STORMWATER REPORT

PROPOSED SINGLE FAMILY RESIDENCE

25 HENRY STREET
ARLINGTON, MASSACHUSETTS

Prepared for;
JOHN CARNEY

Prepared by;
Salem Village Consulting, LLC
90 PINE STREET
DANVERS, MA 01923

January 29, 2021

Narrative

1.0 Introduction and Background

The following report details a storm water analysis completed for a proposed single-family home site located on Henry Street in Arlington, Massachusetts (refer to Figure 1: USGS Locus Map). The change to the property will result in an increase in impervious surfaces by more than 350 s.f. and is therefore required to meet Arlington's Storm Water Mitigation Bylaw (Art. 15). This study will provide a comparative analysis of the hydrologic characteristics of the pre- vs. post-development conditions of the site and provide information on the rate of surface water runoff generated by the project.

2.0 Existing Conditions

The site is located on the east side of the public roadway Henry St. approximately 200 feet north of Elwern St. The property is bounded by Henry St. to the west and residential use properties to the north, east, and south. The subject property is located in the R-1 zoning district and has a land area of 6,441 square feet. The property is primarily undeveloped and was recently subdivided from 29 Henry St. There is presently approximately 250 s.f of impervious surfaces from an existing shed and pavement. The slopes on the property range between 10 and 60 percent with the grades dropping from the highest elevations at the northeast boundary to the western boundaries Henry St. Figure 2 represents the existing topographic conditions at the site.

Based on information available from the USDA Conservation Service the underlying soils at the site are those typical of the Charlton Urban Land Complex. These soils are considered to be in the Hydrologic Soil Group "A". Information on the site's soils has been included in the report's appendix.

3.0 Project Description

The project proposes the construction of a 32' by 44' (1,450 s.f.) single family dwelling. Other impervious surfaces that will be created as part of the development includes a walk and driveway to access a two-car garage. When completed the new building site will have approximately 2,400 s.f. of impervious surfaces. The project will also include two stormwater recharge systems. The proposed dwelling will include a roof drainage system of roof gutters and downspouts. The roof drainage will be directly piped to a storm water recharge system. The driveway will be constructed with a trench grate connected to a second recharge system. Information on the site development and the design of the recharge system has been included in the appendix of this report.

4.0 Peak Flow Runoff Rates

Peak flow rates were studied under existing and proposed conditions for the 2, 10, 25, & 100 year, 24-hour Type III storm events. Two points of comparisons or study point (as described below in Table 1 and as shown in Figures 2 and 3) were developed and studied in an effort to micro-analyze runoff rates to the abutting properties and roadway. The study points were consistent between pre- and post-development conditions.

TABLE 1: STUDY POINT OF COMPARISON

Study Point	Description
A	Flows from the site to Henry St.

For both pre- and post-development conditions, the site was divided into subcatchment areas based on topography, drainage patterns, and "POC's". One subcatchment (E-1) was utilized to study pre-development conditions, and one subcatchments (P-1) was utilized to study post-development conditions (refer to Figures 2 and 3, in the report's appendix). Subcatchment P-2 & P-3 were utilized to determine the performance of the stormwater recharge systems. These subcatchments were made up of the impervious surfaces of the dwelling's roof and driveway that will drain to the recharge systems.

Technical Release 55 (TR-55) was utilized to obtain weighted curve numbers (CNs) for each of the pre- and post-development subcatchment areas. Inputs for obtaining the weighted CNs were based on ground cover type and hydrologic soil group (HSG) soils classified by United States Department of Agriculture (USDA) soil survey data. Supporting information on the weighted curve numbers has been included in the report's appendix.

TR-55 was also utilized to obtain times of concentration (TCs) for each of the pre- and post-development subcatchment areas. Various flow paths were evaluated for each subcatchment area to determine the most hydrologically remote point within that subcatchment, which did not necessarily correspond to the longest flow path. Flow paths generally include a segment of sheet flow of up to 100 feet, segment(s) of shallow concentrated flow, and in some cases segment(s) of channel flow, with the sheet flow having the greatest impact on the TC. For each segment of flow, the length, slope, and cover type were entered to calculate the TC. The same methodology for calculating TC

was employed consistently between pre-and post development conditions. Refer to the attached TR-55 TC data. Since such small watersheds makes up the study areas a 6 minimum time of concentration was assumed for both the pre and post development condition.

CNs and TCs obtained from TR-55 were input into the *Hydraflow*® Hydrographs software package, which utilizes the National Resources Conservation Service (NRCS) (formerly "SCS") method to generate and route hydrographs. The resulting hydrographs have been included in the report's appendix.

The resulting analysis determines flows to the "POC's", as the post-development peak runoff rates do not exceed the pre-development peak runoff rates for the design storms. Table 2 (below) summarizes the attached *Hydraflow*® Hydrographs analysis.

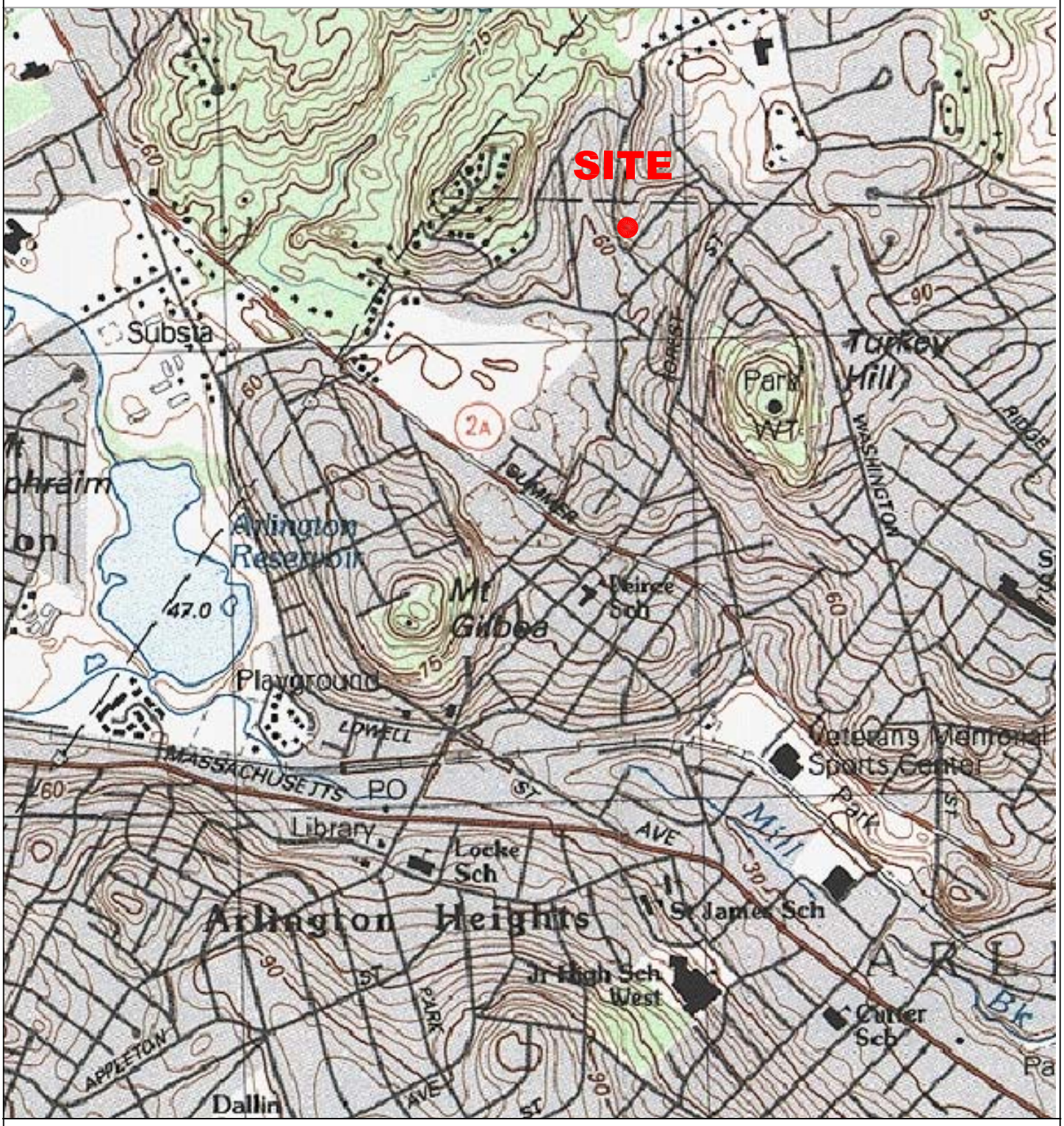
TABLE 2: RUNOFF COMPARISON

Design Point		**Peak Flows (CFS) Storm Events**			
		2 YR	**10 YR**	**25 YR**	**100 YR**
A	Existing	0.0	0.0	0.0	0.1
	Proposed	0.0	0.0	0.0	0.3

10.0 Conclusion

Based on the analysis performed the storm water mitigation (recharge systems) proposed will capture the additional stormwater generated from the proposed construction and their will be no increase in the storm water runoff from the site.

FIGURE 1



USGS LOCUS MAP

25 HENRY ST.
ARLINGTON, MASSACHUSETTS

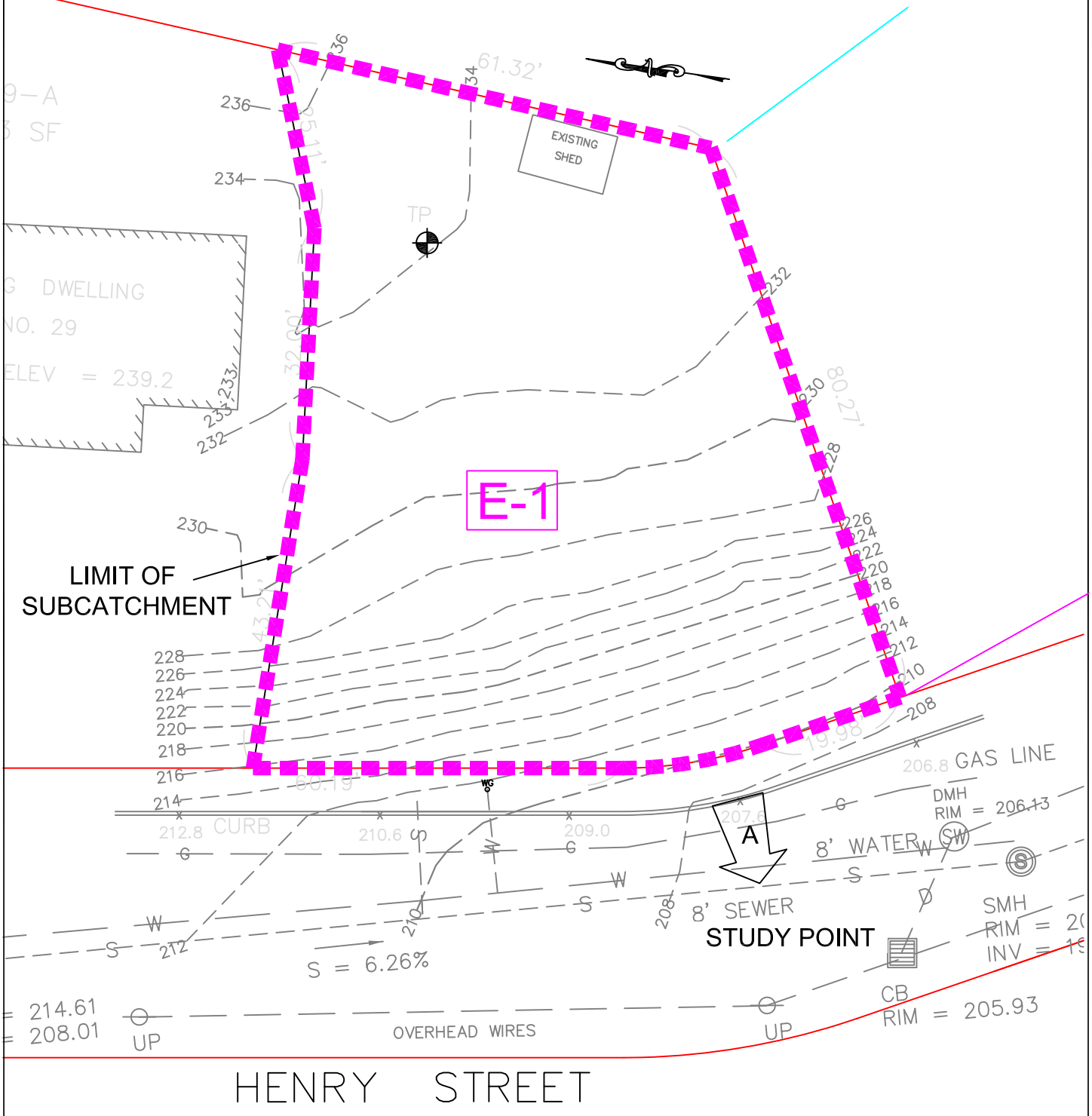
DRAWN FOR
JOHN CARNEY
ARLINGTON, MASSACHUSETTS

Salem Village Consulting, LLC

90 PINE STREET
DANVERS, MA. 01923
(978) 204-2390

DATE: JANUARY 2021 SCALE: 1"=1000'

FIGURE 2



PRE-DEVELOPMENT SUBCATCHMENTS

25 HENRY ST.
ARLINGTON, MASSACHUSETTS

DRAWN FOR
JOHN CARNEY
ARLINGTON, MASSACHUSETTS

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90 PINE STREET
DANVERS, MA. 01923
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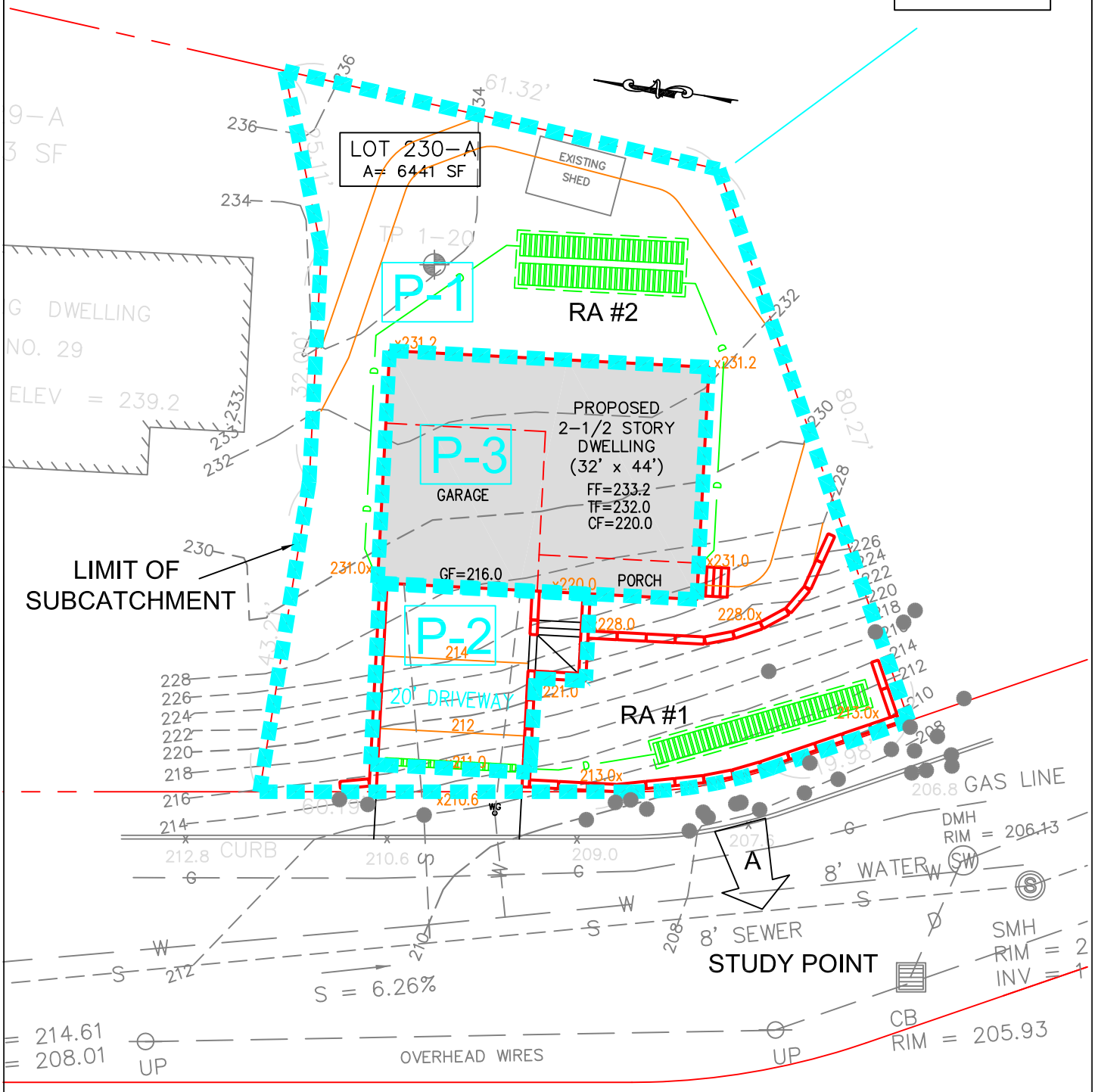
DATE: JANUARY 2021 SCALE: 1"=20'

FIGURE 3



POST DEVELOPMENT SUBCATCHMENTS

25 HENRY ST.
ARLINGTON, MASSACHUSETTS

DRAWN FOR
JOHN CARNEY
ARLINGTON, MASSACHUSETTS

Salem Village Consulting, LLC

90 PINE STREET
DANVERS, MA. 01923
(978) 204-2390

DATE: JANUARY 2021 SCALE: 1"=20'

APPENDIX

SITE SOIL INFORMATION

CURVE NUMBER COMPUTATIONS

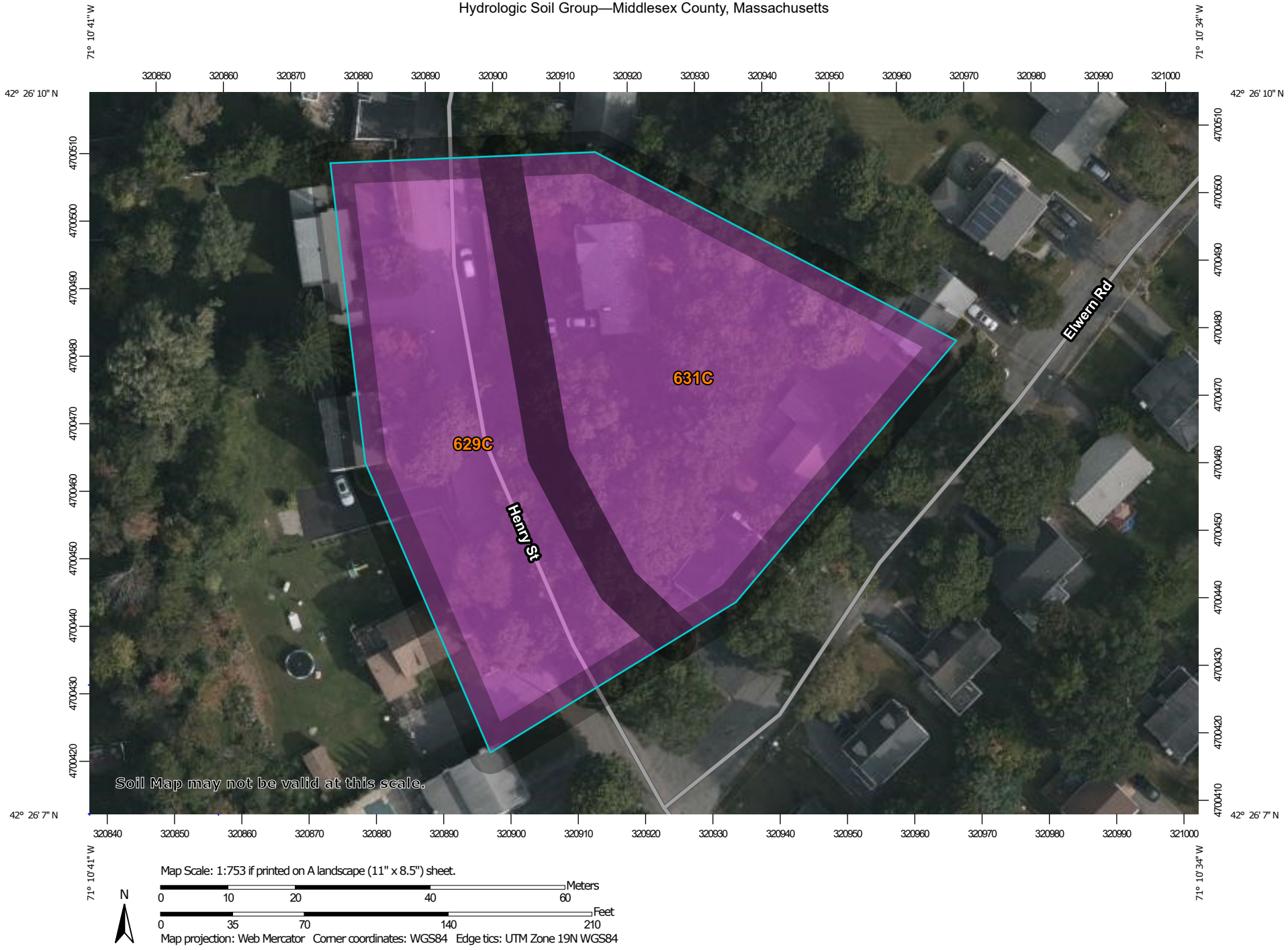
HYDROGRAPH REPORTS

RECHARGE AREA CHARACTERISTICS

STORMWATER MANAGEMENT PLAN

SITE SOIL INFORMATION

Hydrologic Soil Group—Middlesex County, Massachusetts



Map Scale: 1:753 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 10 20 40 60

