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**Drainage Calculations
&
Stormwater Management Report
FOR
Proposed Parking Lot Improvement
Prepared for
Fremont Riverview, LLC
Property Located at
#69 Leggett Street
East Hartford, Connecticut**

June 15, 2018

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1. PROJECT OVERVIEW

The descriptions and computations included within this Engineering Report and Appendix are provided in support of the improvement of the parking lot / loading area and development of new parking area, located at #69 Leggett Street Drive in East Hartford, CT. The current permit applications are for the approvals of a site plan application Town of East Hartford Planning and Zoning Commission.

The overall project will consist of the development of a property located at the westerly side of Leggett Street. The development of this site will consist of the redevelopment of the existing parking lot and loading area along the southerly side of the existing building on this site and the development of a new 11 space parking lot at the northeasterly corner of the site.. This parking lot is being constructed as part of the redevelopment of the existing 71,615 sq. ft. building . The access to these parking lots will be through the existing curb cut from Leggett Street along the southerly side of the site new driveway curb cut from Leggett Street at the northeasterly corner of the site.

The storm water management system for this site has been designed utilizing Best Management Practices (BMPs) and Low Impact Development (LID) methods to improve the storm water quality and to attenuate the peak flows rates and volumes, to prevent increases in the pre-development runoff rates to the existing drainage system in Darlin Street. The overall storm water management system will use underground detention systems, along with several other water quality measures before discharging storm water to the receiving drainage system. The goal of the storm water management design is to provide removal of total suspended solids while attenuating the post development peak runoff rates and volumes. For more detailed information regarding storm water quantity, refer to Section 3 and Section 4 of this report. Refer to Section 5 for storm water quality management provided in the proposed design. Design computations and other relevant information are provided in the Appendix of this report.

2. EXISTING SITE CONDITIONS

The project site is located along the westerly side of Leggett Street. The project site consists of 3.6906 acres of I-2 zoned land. The overall property is bordered by Leggett Street on the east, property of OBS Investments, LLC #47 Leggett Street (presently is I-2 zone, and is developed), , AAJUS III, LLC to the west and south (presently is I-2 zone, and is developed).

This property presently is developed with a 71,615 sq. ft. 1 story brick and concrete block warehouse and distribution building. The area to the south of the existing building that is presently contains a bituminous pavement area that is used as a loading and parking. The remaining areas to the west, north and east of the building area presently lawn.

The soil types on this site consist of a Udorthents-Urban land complex (306).

This project site is located within the Connecticut River (Drainage Basin #4000) watershed as shown on a map entitled "Natural Drainage Basins, Major, Regional, Sub-regional and Local East Hartford, Connecticut, map created by CT DEEP dated January 2010"

In addition, this property is not located within a 100 year floodplain boundaries as delineated on the current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM). A portion of this map has been included in the Appendix A of this report.

3. STORMWATER MANAGEMENT DESIGN

The proposed storm water management system has been designed utilizing BMPs design principles to safely convey storm water runoff from the site while providing storm water quality measures. Storm water management for the proposed project was achieved by collecting storm water from this portion of the development area of the site and conveying it to proposed Bio-Retention Basin and Bio-Retention Swale. The Basin and Swale have also been designed to attenuate the proposed peak flow rates and volume of runoff in order to prevent increases in the existing peak flow rates and volume of runoff post development. The collection system will incorporate several storm water quality measures designed to provide storm water treatment before discharging from the proposed project site. More information regarding water quantity (hydrology) can be found in Section 4. Storm water quality management is discussed further in Section 5.

The computer program entitled "Storm water Studio, ver. 2.0" by Hydrology Studio was used for designing the proposed storm drainage. Storm drainage computations performed include pipe capacity calculations, hydraulic grade line calculations, and gutter flow (inlet capacity) computations. The overall watershed was divided into sub-basins to determine the drainage area and land coverage to each individual catch basin inlet. These values were used to determine the storm water runoff to each inlet using the Rational Method. The rainfall intensities utilized in the storm drainage computations were obtained from the web based NOAA's National Weather Service Hydrometeorological Design Studies Center Precipitation Frequency Data Server (PFDS) NOAA Atlas 14, Vol 10, Ver. 2 for 69 Leggett Street, East Hartford, CT.

The proposed storm drainage systems are required to be designed to the Town of East Hartford Manual of Technical Design to provide adequate pipe capacity to convey the 25-year storm event. Because the storm drainage system will also be used as the outlet from the Bio- Retention Swale and Basin, the analysis on this report was based on a 100 year storm event. In addition, the storm drainage design analysis includes a complete hydraulic grade line computation, which ensures adequate capacity for the 100-year storm event. All storm drainage computations described in this section are provided in the Appendix of this report.

4. HYDROLOGY ANALYSIS

The storm water management system has been designed in part to attenuate the proposed peak rates and volume of runoff from the project site. In order to analyze the pre development and post development peak flow rates from this site, the drainage area to the point where the majority of the stormwater runoff from this site discharges into the existing drainage system to the abutting property to the southwest of this site was used for this report. This drainage system drains in a westerly direction through a 15" culvert from the site into the existing drainage system. The outlet location of this system was not able to be determined in the field. This subarea is referred to as SA-A and SA-B which has a total area of 4.7566 acres as shown on a watershed map for both pre and post condition is included in the appendix H of this report. The remaining area to the north is referred to as SA-C and drains into an existing drainage system along the northerly property, which discharges to an existing detention basin to the northwest of the site. This subarea is also shown on a watershed map for both pre and post condition is included in the appendix H of this report.

The principal method of predicting the surface water runoff rates utilized in this analysis is a computer program entitled "Hydrology Studio V. 2.0.039". The "Hydrology Studio" computer modeling program utilizes the same methods for computing runoff rates that were originally developed by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS, formerly known as the Soil Conservation Service or SCS), also utilized in the TR-20 computer modeling program and others. The "Hydrology Studio" computer program forecasts the rate of surface water runoff and river flow rates based upon several factors. The input data includes information on land use, hydrologic soil type, and vegetation conditions, contributing watershed area, time of concentration, rainfall data, storage volumes, and the hydraulic capacity of structures. The computer model predicts the amount of runoff as a function of time, including the attenuation affect due to flow restriction at roadway culverts, ponds, large wetlands, and floodplains. Runoff rates during specific rainstorms may vary due to different assumptions concerning soil moisture, water levels in ponds, snowmelt, and rainfall patterns. The input data for rainfalls with statistical recurrence frequencies of 2, 10, 25, 50, and 100 years were obtained from the NOAA's National Weather Service Hydrometeorological Design Studies Center Precipitation Frequency Data Server (PFDS) NOAA Atlas 14, Vol 10, Ver. 2 for #39 Leggett Street, East Hartford, CT analysis a Type III rainfall pattern with 24-hour duration was used.

The land use for the site under pre and post conditions was determined from field survey, the proposed site development plans for the on-site drainage areas. Land use types used in the analysis included paved areas and lawn areas (with good land cover). Soil types in the watershed were determined from the available GIS (Geographic Information System) database of the NRCS soil survey for Hartford County, Connecticut. The study area was determined to contain hydrologic soil type B as classified by the NRCS and as shown on attached mapping in Appendix A of this report.

The pre-conditions were modeled with the Hydrographs computer program to determine the flow rates & volumes for the various storm events at the analysis point. A revised model was developed incorporating the post site conditions, and flows obtained with the revised model were then compared to the results of the existing conditions model. The underground infiltration basin was incorporated into the proposed model, which illustrated the attenuation capabilities of this structure.

The NRCS Reservoir routing subroutine utilized within the Hydro Studio computer program was used to design the storage and outlet control requirements. All Hydrographs input computations and model results are included in the Appendix F (for pre-development conditions) and Appendix G (for post development conditions) of this report.

Storm water management for the project was achieved by routing the storm water runoff from the developed subareas of the site through the Bio-Retention Swale & Basin . The storm water discharge rates and volumes from these systems will be attenuated by setting the outlet spillway elevation 1' above the bottom of the Bio Retention Swale elevation.. This will allow for the retention of a portion of the volume of the storm water runoff to be retained within the bottom of the system. Because the soil type in the area is a Udorthents, we were unable to obtain a exfiltration rate form the USDA soils property. Therefore we had a sieve analyses preformed on samples we obtained from the site. Based on these analyses, the material description for this soils was a “sandy-silt” . Based on this soil type, a conservative exfiltration rate of 0.5 inch / hour was incorporated into the storm water modeling for these systems. The following is the Underground Detention Systems routing results and the peak flows is as follows:

Proposed Bio Retention Basin

Storm Frequency	1	2	5	10	25	50	100
Peak Inflow (c.f.s.)	0.548	0.810	1.291	1.715	2.310	2.780	3.248
Peak Outflow (c.f.s.)	0.000	0.000	0.030	0.217	0.677	1.097	1.555
Max. Water Surface El.	49.74	50.09	50.54	50.66	50.85	50.98	51.11
Max. Storage Vol .(cu. ft..)	830	1,351	2,183	2,458	2,876	3,173	3,502

Proposed Bio Retention Swale

Storm Frequency	1	2	5	10	25	50	100
Peak Inflow (c.f.s.)	3.141	1.790	6.050	7.559	9.607	11.55	13.67
Peak Outflow (c.f.s.)	0.584	5.058	4.639	6.367	8.365	10.17	12.18
Max. Water Surface El.	49.06	49.12	49.24	49.29	49.35	49.39	49.44
Max. Storage Vol .(cu. ft..)	4,174	4,600	5,312	5,662	6,026	6,327	6,639

The analysis point , as shown on the existing and proposed conditions watershed maps, was used to determine the peak flow rates. This analysis point was chosen based on the fact that they both receive some storm water runoff from a portion of the project site. Therefore, the pre and post hydrology analysis of these areas provided a comparison of the peak flow rates that ultimately provided guidance when designing the storm water management system. The sum of the pre and post development flows to this analysis point is as follow:

Peak Flow at Design Point 1 (existing drainage off- site to existing drainage system to south)

Peak Flow Rates (cfs)*

Storm Frequency (years)	1	2	5	10	25	50	100
Pre-Development flow rate	5.31	7.43	10.99	13.99	18.09	21.26	24.39
Post-Development flow rate	2.46	5.06	9.20	11.85	15.28	18.27	21.33

*cfs = cubic feet per second

Peak Runoff Volume at Design Point 1 (existing drainage from this site to existing drainage system in Darlin Street)

Peak Runoff Volumes (cu. ft.)

Storm Frequency (years)	1	2	5	10	25	50	100
Pre-Development Volume	21,772	30,442	45,303	58,140	76,024	90,099	104,119
Post-Development Volume	11,748	17,997	29,020	39,389	54,095	65,847	77,657

For more detailed information of these routings, see Appendix H “Storm water Studio”™ Computer Model Report-Post-Development” in this report. For more detail information of these routings, see Appendix H “Storm water Studio”™ Computer Model Report-Post-Development” in this report.

The summary of results above shows that no increases in peak rates of runoff volume are anticipated from this site post development for a 1, 2, 5, 10, 25, 50 & 100 year storm event. Rather, a decrease in rate and volume for these storm events can be anticipated due to the storm water management system and the detention provided.

Peak Flow at Design Point 2 (to existing drainage system to north)

	Peak Flow Rates (cfs)*						
Storm Frequency (years)	1	2	5	10	25	50	100
Pre-Development flow rate	1.56	2.26	3.456	4.479	5.886	6.981	8.061
Development flow rate	1.590	2.25	3.363	4.306	5.596	6.596	7.581

*cfs = cubic feet per second

Peak Runoff Volume at Design Point 2 (to existing drainage system to north)

	Peak Runoff Volumes (cu. ft.)						
Storm Frequency (years)	1	2	5	10	25	50	100
Pre-Development Volume	5,381	7,726	11,816	15,392	20,414	24,388	28,359
Post-Development Volume	5,445	17,997	11,541	14,887	19,562	23,247	26,921

5. WATER QUALITY MANAGEMENT

Several water quality measures or BMPs are incorporated into the storm water management design to maintain water quality. All of the best management control measures described in this section will help maintain the water quality of the storm water runoff from the proposed development.

Storm water runoff from the proposed site will be collected and conveyed via a subsurface pipe and catch basin drainage system. The drainage system will include catch basins with four-foot sumps with hooded outlet, which trap coarse sediments. The four-foot sumps and hooded outlets utilized in the storm drainage design will increase the system's ability to remove suspended solids and trap floatable debris before discharging to the underground infiltration systems.

Providing this water quality measure serves several purposes including storm water renovation, first flush retention, and ground water recharge. A more detailed explanation of each of these measures follows.

The Storm water Quality Manual (Chapter 7) also recommends methods for sizing storm water treatment measures with the Water Quality Volume (WQV) and computations. The WQV addresses the initial storm water runoff also commonly referred to as the "first flush" runoff. The WQV provides adequate volume to store the initial one inch of runoff, which tends to contain the highest concentrations of potential pollutants. Supporting calculations for the volume provided as well as WQV computations have been included in the Appendix of this report.

The storm water management system incorporates an Underground Infiltration System. The system is in accordance with the Connecticut Department of Environmental Protection's (CT DEP) Storm water Quality Manual (SWQM), Chapter 11,(Secondary (S) Treatment Practices - Innovative/Emerging Technologies) . The proposed Underground Infiltration System will have an isolator row which was designed to treat 100% of the Water Quality Volume (WQV).

The Storm water Quality Manual (Chapter 7) also recommends methods for sizing storm water treatment measures with the Water Quality Volume (WQV) and computations. The WQV addresses the initial storm water runoff also commonly referred to as the "first flush" runoff. The WQV provides adequate volume to store the initial one inch of runoff, which tends to contain the highest concentrations of potential pollutants. Supporting calculations for the volume provided as well as WQV computations have been included in the Appendix of this report.

6. BEST MANAGAMENT PRACTICES

STORMWATER SYSTEM MAINTENANCE

The site will be maintained in a clean condition at all times by implementing good housekeeping measures. Trash and surface debris will be removed from parking areas and storm water structures. The site will be regularly cleaned of trash and debris. Storm water structures (i.e., catch basins, underground detention systems, bio-retention swales, etc.) and outfalls will be cleaned of sediment and debris at least once a year during the month in the spring (once snow melt is complete) and at other times as necessary to prevent the off-site discharge of pollutants from the structures or outfalls. Special attention will be directed to the bio-retention swale identified on the site engineering drawings.

Storm water Management Structures	Checked for...
Catch Basins	Accumulated sediment & debris
Bio-Retention Swale & Basin	Accumulated sediments, debris, evidence of erosion, etc.

A member of the maintenance crew will complete thorough, quarterly inspections and complete inspection checklists.

SWEEPING SCHEDULE

All parking areas, sidewalks, loading areas and driveways will be swept as needed, with automatic air sweeping and vacuuming equipment

Yard Maintenance

1. Mowing

- After irrigation, mowing is the most important maintenance operation. With good mowing practices, density, texture, color, root development, wear tolerance and other aspects of turf quality are enhanced, and a healthy turf minimizes the need for use of fertilizers and pesticides.
- When the turf is mowed too closely, it becomes less tolerant of environmental stresses, more disease prone, and more dependent upon a carefully implemented cultural program. The best approach then, is to use a high mowing height.
- Anytime that grass is in a weakened condition, the mowing height will be raised immediately.
- Growth rate and mowing height have the most influence on mowing frequency. As a rule of thumb, mowing should be done often enough that no more than 30 percent of the leaf is removed at any one mowing. This practice minimizes the effect of mowing on photosynthesis and helps maintain a high percentage of leaf surfaces, which is necessary for healthy root development.
- Varied mowing patterns on all surfaces encourage upright growth and reduce wheel or mower wear and compaction.
- Research has shown that returning grass clippings to the surface does not greatly increase thatch building up on turf that is otherwise properly managed. Clippings do have significant nutrient value and decompose rapidly thus returning some fertilizer and organic matter to the soil. They also help conserve moisture and insulate the soils

Erosion and Sediment Control Measures

A detailed Sediment and Erosion (S&E) Control Plan has been developed to mitigate the short-term impacts of the development during construction. The S&E Control Plan includes a detailed proposed construction sequence in addition to descriptive specifications concerning land grading, top soiling, temporary vegetative cover, permanent vegetative cover, and vegetative cover selection and mulching, and erosion checks. Details have been provided for all erosion control measures with corresponding labels on the S&E control site plan. In addition, the S&E controls provided are in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control manual. Specific measures are outlined on sheets #5 & 7 of the plans.

Conclusions

This report demonstrates that all design criteria set forth by the State of Connecticut and Town of East Hartford have been met or exceeded, and all design and mitigation measures have been derived from standard practices and procedures as directed by the Connecticut DEEP 2004 Storm water Quality Manual and DOT design manuals. Based the summary of the post development peak flows and volumes to the design point outlined in section 4 "HYDROLOGY ANALYSIS", it has been demonstrated that there will be a reduction of to the existing drainage system to the south. As outlined in Section 5 "Storm water Quality Measures and Section 6 "Best Management Practices", this storm water management report demonstrates that the post development storm water quality will be improved prior to discharging into the Town or State drainage system. In conclusion, the proposed project will satisfy all design requirements as have been stipulated by the Town, State and Federal regulations that may apply.

Appendices

Appendix A

FEMA FLOOD INSURANCE RATE MAP,

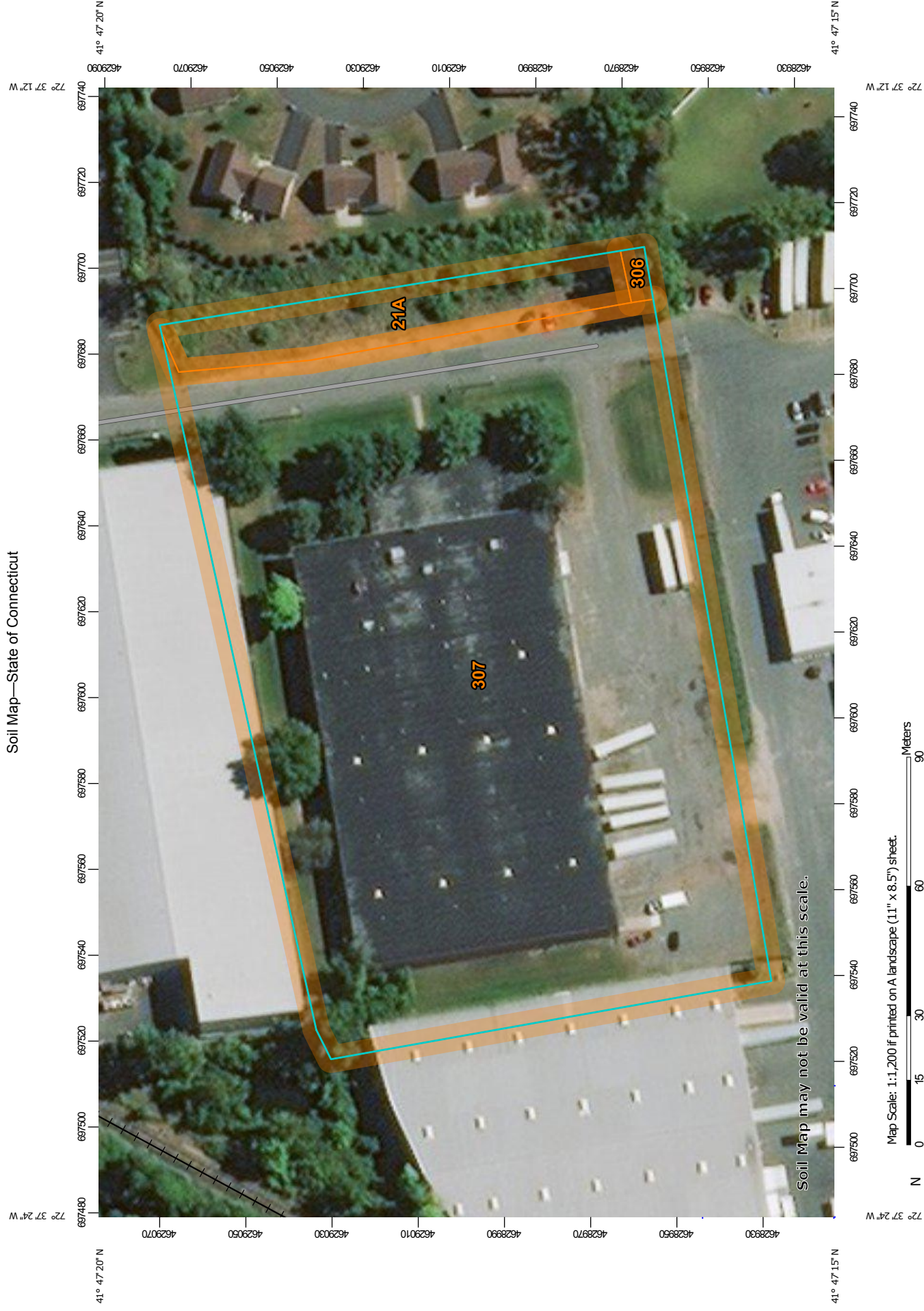
NATURAL DRAINAGE BASINS MAPPING for WEST HARFORD ,

CONENCTICUT

AND

NRCS SOILS MAPPING

Soil Map—State of Connecticut



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
Survey Area Data: Version 16, Sep 15, 2017

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

Date(s) aerial images were photographed: Sep 29, 2013—Oct 16, 2016

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
21A	Ninigret and Tisbury soils, 0 to 5 percent slopes	0.3	7.2%
306	Udorthents-Urban land complex	0.0	0.3%
307	Urban land	4.4	92.4%
Totals for Area of Interest		4.7	100.0%

Appendix B

STORM DRAINAGE SUBAREA DATA and COMPUTATIONS



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JOB #1347 -BKM

SHEET NO. 1

OF 3

CALCULATED BY J.P.C.

DATE 06/11/18

CHECKED BY P.A.H.

DATE 06/17/18

SCALE

PRE DEVELOPMENT DRAINAGE AREA DATA:

Ex. SA-A.

TOTAL AREA = 4.6014 AC

PAVED = 3.4576 AC.

- 0.1998 AC.

3.2578 AC.

LAWN = 1.3436 AC

T.O.C. = 53' - SHEET FLOW, AVG GRASS @ 3.5%
587' - SHALLOW CHANNEL @ 0.56%.

Ex. SA-B

TOTAL AREA = 0.1552 AC.

PAVED = 0.1014 AC

T.O.C. = 5' min

LAWN = 0.0538

Ex. SA-C

TOTAL AREA = ~~1.7257~~ AC
1.3321

PAVED = ~~0.7978~~ AC
0.8401

T.O.C. = 40' - SHEET FLOW AVG. GRASS @ 10%
105' - SHALLOW CHANNEL @ 0.89%
302' - P.O.C. FLOW @ 0.5%

LAWN = ~~0.7978~~ AC
0.4920 AC



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JOB # 1347-BRM

SHEET NO. 2

OF 3

CALCULATED BY J.P.C.

DATE 08/11/18

CHECKED BY P.A.H.

DATE 08/17/18

SCALE

POST DEVELOPMENT DRAINAGE AREA DATA:

PRO SA. A.1

TOTAL AREA = 0.1303 AC

PAVED = 0.1101 AC

LANDSCAPED = 0.0202 AC

T.O.C. = 68' - STREET Flow, PAVED @ 1.30% =
18' - SHALLOW CHANNEL @ 10% =

PROP. SA. A.2

TOTAL AREA = 0.4203 AC

PAVED = 0.1684 AC

LANDSCAPED = 0.2519 AC

T.O.C. = 34' - STREET Flow, LANDSCAPED @ 1.5%
68' - SHALLOW CHANNEL, GRASS @ 3.8% =

PROP. SA. A.3

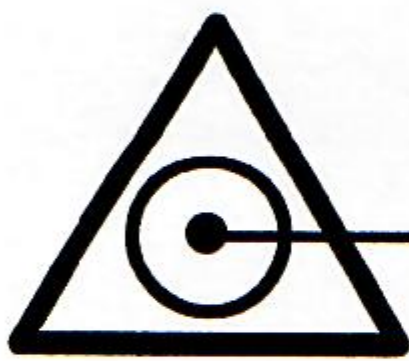
TOTAL AREA = 1.8377 AC

PAVED = 0.8116 AC

ROOF = 0.6524 AC

LANDSCAPED = 0.3737 AC

T.O.C. = 22' - STREET Flow, LANDSCAPED @ 1.0% =
7' - STREET Flow, PAVED @ 1.0% =
30' - SHALLOW CHANNEL @ 10.0% =



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JOB #1347 - BKM

SHEET NO. 3

OF 3

CALCULATED BY J.P.C.

DATE 06/11/18

CHECKED BY P.A.H.

DATE 06/17/18

SCALE

POST DEVELOPMENT DRAINAGE AREA DATA:

PROP. SA - A.4

TOTAL AREA = 2.4762 AC

PAVED = 1.9690 AC

LAWN or LANDSCAPE
= 0.5072

T.O.C. = 41' - STREET ROW, AVG. GRASS @ 1.0%
751' - SHALLOW CHANNEL @ 0.5%

PROP. SA - C

TOTAL AREA = ~~1.7564~~ AC.
1.2201 AC.

0.8401
ROOF AREA = ~~0.8401~~ AC.
~~0.8401~~

LAWN = ~~0.7564~~ AC.
0.3800

T.O.C. =

Appendix C
WATER QUALITY COMPUTATIONS

	A	B	C	D	E	F	G	H	I
1	39 Leggett Street, East Hartford, CT- % Impervious Coverage and Storm Water Quality Volume								
2	<u>SUBAREAS TO BIO-RETENTION BASIN</u>								
3	SUBAREAS	TOTAL AREA	PAVED AREA	% PAVED COV.	ROOF AREA	% ROOF COV.	LAWN AREA	% LANDSCAPE COV.	
4	PRO-SA-A.1	0.1303	0.1101	84.50	0.0000	0.00	0.0202	15.50	
5	PRO-SA-A.2	0.4203	0.1684	40.07	0.0000	0.00	0.2519	59.93	
6	SUM OF SA-A (TO SWQB)	0.5506	0.2785	50.58	0.0000	0.00	0.2721	49.42	
7									
8	<u>WATER QUALITY VOLUME (WQV) SA-SM-E.1 (TO S.W.Q.B.)</u>								
9	WQV= 1" x R x A/12								
10									
11	WQV= water quality volume (ac-ft)								
12	R= volumetric runoff coefficient = 0.05 + 0.009 (I)								
13	I= percent impervious cover								
14	A= site area in acres								
15									
16	WQV (REQUIRED)=	0.0232	acre-feet						
17									
18	WQV (PROVIDED)=	0.0480	acre-feet	PROVIDED BETWEEN ELEV. 49.0 to 50.5					
19									
20	<u>SUBAREAS TO BIO-RETENTION SWALE</u>								
21	SUBAREAS	TOTAL AREA	PAVED AREA	% PAVED COV.	ROOF AREA	% ROOF COV.	LAWN AREA	% LANDSCAPE COV.	
22	PRO-SA-A.3	1.8377	0.8116	44.16	0.6524	35.50	0.3737	20.34	
23	SUM OF SA-A (TO SWQB)	1.8377	0.8116	44.16	0.6524	35.50	0.3737	20.34	
24									
25	<u>WATER QUALITY VOLUME (WQV) SA-SM-E.1 (TO S.W.Q.B.)</u>								
26	WQV= 1" x R x A/12								
27									
28	WQV= water quality volume (ac-ft)								
29	R= volumetric runoff coefficient = 0.05 + 0.009 (I)								
30	I= percent impervious cover								
31	A= site area in acres								
32									
33	WQV (REQUIRED)=	0.0685	acre-feet						
34									
35	WQV (PROVIDED)=	0.0871	acre-feet	PROVIDED BETWEEN ELEV. 48.0 to 49.0					

Appendix E

Storm water Studio, ver. 2.0™

Computer Model Report for On-Site Drainage System

(100 year storm event)

Plan View

Stormwater Studio 2017 v 2.0.0.52

Project Name: 39 Leggett Street, East Hartford, Ct.
06-17-2018



Storm Sewer Tabulation

Stormwater Studio 2017 v 2.0.0.52

Project Name: 34 Leggett Street, East Hartford, CT.

06-17-2018

Line ID	Length (ft)	Drng Area		Rational		C x A		Tc		Intensity (in/hr)	Total Q (cfs)	Capacity (cfs)	Velocity (ft/s)	Line		Invert Elev		HGL Elev		Surface Elev		Line No
		Incr (ac)	Total (ac)	(C)		Incr	Total	Inlet (min)	Syst (min)					Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
CB #2 to Bio-Swale	48.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	11.47	1.56	3.94	2.83	12	1.04	48.50	49.00	49.50	49.53	48.50	50.50	1
CB #1 to Bio-Ret Basin	103.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.00	11.47	0.92	2.74	1.63	12	0.50	49.00	49.52	50.00	50.07	49.00	51.70	2

Notes: IDF File = NOHA Atlas 14 - IDF for 90 East River Drive, East Hartford, CT.idf, Return Period = 100-yrs.

Project File: 1347-sys.sws

Energy Grade Line Calculations

Stormwater Studio 2017 v 2.0.0.52

Project Name: 34 Leggett Street, East Hartford, CT.

06-17-2018

Line No	Line Size (in)	Q (cfs)	Downstream							Length (ft)	Upstream							Pipe		Junction		
			Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)		Invert Elev (ft)	Depth (ft)	Area (sqft)	HGL Elev (ft)	Vel (ft/s)	Vel Head (ft)	EGL Elev (ft)	n Value	Enrgy Loss (ft)	HGLa Elev (ft)	EGLa Elev (ft)	Enrgy Loss (ft)
1	12	1.56	48.50	1.00	0.79	49.50	1.99	0.06	49.56	48.00	49.00	0.53	0.42	49.53	3.67	0.21	49.74	0.012	0.167	49.58	49.79	0.05
2	12	0.92	49.00	1.00	0.79	50.00	1.17	0.02	50.02	103.00	49.52	0.55	0.44	50.07	2.08	0.07	50.14	0.012	0.115	50.08	50.15	0.01

Notes: Return Period = 100-yrs.

Project File: 1347-sys.sws

CT DOT Report

Stormwater Studio 2017 v 2.0.0.52

Project Name: 34 Leggett Street, East Hartford, CT.

06-17-2018

Line No.	Inlet Time (min)	Pipe Travel (min)	Tc (min)	Drain Area (ac)	Runoff Coeff (C)	Incr CxA	Total C x A	Incr Q (cfs)	Flow Rate (cfs)	Line Size (in)	Line Length (ft)	Line Slope (ft/ft)	Vel Ave (ft/s)	Capac. Full (cfs)	Vel Hd Dn (ft)	n-value Pipe	Line ID	
1	0.0	0.40	0.0	0.00	0.00	0.00	0.00	1.56	1.56	12	48.00	0.0104	2.83	3.94	0.06	0.012	CB #2 to Bio-Swale	
2	0.0	1.47	0.0	0.00	0.00	0.00	0.00	0.92	0.92	12	103.00	0.005	1.63	2.74	0.02	0.012	CB #1 to Bio-Ret Basin	

Notes: IDF File = NOHA Atlas 14 - IDF for 90 East River Drive, East Hartford, CT.idf, Return Period = 100-yrs.

Project File: 1347-sys.sws

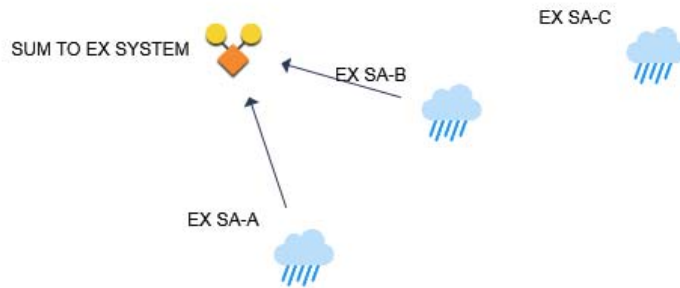
Appendix F
Hydrology Studio™
Computer Model Report – Pre-Development

Basin Model

Hydrology Studio v 2.0.0.52

Project Name: Pre-Development 39 Leggett St East Hartford

06-17-2018



Hydrograph by Return Period

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

[illegible]

Hydrograph 1-yr Summary

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

[illegible]

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

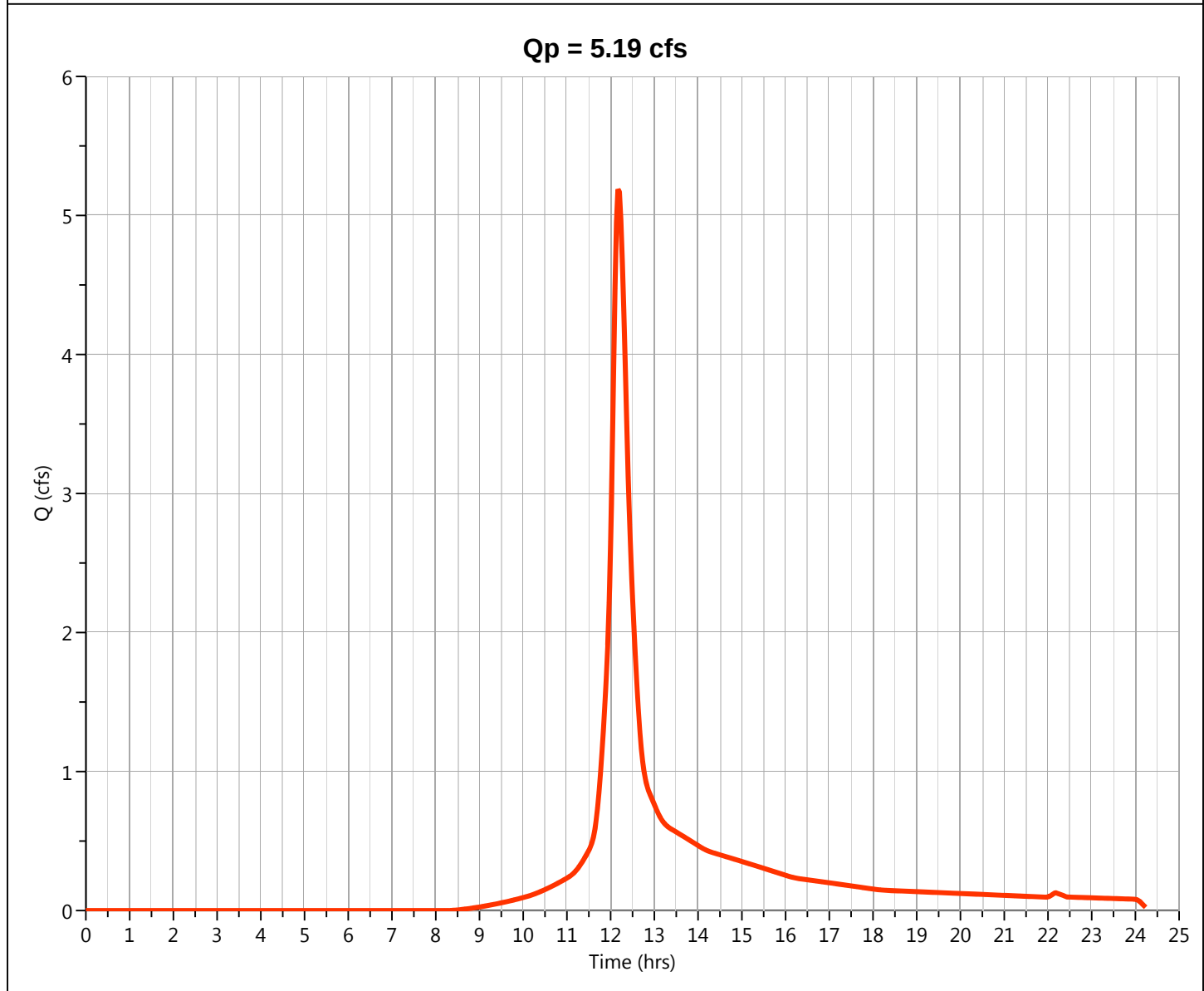
EX SA-A

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 5.189 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 21,159 cuft
Drainage Area	= 4.602 ac	Curve Number	= 87.19*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.81 min
Total Rainfall	= 2.4700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
3.258	98	B - PAVED
1.344	61	B - LAWN
4.602	87	Weighted Average



Hydrograph Discharge Table

EX SA-A

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.519	12.80	0.937						
11.63	0.572	12.83	0.894						
11.67	0.644	12.87	0.862						
11.70	0.737	12.90	0.835						
11.73	0.851	12.93	0.811						
11.77	0.984	12.97	0.786						
11.80	1.134	13.00	0.761						
11.83	1.301	13.03	0.737						
11.87	1.484	13.07	0.713						
11.90	1.680	13.10	0.691						
11.93	1.909	13.13	0.670						
11.97	2.217	13.17	0.652						
12.00	2.654	13.20	0.637						
12.03	3.221	13.23	0.625						
12.07	3.860	13.27	0.614						
12.10	4.476	13.30	0.605						
12.13	4.951	13.33	0.597						
12.17	5.189	13.37	0.590						
12.20	5.169	13.40	0.584						
12.23	4.967	13.43	0.577						
12.27	4.668	13.47	0.571						
12.30	4.319	13.50	0.565						
12.33	3.927	13.53	0.558						
12.37	3.514	13.57	0.552						
12.40	3.117	13.60	0.546						
12.43	2.775	13.63	0.539						
12.47	2.500	13.67	0.533						
12.50	2.264	13.70	0.526						
12.53	2.043	13.73	0.520						
12.57	1.827	13.77	0.513						
12.60	1.625	...end	...end						
12.63	1.444								
12.67	1.290								
12.70	1.167								
12.73	1.069								
12.77	0.994								

TR55 Worksheet

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

EX SA-A NRCS Runoff

Hyd. No. 1

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	GRASS			
Manning's n	0.240	0.013	0.013	
Flow Length (ft)	53			
2-yr, 24-hr Precip. (in)	3.0700	3.0700	3.0700	
Land Slope (%)	3.5			
Travel Time (min)	7.01	0.00	0.00	7.01
Shallow Concentrated Flow				
Flow Length (ft)	587			
Watercourse Slope (%)	.5			
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)	1.44			
Travel Time (min)	6.81	0.00	0.00	6.81
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.013	0.013	0.013	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				13.81 min

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

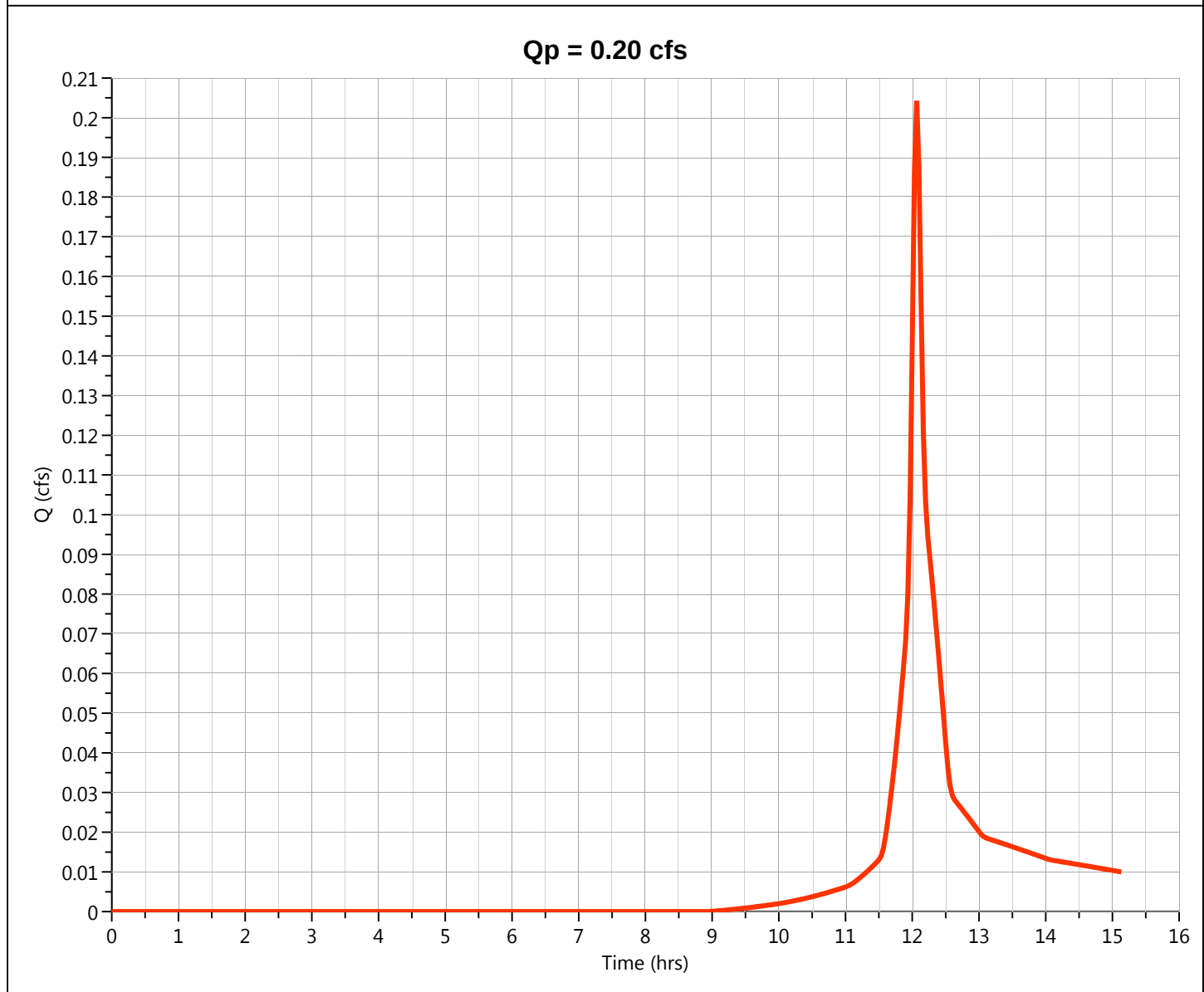
EX SA-B

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.204 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 613 cuft
Drainage Area	= 0.155 ac	Curve Number	= 85.11*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 2.4700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.101	98	B - PAVED
0.054	61	B - GRASS
0.155	85	Weighted Average



Hydrograph Discharge Table

EX SA-B

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.63	0.023	12.83	0.024						
11.67	0.027	12.87	0.023						
11.70	0.032	12.90	0.022						
11.73	0.037	12.93	0.022						
11.77	0.043	12.97	0.021						
11.80	0.048	13.00	0.020						
11.83	0.055	...end	...end						
11.87	0.061								
11.90	0.068								
11.93	0.080								
11.97	0.104								
12.00	0.144								
12.03	0.186								
12.07	0.204								
12.10	0.188								
12.13	0.152								
12.17	0.121								
12.20	0.103								
12.23	0.094								
12.27	0.089								
12.30	0.083								
12.33	0.076								
12.37	0.070								
12.40	0.063								
12.43	0.057								
12.47	0.050								
12.50	0.043								
12.53	0.036								
12.57	0.032								
12.60	0.029								
12.63	0.028								
12.67	0.027								
12.70	0.027								
12.73	0.026								
12.77	0.025								
12.80	0.025								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

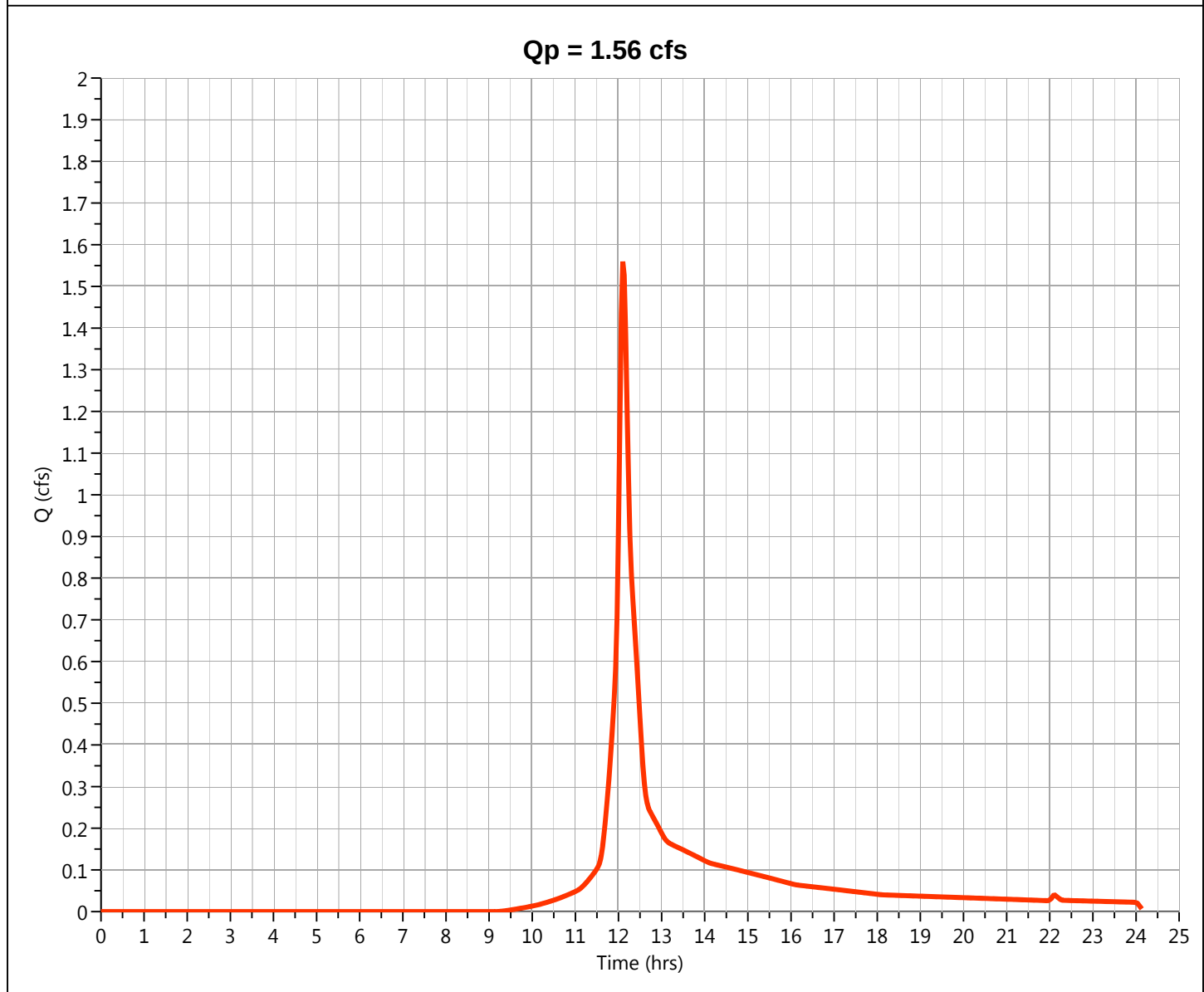
EX SA-C

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.560 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 5,381 cuft
Drainage Area	= 1.332 ac	Curve Number	= 84.33*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.36 min
Total Rainfall	= 2.4700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.492	61	B - GRASS
1.332	84	Weighted Average



Hydrograph Discharge Table

EX SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.63	0.157	12.83	0.221						
11.67	0.187	12.87	0.214						
11.70	0.221	12.90	0.208						
11.73	0.261	12.93	0.201						
11.77	0.304	12.97	0.195						
11.80	0.350	13.00	0.188						
11.83	0.400	13.03	0.182						
11.87	0.453	13.07	0.176						
11.90	0.509	13.10	0.171						
11.93	0.584	13.13	0.168						
11.97	0.708	13.17	0.165						
12.00	0.916	13.20	0.163						
12.03	1.188	13.23	0.161						
12.07	1.436	13.27	0.159						
12.10	1.560	13.30	0.158						
12.13	1.526	13.33	0.156						
12.17	1.386	13.37	0.155						
12.20	1.205	...end	...end						
12.23	1.033								
12.27	0.899								
12.30	0.810								
12.33	0.748								
12.37	0.694								
12.40	0.638								
12.43	0.581								
12.47	0.521								
12.50	0.461								
12.53	0.402								
12.57	0.349								
12.60	0.307								
12.63	0.278								
12.67	0.259								
12.70	0.247								
12.73	0.240								
12.77	0.234								
12.80	0.227								

TR55 Worksheet

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

EX SA-C

Hyd. No. 3

NRCS Runoff

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	GRASS			
Manning's n	0.120	0.013	0.013	
Flow Length (ft)	40			
2-yr, 24-hr Precip. (in)	3.0700	3.0700	3.0700	
Land Slope (%)	1			
Travel Time (min)	5.30	0.00	0.00	5.30
Shallow Concentrated Flow				
Flow Length (ft)	105			
Watercourse Slope (%)	.52			
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	1.16			
Travel Time (min)	1.50	0.00	0.00	1.50
Channel Flow				
X-sectional Flow Area (sqft)	3.2			
Wetted Perimeter (ft)	3			
Channel Slope (%)	.5			
Manning's n	0.012	0.013	0.013	
Velocity (ft/s)	9.17			
Flow Length (ft)	302			
Travel Time (min)	0.55	0.00	0.00	0.55
Total Travel Time				7.36 min

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

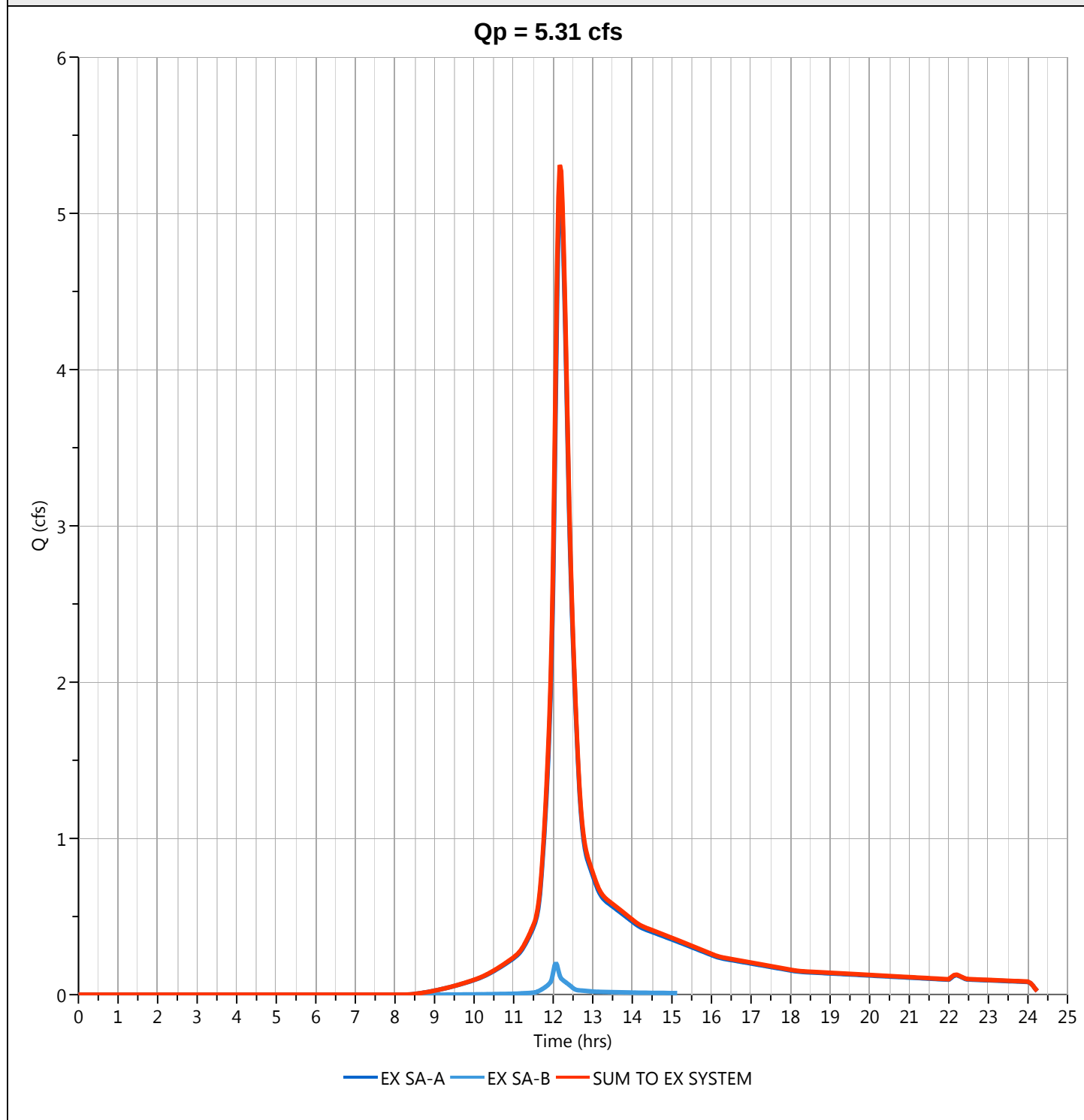
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX SYSTEM

Hyd. No. 4

Hydrograph Type	= Junction	Peak Flow	= 5.309 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Hydrograph Volume	= 21,772 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 4.757 ac



Hydrograph Discharge Table

SUM TO EX SYSTEM

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.538	12.80	0.961						
11.63	0.595	12.83	0.918						
11.67	0.671	12.87	0.885						
11.70	0.770	12.90	0.858						
11.73	0.888	12.93	0.832						
11.77	1.026	12.97	0.807						
11.80	1.183	13.00	0.782						
11.83	1.356	13.03	0.756						
11.87	1.545	13.07	0.732						
11.90	1.748	13.10	0.709						
11.93	1.989	13.13	0.689						
11.97	2.321	13.17	0.671						
12.00	2.798	13.20	0.655						
12.03	3.407	13.23	0.642						
12.07	4.065	13.27	0.632						
12.10	4.663	13.30	0.622						
12.13	5.103	13.33	0.614						
12.17	5.309	13.37	0.607						
12.20	5.272	13.40	0.600						
12.23	5.062	13.43	0.594						
12.27	4.757	13.47	0.588						
12.30	4.402	13.50	0.581						
12.33	4.004	13.53	0.575						
12.37	3.584	13.57	0.568						
12.40	3.180	13.60	0.561						
12.43	2.832	13.63	0.555						
12.47	2.550	13.67	0.548						
12.50	2.307	13.70	0.541						
12.53	2.079	13.73	0.535						
12.57	1.859	13.77	0.528						
12.60	1.654	...end	...end						
12.63	1.472								
12.67	1.318								
12.70	1.193								
12.73	1.095								
12.77	1.019								

Design Storm Report

Custom Storm filename:

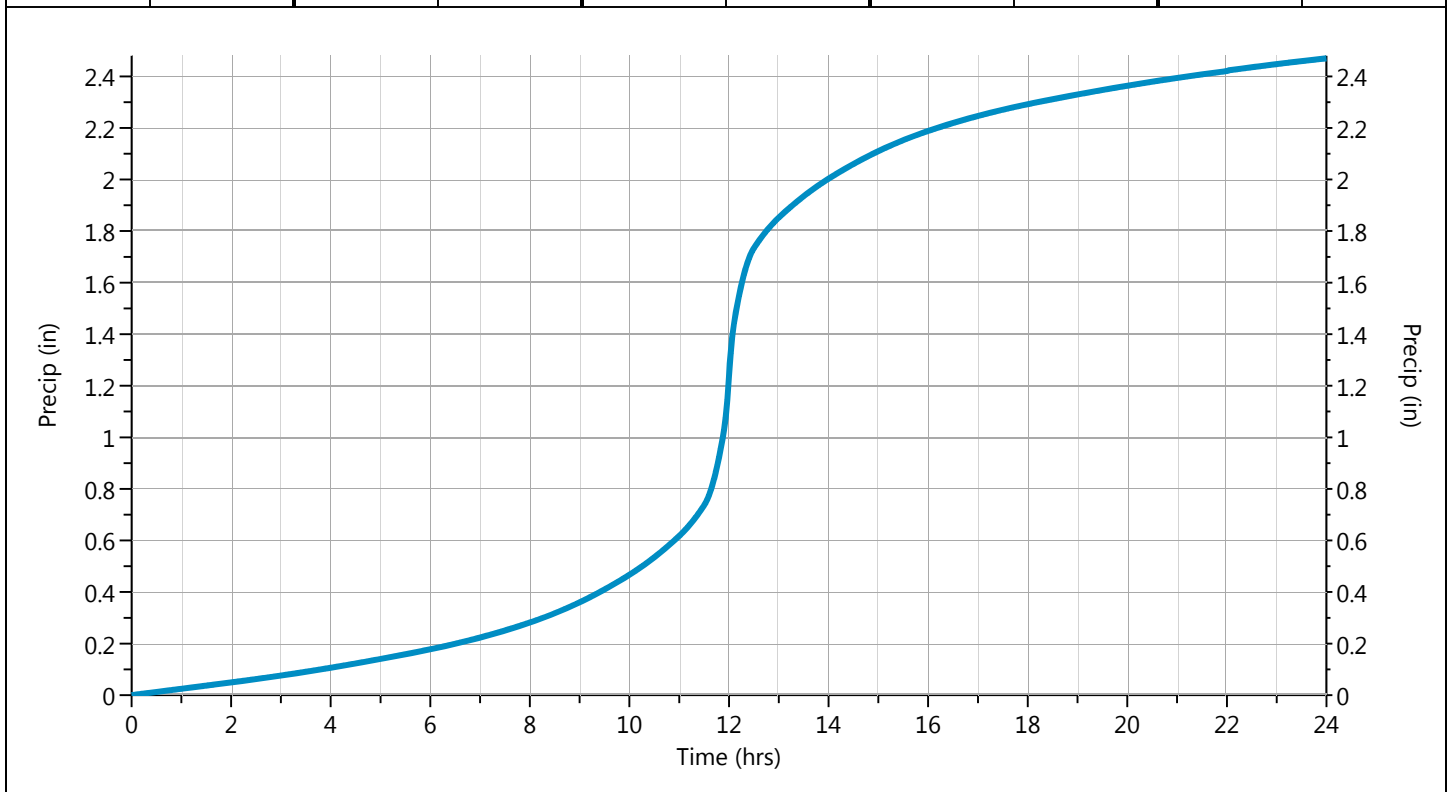
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)								
	✓ 1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72	

Incremental Rainfall Distribution, 1-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0060	11.37	0.0087	11.73	0.0255	12.10	0.0489	12.47	0.0134
11.03	0.0061	11.40	0.0089	11.77	0.0279	12.13	0.0376	12.50	0.0110
11.07	0.0064	11.43	0.0092	11.80	0.0303	12.17	0.0352	12.53	0.0097
11.10	0.0066	11.47	0.0094	11.83	0.0327	12.20	0.0327	12.57	0.0094
11.13	0.0069	11.50	0.0097	11.87	0.0352	12.23	0.0303	12.60	0.0092
11.17	0.0071	11.53	0.0110	11.90	0.0376	12.27	0.0279	12.63	0.0089
11.20	0.0074	11.57	0.0134	11.93	0.0490	12.30	0.0255	12.67	0.0087
11.23	0.0077	11.60	0.0158	11.97	0.0692	12.33	0.0231	12.70	0.0084
11.27	0.0079	11.63	0.0183	12.00	0.0894	12.37	0.0207	12.73	0.0082
11.30	0.0082	11.67	0.0207	12.03	0.0893	12.40	0.0183	12.77	0.0079
11.33	0.0084	11.70	0.0231	12.07	0.0692	12.43	0.0158	12.80	0.0077



Hydrograph 2-yr Summary

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

[illegible]

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

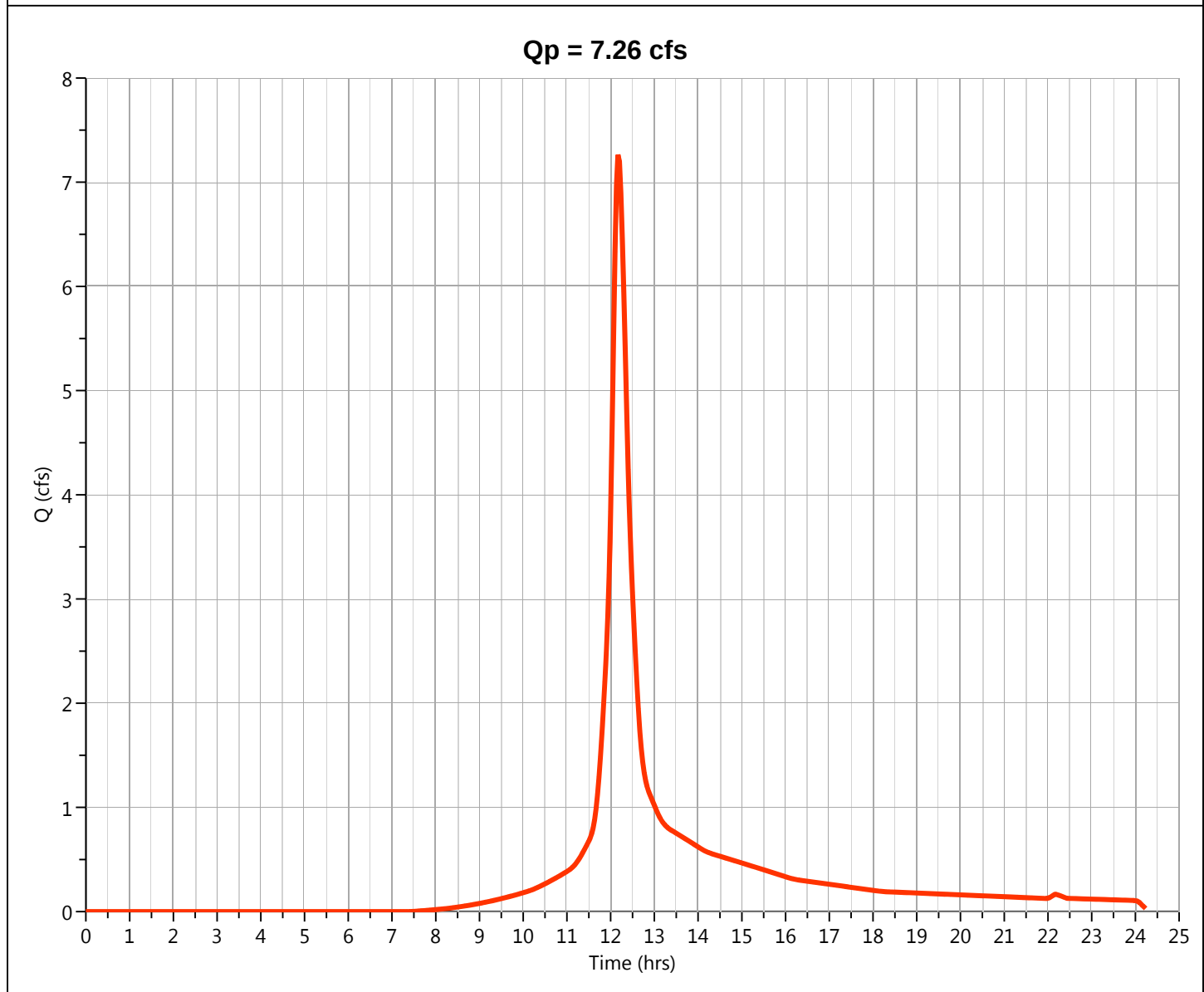
EX SA-A

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 7.264 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 29,569 cuft
Drainage Area	= 4.602 ac	Curve Number	= 87.19*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.81 min
Total Rainfall	= 3.0700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
3.258	98	B - PAVED
1.344	61	B - LAWN
4.602	87	Weighted Average



Hydrograph Discharge Table

EX SA-A

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.748	12.77	1.334						
11.60	0.803	12.80	1.257						
11.63	0.881	12.83	1.199						
11.67	0.988	12.87	1.155						
11.70	1.126	12.90	1.119						
11.73	1.292	12.93	1.086						
11.77	1.486	12.97	1.052						
11.80	1.705	13.00	1.019						
11.83	1.945	13.03	0.986						
11.87	2.206	13.07	0.954						
11.90	2.483	13.10	0.923						
11.93	2.805	13.13	0.896						
11.97	3.233	13.17	0.872						
12.00	3.839	13.20	0.851						
12.03	4.620	13.23	0.834						
12.07	5.497	13.27	0.819						
12.10	6.332	13.30	0.807						
12.13	6.966	13.33	0.796						
12.17	7.264	13.37	0.787						
12.20	7.204	13.40	0.778						
12.23	6.896	13.43	0.769						
12.27	6.456	13.47	0.761						
12.30	5.951	13.50	0.752						
12.33	5.390	13.53	0.744						
12.37	4.804	13.57	0.735						
12.40	4.246	13.60	0.726						
12.43	3.770	...end	...end						
12.47	3.388								
12.50	3.064								
12.53	2.760								
12.57	2.466								
12.60	2.191								
12.63	1.944								
12.67	1.736								
12.70	1.568								
12.73	1.436								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

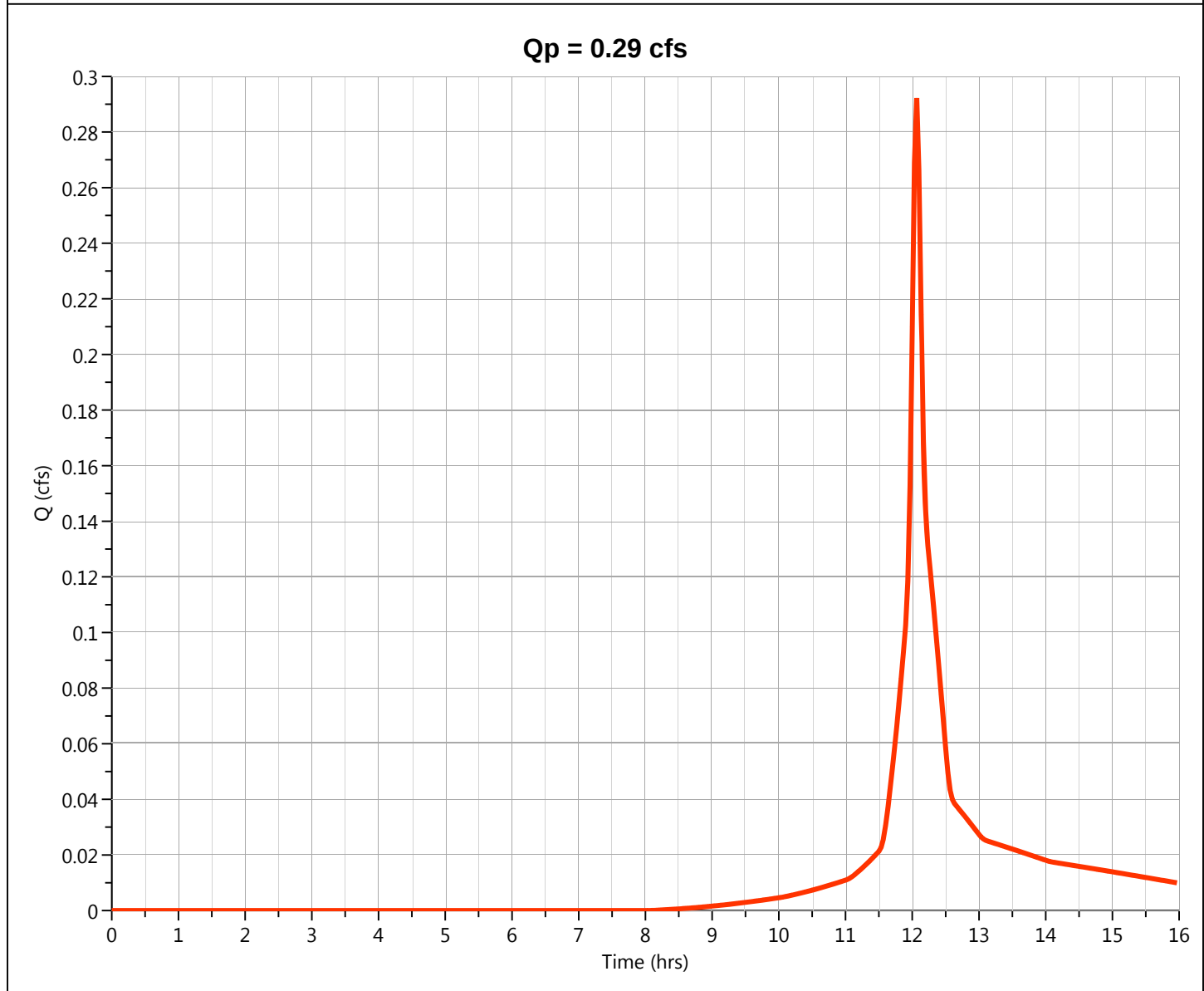
EX SA-B

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.292 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 873 cuft
Drainage Area	= 0.155 ac	Curve Number	= 85.11*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 3.0700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.101	98	B - PAVED
0.054	61	B - GRASS
0.155	85	Weighted Average



Hydrograph Discharge Table

EX SA-B

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.031	12.80	0.034						
11.63	0.037	12.83	0.033						
11.67	0.043	12.87	0.032						
11.70	0.051	12.90	0.030						
11.73	0.058	12.93	0.029						
11.77	0.066	12.97	0.028						
11.80	0.075	...end	...end						
11.83	0.083								
11.87	0.093								
11.90	0.102								
11.93	0.119								
11.97	0.153								
12.00	0.210								
12.03	0.269								
12.07	0.292								
12.10	0.266								
12.13	0.214								
12.17	0.169								
12.20	0.144								
12.23	0.131								
12.27	0.123								
12.30	0.114								
12.33	0.106								
12.37	0.097								
12.40	0.087								
12.43	0.078								
12.47	0.068								
12.50	0.059								
12.53	0.050								
12.57	0.043								
12.60	0.040								
12.63	0.038								
12.67	0.037								
12.70	0.037								
12.73	0.036								
12.77	0.035								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

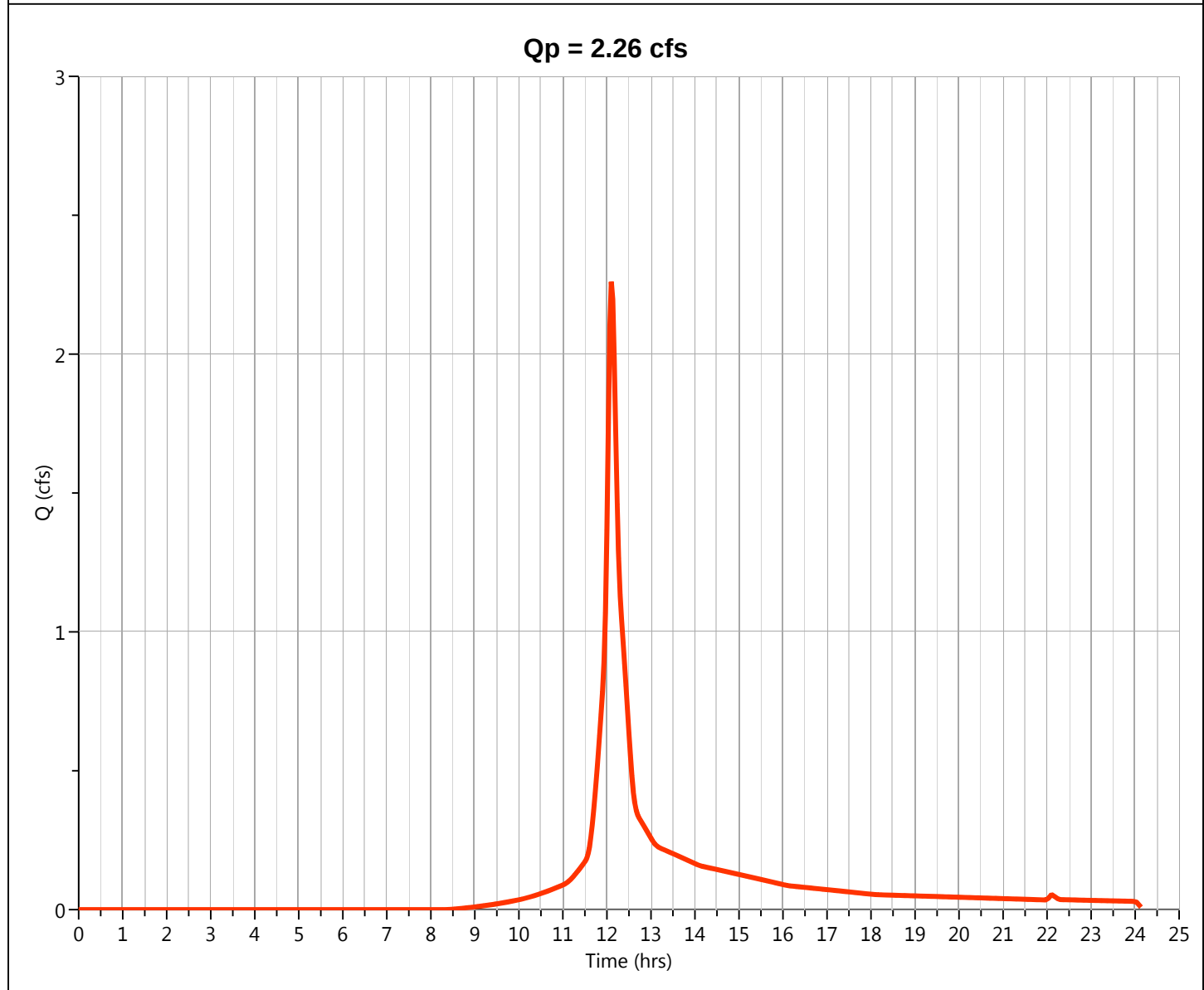
EX SA-C

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 2.260 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 7,726 cuft
Drainage Area	= 1.332 ac	Curve Number	= 84.33*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.36 min
Total Rainfall	= 3.0700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.492	61	B - GRASS
1.332	84	Weighted Average



Hydrograph Discharge Table

EX SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.63	0.259	12.83	0.303						
11.67	0.304	12.87	0.294						
11.70	0.359	12.90	0.285						
11.73	0.419	12.93	0.276						
11.77	0.484	12.97	0.267						
11.80	0.553	13.00	0.258						
11.83	0.626	13.03	0.249						
11.87	0.703	13.07	0.241						
11.90	0.784	13.10	0.234						
11.93	0.891	13.13	0.229						
11.97	1.068	13.17	0.225						
12.00	1.366	...end	...end						
12.03	1.752								
12.07	2.098								
12.10	2.260								
12.13	2.197								
12.17	1.982								
12.20	1.712								
12.23	1.460								
12.27	1.264								
12.30	1.134								
12.33	1.044								
12.37	0.967								
12.40	0.887								
12.43	0.806								
12.47	0.722								
12.50	0.638								
12.53	0.555								
12.57	0.481								
12.60	0.424								
12.63	0.383								
12.67	0.357								
12.70	0.340								
12.73	0.330								
12.77	0.321								
12.80	0.312								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

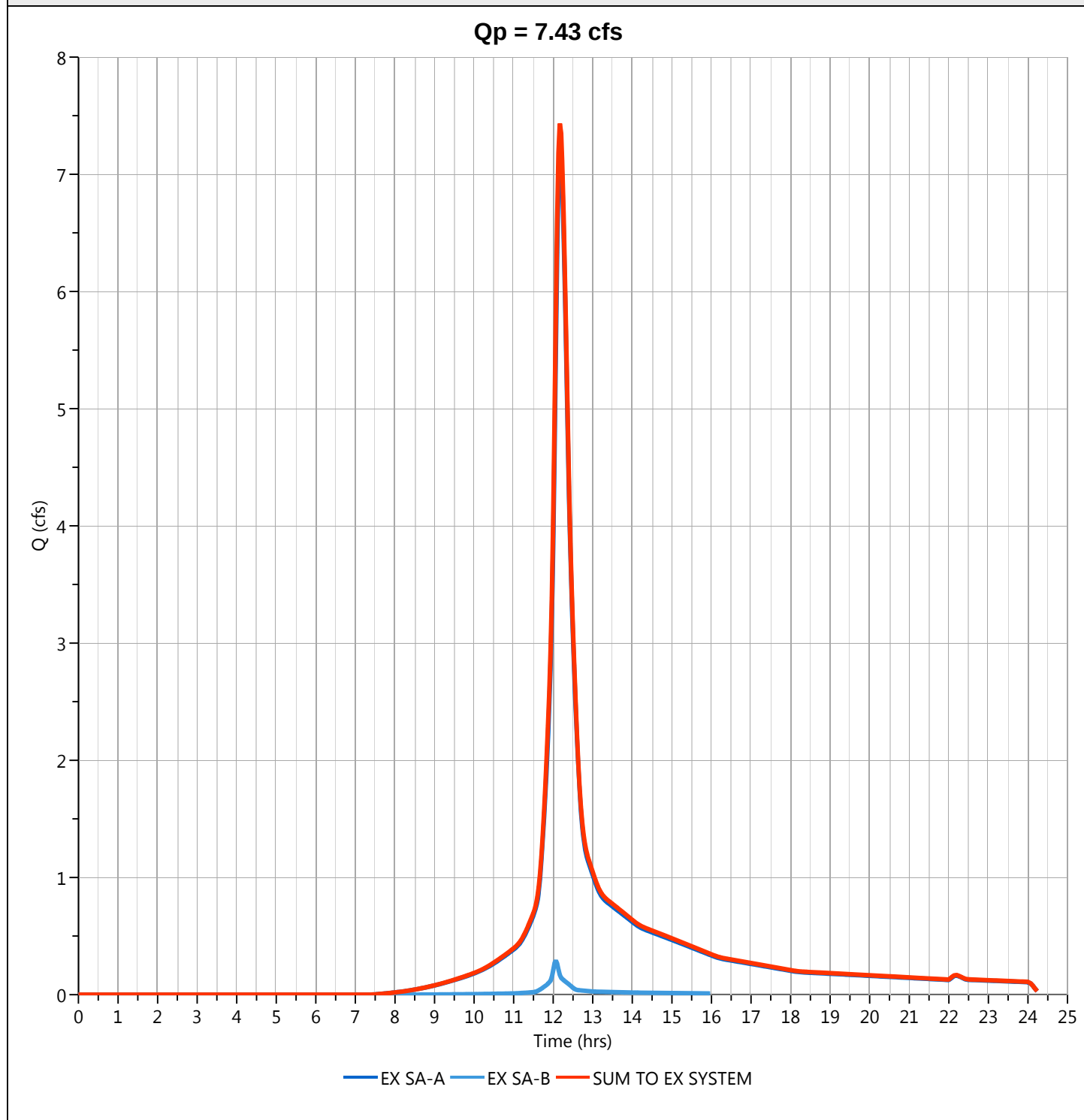
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX SYSTEM

Hyd. No. 4

Hydrograph Type	= Junction	Peak Flow	= 7.433 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Hydrograph Volume	= 30,442 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 4.757 ac



Hydrograph Discharge Table

SUM TO EX SYSTEM

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.773	12.77	1.369						
11.60	0.834	12.80	1.290						
11.63	0.918	12.83	1.231						
11.67	1.031	12.87	1.186						
11.70	1.176	12.90	1.149						
11.73	1.351	12.93	1.115						
11.77	1.552	12.97	1.081						
11.80	1.779	13.00	1.046						
11.83	2.029	13.03	1.012						
11.87	2.298	13.07	0.979						
11.90	2.585	13.10	0.949						
11.93	2.923	13.13	0.921						
11.97	3.386	13.17	0.896						
12.00	4.049	13.20	0.876						
12.03	4.889	13.23	0.858						
12.07	5.789	13.27	0.843						
12.10	6.598	13.30	0.831						
12.13	7.180	13.33	0.820						
12.17	7.433	13.37	0.810						
12.20	7.348	13.40	0.801						
12.23	7.027	13.43	0.792						
12.27	6.579	13.47	0.783						
12.30	6.065	13.50	0.774						
12.33	5.496	13.53	0.766						
12.37	4.901	13.57	0.757						
12.40	4.333	13.60	0.748						
12.43	3.848	13.63	0.739						
12.47	3.457	...end	...end						
12.50	3.123								
12.53	2.810								
12.57	2.510								
12.60	2.231								
12.63	1.983								
12.67	1.773								
12.70	1.605								
12.73	1.472								

Design Storm Report

Custom Storm filename:

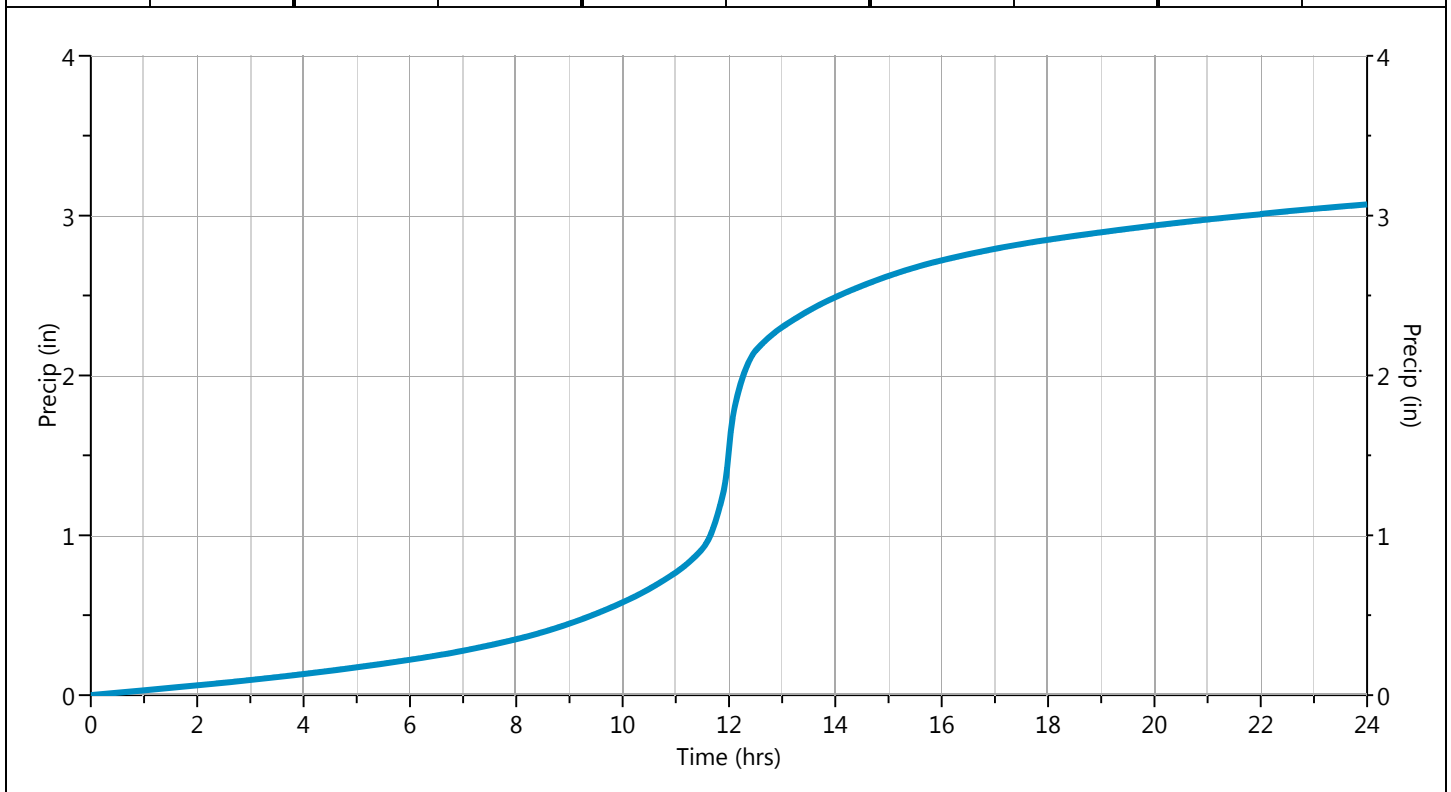
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)								
	1-yr	√ 2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72	

