STORMWATER REPORT

GCE Orange Solar

361 Old Tavern Road
Orange, Connecticut

PREPARED FOR

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September 29, 2021

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Project Summary

Project Description

The Petitioner, Greenskies Clean Energy, LLC, is proposing to construct a ±2.5 MW solar farm on undeveloped farmland along with all associated utilities, access paths, fencing, and landscaping to support this use (the Project). When the Project reaches the end of its life cycle, the improvements constructed as part of this Project will be removed and the land will be restored in accordance with the decommissioning plan.

Site Description

The Project Site will be comprised on approximately ±86.7 acres north of Old Tavern Road, (Map, Block, Lot: 11-3-2) in Orange, Connecticut (see Figure 1). The site is bounded by Old Tavern Road to the south and residential to the west and east. Peck Place School abuts the parcel to the north. All surrounding parcels are zoned RES (Residential). The development site is all within the RES zone (Residential).

The project area under existing conditions is being actively farmed during the growing season and is planted over the winter to maintain soil composition. There are three (3) delineated on-site wetland systems on the development site. Wetland system 1 is located in the tree line on the western portions of the property, wetland system 2 is located in the tree line surrounding the watercourse through the center of the property, and the third wetland system is a small isolated area in the northern edge of the existing farm field. Under existing conditions, runoff from the project area generally flows overland to these wetland systems before exiting the site. Both wetland systems flow off the property to the south, crossing Treat Lane and Old Tavern Road south of the site via culverts.

According to available soil mapping[1], the majority of on-Site soils within the Project area belong to the Hydraulic Soil Group "B", indicating that the soils have a moderate infiltration rate when thoroughly wet. The soil profiles examined in field test pits were mostly consistent

[1] https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

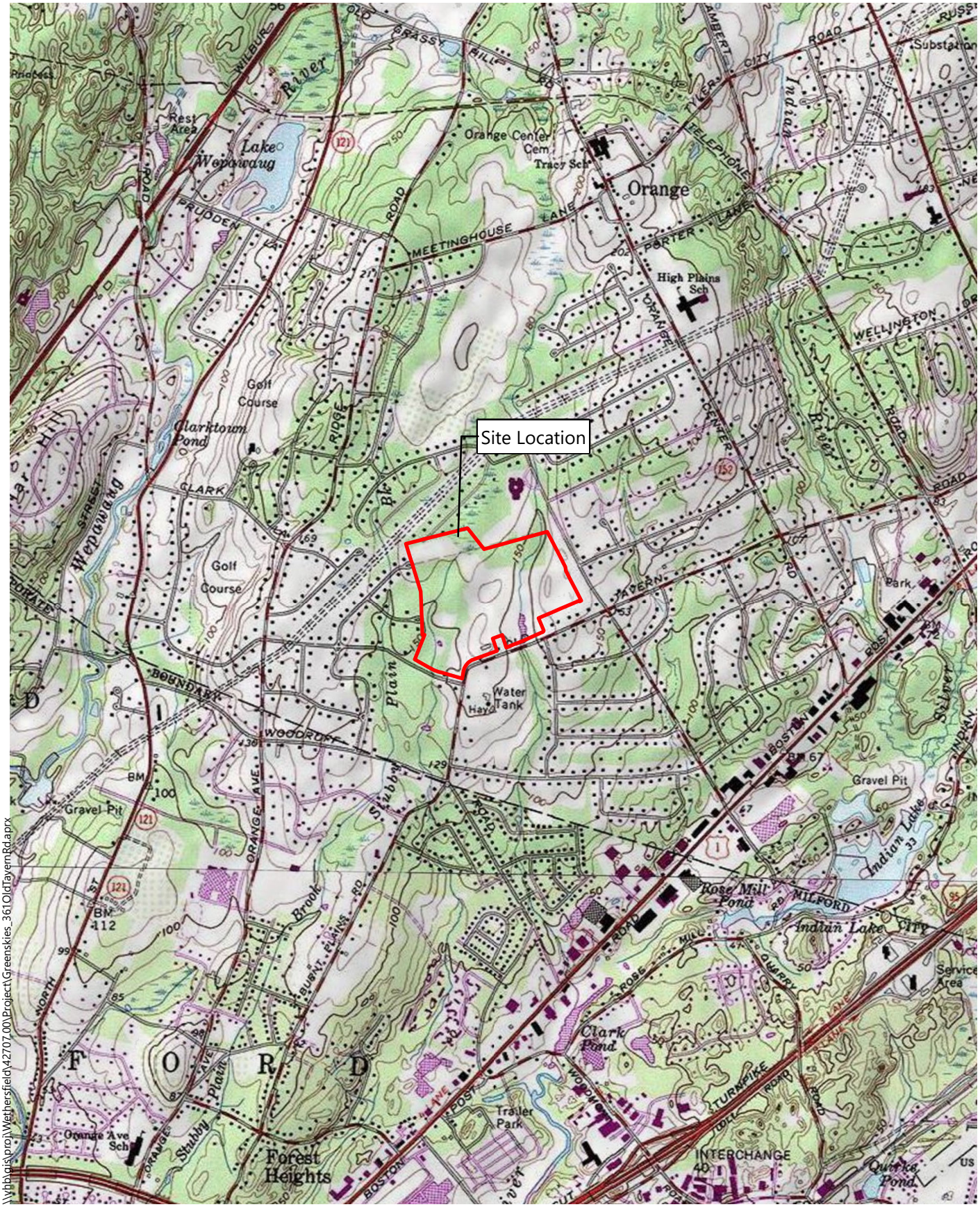
or similar to the named series in the mapped units available on-line. See Appendix B for NRCS Web Soil Survey output and field-performed test pit and infiltration results.

According to available CTDEEP Groundwater Classification maps, groundwater at the site is GA (see Appendix A). The CTDEEP Aquifer Protection Areas Mapping website displays that the Town of Orange does not contain any listed Aquifer Protection Areas.

Methodology

The Project was designed to incorporate measures provided in the Connecticut Stormwater Quality Manual (CTDEEP 2004) as well as the CTDEEP Stormwater General Permit effective December 31, 2020. The conclusion of this analysis is that the proposed improvements will not increase the post-development peak runoff rates in comparison to existing predevelopment rates at any of the critical design points analyzed and the quality of stormwater runoff leaving the Site will be treated prior to discharge from the Site. It is also proposed to meet State stream channel protection requirements for frequent rainfall events.

Figure 1: Site Location Map



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0 1000 2000 4000 Feet

Site Location

USA Topo Maps

Greenskies Solar | Orange, Connecticut

USGS Site Location Map

Source: VHB, CTDEEP, ArcGIS Online

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Existing Drainage Conditions

Summary

Under existing conditions, runoff from the project area generally flows overland to the onsite wetland systems before exiting the site. The Site is generally at its highest elevation in the central portion of the development area. The majority of the Project area is comprised of actively-farmed fields. Terrain slopes in the Project area range from 0% to approximately 10% with no slopes exceeding 15% existing slope. Both wetland systems flow off the property to the south, crossing Treat Lane and Old Tavern Road south of the site via culverts.

Hydrologic Information

For the existing conditions hydrologic analysis, the Site has been divided into six (6) subwatershed areas, which have been identified as areas at the Project limits where flow begins to concentrate naturally prior to entering the wetland systems. Table 1 provides a summary of the existing conditions hydrologic data. Figure 2 illustrates the existing drainage patterns on the Site. All portions of the Project area have been considered in the hydrologic analysis.

Drainage Area 1 - This ±3.4-acre area is located at the southwestern portion of the Project. Untreated stormwater in this area generally flows over farm fields to the west into the wetland system within the tree line.

Drainage Area 2 - This ±1.1-acre area is located at the northwestern portion of the Project. Untreated stormwater in this area generally flows over farm fields to the west into the wetland system within the tree line.

Drainage Area 3 - This ±1.7-acre area is located at the northeastern portion of the Project. Untreated stormwater in this area generally flows over farm fields to the east into the wetland system within the tree line.

Drainage Area 4 - This ±1.2-acre area is located at the eastern portion of the Project. Untreated stormwater in this area generally flows over farm fields to the east into the wetland system within the tree line.

Drainage Area 5 - This ±2.5-acre area is located at the southeastern portion of the Project. Untreated stormwater in this area generally flows over farm fields to the east into the wetland system within the tree line.

Drainage Area 6 - This ±0.9-acre area is located at the northern portion of the Project. Untreated stormwater in this area generally flows towards the isolated wetland located within a corner of actively-farmed fields.

Table 1 summarizes the key hydrologic parameters for each drainage area used in the existing conditions analysis.

Table 1 Existing Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Western Wetland	3.4	78	9.1
2	Western Wetland	1.1	70	10.2
3	Eastern Wetland	1.7	77	6.1
4	Eastern Wetland	1.2	77	4.4
5	Eastern Wetland	2.5	77	6.9
6	Isolated Wetland	0.9	69	8.8

Figure 2: Existing Drainage Areas

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Legend

SYMBOLS

X — **DRAINAGE AREA DESIGNATION**

XP — **DRAINAGE POND**

LINETYPES

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION FLOW LINE

SOIL TYPE BOUNDARY

WETLAND BOUNDARY

0 100 200 Feet

vhb

Existing Drainage Conditions

Figure 2

GCE Orange Solar
361 Old Tavern Road - Orange, CT

9/29/2021

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Proposed Drainage Conditions

Summary

The Site has been designed to maintain existing topography and mimic existing drainage patterns to the maximum extents feasible. Across the majority of the proposed development areas, the Project proposes to install permanent turf-forming grasses to help stabilize the topsoil from erosion, sequester nutrients and pollutants, and lower runoff rates from the facility to the surrounding discharge points. Mature vegetation will be preserved to the maximum extents practicable and no tree clearing is proposed. As a result, the Project will have minimal impact to surrounding ecologically sensitive areas.

The only impervious surfaces proposed to be constructed are access roads and small concrete pads for utility equipment. Once operational, vehicular access to the Project will be limited to infrequent maintenance visits. The vegetated buffers and proposed stormwater basins will provide water quality treatment and stream channel protection for the Project.

In accordance with CTDEEP Stormwater General Permit, it is not proposed to install solar panels within 100 feet of the significant eastern and western wetland systems onsite, nor is it proposed to perform any land disturbance (i.e. grading, swales, stormwater basins, fences) within 50 feet of these systems. It is, however, currently proposed to install panels to within 50 feet of the isolated wetland delineated within the Project area. Preliminary conversations with CTDEEP have taken place regarding this proposal and followup information will be provided to both CTDEEP and Siting Council in regards to this.

Hydrologic Information

Natural drainage patterns will be maintained throughout the Site so that the proposed hydrologic conditions will closely match existing conditions. The proposed conditions analysis utilizes the same six (6) drainage areas from existing conditions. In accordance with CTDEEP Stormwater General Permit, a reduction in Hydrologic Soil

Group of half a step has been considered in the proposed conditions hydrologic model for developed portions of the site.

Drainage Area 1 - This ±3.4-acre area is located at the southwestern portion of the Project. Stormwater in this area will generally flow under the solar panels towards Stormwater Basin 1. After being treated by this basin, stormwater will be conveyed safely towards the western wetland.

