

kratzert, jones & associates, inc.

CIVIL ENGINEERS • LAND SURVEYORS • SITE PLANNERS

1755 MERIDEN-WATERBURY ROAD, BOX 337, MILLDALE, CONNECTICUT 06467-0337

PHONE (860) 621-3638 • FAX (860) 621-9609 • EMAIL INFO@KRATZERTJONES.COM

AN EQUAL OPPORTUNITY EMPLOYER - M - F

STORMWATER MANAGEMENT REPORT 9/30/21

Including:

2, 5, 10, 25, and 100-Year Storms

Prepared for:

CURTISS STREET INDUSTRIAL PARK
136 Curtiss Street
Southington, CT

Andrew J. Quirk, P.E.

kratzert, jones & associates, inc.

CIVIL ENGINEERS • LAND SURVEYORS • SITE PLANNERS

1755 MERIDEN-WATERBURY ROAD, BOX 337, MILLDALE, CONNECTICUT 06467-0337

PHONE (860) 621-3638 • FAX (860) 621-9609 • EMAIL INFO@KRATZERTJONES.COM

AN EQUAL OPPORTUNITY EMPLOYER - M - F

EXECUTIVE SUMMARY

This report summarizes the hydrologic changes and management of stormwater associated with the construction of an industrial subdivision. The existing site land coverage is presently an industrial use with pavement and buildings but the lack of a formalized stormwater system. The proposed development will consist of 12 industrial lots on a public road with a stormwater system designed to meet Town standards. The Stormwater Management Plan will include measures to control increases in runoff and address water quality concerns associated with the development of the site.

Watershed Description

In the pre-development condition, the site is described by one watershed: "EX-1" draining easterly towards the Quinnipiac River including the Ivy Drive drainage system. (See Sheet WS-1) In the post-development condition, the site is described one similar watershed including the upgradient Ivy Drive drainage system as well as the developed site drainage collected and directed to Stormwater Basin #1. (See Sheet WS-2) Hydrologic routing has been performed to compare the stormwater conditions for the total pre- and post-development combined watersheds. Roofwater is to be directed to recharge the groundwater through underground galleys for each of the lots. The stormwater model is based upon each of the 12 lots providing retention for 14,500 sf of impervious area with 744 cubic feet of groundwater recharge storage.

ZIRO (Zero Increase in Peak Discharge Runoff Rates) is achieved through the 100-year storm event each of the watershed areas.

Erosions and Sedimentation Control

The goal of the erosion and sedimentation controls on the site is to maintain water quality to runoff and to minimize erosion to areas both on and off site. In order to accomplish these goals, several erosion control measures are proposed. The plans have been developed in accordance with the 2004 Sedimentation and Erosion Control Guidelines and the Stormwater Quality Manual.

Water quality of the runoff will be provided through the use of **Best Management Practice (BMP)** erosion controls during construction. A detailed construction sequence and erosion control measures have been included with the plans. Silt fences are proposed down slope of areas proposed to be disturbed. Inlet protection devices will be installed around all catch basins during construction.

Following construction, water quality shall be maintained by grassed swales and a stormwater basin that includes a sediment forebay and micropool with a rip rap filter berm to retain sediment prior to discharge.

kratzert, jones & associates, inc.

CIVIL ENGINEERS • LAND SURVEYORS • SITE PLANNERS

1755 MERIDEN-WATERBURY ROAD, BOX 337, MILLDALE, CONNECTICUT 06467-0337

PHONE (860) 621-3638 • FAX (860) 621-9609 • EMAIL INFO@KRATZERTJONES.COM

AN EQUAL OPPORTUNITY EMPLOYER - M - F

Model Formulation

Pre-development and post-development hydrographs were developed using the Rational Method. C values were derived based on land cover and the hydrologic soil groups. Time of concentration values were computed using the TR-55 method which takes into account length of flow-path, basin slope and curve number. The time of concentration calculations are included in this report. Storm routing was performed for the 2-year, 10-year, 25-year, 50-year, and 100-year storm events. For pipe sizing, the runoff rates were determined using the rational formula with the times of concentrations computed using the TR-55 method.

kratzert, jones & associates, inc.

CIVIL ENGINEERS • LAND SURVEYORS • SITE PLANNERS

1755 MERIDEN-WATERBURY ROAD, BOX 337, MILLDALE, CONNECTICUT 06467-0337

PHONE (860) 621-3638 • FAX (860) 621-9609 • EMAIL INFO@KRATZERTJONES.COM

AN EQUAL OPPORTUNITY EMPLOYER - M - F

Summary of Peak Discharge Rates

WATERSHED #1

Values shown are in Runoff Volumes in Cubic Feet per Second (CFS)

Storm Event	Pre-Development	Post-Development	Δ (%)
2-year	29.2	28.7	-0.5 (-2%)
5-year	37.4	36.7	-0.7 (-2%)
10-year	44.1	43.3	-0.8 (-2%)
25-year	53.2	52.4	-0.8(-2%)
100-year	67.5	66.5	-1.0 (-1%)

Project No. 219090

CURTISS STREET INDUSTRIAL PARK

SOUTHINGTON, CT

COMPOSITE 'C' CALCULATIONS:

<i>COVERAGE AND SOIL TYPE</i>	C	AREAS (Acres)	
		PRE-DEVELOPMENT	POST-DEVELOPMENT
		EX #1	PR #1
Residential 1-2 units per acre - Type B Soil	0.36	22.00	22.00
Residential 1-2 units per acre - Type C Soil	0.40	2.50	2.50
Residential 2-3 units per acre - Type D Soil	0.44	6.30	6.30
Open Space Good Condition - Type A Soil	0.30	0.25	1.75
Open Space Good Condition - Type B Soil	0.34	0.30	7.75
Woods Good Condition - Type A Soil	0.26	0.35	0.30
Woods Good Condition - Type B Soil	0.30	16.40	5.20
Impervious Areas (Homes, Drives, Roads)	0.95	4.10	6.40
Retained Impervious Areas (Groundwater Recharge Units for 14,500 sf for 12 lots)			4.00
Area (Ac.)*		52.20	48.20
'C' WEIGHTED		0.40	0.39

* Area excludes retained impervious areas

RETAINED IMPERVIOUS AREA – 14,500 SF FOR EACH OF THE 12 LOTS

GROUNDWATER RECHARGE CALCULATIONS (GRv):

$$GRv = (P) (D) (I) / 12$$

P = 1.0 90% Rainfall Event (in)

D = 0.60 Recharge Factor - Primarily Type A soils

I = 14,500 Impervious Area (sf)

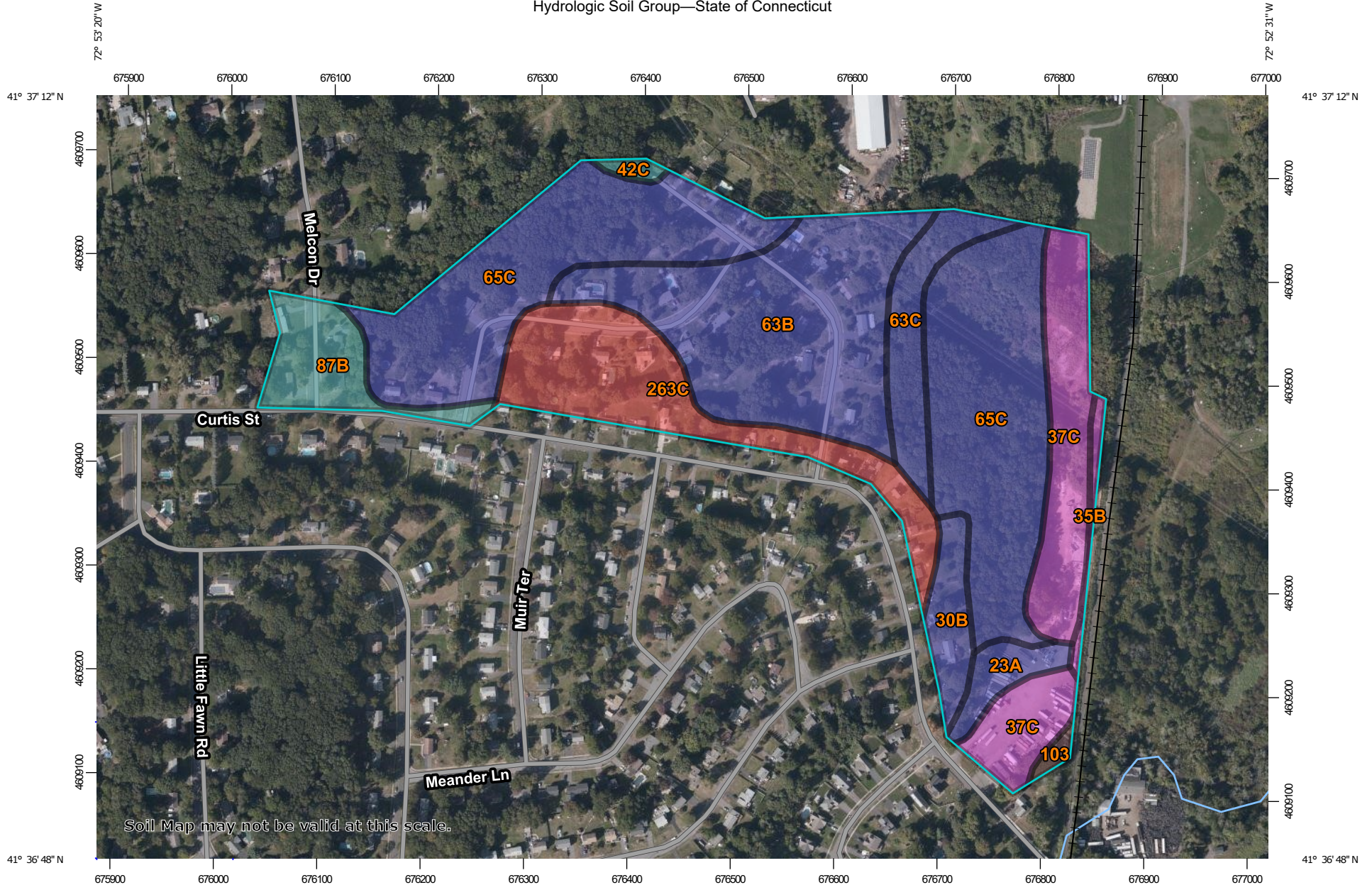
GRv = 0.0166 Groundwater Recharge volume (ac-ft)

725 Groundwater Recharge volume (cf)

PROPOSED: 744 Groundwater Recharge volume (cf)

24 Units of SC-310 chambers at 31.0 cf per chamber

Hydrologic Soil Group—State of Connecticut



Map Scale: 1:5,180 if printed on A landscape (11" x 8.5") sheet.



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



MAP LEGEND

Area of Interest (AOI)









 Area of Interest (AOI)

Soils

Soil Rating Polygons





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

Soil Rating Lines


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

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available


Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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 21, Sep 7, 2021

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

Date(s) aerial images were photographed: Aug 30, 2019—Oct 15, 2019

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
23A	Sudbury sandy loam, 0 to 5 percent slopes	B	1.2	2.3%
30B	Branford silt loam, 3 to 8 percent slopes	B	1.7	3.2%
35B	Penwood loamy sand, 3 to 8 percent slopes	A	0.5	0.9%
37C	Manchester gravelly sandy loam, 3 to 15 percent slopes	A	6.2	12.0%
42C	Ludlow silt loam, 2 to 15 percent slopes, extremely stony	C	0.3	0.5%
63B	Cheshire fine sandy loam, 3 to 8 percent slopes	B	11.1	21.3%
63C	Cheshire fine sandy loam, 8 to 15 percent slopes	B	2.7	5.1%
65C	Cheshire fine sandy loam, 3 to 15 percent slopes, extremely stony	B	19.0	36.6%
87B	Wethersfield loam, 3 to 8 percent slopes	C	2.7	5.2%
103	Rippowam fine sandy loam	B/D	0.2	0.5%
263C	Cheshire-Urban land complex, 8 to 15 percent slopes	D	6.5	12.6%
Totals for Area of Interest			52.0	100.0%

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Watershed Model Schematic	1
Hydrograph Return Period Recap	2
2 - Year	
Summary Report	3
Hydrograph Reports	4
Hydrograph No. 1, Dekalb, EX#1	4
TR-55 Tc Worksheet	5
Hydrograph No. 2, Dekalb, PR#1	6
TR-55 Tc Worksheet	7
Hydrograph No. 3, Reservoir, STORM BASIN #1 ROUTING	8
Pond Report - BASIN #1	9
5 - Year	
Summary Report	11
Hydrograph Reports	12
Hydrograph No. 1, Dekalb, EX#1	12
Hydrograph No. 2, Dekalb, PR#1	13
Hydrograph No. 3, Reservoir, STORM BASIN #1 ROUTING	14
10 - Year	
Summary Report	15
Hydrograph Reports	16
Hydrograph No. 1, Dekalb, EX#1	16
Hydrograph No. 2, Dekalb, PR#1	17
Hydrograph No. 3, Reservoir, STORM BASIN #1 ROUTING	18
25 - Year	
Summary Report	19
Hydrograph Reports	20
Hydrograph No. 1, Dekalb, EX#1	20
Hydrograph No. 2, Dekalb, PR#1	21
Hydrograph No. 3, Reservoir, STORM BASIN #1 ROUTING	22
100 - Year	
Summary Report	23
Hydrograph Reports	24
Hydrograph No. 1, Dekalb, EX#1	24
Hydrograph No. 2, Dekalb, PR#1	25
Hydrograph No. 3, Reservoir, STORM BASIN #1 ROUTING	26
IDF Report	27

Watershed Model Schematic

Hydraflow Hydrographs by Intelisolve v9.1



Legend

<u>Hyd.</u>	<u>Origin</u>	<u>Description</u>
1	Dekalb	EX#1
2	Dekalb	PR#1
3	Reservoir	STORM BASIN #1 ROUTING

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Dekalb	-----	-----	29.21	-----	37.39	44.05	53.18	-----	67.47	EX#1
2	Dekalb	-----	-----	29.23	-----	37.45	44.13	53.30	-----	67.63	PR#1
3	Reservoir	2	-----	28.70	-----	36.73	43.34	52.42	-----	66.53	STORM BASIN #1 ROUTING

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Dekalb	29.21	1	235	172,181	----	-----	-----	EX#1
2	Dekalb	29.23	1	200	146,599	----	-----	-----	PR#1
3	Reservoir	28.70	1	201	146,036	2	157.96	9,954	STORM BASIN #1 ROUTING
RATIONAL.gpw					Return Period: 2 Year			Monday, Oct 4, 2021	

Hydrograph Report

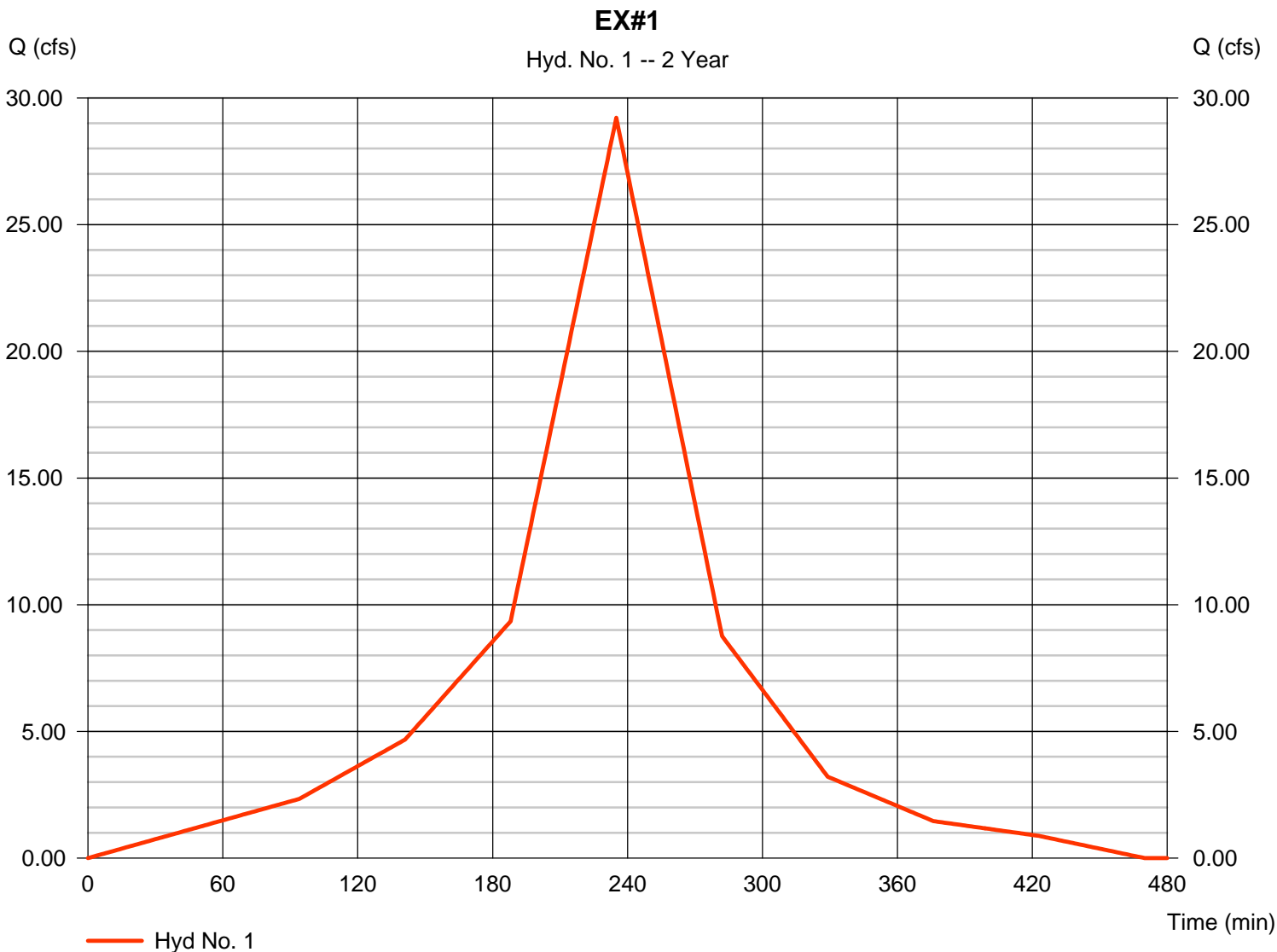
Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 1