Incremental Rainfall Distribution, 2-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0074	11.37	0.0108	11.73	0.0317	12.10	0.0608	12.47	0.0167
11.03	0.0076	11.40	0.0111	11.77	0.0347	12.13	0.0468	12.50	0.0137
11.07	0.0079	11.43	0.0114	11.80	0.0377	12.17	0.0437	12.53	0.0120
11.10	0.0083	11.47	0.0117	11.83	0.0407	12.20	0.0407	12.57	0.0117
11.13	0.0086	11.50	0.0120	11.87	0.0437	12.23	0.0377	12.60	0.0114
11.17	0.0089	11.53	0.0137	11.90	0.0467	12.27	0.0347	12.63	0.0111
11.20	0.0092	11.57	0.0167	11.93	0.0609	12.30	0.0317	12.67	0.0108
11.23	0.0095	11.60	0.0197	11.97	0.0860	12.33	0.0287	12.70	0.0105
11.27	0.0098	11.63	0.0227	12.00	0.1111	12.37	0.0257	12.73	0.0101
11.30	0.0101	11.67	0.0257	12.03	0.1110	12.40	0.0227	12.77	0.0098
11.33	0.0105	11.70	0.0287	12.07	0.0860	12.43	0.0197	12.80	0.0095



Hydrograph 5-yr Summary

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

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Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

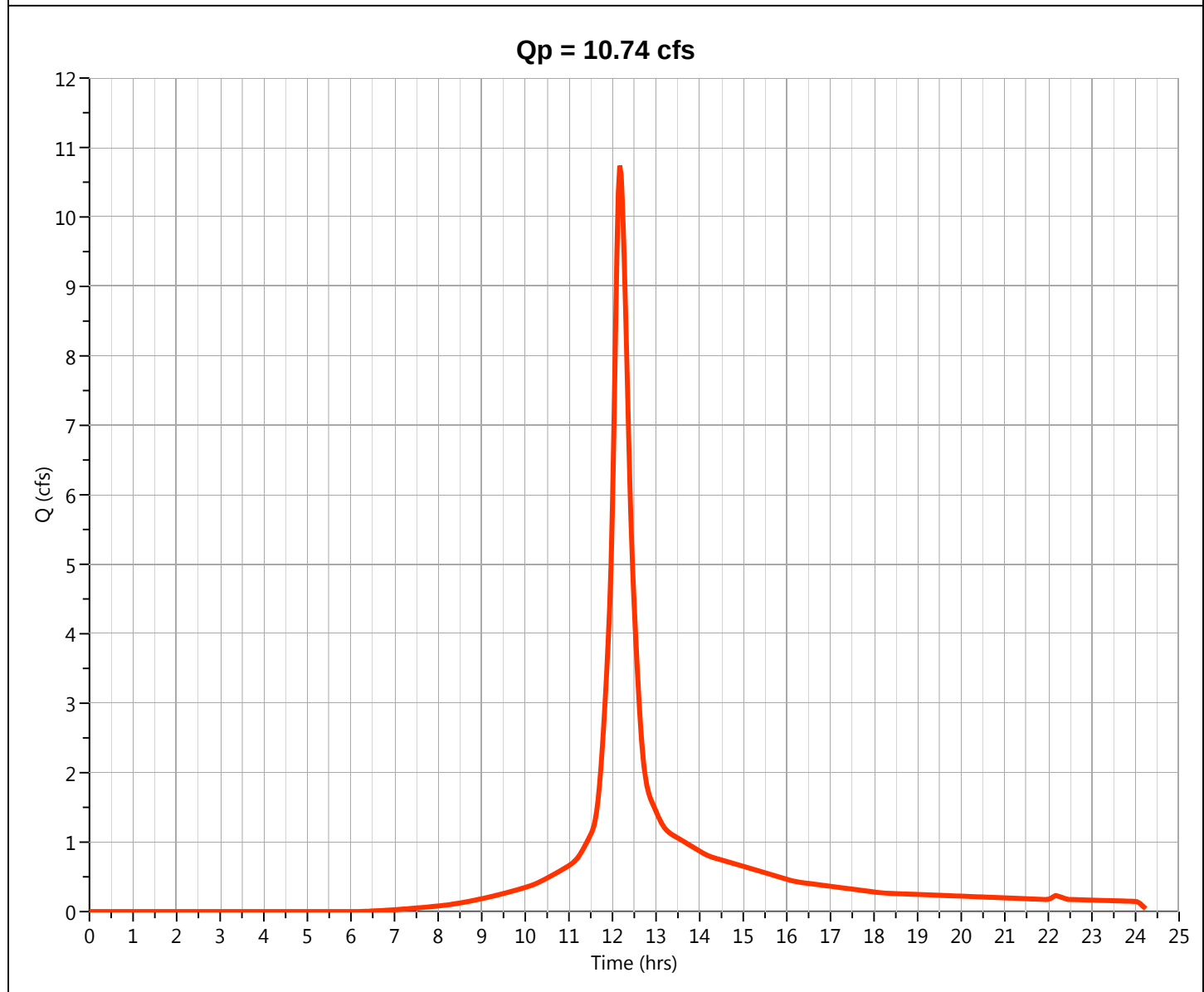
EX SA-A

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 10.74 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 43,977 cuft
Drainage Area	= 4.602 ac	Curve Number	= 87.19*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.81 min
Total Rainfall	= 4.0500 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
3.258	98	B - PAVED
1.344	61	B - LAWN
4.602	87	Weighted Average



Hydrograph Discharge Table

EX SA-A

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.50	1.110	12.70	2.227						
11.53	1.158	12.73	2.037						
11.57	1.220	12.77	1.891						
11.60	1.306	12.80	1.781						
11.63	1.427	12.83	1.698						
11.67	1.593	12.87	1.635						
11.70	1.807	12.90	1.583						
11.73	2.066	12.93	1.536						
11.77	2.364	12.97	1.488						
11.80	2.698	13.00	1.440						
11.83	3.064	13.03	1.393						
11.87	3.456	13.07	1.347						
11.90	3.869	13.10	1.304						
11.93	4.345	13.13	1.264						
11.97	4.975	13.17	1.230						
12.00	5.861	13.20	1.201						
12.03	6.997	13.23	1.176						
12.07	8.263	13.27	1.155						
12.10	9.458	13.30	1.137						
12.13	10.35	13.33	1.122						
12.17	10.74	13.37	1.108						
12.20	10.60	13.40	1.095						
12.23	10.11	13.43	1.083						
12.27	9.429	13.47	1.071						
12.30	8.658	...end	...end						
12.33	7.811								
12.37	6.936								
12.40	6.108								
12.43	5.407								
12.47	4.850								
12.50	4.378								
12.53	3.939								
12.57	3.515								
12.60	3.119								
12.63	2.765								
12.67	2.467								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

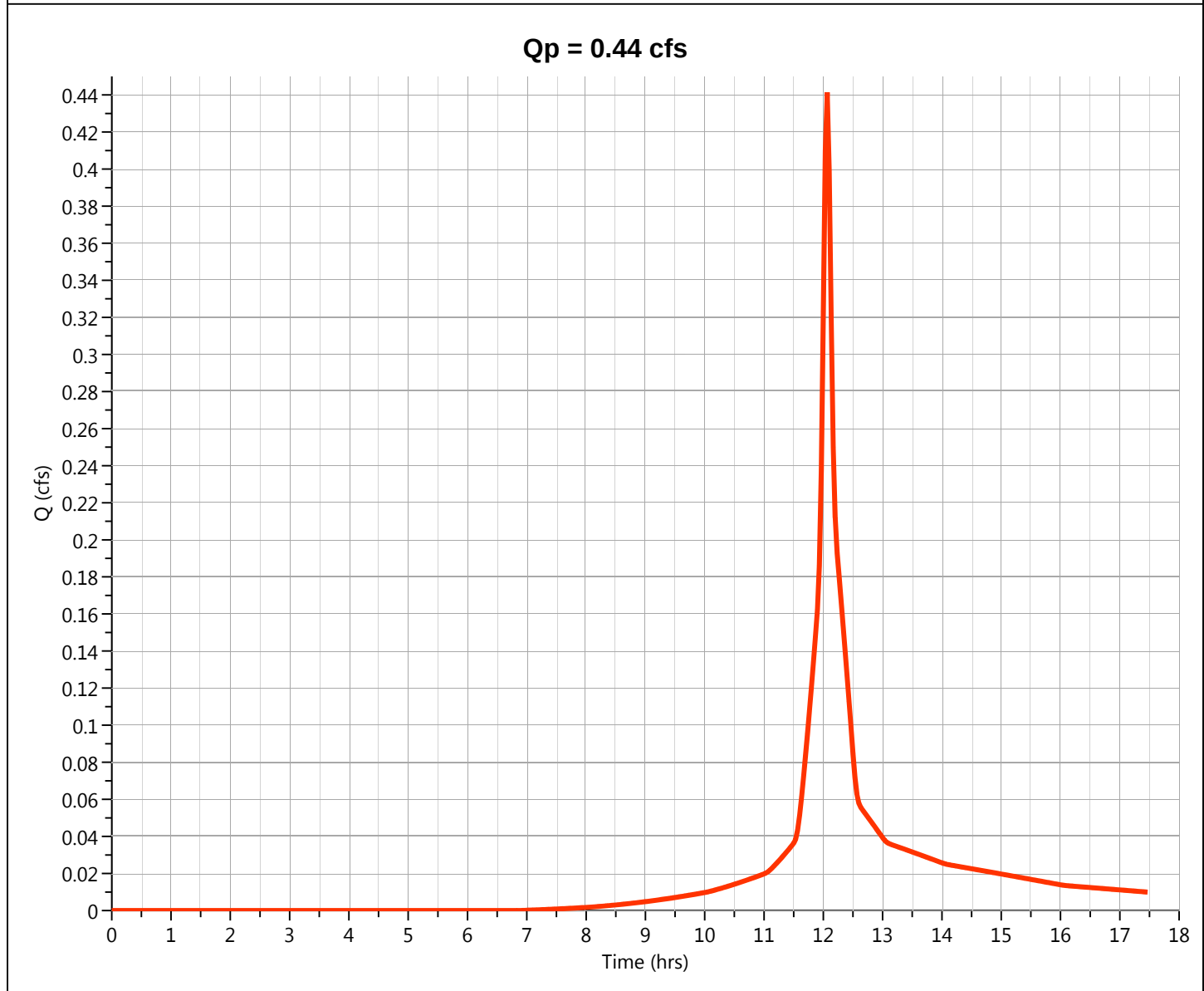
EX SA-B

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.441 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 1,325 cuft
Drainage Area	= 0.155 ac	Curve Number	= 85.11*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 4.0500 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.101	98	B - PAVED
0.054	61	B - GRASS
0.155	85	Weighted Average



Hydrograph Discharge Table

EX SA-B

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.051	12.80	0.048						
11.63	0.061	12.83	0.047						
11.67	0.072	12.87	0.045						
11.70	0.084	12.90	0.044						
11.73	0.095	...end	...end						
11.77	0.108								
11.80	0.121								
11.83	0.134								
11.87	0.148								
11.90	0.162								
11.93	0.186								
11.97	0.238								
12.00	0.323								
12.03	0.410								
12.07	0.441								
12.10	0.399								
12.13	0.319								
12.17	0.250								
12.20	0.212								
12.23	0.193								
12.27	0.180								
12.30	0.167								
12.33	0.154								
12.37	0.140								
12.40	0.127								
12.43	0.113								
12.47	0.099								
12.50	0.085								
12.53	0.072								
12.57	0.063								
12.60	0.058								
12.63	0.056								
12.67	0.054								
12.70	0.053								
12.73	0.051								
12.77	0.050								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

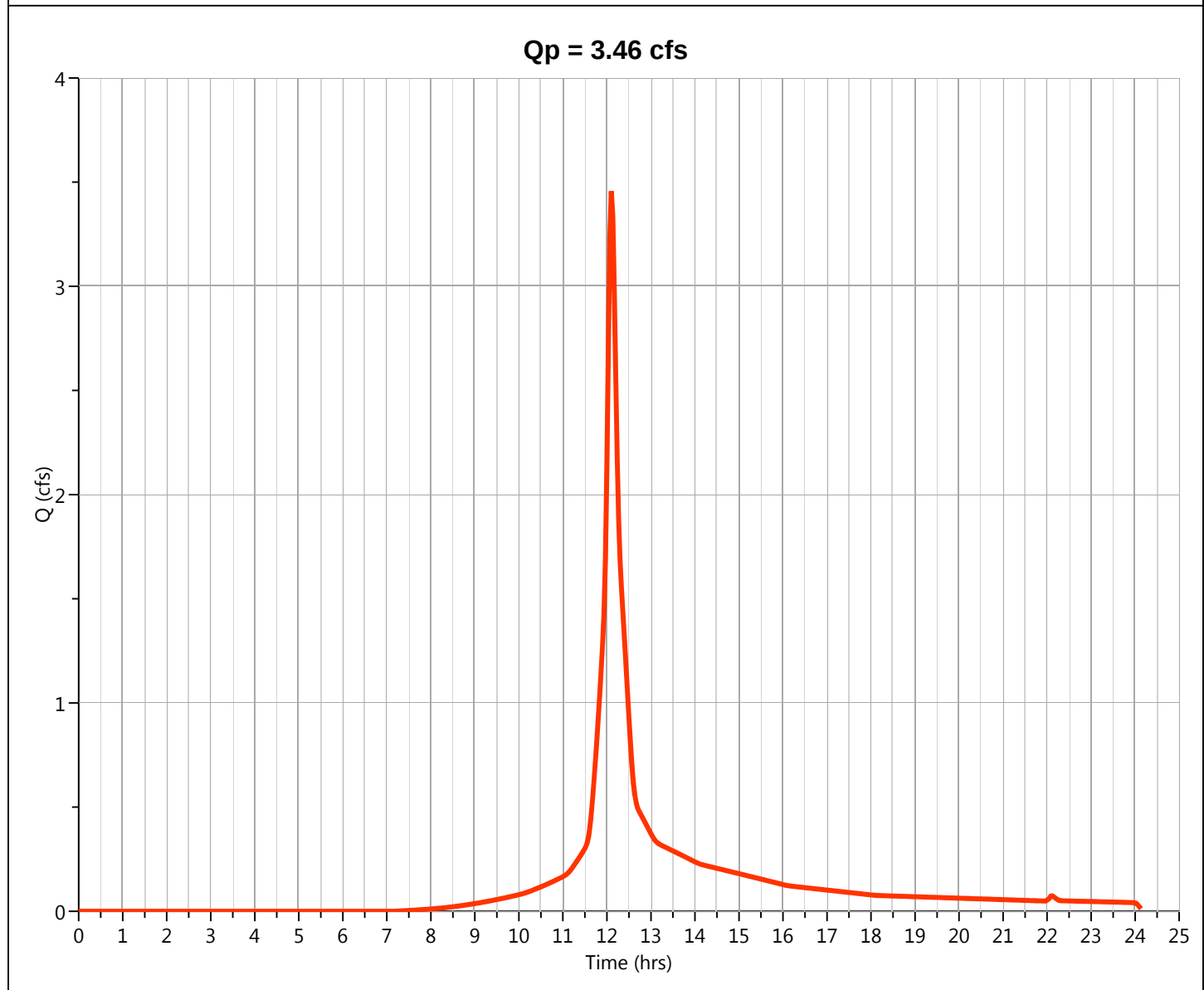
EX SA-C

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 3.456 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 11,816 cuft
Drainage Area	= 1.332 ac	Curve Number	= 84.33*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.36 min
Total Rainfall	= 4.0500 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.492	61	B - GRASS
1.332	84	Weighted Average



Hydrograph Discharge Table

EX SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.382	12.80	0.453						
11.63	0.442	12.83	0.439						
11.67	0.518	12.87	0.426						
11.70	0.606	12.90	0.413						
11.73	0.704	12.93	0.400						
11.77	0.807	12.97	0.386						
11.80	0.916	13.00	0.373						
11.83	1.029	13.03	0.360						
11.87	1.146	13.07	0.348						
11.90	1.269	13.10	0.338						
11.93	1.429	...end	...end						
11.97	1.697								
12.00	2.148								
12.03	2.726								
12.07	3.233								
12.10	3.456								
12.13	3.337								
12.17	2.993								
12.20	2.569								
12.23	2.177								
12.27	1.876								
12.30	1.677								
12.33	1.540								
12.37	1.422								
12.40	1.302								
12.43	1.180								
12.47	1.057								
12.50	0.931								
12.53	0.810								
12.57	0.701								
12.60	0.617								
12.63	0.558								
12.67	0.519								
12.70	0.494								
12.73	0.479								
12.77	0.466								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

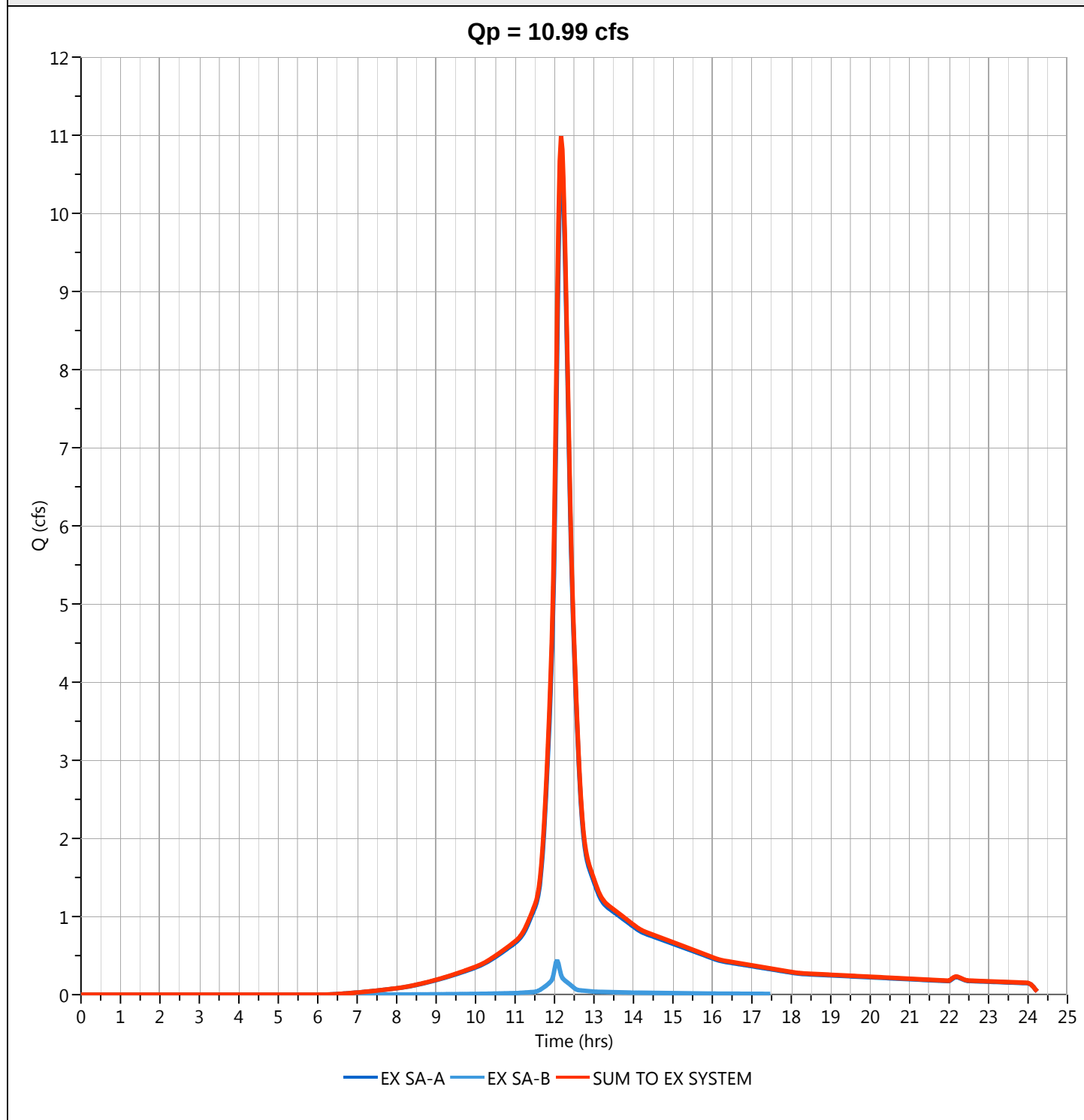
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX SYSTEM

Hyd. No. 4

Hydrograph Type	= Junction	Peak Flow	= 10.99 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Hydrograph Volume	= 45,303 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 4.757 ac



Hydrograph Discharge Table

SUM TO EX SYSTEM

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.47	1.103	12.67	2.521						
11.50	1.147	12.70	2.279						
11.53	1.196	12.73	2.088						
11.57	1.263	12.77	1.941						
11.60	1.357	12.80	1.829						
11.63	1.488	12.83	1.744						
11.67	1.665	12.87	1.680						
11.70	1.891	12.90	1.627						
11.73	2.161	12.93	1.578						
11.77	2.472	12.97	1.529						
11.80	2.819	13.00	1.479						
11.83	3.198	13.03	1.431						
11.87	3.604	13.07	1.384						
11.90	4.031	13.10	1.340						
11.93	4.531	13.13	1.300						
11.97	5.213	13.17	1.265						
12.00	6.184	13.20	1.236						
12.03	7.407	13.23	1.210						
12.07	8.705	13.27	1.189						
12.10	9.857	13.30	1.171						
12.13	10.67	13.33	1.155						
12.17	10.99	13.37	1.141						
12.20	10.82	13.40	1.128						
12.23	10.30	13.43	1.116						
12.27	9.610	13.47	1.103						
12.30	8.825	13.50	1.090						
12.33	7.965	...end	...end						
12.37	7.077								
12.40	6.235								
12.43	5.520								
12.47	4.949								
12.50	4.463								
12.53	4.011								
12.57	3.577								
12.60	3.177								
12.63	2.821								

Design Storm Report

Custom Storm filename:

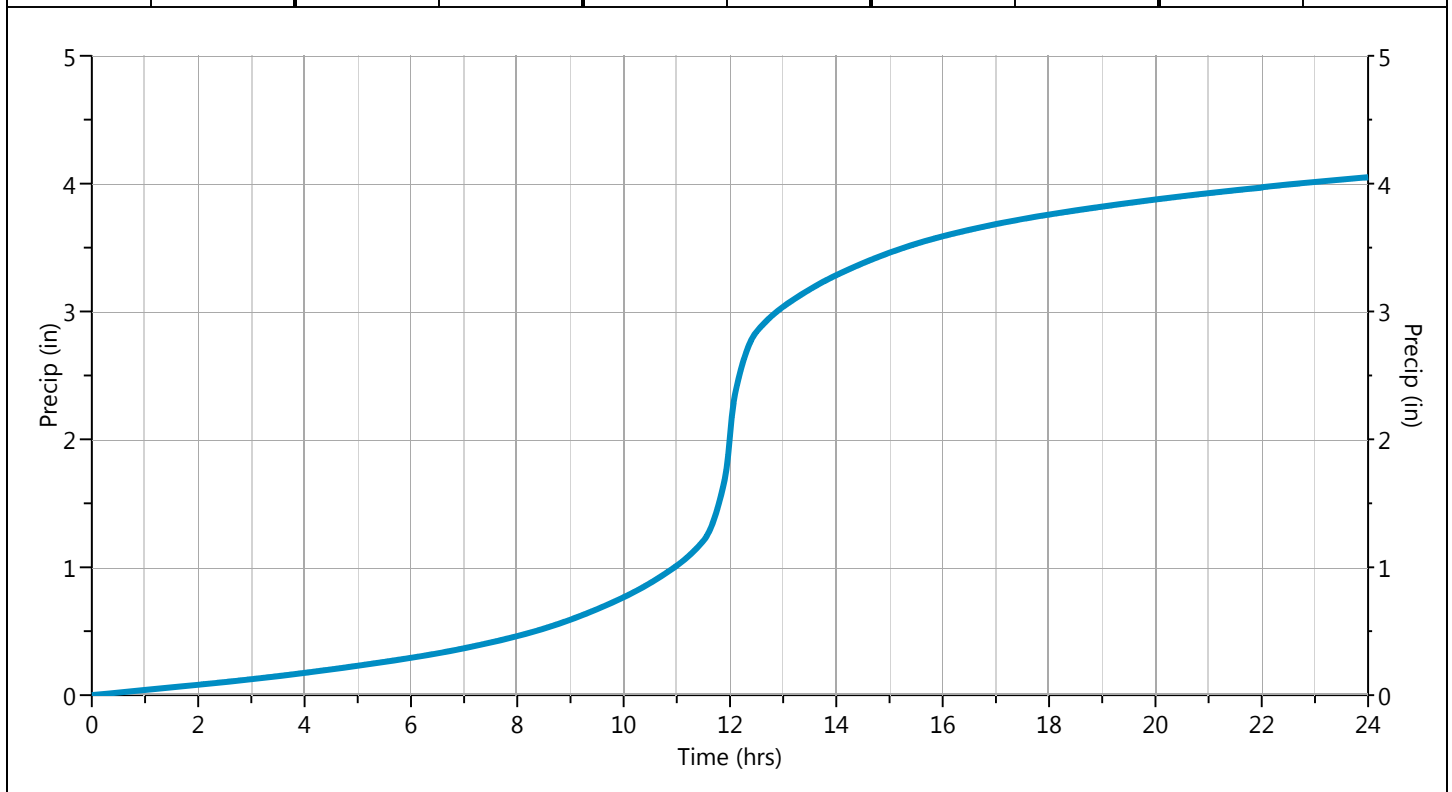
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	√ 5-yr	10-yr	25-yr	50-yr	100-yr	
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72	

Incremental Rainfall Distribution, 5-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0098	11.37	0.0142	11.73	0.0418	12.10	0.0802	12.47	0.0220
11.03	0.0101	11.40	0.0146	11.77	0.0458	12.13	0.0617	12.50	0.0180
11.07	0.0105	11.43	0.0150	11.80	0.0497	12.17	0.0576	12.53	0.0158
11.10	0.0109	11.47	0.0154	11.83	0.0537	12.20	0.0537	12.57	0.0154
11.13	0.0113	11.50	0.0159	11.87	0.0576	12.23	0.0497	12.60	0.0150
11.17	0.0117	11.53	0.0180	11.90	0.0616	12.27	0.0458	12.63	0.0146
11.20	0.0121	11.57	0.0220	11.93	0.0803	12.30	0.0418	12.67	0.0142
11.23	0.0125	11.60	0.0260	11.97	0.1134	12.33	0.0378	12.70	0.0138
11.27	0.0130	11.63	0.0299	12.00	0.1466	12.37	0.0339	12.73	0.0134
11.30	0.0134	11.67	0.0339	12.03	0.1464	12.40	0.0299	12.77	0.0130
11.33	0.0138	11.70	0.0378	12.07	0.1134	12.43	0.0260	12.80	0.0125



Hydrograph 10-yr Summary

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

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Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

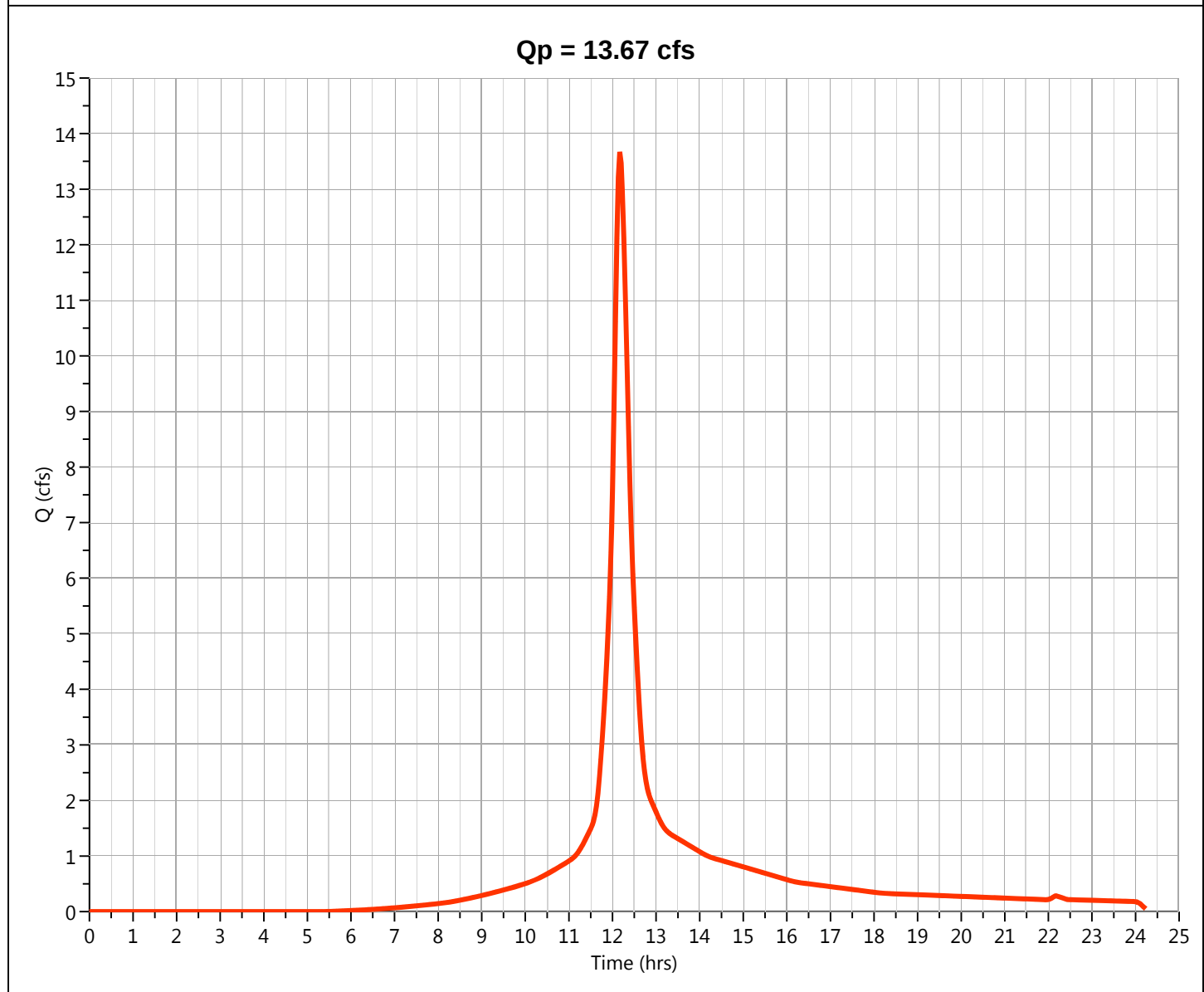
EX SA-A

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 13.67 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 56,421 cuft
Drainage Area	= 4.602 ac	Curve Number	= 87.19*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.81 min
Total Rainfall	= 4.8700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
3.258	98	B - PAVED
1.344	61	B - LAWN
4.602	87	Weighted Average



Hydrograph Discharge Table

EX SA-A

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.43	1.385	12.63	3.449						
11.47	1.438	12.67	3.076						
11.50	1.493	12.70	2.775						
11.53	1.554	12.73	2.538						
11.57	1.634	12.77	2.356						
11.60	1.747	12.80	2.217						
11.63	1.905	12.83	2.113						
11.67	2.122	12.87	2.034						
11.70	2.402	12.90	1.970						
11.73	2.739	12.93	1.910						
11.77	3.128	12.97	1.850						
11.80	3.561	13.00	1.791						
11.83	4.032	13.03	1.731						
11.87	4.536	13.07	1.674						
11.90	5.064	13.10	1.620						
11.93	5.670	13.13	1.571						
11.97	6.469	13.17	1.528						
12.00	7.589	13.20	1.491						
12.03	9.022	13.23	1.460						
12.07	10.61	13.27	1.434						
12.10	12.11	13.30	1.412						
12.13	13.21	13.33	1.393						
12.17	13.67	13.37	1.375						
12.20	13.47	13.40	1.360						
12.23	12.82	...end	...end						
12.27	11.93								
12.30	10.93								
12.33	9.842								
12.37	8.721								
12.40	7.665								
12.43	6.776								
12.47	6.070								
12.50	5.475								
12.53	4.922								
12.57	4.390								
12.60	3.893								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

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06-17-2018

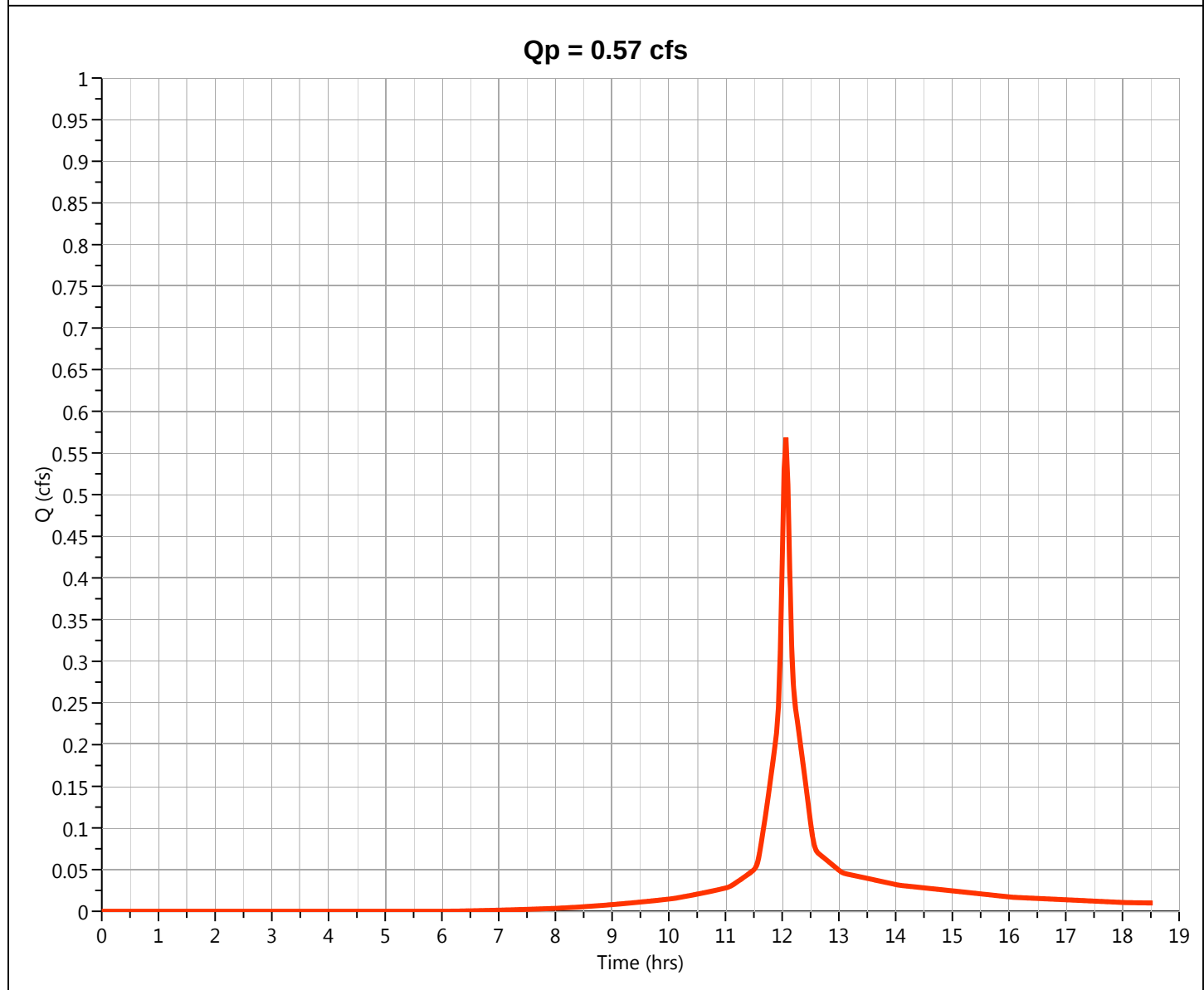
EX SA-B

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.568 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 1,719 cuft
Drainage Area	= 0.155 ac	Curve Number	= 85.11*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 4.8700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.101	98	B - PAVED
0.054	61	B - GRASS
0.155	85	Weighted Average



Hydrograph Discharge Table

EX SA-B

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.059	12.77	0.062						
11.60	0.070	12.80	0.061						
11.63	0.083	12.83	0.059						
11.67	0.098	12.87	0.057						
11.70	0.113	12.90	0.055						
11.73	0.128	...end	...end						
11.77	0.144								
11.80	0.161								
11.83	0.178								
11.87	0.196								
11.90	0.214								
11.93	0.244								
11.97	0.311								
12.00	0.420								
12.03	0.530								
12.07	0.568								
12.10	0.512								
12.13	0.407								
12.17	0.318								
12.20	0.269								
12.23	0.245								
12.27	0.228								
12.30	0.211								
12.33	0.195								
12.37	0.177								
12.40	0.160								
12.43	0.142								
12.47	0.125								
12.50	0.107								
12.53	0.090								
12.57	0.079								
12.60	0.073								
12.63	0.070								
12.67	0.068								
12.70	0.066								
12.73	0.064								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

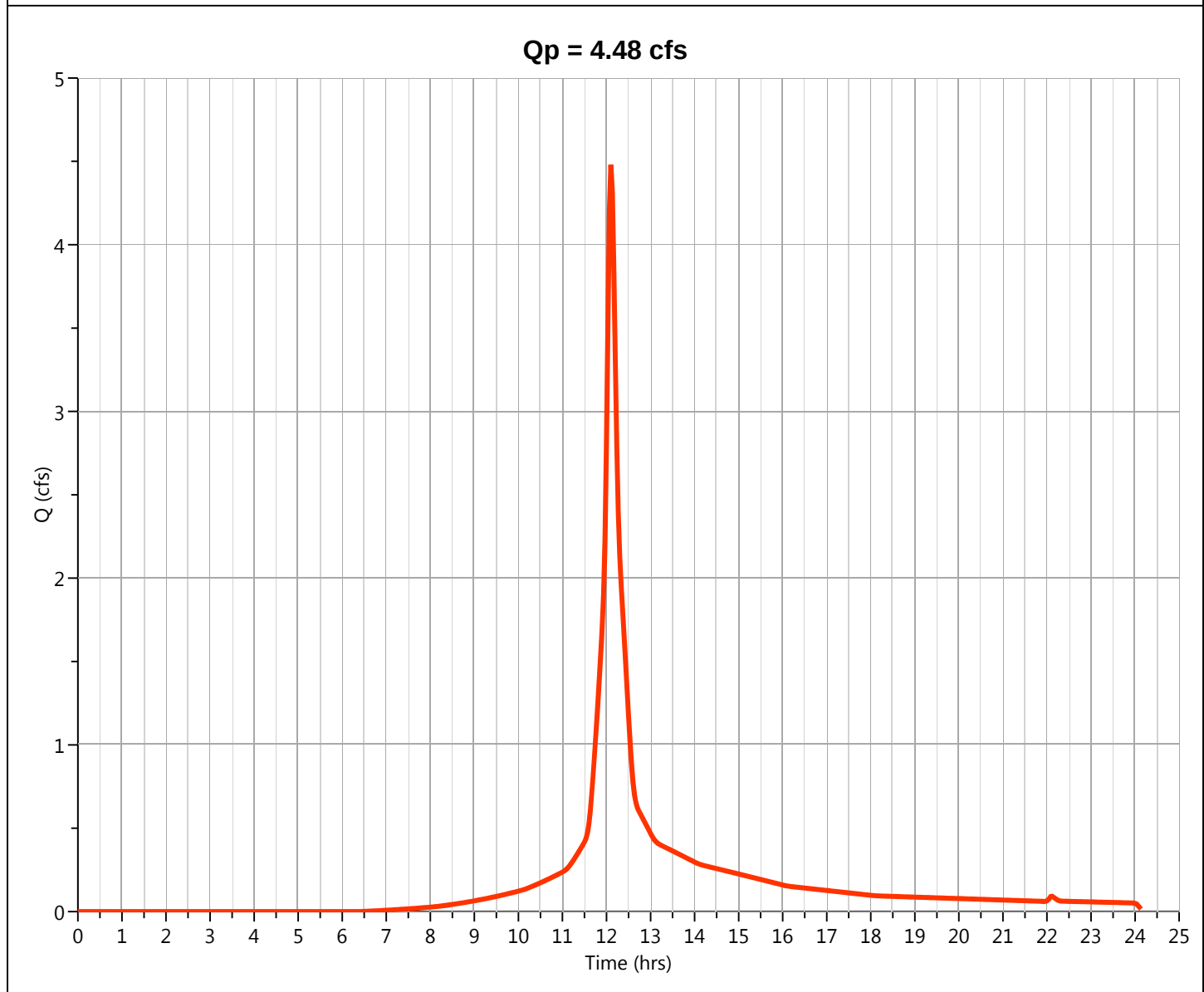
EX SA-C

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 4.479 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 15,392 cuft
Drainage Area	= 1.332 ac	Curve Number	= 84.33*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.36 min
Total Rainfall	= 4.8700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.492	61	B - GRASS
1.332	84	Weighted Average



Hydrograph Discharge Table

EX SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.470	12.77	0.587						
11.60	0.526	12.80	0.570						
11.63	0.607	12.83	0.554						
11.67	0.709	12.87	0.537						
11.70	0.827	12.90	0.520						
11.73	0.957	12.93	0.503						
11.77	1.094	12.97	0.486						
11.80	1.236	13.00	0.469						
11.83	1.383	13.03	0.453						
11.87	1.536	13.07	0.438						
11.90	1.693	...end	...end						
11.93	1.899								
11.97	2.244								
12.00	2.824								
12.03	3.564								
12.07	4.207								
12.10	4.479								
12.13	4.310								
12.17	3.852								
12.20	3.296								
12.23	2.785								
12.27	2.393								
12.30	2.135								
12.33	1.957								
12.37	1.805								
12.40	1.652								
12.43	1.496								
12.47	1.338								
12.50	1.178								
12.53	1.024								
12.57	0.886								
12.60	0.779								
12.63	0.704								
12.67	0.655								
12.70	0.624								
12.73	0.604								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

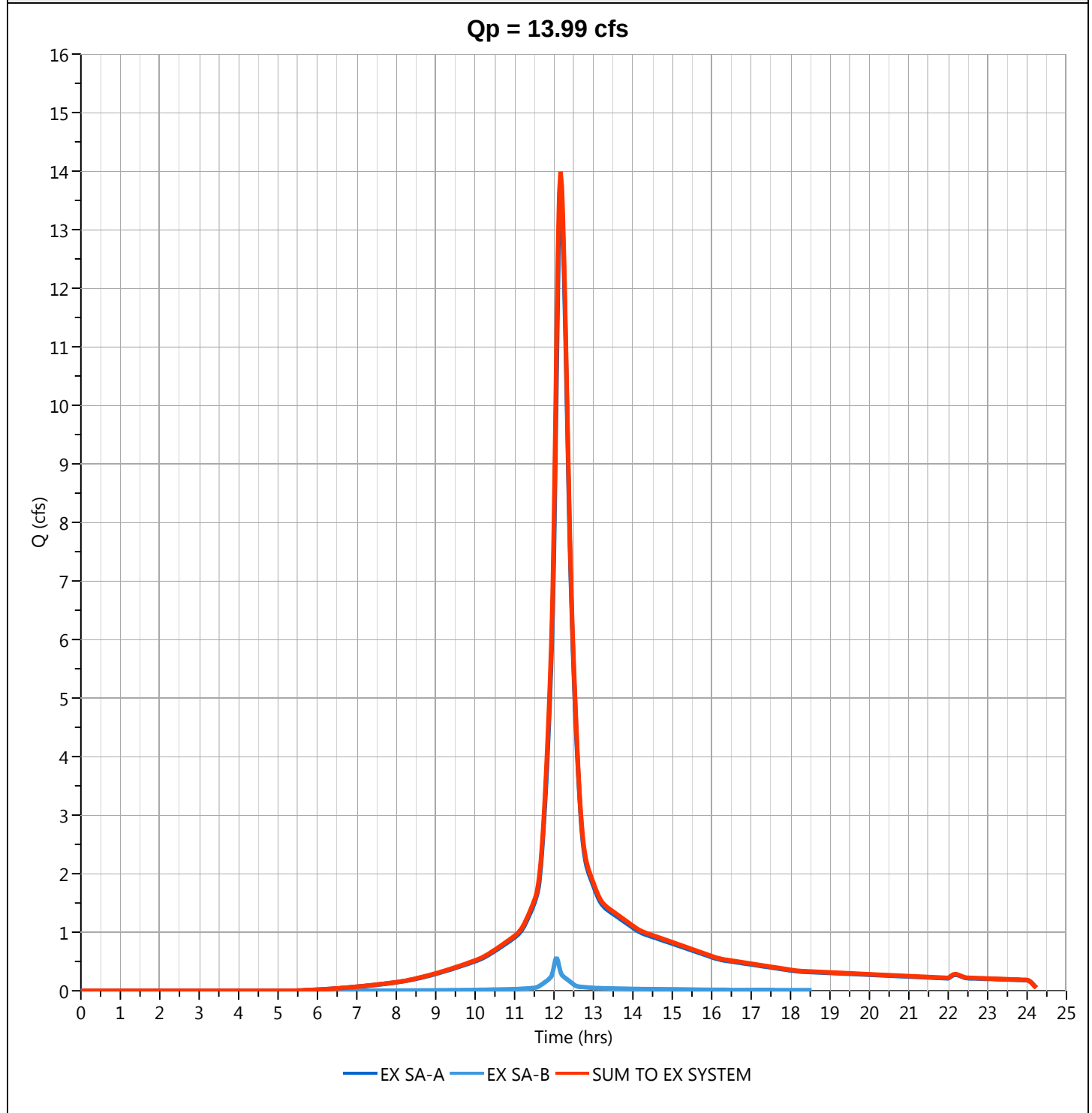
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX SYSTEM

Hyd. No. 4

Hydrograph Type	= Junction	Peak Flow	= 13.99 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Hydrograph Volume	= 58,140 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 4.757 ac



Hydrograph Discharge Table

SUM TO EX SYSTEM

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.43	1.431	12.63	3.519						
11.47	1.486	12.67	3.144						
11.50	1.542	12.70	2.841						
11.53	1.606	12.73	2.603						
11.57	1.693	12.77	2.418						
11.60	1.817	12.80	2.278						
11.63	1.988	12.83	2.172						
11.67	2.220	12.87	2.091						
11.70	2.515	12.90	2.025						
11.73	2.868	12.93	1.963						
11.77	3.272	12.97	1.902						
11.80	3.722	13.00	1.840						
11.83	4.210	13.03	1.779						
11.87	4.732	13.07	1.720						
11.90	5.278	13.10	1.665						
11.93	5.914	13.13	1.616						
11.97	6.780	13.17	1.572						
12.00	8.010	13.20	1.535						
12.03	9.553	13.23	1.504						
12.07	11.18	13.27	1.477						
12.10	12.62	13.30	1.454						
12.13	13.62	13.33	1.435						
12.17	13.99	13.37	1.417						
12.20	13.74	13.40	1.401						
12.23	13.06	13.43	1.385						
12.27	12.16	...end	...end						
12.30	11.14								
12.33	10.04								
12.37	8.898								
12.40	7.825								
12.43	6.918								
12.47	6.195								
12.50	5.582								
12.53	5.013								
12.57	4.468								
12.60	3.966								

Design Storm Report

Custom Storm filename:

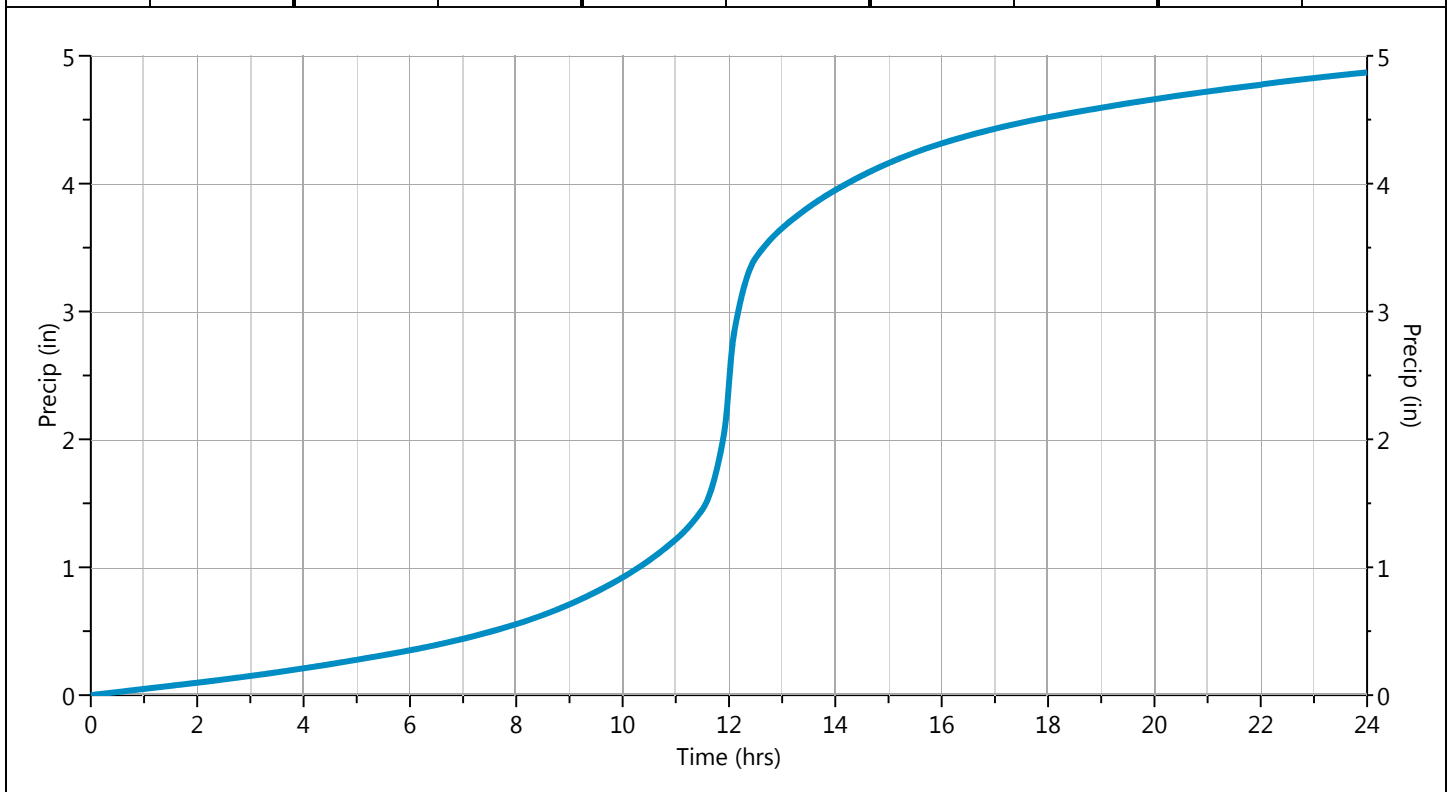
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	5-yr	✓ 10-yr	25-yr	50-yr	100-yr	
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72	

Incremental Rainfall Distribution, 10-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0118	11.37	0.0171	11.73	0.0503	12.10	0.0964	12.47	0.0265
11.03	0.0121	11.40	0.0176	11.77	0.0550	12.13	0.0742	12.50	0.0217
11.07	0.0126	11.43	0.0181	11.80	0.0598	12.17	0.0693	12.53	0.0190
11.10	0.0131	11.47	0.0186	11.83	0.0646	12.20	0.0646	12.57	0.0186
11.13	0.0136	11.50	0.0191	11.87	0.0693	12.23	0.0598	12.60	0.0181
11.17	0.0141	11.53	0.0217	11.90	0.0741	12.27	0.0550	12.63	0.0176
11.20	0.0146	11.57	0.0265	11.93	0.0966	12.30	0.0503	12.67	0.0171
11.23	0.0151	11.60	0.0312	11.97	0.1364	12.33	0.0455	12.70	0.0166
11.27	0.0156	11.63	0.0360	12.00	0.1763	12.37	0.0407	12.73	0.0161
11.30	0.0161	11.67	0.0407	12.03	0.1761	12.40	0.0360	12.77	0.0156
11.33	0.0166	11.70	0.0455	12.07	0.1364	12.43	0.0312	12.80	0.0151



Hydrograph 25-yr Summary

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

[illegible]

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

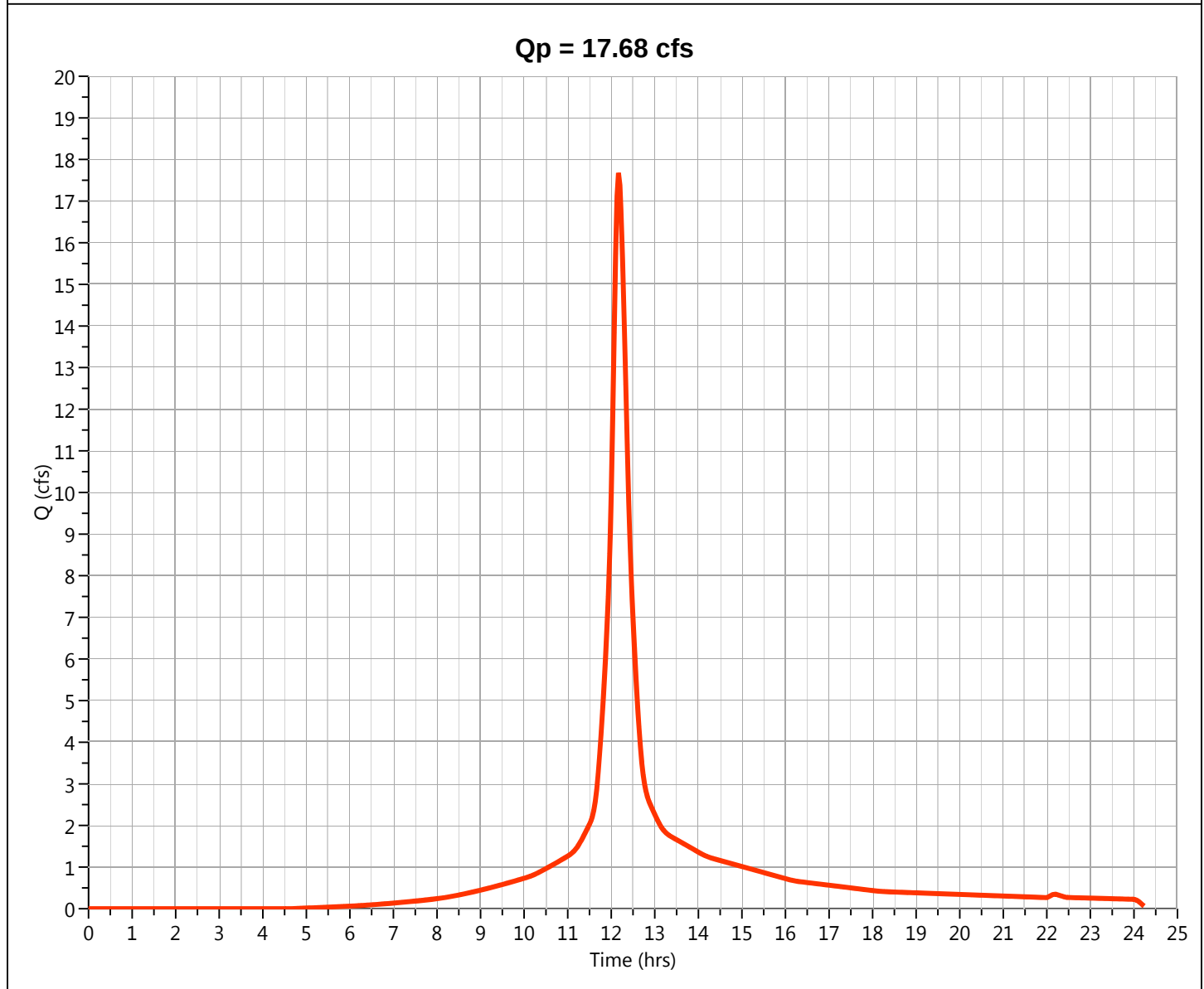
EX SA-A

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 17.68 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 73,754 cuft
Drainage Area	= 4.602 ac	Curve Number	= 87.19*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.81 min
Total Rainfall	= 5.9900 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
3.258	98	B - PAVED
1.344	61	B - LAWN
4.602	87	Weighted Average



Hydrograph Discharge Table

EX SA-A

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.40	1.818	12.60	4.943						
11.43	1.888	12.63	4.378						
11.47	1.958	12.67	3.902						
11.50	2.029	12.70	3.519						
11.53	2.109	12.73	3.218						
11.57	2.215	12.77	2.985						
11.60	2.364	12.80	2.809						
11.63	2.573	12.83	2.677						
11.67	2.861	12.87	2.576						
11.70	3.232	12.90	2.494						
11.73	3.677	12.93	2.418						
11.77	4.189	12.97	2.342						
11.80	4.758	13.00	2.266						
11.83	5.375	13.03	2.191						
11.87	6.031	13.07	2.118						
11.90	6.717	13.10	2.049						
11.93	7.498	13.13	1.987						
11.97	8.528	13.17	1.932						
12.00	9.967	13.20	1.886						
12.03	11.80	13.23	1.846						
12.07	13.84	13.27	1.813						
12.10	15.74	13.30	1.784						
12.13	17.12	13.33	1.760						
12.17	17.68	...end	...end						
12.20	17.38								
12.23	16.50								
12.27	15.33								
12.30	14.02								
12.33	12.60								
12.37	11.15								
12.40	9.782								
12.43	8.635								
12.47	7.727								
12.50	6.965								
12.53	6.257								
12.57	5.577								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

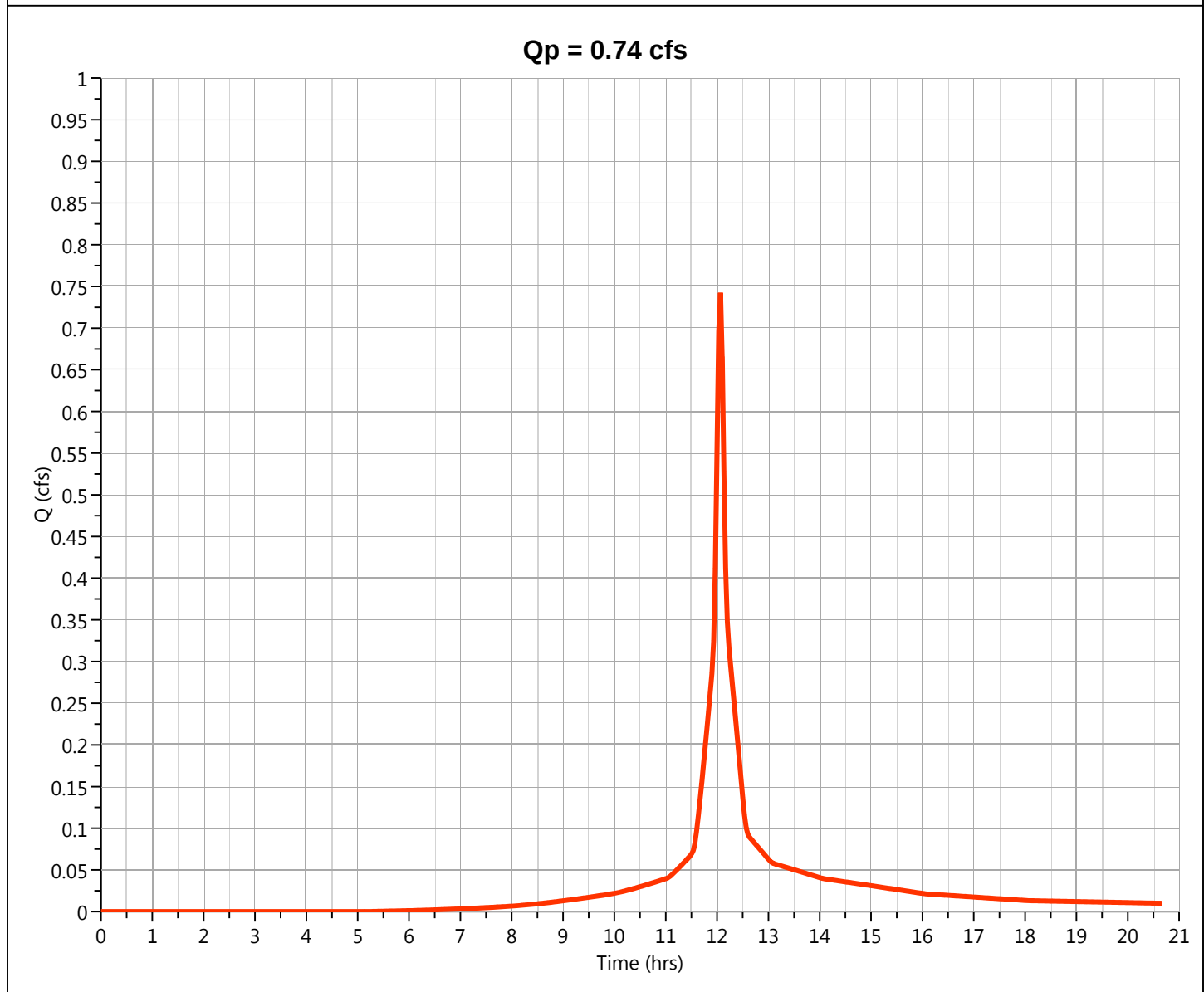
EX SA-B

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.742 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 2,271 cuft
Drainage Area	= 0.155 ac	Curve Number	= 85.11*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 5.9900 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.101	98	B - PAVED
0.054	61	B - GRASS
0.155	85	Weighted Average



Hydrograph Discharge Table

EX SA-B

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.081	12.77	0.080						
11.60	0.096	12.80	0.077						
11.63	0.114	12.83	0.075						
11.67	0.134	12.87	0.073						
11.70	0.154	...end	...end						
11.73	0.174								
11.77	0.196								
11.80	0.217								
11.83	0.240								
11.87	0.262								
11.90	0.286								
11.93	0.325								
11.97	0.412								
12.00	0.554								
12.03	0.696								
12.07	0.742								
12.10	0.666								
12.13	0.529								
12.17	0.412								
12.20	0.347								
12.23	0.315								
12.27	0.294								
12.30	0.272								
12.33	0.250								
12.37	0.227								
12.40	0.205								
12.43	0.182								
12.47	0.159								
12.50	0.137								
12.53	0.116								
12.57	0.101								
12.60	0.093								
12.63	0.089								
12.67	0.087								
12.70	0.084								
12.73	0.082								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

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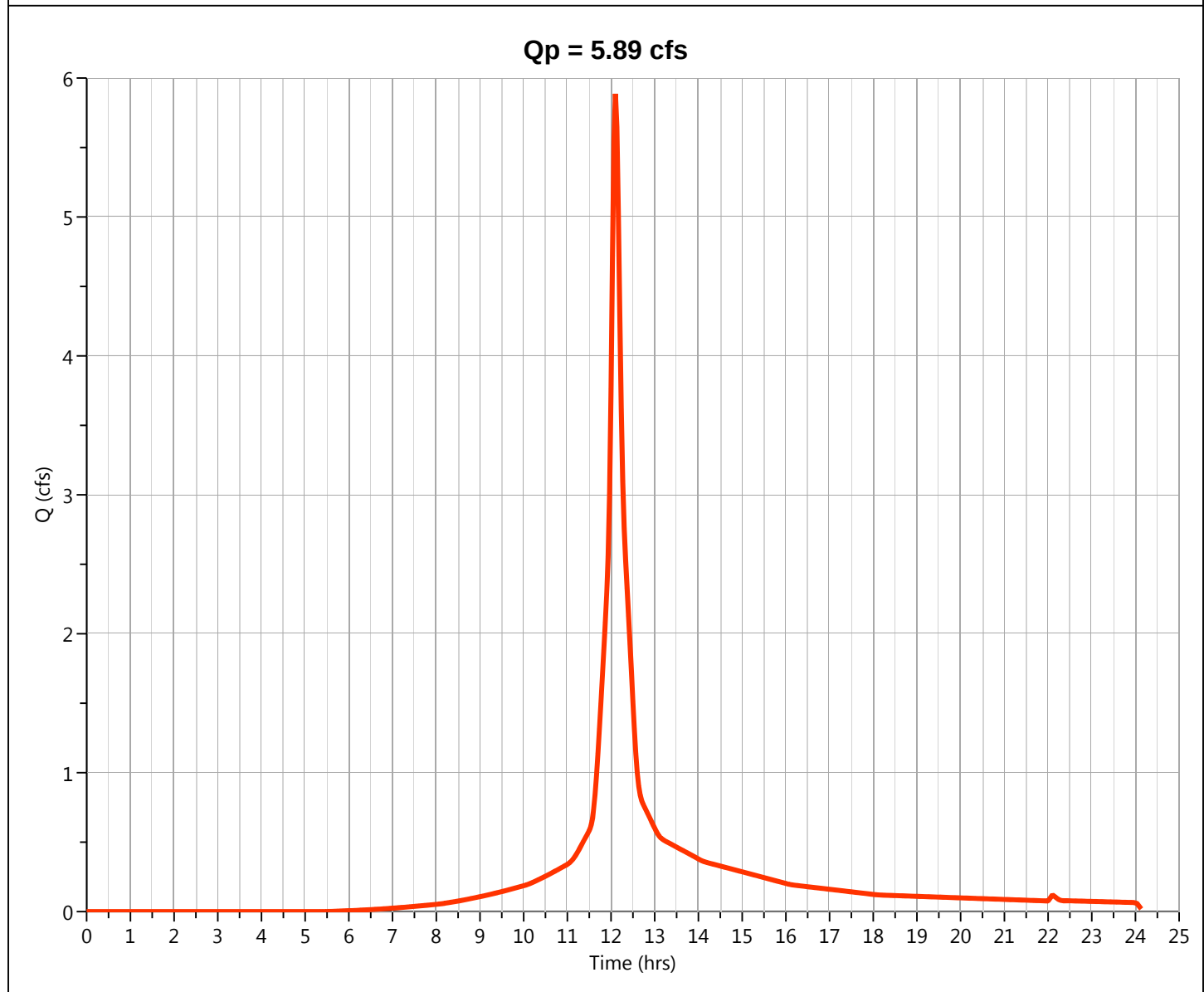
EX SA-C

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 5.886 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 20,414 cuft
Drainage Area	= 1.332 ac	Curve Number	= 84.33*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.36 min
Total Rainfall	= 5.9900 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.492	61	B - GRASS
1.332	84	Weighted Average



Hydrograph Discharge Table

EX SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	0.609	12.73	0.773						
11.57	0.654	12.77	0.752						
11.60	0.730	12.80	0.730						
11.63	0.841	12.83	0.709						
11.67	0.979	12.87	0.687						
11.70	1.139	12.90	0.665						
11.73	1.314	12.93	0.644						
11.77	1.498	12.97	0.622						
11.80	1.687	13.00	0.600						
11.83	1.881	13.03	0.579						
11.87	2.081	...end	...end						
11.90	2.286								
11.93	2.554								
11.97	3.004								
12.00	3.761								
12.03	4.723								
12.07	5.551								
12.10	5.886								
12.13	5.646								
12.17	5.031								
12.20	4.291								
12.23	3.616								
12.27	3.100								
12.30	2.760								
12.33	2.527								
12.37	2.328								
12.40	2.128								
12.43	1.925								
12.47	1.720								
12.50	1.514								
12.53	1.315								
12.57	1.138								
12.60	0.999								
12.63	0.903								
12.67	0.840								
12.70	0.800								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

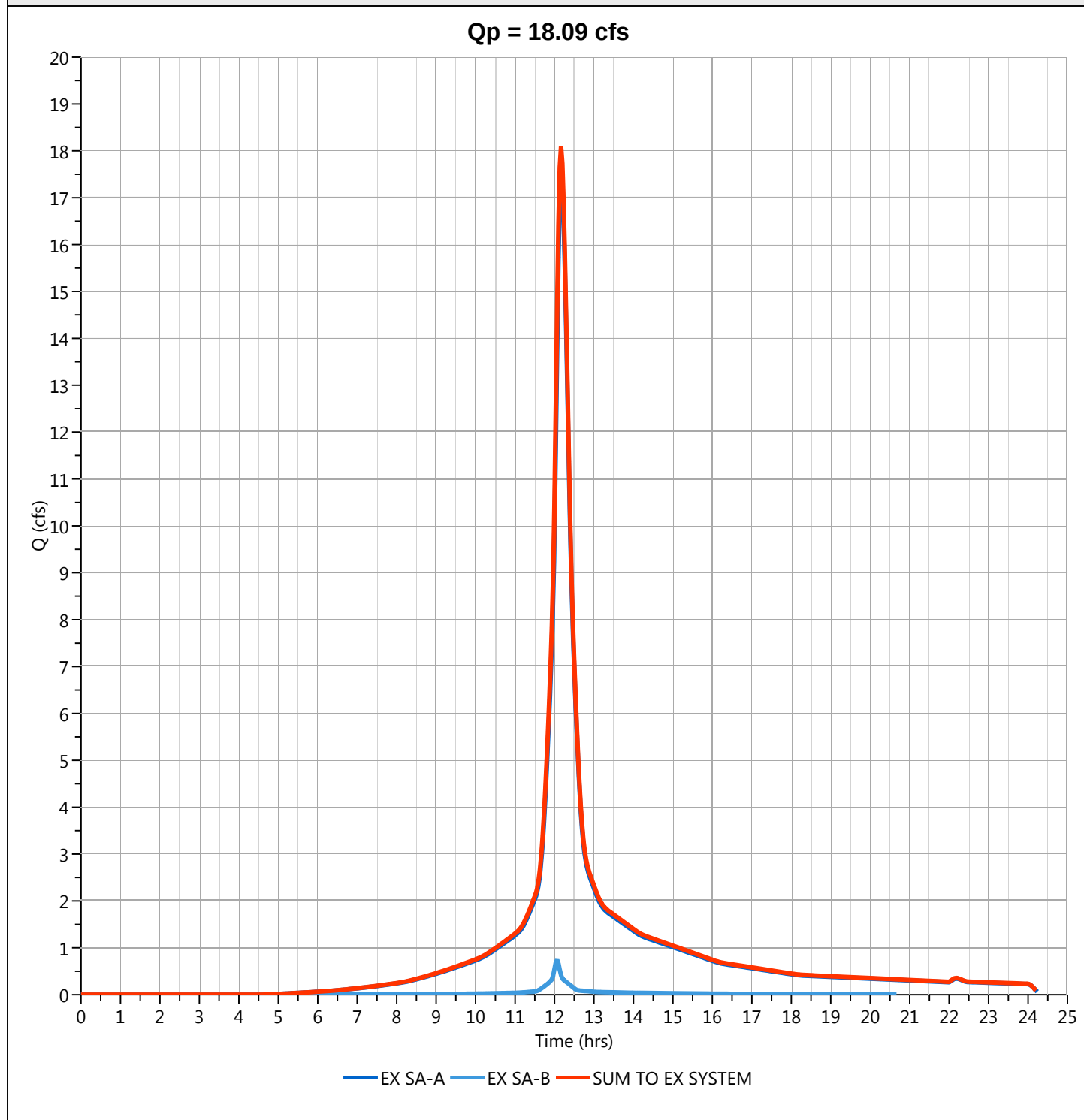
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX SYSTEM

Hyd. No. 4

Hydrograph Type	= Junction	Peak Flow	= 18.09 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Hydrograph Volume	= 76,024 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 4.757 ac



Hydrograph Discharge Table

SUM TO EX SYSTEM

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.37	1.809	12.57	5.678						
11.40	1.880	12.60	5.036						
11.43	1.952	12.63	4.467						
11.47	2.024	12.67	3.989						
11.50	2.098	12.70	3.604						
11.53	2.182	12.73	3.300						
11.57	2.296	12.77	3.065						
11.60	2.460	12.80	2.887						
11.63	2.687	12.83	2.752						
11.67	2.994	12.87	2.649						
11.70	3.385	12.90	2.564						
11.73	3.852	12.93	2.486						
11.77	4.385	12.97	2.408						
11.80	4.975	13.00	2.329						
11.83	5.615	13.03	2.251						
11.87	6.294	13.07	2.177						
11.90	7.002	13.10	2.107						
11.93	7.824	13.13	2.044						
11.97	8.940	13.17	1.988						
12.00	10.52	13.20	1.941						
12.03	12.50	13.23	1.901						
12.07	14.58	13.27	1.867						
12.10	16.40	13.30	1.838						
12.13	17.65	13.33	1.813						
12.17	18.09	13.37	1.791						
12.20	17.73	...end	...end						
12.23	16.82								
12.27	15.63								
12.30	14.30								
12.33	12.85								
12.37	11.38								
12.40	9.987								
12.43	8.817								
12.47	7.887								
12.50	7.101								
12.53	6.373								

Design Storm Report

Custom Storm filename:

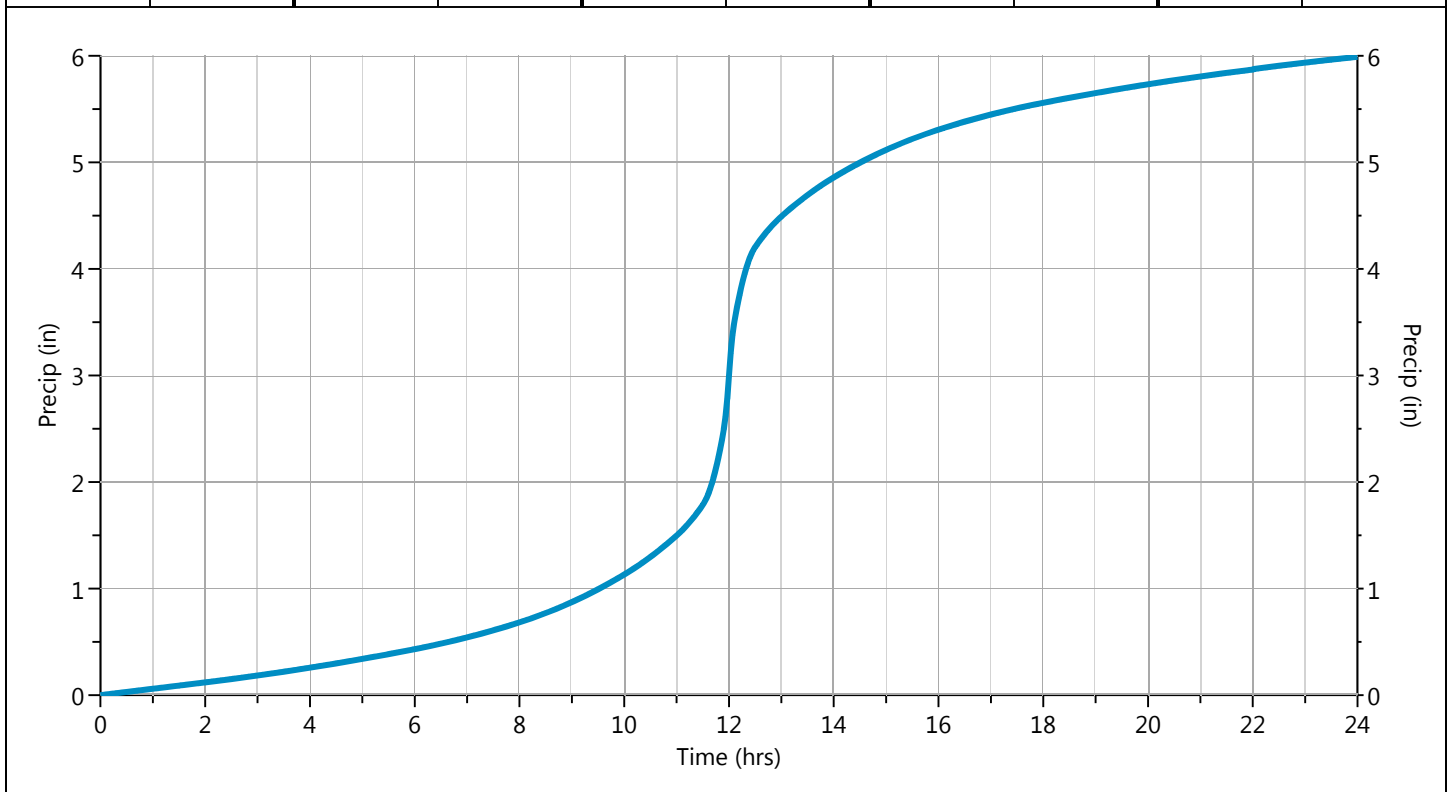
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	✓ 25-yr	50-yr	100-yr
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72

Incremental Rainfall Distribution, 25-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0145	11.37	0.0210	11.73	0.0618	12.10	0.1186	12.47	0.0325
11.03	0.0149	11.40	0.0216	11.77	0.0677	12.13	0.0913	12.50	0.0267
11.07	0.0155	11.43	0.0222	11.80	0.0735	12.17	0.0853	12.53	0.0234
11.10	0.0161	11.47	0.0228	11.83	0.0794	12.20	0.0794	12.57	0.0228
11.13	0.0167	11.50	0.0235	11.87	0.0853	12.23	0.0735	12.60	0.0222
11.17	0.0173	11.53	0.0267	11.90	0.0911	12.27	0.0677	12.63	0.0216
11.20	0.0179	11.57	0.0325	11.93	0.1188	12.30	0.0618	12.67	0.0210
11.23	0.0186	11.60	0.0384	11.97	0.1677	12.33	0.0560	12.70	0.0204
11.27	0.0192	11.63	0.0443	12.00	0.2168	12.37	0.0501	12.73	0.0198
11.30	0.0198	11.67	0.0501	12.03	0.2166	12.40	0.0443	12.77	0.0192
11.33	0.0204	11.70	0.0560	12.07	0.1677	12.43	0.0384	12.80	0.0186



Hydrograph 50-yr Summary

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

[illegible]

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

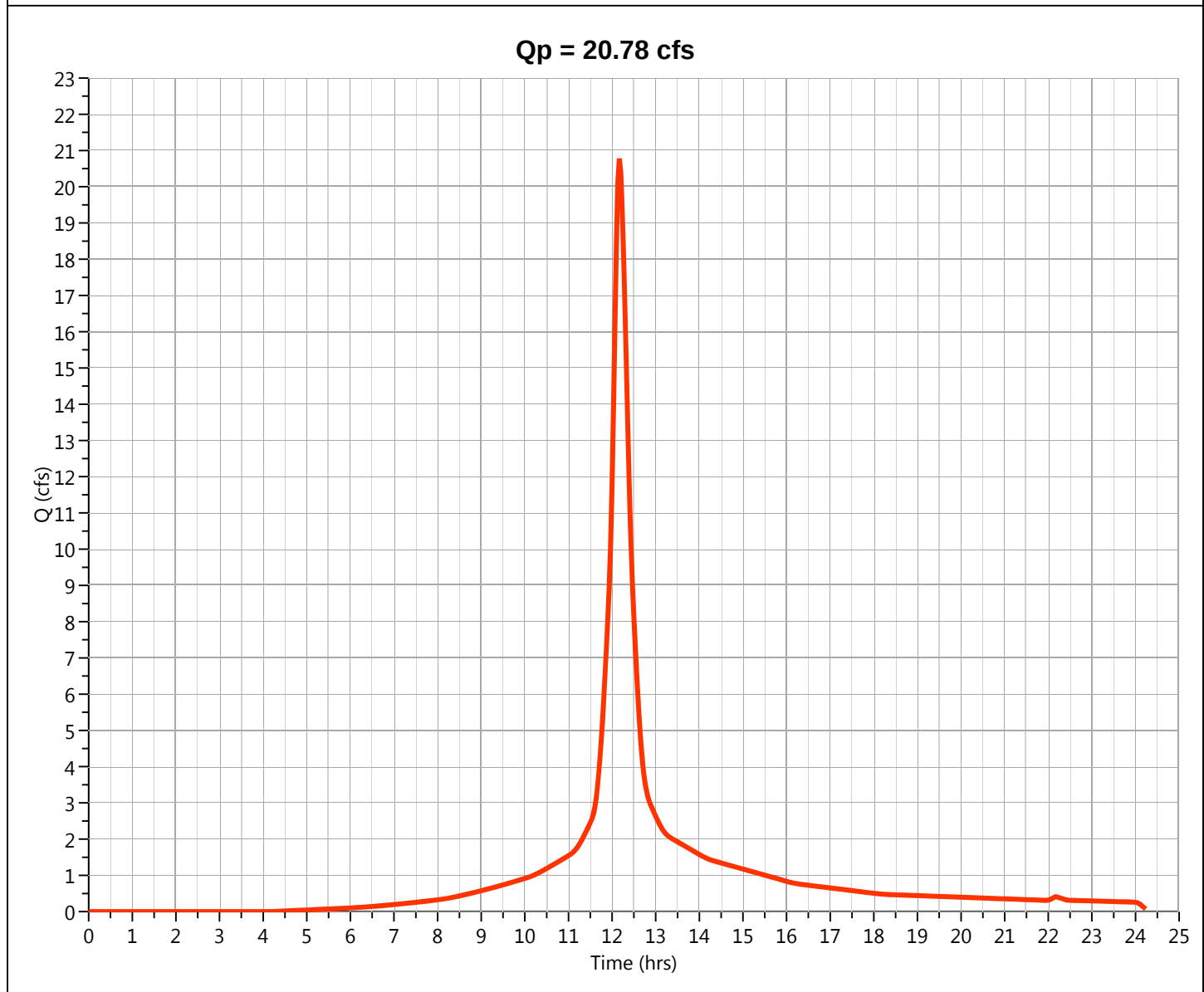
EX SA-A

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 20.78 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 87,393 cuft
Drainage Area	= 4.602 ac	Curve Number	= 87.19*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.81 min
Total Rainfall	= 6.8600 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
3.258	98	B - PAVED
1.344	61	B - LAWN
4.602	87	Weighted Average



Hydrograph Discharge Table

EX SA-A

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.37	2.120	12.57	6.493						
11.40	2.202	12.60	5.754						
11.43	2.284	12.63	5.095						
11.47	2.367	12.67	4.540						
11.50	2.451	12.70	4.094						
11.53	2.546	12.73	3.743						
11.57	2.672	12.77	3.472						
11.60	2.849	12.80	3.266						
11.63	3.098	12.83	3.112						
11.67	3.440	12.87	2.994						
11.70	3.882	12.90	2.899						
11.73	4.412	12.93	2.810						
11.77	5.020	12.97	2.722						
11.80	5.694	13.00	2.633						
11.83	6.425	13.03	2.545						
11.87	7.199	13.07	2.460						
11.90	8.005	13.10	2.380						
11.93	8.923	13.13	2.308						
11.97	10.13	13.17	2.244						
12.00	11.82	13.20	2.190						
12.03	13.96	13.23	2.144						
12.07	16.34	13.27	2.105						
12.10	18.55	13.30	2.072						
12.13	20.15	...end	...end						
12.17	20.78								
12.20	20.41								
12.23	19.36								
12.27	17.97								
12.30	16.42								
12.33	14.74								
12.37	13.02								
12.40	11.42								
12.43	10.07								
12.47	9.007								
12.50	8.115								
12.53	7.288								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

