YANTIC RIVER
CONSULTANTS, LLC

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STORMWATER MANAGEMENT REPORT

NORTH BRIDE BROOK
MULTI-FAMILY DEVELOPMENT
NORTH BRIDE BROOK ROAD, EAST LYME, CT

PREPARED FOR

PAZZ & CONSTRUCTION, LLC
297 BOSTON POST ROAD
EAST LYME, CT 06333

DATE: NOVEMBER 1, 2019
REVISED: JULY 10, 2020

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APPENDICES

PROJECT DESCRIPTION

Pazz & Construction, LLC is proposing to construct a residential multi-family townhouse development on a 20.24-acre parcel of land located on the west side of North Bride Brook Road in East Lyme, CT. The subject property, hereinafter "Site", is identified as Map 9, Lot 37-2 on the Town of East Lyme Tax Assessor Mapping.

The multi-family development will consist of the construction of 10 townhouse buildings with a total of 80 residential units. Main access to the development will be provided from the northeast via a driveway connection to North Bride Brook Road. Additional site work will include:

- 24' access and internal driveways
- 18' wide utility maintenance and emergency access driveway
- Exterior and garage parking
- Pedestrian walks for handicapped accessibility
- Drainage improvements including stormwater collection, treatment, infiltration & detention.
- Connection to the existing sanitary sewer, water, electric, gas and telecom services
- Landscaping including a mixture of street trees, shrubs, foundation plantings and planting beds
- Building and site lighting
- Erosion and sedimentation control measures

EXISTING SITE

The existing site(s) is currently undeveloped.

VEGETATION – The site is generally wooded with moderate to dense undergrowth.

TOPOGRAPHY – The eastern portion of the site generally slopes from a ridge line running north to south through the property towards North Bride Brook Road to the east with the low point at the southeast corner. The western portion of the site slopes from high points at the above described ridge line and the western property line towards a central inland wetland system with a low point at the southern property line. Slopes are generally moderate to steep through the entire site.

SOILS – The USDA NRCS Web Soil Survey indicates that the soils consist of Charlton-Chatfield and Haven soils. These soils have a hydrologic soil group classification (HSG) of B.

DRAINAGE – Existing drainage consists of sheet and concentrated runoff from wooded areas following the general topography described above.

PREDEVELOPMENT HYDROLOGIC CONDITIONS

- **DRAINAGE AREAS:** The existing drainage areas general follow the topography described above. EX-01 is 8.13 acres and consists of the eastern portion of the site draining to North Bride Brook Road and EX-02 is 12.03 acres and consists of the western portion of the site draining to the inland wetland system.
- **RAINFALL:** Precipitation frequency and depth estimates (rainfall data) were obtained from NOAA Atlas 14, Volume 10, Version 2 at the subject site.
- **RUNOFF COEFFICIENT:** Composite Curve Numbers (CN) were calculated based on a wooded area in "good" condition within HSG B. A composite CN of 55 was used for both watersheds.

- **TIME OF CONCENTRATION:** Time of concentration (Tc) was estimated for the watershed based on the SCS method, with sheet and shallow concentrated flow from the hydraulically most distant point of the watershed to the discharge point. EX-01 had a Tc of 26 minutes and EX-02 25 minutes.

PROPOSED DRAINAGE

The proposed development project will consist of the construction of a new buildings, access drives, parking areas, pedestrian walks and other site amenities. As part of the work, a new stormwater collection system consisting of a series of swales, yard drains, catch basins and drainage piping will be installed. This new system will connect to the existing system in North Bride Brook Road.

Peak flow rates for pre-development and post-development conditions were calculated using SCS TR-55 methodology. Hydrology Studio 2016 v.3.0.0.15 was used to generate peak flows from the watershed with the following parameters:

POST-DEVELOPED CONDITIONS

- **DRAINAGE AREA:** The proposed development maintains existing drainage areas and discharge points. PR-01 is 8.13 acres and PR-02 is 12.03 acres, which matches existing conditions.
- **RAINFALL:** Same as Pre-Developed Conditions.
- **CURVE NUMBER:** Same methodology as Pre-Developed Conditions. Composite Curve Numbers (CN) were calculated based on the land cover types for the proposed residential site for HSG B soils, including buildings and impervious surfaces (CN 98), open spaces (CN 61), and remaining wooded areas (CN 55). A composite CN of 75 was calculated for PR-01. There are no proposed activities within the EX-02 watershed, therefore a CN of 55 was used for PR-02 to match existing conditions.
- **TIME OF CONCENTRATION:** Same methodology as Pre-Developed Conditions. A time of 26 minutes was calculated for PR-01 and 25 minutes for PR-02, which generally matches predevelopment conditions.

COMPARISON

A summary of flows for existing and proposed conditions is provided below as referenced from the hydrograph summary table in Appendix B, page 2.

STORM EVENT	PEAK FLOWS 01 (CFS)			PEAK FLOWS 02 (CFS)		
	EX-01	PR-01	PR-01 vs. EX-01	EX-02	PR-02	PR-02 vs. EX-02
1-yr	0.32	4.88	4.56	0.48	0.48	0.00
2-yr	1.06	7.30	6.24	1.61	1.61	0.00
5-yr	3.07	11.60	8.53	4.64	4.64	0.00
10-yr	5.33	15.45	10.12	8.06	8.06	0.00
25-yr	9.00	20.92	11.92	13.63	13.63	0.00
50-yr	12.05	25.09	13.04	18.25	18.25	0.00
100-yr	15.56	29.62	14.06	23.58	23.58	0.00

TABLE 1: PEAK FLOW COMPARISON

As shown in Table 1, there are no changes in peak flows from Area 2 as highlighted in green. Calculated peak flows from Area 1 are substantially higher as highlighted in orange. The increase can be expected as a result of the impervious surfaces associated with the development. Subsurface treatment, infiltration, secondary treatment, and detention is proposed to attenuate the increase in peak flow rates as described below.

DETENTION

Stormwater runoff from the proposed development within Area 1 will be collected by a series of swales, drains, and piping and will be discharged to a subsurface primary treatment and infiltration system consisting of Stormtech MC-3500 chambers. Flow will be diverted into the Stormtech units through a manhole with a diversion baffle. Flow is first diverted to an "Isolator Row", which will filter the water quality flows through a series of geotextile fabrics to remove sediment and debris. Flow within the underground chambers will then equalize thorugh the void spaces as groundwater is recharged.

As water depths increase beyond the infiltrative capacity of the natural soils, flows will be diverted to the detention pond, which is an excavated depression with a stage-discharge outlet structure. The outlet structure connects to an existing catch basin in the westerly shoulder of North Bride Brook Road. The proposed detention pond attenuates peak flow rates and volumes as compared to pre-development conditions for the 1-, 2-, 5-, 10-, 25, 50 and 100-year storm events resulting in a zero-net increase in runoff from the development as shown in the table below.

STORM EVENT	PEAK FLOWS 01 (CFS)				
	EX-01	PR-01	POND-01	PR-01 vs. EX-01	PR-01 vs. EX-01
1-yr	0.32	4.88	0.00	4.56	-0.32
2-yr	1.06	7.30	0.00	6.24	-1.06
5-yr	3.07	11.60	0.00	8.53	-3.07
10-yr	5.33	15.45	0.00	10.12	-5.33
25-yr	9.00	20.92	0.34	11.92	-8.66
50-yr	12.05	25.09	0.77	13.04	-11.28
100-yr	15.56	29.62	2.20	14.06	-13.36

TABLE 2: PEAK FLOW COMPARISON W/ DETENTION

STORMWATER QUALITY AND TREATMENT

As discussed above, runoff from the proposed impervious surfaces will be diverted through a Stormtech MC-3500 Isolator Row, consisting of 16 units that can treat 0.24 cfs each. The total treatment capacity of the Isolator Row is 3.84 cfs, which exceeds the calculated Water Quality Flow of 2.17 cfs. Further, the underground Stormtech MC-3500 system has sufficient volume to fully retain the Water Quality Volume of 0.282 acre-feet (12,300 cubic feet), thereby providing sufficient residence time to maximize infiltration of the treated stormwater into the natural sand and gravel soils.

A toe drain is proposed along the east side of the Stormtech chambers to allow low flows that are not infiltrated to weep into a secondary treatment area within the detention pond, consisting of vegetation and a stone filter berm, to further promote infiltration and treatment.

The final treatment stage consists of a 4" diameter low-level outlet orifice elevated 6" above the basin bottom, further promoting infiltration through the sand and gravel subsoils. The Isolator Row, secondary filter berm, and raised outlet will adequately retain and treat the water quality volume and flow in accordance with the CT DEEP 2004 Stormwater Quality Manual. Additional stormwater quality measures will include:

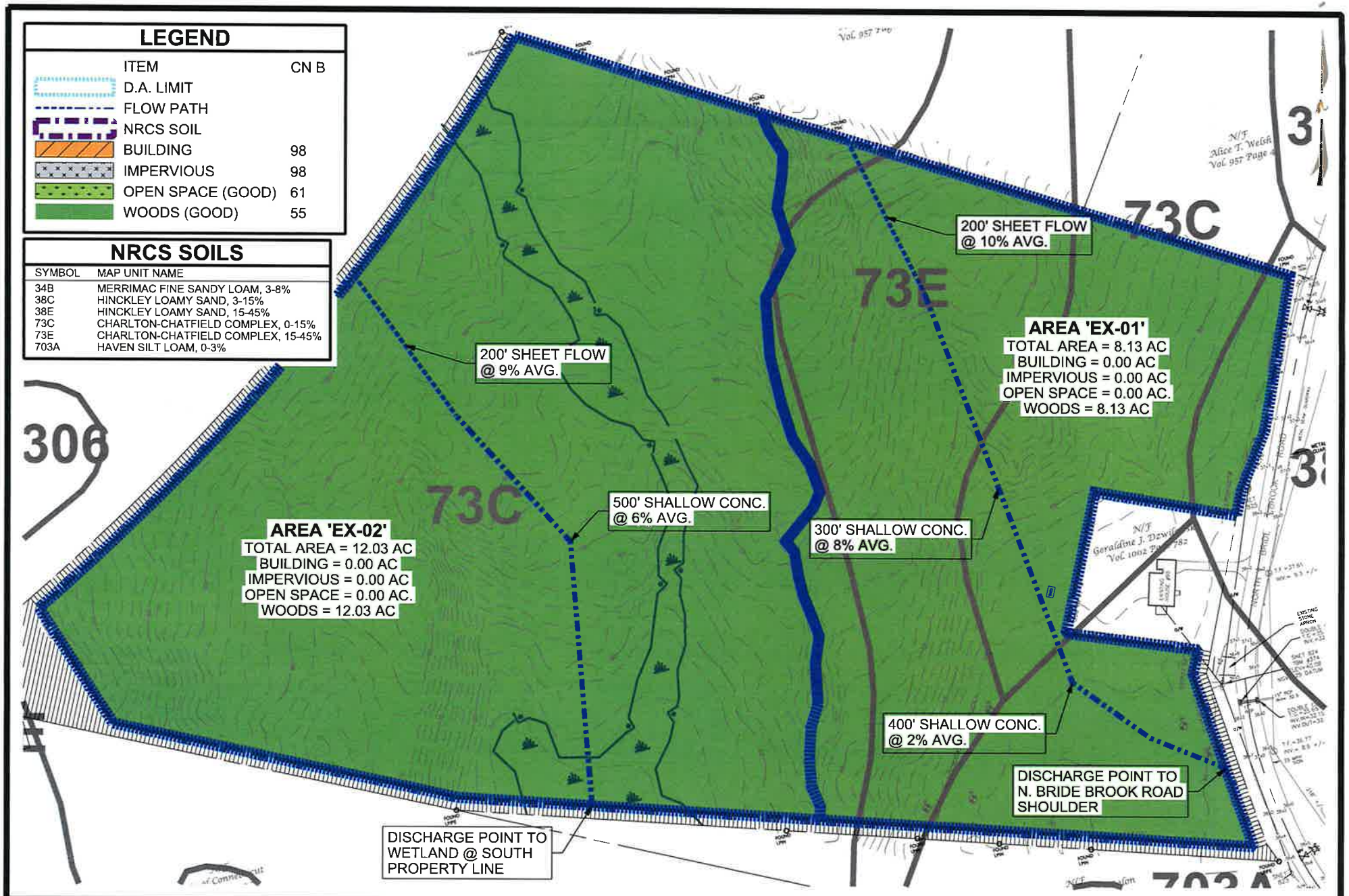
- Minimizing impervious surfaces through the installation of islands and perimeter landscaping
- Minimal slopes over landscaped surfaces to promote infiltration
- Installation of catch basins with 2' sumps
- Disconnection of impervious areas

CONCLUSION

The proposed stormwater system will generally maintain the original drainage patterns with no increase in peak flow rates discharging from the site. No adverse impacts to the site, adjacent properties or North Bridge Brook Road are anticipated.

APPENDIX A
DRAINAGE AREA MAPS

EXISTING CONDITIONS
PROPOSED CONDITIONS



SCALE: 1"= 150'

150 0 150

PROJECT NO:	DATE:	SHEET NO:
00057 - 00001	11/1/19	DA1

CONTACT INFORMATION

YANTIC RIVER CONSULTANTS, LLC
191 NORWICH AVENUE
LEBANON, CONN 06249

Phone: (860) 367-7264
Email: yanticriver@gmail.com
Web: www.yanticriverconsultants.com

NO. BRIDE BROOK MULTI-FAMILY DEVELOPMENT

PREPARED FOR PAZZ & CONSTRUCTION, LLC

EXISTING CONDITIONS DRAINAGE AREA MAP

NORTH BRIDE BROOK ROAD — EAST LYME, CT

SCALE: 1"= 150'

150 0 150

PROJECT NO:	DATE:	SHEET NO:
00057 - 00001	7/8/20	DA2

CONTACT INFORMATION

YANTIC RIVER CONSULTANTS, LLC
191 NORWICH AVENUE
LEBANON, CONN 06249

Phone: (860) 367-7264
Email: yanticriver@gmail.com
Web: www.yanticriverconsultants.com

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PROPOSED CONDITIONS DRAINAGE AREA MAP

NORTH BRIDE BROOK ROAD EAST LYME, CT

APPENDIX B
HYDROLOGIC COMPUTATIONS

HYDROLOGY STUDIO REPORT
STORMWATER TREATMENT CALCULATIONS

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Hydrology Studio v 3.0.0.15

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Basin Model

Hydrology Studio v 3.0.0.15

Project Name:

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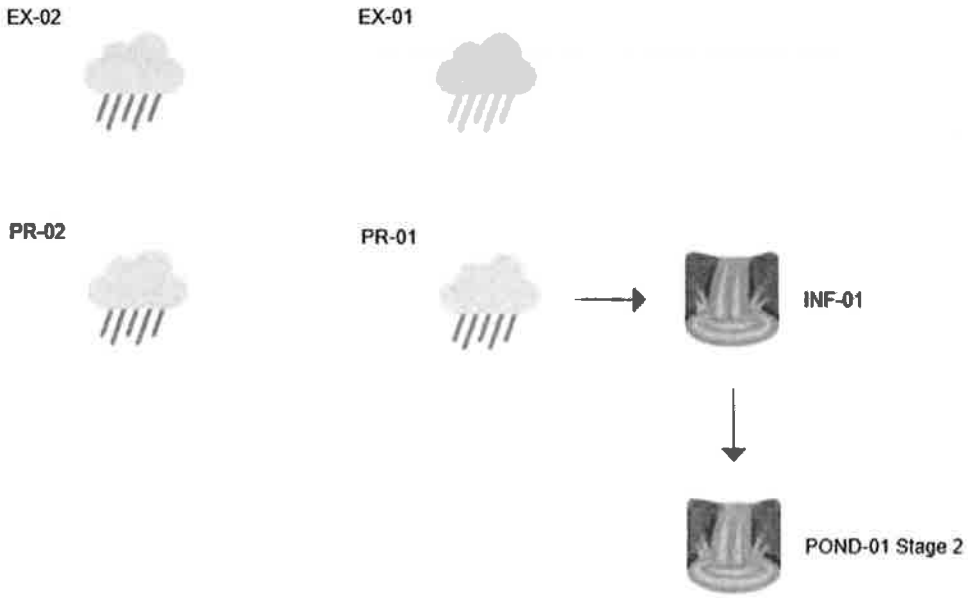

Hydrograph by Return Period

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Outflow (cfs)							
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
1	NRCS Runoff	EX-01	0.317	1.062		3.069	5.329	8.999	12.05	15.56
2	NRCS Runoff	PR-01	4.883	7.297		11.60	15.45	20.92	25.09	29.62
3	Pond Route	INF-01	0.000	0.025		0.393	1.764	3.842	5.587	9.046
4	Pond Route	POND-01 Stage 2	0.000	0.000		0.000	0.000	0.337	0.774	2.196
5	NRCS Runoff	EX-02	0.479	1.606		4.641	8.061	13.63	18.25	23.58
6	NRCS Runoff	PR-02	0.479	1.606		4.641	8.061	13.63	18.25	23.58

Hydrograph 1-yr Summary

Project Name:

Hydrology Studio v 3.0.0.15

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Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	EX-01	0.317	12.68	4,807	----		
2	NRCS Runoff	PR-01	4.883	12.35	26,079	----		
3	Pond Route(i)	INF-01	0.000	12.93	0.000	2	41.24 U 35.08 L	6,504 U 528 L
4	Pond Route	POND-01 Stage 2	0.000	0.00	0.000	3	35.00	0.000
5	NRCS Runoff	EX-02	0.479	12.65	7,057	----		
6	NRCS Runoff	PR-02	0.479	12.65	7,057	----		

(i) = Interconnected ponds, U = Upper pond, L = Lower pond

Hydrograph Report

Project Name:

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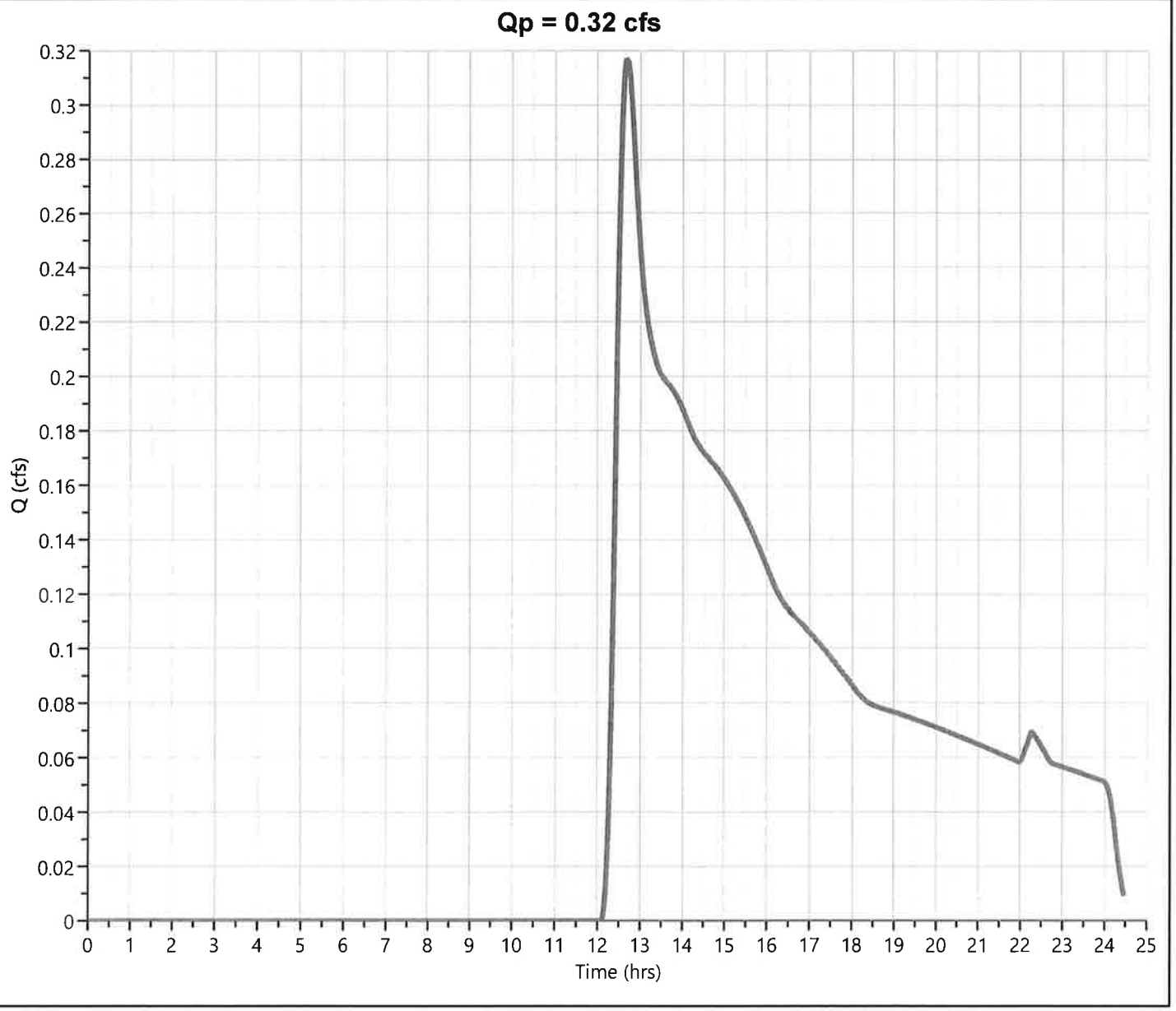
EX-01

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.317 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.68 hrs
Time Interval	= 1 min	Runoff Volume	= 4,807 cuft
Drainage Area	= 8.13 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.75 min
Total Rainfall	= 2.87 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
8.13	55	Woods (Good) B Soils
8.13	**55**	Weighted CN Method Employed



Tc by TR55 Worksheet

Project Name:

Hydrology Studio v 3.0.0.15

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EX-01

Hyd. No. 1

NRCS Runoff

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	Woods	Woods		
Manning's n	0.400	0.400	0.013	
Flow Length (ft)	100	100		
2-yr, 24-hr Precip. (in)	3.450000	3.450000	3.450000	
Land Slope (%)	10	10		
Travel Time (min)	**10.86**	**10.86**	**0.00**	**21.73**
Shallow Concentrated Flow				
Flow Length (ft)	300	400		
Watercourse Slope (%)	8	2		
Surface Description	Unpaved	Unpaved	Paved	
Average Velocity (ft/s)	4.56	2.28		
Travel Time (min)	**1.10**	**2.92**	**0.00**	**4.02**
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimiter (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				**25.75 min**

Hydrograph Report

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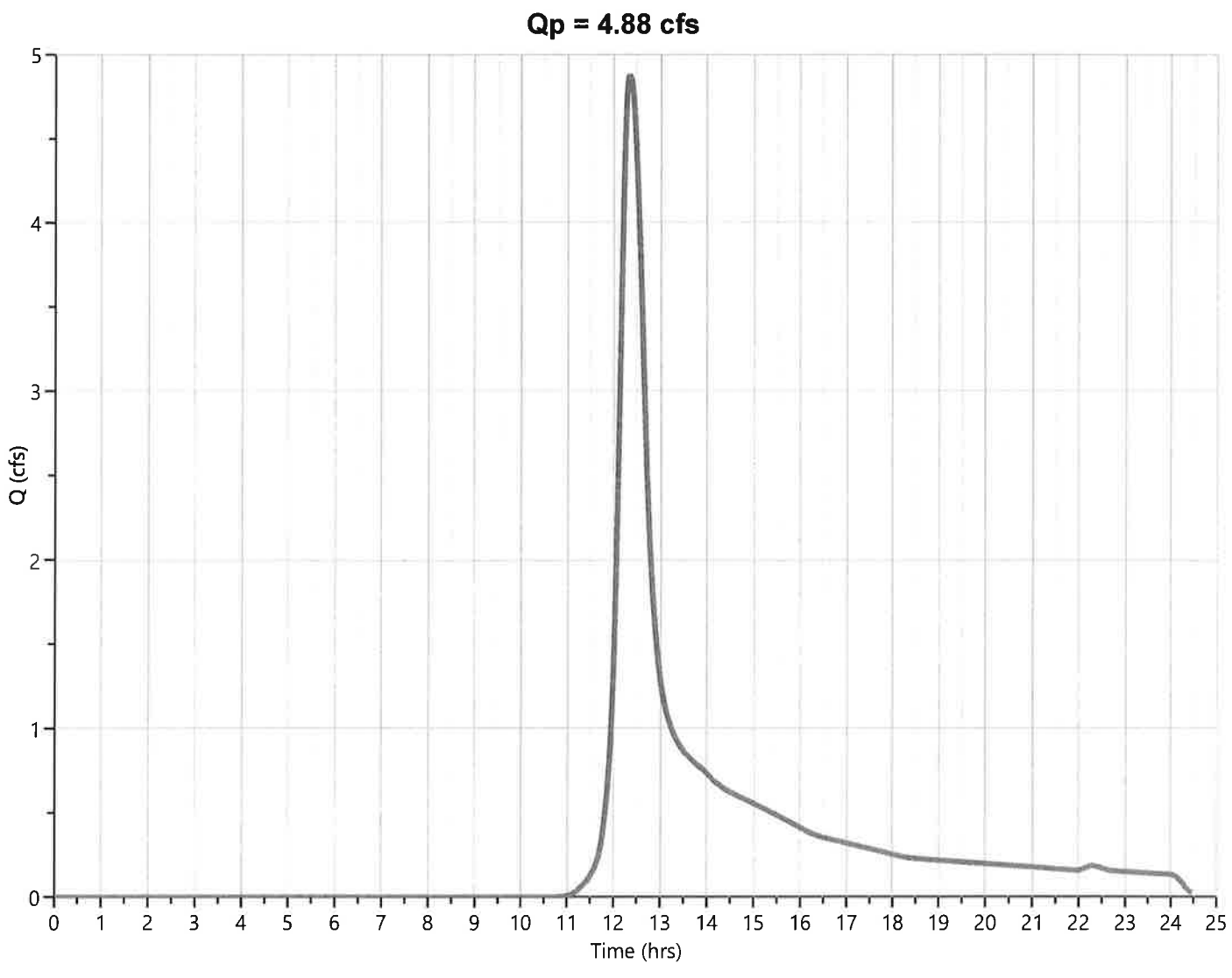
PR-01

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 4.883 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.35 hrs
Time Interval	= 1 min	Runoff Volume	= 26,079 cuft
Drainage Area	= 8.13 ac	Curve Number	= 75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.66 min
Total Rainfall	= 2.87 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
1.242	55	Woods (Good) B Soils
3.58	61	Grass (Good) B Soils
2.147	98	Impervious
1.161	98	Building
8.13	**75**	Weighted CN Method Employed



Tc by TR55 Worksheet

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

PR-01

Hyd. No. 2

NRCS Runoff

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	Woods	Woods		
Manning's n	0.400	0.400	0.013	
Flow Length (ft)	100	100		
2-yr, 24-hr Precip. (in)	3.450000	3.450000	3.450000	
Land Slope (%)	10	10		
Travel Time (min)	**10.86**	**10.86**	**0.00**	**21.73**
Shallow Concentrated Flow				
Flow Length (ft)	100	650	100	
Watercourse Slope (%)	4	5	1	
Surface Description	Unpaved	Paved	Unpaved	
Average Velocity (ft/s)	3.23	4.55	1.61	
Travel Time (min)	**0.52**	**2.38**	**1.03**	**3.93**
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimiter (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				**25.66 min**

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

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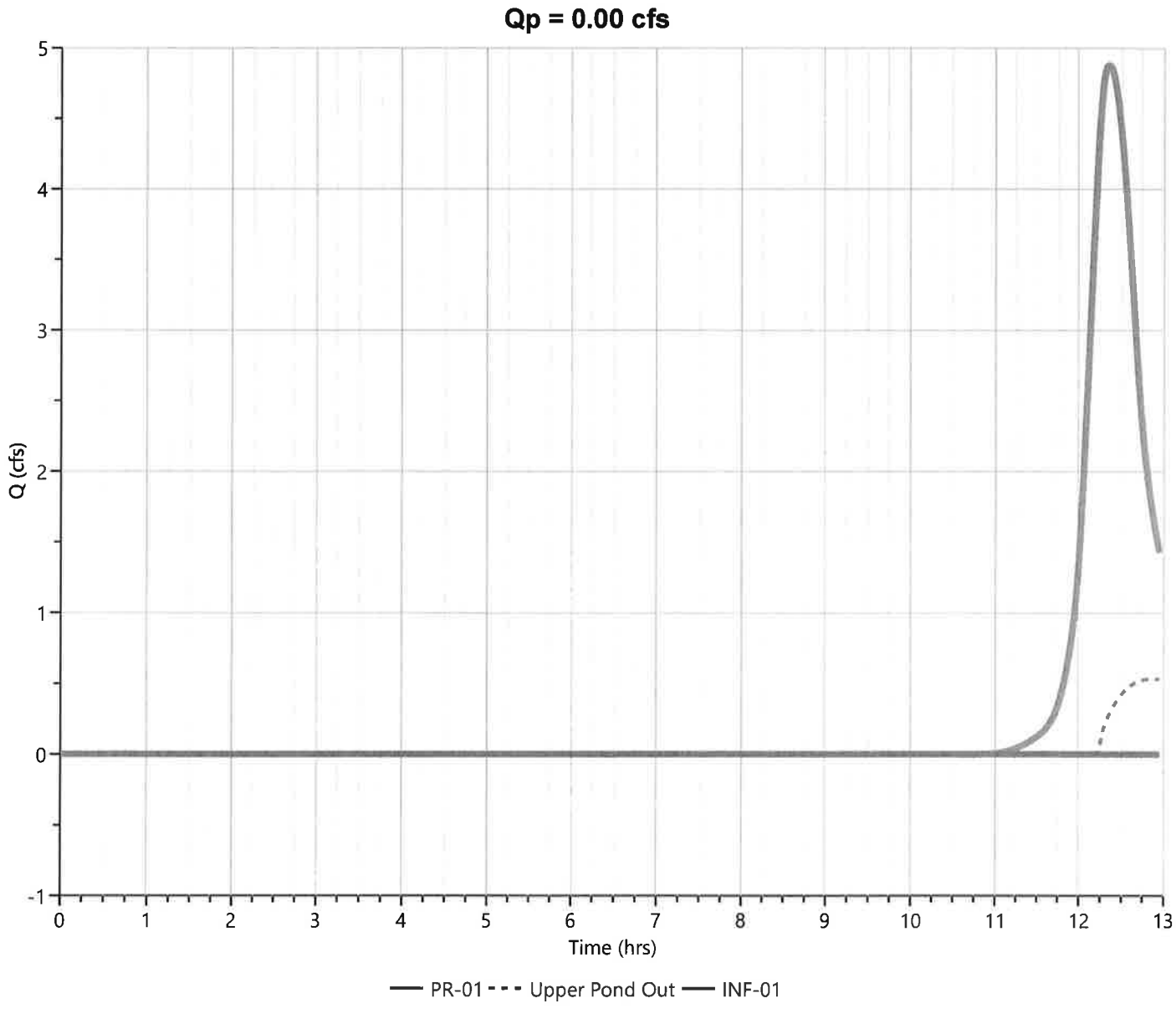
INF-01

Hyd. No. 3

Hydrograph Type	= Pond Route(i)*	Peak Flow	= 0.000 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.93 hrs
Time Interval	= 1 min	Hydrograph Volume	= 0.000 cuft
Upper Pond		**Lower Pond**	
Pond Name	= POND-01B Stormtech	Pond Name	= POND-01A Stage 2
Inflow Hyd	= 2 - PR-01	Addnl Inflow Hyd	= None
Max. Elevation	= 41.24 ft	Max. Elevation	= 35.08 ft
Max. Storage	= 6,504 cuft	Max. Storage	= 528 cuft

**Interconnected Pond Routing by Storage Indication Method.*



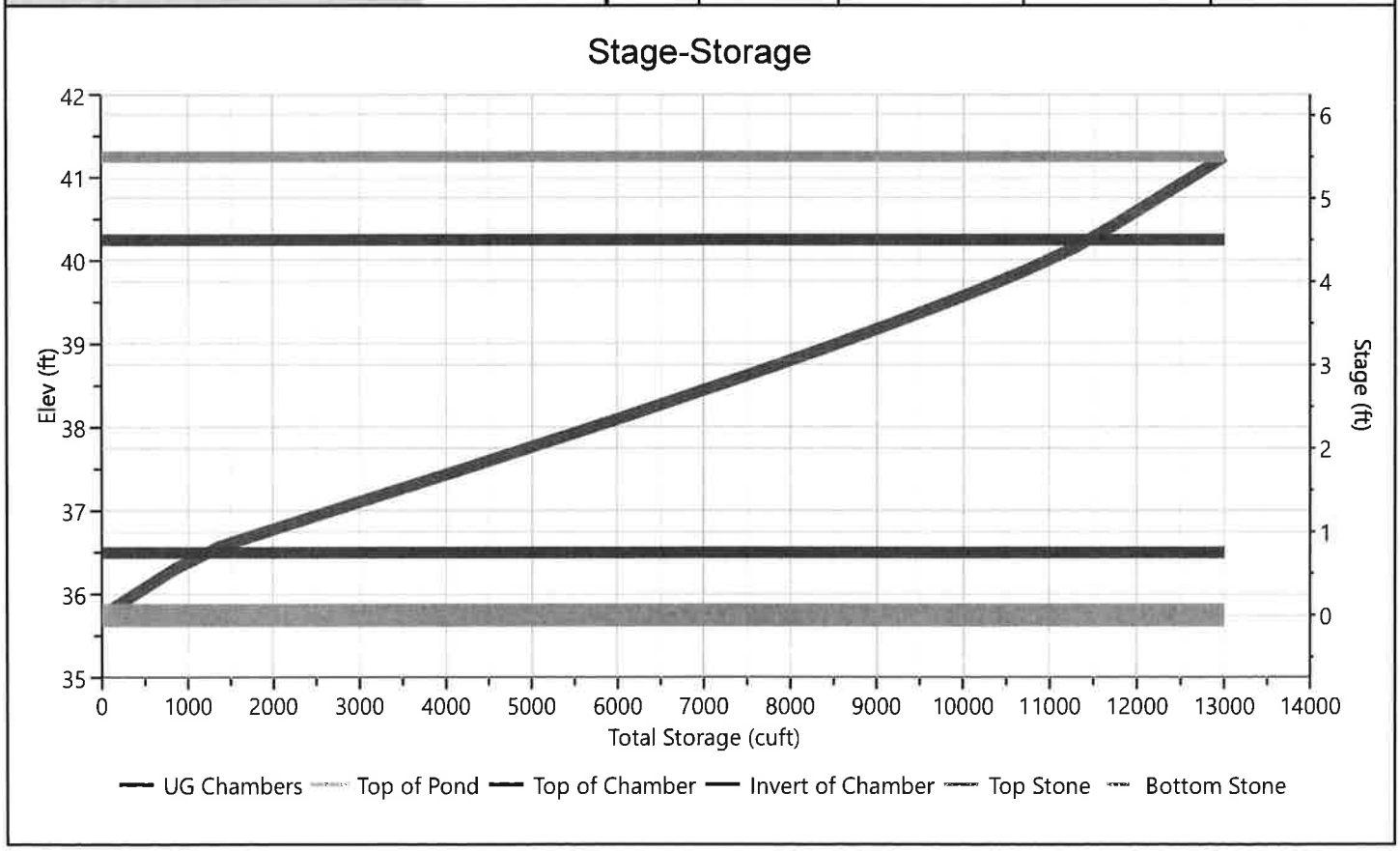
POND-01B Stormtech

Stage-Storage

Description	Input
Chamber Height, in	45
Chamber Shape	Arch
Chamber Width, in	77
Installed Length, ft	7.17
No. Chambers	68
Bare Chamber Stor, cuft	7,473
No. Rows	4
Space Between Rows, in	9
Stone Above, in	12
Stone Below, in	9
Stone Sides, in	12
Stone Ends, in	12
Encasement Voids, %	40.00
Encasement Bottom Elevation, ft	35.75

Stage / Storage Table

Stage (in)	Elevation (ft)	Contour Area (sqft)	Incr. Storage (cuft)	Total Storage (cuft)
0.0	35.75	3,839	0.000	0.000
3.3	36.03	3,839	422	422
6.6	36.30	3,839	422	844
9.9	36.58	3,839	531	1,376
13.2	36.85	3,839	846	2,222
16.5	37.13	3,839	844	3,066
19.8	37.40	3,839	838	3,904
23.1	37.68	3,839	831	4,735
26.4	37.95	3,839	820	5,555
29.7	38.23	3,839	807	6,362
33.0	38.50	3,839	791	7,153
36.3	38.78	3,839	771	7,925
39.6	39.05	3,839	747	8,672
42.9	39.33	3,839	718	9,390
46.2	39.60	3,839	682	10,073
49.5	39.88	3,839	636	10,709
52.8	40.15	3,839	569	11,278
56.1	40.43	3,839	459	11,737
59.4	40.70	3,839	422	12,159
62.7	40.98	3,839	422	12,581
66.0	41.25	3,839	422	13,004



Pond Report

Project Name:

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POND-01B Stormtech

Stage-Discharge

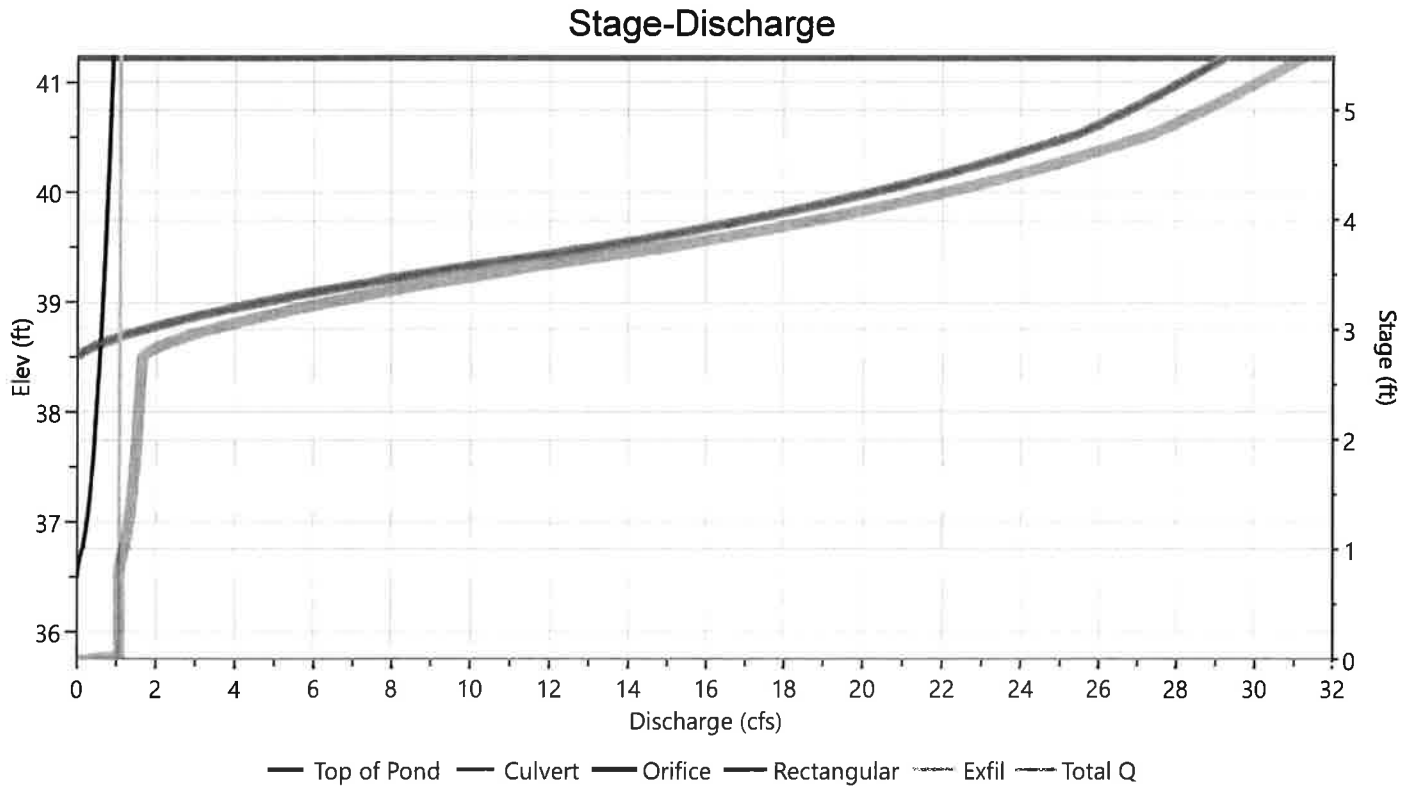
Culvert / Orifices	Culvert	Orifices		
		1	2	3
Rise, in	24	4		
Span, in	24	4		
No. Barrels	1	1		
Invert Elevation, ft	36.20	36.50		
Orifice Coefficient, Co	0.60	0.60		
Length, ft	40			
Barrel Slope, %	.5			
N-Value, n	0.013			

Weirs	Riser*	Weirs		
		1*	2	3
Shape / Type	Box	Rectangular		
Crest Elevation, ft		38.5		
Crest Length, ft		4		
Angle, deg				
Weir Coefficient, Cw		3.3		

Perforated Riser	
Hole Diameter, in	
No. holes	
Invert Elevation, ft	
Height, ft	
Orifice Coefficient, Co	

Ancillary	
Exfiltration, in/hr	12.00**

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



Pond Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

POND-01B Stormtech

Stage-Storage-Discharge Summary

Stage (ft)	Elev. (ft)	Storage (cuft)	Culvert (cfs)	Orifices, cfs			Riser (cfs)	Weirs, cfs			Pf Riser (cfs)	Exfil (cfs)	User (cfs)	Total (cfs)
				1	2	3		1	2	3				
0.00	35.75	0.000	0.000	0.000				0.000				0.000		0.000
0.28	36.03	422	0.000	0.000				0.000				1.067		1.067
0.55	36.30	844	0.000	0.000				0.000				1.068		1.068
0.83	36.58	1,376	0.000	0.014				0.000				1.069		1.083
1.10	36.85	2,222	0.000	0.180				0.000				1.070		1.250
1.38	37.13	3,066	0.000	0.284				0.000				1.071		1.356
1.65	37.40	3,904	0.000	0.360				0.000				1.072		1.432
1.93	37.68	4,735	0.000	0.422				0.000				1.073		1.495
2.20	37.95	5,555	0.000	0.476				0.000				1.074		1.550
2.48	38.23	6,362	0.000	0.524				0.000				1.075		1.600
2.75	38.50	7,153	0.000	0.569				0.000				1.076		1.645
3.03	38.78	7,925	1.904 oc	0.610				1.904				1.077		3.591
3.30	39.05	8,672	5.384 oc	0.649				5.384				1.078		7.111
3.58	39.33	9,390	9.891 oc	0.685				9.891				1.079		11.66
3.85	39.60	10,073	14.81 oc	0.720				14.81 s				1.080		16.61
4.13	39.88	10,709	18.70 oc	0.753				18.70 s				1.081		20.53
4.40	40.15	11,278	21.87 oc	0.784				21.87 s				1.082		23.74
4.68	40.43	11,737	24.52 oc	0.814				24.52 s				1.083		26.42
4.95	40.70	12,159	26.47 ic	0.844				26.47 s				1.084		28.40
5.23	40.98	12,581	27.98 ic	0.872				27.98 s				1.085		29.93
5.50	41.25	13,004	29.32 ic	0.899				29.32 s				1.086		31.31