Feet
0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

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: Middlesex County, Massachusetts
Survey Area Data: Version 20, Jun 9, 2020

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

Date(s) aerial images were photographed: Sep 11, 2019—Oct 5, 2019

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
629C	Canton-Charlton-Urban land complex, 3 to 15 percent slopes	A	0.6	45.2%
631C	Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky	A	0.7	54.8%
Totals for Area of Interest			**1.2**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Middlesex County, Massachusetts

631C—Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky

Map Unit Setting

National map unit symbol: vr1g
Elevation: 0 to 1,000 feet
Mean annual precipitation: 32 to 54 inches
Mean annual air temperature: 43 to 54 degrees F
Frost-free period: 110 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton and similar soils: 45 percent
Urban land: 35 percent
Hollis and similar soils: 10 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Drumlins, ground moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable loamy eolian deposits over friable loamy basal till derived from granite and gneiss

Typical profile

H1 - 0 to 5 inches: fine sandy loam
H2 - 5 to 22 inches: sandy loam
H3 - 22 to 65 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A

Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Description of Urban Land

Setting

Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Excavated and filled land

Description of Hollis

Setting

Landform: Ridges, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Friable, shallow loamy basal till over granite and gneiss

Typical profile

H1 - 0 to 2 inches: fine sandy loam
H2 - 2 to 14 inches: fine sandy loam
H3 - 14 to 18 inches: unweathered bedrock

Properties and qualities

Slope: 3 to 15 percent
Surface area covered with cobbles, stones or boulders: 9.0 percent
Depth to restrictive feature: 8 to 20 inches to lithic bedrock
Drainage class: Well drained
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: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 2.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Minor Components

Canton

Percent of map unit: 4 percent
Landform: Hills
Landform position (two-dimensional): Backslope, toeslope
Landform position (three-dimensional): Side slope, base slope

Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Udorthents, loamy
Percent of map unit: 2 percent
Hydric soil rating: No

Rock outcrop
Percent of map unit: 2 percent
Landform: Ledges
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Head slope
Down-slope shape: Concave
Across-slope shape: Concave

Scituate
Percent of map unit: 1 percent
Landform: Depressions, hillslopes
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Montauk
Percent of map unit: 1 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Nose slope, head slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Data Source Information

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 20, Jun 9, 2020

Commonwealth of Massachusetts
City/Town of ARLINGTON
Form 11 - Soil Suitability Assessment
25 HENRY ST.

C. On-Site Review (continued)

Deep Observation Hole Number: 1-20

Depth (in.)	Soil Horizon/ Layer	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features (mottles)			Soil Texture (USDA)	Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
			Depth	Color	Percent		Gravel	Cobbles & Stones			
8	A	10YR 4/3	—			SiL	5	<5	GRN.	VF	
16	B	10YR 7/6	—			SiL	5	5	GRN.	VF	
84	C	2.5Y 7/2	—			SiL	10	20	GRN.	FIRM IN PLACE	

Additional Notes:
Pit Obsvd by: J. Barrows, date: 11/5/20
Refusal @ bot. of hole (weathered ledge), No GW Obsv. ESHWT >7'
Parent Material: Till

CURVE NUMBER COMPUTATIONS

Worksheet 2: Runoff curve number and runoff

Project	By	Date
25 HENRY ST.	JB	1/29/21
Location	**Checked**	**Date**
ARLINGTON		

Check one: ☑ Present ☐ Developed "E-1"

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 1/ Table 2-2	CN 1/ Figure 2-3	CN 1/ Figure 2-4	Area ☑ acres ☐ mi² ☐ %	Product of CN x area
	IMPERVIOUS	98			0.01	0.98
A	OPEN SPACE (GOOD)	39			0.14	5.46
1/ Use only one CN source per line				Totals ➡	0.15	6.44

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{6.44}{0.15} = 42.9$; Use CN ➡ 43

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr			
Rainfall, P (24-hour)	in			
Runoff, Q	in			

(Use P and CN with table 2-1, figure 2-1, or equation 2-3 and 2-4)

Worksheet 2: Runoff curve number and runoff

Project	25 HENRY ST.	By	JB	Date	1/29/21
Location	ARLINGTON	Checked		Date	

Check one: ☐ Present ☑ Developed "P-1"

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 1/ Table 2-2	CN 1/ Figure 2-3	CN 1/ Figure 2-4	Area ☑ acres ☐ mi² ☐ %	Product of CN x area
	IMPERVIOUS	98			0.005	0.49
A	OPEN SPACE (GOOD)	39			0.10	3.90
1/ Use only one CN source per line				Totals ➡	0.105	4.39

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{4.39}{0.105} = 41.8$; Use CN ➡ 42

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr			
Rainfall, P (24-hour)	in			
Runoff, Q	in			

(Use P and CN with table 2-1, figure 2-1, or equation 2-3 and 2-4)

Worksheet 2: Runoff curve number and runoff

Project	By	Date
25 HENRY ST	JB	1/29/21
Location	**Checked**	**Date**
ARLINGTON		

Check one: ☐ Present ☑ Developed "P-2" (DRIVEWAY)

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 [1/] Table 2-2	CN [1/] Figure 2-3	CN [1/] Figure 2-4	Area ☑ acres ☐ mi² ☐ %	Product of CN x area
	IMPERVIOUS	98			0.015	

[1/] Use only one CN source per line

Totals ➡ 0.015

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = _____ = _____ ; **Use CN** ➡ 98

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr			
Rainfall, P (24-hour) ..... in			
Runoff, Q ..... in			

(Use P and CN with table 2-1, figure 2-1, or equation 2-3 and 2-4)

Worksheet 2: Runoff curve number and runoff

Project	By	Date
25 HENRY ST.	JB	1/29/24
Location	**Checked**	**Date**
ARLINGTON		

Check one: ☐ Present ☑ Developed "P-3" (ROOF)

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 [1/] Table 2-2	CN [1/] Figure 2-3	CN [1/] Figure 2-4	Area ☑ acres ☐ mi^2 ☐ %	Product of CN x area
		98			0.03	

[1/] Use only one CN source per line

Totals ➡ 0.03

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = _____ = _____ ; **Use CN** ➡ 98

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr			
Rainfall, P (24-hour) ..... in			
Runoff, Q ..... in			

(Use P and CN with table 2-1, figure 2-1, or equation 2-3 and 2-4)

HYDROGRAPH REPORTS

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.2

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	SCS Runoff	-------	-------	0.001	-------	-------	0.010	0.030	-------	0.135	E-1
2	SCS Runoff	-------	-------	0.000	-------	-------	0.005	0.017	-------	0.082	P-1
3	SCS Runoff	-------	-------	0.047	-------	-------	0.068	0.081	-------	0.107	P-2
4	SCS Runoff	-------	-------	0.093	-------	-------	0.136	0.161	-------	0.213	P-3
5	Reservoir	3	-------	0.000	-------	-------	0.000	0.000	-------	0.005	Chamber Sys A
6	Reservoir	4	-------	0.000	-------	-------	0.000	0.019	-------	0.221	Chamber Sys B
7	Combine	2, 5, 6	-------	0.000	-------	-------	0.005	0.031	-------	0.301	Flow to SP-A

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.2

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.001	1	1324	8	----	------	------	E-1
2	SCS Runoff	0.000	1	1324	3	----	------	------	P-1
3	SCS Runoff	0.047	1	724	161	----	------	------	P-2
4	SCS Runoff	0.093	1	724	322	----	------	------	P-3
5	Reservoir	0.000	1	655	0	3	209.20	56.2	Chamber Sys A
6	Reservoir	0.000	1	605	0	4	229.47	126	Chamber Sys B
7	Combine	0.000	1	1324	3	2, 5, 6	------	------	Flow to SP-A

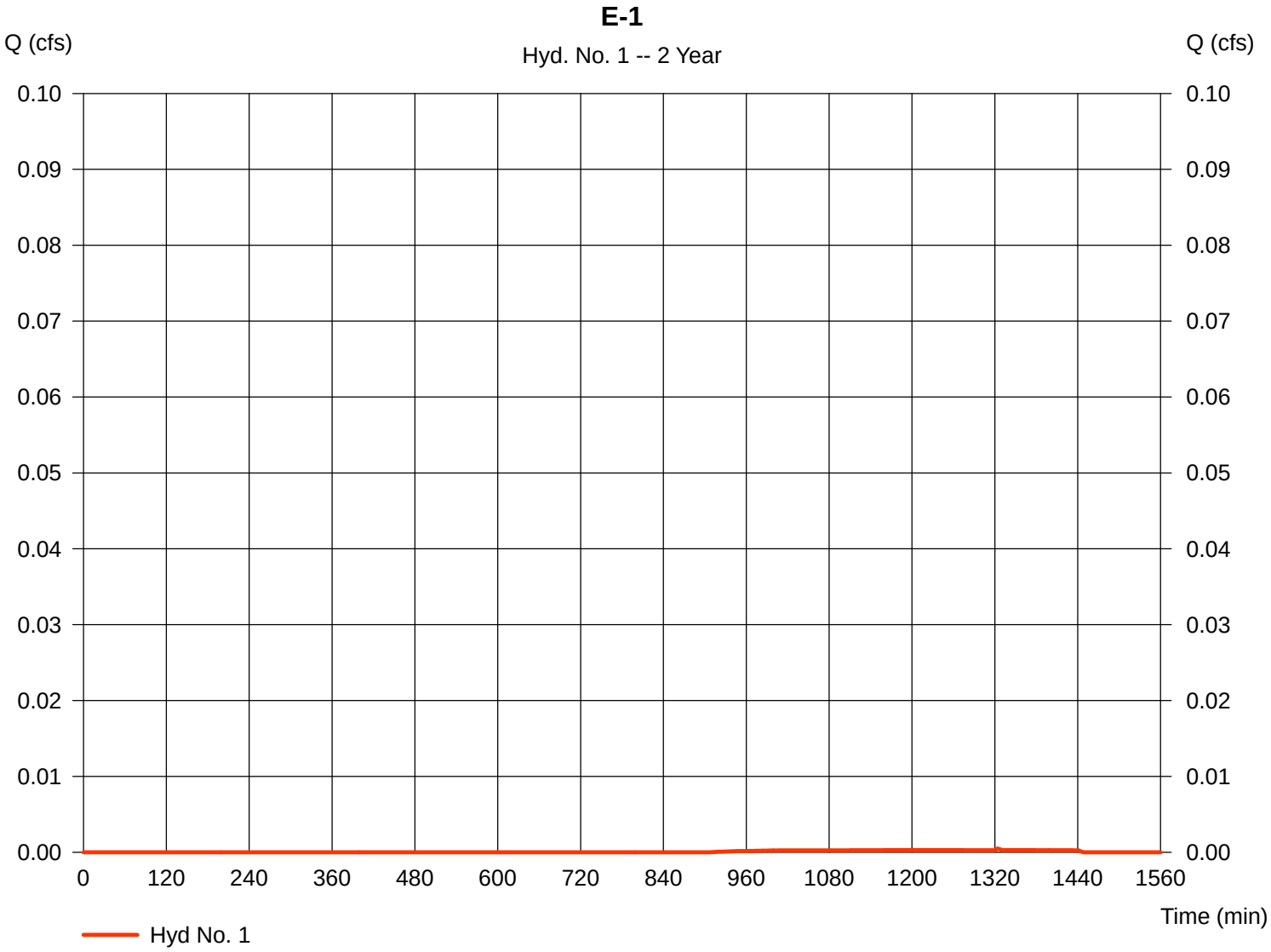
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 1

E-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.001 cfs
Storm frequency	=	2 yrs	Time to peak	=	1324 min
Time interval	=	1 min	Hyd. volume	=	8 cuft
Drainage area	=	0.150 ac	Curve number	=	43
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



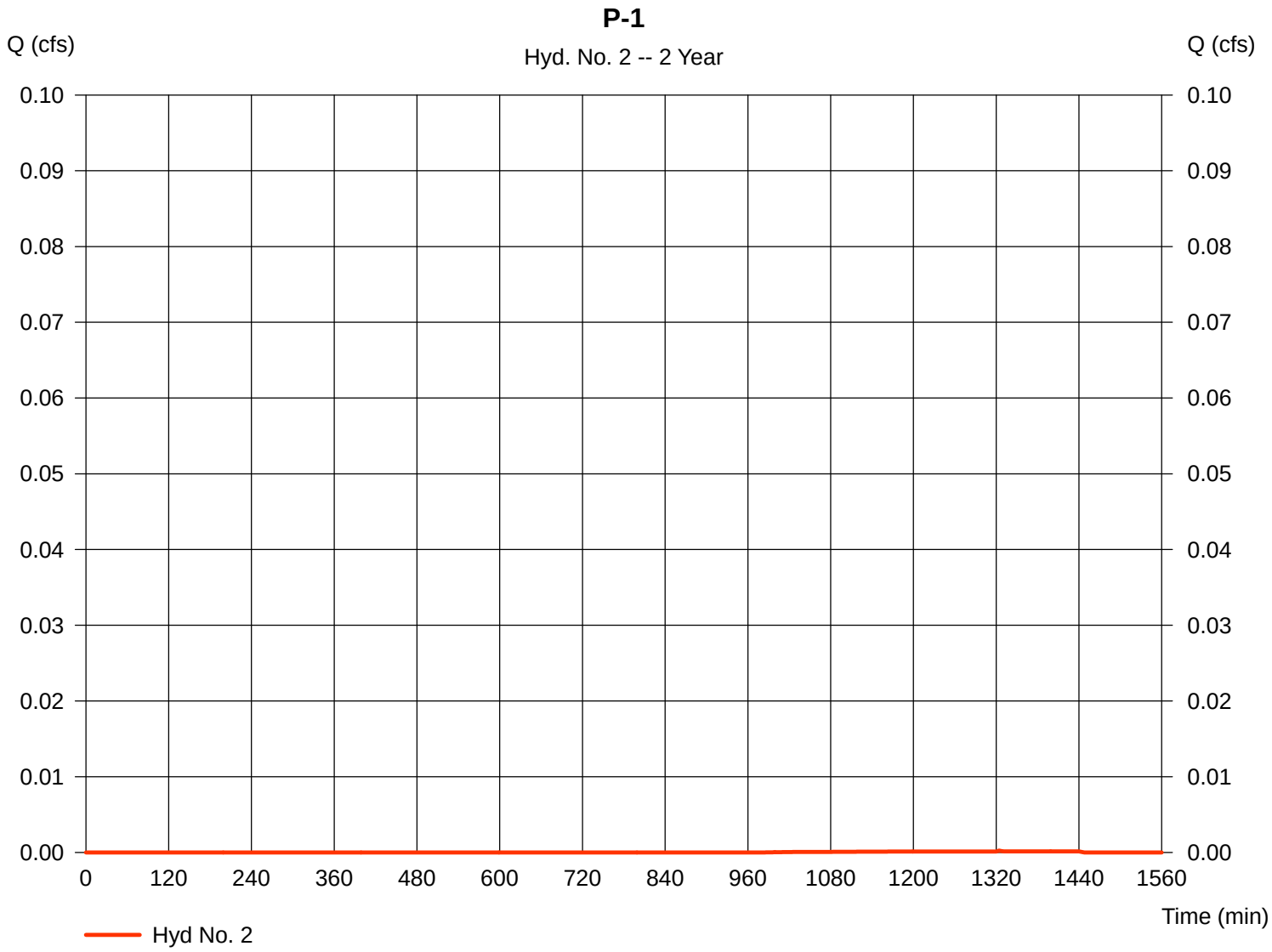
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 2

P-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	1324 min
Time interval	=	1 min	Hyd. volume	=	3 cuft
Drainage area	=	0.105 ac	Curve number	=	42
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

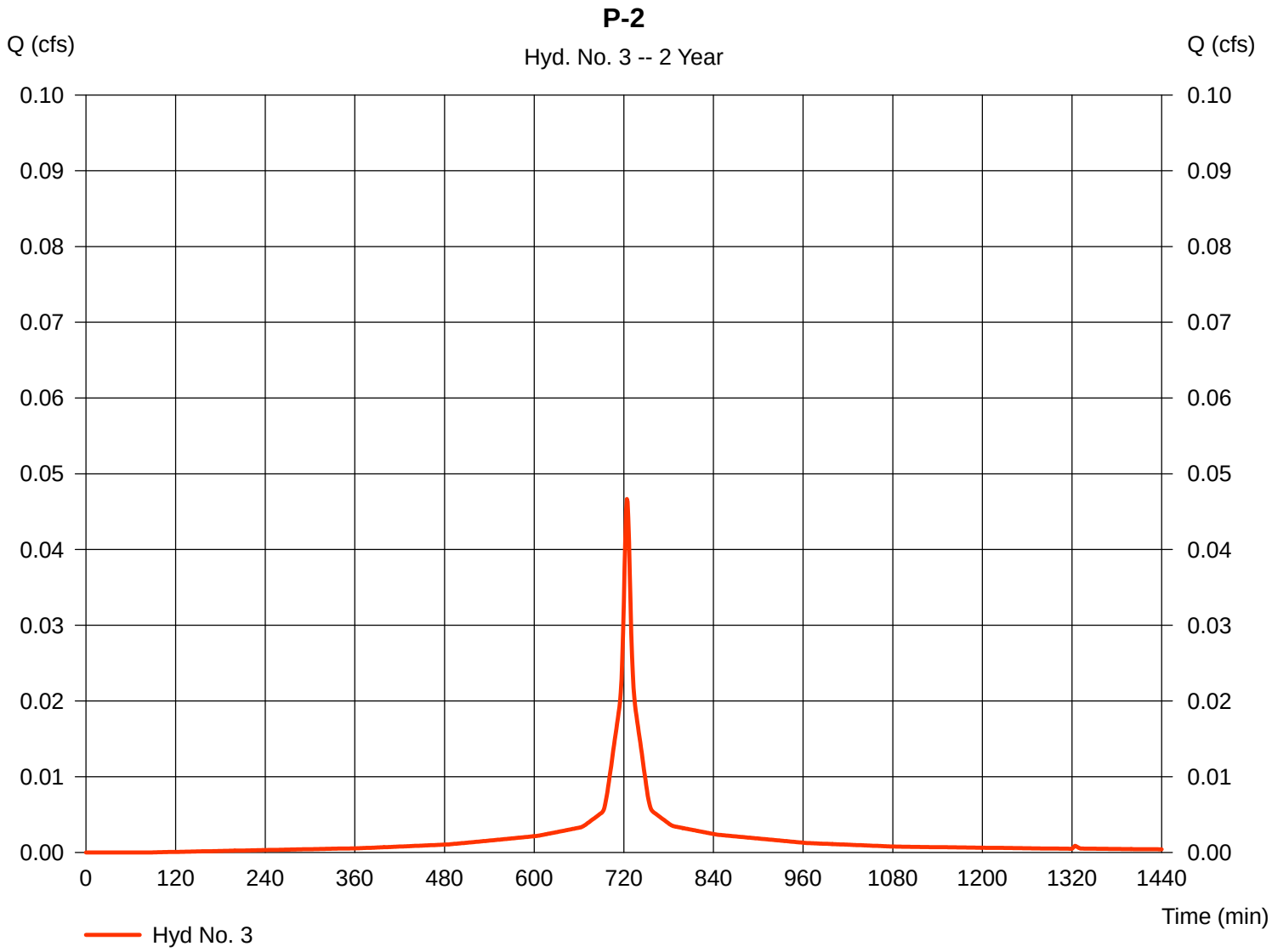


Hydrograph Report

Hyd. No. 3

P-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.047 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	161 cuft
Drainage area	=	0.015 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484