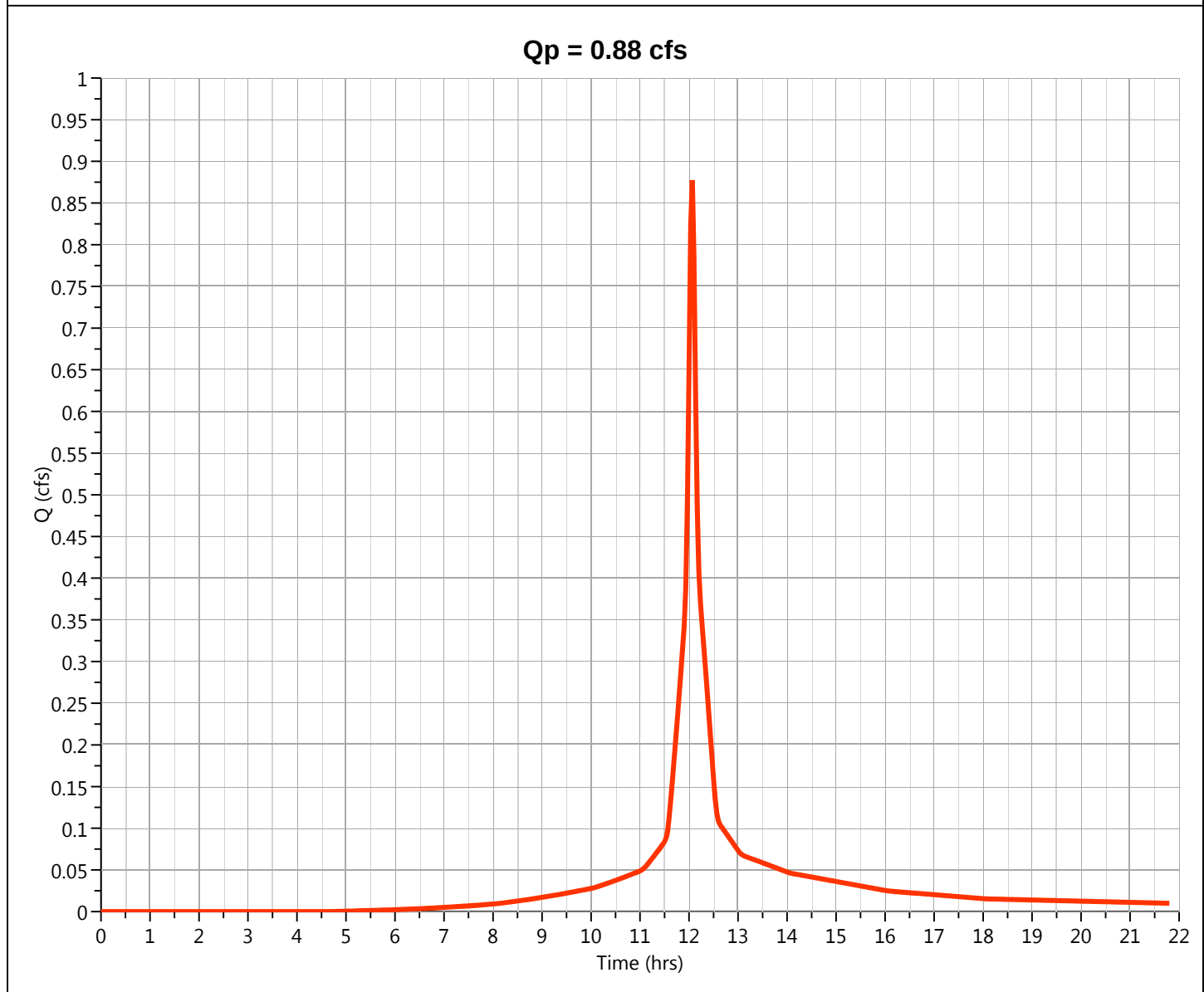
EX SA-B

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.877 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 2,707 cuft
Drainage Area	= 0.155 ac	Curve Number	= 85.11*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 6.8600 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.101	98	B - PAVED
0.054	61	B - GRASS
0.155	85	Weighted Average



Hydrograph Discharge Table

EX SA-B

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	0.088	12.73	0.096						
11.57	0.099	12.77	0.093						
11.60	0.117	12.80	0.090						
11.63	0.138	12.83	0.087						
11.67	0.162	...end	...end						
11.70	0.186								
11.73	0.211								
11.77	0.236								
11.80	0.261								
11.83	0.288								
11.87	0.315								
11.90	0.342								
11.93	0.388								
11.97	0.491								
12.00	0.658								
12.03	0.825								
12.07	0.877								
12.10	0.786								
12.13	0.622								
12.17	0.484								
12.20	0.408								
12.23	0.370								
12.27	0.344								
12.30	0.319								
12.33	0.292								
12.37	0.266								
12.40	0.240								
12.43	0.213								
12.47	0.186								
12.50	0.160								
12.53	0.135								
12.57	0.118								
12.60	0.108								
12.63	0.104								
12.67	0.101								
12.70	0.099								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

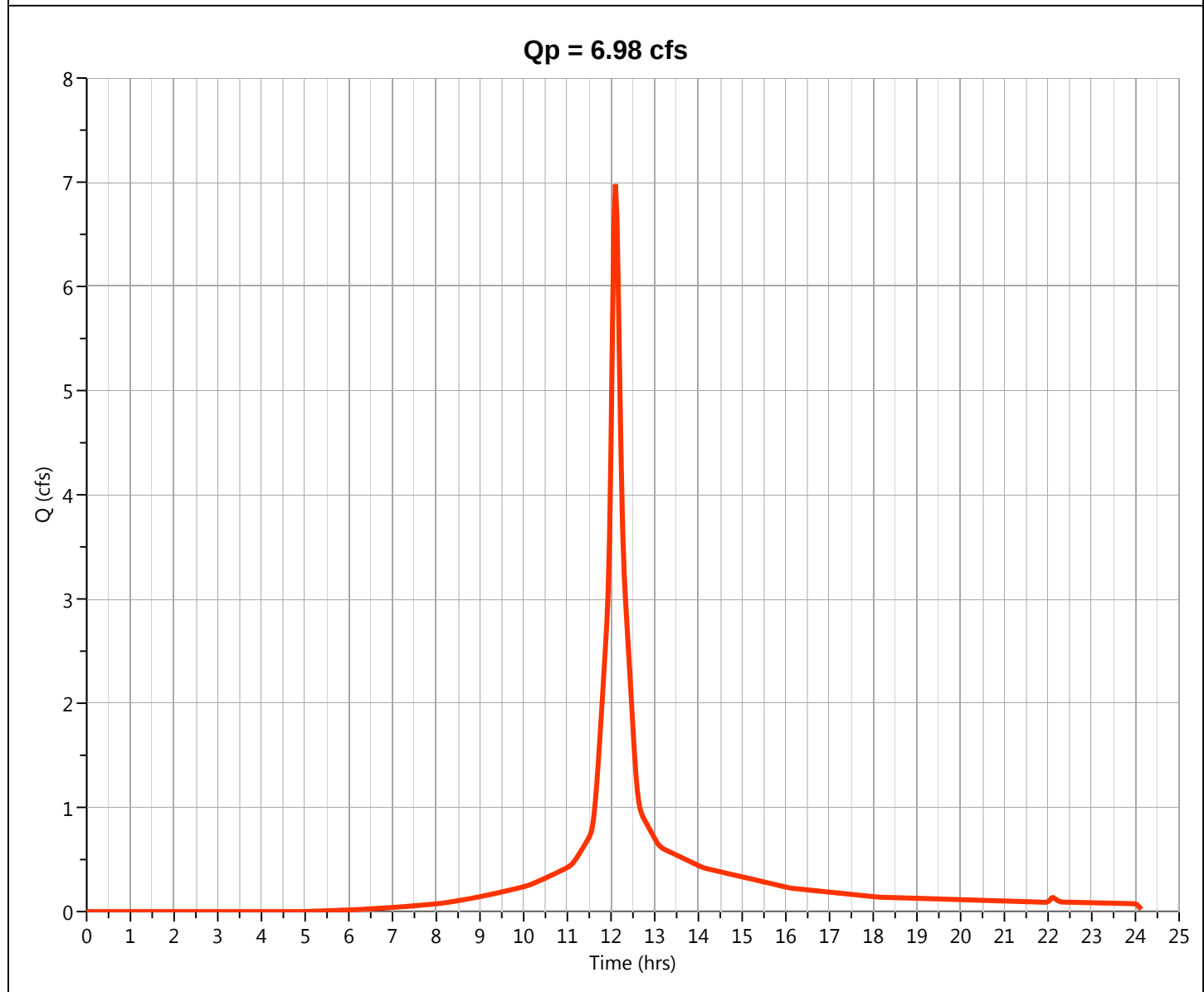
EX SA-C

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 6.981 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 24,388 cuft
Drainage Area	= 1.332 ac	Curve Number	= 84.33*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.36 min
Total Rainfall	= 6.8600 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.492	61	B - GRASS
1.332	84	Weighted Average



Hydrograph Discharge Table

EX SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.50	0.715	12.70	0.935						
11.53	0.747	12.73	0.905						
11.57	0.801	12.77	0.880						
11.60	0.892	12.80	0.854						
11.63	1.026	12.83	0.829						
11.67	1.193	12.87	0.803						
11.70	1.386	12.90	0.778						
11.73	1.597	12.93	0.752						
11.77	1.817	12.97	0.727						
11.80	2.042	13.00	0.701						
11.83	2.273	13.03	0.676						
11.87	2.510	...end	...end						
11.90	2.751								
11.93	3.067								
11.97	3.599								
12.00	4.493								
12.03	5.626								
12.07	6.596								
12.10	6.981								
12.13	6.684								
12.17	5.946								
12.20	5.064								
12.23	4.259								
12.27	3.647								
12.30	3.244								
12.33	2.968								
12.37	2.733								
12.40	2.496								
12.43	2.257								
12.47	2.016								
12.50	1.774								
12.53	1.540								
12.57	1.332								
12.60	1.170								
12.63	1.057								
12.67	0.982								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

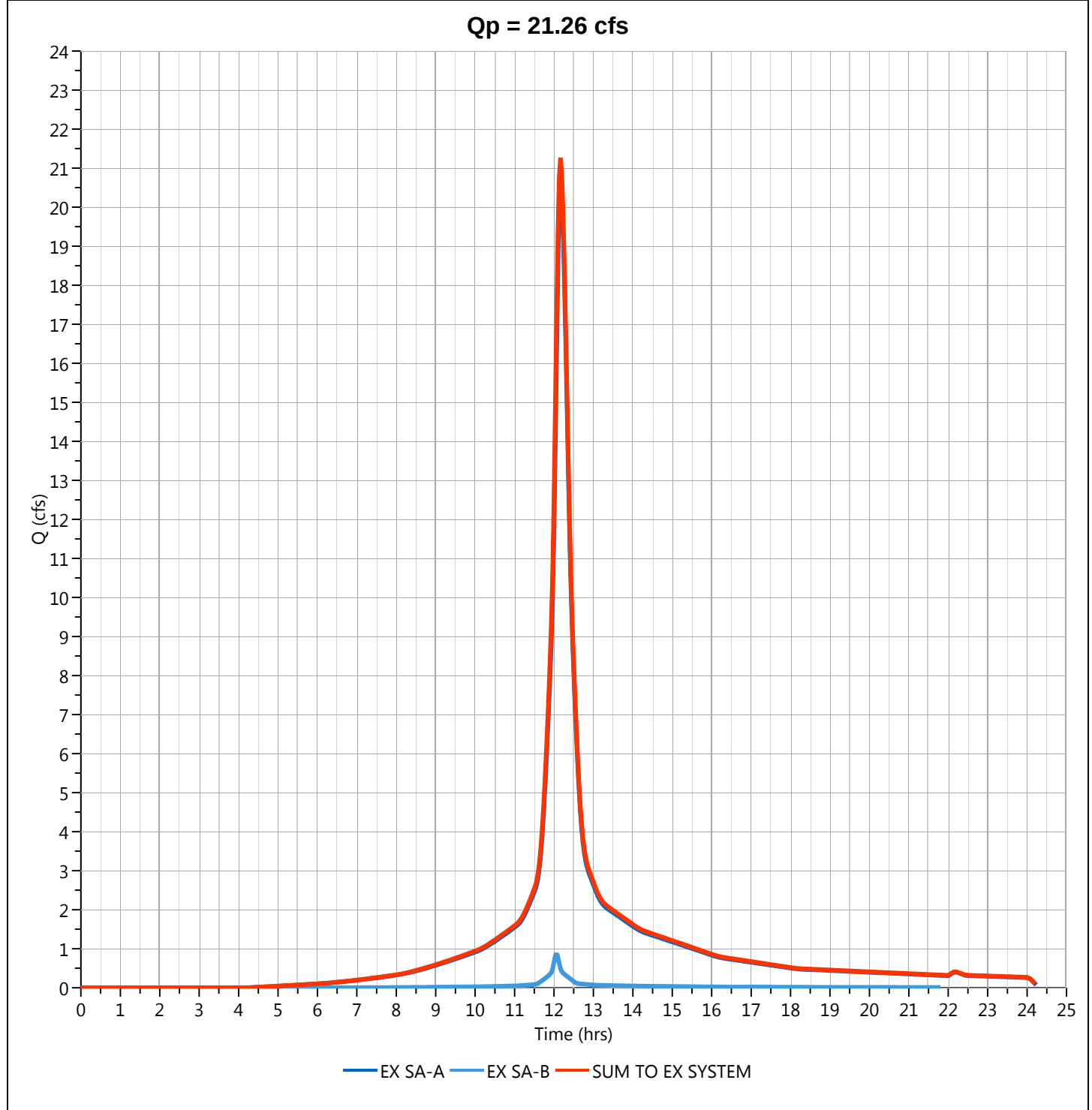
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX SYSTEM

Hyd. No. 4

Hydrograph Type	= Junction	Peak Flow	= 21.26 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Hydrograph Volume	= 90,099 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 4.757 ac



Hydrograph Discharge Table

SUM TO EX SYSTEM

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.37	2.193	12.57	6.611						
11.40	2.277	12.60	5.863						
11.43	2.362	12.63	5.199						
11.47	2.448	12.67	4.641						
11.50	2.535	12.70	4.193						
11.53	2.635	12.73	3.838						
11.57	2.771	12.77	3.565						
11.60	2.965	12.80	3.356						
11.63	3.236	12.83	3.199						
11.67	3.602	12.87	3.079						
11.70	4.068	12.90	2.981						
11.73	4.623	12.93	2.889						
11.77	5.256	12.97	2.798						
11.80	5.956	13.00	2.706						
11.83	6.712	13.03	2.616						
11.87	7.513	13.07	2.529						
11.90	8.347	13.10	2.448						
11.93	9.311	13.13	2.374						
11.97	10.62	13.17	2.310						
12.00	12.47	13.20	2.255						
12.03	14.79	13.23	2.208						
12.07	17.21	13.27	2.169						
12.10	19.33	13.30	2.135						
12.13	20.77	13.33	2.106						
12.17	21.26	...end	...end						
12.20	20.81								
12.23	19.73								
12.27	18.31								
12.30	16.73								
12.33	15.03								
12.37	13.29								
12.40	11.66								
12.43	10.28								
12.47	9.194								
12.50	8.274								
12.53	7.423								

Design Storm Report

Custom Storm filename:

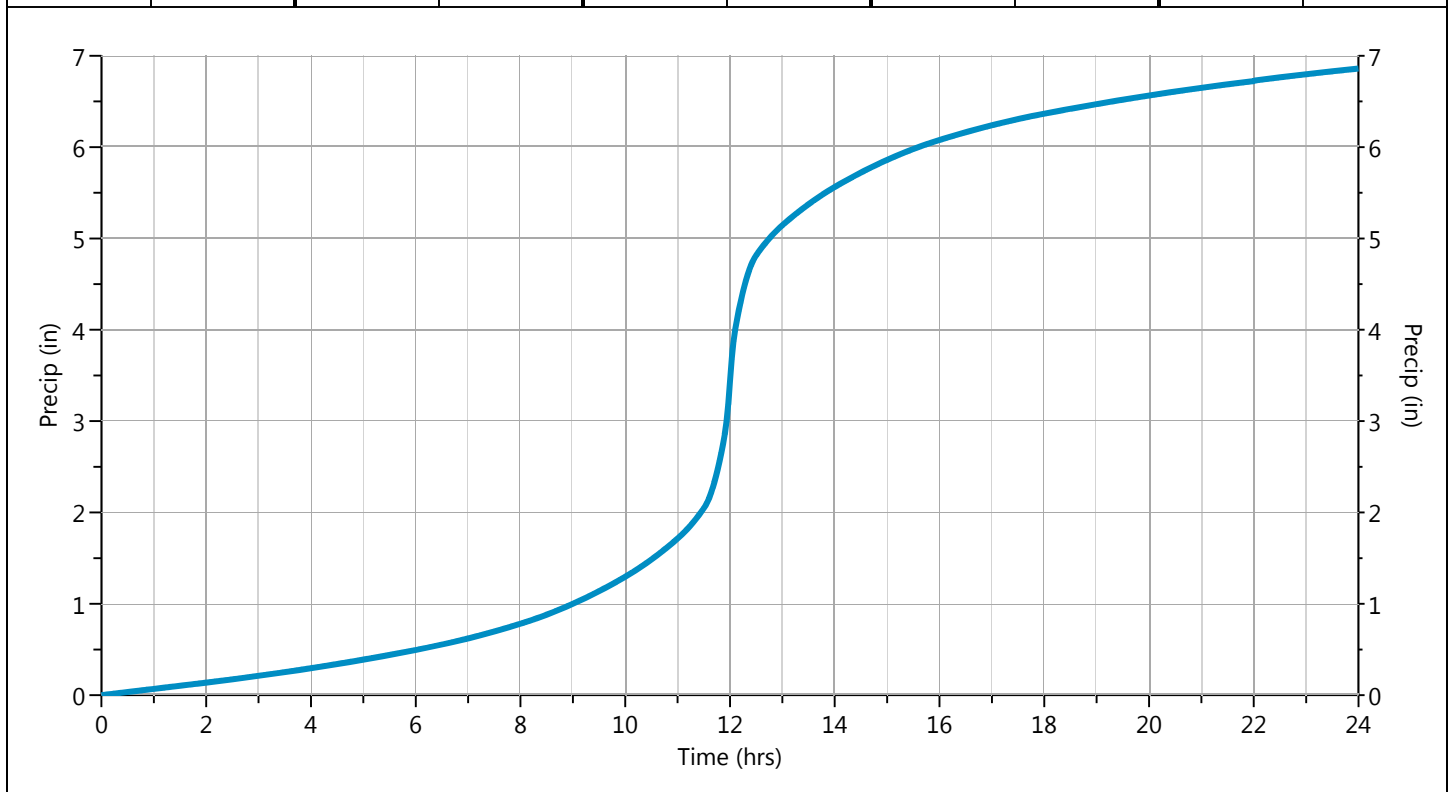
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	✓ 50-yr	100-yr
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72

Incremental Rainfall Distribution, 50-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0166	11.37	0.0241	11.73	0.0708	12.10	0.1358	12.47	0.0373
11.03	0.0170	11.40	0.0248	11.77	0.0775	12.13	0.1045	12.50	0.0306
11.07	0.0177	11.43	0.0255	11.80	0.0842	12.17	0.0976	12.53	0.0268
11.10	0.0184	11.47	0.0262	11.83	0.0909	12.20	0.0909	12.57	0.0262
11.13	0.0191	11.50	0.0269	11.87	0.0976	12.23	0.0842	12.60	0.0255
11.17	0.0198	11.53	0.0305	11.90	0.1043	12.27	0.0775	12.63	0.0248
11.20	0.0205	11.57	0.0373	11.93	0.1360	12.30	0.0708	12.67	0.0241
11.23	0.0213	11.60	0.0440	11.97	0.1921	12.33	0.0641	12.70	0.0234
11.27	0.0220	11.63	0.0507	12.00	0.2483	12.37	0.0574	12.73	0.0227
11.30	0.0227	11.67	0.0574	12.03	0.2480	12.40	0.0507	12.77	0.0220
11.33	0.0234	11.70	0.0641	12.07	0.1921	12.43	0.0440	12.80	0.0213



Hydrograph 100-yr Summary

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

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Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

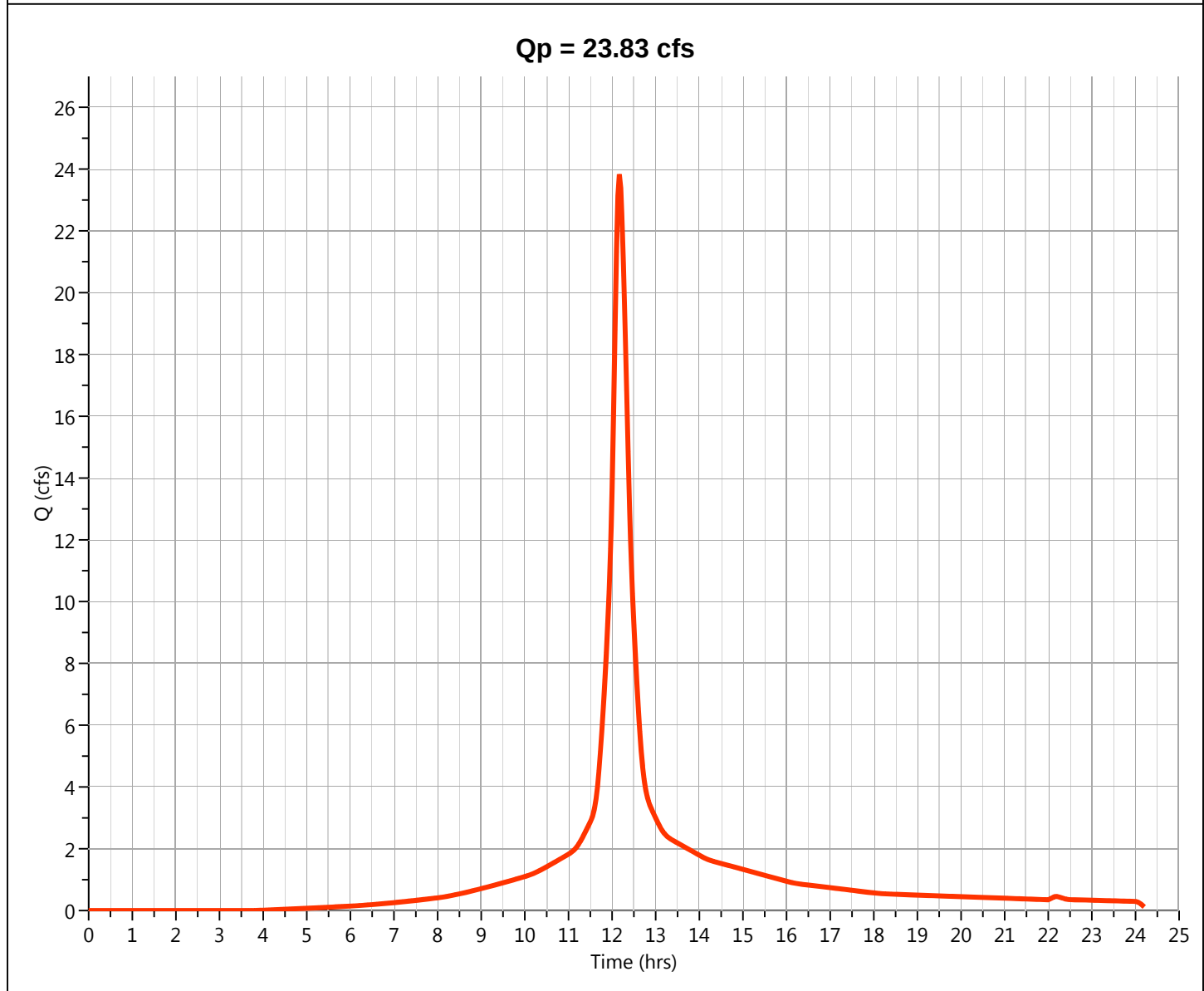
EX SA-A

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 23.83 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 100,977 cuft
Drainage Area	= 4.602 ac	Curve Number	= 87.19*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 13.81 min
Total Rainfall	= 7.7200 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
3.258	98	B - PAVED
1.344	61	B - LAWN
4.602	87	Weighted Average



Hydrograph Discharge Table

EX SA-A

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.33	2.397	12.53	8.302						
11.37	2.489	12.57	7.395						
11.40	2.583	12.60	6.552						
11.43	2.678	12.63	5.800						
11.47	2.774	12.67	5.168						
11.50	2.871	12.70	4.659						
11.53	2.980	12.73	4.259						
11.57	3.125	12.77	3.950						
11.60	3.329	12.80	3.716						
11.63	3.618	12.83	3.540						
11.67	4.015	12.87	3.406						
11.70	4.526	12.90	3.297						
11.73	5.140	12.93	3.196						
11.77	5.842	12.97	3.095						
11.80	6.621	13.00	2.994						
11.83	7.462	13.03	2.894						
11.87	8.353	13.07	2.797						
11.90	9.279	13.10	2.706						
11.93	10.33	13.13	2.623						
11.97	11.71	13.17	2.551						
12.00	13.64	13.20	2.489						
12.03	16.09	13.23	2.437						
12.07	18.80	13.27	2.393						
12.10	21.32	13.30	2.355						
12.13	23.13	...end	...end						
12.17	23.83								
12.20	23.38								
12.23	22.17								
12.27	20.56								
12.30	18.77								
12.33	16.84								
12.37	14.87								
12.40	13.02								
12.43	11.48								
12.47	10.27								
12.50	9.246								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

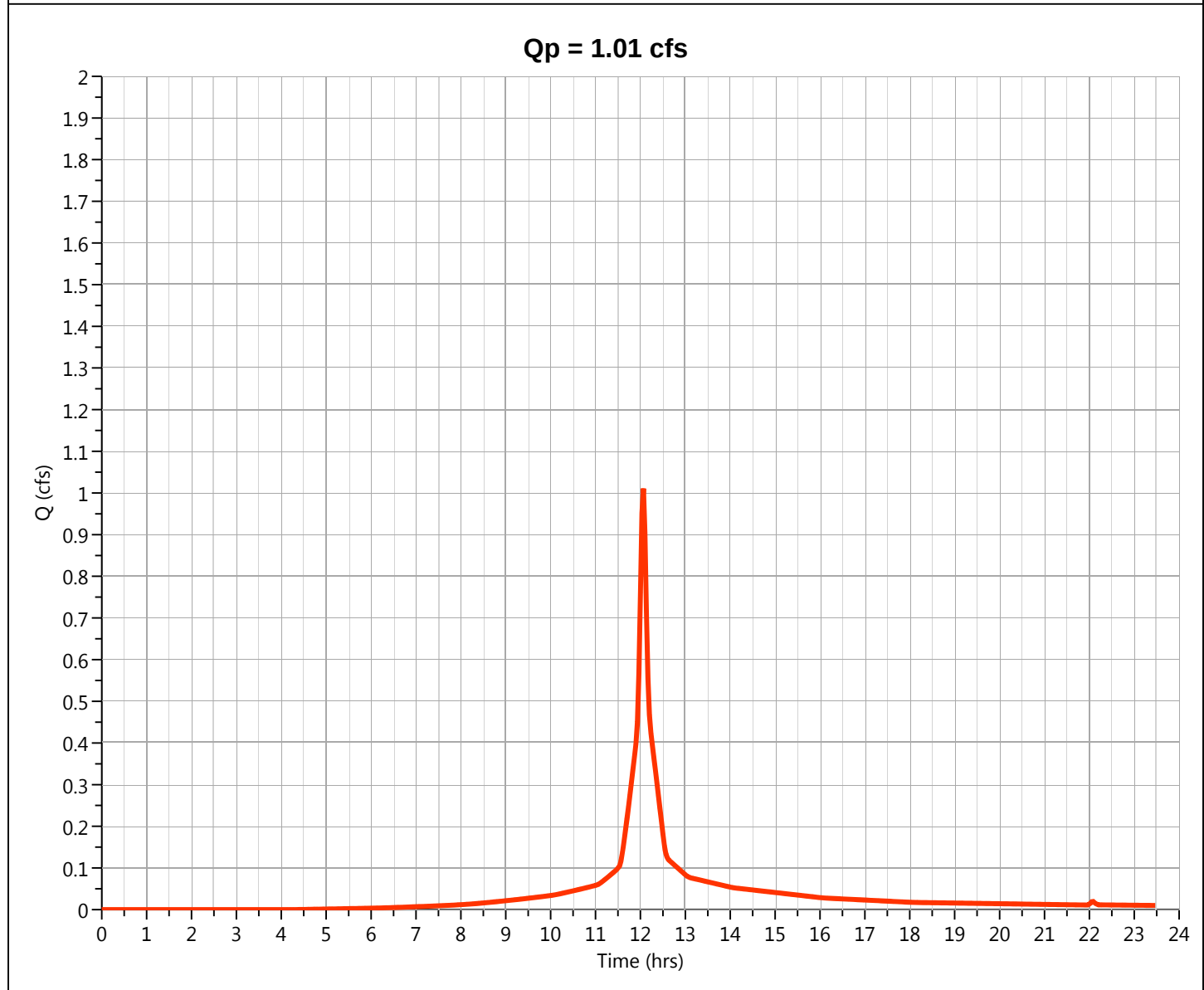
EX SA-B

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.011 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 3,142 cuft
Drainage Area	= 0.155 ac	Curve Number	= 85.11*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 7.7200 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.101	98	B - PAVED
0.054	61	B - GRASS
0.155	85	Weighted Average



Hydrograph Discharge Table

EX SA-B

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	0.104	12.73	0.109						
11.57	0.117	12.77	0.106						
11.60	0.137	12.80	0.103						
11.63	0.163	12.83	0.100						
11.67	0.190	...end	...end						
11.70	0.218								
11.73	0.247								
11.77	0.276								
11.80	0.305								
11.83	0.336								
11.87	0.366								
11.90	0.398								
11.93	0.451								
11.97	0.569								
12.00	0.761								
12.03	0.951								
12.07	1.011								
12.10	0.903								
12.13	0.715								
12.17	0.555								
12.20	0.468								
12.23	0.424								
12.27	0.394								
12.30	0.364								
12.33	0.335								
12.37	0.304								
12.40	0.274								
12.43	0.244								
12.47	0.213								
12.50	0.182								
12.53	0.154								
12.57	0.134								
12.60	0.124								
12.63	0.119								
12.67	0.116								
12.70	0.113								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

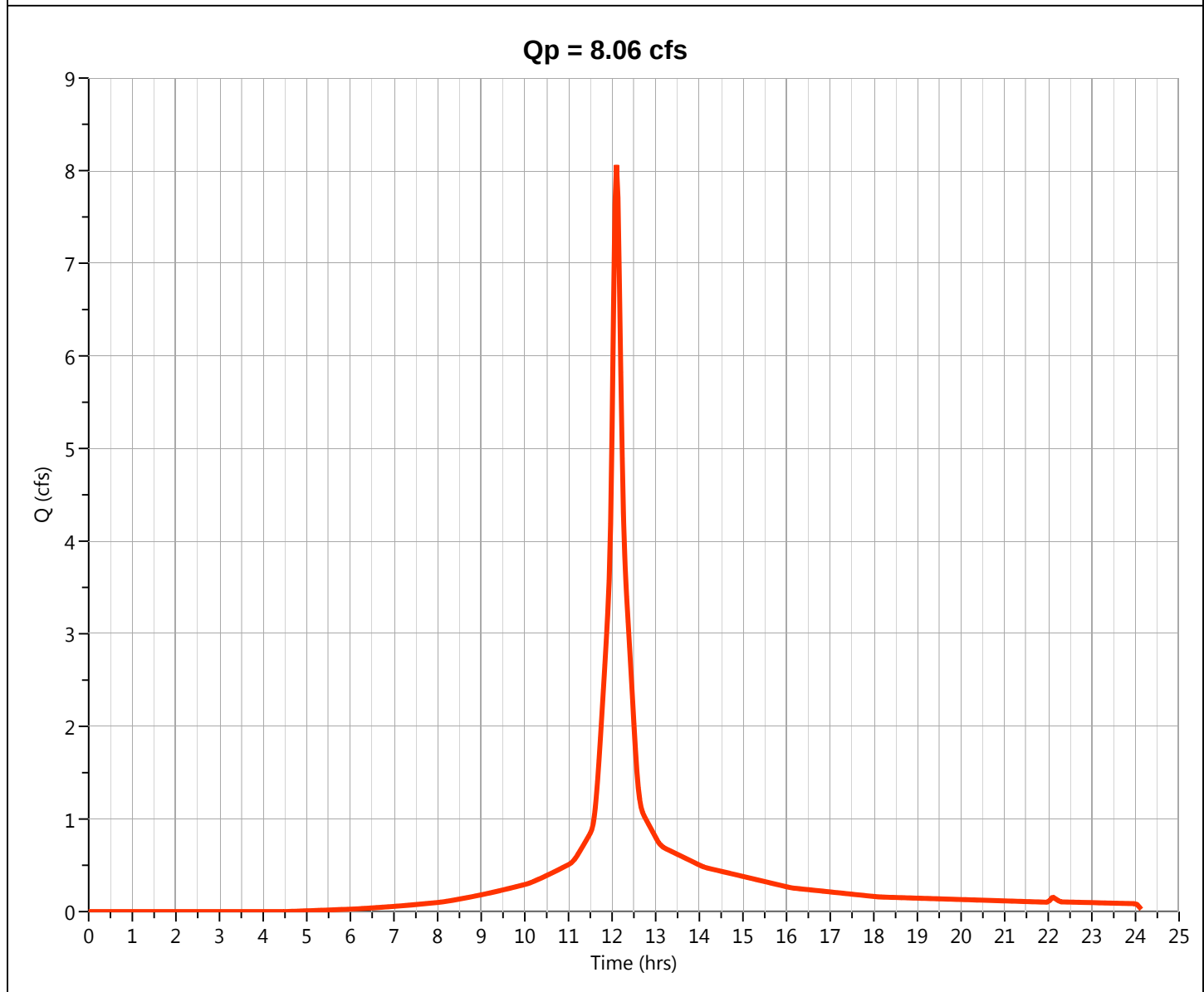
EX SA-C

Hyd. No. 3

Hydrograph Type	= NRCS Runoff	Peak Flow	= 8.061 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 28,359 cuft
Drainage Area	= 1.332 ac	Curve Number	= 84.33*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.36 min
Total Rainfall	= 7.7200 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.492	61	B - GRASS
1.332	84	Weighted Average



Hydrograph Discharge Table

EX SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.47	0.819	12.67	1.123						
11.50	0.847	12.70	1.069						
11.53	0.884	12.73	1.034						
11.57	0.947	12.77	1.005						
11.60	1.054	12.80	0.976						
11.63	1.211	12.83	0.947						
11.67	1.407	12.87	0.918						
11.70	1.632	12.90	0.888						
11.73	1.878	12.93	0.859						
11.77	2.134	12.97	0.830						
11.80	2.396	13.00	0.801						
11.83	2.663	...end	...end						
11.87	2.935								
11.90	3.213								
11.93	3.576								
11.97	4.188								
12.00	5.217								
12.03	6.519								
12.07	7.629								
12.10	8.061								
12.13	7.707								
12.17	6.848								
12.20	5.824								
12.23	4.893								
12.27	4.186								
12.30	3.720								
12.33	3.402								
12.37	3.131								
12.40	2.858								
12.43	2.584								
12.47	2.308								
12.50	2.030								
12.53	1.762								
12.57	1.524								
12.60	1.338								
12.63	1.208								

Hydrograph Report

Project Name: Pre-Development 39 Leggett St East Hartford

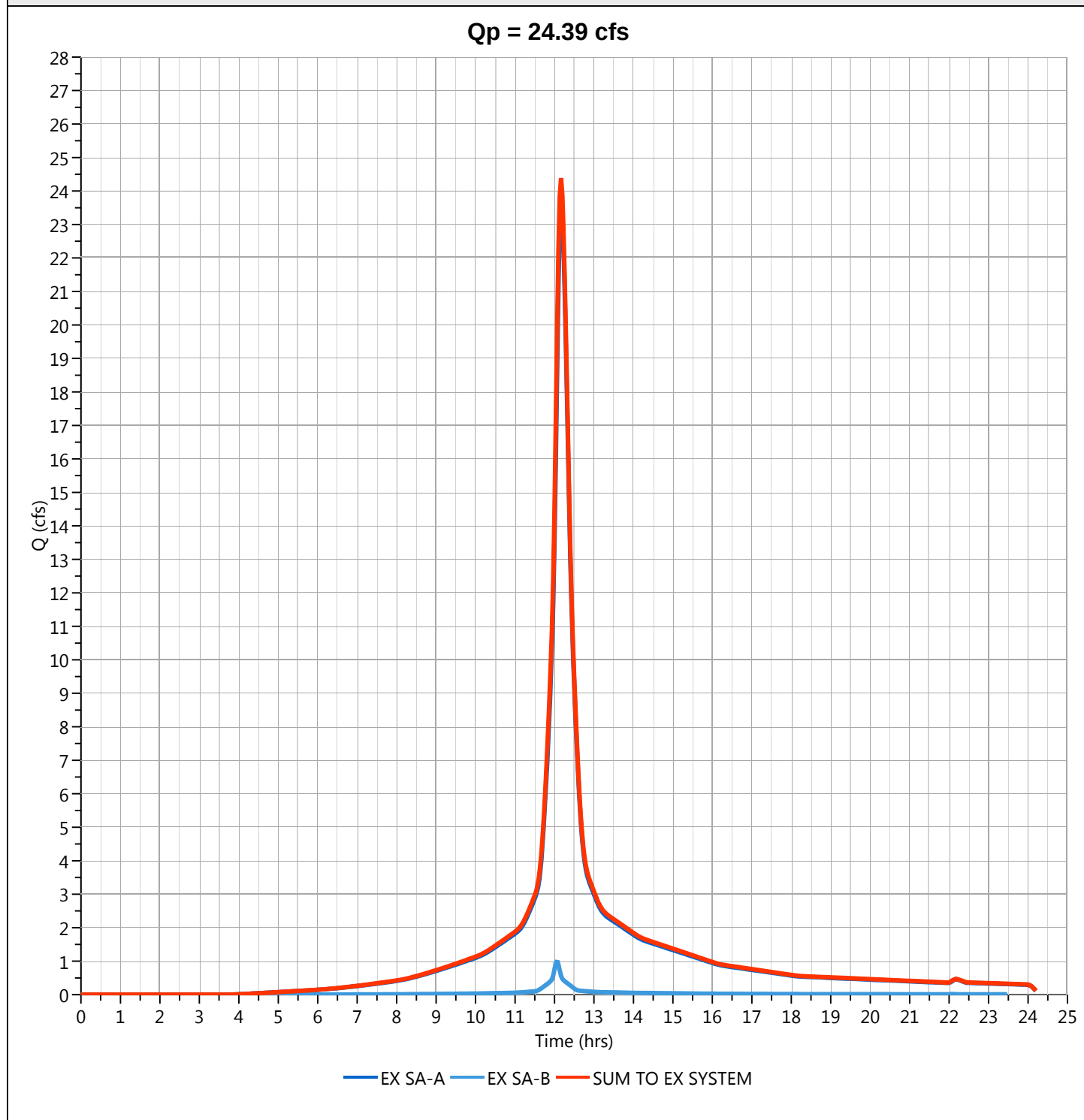
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX SYSTEM

Hyd. No. 4

Hydrograph Type	= Junction	Peak Flow	= 24.39 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Hydrograph Volume	= 104,119 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 4.757 ac



Hydrograph Discharge Table

SUM TO EX SYSTEM

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.33	2.481	12.53	8.456						
11.37	2.575	12.57	7.529						
11.40	2.672	12.60	6.676						
11.43	2.771	12.63	5.919						
11.47	2.870	12.67	5.283						
11.50	2.970	12.70	4.772						
11.53	3.084	12.73	4.368						
11.57	3.242	12.77	4.056						
11.60	3.467	12.80	3.819						
11.63	3.780	12.83	3.640						
11.67	4.205	12.87	3.503						
11.70	4.744	12.90	3.390						
11.73	5.386	12.93	3.286						
11.77	6.118	12.97	3.182						
11.80	6.926	13.00	3.078						
11.83	7.798	13.03	2.975						
11.87	8.719	13.07	2.876						
11.90	9.676	13.10	2.783						
11.93	10.78	13.13	2.699						
11.97	12.28	13.17	2.626						
12.00	14.40	13.20	2.563						
12.03	17.04	13.23	2.510						
12.07	19.81	13.27	2.465						
12.10	22.22	13.30	2.427						
12.13	23.85	...end	...end						
12.17	24.39								
12.20	23.85								
12.23	22.59								
12.27	20.95								
12.30	19.13								
12.33	17.17								
12.37	15.17								
12.40	13.30								
12.43	11.73								
12.47	10.48								
12.50	9.428								

Design Storm Report

Custom Storm filename:

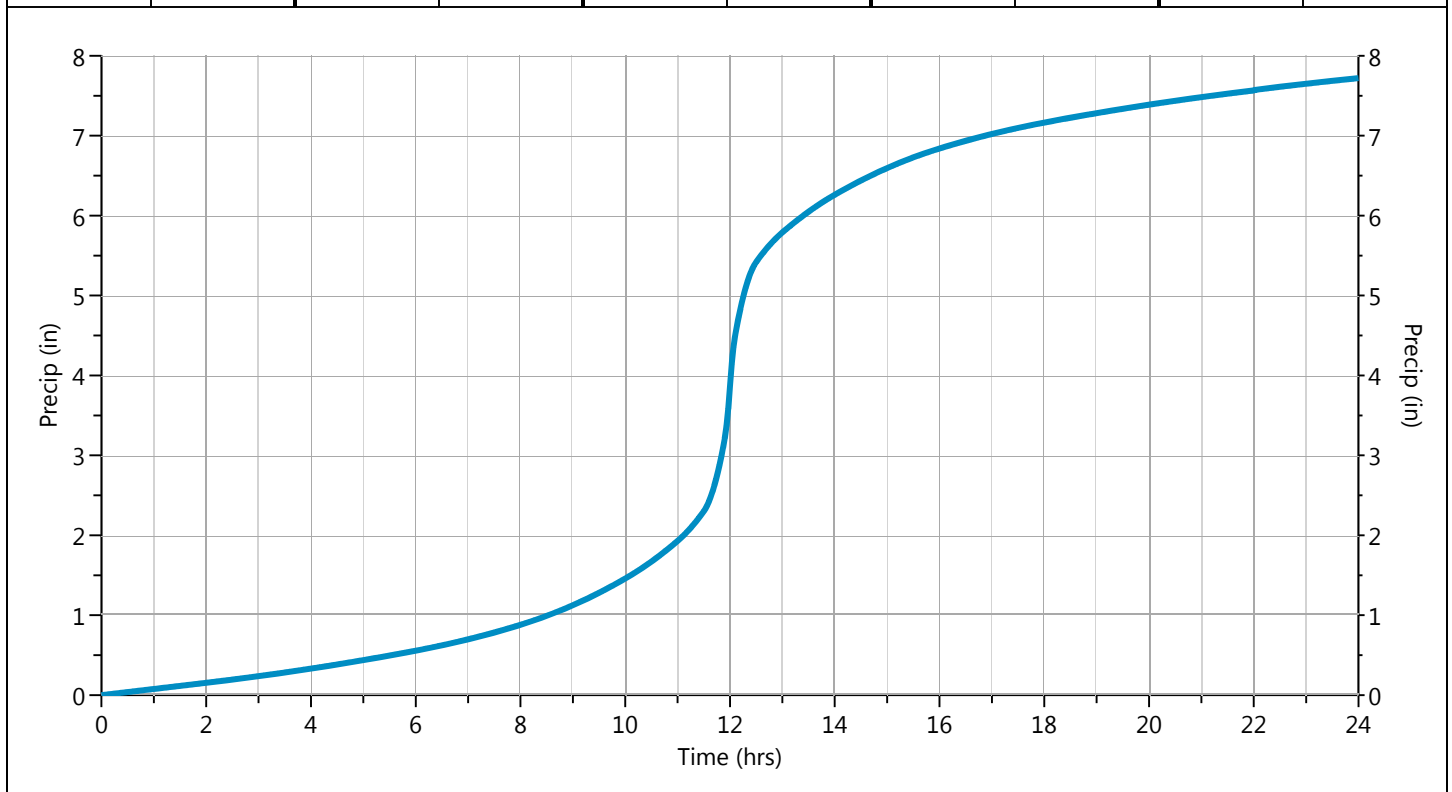
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	✓ 100-yr	
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72	

Incremental Rainfall Distribution, 100-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0187	11.37	0.0271	11.73	0.0797	12.10	0.1529	12.47	0.0419
11.03	0.0192	11.40	0.0279	11.77	0.0872	12.13	0.1177	12.50	0.0344
11.07	0.0200	11.43	0.0286	11.80	0.0948	12.17	0.1099	12.53	0.0302
11.10	0.0208	11.47	0.0294	11.83	0.1023	12.20	0.1023	12.57	0.0294
11.13	0.0215	11.50	0.0302	11.87	0.1099	12.23	0.0948	12.60	0.0286
11.17	0.0223	11.53	0.0344	11.90	0.1174	12.27	0.0872	12.63	0.0279
11.20	0.0231	11.57	0.0419	11.93	0.1531	12.30	0.0797	12.67	0.0271
11.23	0.0239	11.60	0.0495	11.97	0.2162	12.33	0.0721	12.70	0.0263
11.27	0.0247	11.63	0.0570	12.00	0.2795	12.37	0.0646	12.73	0.0255
11.30	0.0255	11.67	0.0646	12.03	0.2791	12.40	0.0570	12.77	0.0247
11.33	0.0263	11.70	0.0721	12.07	0.2162	12.43	0.0495	12.80	0.0239



IDF Report

IDF filename: NOHA Atlas 14 - IDF for 34 Leggett Street East Hartford CT.idf

Hydrology Studio v 2.0.0.52

06-17-2018

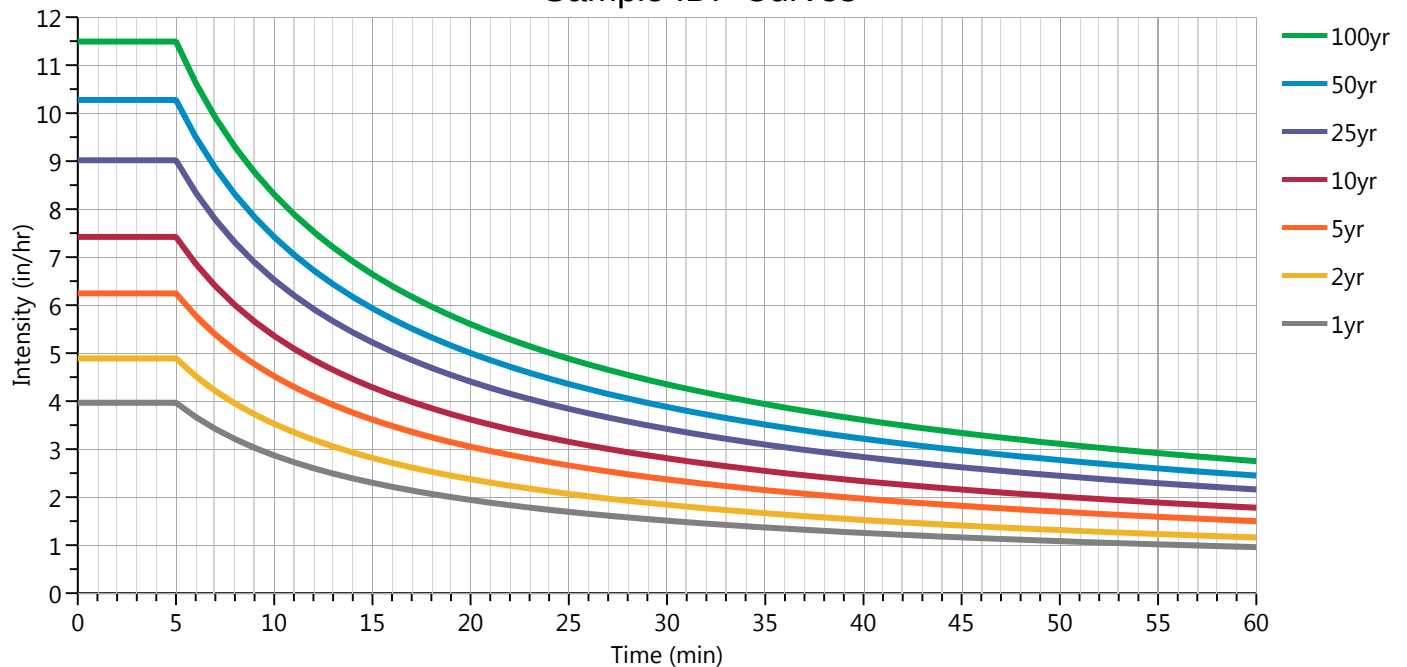
Equation Coefficients	Intensity = B / (Tc + D)^E (in/hr)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
B	18.5446	23.7197	0.0000	29.8953	35.0088	43.9849	49.5764	55.2220	
D	3.7000	3.8000	0.0000	3.8000	3.7000	3.9000	3.8000	3.8000	
E	0.7130	0.7262	0.0000	0.7200	0.7171	0.7249	0.7237	0.7218	

Minimum Tc = 5 minutes

Tc (min)	Intensity Values (in/hr)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
Cf	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
5	3.97	4.89	0	6.25	7.42	9.02	10.27	11.49	
10	2.87	3.53	0	4.52	5.36	6.53	7.42	8.30	
15	2.30	2.82	0	3.62	4.29	5.22	5.93	6.64	
20	1.94	2.37	0	3.05	3.62	4.41	5.00	5.60	
25	1.69	2.07	0	2.66	3.15	3.84	4.36	4.88	
30	1.51	1.84	0	2.37	2.81	3.42	3.88	4.35	
35	1.37	1.66	0	2.15	2.54	3.10	3.51	3.94	
40	1.25	1.52	0	1.97	2.33	2.84	3.22	3.61	
45	1.16	1.41	0	1.82	2.16	2.62	2.97	3.34	
50	1.08	1.31	0	1.70	2.01	2.44	2.77	3.11	
55	1.02	1.23	0	1.59	1.89	2.29	2.60	2.92	
60	0.96	1.16	0	1.50	1.78	2.16	2.45	2.75	

Cf = Correction Factor applied to Rational Method runoff coefficient.

Sample IDF Curves



Precipitation Report

Precipitation filename: NOHA Atlas 14 -PFE for 34 Leggett St East Hartford.idf.pcp

Hydrology Studio v 2.0.0.52

06-17-2018

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✓	✓		✓	✓	✓	✓	✓
NRCS Storms	> NRCS Dimensionless Storms								
SCS 6hr		1.75	2.12	0	2.73	3.24	3.94	4.48	5.02
Type I, 24-hr		2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Type IA, 24-hr		2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Type II, 24-hr		2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Type II FL, 24-hr		2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Type III, 24-hr	✓	2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Synthetic Storms	> IDF-Based Synthetic Storms								
1-hr		0.96	1.16	0	1.50	1.78	2.16	2.45	2.75
2-hr		1.19	1.43	0	1.86	2.21	2.67	3.03	3.41
3-hr		1.35	1.61	0	2.10	2.50	3.01	3.42	3.84
6-hr		1.66	1.97	0	2.57	3.06	3.67	4.17	4.70
12-hr		2.03	2.39	0	3.13	3.74	4.46	5.07	5.72
24-hr		2.49	2.89	0	3.81	4.56	5.41	6.15	6.95
Huff Distribution	> 1st Quartile (0 to 6 hrs)								
1-hr		0.93	1.14	0	1.47	1.75	2.13	2.43	2.72
2-hr		1.21	1.47	0	1.89	2.24	2.72	3.09	3.46
3-hr		1.40	1.69	0	2.18	2.57	3.12	3.55	3.97
6-hr		1.75	2.12	0	2.73	3.24	3.94	4.48	5.02
Huff Distribution	> 2nd Quartile (>6 to 12 hrs)								
8-hr		0	0	0	0	0	0	0	0
12-hr		2.12	2.60	0	3.38	4.02	4.92	5.60	6.29
Huff Distribution	> 3rd Quartile (>12 to 24 hrs)								
18-hr		0	0	0	0	0	0	0	0
24-hr		2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Custom Storms	> Custom Storm Distributions								
My Custom Storm 1		0	0	0	0	0	0	0	0
My Custom Storm 2		0	0	0	0	0	0	0	0
My Custom Storm 3		0	0	0	0	0	0	0	0
My Custom Storm 4		0	0	0	0	0	0	0	0
My Custom Storm 5		0	0	0	0	0	0	0	0
My Custom Storm 6		0	0	0	0	0	0	0	0
My Custom Storm 7		0	0	0	0	0	0	0	0
My Custom Storm 8		0	0	0	0	0	0	0	0
My Custom Storm 9		0	0	0	0	0	0	0	0
My Custom Storm 10		0	0	0	0	0	0	0	0

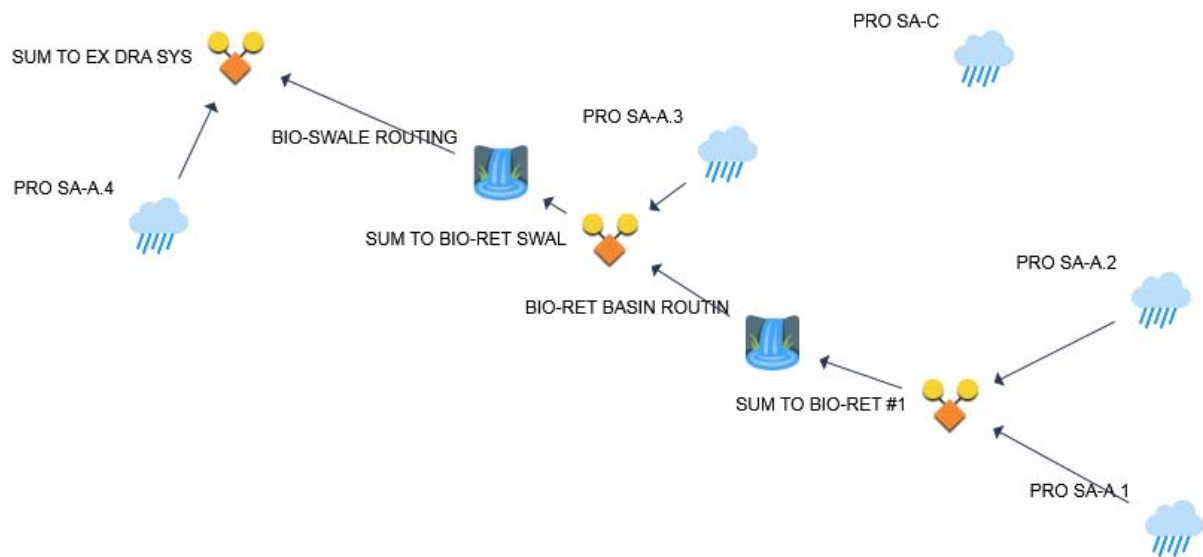
Appendix G
Hydrology Studio™
Computer Model Report – Post Development

Basin Model

Hydrology Studio v 2.0.0.52

Project Name: 39 Leggett St East Hartford

06-17-2018



Hydrograph by Return Period

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

[illegible]

Hydrograph 1-yr Summary

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

[illegible]

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

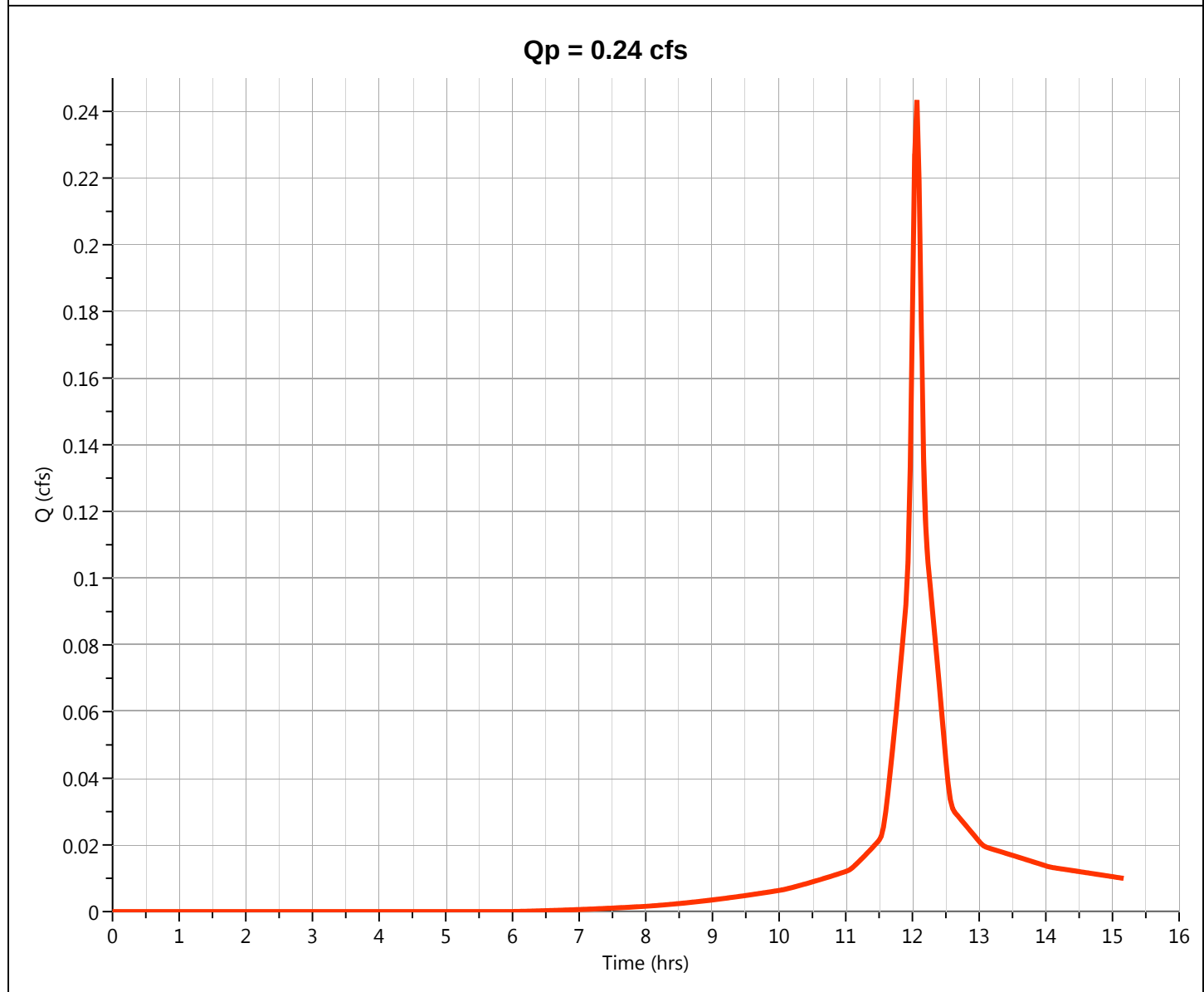
PRO SA-A.1

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.243 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 737 cuft
Drainage Area	= 0.13 ac	Curve Number	= 92*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 2.4700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.11	98	B - PAVED
0.02	61	B - LAWN
0.13	92	Weighted Average



Hydrograph Discharge Table

PRO SA-A.1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.025	12.77	0.027						
11.60	0.030	12.80	0.026						
11.63	0.036	12.83	0.025						
11.67	0.042	12.87	0.024						
11.70	0.049	...end	...end						
11.73	0.055								
11.77	0.062								
11.80	0.069								
11.83	0.076								
11.87	0.084								
11.90	0.092								
11.93	0.105								
11.97	0.133								
12.00	0.180								
12.03	0.227								
12.07	0.243								
12.10	0.219								
12.13	0.174								
12.17	0.136								
12.20	0.115								
12.23	0.105								
12.27	0.098								
12.30	0.090								
12.33	0.083								
12.37	0.076								
12.40	0.068								
12.43	0.061								
12.47	0.053								
12.50	0.046								
12.53	0.039								
12.57	0.034								
12.60	0.031								
12.63	0.030								
12.67	0.029								
12.70	0.028								
12.73	0.027								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

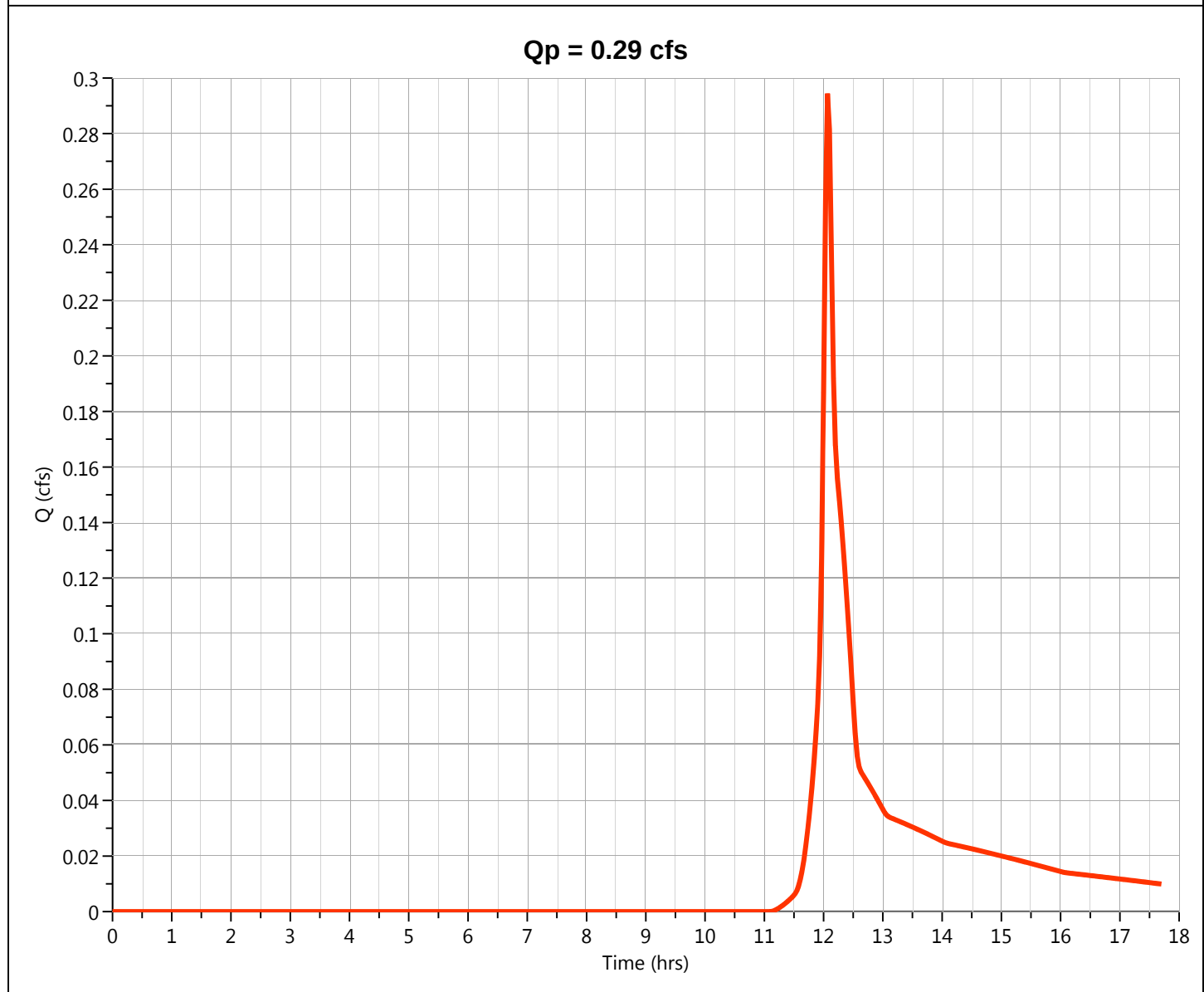
PRO SA-A.2

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.294 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 967 cuft
Drainage Area	= 0.42 ac	Curve Number	= 76*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.31 min
Total Rainfall	= 2.4700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.168	98	B - PAVED
0.252	61	B - LAWN
0.42	76	Weighted Average



Hydrograph Discharge Table

PRO SA-A.2

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.77	0.036	12.97	0.038						
11.80	0.044	13.00	0.037						
11.83	0.053	13.03	0.036						
11.87	0.063	13.07	0.035						
11.90	0.074	13.10	0.034						
11.93	0.091	13.13	0.034						
11.97	0.127	13.17	0.033						
12.00	0.187	13.20	0.033						
12.03	0.256	13.23	0.033						
12.07	0.294	13.27	0.033						
12.10	0.281	13.30	0.032						
12.13	0.236	13.33	0.032						
12.17	0.192	13.37	0.032						
12.20	0.168	13.40	0.031						
12.23	0.156	13.43	0.031						
12.27	0.148	13.47	0.031						
12.30	0.140	13.50	0.030						
12.33	0.130	13.53	0.030						
12.37	0.120	13.57	0.030						
12.40	0.110	13.60	0.029						
12.43	0.099	13.63	0.029						
12.47	0.087	...end	...end						
12.50	0.075								
12.53	0.064								
12.57	0.056								
12.60	0.052								
12.63	0.050								
12.67	0.049								
12.70	0.048								
12.73	0.047								
12.77	0.046								
12.80	0.044								
12.83	0.043								
12.87	0.042								
12.90	0.041								
12.93	0.039								

TR55 Worksheet

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

PRO SA-A.2 NRCS Runoff

Hyd. No. 2

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	LANDSCAPED			
Manning's n	0.120	0.013	0.013	
Flow Length (ft)	34			
2-yr, 24-hr Precip. (in)	3.0700	3.0700	3.0700	
Land Slope (%)	1.5			
Travel Time (min)	3.96	0.00	0.00	3.96
Shallow Concentrated Flow				
Flow Length (ft)	66			
Watercourse Slope (%)	3.8			
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.15			
Travel Time (min)	0.35	0.00	0.00	0.35
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.013	0.013	0.013	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				4.31 min

Hydrograph Report

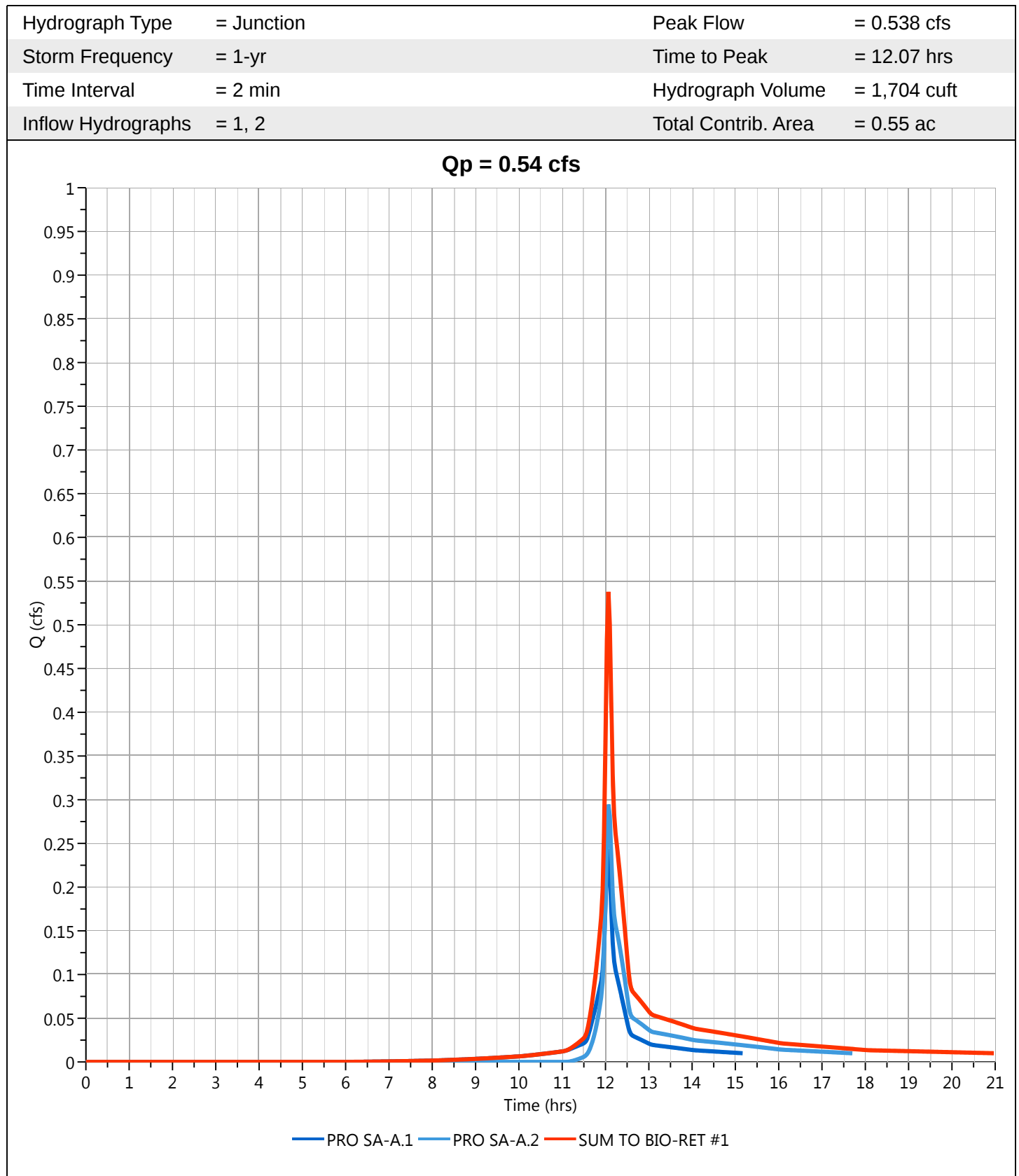
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET #1

Hyd. No. 3



Hydrograph Discharge Table

SUM TO BIO-RET #1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.67	0.061	12.87	0.066						
11.70	0.072	12.90	0.064						
11.73	0.085	12.93	0.062						
11.77	0.098	12.97	0.060						
11.80	0.113	13.00	0.058						
11.83	0.129	13.03	0.056						
11.87	0.147	13.07	0.054						
11.90	0.166	13.10	0.053						
11.93	0.196	...end	...end						
11.97	0.260								
12.00	0.367								
12.03	0.483								
12.07	0.538								
12.10	0.500								
12.13	0.410								
12.17	0.328								
12.20	0.283								
12.23	0.260								
12.27	0.246								
12.30	0.230								
12.33	0.214								
12.37	0.196								
12.40	0.178								
12.43	0.160								
12.47	0.140								
12.50	0.121								
12.53	0.103								
12.57	0.090								
12.60	0.083								
12.63	0.080								
12.67	0.078								
12.70	0.076								
12.73	0.074								
12.77	0.072								
12.80	0.070								
12.83	0.068								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

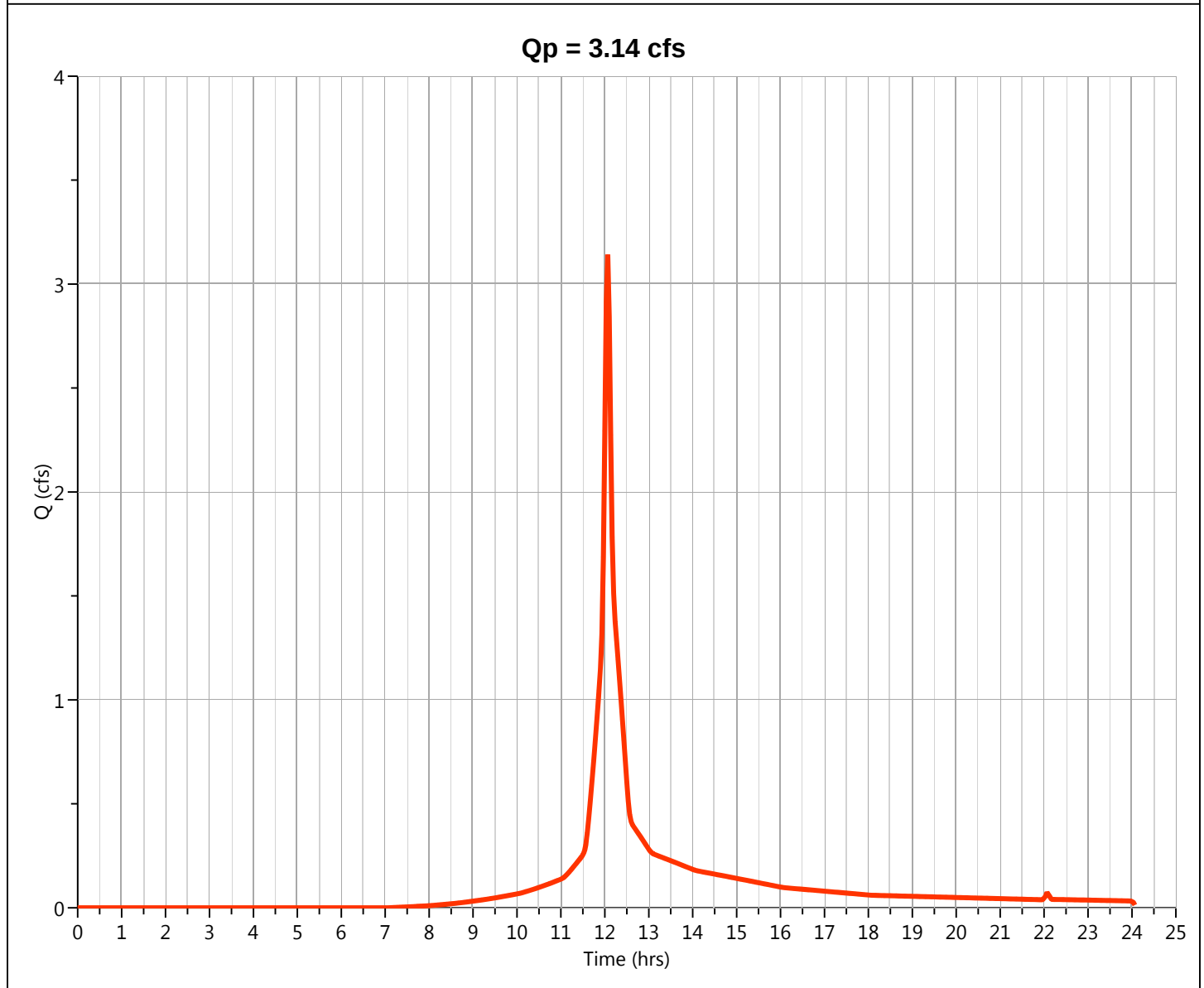
PRO SA-A.3

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 3.141 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 9,419 cuft
Drainage Area	= 1.84 ac	Curve Number	= 90*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.95 min
Total Rainfall	= 2.4700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LAWN
1.84	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.3

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.360	12.80	0.346						
11.63	0.431	12.83	0.335						
11.67	0.508	12.87	0.324						
11.70	0.588	12.90	0.314						
11.73	0.672	...end	...end						
11.77	0.760								
11.80	0.851								
11.83	0.946								
11.87	1.045								
11.90	1.147								
11.93	1.317								
11.97	1.687								
12.00	2.294								
12.03	2.915								
12.07	3.141								
12.10	2.843								
12.13	2.274								
12.17	1.784								
12.20	1.512								
12.23	1.377								
12.27	1.287								
12.30	1.195								
12.33	1.100								
12.37	1.004								
12.40	0.907								
12.43	0.808								
12.47	0.707								
12.50	0.606								
12.53	0.514								
12.57	0.448								
12.60	0.414								
12.63	0.397								
12.67	0.387								
12.70	0.377								
12.73	0.366								
12.77	0.356								

TR55 Worksheet

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

PRO SA-A.3 NRCS Runoff

Hyd. No. 4

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	GRASS	PAVED		
Manning's n	0.120	0.013	0.013	
Flow Length (ft)	22	71		
2-yr, 24-hr Precip. (in)	3.0700	3.0700	3.0700	
Land Slope (%)	1	1		
Travel Time (min)	3.29	1.42	0.00	4.71
Shallow Concentrated Flow				
Flow Length (ft)	30			
Watercourse Slope (%)	1			
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)	2.03			
Travel Time (min)	0.25	0.00	0.00	0.25
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.013	0.013	0.013	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				4.95 min

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

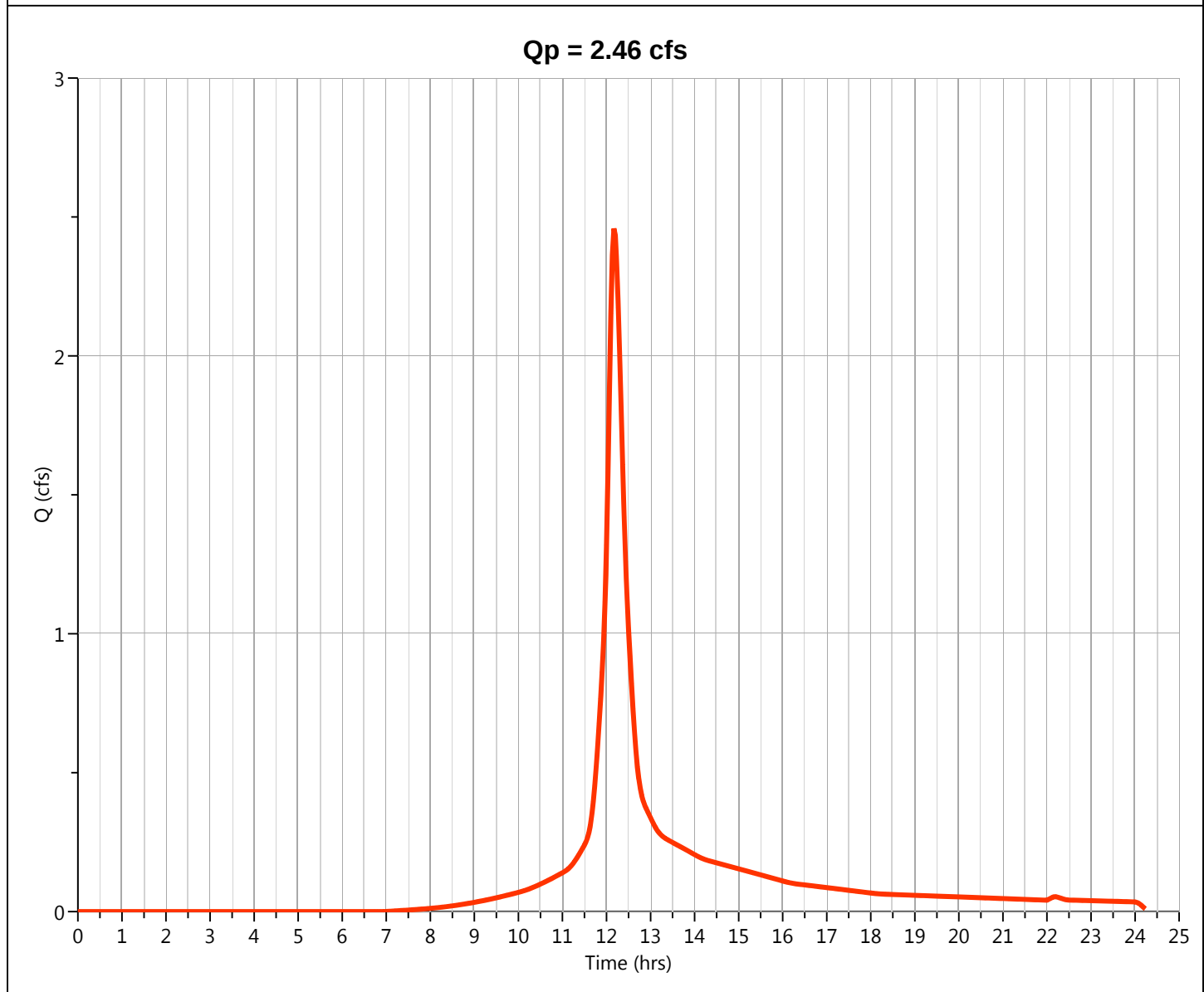
PRO SA-A.4

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 2.458 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 10,024 cuft
Drainage Area	= 1.838 ac	Curve Number	= 90.47*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.12 min
Total Rainfall	= 2.4700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LANDSCAPED
1.838	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.4

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	0.251	12.73	0.477						
11.57	0.265	12.77	0.443						
11.60	0.284	12.80	0.417						
11.63	0.311	12.83	0.398						
11.67	0.348	12.87	0.383						
11.70	0.395	12.90	0.371						
11.73	0.453	12.93	0.360						
11.77	0.520	12.97	0.349						
11.80	0.595	13.00	0.338						
11.83	0.678	13.03	0.327						
11.87	0.766	13.07	0.316						
11.90	0.861	13.10	0.306						
11.93	0.970	13.13	0.297						
11.97	1.114	13.17	0.289						
12.00	1.318	13.20	0.282						
12.03	1.581	13.23	0.276						
12.07	1.875	13.27	0.271						
12.10	2.153	13.30	0.267						
12.13	2.363	13.33	0.264						
12.17	2.458	13.37	0.261						
12.20	2.434	13.40	0.258						
12.23	2.325	13.43	0.255						
12.27	2.173	13.47	0.252						
12.30	2.000	13.50	0.249						
12.33	1.808	13.53	0.246						
12.37	1.609	13.57	0.243						
12.40	1.420	...end	...end						
12.43	1.259								
12.47	1.130								
12.50	1.021								
12.53	0.920								
12.57	0.821								
12.60	0.729								
12.63	0.647								
12.67	0.577								
12.70	0.521								

TR55 Worksheet

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

PRO SA-A.4 NRCS Runoff

Hyd. No. 5

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	GRASS			
Manning's n	0.120	0.013	0.013	
Flow Length (ft)	41			
2-yr, 24-hr Precip. (in)	3.0700	3.0700	3.0700	
Land Slope (%)	1			
Travel Time (min)	5.41	0.00	0.00	5.41
Shallow Concentrated Flow				
Flow Length (ft)	751			
Watercourse Slope (%)	.5			
Surface Description	Paved	Paved	Paved	
Average Velocity (ft/s)	1.44			
Travel Time (min)	8.71	0.00	0.00	8.71
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimeter (ft)				
Channel Slope (%)				
Manning's n	0.013	0.013	0.013	
Velocity (ft/s)				
Flow Length (ft)				
Travel Time (min)	0.00	0.00	0.00	0.00
Total Travel Time				14.12 min