Drainage Area 2 - This ±1.1-acre area is located at the northwestern portion of the Project. Stormwater in this area will generally flow under the solar panels towards Stormwater Basin 2. After being treated by this basin, stormwater will be conveyed safely towards the western wetland.

Drainage Area 3 - This ±1.7- acre area is located at the northeastern portion of the Project. Stormwater in this area will generally flow under the solar panels towards Stormwater Basin 3. After being treated by this basin, stormwater will be conveyed safely towards the eastern wetland.

Drainage Area 4 - This ±1.2- acre area is located at the eastern portion of the Project. Stormwater in this area will generally flow under the solar panels towards Stormwater Basin 4. After being treated by this basin, stormwater will be conveyed safely towards the eastern wetland.

Drainage Area 5 - This ±2.5- acre area is located at the southeastern portion of the Project. Stormwater in this area will generally flow under the solar panels towards Stormwater Basin 5. After being treated by this basin, stormwater will be conveyed safely towards the eastern wetland.

Drainage Area 6 - This ±0.9-acre area is located at the northern portion of the Project. Stormwater in this area will continue to flow towards the isolated wetland located within a corner of actively-farmed fields.

Table 2 summarizes the key hydrologic parameters for each drainage area used in the proposed conditions analysis. Only areas of the Site that are proposed to be disturbed by construction have been included in this drainage analysis, while portions of the Site unaffected by construction have been excluded.

Table 2 Proposed Conditions Hydrologic Data

Drainage Area	*Discharge Location*	*Area (acres)*	*Curve Number*	*Time of Concentration (min)*
1	Western Wetland	3.4	73	13.8
2	Western Wetland	1.1	67	10.5
3	Eastern Wetland	1.7	69	9.9
4	Eastern Wetland	1.2	71	7.3
5	Eastern Wetland	2.5	72	10.9
6	Isolated Wetland	0.9	66	8.8

Figure 3: Proposed Drainage Areas

\\vhb.com\gbl\proj\Wethersfield\42707.00\tech\Drainage\42707.00-Proposed Drainage2.dwg

Legend

SYMBOLS

- X — **DRAINAGE AREA DESIGNATION**
- XP — **DRAINAGE POND**

LINETYPES

- **DRAINAGE AREA BOUNDARY**
- **TIME OF CONCENTRATION FLOW LINE**
- **SOIL TYPE BOUNDARY**
- **WETLAND BOUNDARY**

0 100 200 Feet

Proposed Drainage Conditions **Figure 3**

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361 Old Tavern Road - Orange, CT

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Hydrologic Analysis

Hydrologic Analysis

The rainfall-runoff was evaluated for the 2-, 25-, 50-, and 100-year storm recurrence. Rainfall volumes used for this analysis were based on the National Weather Service NOAA Hydrometeorological Design Studies Center, Type III, 24—hour storm event for the Site. Rainfall depths were 3.54, 6.61, 7.49, 8.43 inches respectively. Runoff coefficients for the pre- and post- development conditions provided in the tables below were determined using NRCS Technical Release 55 (TR-55) methodology as provided in the HydroCAD reports found in Appendix D.

In accordance with the guidance of CTDEEP Stormwater General Permit, the proposed conditions for development areas have been modelled with a loss of one-half class of Hydrologic Soil Group to conservatively estimate the effects of compaction during construction. The results of the pre- and post-development hydrologic models indicate that peak runoff rates from the Site will be reduced within all watersheds for all design storms. The field soil test data was used in the design of the stormwater basins to select an assumed starting water surface elevation within the basins during high groundwater periods. Percolation tests performed at various test pits display that the subsoils can infiltrate runoff into the ground when not completely saturated; however, no percolation rates were considered in the hydrologic analysis to be conservative.

Table 3 presents a summary of the existing and proposed conditions peak discharge rates where stormwater basins are proposed.

Table 3 Peak Discharge Rates (cfs*)

Watershed	2-year	25-year	50-year	100-year
Watershed 1				
Existing	5.26	14.32	17.03	19.93
Proposed	2.02	10.73	13.12	15.65
Watershed 2				
Existing	1.05	3.64	4.46	5.35
Proposed	0.12	3.13	3.91	4.75
Watershed 3				
Existing	2.78	7.73	9.22	10.82
Proposed	0.28	5.28	6.53	7.90
Watershed 4				
Existing	2.01	5.62	6.71	7.87
Proposed	0.76	4.21	5.14	6.15
Watershed 5				
Existing	4.00	11.16	13.31	15.63
Proposed	0.45	8.26	10.08	12.05
Watershed 6				
Existing	0.87	3.11	3.83	4.61
Proposed	0.69	2.80	3.50	4.26

* Expressed in cubic feet per second

Floodplain Information / Analysis

Based upon the most recent Federal Emergency Management Agency (FEMA) mapping (FEMA Flood Insurance Rate Map No. 09003C0418J and No. 09009C0419H, dated May 16, 2017 and December 17, 2010), the site does not contain any Flood Hazard Areas (1% Annual Chance or greater). This mapping is included in Appendix A.

Water Quality Volume

Water Quality Volume (WQV) is based upon the first inch of rainfall, or a 1-inch rainfall event, over the acreage of proposed impervious surfaces for the development. Neither the solar panels nor the concrete equipment pads will be subject to vehicular access nor will they produce any pollutants to stormwater runoff. The crushed stone access paths will be trafficked infrequently and the grassy meadows downstream of

the paths will provide residence time of stormwater runoff to remove the small amount of sediment from runoff.

To be conservative, water quality computations have been performed using 2004 CTDEEP Stormwater Quality Manual for the access roads and equipment pads to determine required water quality volumes. These water quality volumes are addressed in the design of the proposed permanent stormwater basins. Computations can be found in Appendix D.

Water Quality Flow

Water Quality Flow (WQF) is a rate of stormwater runoff based upon the first inch of rainfall, or a 1-inch rainfall event. This regulation is generally followed for "flow-through" treatment devices. As the proposed development does not incorporate any "flow-through" water quality treatment devices, WQF is not applicable to this project.

Stream Channel Protection

Stream channel protection is provided at the discharge point of each permanent stormwater basin, in accordance with the guidance in 2004 CTDEEP Stormwater Quality Manual. The 2-year, 24-hour post-development peak flow rate is mitigated to 50% or less of the 2-year, 24-hour pre-development peak flow for each watershed discharging off the site.

Appendix A:

FEMA Flood Insurance Rate Map

NOAA Rainfall Depth Estimates

CTDEEP Groundwater Classification Map

FEMA Flood Insurance Rate Map

National Flood Hazard Layer FIRMette

FEMA

73°2'12"W 41°15'52"N

73°1'34"W 41°15'25"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/14/2021 at 10:34 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

NOAA Rainfall Depth Estimates

NOAA Atlas 14, Volume 10, Version 3
Location name: Orange, Connecticut, USA*
Latitude: 41.26°, Longitude: -73.0323°
Elevation: 158.97 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	**0.349** (0.281-0.432)	**0.420** (0.337-0.520)	**0.535** (0.428-0.664)	**0.631** (0.502-0.788)	**0.762** (0.583-0.995)	**0.861** (0.644-1.15)	**0.965** (0.696-1.34)	**1.08** (0.735-1.53)	**1.25** (0.811-1.83)	**1.38** (0.874-2.07)
10-min	**0.495** (0.398-0.612)	**0.595** (0.478-0.736)	**0.758** (0.606-0.941)	**0.893** (0.710-1.12)	**1.08** (0.826-1.41)	**1.22** (0.911-1.63)	**1.37** (0.986-1.89)	**1.53** (1.04-2.17)	**1.77** (1.15-2.59)	**1.96** (1.24-2.93)
15-min	**0.582** (0.468-0.720)	**0.700** (0.562-0.866)	**0.892** (0.713-1.11)	**1.05** (0.835-1.31)	**1.27** (0.972-1.66)	**1.44** (1.07-1.91)	**1.61** (1.16-2.23)	**1.80** (1.22-2.55)	**2.08** (1.35-3.05)	**2.30** (1.46-3.45)
30-min	**0.809** (0.650-0.999)	**0.972** (0.780-1.20)	**1.24** (0.991-1.54)	**1.46** (1.16-1.82)	**1.76** (1.35-2.30)	**1.99** (1.49-2.66)	**2.23** (1.61-3.09)	**2.50** (1.70-3.55)	**2.89** (1.88-4.24)	**3.20** (2.03-4.80)
60-min	**1.03** (0.832-1.28)	**1.24** (0.999-1.54)	**1.58** (1.27-1.97)	**1.87** (1.48-2.33)	**2.26** (1.73-2.95)	**2.55** (1.91-3.40)	**2.86** (2.06-3.96)	**3.20** (2.18-4.54)	**3.70** (2.40-5.43)	**4.10** (2.59-6.14)
2-hr	**1.34** (1.09-1.65)	**1.61** (1.30-1.98)	**2.05** (1.65-2.53)	**2.42** (1.93-3.00)	**2.92** (2.25-3.79)	**3.30** (2.48-4.38)	**3.70** (2.69-5.11)	**4.16** (2.84-5.85)	**4.83** (3.15-7.04)	**5.38** (3.42-8.01)
3-hr	**1.55** (1.26-1.90)	**1.87** (1.51-2.28)	**2.38** (1.92-2.92)	**2.80** (2.25-3.46)	**3.38** (2.61-4.38)	**3.82** (2.88-5.05)	**4.28** (3.13-5.89)	**4.82** (3.29-6.76)	**5.61** (3.67-8.15)	**6.27** (3.99-9.29)
6-hr	**1.98** (1.62-2.40)	**2.37** (1.94-2.89)	**3.03** (2.46-3.69)	**3.57** (2.88-4.38)	**4.31** (3.35-5.54)	**4.86** (3.69-6.40)	**5.46** (4.01-7.47)	**6.15** (4.22-8.56)	**7.17** (4.70-10.3)	**8.03** (5.12-11.8)
12-hr	**2.46** (2.03-2.97)	**2.97** (2.44-3.59)	**3.79** (3.10-4.60)	**4.48** (3.64-5.46)	**5.42** (4.24-6.92)	**6.12** (4.67-8.00)	**6.87** (5.07-9.35)	**7.75** (5.34-10.7)	**9.06** (5.96-13.0)	**10.2** (6.50-14.9)
24-hr	**2.91** (2.41-3.48)	**3.54** (2.93-4.25)	**4.57** (3.77-5.51)	**5.43** (4.44-6.58)	**6.61** (5.21-8.41)	**7.49** (5.76-9.75)	**8.43** (6.28-11.4)	**9.57** (6.61-13.2)	**11.3** (7.45-16.1)	**12.8** (8.20-18.5)
2-day	**3.25** (2.71-3.87)	**4.03** (3.36-4.80)	**5.30** (4.39-6.34)	**6.35** (5.23-7.64)	**7.80** (6.19-9.89)	**8.87** (6.88-11.5)	**10.0** (7.55-13.6)	**11.5** (7.97-15.7)	**13.8** (9.12-19.5)	**15.8** (10.2-22.7)
3-day	**3.53** (2.95-4.18)	**4.38** (3.66-5.20)	**5.77** (4.81-6.88)	**6.93** (5.73-8.30)	**8.52** (6.79-10.8)	**9.69** (7.55-12.6)	**11.0** (8.29-14.9)	**12.6** (8.75-17.1)	**15.1** (10.0-21.3)	**17.4** (11.2-24.9)
4-day	**3.78** (3.18-4.47)	**4.68** (3.93-5.54)	**6.15** (5.14-7.31)	**7.37** (6.11-8.81)	**9.05** (7.23-11.4)	**10.3** (8.03-13.3)	**11.6** (8.80-15.7)	**13.3** (9.29-18.1)	**16.0** (10.6-22.5)	**18.3** (11.8-26.3)
7-day	**4.52** (3.81-5.31)	**5.49** (4.63-6.46)	**7.08** (5.94-8.36)	**8.40** (7.00-9.98)	**10.2** (8.18-12.8)	**11.6** (9.03-14.8)	**13.0** (9.84-17.4)	**14.8** (10.3-20.0)	**17.5** (11.7-24.5)	**19.9** (12.9-28.3)
10-day	**5.23** (4.43-6.13)	**6.24** (5.28-7.32)	**7.90** (6.65-9.30)	**9.28** (7.76-11.0)	**11.2** (8.97-13.9)	**12.6** (9.85-16.0)	**14.1** (10.6-18.6)	**15.9** (11.1-21.3)	**18.6** (12.4-25.9)	**20.9** (13.6-29.7)
20-day	**7.37** (6.28-8.58)	**8.48** (7.22-9.88)	**10.3** (8.72-12.0)	**11.8** (9.92-13.9)	**13.9** (11.2-17.0)	**15.4** (12.1-19.3)	**17.0** (12.8-22.1)	**18.9** (13.3-25.1)	**21.5** (14.4-29.6)	**23.6** (15.3-33.2)
30-day	**9.15** (7.83-10.6)	**10.3** (8.82-12.0)	**12.2** (10.4-14.2)	**13.8** (11.7-16.2)	**16.0** (12.9-19.4)	**17.6** (13.8-21.9)	**19.3** (14.5-24.8)	**21.1** (15.0-28.0)	**23.6** (15.9-32.4)	**25.5** (16.6-35.8)
45-day	**11.4** (9.76-13.1)	**12.6** (10.8-14.5)	**14.6** (12.5-16.9)	**16.2** (13.8-18.9)	**18.5** (15.0-22.4)	**20.3** (16.0-25.0)	**22.1** (16.6-28.0)	**23.8** (16.9-31.4)	**26.1** (17.7-35.7)	**27.9** (18.2-38.9)
60-day	**13.2** (11.4-15.2)	**14.5** (12.4-16.7)	**16.5** (14.2-19.1)	**18.3** (15.5-21.2)	**20.6** (16.7-24.8)	**22.5** (17.7-27.5)	**24.3** (18.2-30.6)	**26.0** (18.5-34.1)	**28.2** (19.1-38.3)	**29.7** (19.4-41.3)

