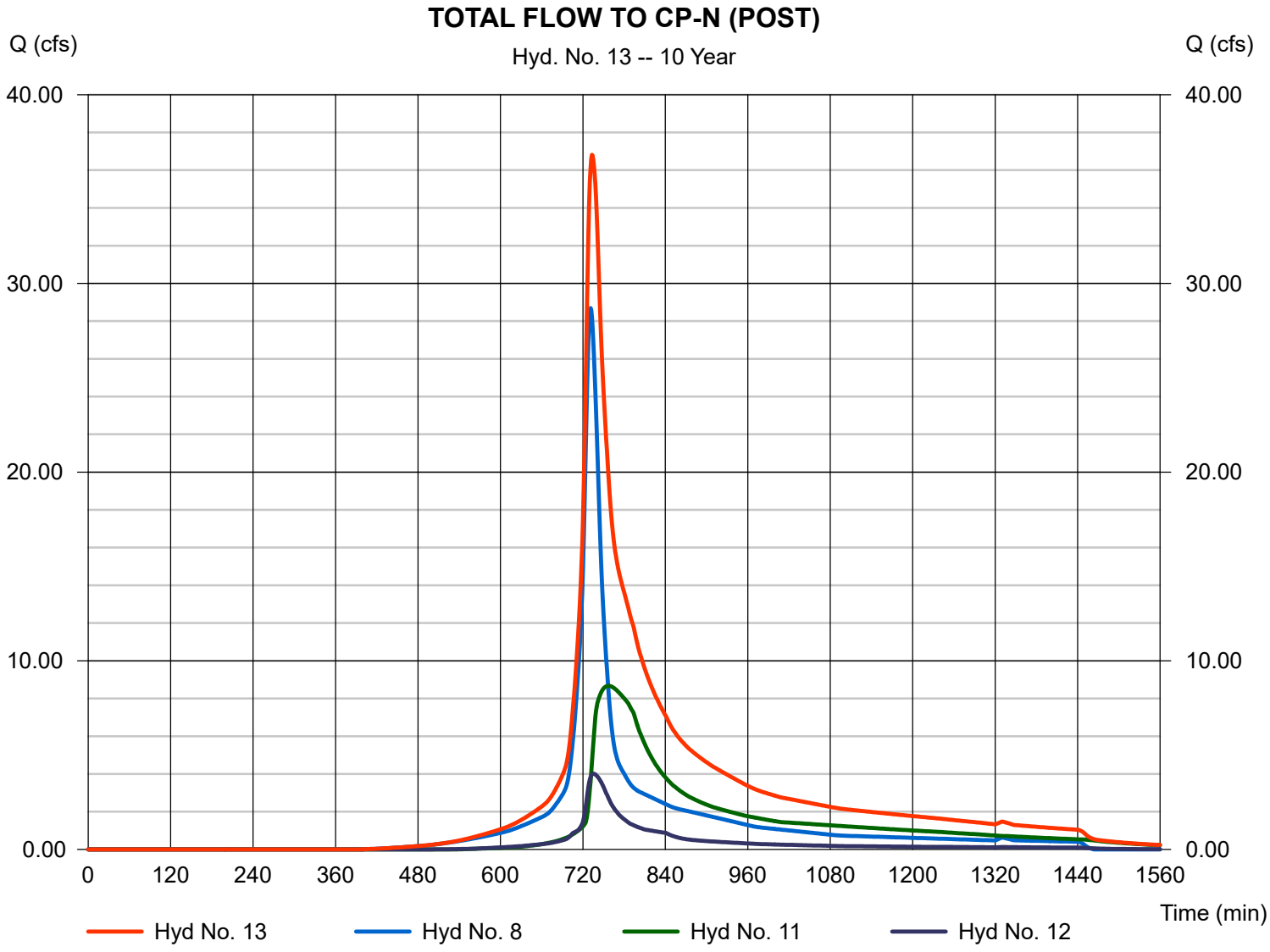


Hydrograph Report

Hyd. No. 13

TOTAL FLOW TO CP-N (POST)

Hydrograph type	= Combine	Peak discharge	= 36.81 cfs
Storm frequency	= 10 yrs	Time to peak	= 733 min
Time interval	= 1 min	Hyd. volume	= 246,161 cuft
Inflow hyds.	= 8, 11, 12	Contrib. drain. area	= 9.630 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

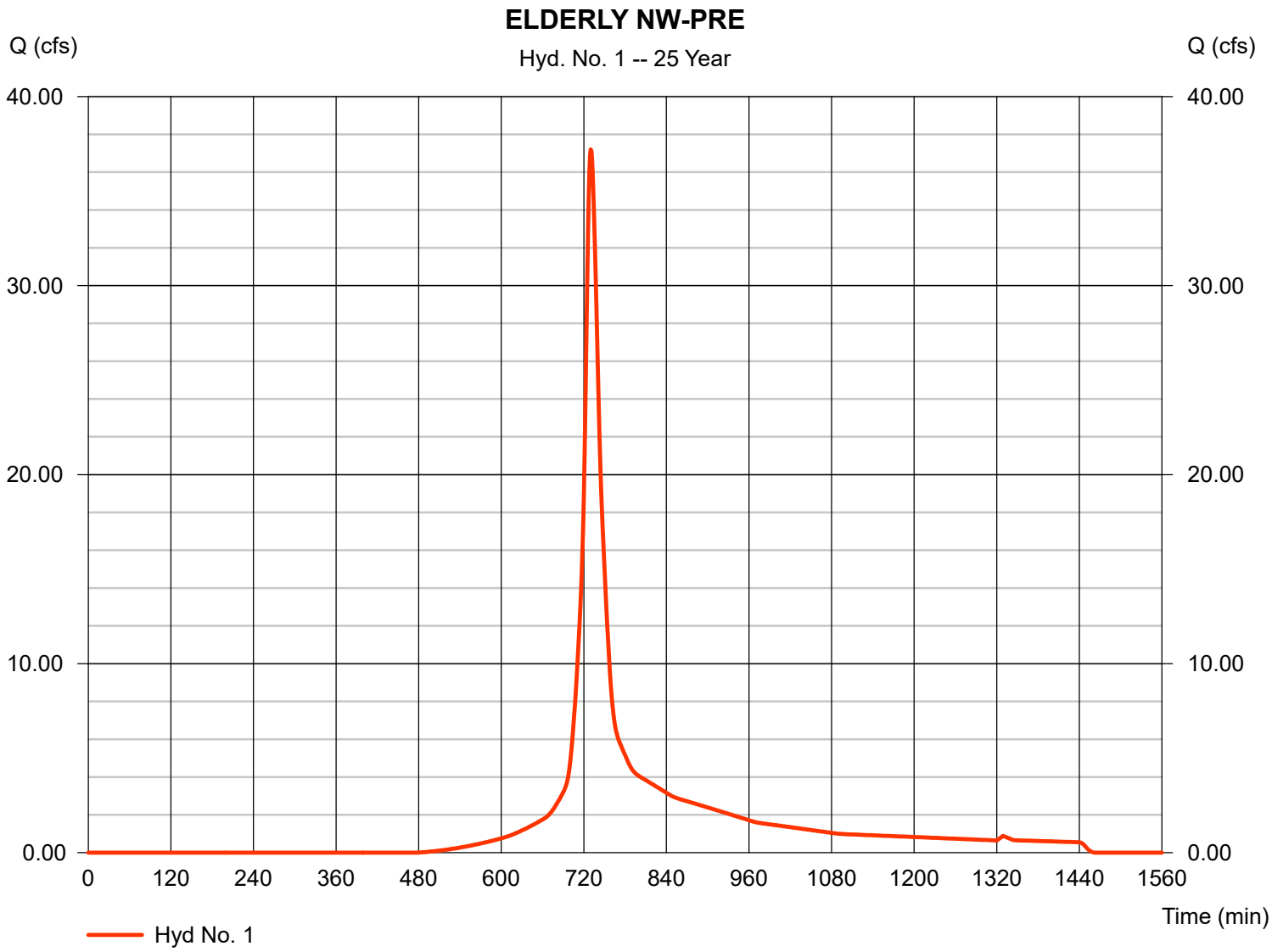
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	37.21	1	730	146,989	----	------	------	ELDERLY NW-PRE
2	SCS Runoff	38.08	1	731	159,324	----	------	------	WESTERLY WETLAND-PRE
3	SCS Runoff	6.628	1	728	24,059	----	------	------	ELDERLY SW-PRE
4	SCS Runoff	11.67	1	729	43,930	----	------	------	ELDERLY U.D.-PRE
5	Combine	75.17	1	731	306,313	1, 2,	------	------	FLOW THRU WETLAND
6	Combine	81.49	1	730	330,372	3, 5	------	------	TOTAL FLOW TO CP-N (PRE)
7	SCS Runoff	31.64	1	734	139,777	----	------	------	ELDERLY NW-POST
8	SCS Runoff	38.08	1	731	159,324	----	------	------	WESTERLY WETLAND-POST
9	SCS Runoff	10.86	1	725	35,214	----	------	------	ELDERLY SW-POST
10	SCS Runoff	14.21	1	731	59,002	----	------	------	ELDERLY U.D.-POST
11	Reservoir	10.82	1	759	139,720	7	168.08	51,729	ELDERLY-NW-DET.
12	Reservoir	4.290	1	770	35,205	9	168.06	8,757	ELDERLY-SW-DET.
13	Combine	49.64	1	732	334,248	8, 11, 12	------	------	TOTAL FLOW TO CP-N (POST)

Hydrograph Report

Hyd. No. 1

ELDERLY NW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	37.21 cfs
Storm frequency	=	25 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	146,989 cuft
Drainage area	=	11.380 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.30 min
Total precip.	=	6.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

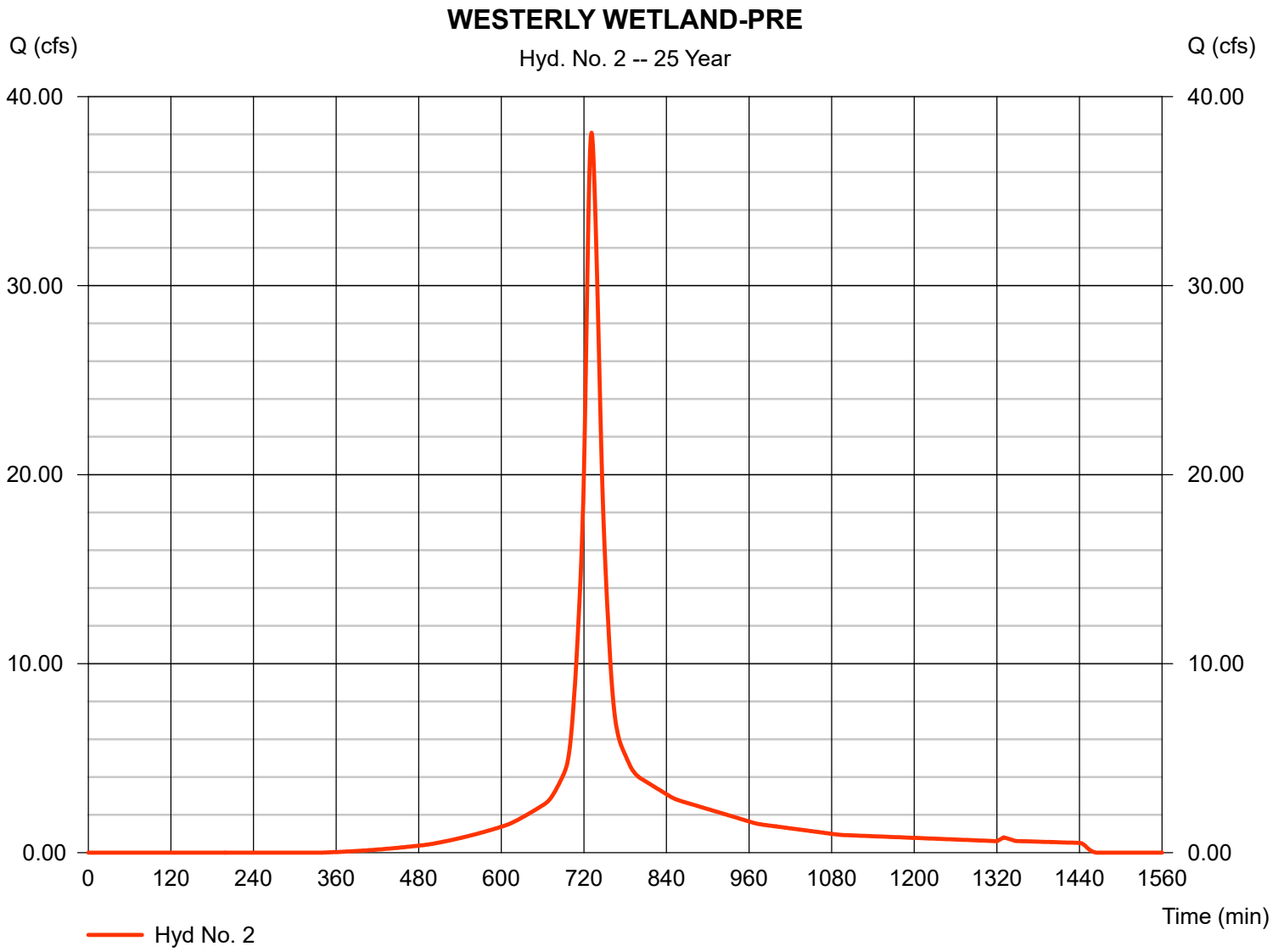


Hydrograph Report

Hyd. No. 2

WESTERLY WETLAND-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.08 cfs
Storm frequency	=	25 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	159,324 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	6.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

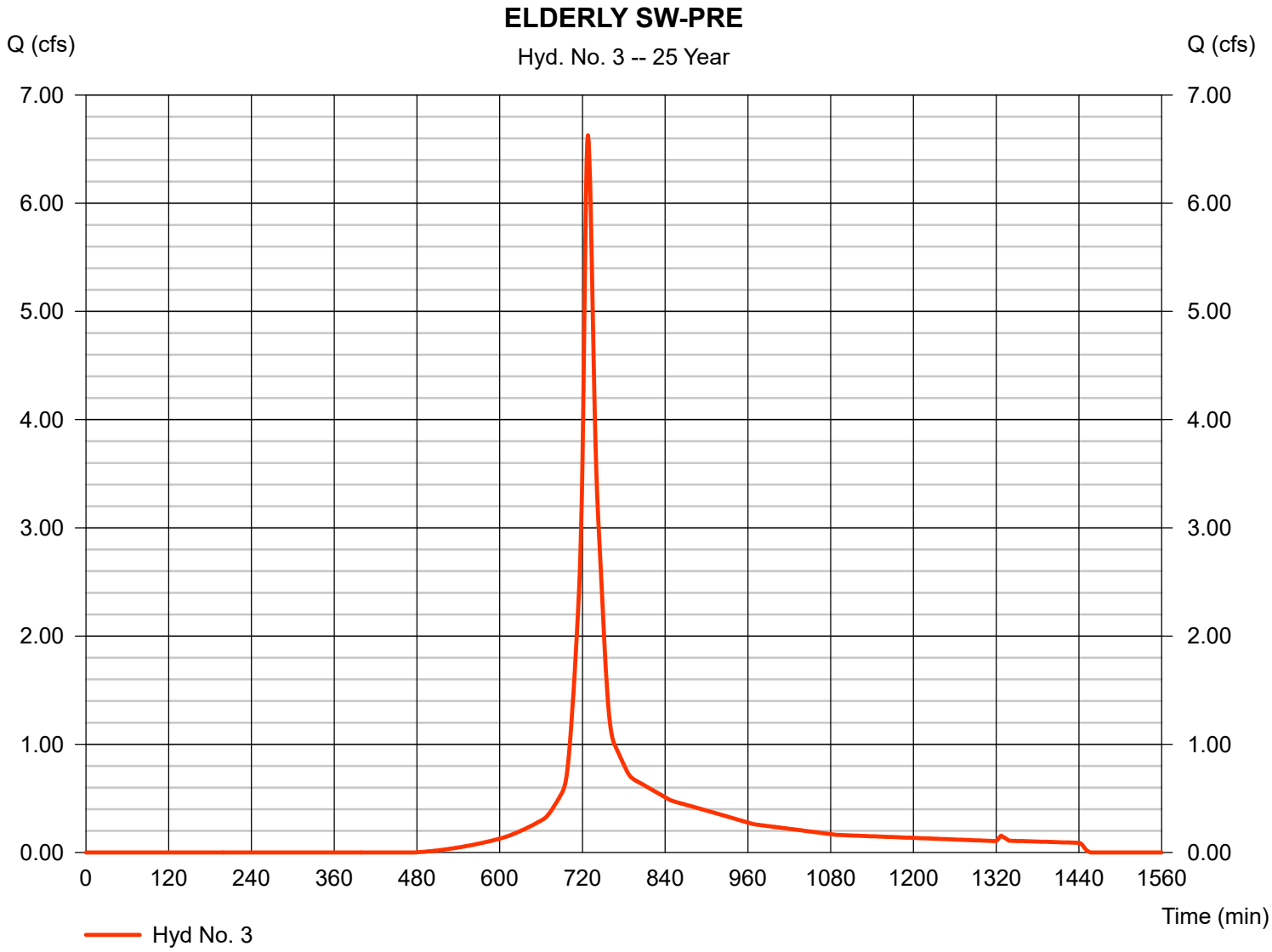


Hydrograph Report

Hyd. No. 3

ELDERLY SW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	6.628 cfs
Storm frequency	=	25 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	24,059 cuft
Drainage area	=	1.830 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.50 min
Total precip.	=	6.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

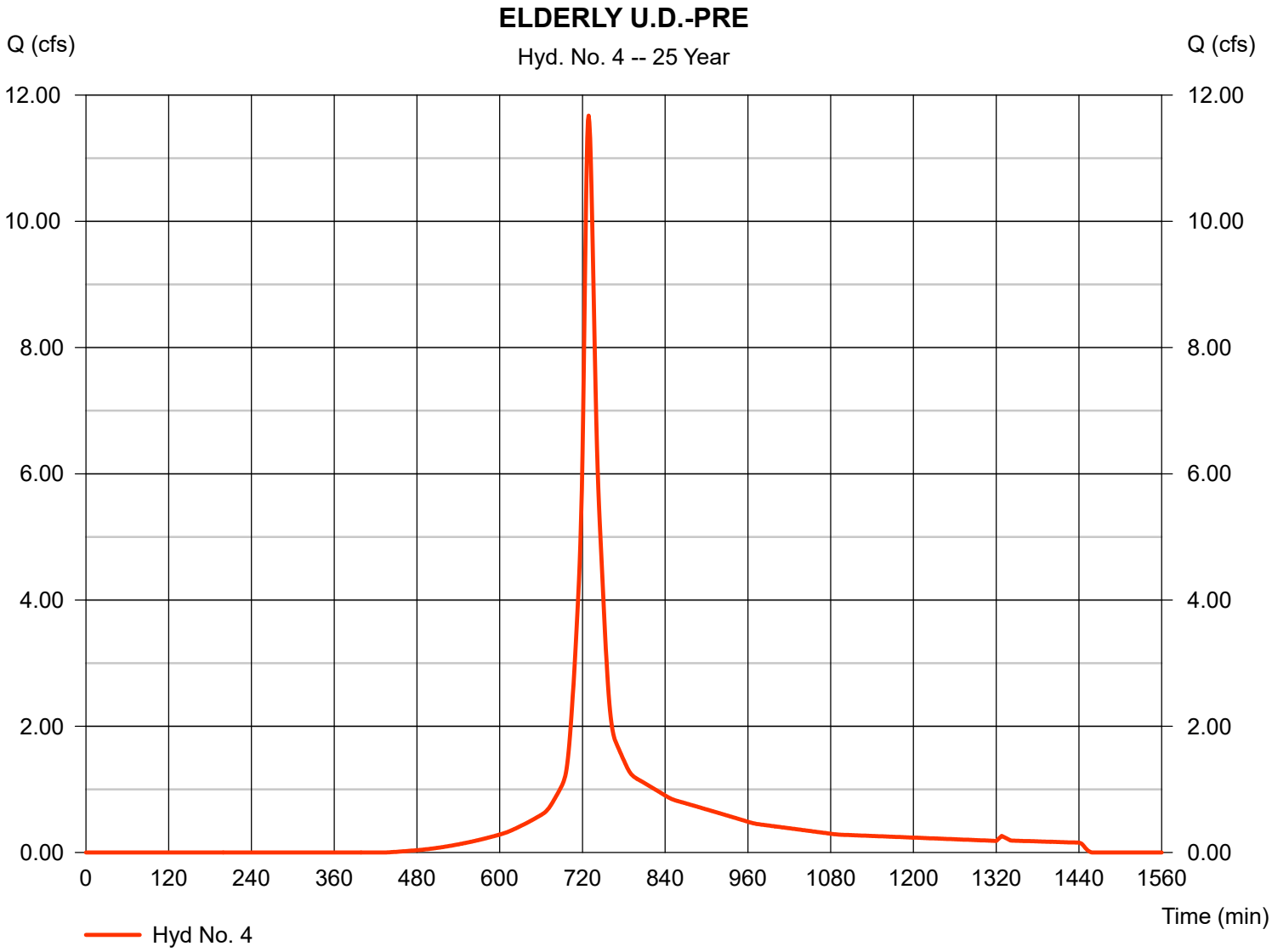


Hydrograph Report

Hyd. No. 4

ELDERLY U.D.-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	11.67 cfs
Storm frequency	=	25 yrs	Time to peak	=	729 min
Time interval	=	1 min	Hyd. volume	=	43,930 cuft
Drainage area	=	3.180 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	6.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