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

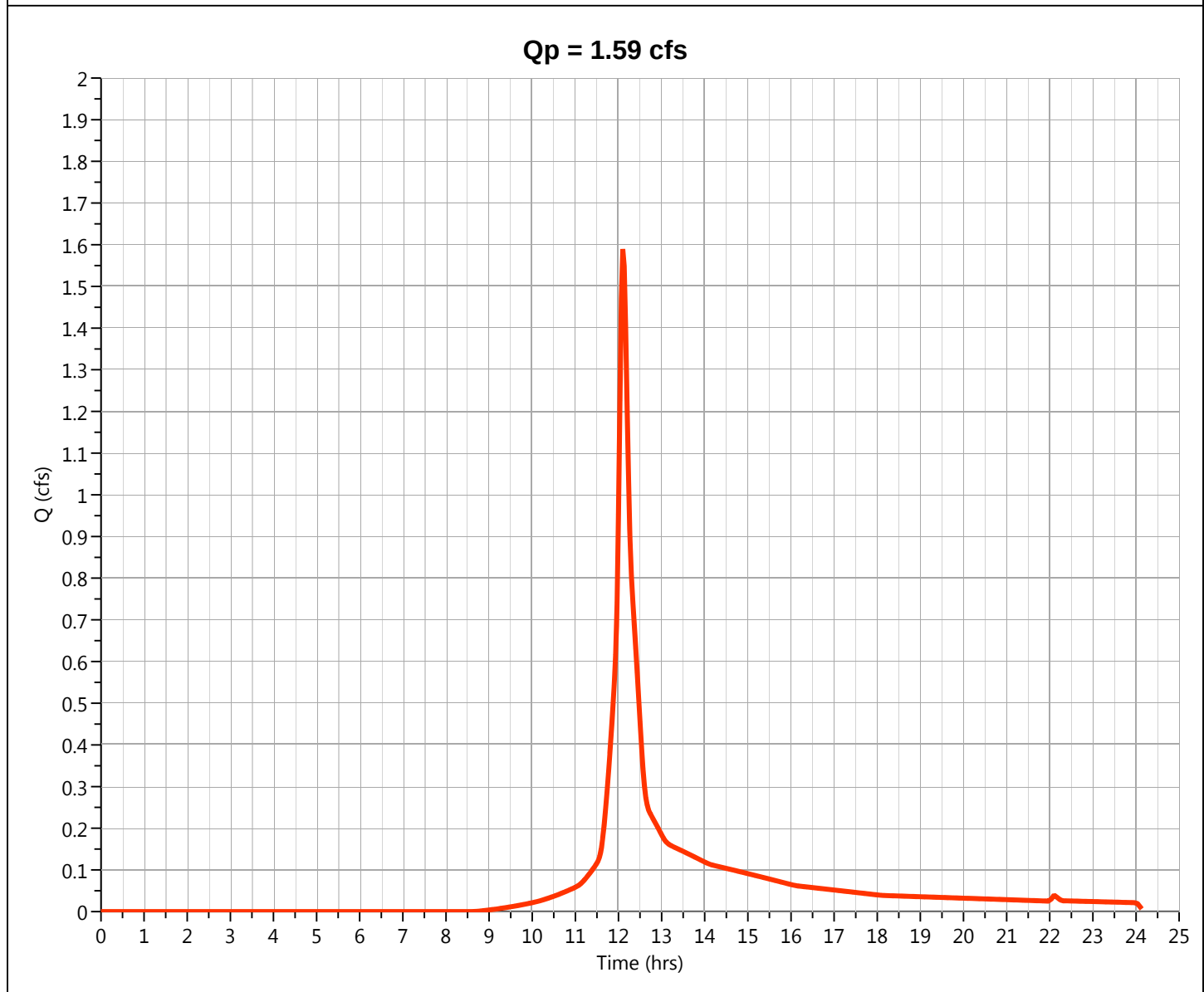
PRO SA-C

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.590 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 5,445 cuft
Drainage Area	= 1.22 ac	Curve Number	= 86.16*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.4 min
Total Rainfall	= 2.4700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.38	61	B - GRASS
1.22	86	Weighted Average



Hydrograph Discharge Table

PRO SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.63	0.175	12.83	0.217						
11.67	0.207	12.87	0.210						
11.70	0.244	12.90	0.204						
11.73	0.286	12.93	0.198						
11.77	0.331	12.97	0.191						
11.80	0.379	13.00	0.185						
11.83	0.430	13.03	0.178						
11.87	0.484	13.07	0.172						
11.90	0.542	13.10	0.168						
11.93	0.617	13.13	0.164						
11.97	0.742	13.17	0.161						
12.00	0.953	13.20	0.159						
12.03	1.226	13.23	0.158						
12.07	1.472	...end	...end						
12.10	1.590								
12.13	1.548								
12.17	1.400								
12.20	1.211								
12.23	1.035								
12.27	0.897								
12.30	0.806								
12.33	0.743								
12.37	0.688								
12.40	0.632								
12.43	0.574								
12.47	0.515								
12.50	0.455								
12.53	0.396								
12.57	0.344								
12.60	0.303								
12.63	0.274								
12.67	0.255								
12.70	0.243								
12.73	0.236								
12.77	0.229								
12.80	0.223								

TR55 Worksheet

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

PRO SA-C NRCS Runoff

Hyd. No. 6

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	GRAS			
Manning's n	0.120	0.013	0.013	
Flow Length (ft)	40			
2-yr, 24-hr Precip. (in)	3.0700	3.0700	3.0700	
Land Slope (%)	1			
Travel Time (min)	5.30	0.00	0.00	5.30
Shallow Concentrated Flow				
Flow Length (ft)	105			
Watercourse Slope (%)	.5			
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	1.14			
Travel Time (min)	1.53	0.00	0.00	1.53
Channel Flow				
X-sectional Flow Area (sqft)	3.1			
Wetted Perimeter (ft)	3			
Channel Slope (%)	.5			
Manning's n	0.012	0.013	0.013	
Velocity (ft/s)	8.97			
Flow Length (ft)	302			
Travel Time (min)	0.56	0.00	0.00	0.56
Total Travel Time				7.4 min

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

BIO-RET BASIN ROUTIN

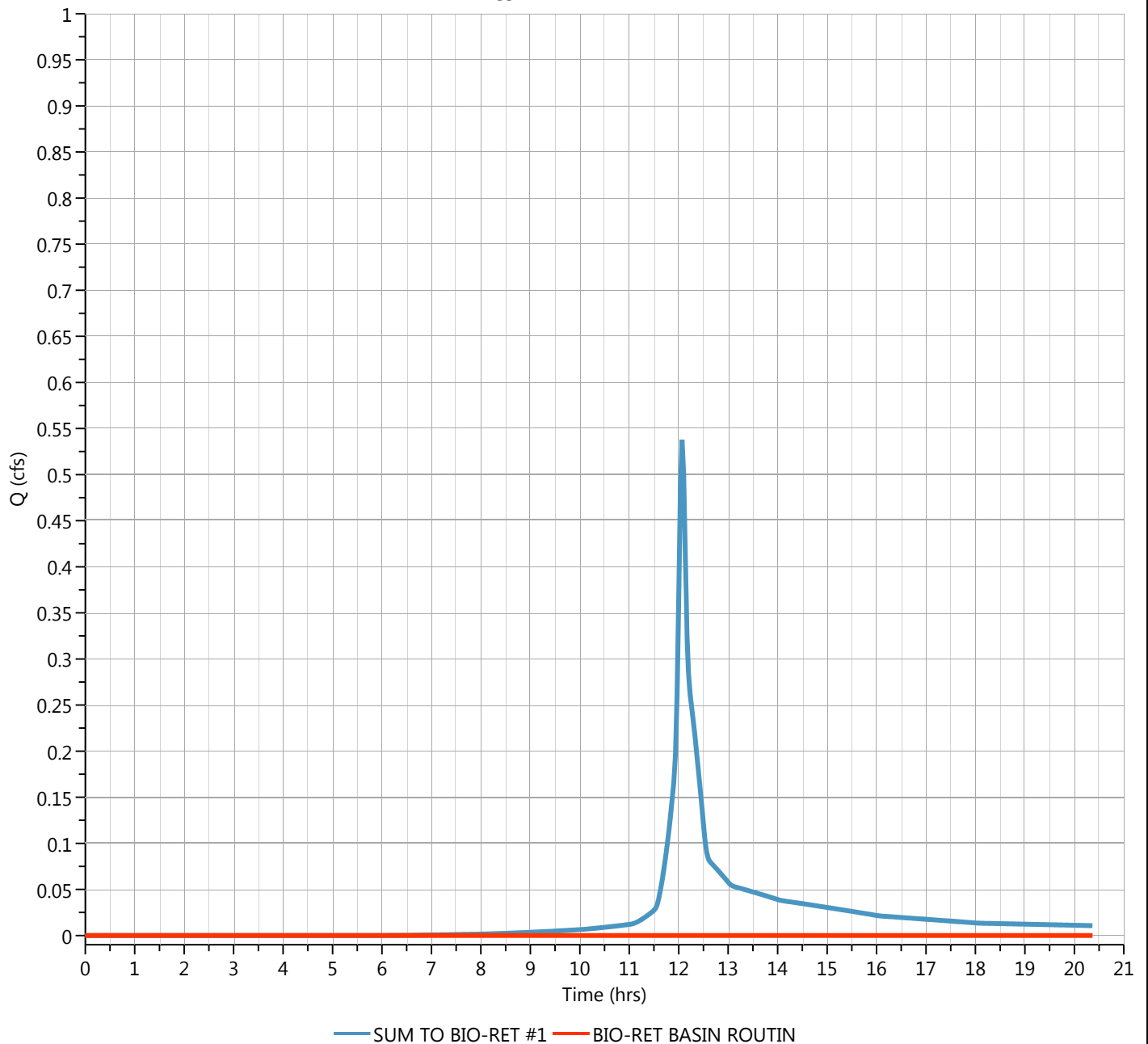
Hyd. No. 7

Hydrograph Type	= Pond Route	Peak Flow	= 0.000 cfs
Storm Frequency	= 1-yr	Time to Peak	= 20.33 hrs
Time Interval	= 2 min	Hydrograph Volume	= 0.001 cuft
Inflow Hydrograph	= 3 - SUM TO BIO-RET #1	Max. Elevation	= 49.74 ft
Pond Name	= PROP. BIO-RETENTION BASIN #1	Max. Storage	= 830 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 1.61 hrs

Qp = 0.00 cfs



Hydrograph Discharge Table

BIO-RET BASIN ROUTIN

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
12.00	0.000	13.20	0.000	14.40	0.000	15.60	0.000	16.80	0.000
12.03	0.000	13.23	0.000	14.43	0.000	15.63	0.000	16.83	0.000
12.07	0.000	13.27	0.000	14.47	0.000	15.67	0.000	16.87	0.000
12.10	0.00	13.30	0.000	14.50	0.000	15.70	0.000	16.90	0.000
12.13	0.00	13.33	0.000	14.53	0.000	15.73	0.000	16.93	0.000
12.17	0.000	13.37	0.000	14.57	0.000	15.77	0.000	16.97	0.000
12.20	0.000	13.40	0.000	14.60	0.000	15.80	0.000	17.00	0.000
12.23	0.000	13.43	0.000	14.63	0.000	15.83	0.000	17.03	0.000
12.27	0.000	13.47	0.000	14.67	0.000	15.87	0.000	17.07	0.000
12.30	0.000	13.50	0.000	14.70	0.000	15.90	0.000	17.10	0.000
12.33	0.000	13.53	0.000	14.73	0.000	15.93	0.000	17.13	0.000
12.37	0.00	13.57	0.000	14.77	0.000	15.97	0.000	17.17	0.000
12.40	0.00	13.60	0.000	14.80	0.000	16.00	0.000	17.20	0.000
12.43	0.00	13.63	0.000	14.83	0.000	16.03	0.000	17.23	0.000
12.47	0.00	13.67	0.000	14.87	0.000	16.07	0.000	17.27	0.000
12.50	0.00	13.70	0.000	14.90	0.000	16.10	0.000	17.30	0.000
12.53	0.00	13.73	0.000	14.93	0.000	16.13	0.000	17.33	0.000
12.57	0.00	13.77	0.000	14.97	0.000	16.17	0.000	17.37	0.000
12.60	0.00	13.80	0.000	15.00	0.000	16.20	0.000	17.40	0.000
12.63	0.00	13.83	0.000	15.03	0.000	16.23	0.000	17.43	0.000
12.67	0.00	13.87	0.000	15.07	0.000	16.27	0.000	17.47	0.000
12.70	0.00	13.90	0.000	15.10	0.000	16.30	0.000	17.50	0.000
12.73	0.00	13.93	0.000	15.13	0.000	16.33	0.000	17.53	0.000
12.77	0.00	13.97	0.000	15.17	0.000	16.37	0.000	17.57	0.00
12.80	0.000	14.00	0.000	15.20	0.000	16.40	0.000	17.60	0.00
12.83	0.000	14.03	0.000	15.23	0.000	16.43	0.000	17.63	0.00
12.87	0.000	14.07	0.000	15.27	0.000	16.47	0.000	17.67	0.00
12.90	0.000	14.10	0.000	15.30	0.000	16.50	0.000	17.70	0.00
12.93	0.000	14.13	0.000	15.33	0.000	16.53	0.000	17.73	0.00
12.97	0.000	14.17	0.000	15.37	0.000	16.57	0.000	17.77	0.00
13.00	0.000	14.20	0.000	15.40	0.000	16.60	0.000	17.80	0.00
13.03	0.000	14.23	0.000	15.43	0.000	16.63	0.000	17.83	0.00
13.07	0.000	14.27	0.000	15.47	0.000	16.67	0.000	17.87	0.00
13.10	0.000	14.30	0.000	15.50	0.000	16.70	0.000	17.90	0.00
13.13	0.000	14.33	0.000	15.53	0.000	16.73	0.000	17.93	0.00
13.17	0.000	14.37	0.000	15.57	0.000	16.77	0.000	17.97	0.00

Hydrograph Discharge Table, cont'd

BIO-RET BASIN ROUTIN

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
18.00	0.00	19.20	0.00	...end	...end				
18.03	0.00	19.23	0.00						
18.07	0.00	19.27	0.00						
18.10	0.00	19.30	0.00						
18.13	0.00	19.33	0.00						
18.17	0.00	19.37	0.00						
18.20	0.00	19.40	0.00						
18.23	0.00	19.43	0.00						
18.27	0.00	19.47	0.00						
18.30	0.00	19.50	0.00						
18.33	0.00	19.53	0.00						
18.37	0.00	19.57	0.00						
18.40	0.00	19.60	0.00						
18.43	0.00	19.63	0.00						
18.47	0.00	19.67	0.00						
18.50	0.00	19.70	0.00						
18.53	0.00	19.73	0.00						
18.57	0.00	19.77	0.00						
18.60	0.00	19.80	0.000						
18.63	0.00	19.83	0.000						
18.67	0.00	19.87	0.000						
18.70	0.00	19.90	0.000						
18.73	0.00	19.93	0.000						
18.77	0.00	19.97	0.000						
18.80	0.00	20.00	0.000						
18.83	0.00	20.03	0.000						
18.87	0.00	20.07	0.000						
18.90	0.00	20.10	0.000						
18.93	0.00	20.13	0.000						
18.97	0.00	20.17	0.000						
19.00	0.00	20.20	0.000						
19.03	0.00	20.23	0.000						
19.07	0.00	20.27	0.000						
19.10	0.00	20.30	0.000						
19.13	0.00	20.33	0.000						
19.17	0.00	20.37	0.000						

Pond Report

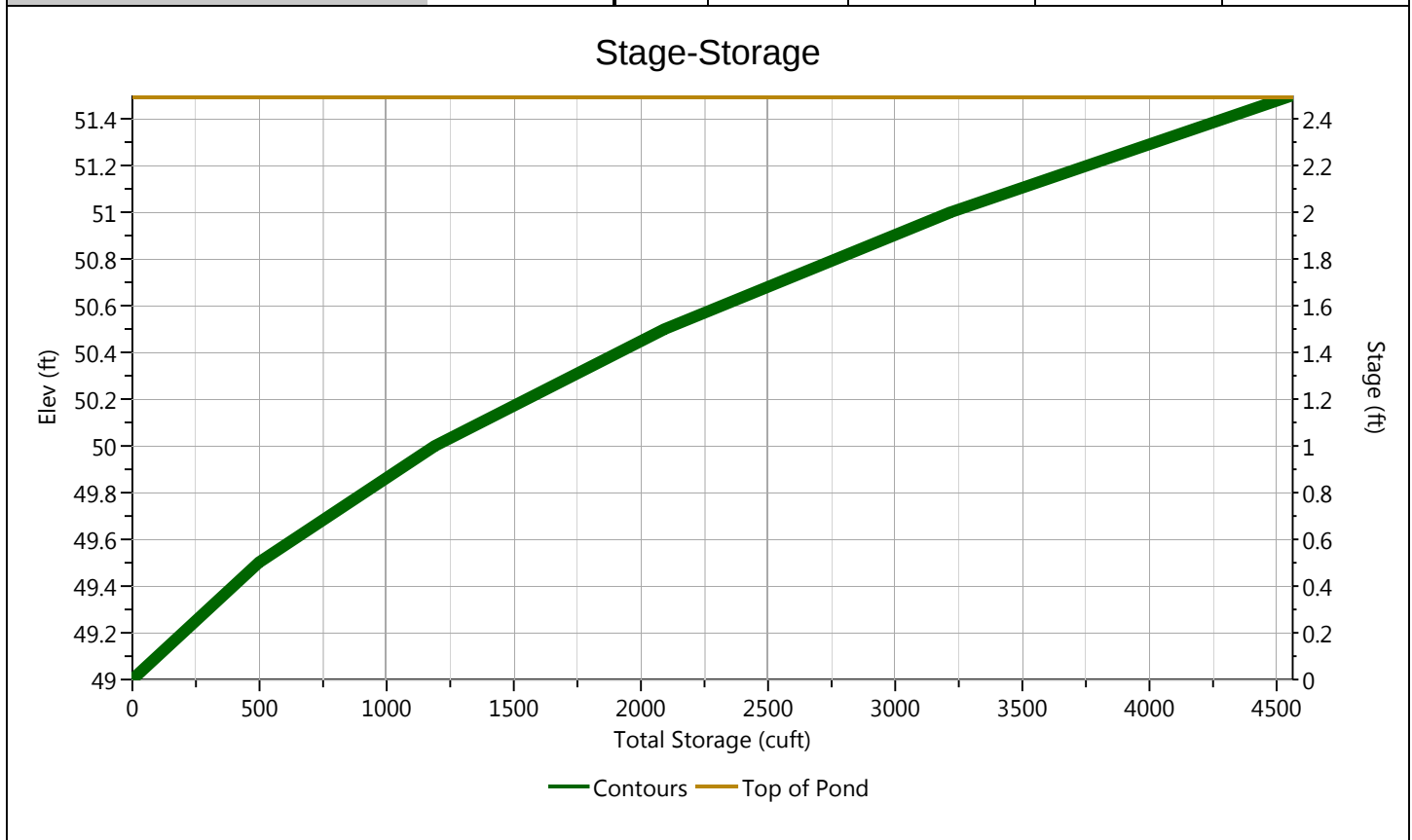
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

PROP. BIO-RETENTION BASIN #1

Stage-Storage

[illegible]

Pond Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

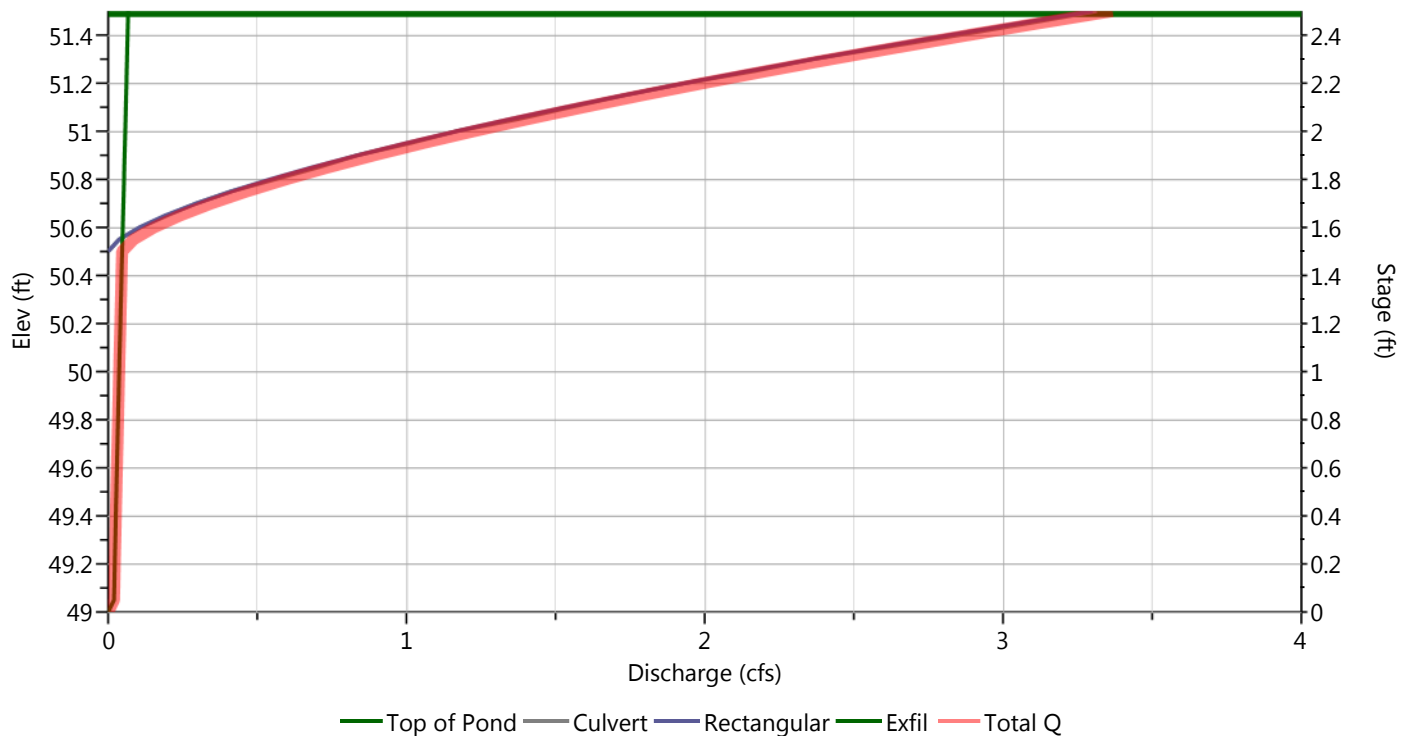
PROP. BIO-RETENTION BASIN #1

Stage-Discharge

Culvert / Orifices	Culvert	Orifices			Perforated Riser	
		1	2	3		
Rise, in	15				Perf. Rise, in	
Span, in	15				Perf. Span, in	
No. Barrels	1				No. Perforations	
Invert Elevation, ft	49				Invert Elevation, ft	
Orifice Coefficient, Co	.6				Height, ft	
Length, ft	48				Orifice Coefficient, Co	
Barrel Slope, %	1					
N-Value, n	0.012					
Weirs	Riser*	Weirs			Ancillary	
		1*	2	3		
Shape / Type		Rectangular			Exfiltration, in/hr	1.00**
Crest Elevation, ft		50.5			Tailwater Elevation, ft	
Crest Length, ft		1				
Angle, deg						
Weir Coefficient, Cw		3.3				

*Routes through Culvert. **Exfiltration extracted from outflow hydrograph. Rate applied to contours.

Stage-Discharge



Pond Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

PROP. BIO-RETENTION BASIN #1

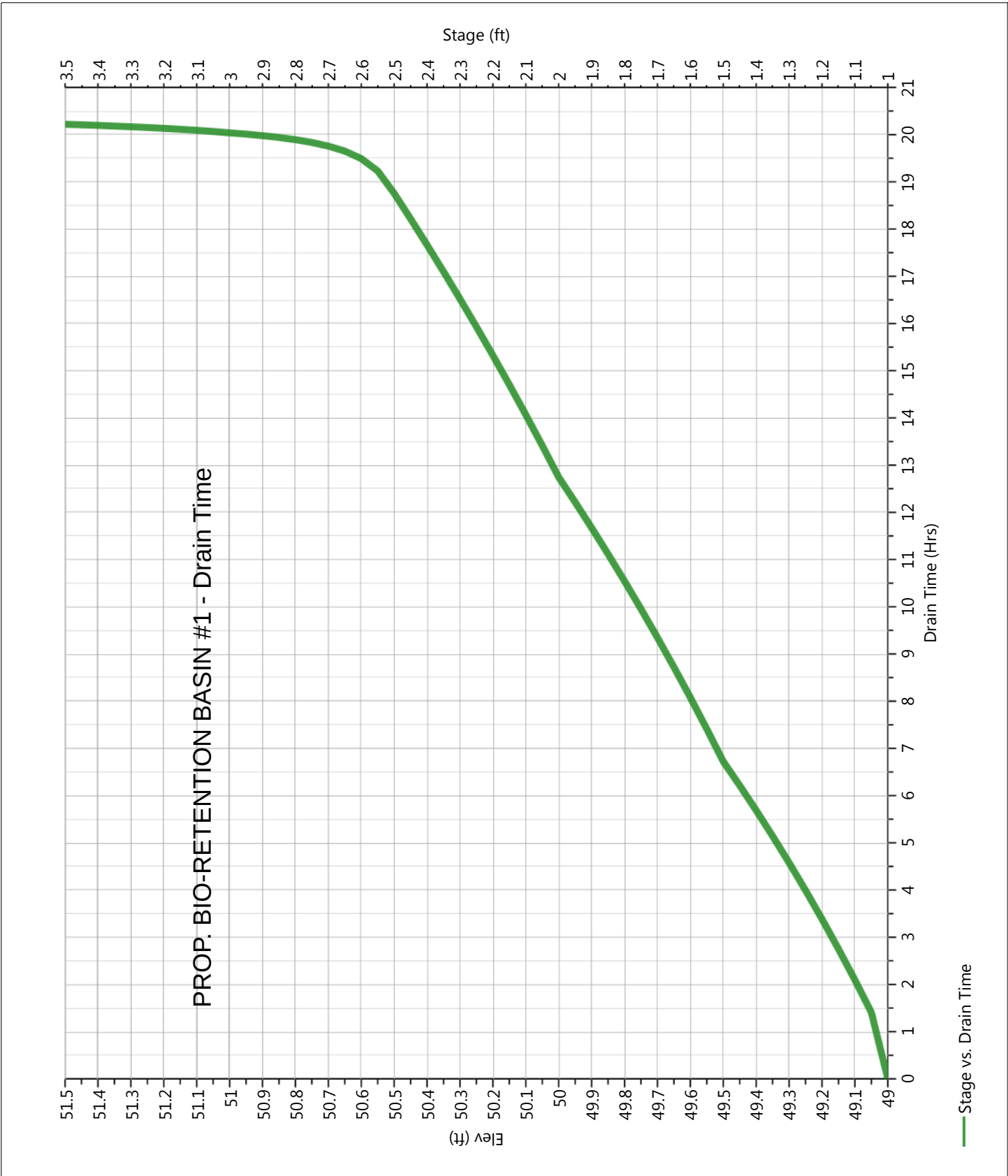
Stage-Storage-Discharge Summary

[illegible]

Suffix key: ic = inlet control, oc = outlet control, s = submerged weir

PROP. BIO-RETENTION BASIN #1

Pond Drawdown



Hydrograph Report

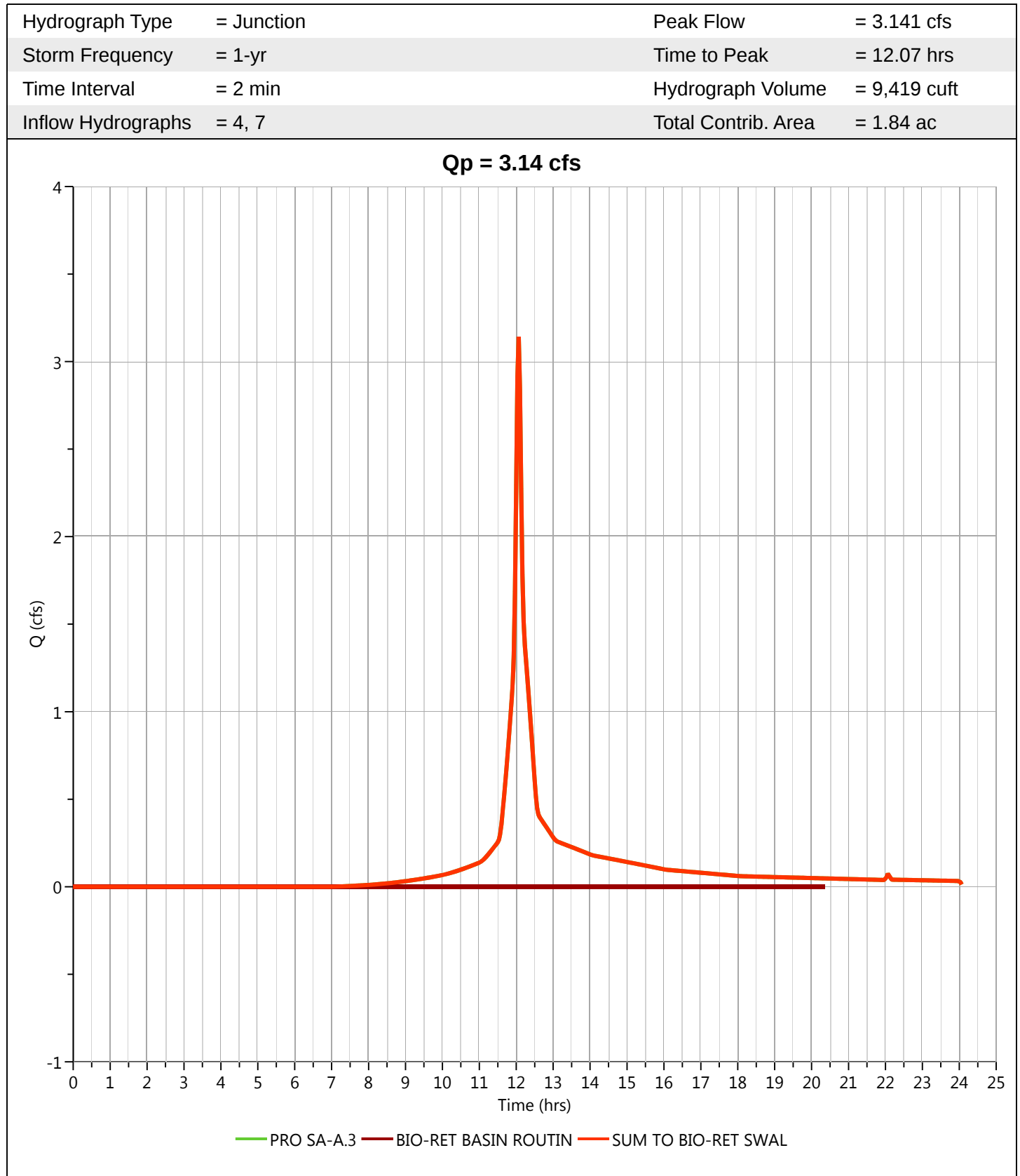
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET SWAL

Hyd. No. 8



Hydrograph Discharge Table

SUM TO BIO-RET SWAL

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.360	12.80	0.346						
11.63	0.431	12.83	0.335						
11.67	0.508	12.87	0.324						
11.70	0.588	12.90	0.314						
11.73	0.672	...end	...end						
11.77	0.760								
11.80	0.851								
11.83	0.946								
11.87	1.045								
11.90	1.147								
11.93	1.317								
11.97	1.687								
12.00	2.294								
12.03	2.915								
12.07	3.141								
12.10	2.843								
12.13	2.274								
12.17	1.784								
12.20	1.512								
12.23	1.377								
12.27	1.287								
12.30	1.195								
12.33	1.100								
12.37	1.004								
12.40	0.907								
12.43	0.808								
12.47	0.707								
12.50	0.606								
12.53	0.514								
12.57	0.448								
12.60	0.414								
12.63	0.397								
12.67	0.387								
12.70	0.377								
12.73	0.366								
12.77	0.356								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

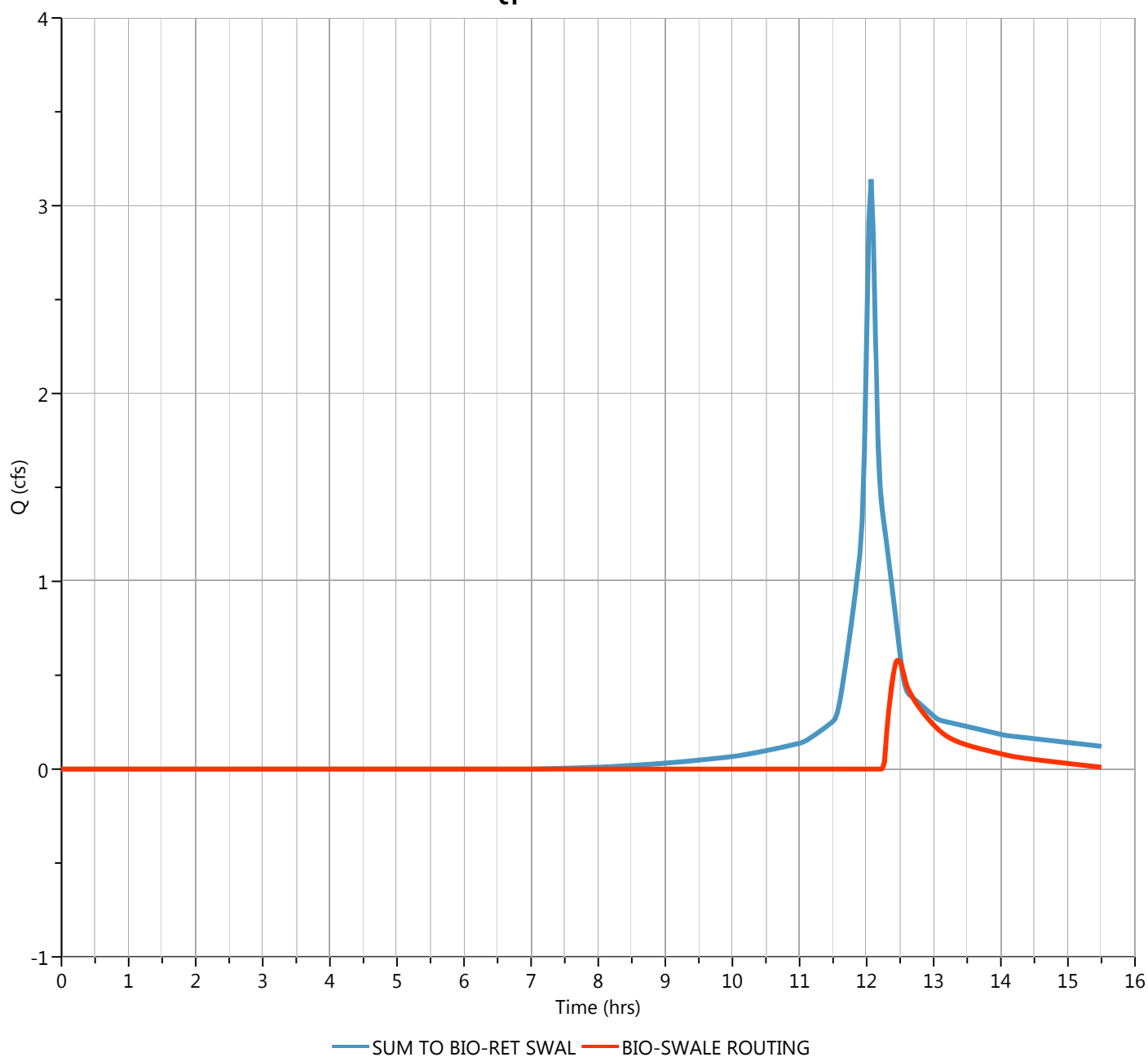
BIO-SWALE ROUTING

Hyd. No. 9

Hydrograph Type	= Pond Route	Peak Flow	= 0.584 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.47 hrs
Time Interval	= 2 min	Hydrograph Volume	= 1,724 cuft
Inflow Hydrograph	= 8 - SUM TO BIO-RET SWAL	Max. Elevation	= 49.06 ft
Pond Name	= PROP. BIO-RETENTION SWALE	Max. Storage	= 4,174 cuft

Pond Routing by Storage Indication Method

Qp = 0.58 cfs



Hydrograph Discharge Table

BIO-SWALE ROUTING

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
12.30	0.203	13.50	0.128						
12.33	0.328	13.53	0.124						
12.37	0.419	13.57	0.121						
12.40	0.509	13.60	0.117						
12.43	0.567	13.63	0.114						
12.47	0.584	13.67	0.111						
12.50	0.570	13.70	0.108						
12.53	0.534	13.73	0.105						
12.57	0.486	13.77	0.102						
12.60	0.442	13.80	0.099						
12.63	0.417	13.83	0.096						
12.67	0.394	13.87	0.093						
12.70	0.373	13.90	0.090						
12.73	0.354	13.93	0.087						
12.77	0.336	13.97	0.084						
12.80	0.320	14.00	0.081						
12.83	0.304	14.03	0.079						
12.87	0.289	14.07	0.076						
12.90	0.275	14.10	0.073						
12.93	0.261	14.13	0.071						
12.97	0.248	14.17	0.068						
13.00	0.235	14.20	0.066						
13.03	0.223	14.23	0.064						
13.07	0.211	14.27	0.062						
13.10	0.200	14.30	0.061						
13.13	0.190	14.33	0.059						
13.17	0.182	14.37	0.057						
13.20	0.174	...end	...end						
13.23	0.167								
13.27	0.161								
13.30	0.155								
13.33	0.149								
13.37	0.145								
13.40	0.140								
13.43	0.136								
13.47	0.132								

Pond Report

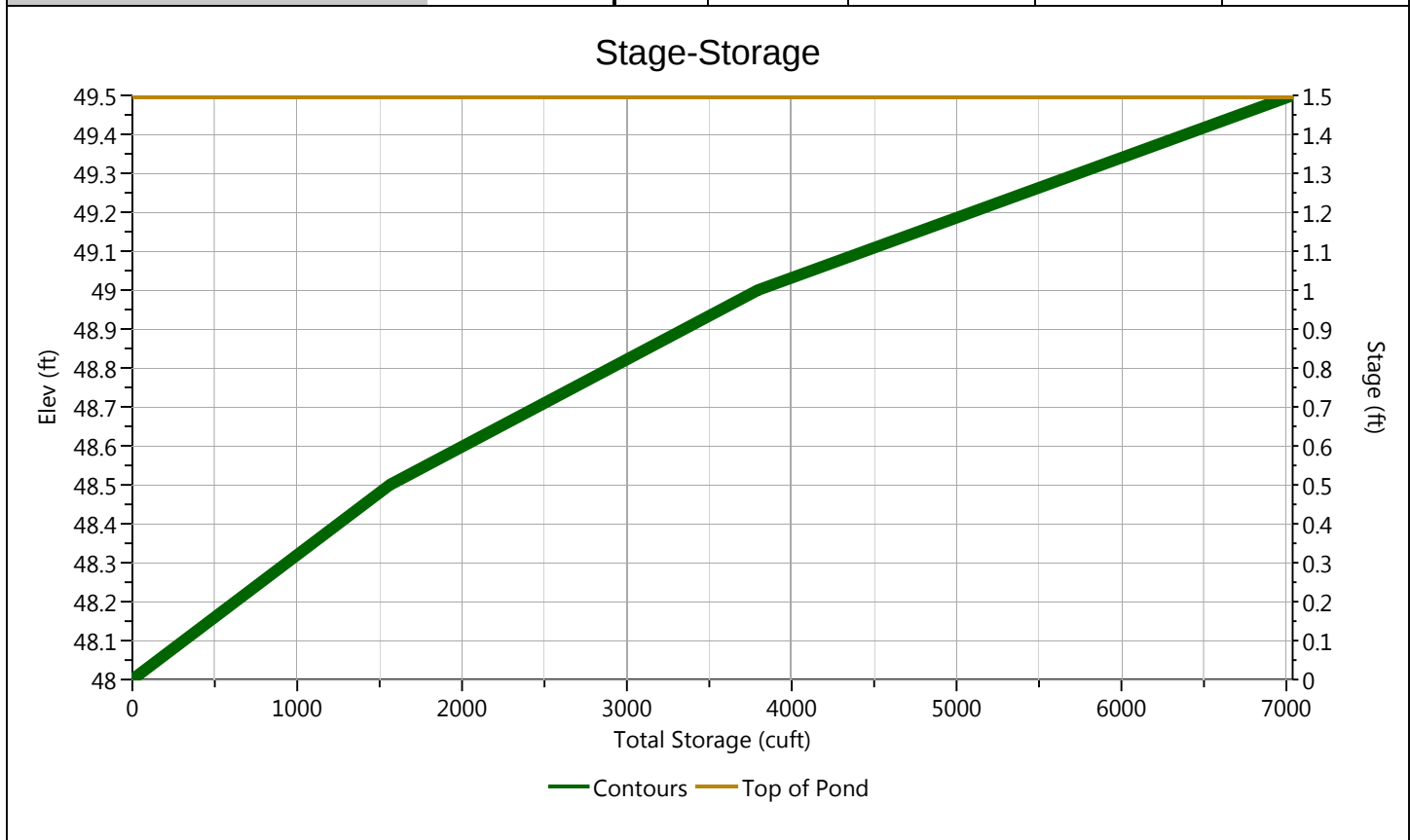
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

PROP. BIO-RETENTION SWALE

Stage-Storage

[illegible]

Pond Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

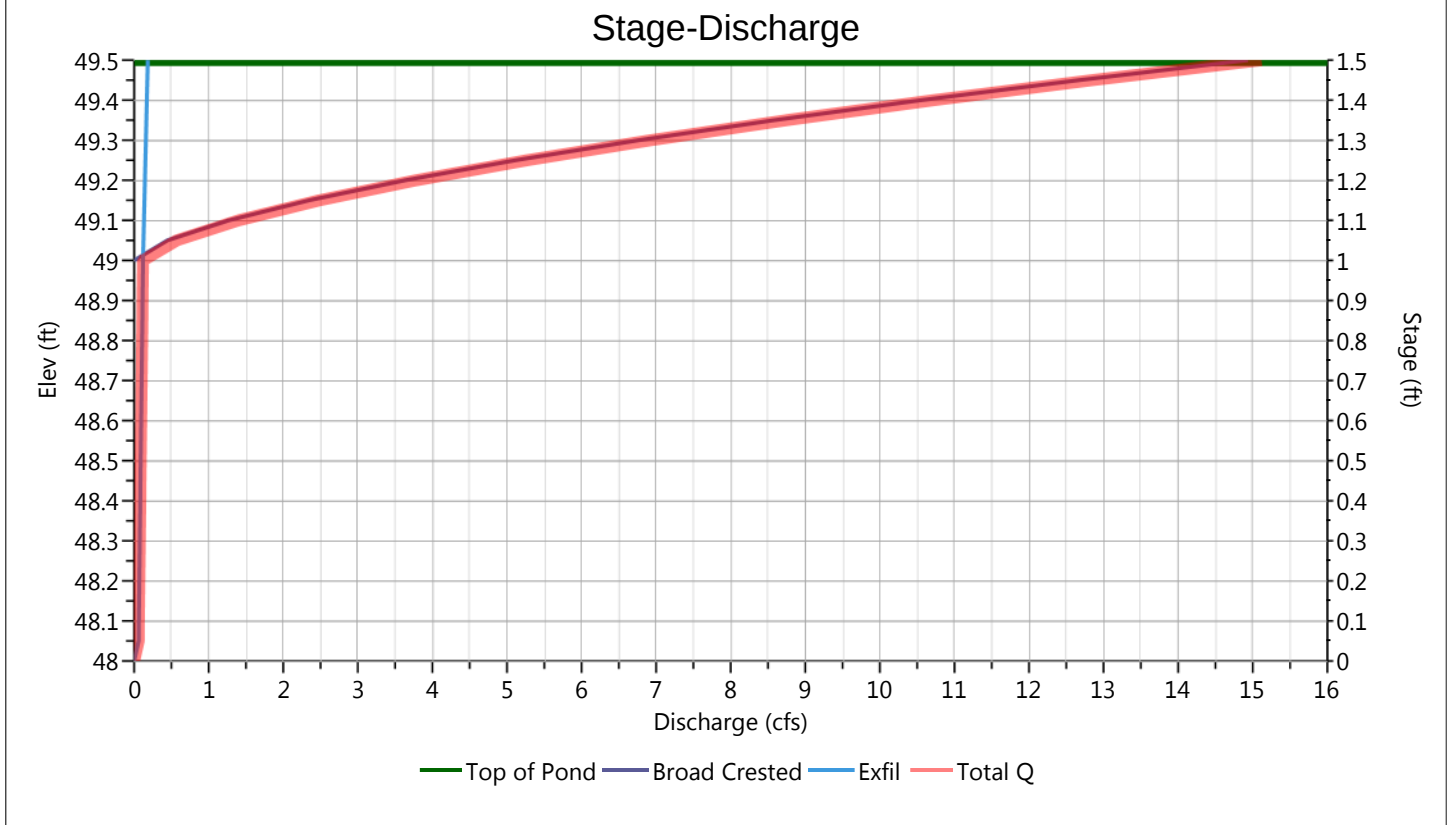
06-17-2018

PROP. BIO-RETENTION SWALE

Stage-Discharge

Culvert / Orifices	Culvert	Orifices			Perforated Riser	
		1	2	3		
Rise, in					Perf. Rise, in	
Span, in					Perf. Span, in	
No. Barrels					No. Perforations	
Invert Elevation, ft					Invert Elevation, ft	
Orifice Coefficient, Co					Height, ft	
Length, ft					Orifice Coefficient, Co	
Barrel Slope, %						
N-Value, n	0.000					
Weirs	Riser*	Weirs			Ancillary	
		1	2	3		
Shape / Type	Circular	Broad Crested			Exfiltration, in/hr	1.00**
Crest Elevation, ft		49			Tailwater Elevation, ft	
Crest Length, ft		12				
Angle, deg		26.6 (2:1)				
Weir Coefficient, Cw		3.3				

*Routes through Culvert. **Exfiltration extracted from outflow hydrograph. Rate applied to contours.



Pond Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

PROP. BIO-RETENTION SWALE

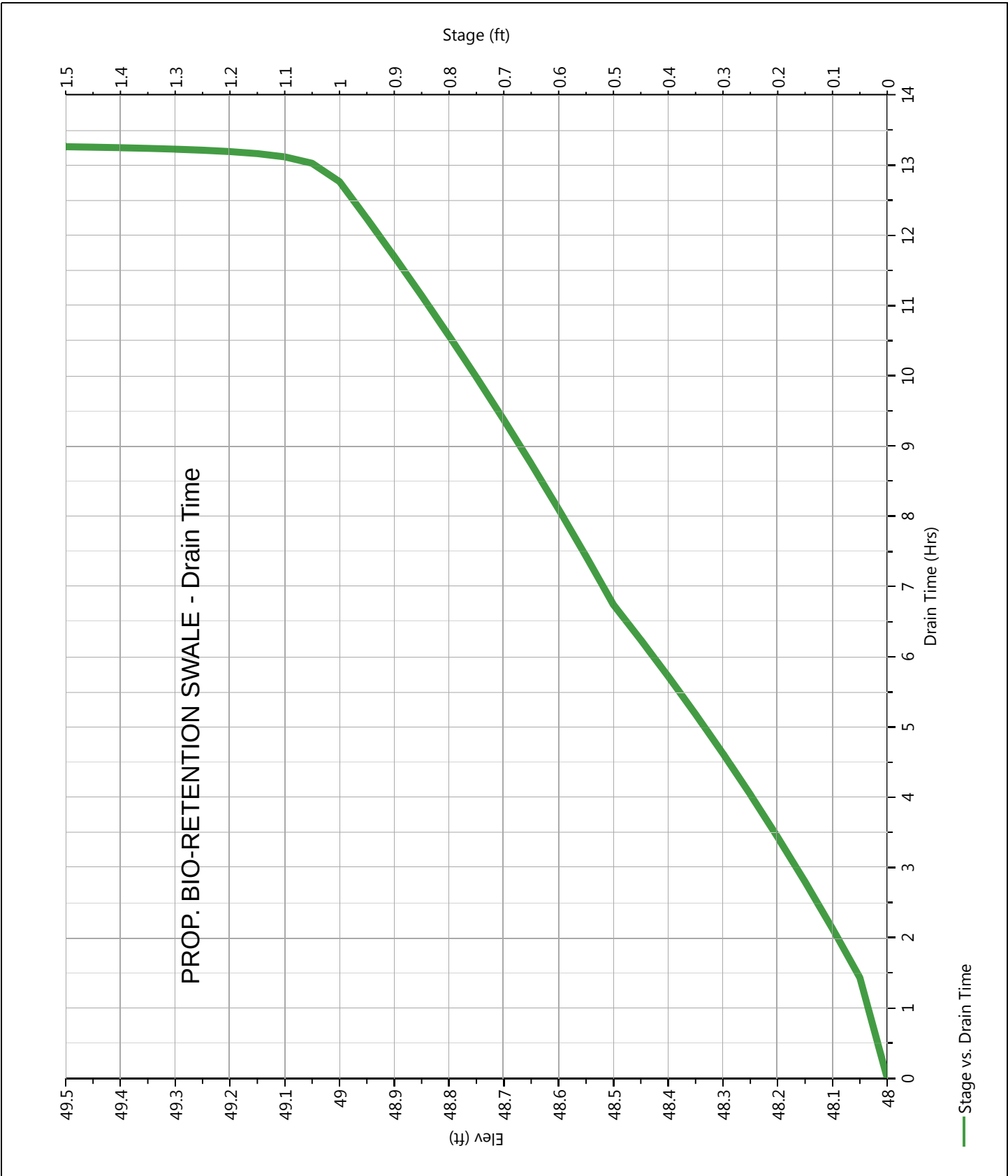
Stage-Storage-Discharge Summary

[illegible]

Suffix key: ic = inlet control, oc = outlet control, s = submerged weir

PROP. BIO-RETENTION SWALE

Pond Drawdown



Hydrograph Report

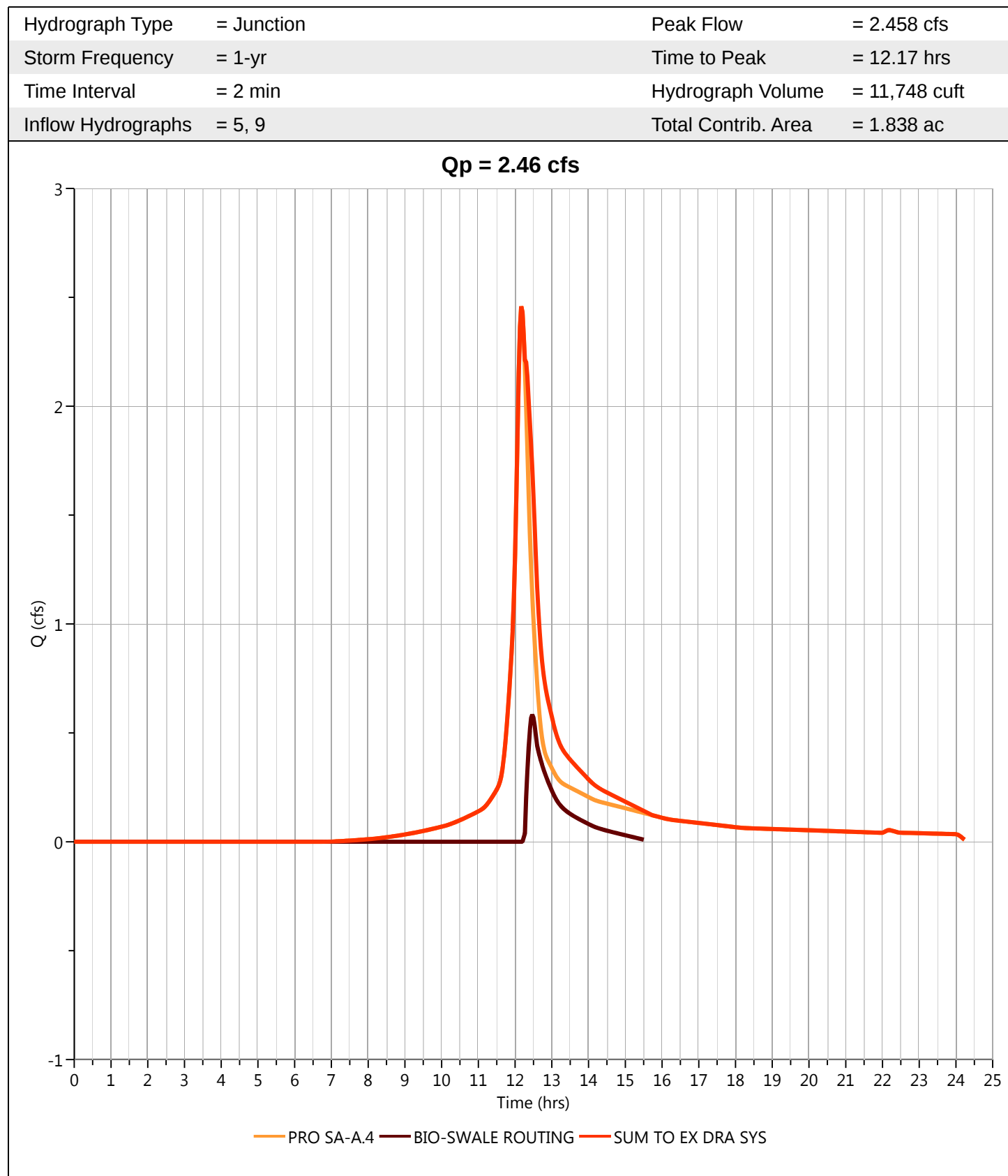
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX DRA SYS

Hyd. No. 10



Hydrograph Discharge Table

SUM TO EX DRA SYS

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	0.251	12.73	0.831	13.93	0.298				
11.57	0.265	12.77	0.779	13.97	0.292				
11.60	0.284	12.80	0.737	14.00	0.287				
11.63	0.311	12.83	0.702	14.03	0.281				
11.67	0.348	12.87	0.672	14.07	0.275				
11.70	0.395	12.90	0.646	14.10	0.270				
11.73	0.453	12.93	0.621	14.13	0.265				
11.77	0.520	12.97	0.597	14.17	0.260				
11.80	0.595	13.00	0.573	14.20	0.256				
11.83	0.678	13.03	0.550	14.23	0.252				
11.87	0.766	13.07	0.527	14.27	0.248				
11.90	0.861	13.10	0.506	14.30	0.245				
11.93	0.970	13.13	0.487	...end	...end				
11.97	1.114	13.17	0.471						
12.00	1.318	13.20	0.456						
12.03	1.581	13.23	0.443						
12.07	1.875	13.27	0.432						
12.10	2.153	13.30	0.422						
12.13	2.363	13.33	0.413						
12.17	2.458	13.37	0.405						
12.20	2.434	13.40	0.398						
12.23	2.325	13.43	0.391						
12.27	2.211	13.47	0.384						
12.30	2.203	13.50	0.377						
12.33	2.136	13.53	0.370						
12.37	2.028	13.57	0.364						
12.40	1.928	13.60	0.358						
12.43	1.826	13.63	0.352						
12.47	1.714	13.67	0.346						
12.50	1.591	13.70	0.339						
12.53	1.453	13.73	0.333						
12.57	1.308	13.77	0.328						
12.60	1.171	13.80	0.322						
12.63	1.064	13.83	0.316						
12.67	0.971	13.87	0.310						
12.70	0.894	13.90	0.304						

Design Storm Report

Custom Storm filename:

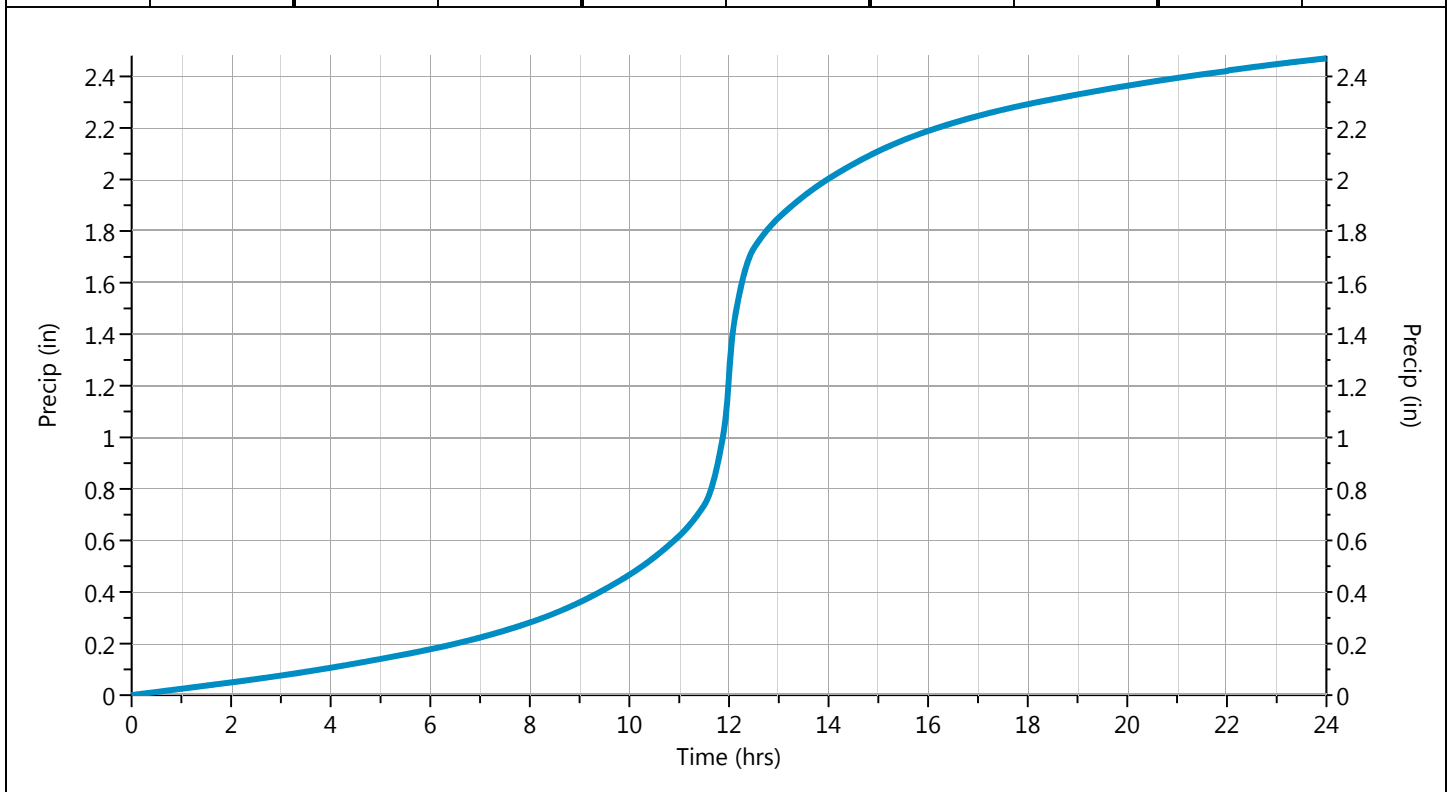
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)								
	✓ 1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72	

Incremental Rainfall Distribution, 1-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0060	11.37	0.0087	11.73	0.0255	12.10	0.0489	12.47	0.0134
11.03	0.0061	11.40	0.0089	11.77	0.0279	12.13	0.0376	12.50	0.0110
11.07	0.0064	11.43	0.0092	11.80	0.0303	12.17	0.0352	12.53	0.0097
11.10	0.0066	11.47	0.0094	11.83	0.0327	12.20	0.0327	12.57	0.0094
11.13	0.0069	11.50	0.0097	11.87	0.0352	12.23	0.0303	12.60	0.0092
11.17	0.0071	11.53	0.0110	11.90	0.0376	12.27	0.0279	12.63	0.0089
11.20	0.0074	11.57	0.0134	11.93	0.0490	12.30	0.0255	12.67	0.0087
11.23	0.0077	11.60	0.0158	11.97	0.0692	12.33	0.0231	12.70	0.0084
11.27	0.0079	11.63	0.0183	12.00	0.0894	12.37	0.0207	12.73	0.0082
11.30	0.0082	11.67	0.0207	12.03	0.0893	12.40	0.0183	12.77	0.0079
11.33	0.0084	11.70	0.0231	12.07	0.0692	12.43	0.0158	12.80	0.0077



Hydrograph 2-yr Summary

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

[illegible]

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

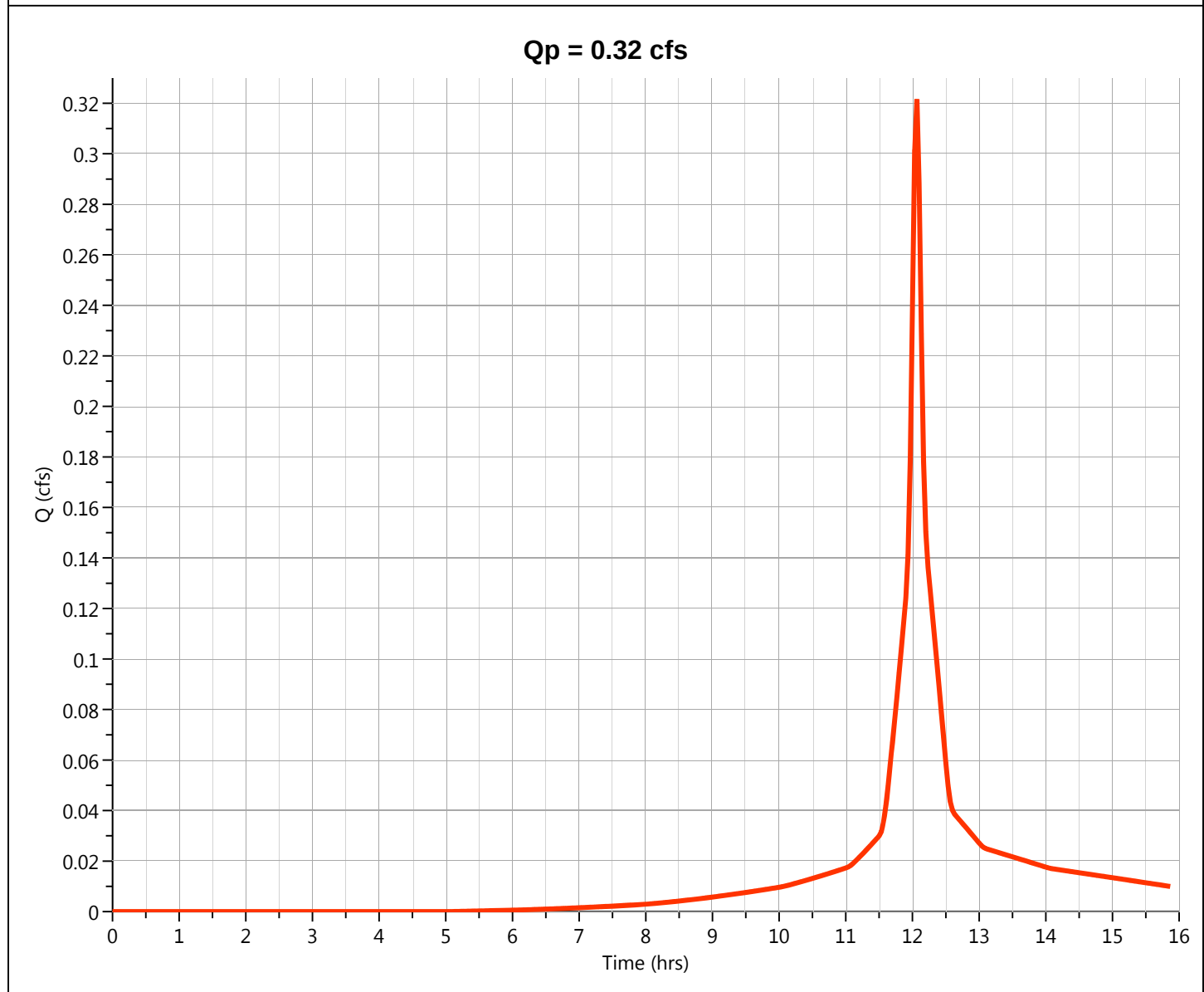
PRO SA-A.1

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.322 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 985 cuft
Drainage Area	= 0.13 ac	Curve Number	= 92*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 3.0700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.11	98	B - PAVED
0.02	61	B - LAWN
0.13	92	Weighted Average



Hydrograph Discharge Table

PRO SA-A.1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.036	12.77	0.034						
11.60	0.042	12.80	0.033						
11.63	0.050	12.83	0.032						
11.67	0.058	12.87	0.031						
11.70	0.067	...end	...end						
11.73	0.076								
11.77	0.085								
11.80	0.095								
11.83	0.104								
11.87	0.114								
11.90	0.124								
11.93	0.141								
11.97	0.179								
12.00	0.240								
12.03	0.302								
12.07	0.322								
12.10	0.288								
12.13	0.229								
12.17	0.178								
12.20	0.150								
12.23	0.136								
12.27	0.127								
12.30	0.118								
12.33	0.108								
12.37	0.098								
12.40	0.089								
12.43	0.079								
12.47	0.069								
12.50	0.059								
12.53	0.050								
12.57	0.044								
12.60	0.040								
12.63	0.039								
12.67	0.037								
12.70	0.036								
12.73	0.035								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

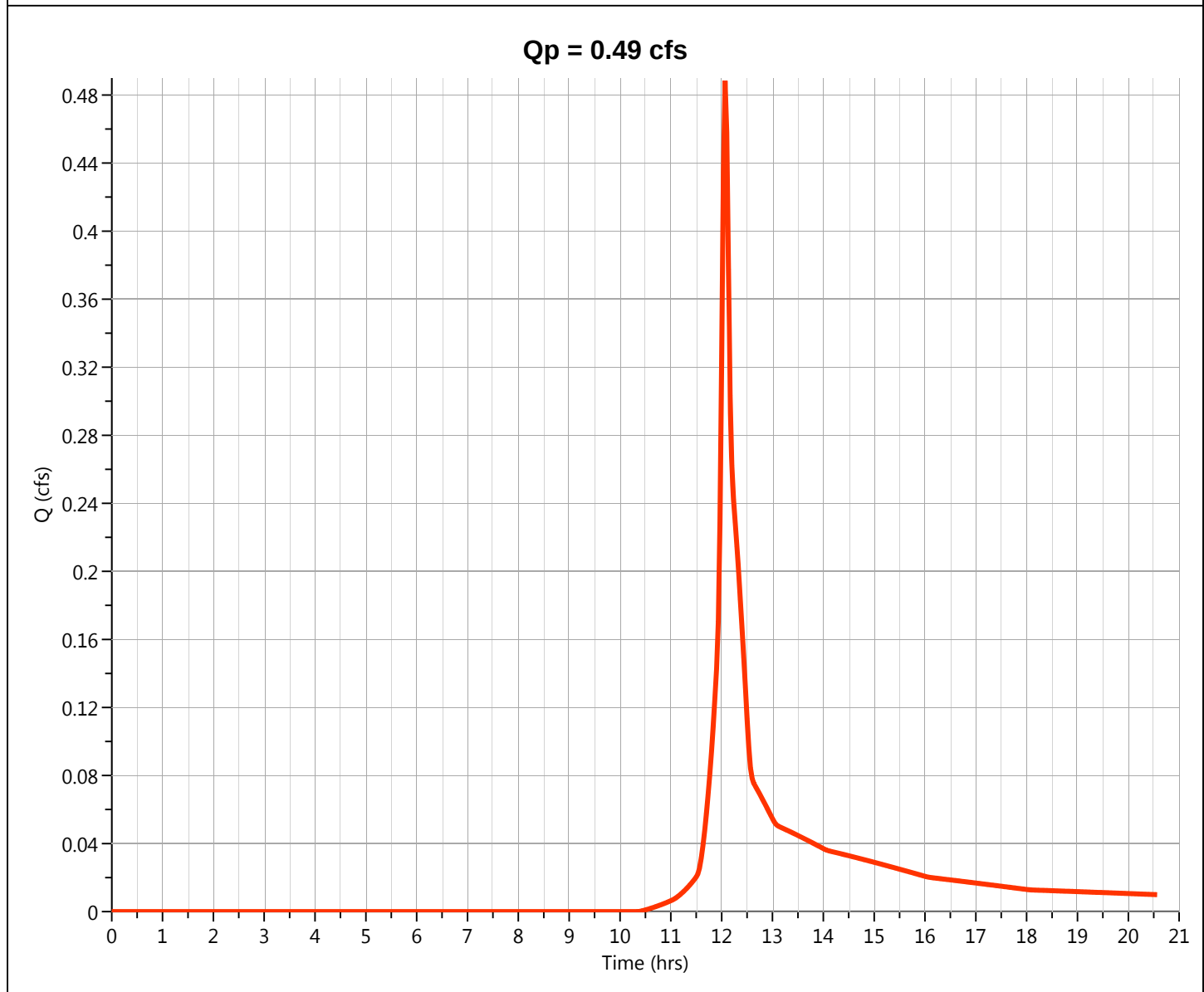
PRO SA-A.2

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.488 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 1,519 cuft
Drainage Area	= 0.42 ac	Curve Number	= 76*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.31 min
Total Rainfall	= 3.0700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.168	98	B - PAVED
0.252	61	B - LAWN
0.42	76	Weighted Average



Hydrograph Discharge Table

PRO SA-A.2

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.70	0.058	12.90	0.060						
11.73	0.069	12.93	0.059						
11.77	0.081	12.97	0.057						
11.80	0.094	13.00	0.055						
11.83	0.109	13.03	0.053						
11.87	0.125	13.07	0.051						
11.90	0.143	13.10	0.051						
11.93	0.171	13.13	0.050						
11.97	0.229	13.17	0.050						
12.00	0.327	13.20	0.049						
12.03	0.435	13.23	0.049						
12.07	0.488	...end	...end						
12.10	0.458								
12.13	0.377								
12.17	0.303								
12.20	0.262								
12.23	0.242								
12.27	0.229								
12.30	0.215								
12.33	0.200								
12.37	0.184								
12.40	0.167								
12.43	0.150								
12.47	0.132								
12.50	0.113								
12.53	0.096								
12.57	0.084								
12.60	0.078								
12.63	0.075								
12.67	0.074								
12.70	0.072								
12.73	0.070								
12.77	0.068								
12.80	0.066								
12.83	0.064								
12.87	0.062								

Hydrograph Report

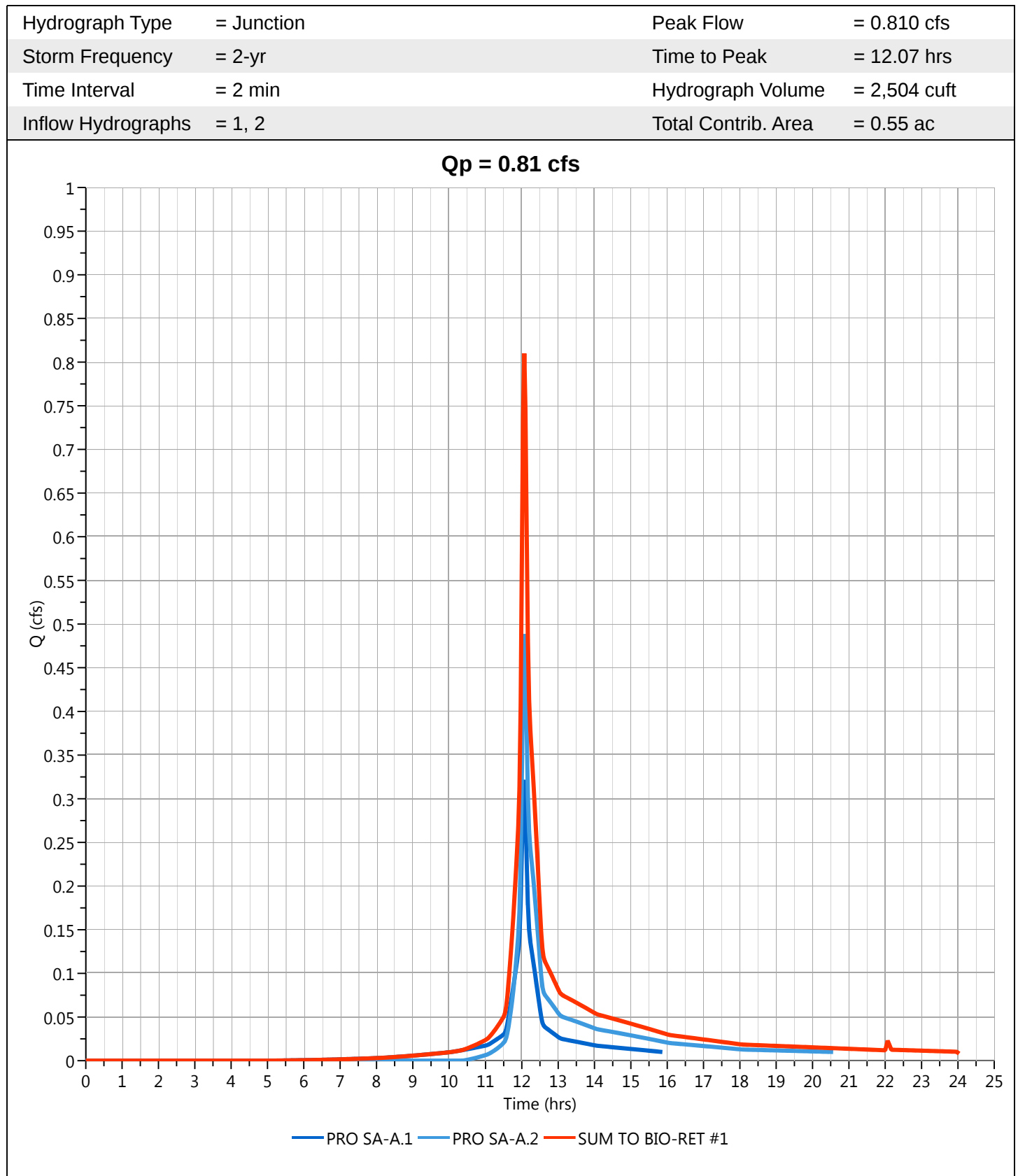
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET #1

Hyd. No. 3



Hydrograph Discharge Table

SUM TO BIO-RET #1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.63	0.089	12.83	0.097						
11.67	0.106	12.87	0.094						
11.70	0.125	12.90	0.091						
11.73	0.144	12.93	0.088						
11.77	0.166	12.97	0.085						
11.80	0.189	13.00	0.082						
11.83	0.213	13.03	0.079						
11.87	0.239	...end	...end						
11.90	0.267								
11.93	0.312								
11.97	0.408								
12.00	0.567								
12.03	0.737								
12.07	0.810								
12.10	0.746								
12.13	0.606								
12.17	0.482								
12.20	0.412								
12.23	0.379								
12.27	0.356								
12.30	0.332								
12.33	0.308								
12.37	0.282								
12.40	0.256								
12.43	0.228								
12.47	0.201								
12.50	0.172								
12.53	0.146								
12.57	0.128								
12.60	0.118								
12.63	0.114								
12.67	0.111								
12.70	0.108								
12.73	0.105								
12.77	0.102								
12.80	0.100								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

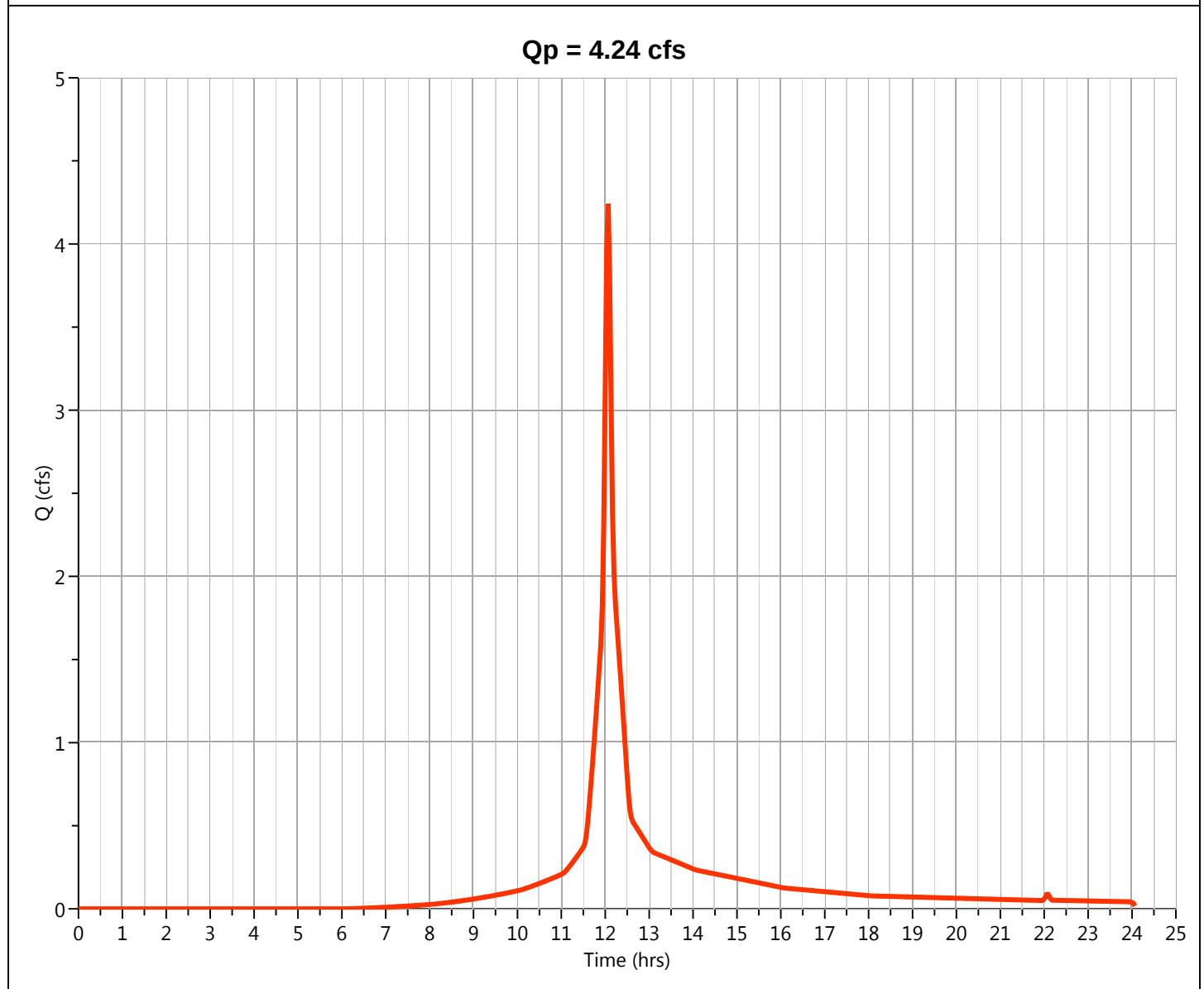
PRO SA-A.3

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 4.242 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 12,827 cuft
Drainage Area	= 1.84 ac	Curve Number	= 90*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.95 min
Total Rainfall	= 3.0700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LAWN
1.84	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.3

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.441	12.77	0.466						
11.60	0.520	12.80	0.452						
11.63	0.620	12.83	0.439						
11.67	0.728	12.87	0.425						
11.70	0.840	12.90	0.411						
11.73	0.956	...end	...end						
11.77	1.076								
11.80	1.200								
11.83	1.328								
11.87	1.460								
11.90	1.596								
11.93	1.823								
11.97	2.321								
12.00	3.136								
12.03	3.959								
12.07	4.242								
12.10	3.821								
12.13	3.043								
12.17	2.378								
12.20	2.010								
12.23	1.827								
12.27	1.704								
12.30	1.580								
12.33	1.453								
12.37	1.324								
12.40	1.194								
12.43	1.063								
12.47	0.930								
12.50	0.797								
12.53	0.675								
12.57	0.589								
12.60	0.543								
12.63	0.521								
12.67	0.508								
12.70	0.494								
12.73	0.480								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

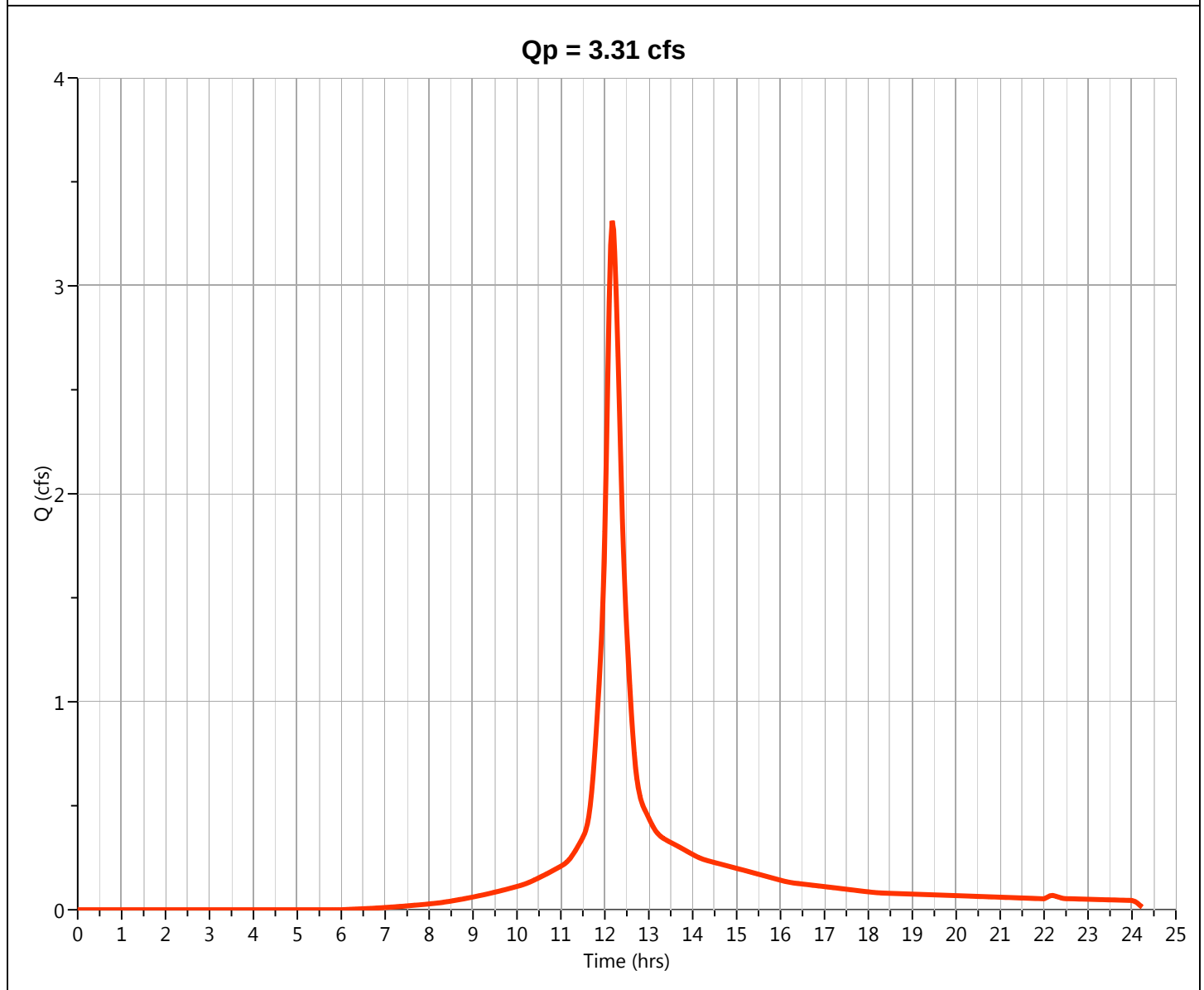
PRO SA-A.4

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 3.312 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 13,593 cuft
Drainage Area	= 1.838 ac	Curve Number	= 90.47*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.12 min
Total Rainfall	= 3.0700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LANDSCAPED
1.838	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.4