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

Pond Report

Project Name:

Hydrology Studio v 3.0.0.15

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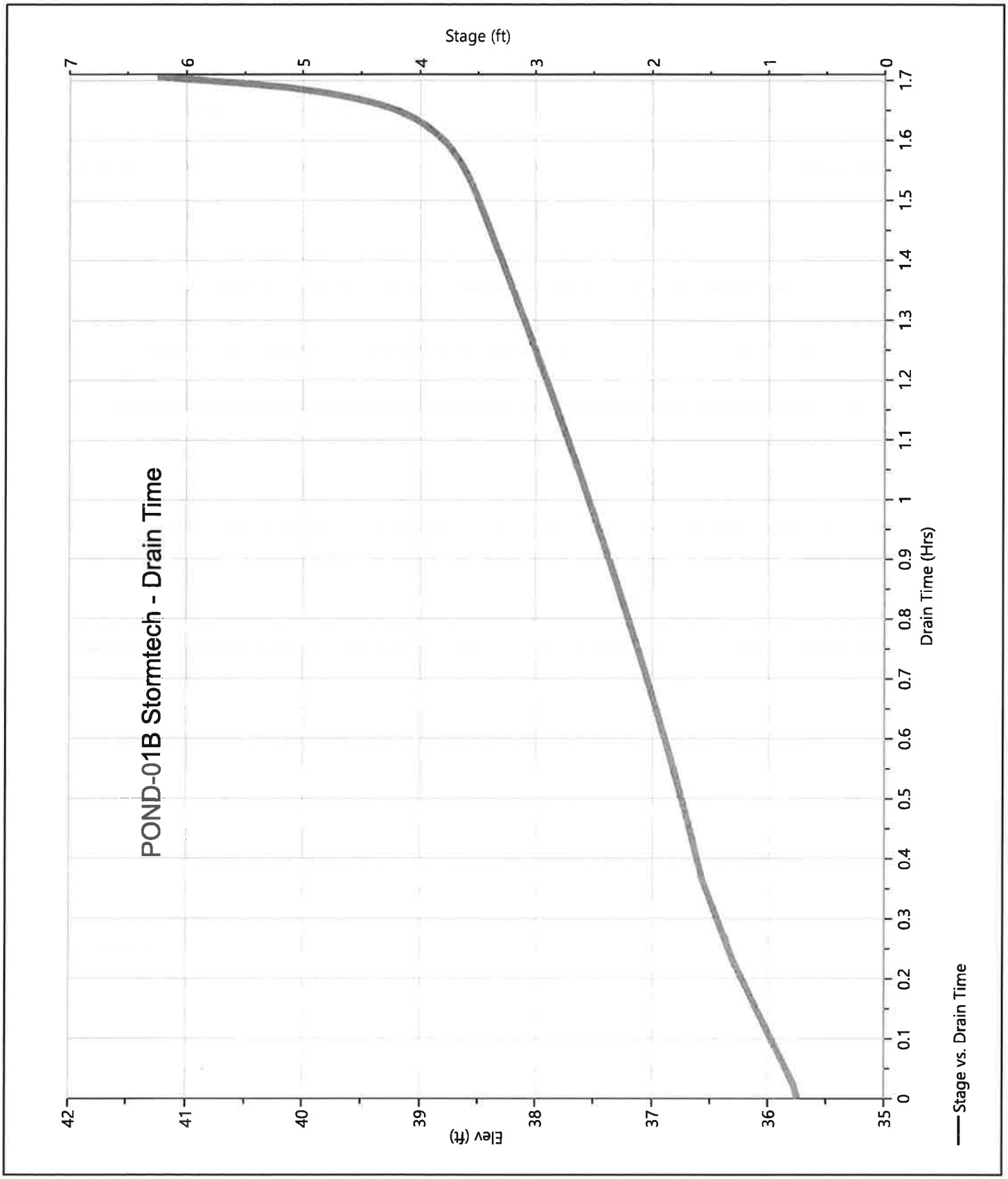
POND-01B Stormtech

Pond Drawdown



Pond Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

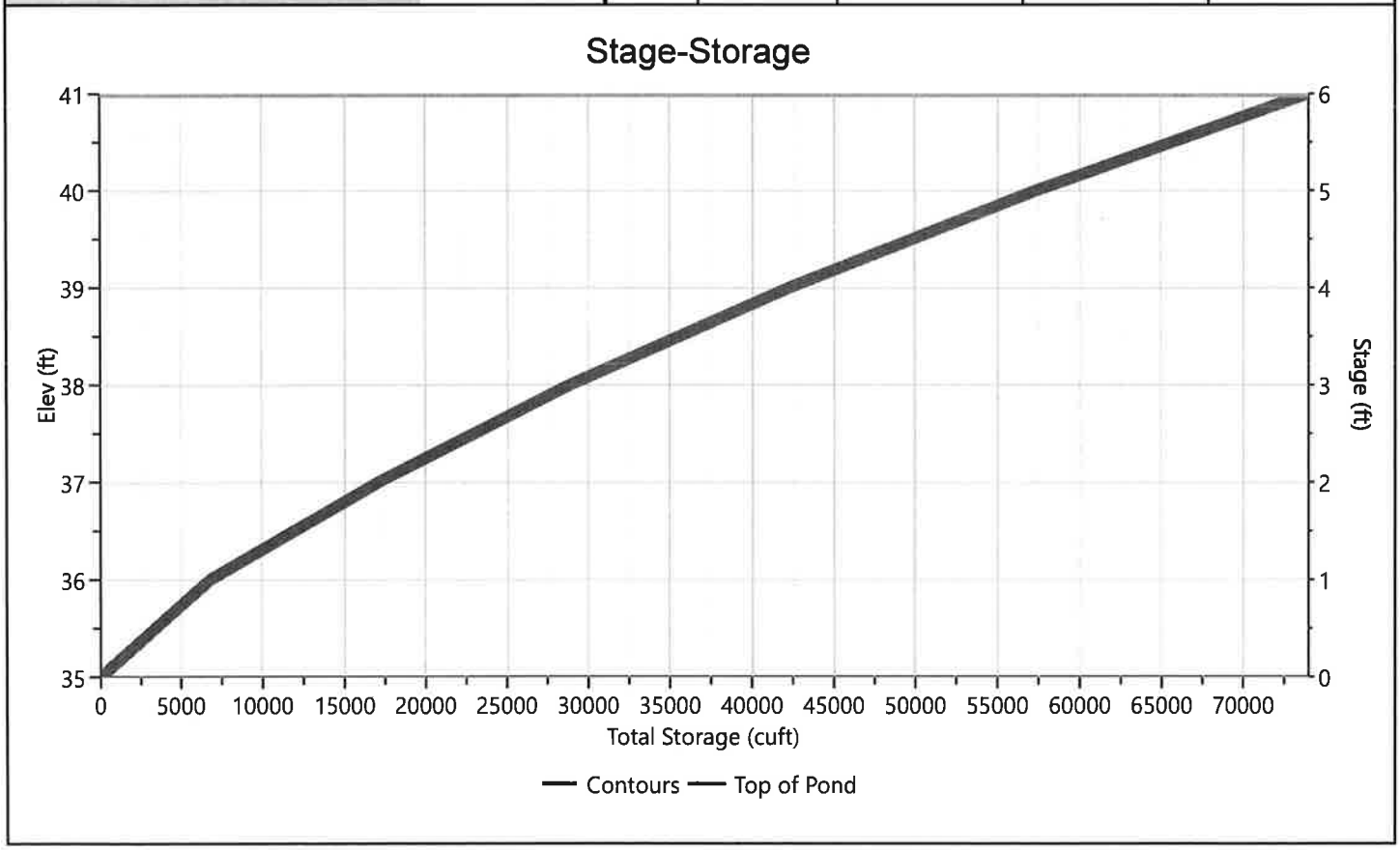
POND-01A Stage 2

Stage-Storage

User Defined Contours	
Description	**Input**
Bottom Elevation, ft	35.00
Voids (%)	100.00
Volume Calc	None

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour Area (sqft)	Incr. Storage (cuft)	Total Storage (cuft)
0.00	35.00	4,000	0.000	0.000
1.00	36.00	9,600	6,800	6,800
2.00	37.00	11,000	10,300	17,100
3.00	38.00	12,600	11,800	28,900
4.00	39.00	14,200	13,400	42,300
5.00	40.00	15,900	15,050	57,350
6.00	41.00	17,400	16,650	74,000



Pond Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

POND-01A Stage 2

Stage-Discharge

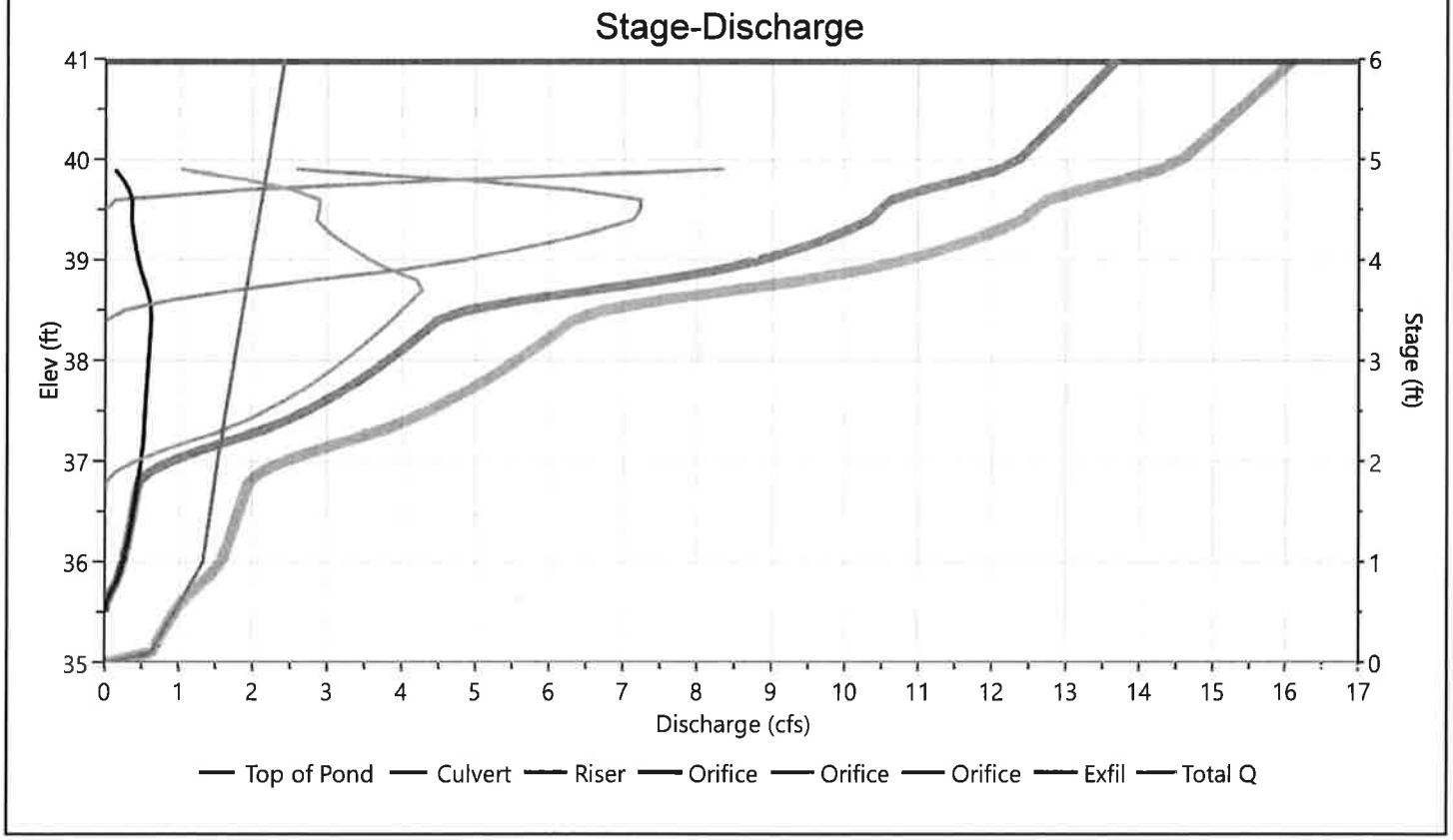
Culvert / Orifices	Culvert	Orifices		
		1*	2*	3*
Rise, in	15	4	8	6
Span, in	15	4	8	42
No. Barrels	1	1	2	1
Invert Elevation, ft	35.00	35.50	36.75	38.42
Orifice Coefficient, Co	0.60	0.60	0.60	0.60
Length, ft	73			
Barrel Slope, %	2			
N-Value, n	0.013			

Weirs	Riser*	Weirs		
		1	2	3
Shape / Type	Box			
Crest Elevation, ft	39.58			
Crest Length, ft	14			
Angle, deg				
Weir Coefficient, Cw	3.3			

Orifice Plate	
Orifice Dia, in	
No. Orifices	
Invert Elevation, ft	
Height, ft	
Orifice Coefficient, Co	

Ancillary	
Exfiltration, in/hr	6.00**

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



Pond Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

POND-01A Stage 2

Stage-Storage-Discharge Summary

Stage (ft)	Elev. (ft)	Storage (cuft)	Culvert (cfs)	Orifices, cfs			Riser (cfs)	Weirs, cfs			Pf Riser (cfs)	Exfil (cfs)	User (cfs)	Total (cfs)
				1	2	3		1	2	3				
0.00	35.00	0.000	0.000	0.000	0.000	0.000	0.000					0.000		0.000
1.00	36.00	6,800	0.243 ic	0.243	0.000	0.000	0.000					1.333		1.576
2.00	37.00	17,100	0.893 ic	0.485	0.408	0.000	0.000					1.528		2.421
3.00	38.00	28,900	3.806 ic	0.588	3.218	0.000	0.000					1.750		5.556
4.00	39.00	42,300	8.856 ic	0.446	3.570	4.841	0.000					1.972		10.83
5.00	40.00	57,350	12.36 ic	0.000	0.000	0.000	0.000					2.208		14.57
6.00	41.00	74,000	13.70 ic	0.000	0.000	0.000	0.000					2.417		16.11

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

Pond Report

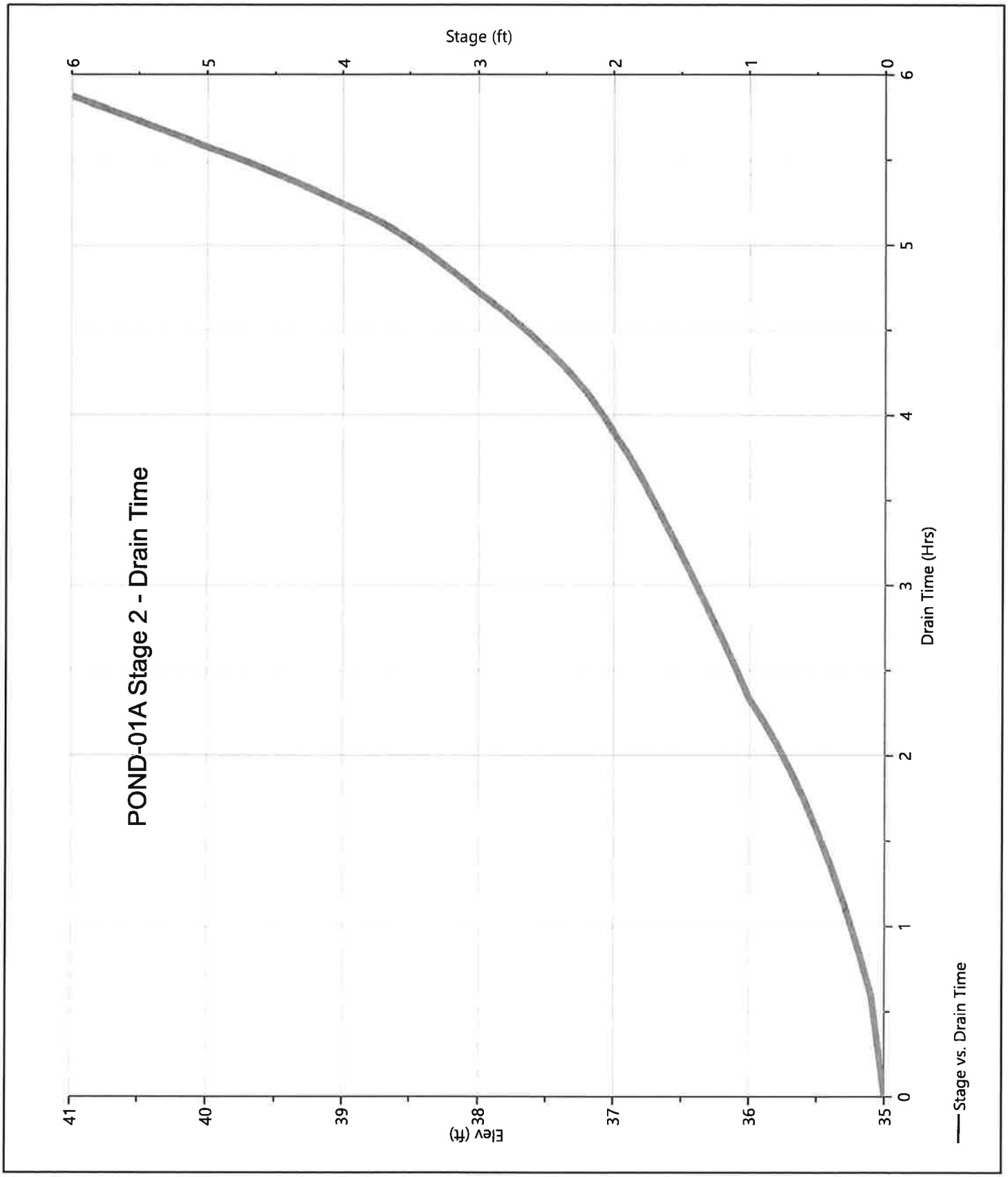
Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

POND-01A Stage 2

Pond Drawdown



POND-01 Stage 2

Hyd. No. 4

Hydrograph Type	= Pond Route	Peak Flow	= 0.000 cfs
Storm Frequency	= 1-yr	Time to Peak	= 0.00 hrs
Time Interval	= 1 min	Hydrograph Volume	= 0.000 cuft
Inflow Hydrograph	= 3 - INF-01	Max. Elevation	= 35.00 ft
Pond Name	= POND-01A Stage 2	Max. Storage	= 0.000 cuft

Pond Routing by Storage Indication Method

Qp = 0.00 cfs

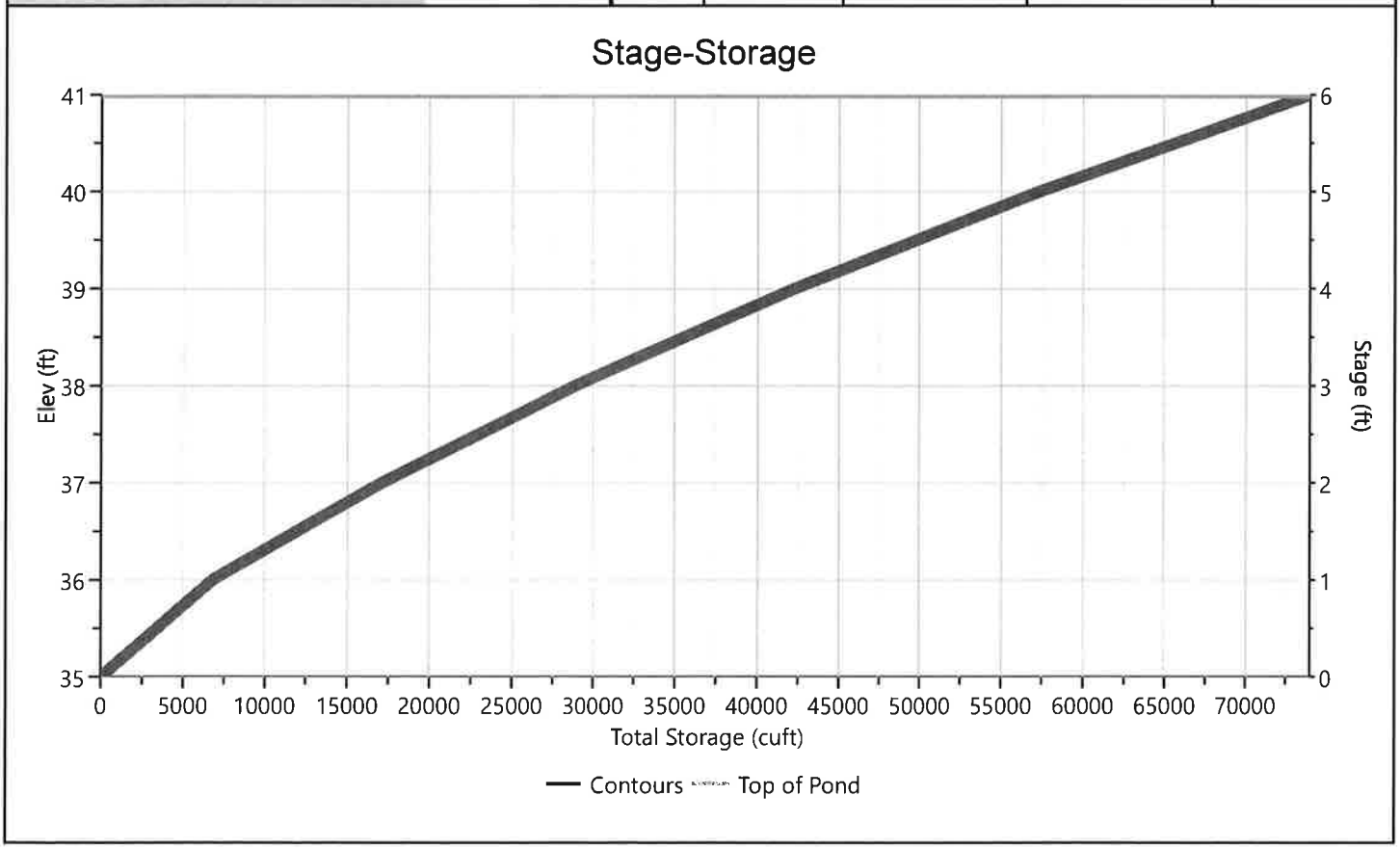
POND-01A Stage 2

Stage-Storage

User Defined Contours	
Description	**Input**
Bottom Elevation, ft	35.00
Voids (%)	100.00
Volume Calc	None

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour Area (sqft)	Incr. Storage (cuft)	Total Storage (cuft)
0.00	35.00	4,000	0.000	0.000
1.00	36.00	9,600	6,800	6,800
2.00	37.00	11,000	10,300	17,100
3.00	38.00	12,600	11,800	28,900
4.00	39.00	14,200	13,400	42,300
5.00	40.00	15,900	15,050	57,350
6.00	41.00	17,400	16,650	74,000



Pond Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

POND-01A Stage 2

Stage-Discharge

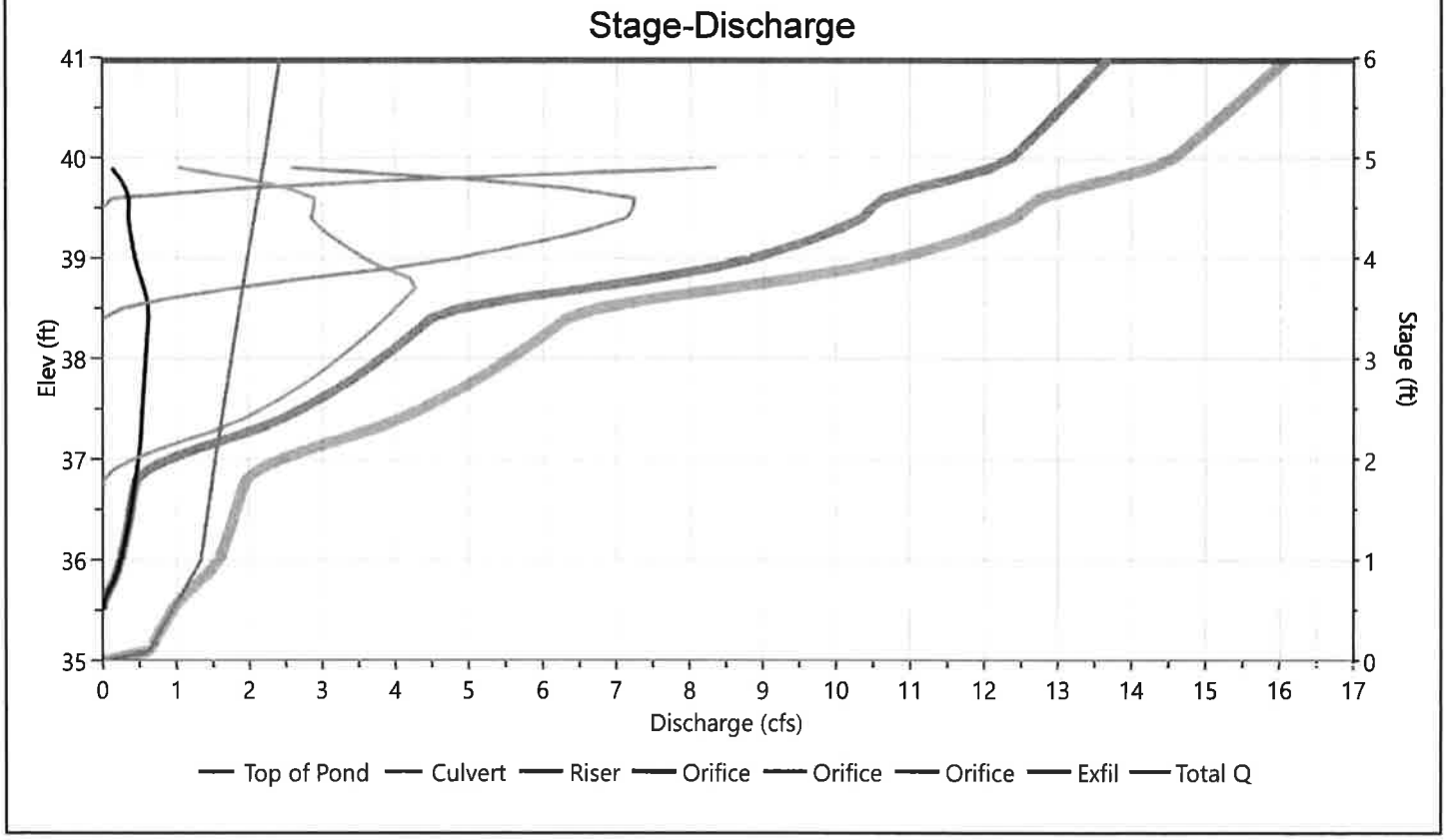
Culvert / Orifices	Culvert	Orifices		
		1*	2*	3*
Rise, in	15	4	8	6
Span, in	15	4	8	42
No. Barrels	1	1	2	1
Invert Elevation, ft	35.00	35.50	36.75	38.42
Orifice Coefficient, Co	0.60	0.60	0.60	0.60
Length, ft	73			
Barrel Slope, %	2			
N-Value, n	0.013			

Weirs	Riser*	Weirs		
		1	2	3
Shape / Type	Box			
Crest Elevation, ft	39.58			
Crest Length, ft	14			
Angle, deg				
Weir Coefficient, Cw	3.3			

Orifice Plate	
Orifice Dia, in	
No. Orifices	
Invert Elevation, ft	
Height, ft	
Orifice Coefficient, Co	

Ancillary	
Exfiltration, in/hr	6.00**

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



Pond Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

POND-01A Stage 2

Stage-Storage-Discharge Summary

Stage (ft)	Elev. (ft)	Storage (cuft)	Culvert (cfs)	Orifices, cfs			Riser (cfs)	Weirs, cfs			Pf Riser (cfs)	Exfil (cfs)	User (cfs)	Total (cfs)
				1	2	3		1	2	3				
0.00	35.00	0.000	0.000	0.000	0.000	0.000	0.000					0.000		0.000
1.00	36.00	6,800	0.243 ic	0.243	0.000	0.000	0.000					1.333		1.576
2.00	37.00	17,100	0.893 ic	0.485	0.408	0.000	0.000					1.528		2.421
3.00	38.00	28,900	3.806 ic	0.588	3.218	0.000	0.000					1.750		5.556
4.00	39.00	42,300	8.856 ic	0.446	3.570	4.841	0.000					1.972		10.83
5.00	40.00	57,350	12.36 ic	0.000	0.000	0.000	0.000					2.208		14.57
6.00	41.00	74,000	13.70 ic	0.000	0.000	0.000	0.000					2.417		16.11

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

Pond Report

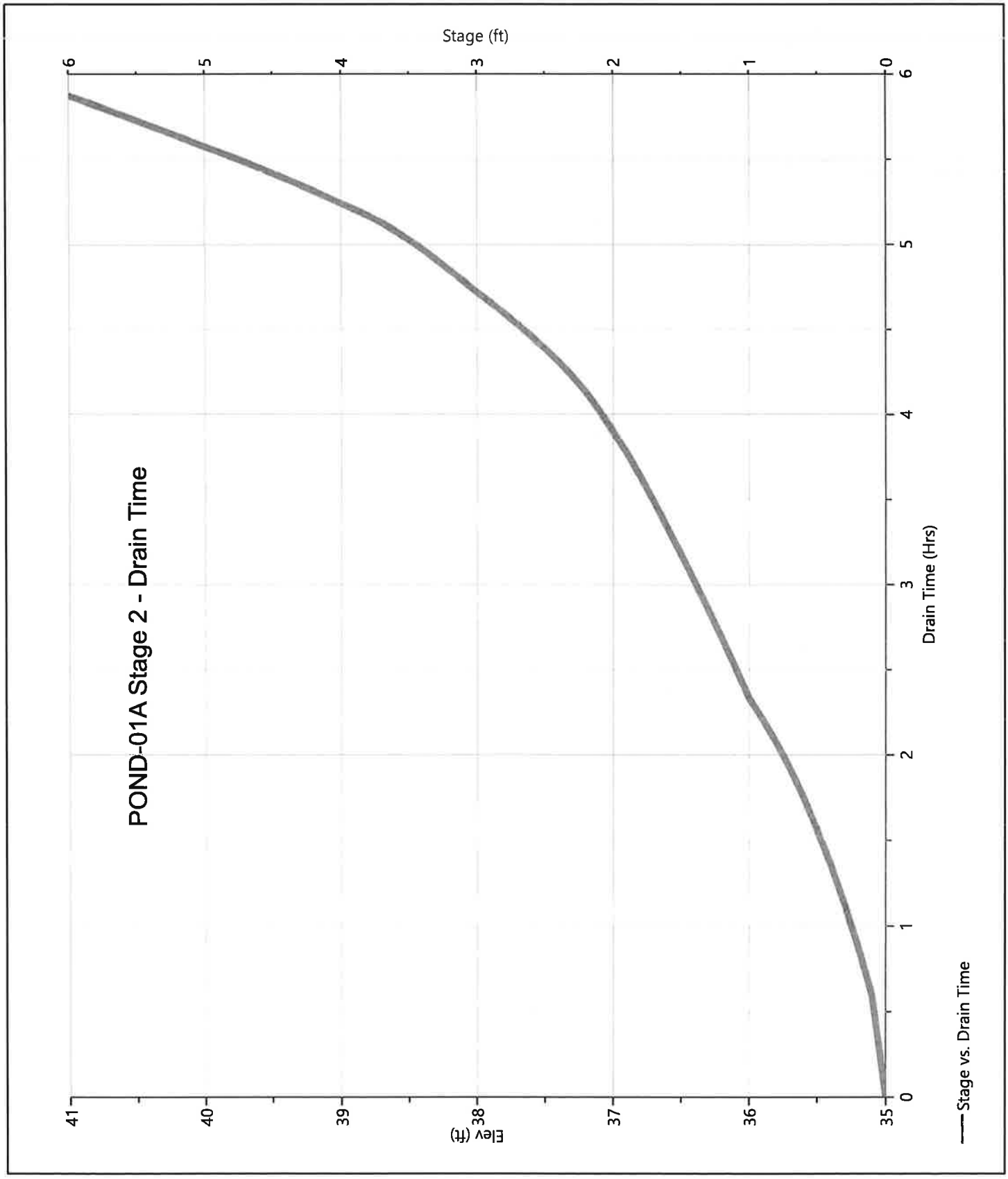
Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

POND-01A Stage 2

Pond Drawdown



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

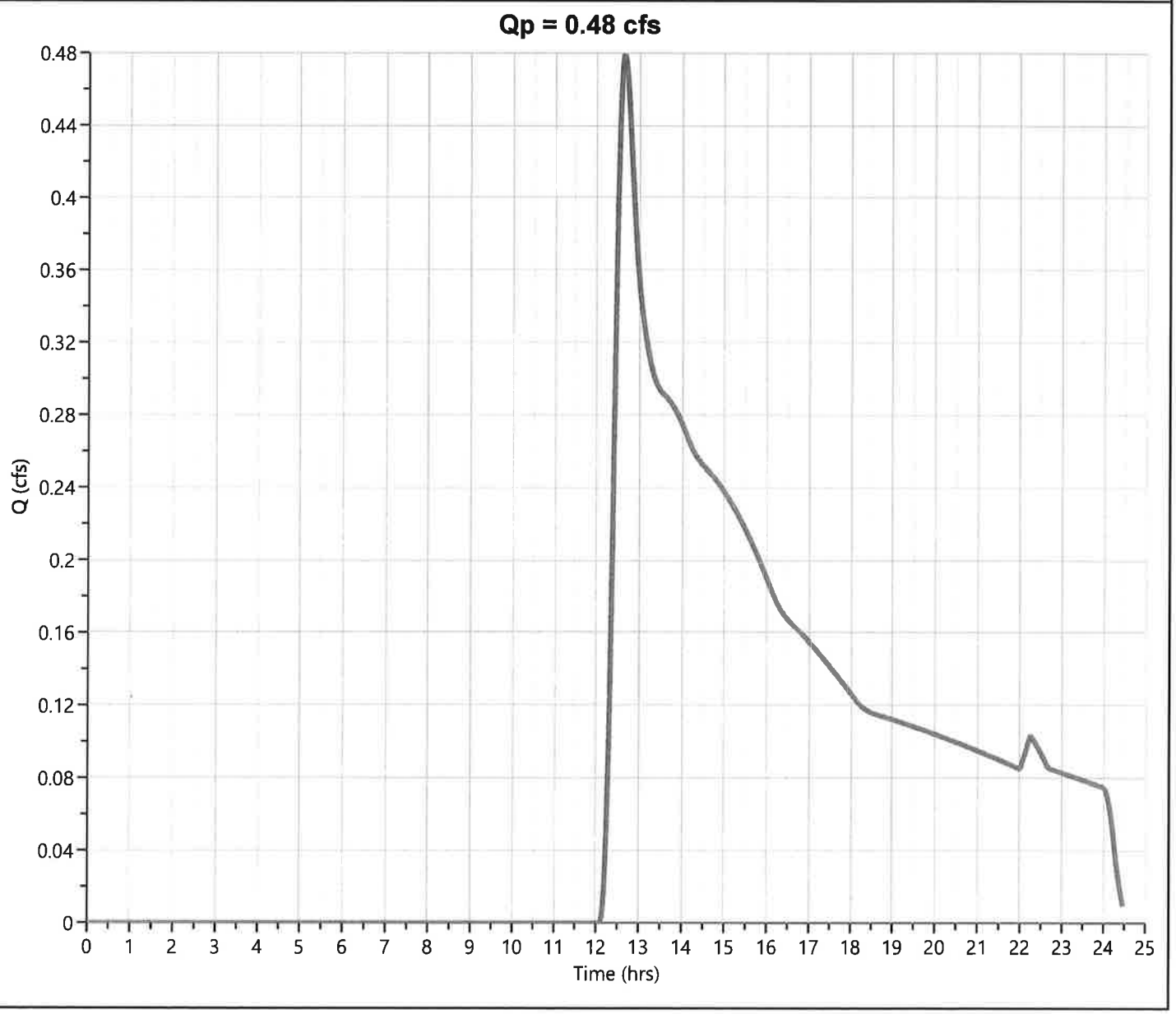
EX-02

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.479 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.65 hrs
Time Interval	= 1 min	Runoff Volume	= 7,057 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 2.87 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Tc by TR55 Worksheet

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

EX-02

Hyd. No. 5

NRCS Runoff

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	Woods	Woods		
Manning's n	0.400	0.400	0.013	
Flow Length (ft)	100	100		
2-yr, 24-hr Precip. (in)	3.450000	3.450000	3.450000	
Land Slope (%)	9	9		
Travel Time (min)	**11.33**	**11.33**	**0.00**	**22.66**
Shallow Concentrated Flow				
Flow Length (ft)	500			
Watercourse Slope (%)	6			
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.95			
Travel Time (min)	**2.11**	**0.00**	**0.00**	**2.11**
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimiter (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				**24.77 min**

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

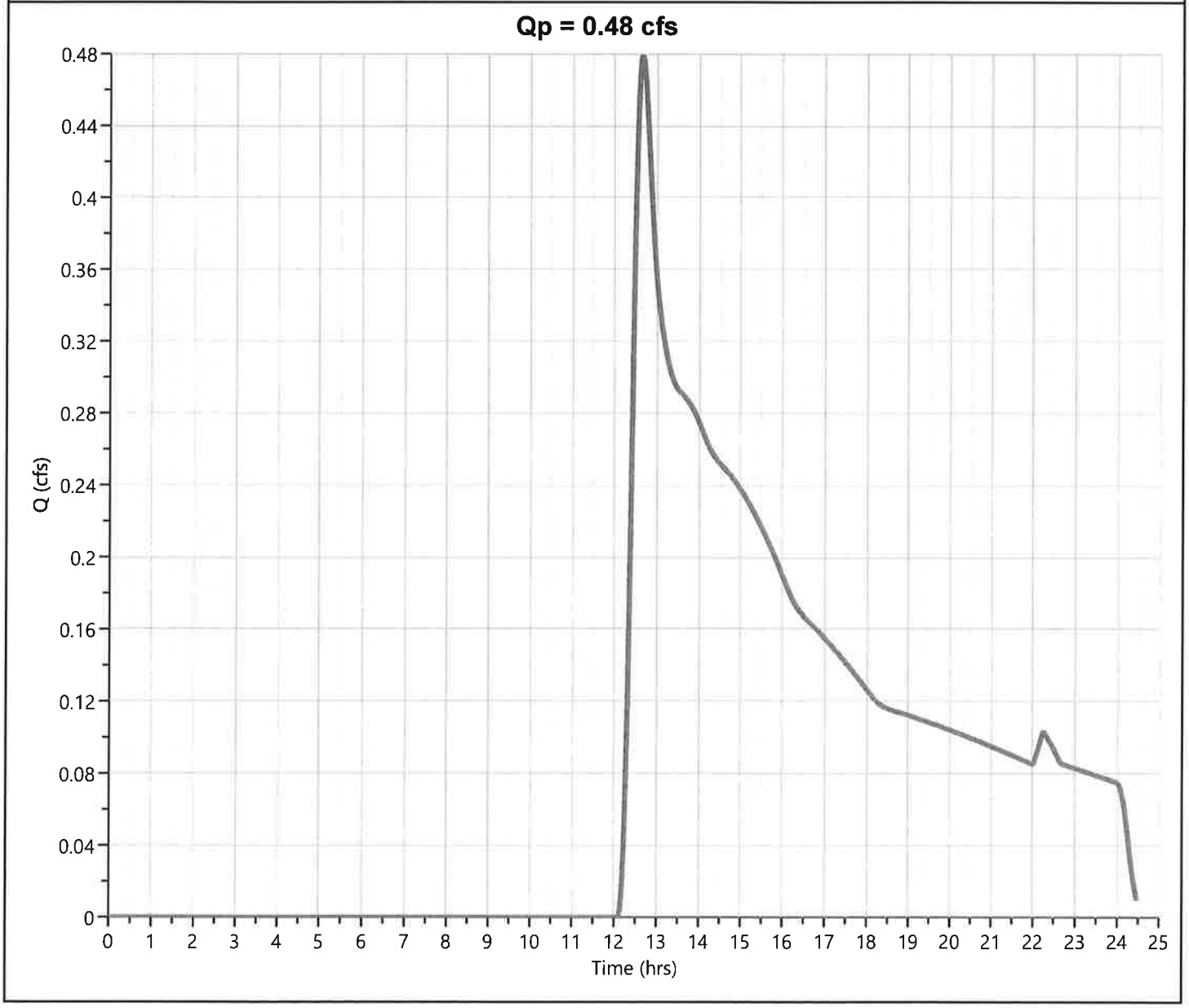
PR-02

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 0.479 cfs
Storm Frequency	= 1-yr	Time to Peak	= 12.65 hrs
Time Interval	= 1 min	Runoff Volume	= 7,057 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 2.87 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Tc by TR55 Worksheet

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

PR-02

Hyd. No. 6

NRCS Runoff

Description	Segments			Tc (min)
	A	B	C	
Sheet Flow				
Description	Woods	Woods		
Manning's n	0.400	0.400	0.013	
Flow Length (ft)	100	100		
2-yr, 24-hr Precip. (in)	3.450000	3.450000	3.450000	
Land Slope (%)	9	9		
Travel Time (min)	**11.33**	**11.33**	**0.00**	**22.66**
Shallow Concentrated Flow				
Flow Length (ft)	500			
Watercourse Slope (%)	6			
Surface Description	Unpaved	Paved	Paved	
Average Velocity (ft/s)	3.95			
Travel Time (min)	**2.11**	**0.00**	**0.00**	**2.11**
Channel Flow				
X-sectional Flow Area (sqft)				
Wetted Perimiter (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				**24.77 min**

Design Storm Report

Custom Storm filename:

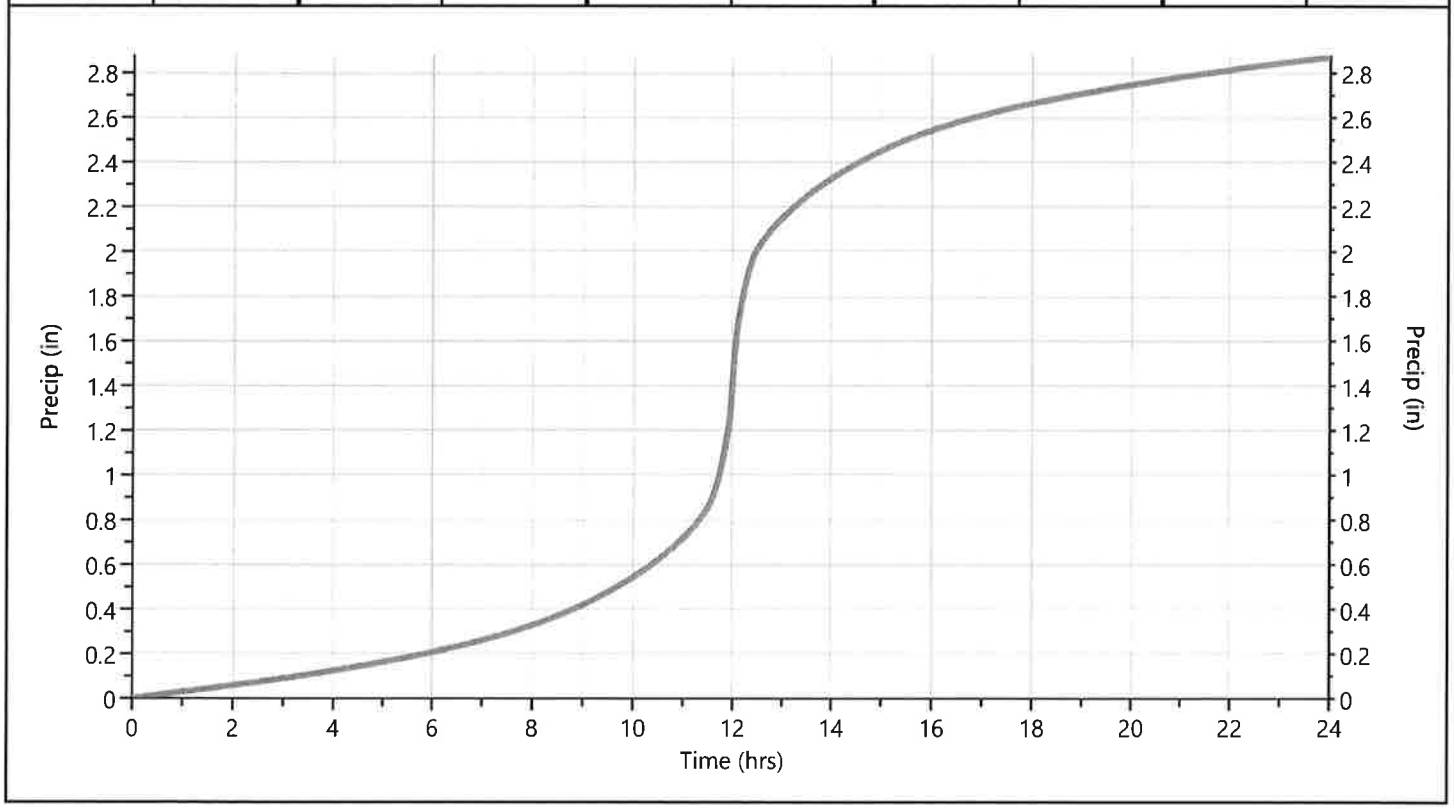
Hydrology Studio v 3.0.0.15

07-13-2020

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	2.87	3.45	0.00	4.39	5.18	6.26	7.06	7.92	

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)
11.50	0.565547	11.68	1.305848	11.87	2.077568	12.05	4.312146	12.23	1.726782
11.52	0.602669	11.70	1.376003	11.88	2.147710	12.07	3.723812	12.25	1.656628
11.53	0.674450	11.72	1.446158	11.90	2.217865	12.08	3.135455	12.27	1.586485
11.55	0.744605	11.73	1.516318	11.92	2.555323	12.10	2.547097	12.28	1.516318
11.57	0.814754	11.75	1.586461	11.93	3.135490	12.12	2.226305	12.30	1.446164
11.58	0.884914	11.77	1.656628	11.95	3.723836	12.13	2.147710	12.32	1.375997
11.60	0.955075	11.78	1.726782	11.97	4.312193	12.15	2.077568	12.33	1.305854
11.62	1.025224	11.80	1.796937	11.98	4.900539	12.17	2.007413	12.35	1.235700
11.63	1.095378	11.82	1.867092	**12.00**	**5.488896**	12.18	1.937246	12.37	1.165545
11.65	1.165539	11.83	1.937246	12.02	5.475712	12.20	1.867104	12.38	1.095378
11.67	1.235694	11.85	2.007401	12.03	4.900515	12.22	1.796937	12.40	1.025236



Hydrograph 2-yr Summary

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	EX-01	1.062	12.55	9,786	----		
2	NRCS Runoff	PR-01	7.297	12.33	37,670	----		
3	Pond Route(i)	INF-01	0.025	13.03	43.4	2	41.23 U 35.60 L	8,335 U 4,091 L
4	Pond Route	POND-01 Stage 2	0.000	12.88	0.000	3	35.00	17.6
5	NRCS Runoff	EX-02	1.606	12.53	14,368	----		
6	NRCS Runoff	PR-02	1.606	12.53	14,368	----		

(i) = Interconnected ponds, U = Upper pond, L = Lower pond

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

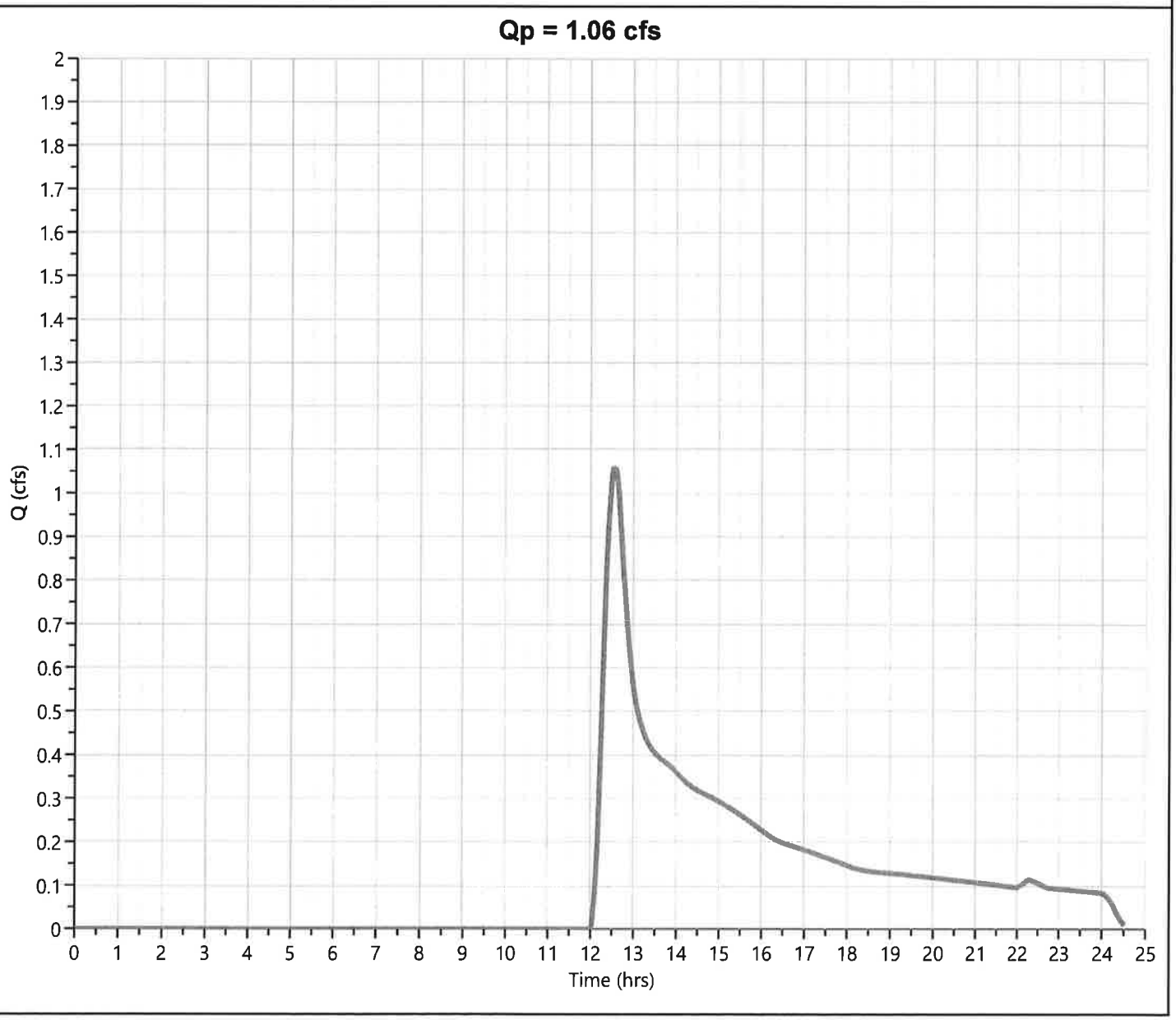
EX-01

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.062 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.55 hrs
Time Interval	= 1 min	Runoff Volume	= 9,786 cuft
Drainage Area	= 8.13 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.75 min
Total Rainfall	= 3.45 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
8.13	55	Woods (Good) B Soils
8.13	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

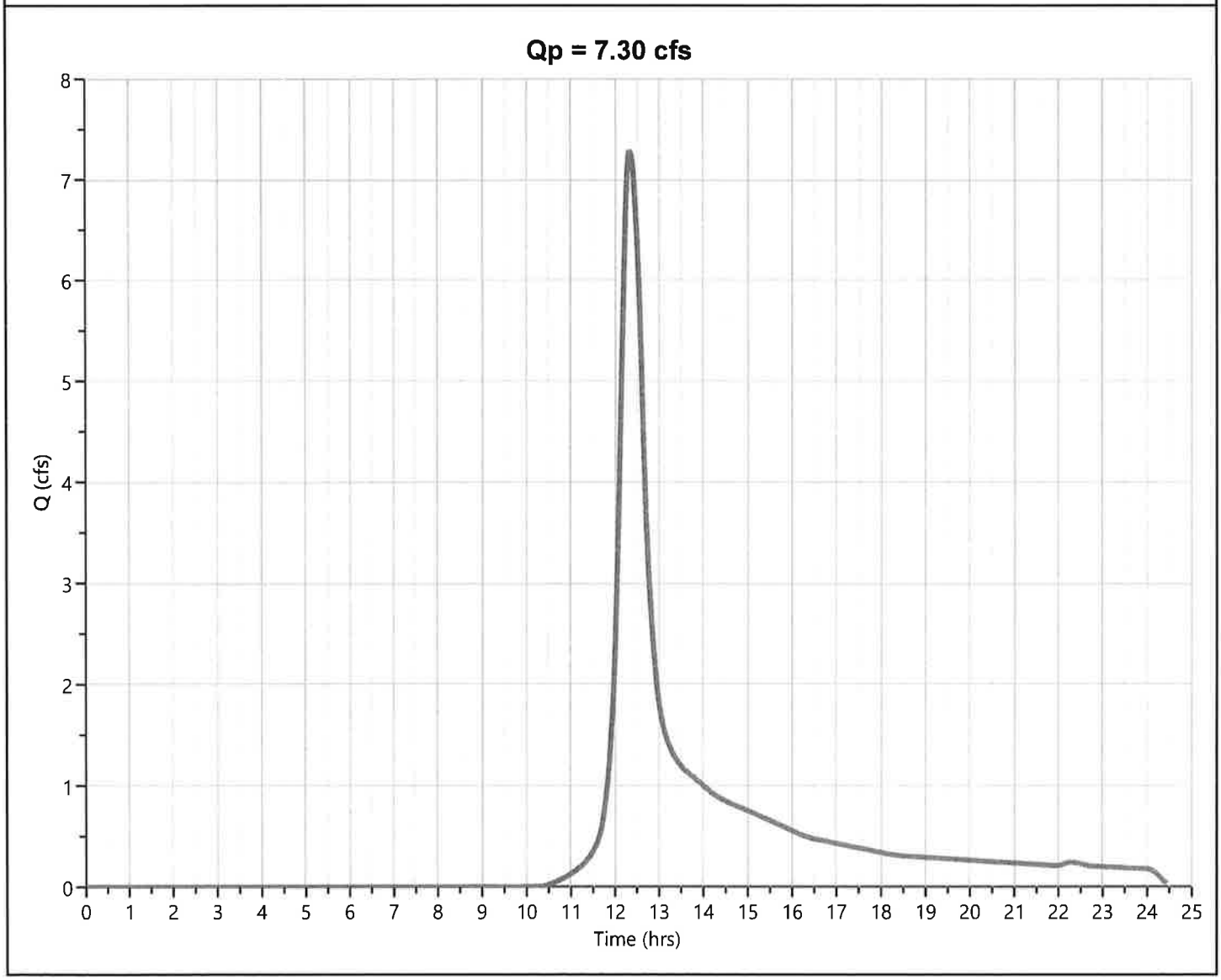
PR-01

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 7.297 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.33 hrs
Time Interval	= 1 min	Runoff Volume	= 37,670 cuft
Drainage Area	= 8.13 ac	Curve Number	= 75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.66 min
Total Rainfall	= 3.45 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
1.242	55	Woods (Good) B Soils
3.58	61	Grass (Good) B Soils
2.147	98	Impervious
1.161	98	Building
8.13	**75**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

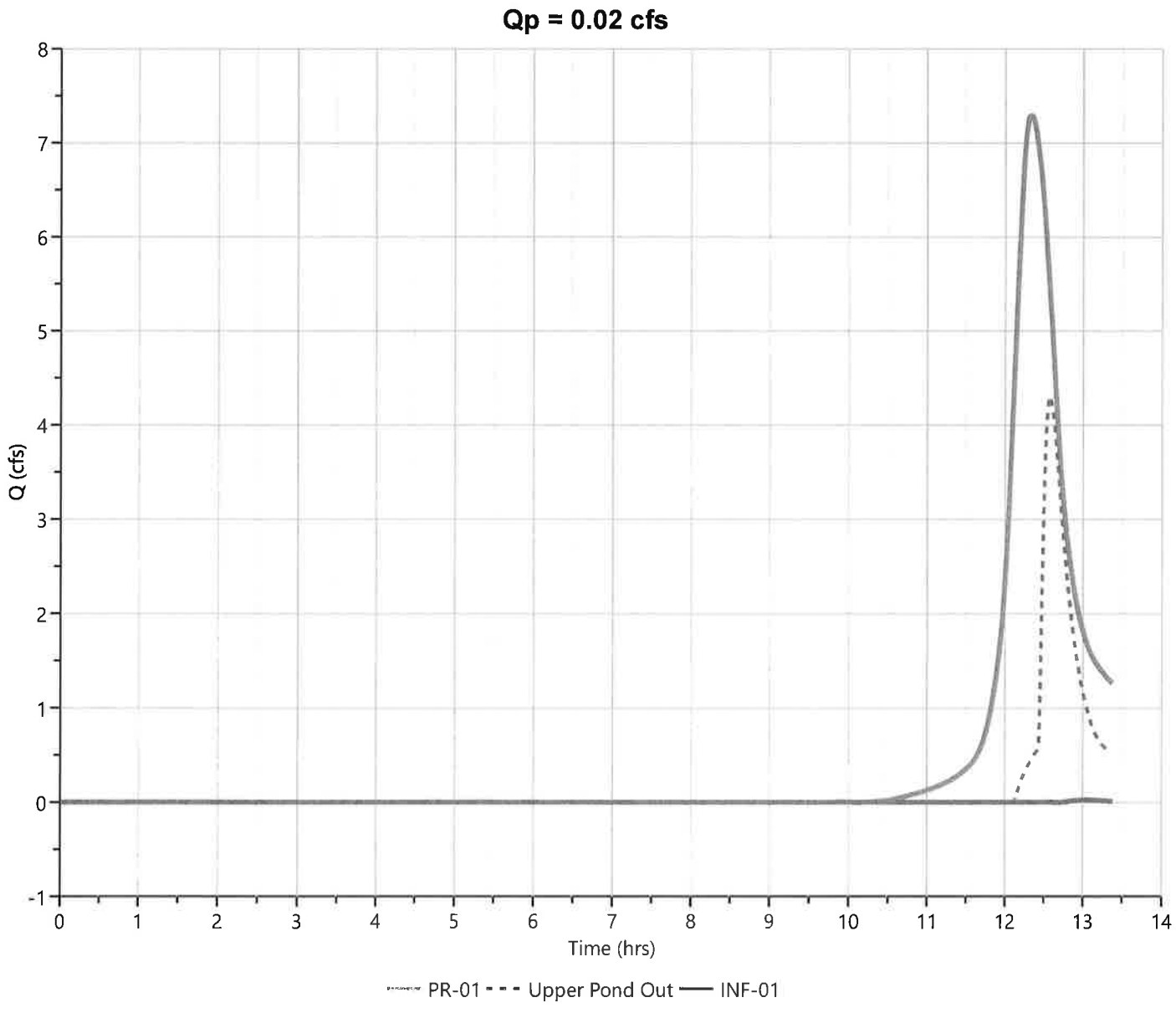
07-13-2020

INF-01

Hyd. No. 3

Hydrograph Type	= Pond Route(i)*	Peak Flow	= 0.025 cfs
Storm Frequency	= 2-yr	Time to Peak	= 13.03 hrs
Time Interval	= 1 min	Hydrograph Volume	= 43.4 cuft
Upper Pond		**Lower Pond**	
Pond Name	= POND-01B Stormtech	Pond Name	= POND-01A Stage 2
Inflow Hyd	= 2 - PR-01	Addnl Inflow Hyd	= None
Max. Elevation	= 41.23 ft	Max. Elevation	= 35.60 ft
Max. Storage	= 8,335 cuft	Max. Storage	= 4,091 cuft

**Interconnected Pond Routing by Storage Indication Method.*



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

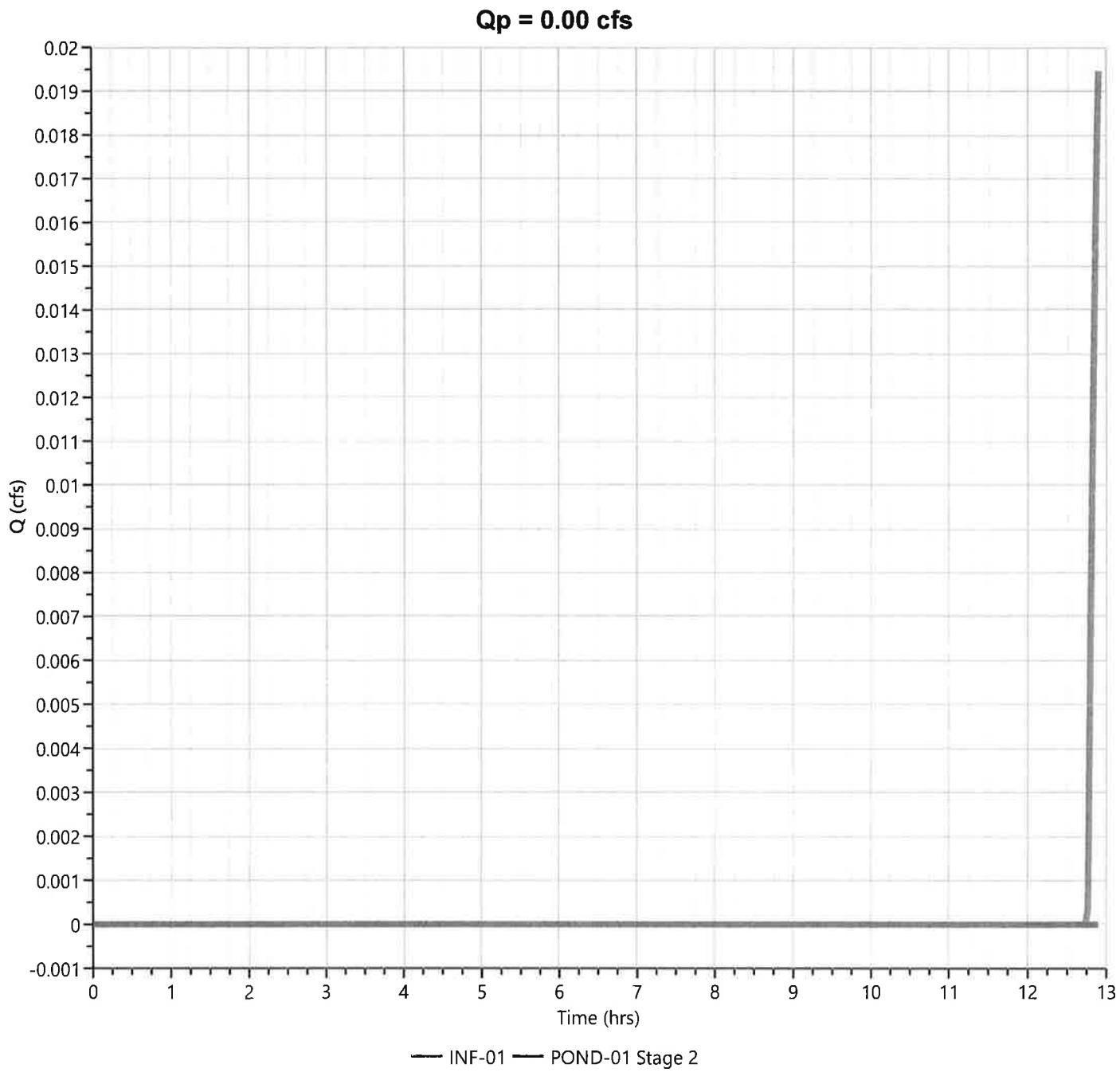
07-13-2020

POND-01 Stage 2

Hyd. No. 4

Hydrograph Type	= Pond Route	Peak Flow	= 0.000 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.88 hrs
Time Interval	= 1 min	Hydrograph Volume	= 0.000 cuft
Inflow Hydrograph	= 3 - INF-01	Max. Elevation	= 35.00 ft
Pond Name	= POND-01A Stage 2	Max. Storage	= 17.6 cuft

Pond Routing by Storage Indication Method



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

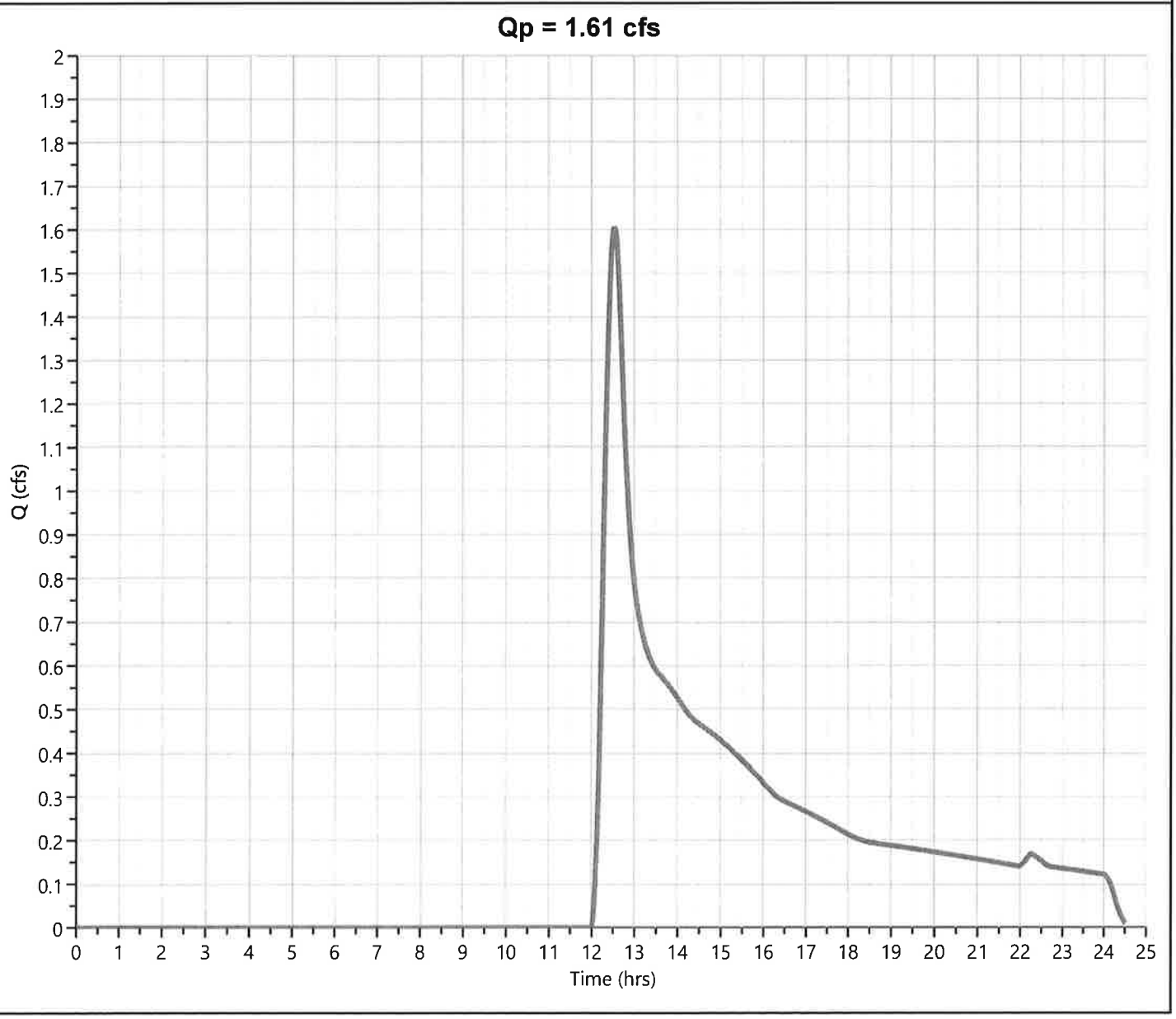
EX-02

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.606 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.53 hrs
Time Interval	= 1 min	Runoff Volume	= 14,368 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 3.45 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

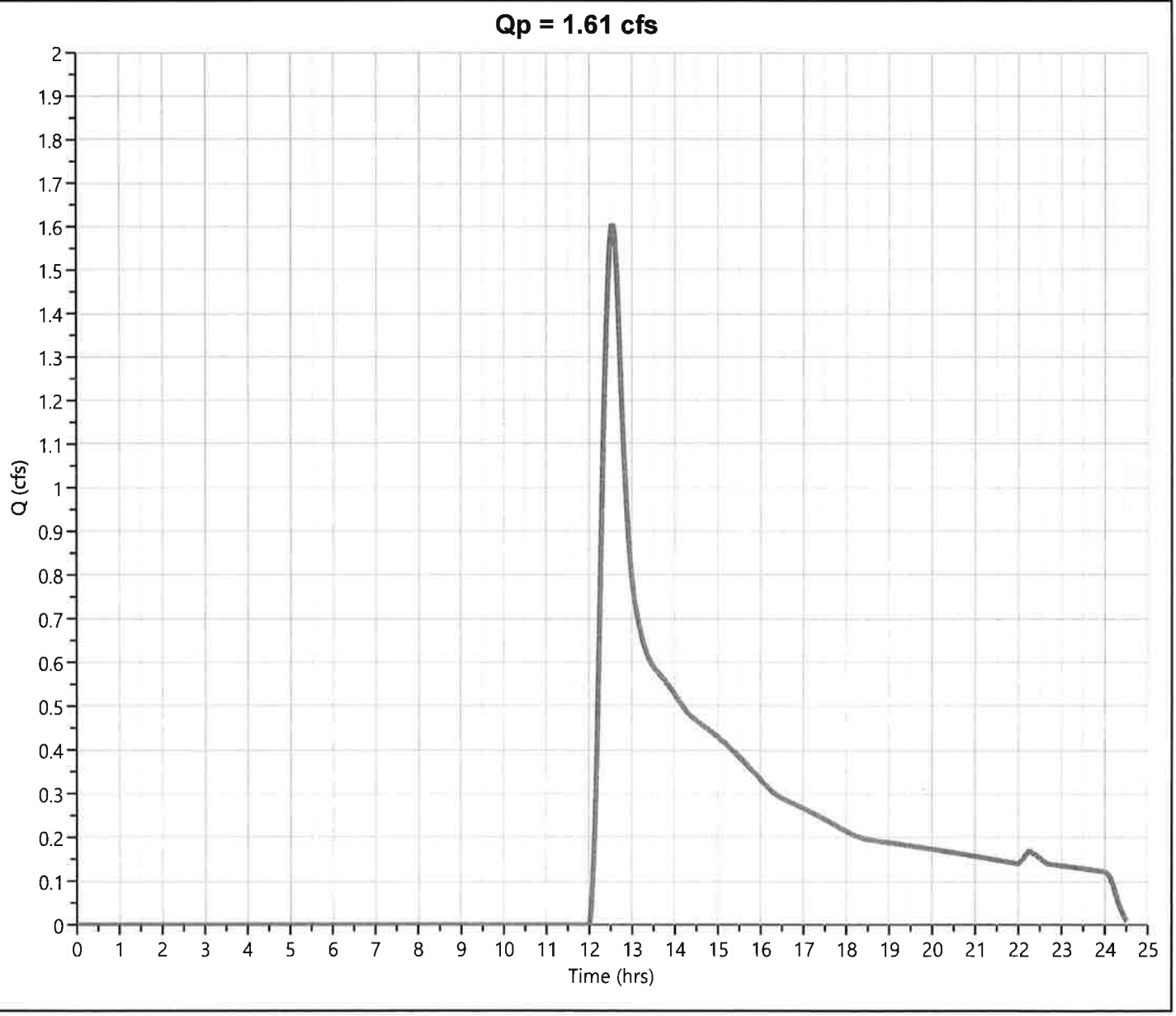
PR-02

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 1.606 cfs
Storm Frequency	= 2-yr	Time to Peak	= 12.53 hrs
Time Interval	= 1 min	Runoff Volume	= 14,368 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 3.45 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Design Storm Report

Custom Storm filename:

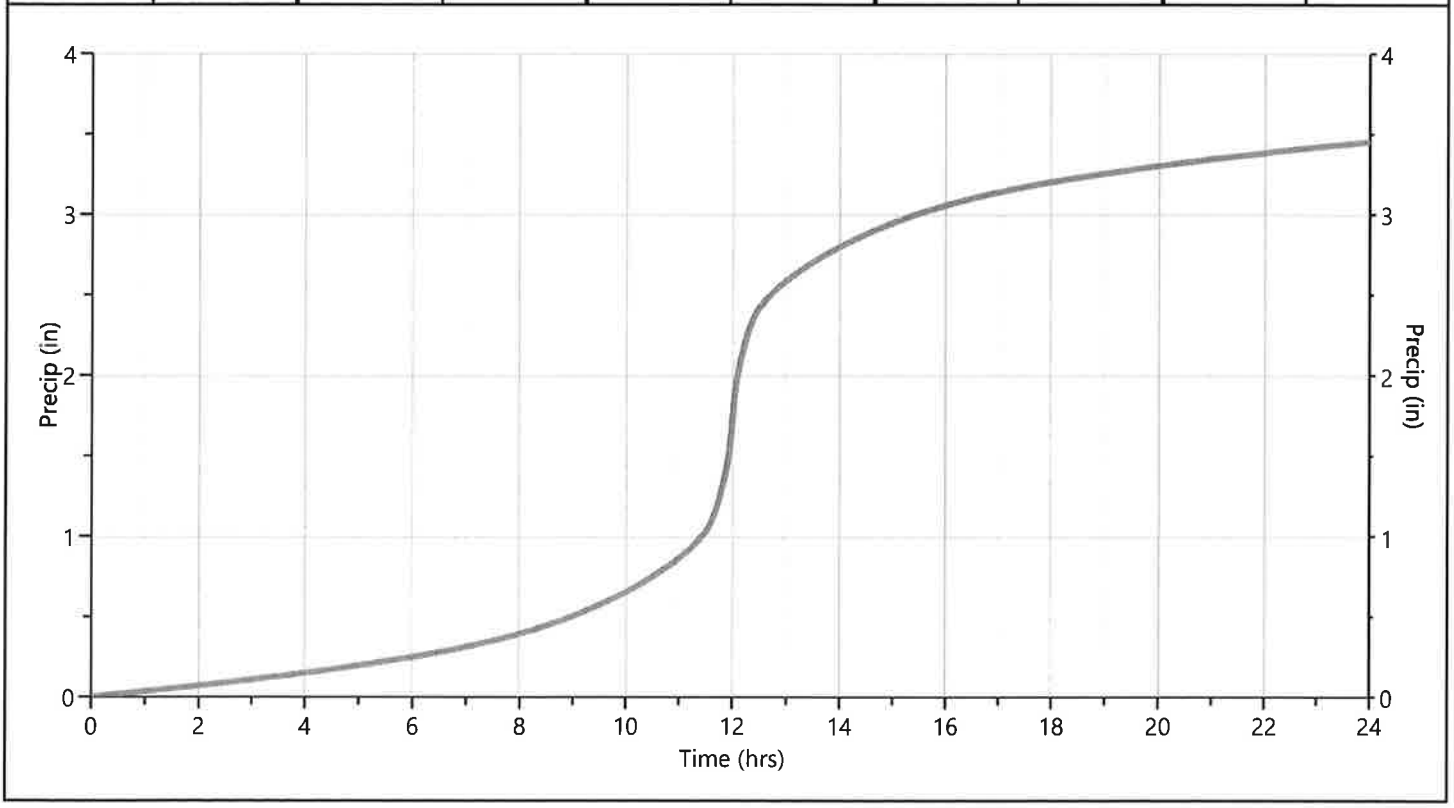
Hydrology Studio v 3.0.0.15

07-13-2020

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	2.87	3.45	0.00	4.39	5.18	6.26	7.06	7.92	

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)
11.50	0.679839	11.68	1.569748	11.87	2.497423	12.05	5.183601	12.23	2.075768
11.52	0.724459	11.70	1.654088	11.88	2.581739	12.07	4.476345	12.25	1.991415
11.53	0.810754	11.72	1.738405	11.90	2.666080	12.08	3.769100	12.27	1.907086
11.55	0.895083	11.73	1.822746	11.92	3.071725	12.10	3.061867	12.28	1.822758
11.57	0.979412	11.75	1.907086	11.93	3.769147	12.12	2.676201	12.30	1.738405
11.58	1.063740	11.77	1.991415	11.95	4.476392	12.13	2.581763	12.32	1.654100
11.60	1.148081	11.78	2.075744	11.97	5.183649	12.15	2.497411	12.33	1.569748
11.62	1.232421	11.80	2.160084	11.98	5.890894	12.17	2.413082	12.35	1.485419
11.63	1.316750	11.82	2.244413	12.00	6.598139	12.18	2.328753	12.37	1.401091
11.65	1.401079	11.83	2.328742	12.02	6.582308	12.20	2.244425	12.38	1.316738
11.67	1.485407	11.85	2.413082	12.03	5.890858	12.22	2.160072	12.40	1.232433



Hydrograph 5-yr Summary

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	EX-01	3.069	12.45	20,623	----		
2	NRCS Runoff	PR-01	11.60	12.32	58,431	----		
3	Pond Route(i)	INF-01	0.393	13.05	3,104	2	41.08 U 36.54 L	9,284 U 12,397 L
4	Pond Route	POND-01 Stage 2	0.000	12.80	0.000	3	35.06	394
5	NRCS Runoff	EX-02	4.641	12.43	30,279	----		
6	NRCS Runoff	PR-02	4.641	12.43	30,279	----		

(i) = Interconnected ponds, U = Upper pond, L = Lower pond

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

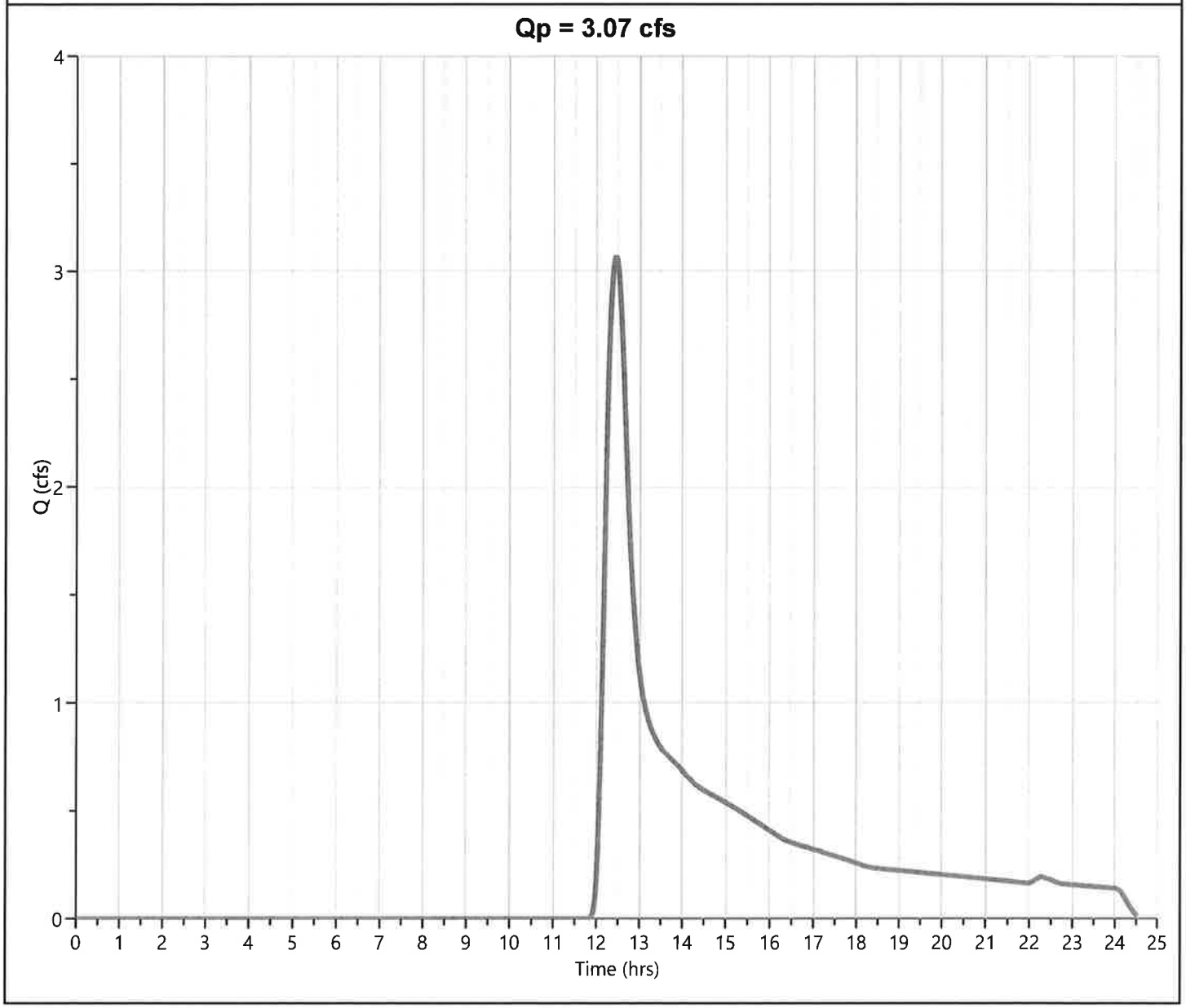
EX-01

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 3.069 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.45 hrs
Time Interval	= 1 min	Runoff Volume	= 20,623 cuft
Drainage Area	= 8.13 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.75 min
Total Rainfall	= 4.39 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
8.13	55	Woods (Good) B Soils
8.13	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

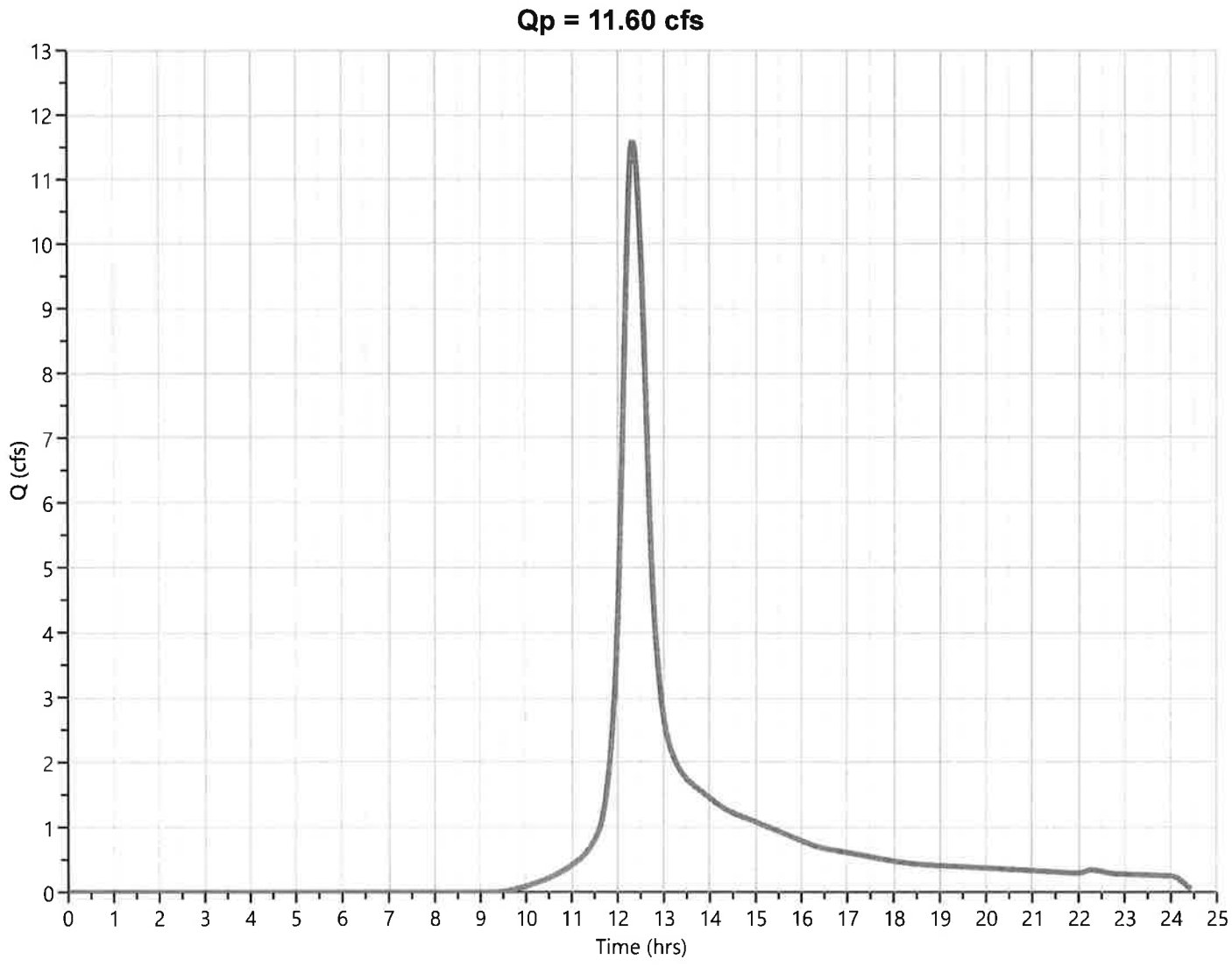
PR-01

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 11.60 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Runoff Volume	= 58,431 cuft
Drainage Area	= 8.13 ac	Curve Number	= 75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.66 min
Total Rainfall	= 4.39 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
1.242	55	Woods (Good) B Soils
3.58	61	Grass (Good) B Soils
2.147	98	Impervious
1.161	98	Building
8.13	**75**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