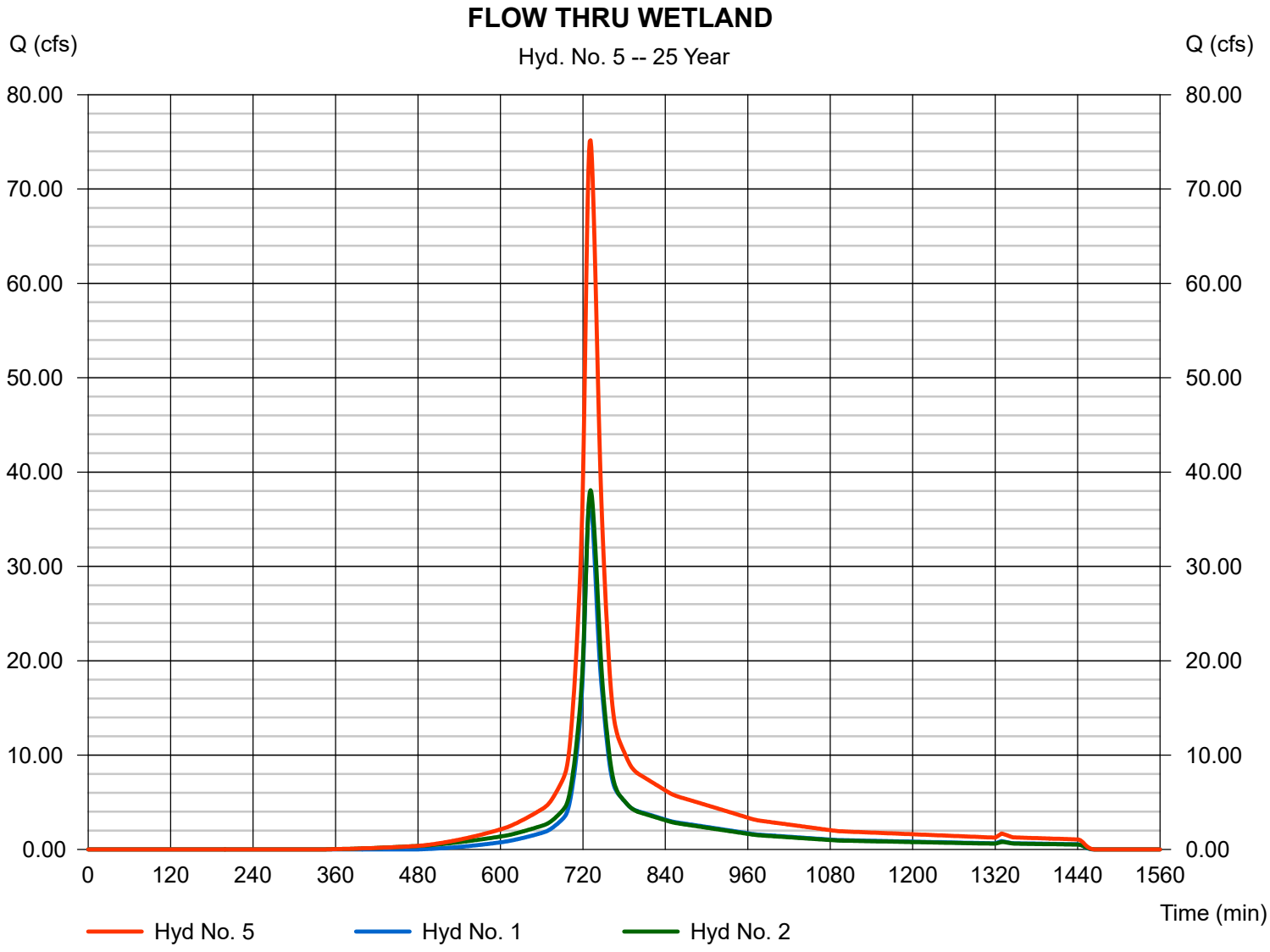


Hydrograph Report

Hyd. No. 5

FLOW THRU WETLAND

Hydrograph type	= Combine	Peak discharge	= 75.17 cfs
Storm frequency	= 25 yrs	Time to peak	= 731 min
Time interval	= 1 min	Hyd. volume	= 306,313 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 21.010 ac

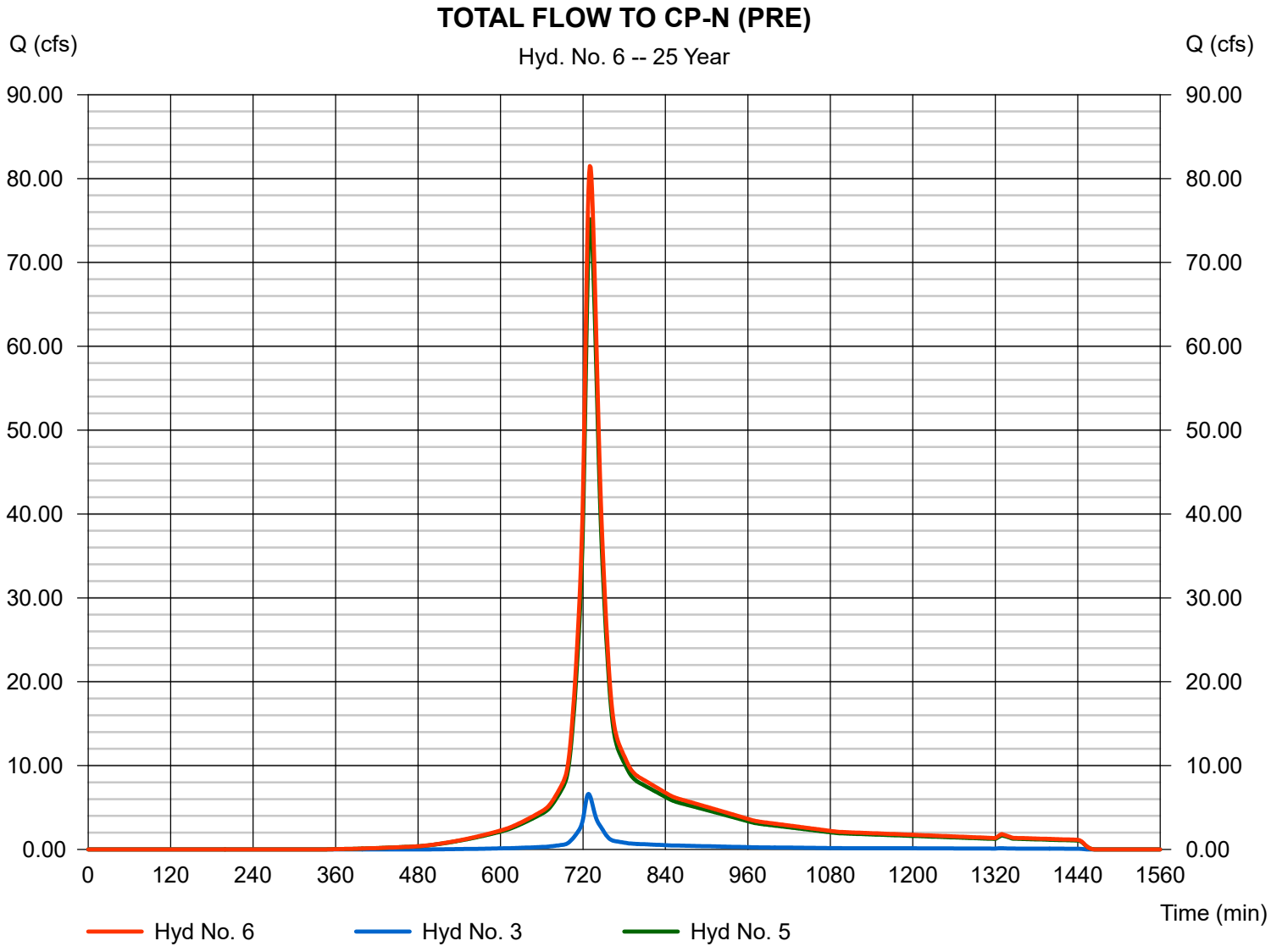


Hydrograph Report

Hyd. No. 6

TOTAL FLOW TO CP-N (PRE)

Hydrograph type	= Combine	Peak discharge	= 81.49 cfs
Storm frequency	= 25 yrs	Time to peak	= 730 min
Time interval	= 1 min	Hyd. volume	= 330,372 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 1.830 ac

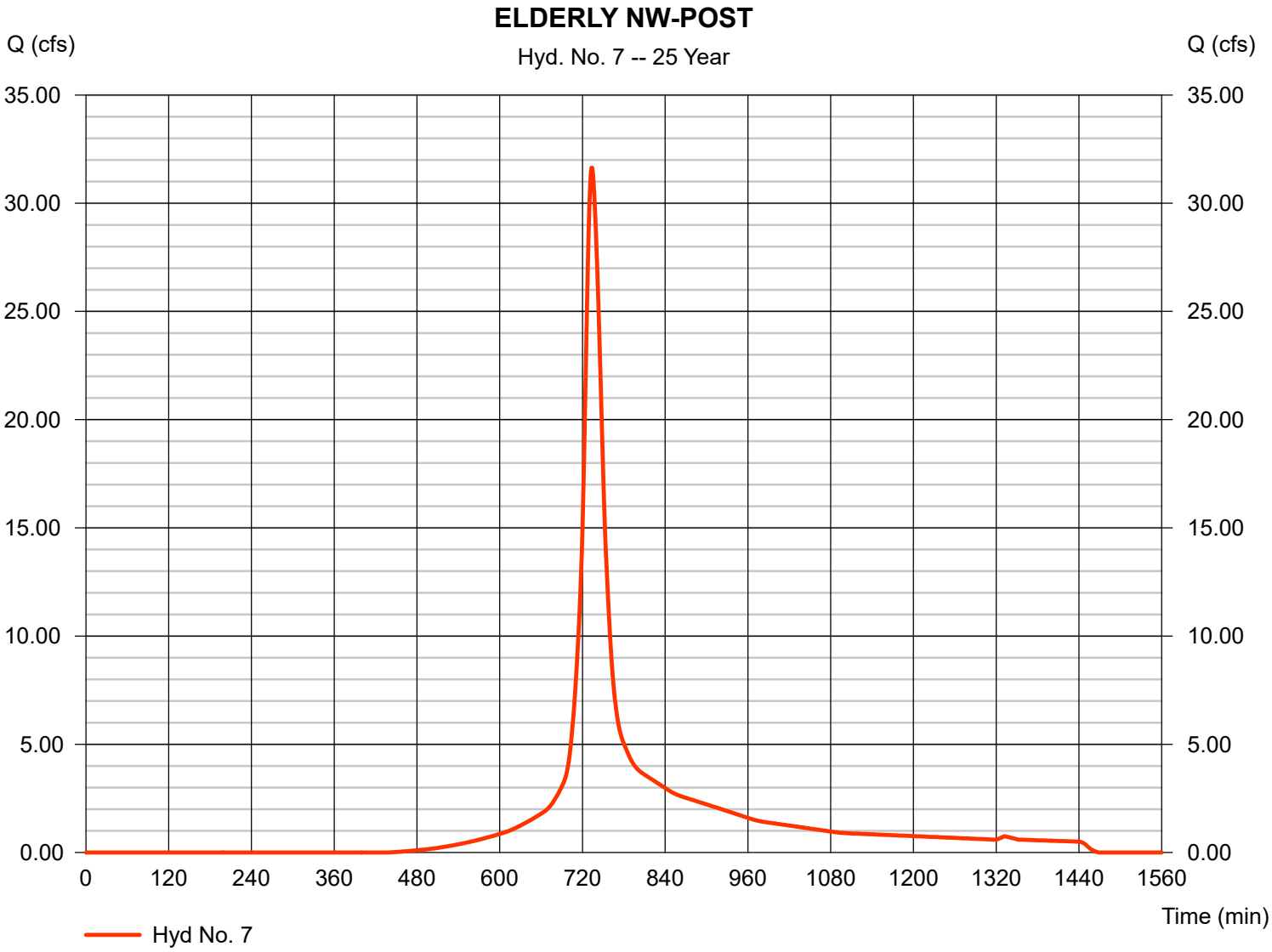


Hydrograph Report

Hyd. No. 7

ELDERLY NW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	31.64 cfs
Storm frequency	=	25 yrs	Time to peak	=	734 min
Time interval	=	1 min	Hyd. volume	=	139,777 cuft
Drainage area	=	9.960 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.70 min
Total precip.	=	6.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

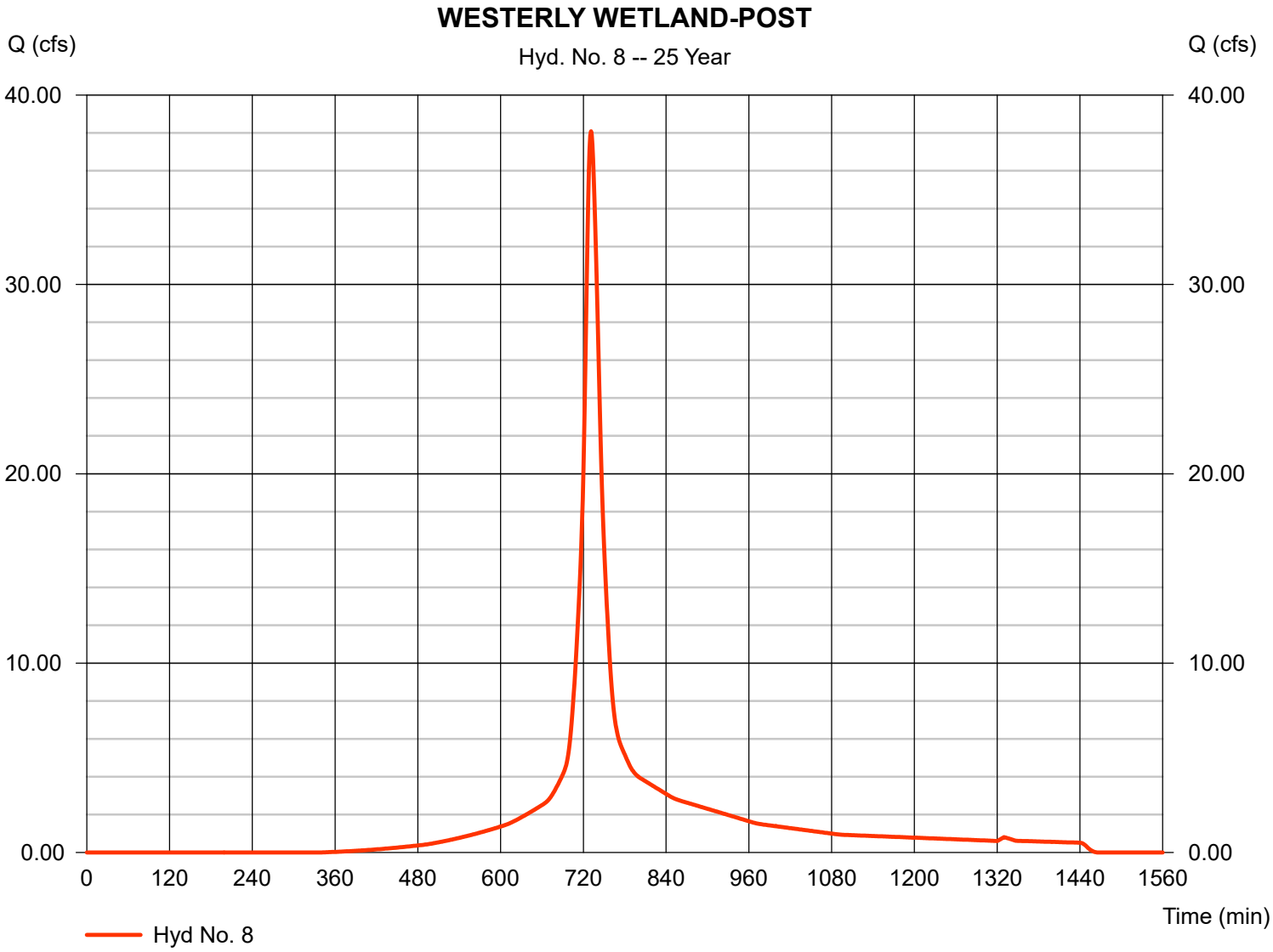


Hydrograph Report

Hyd. No. 8

WESTERLY WETLAND-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.08 cfs
Storm frequency	=	25 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	159,324 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	6.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

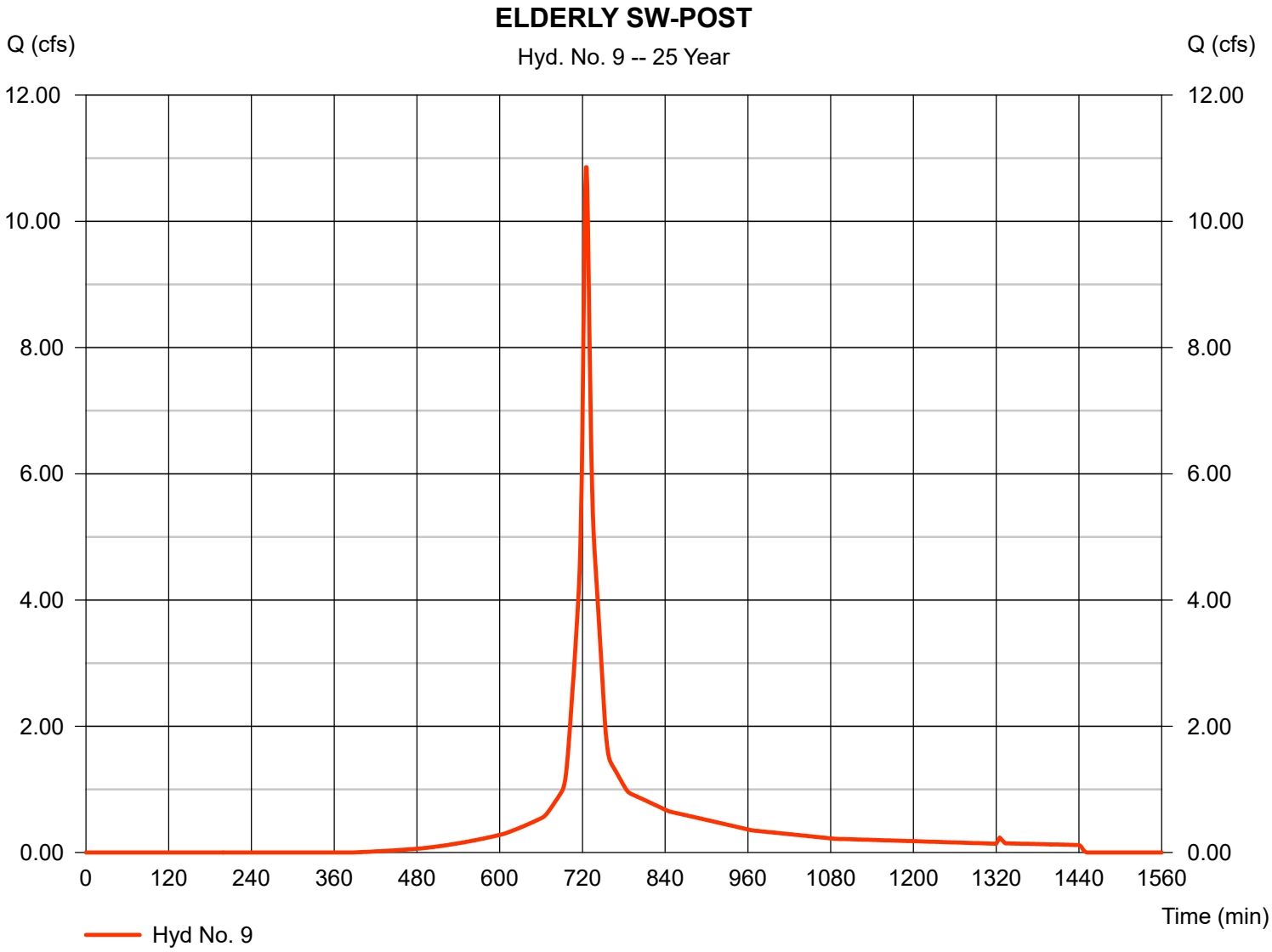


Hydrograph Report

Hyd. No. 9

ELDERLY SW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	10.86 cfs
Storm frequency	=	25 yrs	Time to peak	=	725 min
Time interval	=	1 min	Hyd. volume	=	35,214 cuft
Drainage area	=	2.380 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.00 min
Total precip.	=	6.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