[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.

Please refer to NOAA Atlas 14 document for more information.

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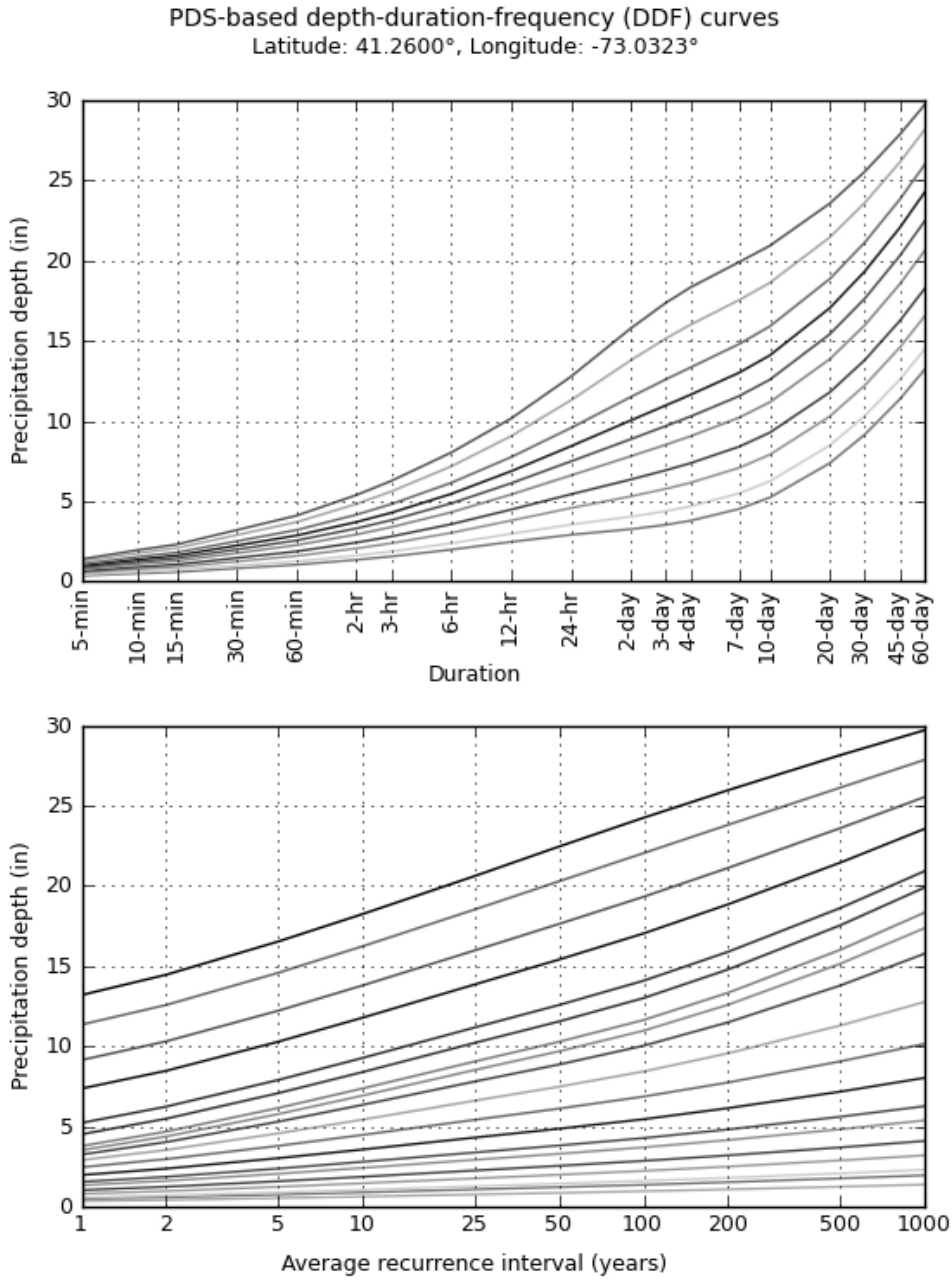
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Wed Jan 27 15:35:46 2021

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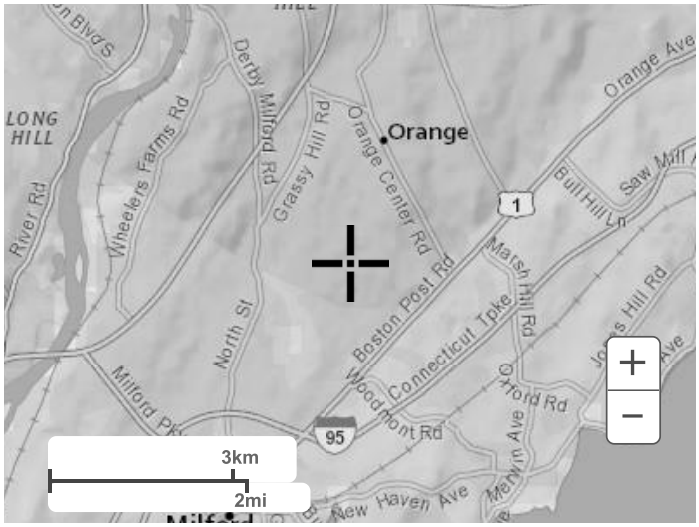
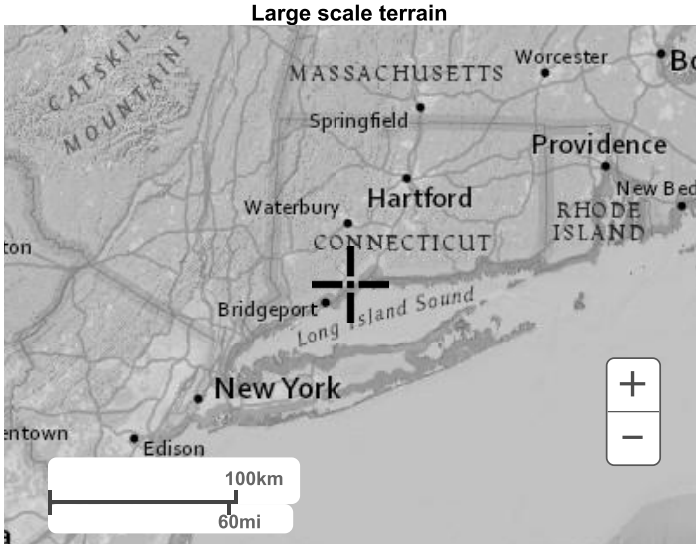
Maps & aerials

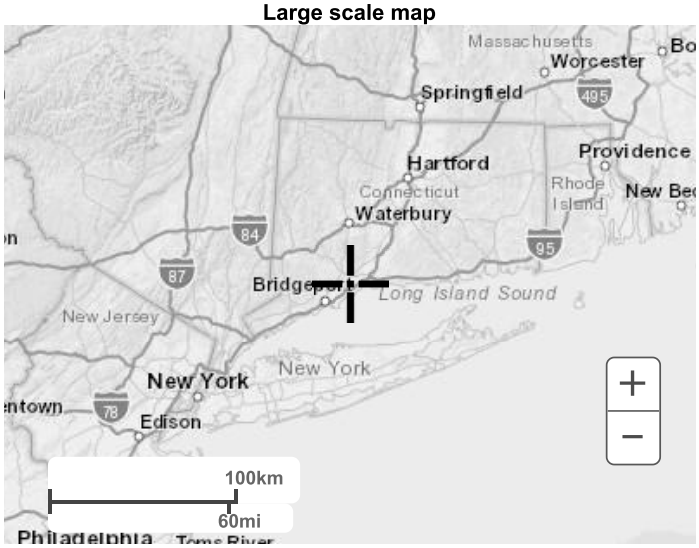
Small scale terrain



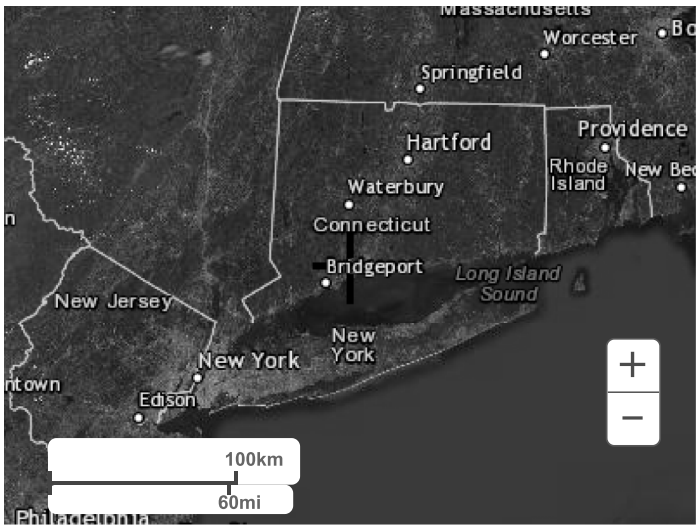
Large scale terrain



Large scale map



Large scale aerial



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

Disclaimer

CTDEEP Groundwater Classification Map

WATER QUALITY CLASSIFICATIONS
ORANGE, CT

SURFACE WATER QUALITY CLASSES

A	A
AA	AA
B, B*	B, B*
SA	SA
SB	SB

NOTES:
Surface Water Classifications beginning with S refer to Coastal and Marine Surface Water.
B* is a subset of Class B where no direct wastewater discharges are allowed other than those consistent with Class AA, A and SA surface waters.