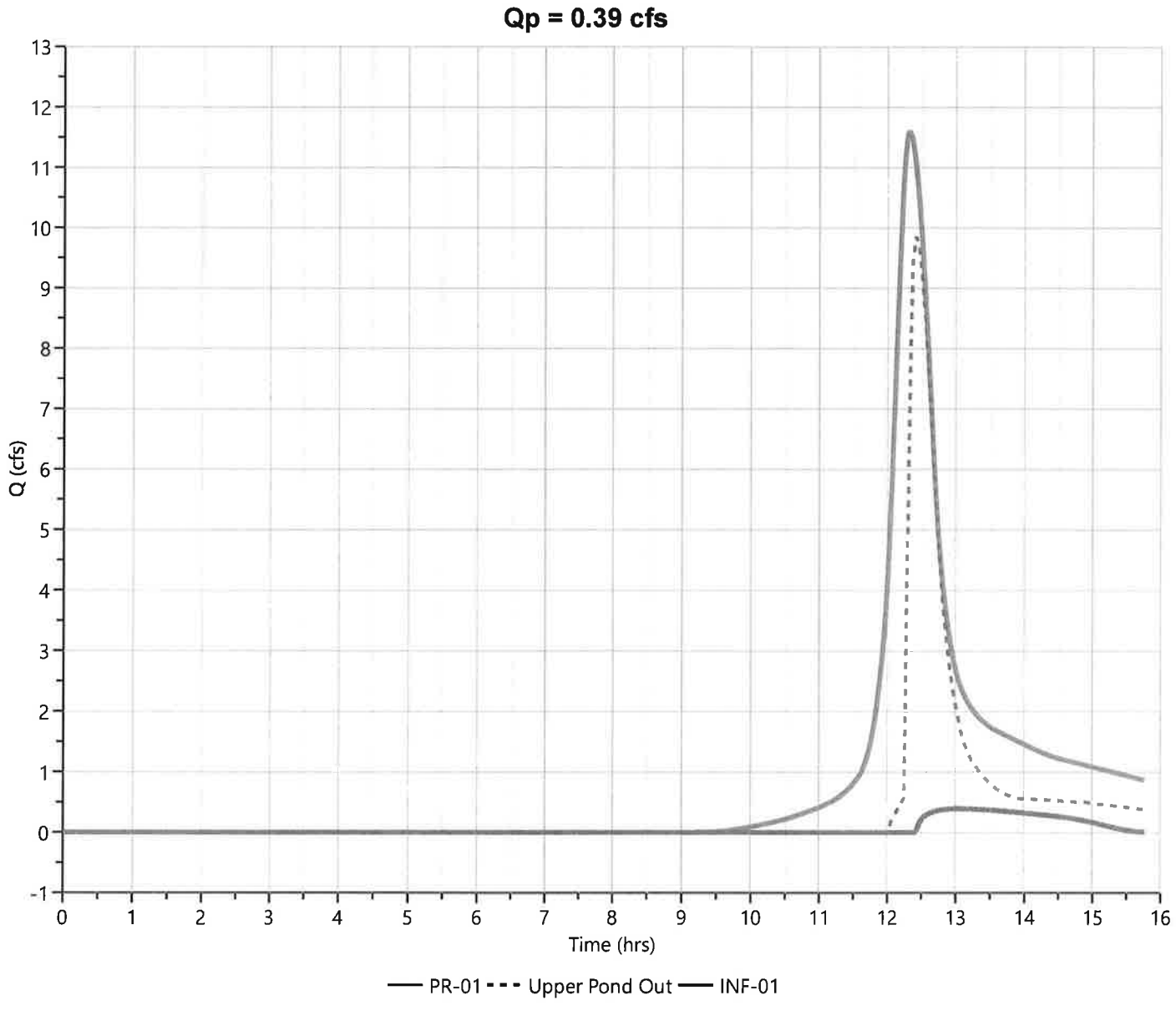
07-13-2020

INF-01

Hyd. No. 3

Hydrograph Type	= Pond Route(i)*	Peak Flow	= 0.393 cfs
Storm Frequency	= 5-yr	Time to Peak	= 13.05 hrs
Time Interval	= 1 min	Hydrograph Volume	= 3,104 cuft
Upper Pond		**Lower Pond**	
Pond Name	= POND-01B Stormtech	Pond Name	= POND-01A Stage 2
Inflow Hyd	= 2 - PR-01	Addnl Inflow Hyd	= None
Max. Elevation	= 41.08 ft	Max. Elevation	= 36.54 ft
Max. Storage	= 9,284 cuft	Max. Storage	= 12,397 cuft

**Interconnected Pond Routing by Storage Indication Method.*



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

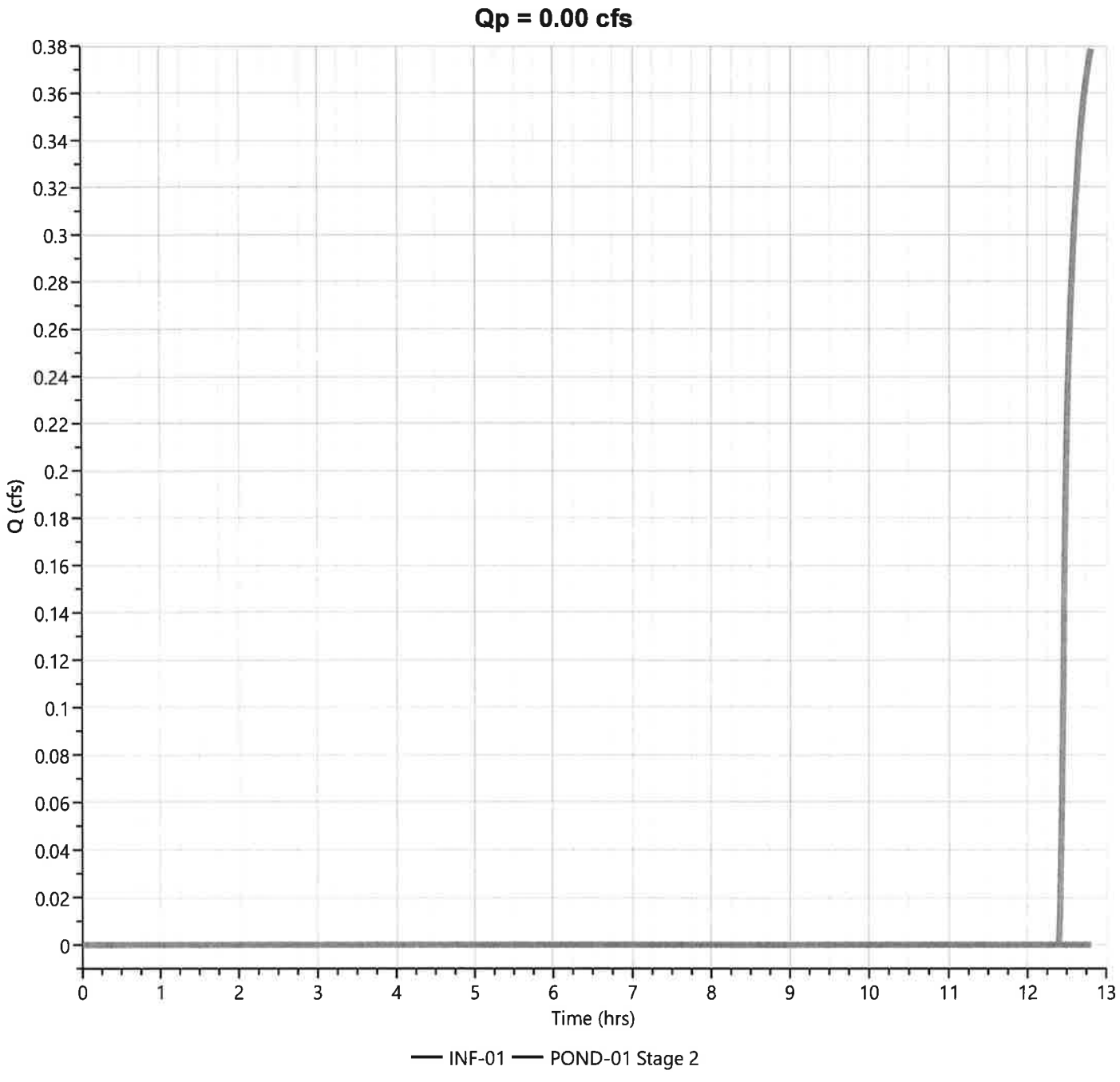
07-13-2020

POND-01 Stage 2

Hyd. No. 4

Hydrograph Type	= Pond Route	Peak Flow	= 0.000 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.80 hrs
Time Interval	= 1 min	Hydrograph Volume	= 0.000 cuft
Inflow Hydrograph	= 3 - INF-01	Max. Elevation	= 35.06 ft
Pond Name	= POND-01A Stage 2	Max. Storage	= 394 cuft

Pond Routing by Storage Indication Method



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

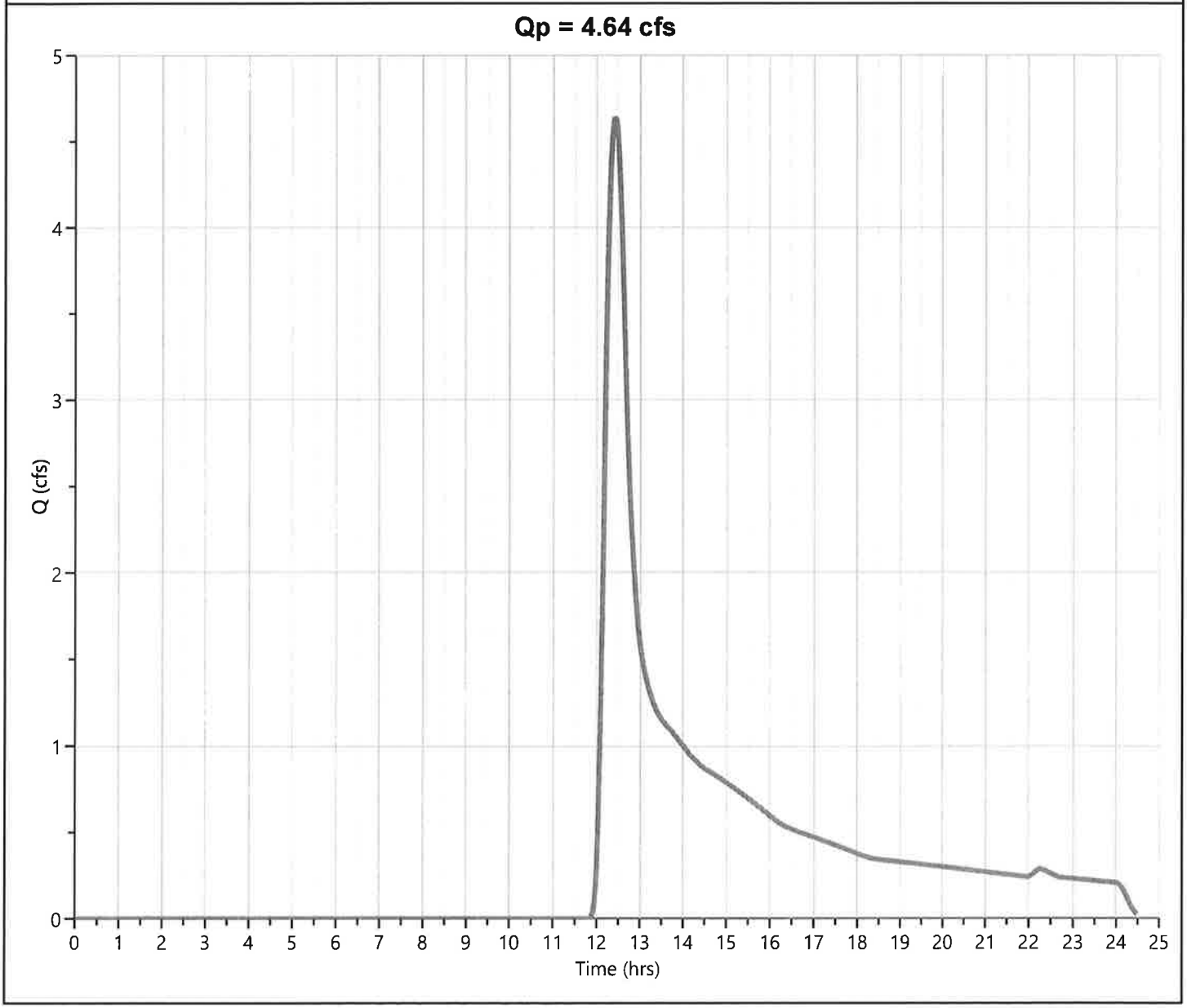
EX-02

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 4.641 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.43 hrs
Time Interval	= 1 min	Runoff Volume	= 30,279 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 4.39 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

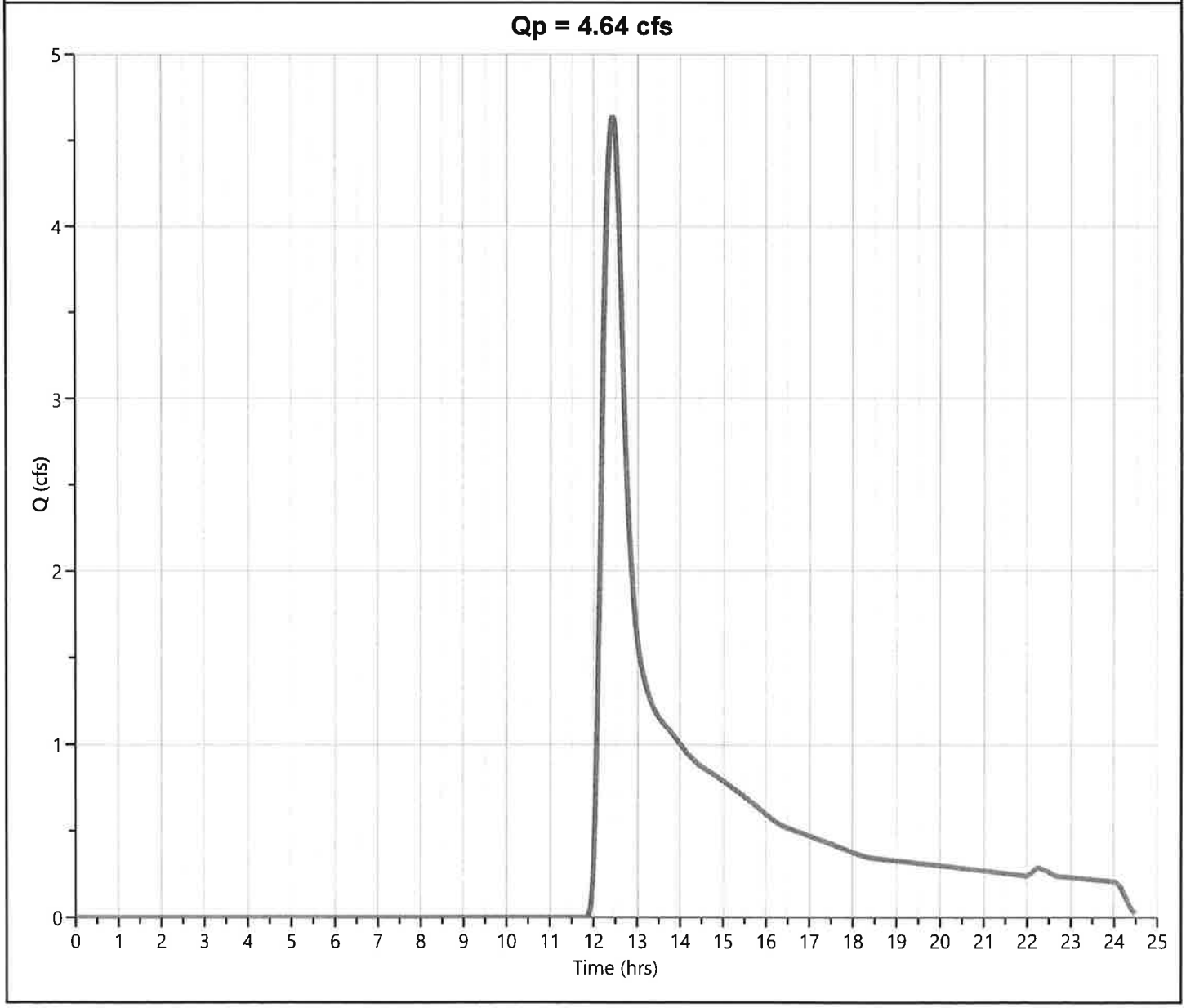
PR-02

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 4.641 cfs
Storm Frequency	= 5-yr	Time to Peak	= 12.43 hrs
Time Interval	= 1 min	Runoff Volume	= 30,279 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 4.39 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Design Storm Report

Custom Storm filename:

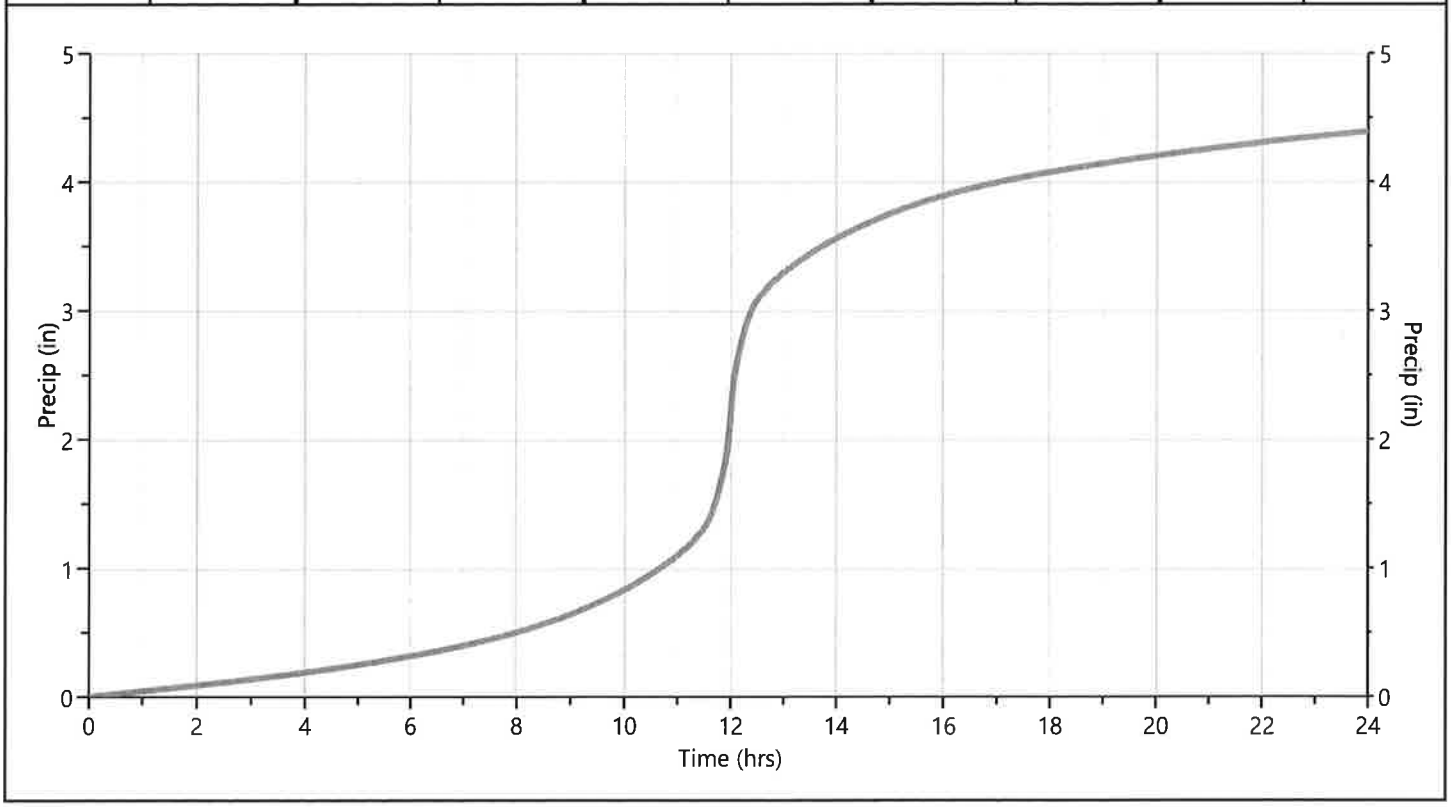
Hydrology Studio v 3.0.0.15

07-13-2020

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	2.87	3.45	0.00	4.39	5.18	6.26	7.06	7.92	

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)
11.50	0.865078	11.68	1.997447	11.87	3.177869	12.05	6.595945	12.23	2.641320
11.52	0.921845	11.70	2.104759	11.88	3.285170	12.07	5.696011	12.25	2.534008
11.53	1.031649	11.72	2.212071	11.90	3.392494	12.08	4.796028	12.27	2.426720
11.55	1.138961	11.73	2.319372	11.92	3.908658	12.10	3.896093	12.28	2.319384
11.57	1.246262	11.75	2.426696	11.93	4.796100	12.12	3.405380	12.30	2.212071
11.58	1.353586	11.77	2.533996	11.95	5.696046	12.13	3.285193	12.32	2.104759
11.60	1.460886	11.78	2.641320	11.97	6.596005	12.15	3.177881	12.33	1.997447
11.62	1.568210	11.80	2.748621	11.98	7.495952	12.17	3.070569	12.35	1.890159
11.63	1.675510	11.82	2.855933	**12.00**	**8.395886**	12.18	2.963257	12.37	1.782823
11.65	1.782823	11.83	2.963257	12.02	8.375764	12.20	2.855921	12.38	1.675510
11.67	1.890135	11.85	3.070557	12.03	7.495880	12.22	2.748632	12.40	1.568222



Hydrograph 10-yr Summary

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	EX-01	5.329	12.40	31,852	----		
2	NRCS Runoff	PR-01	15.45	12.32	77,212	----		
3	Pond Route(i)	INF-01	1.764	12.95	9,339	2	40.93 U 37.22 L	9,853 U 19,724 L
4	Pond Route	POND-01 Stage 2	0.000	13.07	0.000	3	35.39	2,670
5	NRCS Runoff	EX-02	8.061	12.38	46,767	----		
6	NRCS Runoff	PR-02	8.061	12.38	46,767	----		

(i) = Interconnected ponds, U = Upper pond, L = Lower pond

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

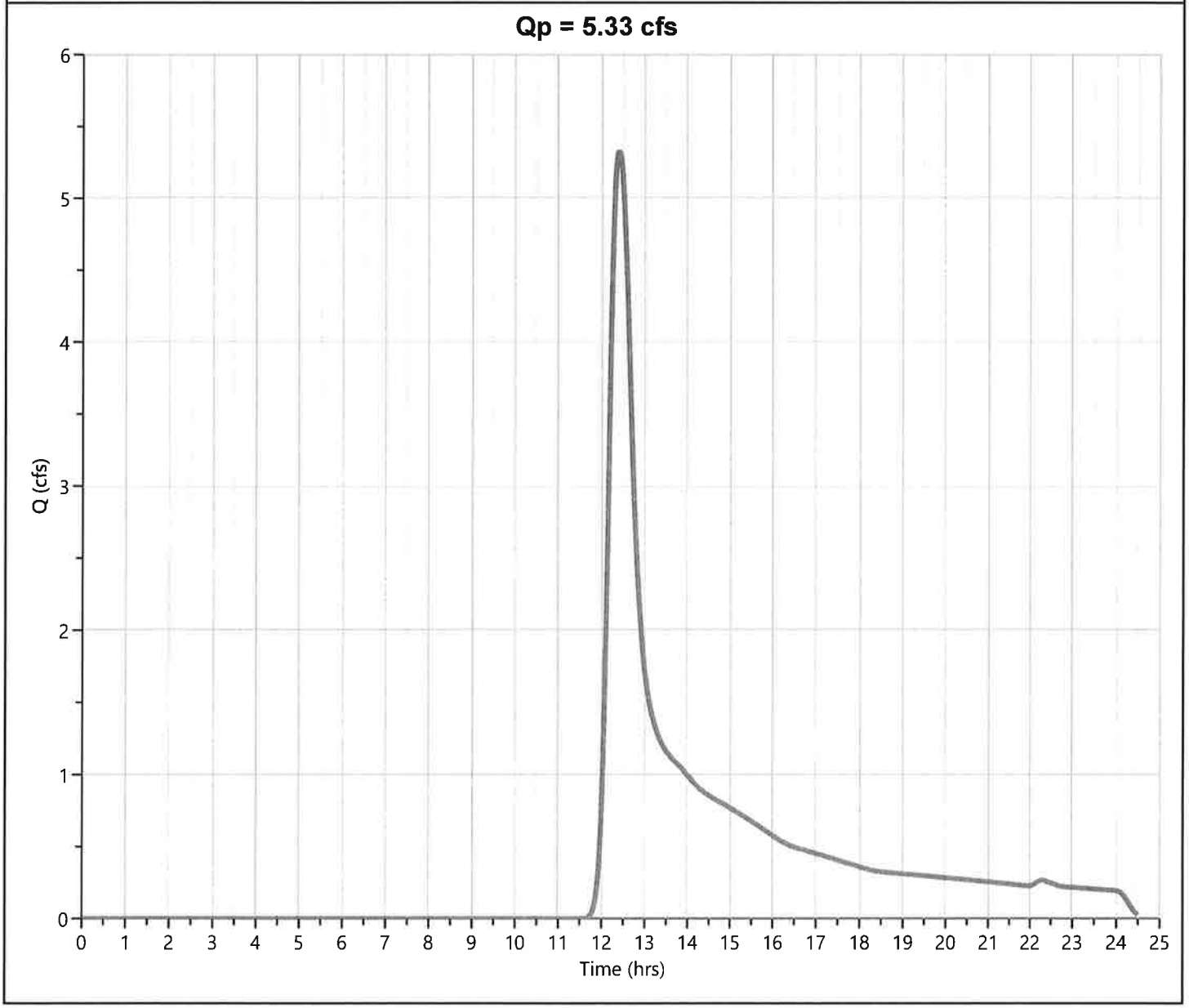
EX-01

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 5.329 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.40 hrs
Time Interval	= 1 min	Runoff Volume	= 31,852 cuft
Drainage Area	= 8.13 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.75 min
Total Rainfall	= 5.18 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
8.13	55	Woods (Good) B Soils
8.13	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

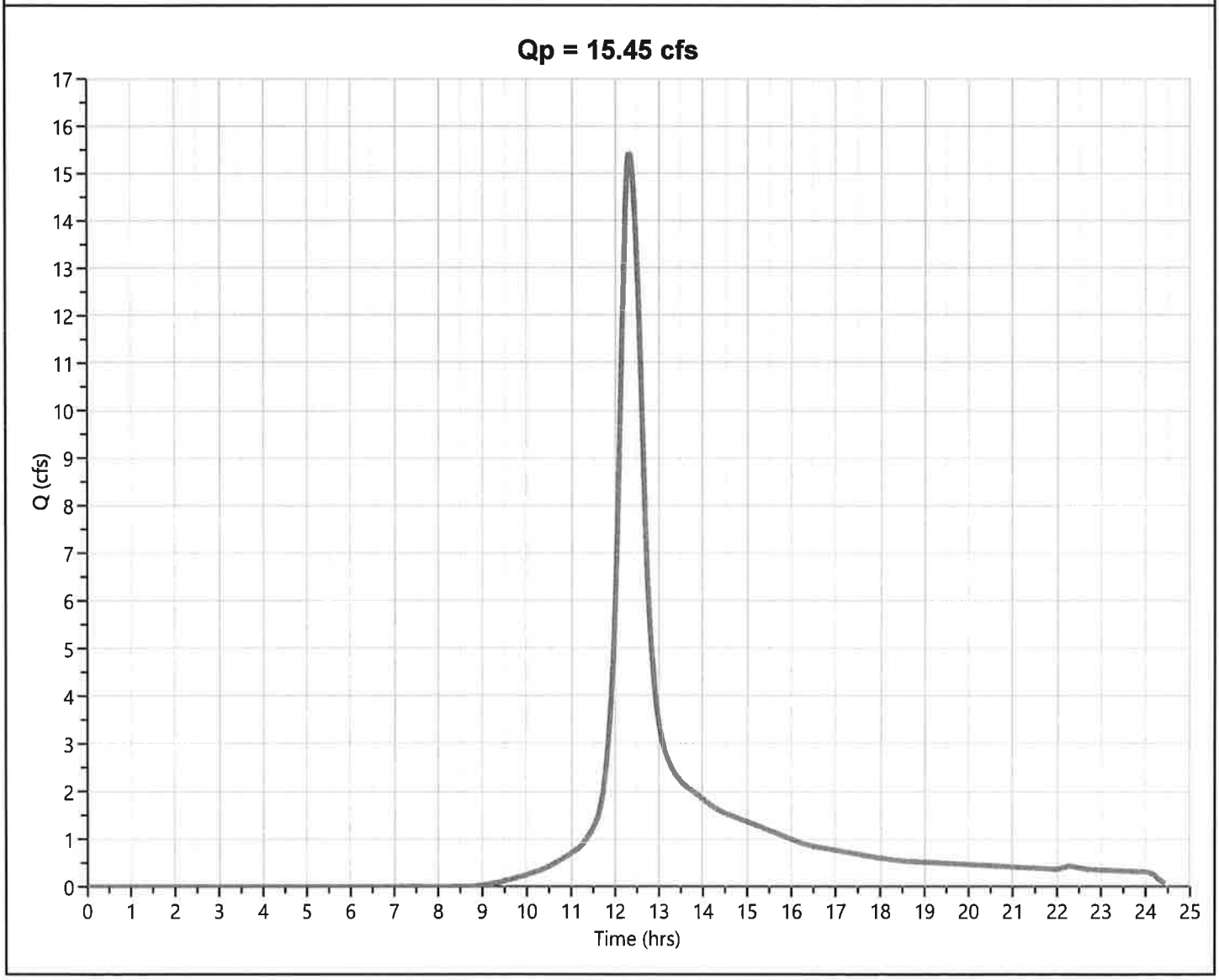
PR-01

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 15.45 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Runoff Volume	= 77,212 cuft
Drainage Area	= 8.13 ac	Curve Number	= 75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.66 min
Total Rainfall	= 5.18 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
1.242	55	Woods (Good) B Soils
3.58	61	Grass (Good) B Soils
2.147	98	Impervious
1.161	98	Building
8.13	**75**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

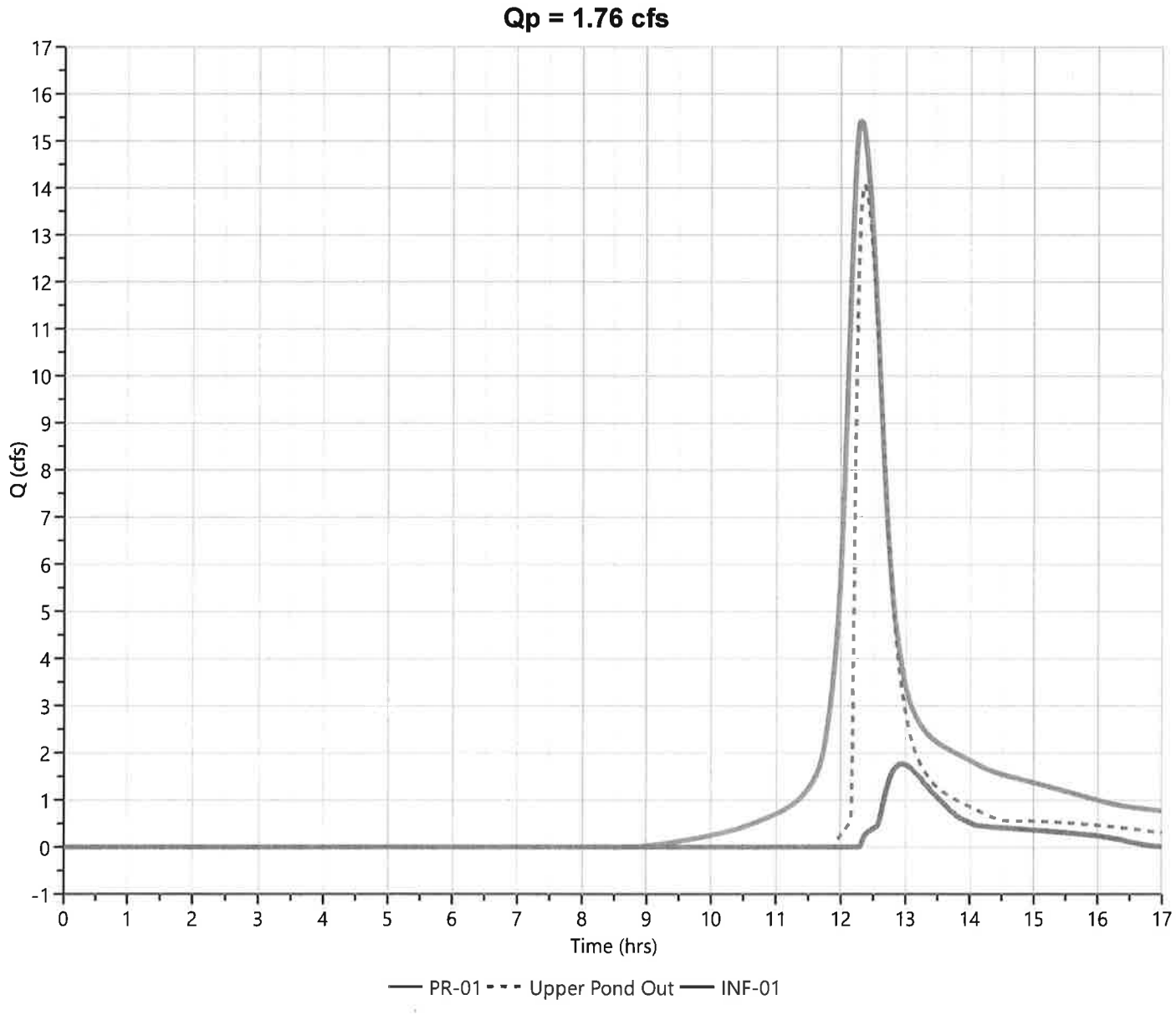
07-13-2020

INF-01

Hyd. No. 3

Hydrograph Type	= Pond Route(i)*	Peak Flow	= 1.764 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.95 hrs
Time Interval	= 1 min	Hydrograph Volume	= 9,339 cuft
Upper Pond		**Lower Pond**	
Pond Name	= POND-01B Stormtech	Pond Name	= POND-01A Stage 2
Inflow Hyd	= 2 - PR-01	Addnl Inflow Hyd	= None
Max. Elevation	= 40.93 ft	Max. Elevation	= 37.22 ft
Max. Storage	= 9,853 cuft	Max. Storage	= 19,724 cuft

**Interconnected Pond Routing by Storage Indication Method.*



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

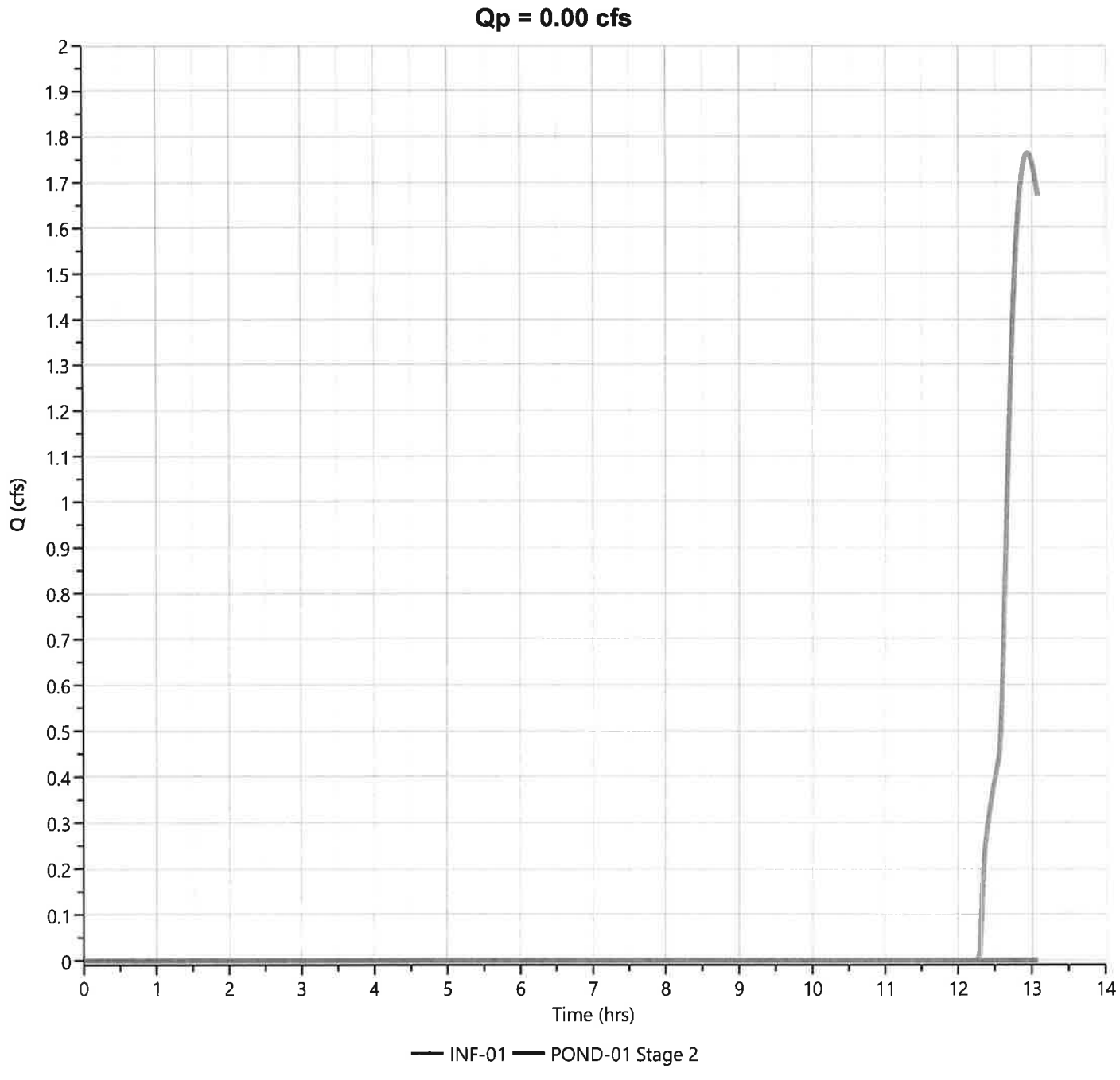
07-13-2020

POND-01 Stage 2

Hyd. No. 4

Hydrograph Type	= Pond Route	Peak Flow	= 0.000 cfs
Storm Frequency	= 10-yr	Time to Peak	= 13.07 hrs
Time Interval	= 1 min	Hydrograph Volume	= 0.000 cuft
Inflow Hydrograph	= 3 - INF-01	Max. Elevation	= 35.39 ft
Pond Name	= POND-01A Stage 2	Max. Storage	= 2,670 cuft

Pond Routing by Storage Indication Method



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

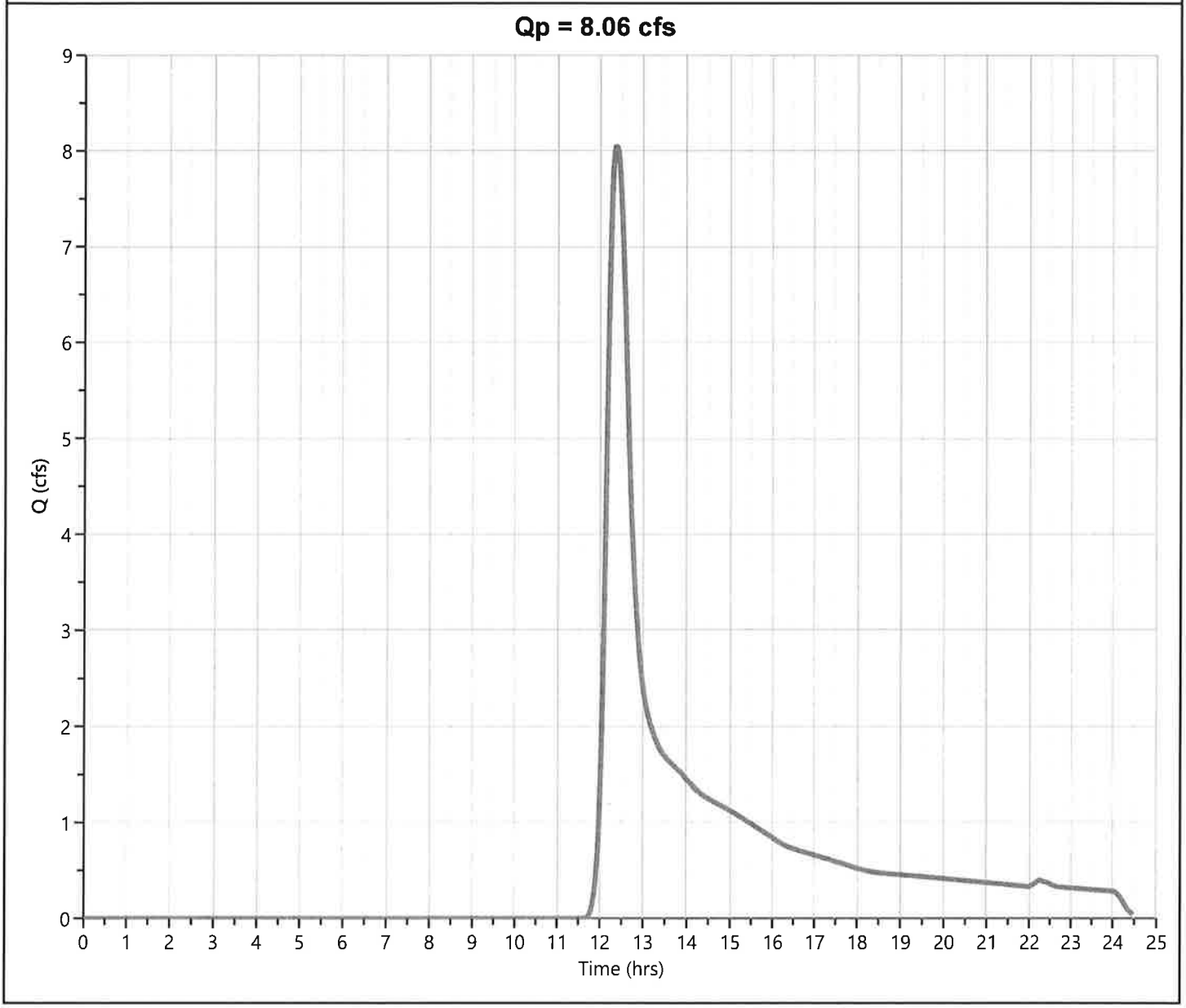
EX-02

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 8.061 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.38 hrs
Time Interval	= 1 min	Runoff Volume	= 46,767 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 5.18 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