EX#1

Hydrograph type	= Dekalb	Peak discharge	= 29.21 cfs
Storm frequency	= 2 yrs	Time to peak	= 235 min
Time interval	= 1 min	Hyd. volume	= 172,181 cuft
Drainage area	= 52.200 ac	Runoff coeff.	= 0.4
Intensity	= 1.399 in/hr	Tc by TR55	= 47.00 min
IDF Curve	= NOAA-SOUTHINGTON.IDF	Asc/Rec limb fact	= n/a



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No. 1

EX#1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.410	0.240	0.011	
Flow length (ft)	= 170.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.40	0.00	0.00	
Land slope (%)	= 2.10	0.00	0.00	
Travel Time (min)	= 31.86	+ 0.00	+ 0.00	= 31.86
Shallow Concentrated Flow				
Flow length (ft)	= 145.00	55.00	1124.00	
Watercourse slope (%)	= 1.40	1.00	2.00	
Surface description	= Unpaved	Paved	Unpaved	
Average velocity (ft/s)	= 1.91	2.03	2.28	
Travel Time (min)	= 1.27	+ 0.45	+ 8.21	= 9.93
Channel Flow				
X sectional flow area (sqft)	= 1.20	1.20	0.00	
Wetted perimeter (ft)	= 3.90	3.90	0.00	
Channel slope (%)	= 5.00	3.00	0.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	= 10.08	7.81	0.00	
Flow length (ft)	= 380.0	1975.0	0.0	
Travel Time (min)	= 0.63	+ 4.21	+ 0.00	= 4.84
Total Travel Time, Tc				47.00 min

Hydrograph Report

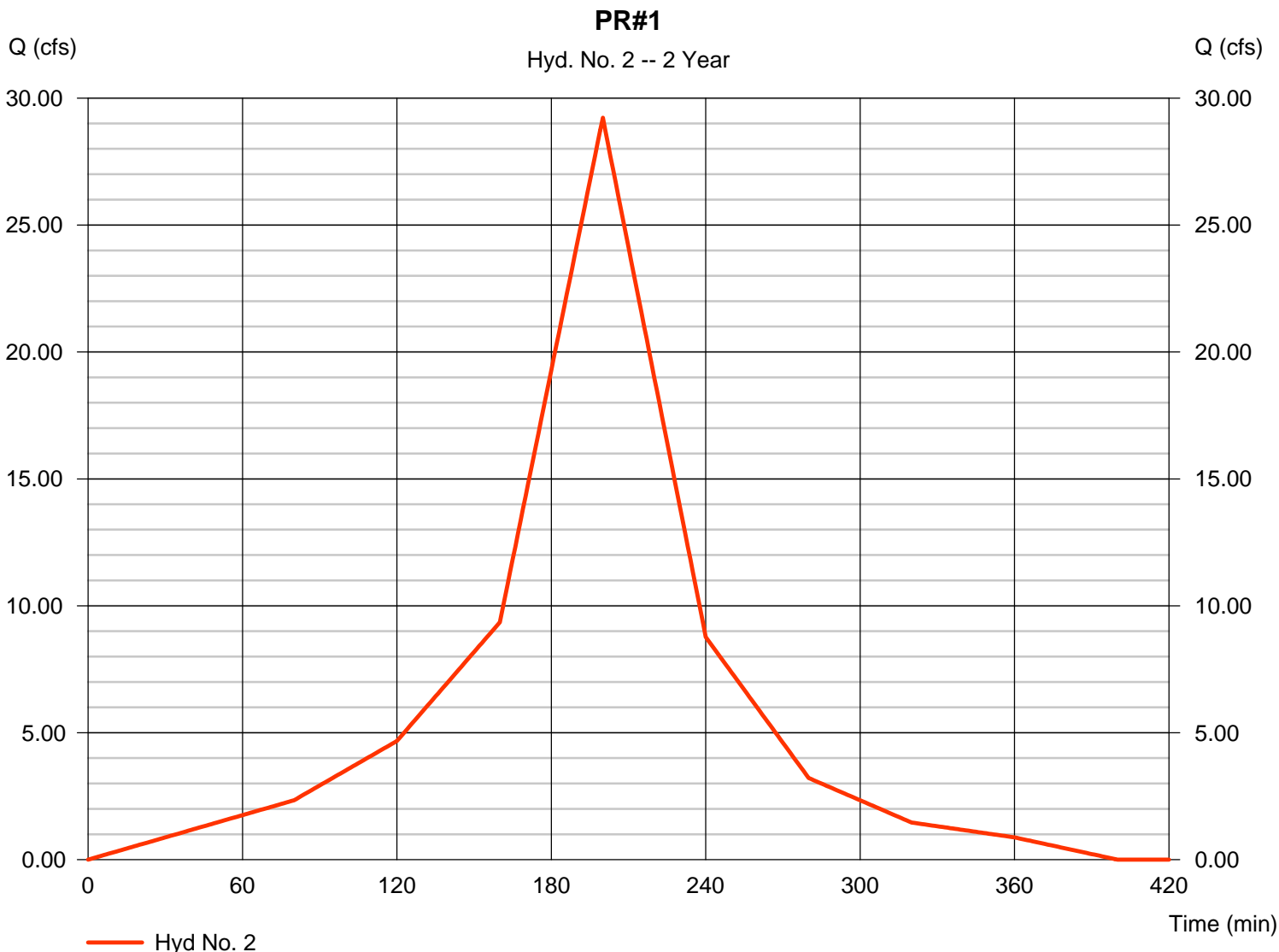
Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 2

PR#1

Hydrograph type	= Dekalb	Peak discharge	= 29.23 cfs
Storm frequency	= 2 yrs	Time to peak	= 200 min
Time interval	= 1 min	Hyd. volume	= 146,599 cuft
Drainage area	= 48.200 ac	Runoff coeff.	= 0.39
Intensity	= 1.555 in/hr	Tc by TR55	= 40.00 min
IDF Curve	= NOAA-SOUTHINGTON.IDF	Asc/Rec limb fact	= n/a



TR55 Tc Worksheet

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No. 2

PR#1

<u>Description</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>Totals</u>
Sheet Flow				
Manning's n-value	= 0.410	0.240	0.011	
Flow length (ft)	= 170.0	0.0	0.0	
Two-year 24-hr precip. (in)	= 3.40	0.00	0.00	
Land slope (%)	= 2.10	0.00	0.00	
Travel Time (min)	= 31.86	+ 0.00	+ 0.00	= 31.86
Shallow Concentrated Flow				
Flow length (ft)	= 145.00	55.00	0.00	
Watercourse slope (%)	= 1.40	1.00	0.00	
Surface description	= Unpaved	Paved	Unpaved	
Average velocity (ft/s)	= 1.91	2.03	0.00	
Travel Time (min)	= 1.27	+ 0.45	+ 0.00	= 1.72
Channel Flow				
X sectional flow area (sqft)	= 1.20	1.20	3.10	
Wetted perimeter (ft)	= 3.90	3.90	6.30	
Channel slope (%)	= 5.00	3.00	2.00	
Manning's n-value	= 0.015	0.015	0.015	
Velocity (ft/s)	= 10.08	7.81	8.74	
Flow length (ft)	= 380.0	1975.0	824.0	
Travel Time (min)	= 0.63	+ 4.21	+ 1.57	= 6.41
Total Travel Time, Tc				40.00 min

Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

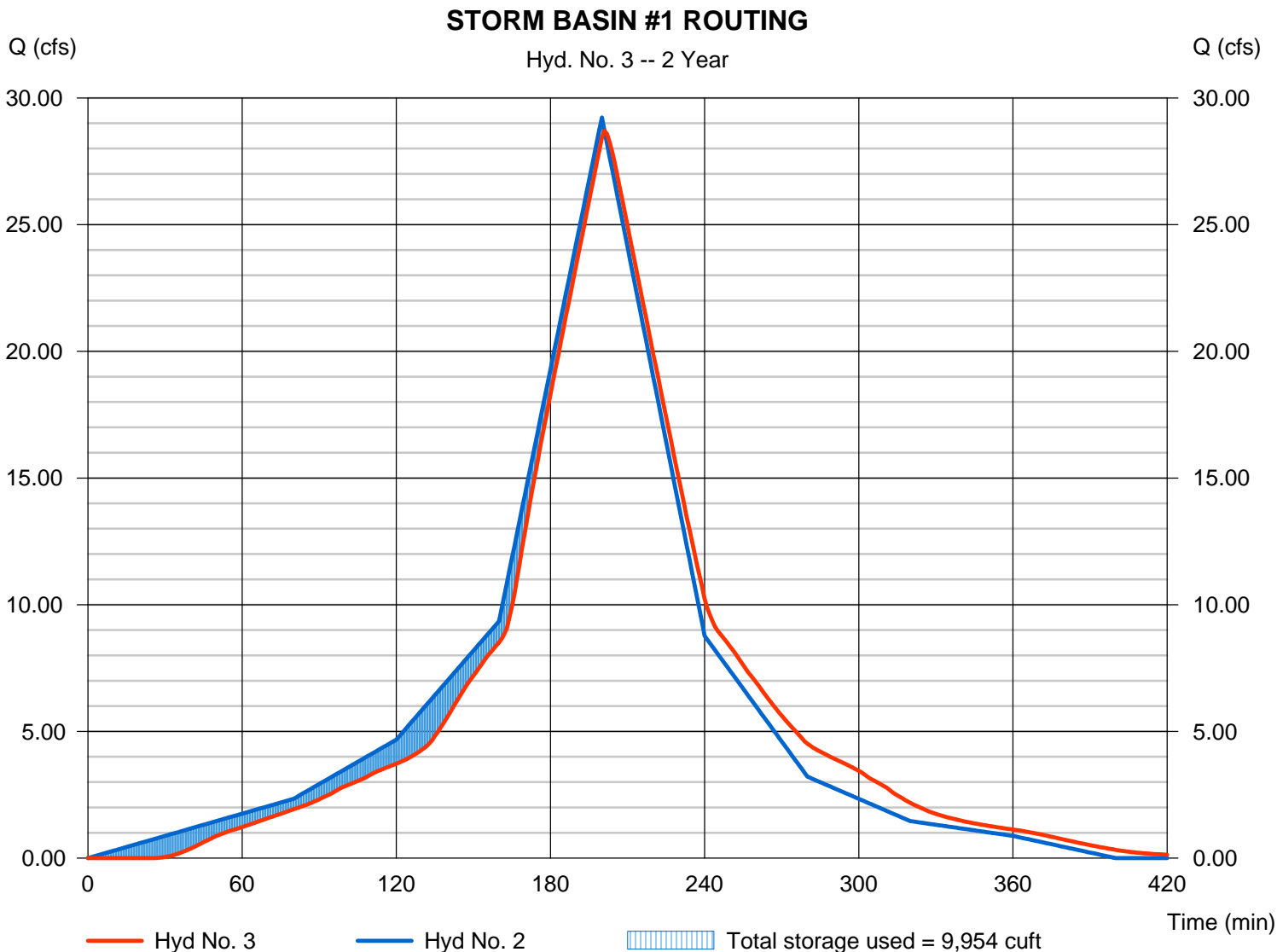
Hyd. No. 3

STORM BASIN #1 ROUTING

Hydrograph type = Reservoir
Storm frequency = 2 yrs
Time interval = 1 min
Inflow hyd. No. = 2 - PR#1
Reservoir name = BASIN #1

Peak discharge = 28.70 cfs
Time to peak = 201 min
Hyd. volume = 146,036 cuft
Max. Elevation = 157.96 ft
Max. Storage = 9,954 cuft

Storage Indication method used.



Pond Report

Pond No. 1 - BASIN #1

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 155.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	155.00	429	0	0
0.50	155.50	1,963	552	552
1.00	156.00	2,688	1,158	1,709
1.50	156.50	3,439	1,528	3,237
2.00	157.00	4,215	1,910	5,147
2.50	157.50	5,015	2,304	7,452
3.00	158.00	5,843	2,712	10,163
3.50	158.50	6,714	3,136	13,300
4.00	159.00	7,639	3,585	16,885
4.50	159.50	10,000	4,396	21,281

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 36.00	15.00	0.00	0.00
Span (in)	= 36.00	15.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 155.50	155.50	0.00	0.00
Length (ft)	= 22.00	0.00	0.00	0.00
Slope (%)	= 0.60	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 5.00	15.00	0.00	0.00
Crest El. (ft)	= 157.00	157.50	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Riser	Broad	---	---
Multi-Stage	= Yes	No	No	No
Exfil.(in/hr)	= 0.000 (by Contour)			
TW Elev. (ft)	= 0.00			

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

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	155.00	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.05	55	155.05	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.10	110	155.10	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.15	165	155.15	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.20	221	155.20	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.25	276	155.25	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.30	331	155.30	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.35	386	155.35	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.40	441	155.40	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.45	496	155.45	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.50	552	155.50	0.00	0.00	---	---	0.00	0.00	---	---	---	---	0.00
0.55	667	155.55	0.01 ic	0.01 ic	---	---	0.00	0.00	---	---	---	---	0.01
0.60	783	155.60	0.04 ic	0.04 ic	---	---	0.00	0.00	---	---	---	---	0.04
0.65	899	155.65	0.10 ic	0.09 ic	---	---	0.00	0.00	---	---	---	---	0.09
0.70	1,015	155.70	0.16 ic	0.16 ic	---	---	0.00	0.00	---	---	---	---	0.16
0.75	1,131	155.75	0.26 ic	0.24 ic	---	---	0.00	0.00	---	---	---	---	0.24
0.80	1,246	155.80	0.37 ic	0.34 ic	---	---	0.00	0.00	---	---	---	---	0.34
0.85	1,362	155.85	0.46 ic	0.46 ic	---	---	0.00	0.00	---	---	---	---	0.46
0.90	1,478	155.90	0.61 ic	0.59 ic	---	---	0.00	0.00	---	---	---	---	0.59
0.95	1,594	155.95	0.74 ic	0.74 ic	---	---	0.00	0.00	---	---	---	---	0.74
1.00	1,709	156.00	0.93 oc	0.89 ic	---	---	0.00	0.00	---	---	---	---	0.89
1.05	1,862	156.05	1.06 oc	1.06 ic	---	---	0.00	0.00	---	---	---	---	1.06
1.10	2,015	156.10	1.21 oc	1.21 ic	---	---	0.00	0.00	---	---	---	---	1.21
1.15	2,168	156.15	1.45 oc	1.38 ic	---	---	0.00	0.00	---	---	---	---	1.38
1.20	2,321	156.20	1.63 oc	1.57 ic	---	---	0.00	0.00	---	---	---	---	1.57
1.25	2,473	156.25	1.82 oc	1.76 ic	---	---	0.00	0.00	---	---	---	---	1.76
1.30	2,626	156.30	2.01 oc	1.97 ic	---	---	0.00	0.00	---	---	---	---	1.97
1.35	2,779	156.35	2.22 oc	2.16 ic	---	---	0.00	0.00	---	---	---	---	2.16
1.40	2,932	156.40	2.44 oc	2.36 ic	---	---	0.00	0.00	---	---	---	---	2.36
1.45	3,084	156.45	2.55 oc	2.55 ic	---	---	0.00	0.00	---	---	---	---	2.55
1.50	3,237	156.50	2.78 oc	2.78 ic	---	---	0.00	0.00	---	---	---	---	2.78
1.55	3,428	156.55	3.03 oc	2.97 ic	---	---	0.00	0.00	---	---	---	---	2.97
1.60	3,619	156.60	3.15 oc	3.15 ic	---	---	0.00	0.00	---	---	---	---	3.15
1.65	3,810	156.65	3.41 oc	3.38 ic	---	---	0.00	0.00	---	---	---	---	3.38
1.70	4,001	156.70	3.54 oc	3.54 ic	---	---	0.00	0.00	---	---	---	---	3.54

Continues on next page...