GROUND WATER QUALITY CLASSES

GA (white background)
GAA, GAAs
GA, GAA may not meet current standards
GB
GC

Area of Contribution to Public Supply Well

Final Aquifer Protection Area (Level A)
Major Basin Boundary

EXPLANATION

WATER QUALITY CLASSIFICATIONS (WQC) MAPS are one of the elements of the Water Quality Standards (WQS) for the State of Connecticut. The WQS are a part of Connecticut's clean water program and are essential for protecting and improving water quality. The WQS follow the principles of Connecticut's Clean Water Act which is in Chapter 446K of the Connecticut General Statutes. The WQS provide policy guidance in many areas, for example decisions on acceptable discharges to water resources, siting of landfills, remediation or prioritization of municipal sewerage system projects. The first two elements of the WQS are the Standards, which set an overall policy for management of water quality, and the Criteria, which are descriptive and numerical standards that describe the allowable parameters and goals for various water quality classifications. A discussion of these two elements is found in the Water Quality Standards document available on the CT DEEP website. The third element is the Classifications and the Water Quality Classification Maps which show the Classification assigned to each surface and groundwater resource throughout the State. The WQS are adopted using a public participation process. The WQC maps are also adopted using a public participation process but go through hearings separately from the Standards and Criteria hearings. Revision and adoption of the WQC data occurs in accordance with the public participation procedures contained in Section 22a-426 of the Connecticut General Statutes. Ground WQC is subject to Connecticut regulation and changes must be reviewed and adopted. All changes to the Surface WQC require an adoption process which is subject to federal review and approval in addition to CT regulation. The adoption dates for the WQC by major drainage basin are: Housatonic River, Hudson River and Southwest Coastal Basins - March 1999; Connecticut River and South Central Coastal Basins - February 1993; Thames River, Pawcatuck River and Southeast Coastal Basins - December 1986. Surface Water Classifications do not change after the adoption date until the next major revision. Ground Water Classifications may change after the adoption date under specific circumstances. The map may have more than one WQC adoption date because a town may be in more than one major drainage basin.

SURFACE WATERS in Connecticut are divided into freshwater classified as AA, A, B or B* and saline waters classified as SA or SB. Class AA designated uses are existing or proposed drinking water supplies; habitat for fish and other aquatic life and wildlife; recreation; and water supply for industry and agriculture. Class A designated uses are habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; navigation; and water supply for industry and agriculture. Class SA designated uses are habitat for marine fish, other aquatic life and wildlife; shellfish harvesting for direct human consumption; recreation; industrial water supply; and navigation. Class B designated uses are habitat for fish and aquatic life and wildlife; recreation; navigation; and industrial and agricultural water supply. Class B*, applicable to Candlewood Lake, is a subset of Class B and is identical in all ways to the designated uses, criteria and standards for Class B waters except for the restriction on direct discharges. Class SB designated uses are habitat for marine fish and aquatic life and wildlife; commercial shellfish harvesting; recreation; industrial water supply; and navigation.

Surface waters which are not specifically classified shall be considered as Class A or Class AA. Surface waters in GA ground water areas are assumed Class A or Class SA unless otherwise indicated. Surface waters in GAA ground water areas are assumed Class AA unless otherwise indicated.

On the WQC map a surface water quality goal of A is represented by blue colored water bodies. Surface water quality goal of AA is represented by purple colored water bodies. Surface water quality goal of B is represented by gold colored water bodies.

GROUND WATERS in Connecticut are classified as GAA, GA, GB and GC. Class GAA designated uses are existing or potential public supply of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies. The Class GAAs is a subclass of GAA for ground water that is tributary to a public water supply reservoir. The area of contribution to a public water supply well is represented by a 500-foot radius around the well and is assumed to be Class GAA unless otherwise classified. Class GA designated uses are existing private and potential public or private supplies of water suitable for drinking without treatment and baseflow for hydraulically-connected surface water bodies. All ground waters not specifically classified are considered as Class GA. Class GB designated uses are industrial process water and cooling waters and baseflow for hydraulically-connected water bodies and is presumed not suitable for human consumption without treatment. Class GC designated uses are assimilation of discharges authorized by the Commissioner pursuant to Section 22a-430 of the General Statutes.

On the WQC map GA is represented by white colored land areas. Class GAA and class GAAs are represented by blue colored land areas. The area of contribution to a public water supply well is shown by a blue cross-hatch overprint. A notation of GAA followed by a state abbreviation indicates a watershed that contributes to the public water supply for a state other than Connecticut. Class GA or Class GAA areas that currently may not be meeting the GA or GAA standards are represented on the WQC maps by tan colored land areas. Class GB is represented by green colored land areas. Class GC is represented by magenta colored land areas.

FINAL AQUIFER PROTECTION AREAS (Level A) are included on the WQC maps for informational purposes. These areas are anticipated to be reclassified GAA during the next major basin updates, subject to public participation. The Aquifer Protection Program helps protect Connecticut's public drinking water resources by delineating aquifer protection areas (also called wellhead protection areas) for public supply wells and establishing land use regulations within these areas. These areas represent the land area contributing ground water to active public water supply wells or well fields that serve more than 1000 people and are set in sand and gravel aquifers (stratified drift deposits).

DATA SOURCES

WATER QUALITY CLASSIFICATIONS DATA – Water quality classifications shown on this map are based on information from the following digital spatial datasets that are topically shown together – Ground Water Quality Classifications Poly, Surface Water Quality Classifications Line, and Surface Water Quality Classifications Poly. The map legend above reflects the content of these three data sources. These WQC data were initially compiled on 1:24,000-scale 7.5 minute USGS topographic quadrangle maps and later digitized at 1:24,000 scale. For example, the Surface Water Quality Classifications Line and Surface Water Quality Classifications Poly digital data assigns surface water quality classifications to water bodies such as rivers, streams, reservoirs, lakes, ponds and coves found in 1:24,000-scale hydrography data available from CT DEEP. The hydrography may not include all the waterbodies in Connecticut. The Ground Water Quality Classifications Poly data assigns ground water quality classifications, at 1:24,000 scale, to the remaining land areas in Connecticut.

AQUIFER PROTECTION AREA DATA – Aquifer Protection Areas shown on this map are from the Aquifer Protection Area digital dataset which contains polygon data intended to be used at 1:24,000 scale. The dataset contains regulated areas classified as Level A Aquifer Protection Area (Final) and Level B Aquifer Protection Area (Preliminary). The Level B areas are not shown on the WQC maps. The data was collected from 1991 to the present and is actively updated as Final area mapping replaces earlier Preliminary areas. The Aquifer Protection Areas are delineated by the individual water companies owning the well fields and submitted to the CT DEEP for approval. Preliminary mapping provides a general estimate of the area contributing ground water to the well field. Final mapping is based on extensive, site-specific, detailed modeling of the ground water flow system. CT DEEP may adjust Final area boundaries to be consistent with 1:24,000 scale topography and base map data where appropriate during the approval process.

MAJOR DRAINAGE BASIN DATA – Major drainage basins shown on this map are from Major Basin Line data developed by CT DEEP and intended to be used at 1:24,000 scale.

BASE MAP DATA - Based on data originally from 1:24,000-scale USGS 7.5 minute topographic quadrangle maps published between 1969 and 1992. It includes political boundaries, railroads, airports, hydrography, geographic names and geographic places. Streets and street names are from Tele Atlas® copyrighted data. Base map information is neither current nor complete.

RELATED INFORMATION
This map is intended to be printed at its original dimensions in order to maintain the 1:24,000 scale (1 inch = 2000 feet).
WATER QUALITY STANDARDS - Go to the CT DEEP website for a summary and the full text of the "Water Quality Standards" and for other information on water quality.
AQUIFER PROTECTION AREAS - Go to the CT DEEP website for more information.

ADOPTED DATES

Water Quality Standards
February 25, 2011

Thames River, Pawcatuck River and Southeast Coastal Basins: December 1986

Connecticut River and South Central Coastal Basins: February 1993

Housatonic River, Hudson River and Southwest Coastal Basins: March 1999

MAJOR BASINS

1 Pawcatuck
2 Southeast Coast
3 Thames
4 Connecticut
5 South Central Coast
6 Housatonic
7 Southwest Coast
8 Hudson

MAP LOCATION

State Plane Coordinate System of 1983, Zone 3526
Lambert Conformal Conic Projection
North American Datum of 1983

1 0.5 0 1 Miles
1000 0 1000 2000 3000 4000 5000 6000 7000 Feet
1 0.5 0 1 Kilometers