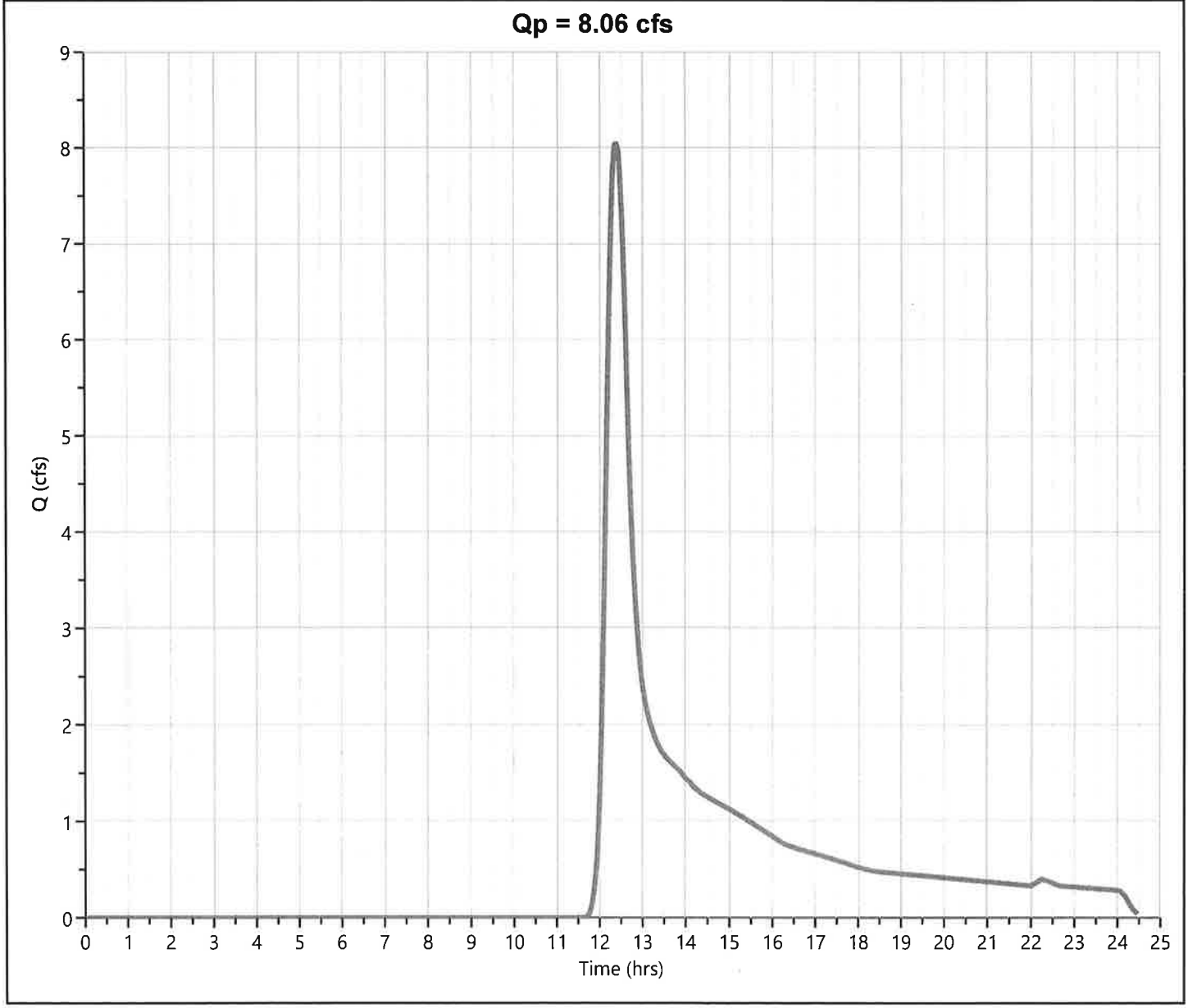
PR-02

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 8.061 cfs
Storm Frequency	= 10-yr	Time to Peak	= 12.38 hrs
Time Interval	= 1 min	Runoff Volume	= 46,767 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 5.18 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Design Storm Report

Custom Storm filename:

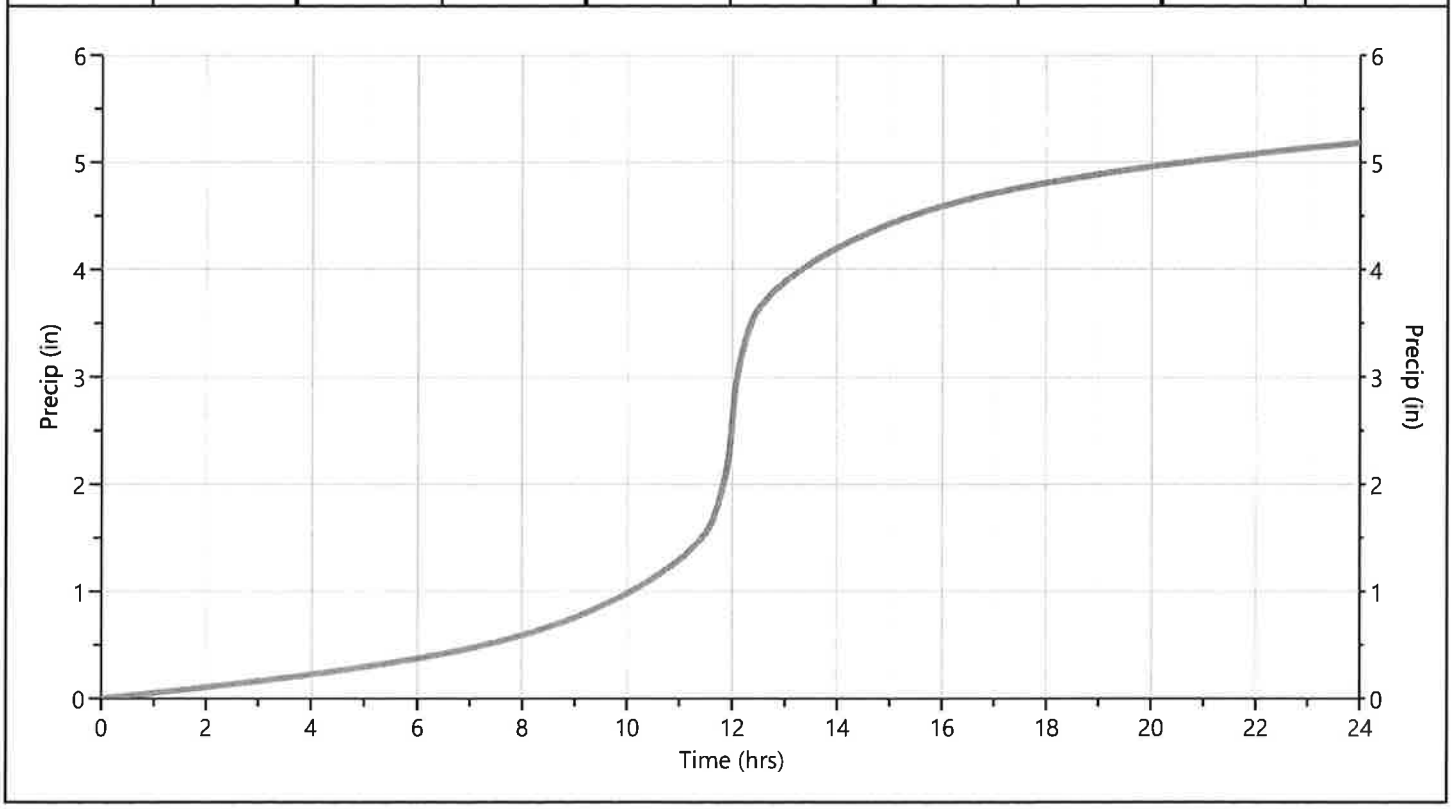
Hydrology Studio v 3.0.0.15

07-13-2020

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	2.87	3.45	0.00	4.39	5.18	6.26	7.06	7.92	

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)
11.50	1.020741	11.68	2.356887	11.87	3.749752	12.05	7.782912	12.23	3.116632
11.52	1.087749	11.70	2.483523	11.88	3.876352	12.07	6.721020	12.25	2.990031
11.53	1.217294	11.72	2.610135	11.90	4.002976	12.08	5.659103	12.27	2.863383
11.55	1.343918	11.73	2.736771	11.92	4.612041	12.10	4.597211	12.28	2.736783
11.57	1.470542	11.75	2.863383	11.93	5.659175	12.12	4.018188	12.30	2.610135
11.58	1.597154	11.77	2.990007	11.95	6.721091	12.13	3.876376	12.32	2.483535
11.60	1.723790	11.78	3.116632	11.97	7.782984	12.15	3.749752	12.33	2.356911
11.62	1.850402	11.80	3.243244	11.98	8.844876	12.17	3.623128	12.35	2.230263
11.63	1.977038	11.82	3.369880	**12.00**	**9.906769**	12.18	3.496504	12.37	2.103662
11.65	2.103651	11.83	3.496504	12.02	9.882998	12.20	3.369880	12.38	1.977038
11.67	2.230275	11.85	3.623104	12.03	8.844829	12.22	3.243256	12.40	1.850414



Hydrograph 25-yr Summary

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	EX-01	8.999	12.37	49,653	----		
2	NRCS Runoff	PR-01	20.92	12.30	104,239	----		
3	Pond Route(i)	INF-01	3.842	12.87	23,832	2	41.13 U 38.02 L	10,704 U 29,169 L
4	Pond Route	POND-01 Stage 2	0.337	14.03	2,721	3	36.31	10,017
5	NRCS Runoff	EX-02	13.63	12.33	72,903	----		
6	NRCS Runoff	PR-02	13.63	12.33	72,903	----		

(i) = Interconnected ponds, U = Upper pond, L = Lower pond

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

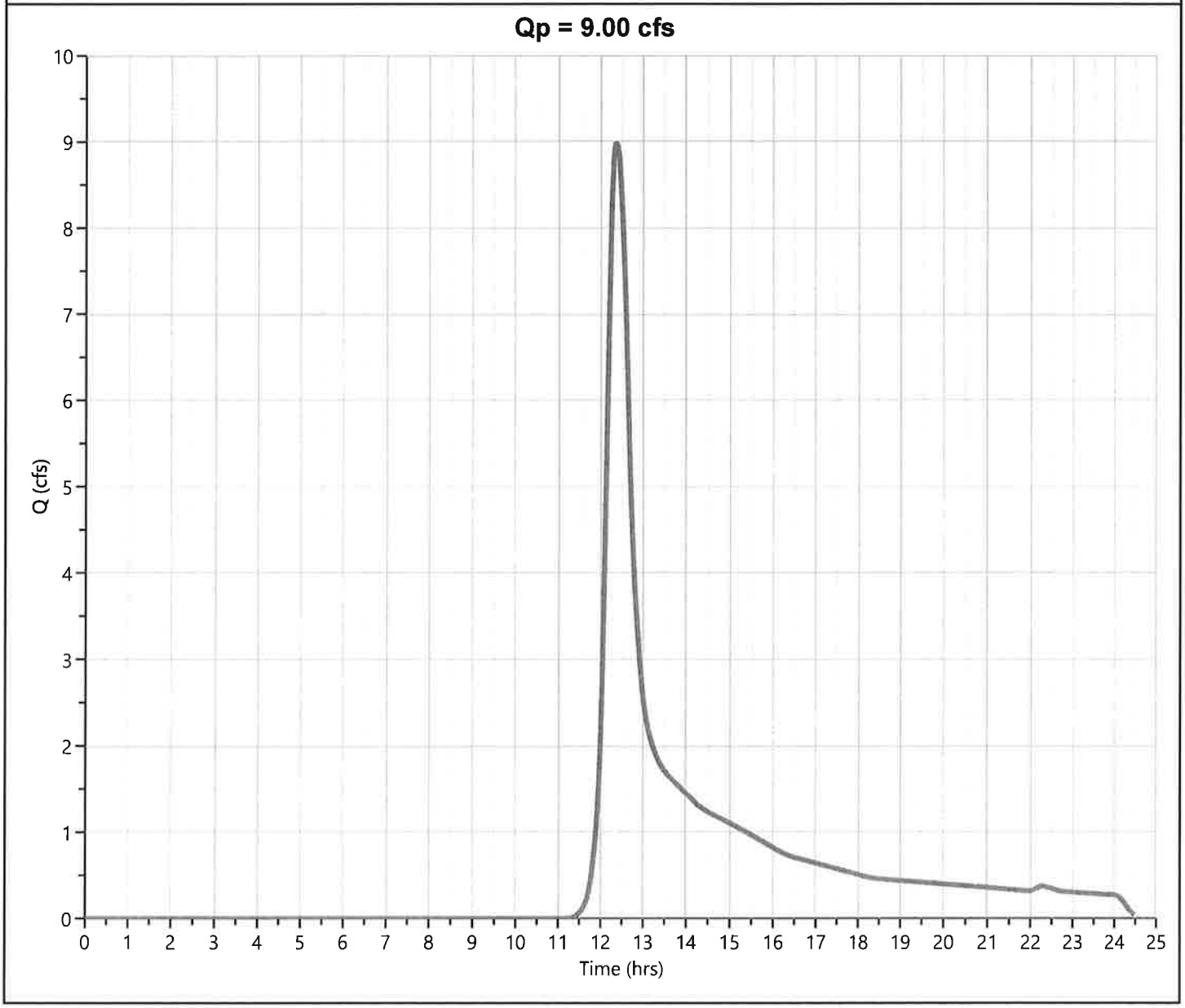
EX-01

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 8.999 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.37 hrs
Time Interval	= 1 min	Runoff Volume	= 49,653 cuft
Drainage Area	= 8.13 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.75 min
Total Rainfall	= 6.26 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
8.13	55	Woods (Good) B Soils
8.13	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

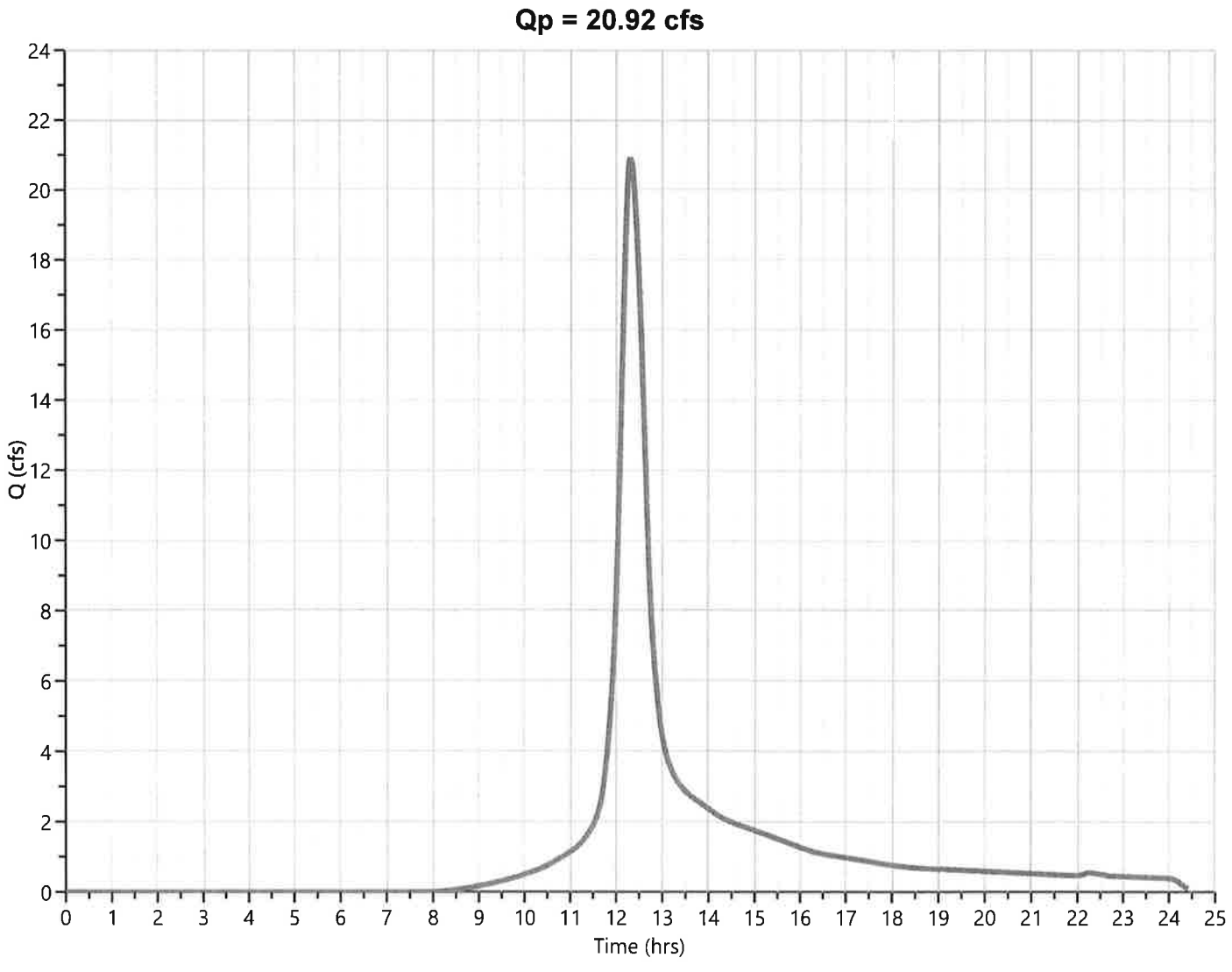
PR-01

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 20.92 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.30 hrs
Time Interval	= 1 min	Runoff Volume	= 104,239 cuft
Drainage Area	= 8.13 ac	Curve Number	= 75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.66 min
Total Rainfall	= 6.26 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
1.242	55	Woods (Good) B Soils
3.58	61	Grass (Good) B Soils
2.147	98	Impervious
1.161	98	Building
8.13	**75**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

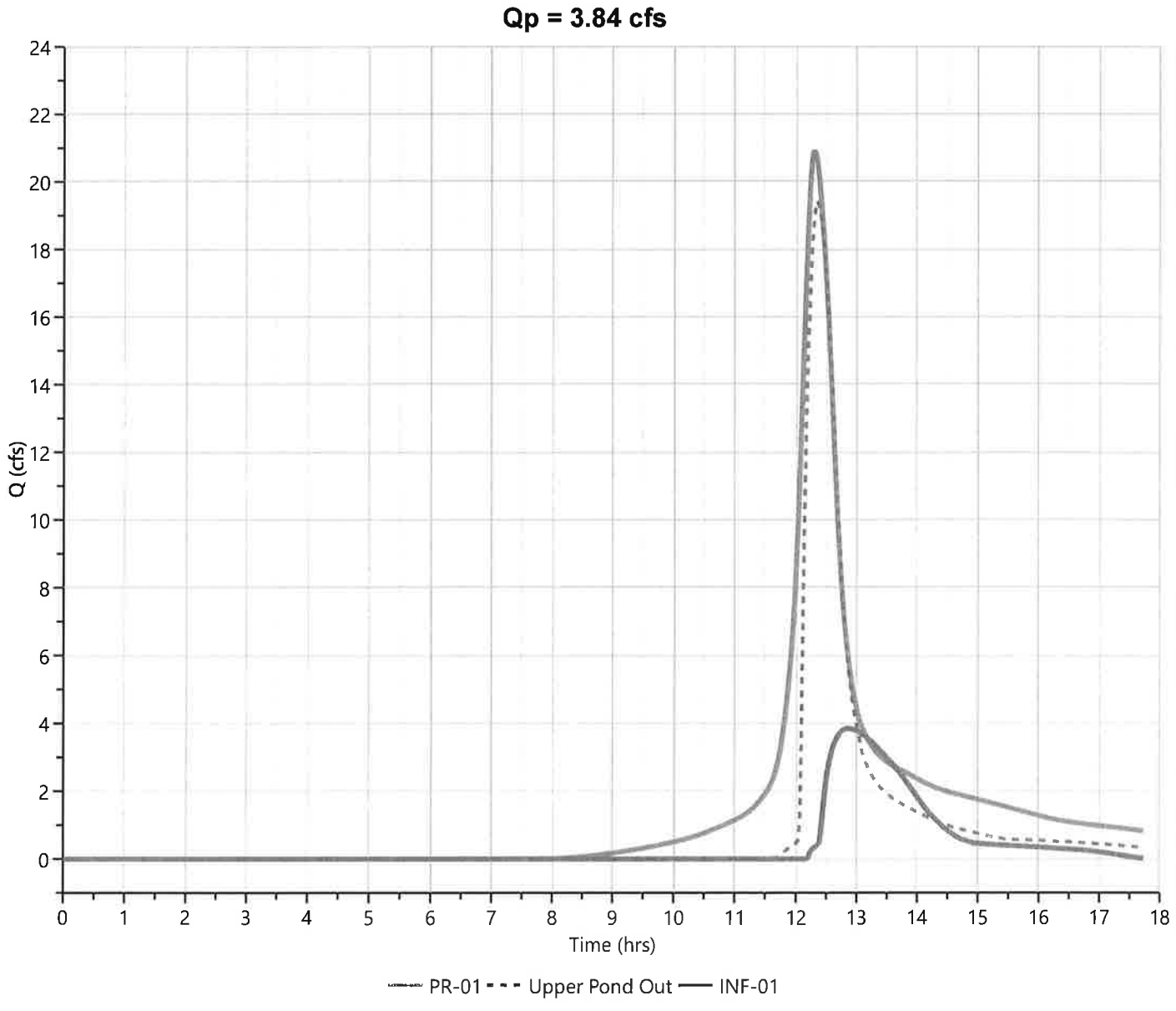
07-13-2020

INF-01

Hyd. No. 3

Hydrograph Type	= Pond Route(i)*	Peak Flow	= 3.842 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.87 hrs
Time Interval	= 1 min	Hydrograph Volume	= 23,832 cuft
Upper Pond		**Lower Pond**	
Pond Name	= POND-01B Stormtech	Pond Name	= POND-01A Stage 2
Inflow Hyd	= 2 - PR-01	Addnl Inflow Hyd	= None
Max. Elevation	= 41.13 ft	Max. Elevation	= 38.02 ft
Max. Storage	= 10,704 cuft	Max. Storage	= 29,169 cuft

**Interconnected Pond Routing by Storage Indication Method.*



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

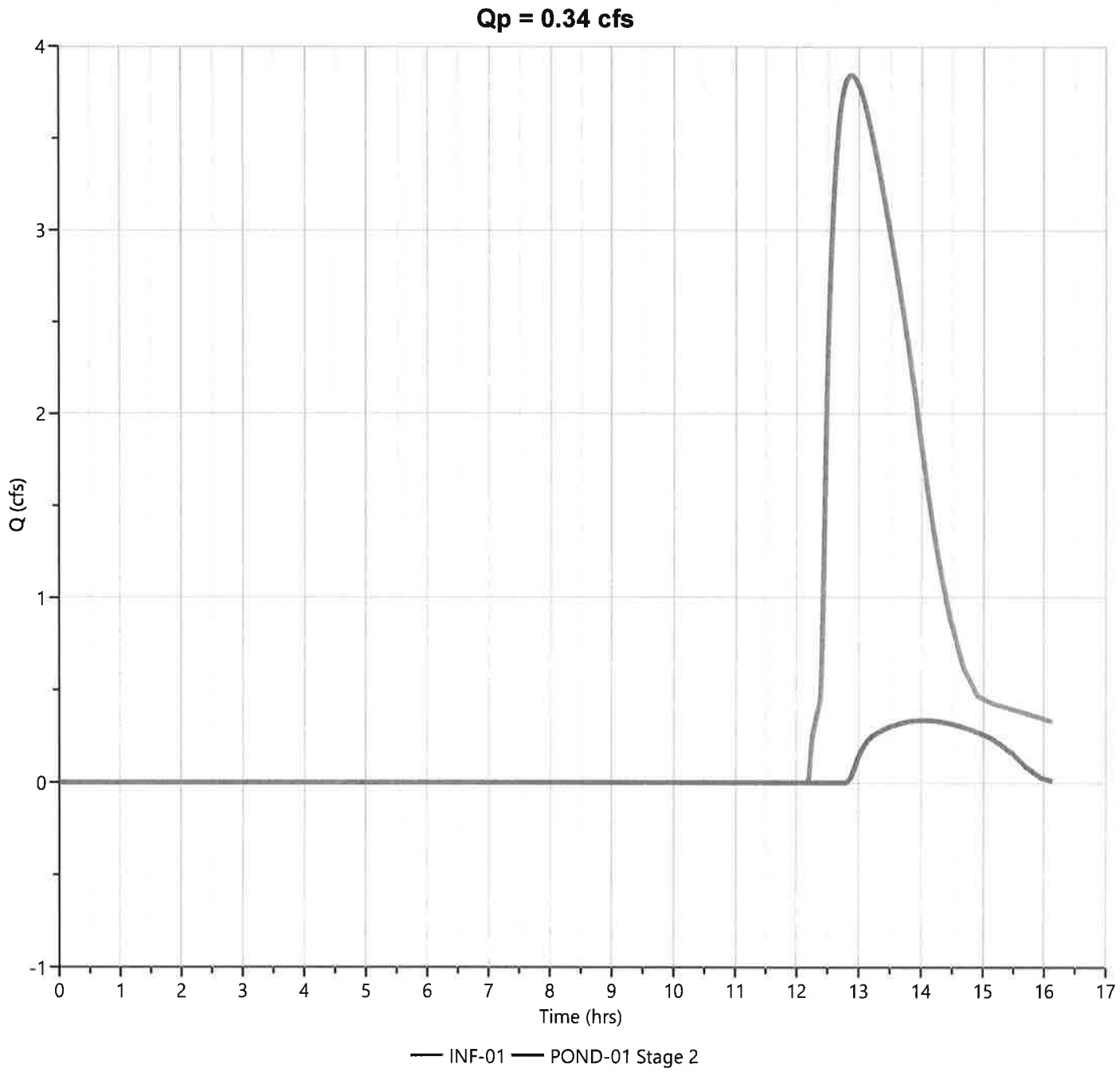
POND-01 Stage 2

Hyd. No. 4

Hydrograph Type	= Pond Route	Peak Flow	= 0.337 cfs
Storm Frequency	= 25-yr	Time to Peak	= 14.03 hrs
Time Interval	= 1 min	Hydrograph Volume	= 2,721 cuft
Inflow Hydrograph	= 3 - INF-01	Max. Elevation	= 36.31 ft
Pond Name	= POND-01A Stage 2	Max. Storage	= 10,017 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 37 min



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

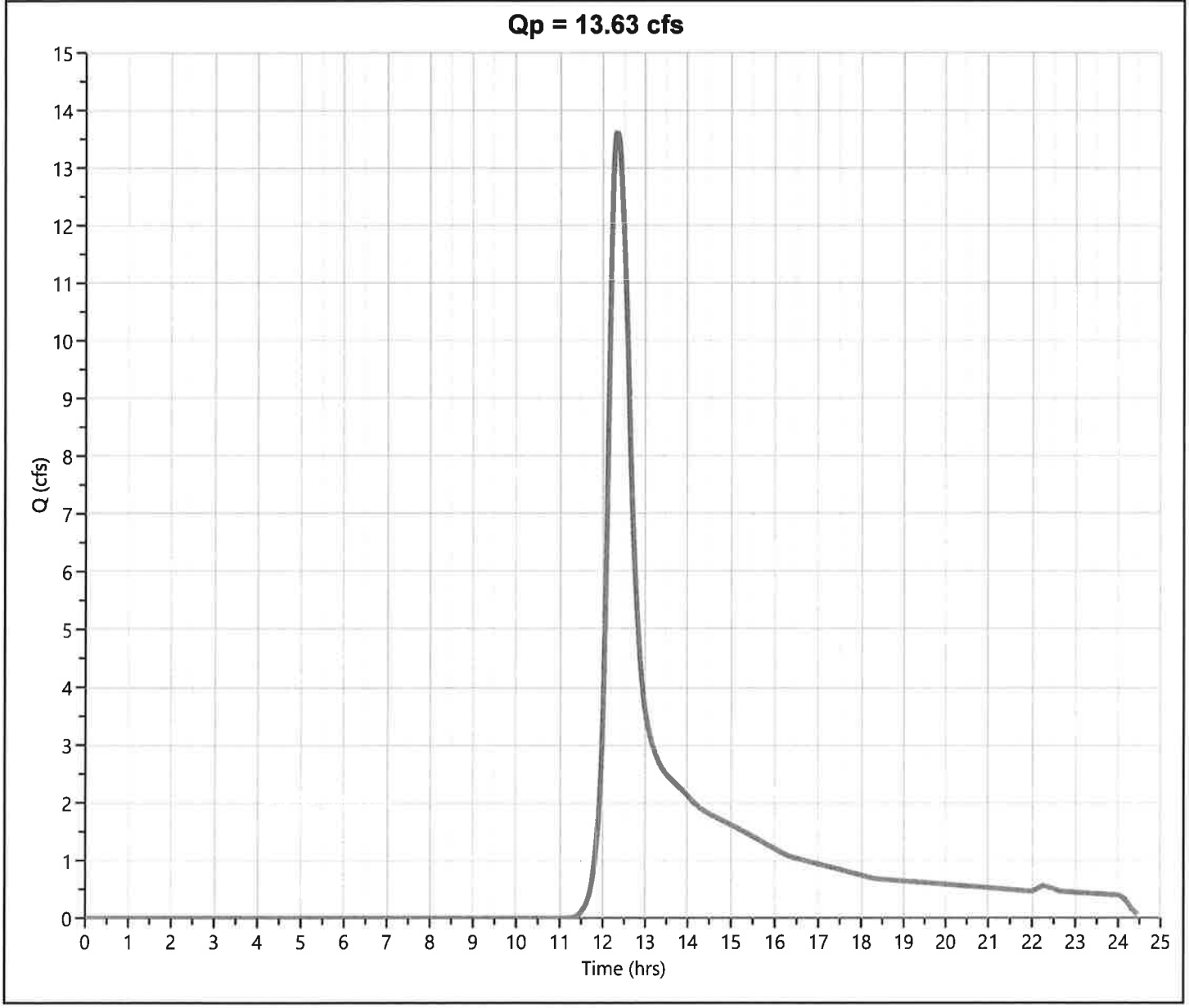
EX-02

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 13.63 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.33 hrs
Time Interval	= 1 min	Runoff Volume	= 72,903 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 6.26 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

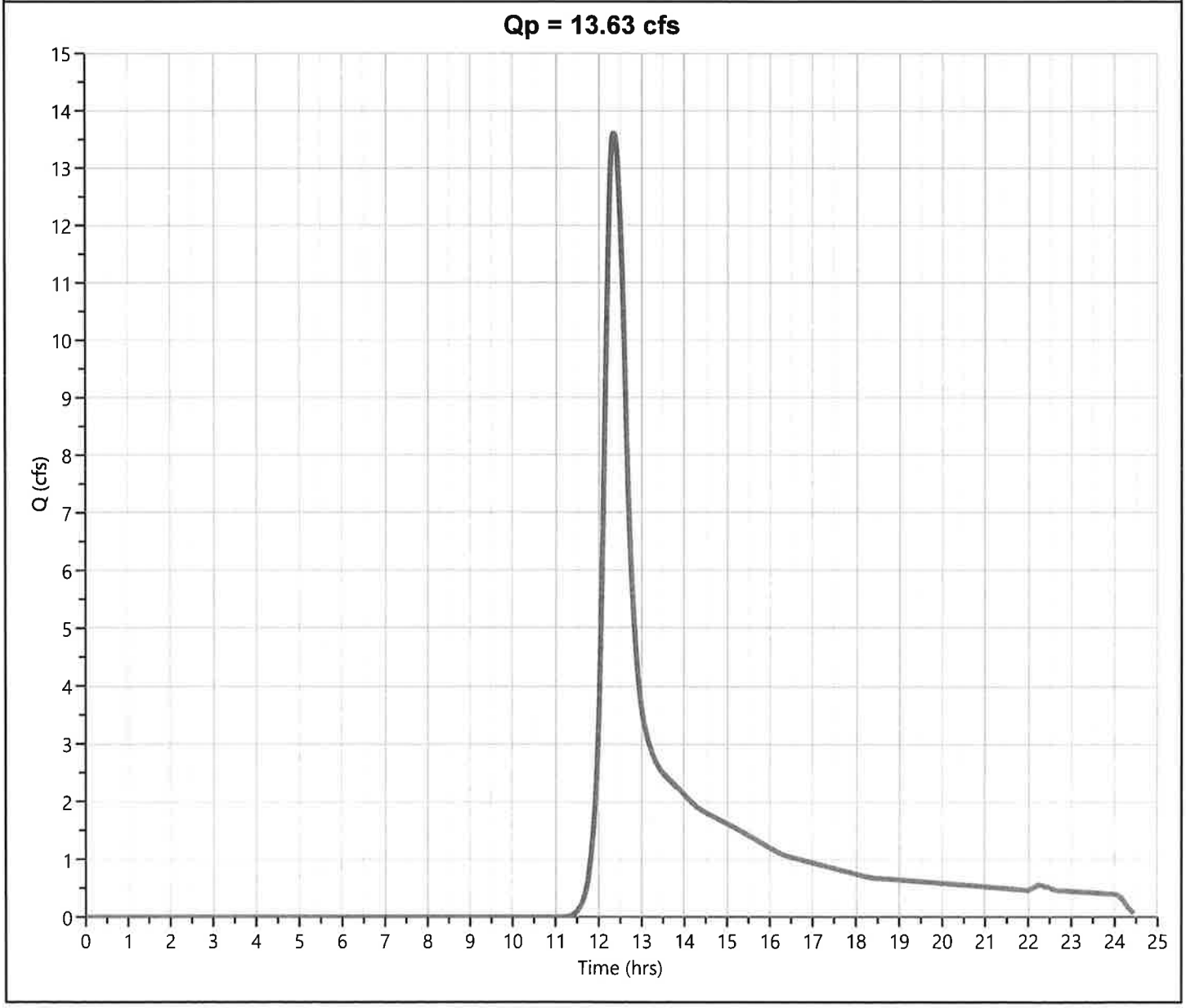
PR-02

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 13.63 cfs
Storm Frequency	= 25-yr	Time to Peak	= 12.33 hrs
Time Interval	= 1 min	Runoff Volume	= 72,903 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 6.26 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Design Storm Report

Custom Storm filename:

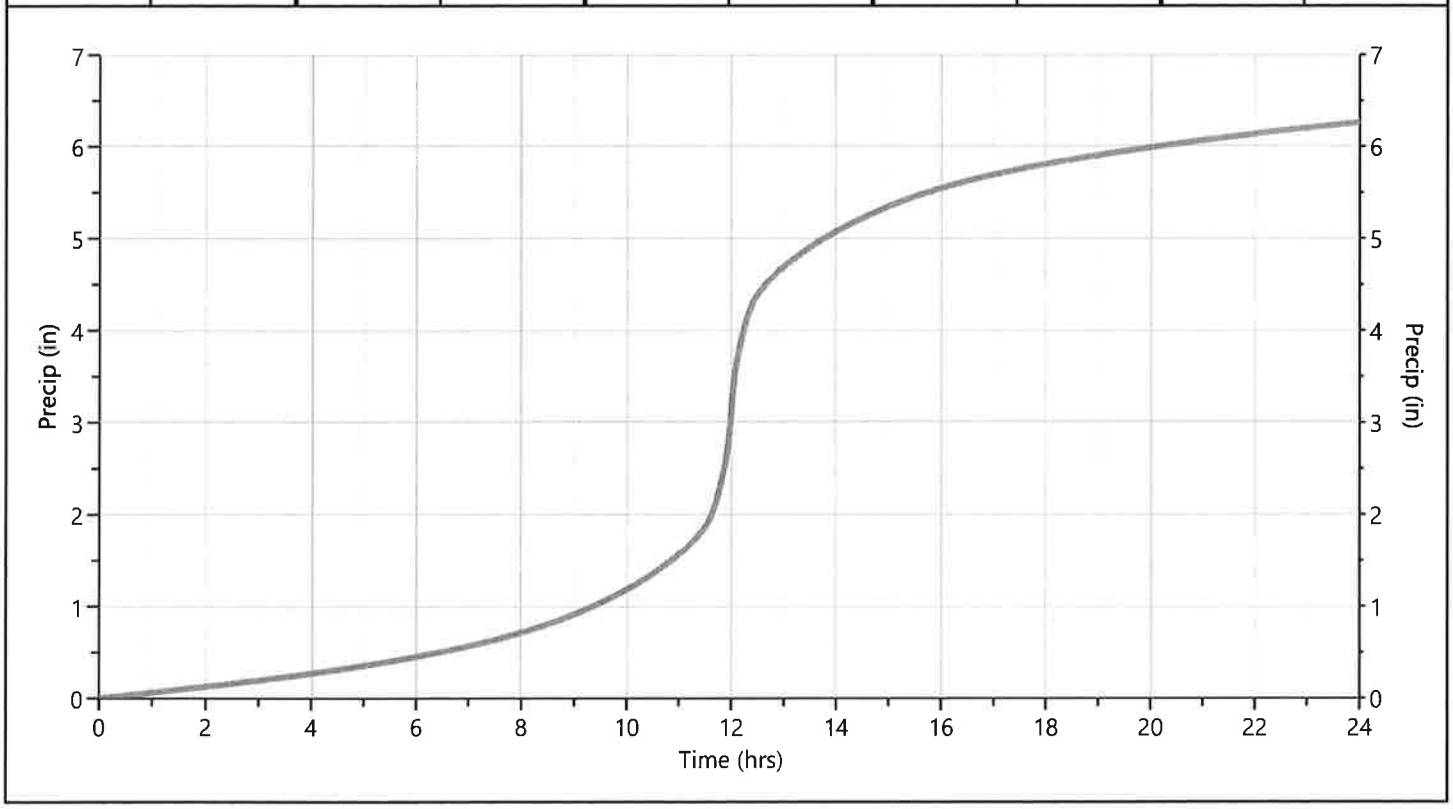
Hydrology Studio v 3.0.0.15

07-13-2020

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	2.87	3.45	0.00	4.39	5.18	6.26	7.06	7.92	

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)
11.50	1.233566	11.68	2.848291	11.87	4.531527	12.05	9.405613	12.23	3.766418
11.52	1.314533	11.70	3.001332	11.88	4.684567	12.07	8.122301	12.25	3.613424
11.53	1.471090	11.72	3.154325	11.90	4.837584	12.08	6.839013	12.27	3.460407
11.55	1.624119	11.73	3.307366	11.92	5.573630	12.10	5.555701	12.28	3.307343
11.57	1.777136	11.75	3.460383	11.93	6.839085	12.12	4.855967	12.30	3.154373
11.58	1.930165	11.77	3.613400	11.95	8.122373	12.13	4.684567	12.32	3.001308
11.60	2.083182	11.78	3.766441	11.97	9.405684	12.15	4.531550	12.33	2.848339
11.62	2.236211	11.80	3.919435	11.98	10.689000	12.17	4.378533	12.35	2.695274
11.63	2.389216	11.82	4.072475	**12.00**	**11.972280**	12.18	4.225492	12.37	2.542257
11.65	2.542257	11.83	4.225492	12.02	11.943550	12.20	4.072499	12.38	2.389240
11.67	2.695274	11.85	4.378533	12.03	10.688900	12.22	3.919458	12.40	2.236223



Hydrograph 50-yr Summary

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	EX-01	12.05	12.35	64,305	----		
2	NRCS Runoff	PR-01	25.09	12.30	124,988	----		
3	Pond Route(i)	INF-01	5.587	12.85	36,140	2	41.08 U 38.59 L	11,414 U 36,825 L
4	Pond Route	POND-01 Stage 2	0.774	14.35	6,777	3	36.96	16,649
5	NRCS Runoff	EX-02	18.25	12.32	94,415	----		
6	NRCS Runoff	PR-02	18.25	12.32	94,415	----		

(i) = Interconnected ponds, U = Upper pond, L = Lower pond

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

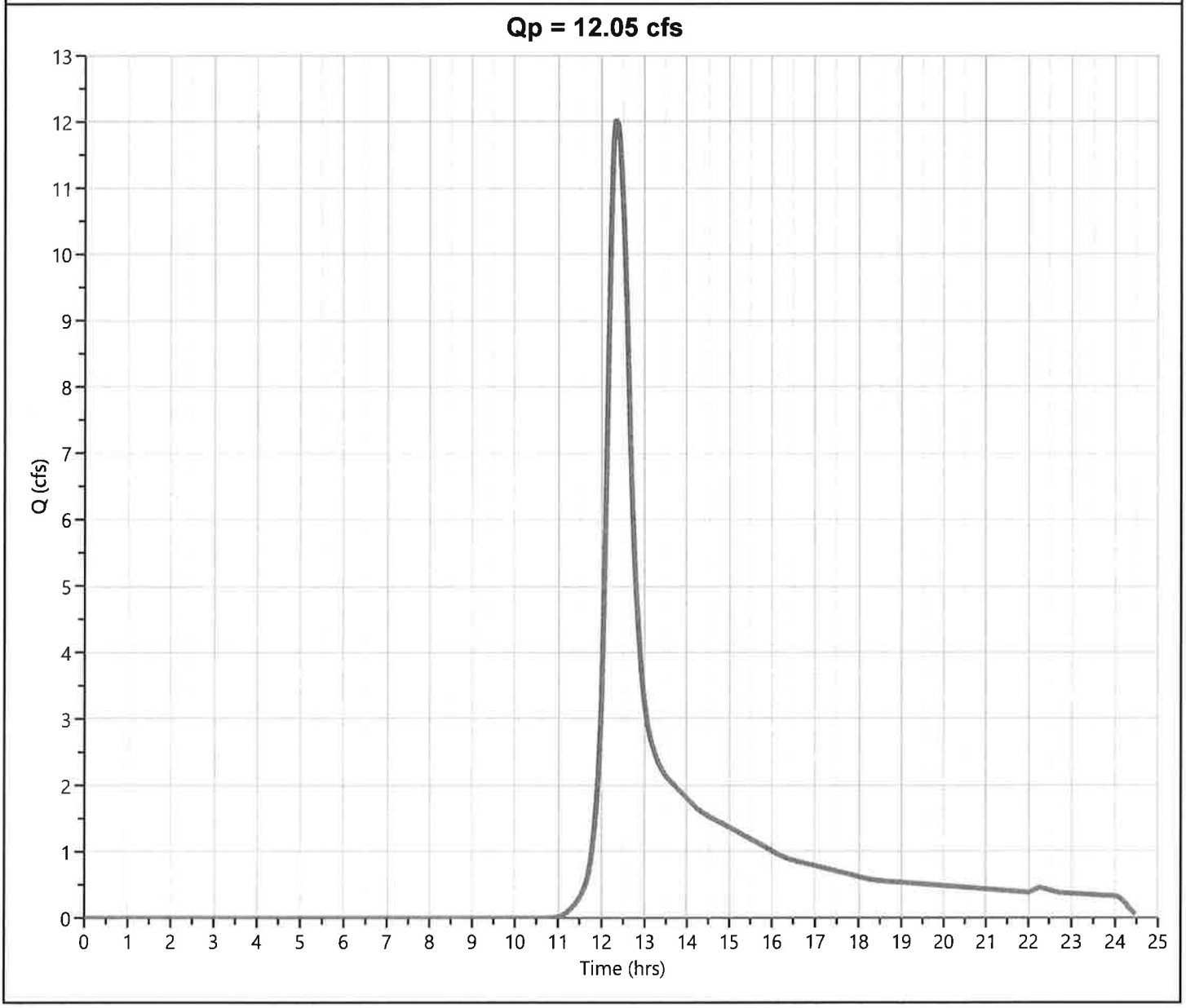
EX-01

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 12.05 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.35 hrs
Time Interval	= 1 min	Runoff Volume	= 64,305 cuft
Drainage Area	= 8.13 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.75 min
Total Rainfall	= 7.06 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
8.13	55	Woods (Good) B Soils
8.13	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