BASIN #1

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
1.75	4,192	156.75	3.81 oc	3.68 ic	---	---	0.00	0.00	---	---	---	---	3.68
1.80	4,383	156.80	3.94 oc	3.82 ic	---	---	0.00	0.00	---	---	---	---	3.82
1.85	4,574	156.85	3.94 oc	3.94 ic	---	---	0.00	0.00	---	---	---	---	3.94
1.90	4,765	156.90	4.08 oc	4.08 ic	---	---	0.00	0.00	---	---	---	---	4.08
1.95	4,956	156.95	4.23 oc	4.23 ic	---	---	0.00	0.00	---	---	---	---	4.23
2.00	5,147	157.00	4.37 oc	4.37 ic	---	---	0.00	0.00	---	---	---	---	4.37
2.05	5,378	157.05	4.66 oc	4.41 ic	---	---	0.19	0.00	---	---	---	---	4.60
2.10	5,608	157.10	4.96 oc	4.43 ic	---	---	0.53	0.00	---	---	---	---	4.96
2.15	5,839	157.15	5.42 oc	4.36 ic	---	---	0.97	0.00	---	---	---	---	5.33
2.20	6,069	157.20	5.89 oc	4.29 ic	---	---	1.49	0.00	---	---	---	---	5.78
2.25	6,299	157.25	6.36 oc	4.21 ic	---	---	2.08	0.00	---	---	---	---	6.29
2.30	6,530	157.30	6.85 oc	4.11 ic	---	---	2.74	0.00	---	---	---	---	6.85
2.35	6,760	157.35	7.51 oc	3.94 ic	---	---	3.45	0.00	---	---	---	---	7.38
2.40	6,991	157.40	8.00 oc	3.79 ic	---	---	4.21	0.00	---	---	---	---	8.00
2.45	7,221	157.45	8.66 oc	3.64 ic	---	---	4.90 s	0.00	---	---	---	---	8.54
2.50	7,452	157.50	9.15 oc	3.54 ic	---	---	5.53 s	0.00	---	---	---	---	9.07
2.55	7,723	157.55	9.64 oc	3.44 ic	---	---	6.12 s	0.56	---	---	---	---	10.11
2.60	7,994	157.60	10.12 oc	3.34 ic	---	---	6.67 s	1.58	---	---	---	---	11.58
2.65	8,265	157.65	10.43 oc	3.24 ic	---	---	7.19 s	2.90	---	---	---	---	13.33
2.70	8,536	157.70	10.89 oc	3.16 ic	---	---	7.73 s	4.47	---	---	---	---	15.36
2.75	8,807	157.75	11.34 oc	3.09 ic	---	---	8.25 s	6.24	---	---	---	---	17.58
2.80	9,079	157.80	11.78 oc	3.02 ic	---	---	8.75 s	8.21	---	---	---	---	19.98
2.85	9,350	157.85	12.19 oc	2.96 ic	---	---	9.24 s	10.34	---	---	---	---	22.54
2.90	9,621	157.90	12.59 oc	2.89 ic	---	---	9.70 s	12.64	---	---	---	---	25.23
2.95	9,892	157.95	12.97 oc	2.82 ic	---	---	10.14 s	15.08	---	---	---	---	28.03
3.00	10,163	158.00	13.33 oc	2.75 ic	---	---	10.55 s	17.66	---	---	---	---	30.96
3.05	10,477	158.05	13.67 oc	2.69 ic	---	---	10.98 s	20.37	---	---	---	---	34.04
3.10	10,790	158.10	13.99 oc	2.62 ic	---	---	11.36 s	23.22	---	---	---	---	37.20
3.15	11,104	158.15	14.28 oc	2.55 ic	---	---	11.72 s	26.18	---	---	---	---	40.45
3.20	11,418	158.20	14.54 oc	2.48 ic	---	---	12.06 s	29.25	---	---	---	---	43.80
3.25	11,731	158.25	14.87 oc	2.43 ic	---	---	12.43 s	32.44	---	---	---	---	47.31
3.30	12,045	158.30	15.08 oc	2.36 ic	---	---	12.71 s	35.74	---	---	---	---	50.82
3.35	12,359	158.35	15.32 oc	2.30 ic	---	---	13.02 s	39.14	---	---	---	---	54.47
3.40	12,672	158.40	15.57 oc	2.25 ic	---	---	13.32 s	42.65	---	---	---	---	58.22
3.45	12,986	158.45	15.73 oc	2.18 ic	---	---	13.55 s	46.25	---	---	---	---	61.98
3.50	13,300	158.50	15.90 oc	2.12 ic	---	---	13.78 s	49.95	---	---	---	---	65.85
3.55	13,658	158.55	16.01 oc	2.05 ic	---	---	13.95 s	53.74	---	---	---	---	69.75
3.60	14,017	158.60	16.04 oc	1.98 ic	---	---	14.06 s	57.63	---	---	---	---	73.66
3.65	14,375	158.65	17.35 oc	2.10 ic	---	---	15.24 s	61.60	---	---	---	---	78.95
3.70	14,734	158.70	18.94 oc	2.27 ic	---	---	16.67 s	65.66	---	---	---	---	84.60
3.75	15,092	158.75	20.45 oc	2.41 ic	---	---	18.04 s	69.81	---	---	---	---	90.26
3.80	15,451	158.80	21.91 oc	2.54 ic	---	---	19.36 s	74.04	---	---	---	---	95.94
3.85	15,809	158.85	23.31 oc	2.66 ic	---	---	20.65 s	78.35	---	---	---	---	101.66
3.90	16,168	158.90	24.67 oc	2.76 ic	---	---	21.91 s	82.74	---	---	---	---	107.41
3.95	16,526	158.95	26.00 oc	2.86 ic	---	---	23.14 s	87.21	---	---	---	---	113.21
4.00	16,885	159.00	27.29 oc	2.94 ic	---	---	24.34 s	91.76	---	---	---	---	119.05
4.05	17,325	159.05	28.56 oc	3.02 ic	---	---	25.53 s	96.39	---	---	---	---	124.95
4.10	17,764	159.10	29.80 oc	3.09 ic	---	---	26.70 s	101.09	---	---	---	---	130.89
4.15	18,204	159.15	31.02 oc	3.16 ic	---	---	27.85 s	105.87	---	---	---	---	136.88
4.20	18,643	159.20	32.21 oc	3.22 ic	---	---	28.99 s	110.72	---	---	---	---	142.93
4.25	19,083	159.25	33.39 oc	3.28 ic	---	---	30.11 s	115.64	---	---	---	---	149.02
4.30	19,523	159.30	34.55 oc	3.33 ic	---	---	31.22 s	120.63	---	---	---	---	155.17
4.35	19,962	159.35	35.68 oc	3.37 ic	---	---	32.31 s	125.69	---	---	---	---	161.37
4.40	20,402	159.40	36.81 oc	3.41 ic	---	---	33.39 s	130.82	---	---	---	---	167.62
4.45	20,842	159.45	37.91 oc	3.45 ic	---	---	34.46 s	136.01	---	---	---	---	173.92
4.50	21,281	159.50	39.00 oc	3.49 ic	---	---	35.51 s	141.28	---	---	---	---	180.28

...End

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description	
1	Dekalb	37.39	1	235	220,352	----	-----	-----	EX#1	
2	Dekalb	37.45	1	200	187,826	----	-----	-----	PR#1	
3	Reservoir	36.73	1	201	187,263	2	158.09	10,744	STORM BASIN #1 ROUTING	
RATIONAL.gpw					Return Period: 5 Year			Monday, Oct 4, 2021		

Hydrograph Report

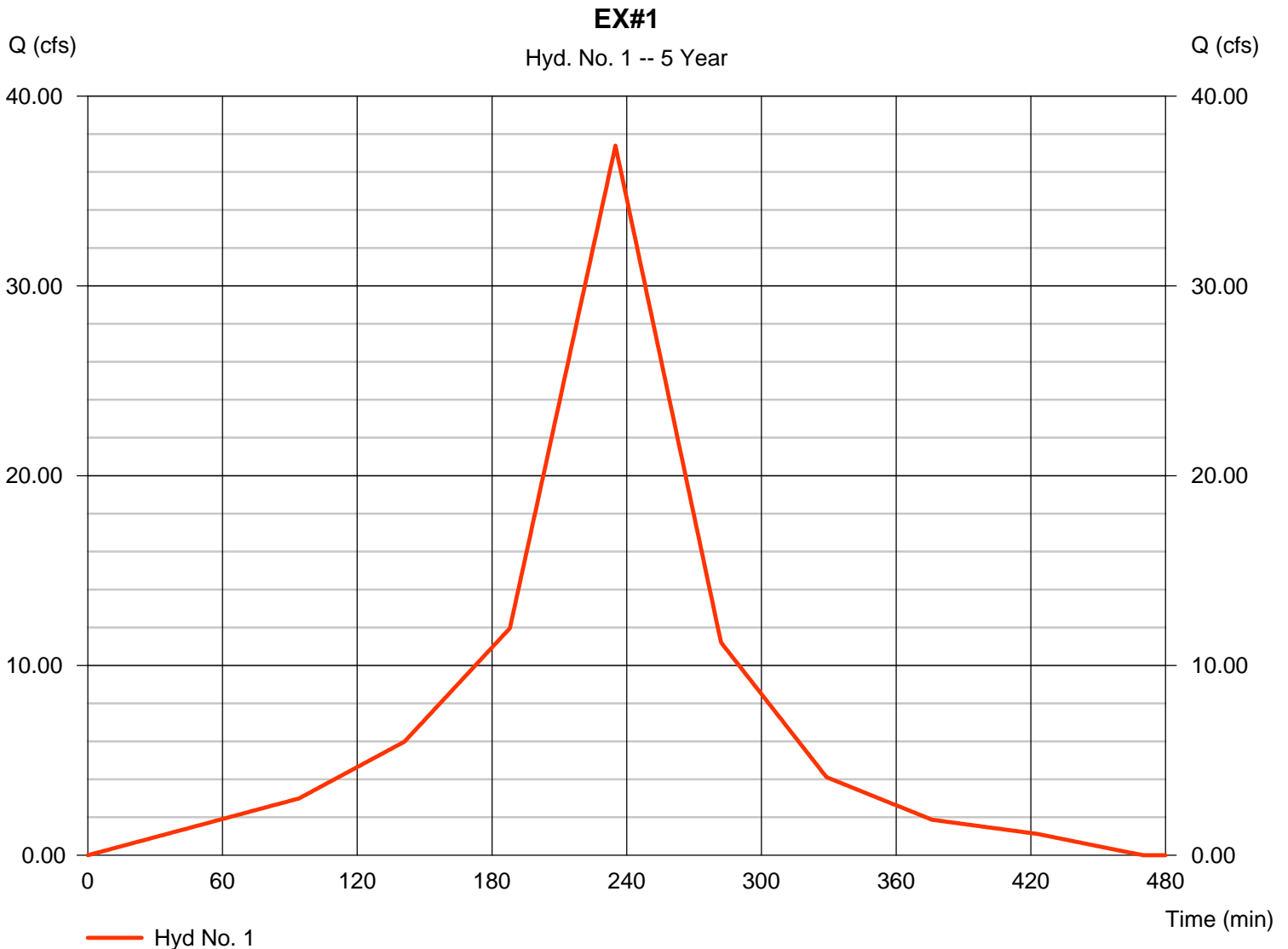
Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 1

EX#1

Hydrograph type	= Dekalb	Peak discharge	= 37.39 cfs
Storm frequency	= 5 yrs	Time to peak	= 235 min
Time interval	= 1 min	Hyd. volume	= 220,352 cuft
Drainage area	= 52.200 ac	Runoff coeff.	= 0.4
Intensity	= 1.791 in/hr	Tc by TR55	= 47.00 min
IDF Curve	= NOAA-SOUTHINGTON.IDF	Asc/Rec limb fact	= n/a



Hydrograph Report

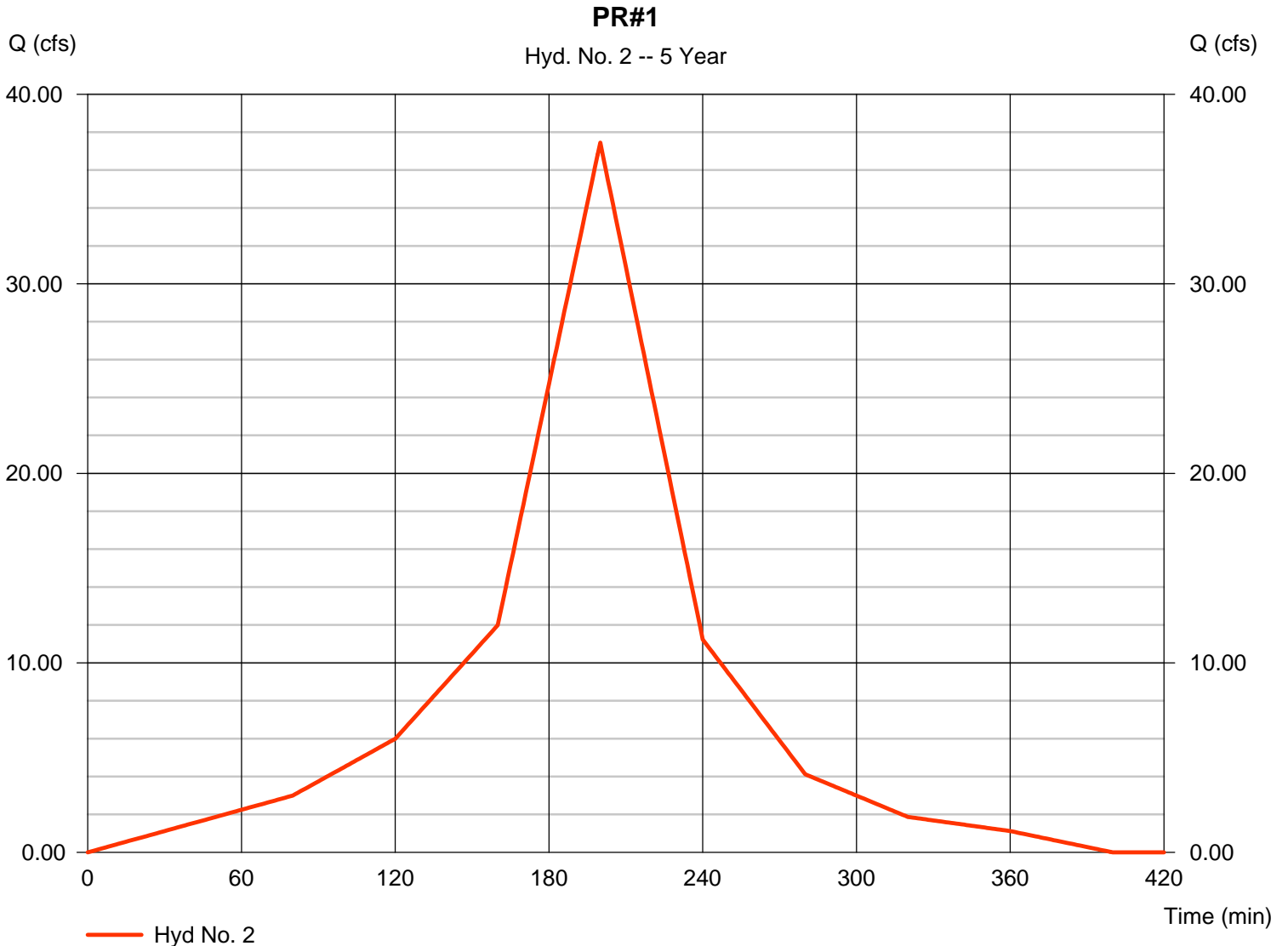
Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 2

PR#1

Hydrograph type	= Dekalb	Peak discharge	= 37.45 cfs
Storm frequency	= 5 yrs	Time to peak	= 200 min
Time interval	= 1 min	Hyd. volume	= 187,826 cuft
Drainage area	= 48.200 ac	Runoff coeff.	= 0.39
Intensity	= 1.992 in/hr	Tc by TR55	= 40.00 min
IDF Curve	= NOAA-SOUTHINGTON.IDF	Asc/Rec limb fact	= n/a



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

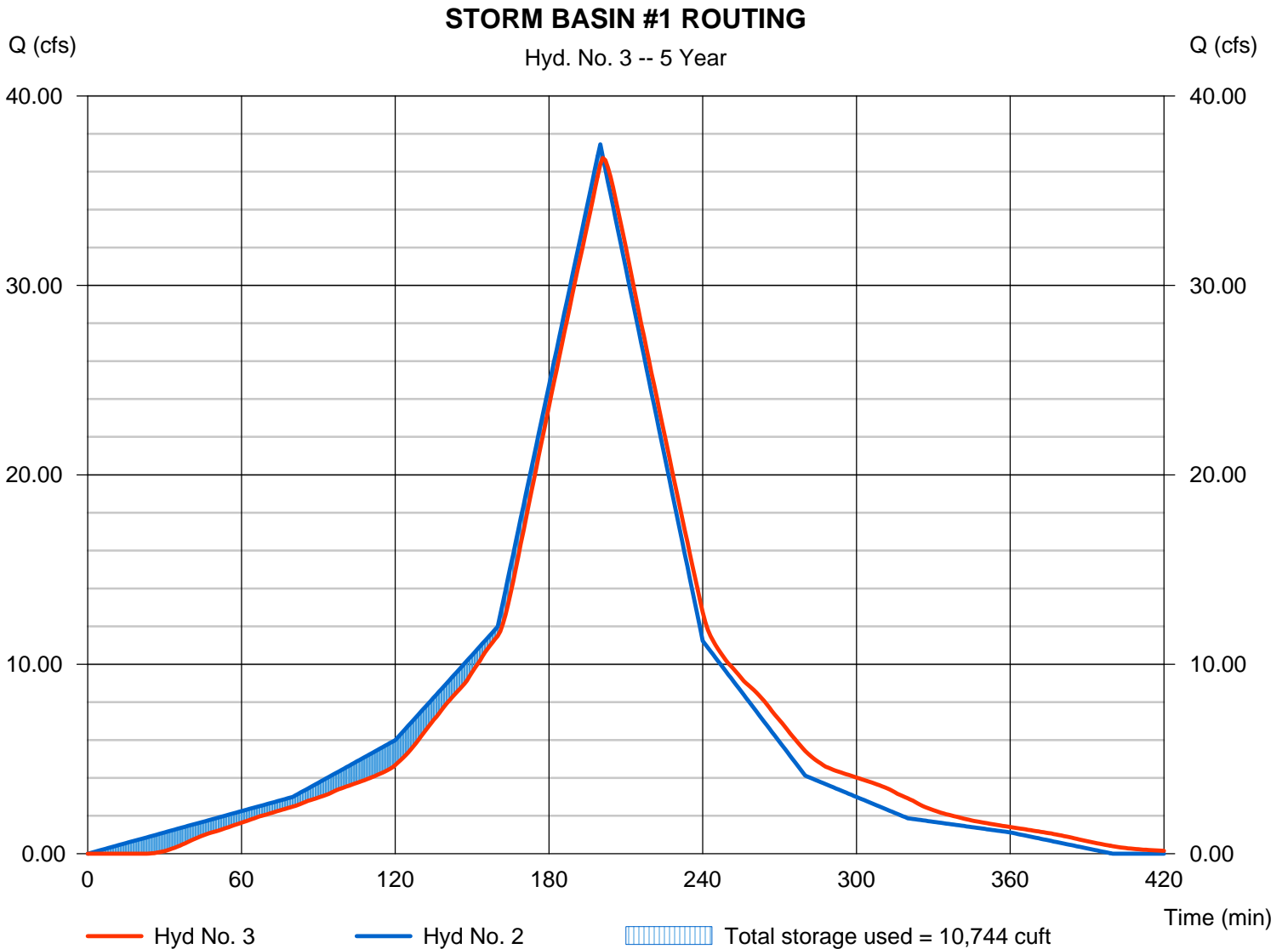
Hyd. No. 3

STORM BASIN #1 ROUTING

Hydrograph type = Reservoir
Storm frequency = 5 yrs
Time interval = 1 min
Inflow hyd. No. = 2 - PR#1
Reservoir name = BASIN #1