SCALE 1:24,000 (1 inch = 2000 feet) when map is printed at original size

STATE OF CONNECTICUT
DEPARTMENT OF
ENERGY & ENVIRONMENTAL PROTECTION
79 Elm Street
Hartford, CT 06106-5127

Map created by CT DEEP
October 2018

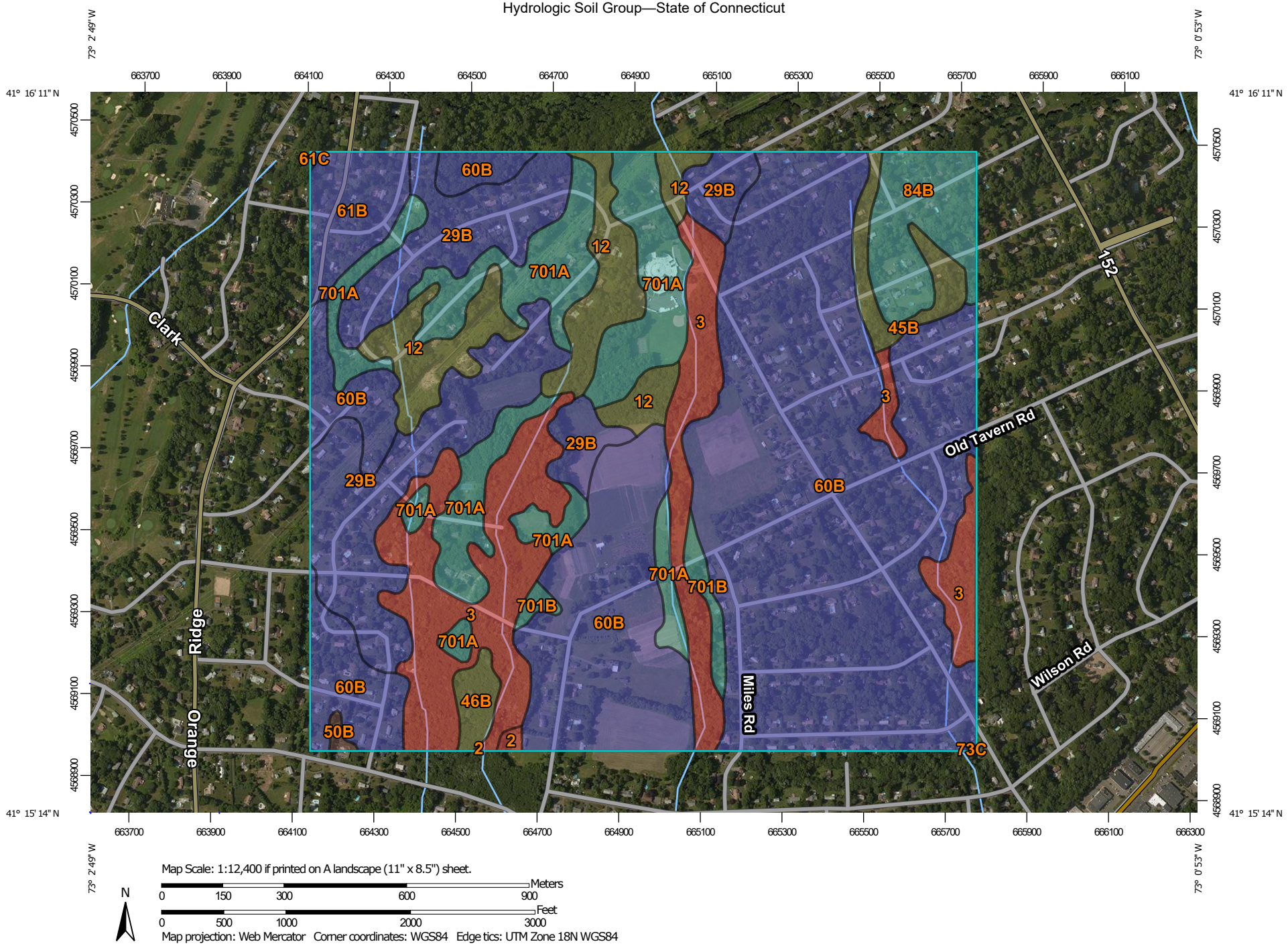
Map is not colorfast
Protect from light and moisture

Appendix B:

NRCS Soil Survey Information
Test Pit and Infiltration Testing Data

NRCS Soil Survey Information

Hydrologic Soil Group—State of Connecticut



Map Scale: 1:12,400 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

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.

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 20, Jun 9, 2020

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

Date(s) aerial images were photographed: Jun 27, 2014—Jul 22, 2014

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
2	Ridgebury fine sandy loam, 0 to 3 percent slopes	D	0.8	0.1%
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	76.0	12.8%
12	Raypol silt loam	C/D	35.9	6.1%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	B	80.6	13.6%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	9.3	1.6%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	C/D	4.8	0.8%
50B	Sutton fine sandy loam, 3 to 8 percent slopes	B/D	0.9	0.2%
60B	Canton and Charlton fine sandy loams, 3 to 8 percent slopes	B	274.7	46.4%
61B	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony	B	15.7	2.6%
61C	Canton and Charlton fine sandy loams, 8 to 15 percent slopes, very stony	B	0.2	0.0%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	B	0.1	0.0%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	C	21.3	3.6%
701A	Ninigret fine sandy loam, 0 to 3 percent slopes	C	67.2	11.3%
701B	Ninigret fine sandy loam, 3 to 8 percent slopes	C	5.2	0.9%
Totals for Area of Interest			**592.6**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Test Pit and Infiltration Testing Data

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 361 Old Tavern Road, Orange, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 7/13/2021 (Record all Test Pits)

TEST PIT: 1A	TEST PIT: 1B	TEST PIT: 1C	TEST PIT:
existing grade +/- 153.6 0-18" brown silty clay 18-30" sandy clay, brown, redox, rocky 30+" dark brown sandy clay, very rocky	existing grade +/- 153.6 0-19" brown silty clay 19-34" reddish brown sandy clay, rocky 34-44" brown sandy clay, rocky 44-63" brown sandy clay loam, very rocky	existing grade +/- 153.6 0-12" brown silty clay 12-32" brown silty clay loam, rocky 32-48" brown sandy loam, very rocky 48-61" brown sandy loam, very rocky	
Mottles: 18"	Mottles: 19"	Mottles: 12"	Mottles:
GW: Seepage at 30"	GW: Seepage @ 53"	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive: +/- 152.0	Restrictive: +/- 152.0	Restrictive: +/- 152.6	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC:		PERC:		PERC:	
DEPTH:		DEPTH:		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
PERC RATE:		PERC RATE:		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 361 Old Tavern Road, Orange, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 7/13/2021 (Record all Test Pits)

TEST PIT: 2A	TEST PIT: 2B	TEST PIT: 2C	TEST PIT:
existing grade +/- 156.0 0-21" silty loam, brown 21-39" sandy loam, brown, rocky, redox 39-57" sandy loam, brown, rocky	existing grade +/- 156.0 0-23" loam, brown, organics 23-35" silt loam, dark grey 35-44" reddish brown sandy loam, rocky 44-61" dark brown loamy sand, rocky	existing grade +/- 156.0 0-10" dark brown loam 10-19" brown silty loam 19-23" brown and dark grey, redox, silt loam 23-36" reddish brown, redox, sandy loam 36-41" grey/brown sandy loam, redox 41-63" brown sandy, rocky	
Mottles: 21"	Mottles:	Mottles: 19"	Mottles:
GW:	GW:	GW: Seepage @ 55"	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive: +/- 154.3	Restrictive:	Restrictive: +/- 154.4	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC: 2B		PERC:		PERC:	
DEPTH:		DEPTH: 18"		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
		10:25 10:40 10:55 11:10 11:25	1.9" 2.9" 3.2" 3.3" 3.4"				
PERC RATE:		PERC RATE: 0.4" per hour		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 361 Old Tavern Road, Orange, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 7/13/2021 (Record all Test Pits)

TEST PIT: 3A	TEST PIT: 3B	TEST PIT: 3C	TEST PIT:
existing grade +/- 152.1 0-19" brown silty loam, organics, saturated 19-26" brown silty loam 26-34" grey silty clay 34-41" brown/grey sandy clay, redox 41-56+" dark brown sandy loam	existing grade +/- 152.3 0-23" brown silty loam, organics, water present, saturated 23-37" brown, clay loam, rocky, redox 37-61" grey/brown, clay loam & sandy loam, very rocky, redox	existing grade +/- 152.5 0-18" brown organics, saturated, silty loam 18-27" brown silty loam 27-40" grey/ brown silty clay 40-45" brown clay loam 45-66" sandy loam, dark brown	
Mottles: 34"	Mottles: 23"	Mottles: 34"	Mottles:
GW: Seepage at 54"	GW: Seepage @ 59"	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive: +/- 149.3	Restrictive: +/- 150.4	Restrictive: +/- 149.7	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC:		PERC: 3B		PERC:		PERC:	
DEPTH:		DEPTH: 18"		DEPTH:		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
		11:40 11:55 12:10 12:25 12:40	2.0" 2.9" 3.2" 3.3" 3.5"				
PERC RATE:		PERC RATE: 0.4" per hour		PERC RATE:		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 361 Old Tavern Road, Orange, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 7/8/2021 (Record all Test Pits)

TEST PIT: 4A	TEST PIT: 4B	TEST PIT: 4C	TEST PIT:
existing grade +/- 150.0 0-17" dark brown loam 17-24" brown silt loam, rocky 24-42" dark brown loamy sand, gravel & pebbles, redox 42-63" dark brown grey sand, gravel, small redox, stones	existing grade +/- 147.7 0-20" loam, dark brown 20-37" sandy loam, brown 37-61" sandy gravel, redox, dark brown, rocky 61+" groundwater, puddles	existing grade +/- 149.5 0-13" brown organics, silt loam 13-20" dark brown, pebbles, sandy loam 20-34" grey rocky loam 34-45" grey rocky pebbles, sandy loam 45-59" dark grey, redox, sand 59-62" grey sand	
Mottles: 24"	Mottles: 37"	Mottles: 45"	Mottles:
GW:	GW: Seepage @ 61"	GW:	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive: +/- 148.0	Restrictive: +/- 144.6	Restrictive: +/- 145.8	Restrictive:

COMMENTS: _____

_____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC: 4A		PERC: 4B		PERC: 4C		PERC:	
DEPTH: 12"		DEPTH: 13.5"		DEPTH: 12"		DEPTH:	
PRESOAK:		PRESOAK:		PRESOAK:		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
12:20	2.8"	12:23	3.4"	12:25	4.4"		
12:35	7.2"	12:37	7.2"	12:40	8.0"		
12:50	8.5"	12:52	9.2"	12:55	11.5"		
1:05	12.0"	1:07	11.0"	1:10	12.0"		
1:20	empty	1:23	12.0"	1:25	empty		
PERC RATE: 5.2" per hour		PERC RATE: 4.0" per hour		PERC RATE: 2.0" per hour		PERC RATE:	

COMMENTS: _____

_____

Form #2 Technical Standards for Subsurface Sewage Disposal Systems

SITE INVESTIGATION FOR A SUBSURFACE SEWAGE DISPOSAL SYSTEM

Application/Permit #: _____

Property Owner_____Location 361 Old Tavern Road, Orange, CT

DEEP TEST PIT DATA/SOIL DESCRIPTIONS

DATE: 7/8/2021 (Record all Test Pits)

TEST PIT: 5A	TEST PIT: 5B	TEST PIT: 5C	TEST PIT:
existing grade +/- 149.9 0-16" silty loam, dark brown 16-29" fine clay, brown 29-47" sandy loam, dark grey rocky 47-69" sandy loam, redox, semi rocky, dark brown 69+" groundwater, very small boulders	existing grade +/- 148.4 0-10" brown silty loam 10-24" brown sandy loam, rocky 24-41" sandy loam, brown, pebbles/ rocky 41-68" fine clay, grey, redox	existing grade +/- 147.5 0-14" silty loam, dark brown 14-19" silty loam, brown 19-31" silty clay, brown 31-48" loamy sandy, dark brown, rocky 48-65" dark brown sand, very rocky, redox 65+" groundwater, puddling, redox	
Mottles: 47"	Mottles: 41"	Mottles: 48"	Mottles:
GW: Seepage at 69"	GW:	GW: Seepage at 48"	GW:
Ledge:	Ledge:	Ledge:	Ledge:
Roots:	Roots:	Roots:	Roots:
Restrictive: +/- 146.0	Restrictive: +/- 145.0	Restrictive: +/- 143.5	Restrictive:

COMMENTS: _____

GROUNDWATER TABLE (Near max., below max., etc.)_____

SOIL MOISTURE (High, medium, low, etc): _____

PERCOLATION TEST DATA

DATE:_____ (Record all Perc Tests)