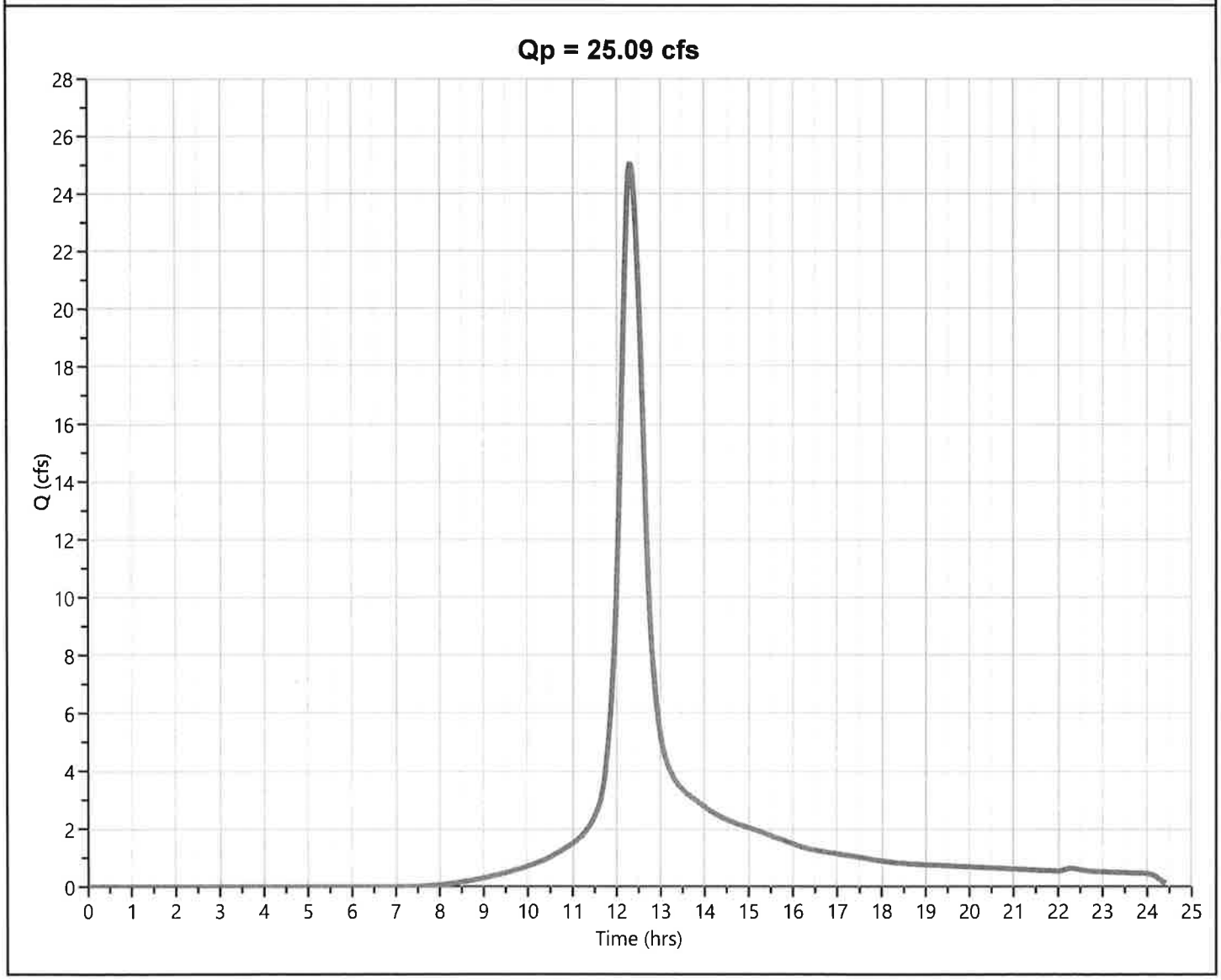
PR-01

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 25.09 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.30 hrs
Time Interval	= 1 min	Runoff Volume	= 124,988 cuft
Drainage Area	= 8.13 ac	Curve Number	= 75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.66 min
Total Rainfall	= 7.06 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
1.242	55	Woods (Good) B Soils
3.58	61	Grass (Good) B Soils
2.147	98	Impervious
1.161	98	Building
8.13	**75**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

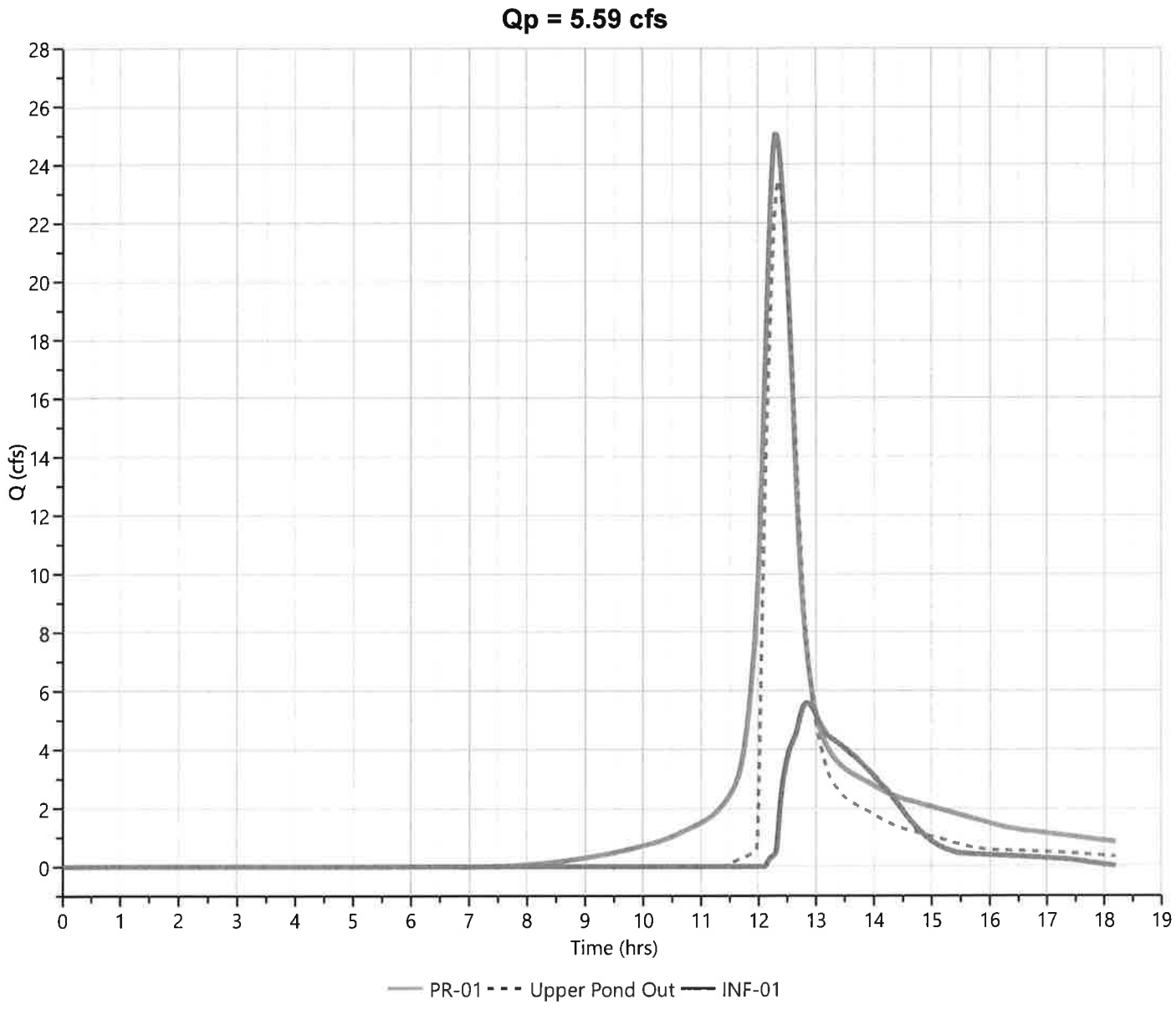
07-13-2020

INF-01

Hyd. No. 3

Hydrograph Type	= Pond Route(i)*	Peak Flow	= 5.587 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.85 hrs
Time Interval	= 1 min	Hydrograph Volume	= 36,140 cuft
Upper Pond		**Lower Pond**	
Pond Name	= POND-01B Stormtech	Pond Name	= POND-01A Stage 2
Inflow Hyd	= 2 - PR-01	Addnl Inflow Hyd	= None
Max. Elevation	= 41.08 ft	Max. Elevation	= 38.59 ft
Max. Storage	= 11,414 cuft	Max. Storage	= 36,825 cuft

**Interconnected Pond Routing by Storage Indication Method.*



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

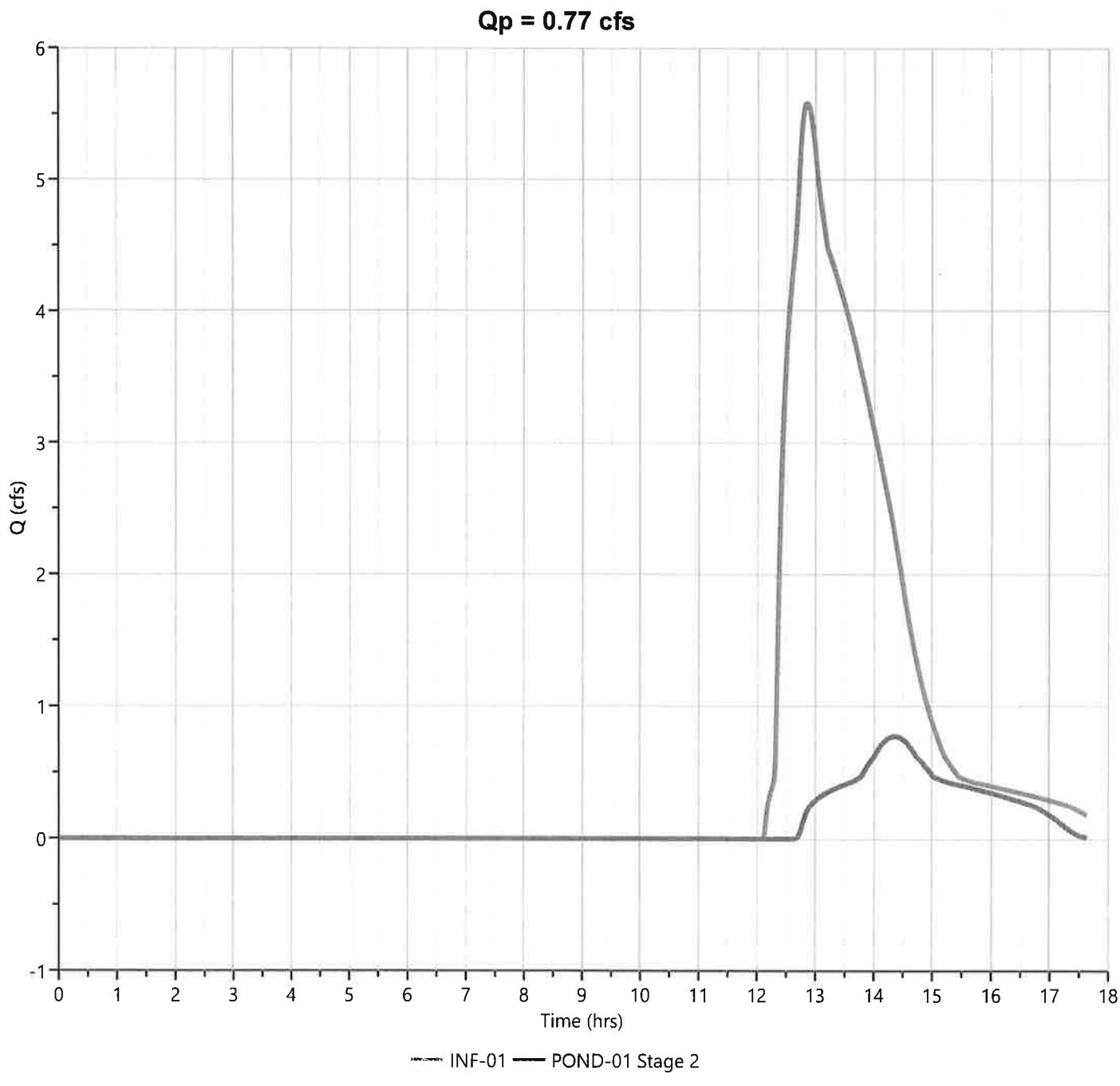
POND-01 Stage 2

Hyd. No. 4

Hydrograph Type	= Pond Route	Peak Flow	= 0.774 cfs
Storm Frequency	= 50-yr	Time to Peak	= 14.35 hrs
Time Interval	= 1 min	Hydrograph Volume	= 6,777 cuft
Inflow Hydrograph	= 3 - INF-01	Max. Elevation	= 36.96 ft
Pond Name	= POND-01A Stage 2	Max. Storage	= 16,649 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 1.09 hrs



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

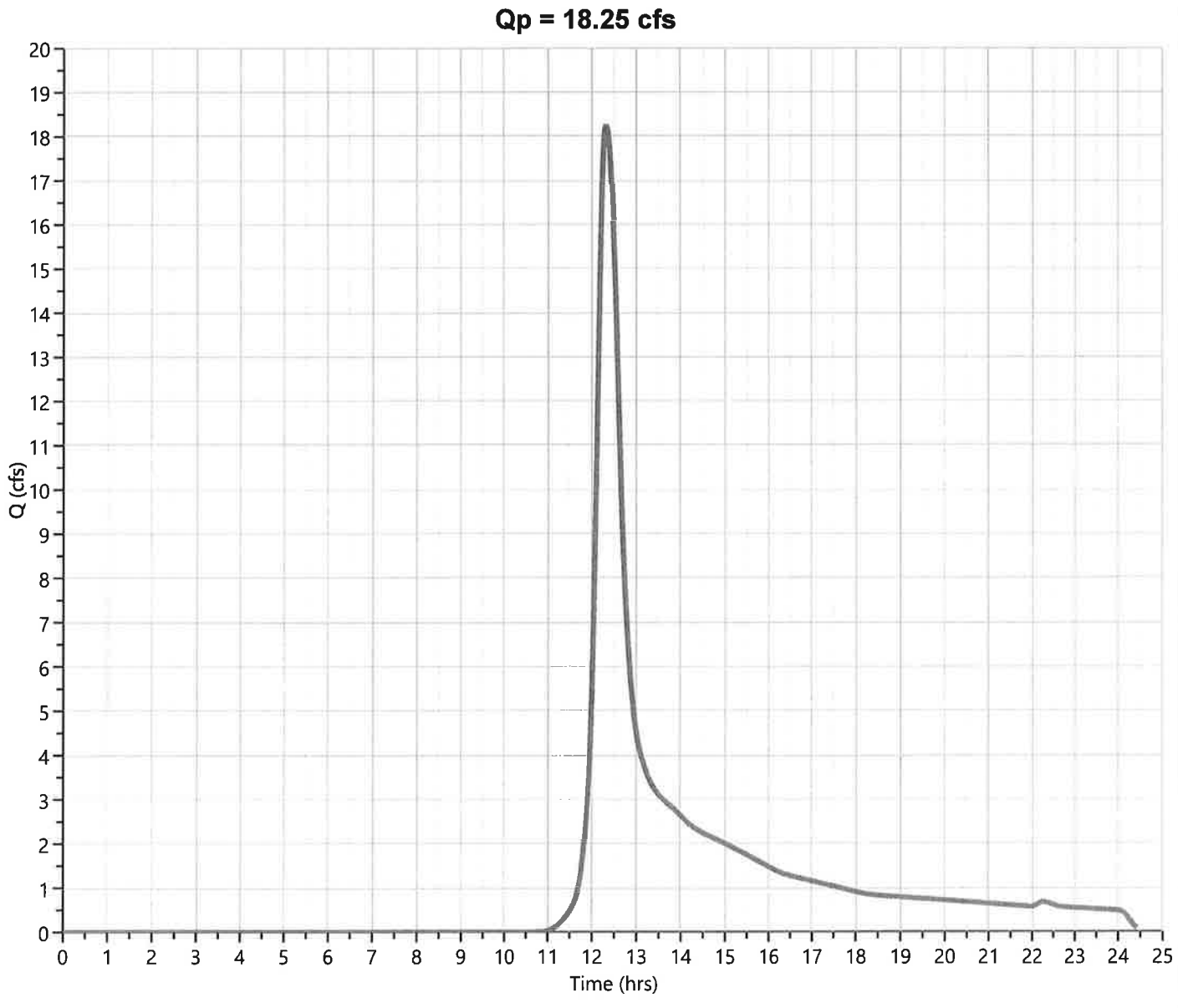
EX-02

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 18.25 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Runoff Volume	= 94,415 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 7.06 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

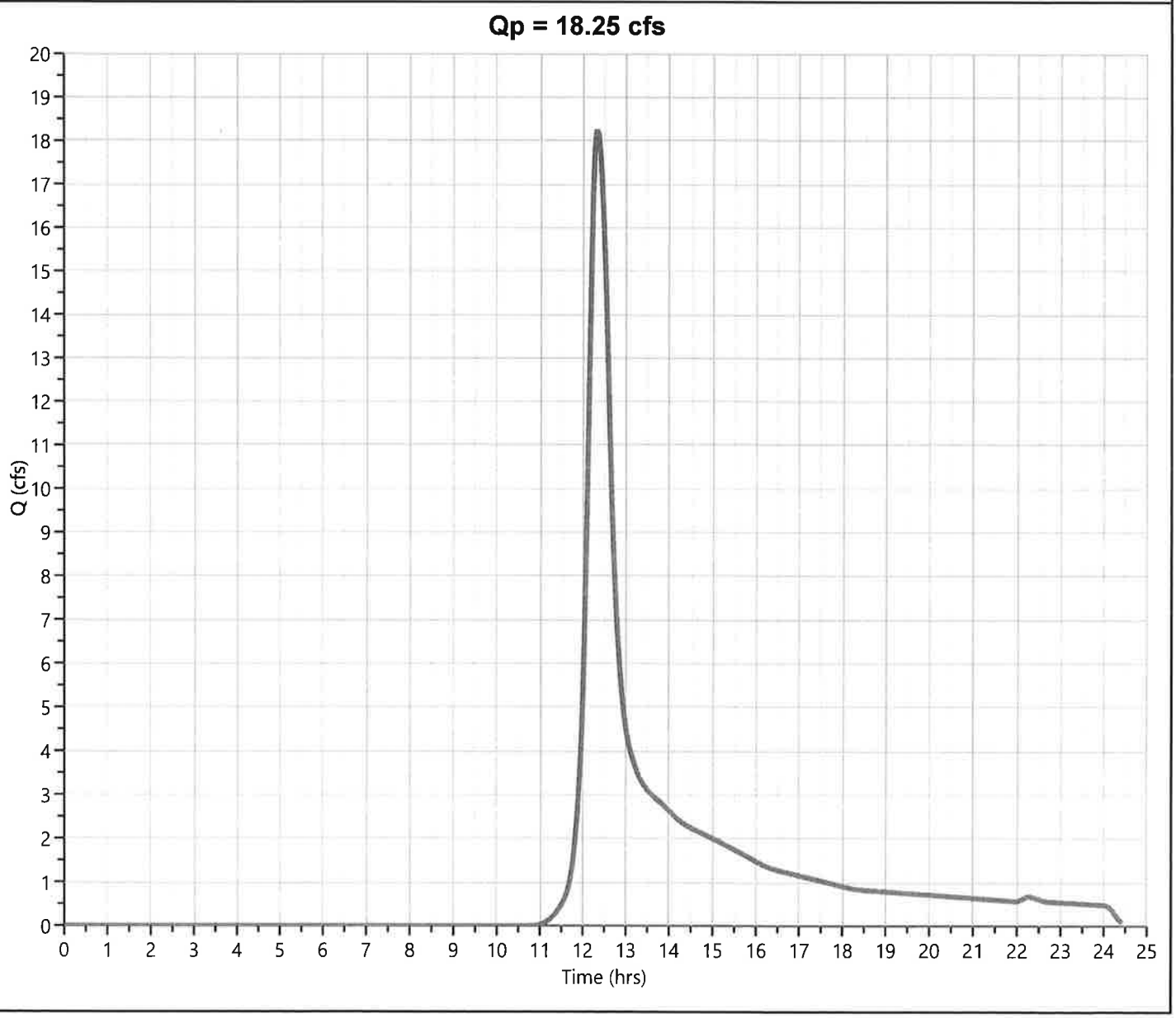
PR-02

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 18.25 cfs
Storm Frequency	= 50-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Runoff Volume	= 94,415 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 7.06 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Design Storm Report

Custom Storm filename:

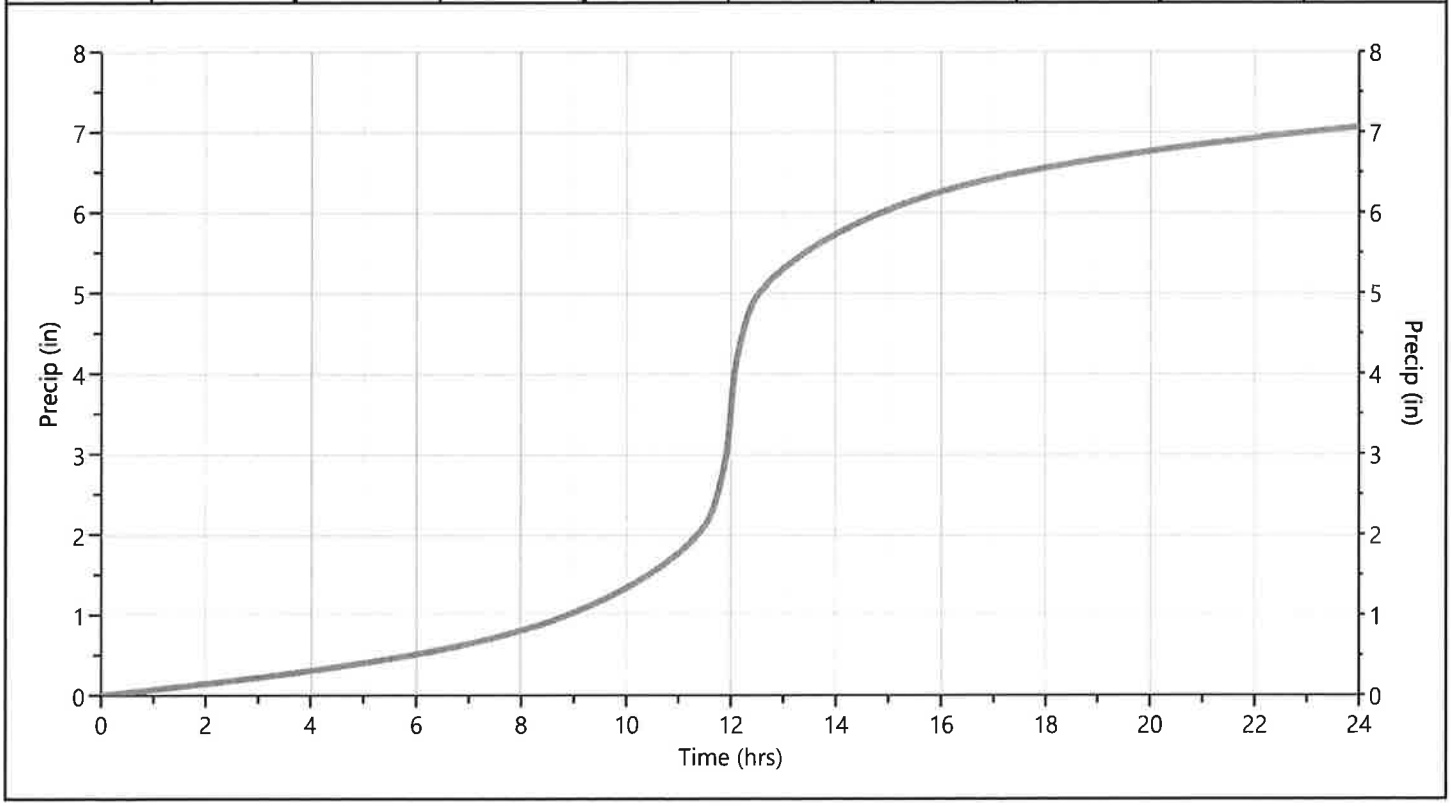
Hydrology Studio v 3.0.0.15

07-13-2020

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	2.87	3.45	0.00	4.39	5.18	6.26	7.06	7.92	

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)
11.50	1.391196	11.68	3.212285	11.87	5.110645	12.05	10.607600	12.23	4.247761
11.52	1.482534	11.70	3.384876	11.88	5.283237	12.07	9.160304	12.25	4.075193
11.53	1.659083	11.72	3.557444	11.90	5.455804	12.08	7.712984	12.27	3.902626
11.55	1.831675	11.73	3.730035	11.92	6.285906	12.10	6.265688	12.28	3.730011
11.57	2.004242	11.75	3.902602	11.93	7.713079	12.12	5.476570	12.30	3.557491
11.58	2.176833	11.77	4.075193	11.95	9.160399	12.13	5.283213	12.32	3.384876
11.60	2.349401	11.78	4.247761	11.97	10.607700	12.15	5.110693	12.33	3.212309
11.62	2.521992	11.80	4.420328	11.98	12.054990	12.17	4.938078	12.35	3.039742
11.63	2.694559	11.82	4.592919	**12.00**	**13.502290**	12.18	4.765511	12.37	2.867126
11.65	2.867150	11.83	4.765487	12.02	13.469890	12.20	4.592896	12.38	2.694559
11.67	3.039718	11.85	4.938078	12.03	12.054900	12.22	4.420376	12.40	2.521992



Hydrograph 100-yr Summary

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

Hyd. No.	Hydrograph Type	Hydrograph Name	Peak Flow (cfs)	Time to Peak (hrs)	Hydrograph Volume (cuft)	Inflow Hyd(s)	Maximum Elevation (ft)	Maximum Storage (cuft)
1	NRCS Runoff	EX-01	15.56	12.33	81,183	----		
2	NRCS Runoff	PR-01	29.62	12.30	147,806	----		
3	Pond Route(i)	INF-01	9.046	12.78	51,196	2	41.19 U 39.04 L	12,524 U 42,943 L
4	Pond Route	POND-01 Stage 2	2.196	13.95	17,658	3	37.33	20,987
5	NRCS Runoff	EX-02	23.58	12.32	119,196	----		
6	NRCS Runoff	PR-02	23.58	12.32	119,196	----		

(i) = Interconnected ponds, U = Upper pond, L = Lower pond

Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

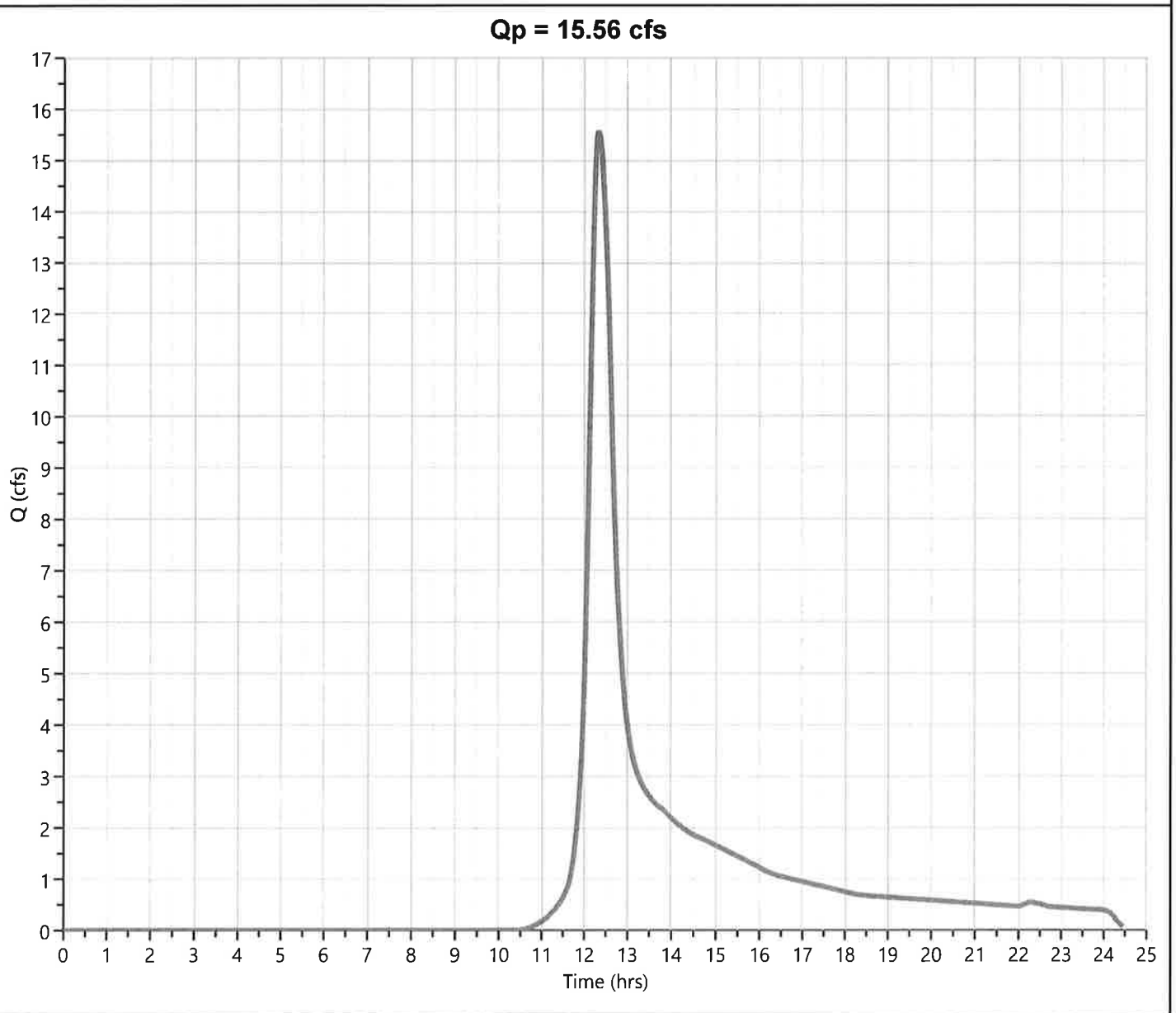
EX-01

Hyd. No. 1

Hydrograph Type	= NRCS Runoff	Peak Flow	= 15.56 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.33 hrs
Time Interval	= 1 min	Runoff Volume	= 81,183 cuft
Drainage Area	= 8.13 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.75 min
Total Rainfall	= 7.92 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
8.13	55	Woods (Good) B Soils
8.13	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

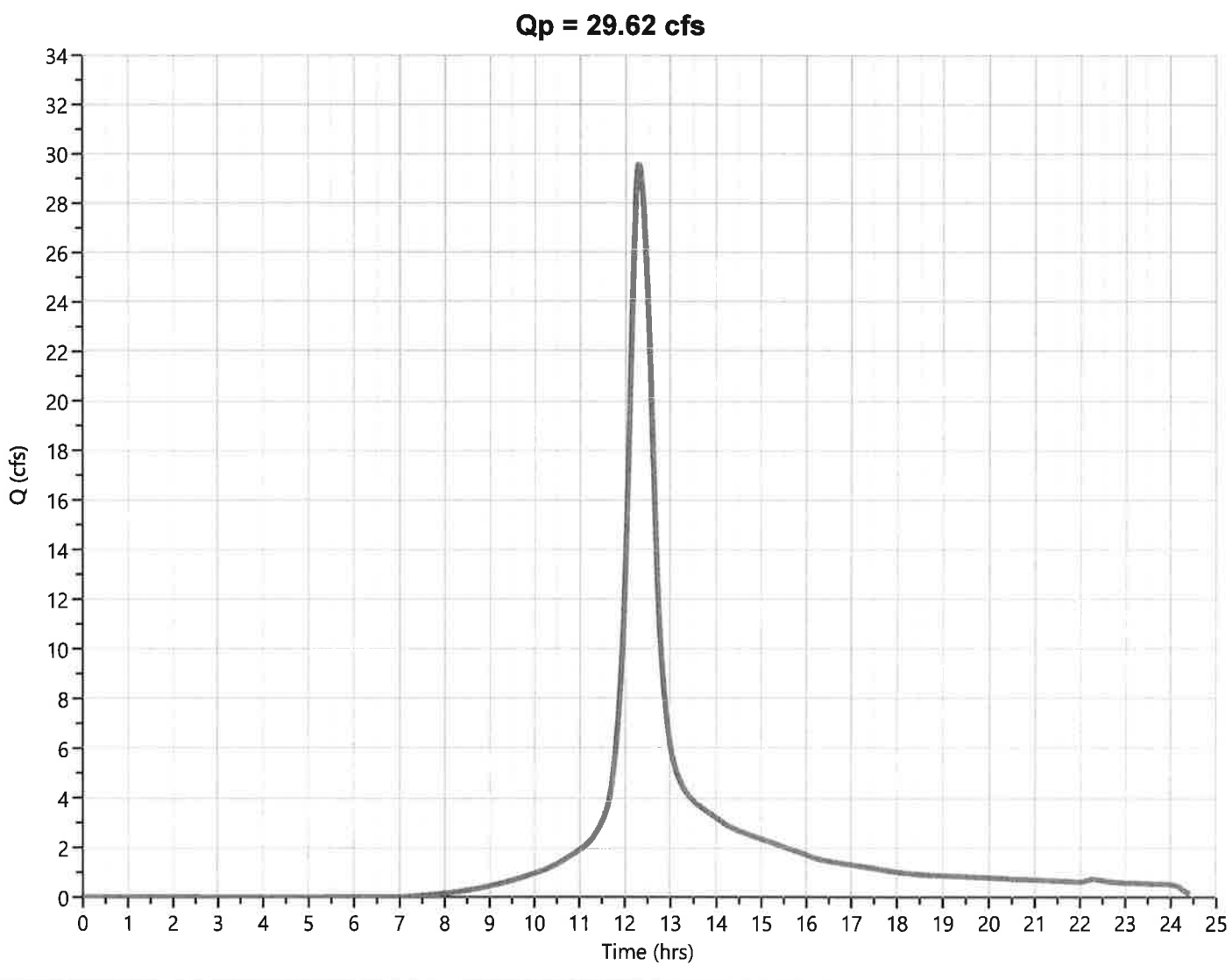
PR-01

Hyd. No. 2

Hydrograph Type	= NRCS Runoff	Peak Flow	= 29.62 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.30 hrs
Time Interval	= 1 min	Runoff Volume	= 147,806 cuft
Drainage Area	= 8.13 ac	Curve Number	= 75*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 25.66 min
Total Rainfall	= 7.92 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
1.242	55	Woods (Good) B Soils
3.58	61	Grass (Good) B Soils
2.147	98	Impervious
1.161	98	Building
8.13	**75**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

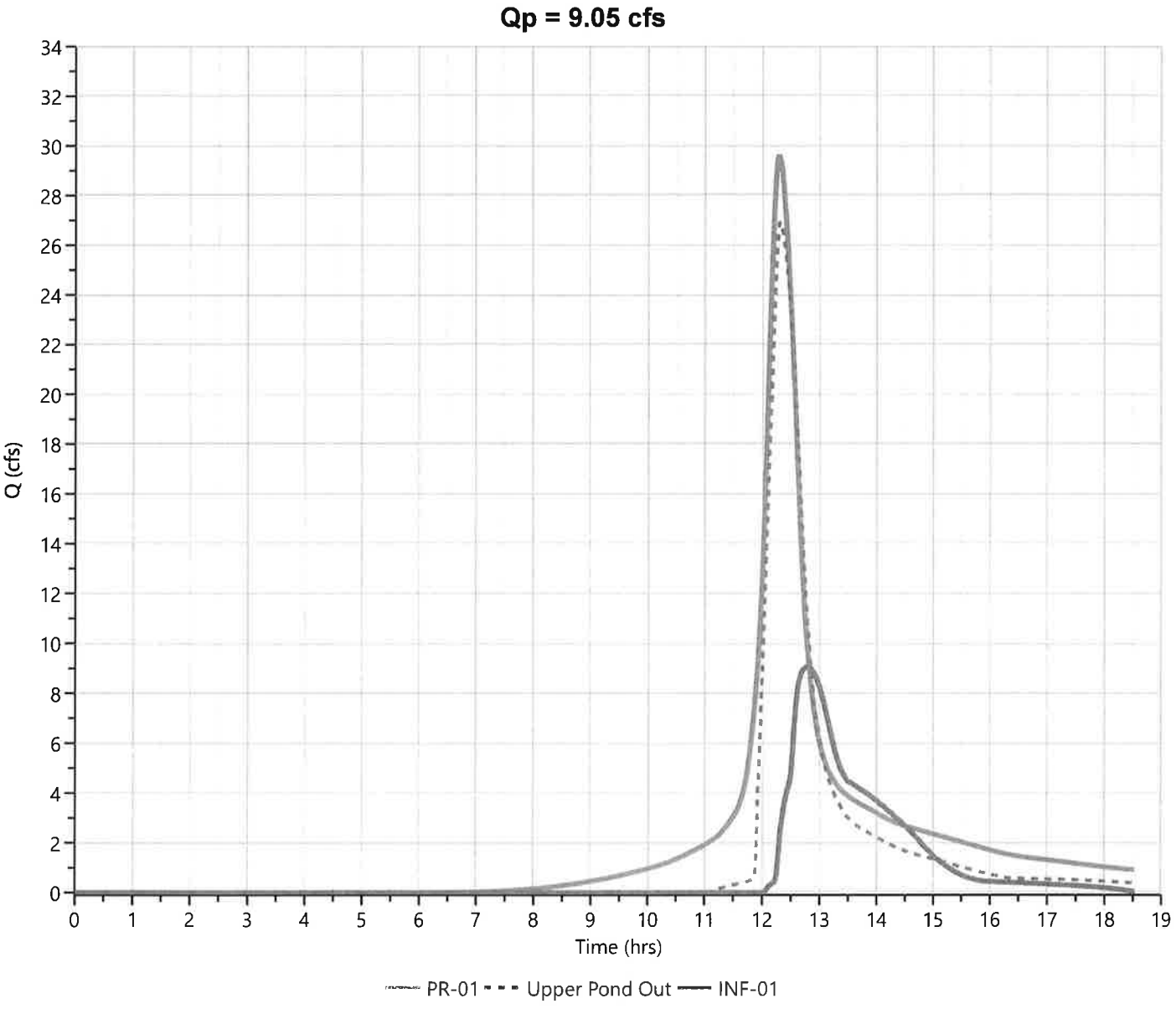
07-13-2020

INF-01

Hyd. No. 3

Hydrograph Type	= Pond Route(i)*	Peak Flow	= 9.046 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.78 hrs
Time Interval	= 1 min	Hydrograph Volume	= 51,196 cuft
Upper Pond		**Lower Pond**	
Pond Name	= POND-01B Stormtech	Pond Name	= POND-01A Stage 2
Inflow Hyd	= 2 - PR-01	Addnl Inflow Hyd	= None
Max. Elevation	= 41.19 ft	Max. Elevation	= 39.04 ft
Max. Storage	= 12,524 cuft	Max. Storage	= 42,943 cuft

**Interconnected Pond Routing by Storage Indication Method.*



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

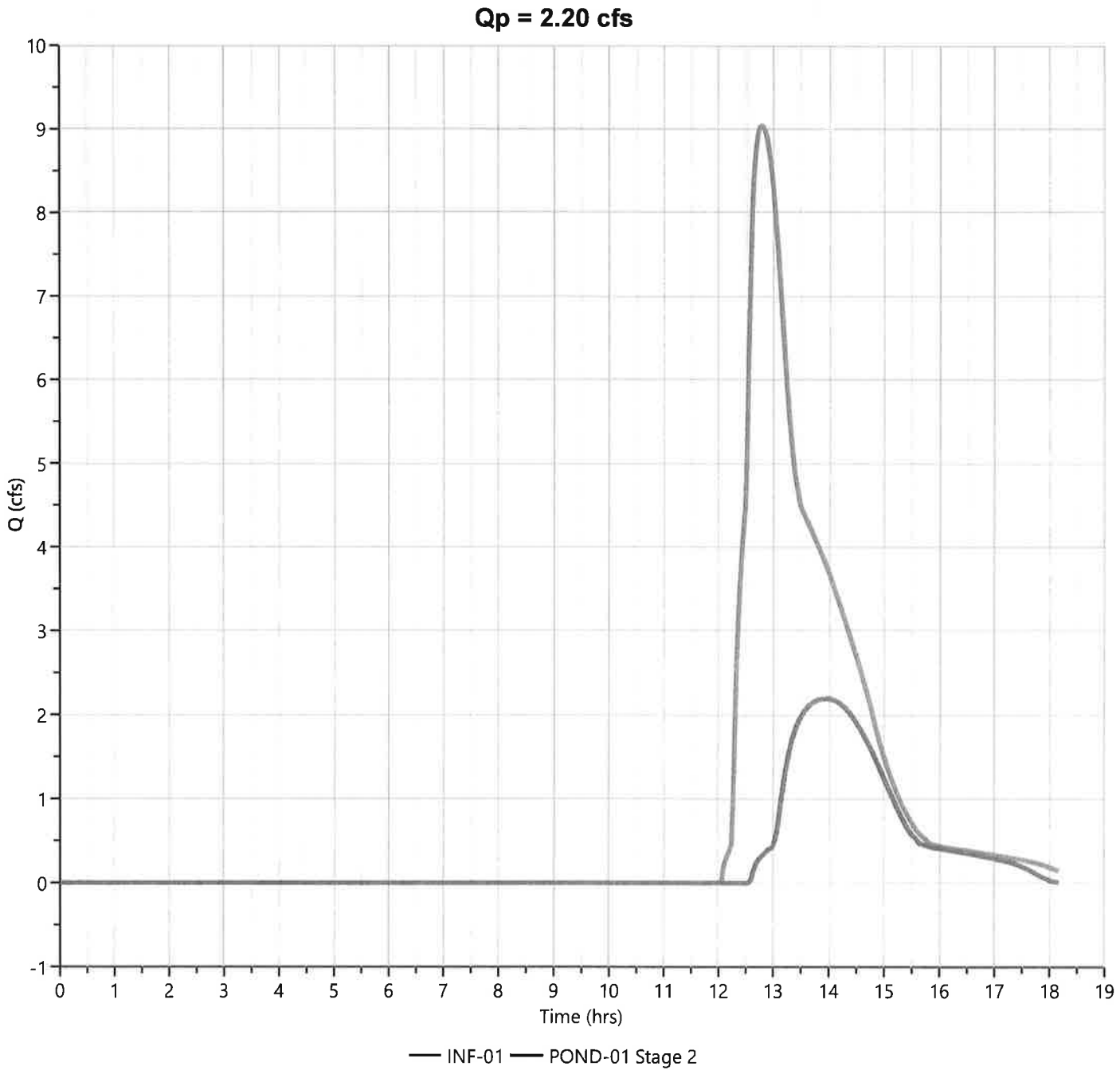
POND-01 Stage 2

Hyd. No. 4

Hydrograph Type	= Pond Route	Peak Flow	= 2.196 cfs
Storm Frequency	= 100-yr	Time to Peak	= 13.95 hrs
Time Interval	= 1 min	Hydrograph Volume	= 17,658 cuft
Inflow Hydrograph	= 3 - INF-01	Max. Elevation	= 37.33 ft
Pond Name	= POND-01A Stage 2	Max. Storage	= 20,987 cuft