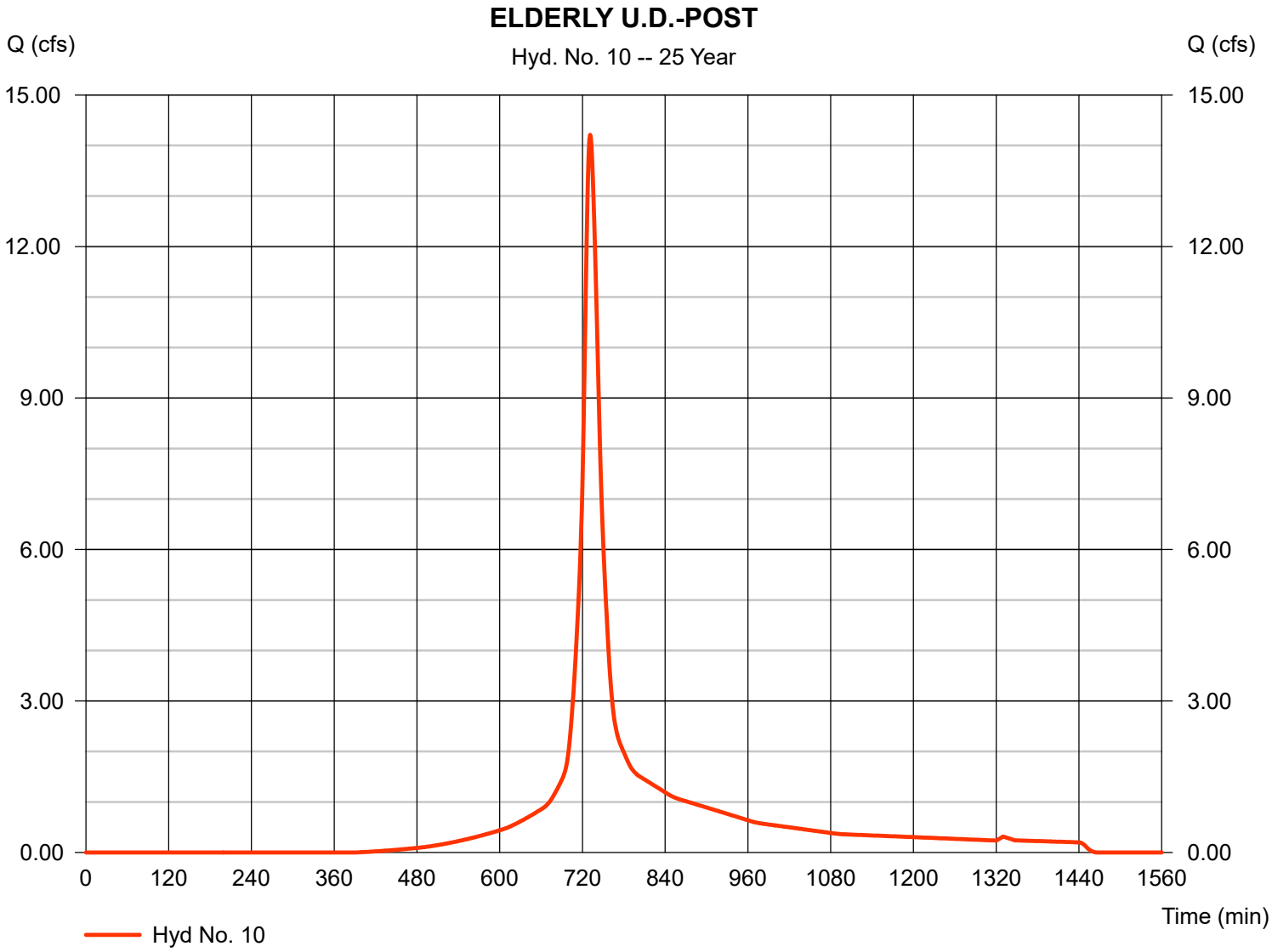


Hydrograph Report

Hyd. No. 10

ELDERLY U.D.-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.21 cfs
Storm frequency	=	25 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	59,002 cuft
Drainage area	=	3.840 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	6.44 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



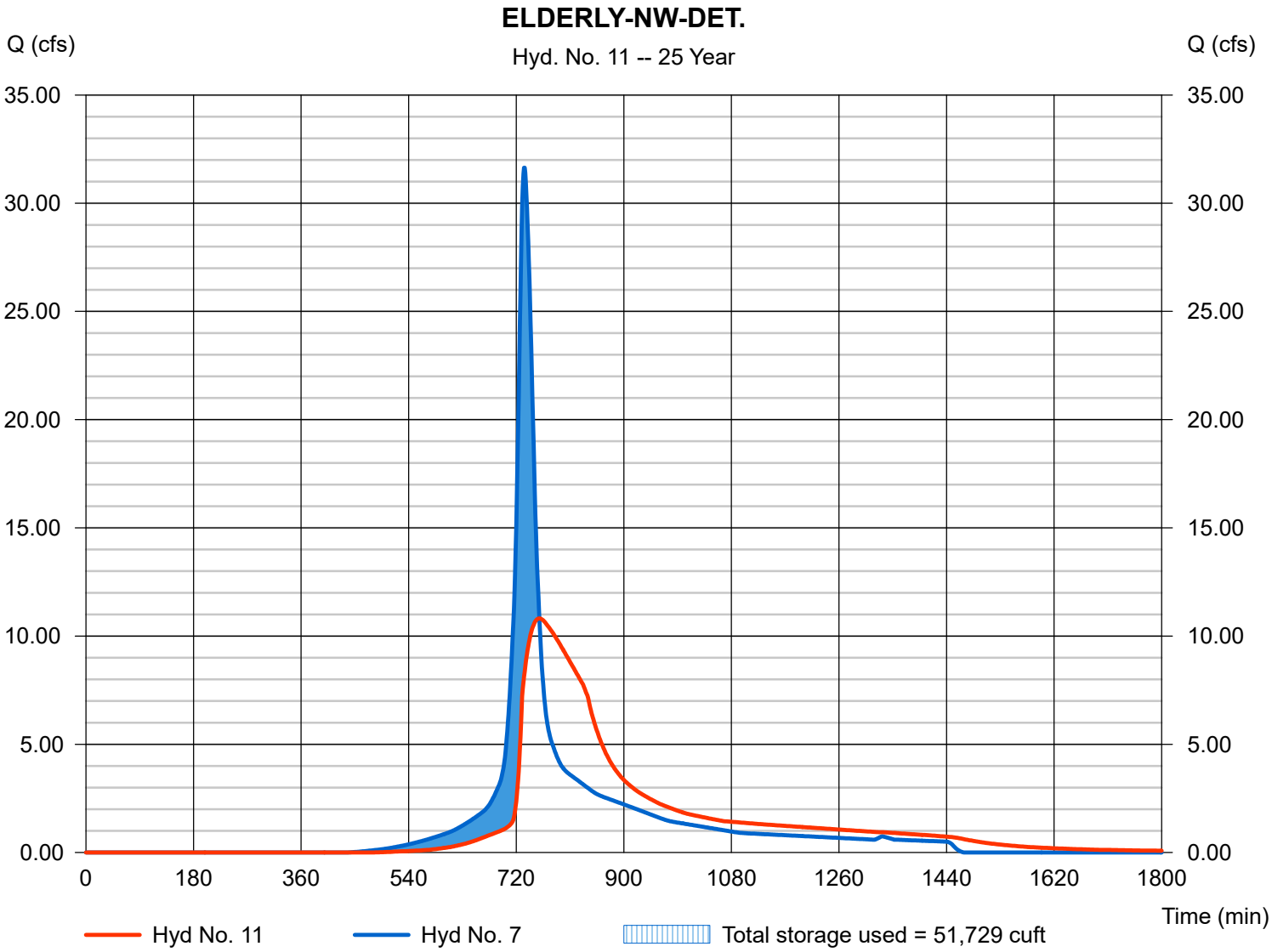
Hydrograph Report

Hyd. No. 11

ELDERLY-NW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	10.82 cfs
Storm frequency	=	25 yrs	Time to peak	=	759 min
Time interval	=	1 min	Hyd. volume	=	139,720 cuft
Inflow hyd. No.	=	7 - ELDERLY NW-POST	Max. Elevation	=	168.08 ft
Reservoir name	=	WQB#4 (ELDERLY-NW-POST)	Max. Storage	=	51,729 cuft

Storage Indication method used.



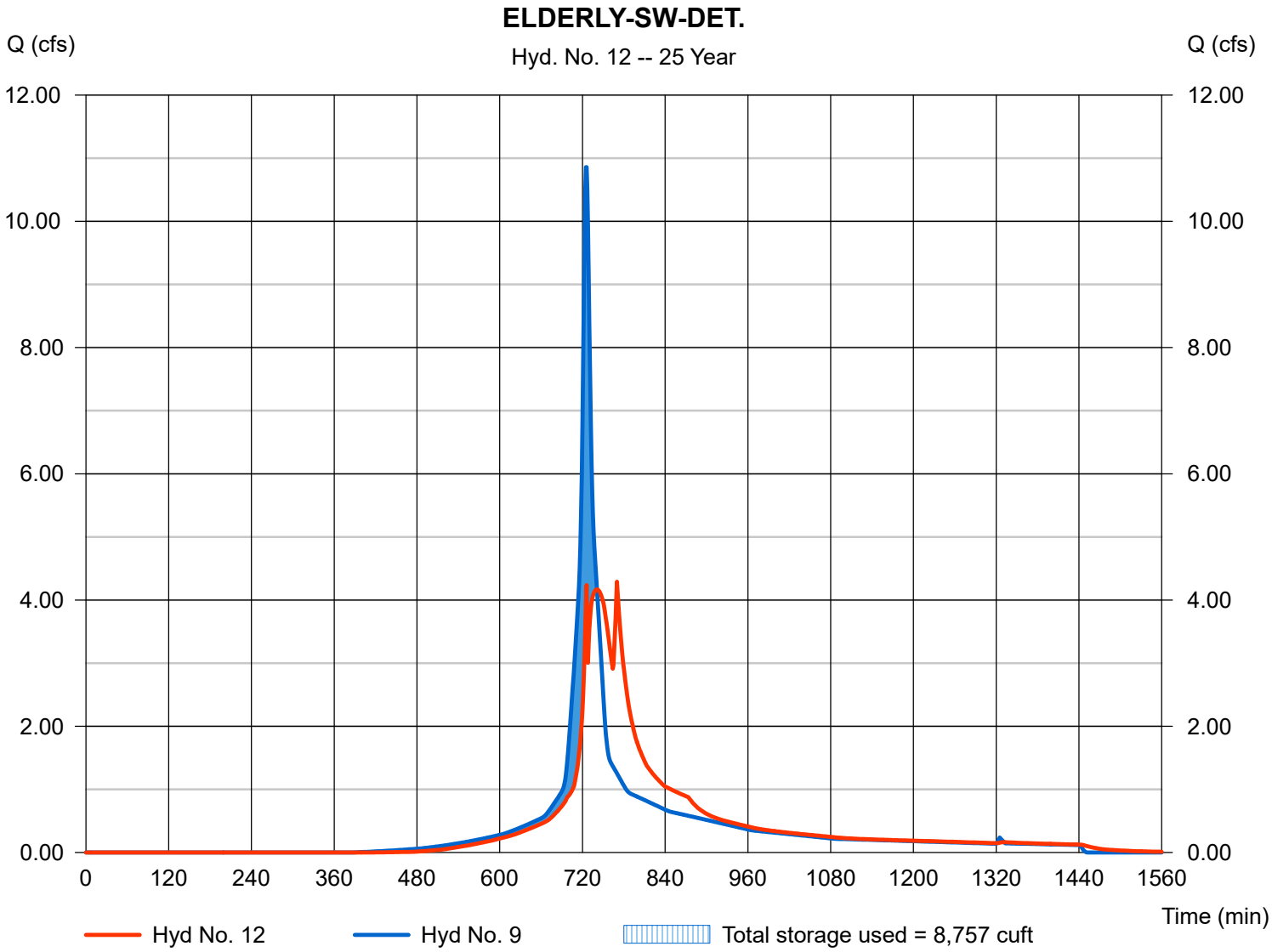
Hydrograph Report

Hyd. No. 12

ELDERLY-SW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	4.290 cfs
Storm frequency	=	25 yrs	Time to peak	=	770 min
Time interval	=	1 min	Hyd. volume	=	35,205 cuft
Inflow hyd. No.	=	9 - ELDERLY SW-POST	Max. Elevation	=	168.06 ft
Reservoir name	=	WQB#5 (ELDERLY-SW-POST)	Max. Storage	=	8,757 cuft

Storage Indication method used.

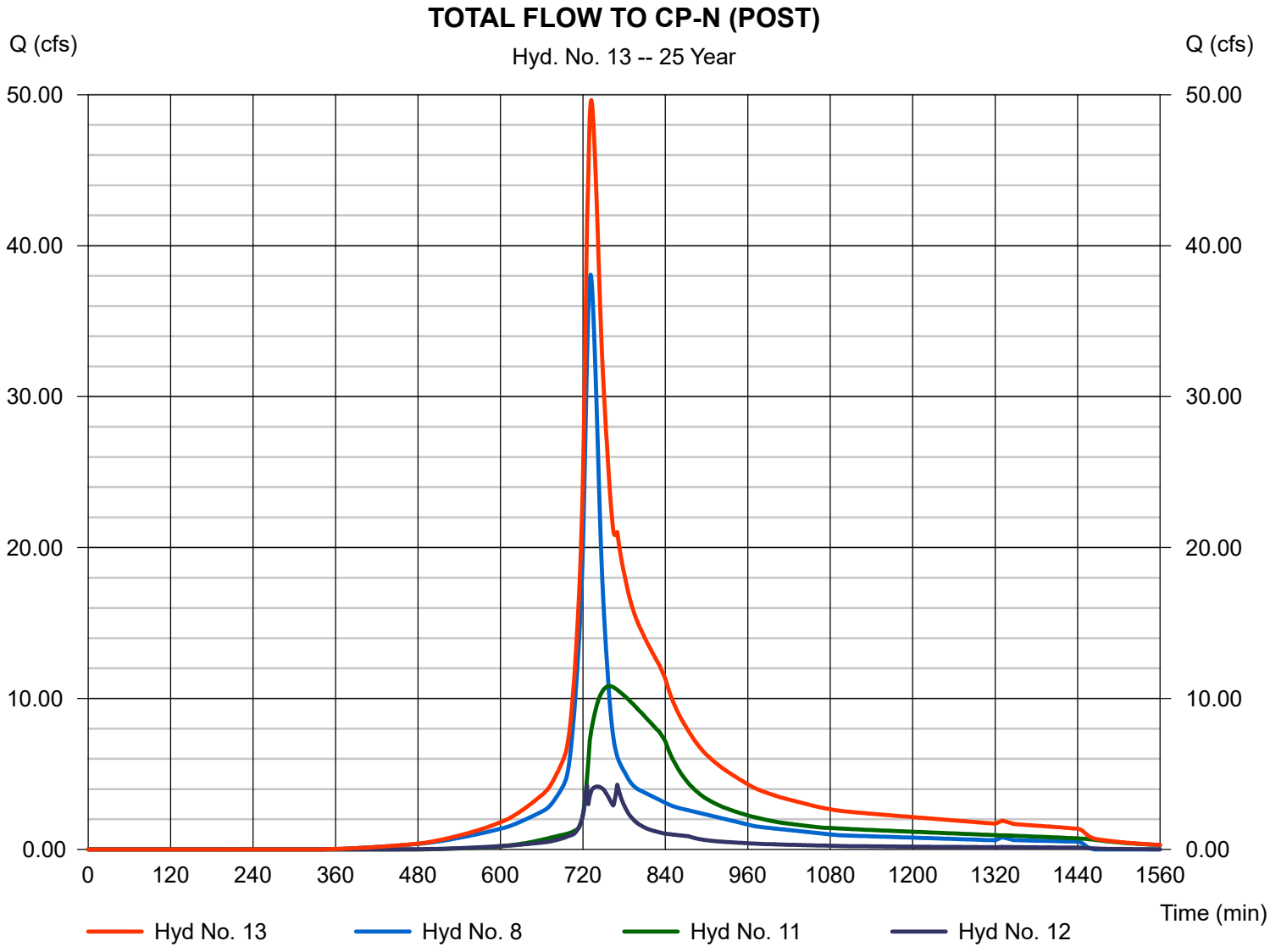


Hydrograph Report

Hyd. No. 13

TOTAL FLOW TO CP-N (POST)

Hydrograph type	=	Combine	Peak discharge	=	49.64 cfs
Storm frequency	=	25 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	334,248 cuft
Inflow hyds.	=	8, 11, 12	Contrib. drain. area	=	9.630 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

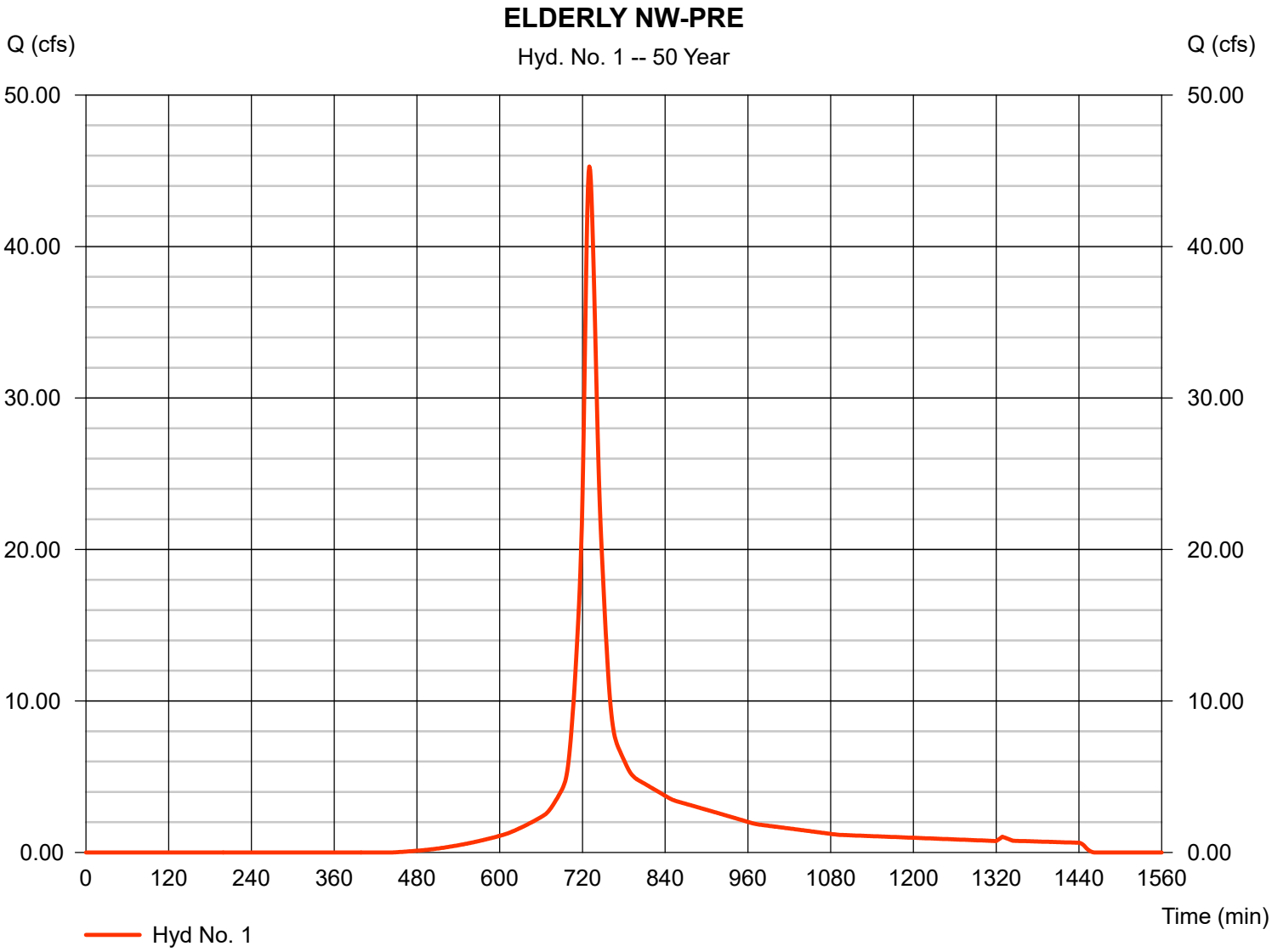
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	45.28	1	730	178,916	----	------	------	ELDERLY NW-PRE
2	SCS Runoff	44.89	1	731	189,001	----	------	------	WESTERLY WETLAND-PRE
3	SCS Runoff	8.061	1	728	29,285	----	------	------	ELDERLY SW-PRE
4	SCS Runoff	14.03	1	729	52,992	----	------	------	ELDERLY U.D.-PRE
5	Combine	89.95	1	731	367,917	1, 2,	------	------	FLOW THRU WETLAND
6	Combine	97.72	1	730	397,201	3, 5	------	------	TOTAL FLOW TO CP-N (PRE)
7	SCS Runoff	38.09	1	733	168,609	----	------	------	ELDERLY NW-POST
8	SCS Runoff	44.89	1	731	189,001	----	------	------	WESTERLY WETLAND-POST
9	SCS Runoff	12.92	1	725	42,116	----	------	------	ELDERLY SW-POST
10	SCS Runoff	16.92	1	731	70,566	----	------	------	ELDERLY U.D.-POST
11	Reservoir	13.39	1	758	168,551	7	168.46	62,559	ELDERLY-NW-DET.
12	Reservoir	4.901	1	741	42,107	9	168.26	10,572	ELDERLY-SW-DET.
13	Combine	58.29	1	732	399,658	8, 11, 12	------	------	TOTAL FLOW TO CP-N (POST)

Hydrograph Report

Hyd. No. 1

ELDERLY NW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	45.28 cfs
Storm frequency	=	50 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	178,916 cuft
Drainage area	=	11.380 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.30 min
Total precip.	=	7.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