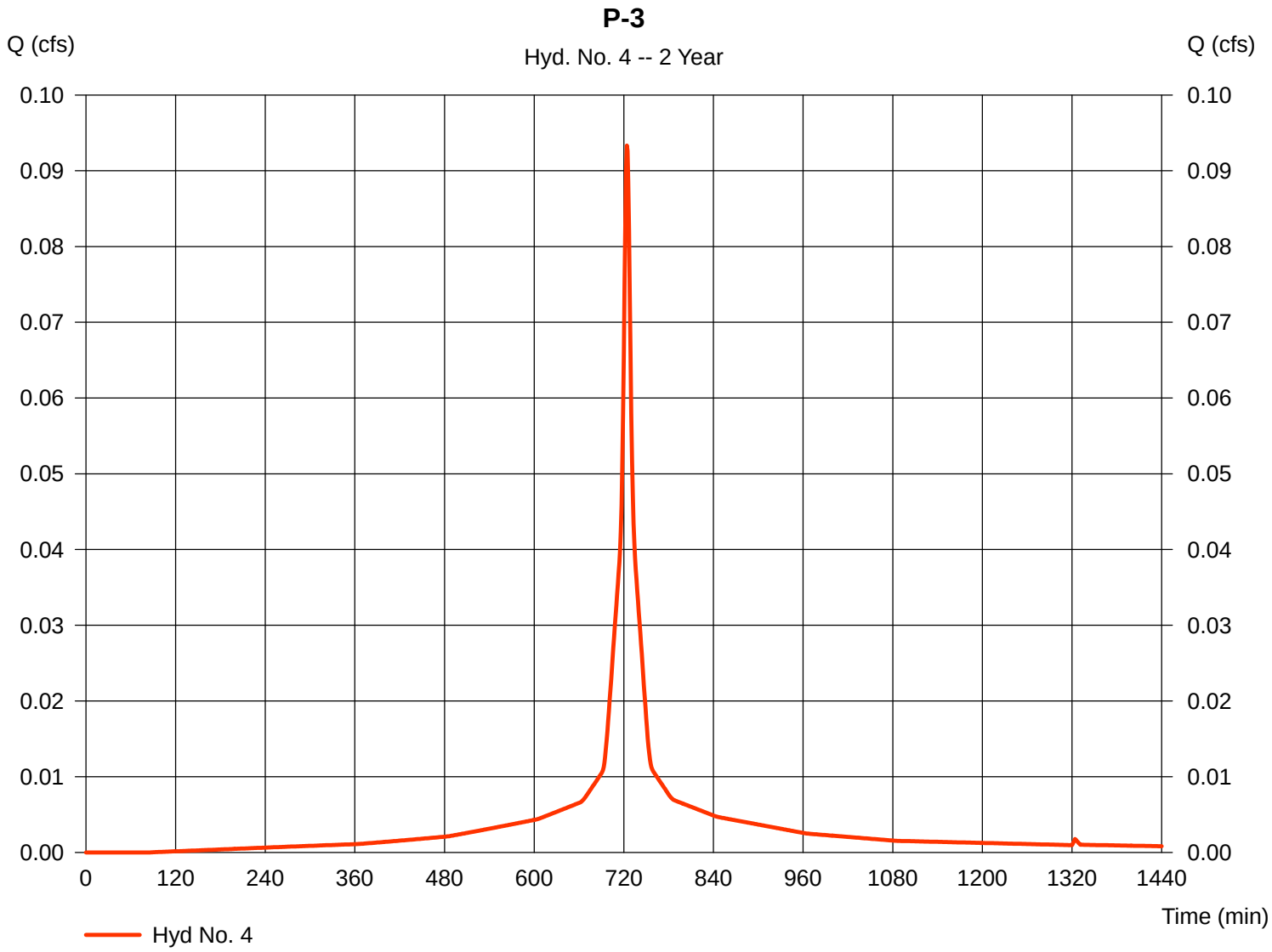


Hydrograph Report

Hyd. No. 4

P-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.093 cfs
Storm frequency	=	2 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	322 cuft
Drainage area	=	0.030 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	3.10 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

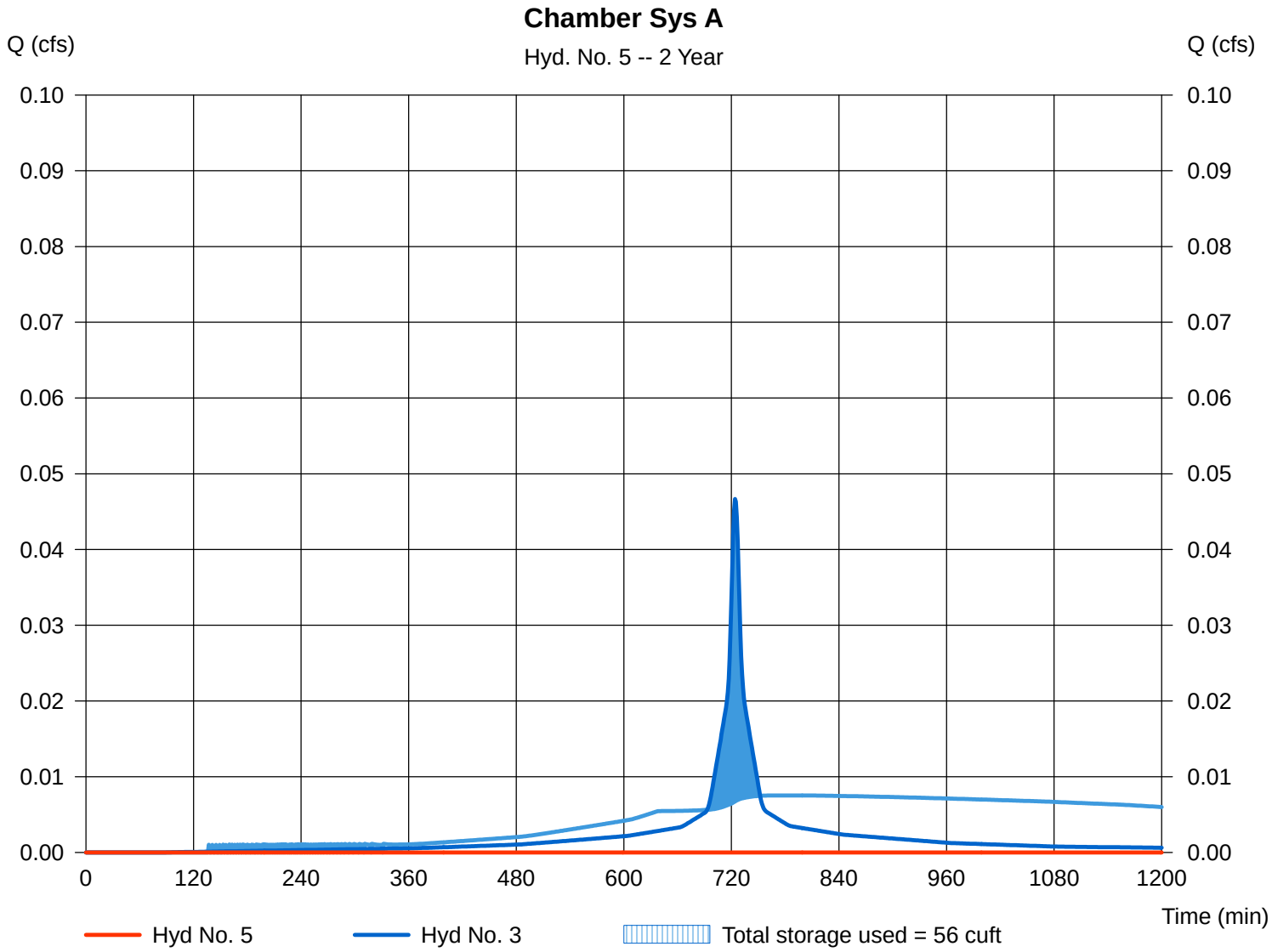
Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 5

Chamber Sys A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	655 min
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	3 - P-2	Max. Elevation	=	209.20 ft
Reservoir name	=	RA-B	Max. Storage	=	56 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Pond No. 1 - RA-B

Pond Data

UG Chambers - Invert elev. = 209.00 ft, Rise x Span = 1.00 x 3.00 ft, Barrel Len = 32.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement - Invert elev. = 208.50 ft, Width = 5.00 ft, Height = 2.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	208.50	n/a	0	0
0.20	208.70	n/a	13	13
0.40	208.90	n/a	13	26
0.60	209.10	n/a	19	44
0.80	209.30	n/a	24	68
1.00	209.50	n/a	23	92
1.20	209.70	n/a	22	114
1.40	209.90	n/a	20	133
1.60	210.10	n/a	14	148
1.80	210.30	n/a	13	160
2.00	210.50	n/a	13	173

Culvert / Orifice Structures

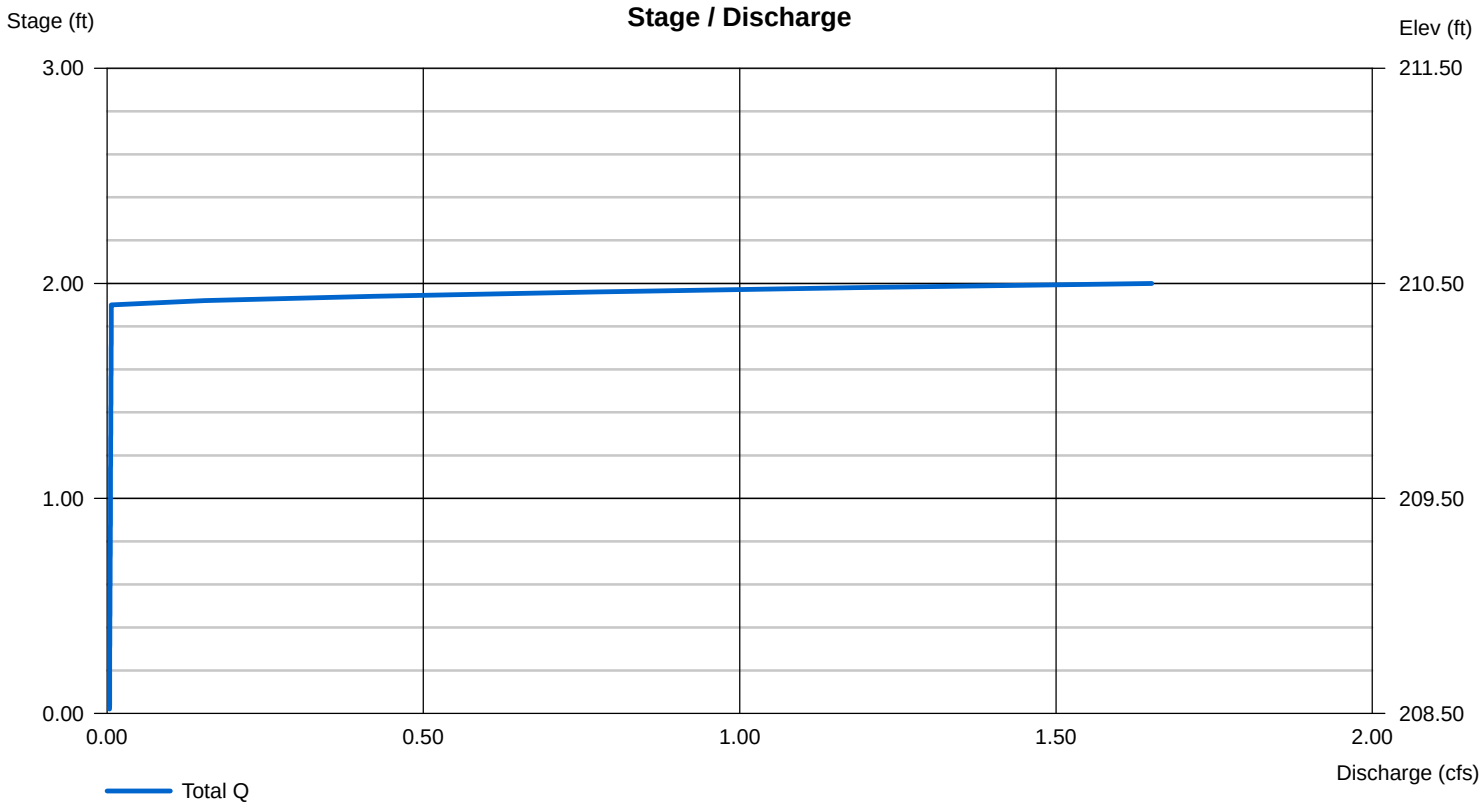
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 210.40	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.020 (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).



Hydrograph Report

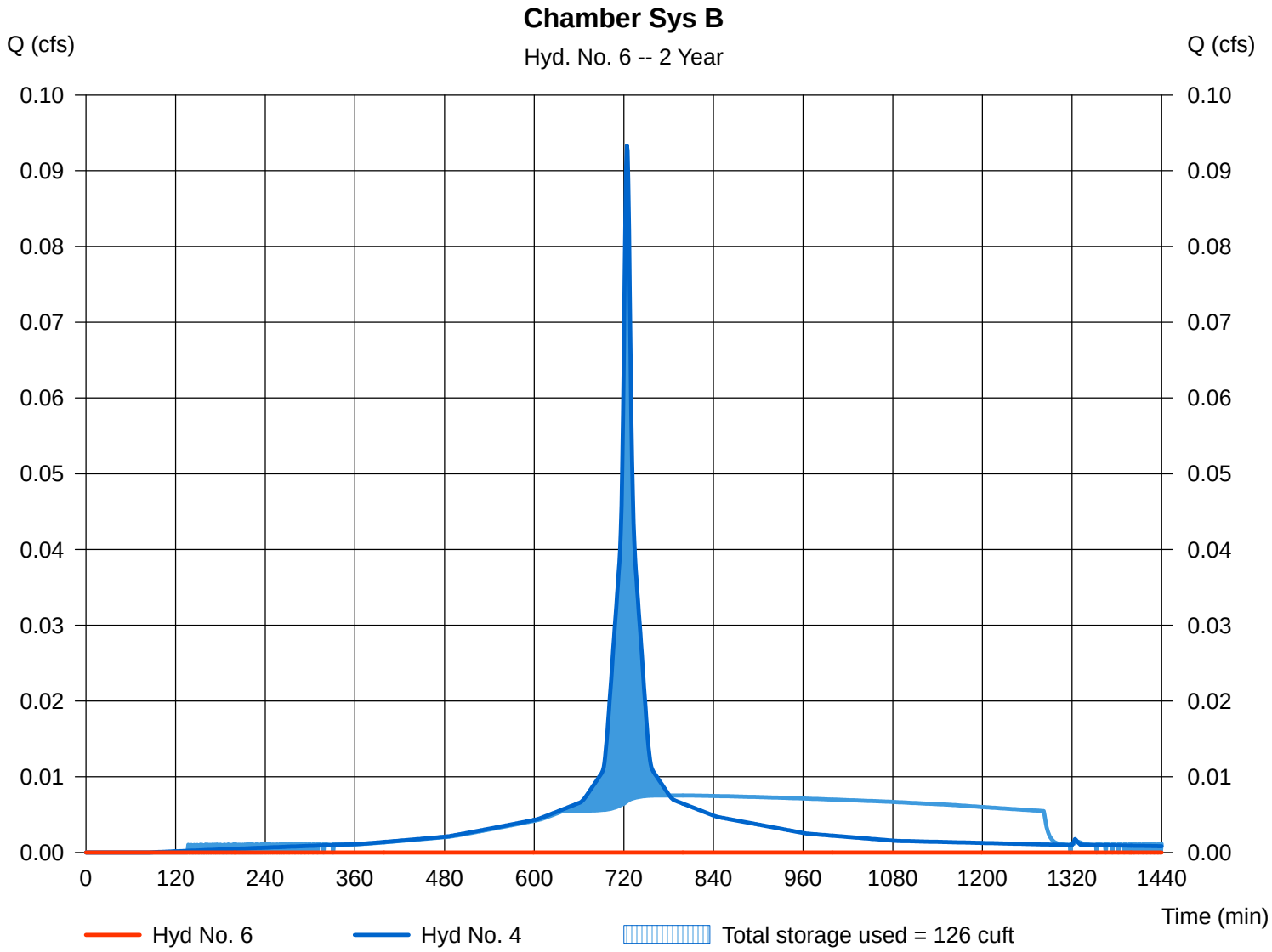
Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 6

Chamber Sys B

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	605 min
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	4 - P-3	Max. Elevation	=	229.47 ft
Reservoir name	=	RA-B	Max. Storage	=	126 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Pond Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Pond No. 2 - RA-B

Pond Data

UG Chambers - Invert elev. = 229.00 ft, Rise x Span = 1.00 x 3.00 ft, Barrel Len = 23.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Encasement - Invert elev. = 228.50 ft, Width = 5.00 ft, Height = 2.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	228.50	n/a	0	0
0.20	228.70	n/a	18	18
0.40	228.90	n/a	18	37
0.60	229.10	n/a	27	63
0.80	229.30	n/a	35	98
1.00	229.50	n/a	34	132
1.20	229.70	n/a	32	163
1.40	229.90	n/a	28	191
1.60	230.10	n/a	21	212
1.80	230.30	n/a	18	231
2.00	230.50	n/a	18	249

Culvert / Orifice Structures

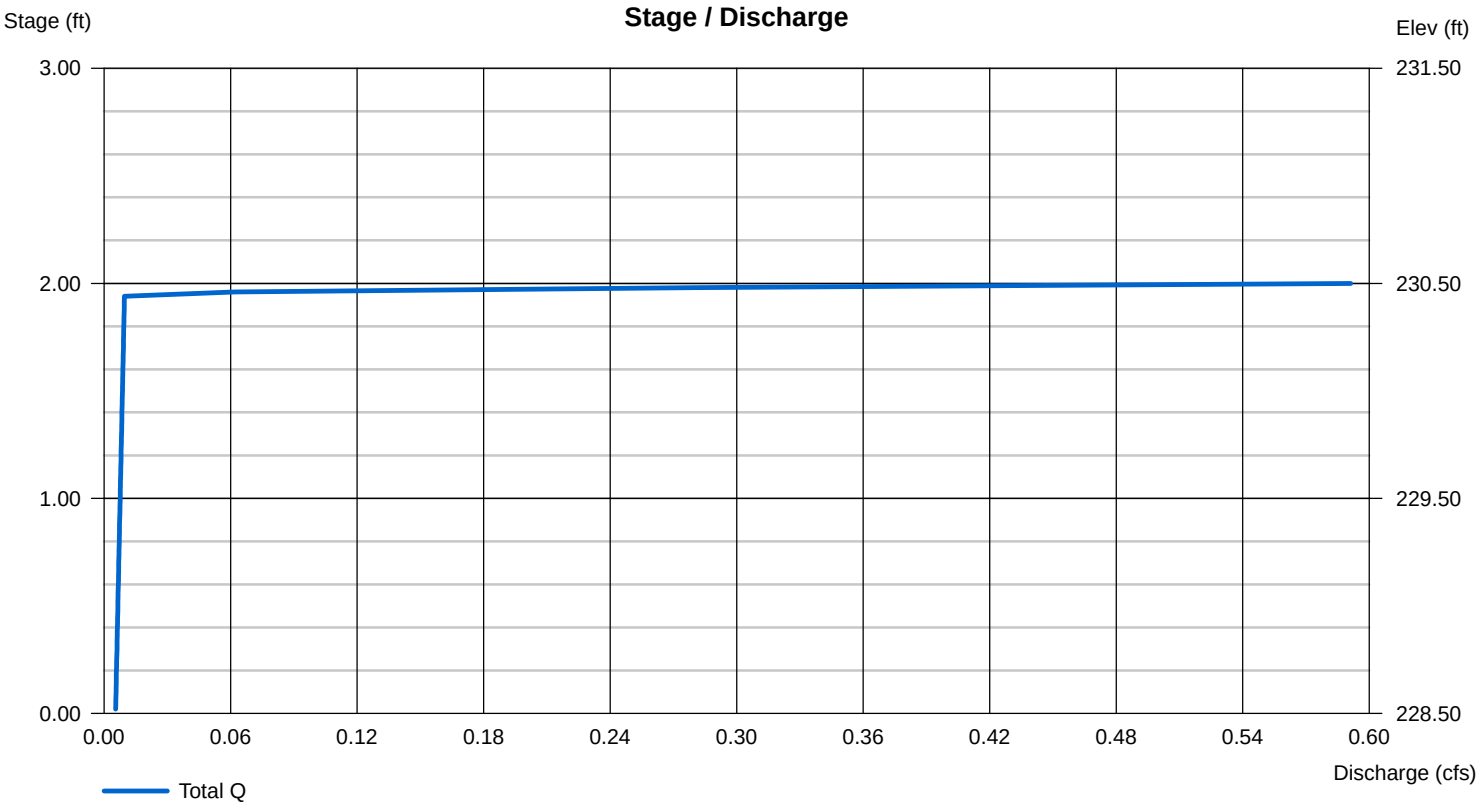
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 230.45	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.020 (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).