Pond Routing by Storage Indication Method

Center of mass detention time = 50 min



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

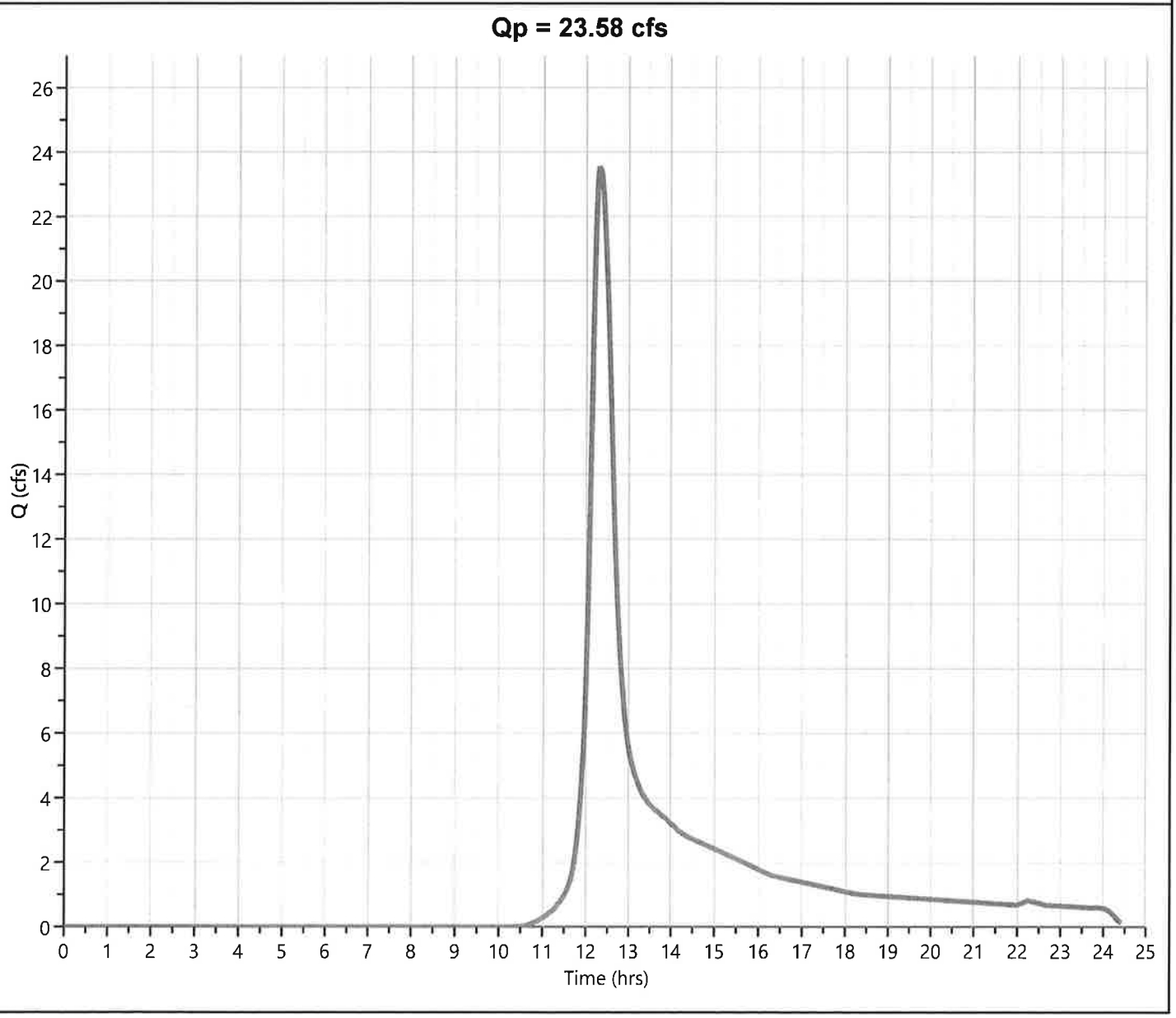
EX-02

Hyd. No. 5

Hydrograph Type	= NRCS Runoff	Peak Flow	= 23.58 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Runoff Volume	= 119,196 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 7.92 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Hydrograph Report

Project Name:

Hydrology Studio v 3.0.0.15

07-13-2020

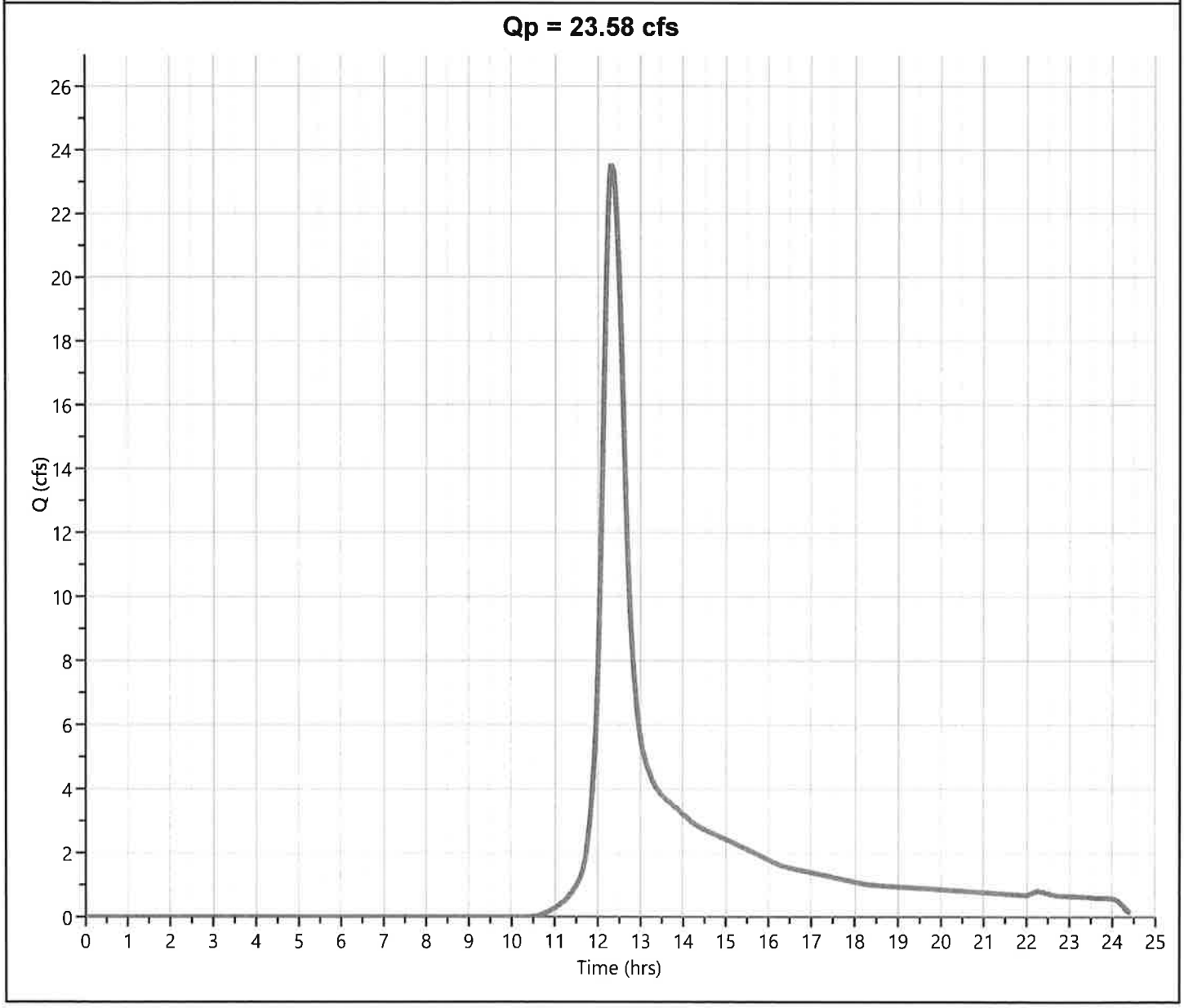
PR-02

Hyd. No. 6

Hydrograph Type	= NRCS Runoff	Peak Flow	= 23.58 cfs
Storm Frequency	= 100-yr	Time to Peak	= 12.32 hrs
Time Interval	= 1 min	Runoff Volume	= 119,196 cuft
Drainage Area	= 12.03 ac	Curve Number	= 55*
Tc Method	= TR55 (See Worksheet)	Time of Conc. (Tc)	= 24.77 min
Total Rainfall	= 7.92 in	Design Storm	= Type III
Storm Duration	= 24 hrs	Shape Factor	= 484

*** Composite CN Worksheet**

AREA (ac)	CN	DESCRIPTION
12.03	55	Woods (Good) B Soils
12.03	**55**	Weighted CN Method Employed



Design Storm Report

Custom Storm filename:

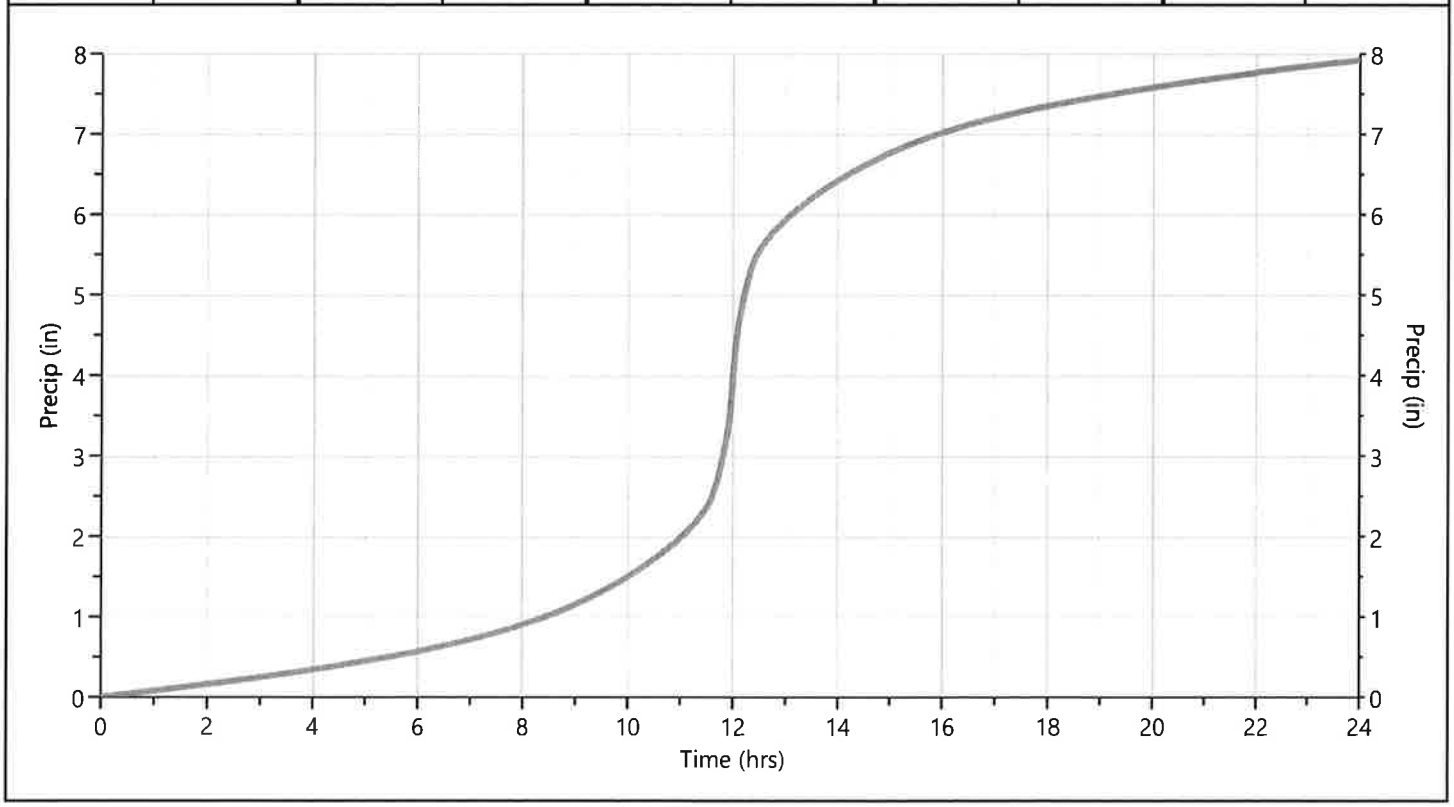
Hydrology Studio v 3.0.0.15

07-13-2020

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	2.87	3.45	0.00	4.39	5.18	6.26	7.06	7.92	

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)
11.50	1.560664	11.68	3.603578	11.87	5.733180	12.05	11.899760	12.23	4.765224
11.52	1.663113	11.70	3.797197	11.88	5.926800	12.07	10.276170	12.25	4.571629
11.53	1.861191	11.72	3.990793	11.90	6.120396	12.08	8.652544	12.27	4.377985
11.55	2.054811	11.73	4.184389	11.92	7.051611	12.10	7.028913	12.28	4.184389
11.57	2.248383	11.75	4.378009	11.93	8.652639	12.12	6.143665	12.30	3.990841
11.58	2.442002	11.77	4.571581	11.95	10.276250	12.13	5.926800	12.32	3.797197
11.60	2.635598	11.78	4.765201	11.97	11.899850	12.15	5.733204	12.33	3.603601
11.62	2.829194	11.80	4.958797	11.98	13.523440	12.17	5.539608	12.35	3.410006
11.63	3.022790	11.82	5.152392	**12.00**	**15.147040**	12.18	5.346012	12.37	3.216410
11.65	3.216386	11.83	5.345988	12.02	15.110680	12.20	5.152416	12.38	3.022814
11.67	3.410006	11.85	5.539608	12.03	13.523340	12.22	4.958773	12.40	2.829218



IDF Report

IDF filename: North Bride Brook.idf

Hydrology Studio v 3.0.0.15

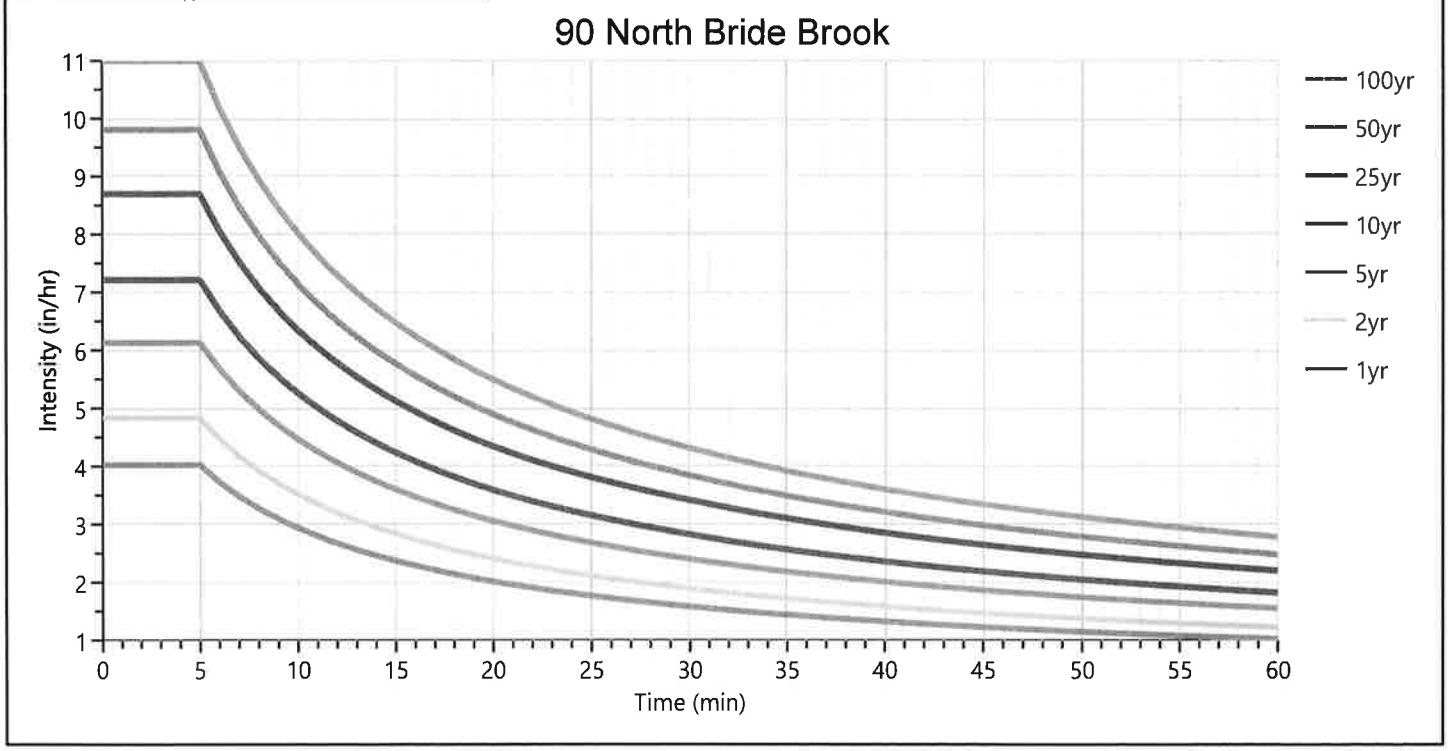
07-13-2020

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	17.5984	20.9091	0.0000	26.4767	31.2276	38.1139	42.3627	48.2349	
D	3.6000	3.5000	0.0000	3.5000	3.5000	3.6000	3.5000	3.6000	
E	0.6858	0.6845	0.0000	0.6837	0.6848	0.6868	0.6837	0.6872	

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	4.83	0	6.13	7.21	8.69	9.81	10.99	
10	2.94	3.52	0	4.47	5.25	6.35	7.15	8.02	
15	2.37	2.84	0	3.60	4.23	5.12	5.76	6.47	
20	2.01	2.41	0	3.06	3.59	4.35	4.89	5.49	
25	1.76	2.11	0	2.68	3.15	3.81	4.29	4.81	
30	1.58	1.89	0	2.40	2.82	3.41	3.84	4.31	
35	1.44	1.72	0	2.18	2.56	3.10	3.49	3.92	
40	1.32	1.58	0	2.01	2.36	2.85	3.21	3.60	
45	1.23	1.47	0	1.86	2.19	2.65	2.98	3.34	
50	1.15	1.37	0	1.74	2.05	2.47	2.79	3.13	
55	1.08	1.29	0	1.64	1.93	2.33	2.62	2.94	
60	1.02	1.22	0	1.55	1.82	2.20	2.48	2.78	

Cf = Correction Factor applied to Rational Method runoff coefficient



Precipitation Report

Precipitation filename: North Bride Brook.pcp

Hydrology Studio v 3.0.0.15 (Rainfall totals in Inches)

07-13-2020

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✔	✔		✔	✔	✔	✔	✔
SCS Storms	**> SCS Dimensionless Storms**								
SCS 6hr		1.97	2.36	0	2.99	3.51	4.23	4.77	5.35
Type I, 24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
Type IA, 24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
Type II, 24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
Type II FL, 24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
Type III, 24-hr	✔	2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
Synthetic Storms	**> IDF-Based Synthetic Storms**								
1-hr		1.02	1.22	0	1.55	1.82	2.20	2.48	2.78
2-hr		1.29	1.55	0	1.97	2.31	2.79	3.15	3.52
3-hr		1.48	1.77	0	2.25	2.64	3.19	3.60	4.03
6-hr		1.85	2.22	0	2.82	3.31	3.99	4.51	5.03
12-hr		2.31	2.77	0	3.52	4.13	4.97	5.64	6.27
24-hr		2.88	3.45	0	4.40	5.14	6.18	7.03	7.81
Huff Distribution	**> 1st Quartile (0 to 6 hrs)**								
1-hr		1.02	1.22	0	1.55	1.82	2.20	2.48	2.78
2-hr		1.33	1.60	0	2.03	2.39	2.88	3.25	3.65
3-hr		1.55	1.85	0	2.36	2.77	3.34	3.77	4.23
6-hr		1.97	2.36	0	2.99	3.51	4.23	4.77	5.35
Huff Distribution	**> 2nd Quartile (>6 to 12 hrs)**								
8-hr		0	0	0	0	0	0	0	0
12-hr		2.45	2.92	0	3.70	4.35	5.23	5.90	6.60
Huff Distribution	**> 3rd Quartile (>12 to 24 hrs)**								
18-hr		0	0	0	0	0	0	0	0
24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
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

Precipitation Report Cont'd

Precipitation filename: North Bride Brook.pcp

Rainfall totals in Inches

07-13-2020

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✔	✔		✔	✔	✔	✔	✔
Huff Indiana	**> Indianapolis**								
30-min		0.79	0.95	0	1.20	1.41	1.70	1.92	2.15
1-hr		1.02	1.22	0	1.55	1.82	2.20	2.48	2.78
2-hr		1.33	1.60	0	2.03	2.39	2.88	3.25	3.65
3-hr		1.55	1.85	0	2.36	2.77	3.34	3.77	4.23
6-hr		1.97	2.36	0	2.99	3.51	4.23	4.77	5.35
12-hr		2.45	2.92	0	3.70	4.35	5.23	5.90	6.60
24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
Huff Indiana	**> Evansville**								
30-min		0.79	0.95	0	1.20	1.41	1.70	1.92	2.15
1-hr		1.02	1.22	0	1.55	1.82	2.20	2.48	2.78
2-hr		1.33	1.60	0	2.03	2.39	2.88	3.25	3.65
3-hr		1.55	1.85	0	2.36	2.77	3.34	3.77	4.23
6-hr		1.97	2.36	0	2.99	3.51	4.23	4.77	5.35
12-hr		2.45	2.92	0	3.70	4.35	5.23	5.90	6.60
24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
Huff Indiana	**> Fort Wayne**								
30-min		0.79	0.95	0	1.20	1.41	1.70	1.92	2.15
1-hr		1.02	1.22	0	1.55	1.82	2.20	2.48	2.78
2-hr		1.33	1.60	0	2.03	2.39	2.88	3.25	3.65
3-hr		1.55	1.85	0	2.36	2.77	3.34	3.77	4.23
6-hr		1.97	2.36	0	2.99	3.51	4.23	4.77	5.35
12-hr		2.45	2.92	0	3.70	4.35	5.23	5.90	6.60
24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
Huff Indiana	**> South Bend**								
30-min		0.79	0.95	0	1.20	1.41	1.70	1.92	2.15
1-hr		1.02	1.22	0	1.55	1.82	2.20	2.48	2.78
2-hr		1.33	1.60	0	2.03	2.39	2.88	3.25	3.65
3-hr		1.55	1.85	0	2.36	2.77	3.34	3.77	4.23
6-hr		1.97	2.36	0	2.99	3.51	4.23	4.77	5.35
12-hr		2.45	2.92	0	3.70	4.35	5.23	5.90	6.60
24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92

Precipitation Report Cont'd

Precipitation filename: North Bride Brook.pcp

Rainfall totals in Inches

07-13-2020

	Active	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
Active		✔	✔		✔	✔	✔	✔	✔
NRCS Storms	**> NRCS Dimensionless Storms**								
NRCS MSE3, 24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
NRCS MSE4, 24-hr		2.87	3.45	0	4.39	5.18	6.26	7.06	7.92
NRCS MSE3, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NRCS MSE4, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NRCS MSE5, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NRCS MSE6, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NOAA-A, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NOAA-B, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NOAA-C, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NOAA-D, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NRCC-A, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NRCC-B, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NRCC-C, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
NRCC-D, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
CA-1, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
CA-2, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
CA-3, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
CA-4, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
CA-5, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15
CA-6, 24-hr		2.72	3.27	0	4.07	4.72	5.63	6.37	7.15

STORMWATER TREATMENT CALCULATIONS [AREA PR-01]

Compute Water Quality Volume

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

WQV = Water Quality Volume (acre-feet)
R = Volumetric Runoff Coefficient, 0.050 + 0.009(I)
I = Percent Impervious Cover, Impervious Area / Total Area
DA = Drainage Area (Acres) — DA = **8.130** acres
IA = Impervious Area (Acres) — IA = **3.308** acres

Determine Percent Impervious Cover (I)

I = 41%

Calculate Volumetric Runoff Coefficient (R)

R = 0.42

Calculate Water Quality Volume

WQV = 0.282 acre-feet

Compute Runoff Depth

$$Q_{(in)} = \frac{(WQV \times 12)}{DA}$$

Q = Runoff Depth (in watershed inches)
WQV = Water Quality Volume (acre-feet)
DA = Drainage Area (acres)

$Q_{(in)}$ = 0.42 watershed inches

Determine NCRS Curve Number (CN)

$Q_{(in)}$ = 0.42 watershed inches P = 1 in

From Appendix B, Figure 2-1 of the 2004 Connecticut Stormwater Manual

CN = **92**

Determine Initial Abstraction (I_a)

From Appendix B, Table 4-1 of the 2004 Connecticut Stormwater Manual

I_a = **0.174** inches

Determine Unit Peak Discharge (q_u)

Time of Concentration (T_c), referenced from Pipe Flow Calculation Worksheet

T_c = **0.43** hours

I_a/P = 0.174

From Appendix B, Exhibit 4-111 of the 2004 Connecticut Stormwater Manual

q_u = **410** csm/in

Compute Water Quality Flow

$$WQF = q_u \times DA \times Q_{(in)}$$

WQF = Water Quality Flow (cfs)
qu = unit peak discharge (cfs/mi^2/inch)
DA = drainage area (mi^2)
Q(in) = runoff depth (watershed inches)

WQF = 2.168 **cfs**

Figure 2-1 Solution of Runoff Equation

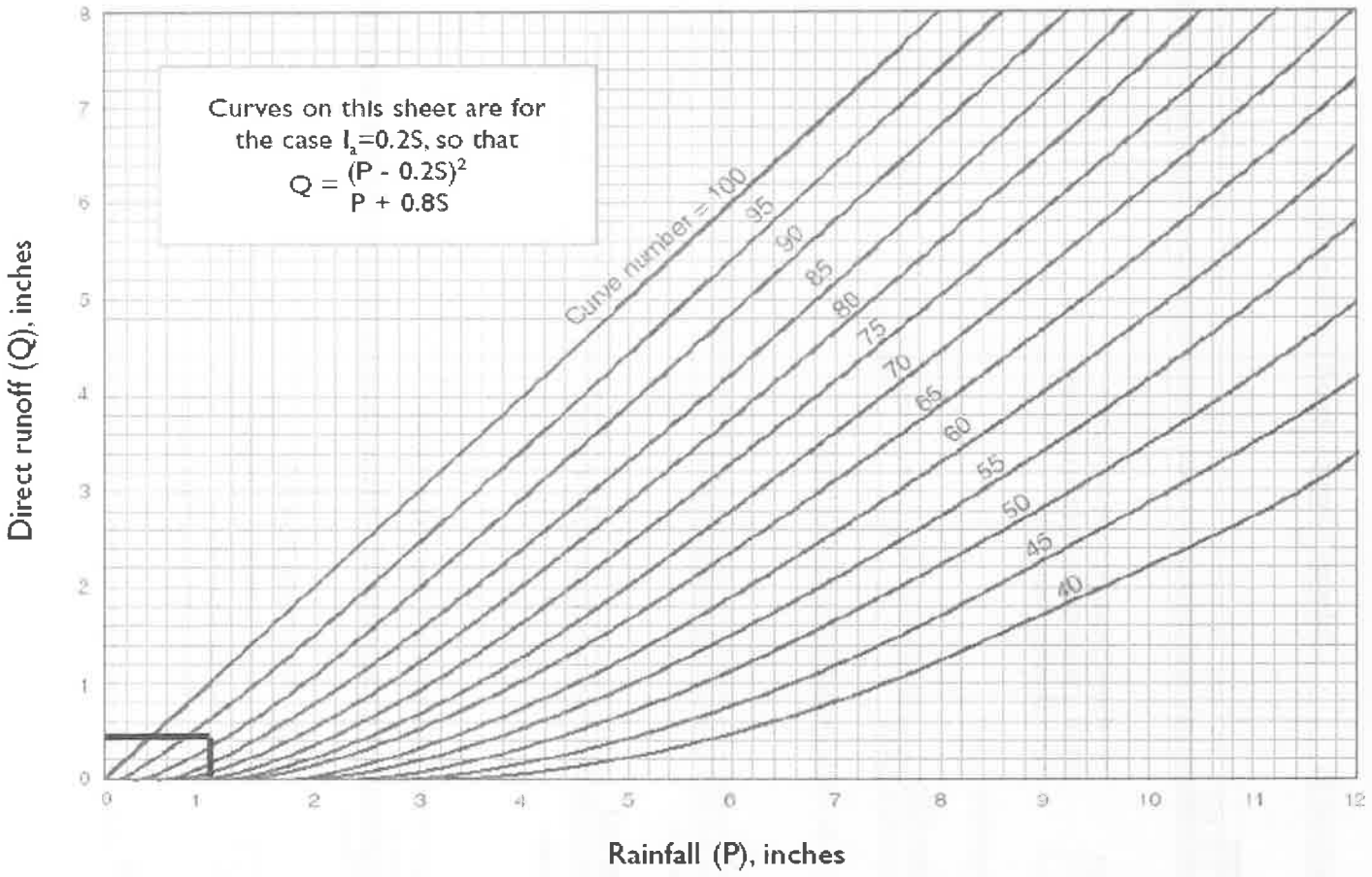
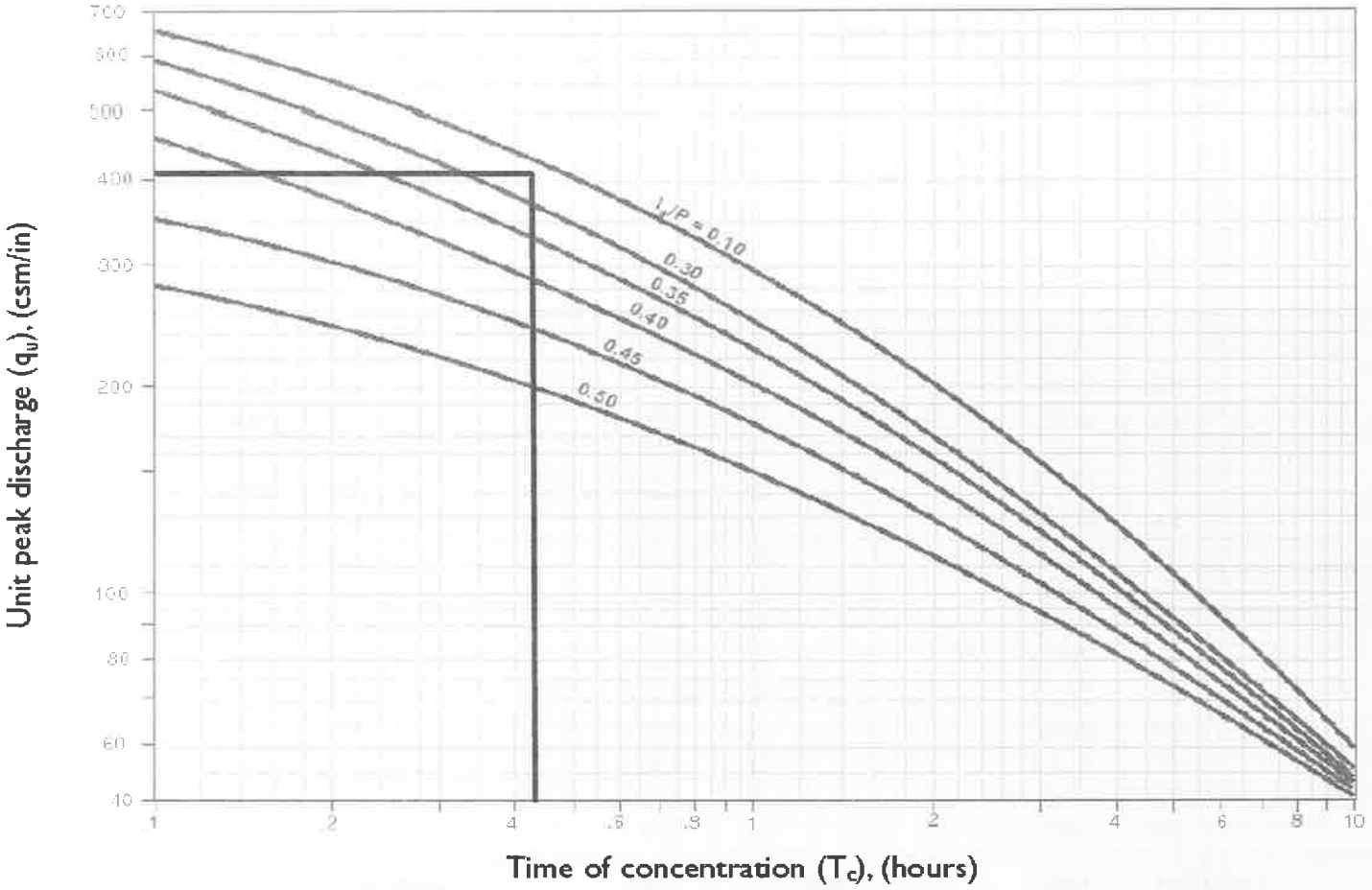


Table 4-1 I_a values for runoff curve numbers

Curve number	I_a (in)	Curve number	I_a (in)	Curve number	I_a (in)	Curve number	I_a (in)
40	3.000	55	1.636	70	0.857	85	0.353
41	2.878	56	1.571	71	0.817	86	0.326
42	2.762	57	1.509	72	0.778	87	0.299
43	2.651	58	1.448	73	0.740	88	0.273
44	2.545	59	1.390	74	0.703	89	0.247
45	2.444	60	1.333	75	0.667	90	0.222
46	2.348	61	1.279	76	0.632	91	0.198
47	2.255	62	1.226	77	0.597	92	0.174
48	2.167	63	1.175	78	0.564	93	0.151
49	2.082	64	1.125	79	0.532	94	0.128
50	2.000	65	1.077	80	0.500	95	0.105
51	1.922	66	1.030	81	0.469	96	0.083
52	1.846	67	0.985	82	0.439	97	0.062
53	1.774	68	0.941	83	0.410	98	0.041
54	1.704	69	0.899	84	0.381		

Exhibit 4-111 Unit peak discharge (q_u) for NRCS (SCS) type III rainfall distribution



Return to Outlet Treatment Summary

StormTech®

Detention • Retention • Water Quality

Division of ADS

STORMTECH ISOLATOR ROW SIZING CHART						
	SC-160LP	SC-310	SC-740	DC-780	MC-3500	MC-4500
Chamber Area (Sq.Ft.)	11.4	20	27.8	27.8	43.2	30.1
Treated Flow Rate per chamber (CFS)	0.055	0.11	0.15	0.15	0.24	0.17

NOTE: *Testing of the Isolator Row verified by NJCAT.It has shown to have a TSS removal efficiency of 84% for SIL-CO-SIL 250. MASTEP verification of up to 83% TSS of the OK-110.*

NJCAT verified Treated Flow Rate (GPM / Sq.Ft.) 2.5

ISOLATOR ROW SIZING (MIN. # CHAMBERS)

MODEL	WQF	# CHAMBERS
SC-160LP	2.17	39.41
SC-310	2.17	19.71
SC-740	2.17	14.45
DC-780	2.17	14.45
MC-3500	2.17	9.03
MC-4500	2.17	12.75

YRC
YANTIC RIVER
CONSULTANTS, LLC

APPENDIX C
SUPPLEMENTAL DATA

NRCS SOIL DATA
NOAA RAINFALL DATA

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for State of Connecticut

NORTH BRIDE BROOK

November 15, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (North Bride Brook Road)

Map Scale: 1:3,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 150 300 600 900

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

MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: State of Connecticut
Survey Area Data: Version 19, Sep 13, 2019

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

Date(s) aerial images were photographed: Mar 20, 2019—Mar 27, 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.

Map Unit Legend (North Bride Brook Road)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	0.2	0.8%
34B	Merrimac fine sandy loam, 3 to 8 percent slopes	0.4	1.1%
38C	Hinckley loamy sand, 3 to 15 percent slopes	2.4	7.3%
38E	Hinckley loamy sand, 15 to 45 percent slopes	0.0	0.0%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	21.2	65.3%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	4.4	13.4%
306	Udorthents-Urban land complex	0.4	1.2%
703A	Haven silt loam, 0 to 3 percent slopes	3.6	11.0%
Totals for Area of Interest		**32.5**	**100.0%**

Map Unit Descriptions (North Bride Brook Road)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different

management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut

3—Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony

Map Unit Setting

National map unit symbol: 2t2qt
Elevation: 0 to 1,480 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Ridgebury, extremely stony, and similar soils: 40 percent
Leicester, extremely stony, and similar soils: 35 percent
Whitman, extremely stony, and similar soils: 17 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury, Extremely Stony

Setting

Landform: Ground moraines, drumlins, drainageways, depressions, hills
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: fine sandy loam
Bw - 6 to 10 inches: sandy loam
Bg - 10 to 19 inches: gravelly sandy loam
Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 15 to 35 inches to densic material
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D
Hydric soil rating: Yes

Description of Leicester, Extremely Stony

Setting

Landform: Hills, ground moraines, drainageways, depressions
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave
Parent material: Coarse-loamy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 7 inches: fine sandy loam
Bg - 7 to 18 inches: fine sandy loam
BC - 18 to 24 inches: fine sandy loam
C1 - 24 to 39 inches: gravelly fine sandy loam
C2 - 39 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 0 to 8 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: High (about 9.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Description of Whitman, Extremely Stony

Setting

Landform: Hills, ground moraines, drumlins, drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 1 inches: peat
A - 1 to 10 inches: fine sandy loam
Bg - 10 to 17 inches: gravelly fine sandy loam

Cdg - 17 to 61 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Percent of area covered with surface fragments: 9.0 percent
Depth to restrictive feature: 7 to 38 inches to densic material
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: Yes

Minor Components

Woodbridge, extremely stony

Percent of map unit: 6 percent
Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Swansea

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

34B—Merrimac fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyqs
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days

Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Merrimac

Setting

Landform: Outwash plains, kames, eskers, outwash terraces, moraines
Landform position (two-dimensional): Backslope, footslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Sudbury

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

Hinckley

Percent of map unit: 5 percent
Landform: Outwash plains, kames, deltas, eskers
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, rise
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Windsor

Percent of map unit: 3 percent
Landform: Outwash plains, dunes, deltas, outwash terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Agawam

Percent of map unit: 2 percent
Landform: Outwash terraces, moraines, outwash plains, kames, stream terraces, eskers
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

38C—Hinckley loamy sand, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2svmb
Elevation: 0 to 1,290 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

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

Description of Hinckley

Setting

Landform: Eskers, outwash terraces, kames, kame terraces, outwash plains, moraines, outwash deltas
Landform position (two-dimensional): Footslope, toeslope, shoulder, backslope, summit

Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser, tread
Down-slope shape: Convex, concave, linear
Across-slope shape: Concave, linear, convex
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Windsor

Percent of map unit: 5 percent
Landform: Moraines, outwash terraces, eskers, kames, kame terraces, outwash plains, outwash deltas
Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope, summit
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser, tread
Down-slope shape: Convex, linear, concave
Across-slope shape: Linear, convex, concave
Hydric soil rating: No

Merrimac

Percent of map unit: 5 percent
Landform: Outwash terraces, kames, moraines, outwash plains, eskers
Landform position (two-dimensional): Backslope, footslope, shoulder, toeslope, summit
Landform position (three-dimensional): Side slope, crest, head slope, nose slope, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex

Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Eskers, outwash terraces, kames, kame terraces, outwash plains, moraines, outwash deltas
Landform position (two-dimensional): Shoulder, backslope, toeslope, summit, footslope
Landform position (three-dimensional): Crest, head slope, nose slope, side slope, riser, tread
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent
Landform: Outwash deltas, outwash terraces, kame terraces, outwash plains, moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Hydric soil rating: No

38E—Hinckley loamy sand, 15 to 45 percent slopes

Map Unit Setting

National map unit symbol: 2svmj
Elevation: 0 to 1,280 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, eskers, kames, kame terraces, outwash plains, moraines
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser
Down-slope shape: Linear, convex, concave
Across-slope shape: Linear, concave, convex

Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Merrimac

Percent of map unit: 5 percent
Landform: Eskers, outwash terraces, kames, moraines, outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope, nose slope, crest, riser
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash deltas, moraines, outwash terraces, eskers, kames, kame terraces, outwash plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, riser
Down-slope shape: Convex, linear, concave
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Kame terraces, outwash terraces, eskers, kames, outwash plains, moraines, outwash deltas

Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Nose slope, side slope, crest, head slope, riser
Down-slope shape: Linear, convex, concave
Across-slope shape: Convex, linear, concave
Hydric soil rating: No

Sudbury

Percent of map unit: 2 percent
Landform: Kame terraces, outwash plains, outwash deltas, outwash terraces, eskers, kames, moraines
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear, concave
Across-slope shape: Concave, linear
Hydric soil rating: No

73C—Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky

Map Unit Setting

National map unit symbol: 2w698
Elevation: 0 to 1,550 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Charlton, very stony, and similar soils: 50 percent
Chatfield, very stony, and similar soils: 30 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material
A - 2 to 4 inches: fine sandy loam
Bw - 4 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Chatfield, Very Stony

Setting

Landform: Hills, ridges
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 3 to 15 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Sutton, very stony
Percent of map unit: 5 percent
Landform: Hills, ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop
Percent of map unit: 5 percent
Hydric soil rating: No

Hollis, very stony
Percent of map unit: 5 percent
Landform: Ridges, hills
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Leicester, very stony
Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

73E—Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky

Map Unit Setting
National map unit symbol: 9lql
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition
Charlton and similar soils: 45 percent
Chatfield and similar soils: 30 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 7 inches: fine sandy loam
Bw2 - 7 to 19 inches: fine sandy loam
Bw3 - 19 to 27 inches: gravelly fine sandy loam
C - 27 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 15 to 45 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Chatfield

Setting

Landform: Ridges, hills
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy melt-out till derived from granite and/or schist and/or gneiss

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material
A - 1 to 6 inches: gravelly fine sandy loam
Bw1 - 6 to 15 inches: gravelly fine sandy loam
Bw2 - 15 to 29 inches: gravelly fine sandy loam
2R - 29 to 80 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Percent of area covered with surface fragments: 1.6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 10 percent
Hydric soil rating: No

Leicester

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Sutton

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

Hollis

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

Unnamed, sandy subsoil

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, red parent material

Percent of map unit: 1 percent
Hydric soil rating: No

306—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 9lmg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Typical profile

H - 0 to 6 inches: material

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils

Percent of map unit: 8 percent
Hydric soil rating: No

Udorthents, wet substratum

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

Rock outcrop

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

703A—Haven silt loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2y07k
Elevation: 0 to 1,200 feet
Mean annual precipitation: 43 to 54 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

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

Description of Haven

Setting

Landform: Outwash terraces, outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear

Parent material: Coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss

Typical profile

Ap - 0 to 7 inches: silt loam
Bw1 - 7 to 14 inches: silt loam
Bw2 - 14 to 20 inches: silt loam
BC - 20 to 24 inches: fine sandy loam
2C - 24 to 60 inches: stratified very gravelly sand to gravelly fine sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 18 to 36 inches to strongly contrasting textural stratification
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Enfield

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

Tisbury

Percent of map unit: 5 percent
Landform: Valley trains, outwash terraces, outwash plains, deltas
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: No

Agawam

Percent of map unit: 3 percent
Landform: Outwash terraces, kames, moraines, outwash plains, kame terraces
Landform position (two-dimensional): Summit, shoulder
Landform position (three-dimensional): Side slope, crest, tread
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Raypol

Percent of map unit: 2 percent

Landform: Depressions, drainageways
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Physical Properties

Soil Physical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Saturated Hydraulic Conductivity (Ksat), Standard Classes (North Bride Brook Road)

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity is considered in the design of soil drainage systems and septic tank absorption fields.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

The numeric Ksat values have been grouped according to standard Ksat class limits. The classes are:

Very low: 0.00 to 0.01

Low: 0.01 to 0.1

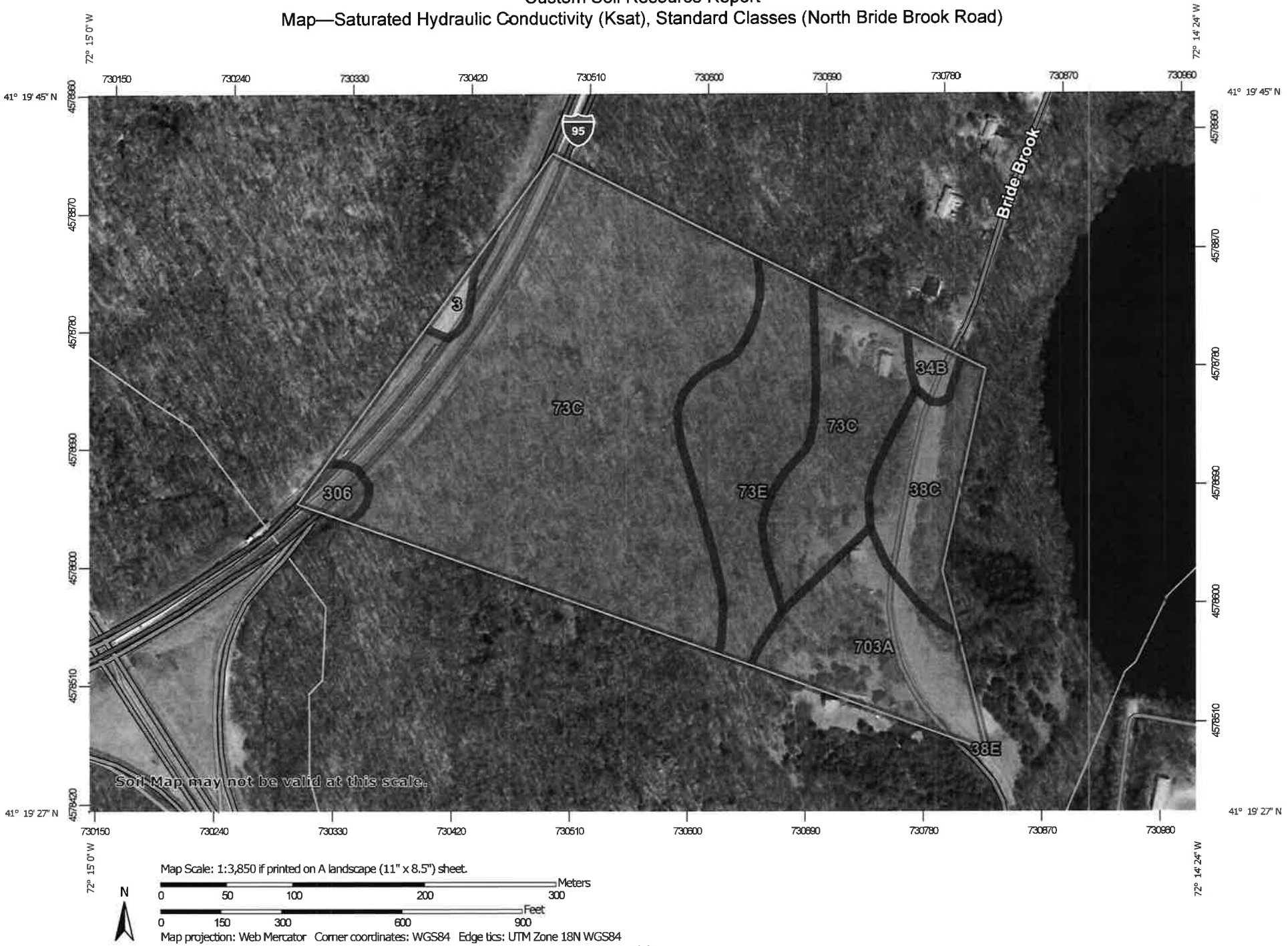
Moderately low: 0.1 to 1.0

Moderately high: 1 to 10

High: 10 to 100

Very high: 100 to 705

Map—Saturated Hydraulic Conductivity (Ksat), Standard Classes (North Bride Brook Road)



Map Scale: 1:3,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 150 300 600 900

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
- Very Low (0.0 - 0.01)
- Low (0.01 - 0.1)
- Moderately Low (0.1 - 1)
- Moderately High (1 - 10)
- High (10 - 100)
- Very High (100 - 705)
- Not rated or not available

Soil Rating Lines
- Very Low (0.0 - 0.01)
- Low (0.01 - 0.1)
- Moderately Low (0.1 - 1)
- Moderately High (1 - 10)
- High (10 - 100)
- Very High (100 - 705)
- Not rated or not available

Soil Rating Points
- Very Low (0.0 - 0.01)
- Low (0.01 - 0.1)
- Moderately Low (0.1 - 1)
- Moderately High (1 - 10)
- High (10 - 100)
- Very High (100 - 705)
- 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 19, Sep 13, 2019

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

Date(s) aerial images were photographed: Mar 20, 2019—Mar 27, 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.