Peak discharge = 36.73 cfs
Time to peak = 201 min
Hyd. volume = 187,263 cuft
Max. Elevation = 158.09 ft
Max. Storage = 10,744 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Dekalb	44.05	1	235	259,615	----	-----	-----	EX#1
2	Dekalb	44.13	1	200	221,360	----	-----	-----	PR#1
3	Reservoir	43.34	1	201	220,797	2	158.19	11,375	STORM BASIN #1 ROUTING
RATIONAL.gpw					Return Period: 10 Year			Monday, Oct 4, 2021	

Hydrograph Report

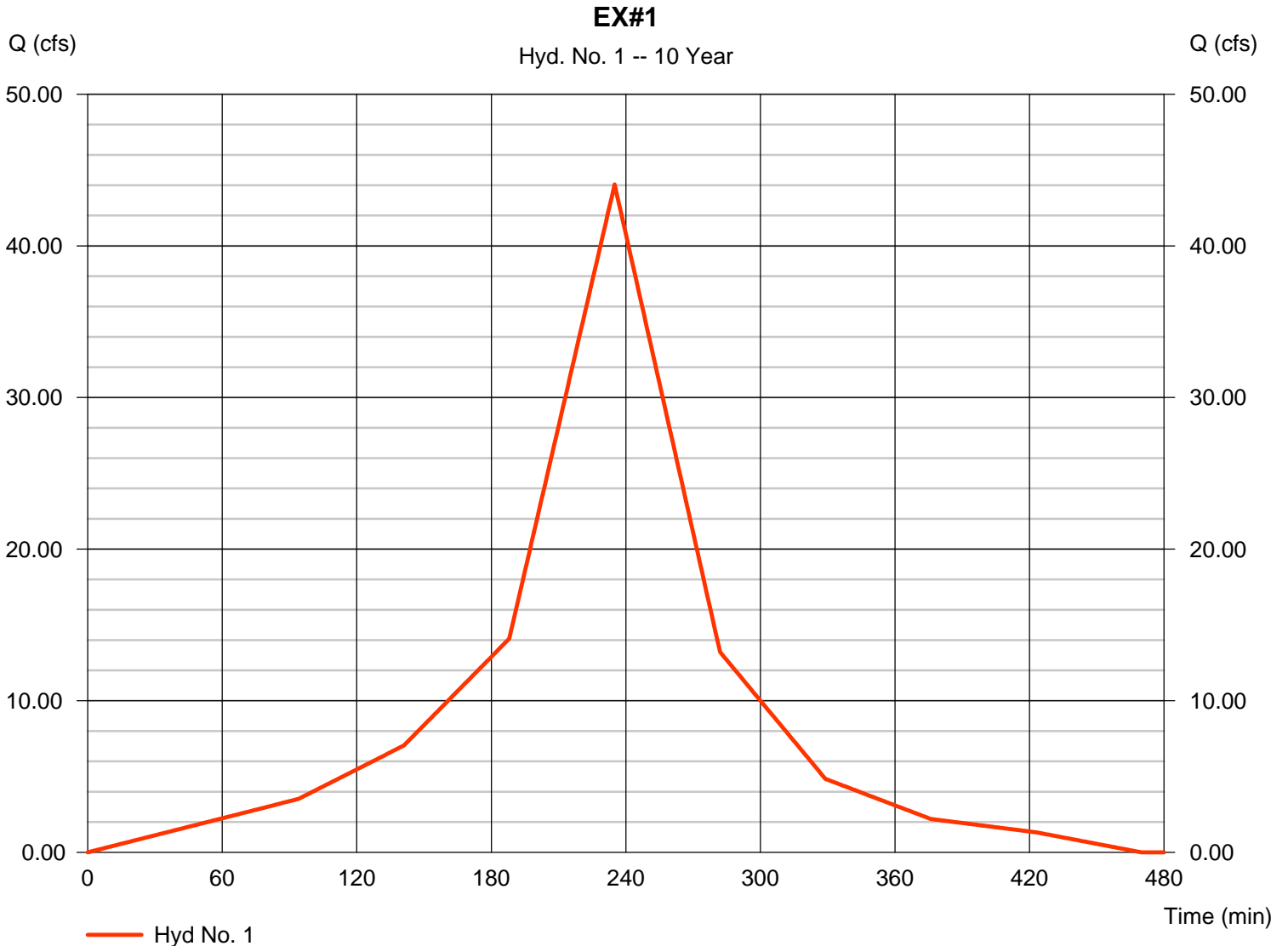
Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 1

EX#1

Hydrograph type	= Dekalb	Peak discharge	= 44.05 cfs
Storm frequency	= 10 yrs	Time to peak	= 235 min
Time interval	= 1 min	Hyd. volume	= 259,615 cuft
Drainage area	= 52.200 ac	Runoff coeff.	= 0.4
Intensity	= 2.110 in/hr	Tc by TR55	= 47.00 min
IDF Curve	= NOAA-SOUTHINGTON.IDF	Asc/Rec limb fact	= n/a



Hydrograph Report

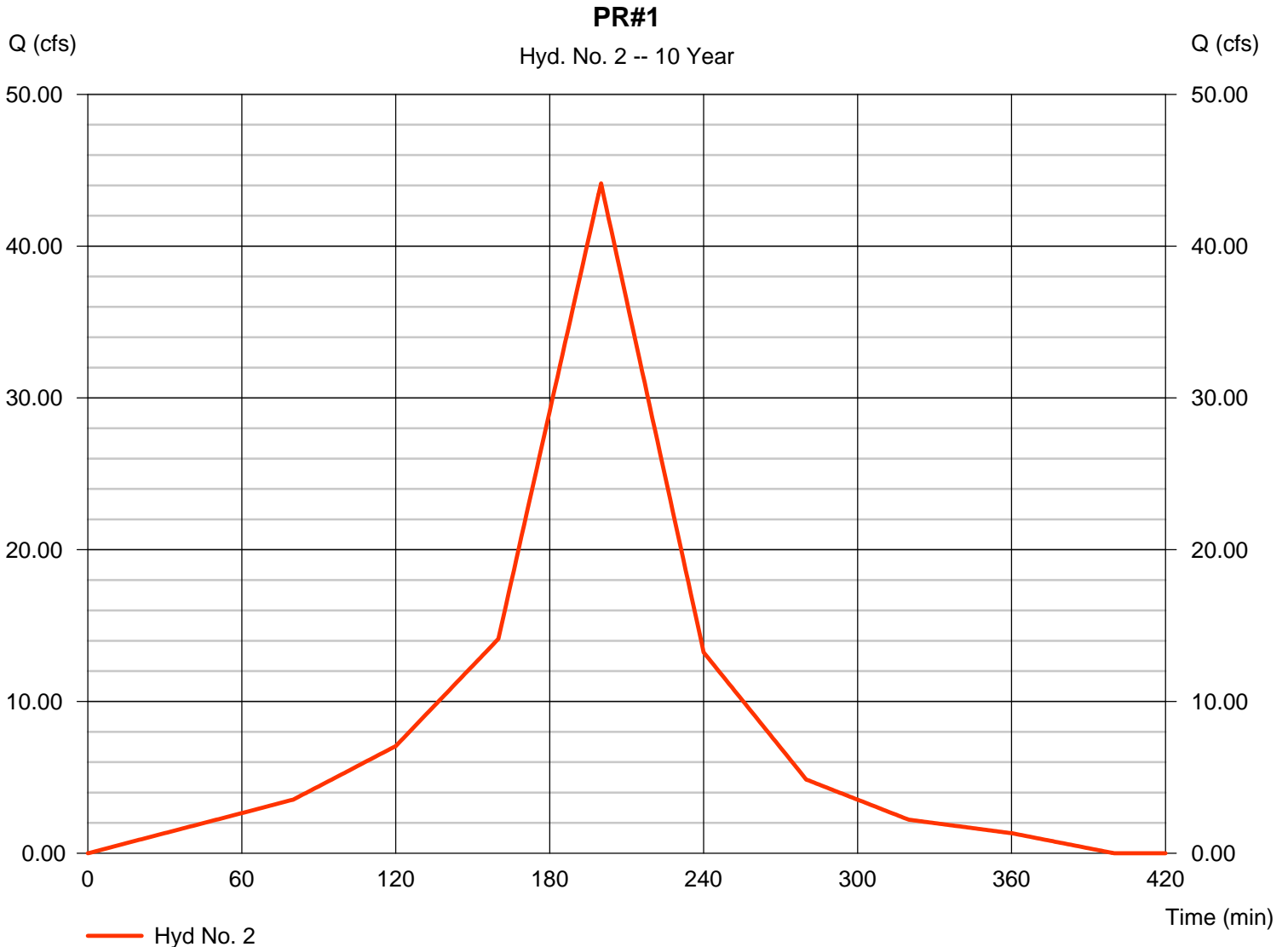
Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 2

PR#1

Hydrograph type	= Dekalb	Peak discharge	= 44.13 cfs
Storm frequency	= 10 yrs	Time to peak	= 200 min
Time interval	= 1 min	Hyd. volume	= 221,360 cuft
Drainage area	= 48.200 ac	Runoff coeff.	= 0.39
Intensity	= 2.348 in/hr	Tc by TR55	= 40.00 min
IDF Curve	= NOAA-SOUTHINGTON.IDF	Asc/Rec limb fact	= n/a



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 3

STORM BASIN #1 ROUTING

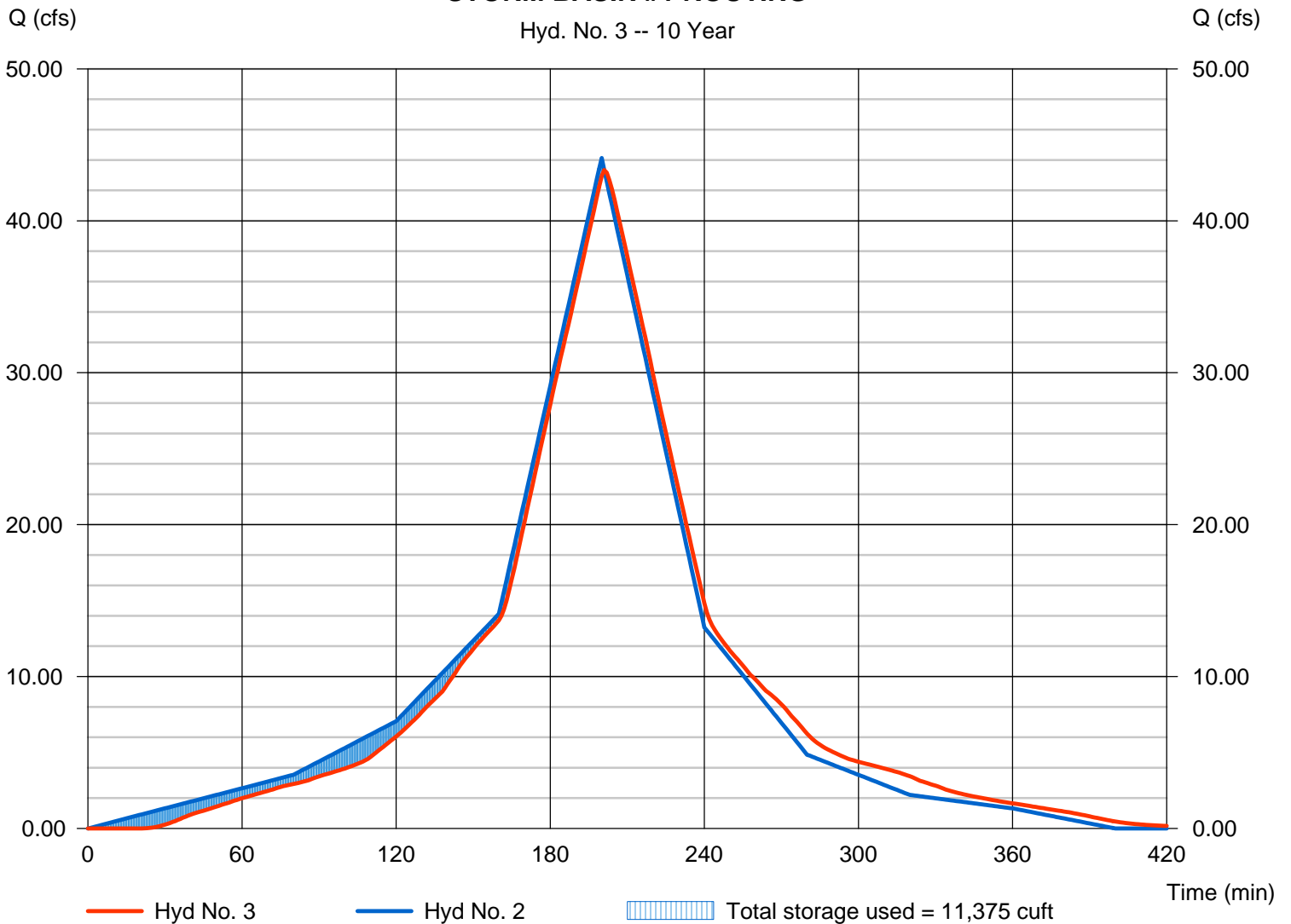
Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 1 min
 Inflow hyd. No. = 2 - PR#1
 Reservoir name = BASIN #1

Peak discharge = 43.34 cfs
 Time to peak = 201 min
 Hyd. volume = 220,797 cuft
 Max. Elevation = 158.19 ft
 Max. Storage = 11,375 cuft

Storage Indication method used.

STORM BASIN #1 ROUTING

Hyd. No. 3 -- 10 Year



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description	
1	Dekalb	53.18	1	235	313,444	----	-----	-----	EX#1	
2	Dekalb	53.30	1	200	267,349	----	-----	-----	PR#1	
3	Reservoir	52.42	1	201	266,786	2	158.32	12,183	STORM BASIN #1 ROUTING	
RATIONAL.gpw					Return Period: 25 Year			Monday, Oct 4, 2021		

Hydrograph Report

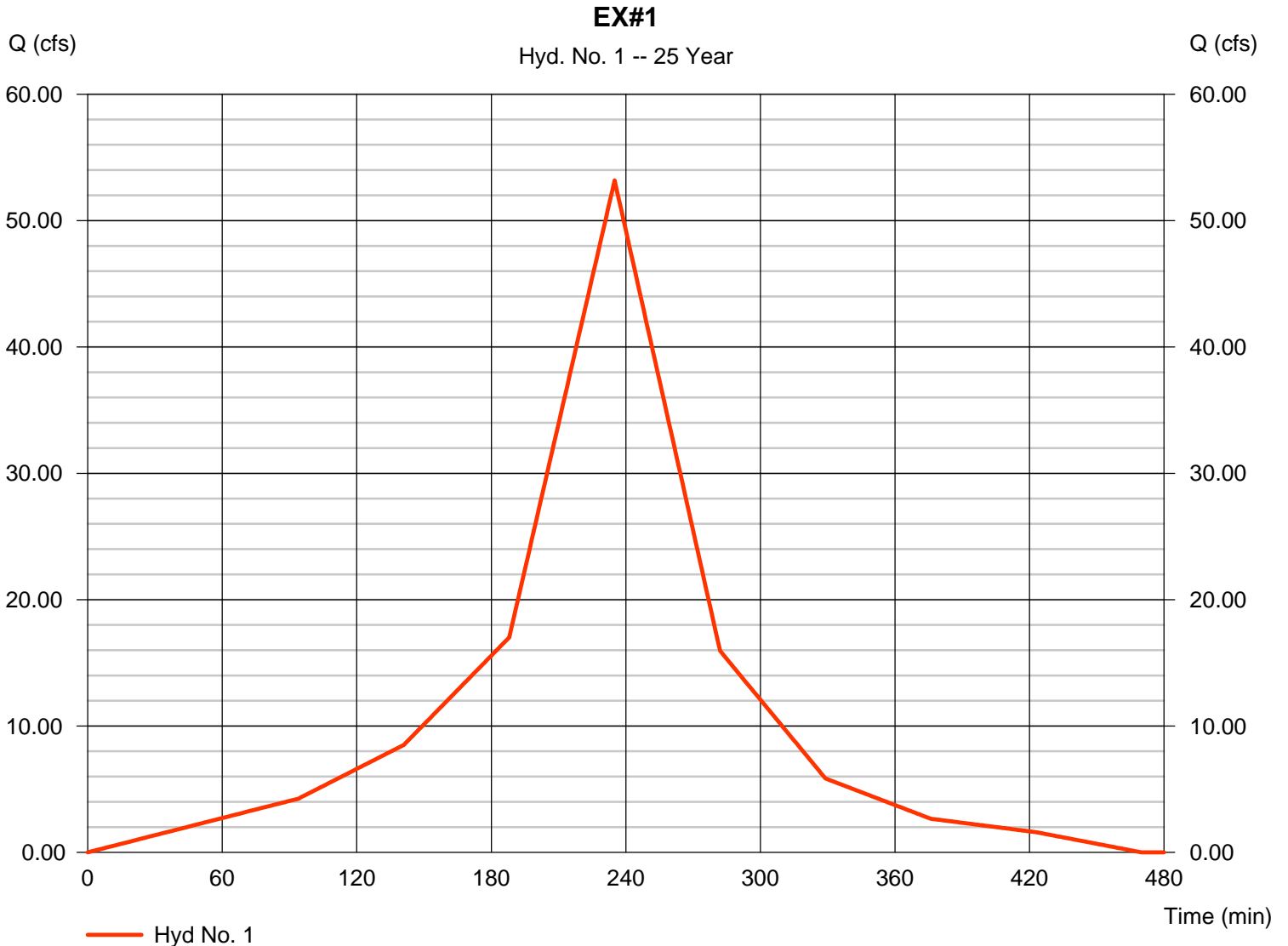
Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 1