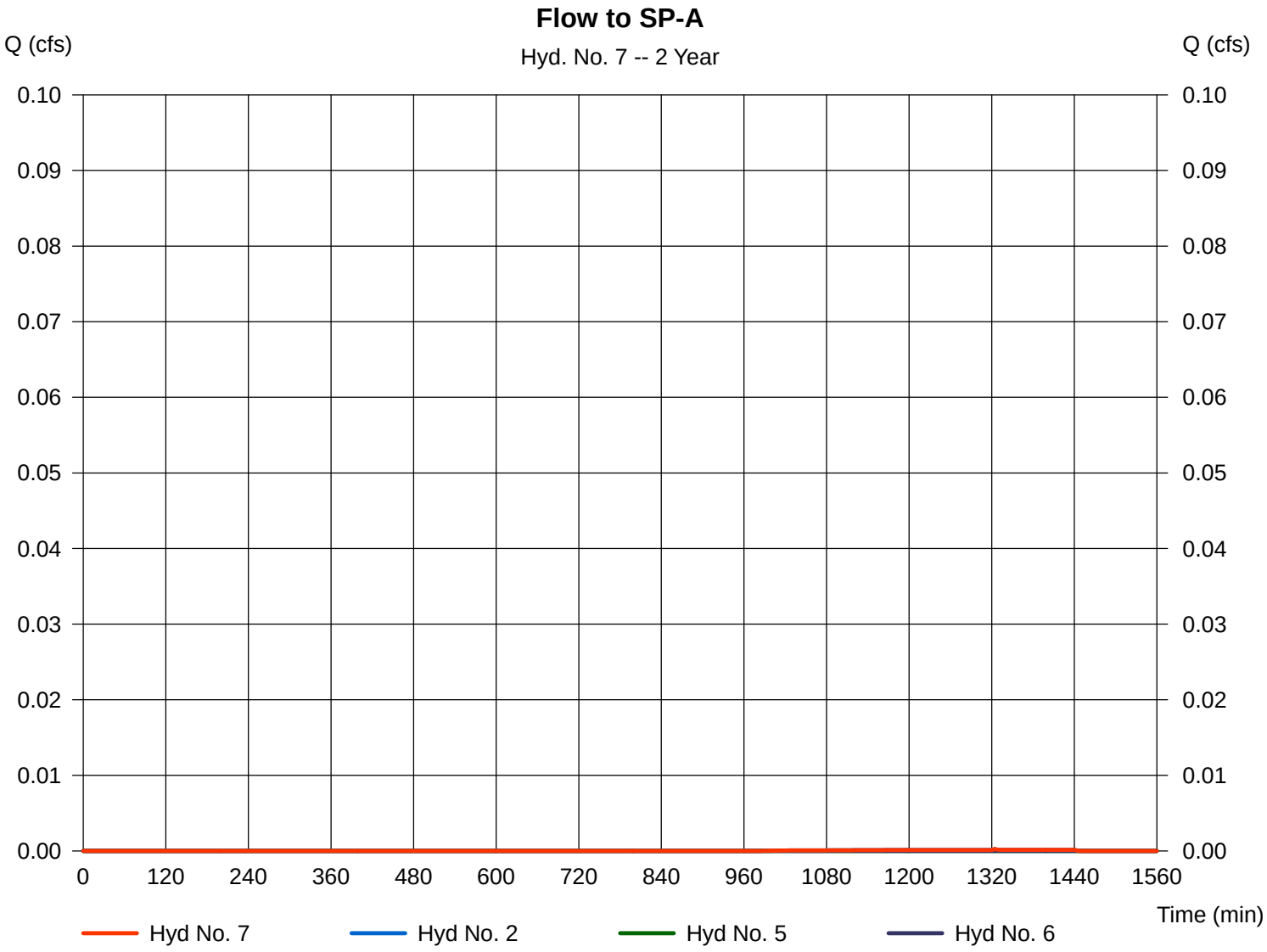
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 7

Flow to SP-A

Hydrograph type	=	Combine	Peak discharge	=	0.000 cfs
Storm frequency	=	2 yrs	Time to peak	=	1324 min
Time interval	=	1 min	Hyd. volume	=	3 cuft
Inflow hyds.	=	2, 5, 6	Contrib. drain. area	=	0.105 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.2

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.010	1	744	127	----	------	------	E-1
2	SCS Runoff	0.005	1	746	76	----	------	------	P-1
3	SCS Runoff	0.068	1	724	239	----	------	------	P-2
4	SCS Runoff	0.136	1	724	479	----	------	------	P-3
5	Reservoir	0.000	1	599	0	3	209.53	94.4	Chamber Sys A
6	Reservoir	0.000	1	424	0	4	230.09	211	Chamber Sys B
7	Combine	0.005	1	746	76	2, 5, 6	------	------	Flow to SP-A

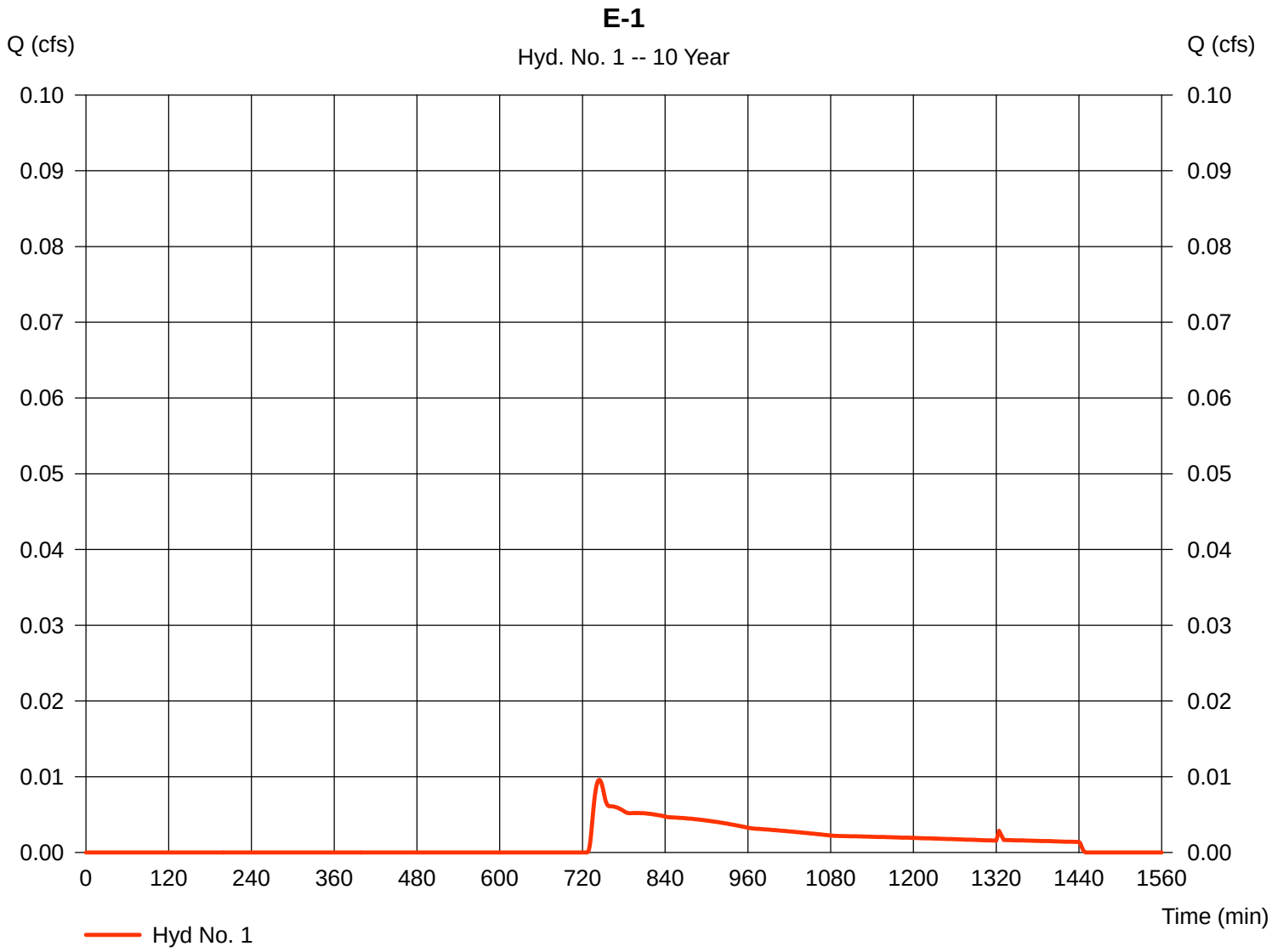
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 1

E-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.010 cfs
Storm frequency	=	10 yrs	Time to peak	=	744 min
Time interval	=	1 min	Hyd. volume	=	127 cuft
Drainage area	=	0.150 ac	Curve number	=	43
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.50 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



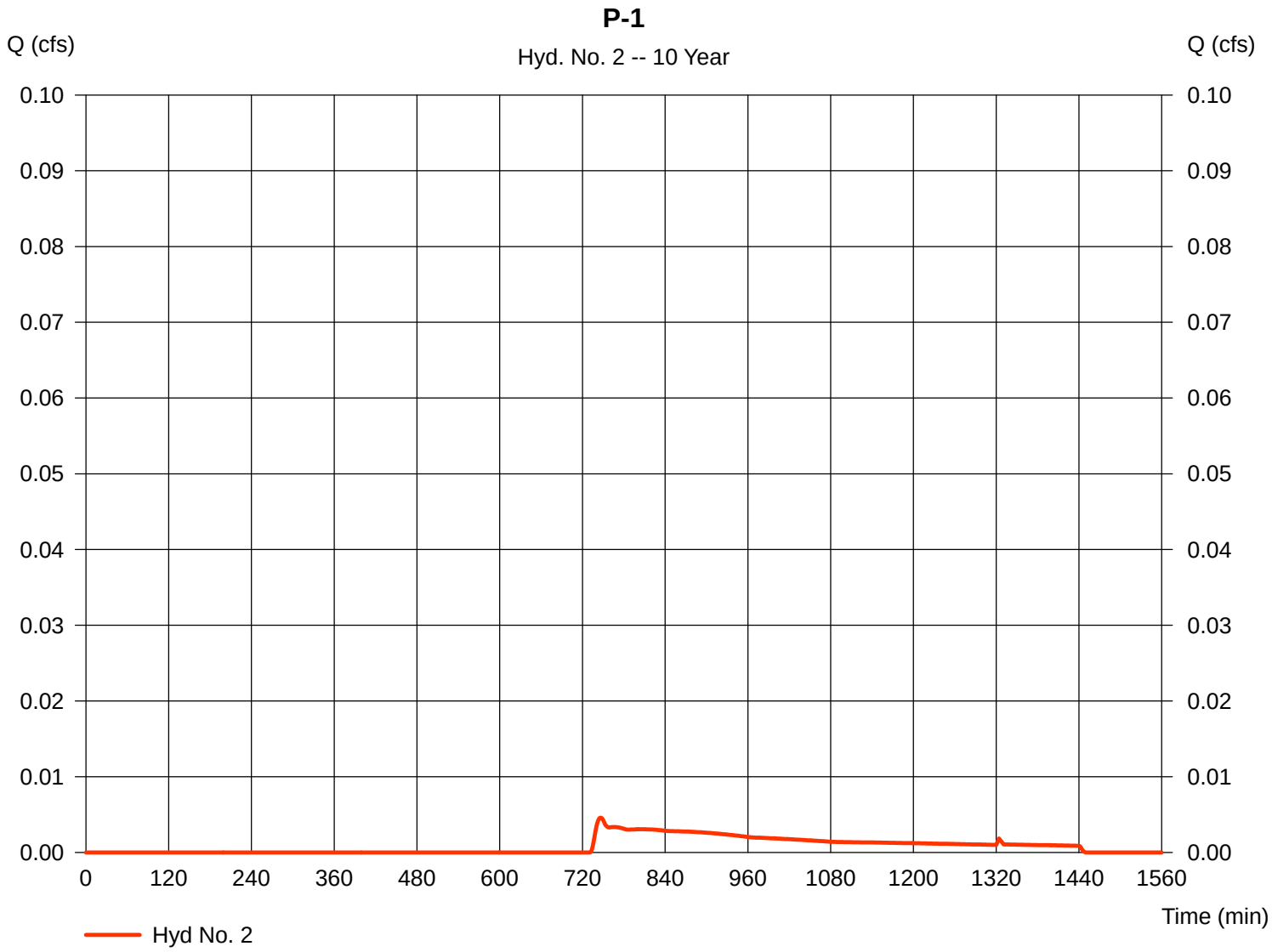
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 2

P-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.005 cfs
Storm frequency	=	10 yrs	Time to peak	=	746 min
Time interval	=	1 min	Hyd. volume	=	76 cuft
Drainage area	=	0.105 ac	Curve number	=	42
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.50 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



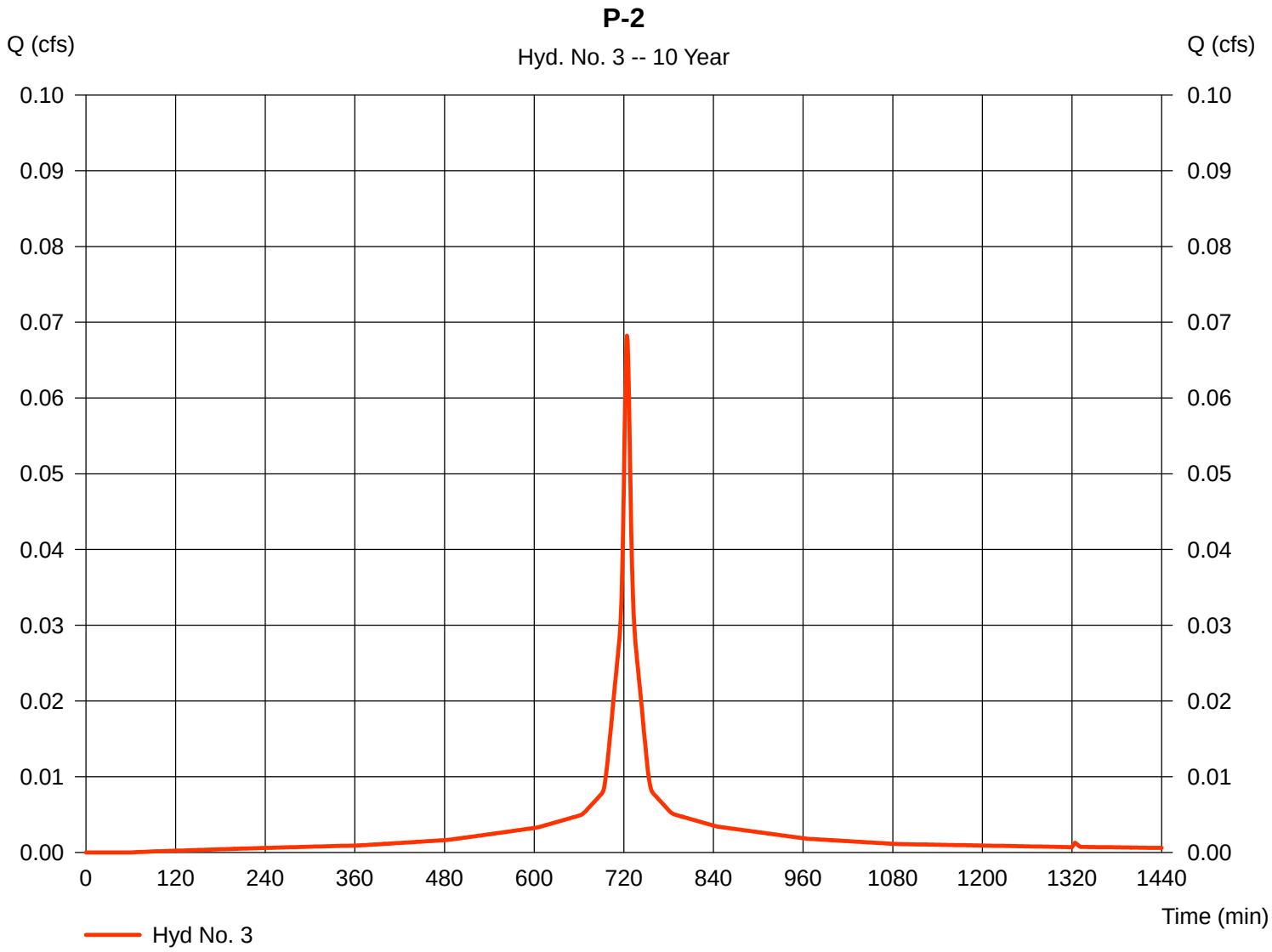
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 3

P-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.068 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	239 cuft
Drainage area	=	0.015 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.50 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



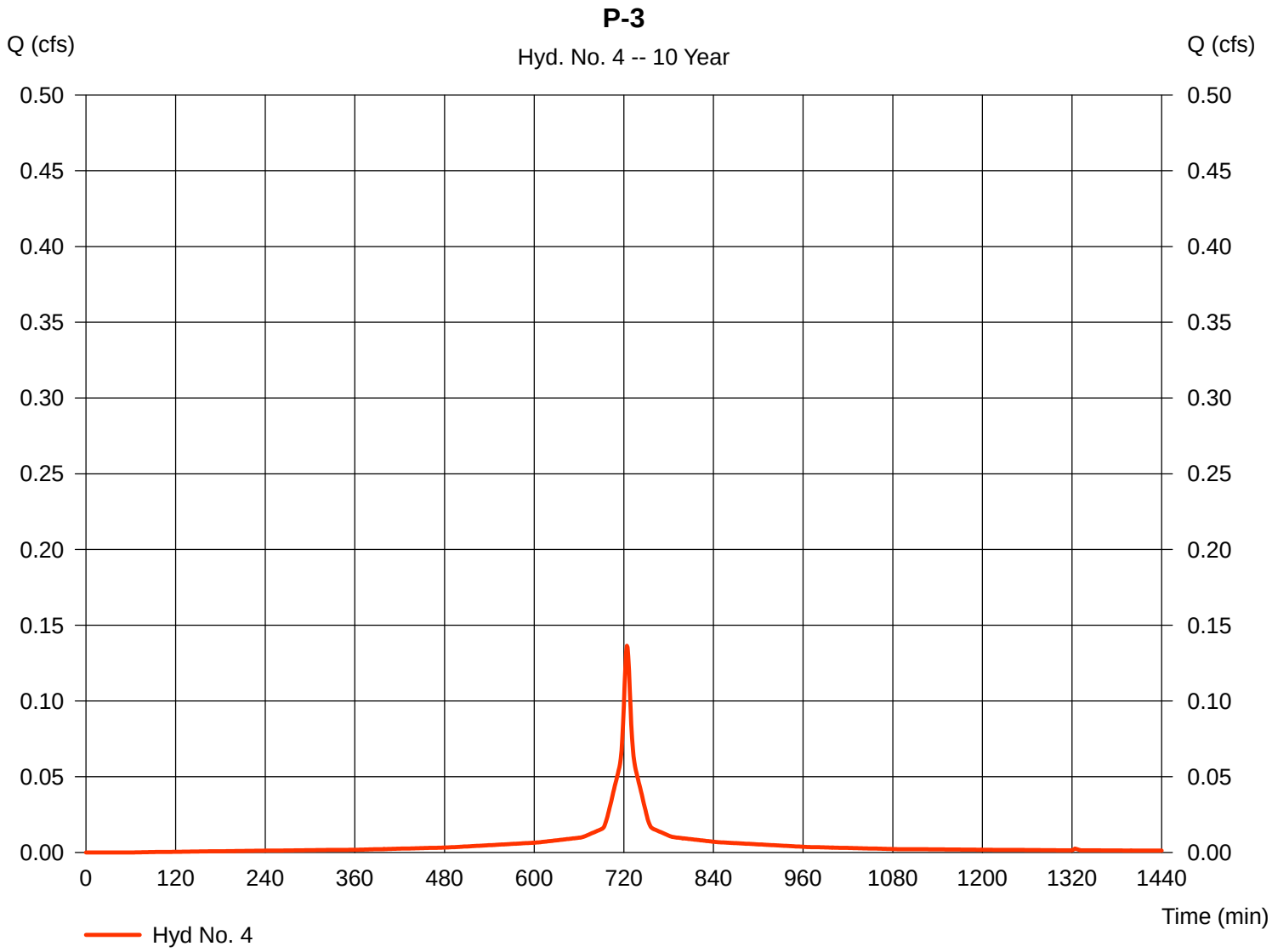
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 4