PERC: 5A		PERC: 5B		PERC: 5C		PERC:	
DEPTH: 17"		DEPTH: 15"		DEPTH: 12"		DEPTH:	
PRESOAK: N/A		PRESOAK: N/A		PRESOAK: N/A		PRESOAK:	
TIME	READING	TIME	READING	TIME	READING	TIME	READING
11:13	5"	11:15	5"	11:18	3.3"		
11:28	8.9"	11:30	refill (2")	11:33	6.5"		
11:43	10.8"	11:45	12.5"	11:48	9.9"		
11:58	12.1"	12:00	15"	12:03	12"		
12:13	13.3"						
PERC RATE: 4.8" per hour		PERC RATE: 10" per hour		PERC RATE: 8.4" per hour		PERC RATE:	

COMMENTS: _____

Appendix C:

Erosion and Sedimentation Control Checklist
Long Term Stormwater Operation and Maintenance Measures

Erosion and Sedimentation Control Checklist

Orange Solar – Orange, CT – Old Tavern Road

Best Management Practices – Maintenance/ Evaluation Checklist

Construction Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Silt Fencing	Once per week or after a 0.5″ or greater storm event						
Compost Filter Sock	Once per week or after a 0.5″ or greater storm event						
Straw Wattles	Once per week or after a 0.5″ or greater storm event						
Stabilized Construction Exit	Once per week or after a 0.5″ or greater storm event						
Temporary Sediment Trap/Basin & Diversion Swales	Once per week or after a 0.5″ or greater storm event						
Vegetated Slope Stabilization	Once per week or after a 0.5″ or greater storm event						
Energy Dissipators	Once per week or after a 0.5″ or greater storm event						

Stormwater Control Manager _____

Long Term Stormwater Operation and Maintenance Measures

Orange Solar – Orange, CT – Old Tavern Road

Best Management Practices – Maintenance/ Evaluation Checklist

Long Term Practices

Best Management Practice	Inspection Frequency	Date Inspected	Inspector	Minimum Maintenance and Key Items to Check	Cleaning/Repair Needed ☐yes ☐no (List Items)	Date of Cleaning/Repair	Performed by
Trash/Litter	Routinely pick up and remove litter from entire property as required.						
Vegetated Areas	Inspect bi-annually. Replant bare areas upon identification.						
Energy Dissipators	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						
Diversion Swales	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						
Infiltration Basin	Inspect monthly for the first 3 months and after any rain event exceeding 0.5″. Inspect 2x per year thereafter.						

Stormwater Control Manager _____

Project Information

Site

Project Name:	Orange Solar
Address or Locus:	361 Old Tavern Road
City, State & Zip:	Orange, CT 06477

Developer

Client Name:	Greenskies Clean Energy, LLC
Client Address:	127 Washington Ave, West Bldg, Lower Level
Client City, State & Zip:	North Haven, CT 06473
Client Telephone No.:	(860) 740-5289
Client Cell Phone:	
Client E-Mail:	Bonnie.potocki@greenskies.com

Site Supervisor

Site Manager Name:	To be determined
Site Manager Address:	
Site Manager City, State & Zip:	
Site Manager Telephone No.:	
Site Manager Cell Phone:	
Site Manager E-Mail:	

Appendix D:

Diversion Swale & Sediment Trap Sizing
Water Quality Computations
HydroCAD: Existing Conditions
HydroCAD: Proposed Conditions

Diversion Swale & Sediment Trap Sizing

Swale Sizing

Swale 1

72,600 sf

1.67 ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.005	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (fallow soil) =	8.20	cfs	
Bottom width, w =	4	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.72	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**2.90**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	4.44	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	8.55	ft	
R = A / P =	0.52	ft	
A * R^(2/3) =	**2.86**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.22**	psf	< 1.55 psf for ECB - OK
Velocity, V = Q / A =	**1.85**	fps	< 5.00 fps for ECB - OK

Swale Sizing

Swale	2S	
6,100	sf	
0.14	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.005	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (fallow soil) =	0.69	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.33	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.24**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.66	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.09	ft	
R = A / P =	0.21	ft	
A * R^(2/3) =	**0.23**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.10**	psf	< 1.55 psf for ECB - OK
Velocity, V = Q / A =	**1.05**	fps	< 5.00 fps for ECB - OK

Swale Sizing

Swale 2N

12,900 sf

0.30 ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.015	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (fallow soil) =	1.46	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.38	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.30**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.81	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.40	ft	
R = A / P =	0.24	ft	
A * R^(2/3) =	**0.31**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.36**	psf	< 1.55 psf for ECB - OK
Velocity, V = Q / A =	**1.79**	fps	< 5.00 fps for ECB - OK

Swale Sizing

Swale 3N

33,200 sf

0.76 ac

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.015	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (fallow soil) =	3.75	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.58	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.77**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.59	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	4.67	ft	
R = A / P =	0.34	ft	
A * R^(2/3) =	**0.77**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.54**	psf	< 1.55 psf for ECB - OK
Velocity, V = Q / A =	**2.36**	fps	< 5.00 fps for ECB - OK

Swale Sizing

Swale	3S	
15,000	sf	
0.34	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.005	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (fallow soil) =	1.69	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.52	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.60**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.33	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	4.29	ft	
R = A / P =	0.31	ft	
A * R^(2/3) =	**0.61**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.16**	psf	< 1.55 psf for ECB - OK
Velocity, V = Q / A =	**1.27**	fps	< 5.00 fps for ECB - OK

Swale Sizing

Swale	4	
18,400	sf	
0.42	ac	

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.025	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (fallow soil) =	2.08	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.39	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.33**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	0.85	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	3.47	ft	
R = A / P =	0.24	ft	
A * R^(2/3) =	**0.33**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.61**	psf	< 1.55 psf for ECB - OK
Velocity, V = Q / A =	**2.46**	fps	< 5.00 fps for ECB - OK

Swale Sizing

Swale	5		
23,900	sf		
0.55	ac		

Reference DOT Drainage Manual 2000

Swale Slope, S =	0.005	ft / ft	
Manning's n for bare soil / ECB, n =	0.025		
Q25 (fallow soil) =	2.70	cfs	
Bottom width, w =	1	ft	
Side slopes, X:1 =	3		
Estimated flow depth, d =	0.64	ft	
Q = (1/n) * A * R^(2/3) * S^(1/2)			
A * R^(2/3) = Q / (1/n) / S^(1/2) =	**0.95**	(target for variable depth)	
A = (w * d) + 2 * (0.5d * Xd) =	1.87	sf	
P = w + 2 * (sqrt(d^2 + (Xd)^2) =	5.05	ft	
R = A / P =	0.37	ft	
A * R^(2/3) =	**0.96**	(must be close to target)	
y =	62.4	pcf	
ŧd = y * d * S =	**0.20**	psf	< 1.55 psf for ECB - OK
Velocity, V = Q / A =	**1.45**	fps	< 5.00 fps for ECB - OK

Sediment Trap Sizing
GCE Orange Solar
September 2021

TST #	Tributary Acreage, ac	*(134 cy / acre)** Volume Required Below Top of Spillway, cf	Volume Provided in Permanent Basin Below Top of Spillway, cf
1	3.4	12,301	12,807
2	1.1	3,980	4,748
3	1.7	6,151	6,360
4	1.2	4,342	4,748
5	2.5	9,045	9,583

* Per 2002 Connecticut Guidelines for Soil Erosion and Sediment Control

Water Quality Computations

Water Quality Volume Calculations

Project: GCE Orange Solar By: JDW Date: 9/29/21
Location: 361 Old Tavern Road, Orange, CT Checked: SJK Date: 9/29/21

Basin Name	1	2	3	4	5	
Rainfall, P	1.0 in.	1.0 in.	1.0 in.	1.0 in.	1.0 in.	a
Area, A	3.37 ac	1.10 ac	1.68 ac	1.16 ac	2.48 ac	b
Impervious Cover Area	0.09 ac	0.00 ac	0.08 ac	0.00 ac	0.16 ac	c
% Impervious, I	3 %	0 %	5 %	0 %	6 %	
Volumetric Runoff Coeff., R	0.074	0.050	0.093	0.050	0.108	d
Water Quality Volume, WQV	0.021 ac-ft	0.005 ac-ft	0.013 ac-ft	0.005 ac-ft	0.022 ac-ft	e
	906 cf	200 cf	566 cf	211 cf	973 cf	

Water Quality Volume Provided	**0.250 ac-ft**	**0.086 ac-ft**	**0.091 ac-ft**	**0.050 ac-ft**	**0.108 ac-ft**	f
	10,890 cf	**3,746 cf**	**3,964 cf**	**2,178 cf**	**4,704 cf**	

[a] First one inch of rainfall; 2004 Connecticut Stormwater Quality Manual

[b] Area tributary to the stormwater management basin

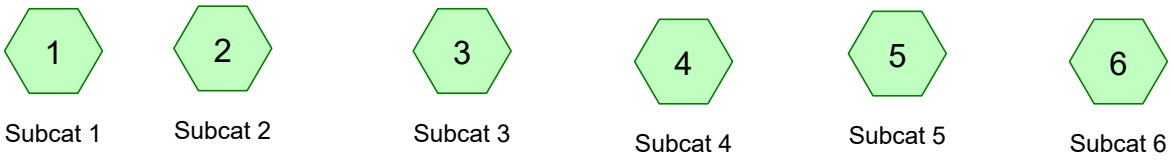
[c] Impervious cover area tributary to the stormwater management basin

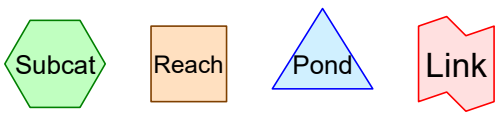
[d] R=0.05+0.009*I; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[e] WQV=P*R*A/12; Section 7.4.1 from 2004 Connecticut Stormwater Quality Manual

[f] Storage volume beneath the crest of the proposed basin spillway

HydroCAD Analysis: Existing Conditions





Routing Diagram for 42707.00 - Existing Conditions2
Prepared by VHB, Printed 9/29/2021

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 year	Type III 24-hr		Default	24.00	1	3.54	2
2	25 year	Type III 24-hr		Default	24.00	1	6.61	2
3	50 year	Type III 24-hr		Default	24.00	1	7.49	2
4	100 year	Type III 24-hr		Default	24.00	1	8.43	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.323	61	>75% Grass cover, Good, HSG B (2, 3, 4, 5, 6)
0.064	74	>75% Grass cover, Good, HSG C (1)
9.007	78	Row crops, straight row, Good, HSG B (1, 2, 3, 4, 5, 6)
0.170	85	Row crops, straight row, Good, HSG C (1)
0.164	89	Row crops, straight row, Good, HSG D (5)
10.728	**76**	**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.368 ac 0.00% Impervious Runoff Depth>1.41"
Flow Length=550' Slope=0.0200 '/' Tc=9.1 min CN=78 Runoff=5.26 cfs 0.395 af

Subcatchment2: Subcat 2 Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>0.94"
Flow Length=350' Slope=0.0200 '/' Tc=10.2 min CN=70 Runoff=1.05 cfs 0.086 af

Subcatchment3: Subcat 3 Runoff Area=1.683 ac 0.00% Impervious Runoff Depth>1.35"
Flow Length=320' Slope=0.0200 '/' Tc=6.1 min CN=77 Runoff=2.78 cfs 0.189 af

Subcatchment4: Subcat 4 Runoff Area=1.159 ac 0.00% Impervious Runoff Depth>1.35"
Flow Length=320' Slope=0.0400 '/' Tc=4.4 min CN=77 Runoff=2.01 cfs 0.130 af