EX#1

Hydrograph type	= Dekalb	Peak discharge	= 53.18 cfs
Storm frequency	= 25 yrs	Time to peak	= 235 min
Time interval	= 1 min	Hyd. volume	= 313,444 cuft
Drainage area	= 52.200 ac	Runoff coeff.	= 0.4
Intensity	= 2.547 in/hr	Tc by TR55	= 47.00 min
IDF Curve	= NOAA-SOUTHINGTON.IDF	Asc/Rec limb fact	= n/a



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

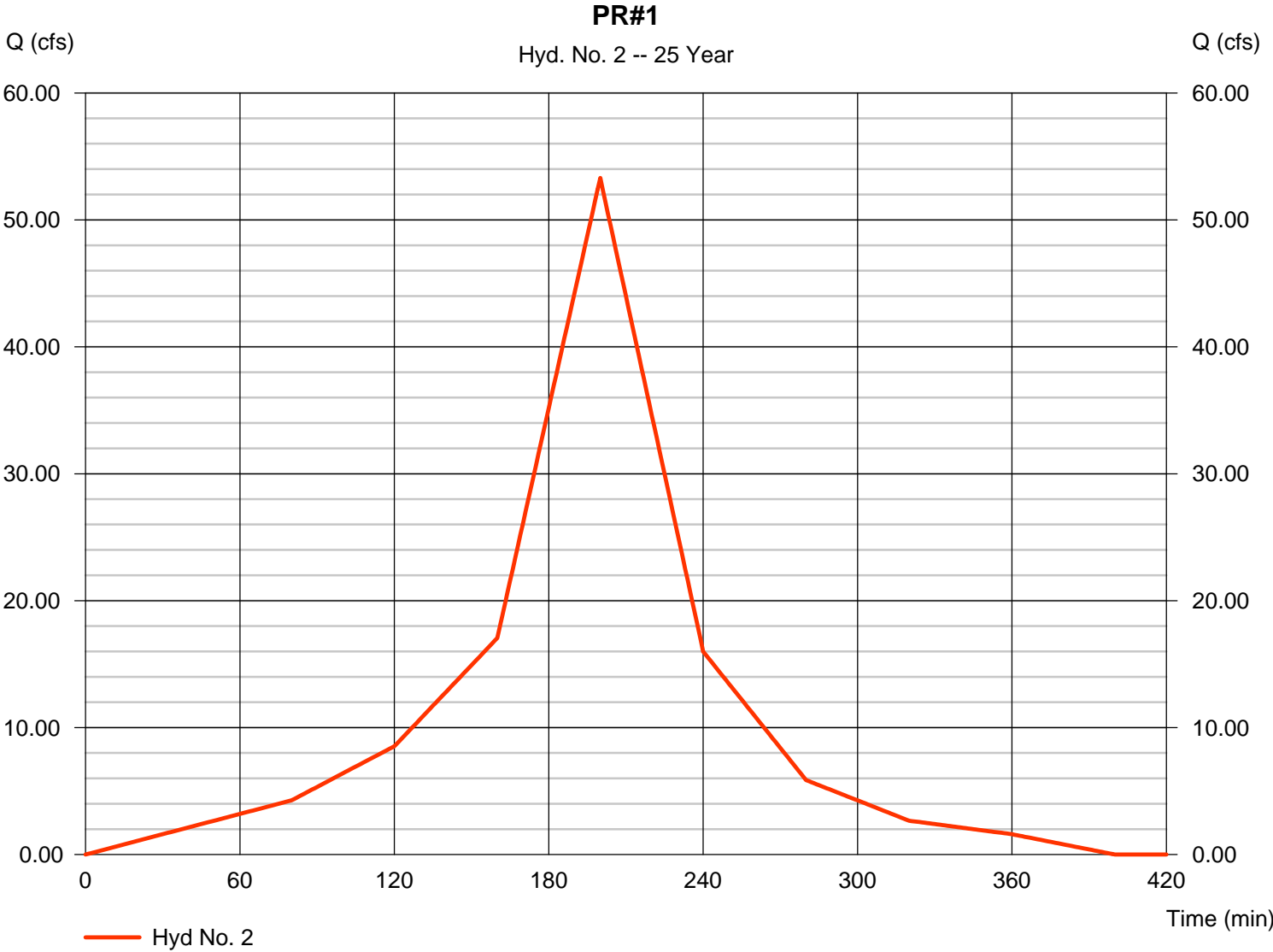
Monday, Oct 4, 2021

Hyd. No. 2

PR#1

Hydrograph type = Dekalb
Storm frequency = 25 yrs
Time interval = 1 min
Drainage area = 48.200 ac
Intensity = 2.835 in/hr
IDF Curve = NOAA-SOUTHINGTON.IDF

Peak discharge = 53.30 cfs
Time to peak = 200 min
Hyd. volume = 267,349 cuft
Runoff coeff. = 0.39
Tc by TR55 = 40.00 min
Asc/Rec limb fact = n/a



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

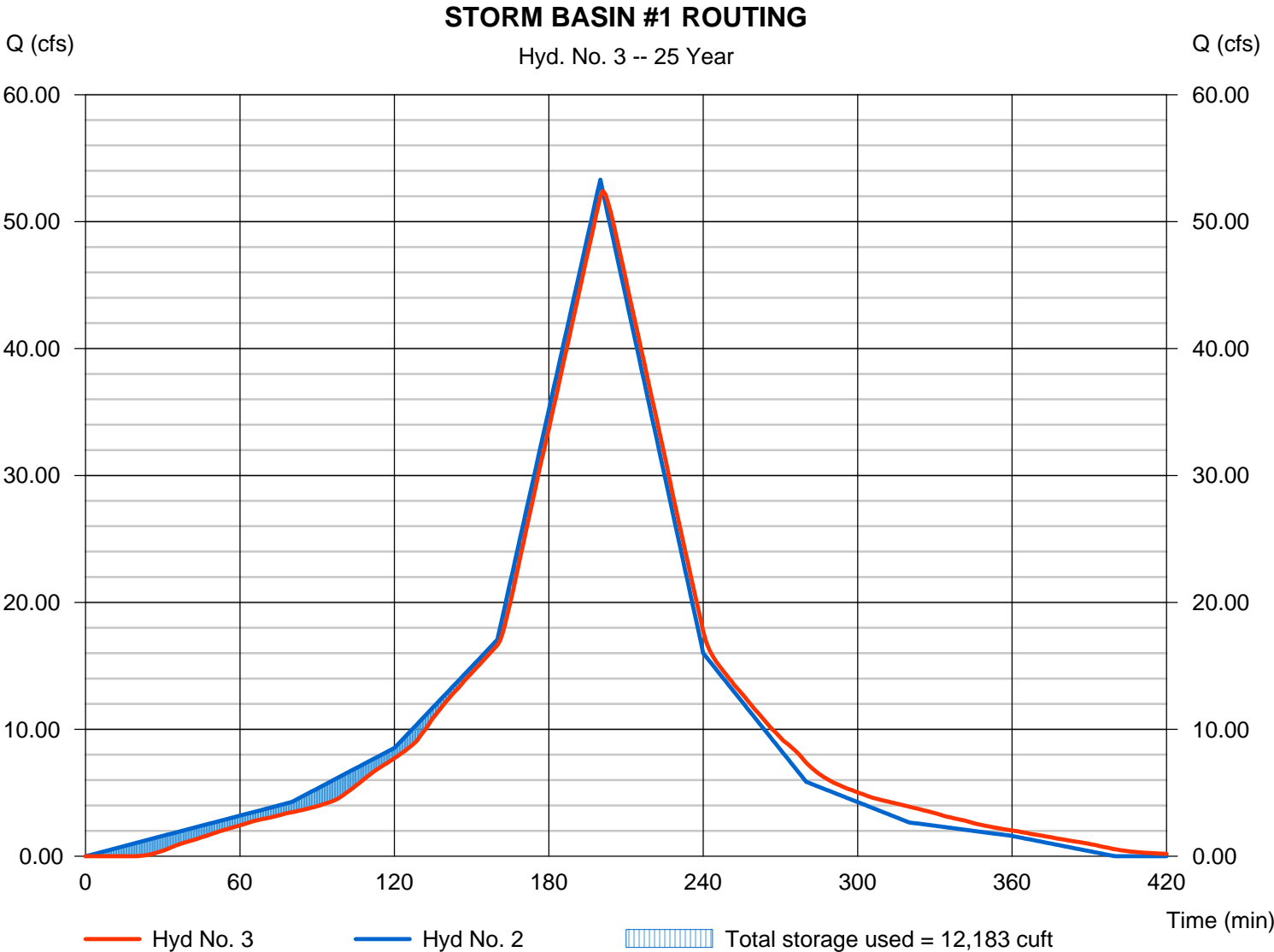
Hyd. No. 3

STORM BASIN #1 ROUTING

Hydrograph type = Reservoir
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyd. No. = 2 - PR#1
Reservoir name = BASIN #1

Peak discharge = 52.42 cfs
Time to peak = 201 min
Hyd. volume = 266,786 cuft
Max. Elevation = 158.32 ft
Max. Storage = 12,183 cuft

Storage Indication method used.



Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.1

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Dekalb	67.47	1	235	397,664	----	-----	-----	EX#1
2	Dekalb	67.63	1	200	339,214	----	-----	-----	PR#1
3	Reservoir	66.53	1	201	338,651	2	158.51	13,363	STORM BASIN #1 ROUTING
RATIONAL.gpw					Return Period: 100 Year			Monday, Oct 4, 2021	

Hydrograph Report

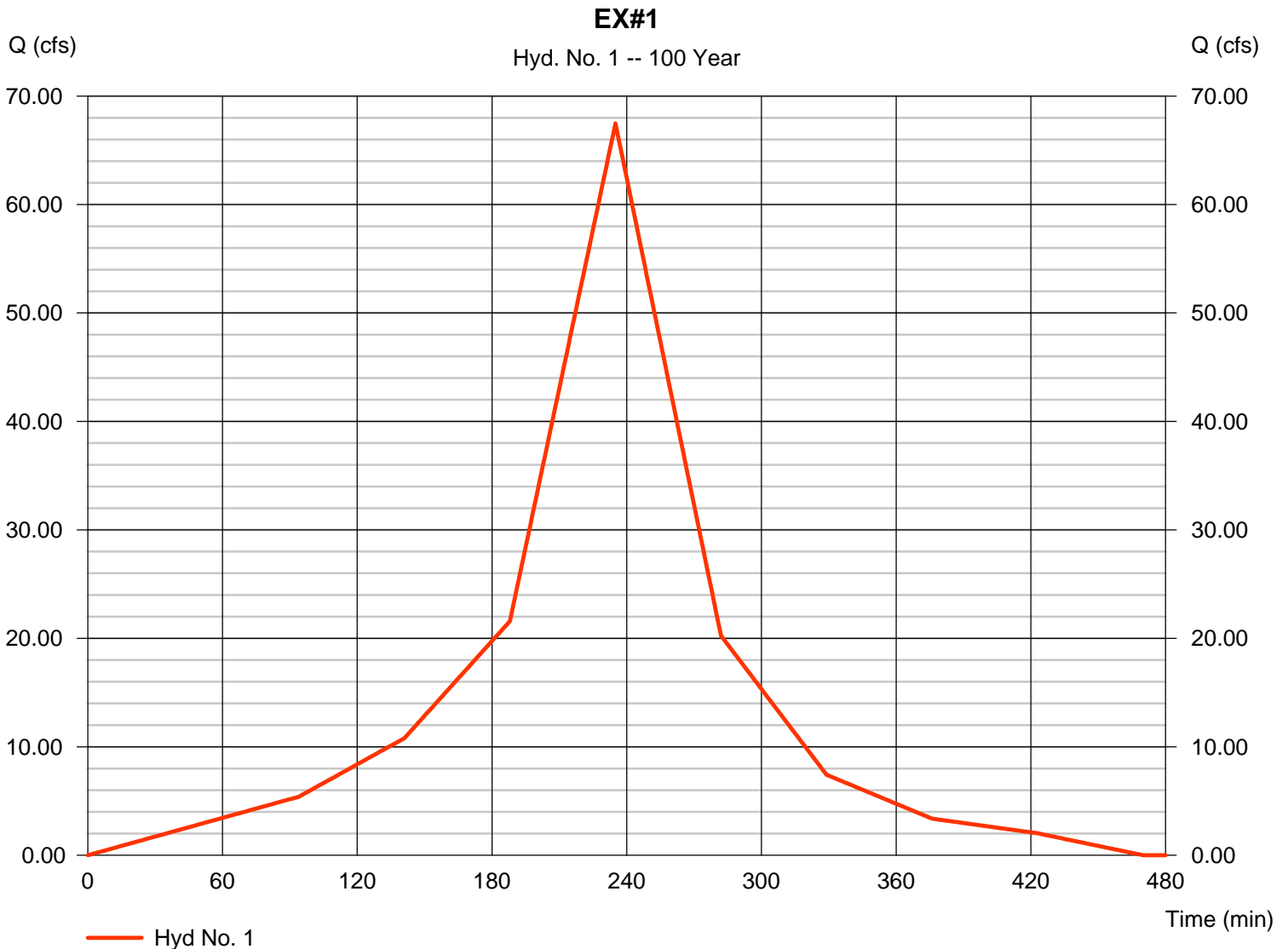
Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 1

EX#1

Hydrograph type	= Dekalb	Peak discharge	= 67.47 cfs
Storm frequency	= 100 yrs	Time to peak	= 235 min
Time interval	= 1 min	Hyd. volume	= 397,664 cuft
Drainage area	= 52.200 ac	Runoff coeff.	= 0.4
Intensity	= 3.231 in/hr	Tc by TR55	= 47.00 min
IDF Curve	= NOAA-SOUTHINGTON.IDF	Asc/Rec limb fact	= n/a



Hydrograph Report

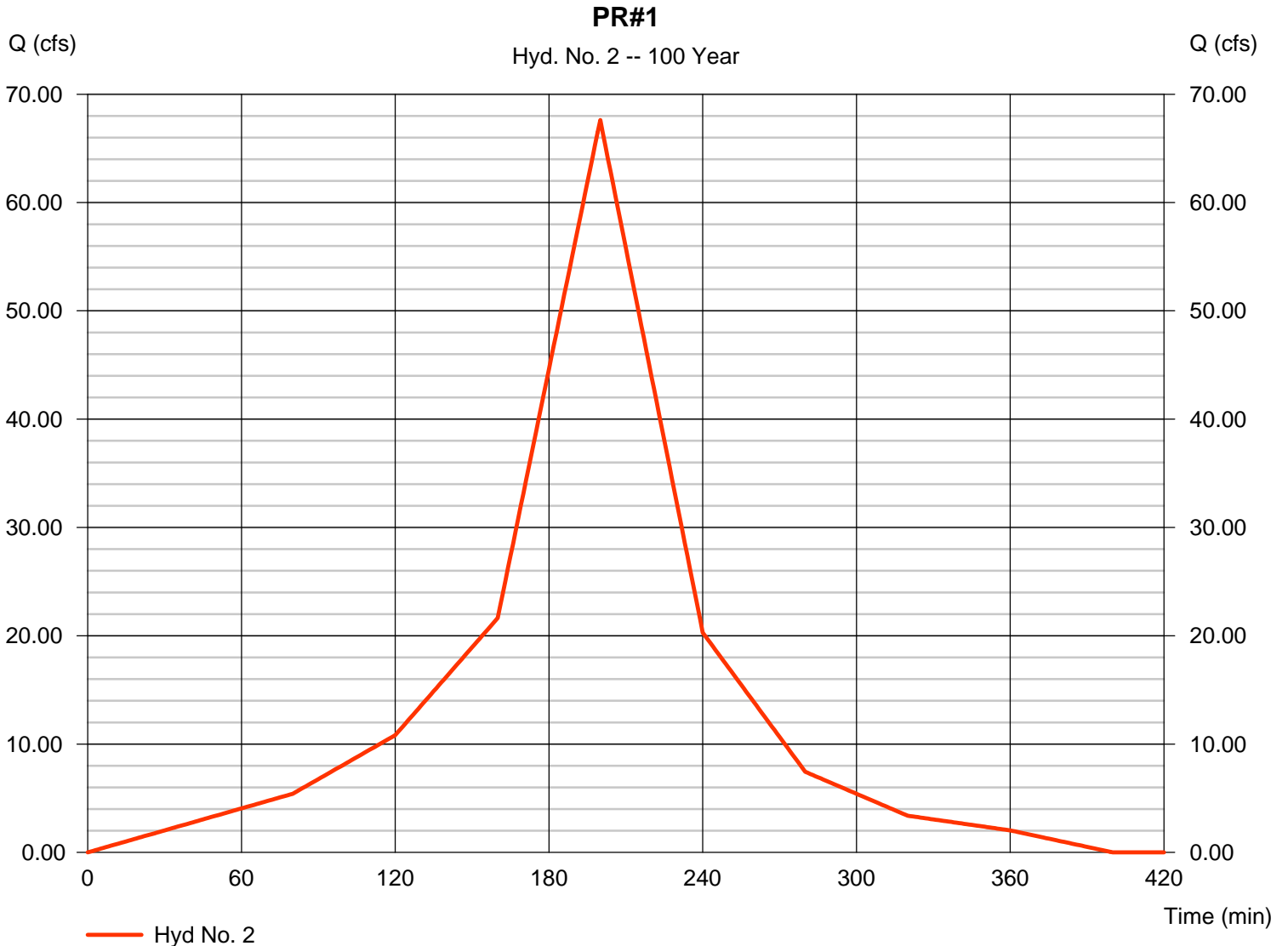
Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 2