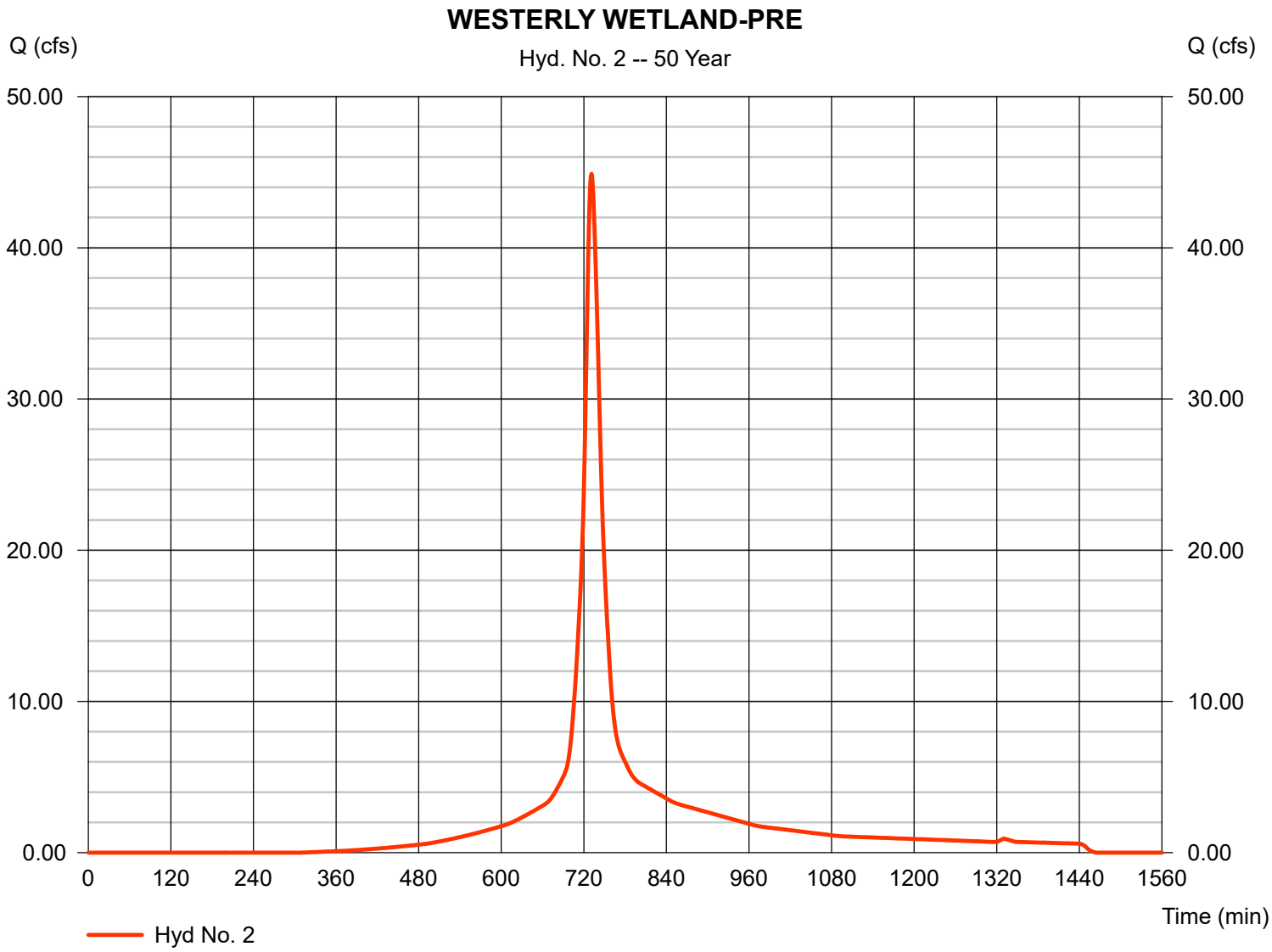


Hydrograph Report

Hyd. No. 2

WESTERLY WETLAND-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	44.89 cfs
Storm frequency	=	50 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	189,001 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	7.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

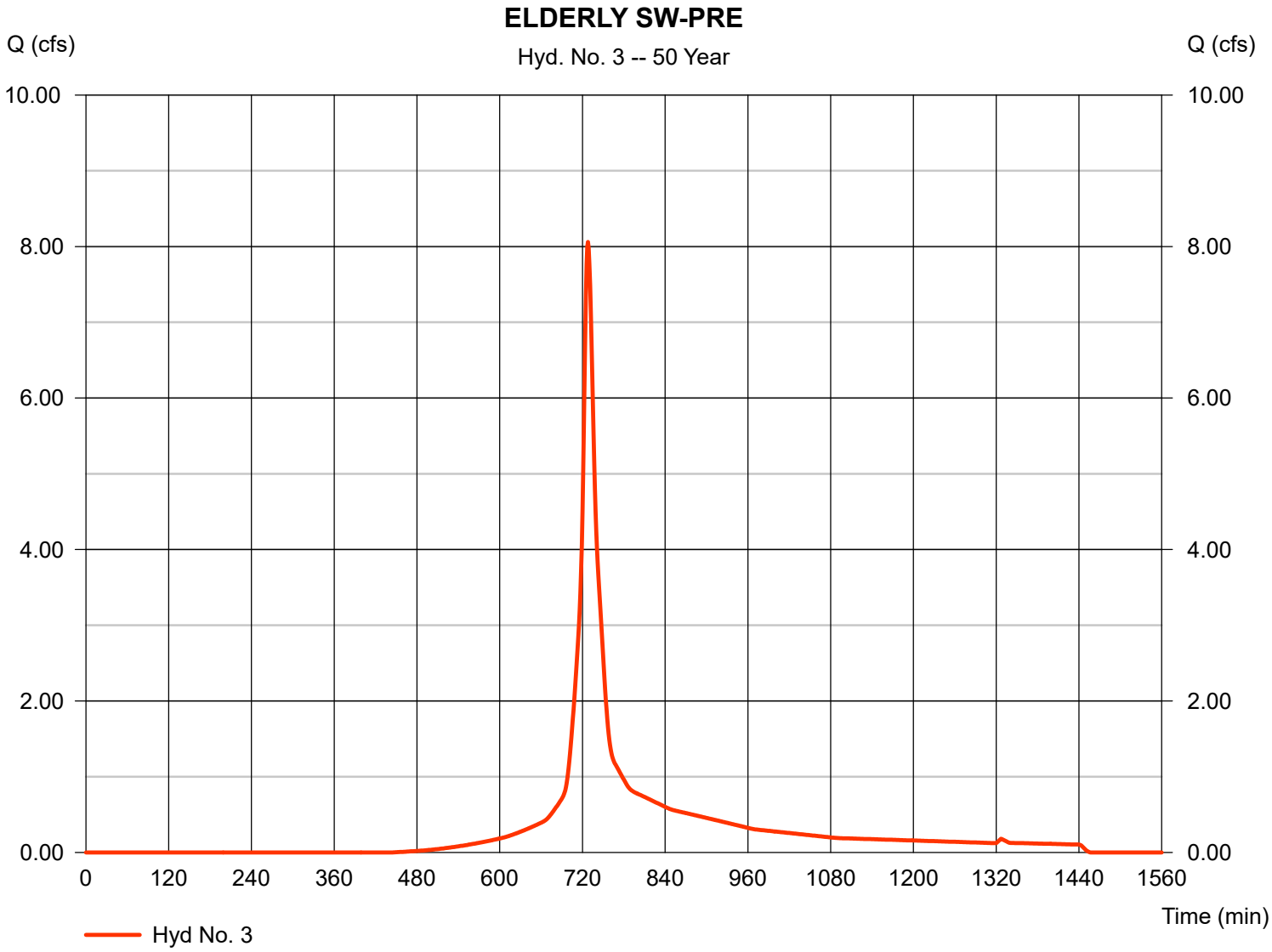


Hydrograph Report

Hyd. No. 3

ELDERLY SW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	8.061 cfs
Storm frequency	=	50 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	29,285 cuft
Drainage area	=	1.830 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.50 min
Total precip.	=	7.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

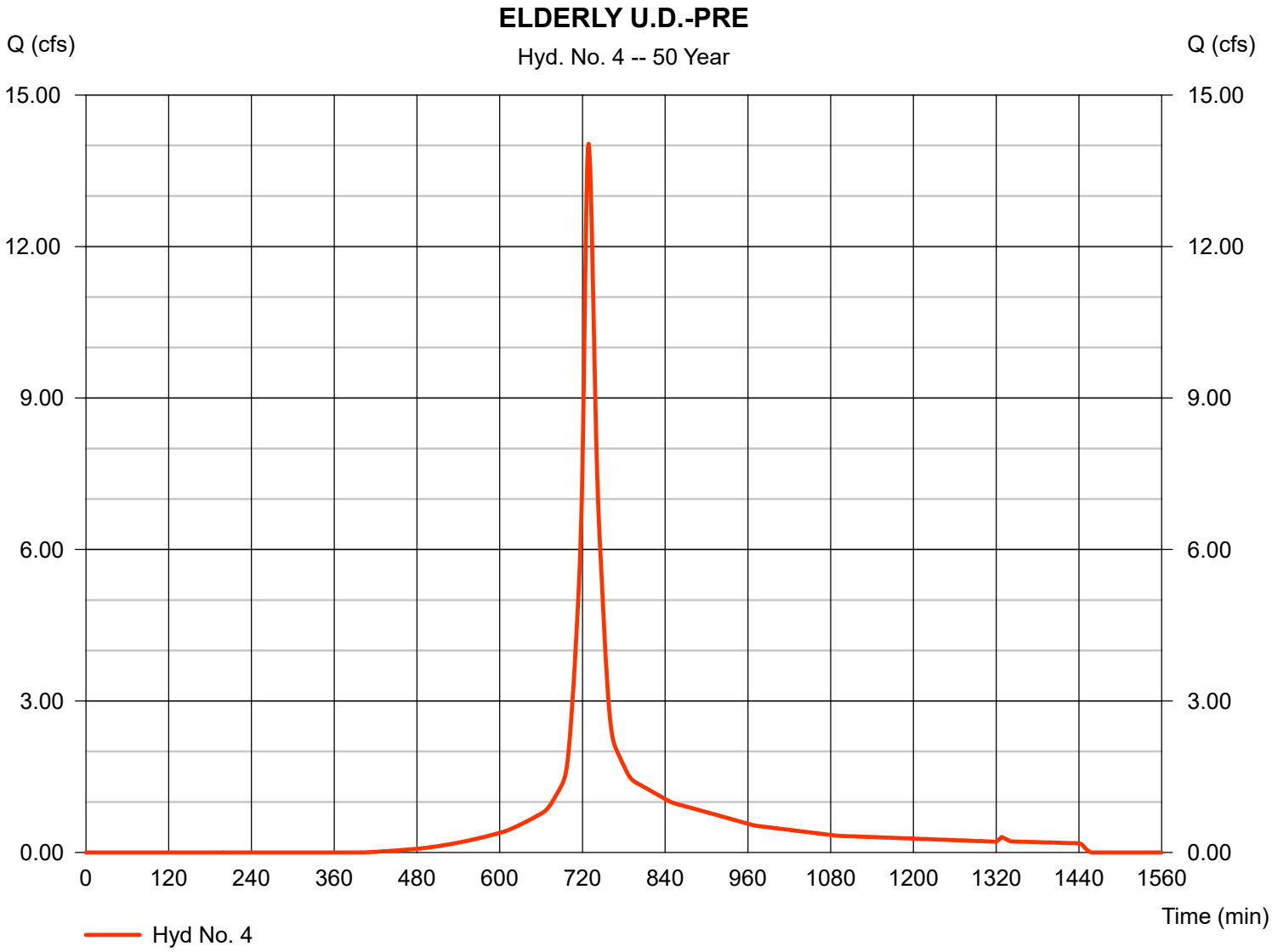


Hydrograph Report

Hyd. No. 4

ELDERLY U.D.-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	14.03 cfs
Storm frequency	=	50 yrs	Time to peak	=	729 min
Time interval	=	1 min	Hyd. volume	=	52,992 cuft
Drainage area	=	3.180 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	7.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

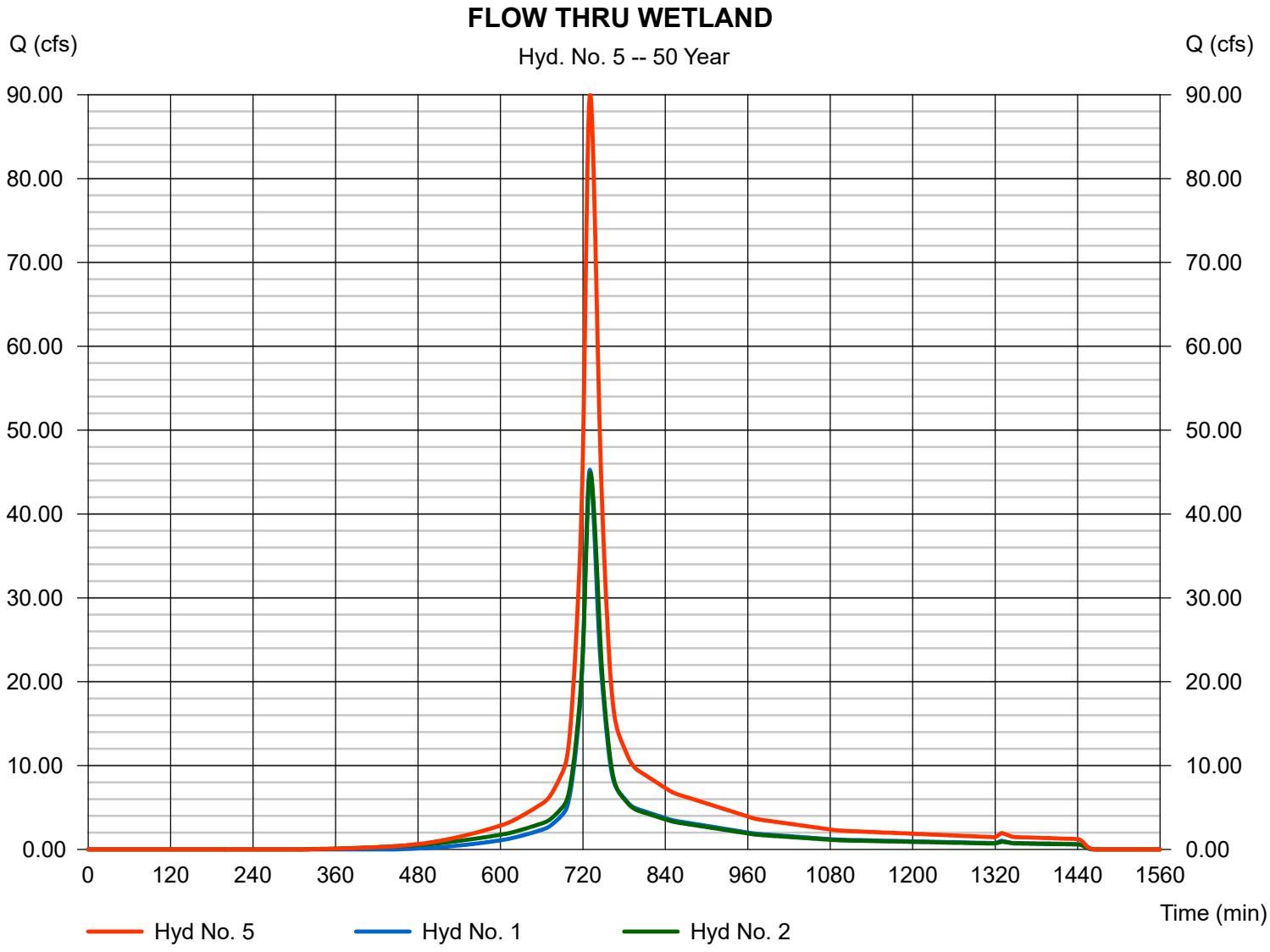


Hydrograph Report

Hyd. No. 5

FLOW THRU WETLAND

Hydrograph type	= Combine	Peak discharge	= 89.95 cfs
Storm frequency	= 50 yrs	Time to peak	= 731 min
Time interval	= 1 min	Hyd. volume	= 367,917 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 21.010 ac

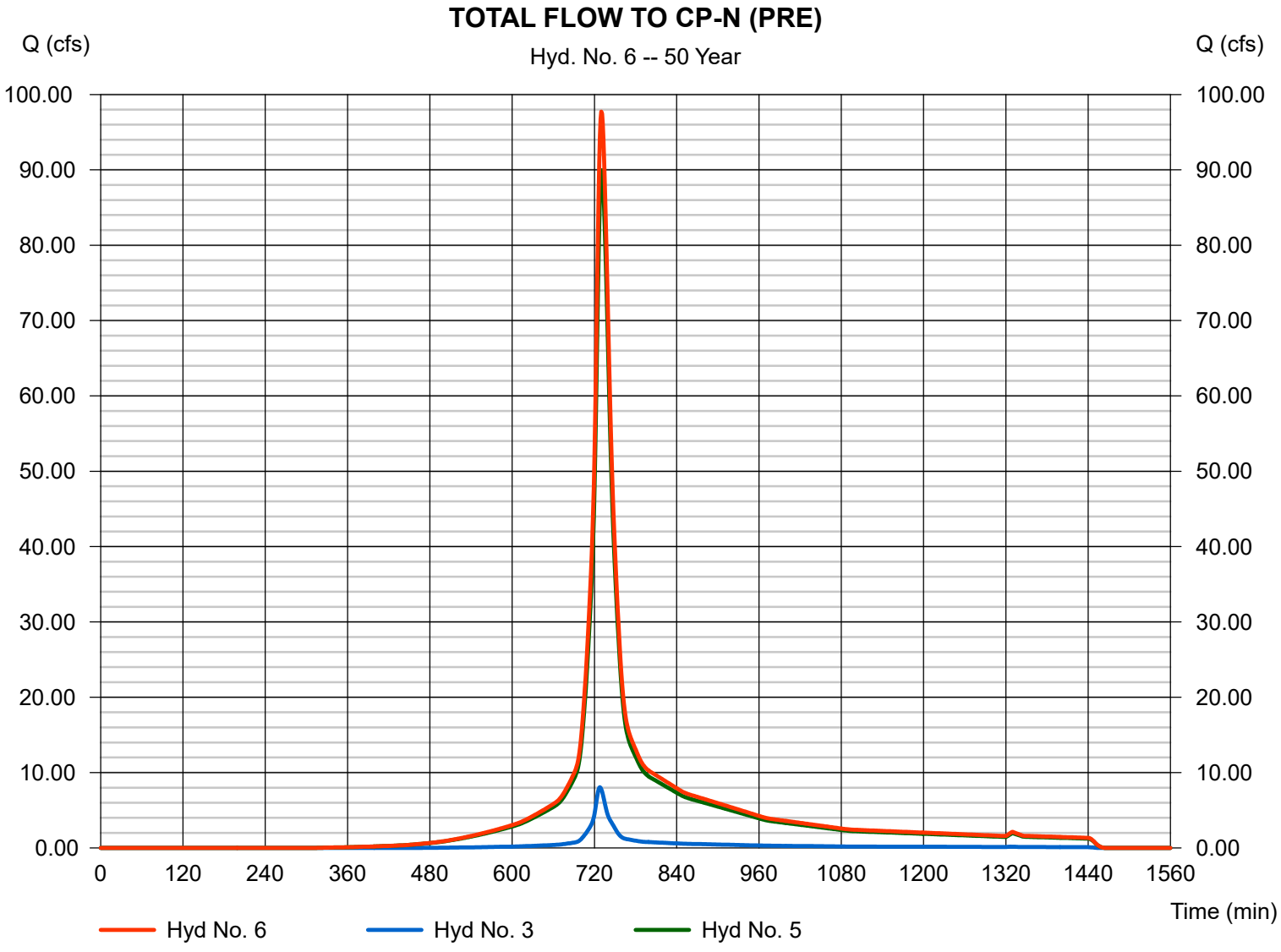


Hydrograph Report

Hyd. No. 6

TOTAL FLOW TO CP-N (PRE)

Hydrograph type	=	Combine	Peak discharge	=	97.72 cfs
Storm frequency	=	50 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	397,201 cuft
Inflow hyds.	=	3, 5	Contrib. drain. area	=	1.830 ac