P-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.136 cfs
Storm frequency	=	10 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	479 cuft
Drainage area	=	0.030 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	4.50 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

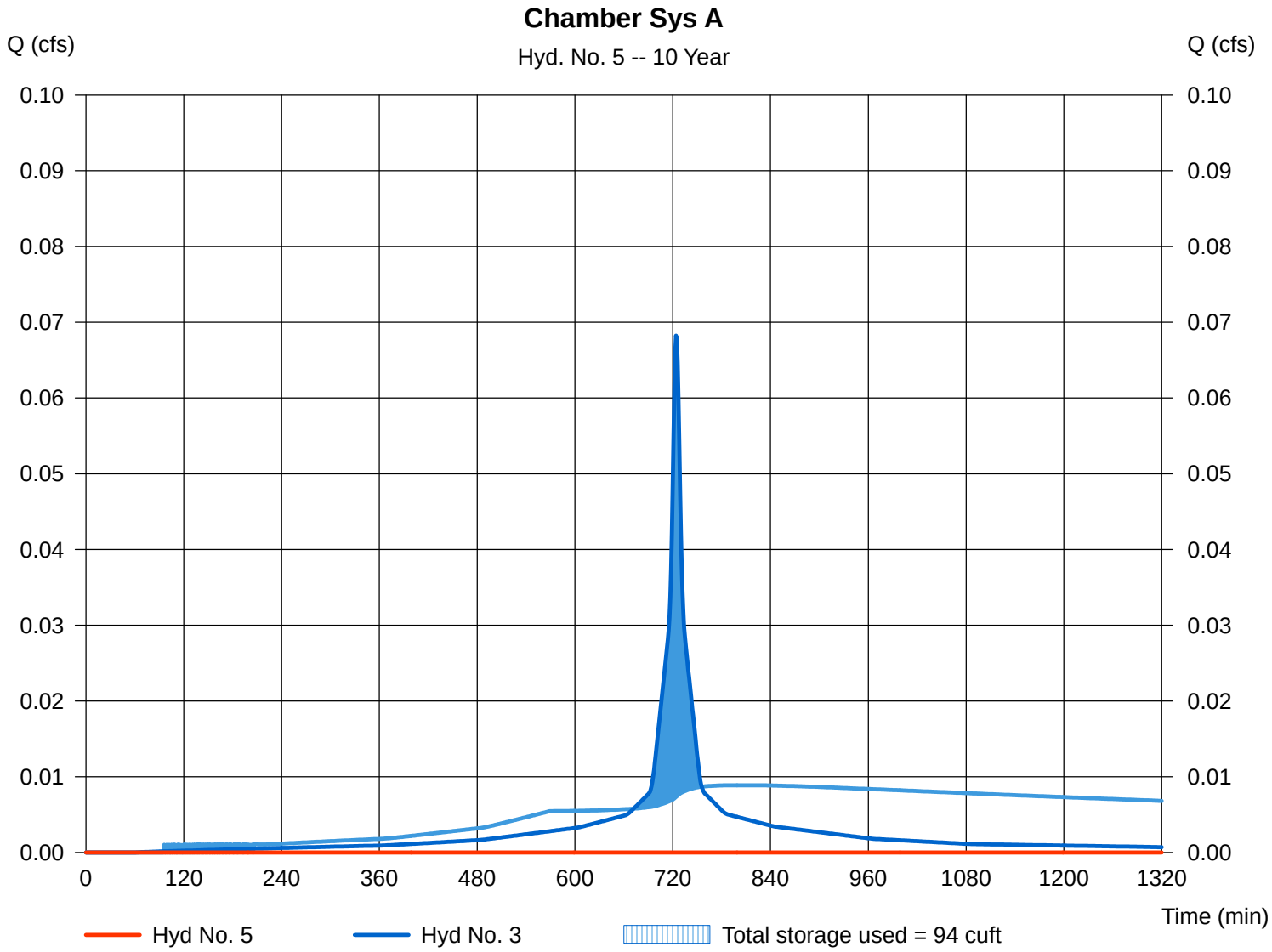
Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 5

Chamber Sys A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	10 yrs	Time to peak	=	599 min
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	3 - P-2	Max. Elevation	=	209.53 ft
Reservoir name	=	RA-B	Max. Storage	=	94 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

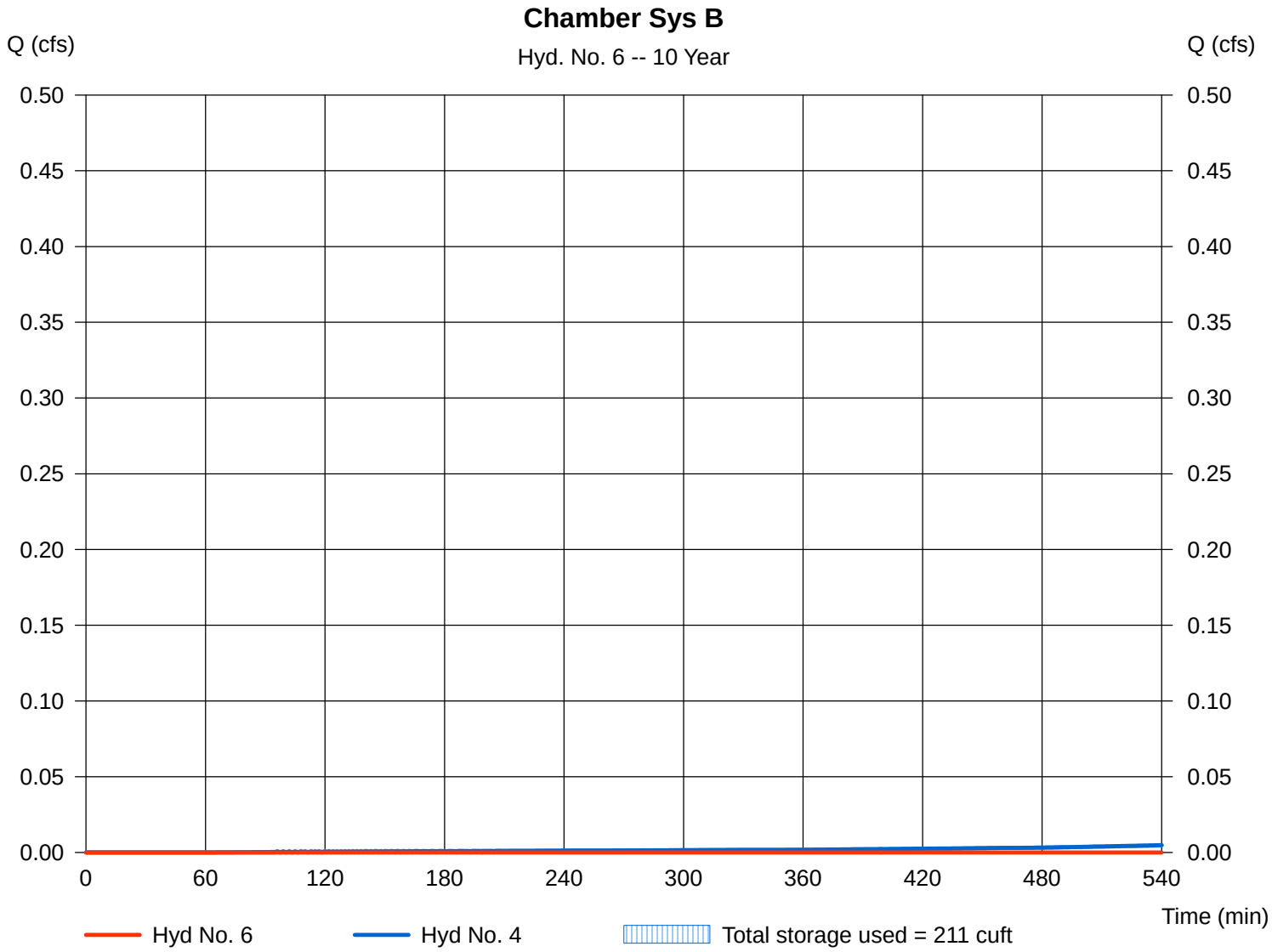
Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 6

Chamber Sys B

Hydrograph type	= Reservoir	Peak discharge	= 0.000 cfs
Storm frequency	= 10 yrs	Time to peak	= 424 min
Time interval	= 1 min	Hyd. volume	= 0 cuft
Inflow hyd. No.	= 4 - P-3	Max. Elevation	= 230.09 ft
Reservoir name	= RA-B	Max. Storage	= 211 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



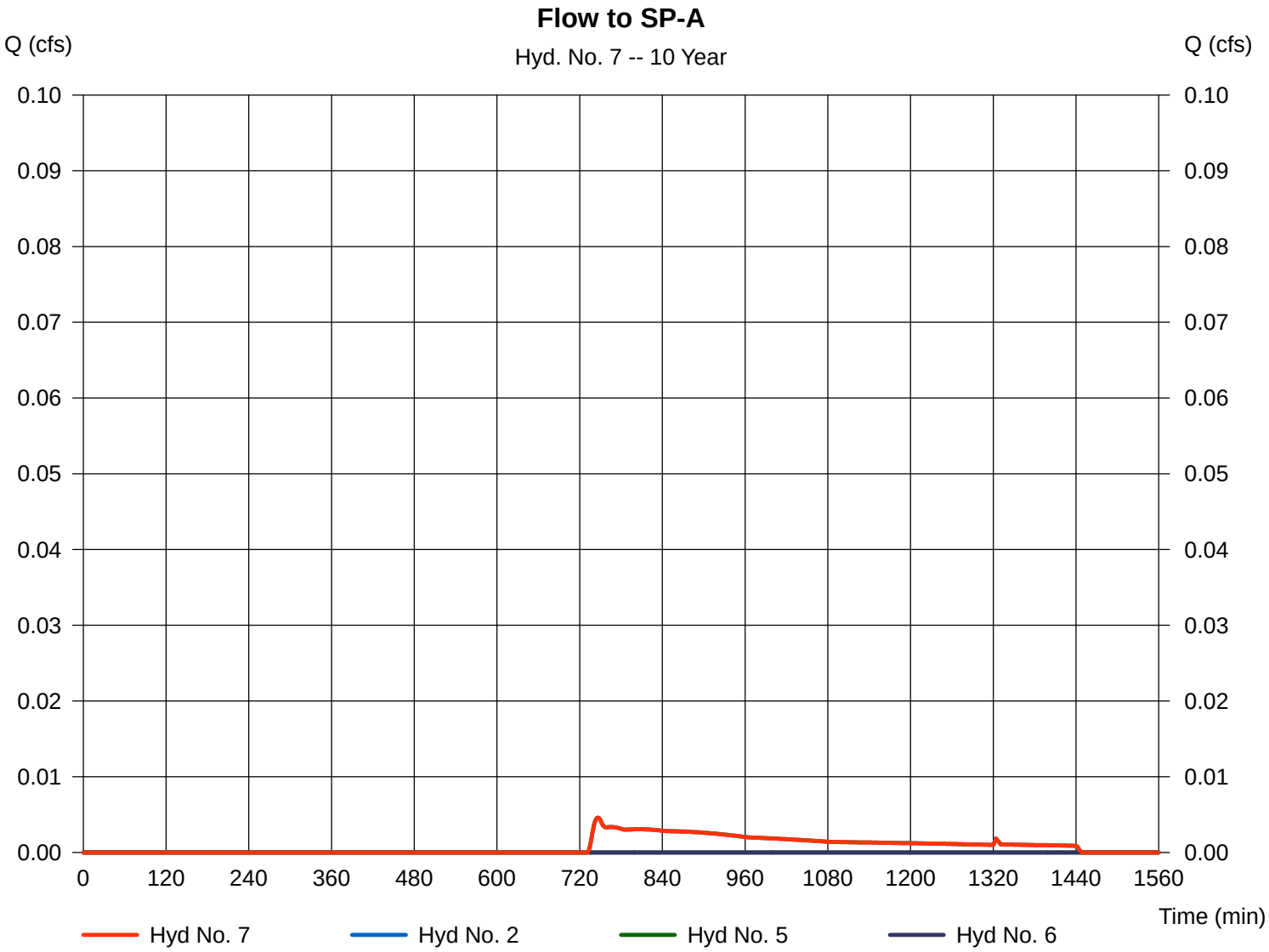
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 7

Flow to SP-A

Hydrograph type	=	Combine	Peak discharge	=	0.005 cfs
Storm frequency	=	10 yrs	Time to peak	=	746 min
Time interval	=	1 min	Hyd. volume	=	76 cuft
Inflow hyds.	=	2, 5, 6	Contrib. drain. area	=	0.105 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.2

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.030	1	738	248	----	------	------	E-1
2	SCS Runoff	0.017	1	740	155	----	------	------	P-1
3	SCS Runoff	0.081	1	724	284	----	------	------	P-2
4	SCS Runoff	0.161	1	724	569	----	------	------	P-3
5	Reservoir	0.000	1	554	0	3	209.75	118	Chamber Sys A
6	Reservoir	0.019	1	751	19	4	230.45	244	Chamber Sys B
7	Combine	0.031	1	751	174	2, 5, 6	------	------	Flow to SP-A

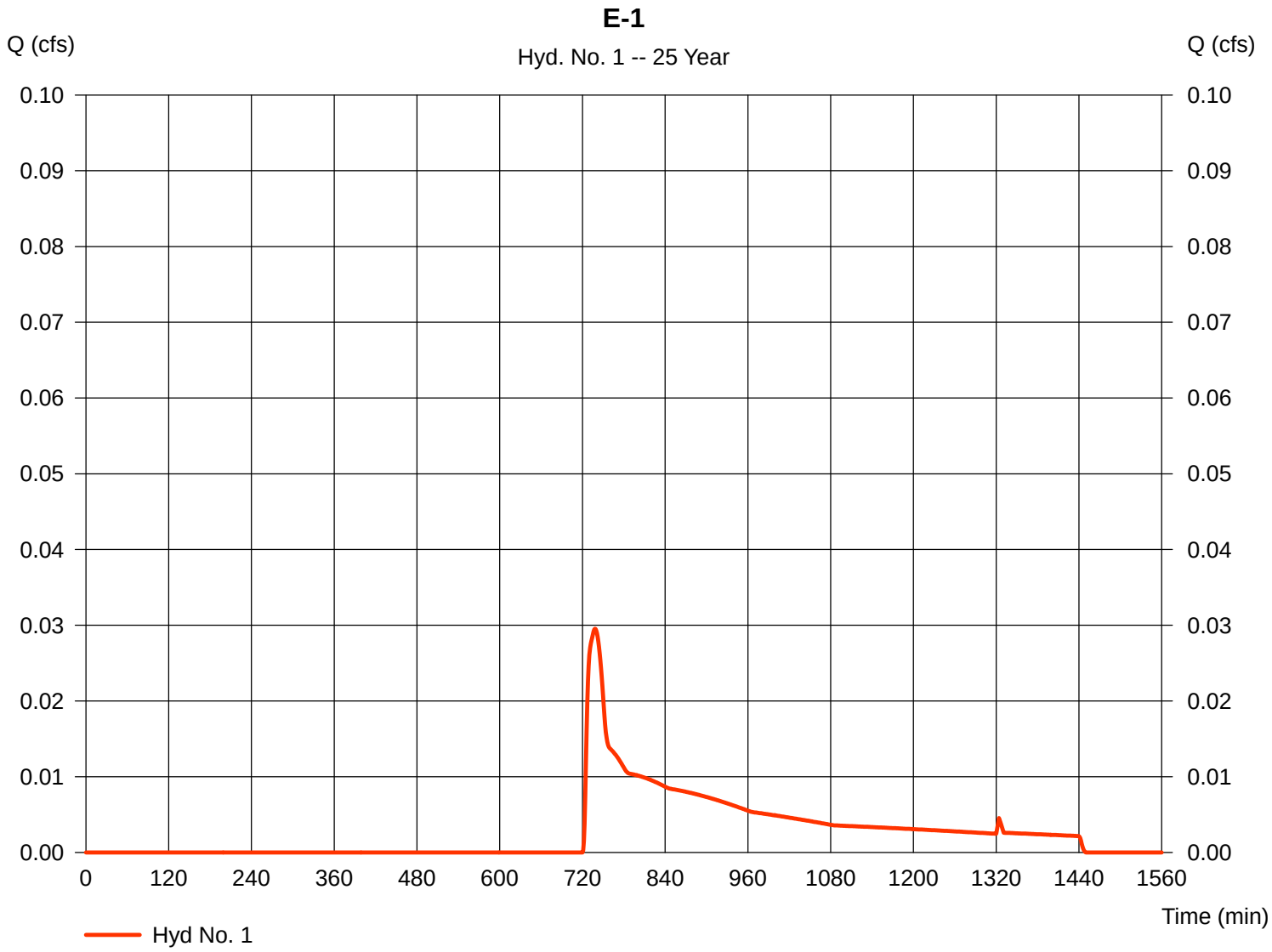
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 1

E-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.030 cfs
Storm frequency	=	25 yrs	Time to peak	=	738 min
Time interval	=	1 min	Hyd. volume	=	248 cuft
Drainage area	=	0.150 ac	Curve number	=	43
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.30 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



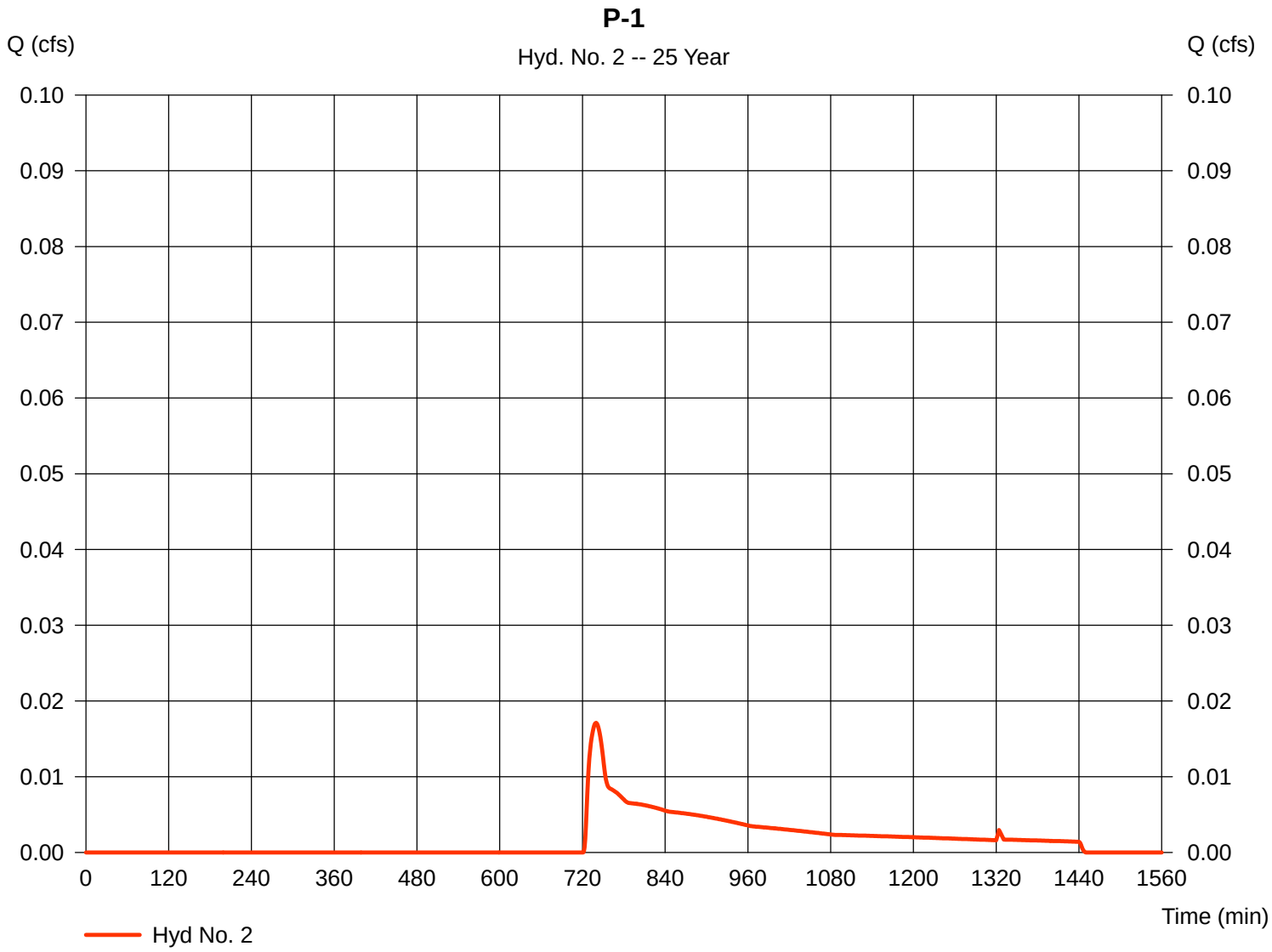
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 2