Subcatchment5: Subcat 5 Runoff Area=2.483 ac 0.00% Impervious Runoff Depth>1.34"
Flow Length=450' Tc=6.9 min CN=77 Runoff=4.00 cfs 0.278 af

Subcatchment6: Subcat 6 Runoff Area=0.937 ac 0.00% Impervious Runoff Depth>0.88"
Flow Length=250' Slope=0.0200 '/' Tc=8.8 min CN=69 Runoff=0.87 cfs 0.069 af

Total Runoff Area = 10.728 ac Runoff Volume = 1.147 af Average Runoff Depth = 1.28"
100.00% Pervious = 10.728 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

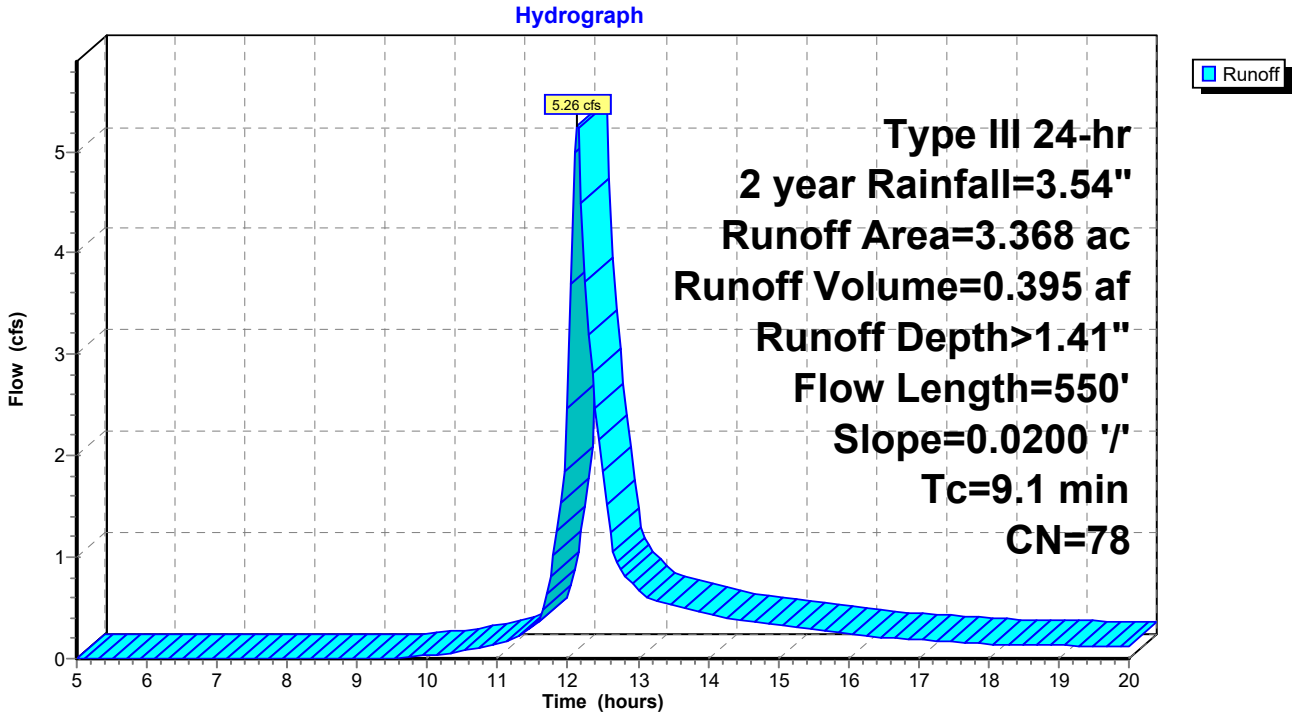
Runoff = 5.26 cfs @ 12.14 hrs, Volume= 0.395 af, Depth> 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

Area (ac)	CN	Description
0.064	74	>75% Grass cover, Good, HSG C
0.170	85	Row crops, straight row, Good, HSG C
3.134	78	Row crops, straight row, Good, HSG B
3.368	78	Weighted Average
3.368		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
6.5	500	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.1	550	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

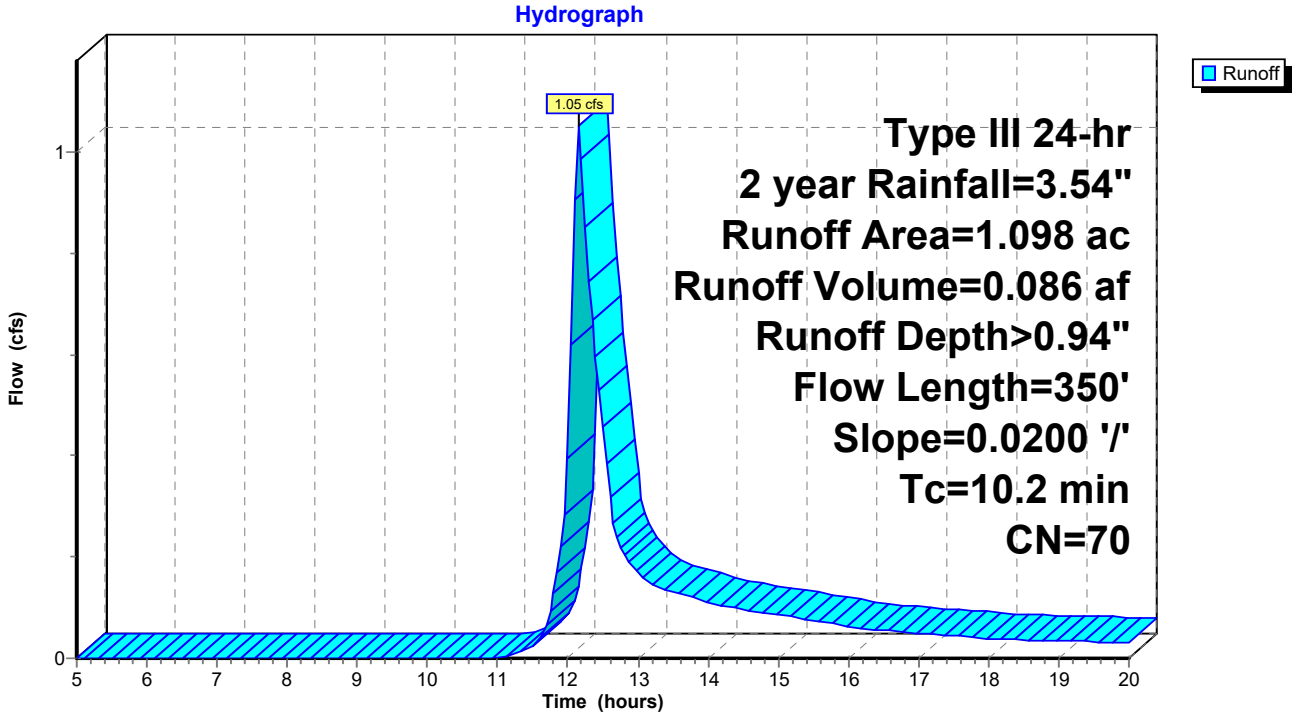
Runoff = 1.05 cfs @ 12.16 hrs, Volume= 0.086 af, Depth> 0.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

Area (ac)	CN	Description
0.594	78	Row crops, straight row, Good, HSG B
0.504	61	>75% Grass cover, Good, HSG B
1.098	70	Weighted Average
1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.9	230	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	70	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.2	350	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

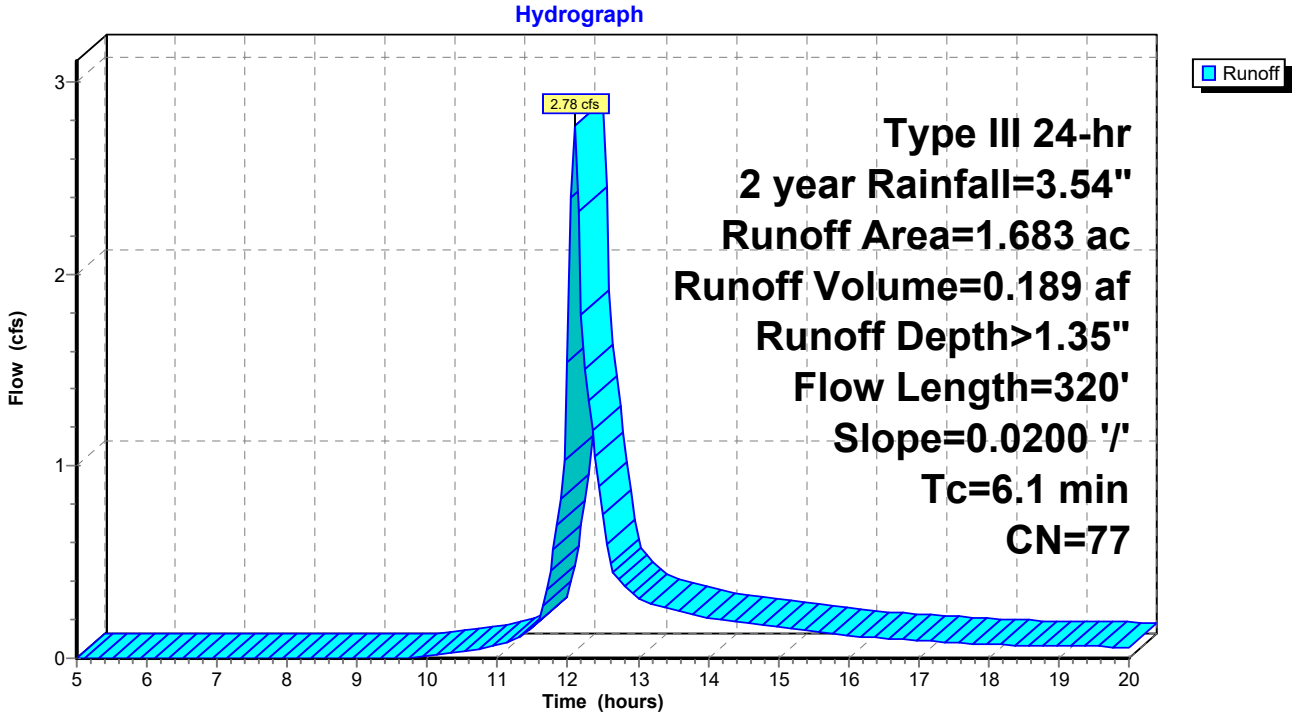
Runoff = 2.78 cfs @ 12.10 hrs, Volume= 0.189 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

Area (ac)	CN	Description
0.054	61	>75% Grass cover, Good, HSG B
1.629	78	Row crops, straight row, Good, HSG B
1.683	77	Weighted Average
1.683		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
3.5	270	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.1	320	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