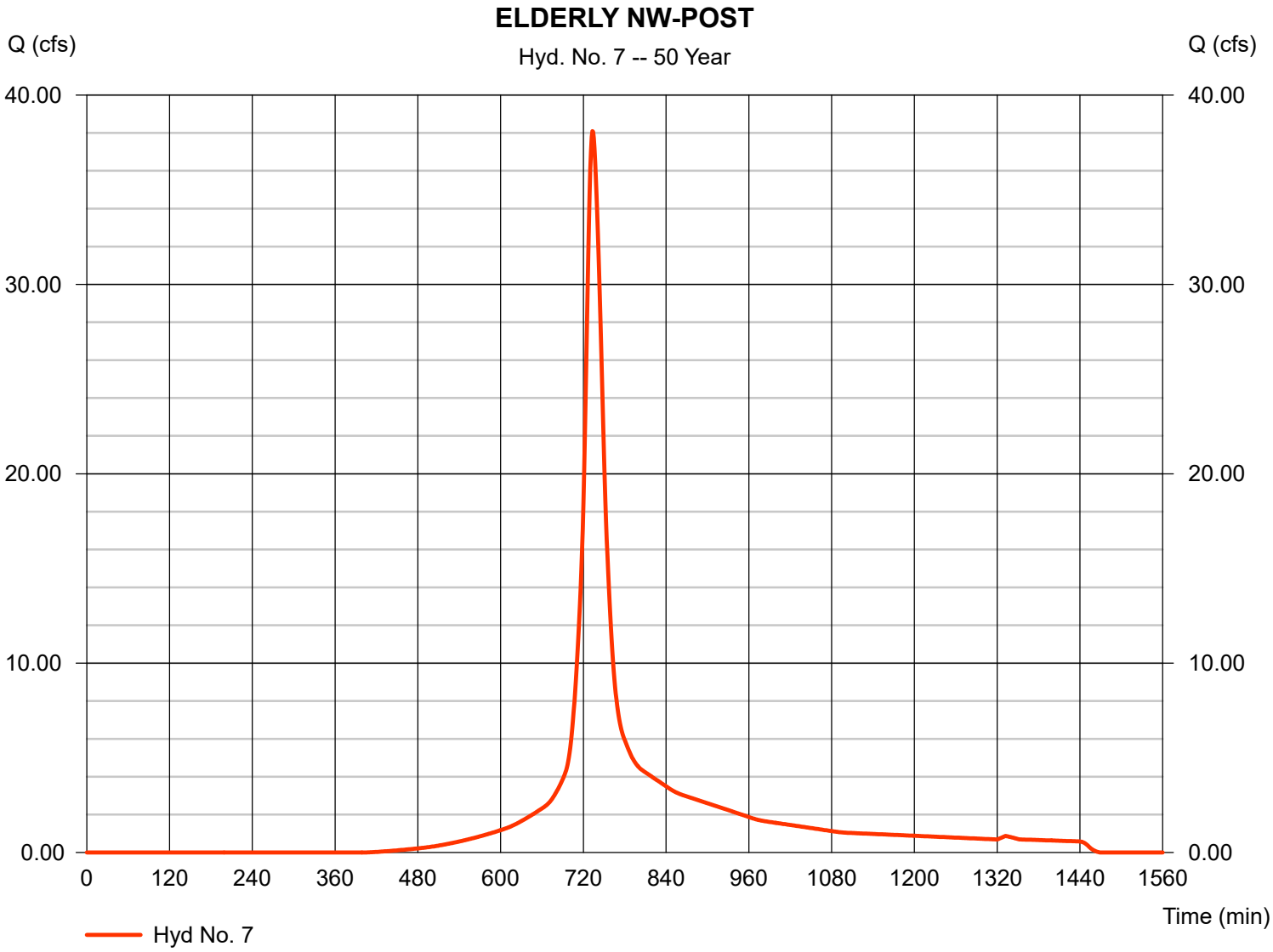


Hydrograph Report

Hyd. No. 7

ELDERLY NW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	38.09 cfs
Storm frequency	=	50 yrs	Time to peak	=	733 min
Time interval	=	1 min	Hyd. volume	=	168,609 cuft
Drainage area	=	9.960 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.70 min
Total precip.	=	7.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

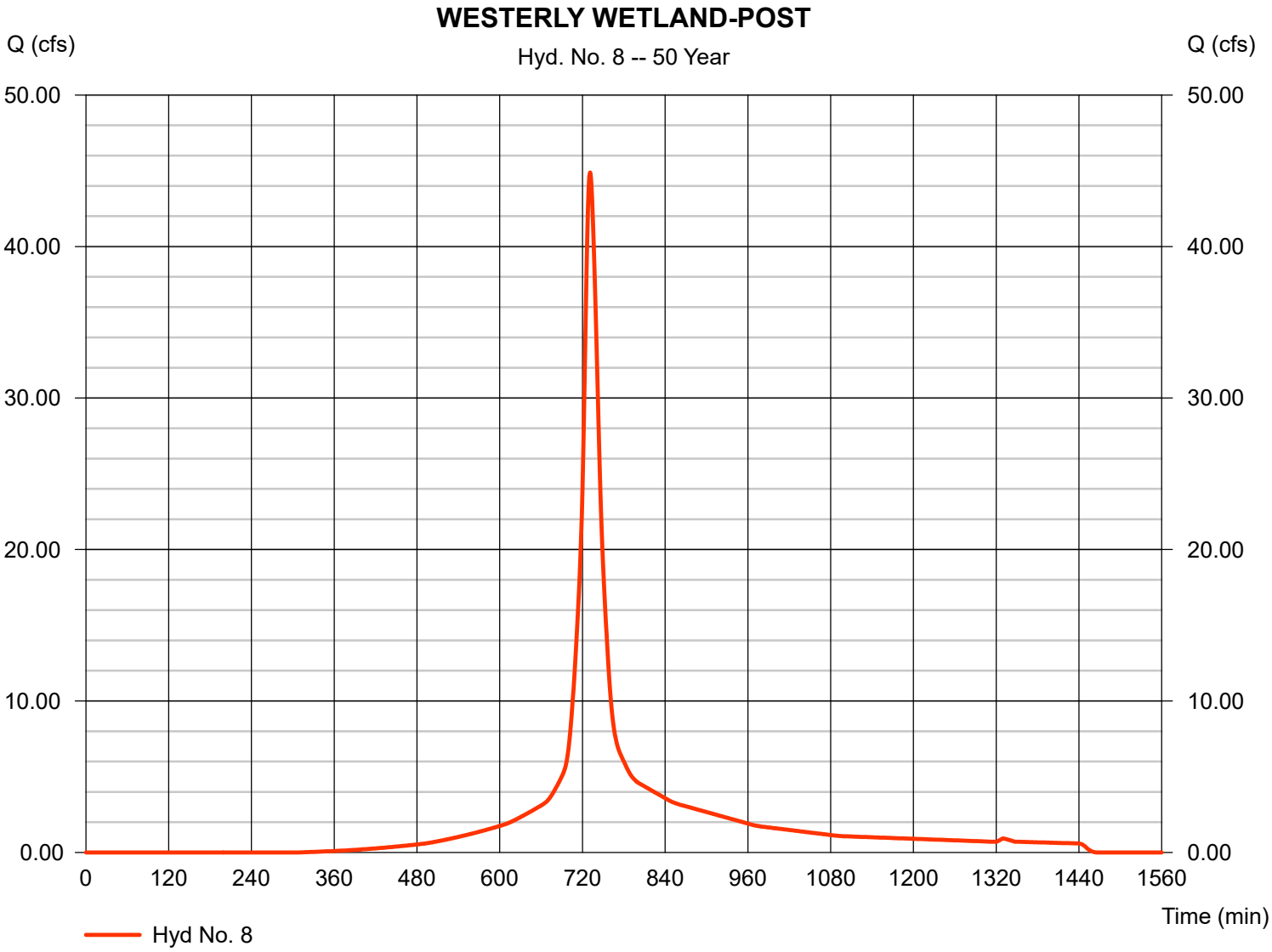


Hydrograph Report

Hyd. No. 8

WESTERLY WETLAND-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	44.89 cfs
Storm frequency	=	50 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	189,001 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	7.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

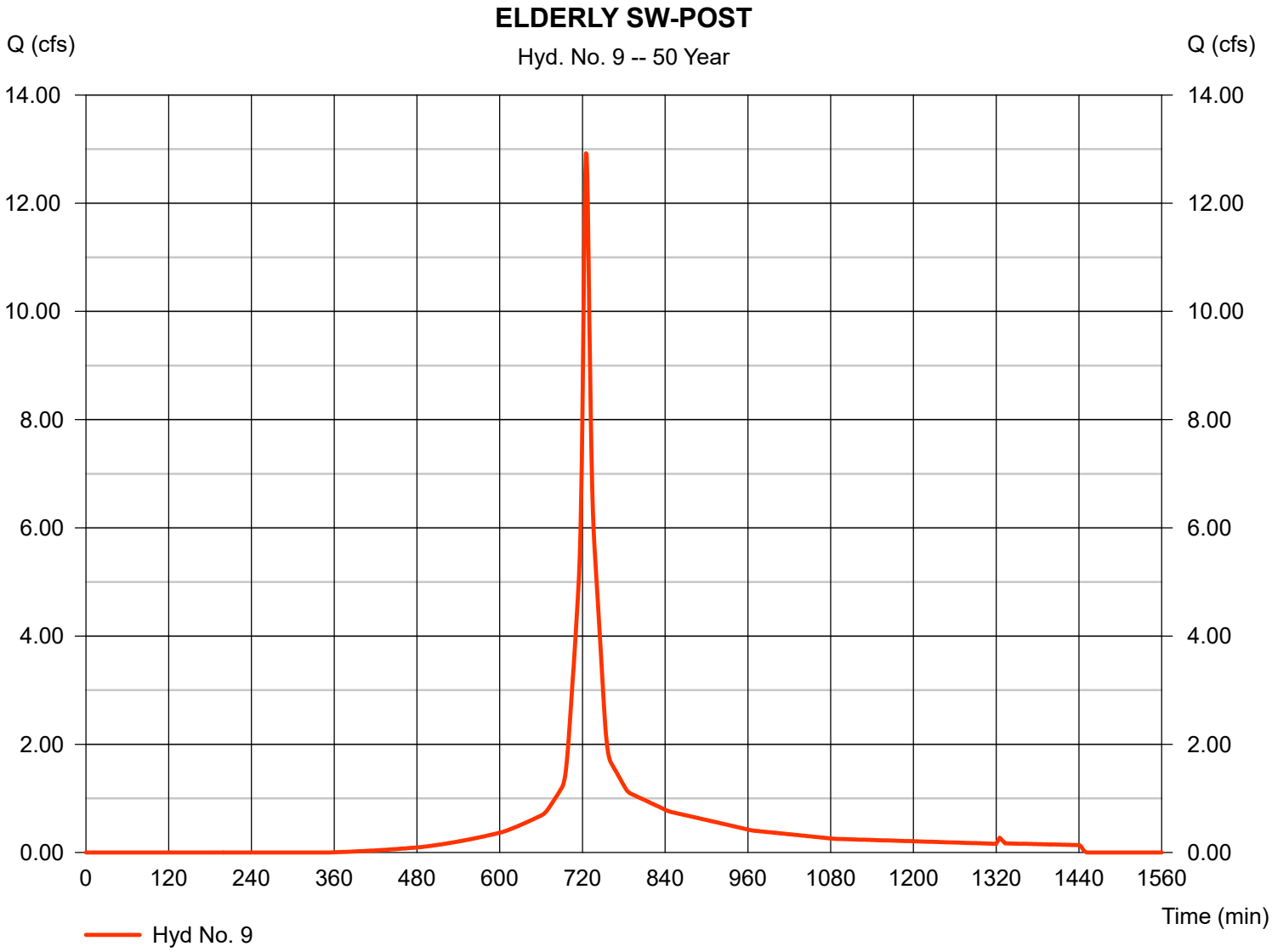


Hydrograph Report

Hyd. No. 9

ELDERLY SW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	12.92 cfs
Storm frequency	=	50 yrs	Time to peak	=	725 min
Time interval	=	1 min	Hyd. volume	=	42,116 cuft
Drainage area	=	2.380 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.00 min
Total precip.	=	7.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

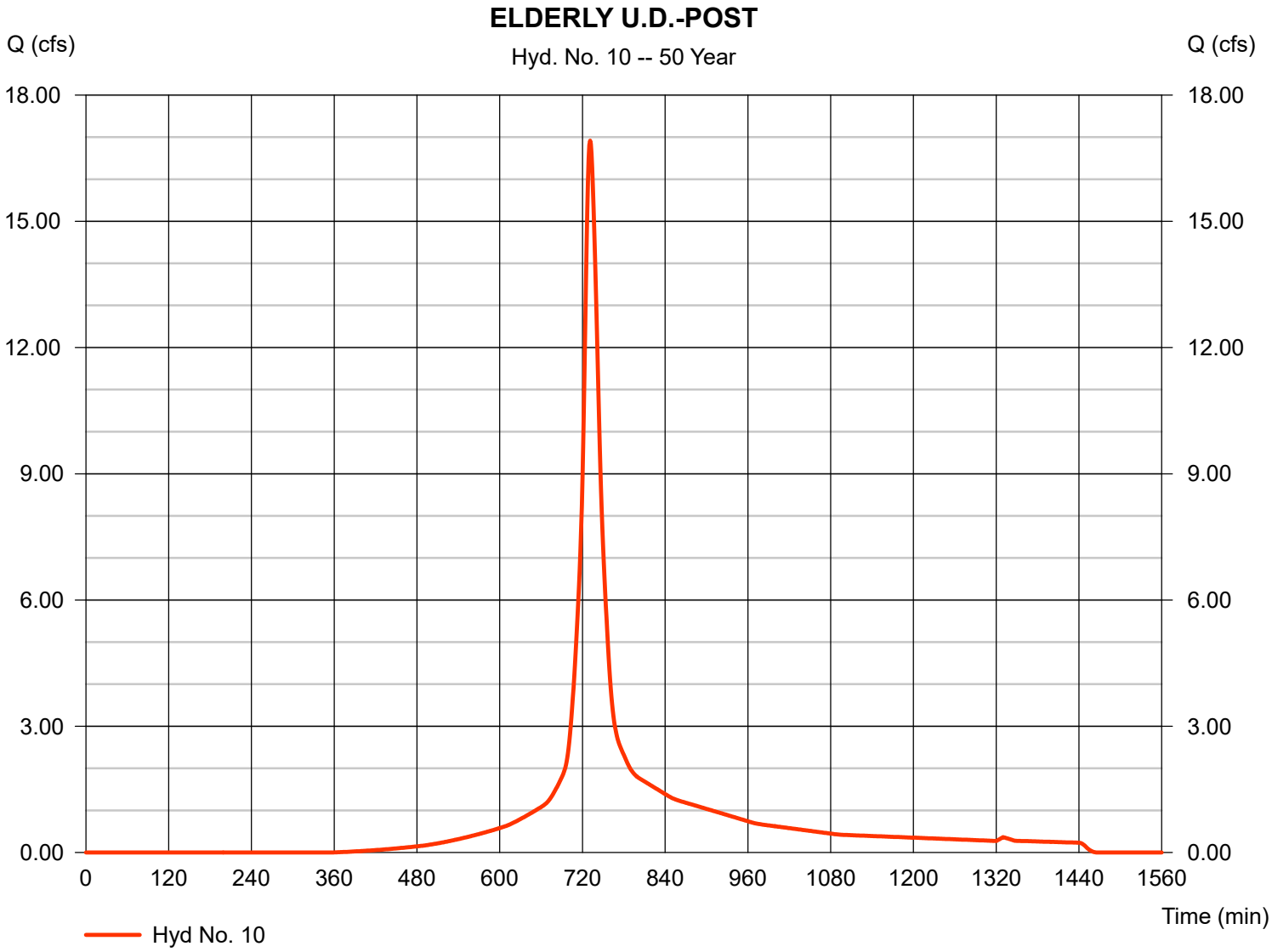


Hydrograph Report

Hyd. No. 10

ELDERLY U.D.-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.92 cfs
Storm frequency	=	50 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	70,566 cuft
Drainage area	=	3.840 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	7.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



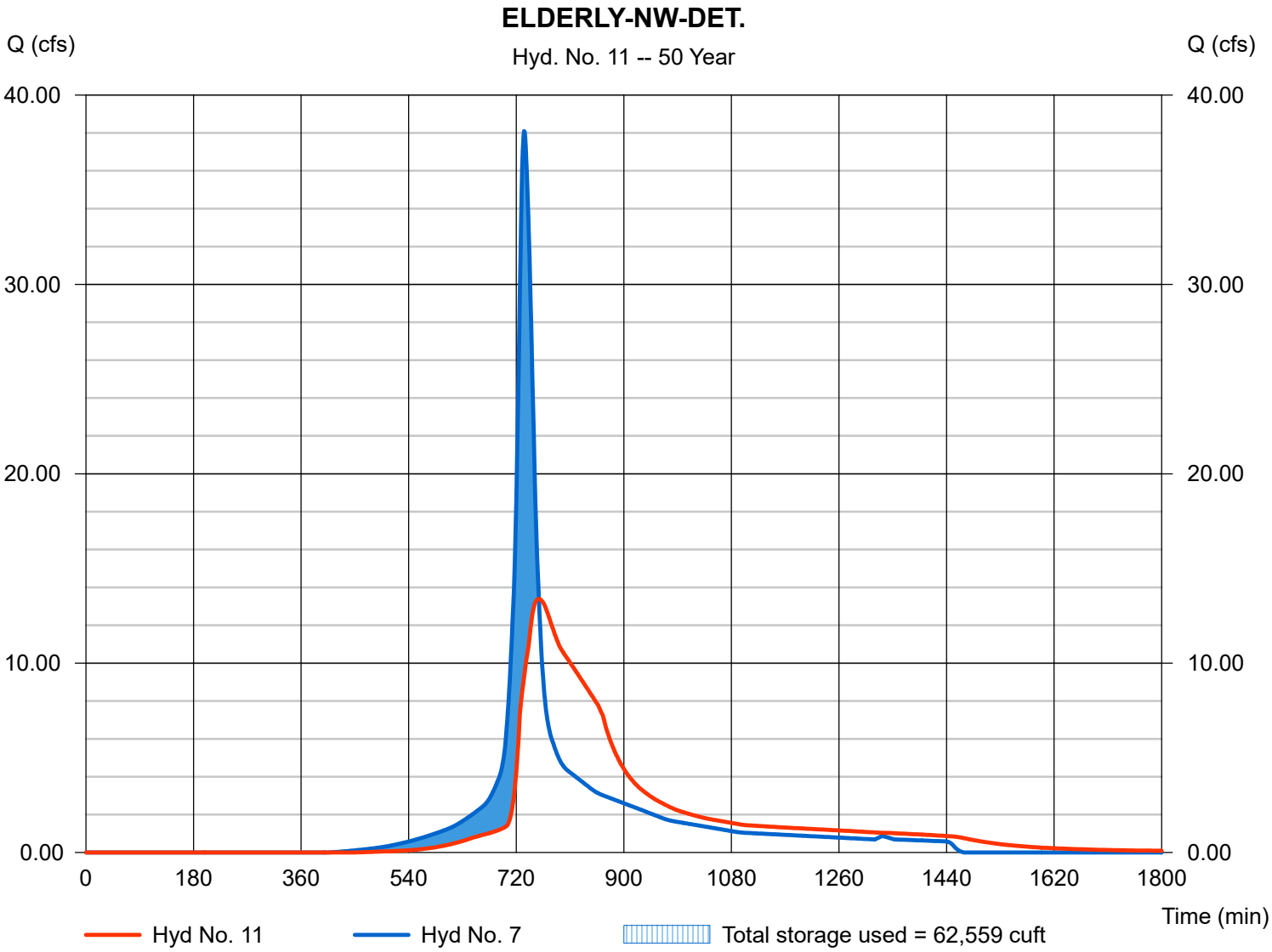
Hydrograph Report

Hyd. No. 11

ELDERLY-NW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	13.39 cfs
Storm frequency	=	50 yrs	Time to peak	=	758 min
Time interval	=	1 min	Hyd. volume	=	168,551 cuft
Inflow hyd. No.	=	7 - ELDERLY NW-POST	Max. Elevation	=	168.46 ft
Reservoir name	=	WQB#4 (ELDERLY-NW-POST)	Max. Storage	=	62,559 cuft

Storage Indication method used.



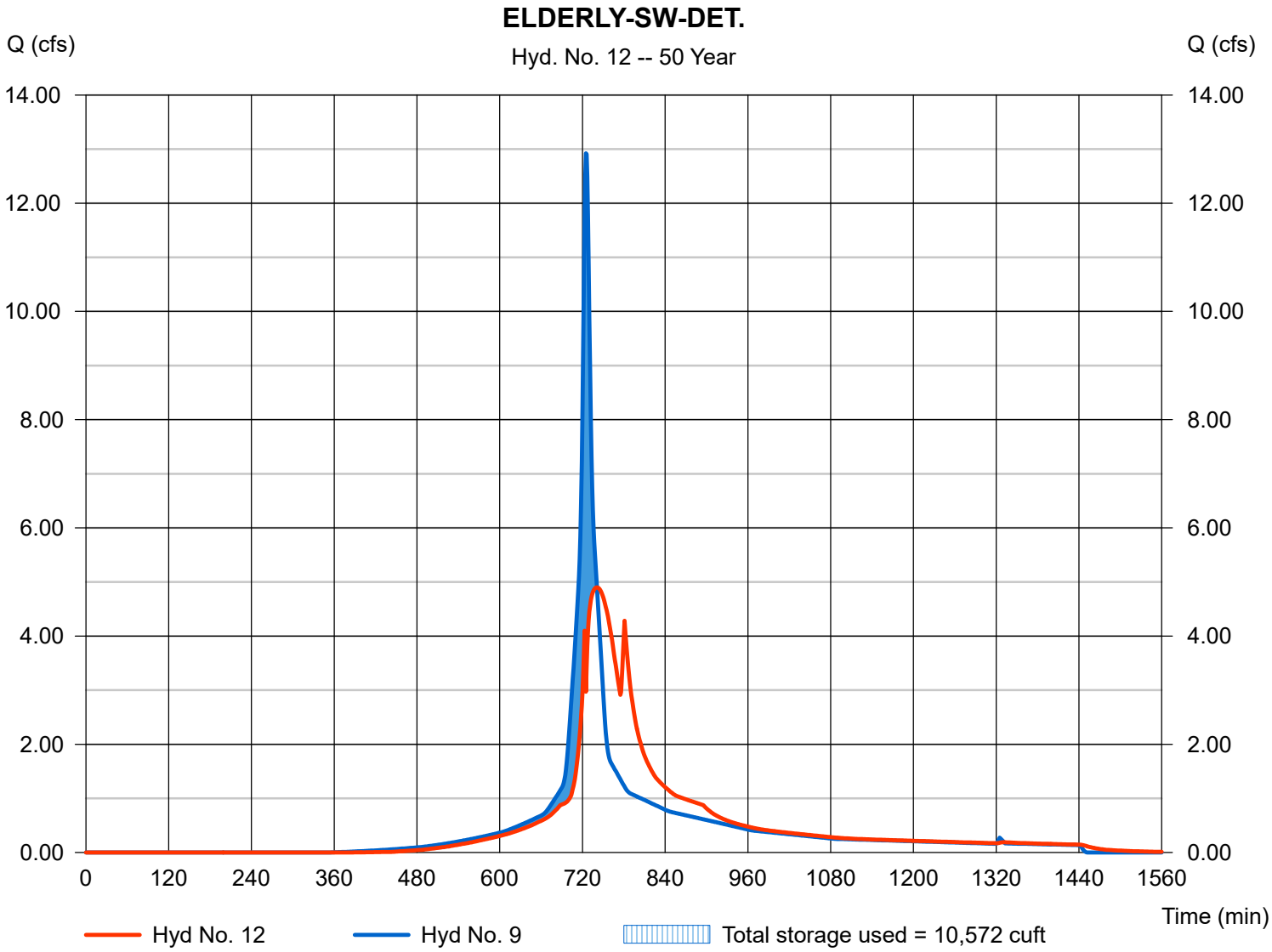
Hydrograph Report

Hyd. No. 12

ELDERLY-SW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	4.901 cfs
Storm frequency	=	50 yrs	Time to peak	=	741 min
Time interval	=	1 min	Hyd. volume	=	42,107 cuft
Inflow hyd. No.	=	9 - ELDERLY SW-POST	Max. Elevation	=	168.26 ft
Reservoir name	=	WQB#5 (ELDERLY-SW-POST)	Max. Storage	=	10,572 cuft

Storage Indication method used.