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.47	0.335	12.67	0.756						
11.50	0.349	12.70	0.682						
11.53	0.363	12.73	0.624						
11.57	0.382	12.77	0.579						
11.60	0.409	12.80	0.545						
11.63	0.447	12.83	0.520						
11.67	0.499	12.87	0.500						
11.70	0.565	12.90	0.485						
11.73	0.646	12.93	0.470						
11.77	0.738	12.97	0.455						
11.80	0.842	13.00	0.441						
11.83	0.955	13.03	0.426						
11.87	1.076	13.07	0.412						
11.90	1.204	13.10	0.399						
11.93	1.351	13.13	0.387						
11.97	1.545	13.17	0.376						
12.00	1.818	13.20	0.367						
12.03	2.167	13.23	0.360						
12.07	2.556	13.27	0.353						
12.10	2.923	13.30	0.348						
12.13	3.195	13.33	0.343						
12.17	3.312	13.37	0.339						
12.20	3.268	13.40	0.335						
12.23	3.114	13.43	0.331						
12.27	2.903	13.47	0.328						
12.30	2.663	...end	...end						
12.33	2.401								
12.37	2.131								
12.40	1.875								
12.43	1.659								
12.47	1.488								
12.50	1.343								
12.53	1.208								
12.57	1.077								
12.60	0.956								
12.63	0.847								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

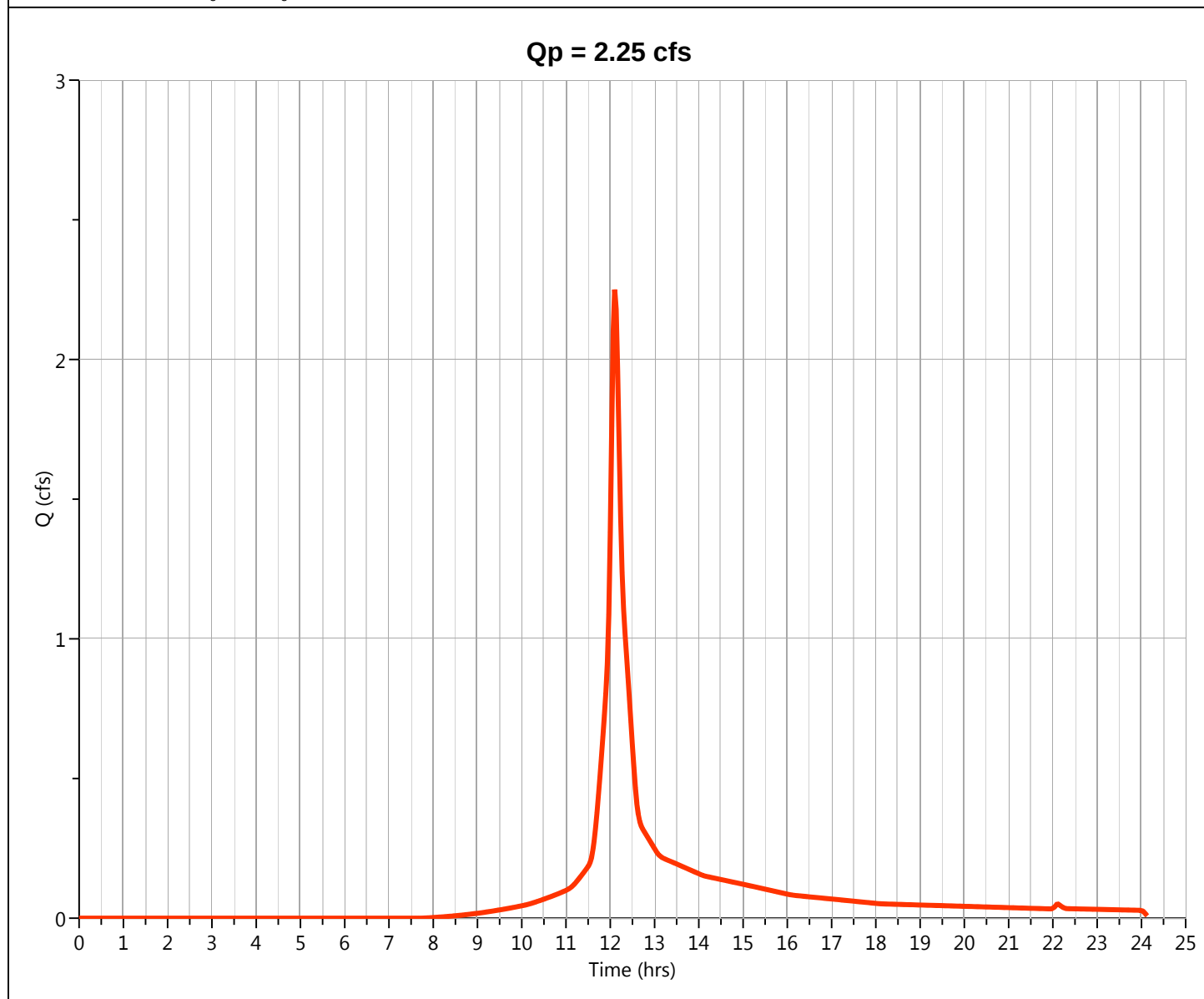
PRO SA-C

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 2.250 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 7,683 cuft
Drainage Area	= 1.22 ac	Curve Number	= 86.16*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.4 min
Total Rainfall	= 3.0700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.38	61	B - GRASS
1.22	86	Weighted Average



Hydrograph Discharge Table

PRO SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.237	12.80	0.302						
11.63	0.274	12.83	0.293						
11.67	0.322	12.87	0.284						
11.70	0.378	12.90	0.275						
11.73	0.440	12.93	0.267						
11.77	0.506	12.97	0.258						
11.80	0.576	13.00	0.249						
11.83	0.649	13.03	0.240						
11.87	0.726	13.07	0.232						
11.90	0.806	13.10	0.226						
11.93	0.911	13.13	0.221						
11.97	1.087	...end	...end						
12.00	1.382								
12.03	1.762								
12.07	2.098								
12.10	2.250								
12.13	2.179								
12.17	1.960								
12.20	1.687								
12.23	1.433								
12.27	1.238								
12.30	1.108								
12.33	1.019								
12.37	0.942								
12.40	0.863								
12.43	0.783								
12.47	0.702								
12.50	0.619								
12.53	0.538								
12.57	0.466								
12.60	0.410								
12.63	0.371								
12.67	0.346								
12.70	0.329								
12.73	0.319								
12.77	0.310								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

BIO-RET BASIN ROUTIN

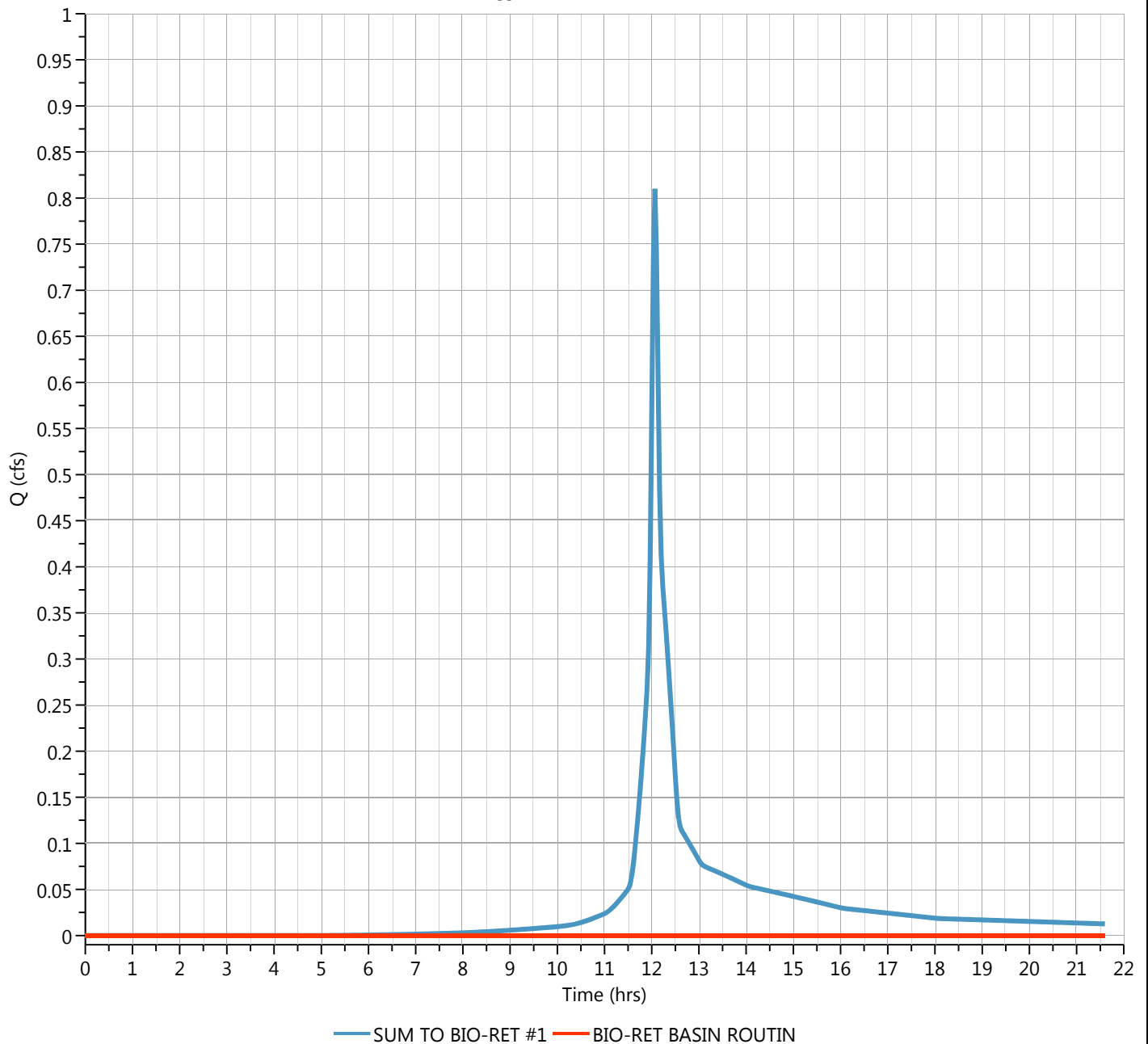
Hyd. No. 7

Hydrograph Type	= Pond Route	Peak Flow	= 0.000 cfs
Storm Frequency	= 2-yr	Time to Peak	= 21.57 hrs
Time Interval	= 2 min	Hydrograph Volume	= 0.000 cuft
Inflow Hydrograph	= 3 - SUM TO BIO-RET #1	Max. Elevation	= 50.09 ft
Pond Name	= PROP. BIO-RETENTION BASIN #1	Max. Storage	= 1,351 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 74.96 hrs

Qp = 0.00 cfs



Hydrograph Discharge Table

BIO-RET BASIN ROUTIN

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.87	0.000	13.07	0.00	14.27	0.00	15.47	0.00	16.67	0.000
11.90	0.000	13.10	0.00	14.30	0.00	15.50	0.00	16.70	0.000
11.93	0.000	13.13	0.000	14.33	0.00	15.53	0.00	16.73	0.000
11.97	0.000	13.17	0.000	14.37	0.00	15.57	0.00	16.77	0.000
12.00	0.00	13.20	0.000	14.40	0.00	15.60	0.00	16.80	0.000
12.03	0.00	13.23	0.000	14.43	0.00	15.63	0.00	16.83	0.000
12.07	0.000	13.27	0.000	14.47	0.00	15.67	0.00	16.87	0.000
12.10	0.00	13.30	0.000	14.50	0.00	15.70	0.00	16.90	0.000
12.13	0.00	13.33	0.000	14.53	0.00	15.73	0.00	16.93	0.000
12.17	0.000	13.37	0.000	14.57	0.00	15.77	0.00	16.97	0.000
12.20	0.000	13.40	0.000	14.60	0.00	15.80	0.00	17.00	0.000
12.23	0.000	13.43	0.000	14.63	0.00	15.83	0.00	17.03	0.000
12.27	0.000	13.47	0.000	14.67	0.00	15.87	0.00	17.07	0.000
12.30	0.000	13.50	0.000	14.70	0.00	15.90	0.00	17.10	0.000
12.33	0.000	13.53	0.000	14.73	0.00	15.93	0.00	17.13	0.000
12.37	0.000	13.57	0.000	14.77	0.00	15.97	0.00	17.17	0.000
12.40	0.00	13.60	0.000	14.80	0.00	16.00	0.00	17.20	0.000
12.43	0.00	13.63	0.000	14.83	0.00	16.03	0.00	17.23	0.000
12.47	0.00	13.67	0.000	14.87	0.00	16.07	0.00	17.27	0.000
12.50	0.00	13.70	0.000	14.90	0.00	16.10	0.00	17.30	0.000
12.53	0.00	13.73	0.000	14.93	0.00	16.13	0.00	17.33	0.000
12.57	0.00	13.77	0.000	14.97	0.00	16.17	0.00	17.37	0.000
12.60	0.00	13.80	0.000	15.00	0.00	16.20	0.00	17.40	0.000
12.63	0.00	13.83	0.000	15.03	0.00	16.23	0.00	17.43	0.000
12.67	0.00	13.87	0.000	15.07	0.00	16.27	0.00	17.47	0.000
12.70	0.00	13.90	0.000	15.10	0.00	16.30	0.00	17.50	0.000
12.73	0.00	13.93	0.000	15.13	0.00	16.33	0.00	17.53	0.000
12.77	0.00	13.97	0.000	15.17	0.00	16.37	0.00	17.57	0.000
12.80	0.00	14.00	0.000	15.20	0.00	16.40	0.00	17.60	0.000
12.83	0.00	14.03	0.000	15.23	0.00	16.43	0.00	17.63	0.000
12.87	0.00	14.07	0.000	15.27	0.00	16.47	0.00	17.67	0.000
12.90	0.00	14.10	0.00	15.30	0.00	16.50	0.00	17.70	0.000
12.93	0.00	14.13	0.00	15.33	0.00	16.53	0.00	17.73	0.000
12.97	0.00	14.17	0.00	15.37	0.00	16.57	0.00	17.77	0.000
13.00	0.00	14.20	0.00	15.40	0.00	16.60	0.00	17.80	0.000
13.03	0.00	14.23	0.00	15.43	0.00	16.63	0.000	17.83	0.000

Hydrograph Discharge Table, cont'd

BIO-RET BASIN ROUTIN

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
17.87	0.000	19.07	0.00						
17.90	0.000	19.10	0.00						
17.93	0.000	19.13	0.00						
17.97	0.000	19.17	0.00						
18.00	0.000	19.20	0.00						
18.03	0.000	19.23	0.00						
18.07	0.000	19.27	0.00						
18.10	0.000	19.30	0.00						
18.13	0.000	19.33	0.00						
18.17	0.000	19.37	0.00						
18.20	0.00	19.40	0.00						
18.23	0.00	19.43	0.00						
18.27	0.00	19.47	0.00						
18.30	0.00	19.50	0.00						
18.33	0.00	...end	...end						
18.37	0.00								
18.40	0.00								
18.43	0.00								
18.47	0.00								
18.50	0.00								
18.53	0.00								
18.57	0.00								
18.60	0.00								
18.63	0.00								
18.67	0.00								
18.70	0.00								
18.73	0.00								
18.77	0.00								
18.80	0.00								
18.83	0.00								
18.87	0.00								
18.90	0.00								
18.93	0.00								
18.97	0.00								
19.00	0.00								
19.03	0.00								

Hydrograph Report

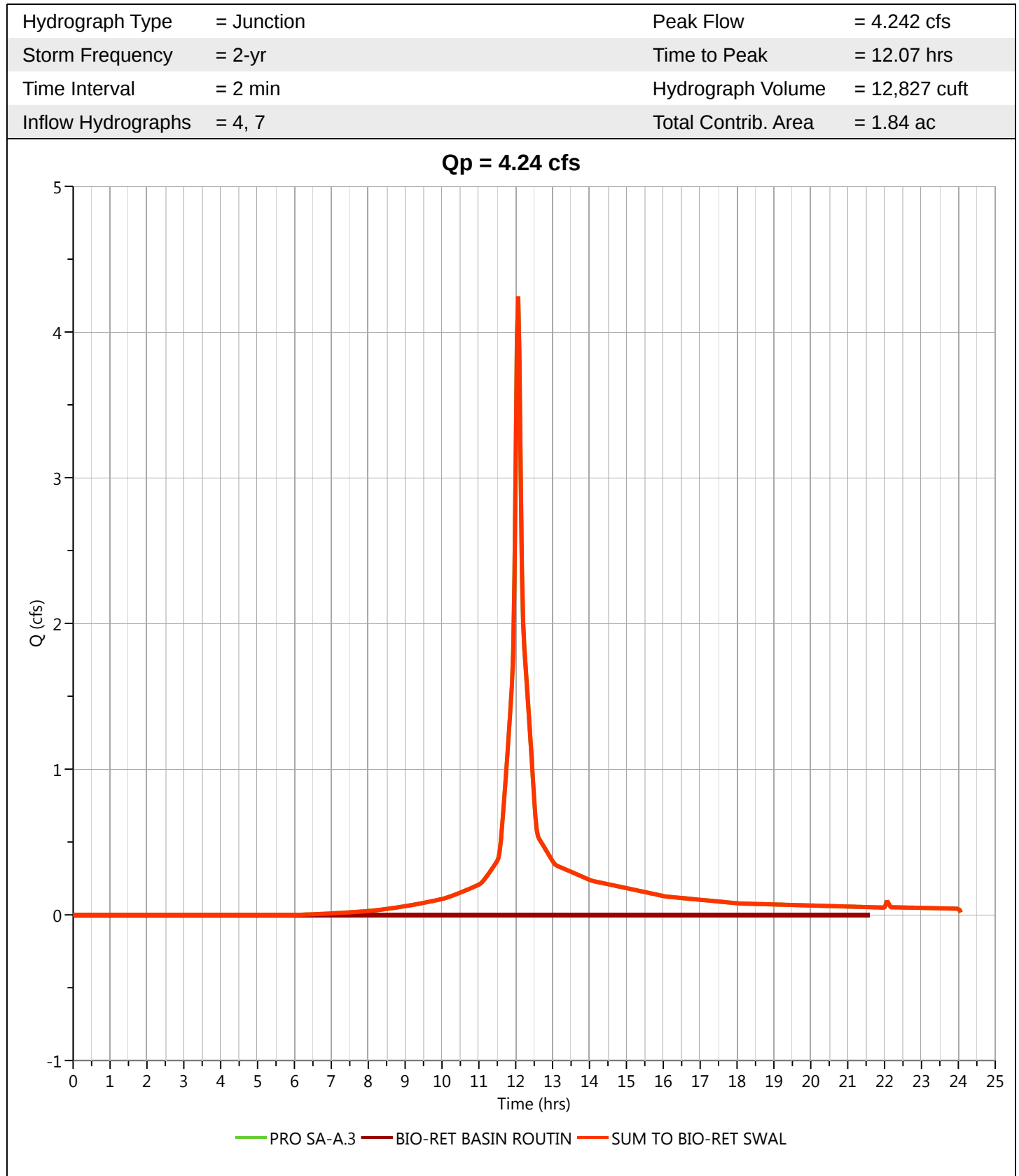
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET SWAL

Hyd. No. 8



Hydrograph Discharge Table

SUM TO BIO-RET SWAL

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.441	12.77	0.466						
11.60	0.520	12.80	0.452						
11.63	0.620	12.83	0.439						
11.67	0.728	12.87	0.425						
11.70	0.840	12.90	0.411						
11.73	0.956	...end	...end						
11.77	1.076								
11.80	1.200								
11.83	1.328								
11.87	1.460								
11.90	1.596								
11.93	1.823								
11.97	2.321								
12.00	3.136								
12.03	3.959								
12.07	4.242								
12.10	3.821								
12.13	3.043								
12.17	2.378								
12.20	2.010								
12.23	1.827								
12.27	1.704								
12.30	1.580								
12.33	1.453								
12.37	1.324								
12.40	1.194								
12.43	1.063								
12.47	0.930								
12.50	0.797								
12.53	0.675								
12.57	0.589								
12.60	0.543								
12.63	0.521								
12.67	0.508								
12.70	0.494								
12.73	0.480								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

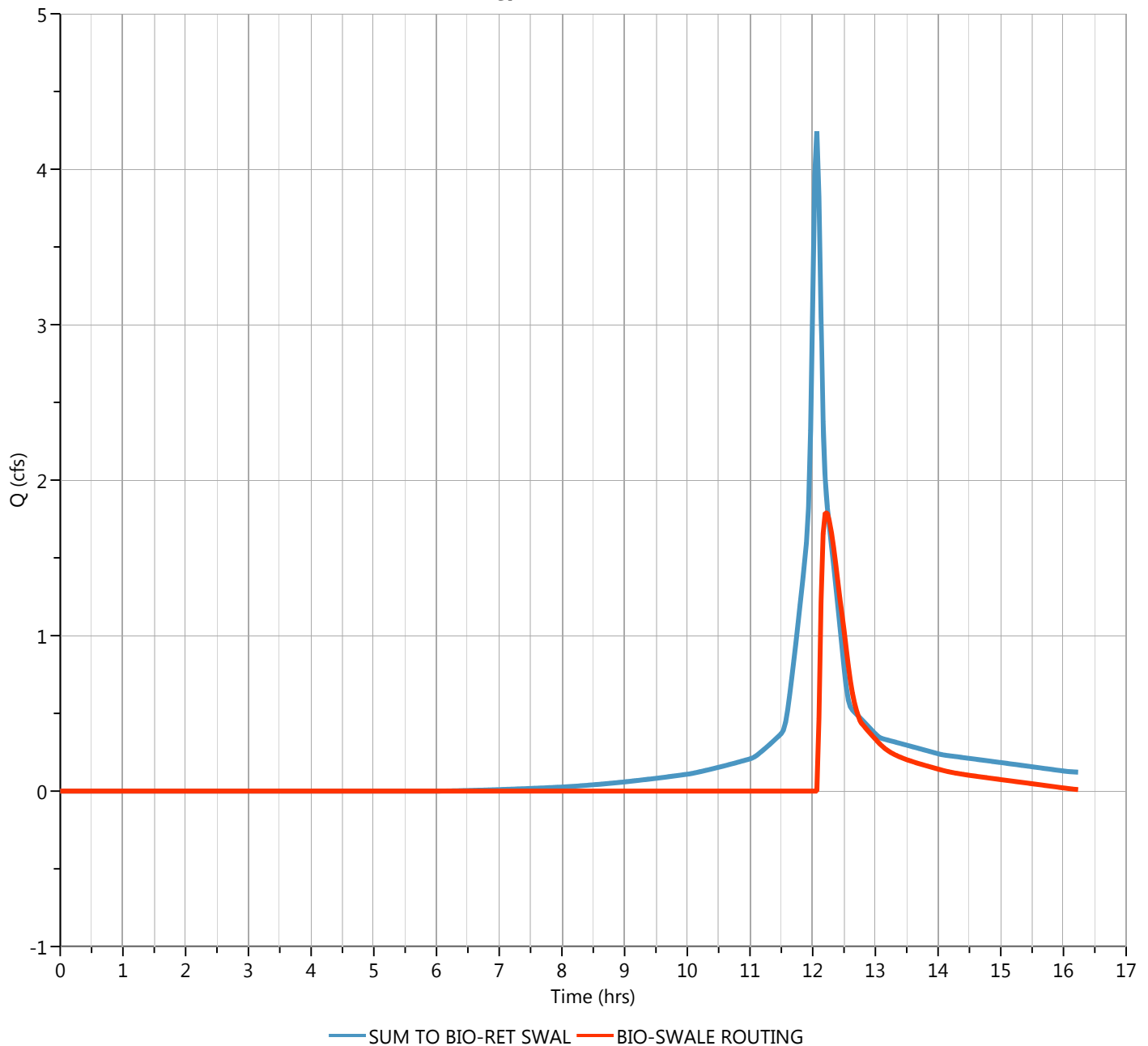
BIO-SWALE ROUTING

Hyd. No. 9

Hydrograph Type	= Pond Route	Peak Flow	= 1.790 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.20 hrs
Time Interval	= 2 min	Hydrograph Volume	= 4,404 cuft
Inflow Hydrograph	= 8 - SUM TO BIO-RET SWAL	Max. Elevation	= 49.12 ft
Pond Name	= PROP. BIO-RETENTION SWALE	Max. Storage	= 4,600 cuft

Pond Routing by Storage Indication Method

Qp = 1.79 cfs



Hydrograph Discharge Table

BIO-SWALE ROUTING

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
12.10	0.467	13.30	0.236						
12.13	1.217	13.33	0.229						
12.17	1.655	13.37	0.223						
12.20	1.790	13.40	0.218						
12.23	1.788	13.43	0.212						
12.27	1.735	13.47	0.207						
12.30	1.660	13.50	0.202						
12.33	1.567	13.53	0.197						
12.37	1.464	13.57	0.193						
12.40	1.351	13.60	0.189						
12.43	1.241	13.63	0.184						
12.47	1.141	13.67	0.180						
12.50	1.033	13.70	0.176						
12.53	0.921	...end	...end						
12.57	0.810								
12.60	0.712								
12.63	0.630								
12.67	0.566								
12.70	0.515								
12.73	0.475								
12.77	0.443								
12.80	0.426								
12.83	0.410								
12.87	0.394								
12.90	0.379								
12.93	0.364								
12.97	0.349								
13.00	0.334								
13.03	0.319								
13.07	0.305								
13.10	0.292								
13.13	0.280								
13.17	0.269								
13.20	0.260								
13.23	0.251								
13.27	0.243								

Hydrograph Report

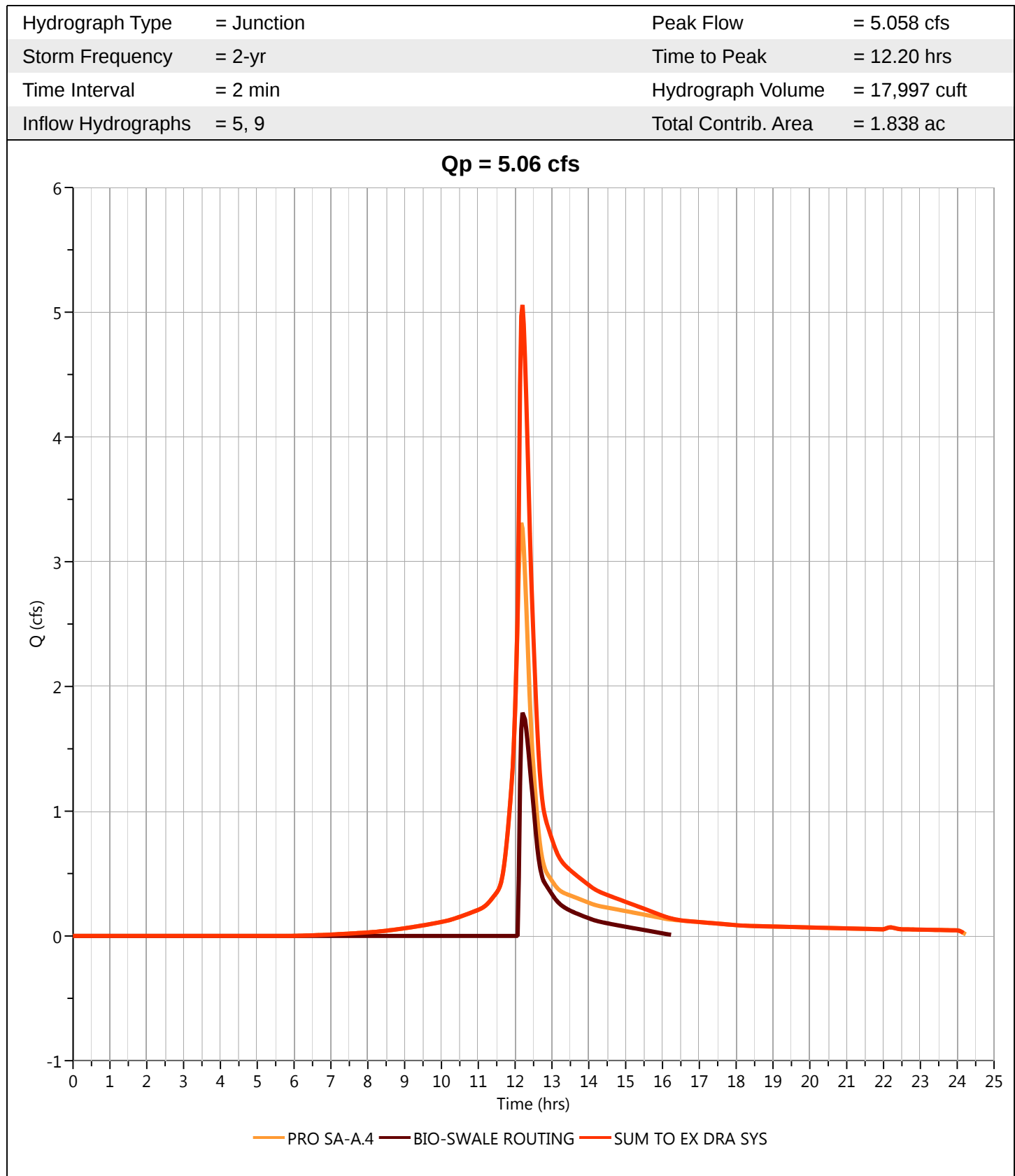
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX DRA SYS

Hyd. No. 10



Hydrograph Discharge Table

SUM TO EX DRA SYS

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.70	0.565	12.90	0.864						
11.73	0.646	12.93	0.834						
11.77	0.738	12.97	0.804						
11.80	0.842	13.00	0.775						
11.83	0.955	13.03	0.746						
11.87	1.076	13.07	0.717						
11.90	1.204	13.10	0.691						
11.93	1.351	13.13	0.667						
11.97	1.545	13.17	0.646						
12.00	1.818	13.20	0.627						
12.03	2.167	13.23	0.611						
12.07	2.556	13.27	0.597						
12.10	3.389	13.30	0.584						
12.13	4.411	13.33	0.573						
12.17	4.968	13.37	0.562						
12.20	5.058	13.40	0.553						
12.23	4.902	13.43	0.543						
12.27	4.638	13.47	0.535						
12.30	4.323	13.50	0.526						
12.33	3.969	13.53	0.517						
12.37	3.594	13.57	0.509						
12.40	3.227	13.60	0.501						
12.43	2.900	...end	...end						
12.47	2.629								
12.50	2.376								
12.53	2.128								
12.57	1.888								
12.60	1.668								
12.63	1.478								
12.67	1.322								
12.70	1.198								
12.73	1.099								
12.77	1.022								
12.80	0.972								
12.83	0.930								
12.87	0.895								

Design Storm Report

Custom Storm filename:

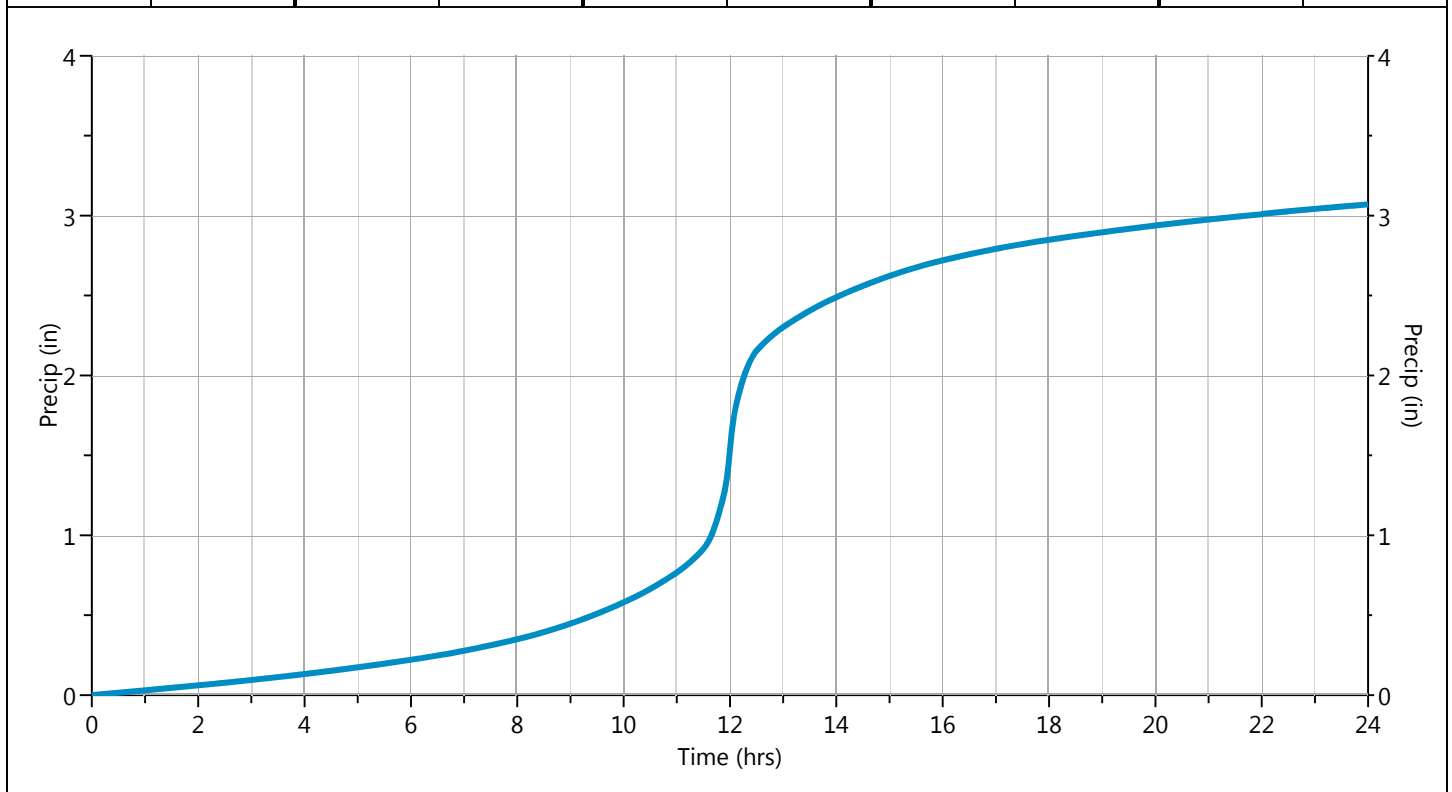
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)								
	1-yr	√ 2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72	

Incremental Rainfall Distribution, 2-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0074	11.37	0.0108	11.73	0.0317	12.10	0.0608	12.47	0.0167
11.03	0.0076	11.40	0.0111	11.77	0.0347	12.13	0.0468	12.50	0.0137
11.07	0.0079	11.43	0.0114	11.80	0.0377	12.17	0.0437	12.53	0.0120
11.10	0.0083	11.47	0.0117	11.83	0.0407	12.20	0.0407	12.57	0.0117
11.13	0.0086	11.50	0.0120	11.87	0.0437	12.23	0.0377	12.60	0.0114
11.17	0.0089	11.53	0.0137	11.90	0.0467	12.27	0.0347	12.63	0.0111
11.20	0.0092	11.57	0.0167	11.93	0.0609	12.30	0.0317	12.67	0.0108
11.23	0.0095	11.60	0.0197	11.97	0.0860	12.33	0.0287	12.70	0.0105
11.27	0.0098	11.63	0.0227	12.00	0.1111	12.37	0.0257	12.73	0.0101
11.30	0.0101	11.67	0.0257	12.03	0.1110	12.40	0.0227	12.77	0.0098
11.33	0.0105	11.70	0.0287	12.07	0.0860	12.43	0.0197	12.80	0.0095



Hydrograph 5-yr Summary

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

[illegible]

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

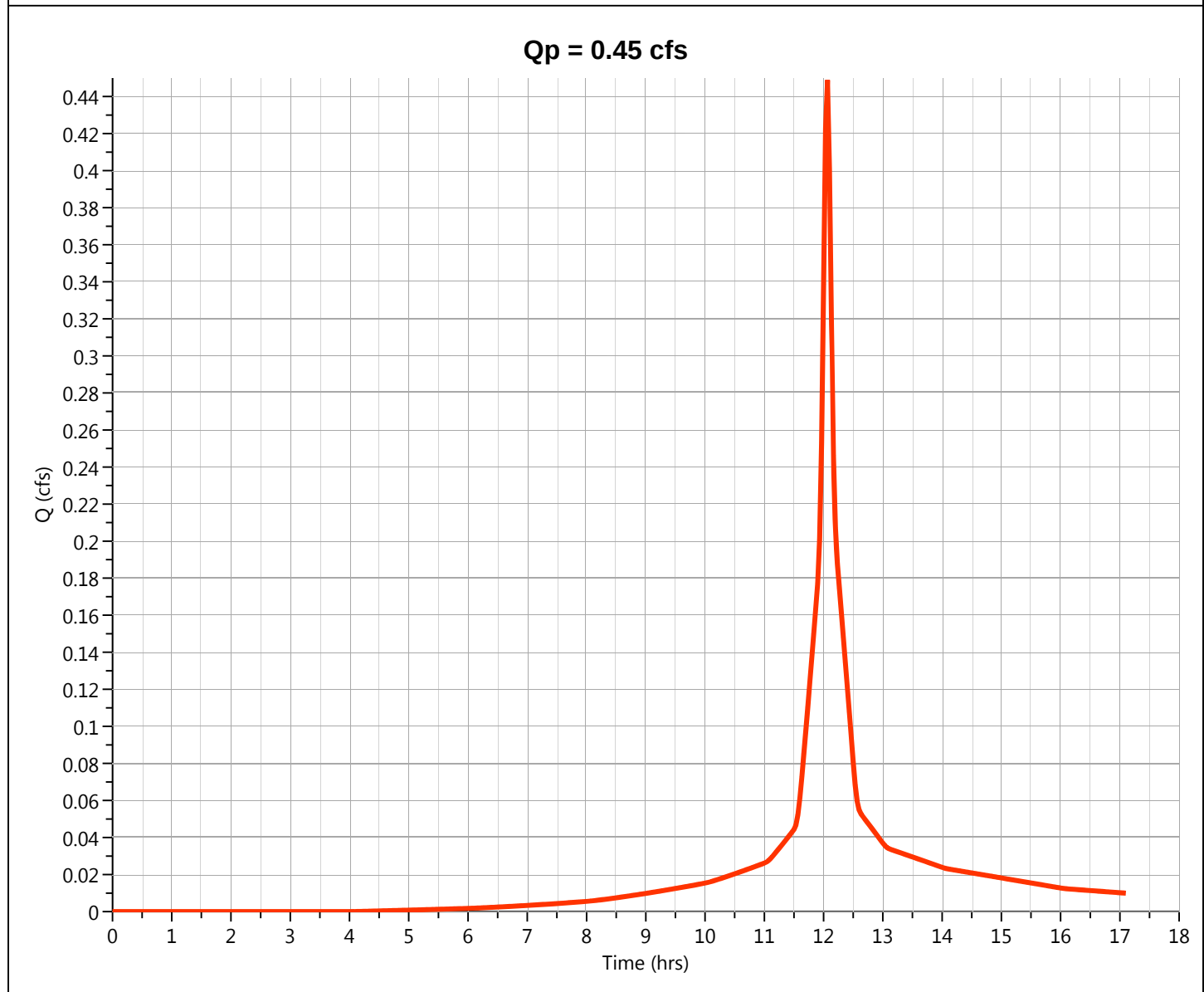
PRO SA-A.1

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.449 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 1,401 cuft
Drainage Area	= 0.13 ac	Curve Number	= 92*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 4.0500 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.11	98	B - PAVED
0.02	61	B - LAWN
0.13	92	Weighted Average



Hydrograph Discharge Table

PRO SA-A.1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	0.047	12.73	0.048						
11.57	0.052	12.77	0.047						
11.60	0.061	12.80	0.046						
11.63	0.073	12.83	0.044						
11.67	0.085	...end	...end						
11.70	0.098								
11.73	0.110								
11.77	0.123								
11.80	0.136								
11.83	0.150								
11.87	0.163								
11.90	0.177								
11.93	0.201								
11.97	0.253								
12.00	0.339								
12.03	0.423								
12.07	0.449								
12.10	0.401								
12.13	0.317								
12.17	0.246								
12.20	0.207								
12.23	0.188								
12.27	0.175								
12.30	0.161								
12.33	0.148								
12.37	0.135								
12.40	0.121								
12.43	0.108								
12.47	0.094								
12.50	0.081								
12.53	0.068								
12.57	0.059								
12.60	0.055								
12.63	0.053								
12.67	0.051								
12.70	0.050								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

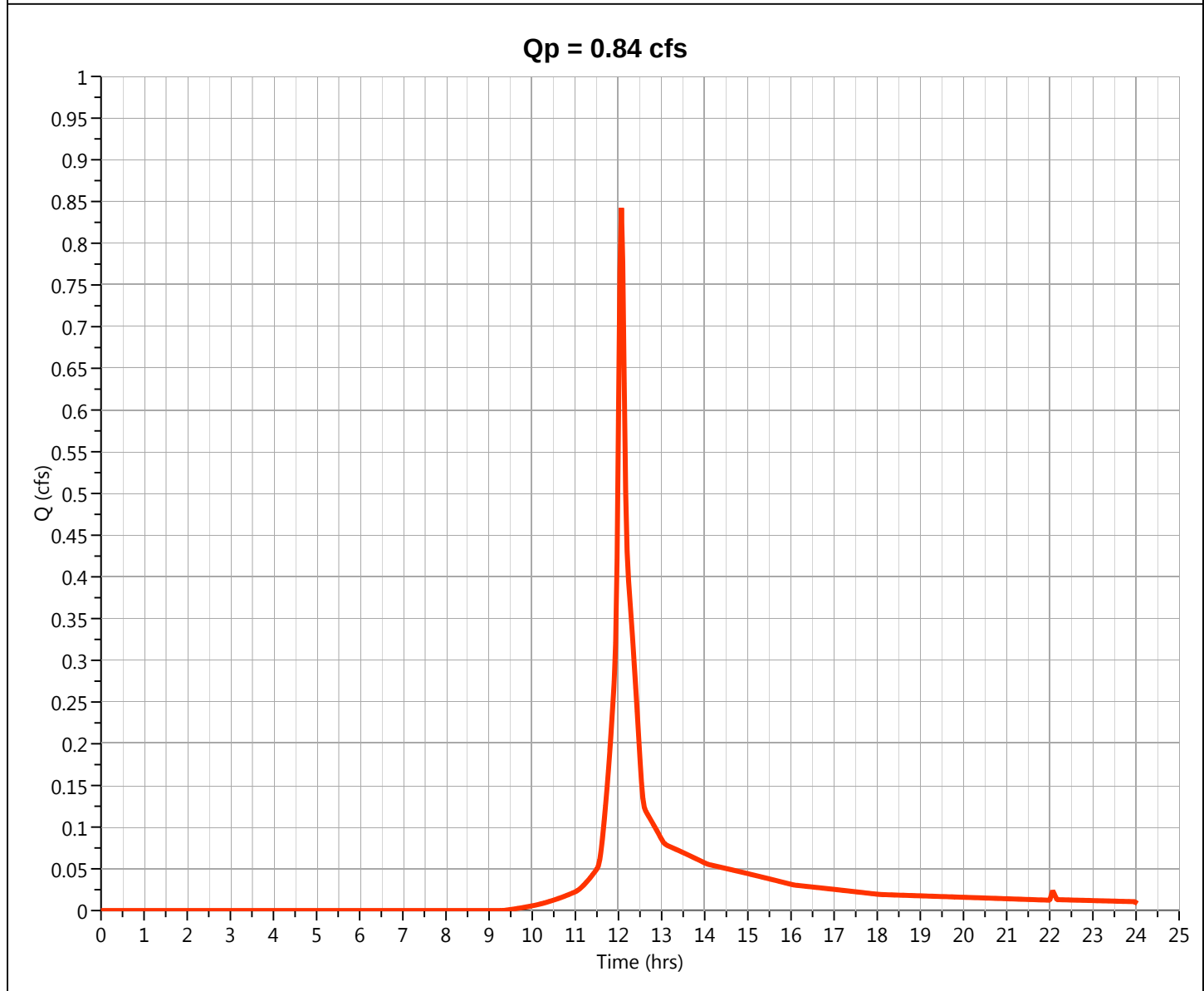
PRO SA-A.2

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.842 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 2,540 cuft
Drainage Area	= 0.42 ac	Curve Number	= 76*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.31 min
Total Rainfall	= 4.0500 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.168	98	B - PAVED
0.252	61	B - LAWN
0.42	76	Weighted Average



Hydrograph Discharge Table

PRO SA-A.2

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.63	0.089	12.83	0.101						
11.67	0.107	12.87	0.098						
11.70	0.126	12.90	0.095						
11.73	0.146	12.93	0.092						
11.77	0.168	12.97	0.089						
11.80	0.192	13.00	0.085						
11.83	0.217	13.03	0.082						
11.87	0.245	...end	...end						
11.90	0.274								
11.93	0.321								
11.97	0.421								
12.00	0.587								
12.03	0.765								
12.07	0.842								
12.10	0.777								
12.13	0.632								
12.17	0.503								
12.20	0.431								
12.23	0.395								
12.27	0.372								
12.30	0.347								
12.33	0.321								
12.37	0.295								
12.40	0.267								
12.43	0.239								
12.47	0.210								
12.50	0.180								
12.53	0.153								
12.57	0.134								
12.60	0.124								
12.63	0.119								
12.67	0.116								
12.70	0.113								
12.73	0.110								
12.77	0.107								
12.80	0.104								

Hydrograph Report

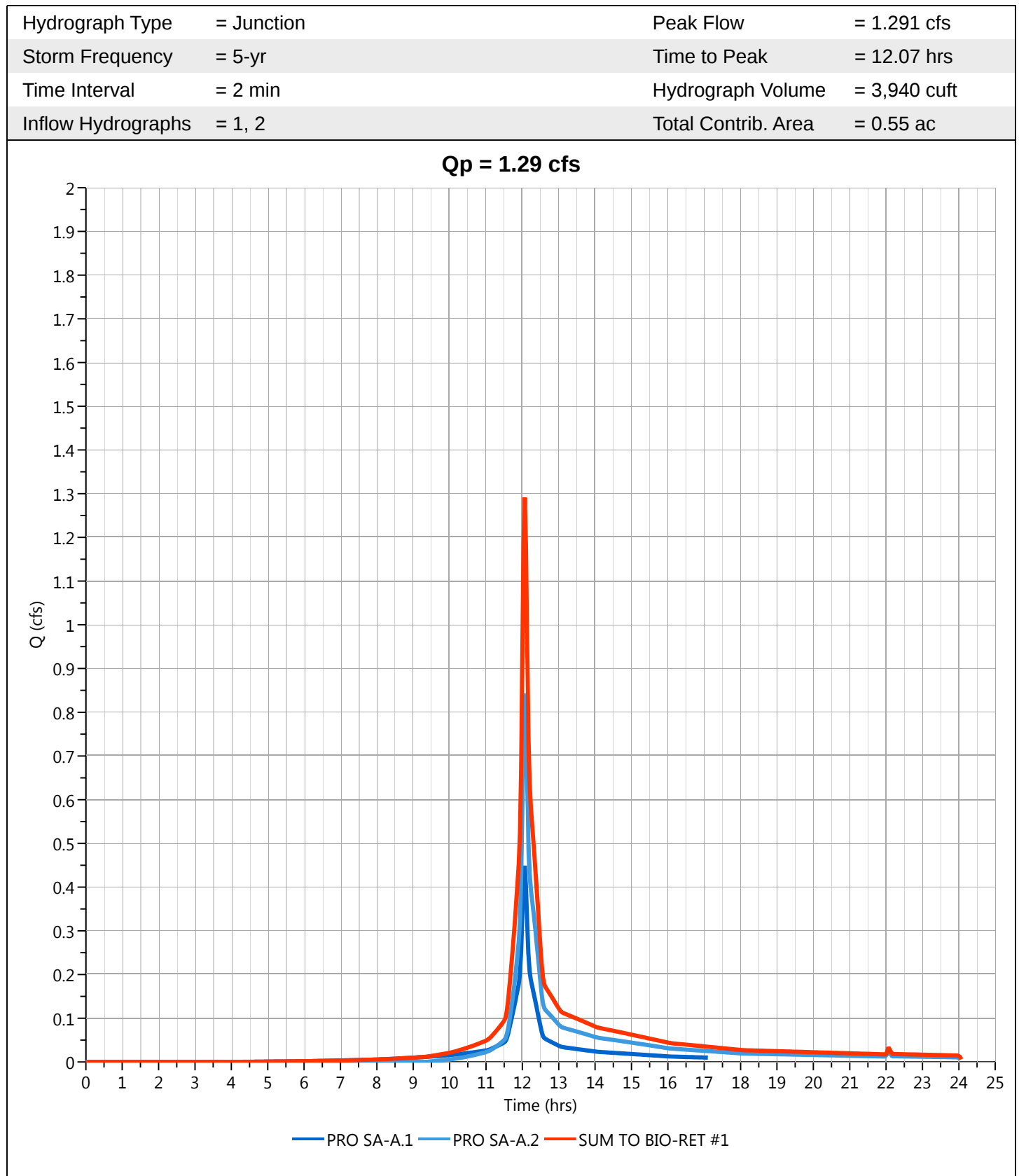
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET #1

Hyd. No. 3



Hydrograph Discharge Table

SUM TO BIO-RET #1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.135	12.80	0.150						
11.63	0.162	12.83	0.145						
11.67	0.192	12.87	0.141						
11.70	0.223	12.90	0.136						
11.73	0.256	12.93	0.132						
11.77	0.291	12.97	0.127						
11.80	0.328	...end	...end						
11.83	0.367								
11.87	0.408								
11.90	0.451								
11.93	0.522								
11.97	0.674								
12.00	0.926								
12.03	1.187								
12.07	1.291								
12.10	1.178								
12.13	0.949								
12.17	0.749								
12.20	0.638								
12.23	0.583								
12.27	0.546								
12.30	0.509								
12.33	0.469								
12.37	0.429								
12.40	0.388								
12.43	0.347								
12.47	0.304								
12.50	0.261								
12.53	0.221								
12.57	0.193								
12.60	0.178								
12.63	0.172								
12.67	0.167								
12.70	0.163								
12.73	0.158								
12.77	0.154								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

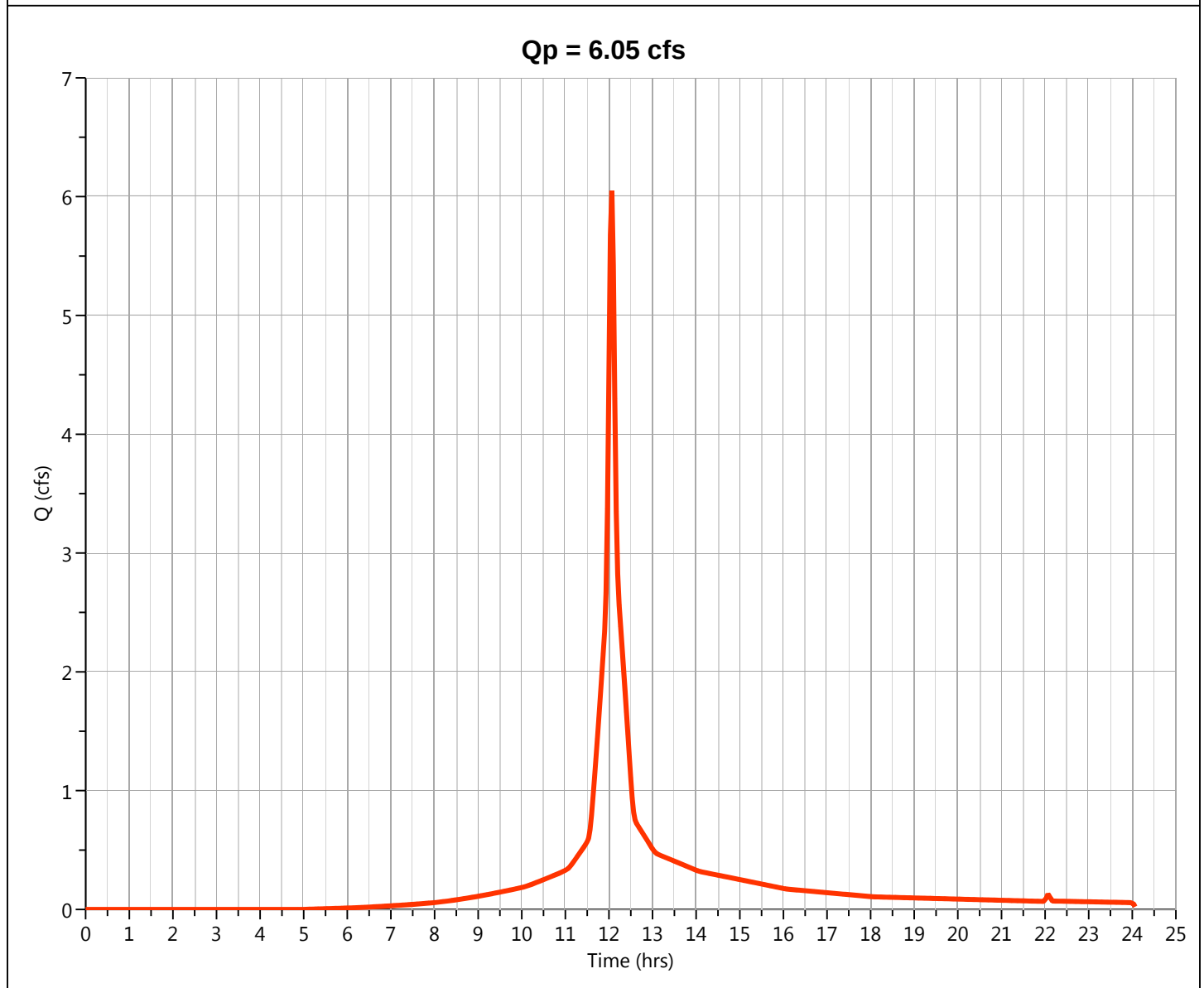
PRO SA-A.3

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 6.050 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 18,576 cuft
Drainage Area	= 1.84 ac	Curve Number	= 90*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.95 min
Total Rainfall	= 4.0500 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LAWN
1.84	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.3

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.673	12.77	0.645						
11.60	0.792	12.80	0.626						
11.63	0.941	12.83	0.607						
11.67	1.102	12.87	0.587						
11.70	1.267	...end	...end						
11.73	1.436								
11.77	1.609								
11.80	1.786								
11.83	1.968								
11.87	2.153								
11.90	2.343								
11.93	2.664								
11.97	3.372								
12.00	4.527								
12.03	5.679								
12.07	6.050								
12.10	5.422								
12.13	4.299								
12.17	3.347								
12.20	2.823								
12.23	2.560								
12.27	2.384								
12.30	2.206								
12.33	2.027								
12.37	1.845								
12.40	1.662								
12.43	1.478								
12.47	1.293								
12.50	1.107								
12.53	0.937								
12.57	0.816								
12.60	0.753								
12.63	0.722								
12.67	0.703								
12.70	0.684								
12.73	0.665								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

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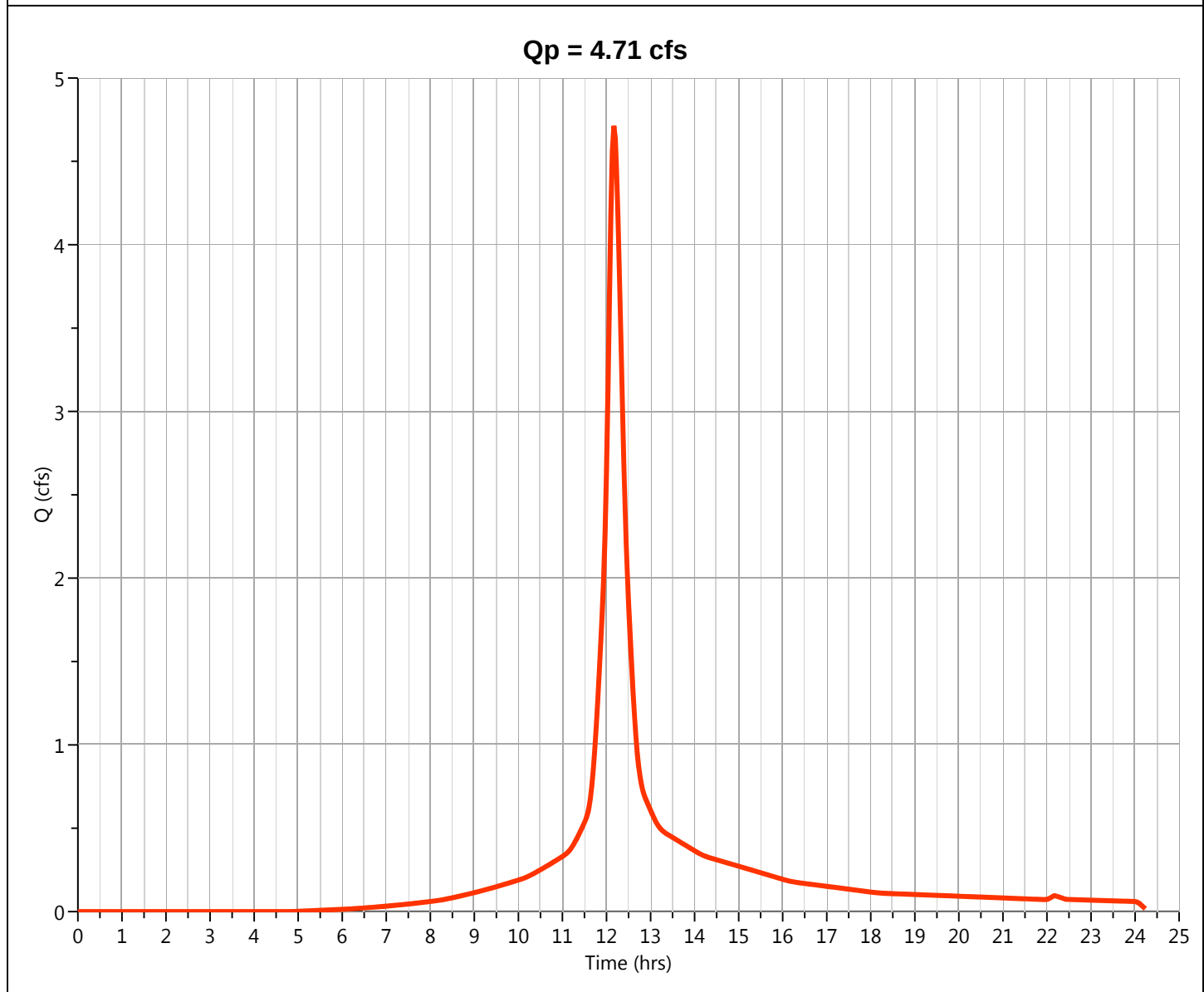
PRO SA-A.4

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 4.713 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 19,598 cuft
Drainage Area	= 1.838 ac	Curve Number	= 90.47*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.12 min
Total Rainfall	= 4.0500 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LANDSCAPED
1.838	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.4

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.40	0.478	12.60	1.324						
11.43	0.496	12.63	1.173						
11.47	0.515	12.67	1.045						
11.50	0.534	12.70	0.943						
11.53	0.555	12.73	0.862						
11.57	0.583	12.77	0.800						
11.60	0.623	12.80	0.753						
11.63	0.678	12.83	0.718						
11.67	0.754	12.87	0.691						
11.70	0.853	12.90	0.669						
11.73	0.971	12.93	0.648						
11.77	1.107	12.97	0.628						
11.80	1.258	13.00	0.608						
11.83	1.422	13.03	0.587						
11.87	1.596	13.07	0.568						
11.90	1.779	13.10	0.549						
11.93	1.987	13.13	0.533						
11.97	2.262	13.17	0.518						
12.00	2.646	13.20	0.506						
12.03	3.137	13.23	0.495						
12.07	3.681	13.27	0.486						
12.10	4.190	13.30	0.479						
12.13	4.561	13.33	0.472						
12.17	4.713	13.37	0.466						
12.20	4.636	...end	...end						
12.23	4.405								
12.27	4.094								
12.30	3.746								
12.33	3.369								
12.37	2.981								
12.40	2.617								
12.43	2.311								
12.47	2.069								
12.50	1.865								
12.53	1.676								
12.57	1.494								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

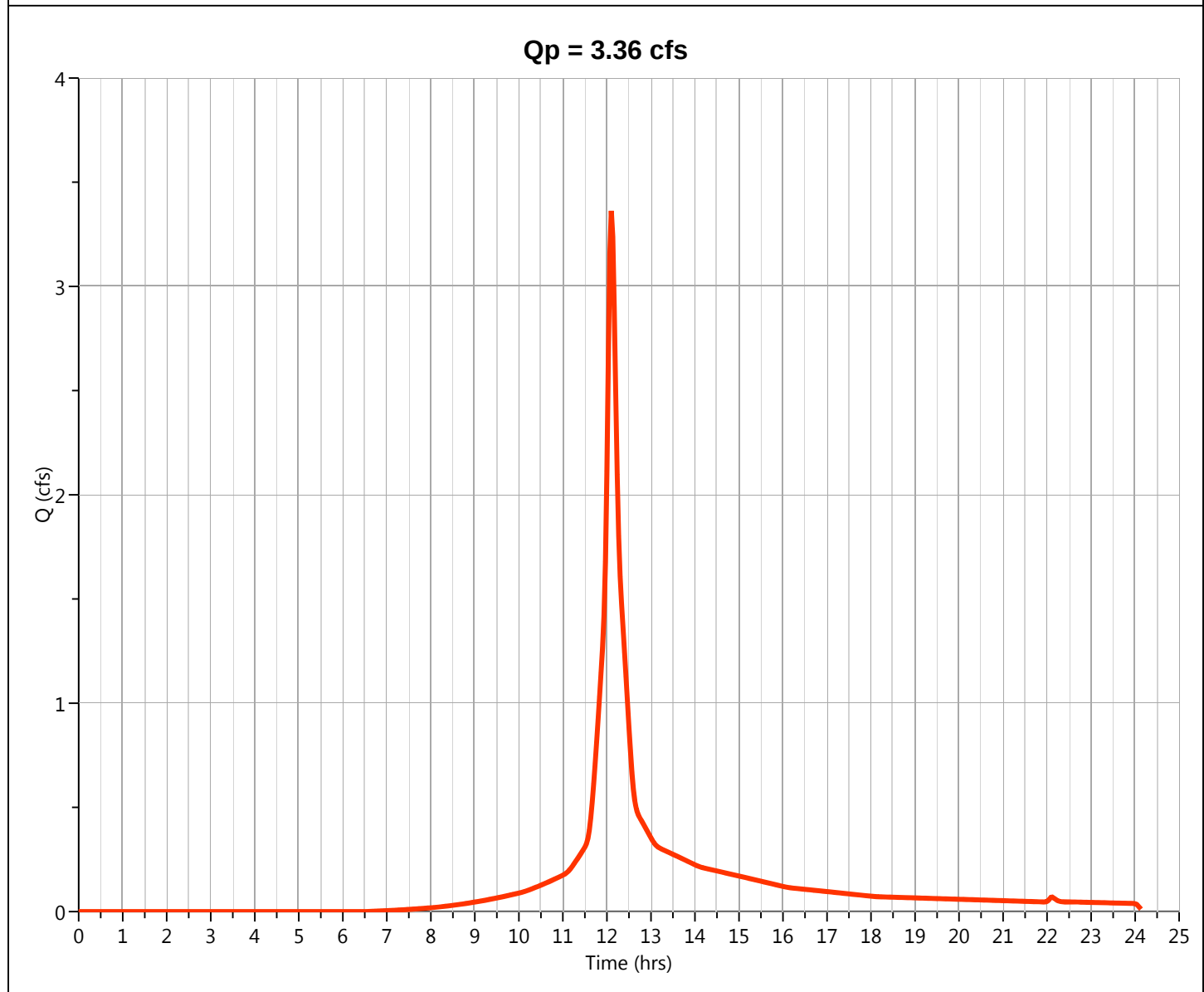
PRO SA-C

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 3.363 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 11,541 cuft
Drainage Area	= 1.22 ac	Curve Number	= 86.16*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.4 min
Total Rainfall	= 4.0500 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.38	61	B - GRASS
1.22	86	Weighted Average



Hydrograph Discharge Table

PRO SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.349	12.77	0.443						
11.60	0.390	12.80	0.431						
11.63	0.451	12.83	0.418						
11.67	0.527	12.87	0.405						
11.70	0.615	12.90	0.393						
11.73	0.712	12.93	0.380						
11.77	0.814	12.97	0.367						
11.80	0.921	13.00	0.354						
11.83	1.031	13.03	0.342						
11.87	1.146	13.07	0.331						
11.90	1.264	...end	...end						
11.93	1.419								
11.97	1.678								
12.00	2.114								
12.03	2.671								
12.07	3.157								
12.10	3.363								
12.13	3.238								
12.17	2.896								
12.20	2.479								
12.23	2.096								
12.27	1.802								
12.30	1.608								
12.33	1.475								
12.37	1.361								
12.40	1.245								
12.43	1.128								
12.47	1.009								
12.50	0.889								
12.53	0.772								
12.57	0.669								
12.60	0.588								
12.63	0.531								
12.67	0.494								
12.70	0.471								
12.73	0.456								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

BIO-RET BASIN ROUTIN

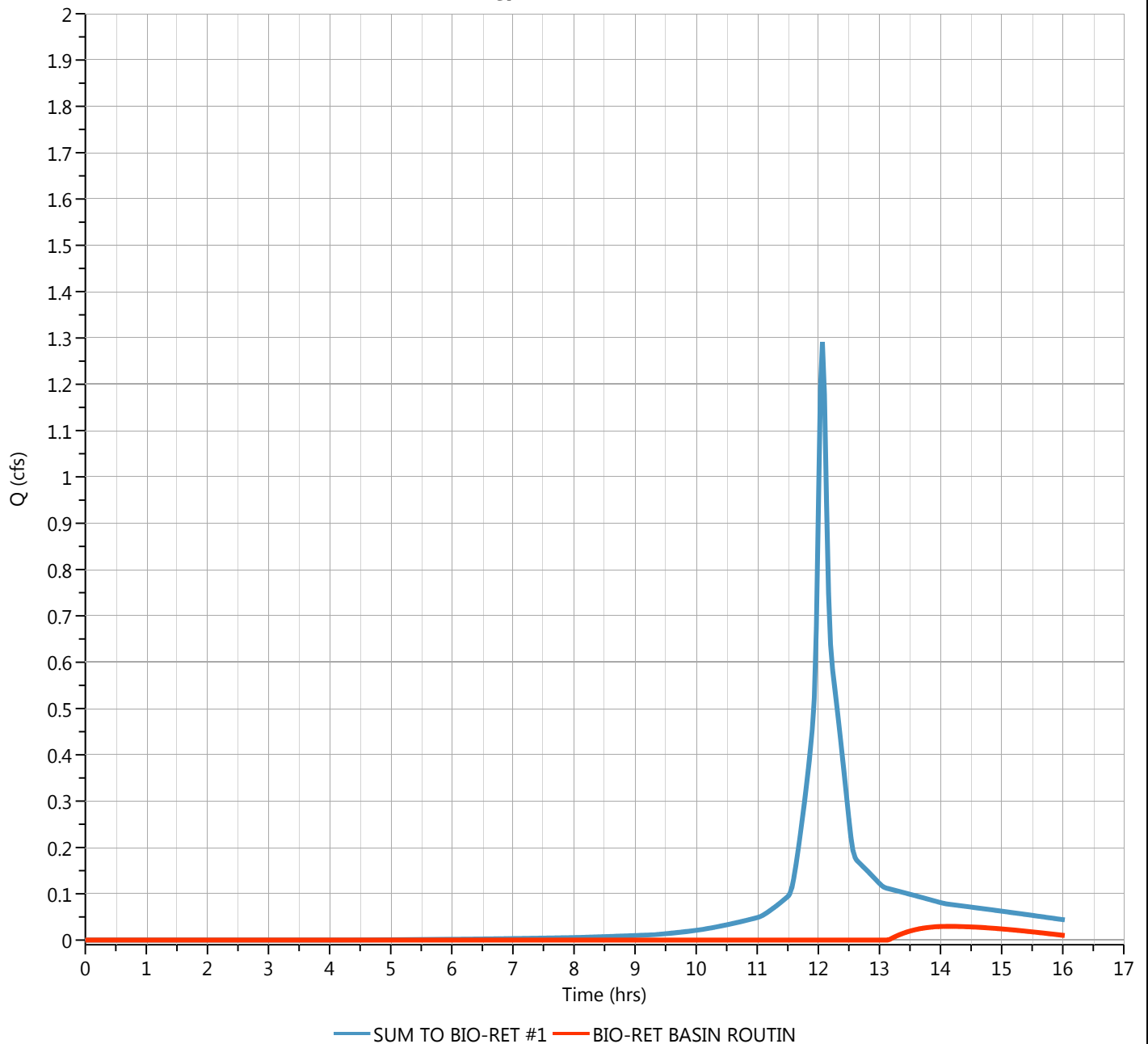
Hyd. No. 7

Hydrograph Type	= Pond Route	Peak Flow	= 0.030 cfs
Storm Frequency	= 5-yr	Time to Peak	= 14.13 hrs
Time Interval	= 2 min	Hydrograph Volume	= 238 cuft
Inflow Hydrograph	= 3 - SUM TO BIO-RET #1	Max. Elevation	= 50.54 ft
Pond Name	= PROP. BIO-RETENTION BASIN #1	Max. Storage	= 2,183 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 56 min

Qp = 0.03 cfs



Hydrograph Discharge Table

BIO-RET BASIN ROUTIN

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
13.20	0.004	14.40	0.029	15.60	0.016				
13.23	0.006	14.43	0.029	15.63	0.016				
13.27	0.008	14.47	0.029	15.67	0.015				
13.30	0.010	14.50	0.028	15.70	0.015				
13.33	0.012	14.53	0.028	15.73	0.014				
13.37	0.014	14.57	0.028	15.77	0.014				
13.40	0.015	14.60	0.028	15.80	0.013				
13.43	0.017	14.63	0.028	15.83	0.013				
13.47	0.018	14.67	0.027	15.87	0.012				
13.50	0.020	14.70	0.027	15.90	0.012				
13.53	0.021	14.73	0.027	15.93	0.011				
13.57	0.022	14.77	0.027	15.97	0.011				
13.60	0.023	14.80	0.026	16.00	0.010				
13.63	0.024	14.83	0.026	16.03	0.010				
13.67	0.025	14.87	0.026	16.07	0.009				
13.70	0.025	14.90	0.025	16.10	0.009				
13.73	0.026	14.93	0.025	16.13	0.008				
13.77	0.027	14.97	0.025	16.17	0.008				
13.80	0.027	15.00	0.024	16.20	0.007				
13.83	0.028	15.03	0.024	16.23	0.007				
13.87	0.028	15.07	0.023	16.27	0.006				
13.90	0.029	15.10	0.023	16.30	0.006				
13.93	0.029	15.13	0.023	16.33	0.005				
13.97	0.029	15.17	0.022	16.37	0.005				
14.00	0.029	15.20	0.022	16.40	0.005				
14.03	0.029	15.23	0.021	16.43	0.004				
14.07	0.030	15.27	0.021	16.47	0.004				
14.10	0.030	15.30	0.021	16.50	0.003				
14.13	0.030	15.33	0.020	16.53	0.003				
14.17	0.030	15.37	0.020	...end	...end				
14.20	0.030	15.40	0.019						
14.23	0.030	15.43	0.019						
14.27	0.029	15.47	0.018						
14.30	0.029	15.50	0.018						
14.33	0.029	15.53	0.017						
14.37	0.029	15.57	0.017						

Hydrograph Report

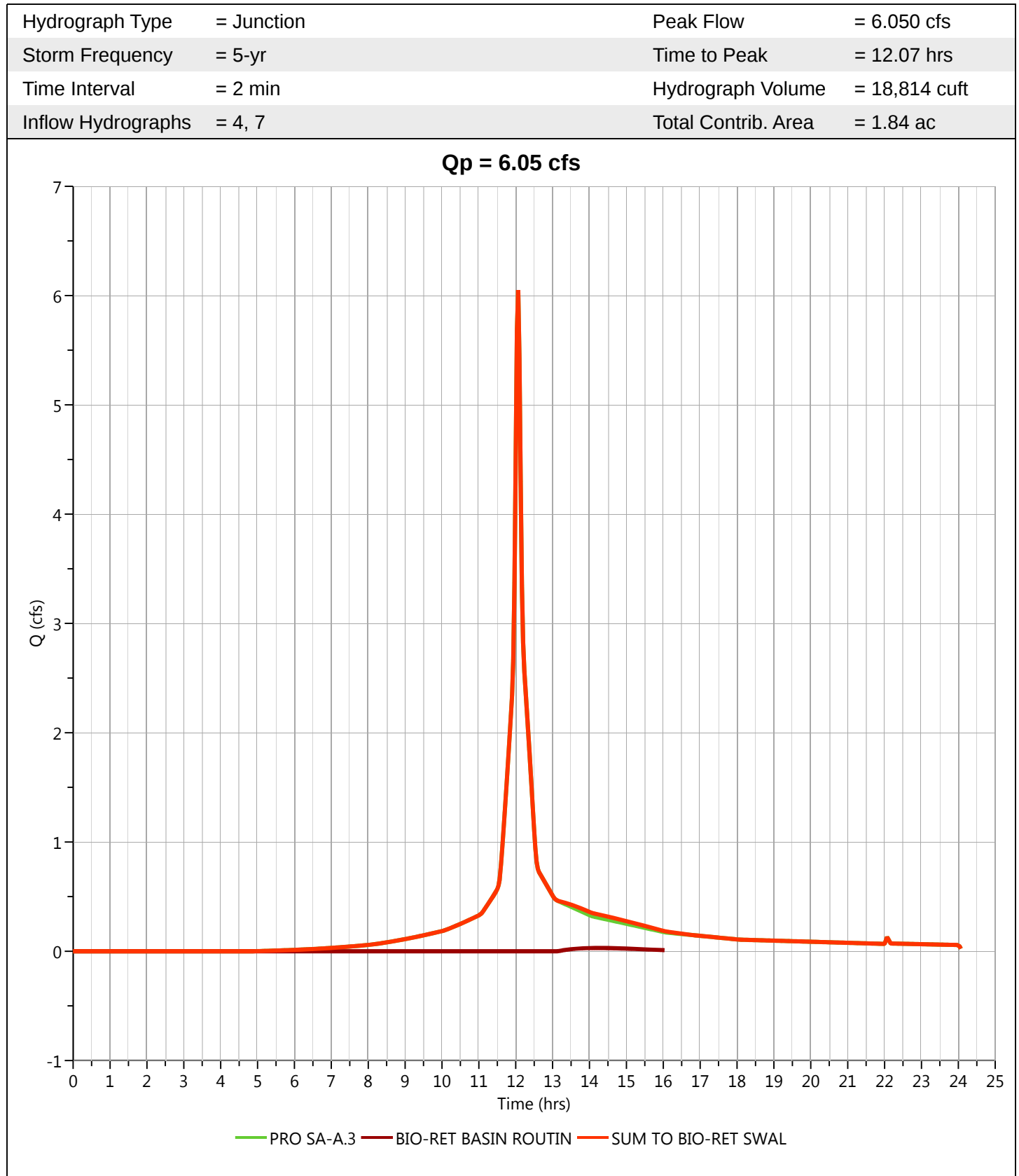
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET SWAL

Hyd. No. 8



Hydrograph Discharge Table

SUM TO BIO-RET SWAL

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.673	12.77	0.645						
11.60	0.792	12.80	0.626						
11.63	0.941	12.83	0.607						
11.67	1.102	12.87	0.587						
11.70	1.267	...end	...end						
11.73	1.436								
11.77	1.609								
11.80	1.786								
11.83	1.968								
11.87	2.153								
11.90	2.343								
11.93	2.664								
11.97	3.372								
12.00	4.527								
12.03	5.679								
12.07	6.050								
12.10	5.422								
12.13	4.299								
12.17	3.347								
12.20	2.823								
12.23	2.560								
12.27	2.384								
12.30	2.206								
12.33	2.027								
12.37	1.845								
12.40	1.662								
12.43	1.478								
12.47	1.293								
12.50	1.107								
12.53	0.937								
12.57	0.816								
12.60	0.753								
12.63	0.722								
12.67	0.703								
12.70	0.684								
12.73	0.665								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

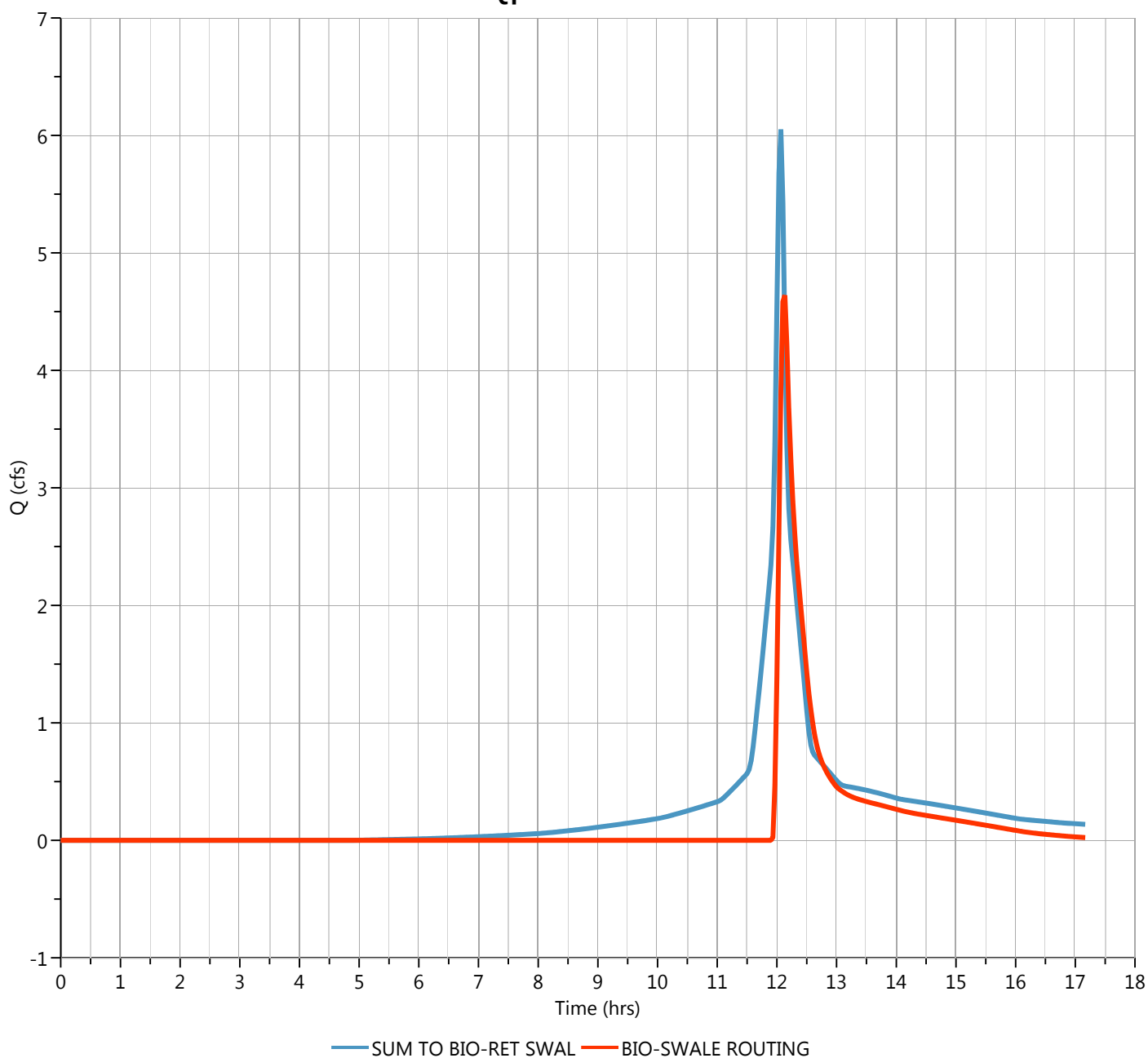
BIO-SWALE ROUTING

Hyd. No. 9

Hydrograph Type	= Pond Route	Peak Flow	= 4.639 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.13 hrs
Time Interval	= 2 min	Hydrograph Volume	= 9,422 cuft
Inflow Hydrograph	= 8 - SUM TO BIO-RET SWAL	Max. Elevation	= 49.24 ft
Pond Name	= PROP. BIO-RETENTION SWALE	Max. Storage	= 5,312 cuft

Pond Routing by Storage Indication Method

Qp = 4.64 cfs



Hydrograph Discharge Table

BIO-SWALE ROUTING

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.97	0.474								
12.00	1.382								
12.03	2.610								
12.07	3.829								
12.10	4.585								
12.13	4.639								
12.17	4.225								
12.20	3.672								
12.23	3.235								
12.27	2.886								
12.30	2.604								
12.33	2.363								
12.37	2.173								
12.40	1.988								
12.43	1.804								
12.47	1.620								
12.50	1.436								
12.53	1.257								
12.57	1.122								
12.60	0.998								
12.63	0.895								
12.67	0.813								
12.70	0.747								
12.73	0.694								
12.77	0.650								
12.80	0.613								
12.83	0.580								
12.87	0.551								
12.90	0.525								
12.93	0.500								
12.97	0.477								
13.00	0.455								
...end	...end								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