P-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.017 cfs
Storm frequency	=	25 yrs	Time to peak	=	740 min
Time interval	=	1 min	Hyd. volume	=	155 cuft
Drainage area	=	0.105 ac	Curve number	=	42
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.30 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



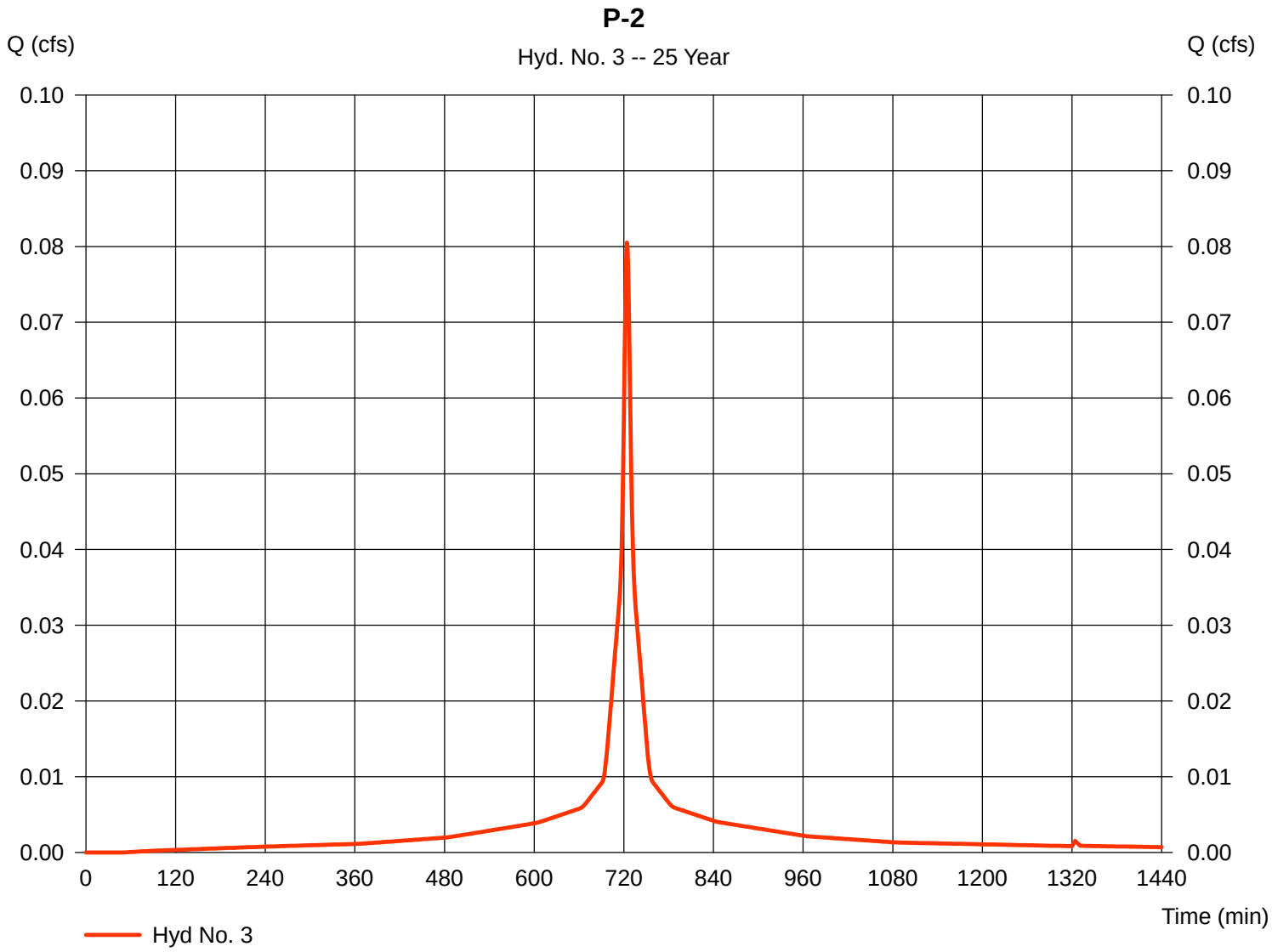
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 3

P-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.081 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	284 cuft
Drainage area	=	0.015 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.30 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



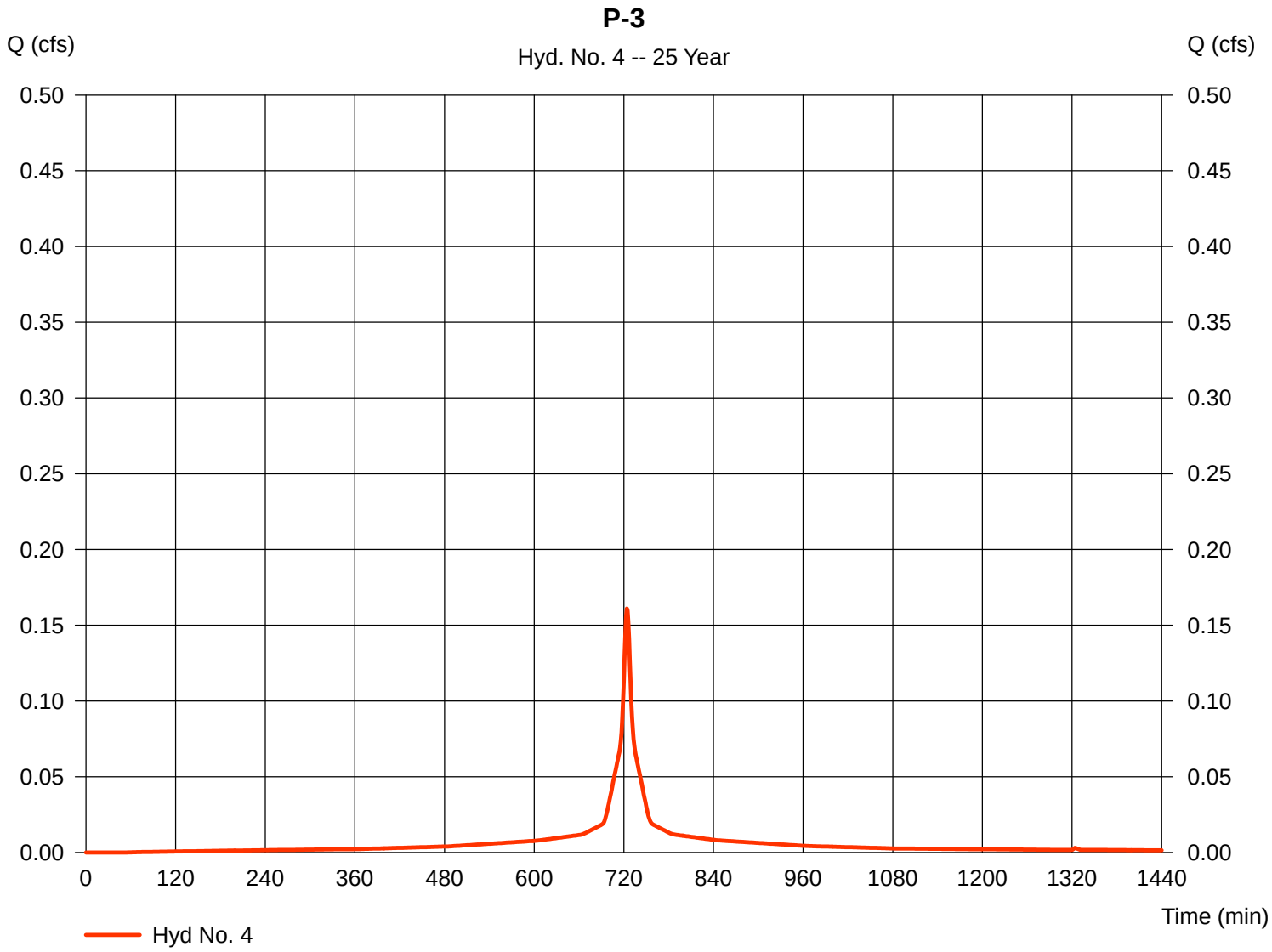
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 4

P-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.161 cfs
Storm frequency	=	25 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	569 cuft
Drainage area	=	0.030 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	5.30 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

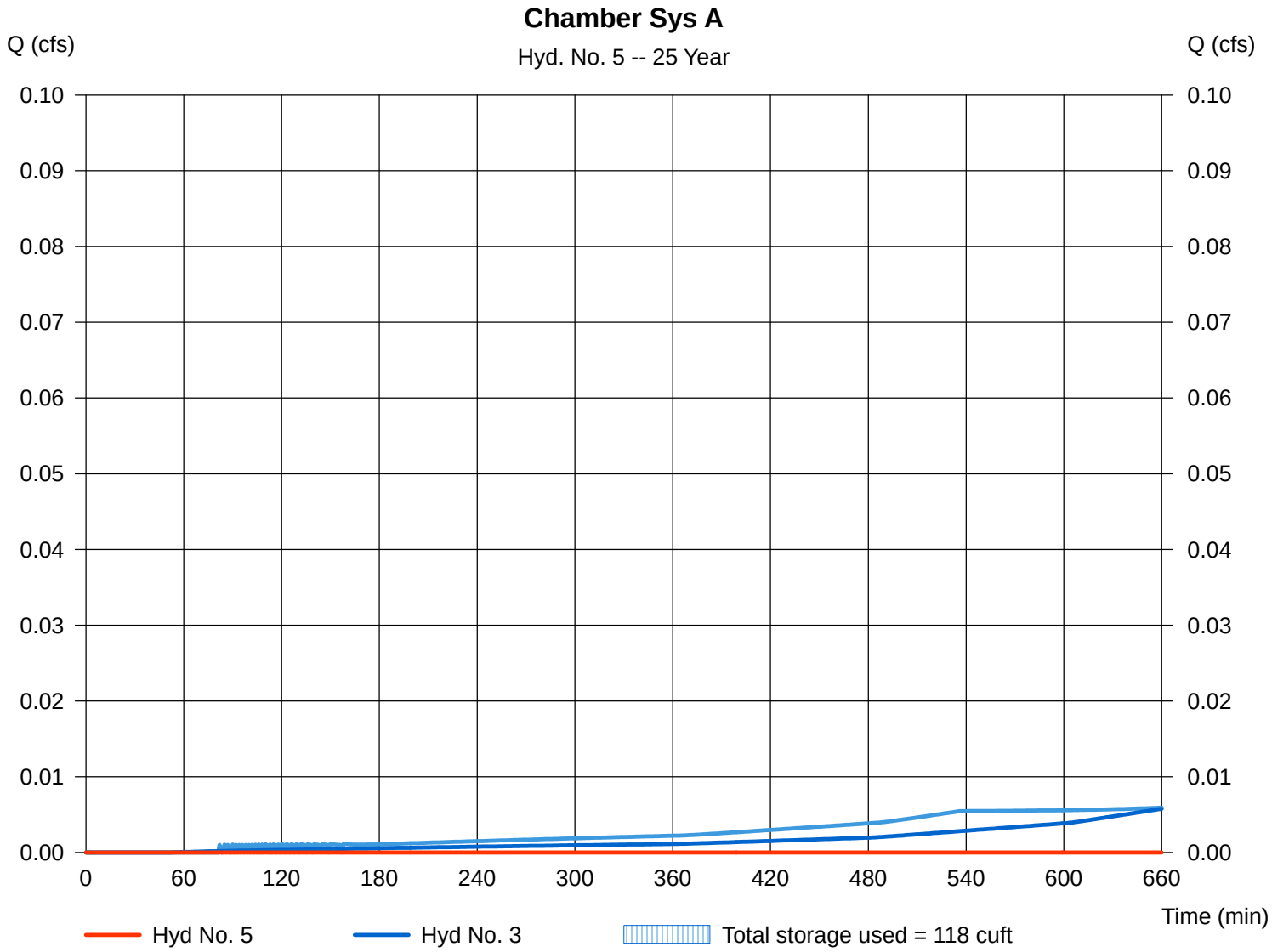
Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 5

Chamber Sys A

Hydrograph type	=	Reservoir	Peak discharge	=	0.000 cfs
Storm frequency	=	25 yrs	Time to peak	=	554 min
Time interval	=	1 min	Hyd. volume	=	0 cuft
Inflow hyd. No.	=	3 - P-2	Max. Elevation	=	209.75 ft
Reservoir name	=	RA-B	Max. Storage	=	118 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

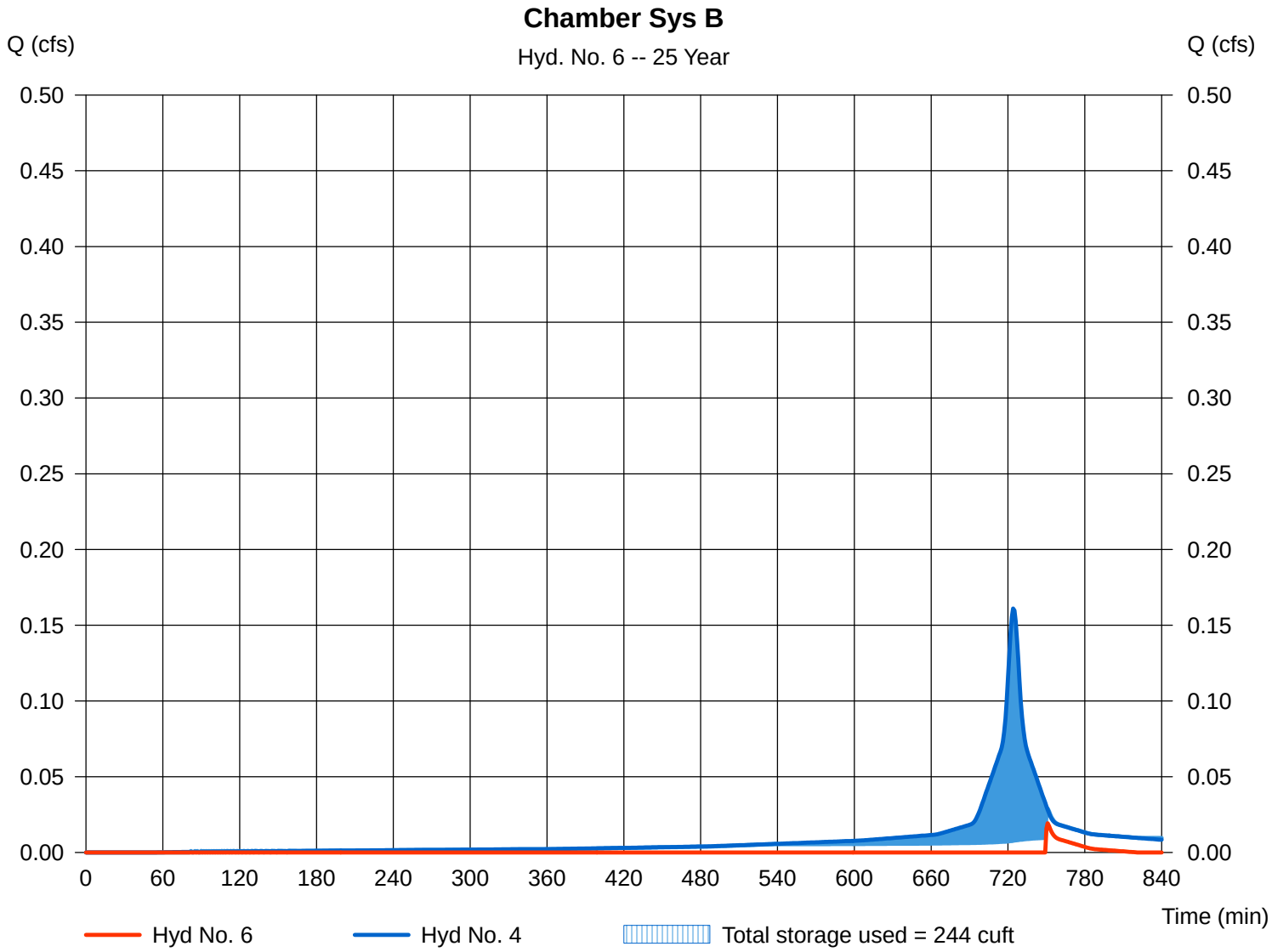
Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 6

Chamber Sys B

Hydrograph type	=	Reservoir	Peak discharge	=	0.019 cfs
Storm frequency	=	25 yrs	Time to peak	=	751 min
Time interval	=	1 min	Hyd. volume	=	19 cuft
Inflow hyd. No.	=	4 - P-3	Max. Elevation	=	230.45 ft
Reservoir name	=	RA-B	Max. Storage	=	244 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



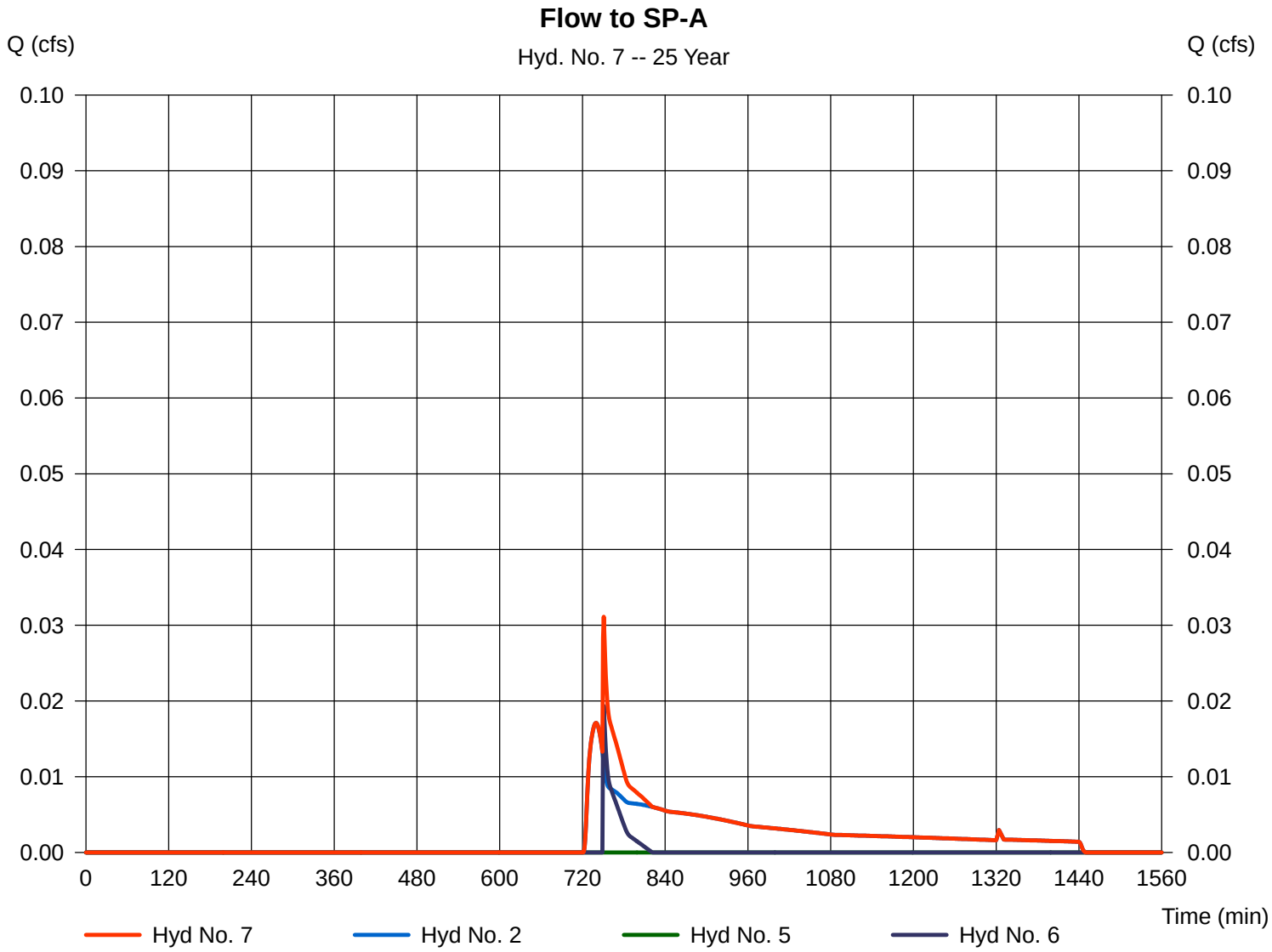
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 7