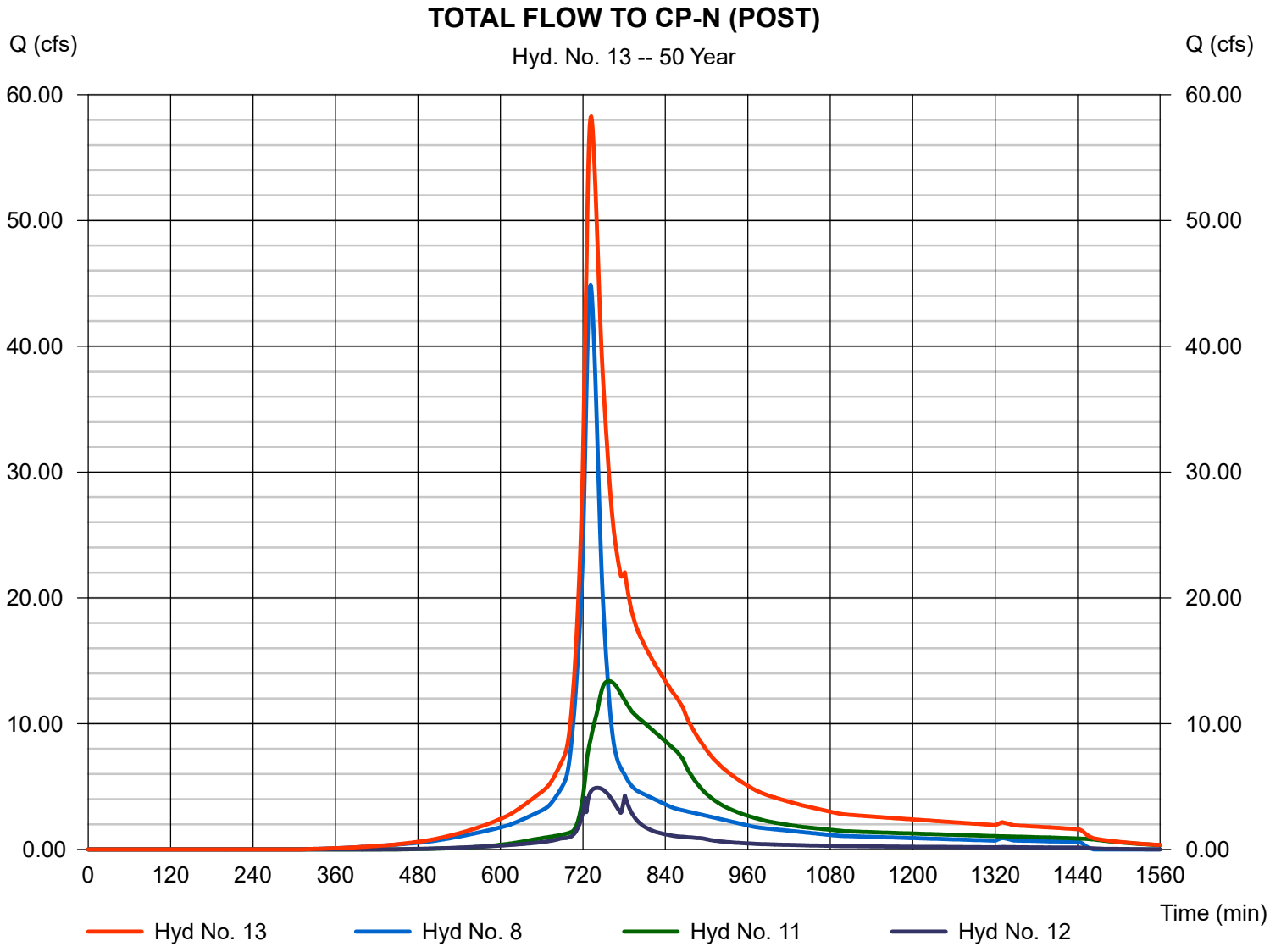


Hydrograph Report

Hyd. No. 13

TOTAL FLOW TO CP-N (POST)

Hydrograph type	=	Combine	Peak discharge	=	58.29 cfs
Storm frequency	=	50 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	399,658 cuft
Inflow hyds.	=	8, 11, 12	Contrib. drain. area	=	9.630 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

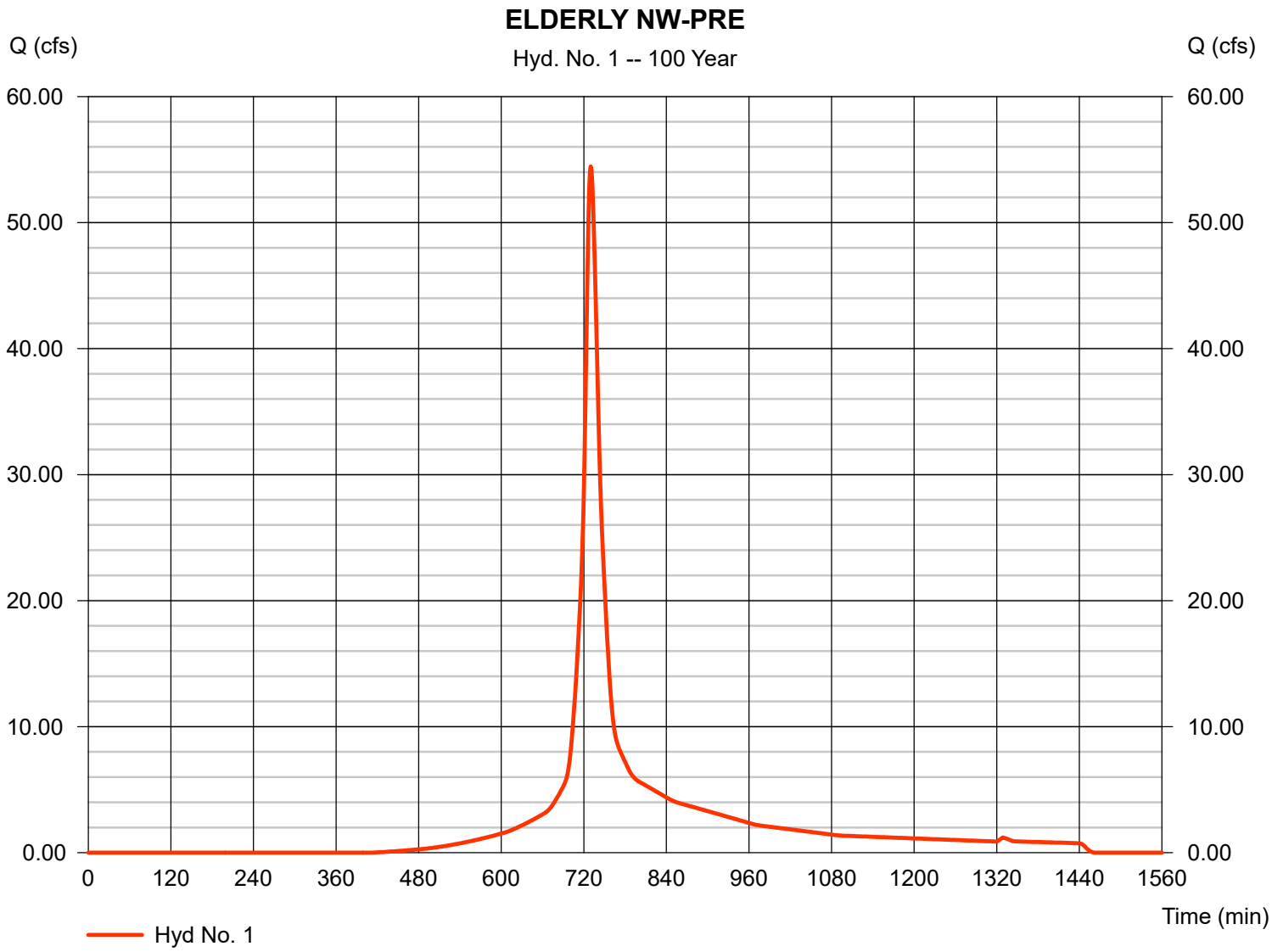
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	54.46	1	730	215,711	----	------	------	ELDERLY NW-PRE
2	SCS Runoff	52.53	1	731	222,734	----	------	------	WESTERLY WETLAND-PRE
3	SCS Runoff	9.691	1	728	35,308	----	------	------	ELDERLY SW-PRE
4	SCS Runoff	16.71	1	729	63,382	----	------	------	ELDERLY U.D.-PRE
5	Combine	106.75	1	730	438,445	1, 2,	------	------	FLOW THRU WETLAND
6	Combine	116.08	1	730	473,753	3, 5	------	------	TOTAL FLOW TO CP-N (PRE)
7	SCS Runoff	45.39	1	733	201,669	----	------	------	ELDERLY NW-POST
8	SCS Runoff	52.53	1	731	222,734	----	------	------	WESTERLY WETLAND-POST
9	SCS Runoff	15.25	1	725	49,993	----	------	------	ELDERLY SW-POST
10	SCS Runoff	19.97	1	731	83,764	----	------	------	ELDERLY U.D.-POST
11	Reservoir	15.10	1	759	201,608	7	168.90	75,272	ELDERLY-NW-DET.
12	Reservoir	5.624	1	741	49,984	9	168.51	12,712	ELDERLY-SW-DET.
13	Combine	67.67	1	732	474,324	8, 11, 12	------	------	TOTAL FLOW TO CP-N (POST)

Hydrograph Report

Hyd. No. 1

ELDERLY NW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	54.46 cfs
Storm frequency	=	100 yrs	Time to peak	=	730 min
Time interval	=	1 min	Hyd. volume	=	215,711 cuft
Drainage area	=	11.380 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	14.30 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

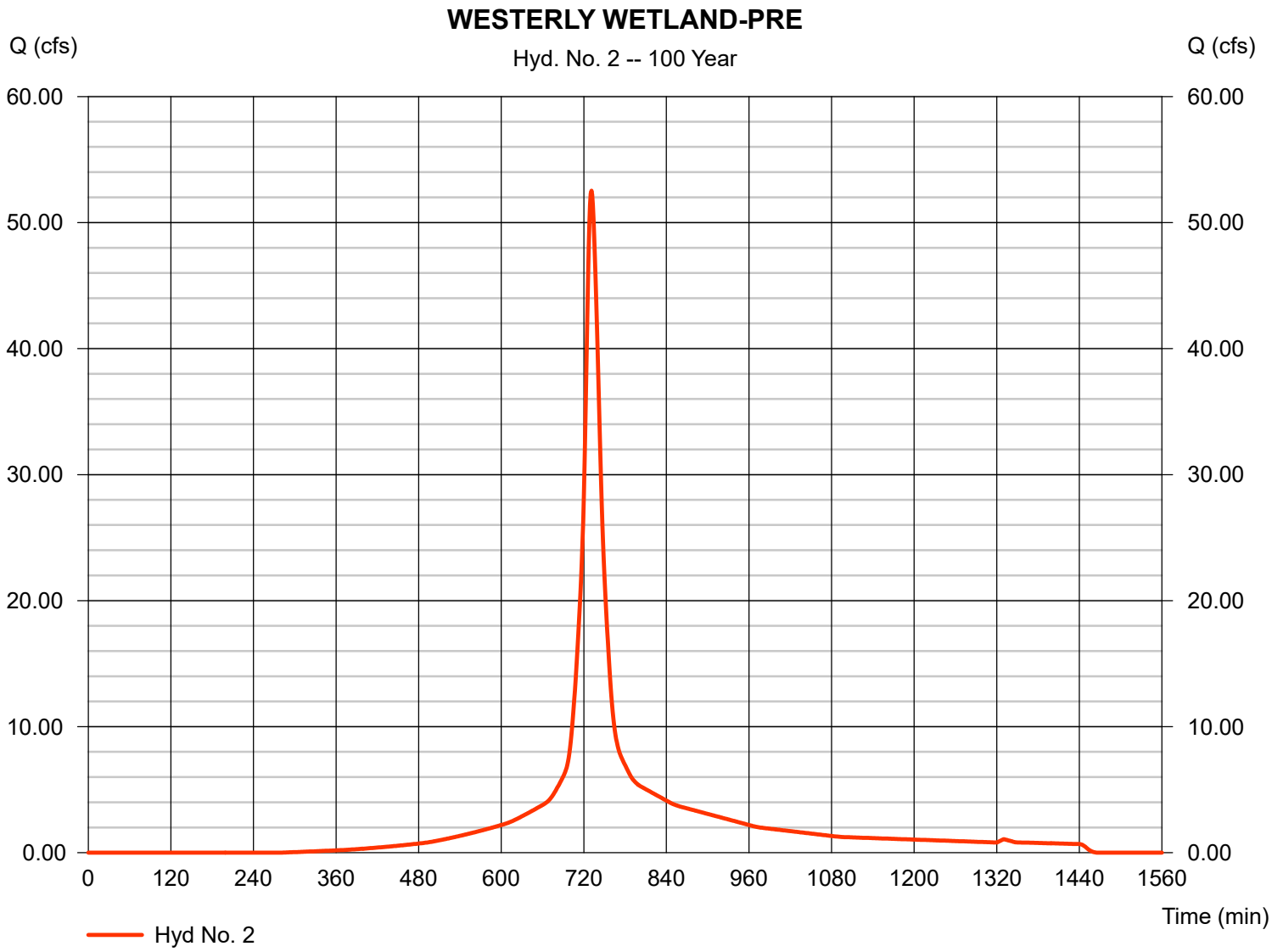


Hydrograph Report

Hyd. No. 2

WESTERLY WETLAND-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	52.53 cfs
Storm frequency	=	100 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	222,734 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

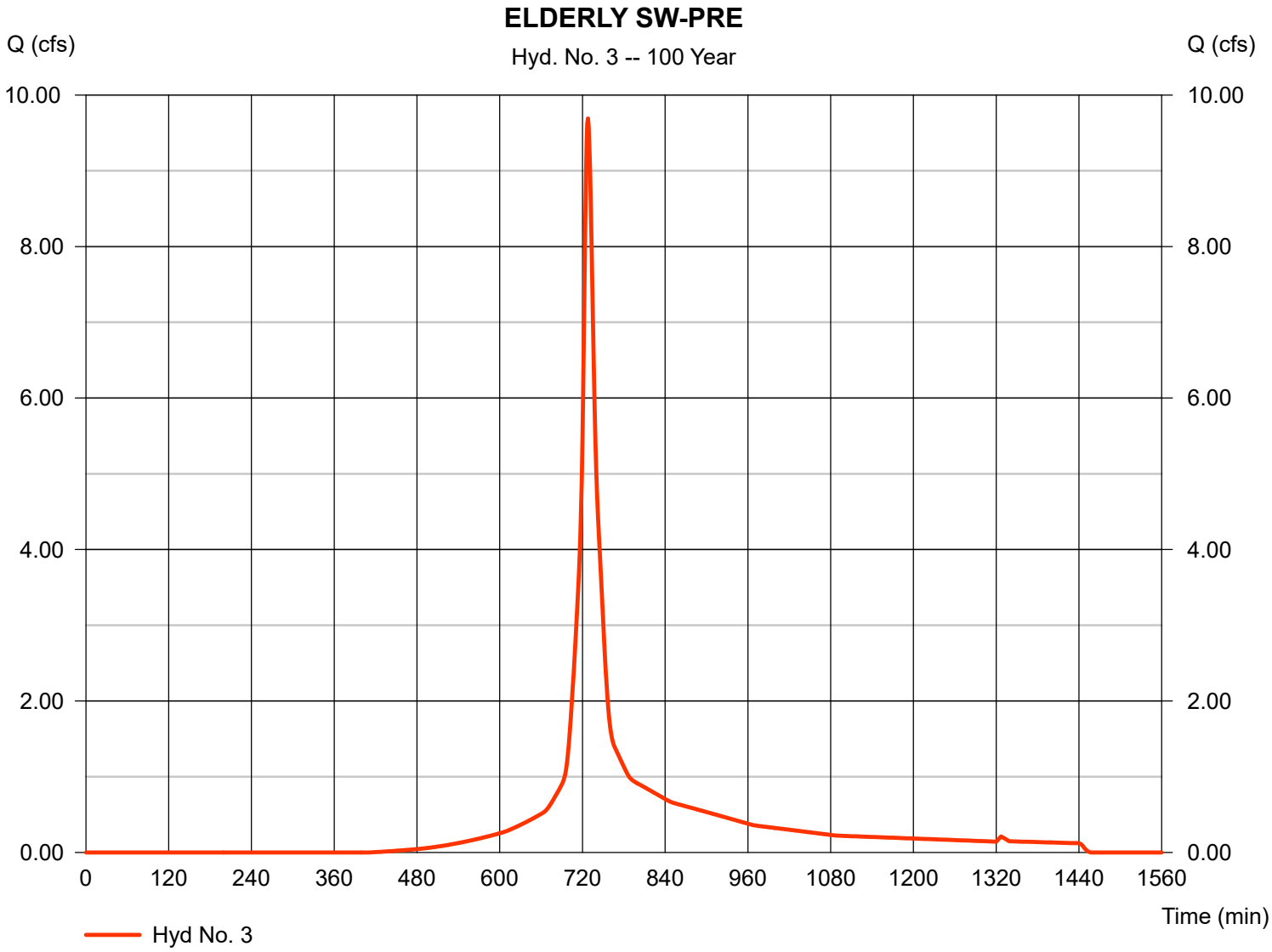


Hydrograph Report

Hyd. No. 3

ELDERLY SW-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	9.691 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	35,308 cuft
Drainage area	=	1.830 ac	Curve number	=	74
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	11.50 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