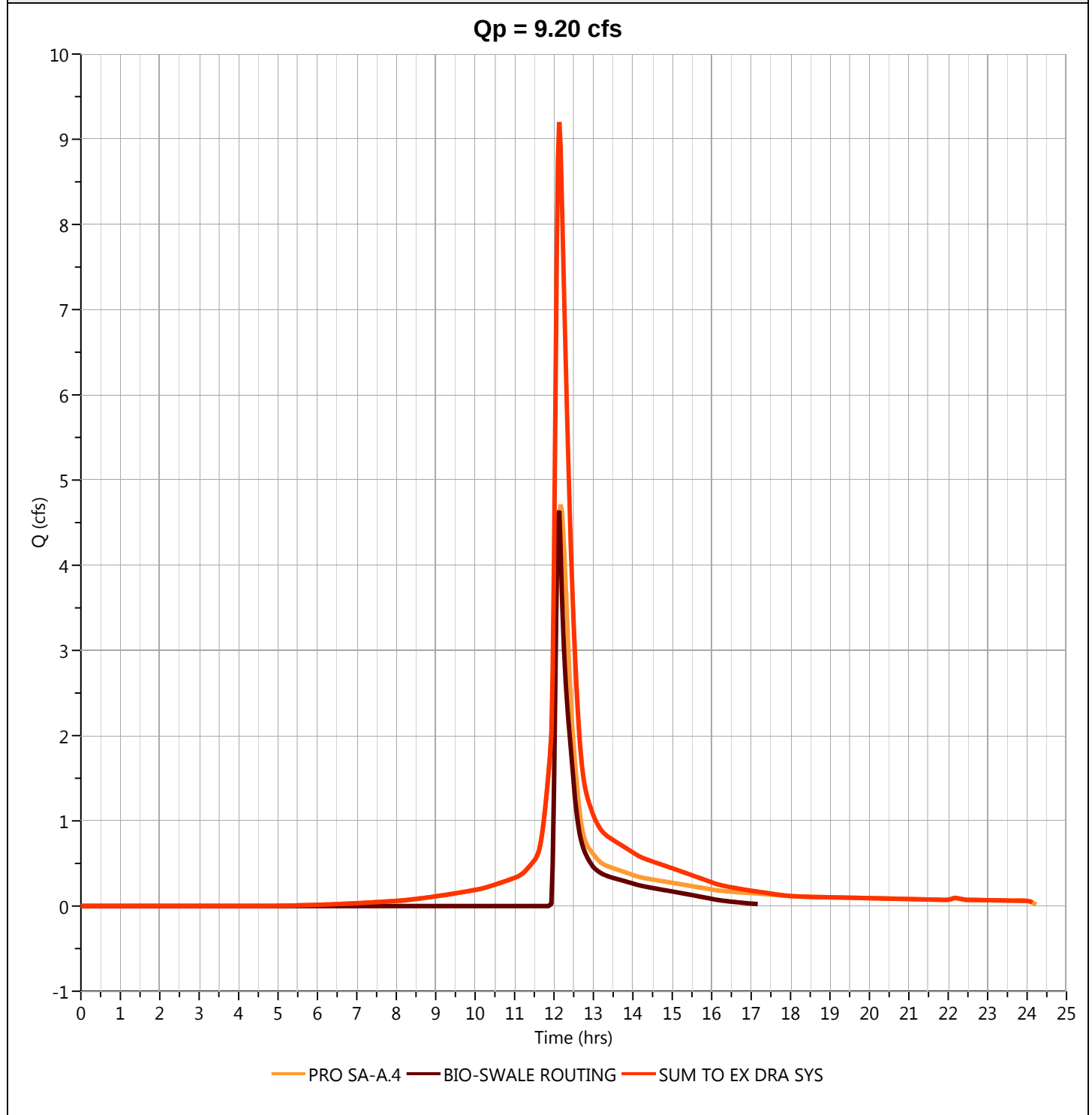
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX DRA SYS

Hyd. No. 10

Hydrograph Type	= Junction	Peak Flow	= 9.201 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.13 hrs
Time Interval	= 2 min	Hydrograph Volume	= 29,020 cuft
Inflow Hydrographs	= 5, 9	Total Contrib. Area	= 1.838 ac



Hydrograph Discharge Table

SUM TO EX DRA SYS

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.73	0.971	12.93	1.148						
11.77	1.107	12.97	1.105						
11.80	1.258	13.00	1.062						
11.83	1.422	13.03	1.026						
11.87	1.596	13.07	0.994						
11.90	1.779	13.10	0.964						
11.93	2.012	13.13	0.936						
11.97	2.736	13.17	0.911						
12.00	4.028	...end	...end						
12.03	5.747								
12.07	7.510								
12.10	8.774								
12.13	9.201								
12.17	8.938								
12.20	8.309								
12.23	7.640								
12.27	6.981								
12.30	6.351								
12.33	5.731								
12.37	5.154								
12.40	4.605								
12.43	4.115								
12.47	3.688								
12.50	3.301								
12.53	2.933								
12.57	2.615								
12.60	2.322								
12.63	2.068								
12.67	1.858								
12.70	1.690								
12.73	1.557								
12.77	1.450								
12.80	1.366								
12.83	1.298								
12.87	1.242								
12.90	1.193								

Design Storm Report

Custom Storm filename:

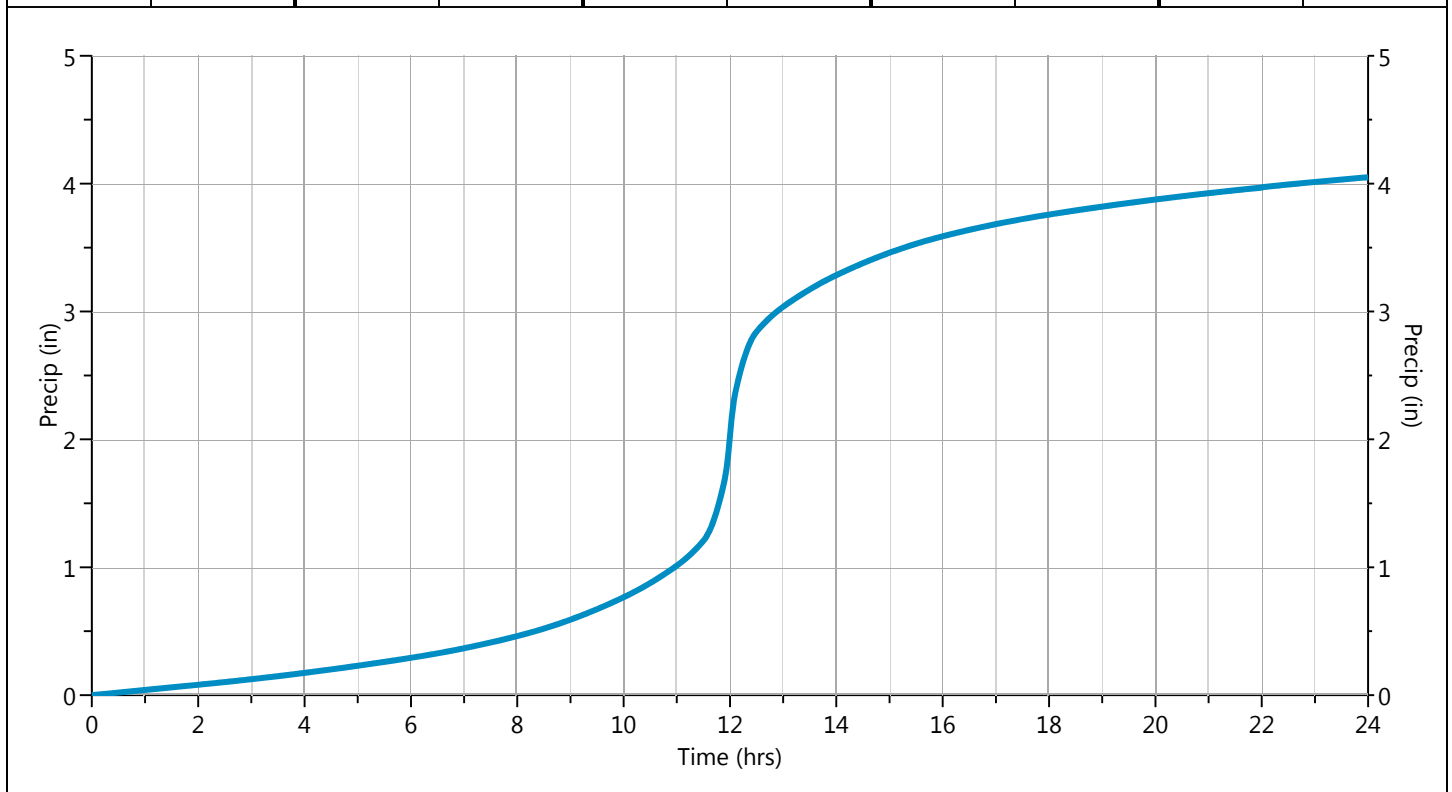
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	√ 5-yr	10-yr	25-yr	50-yr	100-yr	
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72	

Incremental Rainfall Distribution, 5-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0098	11.37	0.0142	11.73	0.0418	12.10	0.0802	12.47	0.0220
11.03	0.0101	11.40	0.0146	11.77	0.0458	12.13	0.0617	12.50	0.0180
11.07	0.0105	11.43	0.0150	11.80	0.0497	12.17	0.0576	12.53	0.0158
11.10	0.0109	11.47	0.0154	11.83	0.0537	12.20	0.0537	12.57	0.0154
11.13	0.0113	11.50	0.0159	11.87	0.0576	12.23	0.0497	12.60	0.0150
11.17	0.0117	11.53	0.0180	11.90	0.0616	12.27	0.0458	12.63	0.0146
11.20	0.0121	11.57	0.0220	11.93	0.0803	12.30	0.0418	12.67	0.0142
11.23	0.0125	11.60	0.0260	11.97	0.1134	12.33	0.0378	12.70	0.0138
11.27	0.0130	11.63	0.0299	12.00	0.1466	12.37	0.0339	12.73	0.0134
11.30	0.0134	11.67	0.0339	12.03	0.1464	12.40	0.0299	12.77	0.0130
11.33	0.0138	11.70	0.0378	12.07	0.1134	12.43	0.0260	12.80	0.0125



Hydrograph 10-yr Summary

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

[illegible]

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

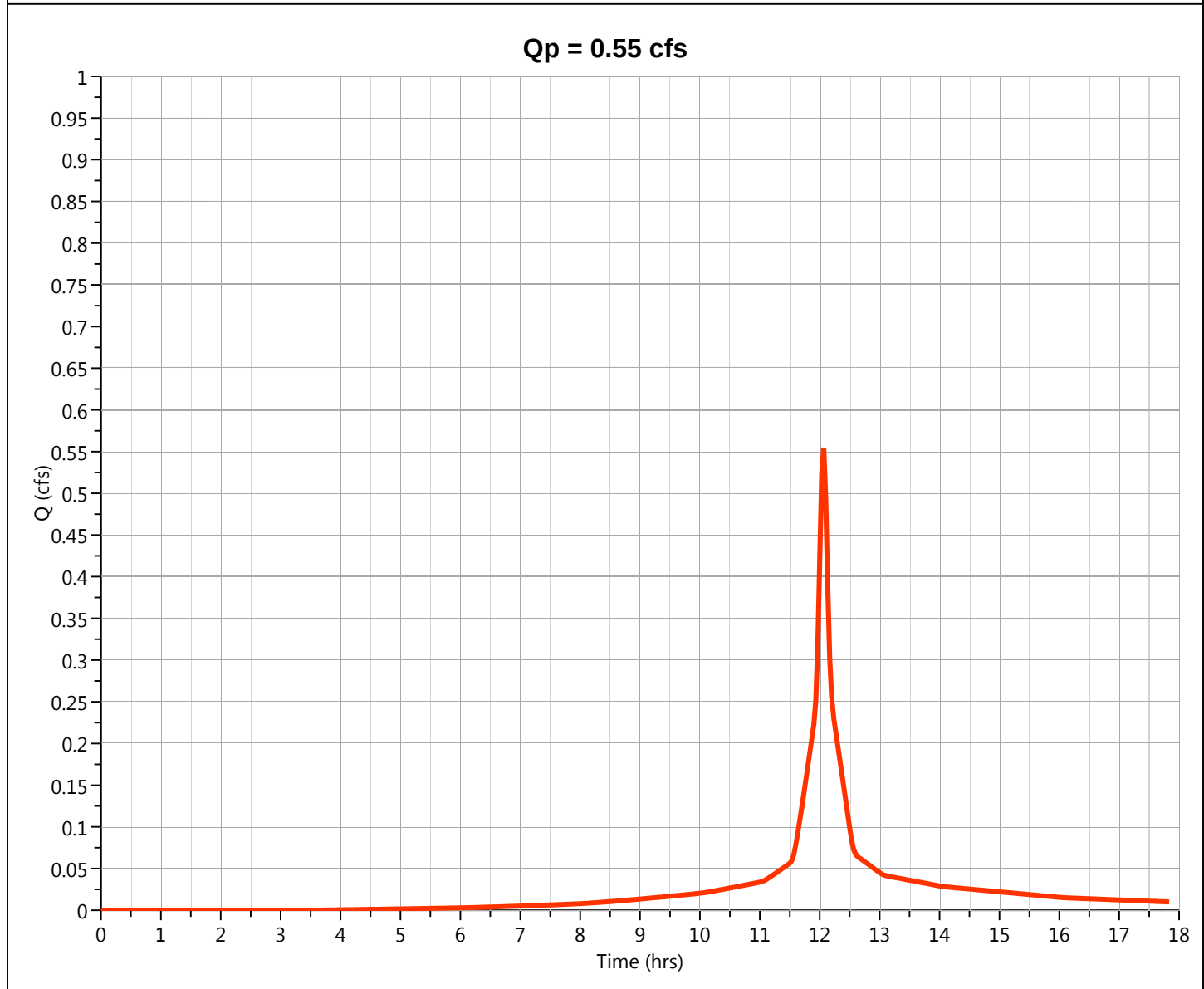
PRO SA-A.1

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.555 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 1,753 cuft
Drainage Area	= 0.13 ac	Curve Number	= 92*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 4.8700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.11	98	B - PAVED
0.02	61	B - LAWN
0.13	92	Weighted Average



Hydrograph Discharge Table

PRO SA-A.1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.50	0.056	12.70	0.061						
11.53	0.059	12.73	0.059						
11.57	0.066	12.77	0.057						
11.60	0.078	12.80	0.056						
11.63	0.092	12.83	0.054						
11.67	0.108	...end	...end						
11.70	0.123								
11.73	0.139								
11.77	0.155								
11.80	0.171								
11.83	0.188								
11.87	0.205								
11.90	0.222								
11.93	0.251								
11.97	0.315								
12.00	0.420								
12.03	0.524								
12.07	0.555								
12.10	0.494								
12.13	0.390								
12.17	0.303								
12.20	0.255								
12.23	0.230								
12.27	0.214								
12.30	0.198								
12.33	0.181								
12.37	0.165								
12.40	0.149								
12.43	0.132								
12.47	0.115								
12.50	0.099								
12.53	0.083								
12.57	0.073								
12.60	0.067								
12.63	0.064								
12.67	0.063								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

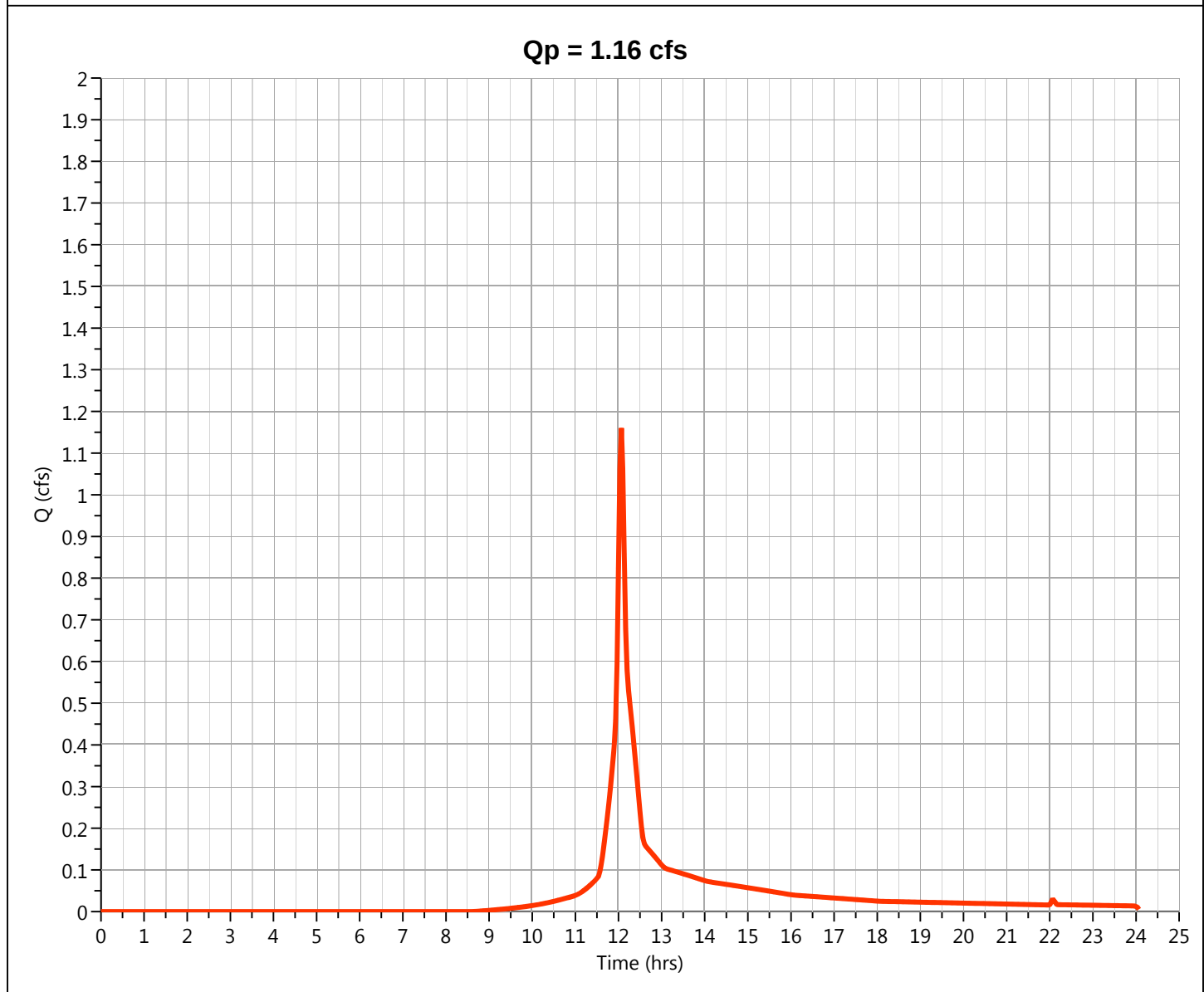
PRO SA-A.2

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.160 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 3,472 cuft
Drainage Area	= 0.42 ac	Curve Number	= 76*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.31 min
Total Rainfall	= 4.8700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.168	98	B - PAVED
0.252	61	B - LAWN
0.42	76	Weighted Average



Hydrograph Discharge Table

PRO SA-A.2

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.63	0.137	12.83	0.133						
11.67	0.163	12.87	0.129						
11.70	0.190	12.90	0.125						
11.73	0.220	12.93	0.120						
11.77	0.251	12.97	0.116						
11.80	0.284	13.00	0.112						
11.83	0.319	...end	...end						
11.87	0.357								
11.90	0.396								
11.93	0.460								
11.97	0.597								
12.00	0.824								
12.03	1.063								
12.07	1.160								
12.10	1.062								
12.13	0.858								
12.17	0.679								
12.20	0.579								
12.23	0.530								
12.27	0.497								
12.30	0.463								
12.33	0.428								
12.37	0.391								
12.40	0.354								
12.43	0.316								
12.47	0.277								
12.50	0.238								
12.53	0.202								
12.57	0.177								
12.60	0.163								
12.63	0.157								
12.67	0.153								
12.70	0.149								
12.73	0.145								
12.77	0.141								
12.80	0.137								

Hydrograph Report

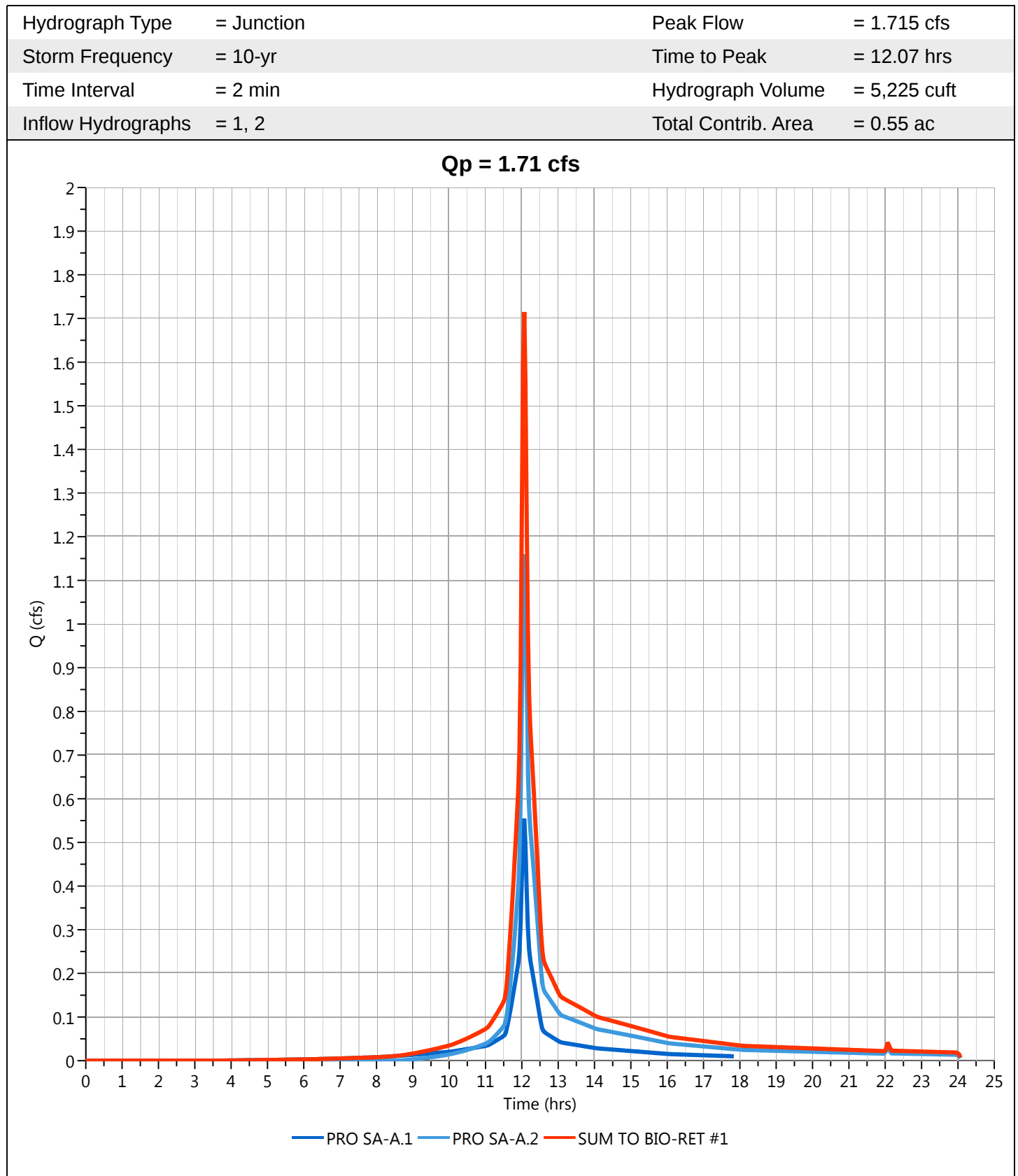
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET #1

Hyd. No. 3



Hydrograph Discharge Table

SUM TO BIO-RET #1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.192	12.80	0.192						
11.63	0.229	12.83	0.187						
11.67	0.271	12.87	0.181						
11.70	0.314	12.90	0.175						
11.73	0.359	12.93	0.169						
11.77	0.406	...end	...end						
11.80	0.456								
11.83	0.507								
11.87	0.561								
11.90	0.618								
11.93	0.711								
11.97	0.912								
12.00	1.245								
12.03	1.586								
12.07	1.715								
12.10	1.557								
12.13	1.248								
12.17	0.981								
12.20	0.834								
12.23	0.760								
12.27	0.711								
12.30	0.661								
12.33	0.609								
12.37	0.556								
12.40	0.503								
12.43	0.448								
12.47	0.393								
12.50	0.337								
12.53	0.285								
12.57	0.249								
12.60	0.230								
12.63	0.221								
12.67	0.215								
12.70	0.210								
12.73	0.204								
12.77	0.198								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

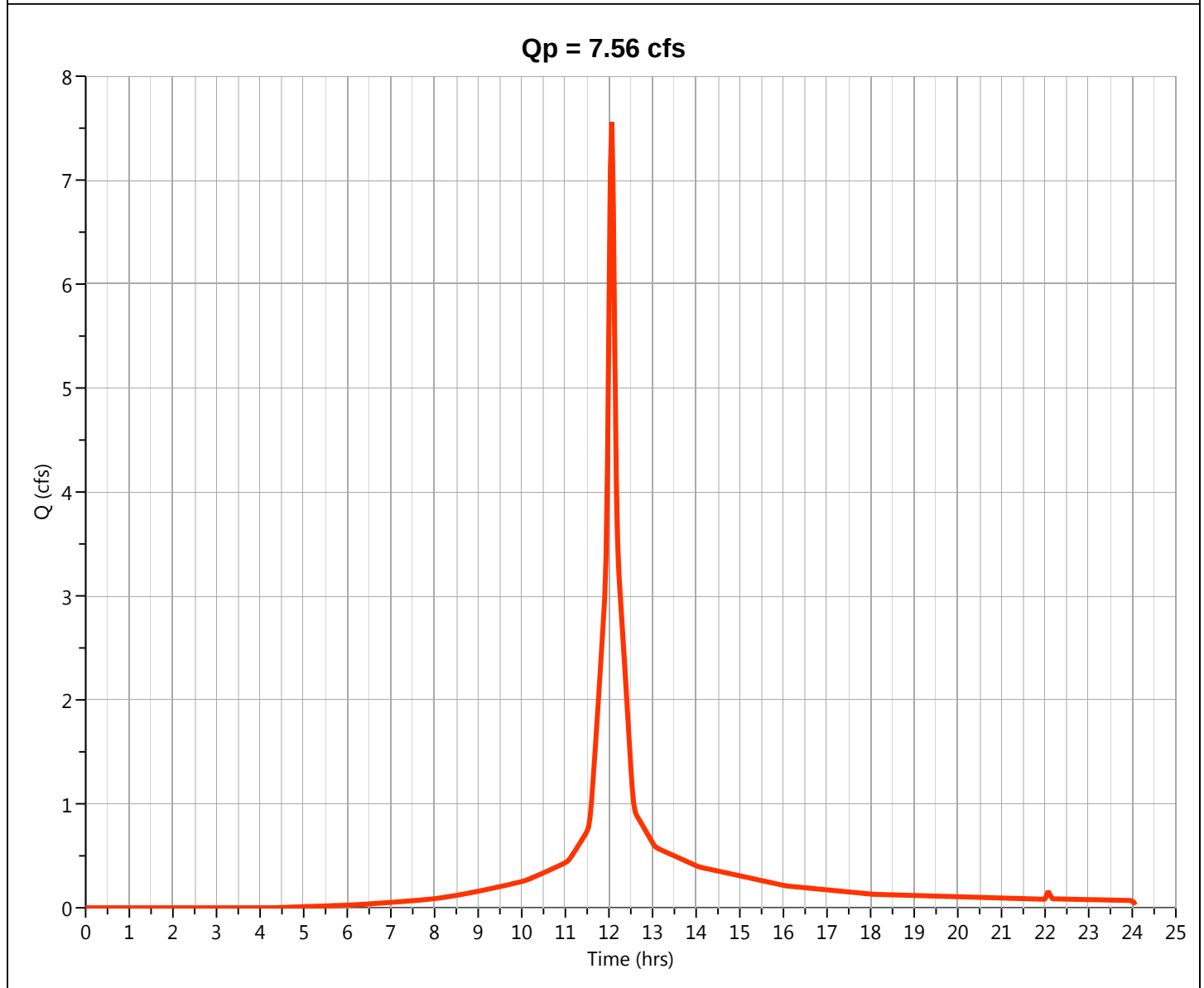
PRO SA-A.3

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 7.559 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 23,488 cuft
Drainage Area	= 1.84 ac	Curve Number	= 90*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.95 min
Total Rainfall	= 4.8700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LAWN
1.84	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.3

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	0.778	12.73	0.818						
11.57	0.871	12.77	0.794						
11.60	1.024	12.80	0.770						
11.63	1.215	12.83	0.746						
11.67	1.420	...end	...end						
11.70	1.629								
11.73	1.842								
11.77	2.060								
11.80	2.282								
11.83	2.508								
11.87	2.738								
11.90	2.973								
11.93	3.370								
11.97	4.254								
12.00	5.692								
12.03	7.116								
12.07	7.559								
12.10	6.757								
12.13	5.345								
12.17	4.154								
12.20	3.498								
12.23	3.169								
12.27	2.949								
12.30	2.727								
12.33	2.503								
12.37	2.278								
12.40	2.051								
12.43	1.823								
12.47	1.594								
12.50	1.364								
12.53	1.154								
12.57	1.006								
12.60	0.927								
12.63	0.889								
12.67	0.866								
12.70	0.842								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

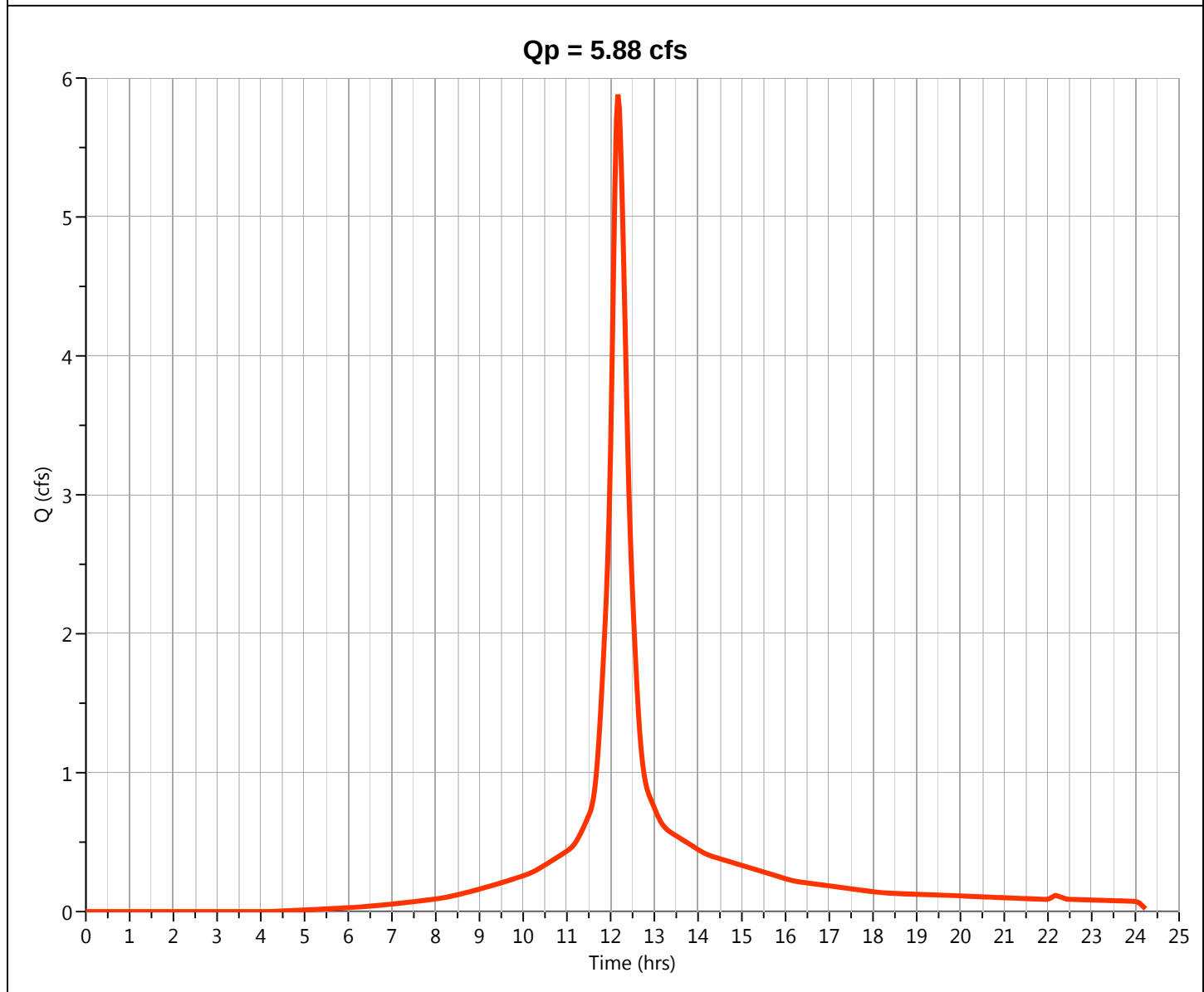
PRO SA-A.4

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 5.881 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 24,721 cuft
Drainage Area	= 1.838 ac	Curve Number	= 90.47*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.12 min
Total Rainfall	= 4.8700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LANDSCAPED
1.838	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.4

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.37	0.599	12.57	1.839						
11.40	0.622	12.60	1.630						
11.43	0.645	12.63	1.443						
11.47	0.669	12.67	1.286						
11.50	0.693	12.70	1.160						
11.53	0.719	12.73	1.060						
11.57	0.755	12.77	0.983						
11.60	0.805	12.80	0.925						
11.63	0.875	12.83	0.881						
11.67	0.972	12.87	0.848						
11.70	1.097	12.90	0.821						
11.73	1.247	12.93	0.796						
11.77	1.419	12.97	0.771						
11.80	1.610	13.00	0.746						
11.83	1.816	13.03	0.721						
11.87	2.035	13.07	0.697						
11.90	2.264	13.10	0.674						
11.93	2.523	13.13	0.654						
11.97	2.865	13.17	0.636						
12.00	3.342	13.20	0.620						
12.03	3.950	13.23	0.607						
12.07	4.622	13.27	0.596						
12.10	5.249	13.30	0.587						
12.13	5.703	...end	...end						
12.17	5.881								
12.20	5.776								
12.23	5.480								
12.27	5.086								
12.30	4.648								
12.33	4.173								
12.37	3.688								
12.40	3.233								
12.43	2.852								
12.47	2.551								
12.50	2.298								
12.53	2.064								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

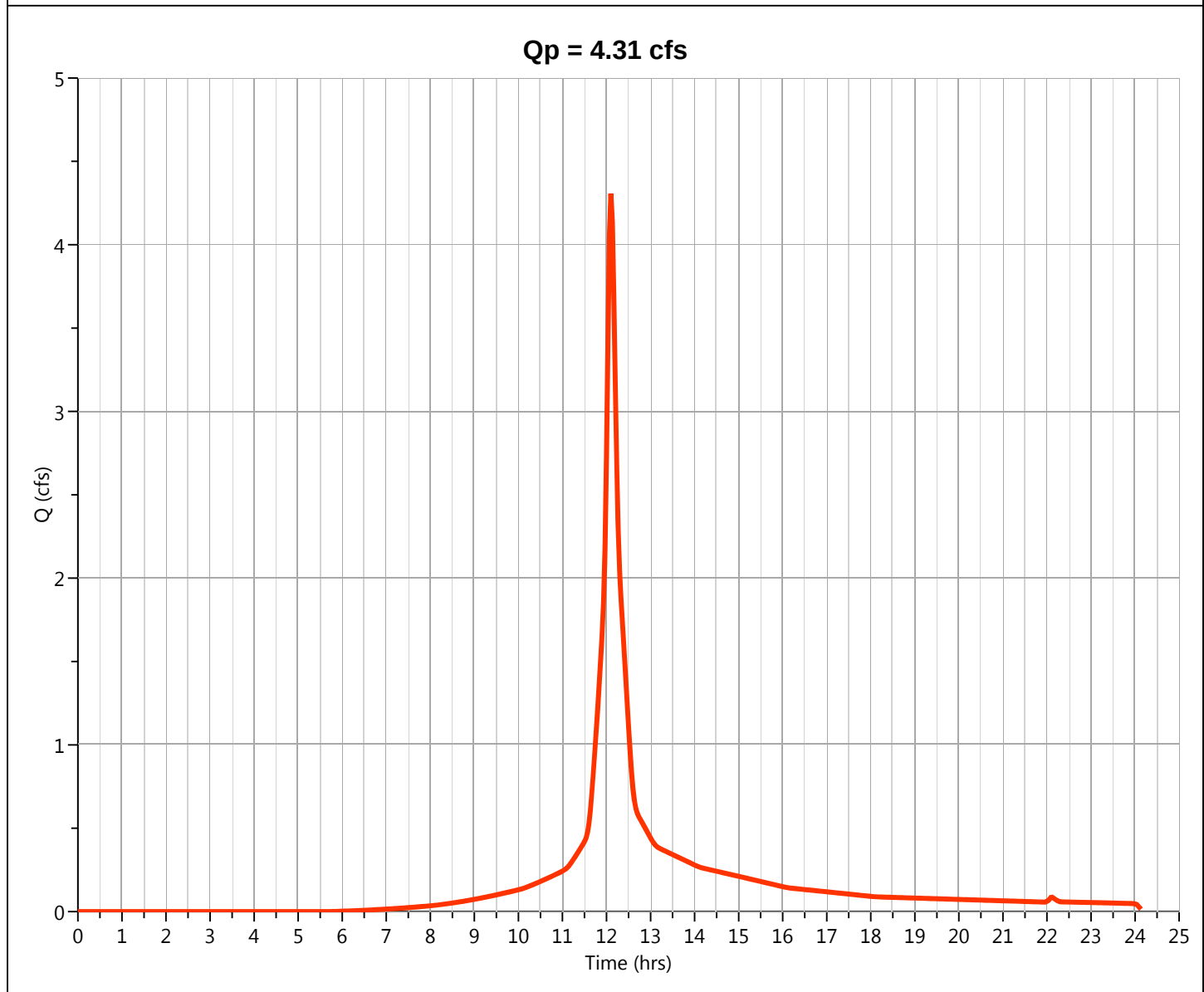
PRO SA-C

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 4.306 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 14,887 cuft
Drainage Area	= 1.22 ac	Curve Number	= 86.16*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.4 min
Total Rainfall	= 4.8700 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.38	61	B - GRASS
1.22	86	Weighted Average



Hydrograph Discharge Table

PRO SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	0.439	12.73	0.570						
11.57	0.471	12.77	0.554						
11.60	0.526	12.80	0.538						
11.63	0.606	12.83	0.522						
11.67	0.706	12.87	0.506						
11.70	0.822	12.90	0.490						
11.73	0.950	12.93	0.474						
11.77	1.083	12.97	0.458						
11.80	1.221	13.00	0.442						
11.83	1.363	13.03	0.427						
11.87	1.509	...end	...end						
11.90	1.660								
11.93	1.856								
11.97	2.186								
12.00	2.741								
12.03	3.447								
12.07	4.056								
12.10	4.306								
12.13	4.133								
12.17	3.686								
12.20	3.147								
12.23	2.654								
12.27	2.277								
12.30	2.028								
12.33	1.857								
12.37	1.712								
12.40	1.565								
12.43	1.416								
12.47	1.266								
12.50	1.115								
12.53	0.968								
12.57	0.838								
12.60	0.736								
12.63	0.665								
12.67	0.618								
12.70	0.589								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

BIO-RET BASIN ROUTIN

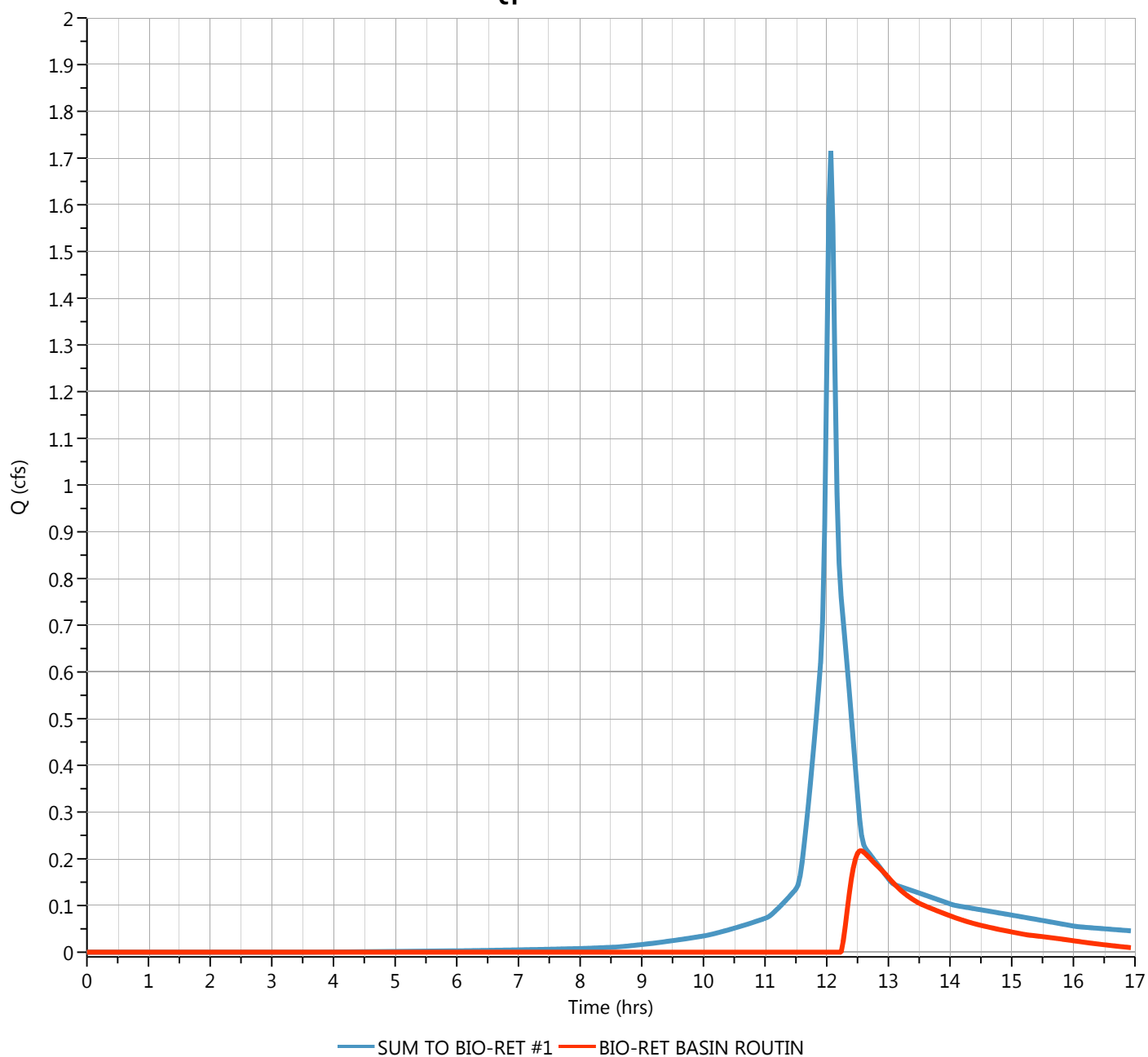
Hyd. No. 7

Hydrograph Type	= Pond Route	Peak Flow	= 0.217 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.53 hrs
Time Interval	= 2 min	Hydrograph Volume	= 1,257 cuft
Inflow Hydrograph	= 3 - SUM TO BIO-RET #1	Max. Elevation	= 50.66 ft
Pond Name	= PROP. BIO-RETENTION BASIN #1	Max. Storage	= 2,458 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 7 min

Qp = 0.22 cfs



Hydrograph Discharge Table

BIO-RET BASIN ROUTIN

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
12.27	0.023	13.47	0.107	14.67	0.052	15.87	0.027		
12.30	0.054	13.50	0.105	14.70	0.051	15.90	0.026		
12.33	0.091	13.53	0.103	14.73	0.051	15.93	0.026		
12.37	0.127	13.57	0.101	14.77	0.050	15.97	0.025		
12.40	0.158	13.60	0.099	14.80	0.049	16.00	0.025		
12.43	0.182	13.63	0.097	14.83	0.048	16.03	0.024		
12.47	0.200	13.67	0.095	14.87	0.047	16.07	0.023		
12.50	0.212	13.70	0.093	14.90	0.046	16.10	0.023		
12.53	0.217	13.73	0.092	14.93	0.045	16.13	0.022		
12.57	0.217	13.77	0.090	14.97	0.044	16.17	0.021		
12.60	0.214	13.80	0.088	15.00	0.043	...end	...end		
12.63	0.210	13.83	0.086	15.03	0.042				
12.67	0.206	13.87	0.085	15.07	0.042				
12.70	0.201	13.90	0.083	15.10	0.041				
12.73	0.196	13.93	0.081	15.13	0.040				
12.77	0.192	13.97	0.080	15.17	0.039				
12.80	0.188	14.00	0.078	15.20	0.038				
12.83	0.183	14.03	0.076	15.23	0.037				
12.87	0.179	14.07	0.075	15.27	0.037				
12.90	0.174	14.10	0.073	15.30	0.036				
12.93	0.170	14.13	0.072	15.33	0.036				
12.97	0.165	14.17	0.070	15.37	0.035				
13.00	0.160	14.20	0.069	15.40	0.035				
13.03	0.155	14.23	0.067	15.43	0.034				
13.07	0.150	14.27	0.066	15.47	0.034				
13.10	0.145	14.30	0.065	15.50	0.033				
13.13	0.141	14.33	0.063	15.53	0.033				
13.17	0.137	14.37	0.062	15.57	0.032				
13.20	0.133	14.40	0.061	15.60	0.032				
13.23	0.129	14.43	0.060	15.63	0.031				
13.27	0.125	14.47	0.059	15.67	0.031				
13.30	0.122	14.50	0.058	15.70	0.030				
13.33	0.119	14.53	0.056	15.73	0.029				
13.37	0.116	14.57	0.055	15.77	0.029				
13.40	0.113	14.60	0.054	15.80	0.028				
13.43	0.110	14.63	0.053	15.83	0.028				

Hydrograph Report

Project Name: 39 Leggett St East Hartford

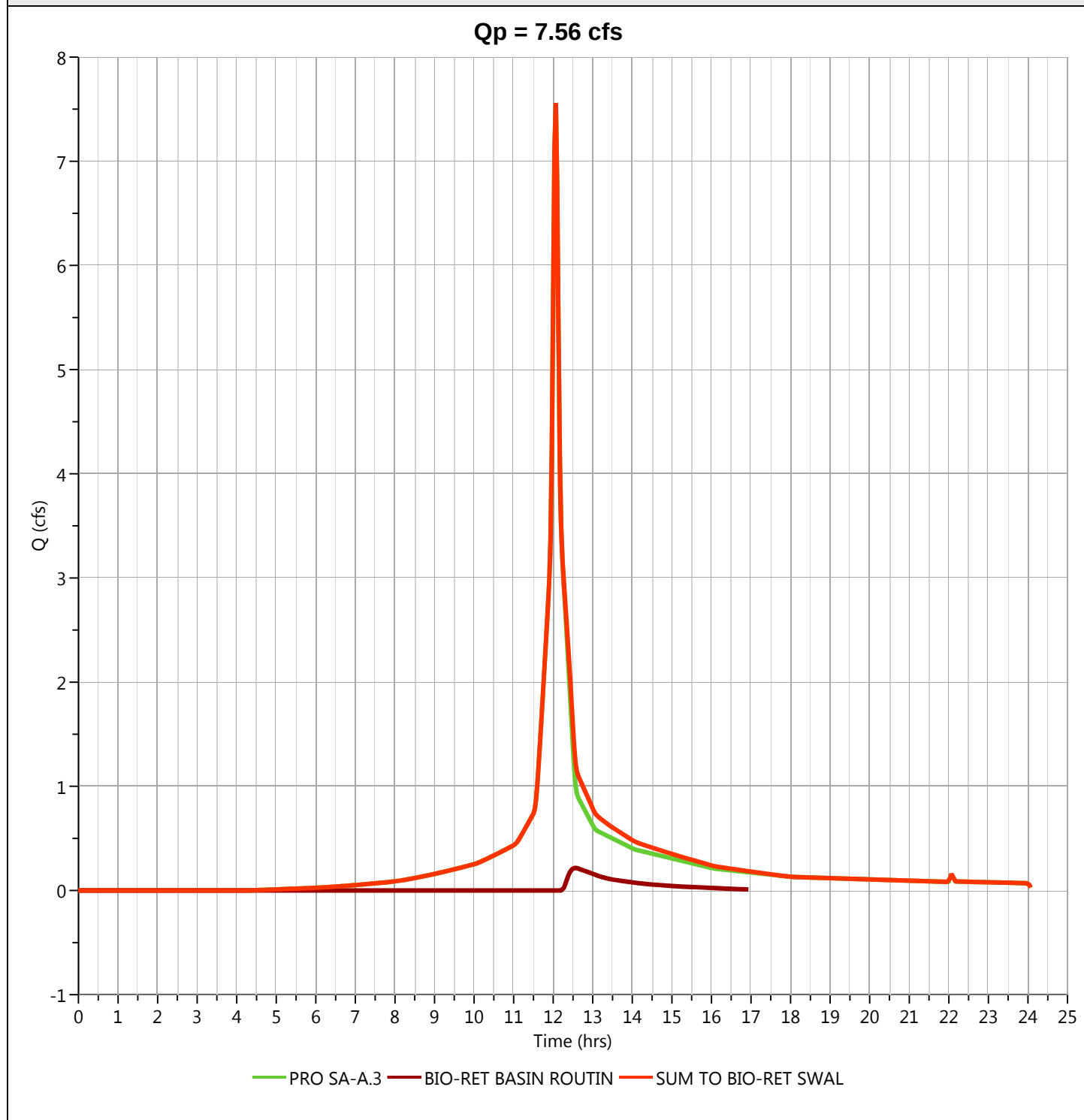
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET SWAL

Hyd. No. 8

Hydrograph Type	= Junction	Peak Flow	= 7.559 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Hydrograph Volume	= 24,745 cuft
Inflow Hydrographs	= 4, 7	Total Contrib. Area	= 1.84 ac



Hydrograph Discharge Table

SUM TO BIO-RET SWAL

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	0.778	12.73	1.015						
11.57	0.871	12.77	0.986						
11.60	1.024	12.80	0.958						
11.63	1.215	12.83	0.930						
11.67	1.420	12.87	0.901						
11.70	1.629	12.90	0.872						
11.73	1.842	12.93	0.844						
11.77	2.060	12.97	0.815						
11.80	2.282	13.00	0.786						
11.83	2.508	13.03	0.758						
11.87	2.738	13.07	0.737						
11.90	2.973	...end	...end						
11.93	3.370								
11.97	4.254								
12.00	5.692								
12.03	7.116								
12.07	7.559								
12.10	6.757								
12.13	5.345								
12.17	4.154								
12.20	3.498								
12.23	3.169								
12.27	2.971								
12.30	2.781								
12.33	2.594								
12.37	2.404								
12.40	2.209								
12.43	2.005								
12.47	1.794								
12.50	1.576								
12.53	1.371								
12.57	1.223								
12.60	1.141								
12.63	1.099								
12.67	1.071								
12.70	1.043								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

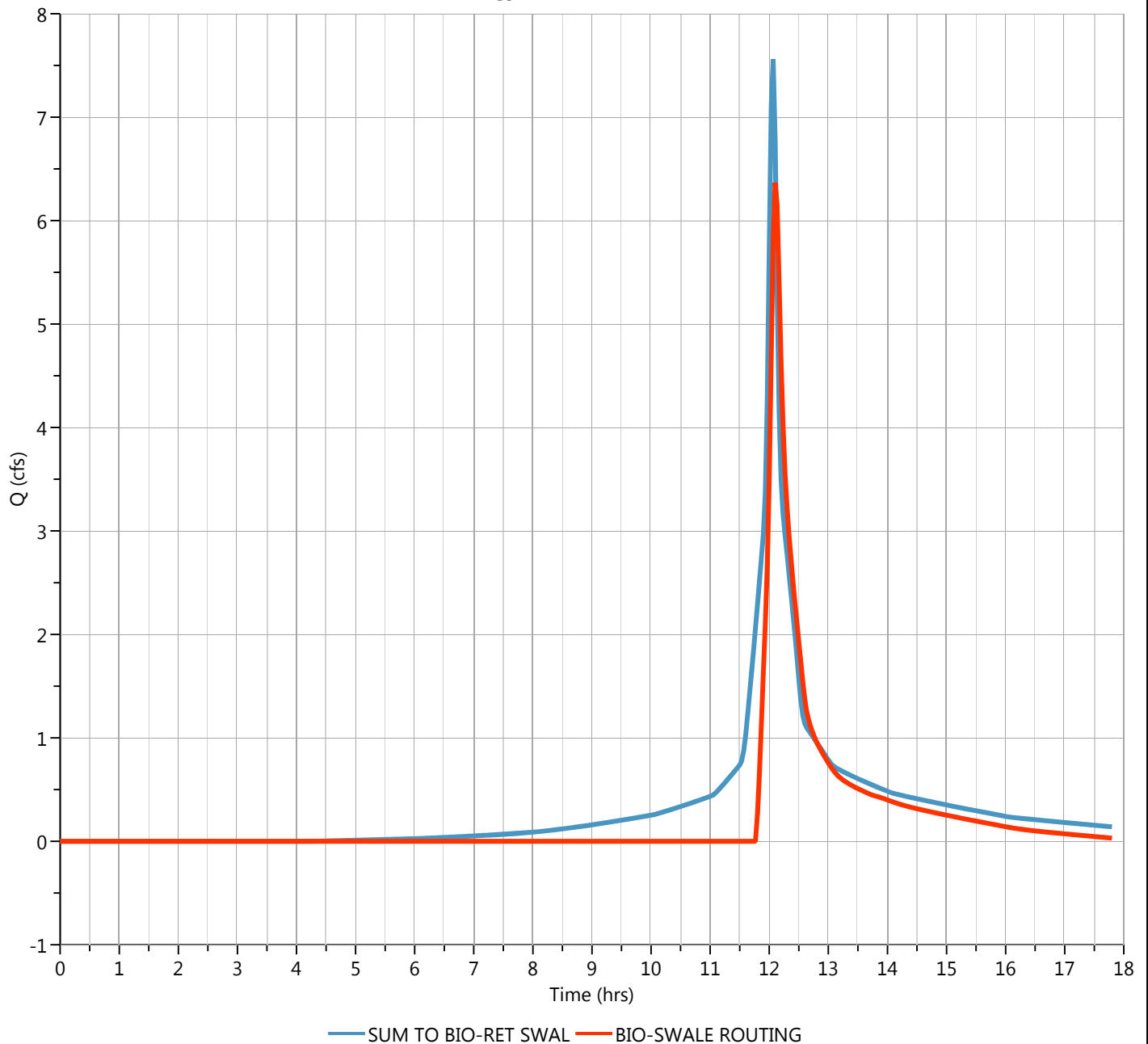
BIO-SWALE ROUTING

Hyd. No. 9

Hydrograph Type	= Pond Route	Peak Flow	= 6.367 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Hydrograph Volume	= 14,668 cuft
Inflow Hydrograph	= 8 - SUM TO BIO-RET SWAL	Max. Elevation	= 49.29 ft
Pond Name	= PROP. BIO-RETENTION SWALE	Max. Storage	= 5,662 cuft

Pond Routing by Storage Indication Method

Qp = 6.37 cfs



Hydrograph Discharge Table

BIO-SWALE ROUTING

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.83	0.650	13.03	0.728						
11.87	1.137	13.07	0.699						
11.90	1.631	13.10	0.673						
11.93	2.098	13.13	0.651						
11.97	2.665	13.17	0.631						
12.00	3.500	...end	...end						
12.03	4.668								
12.07	5.807								
12.10	6.367								
12.13	6.146								
12.17	5.420								
12.20	4.645								
12.23	4.018								
12.27	3.557								
12.30	3.239								
12.33	2.972								
12.37	2.735								
12.40	2.516								
12.43	2.311								
12.47	2.128								
12.50	1.935								
12.53	1.737								
12.57	1.546								
12.60	1.380								
12.63	1.254								
12.67	1.174								
12.70	1.109								
12.73	1.053								
12.77	1.005								
12.80	0.962								
12.83	0.923								
12.87	0.887								
12.90	0.853								
12.93	0.820								
12.97	0.788								
13.00	0.758								

Hydrograph Report

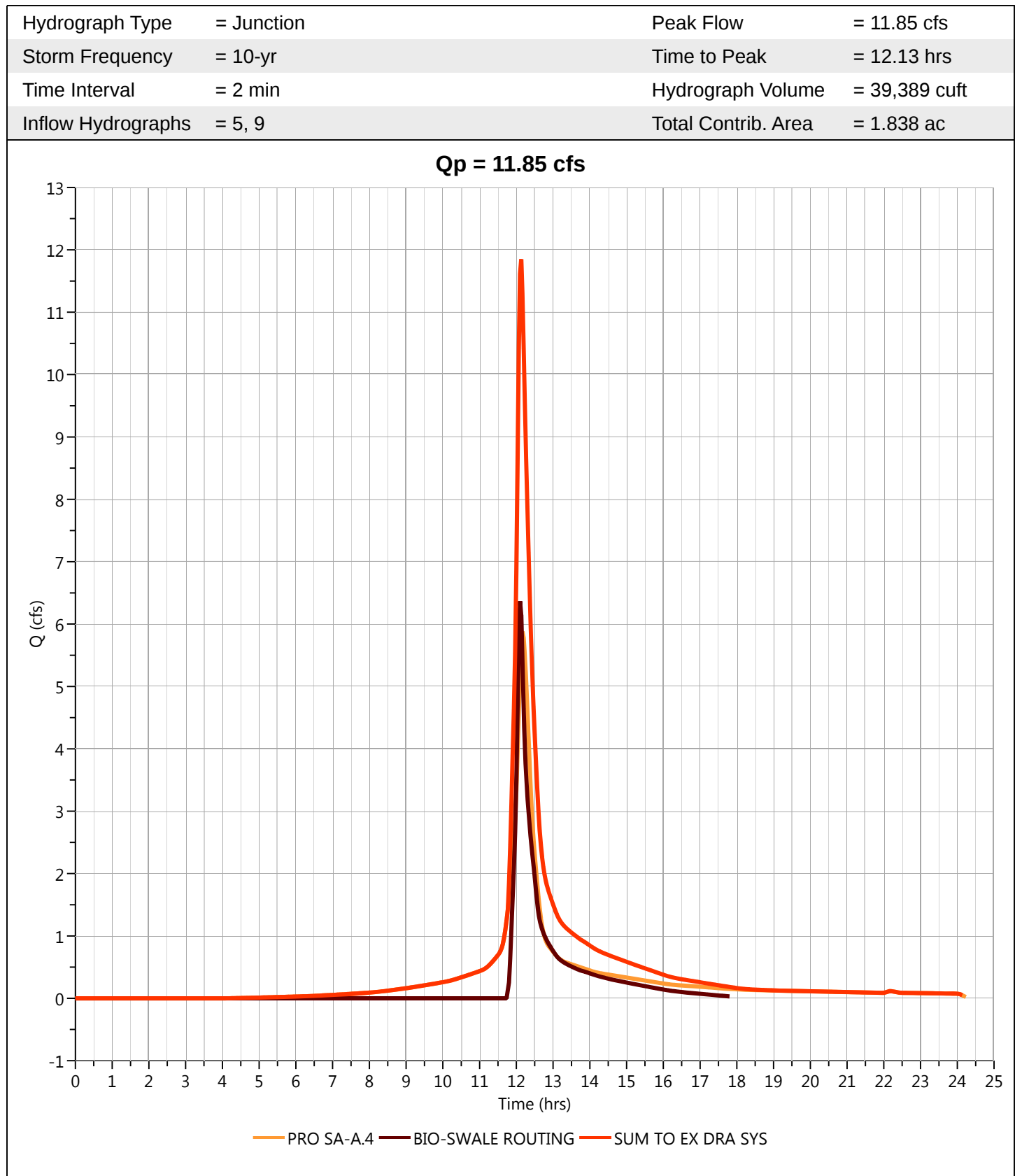
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX DRA SYS

Hyd. No. 10



Hydrograph Discharge Table

SUM TO EX DRA SYS

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.73	1.247	12.93	1.616						
11.77	1.419	12.97	1.559						
11.80	1.866	13.00	1.504						
11.83	2.466	13.03	1.449						
11.87	3.173	13.07	1.396						
11.90	3.894	13.10	1.347						
11.93	4.621	13.13	1.304						
11.97	5.530	13.17	1.267						
12.00	6.842	13.20	1.234						
12.03	8.619	13.23	1.206						
12.07	10.43	13.27	1.181						
12.10	11.62	...end	...end						
12.13	11.85								
12.17	11.30								
12.20	10.42								
12.23	9.498								
12.27	8.644								
12.30	7.887								
12.33	7.145								
12.37	6.423								
12.40	5.749								
12.43	5.162								
12.47	4.679								
12.50	4.233								
12.53	3.801								
12.57	3.385								
12.60	3.010								
12.63	2.697								
12.67	2.460								
12.70	2.268								
12.73	2.113								
12.77	1.988								
12.80	1.887								
12.83	1.804								
12.87	1.735								
12.90	1.674								

Design Storm Report

Custom Storm filename:

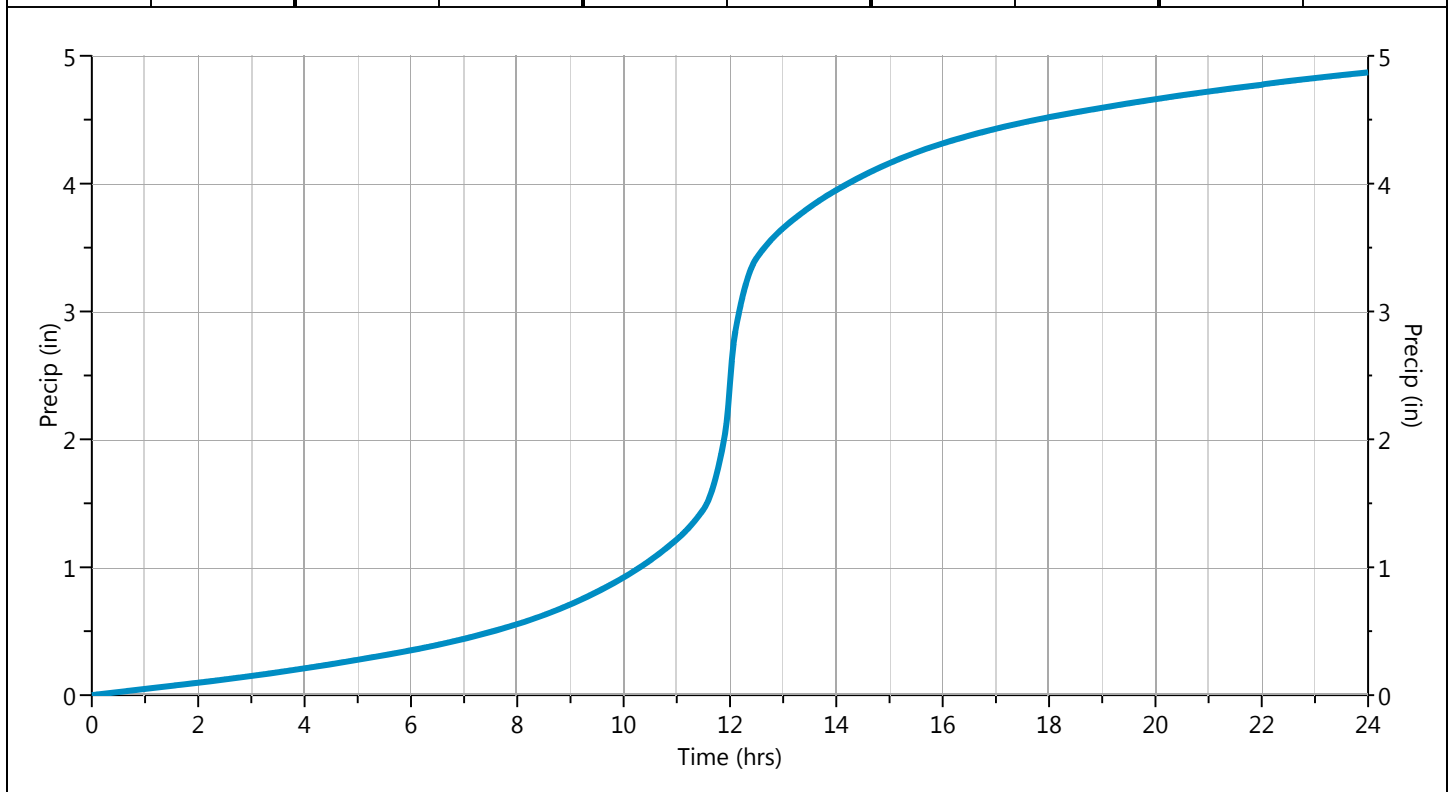
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	5-yr	✓ 10-yr	25-yr	50-yr	100-yr	
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72	

Incremental Rainfall Distribution, 10-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0118	11.37	0.0171	11.73	0.0503	12.10	0.0964	12.47	0.0265
11.03	0.0121	11.40	0.0176	11.77	0.0550	12.13	0.0742	12.50	0.0217
11.07	0.0126	11.43	0.0181	11.80	0.0598	12.17	0.0693	12.53	0.0190
11.10	0.0131	11.47	0.0186	11.83	0.0646	12.20	0.0646	12.57	0.0186
11.13	0.0136	11.50	0.0191	11.87	0.0693	12.23	0.0598	12.60	0.0181
11.17	0.0141	11.53	0.0217	11.90	0.0741	12.27	0.0550	12.63	0.0176
11.20	0.0146	11.57	0.0265	11.93	0.0966	12.30	0.0503	12.67	0.0171
11.23	0.0151	11.60	0.0312	11.97	0.1364	12.33	0.0455	12.70	0.0166
11.27	0.0156	11.63	0.0360	12.00	0.1763	12.37	0.0407	12.73	0.0161
11.30	0.0161	11.67	0.0407	12.03	0.1761	12.40	0.0360	12.77	0.0156
11.33	0.0166	11.70	0.0455	12.07	0.1364	12.43	0.0312	12.80	0.0151



Hydrograph 25-yr Summary

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

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Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

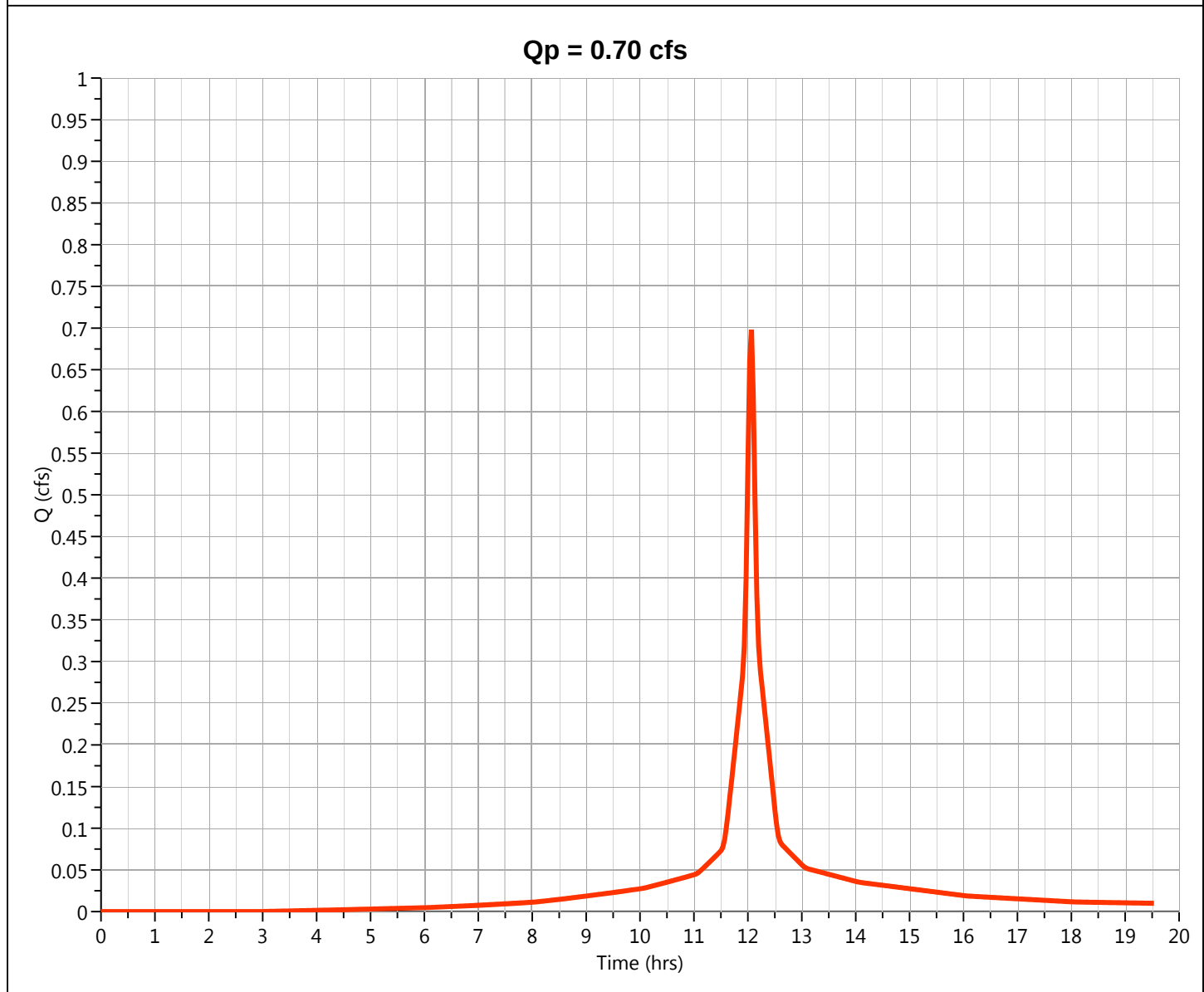
PRO SA-A.1

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.698 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 2,238 cuft
Drainage Area	= 0.13 ac	Curve Number	= 92*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 5.9900 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.11	98	B - PAVED
0.02	61	B - LAWN
0.13	92	Weighted Average



Hydrograph Discharge Table

PRO SA-A.1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.47	0.071	12.67	0.078						
11.50	0.073	12.70	0.076						
11.53	0.077	12.73	0.074						
11.57	0.086	12.77	0.071						
11.60	0.100	12.80	0.069						
11.63	0.119	...end	...end						
11.67	0.138								
11.70	0.158								
11.73	0.178								
11.77	0.199								
11.80	0.219								
11.83	0.240								
11.87	0.261								
11.90	0.282								
11.93	0.318								
11.97	0.399								
12.00	0.531								
12.03	0.660								
12.07	0.698								
12.10	0.621								
12.13	0.490								
12.17	0.379								
12.20	0.319								
12.23	0.288								
12.27	0.268								
12.30	0.247								
12.33	0.227								
12.37	0.206								
12.40	0.185								
12.43	0.165								
12.47	0.144								
12.50	0.123								
12.53	0.104								
12.57	0.091								
12.60	0.084								
12.63	0.080								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

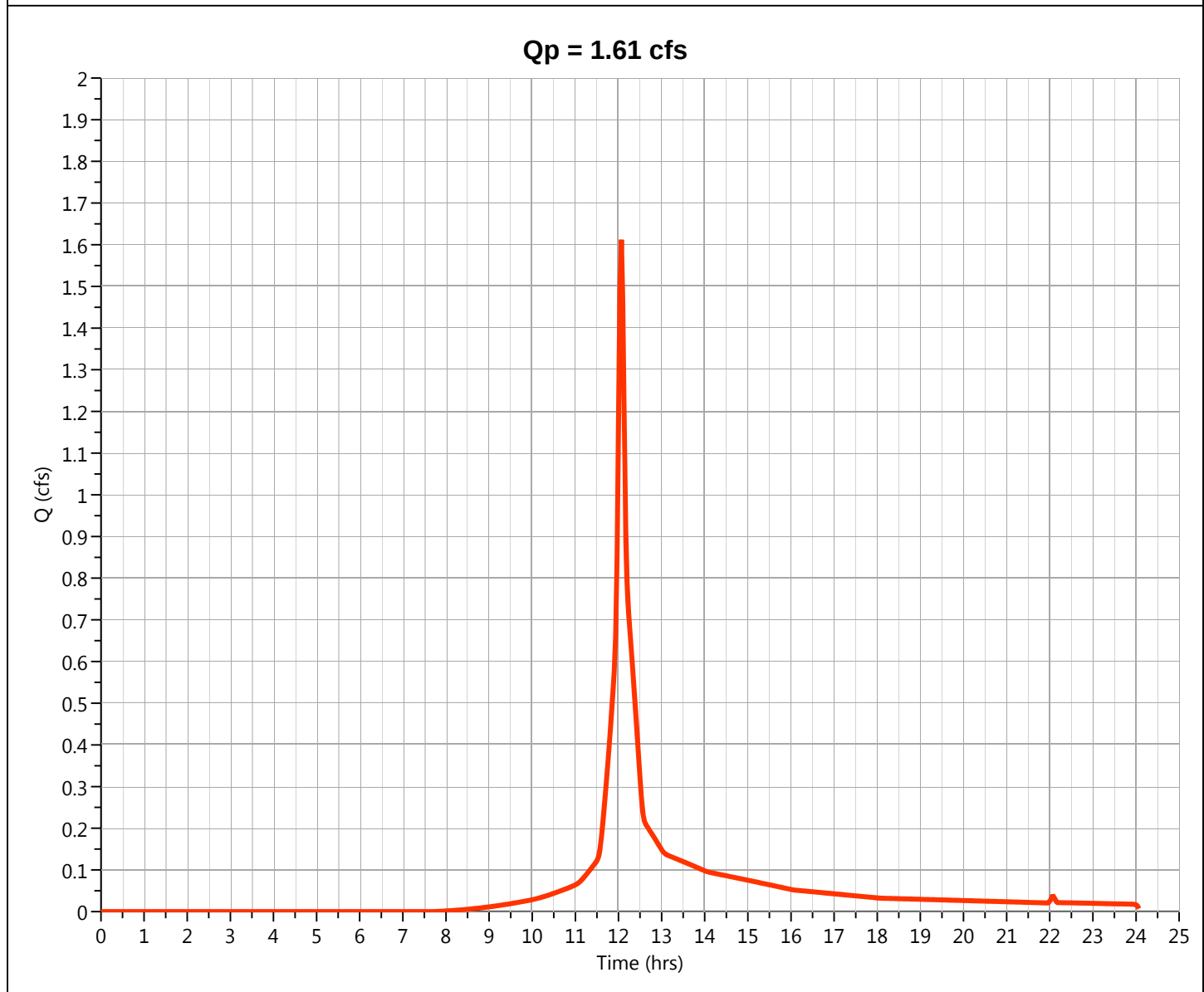
PRO SA-A.2

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.612 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 4,819 cuft
Drainage Area	= 0.42 ac	Curve Number	= 76*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.31 min
Total Rainfall	= 5.9900 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.168	98	B - PAVED
0.252	61	B - LAWN
0.42	76	Weighted Average



Hydrograph Discharge Table

PRO SA-A.2

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.174	12.80	0.182						
11.63	0.209	12.83	0.177						
11.67	0.247	12.87	0.171						
11.70	0.287	12.90	0.166						
11.73	0.329	12.93	0.160						
11.77	0.374	...end	...end						
11.80	0.420								
11.83	0.469								
11.87	0.520								
11.90	0.574								
11.93	0.662								
11.97	0.852								
12.00	1.165								
12.03	1.488								
12.07	1.612								
12.10	1.466								
12.13	1.177								
12.17	0.926								
12.20	0.787								
12.23	0.718								
12.27	0.672								
12.30	0.625								
12.33	0.576								
12.37	0.526								
12.40	0.476								
12.43	0.424								
12.47	0.372								
12.50	0.319								
12.53	0.270								
12.57	0.236								
12.60	0.218								
12.63	0.209								
12.67	0.204								
12.70	0.199								
12.73	0.193								
12.77	0.188								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

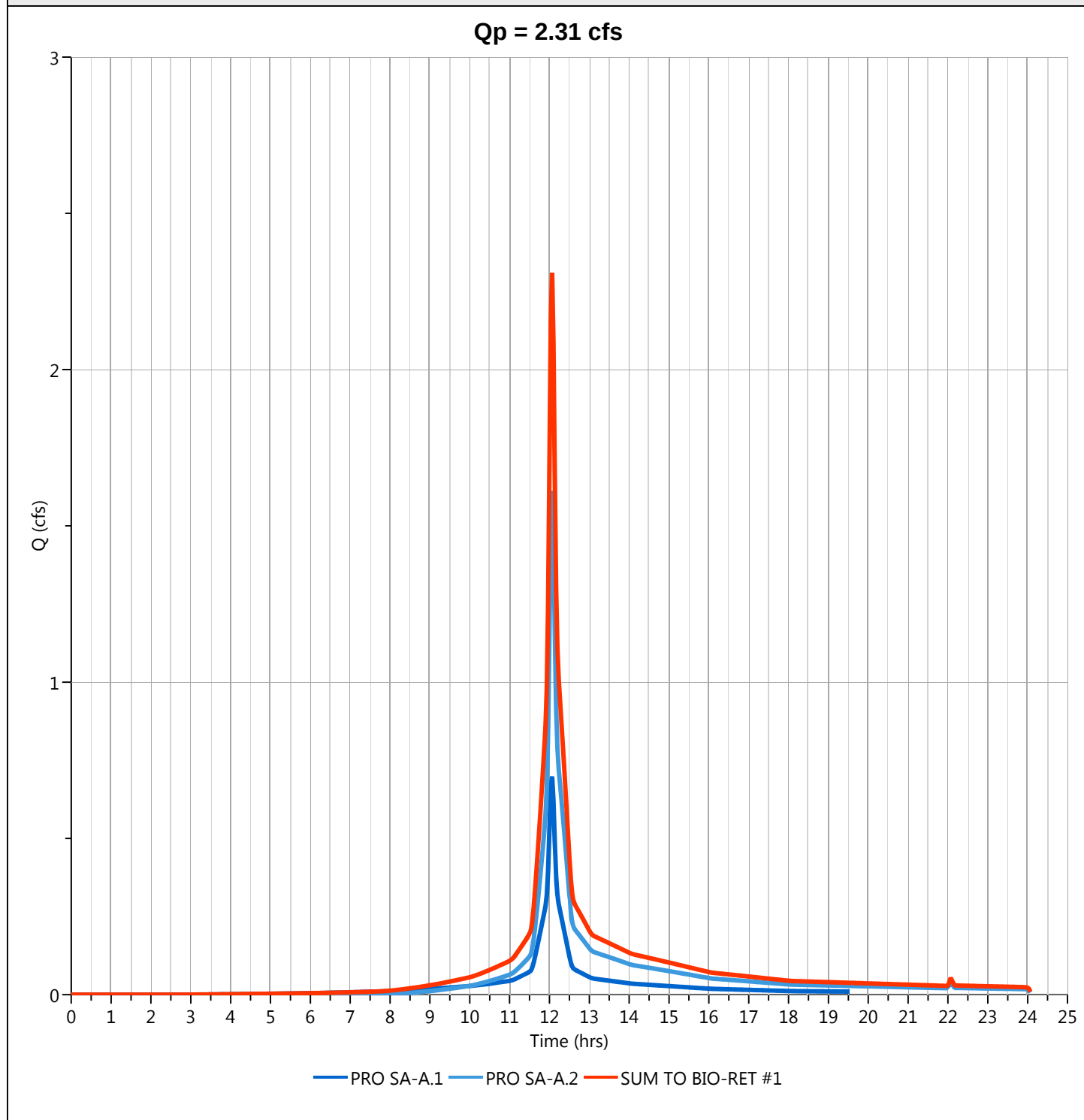
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET #1

Hyd. No. 3

Hydrograph Type	= Junction	Peak Flow	= 2.310 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Hydrograph Volume	= 7,057 cuft
Inflow Hydrographs	= 1, 2	Total Contrib. Area	= 0.55 ac



Hydrograph Discharge Table

SUM TO BIO-RET #1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.233	12.77	0.259						
11.60	0.275	12.80	0.252						
11.63	0.328	12.83	0.244						
11.67	0.386	12.87	0.236						
11.70	0.445	12.90	0.228						
11.73	0.508	...end	...end						
11.77	0.572								
11.80	0.639								
11.83	0.709								
11.87	0.781								
11.90	0.855								
11.93	0.980								
11.97	1.251								
12.00	1.696								
12.03	2.149								
12.07	2.310								
12.10	2.087								
12.13	1.666								
12.17	1.305								
12.20	1.106								
12.23	1.006								
12.27	0.940								
12.30	0.872								
12.33	0.803								
12.37	0.732								
12.40	0.661								
12.43	0.589								
12.47	0.516								
12.50	0.442								
12.53	0.374								
12.57	0.327								
12.60	0.301								
12.63	0.289								
12.67	0.282								
12.70	0.274								
12.73	0.267								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

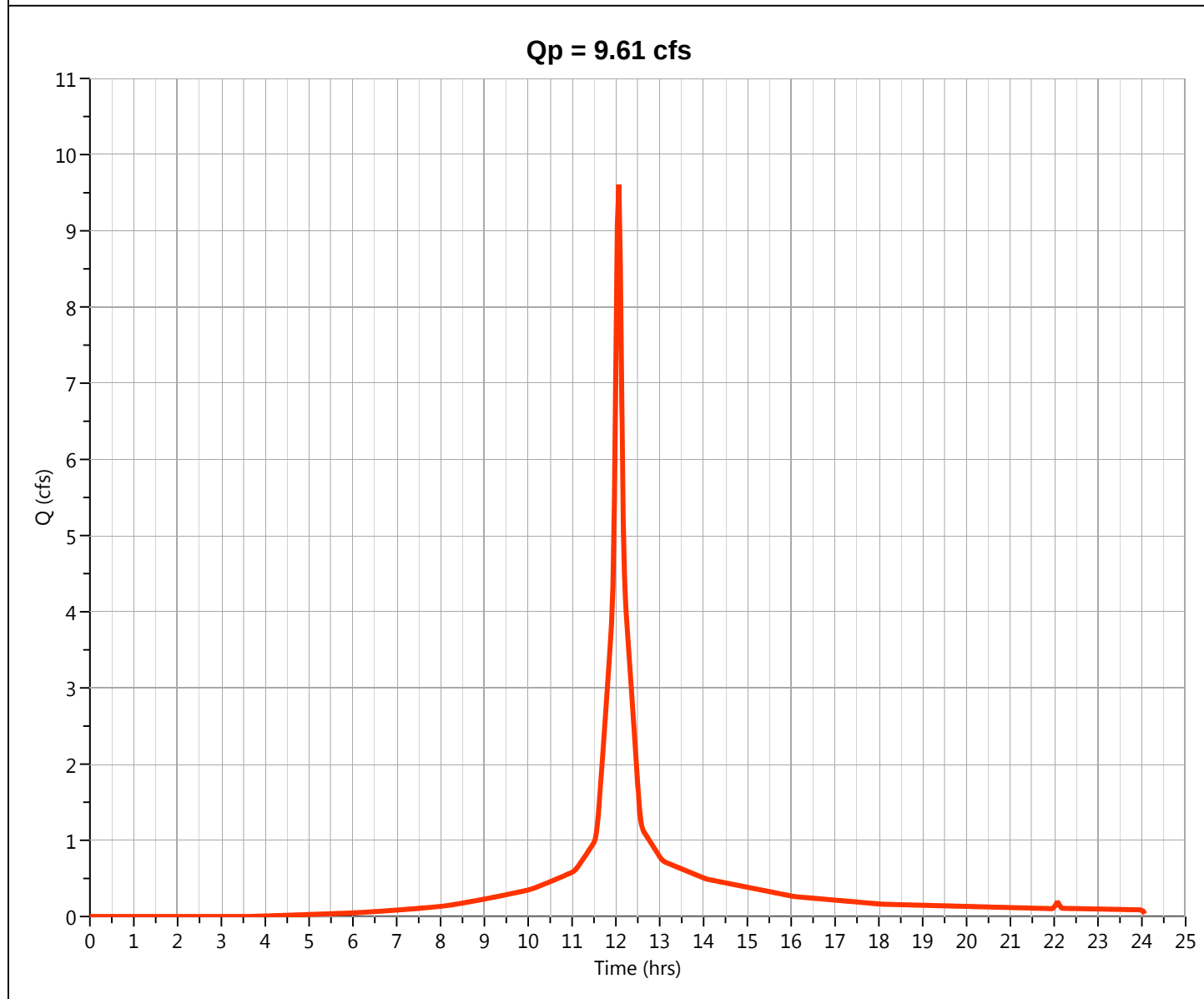
PRO SA-A.3

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 9.607 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 30,283 cuft
Drainage Area	= 1.84 ac	Curve Number	= 90*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.95 min
Total Rainfall	= 5.9900 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LAWN
1.84	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.3