PR#1

Hydrograph type	= Dekalb	Peak discharge	= 67.63 cfs
Storm frequency	= 100 yrs	Time to peak	= 200 min
Time interval	= 1 min	Hyd. volume	= 339,214 cuft
Drainage area	= 48.200 ac	Runoff coeff.	= 0.39
Intensity	= 3.598 in/hr	Tc by TR55	= 40.00 min
IDF Curve	= NOAA-SOUTHINGTON.IDF	Asc/Rec limb fact	= n/a



Hydrograph Report

Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Hyd. No. 3

STORM BASIN #1 ROUTING

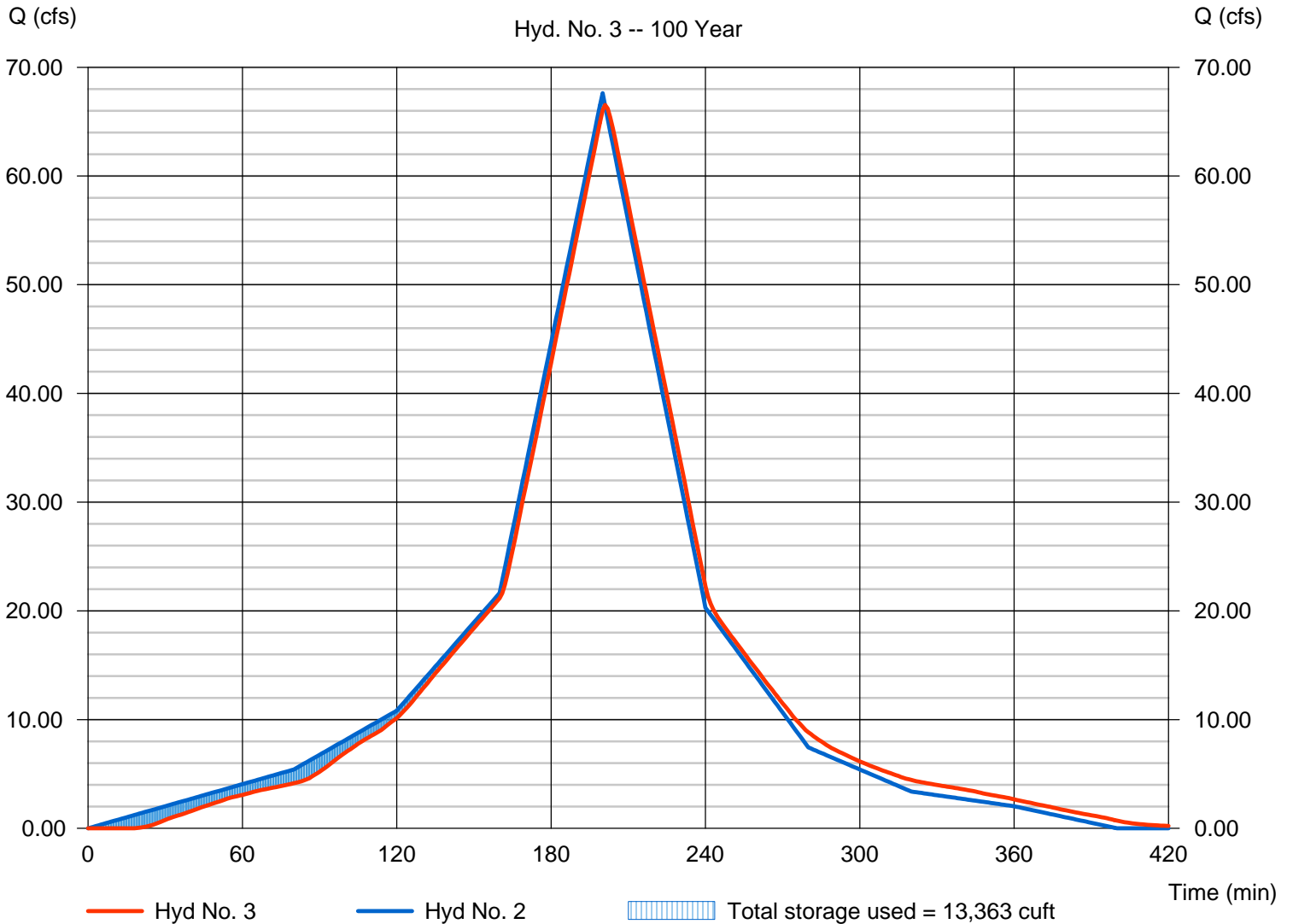
Hydrograph type = Reservoir
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyd. No. = 2 - PR#1
 Reservoir name = BASIN #1

Peak discharge = 66.53 cfs
 Time to peak = 201 min
 Hyd. volume = 338,651 cuft
 Max. Elevation = 158.51 ft
 Max. Storage = 13,363 cuft

Storage Indication method used.

STORM BASIN #1 ROUTING

Hyd. No. 3 -- 100 Year



Hydraflow Rainfall Report

Hydraflow Hydrographs by Intelisolve v9.1

Monday, Oct 4, 2021

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	19.5355	3.9000	0.7174	-----
2	22.3728	3.5000	0.7068	-----
3	0.0000	0.0000	0.0000	-----
5	30.1622	3.8000	0.7190	-----
10	35.8238	3.8000	0.7210	-----
25	43.6468	3.8000	0.7233	-----
50	49.5764	3.8000	0.7237	-----
100	55.5061	3.8000	0.7239	-----

File name: NOAA-SOUTHINGTON.IDF

$$\text{Intensity} = B / (T_c + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	4.07	2.96	2.37	2.00	1.75	1.56	1.41	1.30	1.20	1.12	1.05	0.99
2	4.93	3.55	2.85	2.40	2.10	1.87	1.69	1.55	1.44	1.34	1.26	1.19
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.32	4.57	3.66	3.09	2.69	2.40	2.17	1.99	1.84	1.72	1.61	1.52
10	7.47	5.40	4.32	3.64	3.18	2.83	2.56	2.35	2.17	2.02	1.90	1.79
25	9.05	6.54	5.23	4.41	3.84	3.42	3.10	2.84	2.62	2.44	2.29	2.16
50	10.27	7.42	5.93	5.00	4.36	3.88	3.51	3.22	2.97	2.77	2.60	2.45
100	11.50	8.30	6.64	5.59	4.87	4.34	3.93	3.60	3.33	3.10	2.91	2.74

T_c = time in minutes. Values may exceed 60.

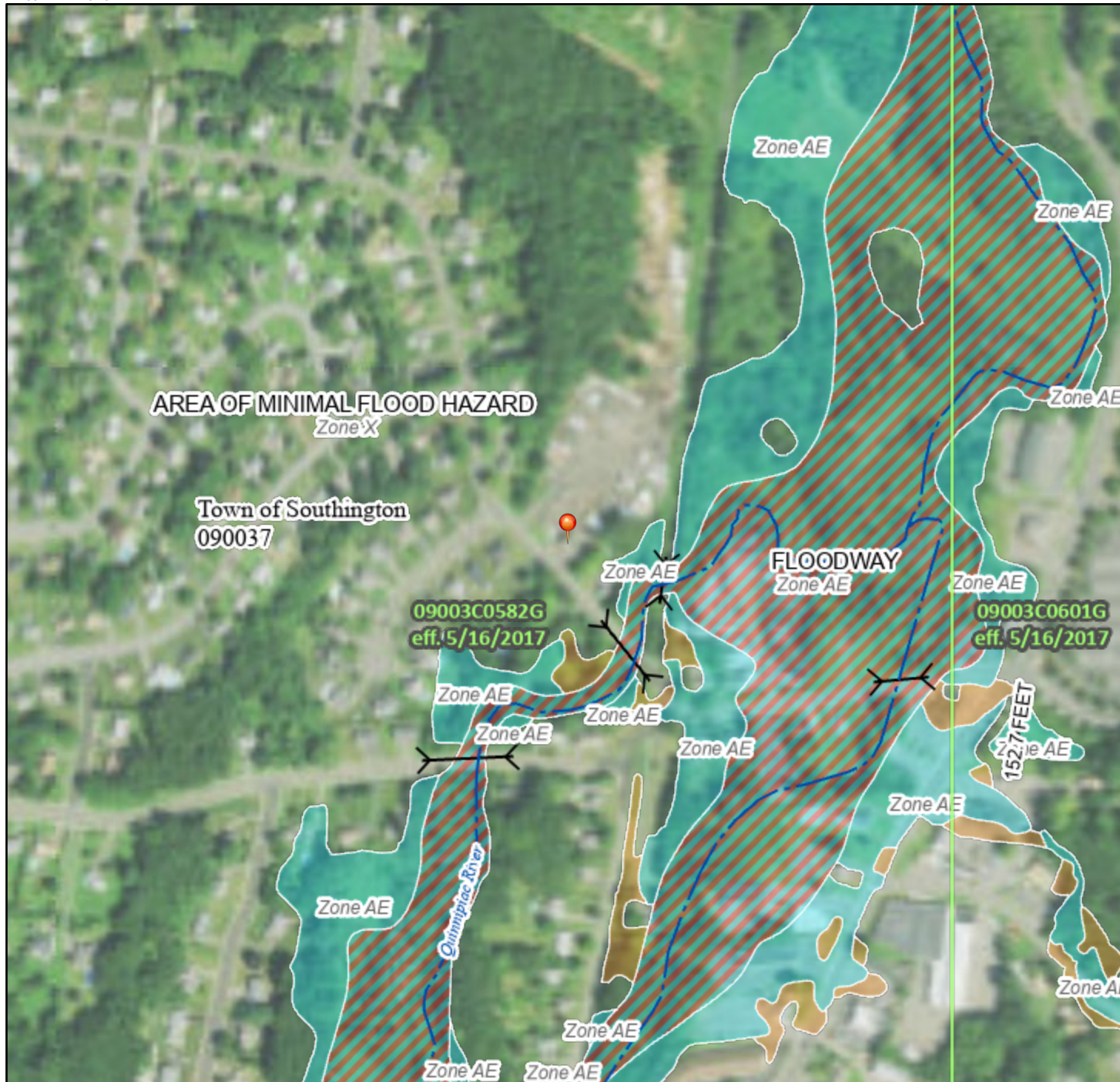
Precip. file name: NOAA-SOUTHINGTON (SO END RD).pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.77	3.42	0.00	4.49	5.38	6.61	7.55	8.50
SCS 6-Hr	1.91	2.30	0.00	2.93	3.45	4.17	4.73	5.28
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Custom	0.00	1.75	0.00	2.80	3.90	5.25	6.00	7.10

National Flood Hazard Layer FIRMette



72°53'2"W 41°37'5"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
		17.5
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/29/2021 at 7:11 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



* source: ESRI Maps
 ** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.343 (0.266-0.438)	0.414 (0.321-0.529)	0.530 (0.410-0.680)	0.626 (0.481-0.809)	0.759 (0.564-1.03)	0.859 (0.626-1.19)	0.963 (0.681-1.39)	1.08 (0.725-1.60)	1.24 (0.803-1.91)	1.37 (0.867-2.16)
10-min	0.486 (0.377-0.621)	0.587 (0.455-0.750)	0.751 (0.580-0.964)	0.888 (0.682-1.15)	1.08 (0.799-1.45)	1.22 (0.887-1.69)	1.36 (0.965-1.96)	1.53 (1.03-2.26)	1.76 (1.14-2.70)	1.94 (1.23-3.06)
15-min	0.572 (0.444-0.730)	0.690 (0.535-0.882)	0.883 (0.682-1.13)	1.04 (0.802-1.35)	1.26 (0.941-1.71)	1.43 (1.04-1.98)	1.60 (1.14-2.31)	1.80 (1.21-2.66)	2.07 (1.34-3.18)	2.28 (1.45-3.60)
30-min	0.781 (0.606-0.996)	0.940 (0.729-1.20)	1.20 (0.927-1.54)	1.42 (1.09-1.83)	1.71 (1.27-2.32)	1.94 (1.41-2.68)	2.17 (1.54-3.13)	2.43 (1.63-3.60)	2.80 (1.81-4.30)	3.09 (1.96-4.87)
60-min	0.990 (0.768-1.26)	1.19 (0.922-1.52)	1.52 (1.17-1.94)	1.79 (1.37-2.31)	2.16 (1.61-2.92)	2.44 (1.78-3.38)	2.74 (1.94-3.94)	3.06 (2.06-4.54)	3.53 (2.28-5.43)	3.90 (2.47-6.14)
2-hr	1.29 (1.01-1.64)	1.54 (1.20-1.96)	1.96 (1.52-2.49)	2.30 (1.78-2.95)	2.77 (2.08-3.74)	3.13 (2.30-4.32)	3.50 (2.50-5.04)	3.93 (2.65-5.80)	4.56 (2.96-6.99)	5.08 (3.23-7.96)
3-hr	1.49 (1.17-1.89)	1.79 (1.40-2.26)	2.27 (1.77-2.88)	2.67 (2.07-3.41)	3.22 (2.42-4.33)	3.63 (2.67-5.00)	4.06 (2.92-5.85)	4.58 (3.10-6.73)	5.34 (3.47-8.15)	5.97 (3.80-9.33)
6-hr	1.89 (1.49-2.37)	2.28 (1.79-2.86)	2.91 (2.28-3.68)	3.44 (2.68-4.37)	4.17 (3.16-5.58)	4.71 (3.50-6.47)	5.29 (3.83-7.61)	5.99 (4.06-8.76)	7.05 (4.60-10.7)	7.95 (5.07-12.4)
12-hr	2.33 (1.85-2.90)	2.85 (2.25-3.56)	3.70 (2.92-4.64)	4.41 (3.45-5.56)	5.38 (4.09-7.17)	6.09 (4.55-8.35)	6.87 (5.01-9.88)	7.83 (5.33-11.4)	9.31 (6.10-14.1)	10.6 (6.77-16.4)
24-hr	2.73 (2.17-3.38)	3.40 (2.71-4.22)	4.50 (3.57-5.61)	5.42 (4.27-6.79)	6.67 (5.12-8.88)	7.59 (5.72-10.4)	8.61 (6.35-12.4)	9.91 (6.77-14.4)	12.0 (7.87-18.1)	13.8 (8.86-21.2)
2-day	3.06 (2.45-3.76)	3.89 (3.11-4.79)	5.25 (4.18-6.49)	6.37 (5.05-7.94)	7.92 (6.13-10.5)	9.05 (6.88-12.4)	10.3 (7.70-14.9)	12.0 (8.22-17.3)	14.8 (9.75-22.2)	17.3 (11.2-26.5)
3-day	3.32 (2.67-4.07)	4.24 (3.40-5.20)	5.73 (4.59-7.07)	6.98 (5.55-8.66)	8.69 (6.74-11.5)	9.92 (7.58-13.6)	11.3 (8.49-16.4)	13.2 (9.07-19.0)	16.4 (10.8-24.5)	19.2 (12.4-29.4)
4-day	3.56 (2.87-4.36)	4.54 (3.66-5.56)	6.14 (4.92-7.54)	7.46 (5.95-9.23)	9.28 (7.22-12.3)	10.6 (8.11-14.5)	12.1 (9.08-17.5)	14.1 (9.69-20.3)	17.5 (11.5-26.1)	20.5 (13.2-31.2)
7-day	4.25 (3.45-5.18)	5.34 (4.33-6.51)	7.12 (5.75-8.71)	8.60 (6.89-10.6)	10.6 (8.29-14.0)	12.1 (9.28-16.4)	13.8 (10.3-19.7)	16.0 (11.0-22.8)	19.6 (13.0-29.1)	22.8 (14.7-34.6)
10-day	4.95 (4.02-6.00)	6.10 (4.95-7.40)	7.97 (6.45-9.72)	9.53 (7.66-11.7)	11.7 (9.11-15.2)	13.2 (10.1-17.8)	15.0 (11.2-21.2)	17.2 (11.9-24.5)	20.8 (13.8-30.9)	24.0 (15.6-36.4)
20-day	7.14 (5.84-8.60)	8.35 (6.82-10.1)	10.3 (8.40-12.5)	12.0 (9.67-14.6)	14.2 (11.1-18.3)	15.9 (12.2-21.0)	17.7 (13.2-24.5)	19.9 (13.8-28.1)	23.2 (15.5-34.1)	26.0 (16.9-39.2)
30-day	8.97 (7.36-10.8)	10.2 (8.36-12.3)	12.2 (9.98-14.7)	13.9 (11.3-16.9)	16.2 (12.7-20.7)	17.9 (13.7-23.5)	19.8 (14.6-27.0)	21.8 (15.2-30.7)	24.8 (16.6-36.4)	27.3 (17.8-40.9)
45-day	11.2 (9.25-13.4)	12.5 (10.3-15.0)	14.6 (11.9-17.5)	16.3 (13.3-19.7)	18.7 (14.7-23.6)	20.5 (15.7-26.6)	22.4 (16.5-30.1)	24.3 (17.0-34.0)	26.9 (18.1-39.2)	28.9 (18.9-43.3)
60-day	13.1 (10.8-15.6)	14.4 (11.9-17.2)	16.6 (13.6-19.9)	18.4 (15.0-22.1)	20.8 (16.3-26.2)	22.7 (17.4-29.2)	24.6 (18.1-32.8)	26.4 (18.6-36.9)	28.8 (19.4-41.8)	30.5 (19.9-45.5)