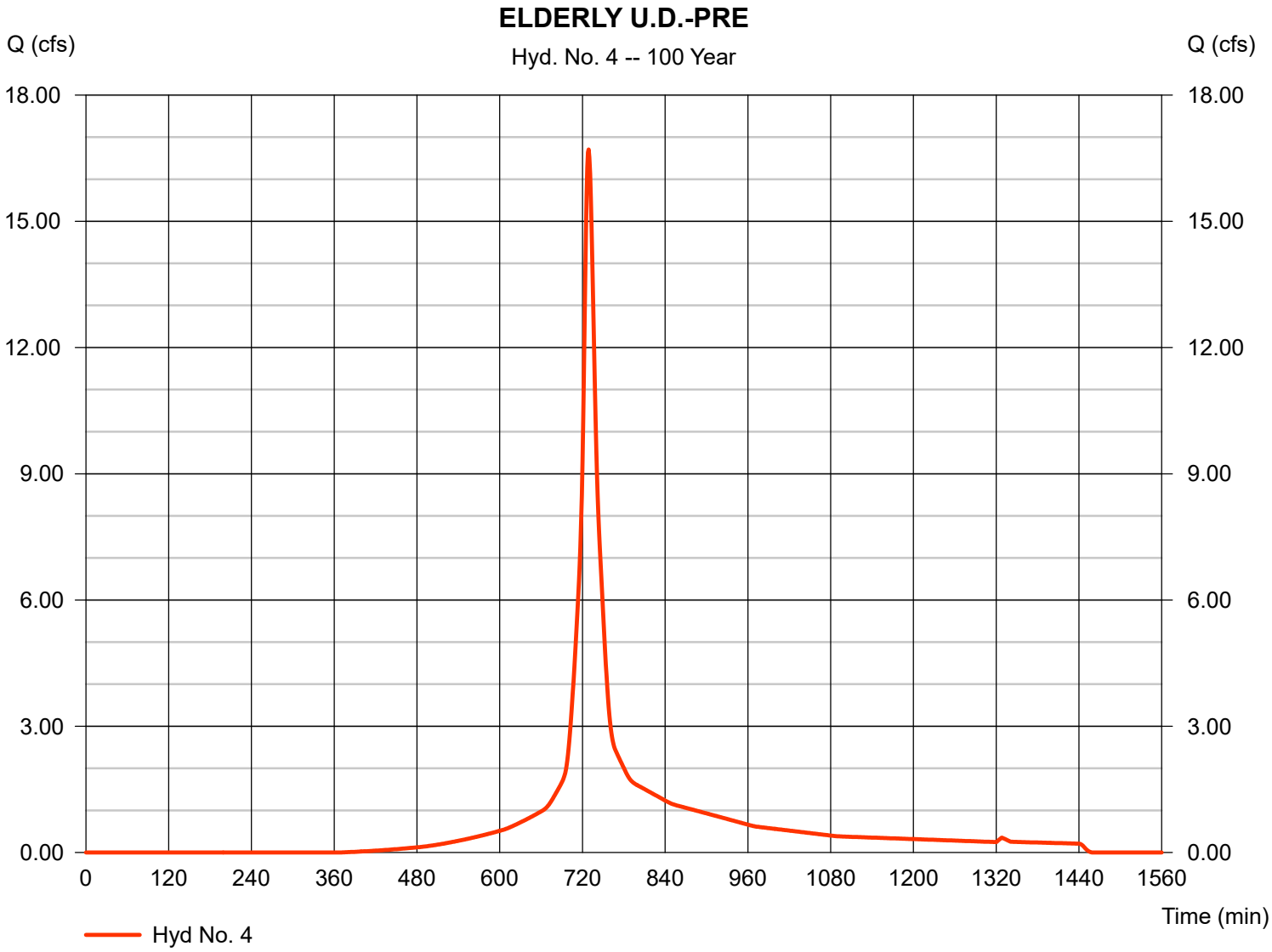


Hydrograph Report

Hyd. No. 4

ELDERLY U.D.-PRE

Hydrograph type	=	SCS Runoff	Peak discharge	=	16.71 cfs
Storm frequency	=	100 yrs	Time to peak	=	729 min
Time interval	=	1 min	Hyd. volume	=	63,382 cuft
Drainage area	=	3.180 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	12.30 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

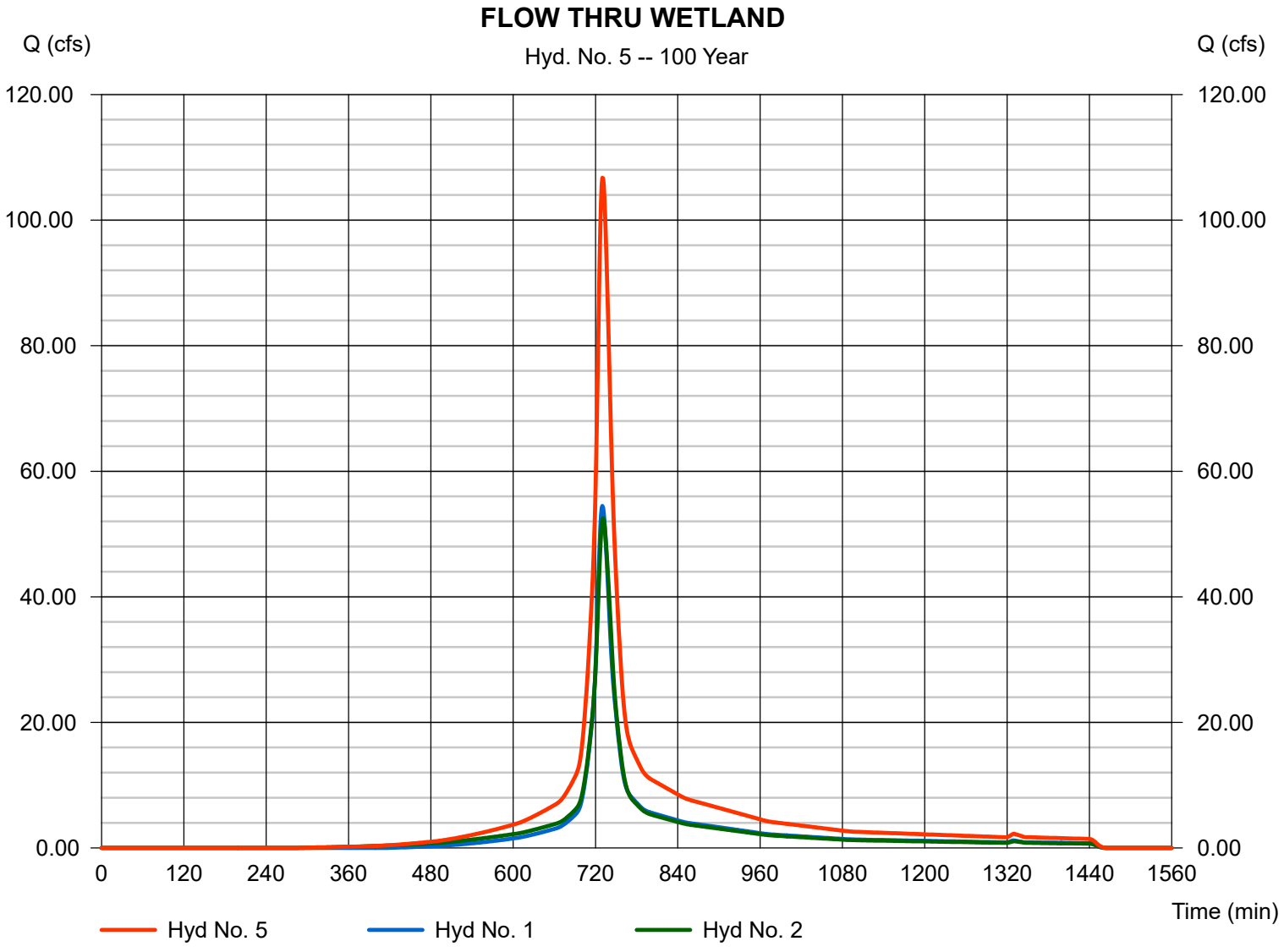


Hydrograph Report

Hyd. No. 5

FLOW THRU WETLAND

Hydrograph type	= Combine	Peak discharge	= 106.75 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 1 min	Hyd. volume	= 438,445 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 21.010 ac

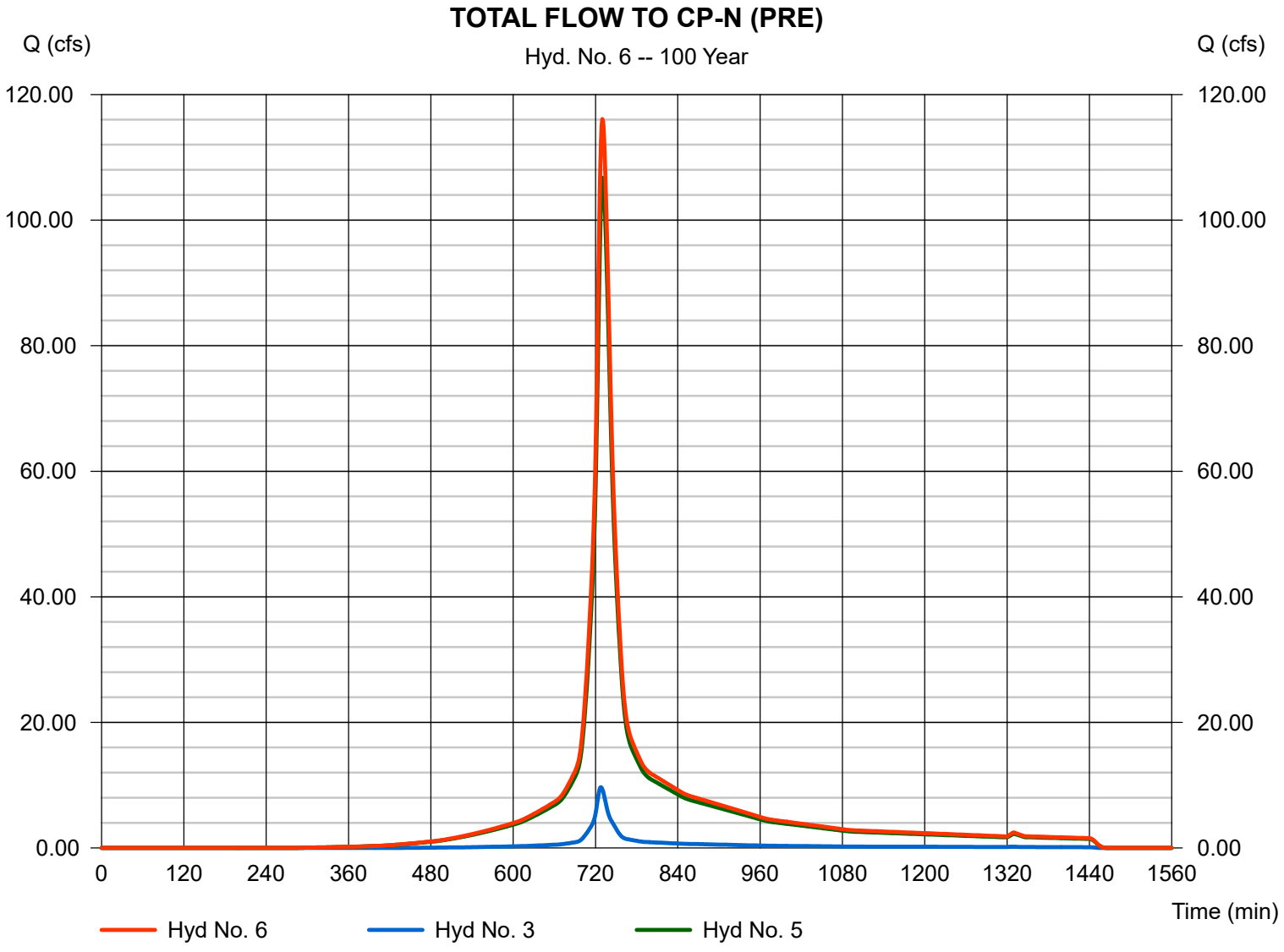


Hydrograph Report

Hyd. No. 6

TOTAL FLOW TO CP-N (PRE)

Hydrograph type	= Combine	Peak discharge	= 116.08 cfs
Storm frequency	= 100 yrs	Time to peak	= 730 min
Time interval	= 1 min	Hyd. volume	= 473,753 cuft
Inflow hyds.	= 3, 5	Contrib. drain. area	= 1.830 ac

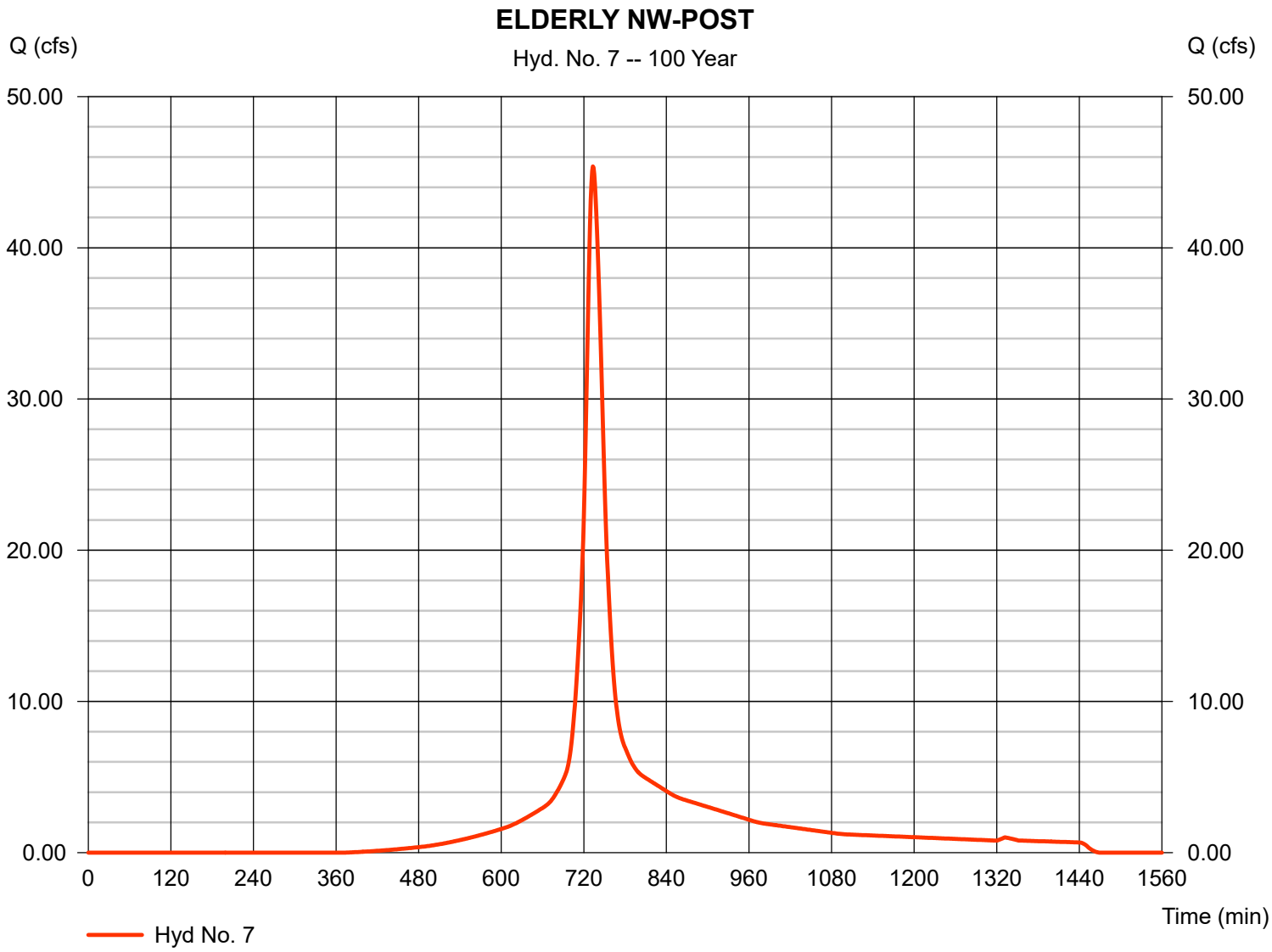


Hydrograph Report

Hyd. No. 7

ELDERLY NW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	45.39 cfs
Storm frequency	=	100 yrs	Time to peak	=	733 min
Time interval	=	1 min	Hyd. volume	=	201,669 cuft
Drainage area	=	9.960 ac	Curve number	=	77
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	18.70 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

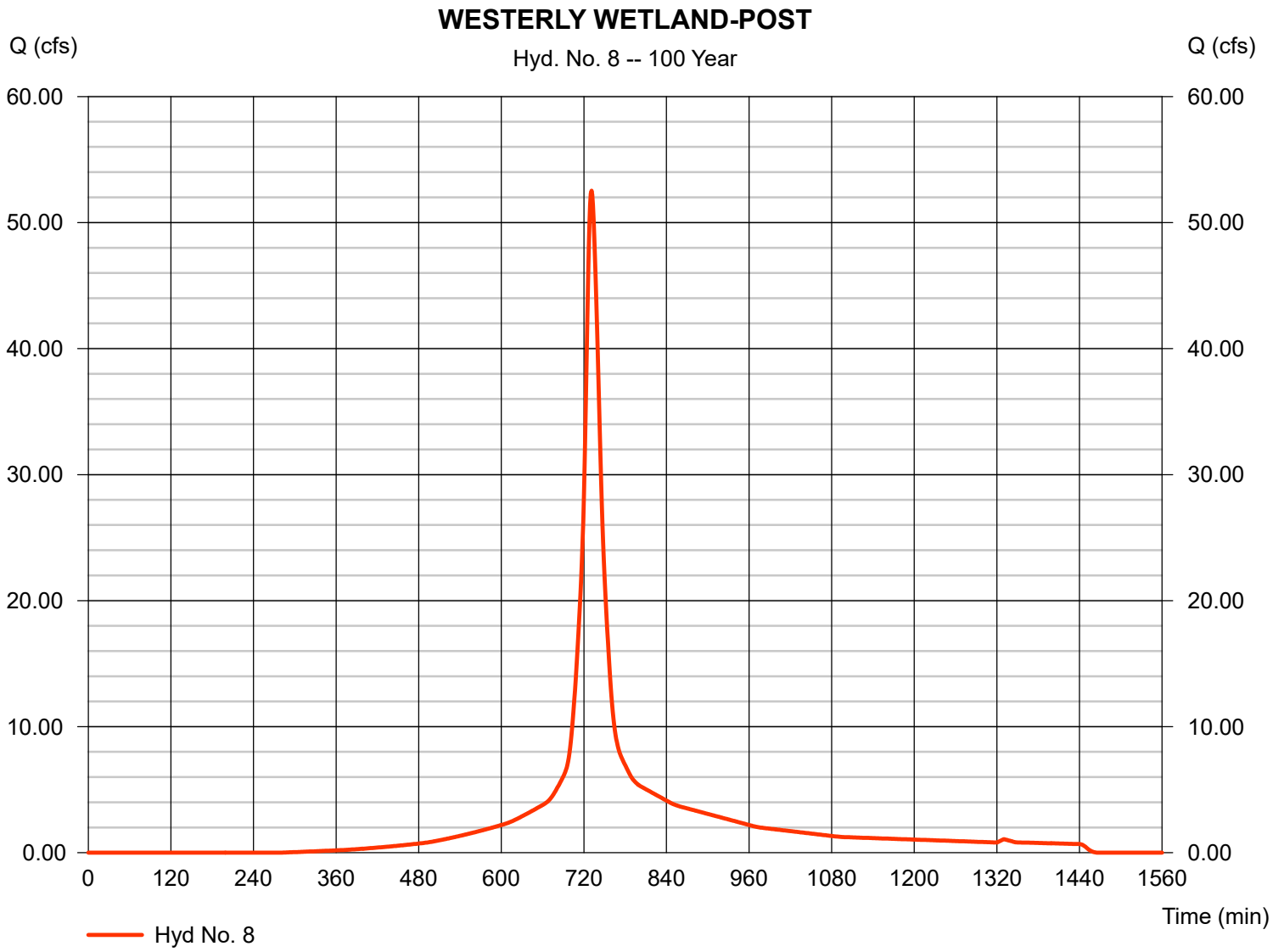


Hydrograph Report

Hyd. No. 8

WESTERLY WETLAND-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	52.53 cfs
Storm frequency	=	100 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	222,734 cuft
Drainage area	=	9.630 ac	Curve number	=	83
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

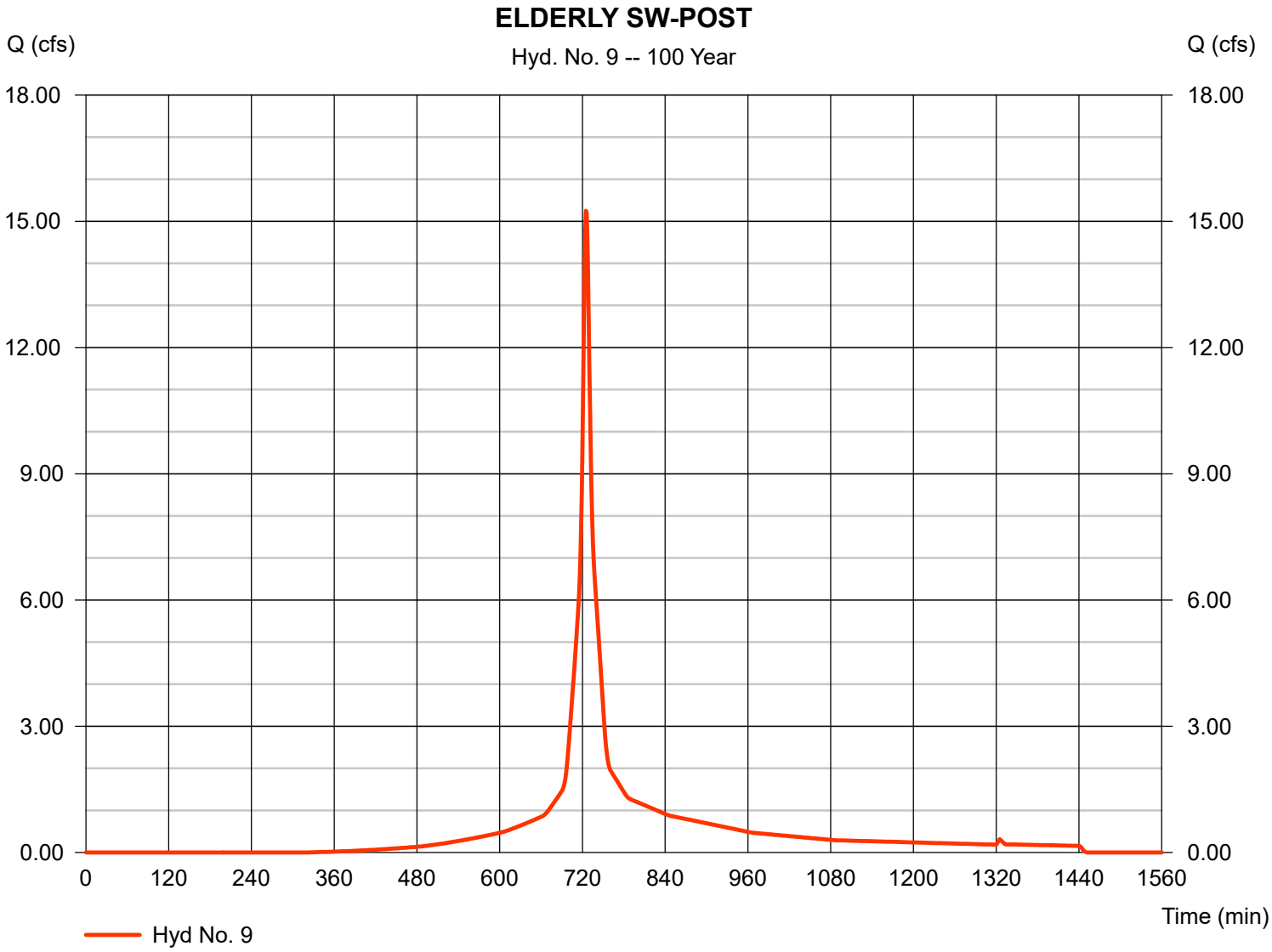


Hydrograph Report

Hyd. No. 9

ELDERLY SW-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	15.25 cfs
Storm frequency	=	100 yrs	Time to peak	=	725 min
Time interval	=	1 min	Hyd. volume	=	49,993 cuft
Drainage area	=	2.380 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	8.00 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