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.50	0.971	12.70	1.056						
11.53	1.023	12.73	1.026						
11.57	1.144	12.77	0.996						
11.60	1.343	12.80	0.966						
11.63	1.591	12.83	0.935						
11.67	1.857	...end	...end						
11.70	2.126								
11.73	2.400								
11.77	2.678								
11.80	2.960								
11.83	3.246								
11.87	3.536								
11.90	3.831								
11.93	4.333								
11.97	5.453								
12.00	7.275								
12.03	9.068								
12.07	9.607								
12.10	8.568								
12.13	6.764								
12.17	5.248								
12.20	4.414								
12.23	3.995								
12.27	3.714								
12.30	3.432								
12.33	3.149								
12.37	2.864								
12.40	2.577								
12.43	2.290								
12.47	2.002								
12.50	1.712								
12.53	1.448								
12.57	1.262								
12.60	1.163								
12.63	1.116								
12.67	1.086								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

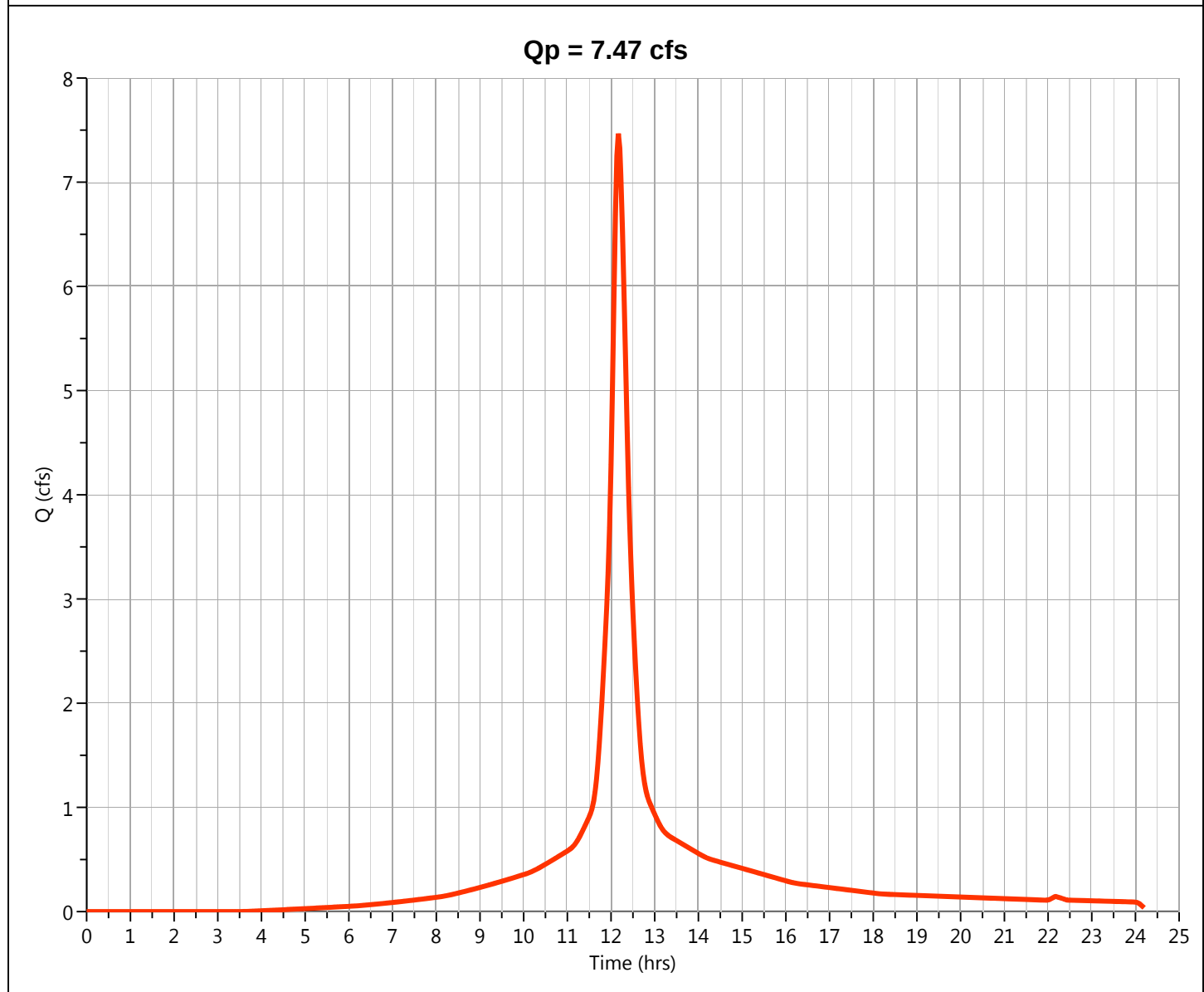
PRO SA-A.4

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 7.467 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 31,799 cuft
Drainage Area	= 1.838 ac	Curve Number	= 90.47*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.12 min
Total Rainfall	= 5.9900 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LANDSCAPED
1.838	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.4

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.33	0.762	12.53	2.591						
11.37	0.791	12.57	2.307						
11.40	0.820	12.60	2.044						
11.43	0.850	12.63	1.809						
11.47	0.881	12.67	1.612						
11.50	0.911	12.70	1.453						
11.53	0.945	12.73	1.328						
11.57	0.991	12.77	1.232						
11.60	1.055	12.80	1.159						
11.63	1.146	12.83	1.104						
11.67	1.271	12.87	1.062						
11.70	1.432	12.90	1.028						
11.73	1.626	12.93	0.996						
11.77	1.847	12.97	0.965						
11.80	2.092	13.00	0.933						
11.83	2.356	13.03	0.902						
11.87	2.635	13.07	0.872						
11.90	2.926	13.10	0.844						
11.93	3.255	13.13	0.818						
11.97	3.687	13.17	0.795						
12.00	4.290	13.20	0.776						
12.03	5.056	13.23	0.760						
12.07	5.902	13.27	0.746						
12.10	6.687	...end	...end						
12.13	7.252								
12.17	7.467								
12.20	7.323								
12.23	6.939								
12.27	6.432								
12.30	5.870								
12.33	5.264								
12.37	4.646								
12.40	4.068								
12.43	3.585								
12.47	3.205								
12.50	2.886								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

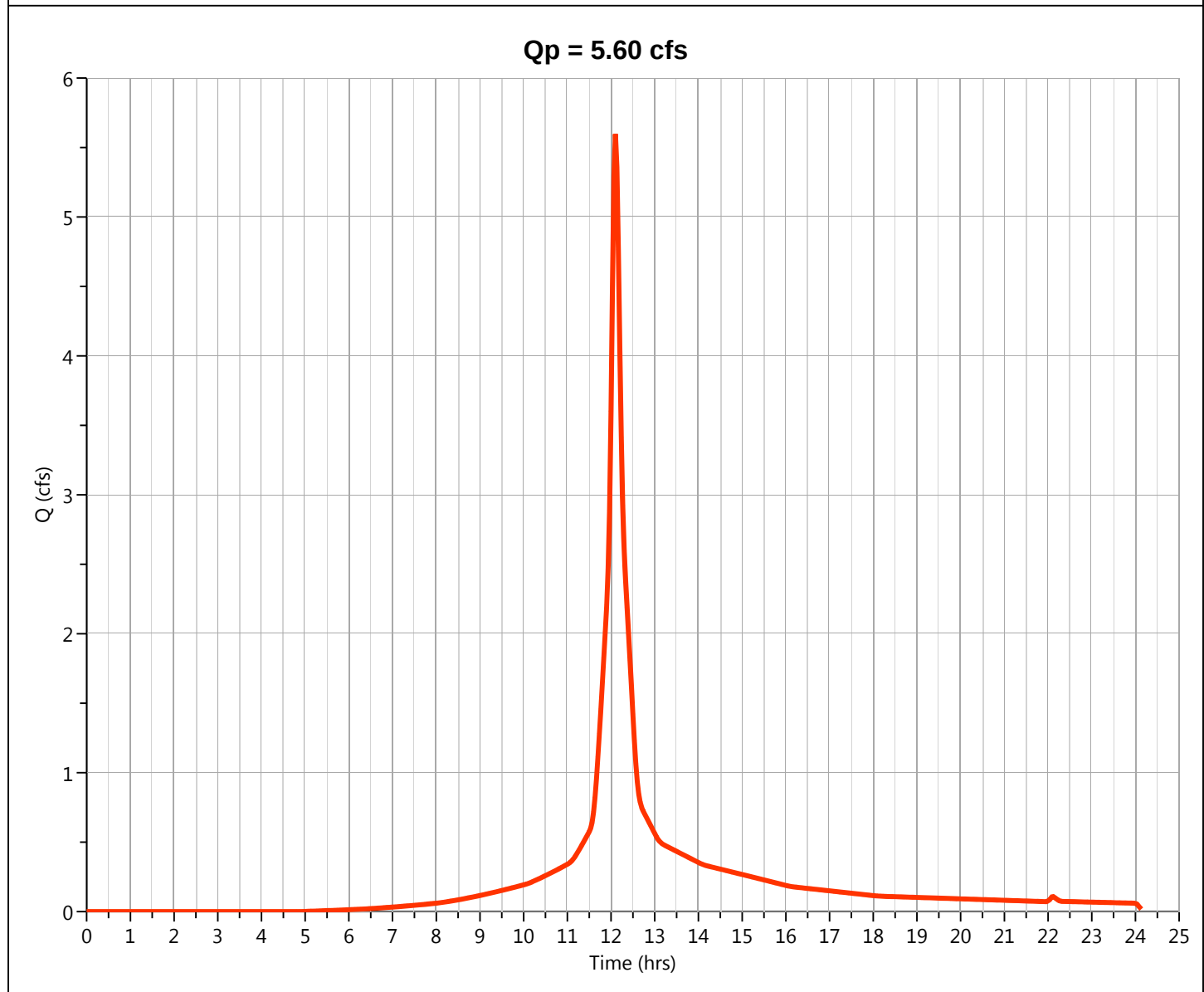
PRO SA-C

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 5.596 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 19,562 cuft
Drainage Area	= 1.22 ac	Curve Number	= 86.16*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.4 min
Total Rainfall	= 5.9900 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.38	61	B - GRASS
1.22	86	Weighted Average



Hydrograph Discharge Table

PRO SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.50	0.574	12.70	0.749						
11.53	0.600	12.73	0.725						
11.57	0.643	12.77	0.704						
11.60	0.717	12.80	0.684						
11.63	0.824	12.83	0.664						
11.67	0.958	12.87	0.643						
11.70	1.113	12.90	0.623						
11.73	1.282	12.93	0.603						
11.77	1.459	12.97	0.582						
11.80	1.640	13.00	0.562						
11.83	1.825	13.03	0.542						
11.87	2.014	...end	...end						
11.90	2.208								
11.93	2.461								
11.97	2.887								
12.00	3.603								
12.03	4.512								
12.07	5.289								
12.10	5.596								
12.13	5.357								
12.17	4.766								
12.20	4.058								
12.23	3.413								
12.27	2.922								
12.30	2.599								
12.33	2.377								
12.37	2.189								
12.40	1.999								
12.43	1.808								
12.47	1.615								
12.50	1.421								
12.53	1.233								
12.57	1.067								
12.60	0.937								
12.63	0.847								
12.67	0.787								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

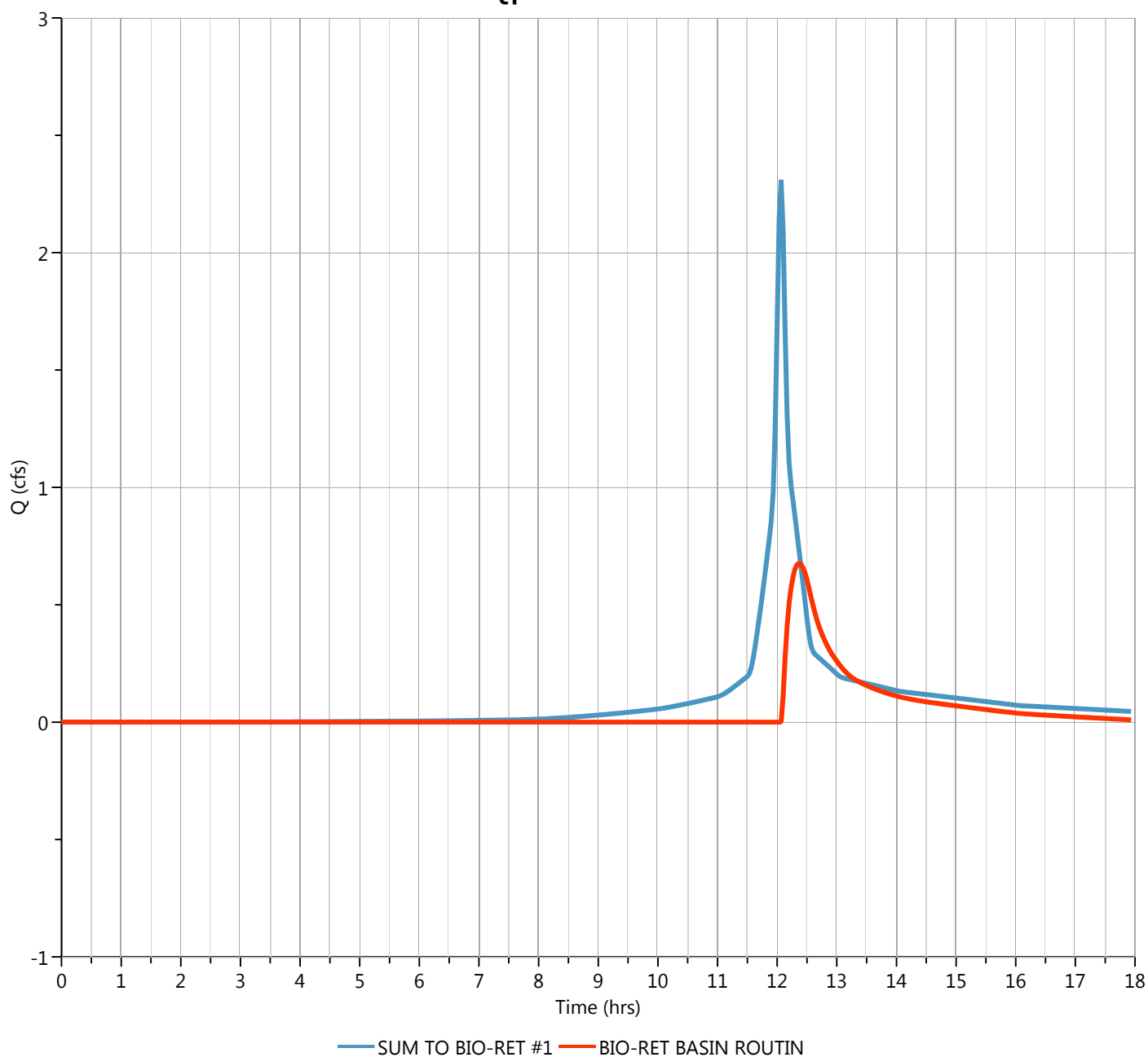
BIO-RET BASIN ROUTIN

Hyd. No. 7

Hydrograph Type	= Pond Route	Peak Flow	= 0.677 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.37 hrs
Time Interval	= 2 min	Hydrograph Volume	= 2,801 cuft
Inflow Hydrograph	= 3 - SUM TO BIO-RET #1	Max. Elevation	= 50.85 ft
Pond Name	= PROP. BIO-RETENTION BASIN #1	Max. Storage	= 2,876 cuft

Pond Routing by Storage Indication Method

Qp = 0.68 cfs



Hydrograph Discharge Table

BIO-RET BASIN ROUTIN

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
12.10	0.110	13.30	0.182	14.50	0.087				
12.13	0.275	13.33	0.177	14.53	0.085				
12.17	0.409	13.37	0.173	14.57	0.084				
12.20	0.505	13.40	0.168	14.60	0.083				
12.23	0.572	13.43	0.164	14.63	0.082				
12.27	0.620	13.47	0.160	14.67	0.081				
12.30	0.653	13.50	0.156	14.70	0.079				
12.33	0.671	13.53	0.152	14.73	0.078				
12.37	0.677	13.57	0.149	14.77	0.077				
12.40	0.672	13.60	0.145	14.80	0.076				
12.43	0.658	13.63	0.142	14.83	0.075				
12.47	0.636	13.67	0.139	14.87	0.074				
12.50	0.606	13.70	0.136	14.90	0.073				
12.53	0.571	13.73	0.133	14.93	0.071				
12.57	0.533	13.77	0.130	14.97	0.070				
12.60	0.498	13.80	0.127	15.00	0.069				
12.63	0.465	13.83	0.124	15.03	0.068				
12.67	0.435	13.87	0.122	15.07	0.067				
12.70	0.408	13.90	0.119	...end	...end				
12.73	0.386	13.93	0.116						
12.77	0.365	13.97	0.114						
12.80	0.346	14.00	0.111						
12.83	0.329	14.03	0.109						
12.87	0.312	14.07	0.107						
12.90	0.297	14.10	0.104						
12.93	0.284	14.13	0.103						
12.97	0.271	14.17	0.101						
13.00	0.260	14.20	0.099						
13.03	0.248	14.23	0.098						
13.07	0.237	14.27	0.096						
13.10	0.227	14.30	0.095						
13.13	0.218	14.33	0.093						
13.17	0.209	14.37	0.092						
13.20	0.201	14.40	0.091						
13.23	0.194	14.43	0.089						
13.27	0.188	14.47	0.088						

Hydrograph Report

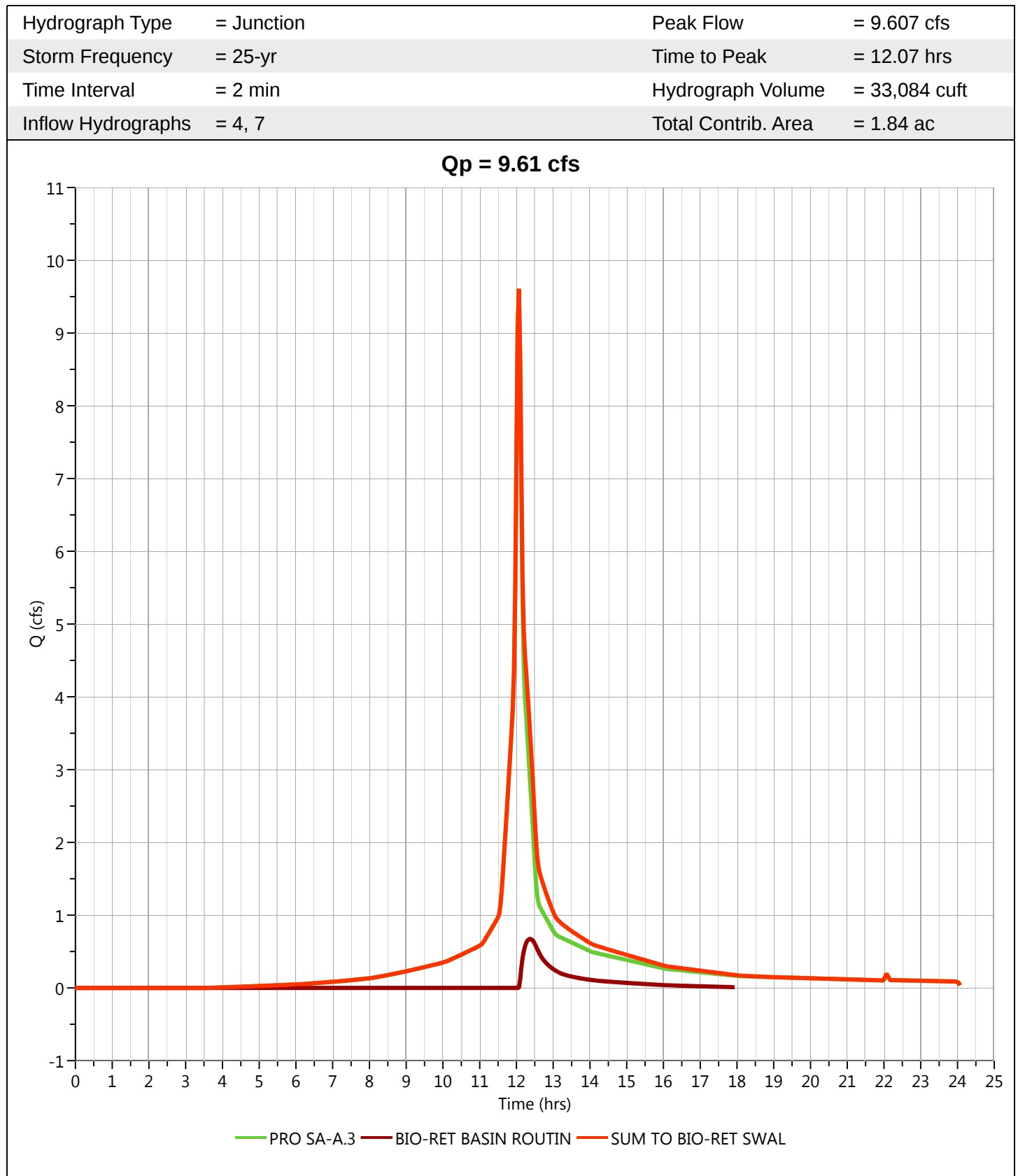
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET SWAL

Hyd. No. 8



Hydrograph Discharge Table

SUM TO BIO-RET SWAL

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.50	0.971	12.70	1.464						
11.53	1.023	12.73	1.412						
11.57	1.144	12.77	1.361						
11.60	1.343	12.80	1.312						
11.63	1.591	12.83	1.264						
11.67	1.857	12.87	1.217						
11.70	2.126	12.90	1.172						
11.73	2.400	12.93	1.128						
11.77	2.678	12.97	1.086						
11.80	2.960	13.00	1.043						
11.83	3.246	13.03	1.004						
11.87	3.536	13.07	0.972						
11.90	3.831	13.10	0.948						
11.93	4.333	...end	...end						
11.97	5.453								
12.00	7.275								
12.03	9.068								
12.07	9.607								
12.10	8.678								
12.13	7.040								
12.17	5.657								
12.20	4.919								
12.23	4.567								
12.27	4.335								
12.30	4.085								
12.33	3.820								
12.37	3.541								
12.40	3.250								
12.43	2.948								
12.47	2.637								
12.50	2.318								
12.53	2.019								
12.57	1.795								
12.60	1.661								
12.63	1.581								
12.67	1.521								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

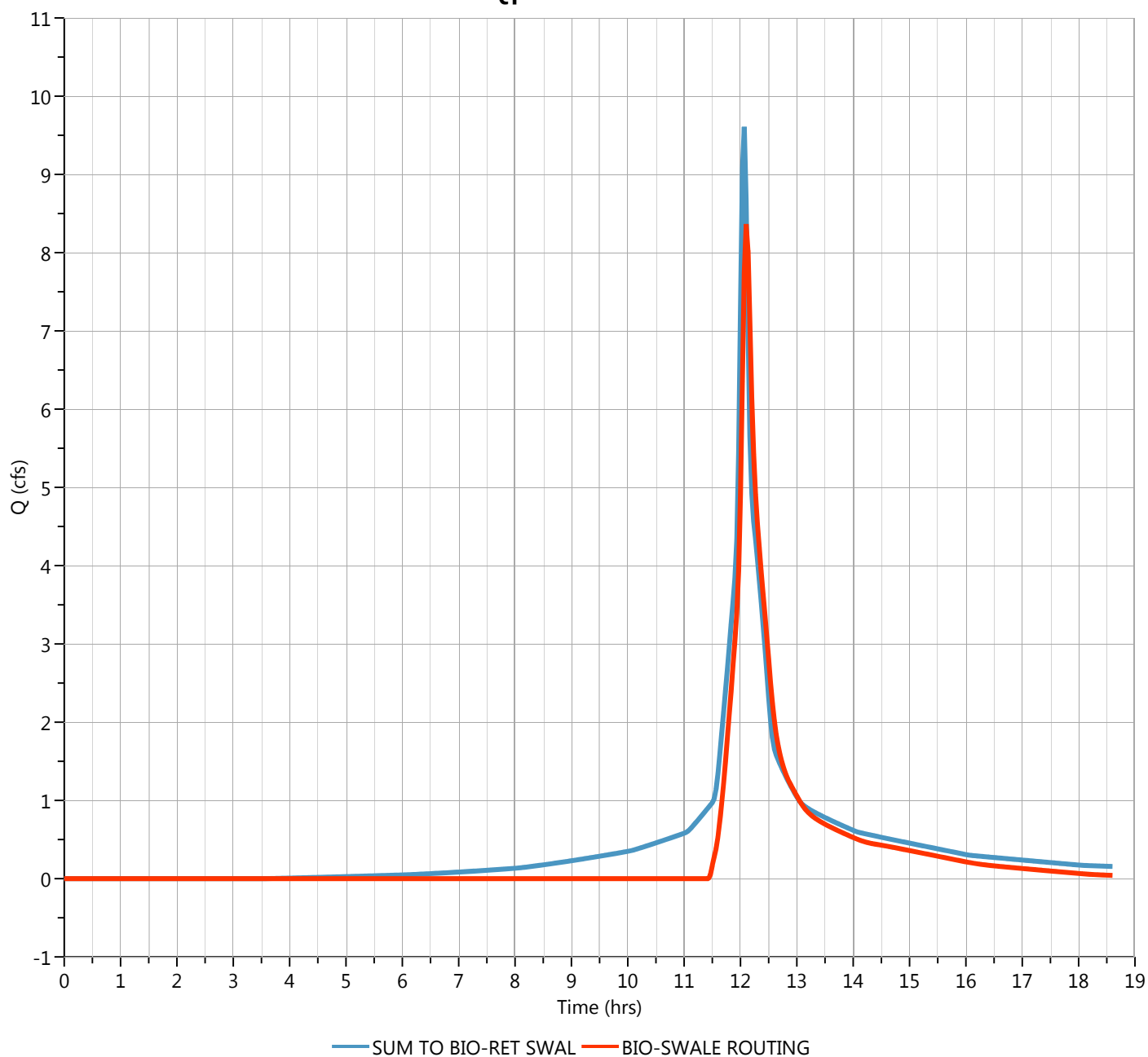
BIO-SWALE ROUTING

Hyd. No. 9

Hydrograph Type	= Pond Route	Peak Flow	= 8.365 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Hydrograph Volume	= 22,296 cuft
Inflow Hydrograph	= 8 - SUM TO BIO-RET SWAL	Max. Elevation	= 49.35 ft
Pond Name	= PROP. BIO-RETENTION SWALE	Max. Storage	= 6,026 cuft

Pond Routing by Storage Indication Method

Qp = 8.37 cfs



Hydrograph Discharge Table

BIO-SWALE ROUTING

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.67	0.969	12.87	1.233						
11.70	1.205	12.90	1.188						
11.73	1.496	12.93	1.143						
11.77	1.798	12.97	1.099						
11.80	2.092	13.00	1.055						
11.83	2.388	13.03	1.013						
11.87	2.721	13.07	0.972						
11.90	3.037	13.10	0.934						
11.93	3.385	13.13	0.901						
11.97	3.941	13.17	0.872						
12.00	4.918	13.20	0.847						
12.03	6.352	13.23	0.824						
12.07	7.743	...end	...end						
12.10	8.365								
12.13	8.029								
12.17	7.103								
12.20	6.157								
12.23	5.423								
12.27	4.915								
12.30	4.547								
12.33	4.228								
12.37	3.930								
12.40	3.638								
12.43	3.374								
12.47	3.095								
12.50	2.803								
12.53	2.504								
12.57	2.238								
12.60	2.023								
12.63	1.844								
12.67	1.702								
12.70	1.587								
12.73	1.493								
12.77	1.414								
12.80	1.344								
12.83	1.281								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

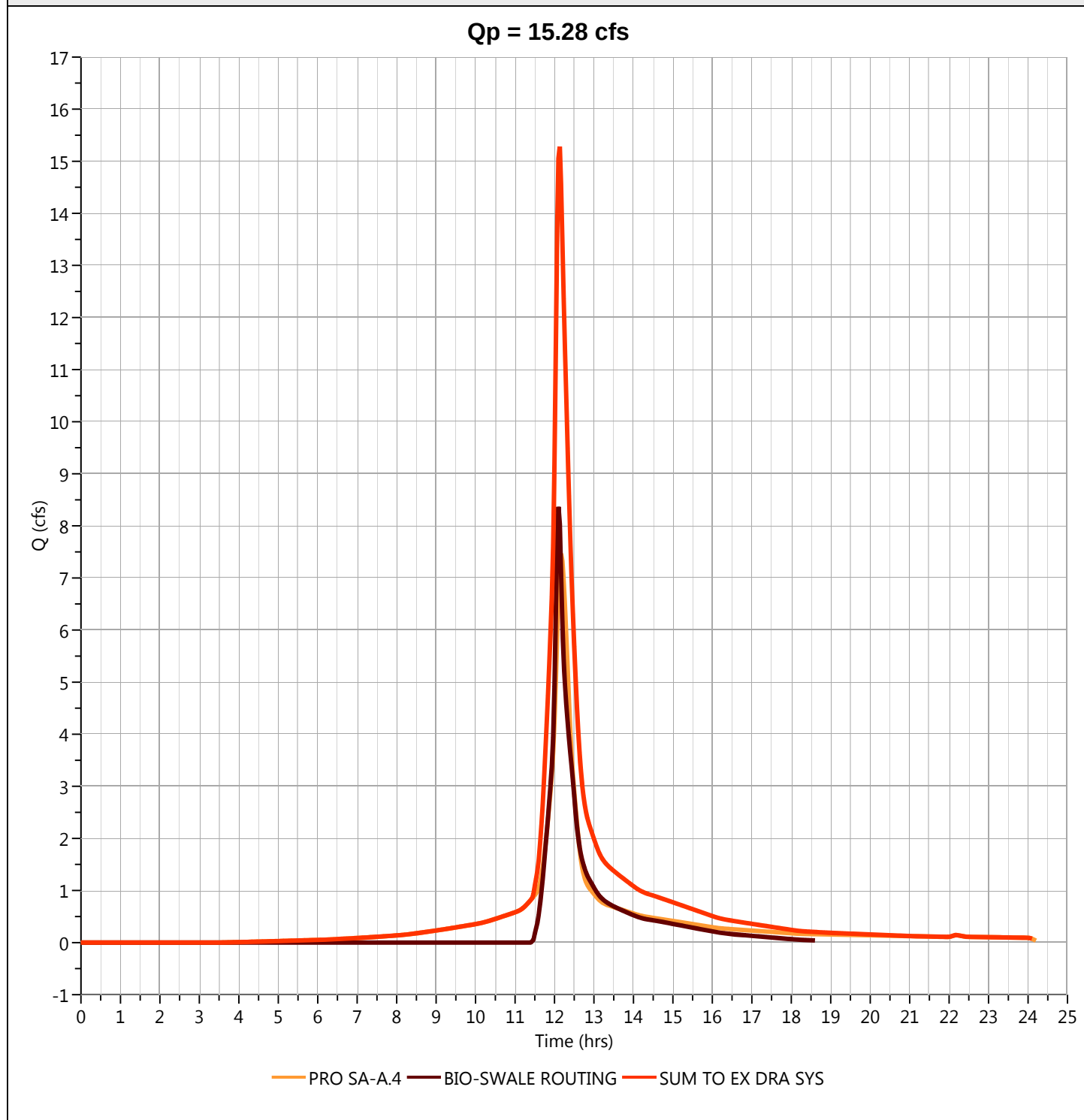
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX DRA SYS

Hyd. No. 10

Hydrograph Type	= Junction	Peak Flow	= 15.28 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.13 hrs
Time Interval	= 2 min	Hydrograph Volume	= 54,095 cuft
Inflow Hydrographs	= 5, 9	Total Contrib. Area	= 1.838 ac



Hydrograph Discharge Table

SUM TO EX DRA SYS

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	1.585	12.80	2.502						
11.63	1.890	12.83	2.385						
11.67	2.240	12.87	2.295						
11.70	2.637	12.90	2.216						
11.73	3.121	12.93	2.140						
11.77	3.645	12.97	2.064						
11.80	4.184	13.00	1.989						
11.83	4.744	13.03	1.915						
11.87	5.356	13.07	1.844						
11.90	5.963	13.10	1.778						
11.93	6.640	13.13	1.719						
11.97	7.629	13.17	1.667						
12.00	9.208	13.20	1.622						
12.03	11.41	13.23	1.583						
12.07	13.64	13.27	1.549						
12.10	15.05	13.30	1.519						
12.13	15.28	...end	...end						
12.17	14.57								
12.20	13.48								
12.23	12.36								
12.27	11.35								
12.30	10.42								
12.33	9.492								
12.37	8.575								
12.40	7.705								
12.43	6.959								
12.47	6.300								
12.50	5.688								
12.53	5.095								
12.57	4.546								
12.60	4.067								
12.63	3.653								
12.67	3.313								
12.70	3.041								
12.73	2.822								
12.77	2.645								

Design Storm Report

Custom Storm filename:

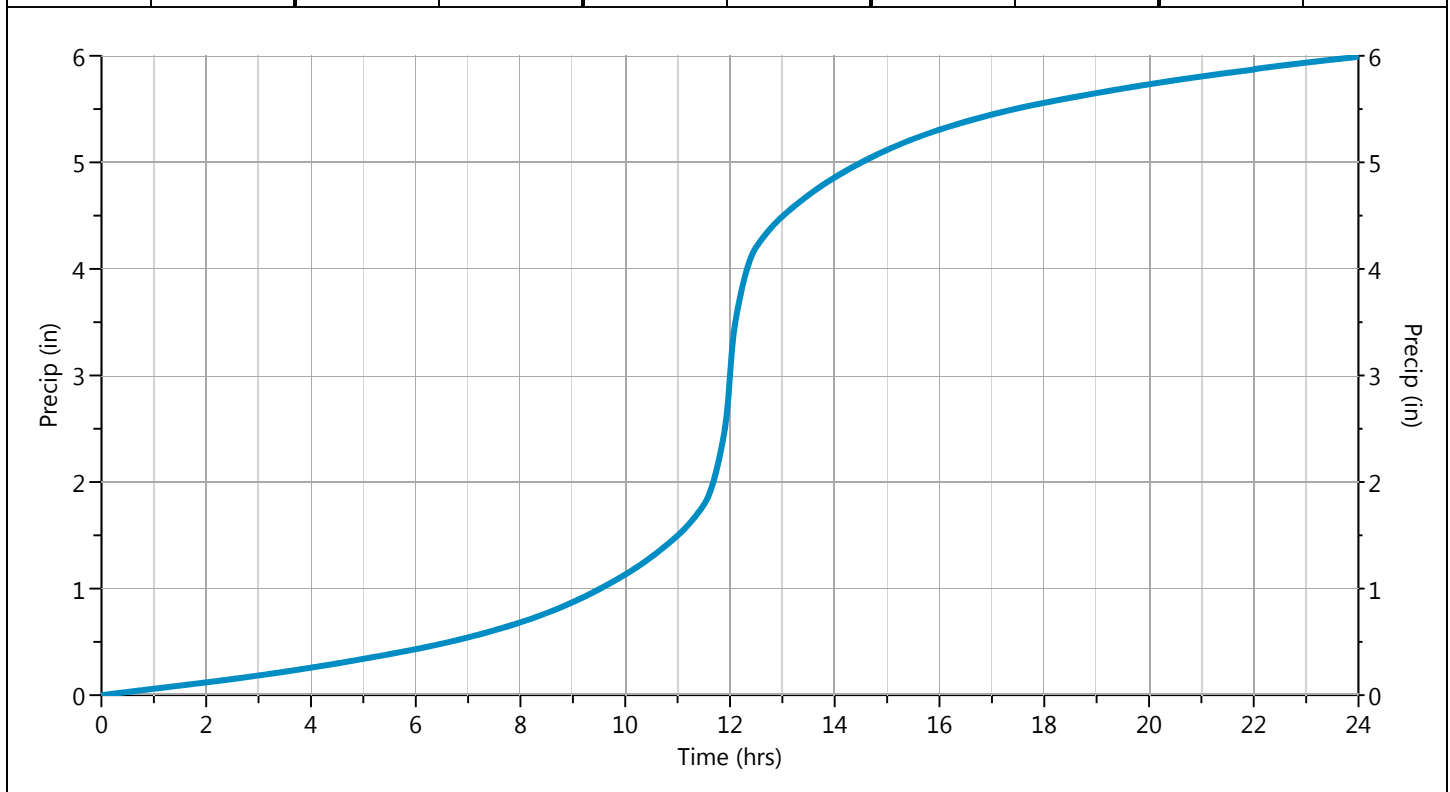
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	✓ 25-yr	50-yr	100-yr
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72

Incremental Rainfall Distribution, 25-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0145	11.37	0.0210	11.73	0.0618	12.10	0.1186	12.47	0.0325
11.03	0.0149	11.40	0.0216	11.77	0.0677	12.13	0.0913	12.50	0.0267
11.07	0.0155	11.43	0.0222	11.80	0.0735	12.17	0.0853	12.53	0.0234
11.10	0.0161	11.47	0.0228	11.83	0.0794	12.20	0.0794	12.57	0.0228
11.13	0.0167	11.50	0.0235	11.87	0.0853	12.23	0.0735	12.60	0.0222
11.17	0.0173	11.53	0.0267	11.90	0.0911	12.27	0.0677	12.63	0.0216
11.20	0.0179	11.57	0.0325	11.93	0.1188	12.30	0.0618	12.67	0.0210
11.23	0.0186	11.60	0.0384	11.97	0.1677	12.33	0.0560	12.70	0.0204
11.27	0.0192	11.63	0.0443	12.00	0.2168	12.37	0.0501	12.73	0.0198
11.30	0.0198	11.67	0.0501	12.03	0.2166	12.40	0.0443	12.77	0.0192
11.33	0.0204	11.70	0.0560	12.07	0.1677	12.43	0.0384	12.80	0.0186



Hydrograph 50-yr Summary

Project Name: 39 Leggett St East Hartford

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Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

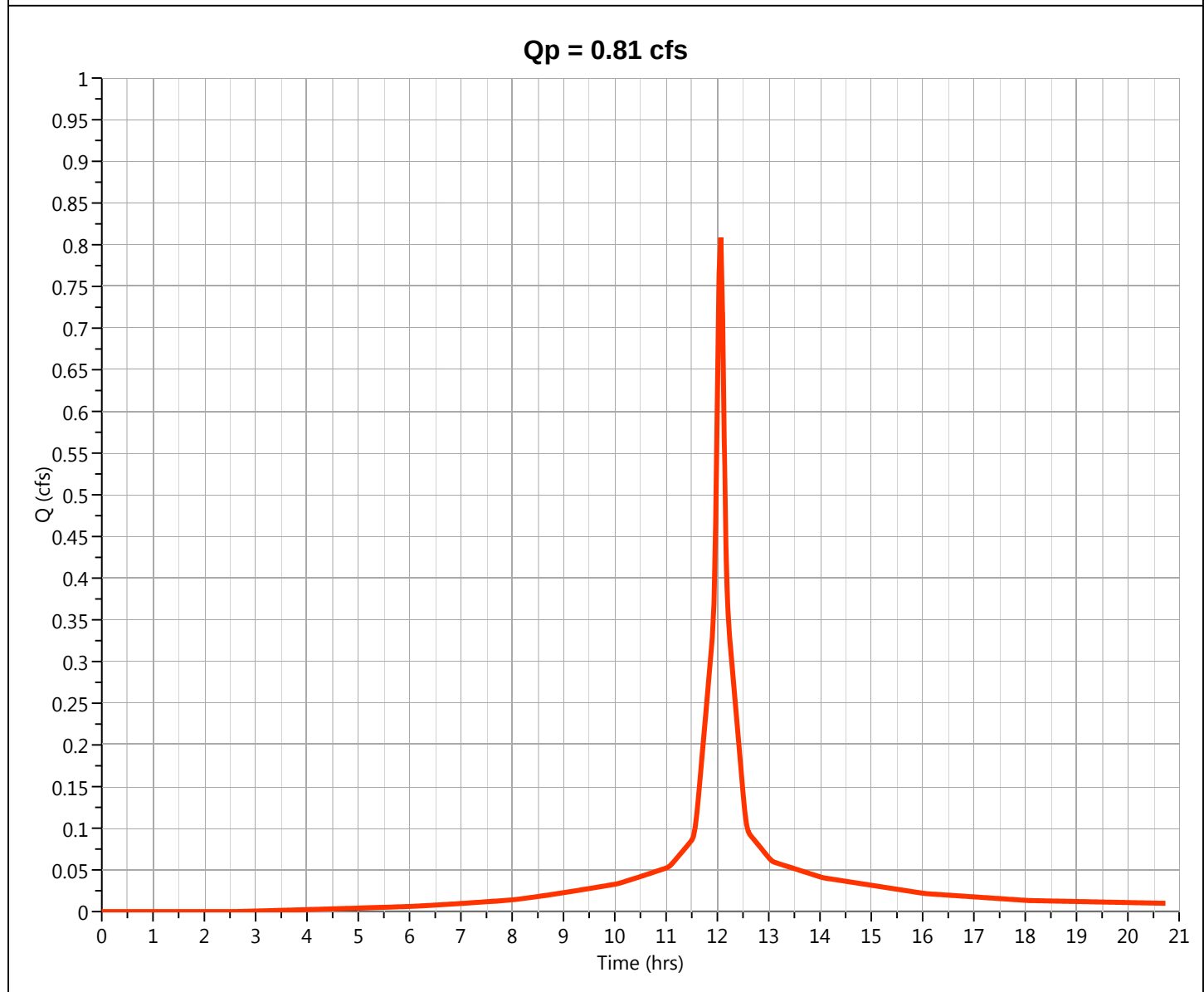
PRO SA-A.1

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.809 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 2,618 cuft
Drainage Area	= 0.13 ac	Curve Number	= 92*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 6.8600 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.11	98	B - PAVED
0.02	61	B - LAWN
0.13	92	Weighted Average



Hydrograph Discharge Table

PRO SA-A.1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.47	0.083	12.67	0.090						
11.50	0.086	12.70	0.087						
11.53	0.090	12.73	0.085						
11.57	0.101	12.77	0.082						
11.60	0.118	12.80	0.080						
11.63	0.139	...end	...end						
11.67	0.162								
11.70	0.185								
11.73	0.209								
11.77	0.232								
11.80	0.256								
11.83	0.280								
11.87	0.304								
11.90	0.328								
11.93	0.370								
11.97	0.464								
12.00	0.617								
12.03	0.766								
12.07	0.809								
12.10	0.719								
12.13	0.566								
12.17	0.438								
12.20	0.368								
12.23	0.333								
12.27	0.309								
12.30	0.285								
12.33	0.262								
12.37	0.238								
12.40	0.214								
12.43	0.190								
12.47	0.166								
12.50	0.142								
12.53	0.120								
12.57	0.105								
12.60	0.096								
12.63	0.092								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

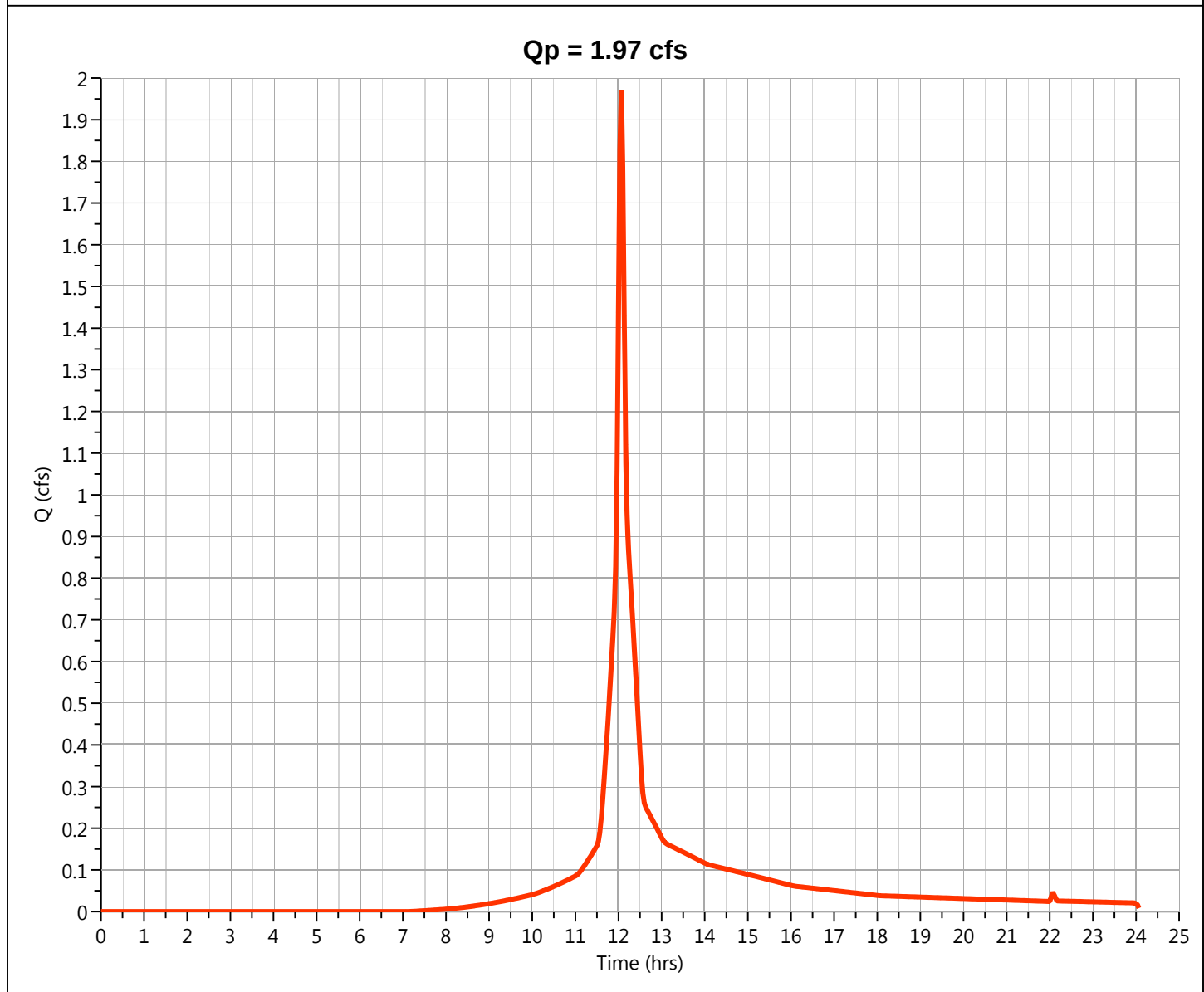
PRO SA-A.2

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.971 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 5,907 cuft
Drainage Area	= 0.42 ac	Curve Number	= 76*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.31 min
Total Rainfall	= 6.8600 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.168	98	B - PAVED
0.252	61	B - LAWN
0.42	76	Weighted Average



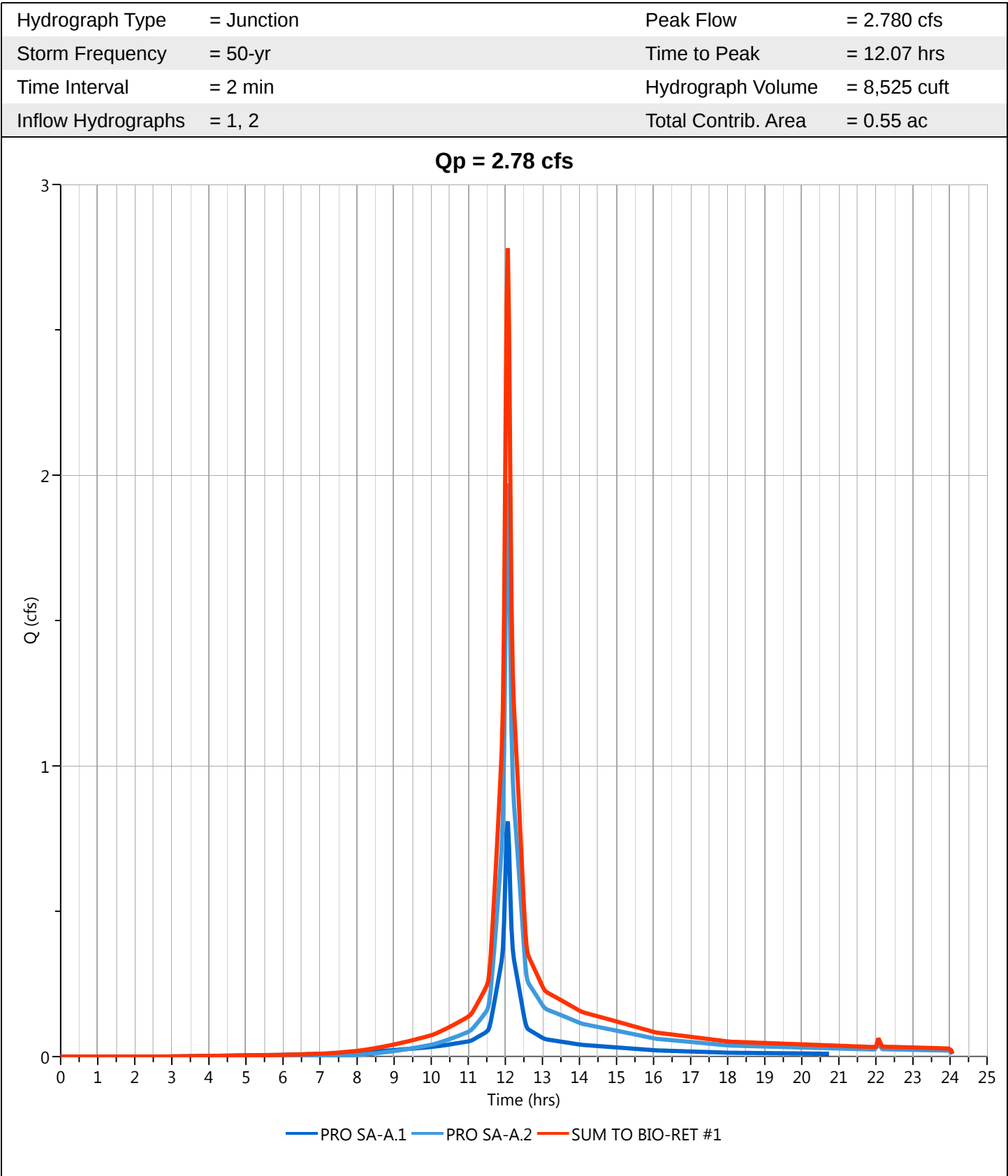
Hydrograph Discharge Table

PRO SA-A.2

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	0.224	12.80	0.218						
11.63	0.268	12.83	0.211						
11.67	0.317	12.87	0.204						
11.70	0.367	12.90	0.198						
11.73	0.419	12.93	0.191						
11.77	0.474	...end	...end						
11.80	0.531								
11.83	0.591								
11.87	0.653								
11.90	0.717								
11.93	0.824								
11.97	1.056								
12.00	1.438								
12.03	1.828								
12.07	1.971								
12.10	1.785								
12.13	1.429								
12.17	1.121								
12.20	0.951								
12.23	0.866								
12.27	0.810								
12.30	0.752								
12.33	0.692								
12.37	0.632								
12.40	0.571								
12.43	0.508								
12.47	0.445								
12.50	0.382								
12.53	0.323								
12.57	0.282								
12.60	0.260								
12.63	0.250								
12.67	0.244								
12.70	0.237								
12.73	0.231								
12.77	0.224								

SUM TO BIO-RET #1

Hyd. No. 3



Hydrograph Discharge Table

SUM TO BIO-RET #1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.290	12.77	0.307						
11.60	0.342	12.80	0.298						
11.63	0.408	12.83	0.288						
11.67	0.479	12.87	0.279						
11.70	0.552	12.90	0.270						
11.73	0.628	...end	...end						
11.77	0.706								
11.80	0.787								
11.83	0.871								
11.87	0.957								
11.90	1.046								
11.93	1.194								
11.97	1.521								
12.00	2.055								
12.03	2.594								
12.07	2.780								
12.10	2.505								
12.13	1.995								
12.17	1.559								
12.20	1.319								
12.23	1.199								
12.27	1.119								
12.30	1.037								
12.33	0.954								
12.37	0.870								
12.40	0.785								
12.43	0.698								
12.47	0.611								
12.50	0.524								
12.53	0.443								
12.57	0.387								
12.60	0.357								
12.63	0.343								
12.67	0.334								
12.70	0.325								
12.73	0.316								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

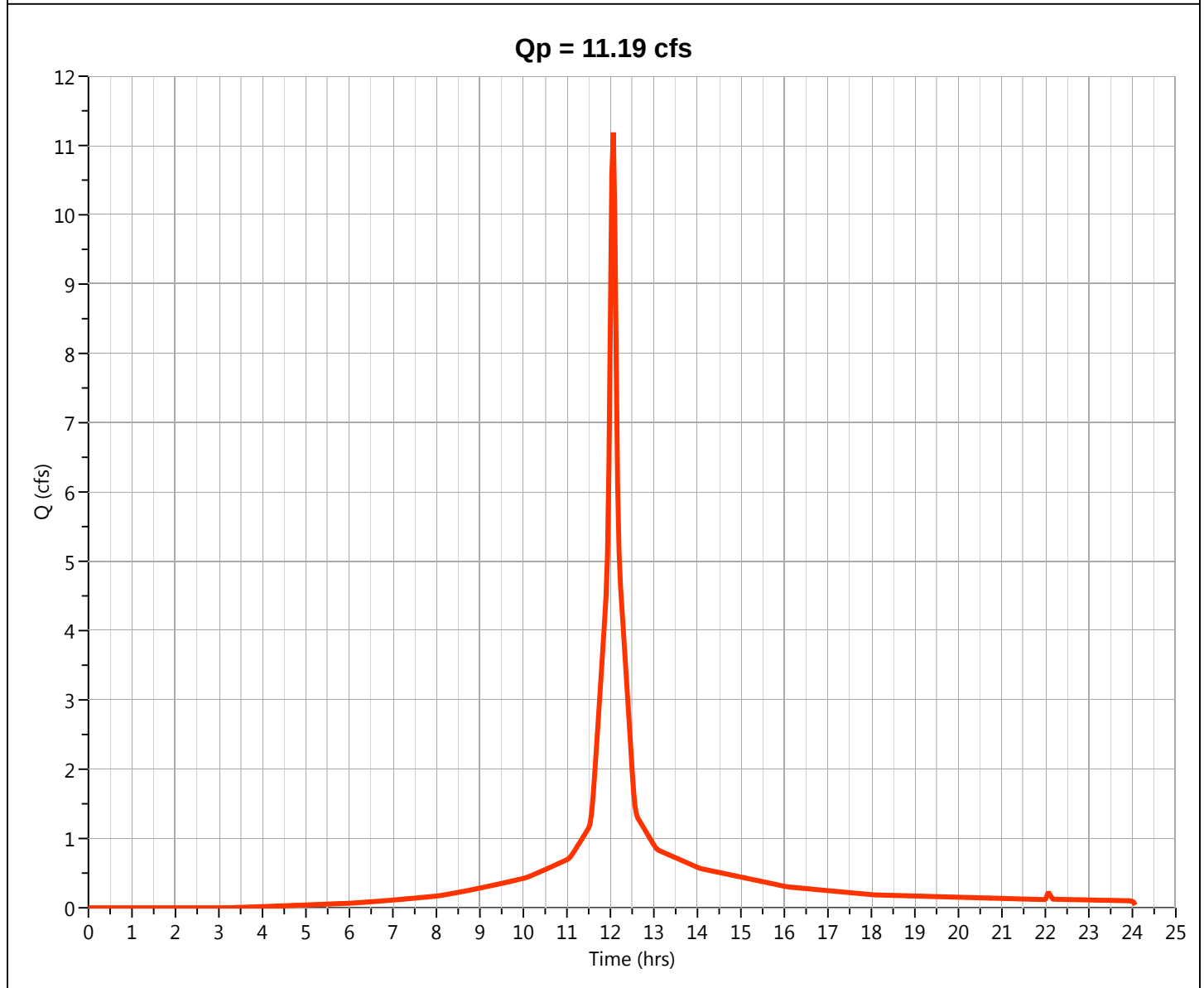
PRO SA-A.3

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 11.19 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 35,604 cuft
Drainage Area	= 1.84 ac	Curve Number	= 90*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.95 min
Total Rainfall	= 6.8600 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LAWN
1.84	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.3

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.50	1.152	12.70	1.221						
11.53	1.214	12.73	1.186						
11.57	1.356	12.77	1.151						
11.60	1.591	12.80	1.116						
11.63	1.883	...end	...end						
11.67	2.195								
11.70	2.512								
11.73	2.832								
11.77	3.156								
11.80	3.485								
11.83	3.818								
11.87	4.154								
11.90	4.494								
11.93	5.077								
11.97	6.380								
12.00	8.497								
12.03	10.58								
12.07	11.19								
12.10	9.965								
12.13	7.859								
12.17	6.092								
12.20	5.120								
12.23	4.632								
12.27	4.305								
12.30	3.977								
12.33	3.647								
12.37	3.316								
12.40	2.984								
12.43	2.651								
12.47	2.316								
12.50	1.981								
12.53	1.676								
12.57	1.460								
12.60	1.345								
12.63	1.291								
12.67	1.256								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

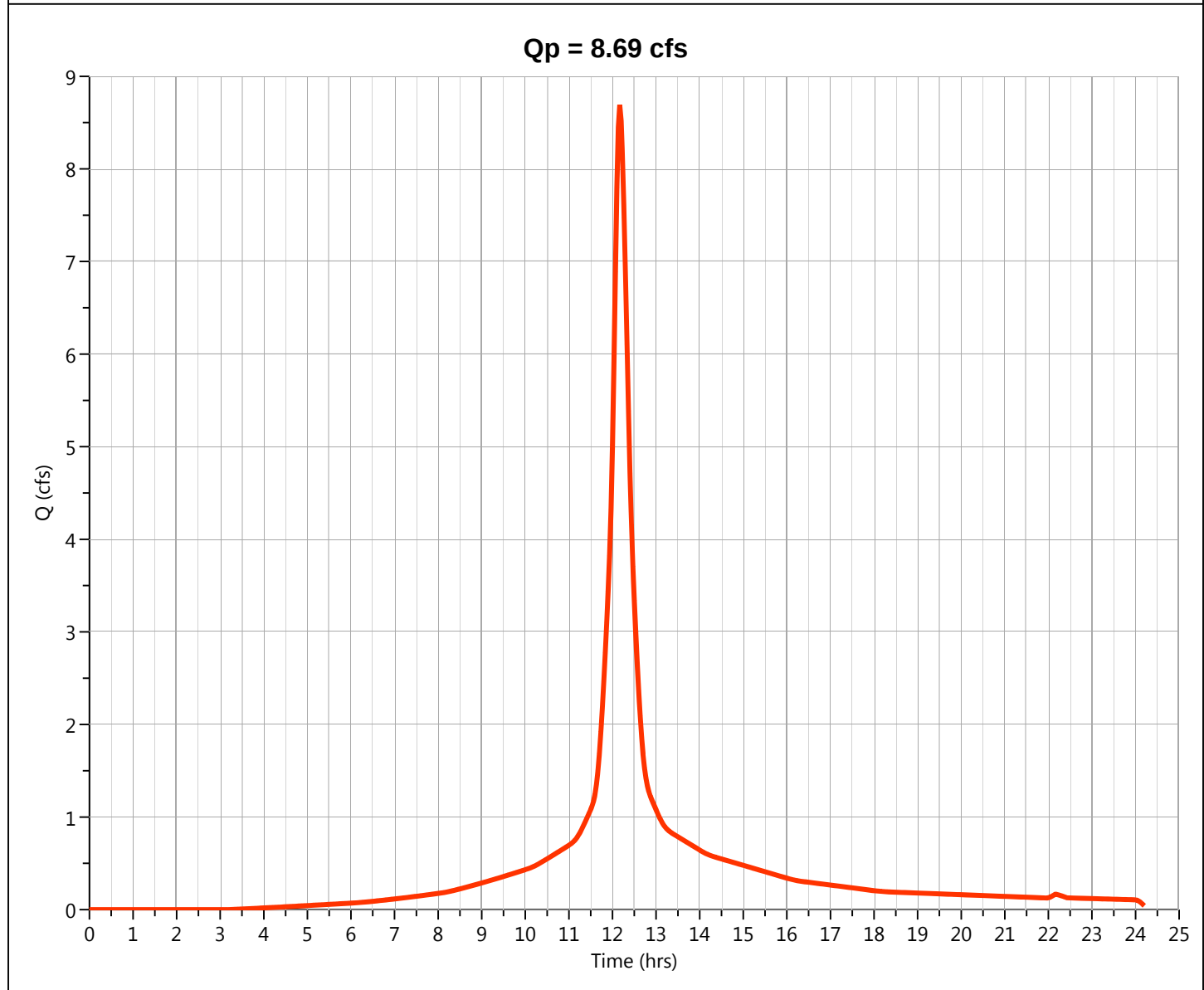
PRO SA-A.4

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 8.691 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 37,339 cuft
Drainage Area	= 1.838 ac	Curve Number	= 90.47*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.12 min
Total Rainfall	= 6.8600 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LANDSCAPED
1.838	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.4

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.30	0.874	12.50	3.339						
11.33	0.907	12.53	2.997						
11.37	0.940	12.57	2.669						
11.40	0.975	12.60	2.364						
11.43	1.010	12.63	2.092						
11.47	1.045	12.67	1.864						
11.50	1.081	12.70	1.680						
11.53	1.121	12.73	1.535						
11.57	1.174	12.77	1.424						
11.60	1.249	12.80	1.339						
11.63	1.356	12.83	1.275						
11.67	1.503	12.87	1.227						
11.70	1.692	12.90	1.188						
11.73	1.919	12.93	1.151						
11.77	2.178	12.97	1.115						
11.80	2.465	13.00	1.078						
11.83	2.774	13.03	1.042						
11.87	3.100	13.07	1.007						
11.90	3.438	13.10	0.974						
11.93	3.821	13.13	0.944						
11.97	4.323	13.17	0.918						
12.00	5.022	13.20	0.896						
12.03	5.911	13.23	0.877						
12.07	6.890	13.27	0.861						
12.10	7.799	...end	...end						
12.13	8.449								
12.17	8.691								
12.20	8.518								
12.23	8.065								
12.27	7.471								
12.30	6.814								
12.33	6.106								
12.37	5.385								
12.40	4.713								
12.43	4.151								
12.47	3.709								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

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06-17-2018

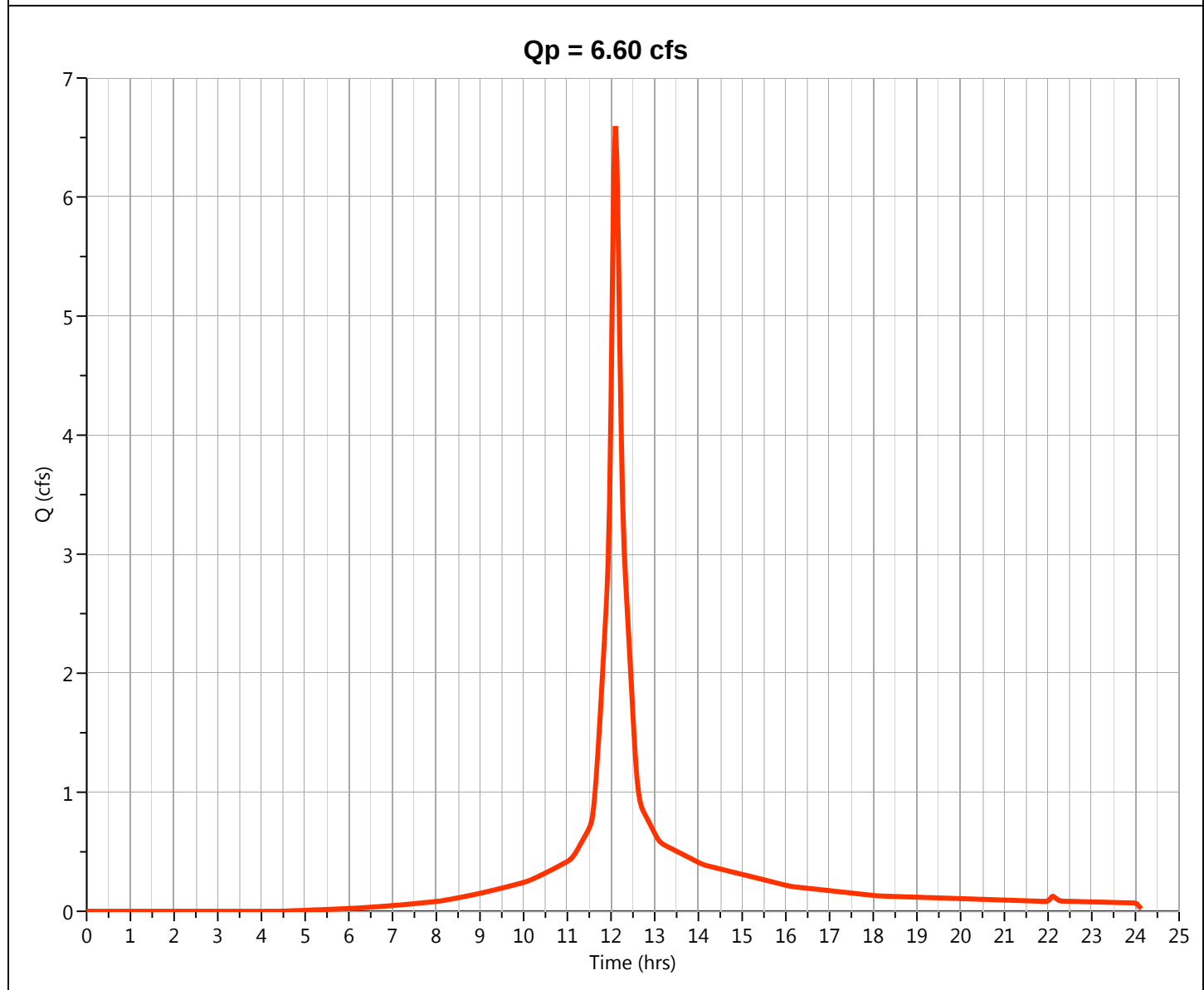
PRO SA-C

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 6.596 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 23,247 cuft
Drainage Area	= 1.22 ac	Curve Number	= 86.16*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.4 min
Total Rainfall	= 6.8600 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.38	61	B - GRASS
1.22	86	Weighted Average



Hydrograph Discharge Table

PRO SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.47	0.674	12.67	0.917						
11.50	0.697	12.70	0.873						
11.53	0.727	12.73	0.844						
11.57	0.779	12.77	0.821						
11.60	0.867	12.80	0.797						
11.63	0.996	12.83	0.773						
11.67	1.156	12.87	0.749						
11.70	1.341	12.90	0.725						
11.73	1.543	12.93	0.701						
11.77	1.753	12.97	0.678						
11.80	1.967	13.00	0.654						
11.83	2.186	...end	...end						
11.87	2.408								
11.90	2.635								
11.93	2.933								
11.97	3.433								
12.00	4.274								
12.03	5.339								
12.07	6.245								
12.10	6.596								
12.13	6.305								
12.17	5.601								
12.20	4.762								
12.23	4.000								
12.27	3.421								
12.30	3.040								
12.33	2.779								
12.37	2.558								
12.40	2.335								
12.43	2.111								
12.47	1.885								
12.50	1.658								
12.53	1.439								
12.57	1.244								
12.60	1.092								
12.63	0.987								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

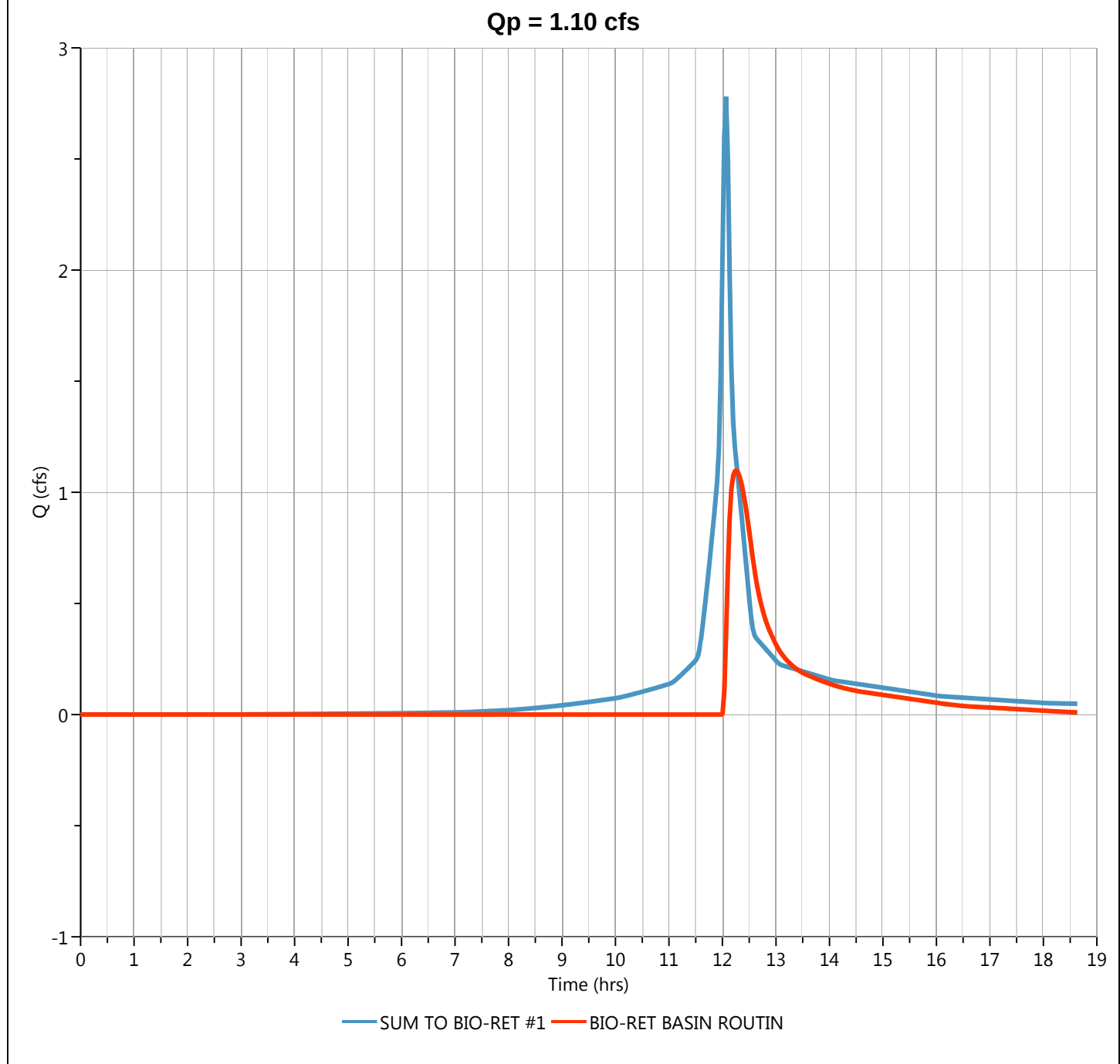
06-17-2018

BIO-RET BASIN ROUTIN

Hyd. No. 7

Hydrograph Type	= Pond Route	Peak Flow	= 1.097 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.27 hrs
Time Interval	= 2 min	Hydrograph Volume	= 4,082 cuft
Inflow Hydrograph	= 3 - SUM TO BIO-RET #1	Max. Elevation	= 50.98 ft
Pond Name	= PROP. BIO-RETENTION BASIN #1	Max. Storage	= 3,173 cuft

Pond Routing by Storage Indication Method



Hydrograph Discharge Table

BIO-RET BASIN ROUTIN

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
12.07	0.357	13.27	0.229	14.47	0.108				
12.10	0.649	13.30	0.222	...end	...end				
12.13	0.880	13.33	0.215						
12.17	1.014	13.37	0.208						
12.20	1.076	13.40	0.203						
12.23	1.097	13.43	0.197						
12.27	1.097	13.47	0.192						
12.30	1.085	13.50	0.188						
12.33	1.060	13.53	0.184						
12.37	1.026	13.57	0.180						
12.40	0.984	13.60	0.176						
12.43	0.937	13.63	0.173						
12.47	0.883	13.67	0.169						
12.50	0.825	13.70	0.166						
12.53	0.766	13.73	0.163						
12.57	0.705	13.77	0.159						
12.60	0.650	13.80	0.156						
12.63	0.600	13.83	0.153						
12.67	0.556	13.87	0.150						
12.70	0.519	13.90	0.147						
12.73	0.486	13.93	0.144						
12.77	0.457	13.97	0.142						
12.80	0.430	14.00	0.139						
12.83	0.406	14.03	0.136						
12.87	0.386	14.07	0.133						
12.90	0.366	14.10	0.131						
12.93	0.348	14.13	0.128						
12.97	0.331	14.17	0.126						
13.00	0.315	14.20	0.123						
13.03	0.300	14.23	0.121						
13.07	0.287	14.27	0.119						
13.10	0.275	14.30	0.117						
13.13	0.264	14.33	0.115						
13.17	0.254	14.37	0.113						
13.20	0.245	14.40	0.112						
13.23	0.237	14.43	0.110						

Hydrograph Report

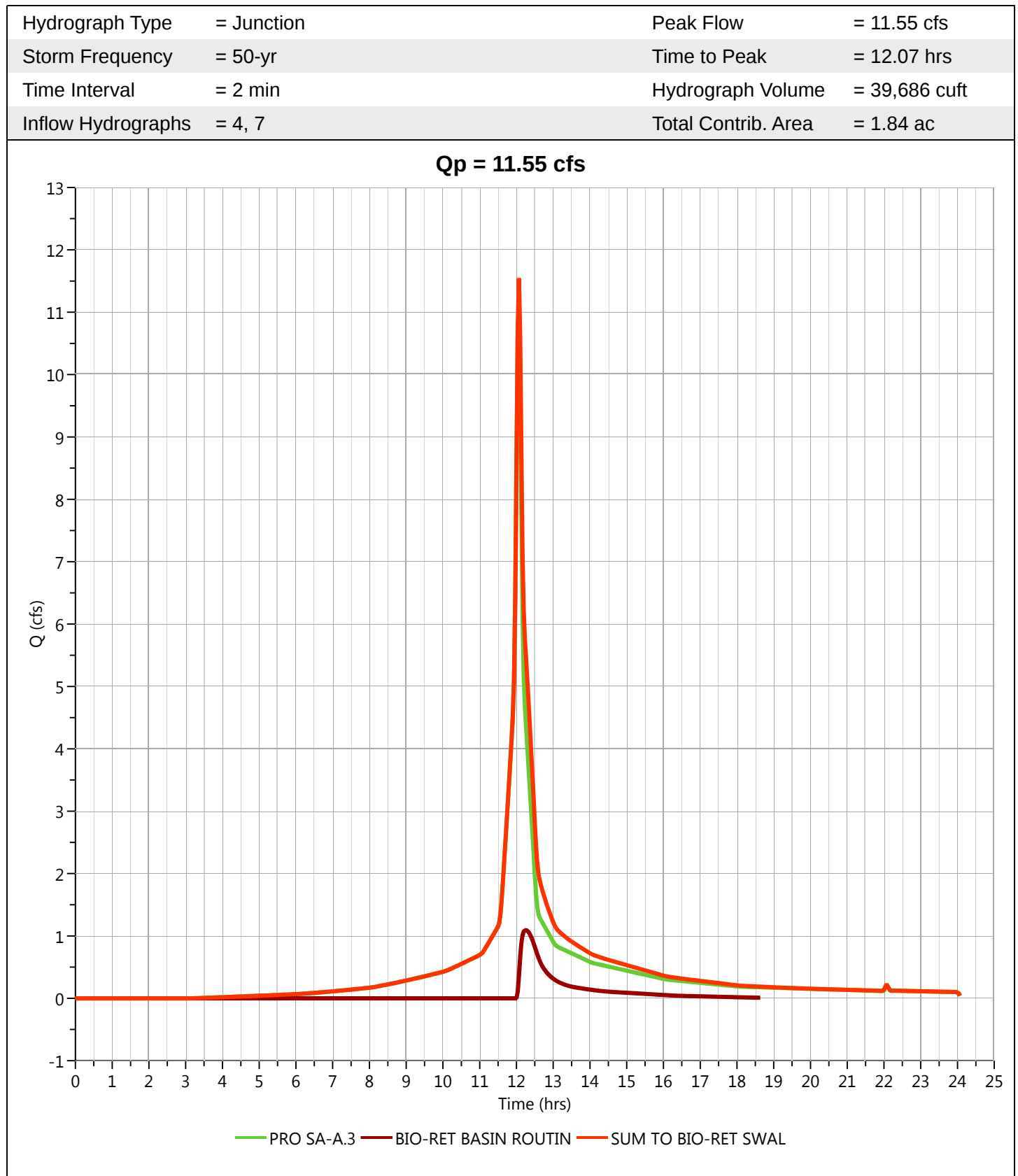
Project Name: 39 Leggett St East Hartford

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06-17-2018

SUM TO BIO-RET SWAL

Hyd. No. 8



Hydrograph Discharge Table

SUM TO BIO-RET SWAL

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	1.214	12.73	1.672						
11.57	1.356	12.77	1.608						
11.60	1.591	12.80	1.546						
11.63	1.883	12.83	1.487						
11.67	2.195	12.87	1.432						
11.70	2.512	12.90	1.378						
11.73	2.832	12.93	1.325						
11.77	3.156	12.97	1.273						
11.80	3.485	13.00	1.221						
11.83	3.818	13.03	1.174						
11.87	4.154	13.07	1.136						
11.90	4.494	...end	...end						
11.93	5.077								
11.97	6.380								
12.00	8.497								
12.03	10.68								
12.07	11.55								
12.10	10.61								
12.13	8.739								
12.17	7.106								
12.20	6.196								
12.23	5.729								
12.27	5.402								
12.30	5.062								
12.33	4.708								
12.37	4.342								
12.40	3.968								
12.43	3.587								
12.47	3.200								
12.50	2.807								
12.53	2.441								
12.57	2.165								
12.60	1.995								
12.63	1.891								
12.67	1.812								
12.70	1.740								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

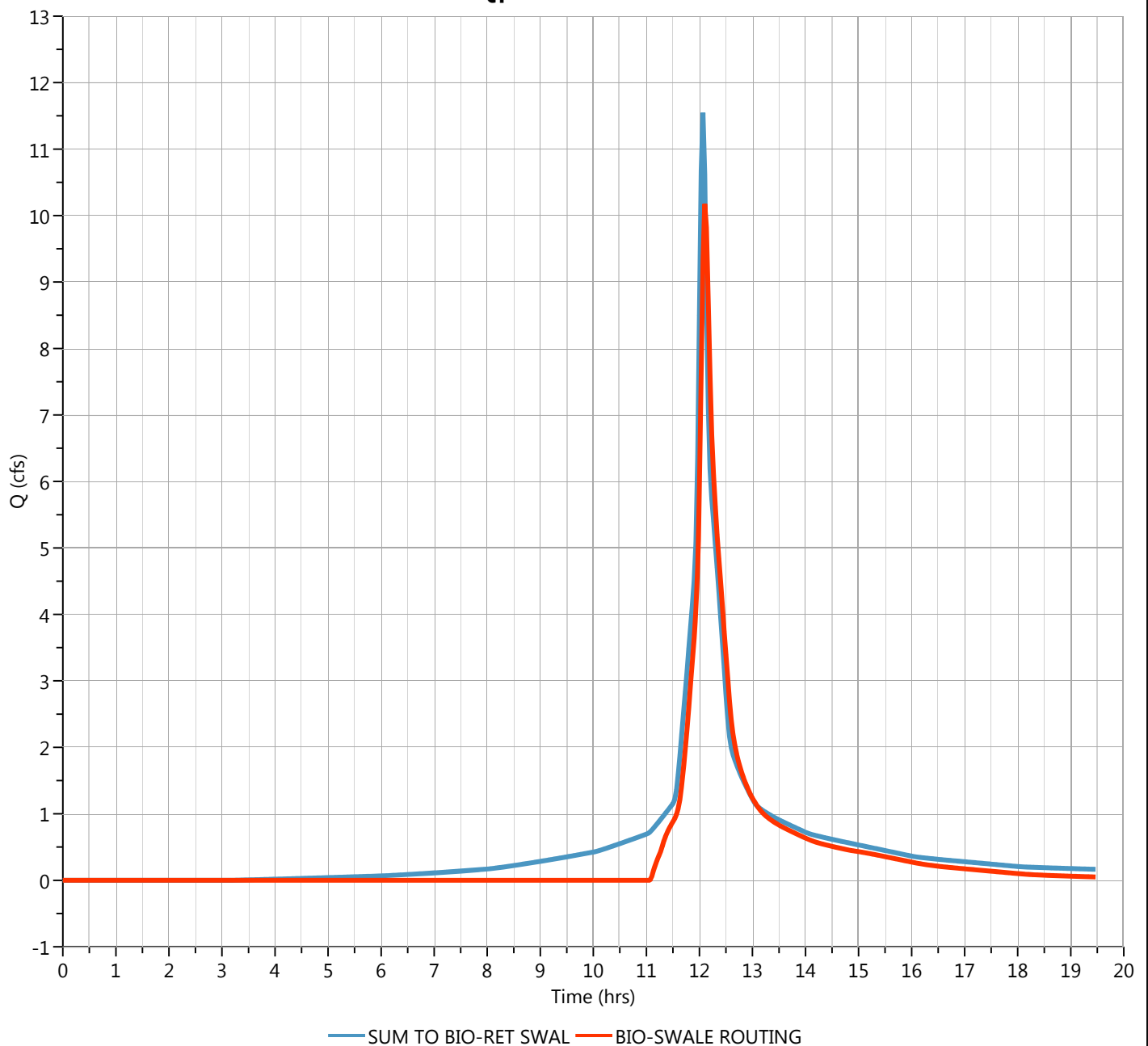
BIO-SWALE ROUTING

Hyd. No. 9

Hydrograph Type	= Pond Route	Peak Flow	= 10.17 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Hydrograph Volume	= 28,507 cuft
Inflow Hydrograph	= 8 - SUM TO BIO-RET SWAL	Max. Elevation	= 49.39 ft
Pond Name	= PROP. BIO-RETENTION SWALE	Max. Storage	= 6,327 cuft