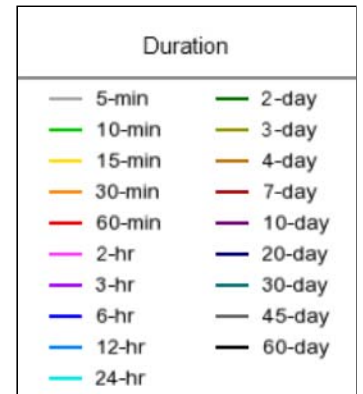
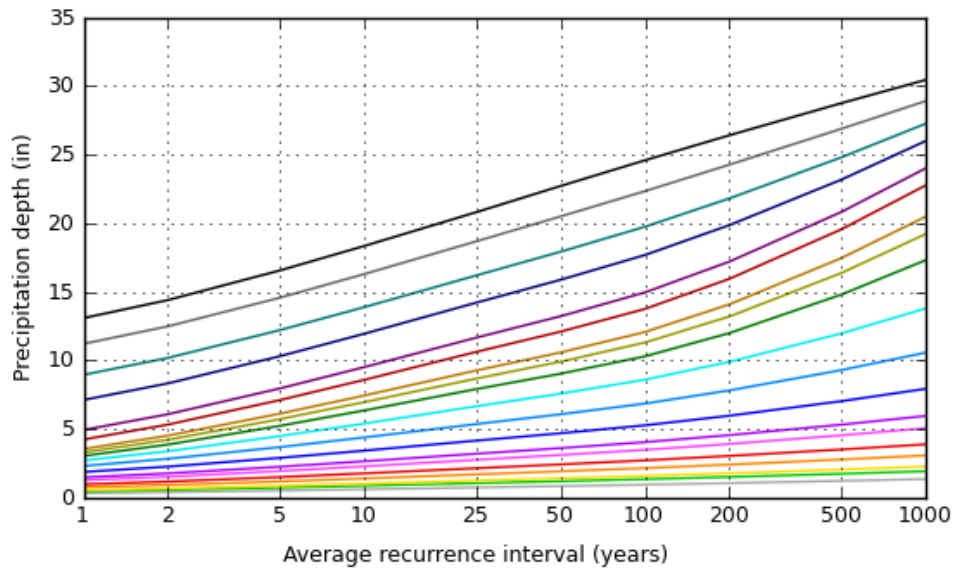
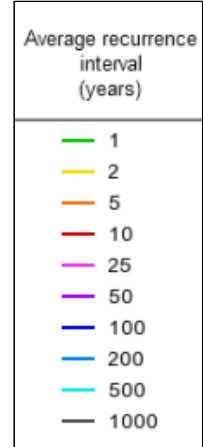
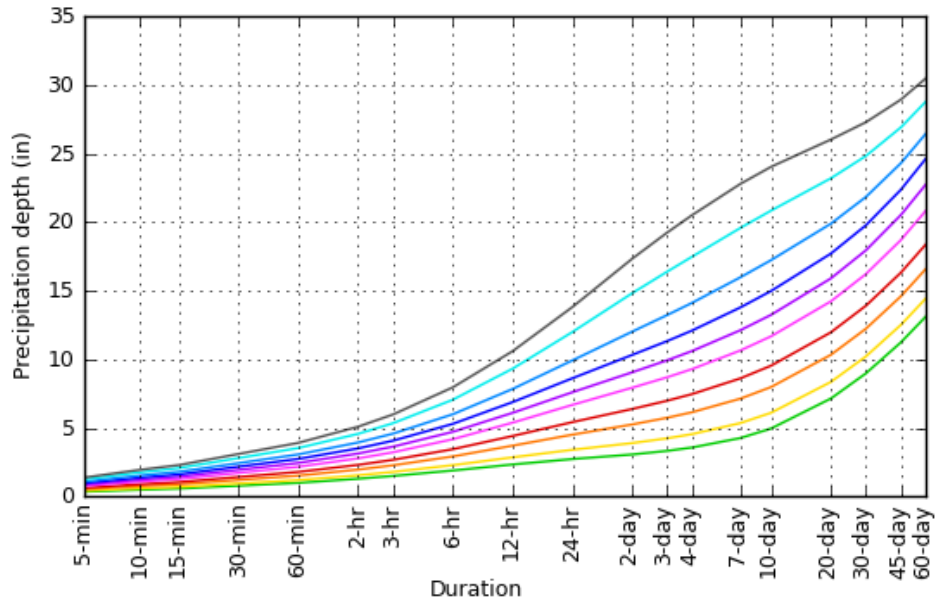
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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

Please refer to NOAA Atlas 14 document for more information.

PF graphical

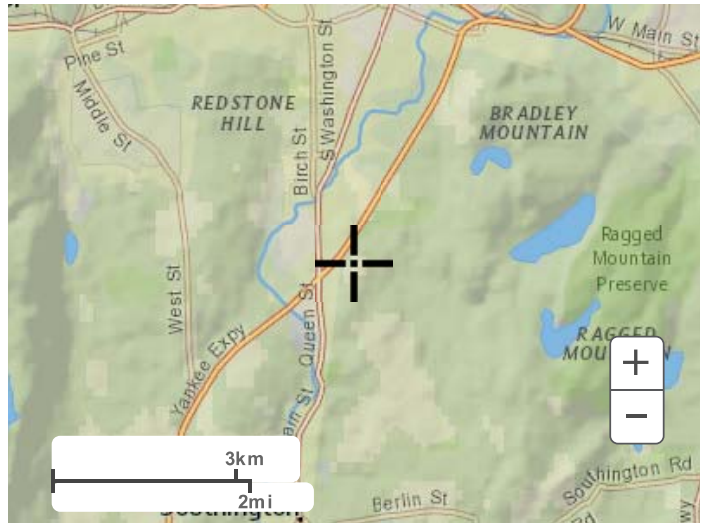
PDS-based depth-duration-frequency (DDF) curves
 Latitude: 41.6342°, Longitude: -72.8666°



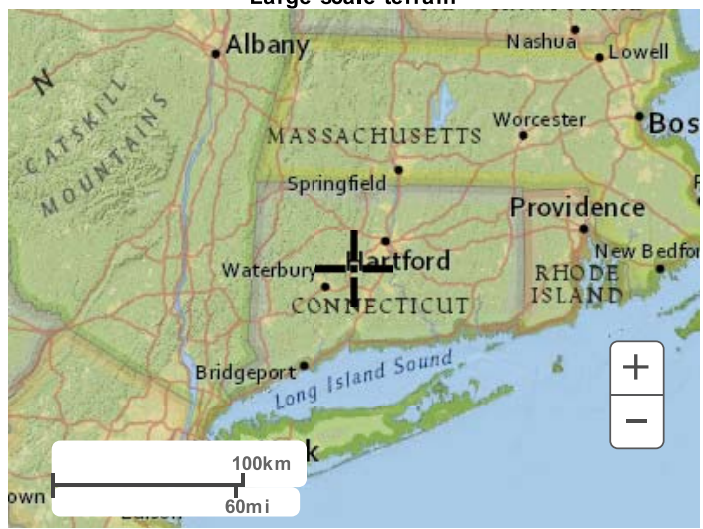
[Back to Top](#)

Maps & aerials

Small scale terrain



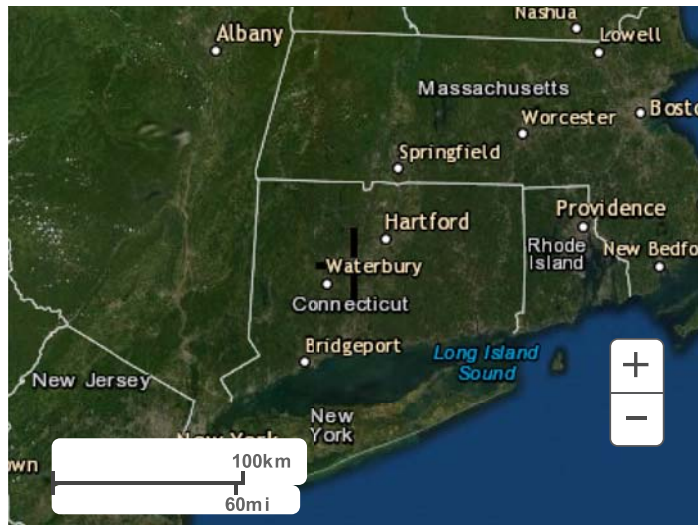
Large scale terrain



Large scale map



Large scale aerial



[Back to Top](#)

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

[Disclaimer](#)



NOAA Atlas 14, Volume 10, Version 2
 Location name: Southington, Connecticut, USA*
 Latitude: 41.5616°, Longitude: -72.8716°
 Elevation: 151.56 ft**



* source: ESRI Maps
 ** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

[PF tabular](#) | [PF graphical](#) | [Maps & aerals](#)

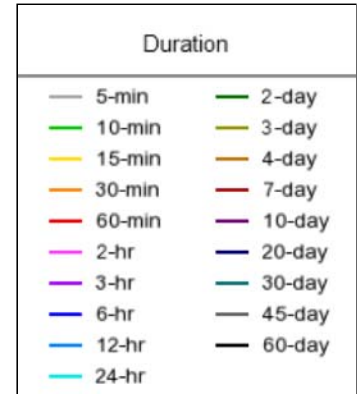
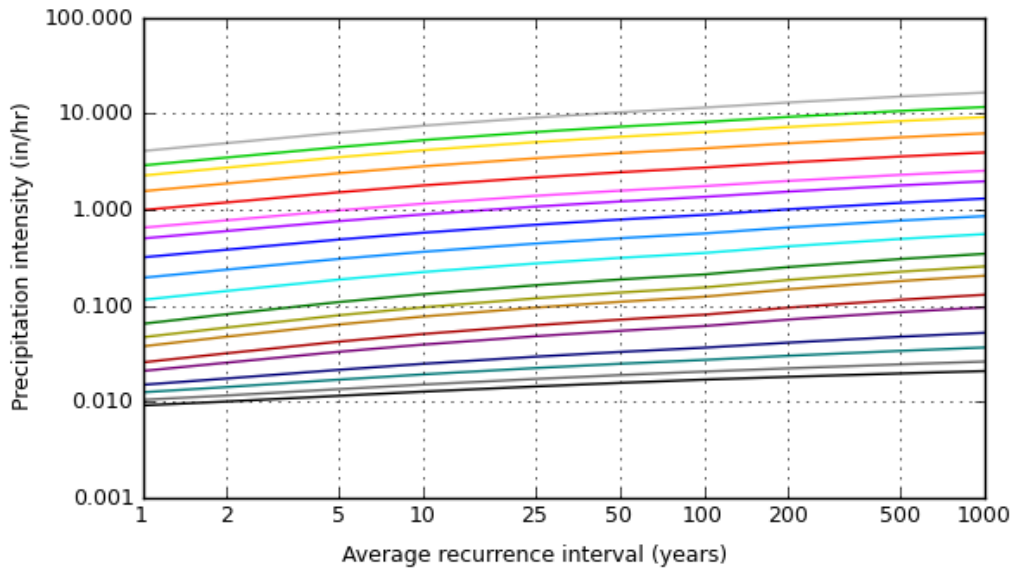
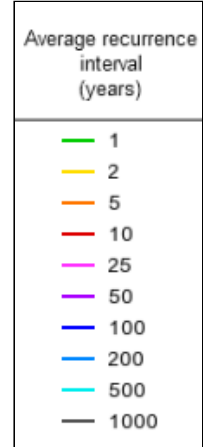
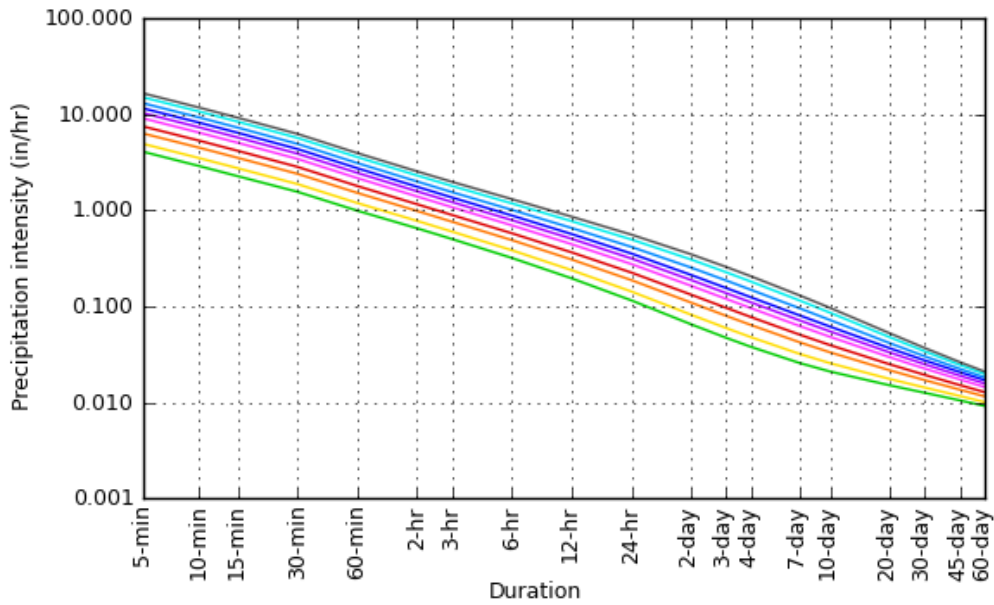
PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.08 (3.19-5.14)	4.93 (3.85-6.22)	6.32 (4.92-8.02)	7.49 (5.80-9.54)	9.08 (6.79-12.1)	10.3 (7.56-14.1)	11.5 (8.21-16.5)	13.1 (8.80-19.1)	15.0 (9.76-22.9)	16.6 (10.5-25.8)
10-min	2.89 (2.26-3.64)	3.49 (2.72-4.40)	4.48 (3.49-5.68)	5.30 (4.10-6.76)	6.43 (4.81-8.60)	7.30 (5.35-10.0)	8.17 (5.81-11.7)	9.25 (6.23-13.5)	10.7 (6.91-16.2)	11.7 (7.42-18.3)
15-min	2.26 (1.77-2.86)	2.74 (2.14-3.46)	3.52 (2.74-4.45)	4.16 (3.22-5.30)	5.04 (3.78-6.75)	5.73 (4.20-7.84)	6.41 (4.56-9.14)	7.25 (4.89-10.6)	8.36 (5.42-12.7)	9.20 (5.82-14.3)
30-min	1.56 (1.22-1.96)	1.87 (1.46-2.37)	2.40 (1.86-3.03)	2.83 (2.19-3.61)	3.42 (2.56-4.58)	3.88 (2.85-5.32)	4.34 (3.09-6.19)	4.91 (3.31-7.20)	5.67 (3.67-8.63)	6.24 (3.95-9.71)
60-min	0.990 (0.773-1.25)	1.19 (0.929-1.50)	1.52 (1.18-1.92)	1.79 (1.38-2.28)	2.16 (1.62-2.89)	2.45 (1.80-3.36)	2.74 (1.95-3.91)	3.10 (2.09-4.54)	3.58 (2.32-5.45)	3.94 (2.49-6.13)
2-hr	0.649 (0.510-0.812)	0.776 (0.610-0.972)	0.983 (0.770-1.24)	1.16 (0.899-1.46)	1.39 (1.05-1.85)	1.58 (1.16-2.15)	1.76 (1.26-2.50)	1.99 (1.35-2.90)	2.30 (1.50-3.49)	2.54 (1.61-3.93)
3-hr	0.501 (0.396-0.625)	0.600 (0.473-0.749)	0.760 (0.597-0.952)	0.893 (0.697-1.13)	1.08 (0.814-1.43)	1.22 (0.901-1.65)	1.36 (0.977-1.93)	1.54 (1.05-2.24)	1.79 (1.17-2.70)	1.98 (1.26-3.05)
6-hr	0.319 (0.254-0.395)	0.383 (0.304-0.475)	0.489 (0.387-0.609)	0.576 (0.453-0.722)	0.697 (0.530-0.919)	0.789 (0.589-1.07)	0.882 (0.639-1.25)	1.01 (0.687-1.46)	1.18 (0.770-1.77)	1.31 (0.833-2.00)
12-hr	0.196 (0.156-0.241)	0.238 (0.190-0.293)	0.307 (0.244-0.380)	0.364 (0.288-0.454)	0.444 (0.340-0.583)	0.504 (0.379-0.680)	0.565 (0.413-0.798)	0.653 (0.446-0.938)	0.769 (0.504-1.15)	0.857 (0.549-1.31)
24-hr	0.115 (0.093-0.141)	0.143 (0.115-0.174)	0.187 (0.150-0.230)	0.224 (0.179-0.277)	0.275 (0.213-0.361)	0.315 (0.238-0.424)	0.354 (0.262-0.501)	0.415 (0.284-0.593)	0.496 (0.326-0.736)	0.557 (0.358-0.844)
2-day	0.065 (0.053-0.079)	0.082 (0.066-0.099)	0.109 (0.088-0.133)	0.132 (0.106-0.162)	0.163 (0.127-0.214)	0.188 (0.143-0.252)	0.212 (0.158-0.300)	0.253 (0.174-0.359)	0.307 (0.202-0.453)	0.347 (0.224-0.523)
3-day	0.047 (0.038-0.057)	0.059 (0.048-0.072)	0.080 (0.064-0.097)	0.096 (0.078-0.118)	0.119 (0.093-0.156)	0.137 (0.105-0.184)	0.155 (0.116-0.220)	0.186 (0.128-0.263)	0.226 (0.149-0.333)	0.257 (0.166-0.385)
4-day	0.038 (0.031-0.046)	0.048 (0.039-0.058)	0.064 (0.052-0.077)	0.077 (0.062-0.094)	0.096 (0.075-0.124)	0.110 (0.085-0.147)	0.124 (0.093-0.175)	0.148 (0.102-0.210)	0.181 (0.120-0.265)	0.205 (0.133-0.307)
7-day	0.026 (0.021-0.031)	0.032 (0.026-0.038)	0.042 (0.035-0.051)	0.051 (0.041-0.062)	0.063 (0.049-0.081)	0.072 (0.055-0.095)	0.081 (0.061-0.113)	0.096 (0.066-0.134)	0.115 (0.077-0.168)	0.130 (0.084-0.194)
10-day	0.021 (0.017-0.025)	0.026 (0.021-0.031)	0.033 (0.027-0.040)	0.039 (0.032-0.048)	0.048 (0.038-0.062)	0.055 (0.042-0.072)	0.061 (0.046-0.085)	0.072 (0.050-0.101)	0.086 (0.057-0.125)	0.096 (0.062-0.143)
20-day	0.015 (0.012-0.018)	0.018 (0.014-0.021)	0.022 (0.018-0.026)	0.025 (0.020-0.030)	0.029 (0.023-0.037)	0.033 (0.025-0.043)	0.037 (0.027-0.049)	0.041 (0.029-0.057)	0.048 (0.032-0.069)	0.052 (0.034-0.077)
30-day	0.013 (0.010-0.015)	0.014 (0.012-0.017)	0.017 (0.014-0.020)	0.019 (0.016-0.023)	0.022 (0.018-0.028)	0.025 (0.019-0.032)	0.027 (0.020-0.036)	0.030 (0.021-0.042)	0.034 (0.023-0.049)	0.037 (0.024-0.054)
45-day	0.010 (0.009-0.012)	0.012 (0.010-0.014)	0.014 (0.011-0.016)	0.015 (0.012-0.018)	0.017 (0.014-0.021)	0.019 (0.015-0.024)	0.021 (0.015-0.027)	0.022 (0.016-0.031)	0.025 (0.017-0.035)	0.026 (0.017-0.038)
60-day	0.009 (0.008-0.011)	0.010 (0.008-0.012)	0.012 (0.010-0.014)	0.013 (0.011-0.015)	0.014 (0.011-0.018)	0.016 (0.012-0.020)	0.017 (0.013-0.022)	0.018 (0.013-0.025)	0.020 (0.013-0.028)	0.021 (0.014-0.031)

¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).
 Numbers in parenthesis are PF estimates at low er and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) w ill be greater than the upper bound (or less than the low er bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.
 Please refer to NOAA Atlas 14 document for more information.

PF graphical

PDS-based intensity-duration-frequency (IDF) curves
 Latitude: 41.5616°, Longitude: -72.8716°



[Back to Top](#)

Maps & aerials

Small scale terrain



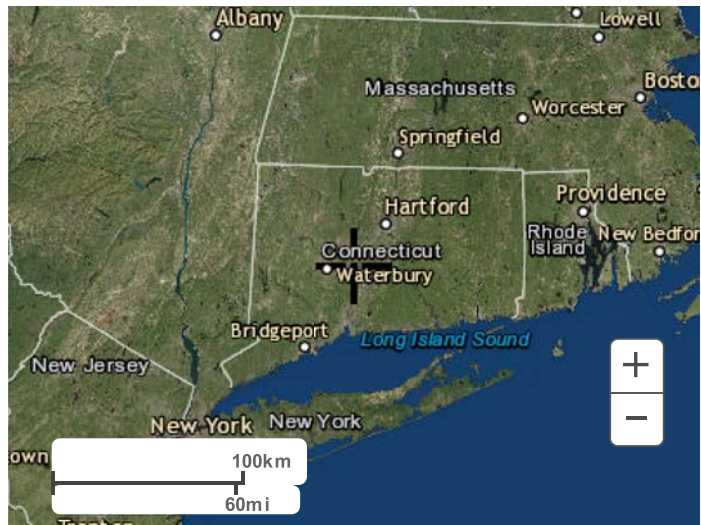
Large scale terrain



Large scale map



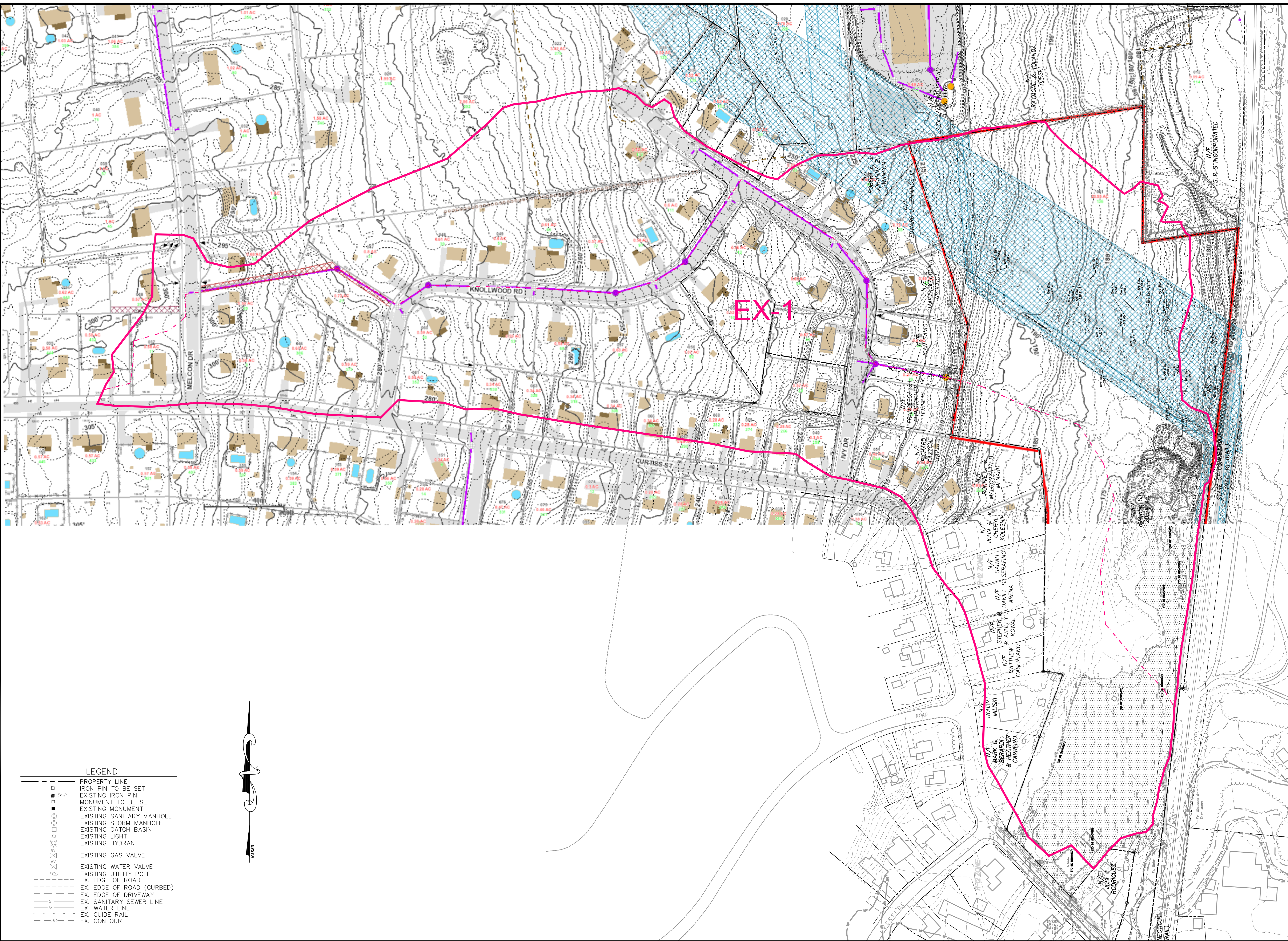
Large scale aerial



[Back to Top](#)

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

[Disclaimer](#)



Disclaimer:
 The underground utilities shown have been located from limited field survey information and existing drawings. The surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area either in service or abandoned. To meet the requirements of our professional liability insurance, the terms CERTIFICATE, CERTIFY, and CERTIFICATION mean to the best information, knowledge, and belief of the engineer, and are not an unconditional certification, warranty or guarantee which are not covered under the policy.

REVISIONS TO THESE PLANS BY ANYONE OTHER THAN KJA SHALL MAKE THESE PLANS NULL AND VOID. KJA SHALL TAKE NO RESPONSIBILITY FOR SAID REVISIONS.

REVISION-7:	
REVISION-6:	
REVISION-5:	
REVISION-4:	
REVISION-3:	
REVISION-2:	
REVISION-1:	
PROJECT:	
DATE:	DB: AQ SR: - DR: AQ
SCALE:	

James W. Sakonchick
 CT P.E. & L.S. #11302

kratzer, jones & associates, inc.
 CIVIL ENGINEERS • LAND SURVEYORS
 SITE PLANNERS • BUILDING ENGINEERS
 P.O. BOX 337
 1755 MERIDEN-WATERBURY RD.
 MILDALE, CT 06467-0337
 PHONE: (860) 621-3638
 FAX: (860) 621-9609
 EMAIL: INFO@KRATZERTJONES.COM

**PRE-DEVELOPMENT
 WATERSHED
 MAP**

for
**CURTISS STREET
 INDUSTRIAL
 PARK**

136 CURTISS STREET
 SOUTHINGTON, CT

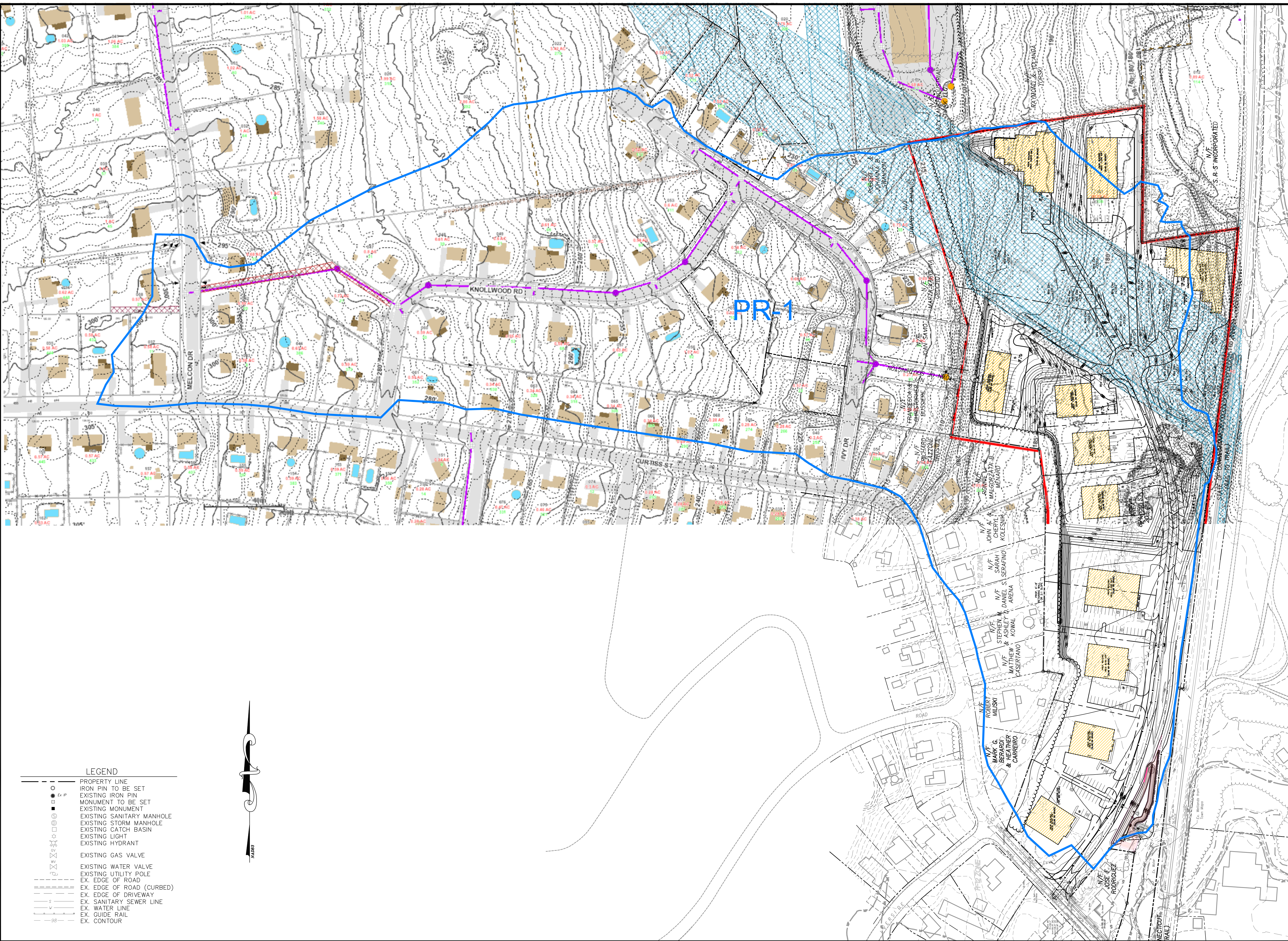
SCALE: 1" = 100'
 DATE: SEPTEMBER 21, 2021

HALF ONE INCH TWO INCH
 INCHES ON ORIGINAL

KJA FILE NO.: DRAWING NO.:
219-090 WS-1

- LEGEND**
- PROPERTY LINE
 - IRON PIN TO BE SET
 - EXISTING IRON PIN
 - MONUMENT TO BE SET
 - EXISTING MONUMENT
 - WITH X EXISTING SANITARY MANHOLE
 - WITH S EXISTING STORM MANHOLE
 - WITH C EXISTING CATCH BASIN
 - WITH L EXISTING LIGHT
 - WITH H EXISTING HYDRANT
 - WITH G EXISTING GAS VALVE
 - WITH W EXISTING WATER VALVE
 - WITH U EXISTING UTILITY POLE
 - EX. EDGE OF ROAD
 - EX. EDGE OF ROAD (CURBED)
 - EX. EDGE OF DRIVEWAY
 - EX. SANITARY SEWER LINE
 - EX. WATER LINE
 - EX. GUIDE RAIL
 - EX. CONTOUR





Disclaimer:
 The underground utilities shown have been located from limited field survey information and existing drawings. The surveyor makes no guarantee that the underground utilities shown comprise all such utilities in the area either in service or abandoned. To meet the requirements of our professional liability insurance, the terms CERTIFICATE, CERTIFY, AND CERTIFICATION mean to the best information, knowledge, and belief of the engineer, and are not an unconditional certification, warranty or guarantee which are not covered under the policy.

REVISIONS TO THESE PLANS BY ANYONE OTHER THAN KJA SHALL MAKE THESE PLANS NULL AND VOID. KJA SHALL TAKE NO RESPONSIBILITY FOR SAID REVISIONS.

REVISION-7:
REVISION-6:
REVISION-5:
REVISION-4:
REVISION-3:
REVISION-2:
REVISION-1:
PROJECT:
DB: AG SR: - DR: AG
SCALE:

James W. Sakonchick
 CT P.E. & L.S. #11,302

kratzer, KJA jones & associates, inc.
 CIVIL ENGINEERS • LAND SURVEYORS
 SITE PLANNERS • BUILDING ENGINEERS

P.O. BOX 337
 1755 MERIDEN-WATERBURY RD.
 MILDALE, CT 06467-0337
 PHONE: (860) 621-3638
 FAX: (860) 621-9609
 EMAIL: INFO@KRATZERTJONES.COM

**POST-DEVELOPMENT
 WATERSHED
 MAP**

for
**CURTISS STREET
 INDUSTRIAL
 PARK**

136 CURTISS STREET
 SOUTHTON, CT

SCALE: 1" = 100'
 DATE: SEPTEMBER 21, 2021

HALF ONE INCH TWO INCH
 INCHES ON ORIGINAL

KJA FILE NO.: DRAWING NO.:
219-090 WS-2

- LEGEND**
- PROPERTY LINE
 - IRON PIN TO BE SET
 - EXISTING IRON PIN
 - MONUMENT TO BE SET
 - EXISTING MONUMENT
 - EXISTING SANITARY MANHOLE
 - EXISTING STORM MANHOLE
 - EXISTING CATCH BASIN
 - EXISTING LIGHT
 - EXISTING HYDRANT
 - EXISTING GAS VALVE
 - EXISTING WATER VALVE
 - EXISTING UTILITY POLE
 - EX. EDGE OF ROAD
 - EX. EDGE OF ROAD (CURBED)
 - EX. EDGE OF DRIVEWAY
 - EX. SANITARY SEWER LINE
 - EX. WATER LINE
 - EX. GUIDE RAIL
 - EX. CONTOUR