Flow to SP-A

Hydrograph type	=	Combine	Peak discharge	=	0.031 cfs
Storm frequency	=	25 yrs	Time to peak	=	751 min
Time interval	=	1 min	Hyd. volume	=	174 cuft
Inflow hyds.	=	2, 5, 6	Contrib. drain. area	=	0.105 ac



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.2

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	SCS Runoff	0.135	1	726	603	----	------	------	E-1
2	SCS Runoff	0.082	1	727	391	----	------	------	P-1
3	SCS Runoff	0.107	1	724	380	----	------	------	P-2
4	SCS Runoff	0.213	1	724	759	----	------	------	P-3
5	Reservoir	0.005	1	767	5	3	210.40	167	Chamber Sys A
6	Reservoir	0.221	1	728	146	4	230.50	247	Chamber Sys B
7	Combine	0.301	1	728	541	2, 5, 6	------	------	Flow to SP-A

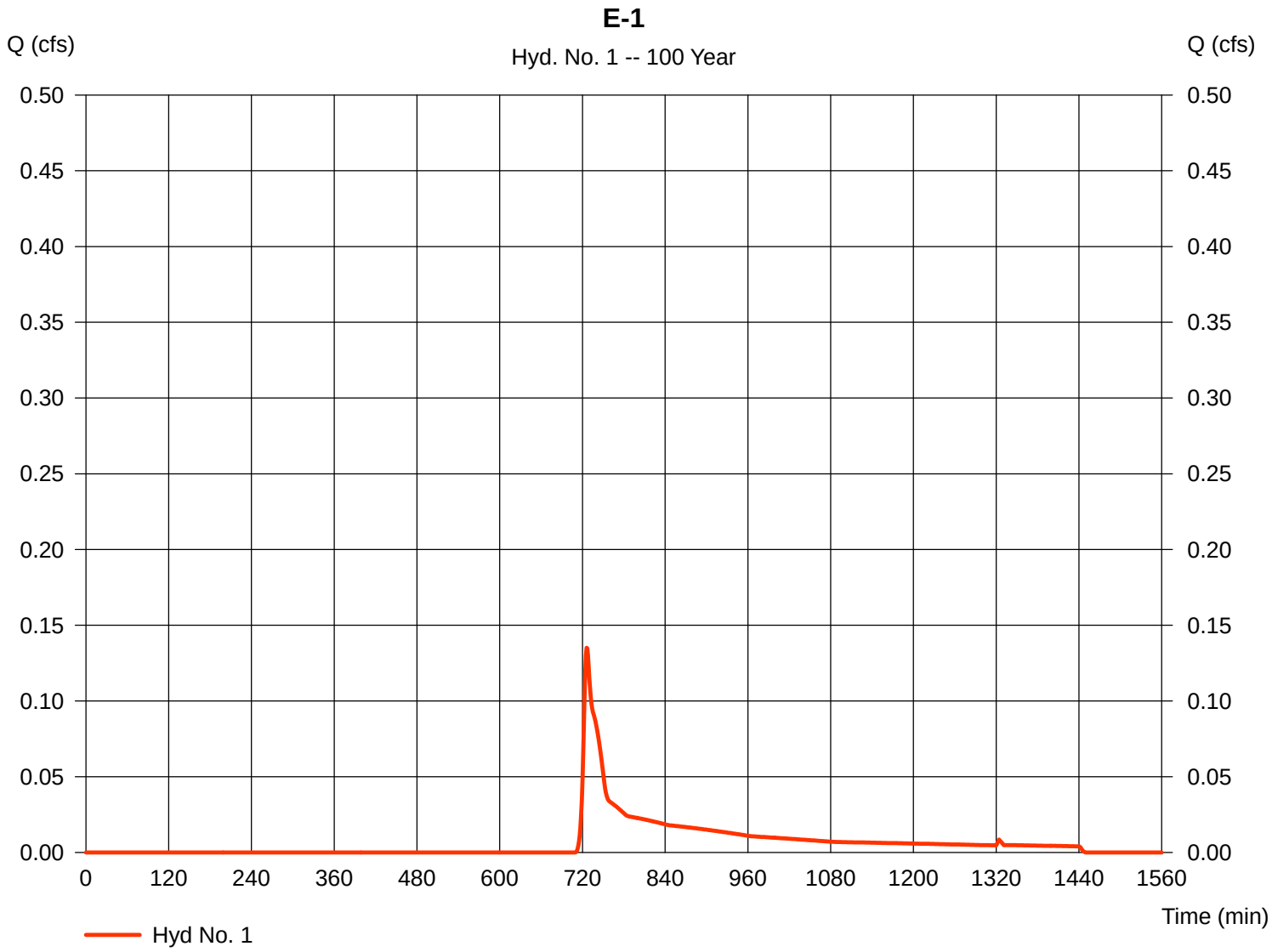
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 1

E-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.135 cfs
Storm frequency	=	100 yrs	Time to peak	=	726 min
Time interval	=	1 min	Hyd. volume	=	603 cuft
Drainage area	=	0.150 ac	Curve number	=	43
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



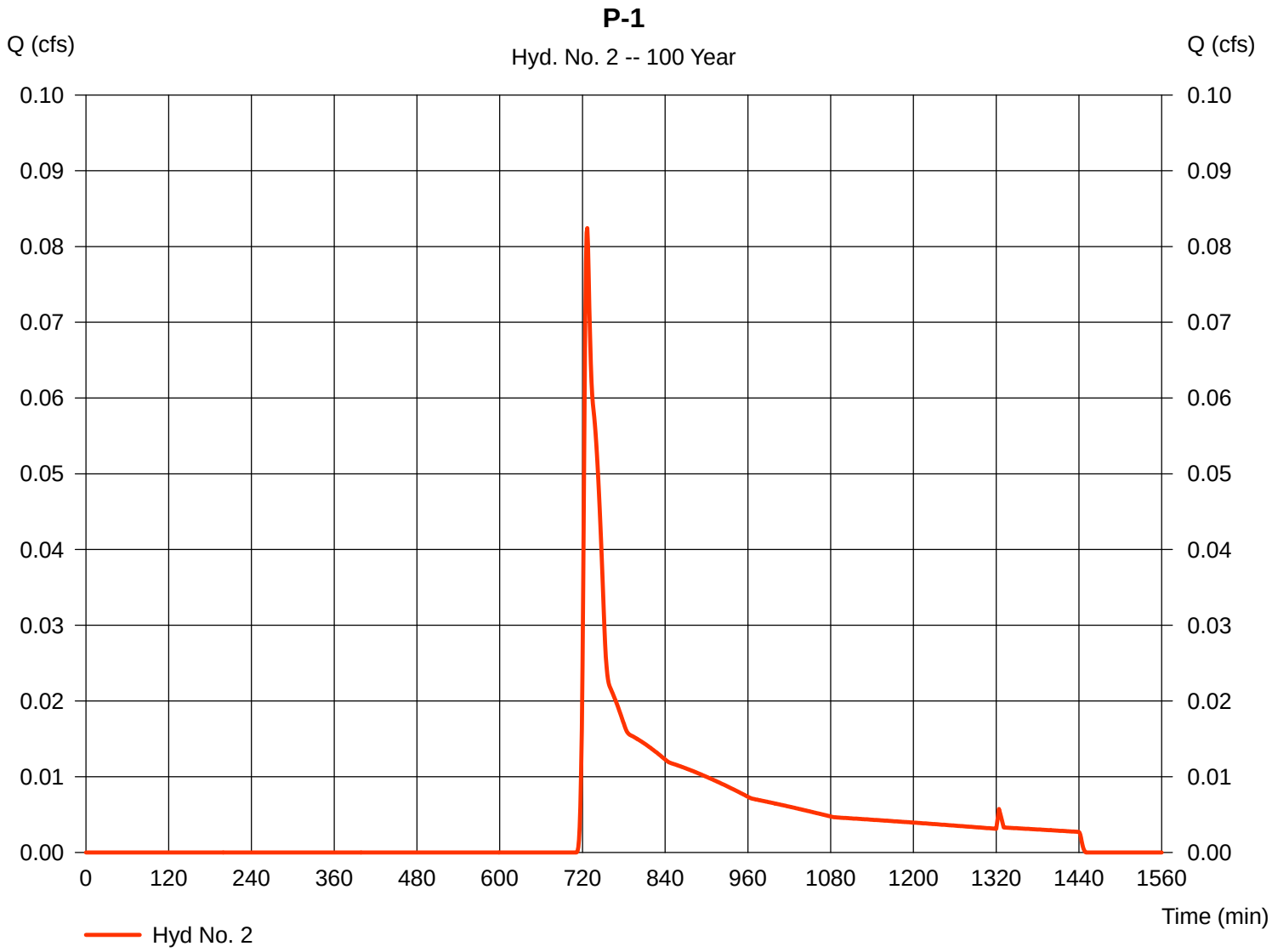
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 2

P-1

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.082 cfs
Storm frequency	=	100 yrs	Time to peak	=	727 min
Time interval	=	1 min	Hyd. volume	=	391 cuft
Drainage area	=	0.105 ac	Curve number	=	42
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



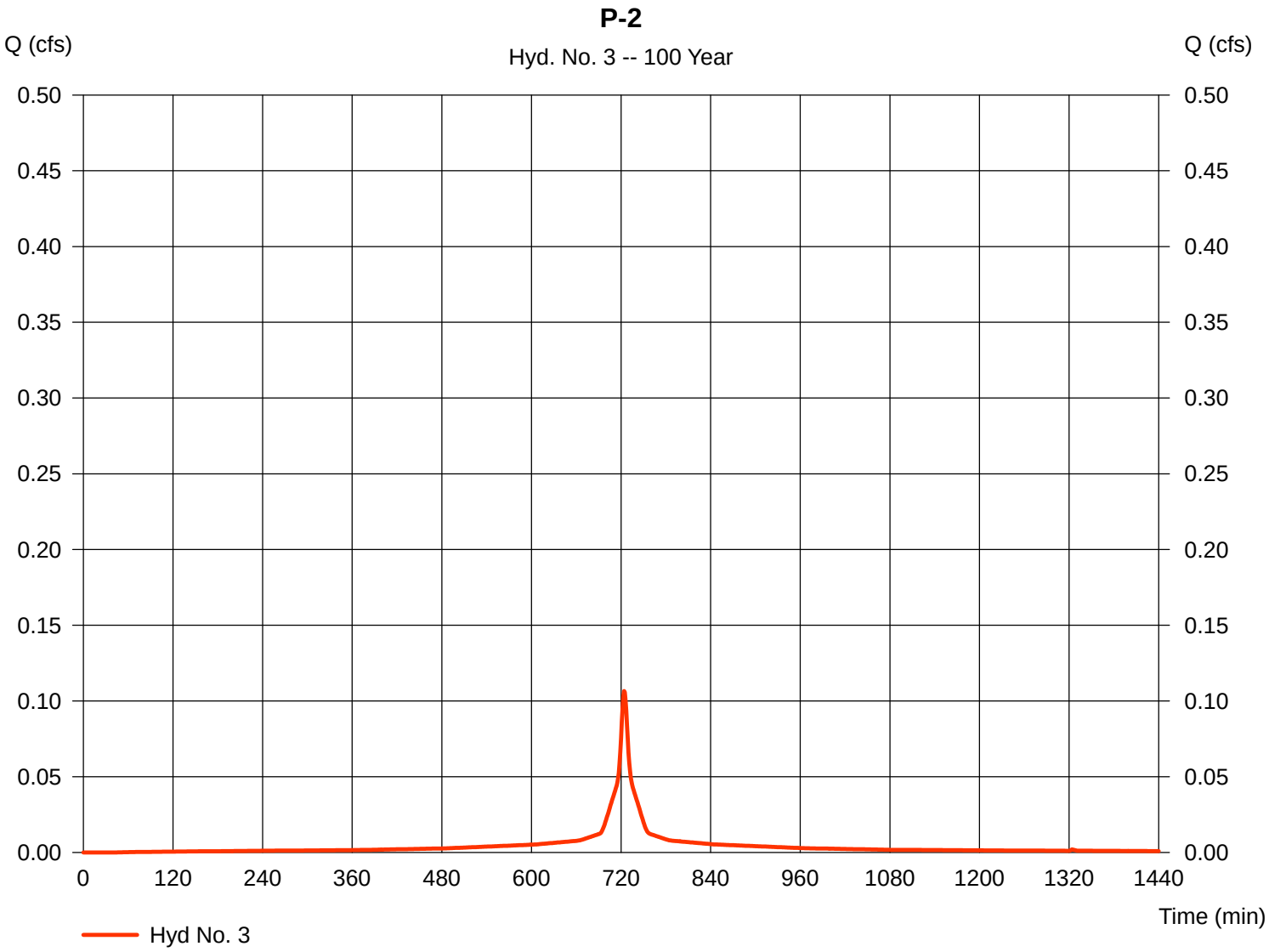
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 3

P-2

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.107 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	380 cuft
Drainage area	=	0.015 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



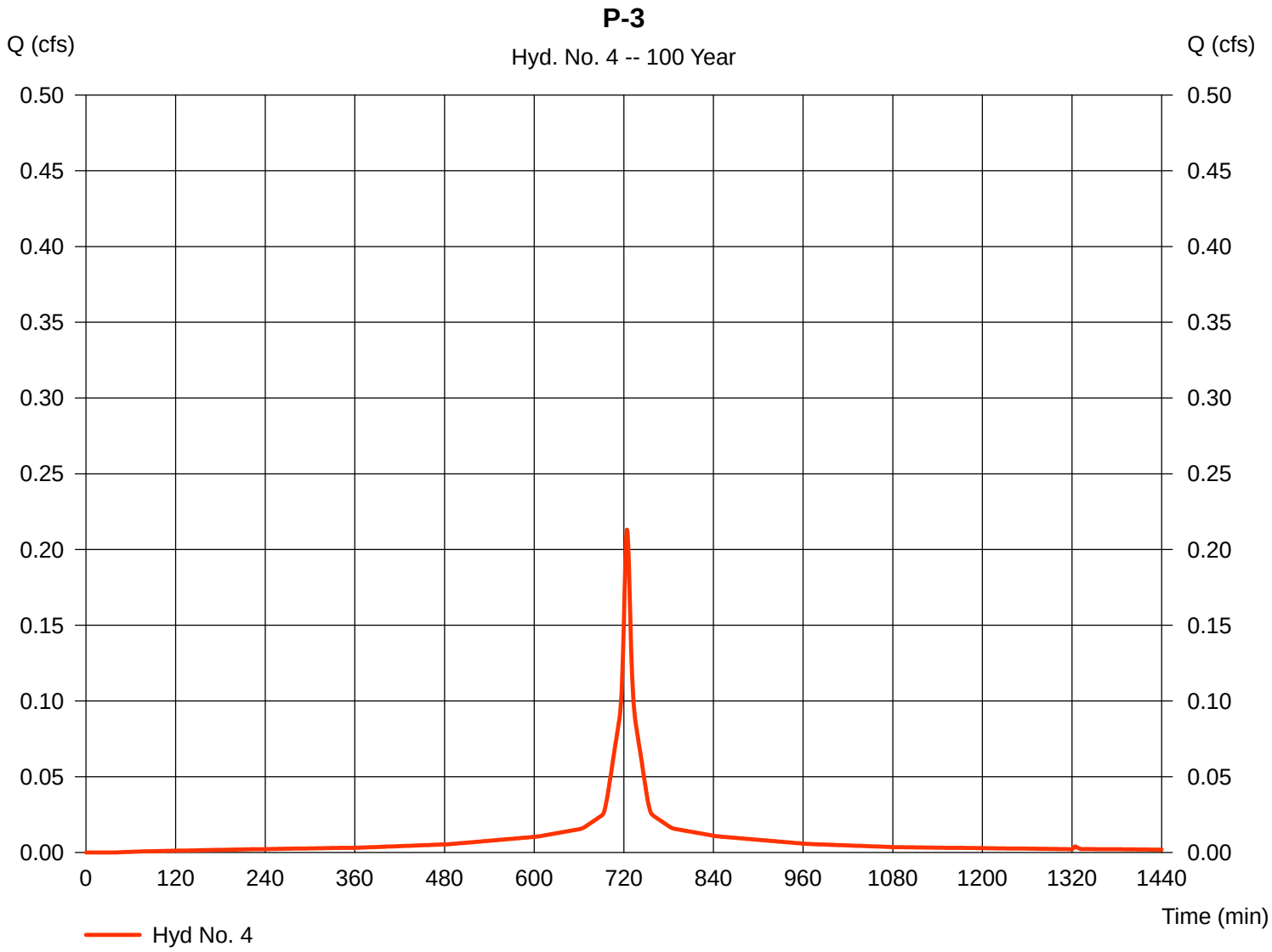
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 4

P-3

Hydrograph type	=	SCS Runoff	Peak discharge	=	0.213 cfs
Storm frequency	=	100 yrs	Time to peak	=	724 min
Time interval	=	1 min	Hyd. volume	=	759 cuft
Drainage area	=	0.030 ac	Curve number	=	98
Basin Slope	=	0.0 %	Hydraulic length	=	0 ft
Tc method	=	USER	Time of conc. (Tc)	=	6.00 min
Total precip.	=	7.00 in	Distribution	=	Type III
Storm duration	=	24 hrs	Shape factor	=	484



Hydrograph Report

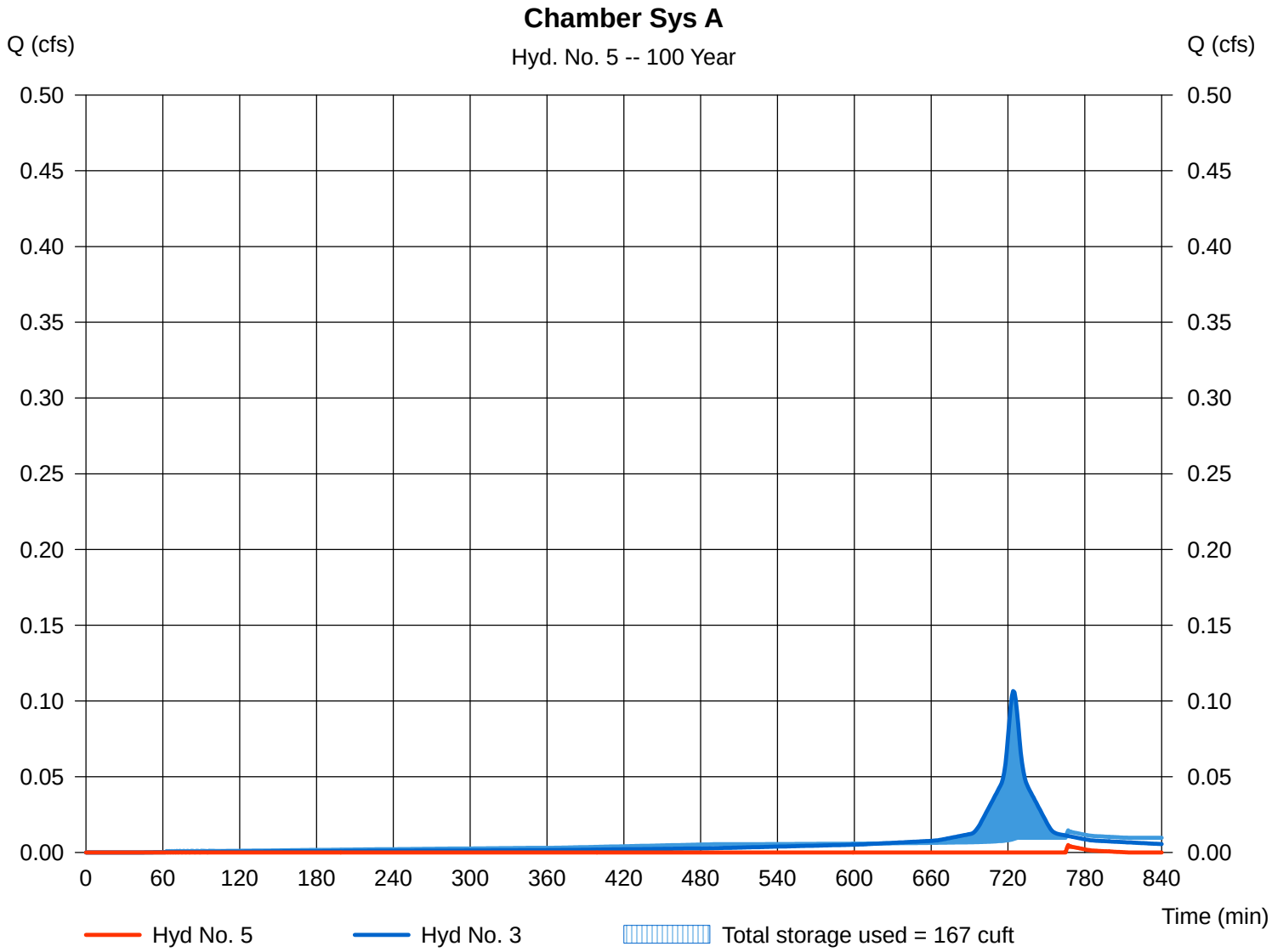
Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 5