Pond Routing by Storage Indication Method

Qp = 10.17 cfs



Hydrograph Discharge Table

BIO-SWALE ROUTING

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	1.081	12.80	1.613						
11.63	1.220	12.83	1.537						
11.67	1.436	12.87	1.467						
11.70	1.696	12.90	1.402						
11.73	1.976	12.93	1.341						
11.77	2.269	12.97	1.283						
11.80	2.608	13.00	1.236						
11.83	2.956	13.03	1.191						
11.87	3.298	13.07	1.146						
11.90	3.638	13.10	1.105						
11.93	4.068	13.13	1.069						
11.97	4.718	13.17	1.036						
12.00	5.885	13.20	1.008						
12.03	7.602	...end	...end						
12.07	9.328								
12.10	10.17								
12.13	9.818								
12.17	8.717								
12.20	7.588								
12.23	6.696								
12.27	6.094								
12.30	5.618								
12.33	5.203								
12.37	4.840								
12.40	4.482								
12.43	4.116								
12.47	3.743								
12.50	3.391								
12.53	3.040								
12.57	2.702								
12.60	2.409								
12.63	2.199								
12.67	2.038								
12.70	1.905								
12.73	1.794								
12.77	1.698								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

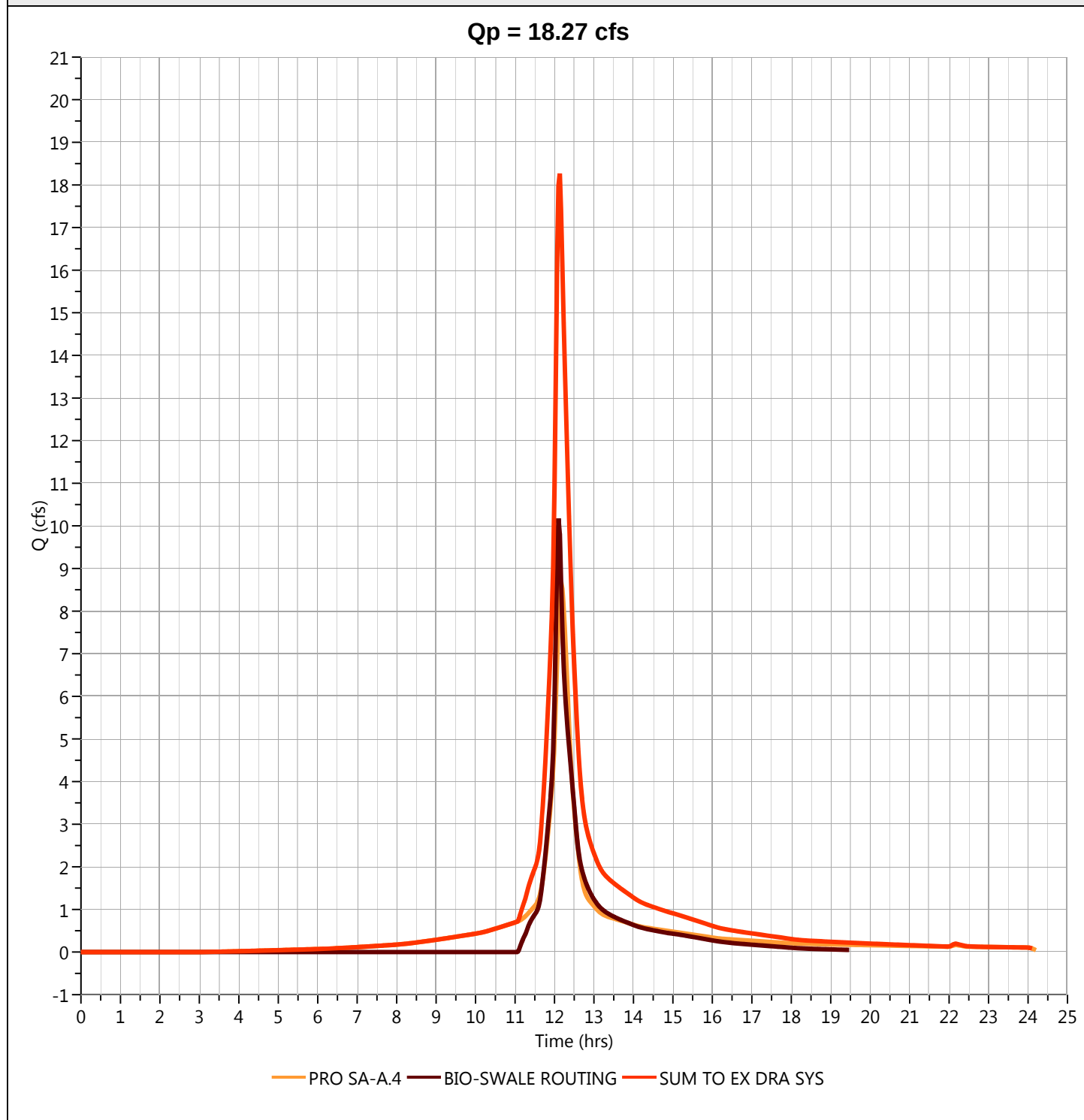
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX DRA SYS

Hyd. No. 10

Hydrograph Type	= Junction	Peak Flow	= 18.27 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.13 hrs
Time Interval	= 2 min	Hydrograph Volume	= 65,847 cuft
Inflow Hydrographs	= 5, 9	Total Contrib. Area	= 1.838 ac



Hydrograph Discharge Table

SUM TO EX DRA SYS

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.47	1.881	12.67	3.901						
11.50	1.962	12.70	3.585						
11.53	2.047	12.73	3.329						
11.57	2.161	12.77	3.122						
11.60	2.331	12.80	2.952						
11.63	2.576	12.83	2.812						
11.67	2.939	12.87	2.694						
11.70	3.389	12.90	2.589						
11.73	3.895	12.93	2.492						
11.77	4.447	12.97	2.398						
11.80	5.073	13.00	2.314						
11.83	5.730	13.03	2.233						
11.87	6.398	13.07	2.154						
11.90	7.076	13.10	2.080						
11.93	7.889	13.13	2.013						
11.97	9.040	13.17	1.954						
12.00	10.91	13.20	1.903						
12.03	13.51	13.23	1.859						
12.07	16.22	13.27	1.819						
12.10	17.97	...end	...end						
12.13	18.27								
12.17	17.41								
12.20	16.11								
12.23	14.76								
12.27	13.56								
12.30	12.43								
12.33	11.31								
12.37	10.22								
12.40	9.194								
12.43	8.267								
12.47	7.452								
12.50	6.730								
12.53	6.038								
12.57	5.371								
12.60	4.773								
12.63	4.291								

Design Storm Report

Custom Storm filename:

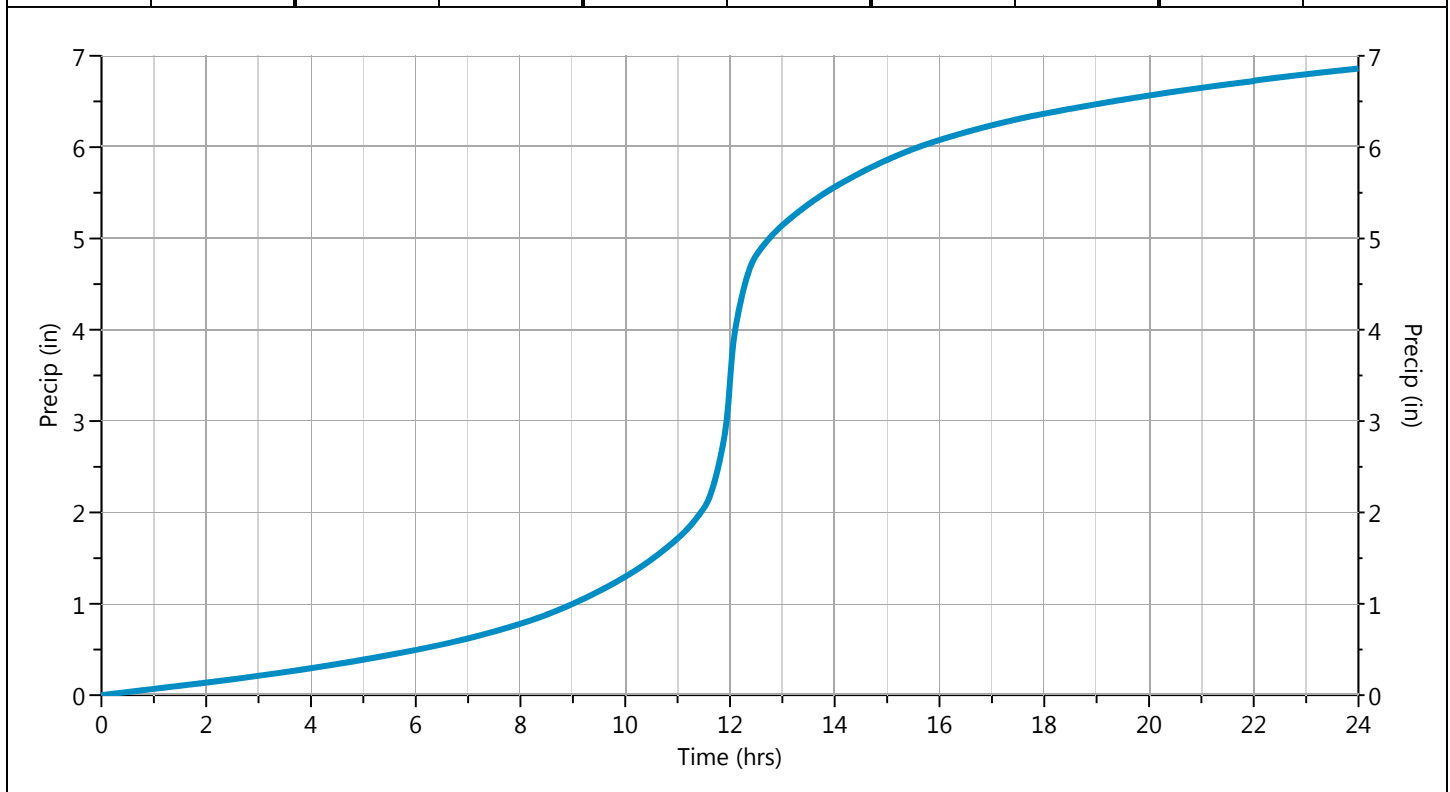
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	✓ 50-yr	100-yr
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72

Incremental Rainfall Distribution, 50-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0166	11.37	0.0241	11.73	0.0708	12.10	0.1358	12.47	0.0373
11.03	0.0170	11.40	0.0248	11.77	0.0775	12.13	0.1045	12.50	0.0306
11.07	0.0177	11.43	0.0255	11.80	0.0842	12.17	0.0976	12.53	0.0268
11.10	0.0184	11.47	0.0262	11.83	0.0909	12.20	0.0909	12.57	0.0262
11.13	0.0191	11.50	0.0269	11.87	0.0976	12.23	0.0842	12.60	0.0255
11.17	0.0198	11.53	0.0305	11.90	0.1043	12.27	0.0775	12.63	0.0248
11.20	0.0205	11.57	0.0373	11.93	0.1360	12.30	0.0708	12.67	0.0241
11.23	0.0213	11.60	0.0440	11.97	0.1921	12.33	0.0641	12.70	0.0234
11.27	0.0220	11.63	0.0507	12.00	0.2483	12.37	0.0574	12.73	0.0227
11.30	0.0227	11.67	0.0574	12.03	0.2480	12.40	0.0507	12.77	0.0220
11.33	0.0234	11.70	0.0641	12.07	0.1921	12.43	0.0440	12.80	0.0213



Hydrograph 100-yr Summary

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

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Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

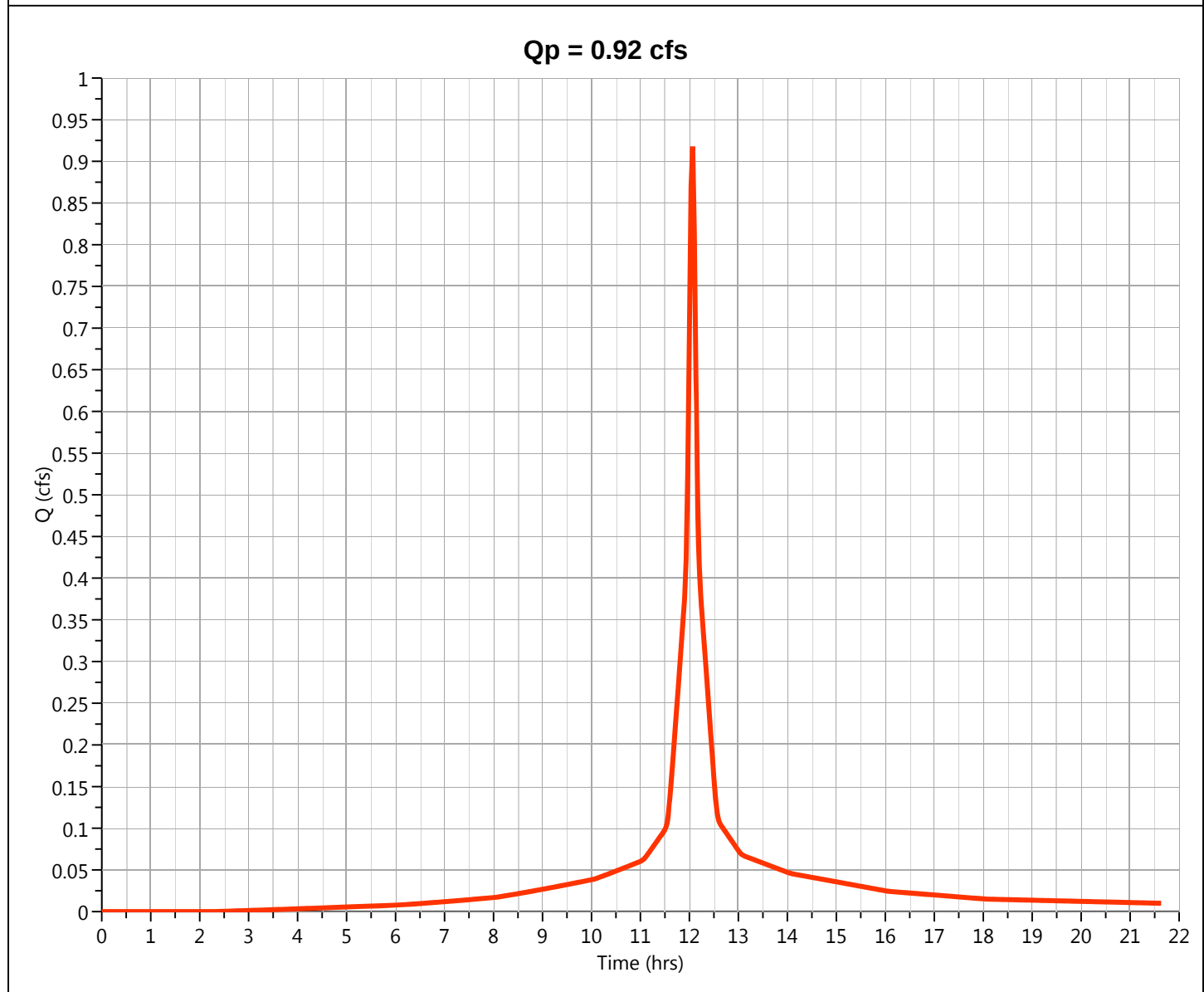
PRO SA-A.1

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.918 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 2,993 cuft
Drainage Area	= 0.13 ac	Curve Number	= 92*
Tc Method	= User	Time of Conc. (Tc)	= 5.0 min
Total Rainfall	= 7.7200 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.11	98	B - PAVED
0.02	61	B - LAWN
0.13	92	Weighted Average



Hydrograph Discharge Table

PRO SA-A.1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.43	0.093	12.63	0.104						
11.47	0.095	12.67	0.102						
11.50	0.098	12.70	0.099						
11.53	0.103	12.73	0.096						
11.57	0.115	12.77	0.093						
11.60	0.135	12.80	0.090						
11.63	0.159	...end	...end						
11.67	0.186								
11.70	0.212								
11.73	0.238								
11.77	0.265								
11.80	0.292								
11.83	0.319								
11.87	0.347								
11.90	0.374								
11.93	0.421								
11.97	0.528								
12.00	0.701								
12.03	0.870								
12.07	0.918								
12.10	0.815								
12.13	0.642								
12.17	0.497								
12.20	0.417								
12.23	0.377								
12.27	0.350								
12.30	0.323								
12.33	0.296								
12.37	0.269								
12.40	0.242								
12.43	0.215								
12.47	0.188								
12.50	0.161								
12.53	0.136								
12.57	0.118								
12.60	0.109								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

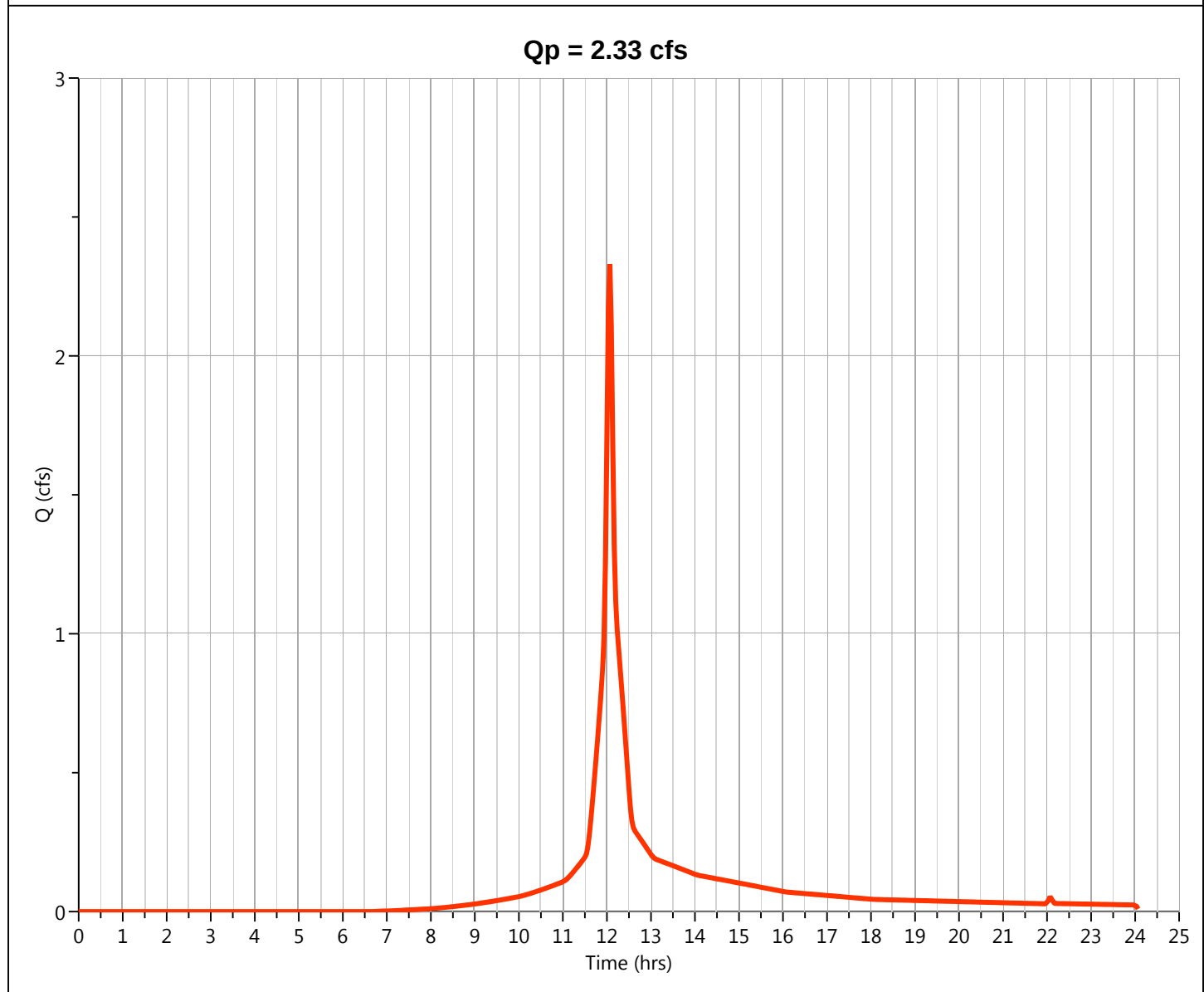
PRO SA-A.2

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 2.330 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 7,009 cuft
Drainage Area	= 0.42 ac	Curve Number	= 76*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.31 min
Total Rainfall	= 7.7200 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.168	98	B - PAVED
0.252	61	B - LAWN
0.42	76	Weighted Average



Hydrograph Discharge Table

PRO SA-A.2

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.233	12.77	0.260						
11.60	0.276	12.80	0.253						
11.63	0.329	12.83	0.245						
11.67	0.387	12.87	0.237						
11.70	0.448	12.90	0.229						
11.73	0.511	...end	...end						
11.77	0.576								
11.80	0.644								
11.83	0.714								
11.87	0.787								
11.90	0.863								
11.93	0.988								
11.97	1.262								
12.00	1.712								
12.03	2.168								
12.07	2.330								
12.10	2.104								
12.13	1.680								
12.17	1.315								
12.20	1.114								
12.23	1.013								
12.27	0.946								
12.30	0.878								
12.33	0.808								
12.37	0.737								
12.40	0.665								
12.43	0.592								
12.47	0.518								
12.50	0.444								
12.53	0.376								
12.57	0.328								
12.60	0.303								
12.63	0.291								
12.67	0.283								
12.70	0.276								
12.73	0.268								

Hydrograph Report

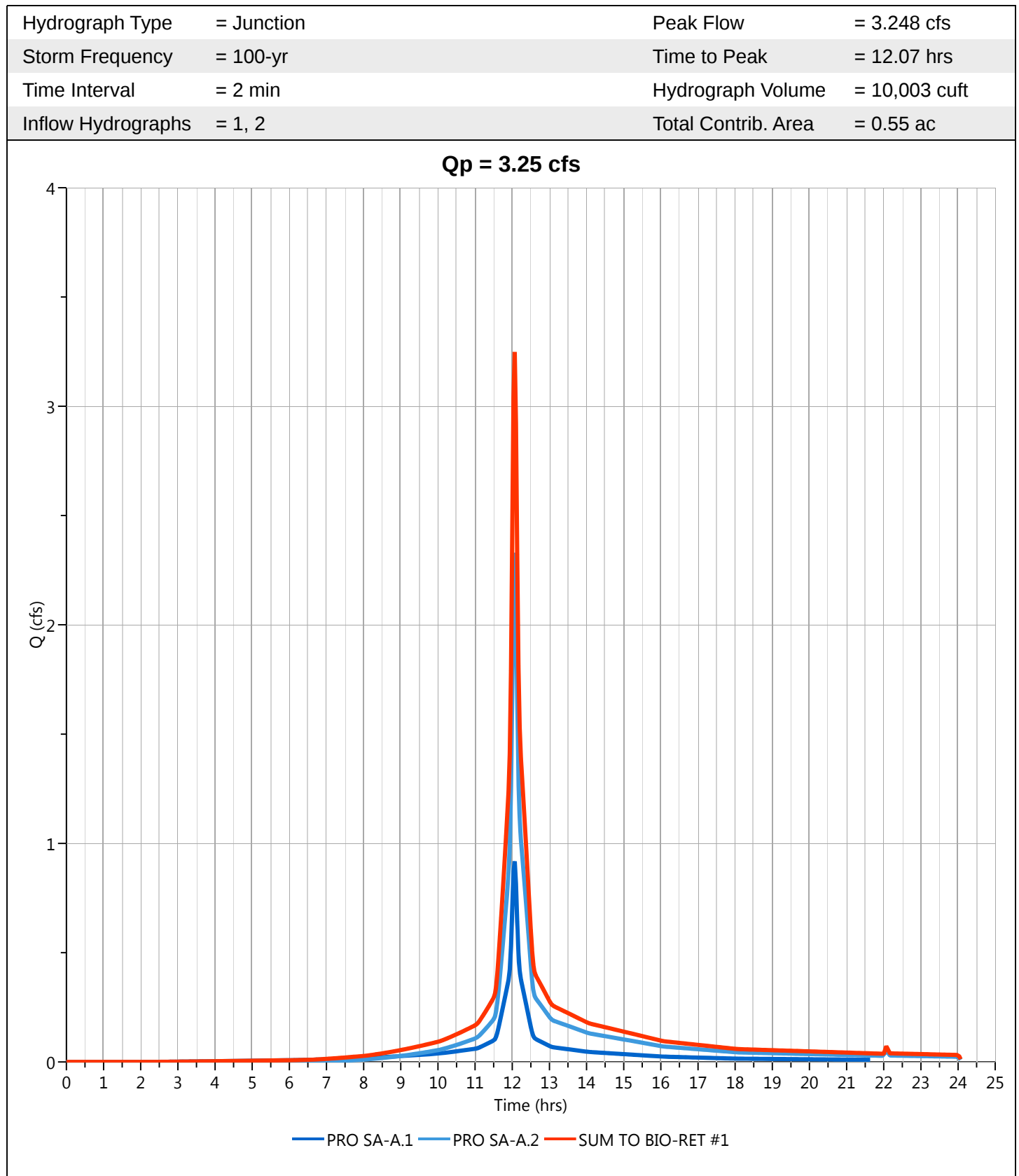
Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET #1

Hyd. No. 3



Hydrograph Discharge Table

SUM TO BIO-RET #1

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.57	0.349	12.77	0.354						
11.60	0.411	12.80	0.343						
11.63	0.489	12.83	0.332						
11.67	0.573	12.87	0.322						
11.70	0.660	...end	...end						
11.73	0.749								
11.77	0.841								
11.80	0.936								
11.83	1.034								
11.87	1.134								
11.90	1.237								
11.93	1.410								
11.97	1.790								
12.00	2.413								
12.03	3.038								
12.07	3.248								
12.10	2.920								
12.13	2.321								
12.17	1.812								
12.20	1.531								
12.23	1.390								
12.27	1.296								
12.30	1.201								
12.33	1.104								
12.37	1.006								
12.40	0.907								
12.43	0.807								
12.47	0.706								
12.50	0.605								
12.53	0.512								
12.57	0.446								
12.60	0.412								
12.63	0.395								
12.67	0.385								
12.70	0.374								
12.73	0.364								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

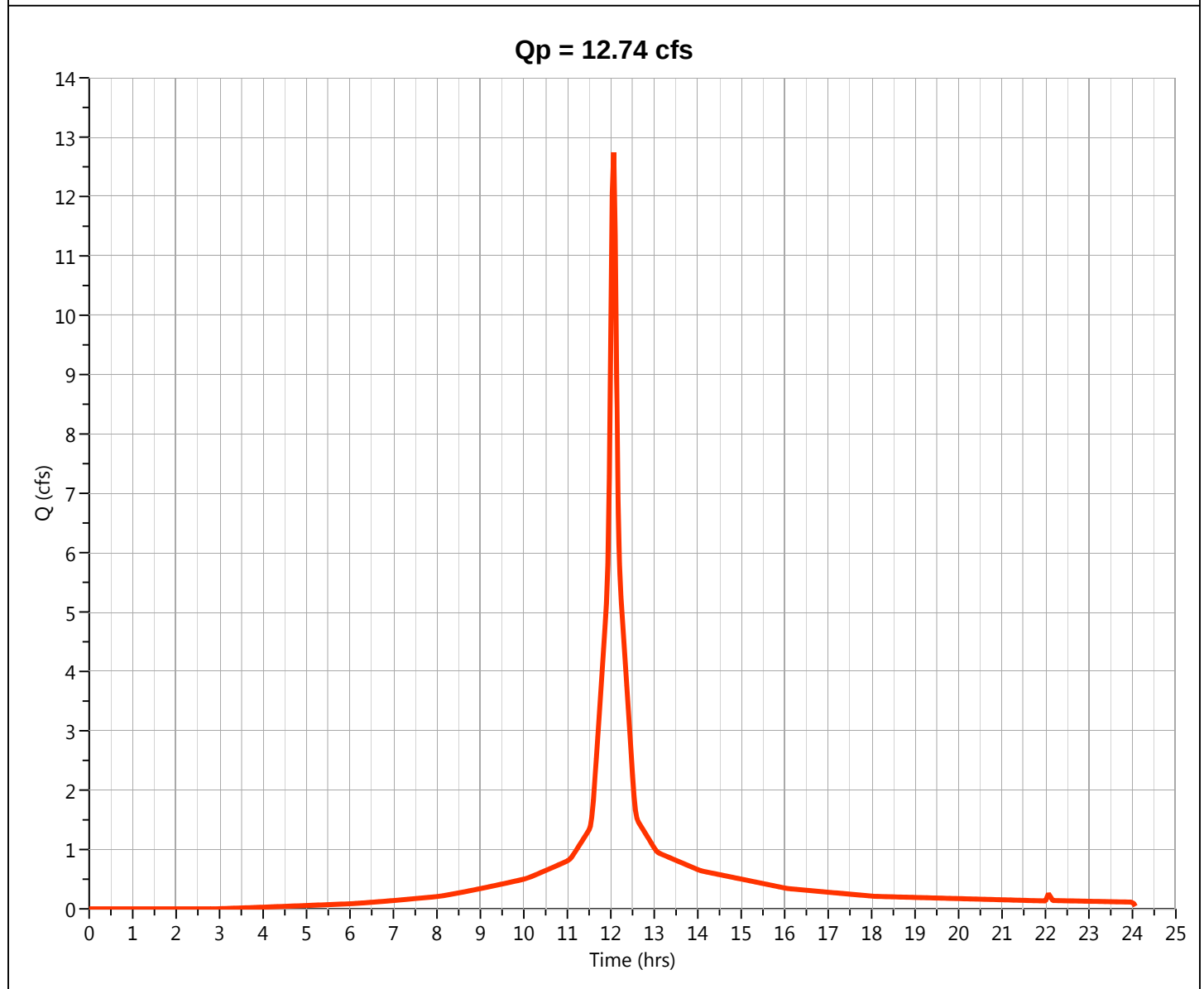
PRO SA-A.3

Hyd. No. 4

Hydrograph Type	= NRCS Runoff	Peak Flow	= 12.74 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Runoff Volume	= 40,890 cuft
Drainage Area	= 1.84 ac	Curve Number	= 90*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 4.95 min
Total Rainfall	= 7.7200 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LAWN
1.84	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.3

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.47	1.292	12.67	1.423						
11.50	1.331	12.70	1.384						
11.53	1.402	12.73	1.344						
11.57	1.566	12.77	1.304						
11.60	1.836	12.80	1.265						
11.63	2.170	...end	...end						
11.67	2.529								
11.70	2.892								
11.73	3.258								
11.77	3.628								
11.80	4.002								
11.83	4.380								
11.87	4.762								
11.90	5.147								
11.93	5.809								
11.97	7.292								
12.00	9.700								
12.03	12.06								
12.07	12.74								
12.10	11.34								
12.13	8.937								
12.17	6.923								
12.20	5.816								
12.23	5.259								
12.27	4.886								
12.30	4.513								
12.33	4.138								
12.37	3.762								
12.40	3.384								
12.43	3.006								
12.47	2.626								
12.50	2.246								
12.53	1.899								
12.57	1.655								
12.60	1.525								
12.63	1.463								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

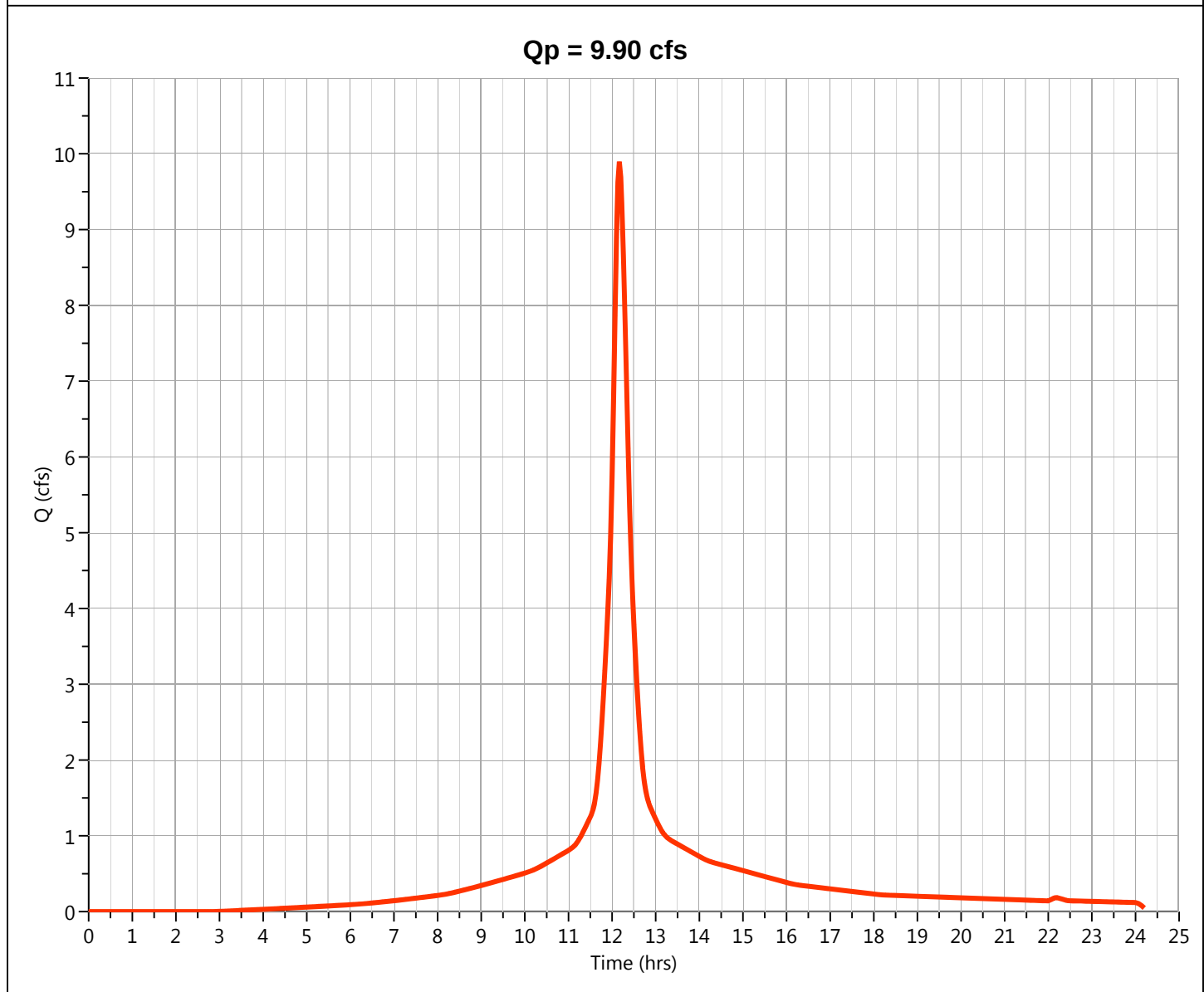
PRO SA-A.4

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 9.896 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.17 hrs
Time Interval	= 2 min	Runoff Volume	= 42,840 cuft
Drainage Area	= 1.838 ac	Curve Number	= 90.47*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 14.12 min
Total Rainfall	= 7.7200 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
1.464	98	B - PAVED
0.374	61	B - LANDSCAPED
1.838	90	Weighted Average



Hydrograph Discharge Table

PRO SA-A.4

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.30	1.012	12.50	3.786						
11.33	1.049	12.53	3.397						
11.37	1.088	12.57	3.025						
11.40	1.127	12.60	2.679						
11.43	1.168	12.63	2.371						
11.47	1.208	12.67	2.111						
11.50	1.248	12.70	1.903						
11.53	1.294	12.73	1.739						
11.57	1.355	12.77	1.612						
11.60	1.441	12.80	1.517						
11.63	1.563	12.83	1.445						
11.67	1.732	12.87	1.390						
11.70	1.949	12.90	1.345						
11.73	2.208	12.93	1.304						
11.77	2.505	12.97	1.262						
11.80	2.833	13.00	1.221						
11.83	3.185	13.03	1.180						
11.87	3.557	13.07	1.140						
11.90	3.942	13.10	1.103						
11.93	4.378	13.13	1.069						
11.97	4.948	13.17	1.039						
12.00	5.743	13.20	1.014						
12.03	6.752	13.23	0.993						
12.07	7.863	13.27	0.975						
12.10	8.892	...end	...end						
12.13	9.626								
12.17	9.896								
12.20	9.693								
12.23	9.172								
12.27	8.493								
12.30	7.742								
12.33	6.934								
12.37	6.113								
12.40	5.347								
12.43	4.708								
12.47	4.206								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

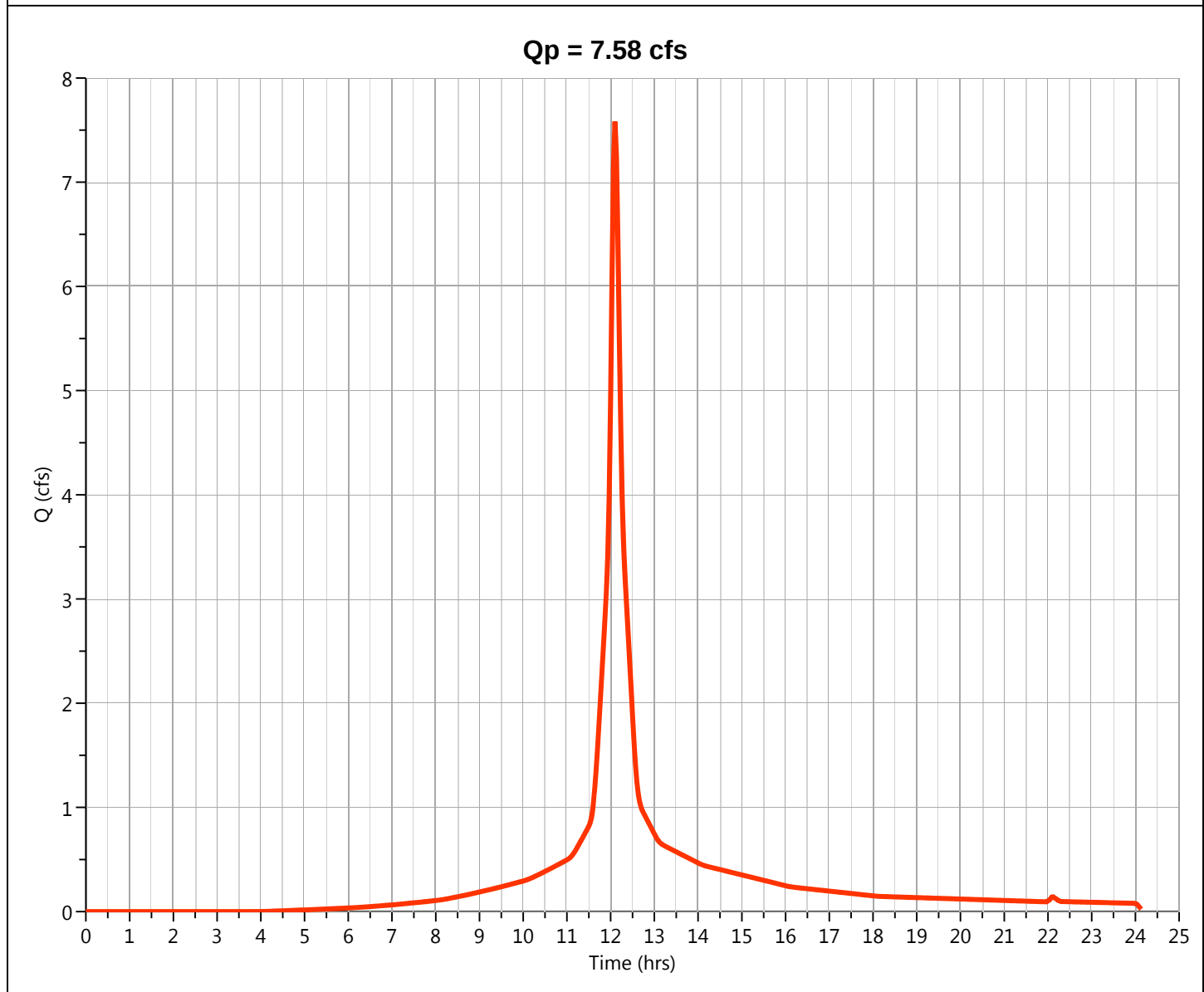
PRO SA-C

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 7.581 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Runoff Volume	= 26,921 cuft
Drainage Area	= 1.22 ac	Curve Number	= 86.16*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 7.4 min
Total Rainfall	= 7.7200 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

Composite CN Worksheet

AREA (ac)	CN	DESCRIPTION
0.84	98	B - PAVED
0.38	61	B - GRASS
1.22	86	Weighted Average



Hydrograph Discharge Table

PRO SA-C

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.43	0.766	12.63	1.125						
11.47	0.792	12.67	1.045						
11.50	0.819	12.70	0.995						
11.53	0.853	12.73	0.962						
11.57	0.914	12.77	0.935						
11.60	1.017	12.80	0.908						
11.63	1.166	12.83	0.881						
11.67	1.353	12.87	0.853						
11.70	1.568	12.90	0.826						
11.73	1.802	12.93	0.799						
11.77	2.045	12.97	0.772						
11.80	2.292	13.00	0.744						
11.83	2.543	...end	...end						
11.87	2.799								
11.90	3.058								
11.93	3.398								
11.97	3.971								
12.00	4.936								
12.03	6.154								
12.07	7.187								
12.10	7.581								
12.13	7.238								
12.17	6.423								
12.20	5.455								
12.23	4.578								
12.27	3.911								
12.30	3.474								
12.33	3.174								
12.37	2.920								
12.40	2.665								
12.43	2.408								
12.47	2.150								
12.50	1.891								
12.53	1.640								
12.57	1.419								
12.60	1.245								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

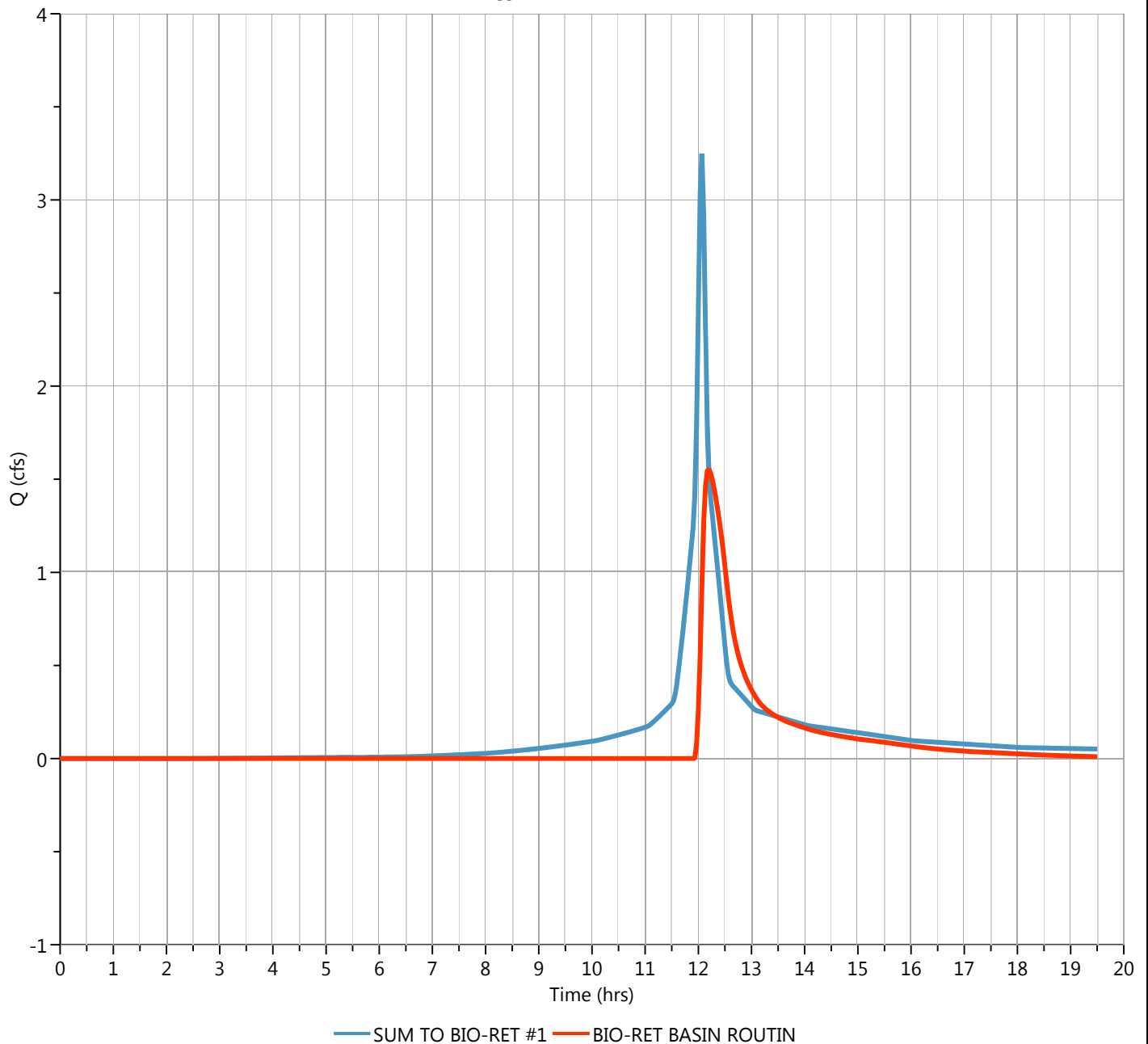
BIO-RET BASIN ROUTIN

Hyd. No. 7

Hydrograph Type	= Pond Route	Peak Flow	= 1.555 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.20 hrs
Time Interval	= 2 min	Hydrograph Volume	= 5,406 cuft
Inflow Hydrograph	= 3 - SUM TO BIO-RET #1	Max. Elevation	= 51.11 ft
Pond Name	= PROP. BIO-RETENTION BASIN #1	Max. Storage	= 3,502 cuft

Pond Routing by Storage Indication Method

Qp = 1.55 cfs



Hydrograph Discharge Table

BIO-RET BASIN ROUTIN

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
12.00	0.259	13.20	0.284						
12.03	0.552	13.23	0.275						
12.07	0.927	13.27	0.266						
12.10	1.261	13.30	0.258						
12.13	1.459	13.33	0.251						
12.17	1.544	13.37	0.244						
12.20	1.555	13.40	0.238						
12.23	1.530	13.43	0.232						
12.27	1.492	13.47	0.226						
12.30	1.445	13.50	0.221						
12.33	1.391	13.53	0.216						
12.37	1.331	13.57	0.211						
12.40	1.266	13.60	0.206						
12.43	1.197	13.63	0.202						
12.47	1.118	13.67	0.197						
12.50	1.031	13.70	0.193						
12.53	0.946	13.73	0.190						
12.57	0.863	13.77	0.186						
12.60	0.788	13.80	0.183						
12.63	0.723	13.83	0.180						
12.67	0.666	13.87	0.177						
12.70	0.618	13.90	0.174						
12.73	0.576	13.93	0.171						
12.77	0.538	13.97	0.168						
12.80	0.507	14.00	0.164						
12.83	0.478	14.03	0.161						
12.87	0.452	14.07	0.159						
12.90	0.428	14.10	0.156						
12.93	0.406	14.13	0.153						
12.97	0.387	...end	...end						
13.00	0.368								
13.03	0.351								
13.07	0.335								
13.10	0.320								
13.13	0.306								
13.17	0.294								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

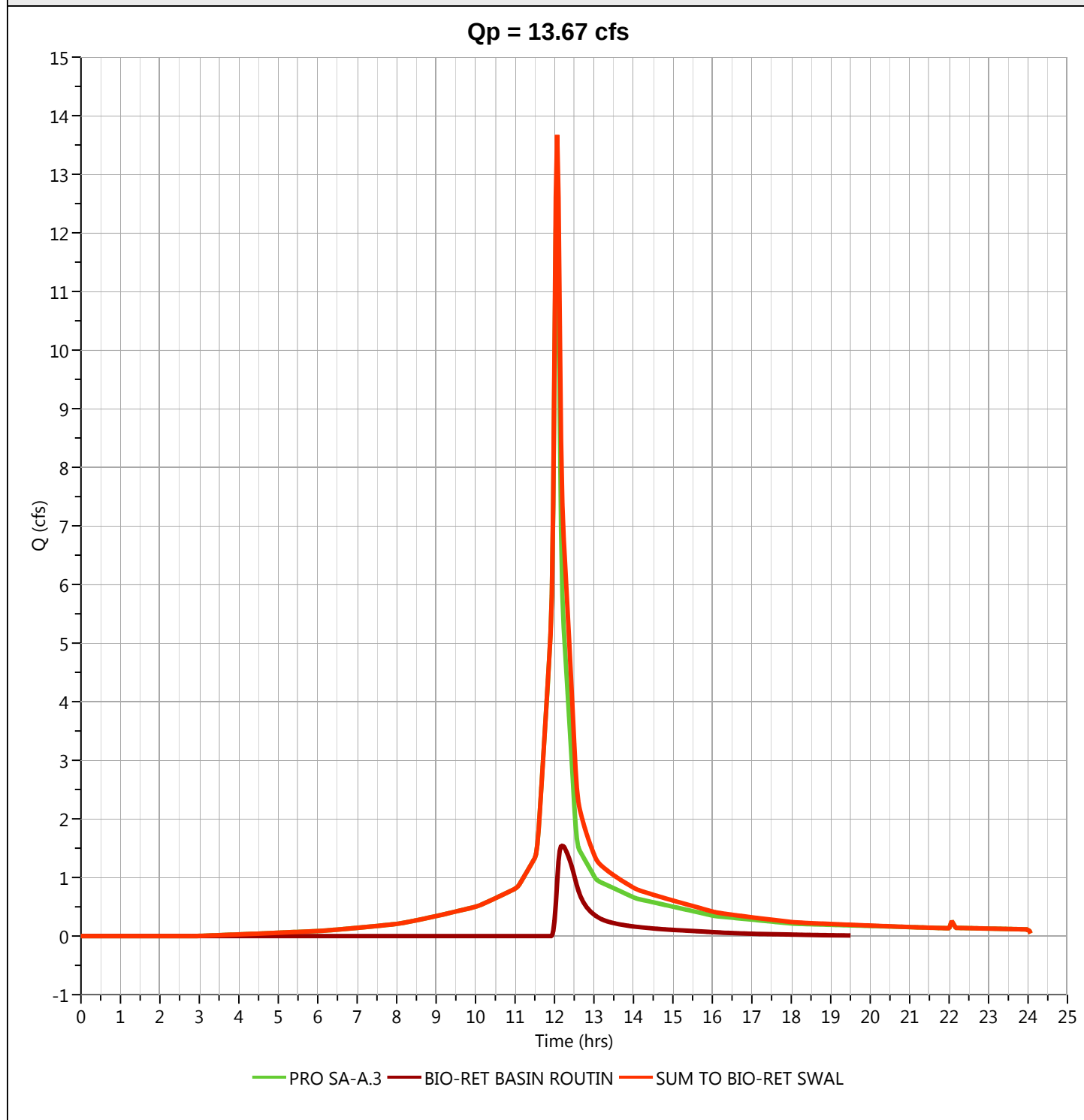
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO BIO-RET SWAL

Hyd. No. 8

Hydrograph Type	= Junction	Peak Flow	= 13.67 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.07 hrs
Time Interval	= 2 min	Hydrograph Volume	= 46,296 cuft
Inflow Hydrographs	= 4, 7	Total Contrib. Area	= 1.84 ac



Hydrograph Discharge Table

SUM TO BIO-RET SWAL

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.53	1.402	12.73	1.920						
11.57	1.566	12.77	1.843						
11.60	1.836	12.80	1.772						
11.63	2.170	12.83	1.703						
11.67	2.529	12.87	1.637						
11.70	2.892	12.90	1.573						
11.73	3.258	12.93	1.512						
11.77	3.628	12.97	1.453						
11.80	4.002	13.00	1.395						
11.83	4.380	13.03	1.340						
11.87	4.762	...end	...end						
11.90	5.147								
11.93	5.810								
11.97	7.372								
12.00	9.959								
12.03	12.61								
12.07	13.67								
12.10	12.60								
12.13	10.40								
12.17	8.467								
12.20	7.370								
12.23	6.790								
12.27	6.378								
12.30	5.958								
12.33	5.529								
12.37	5.092								
12.40	4.650								
12.43	4.203								
12.47	3.744								
12.50	3.278								
12.53	2.845								
12.57	2.518								
12.60	2.313								
12.63	2.185								
12.67	2.089								
12.70	2.002								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

Hydrology Studio v 2.0.0.52

06-17-2018

BIO-SWALE ROUTING

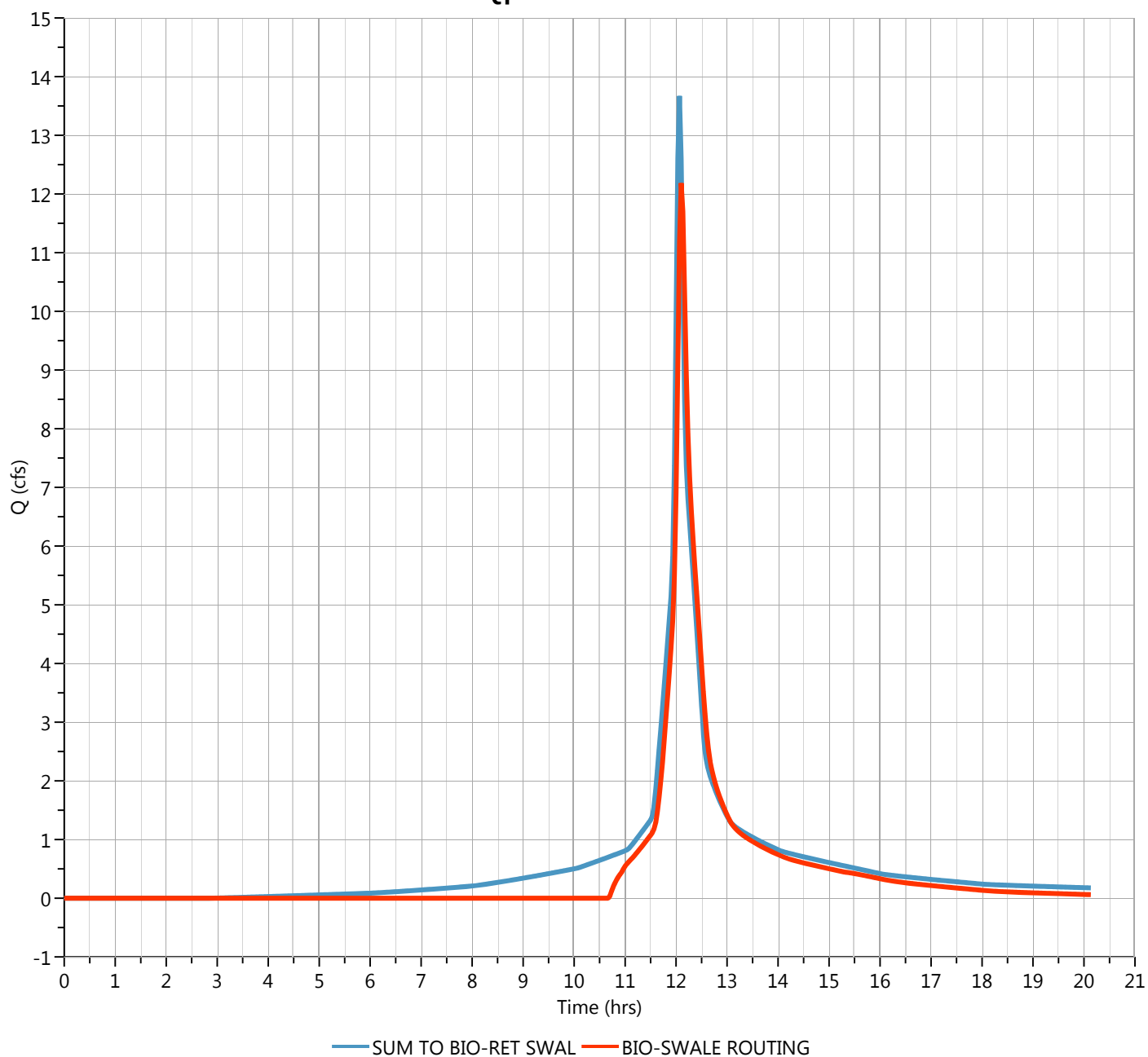
Hyd. No. 9

Hydrograph Type	= Pond Route	Peak Flow	= 12.18 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.10 hrs
Time Interval	= 2 min	Hydrograph Volume	= 34,817 cuft
Inflow Hydrograph	= 8 - SUM TO BIO-RET SWAL	Max. Elevation	= 49.44 ft
Pond Name	= PROP. BIO-RETENTION SWALE	Max. Storage	= 6,639 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 5 min

Qp = 12.18 cfs



Hydrograph Discharge Table

BIO-SWALE ROUTING

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.60	1.286	12.80	1.865						
11.63	1.480	12.83	1.778						
11.67	1.725	12.87	1.697						
11.70	2.007	12.90	1.622						
11.73	2.316	12.93	1.551						
11.77	2.692	12.97	1.484						
11.80	3.070	13.00	1.419						
11.83	3.447	13.03	1.358						
11.87	3.846	13.07	1.301						
11.90	4.259	13.10	1.254						
11.93	4.719	13.13	1.218						
11.97	5.489	...end	...end						
12.00	6.914								
12.03	9.058								
12.07	11.18								
12.10	12.18								
12.13	11.70								
12.17	10.34								
12.20	8.955								
12.23	7.908								
12.27	7.162								
12.30	6.595								
12.33	6.123								
12.37	5.670								
12.40	5.225								
12.43	4.808								
12.47	4.385								
12.50	3.946								
12.53	3.517								
12.57	3.140								
12.60	2.806								
12.63	2.538								
12.67	2.332								
12.70	2.191								
12.73	2.069								
12.77	1.961								

Hydrograph Report

Project Name: 39 Leggett St East Hartford

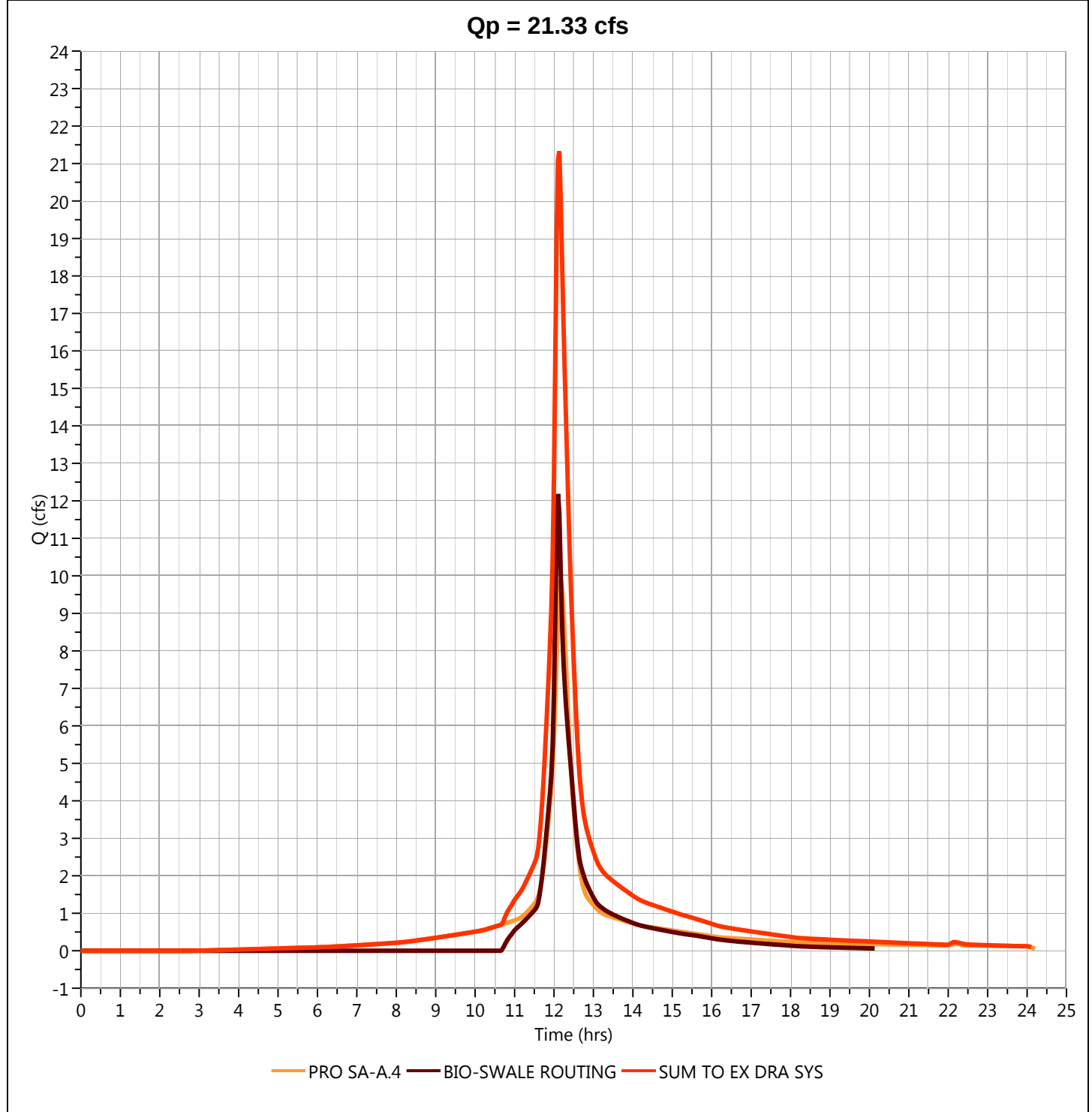
Hydrology Studio v 2.0.0.52

06-17-2018

SUM TO EX DRA SYS

Hyd. No. 10

Hydrograph Type	= Junction	Peak Flow	= 21.33 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.13 hrs
Time Interval	= 2 min	Hydrograph Volume	= 77,657 cuft
Inflow Hydrographs	= 5, 9	Total Contrib. Area	= 1.838 ac



Hydrograph Discharge Table

SUM TO EX DRA SYS

Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)	Time (hrs)	Outflow (cfs)
11.43	2.166	12.63	4.908						
11.47	2.244	12.67	4.443						
11.50	2.323	12.70	4.094						
11.53	2.411	12.73	3.808						
11.57	2.534	12.77	3.574						
11.60	2.727	12.80	3.381						
11.63	3.043	12.83	3.222						
11.67	3.456	12.87	3.087						
11.70	3.956	12.90	2.967						
11.73	4.525	12.93	2.854						
11.77	5.197	12.97	2.746						
11.80	5.903	13.00	2.640						
11.83	6.633	13.03	2.538						
11.87	7.403	13.07	2.441						
11.90	8.201	13.10	2.357						
11.93	9.097	13.13	2.287						
11.97	10.44	13.17	2.225						
12.00	12.66	13.20	2.170						
12.03	15.81	13.23	2.121						
12.07	19.04	...end	...end						
12.10	21.08								
12.13	21.33								
12.17	20.23								
12.20	18.65								
12.23	17.08								
12.27	15.65								
12.30	14.34								
12.33	13.06								
12.37	11.78								
12.40	10.57								
12.43	9.517								
12.47	8.592								
12.50	7.732								
12.53	6.915								
12.57	6.165								
12.60	5.485								

Design Storm Report

Custom Storm filename:

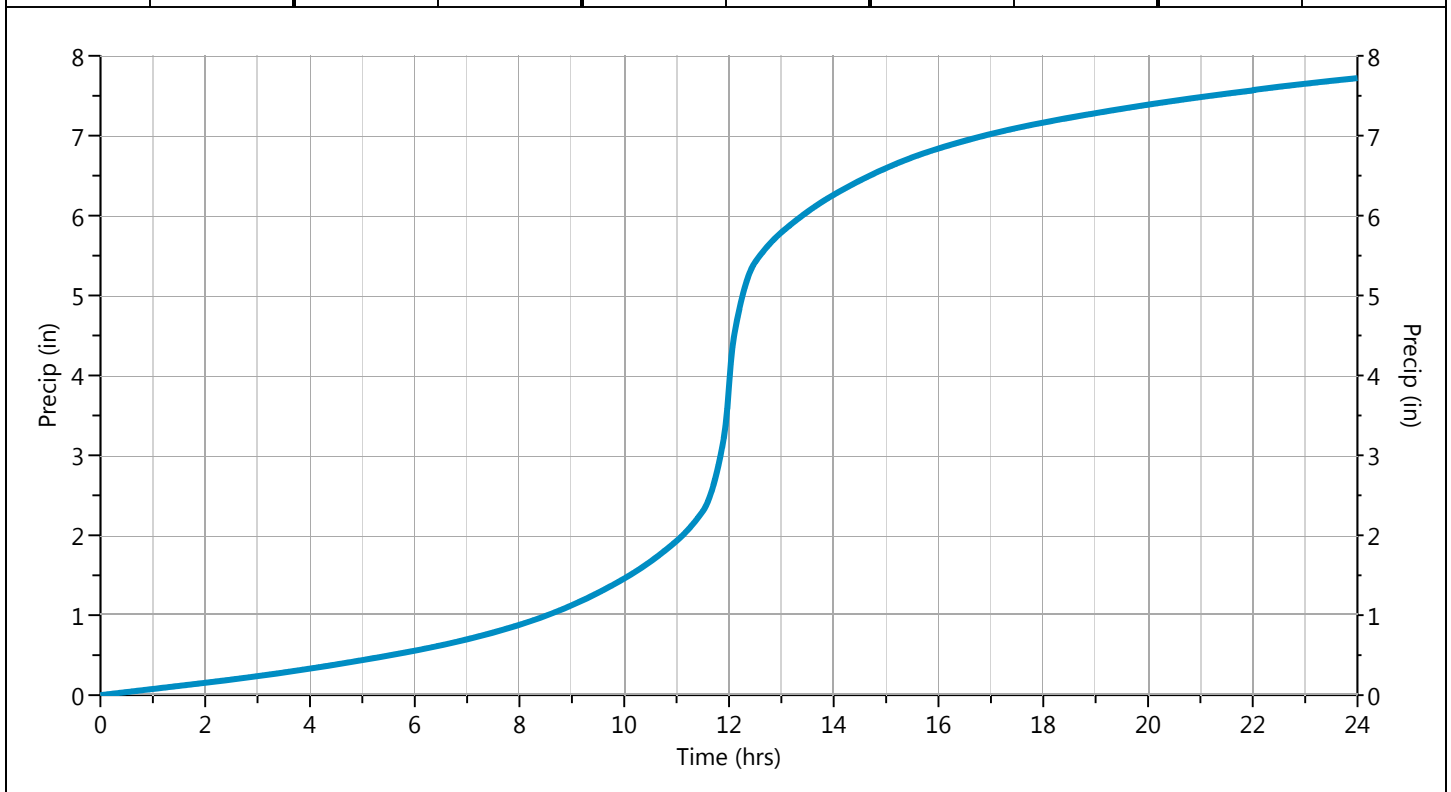
Hydrology Studio v 2.0.0.52

06-17-2018

Storm Distribution: NRCS/SCS - Type III

Storm Duration	Total Rainfall Volume (in)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	✓ 100-yr	
24 hrs	2.47	3.07	0.00	4.05	4.87	5.99	6.86	7.72	

Incremental Rainfall Distribution, 100-yr									
Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)	Time (hrs)	Precip (in)
11.00	0.0187	11.37	0.0271	11.73	0.0797	12.10	0.1529	12.47	0.0419
11.03	0.0192	11.40	0.0279	11.77	0.0872	12.13	0.1177	12.50	0.0344
11.07	0.0200	11.43	0.0286	11.80	0.0948	12.17	0.1099	12.53	0.0302
11.10	0.0208	11.47	0.0294	11.83	0.1023	12.20	0.1023	12.57	0.0294
11.13	0.0215	11.50	0.0302	11.87	0.1099	12.23	0.0948	12.60	0.0286
11.17	0.0223	11.53	0.0344	11.90	0.1174	12.27	0.0872	12.63	0.0279
11.20	0.0231	11.57	0.0419	11.93	0.1531	12.30	0.0797	12.67	0.0271
11.23	0.0239	11.60	0.0495	11.97	0.2162	12.33	0.0721	12.70	0.0263
11.27	0.0247	11.63	0.0570	12.00	0.2795	12.37	0.0646	12.73	0.0255
11.30	0.0255	11.67	0.0646	12.03	0.2791	12.40	0.0570	12.77	0.0247
11.33	0.0263	11.70	0.0721	12.07	0.2162	12.43	0.0495	12.80	0.0239



IDF Report

IDF filename: NOHA Atlas 14 - IDF for 34 Leggett Street East Hartford CT.idf

Hydrology Studio v 2.0.0.52

06-17-2018

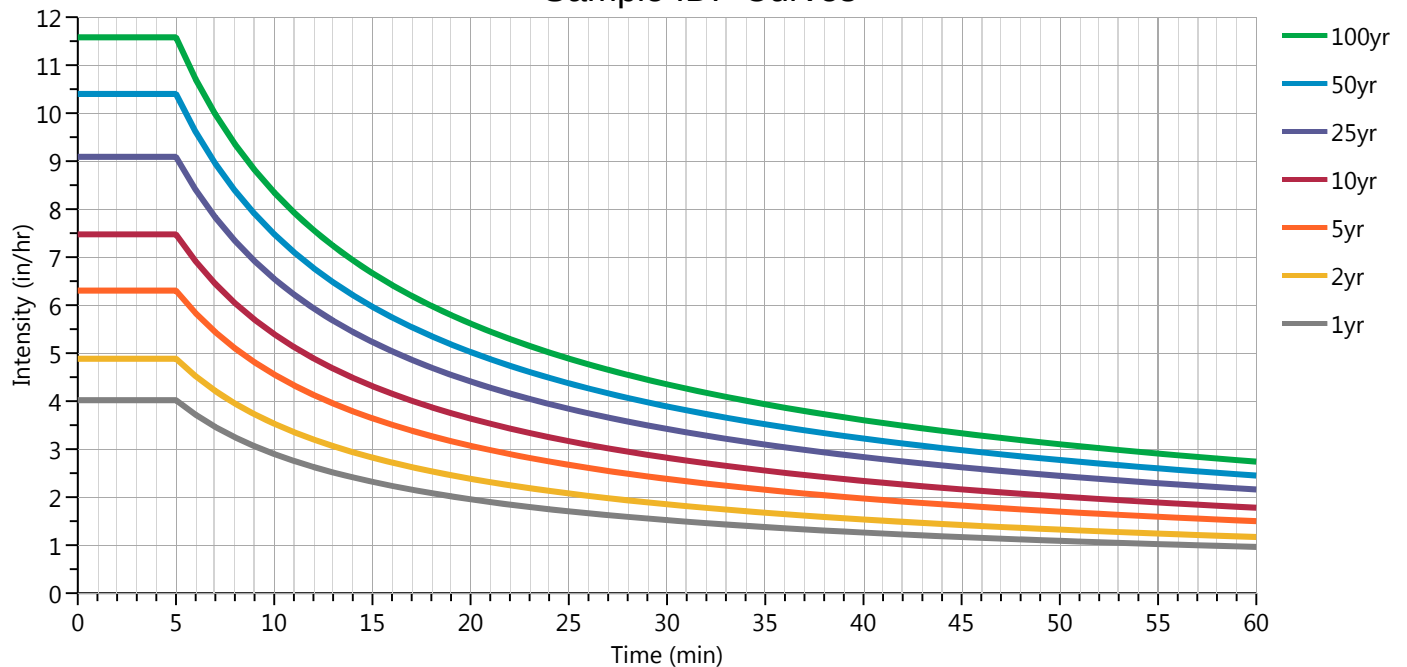
Equation Coefficients	Intensity = B / (Tc + D)^E (in/hr)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
B	18.6691	23.4341	0.0000	30.9693	36.1076	43.3114	50.0284	56.3481	
D	3.6000	3.8000	0.0000	3.9000	3.8000	3.7000	3.7000	3.8000	
E	0.7137	0.7212	0.0000	0.7282	0.7243	0.7218	0.7261	0.7276	

Minimum Tc = 5 minutes

Tc (min)	Intensity Values (in/hr)								
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
Cf	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
5	4.02	4.88	0	6.30	7.47	9.09	10.40	11.58	
10	2.90	3.53	0	4.56	5.40	6.55	7.48	8.35	
15	2.32	2.82	0	3.64	4.31	5.23	5.97	6.67	
20	1.96	2.38	0	3.07	3.64	4.41	5.02	5.61	
25	1.71	2.08	0	2.67	3.17	3.84	4.37	4.89	
30	1.52	1.85	0	2.38	2.82	3.42	3.89	4.35	
35	1.38	1.67	0	2.15	2.55	3.10	3.52	3.93	
40	1.26	1.53	0	1.97	2.34	2.84	3.22	3.60	
45	1.17	1.42	0	1.82	2.16	2.62	2.98	3.33	
50	1.09	1.32	0	1.70	2.01	2.44	2.77	3.10	
55	1.02	1.24	0	1.59	1.89	2.29	2.60	2.91	
60	0.96	1.17	0	1.50	1.78	2.16	2.45	2.74	

Cf = Correction Factor applied to Rational Method runoff coefficient.

Sample IDF Curves



Precipitation Report

Precipitation filename: NOHA Atlas 14 -PFE for 34 Leggett St East Hartford.idf.pcp

Hydrology Studio v 2.0.0.52

06-17-2018

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✓	✓		✓	✓	✓	✓	✓
NRCS Storms	> NRCS Dimensionless Storms								
SCS 6hr		1.75	2.12	0	2.73	3.24	3.94	4.48	5.02
Type I, 24-hr		2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Type IA, 24-hr		2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Type II, 24-hr		2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Type II FL, 24-hr		2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Type III, 24-hr	✓	2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Synthetic Storms	> IDF-Based Synthetic Storms								
1-hr		0.96	1.17	0	1.50	1.78	2.16	2.45	2.74
2-hr		1.20	1.45	0	1.85	2.20	2.68	3.03	3.38
3-hr		1.36	1.64	0	2.08	2.48	3.02	3.41	3.81
6-hr		1.67	2.00	0	2.54	3.03	3.69	4.15	4.63
12-hr		2.04	2.44	0	3.07	3.68	4.49	5.03	5.62
24-hr		2.49	2.96	0	3.72	4.46	5.45	6.10	6.80
Huff Distribution	> 1st Quartile (0 to 6 hrs)								
1-hr		0.93	1.14	0	1.47	1.75	2.13	2.43	2.72
2-hr		1.21	1.47	0	1.89	2.24	2.72	3.09	3.46
3-hr		1.40	1.69	0	2.18	2.57	3.12	3.55	3.97
6-hr		1.75	2.12	0	2.73	3.24	3.94	4.48	5.02
Huff Distribution	> 2nd Quartile (>6 to 12 hrs)								
8-hr		0	0	0	0	0	0	0	0
12-hr		2.12	2.60	0	3.38	4.02	4.92	5.60	6.29
Huff Distribution	> 3rd Quartile (>12 to 24 hrs)								
18-hr		0	0	0	0	0	0	0	0
24-hr		2.47	3.07	0	4.05	4.87	5.99	6.86	7.72
Custom Storms	> Custom Storm Distributions								
My Custom Storm 1		0	0	0	0	0	0	0	0
My Custom Storm 2		0	0	0	0	0	0	0	0
My Custom Storm 3		0	0	0	0	0	0	0	0
My Custom Storm 4		0	0	0	0	0	0	0	0
My Custom Storm 5		0	0	0	0	0	0	0	0
My Custom Storm 6		0	0	0	0	0	0	0	0
My Custom Storm 7		0	0	0	0	0	0	0	0
My Custom Storm 8		0	0	0	0	0	0	0	0
My Custom Storm 9		0	0	0	0	0	0	0	0
My Custom Storm 10		0	0	0	0	0	0	0	0

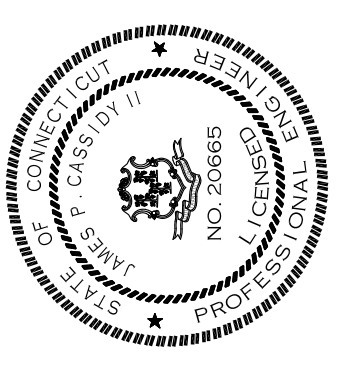
Appendix H

Onsite Drainage Subarea Map

Drainage Subarea Map – Pre Drainage Area

&

Drainage Subarea Map – Post Drainage Area



PRE DEVELOPMENT DRAINAGE AREA
SHOWING EXISTING CONDITIONS
PREPARED FOR
LEGGETT STREET REALTY, LLC
PROPERTY LOCATED AT
#69 & #34 LEGGETT STREET
EAST HARTFORD, CONNECTICUT

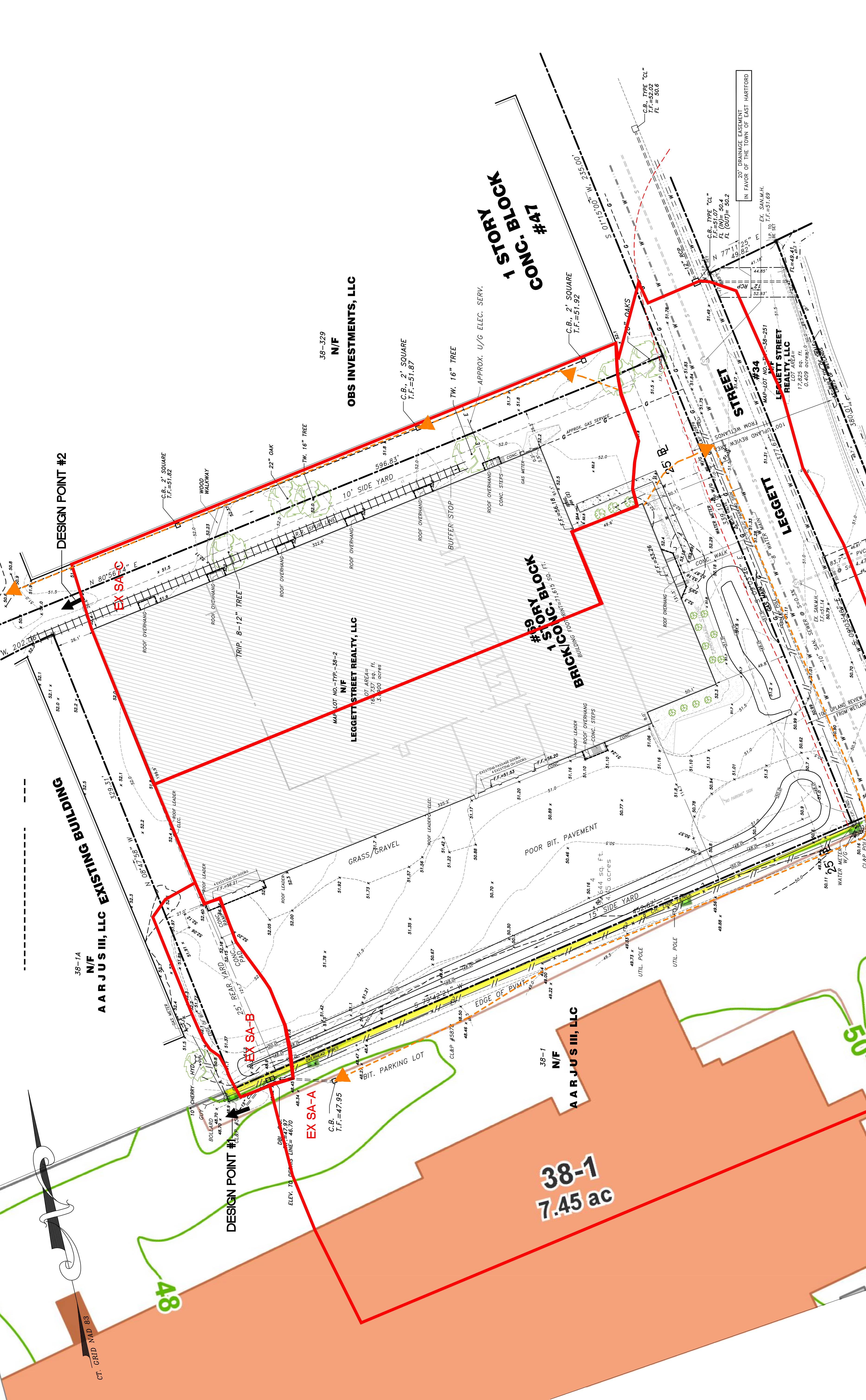
HALLISEY, PEARSON & CASSIDY
CIVIL ENGINEERS & LAND SURVEYORS
630 MAIN STREET, UNIT #1A
CROMWELL, CONNECTICUT 06416
PHONE: (860)-529-6812, FAX: (860)-721-7709

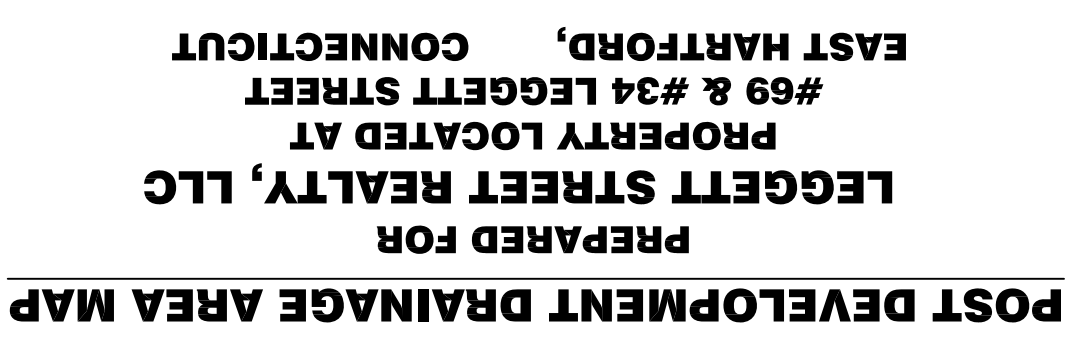
SCALE: 1"= 30'	CHECKED BY: J.P.C.	DATE: JUNE 11, 2018	DRAWN BY: G.T.	JOB NO.: 1347-BKM	SHEET: 1	REVISIONS:
						OF: 1

DRAINAGE SUBAREA - LEGEND

LIMITS OF PRE DEVELOPMENT DRAINAGE SUBAREA

TIME OF CONCENTRATION FLOW LINE





DATE: JUNE 15, 2018	DRAWN BY: G.T.
JOB NO.: 1347-BKM	ACAD FILE: 1347-POST-DRA
SHEET: 1	OF: 1
REVISONS:	