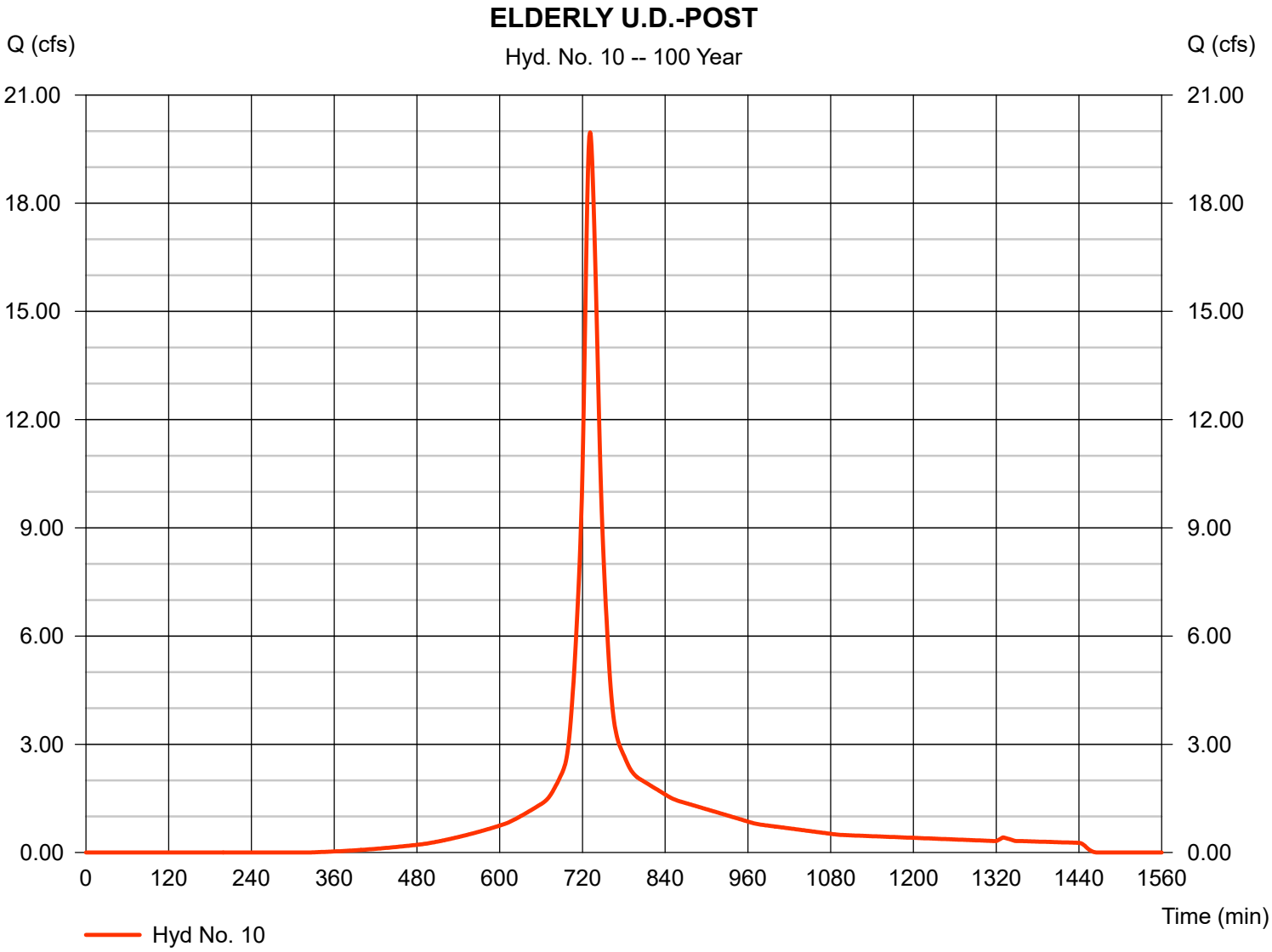


Hydrograph Report

Hyd. No. 10

ELDERLY U.D.-POST

Hydrograph type	=	SCS Runoff	Peak discharge	=	19.97 cfs
Storm frequency	=	100 yrs	Time to peak	=	731 min
Time interval	=	1 min	Hyd. volume	=	83,764 cuft
Drainage area	=	3.840 ac	Curve number	=	80
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	TR55	Time of conc. (Tc)	=	16.70 min
Total precip.	=	8.33 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



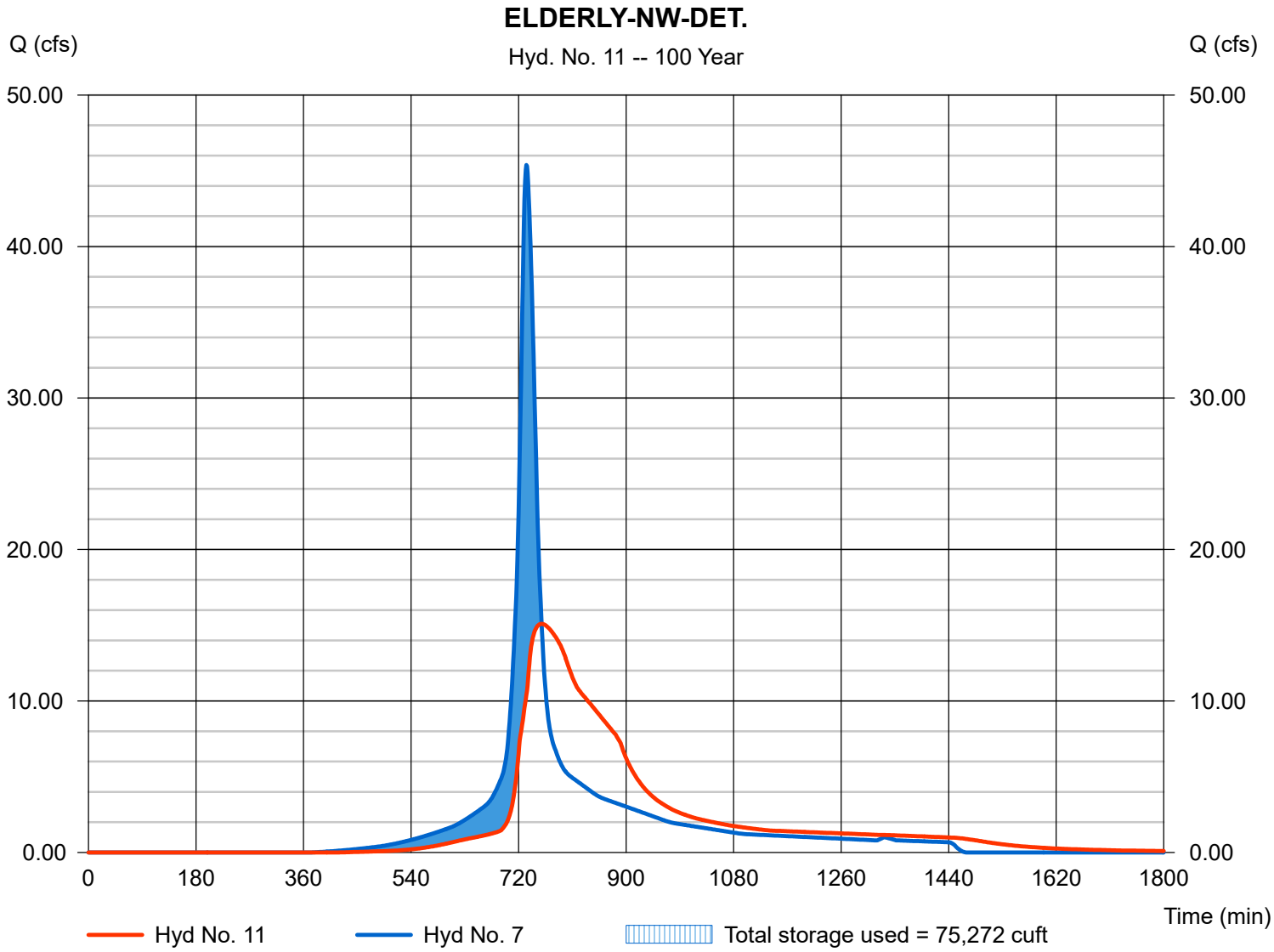
Hydrograph Report

Hyd. No. 11

ELDERLY-NW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	15.10 cfs
Storm frequency	=	100 yrs	Time to peak	=	759 min
Time interval	=	1 min	Hyd. volume	=	201,608 cuft
Inflow hyd. No.	=	7 - ELDERLY NW-POST	Max. Elevation	=	168.90 ft
Reservoir name	=	WQB#4 (ELDERLY-NW-POST)	Max. Storage	=	75,272 cuft

Storage Indication method used.



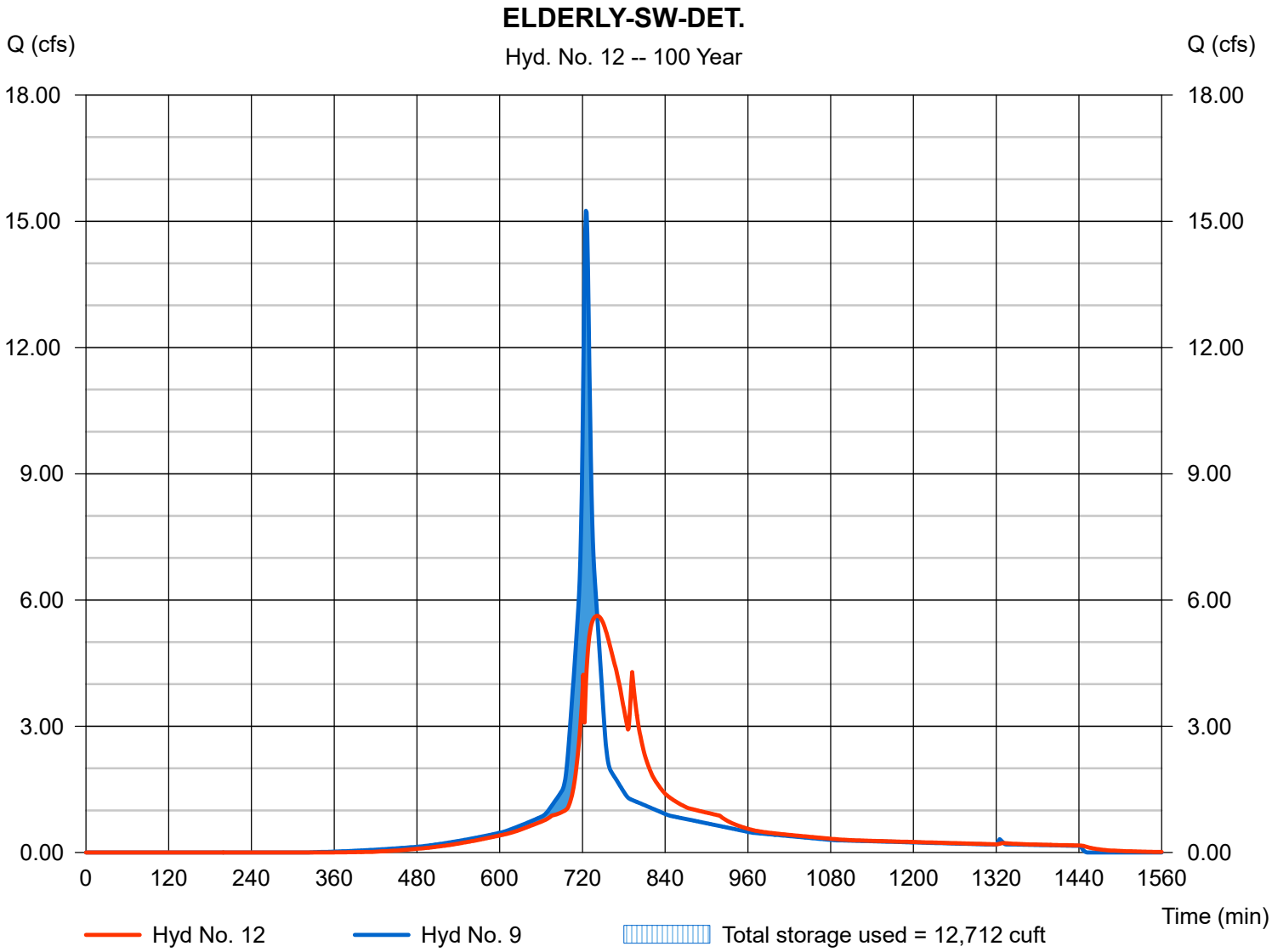
Hydrograph Report

Hyd. No. 12

ELDERLY-SW-DET.

Hydrograph type	=	Reservoir	Peak discharge	=	5.624 cfs
Storm frequency	=	100 yrs	Time to peak	=	741 min
Time interval	=	1 min	Hyd. volume	=	49,984 cuft
Inflow hyd. No.	=	9 - ELDERLY SW-POST	Max. Elevation	=	168.51 ft
Reservoir name	=	WQB#5 (ELDERLY-SW-POST)	Max. Storage	=	12,712 cuft

Storage Indication method used.

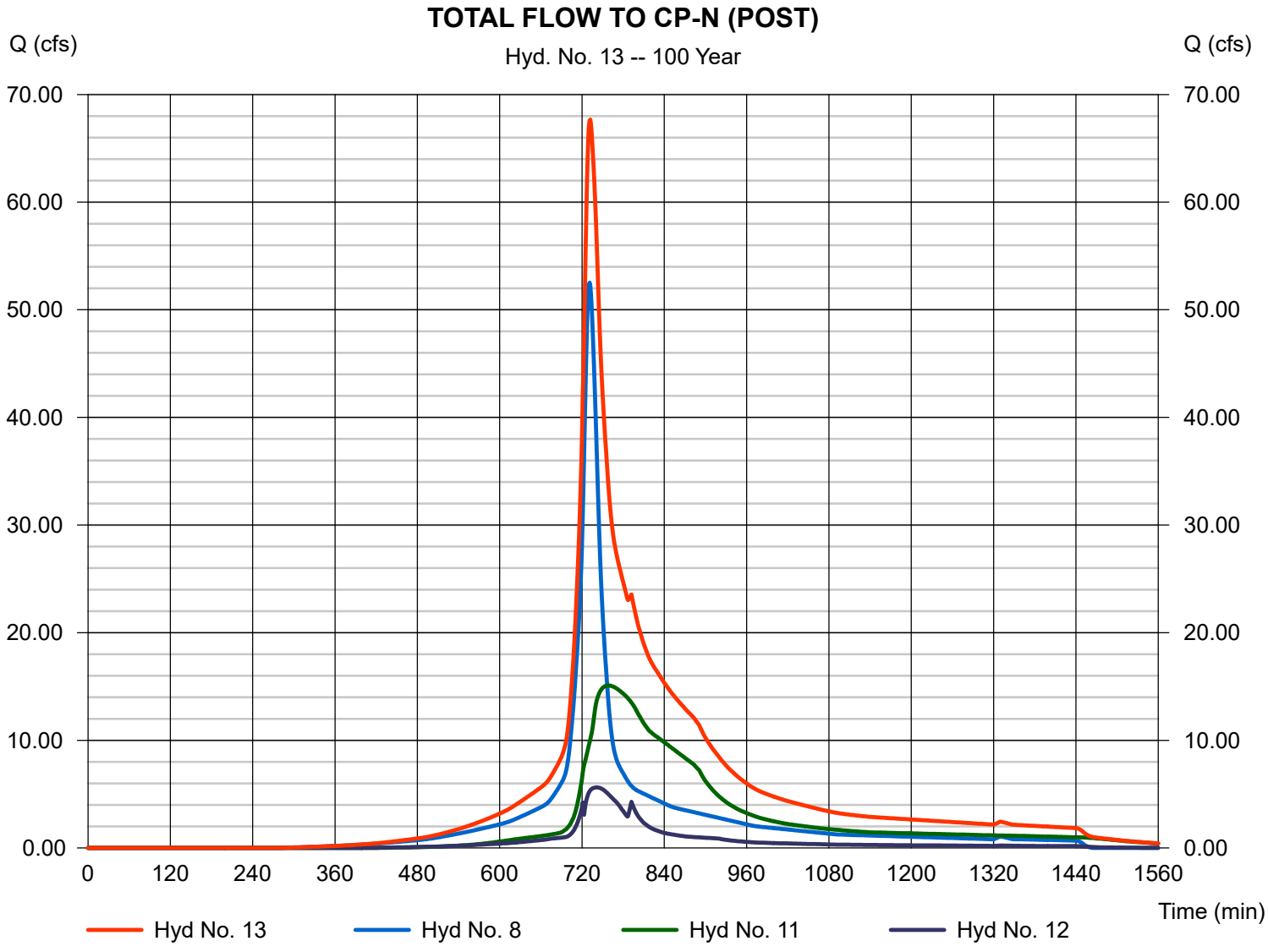


Hydrograph Report

Hyd. No. 13

TOTAL FLOW TO CP-N (POST)

Hydrograph type	=	Combine	Peak discharge	=	67.67 cfs
Storm frequency	=	100 yrs	Time to peak	=	732 min
Time interval	=	1 min	Hyd. volume	=	474,324 cuft
Inflow hyds.	=	8, 11, 12	Contrib. drain. area	=	9.630 ac



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	20.5089	3.8000	0.7318	--------
2	25.4250	4.1000	0.7380	--------
3	0.0000	0.0000	0.0000	--------
5	29.9317	3.7000	0.7174	--------
10	36.1004	3.9000	0.7226	--------
25	42.5438	3.8000	0.7161	--------
50	47.2025	3.6000	0.7124	--------
100	53.1753	3.7000	0.7130	--------

File name: EGM 2024-02-27.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	4.18	3.00	2.40	2.02	1.75	1.56	1.41	1.29	1.19	1.11	1.04	0.98
2	4.98	3.61	2.88	2.43	2.11	1.88	1.70	1.56	1.44	1.34	1.25	1.18
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	6.34	4.58	3.66	3.09	2.69	2.40	2.17	1.99	1.84	1.72	1.61	1.52
10	7.44	5.39	4.32	3.64	3.18	2.83	2.56	2.35	2.17	2.02	1.90	1.79
25	8.96	6.50	5.21	4.40	3.84	3.42	3.10	2.84	2.63	2.45	2.30	2.17
50	10.19	7.35	5.88	4.96	4.33	3.86	3.50	3.21	2.97	2.77	2.60	2.45
100	11.37	8.23	6.59	5.57	4.86	4.33	3.92	3.60	3.33	3.11	2.92	2.75

Tc = time in minutes. Values may exceed 60.

Precip. file name: EGM 2024-02-27.pcp

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	2.59	3.24	0.00	4.32	5.21	6.44	7.33	8.33
SCS 6-Hr	1.82	2.21	0.00	2.84	3.37	4.09	4.62	5.21
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

Attachment 6

Water Quality Volume Computations

Water Quality Volume Comps

Project:	Krown Point: East Granby Meadow - East	By:	DRT	Date:	3/28/2024
Location	East Granby, CT.	Checked:	GAH	Date:	

Minimum-Recommended Water Quality Volume (WQV)

Watershed	Total Area (Ac)	Impervious Area - I (Ac)	Impervious (%)	Runoff (R)	Min. Rec. WQV (ac-ft)	Min. Rec. WQV (Cu.Ft.)
ELDERLY-NW-POST	9.96	1.62	16.3	0.1966	0.16322	7,110
ELDERLY-SW-POST	2.38	0.10	4.2	0.0879	0.01741	758

$$WQV = \frac{(1")(R)(A)}{12}$$

WQV = water quality volume (ac-ft)

Provided Water Quality Volume

Water Quality Basins

Water Quality Basin ID (Watershed)	Elevations (Ft.)	Area (Sq. Ft.)	Avg. Area (Sq. Ft.)	Avg. Depth (FT)	Avg. Vol (Cu. Ft.)	Total Provided (Cu. Ft.)
WQB #4 (ELDERLY-NW-POST)	165.00	10,999				**75,212**
			12,610	1.00	**12,610**	
	166.00	14,220				
			16,004	1.00	**16,004**	
	167.00	17,787				
			20,555	1.00	**20,555**	
	168.00	23,323				
			26,044	1.00	**26,044**	
	169.00	28,765				
WQB #5 (ELDERLY-SW-POST)	167.00	6,186				**26,493**
			7,048	1.00	**7,048**	
	168.00	7,909				
			8,801	1.00	**8,801**	
	169.00	9,694				
			10,644	1.00	**10,644**	
	170.00	11,594				