Chamber Sys A

Hydrograph type	=	Reservoir	Peak discharge	=	0.005 cfs
Storm frequency	=	100 yrs	Time to peak	=	767 min
Time interval	=	1 min	Hyd. volume	=	5 cuft
Inflow hyd. No.	=	3 - P-2	Max. Elevation	=	210.40 ft
Reservoir name	=	RA-B	Max. Storage	=	167 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



Hydrograph Report

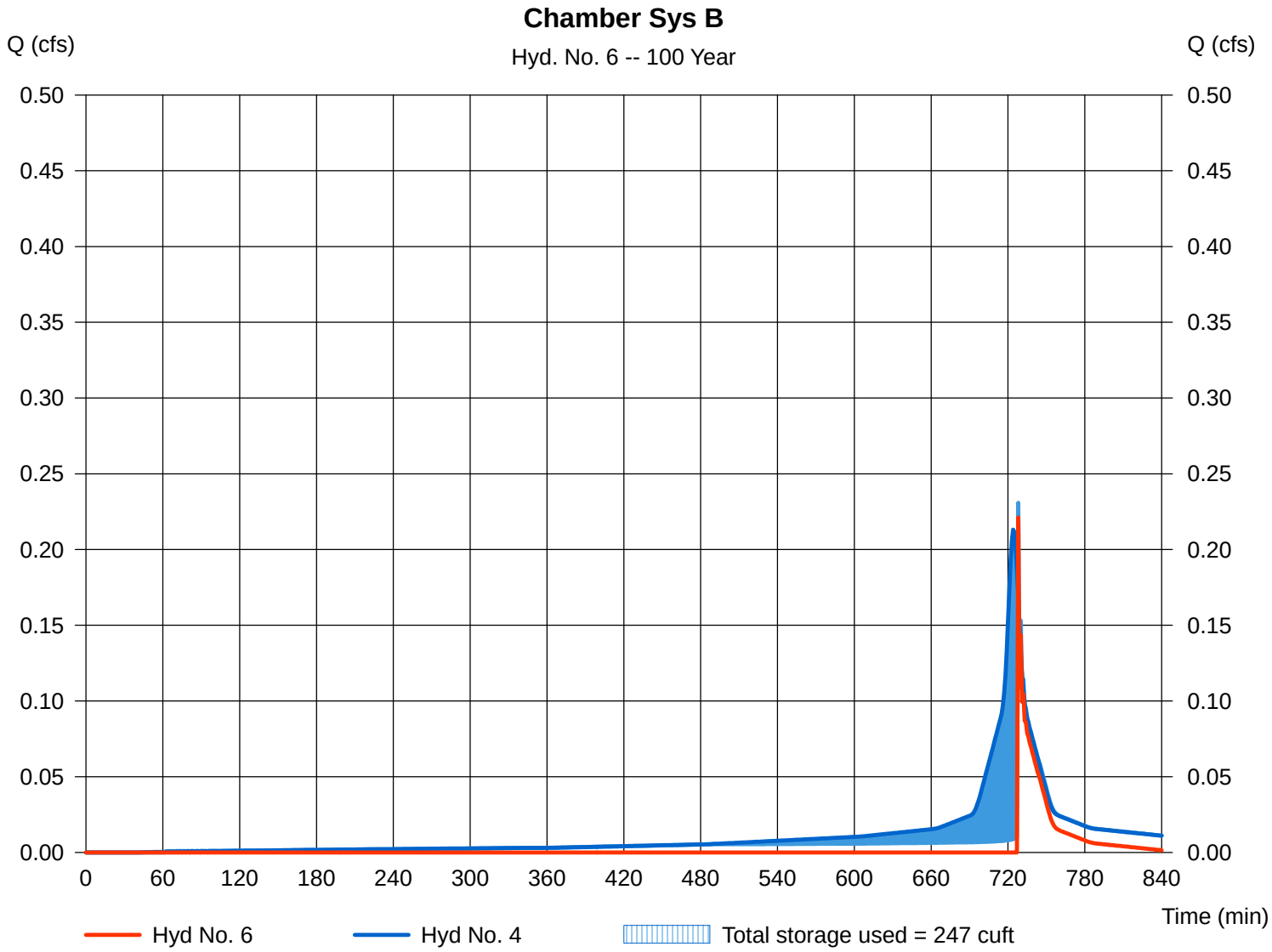
Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Hyd. No. 6

Chamber Sys B

Hydrograph type	=	Reservoir	Peak discharge	=	0.221 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	146 cuft
Inflow hyd. No.	=	4 - P-3	Max. Elevation	=	230.50 ft
Reservoir name	=	RA-B	Max. Storage	=	247 cuft

Storage Indication method used. Exfiltration extracted from Outflow.



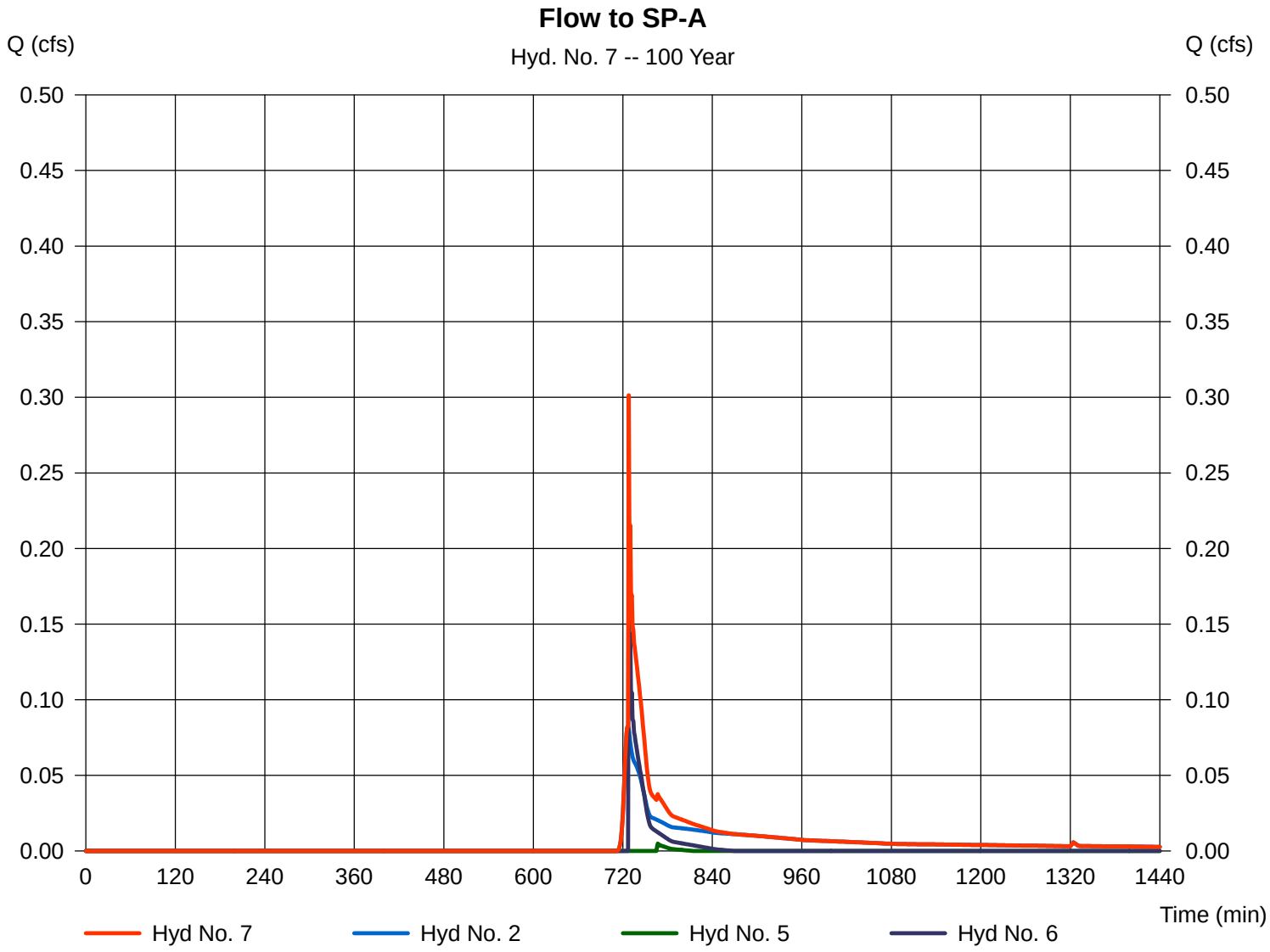
Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.2 Monday, Feb 1, 2021

Hyd. No. 7

Flow to SP-A

Hydrograph type	=	Combine	Peak discharge	=	0.301 cfs
Storm frequency	=	100 yrs	Time to peak	=	728 min
Time interval	=	1 min	Hyd. volume	=	541 cuft
Inflow hyds.	=	2, 5, 6	Contrib. drain. area	=	0.105 ac



RECHARGE AREA CHARACTERISTICS

Pond Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Pond No. 1 - RA-B

Pond Data

UG Chambers - Invert elev. = 209.00 ft, Rise x Span = 1.00 x 3.00 ft, Barrel Len = 32.00 ft, No. Barrels = 1, Slope = 0.00%, Headers = No
Encasement - Invert elev. = 208.50 ft, Width = 5.00 ft, Height = 2.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	208.50	n/a	0	0
0.20	208.70	n/a	13	13
0.40	208.90	n/a	13	26
0.60	209.10	n/a	19	44
0.80	209.30	n/a	24	68
1.00	209.50	n/a	23	92
1.20	209.70	n/a	22	114
1.40	209.90	n/a	20	133
1.60	210.10	n/a	14	148
1.80	210.30	n/a	13	160
2.00	210.50	n/a	13	173

Culvert / Orifice Structures

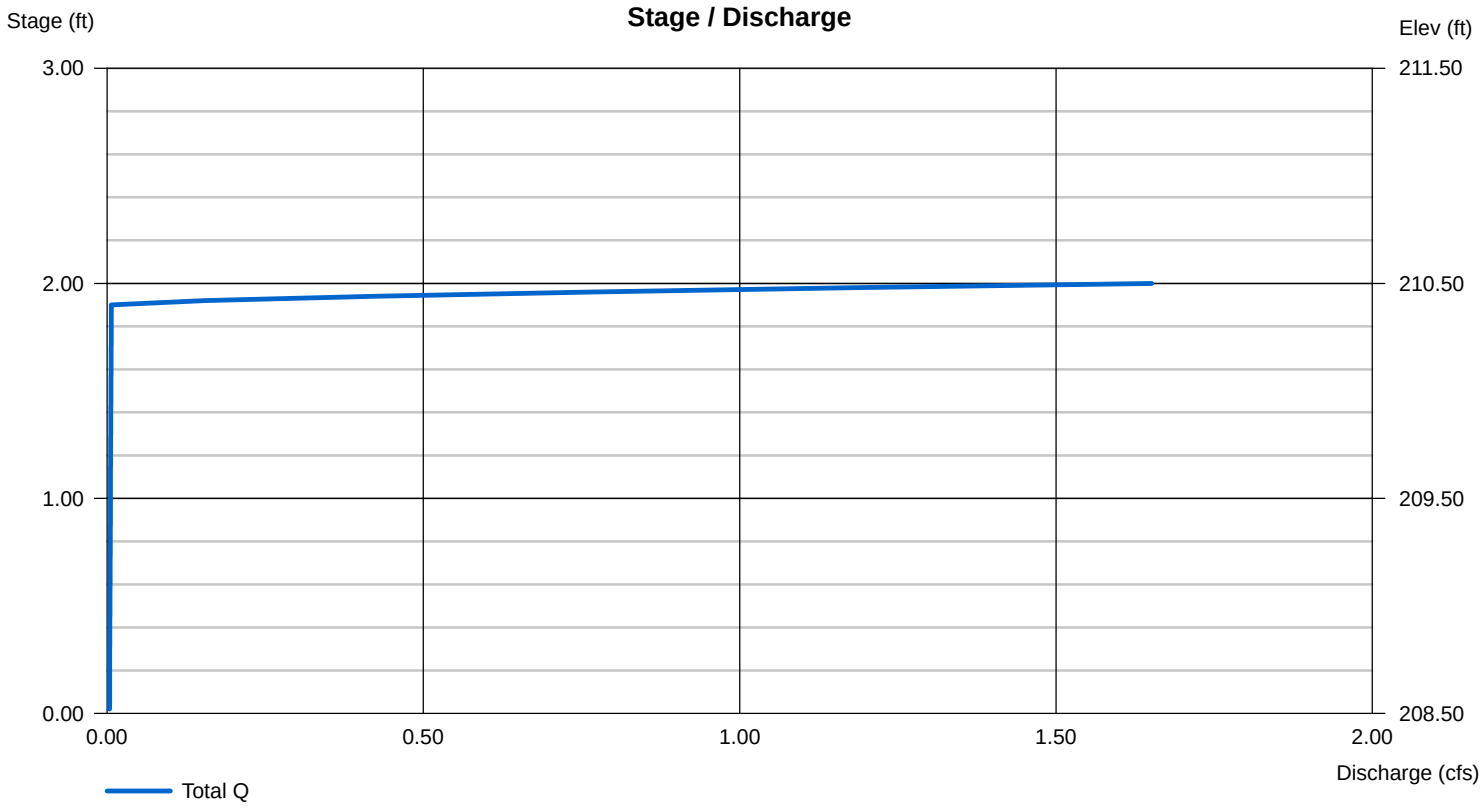
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 210.40	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.020 (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).



Pond Report

Hydraflow Hydrographs by Intelisolve v9.2 — Monday, Feb 1, 2021

Pond No. 2 - RA-B

Pond Data

UG Chambers - Invert elev. = 229.00 ft, Rise x Span = 1.00 x 3.00 ft, Barrel Len = 23.00 ft, No. Barrels = 2, Slope = 0.00%, Headers = No
Encasement - Invert elev. = 228.50 ft, Width = 5.00 ft, Height = 2.00 ft, Voids = 40.00%

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	228.50	n/a	0	0
0.20	228.70	n/a	18	18
0.40	228.90	n/a	18	37
0.60	229.10	n/a	27	63
0.80	229.30	n/a	35	98
1.00	229.50	n/a	34	132
1.20	229.70	n/a	32	163
1.40	229.90	n/a	28	191
1.60	230.10	n/a	21	212
1.80	230.30	n/a	18	231
2.00	230.50	n/a	18	249

Culvert / Orifice Structures

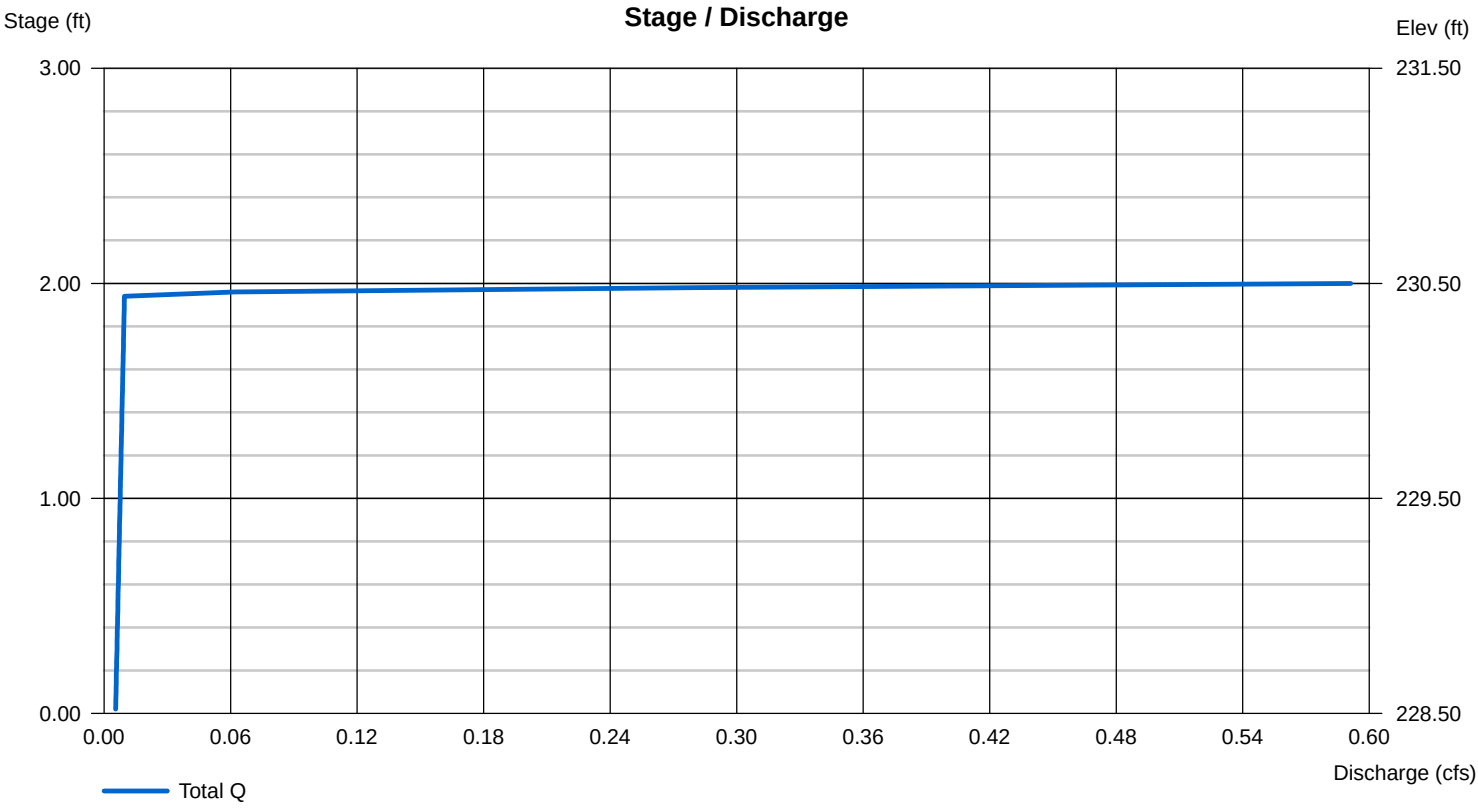
	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 20.00	0.00	0.00	0.00
Crest El. (ft)	= 230.45	0.00	0.00	0.00
Weir Coeff.	= 2.60	3.33	3.33	3.33
Weir Type	= Broad	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 1.020 (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).



Operation and Maintenance Plan

This Stormwater Operation and Maintenance Plan covers the post-construction operation and maintenance of the stormwater management system for 25 Henry St. in Arlington, Massachusetts.

The procedures, practices, and schedule outlined in this plan are intended to be ongoing requirements and are an important factor in ensuring the continued proper functioning of the stormwater management system and integrity of the discharged stormwater.

The following maintenance requirements are the sole responsibility of the property owner(s).

Trench Grate

- Remove leaf litter and other debris from grate as needed to ensure adequate capacity for collection of runoff.

- Inspect system at least four times per year and clean sump when debris is accumulated to a depth of six inches.

Recharge Systems

- Inspect systems after every major storm in the first three months of construction to ensure proper stabilization and function. Thereafter, inspect quarterly.

- Clean systems at least once per year, or more frequently, as needed to prevent accumulation of sediment and other debris in the system.

- Clean structures when debris is accumulated to a depth of 6 inches.