Table—Saturated Hydraulic Conductivity (Ksat), Standard Classes (North Bride Brook Road)

Map unit symbol	Map unit name	Rating (micrometers per second)	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	4.5628	0.2	0.8%
34B	Merrimac fine sandy loam, 3 to 8 percent slopes	100.0000	0.4	1.1%
38C	Hinckley loamy sand, 3 to 15 percent slopes	100.0000	2.4	7.3%
38E	Hinckley loamy sand, 15 to 45 percent slopes	100.0000	0.0	0.0%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	12.1818	21.2	65.3%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	22.2121	4.4	13.4%
306	Udorthents-Urban land complex	23.0099	0.4	1.2%
703A	Haven silt loam, 0 to 3 percent slopes	88.0263	3.6	11.0%
Totals for Area of Interest			**32.5**	**100.0%**

Rating Options—Saturated Hydraulic Conductivity (Ksat), Standard Classes (North Bride Brook Road)

Units of Measure: micrometers per second

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Fastest

Interpret Nulls as Zero: No

Layer Options (Horizon Aggregation Method): All Layers (Weighted Average)

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil

features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group (North Bride Brook Road)

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.

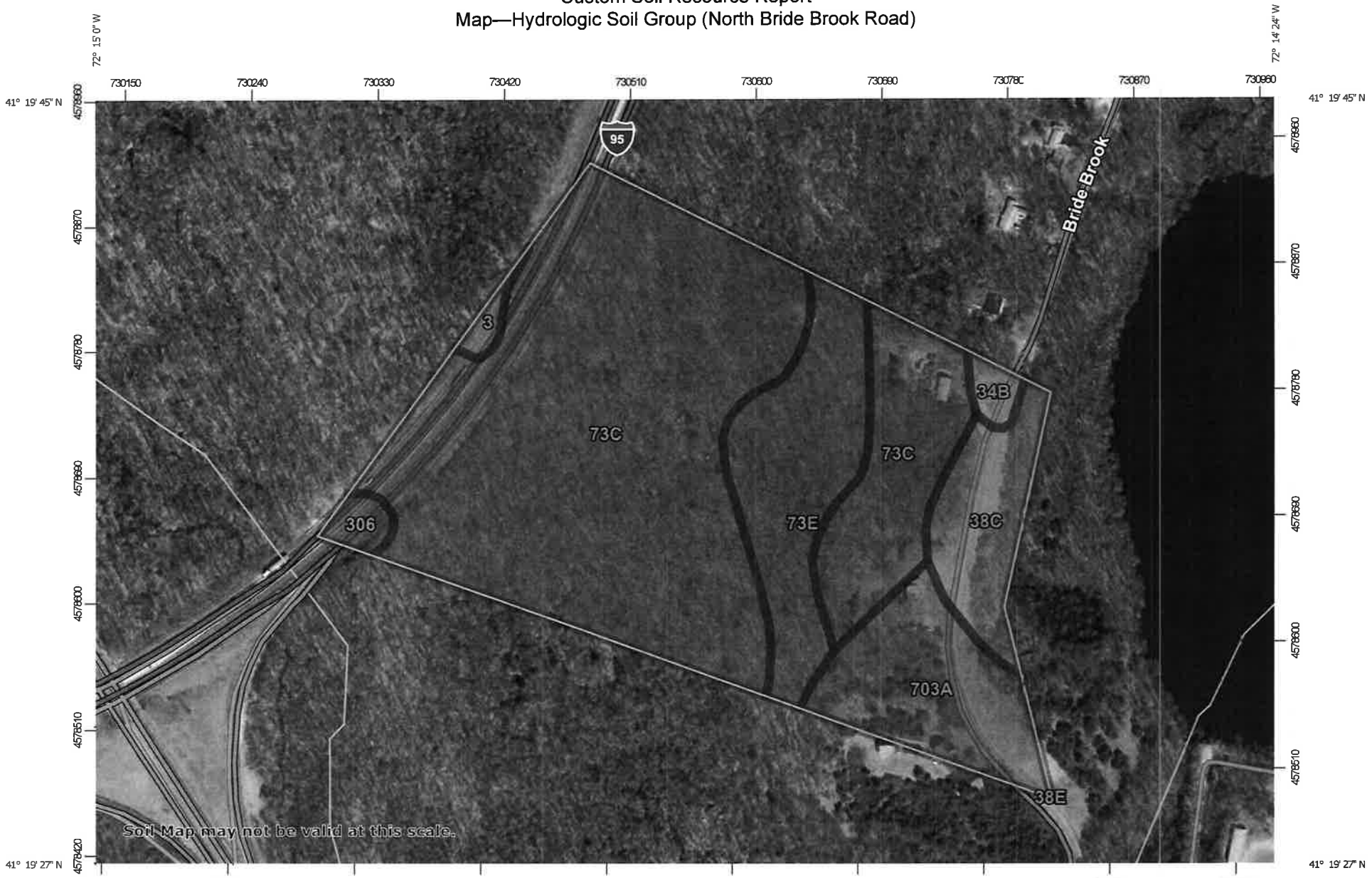
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

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.

Custom Soil Resource Report
Map—Hydrologic Soil Group (North Bride Brook Road)



Map Scale: 1:3,850 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

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 19, Sep 13, 2019

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

Date(s) aerial images were photographed: Mar 20, 2019—Mar 27, 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.

Table—Hydrologic Soil Group (North Bride Brook Road)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	0.2	0.8%
34B	Merrimac fine sandy loam, 3 to 8 percent slopes	A	0.4	1.1%
38C	Hinckley loamy sand, 3 to 15 percent slopes	A	2.4	7.3%
38E	Hinckley loamy sand, 15 to 45 percent slopes	A	0.0	0.0%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	21.2	65.3%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	B	4.4	13.4%
306	Udorthents-Urban land complex	B	0.4	1.2%
703A	Haven silt loam, 0 to 3 percent slopes	B	3.6	11.0%
Totals for Area of Interest			**32.5**	**100.0%**

Rating Options—Hydrologic Soil Group (North Bride Brook Road)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

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NOAA Atlas 14, Volume 10, Version 3
Location name: Niantic, Connecticut, USA*
Latitude: 41.3264°, Longitude: -72.245°
Elevation: 68.89 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.336 (0.259-0.427)	0.403 (0.310-0.512)	0.512 (0.393-0.653)	0.602 (0.460-0.771)	0.726 (0.539-0.964)	0.819 (0.596-1.11)	0.918 (0.651-1.28)	1.03 (0.691-1.45)	1.19 (0.773-1.73)	1.33 (0.841-1.96)
10-min	0.476 (0.367-0.605)	0.571 (0.440-0.726)	0.725 (0.557-0.925)	0.853 (0.652-1.09)	1.03 (0.763-1.37)	1.16 (0.845-1.57)	1.30 (0.922-1.81)	1.46 (0.980-2.06)	1.69 (1.10-2.45)	1.88 (1.19-2.77)
15-min	0.560 (0.432-0.712)	0.671 (0.517-0.854)	0.853 (0.655-1.09)	1.00 (0.767-1.29)	1.21 (0.898-1.61)	1.37 (0.994-1.85)	1.53 (1.08-2.13)	1.72 (1.15-2.42)	1.99 (1.29-2.88)	2.22 (1.40-3.26)
30-min	0.789 (0.609-1.00)	0.945 (0.728-1.20)	1.20 (0.922-1.53)	1.41 (1.08-1.81)	1.70 (1.26-2.26)	1.92 (1.40-2.59)	2.15 (1.53-3.00)	2.42 (1.62-3.40)	2.80 (1.81-4.05)	3.11 (1.97-4.58)
60-min	1.02 (0.785-1.29)	1.22 (0.940-1.55)	1.55 (1.19-1.97)	1.82 (1.39-2.33)	2.20 (1.63-2.91)	2.48 (1.80-3.34)	2.78 (1.97-3.86)	3.11 (2.09-4.39)	3.60 (2.33-5.22)	4.00 (2.53-5.89)
2-hr	1.33 (1.04-1.68)	1.60 (1.24-2.02)	2.03 (1.57-2.57)	2.39 (1.84-3.04)	2.88 (2.15-3.80)	3.25 (2.38-4.36)	3.65 (2.60-5.04)	4.10 (2.77-5.73)	4.78 (3.10-6.86)	5.34 (3.39-7.78)
3-hr	1.55 (1.21-1.94)	1.85 (1.45-2.33)	2.36 (1.83-2.97)	2.77 (2.14-3.51)	3.34 (2.51-4.39)	3.77 (2.78-5.04)	4.23 (3.03-5.83)	4.76 (3.22-6.62)	5.56 (3.62-7.93)	6.22 (3.96-9.02)
6-hr	1.97 (1.55-2.45)	2.36 (1.85-2.94)	2.99 (2.34-3.74)	3.51 (2.74-4.41)	4.23 (3.20-5.51)	4.77 (3.54-6.32)	5.35 (3.86-7.31)	6.02 (4.10-8.30)	7.02 (4.60-9.94)	7.87 (5.03-11.3)
12-hr	2.44 (1.94-3.02)	2.92 (2.32-3.61)	3.70 (2.92-4.59)	4.35 (3.42-5.41)	5.23 (3.99-6.75)	5.90 (4.40-7.74)	6.60 (4.80-8.94)	7.43 (5.08-10.1)	8.65 (5.69-12.1)	9.67 (6.21-13.8)
24-hr	2.87 (2.30-3.52)	3.45 (2.76-4.23)	4.39 (3.50-5.40)	5.18 (4.10-6.40)	6.26 (4.80-8.02)	7.06 (5.31-9.20)	7.92 (5.80-10.7)	8.95 (6.15-12.1)	10.5 (6.92-14.5)	11.8 (7.58-16.6)
2-day	3.20 (2.58-3.90)	3.89 (3.14-4.74)	5.02 (4.03-6.13)	5.95 (4.75-7.30)	7.24 (5.61-9.22)	8.19 (6.22-10.6)	9.22 (6.82-12.4)	10.5 (7.24-14.1)	12.4 (8.23-17.1)	14.1 (9.11-19.6)
3-day	3.47 (2.82-4.20)	4.21 (3.42-5.11)	5.43 (4.38-6.60)	6.44 (5.17-7.85)	7.82 (6.08-9.91)	8.84 (6.75-11.4)	9.96 (7.40-13.3)	11.3 (7.84-15.1)	13.4 (8.92-18.4)	15.2 (9.88-21.1)
4-day	3.73 (3.03-4.50)	4.50 (3.66-5.44)	5.77 (4.68-6.99)	6.82 (5.50-8.30)	8.27 (6.45-10.4)	9.34 (7.14-12.0)	10.5 (7.82-13.9)	11.9 (8.28-15.8)	14.1 (9.39-19.2)	16.0 (10.4-22.0)
7-day	4.45 (3.65-5.33)	5.28 (4.33-6.34)	6.65 (5.42-8.00)	7.78 (6.31-9.40)	9.34 (7.33-11.7)	10.5 (8.06-13.4)	11.7 (8.76-15.4)	13.2 (9.23-17.4)	15.5 (10.3-20.9)	17.4 (11.3-23.8)
10-day	5.15 (4.24-6.15)	6.02 (4.95-7.20)	7.45 (6.10-8.92)	8.63 (7.02-10.4)	10.3 (8.06-12.7)	11.5 (8.82-14.5)	12.8 (9.51-16.6)	14.3 (9.98-18.7)	16.5 (11.1-22.1)	18.3 (12.0-25.0)
20-day	7.30 (6.07-8.65)	8.24 (6.84-9.77)	9.77 (8.07-11.6)	11.0 (9.06-13.2)	12.8 (10.1-15.7)	14.1 (10.9-17.5)	15.5 (11.5-19.7)	16.9 (11.9-22.0)	19.0 (12.8-25.2)	20.6 (13.5-27.7)
30-day	9.10 (7.60-10.7)	10.1 (8.41-11.9)	11.7 (9.70-13.8)	13.0 (10.7-15.4)	14.8 (11.8-18.0)	16.2 (12.6-20.0)	17.6 (13.1-22.2)	19.1 (13.5-24.6)	20.9 (14.2-27.6)	22.3 (14.7-29.9)
45-day	11.3 (9.52-13.3)	12.4 (10.4-14.5)	14.1 (11.7-16.5)	15.5 (12.8-18.3)	17.4 (13.9-21.0)	18.9 (14.7-23.1)	20.4 (15.1-25.3)	21.7 (15.5-27.8)	23.4 (15.9-30.7)	24.6 (16.2-32.8)
60-day	13.2 (11.1-15.4)	14.3 (12.0-16.7)	16.1 (13.5-18.8)	17.5 (14.6-20.6)	19.5 (15.6-23.5)	21.2 (16.4-25.7)	22.7 (16.8-28.0)	24.0 (17.1-30.6)	25.5 (17.4-33.4)	26.6 (17.5-35.3)

[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.

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PF graphical

PDS-based depth-duration-frequency (DDF) curves
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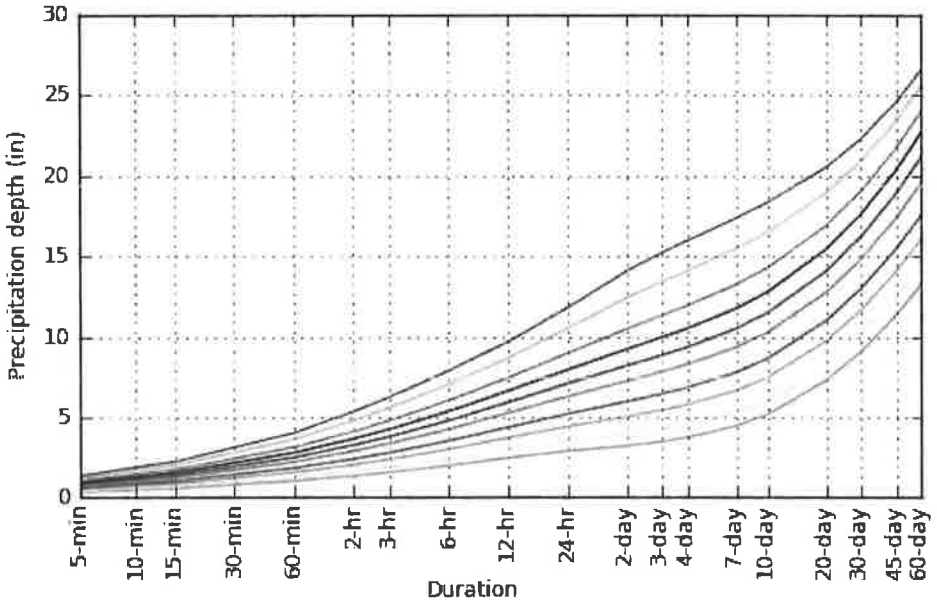

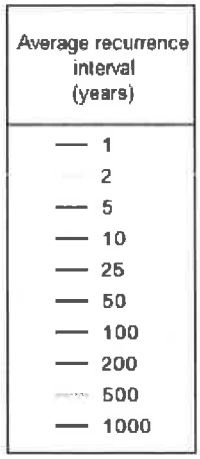

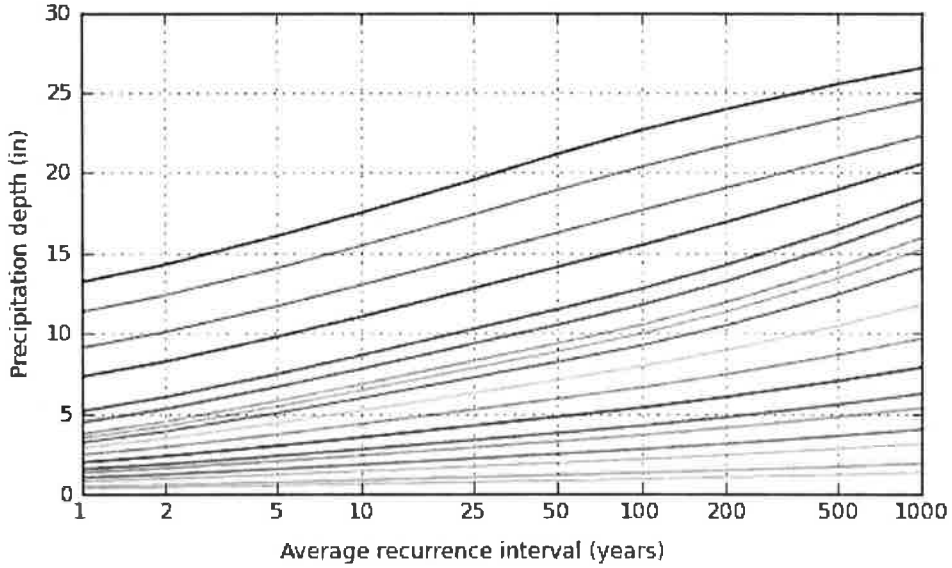

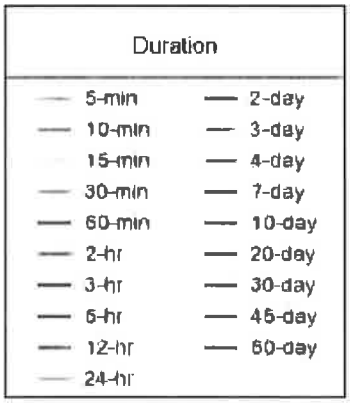

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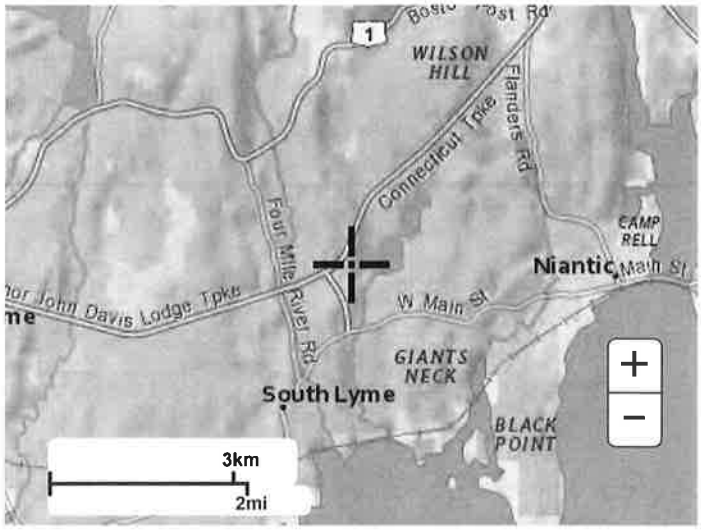
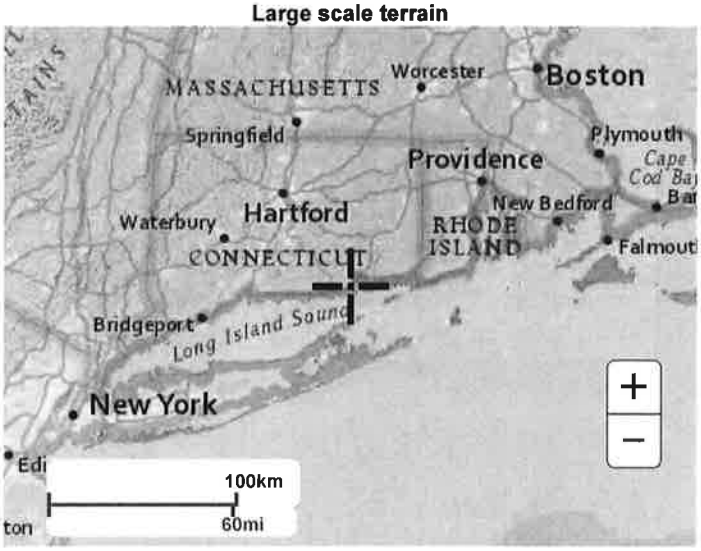
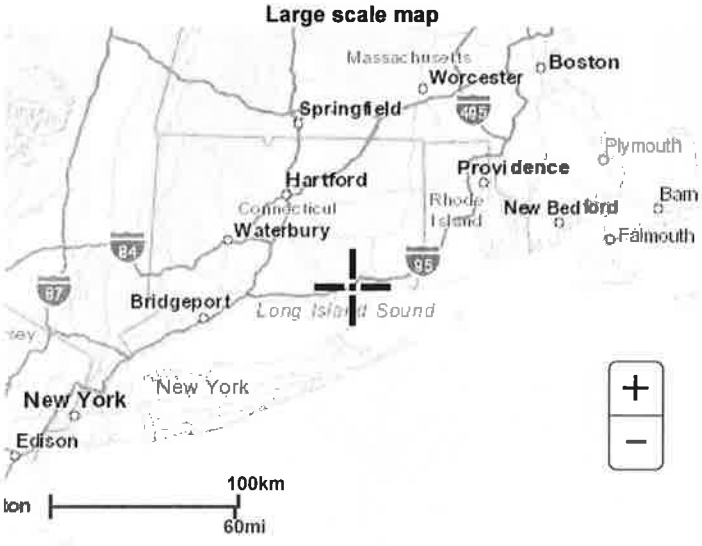
Small scale terrain



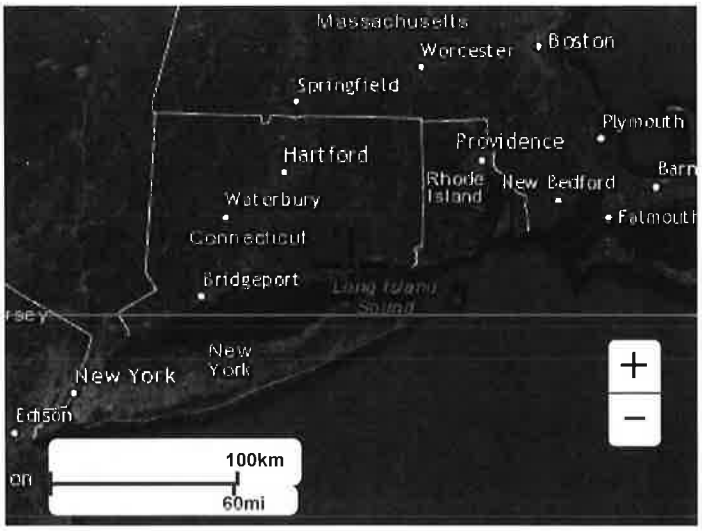
Large scale terrain



Large scale map



Large scale aerial



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

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NOAA Atlas 14, Volume 10, Version 3
Location name: Niantic, Connecticut, USA*
Latitude: 41.3264°, Longitude: -72.245°
Elevation: 68.89 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

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

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

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

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.03 (3.11-5.12)	4.84 (3.72-6.14)	6.14 (4.72-7.84)	7.22 (5.52-9.25)	8.71 (6.47-11.6)	9.83 (7.15-13.3)	11.0 (7.81-15.3)	12.4 (8.29-17.4)	14.3 (9.28-20.8)	15.9 (10.1-23.5)
10-min	2.86 (2.20-3.63)	3.43 (2.64-4.36)	4.35 (3.34-5.55)	5.12 (3.91-6.55)	6.17 (4.58-8.20)	6.97 (5.07-9.40)	7.81 (5.53-10.9)	8.76 (5.88-12.3)	10.2 (6.57-14.7)	11.3 (7.15-16.6)
15-min	2.24 (1.73-2.85)	2.68 (2.07-3.42)	3.41 (2.62-4.35)	4.02 (3.07-5.14)	4.84 (3.59-6.43)	5.46 (3.98-7.38)	6.12 (4.34-8.52)	6.87 (4.61-9.68)	7.96 (5.15-11.5)	8.86 (5.61-13.0)
30-min	1.58 (1.22-2.01)	1.89 (1.46-2.40)	2.40 (1.84-3.06)	2.82 (2.16-3.61)	3.41 (2.53-4.52)	3.84 (2.80-5.19)	4.31 (3.05-5.99)	4.83 (3.24-6.81)	5.59 (3.62-8.10)	6.22 (3.94-9.15)
60-min	1.02 (0.785-1.29)	1.22 (0.940-1.55)	1.55 (1.19-1.97)	1.82 (1.39-2.33)	2.20 (1.63-2.91)	2.48 (1.80-3.34)	2.78 (1.97-3.86)	3.11 (2.09-4.39)	3.60 (2.33-5.22)	4.00 (2.53-5.89)
2-hr	0.666 (0.518-0.840)	0.798 (0.620-1.01)	1.01 (0.786-1.28)	1.19 (0.920-1.52)	1.44 (1.08-1.90)	1.63 (1.19-2.18)	1.82 (1.30-2.52)	2.05 (1.38-2.87)	2.39 (1.55-3.43)	2.67 (1.70-3.89)
3-hr	0.515 (0.403-0.647)	0.617 (0.482-0.776)	0.785 (0.610-0.988)	0.923 (0.714-1.17)	1.11 (0.836-1.46)	1.26 (0.925-1.68)	1.41 (1.01-1.94)	1.59 (1.07-2.20)	1.85 (1.21-2.64)	2.07 (1.32-3.00)
6-hr	0.329 (0.259-0.410)	0.393 (0.309-0.490)	0.499 (0.391-0.624)	0.587 (0.457-0.736)	0.707 (0.535-0.920)	0.797 (0.591-1.06)	0.893 (0.645-1.22)	1.01 (0.684-1.39)	1.17 (0.768-1.66)	1.31 (0.840-1.89)
12-hr	0.203 (0.161-0.251)	0.242 (0.192-0.300)	0.307 (0.243-0.381)	0.361 (0.283-0.449)	0.434 (0.331-0.560)	0.489 (0.365-0.642)	0.548 (0.398-0.742)	0.617 (0.422-0.842)	0.718 (0.472-1.01)	0.803 (0.515-1.14)
24-hr	0.119 (0.096-0.147)	0.144 (0.115-0.176)	0.183 (0.146-0.225)	0.216 (0.171-0.267)	0.261 (0.200-0.334)	0.294 (0.221-0.384)	0.330 (0.242-0.444)	0.373 (0.256-0.504)	0.436 (0.288-0.606)	0.490 (0.316-0.691)
2-day	0.067 (0.054-0.081)	0.081 (0.065-0.099)	0.105 (0.084-0.128)	0.124 (0.099-0.152)	0.151 (0.117-0.192)	0.171 (0.130-0.221)	0.192 (0.142-0.258)	0.218 (0.151-0.293)	0.259 (0.171-0.356)	0.293 (0.190-0.409)
3-day	0.048 (0.039-0.058)	0.059 (0.047-0.071)	0.075 (0.061-0.092)	0.089 (0.072-0.109)	0.109 (0.085-0.138)	0.123 (0.094-0.158)	0.138 (0.103-0.185)	0.157 (0.109-0.210)	0.186 (0.124-0.255)	0.211 (0.137-0.293)
4-day	0.039 (0.032-0.047)	0.047 (0.038-0.057)	0.060 (0.049-0.073)	0.071 (0.057-0.086)	0.086 (0.067-0.109)	0.097 (0.074-0.125)	0.109 (0.081-0.145)	0.124 (0.086-0.165)	0.147 (0.098-0.200)	0.166 (0.108-0.230)
7-day	0.026 (0.022-0.032)	0.031 (0.026-0.038)	0.040 (0.032-0.048)	0.046 (0.038-0.056)	0.056 (0.044-0.070)	0.063 (0.048-0.080)	0.070 (0.052-0.092)	0.079 (0.055-0.104)	0.092 (0.062-0.124)	0.103 (0.067-0.142)
10-day	0.021 (0.018-0.026)	0.025 (0.021-0.030)	0.031 (0.025-0.037)	0.036 (0.029-0.043)	0.043 (0.034-0.053)	0.048 (0.037-0.060)	0.053 (0.040-0.069)	0.059 (0.042-0.078)	0.069 (0.046-0.092)	0.076 (0.050-0.104)
20-day	0.015 (0.013-0.018)	0.017 (0.014-0.020)	0.020 (0.017-0.024)	0.023 (0.019-0.027)	0.027 (0.021-0.033)	0.029 (0.023-0.037)	0.032 (0.024-0.041)	0.035 (0.025-0.046)	0.039 (0.027-0.052)	0.043 (0.028-0.058)
30-day	0.013 (0.011-0.015)	0.014 (0.012-0.017)	0.016 (0.013-0.019)	0.018 (0.015-0.021)	0.021 (0.016-0.025)	0.023 (0.017-0.028)	0.024 (0.018-0.031)	0.026 (0.019-0.034)	0.029 (0.020-0.038)	0.031 (0.020-0.042)
45-day	0.010 (0.009-0.012)	0.011 (0.010-0.013)	0.013 (0.011-0.015)	0.014 (0.012-0.017)	0.016 (0.013-0.019)	0.018 (0.014-0.021)	0.019 (0.014-0.023)	0.020 (0.014-0.026)	0.022 (0.015-0.028)	0.023 (0.015-0.030)
60-day	0.009 (0.008-0.011)	0.010 (0.008-0.012)	0.011 (0.009-0.013)	0.012 (0.010-0.014)	0.014 (0.011-0.016)	0.015 (0.011-0.018)	0.016 (0.012-0.019)	0.017 (0.012-0.021)	0.018 (0.012-0.023)	0.018 (0.012-0.024)

[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.

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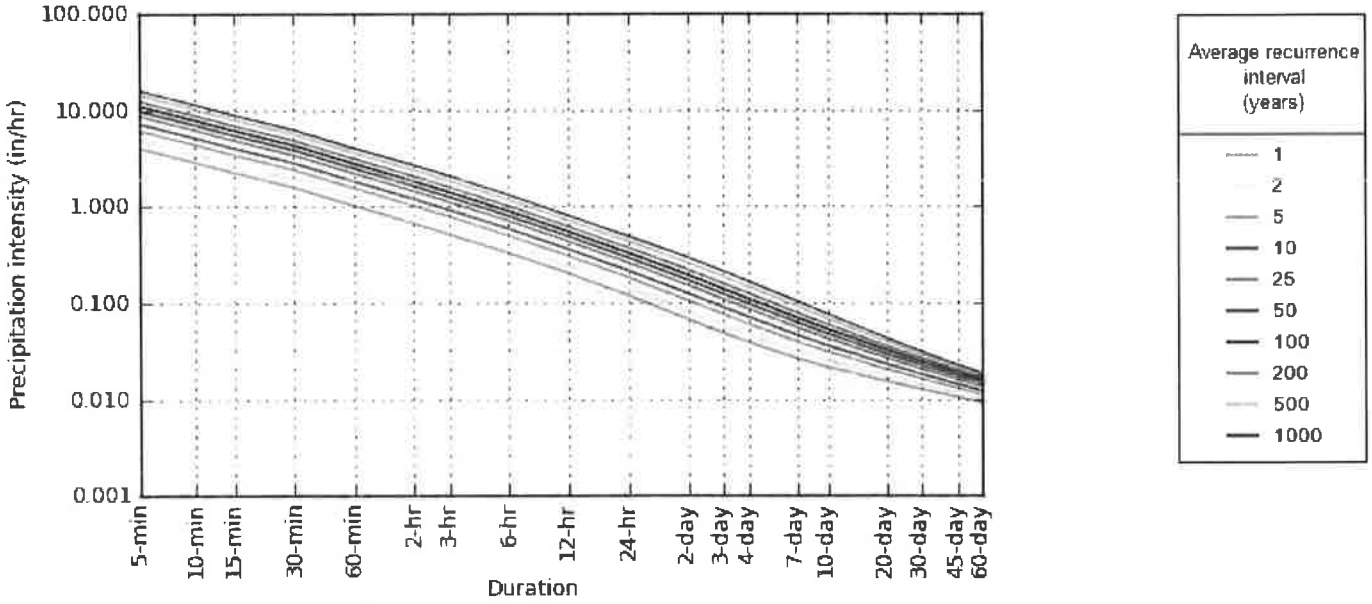
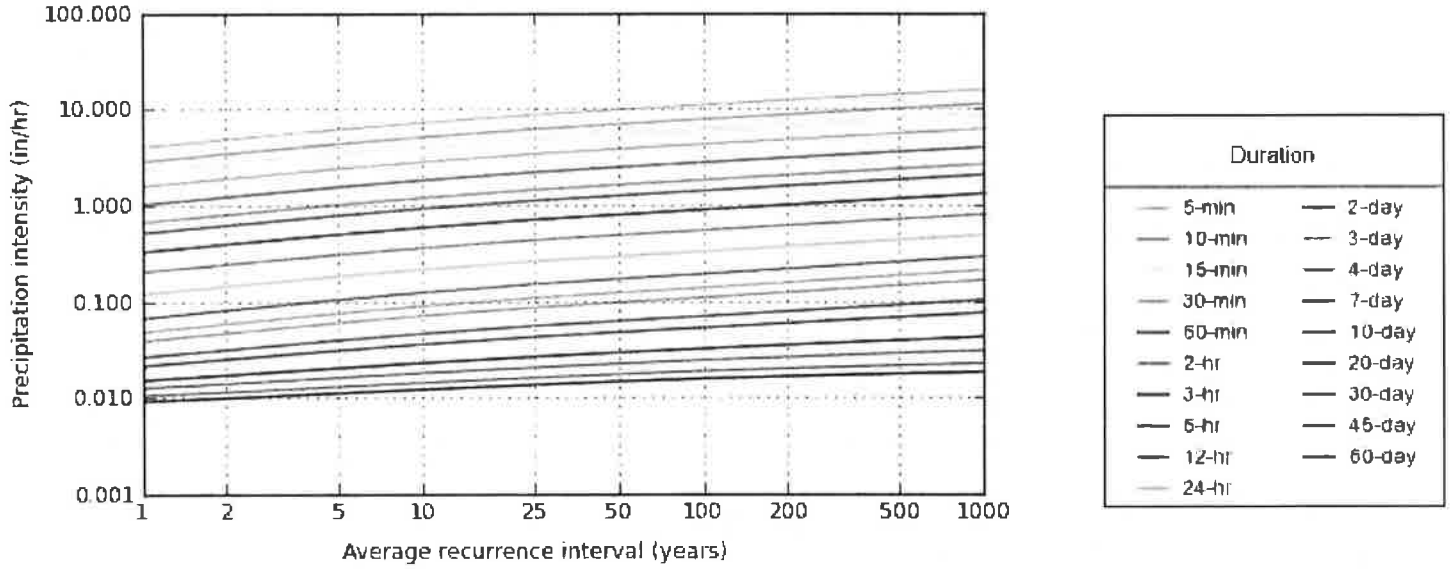
PF graphical

PDS-based intensity-duration-frequency (IDF) curves
Latitude: 41.3264°, Longitude: -72.2450°





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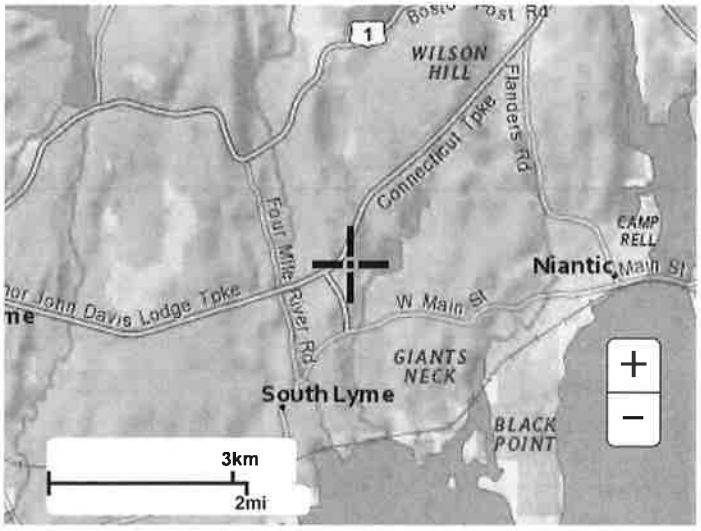
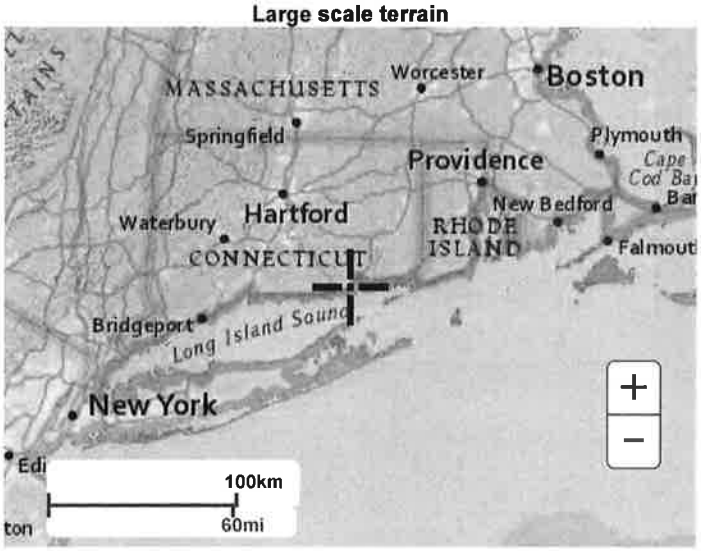
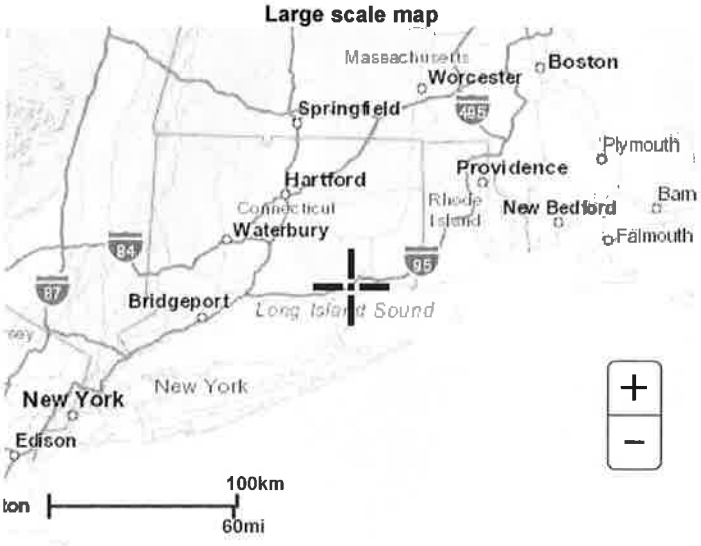


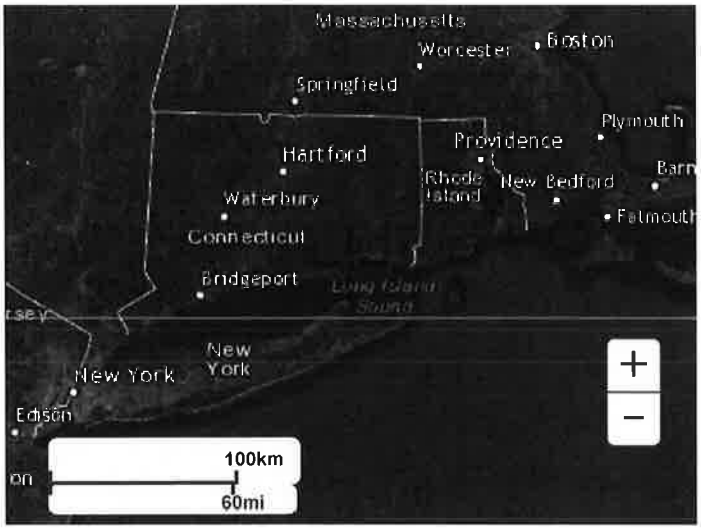
Large scale terrain



Large scale map



Large scale aerial



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