[49] Hint: Tc<2dt may require smaller dt

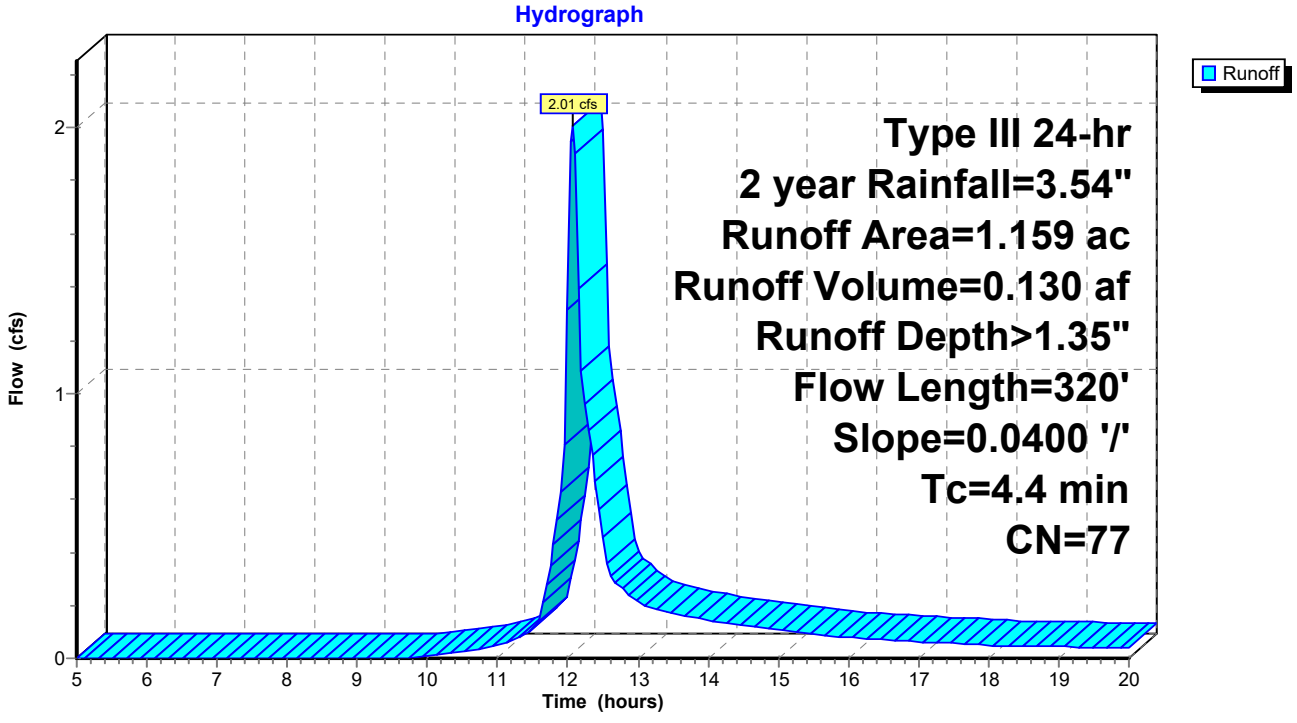
Runoff = 2.01 cfs @ 12.07 hrs, Volume= 0.130 af, Depth> 1.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

Area (ac)	CN	Description
0.057	61	>75% Grass cover, Good, HSG B
1.102	78	Row crops, straight row, Good, HSG B
1.159	77	Weighted Average
1.159		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	50	0.0400	0.43		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
2.5	270	0.0400	1.80		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
4.4	320	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

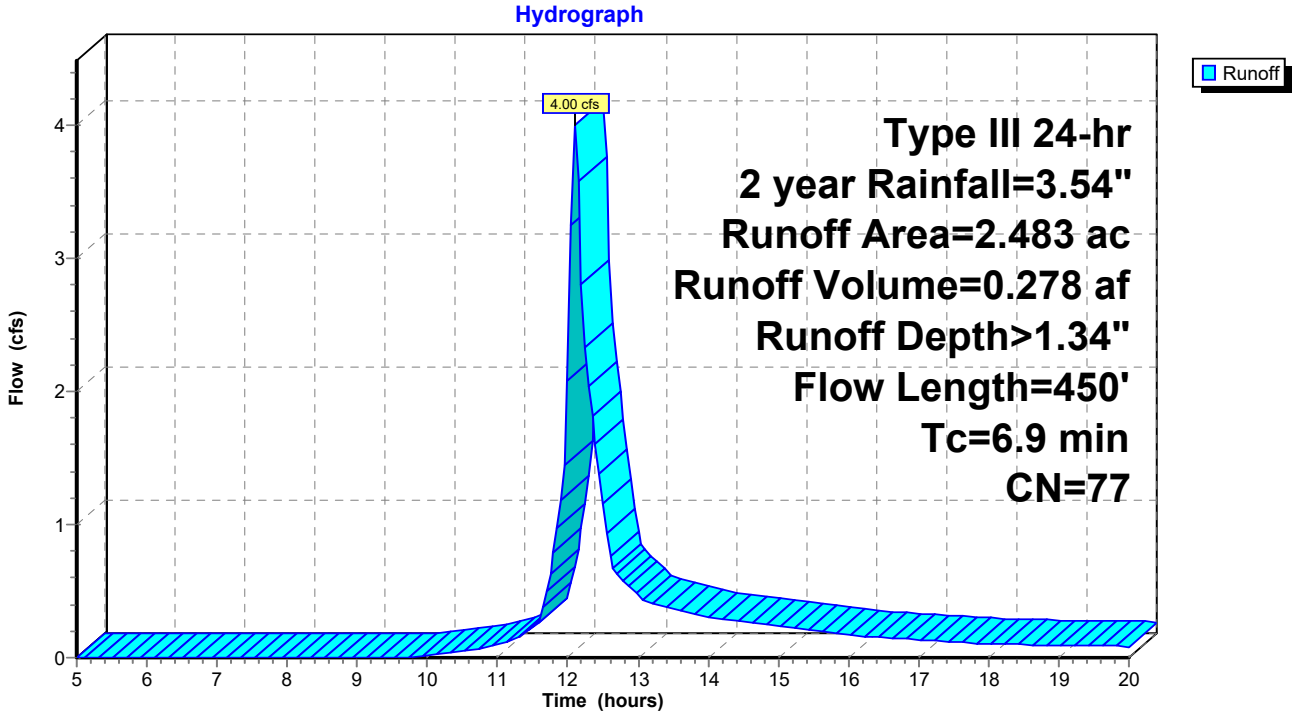
Runoff = 4.00 cfs @ 12.11 hrs, Volume= 0.278 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

Area (ac)	CN	Description
0.215	61	>75% Grass cover, Good, HSG B
2.104	78	Row crops, straight row, Good, HSG B
0.164	89	Row crops, straight row, Good, HSG D
2.483	77	Weighted Average
2.483		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
2.6	200	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.7	200	0.0500	2.01		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.9	450	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

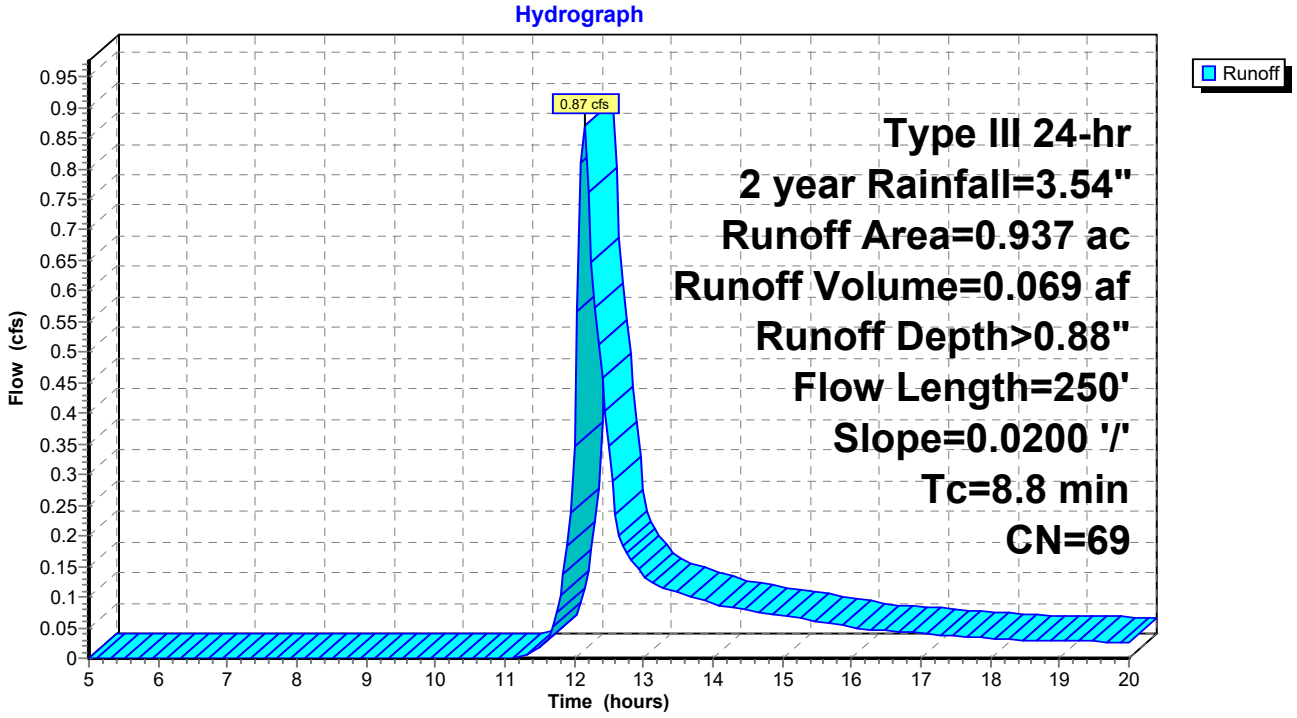
Runoff = 0.87 cfs @ 12.14 hrs, Volume= 0.069 af, Depth> 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

Area (ac)	CN	Description
0.493	61	>75% Grass cover, Good, HSG B
0.444	78	Row crops, straight row, Good, HSG B
0.937	69	Weighted Average
0.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	250	Total			

Subcatchment 6: Subcat 6



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.368 ac 0.00% Impervious Runoff Depth>3.86"
Flow Length=550' Slope=0.0200 '/' Tc=9.1 min CN=78 Runoff=14.32 cfs 1.083 af

Subcatchment2: Subcat 2 Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>3.06"
Flow Length=350' Slope=0.0200 '/' Tc=10.2 min CN=70 Runoff=3.64 cfs 0.280 af

Subcatchment3: Subcat 3 Runoff Area=1.683 ac 0.00% Impervious Runoff Depth>3.76"
Flow Length=320' Slope=0.0200 '/' Tc=6.1 min CN=77 Runoff=7.73 cfs 0.527 af

Subcatchment4: Subcat 4 Runoff Area=1.159 ac 0.00% Impervious Runoff Depth>3.76"
Flow Length=320' Slope=0.0400 '/' Tc=4.4 min CN=77 Runoff=5.62 cfs 0.363 af

Subcatchment5: Subcat 5 Runoff Area=2.483 ac 0.00% Impervious Runoff Depth>3.76"
Flow Length=450' Tc=6.9 min CN=77 Runoff=11.16 cfs 0.778 af

Subcatchment6: Subcat 6 Runoff Area=0.937 ac 0.00% Impervious Runoff Depth>2.96"
Flow Length=250' Slope=0.0200 '/' Tc=8.8 min CN=69 Runoff=3.11 cfs 0.231 af

Total Runoff Area = 10.728 ac Runoff Volume = 3.262 af Average Runoff Depth = 3.65"
100.00% Pervious = 10.728 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

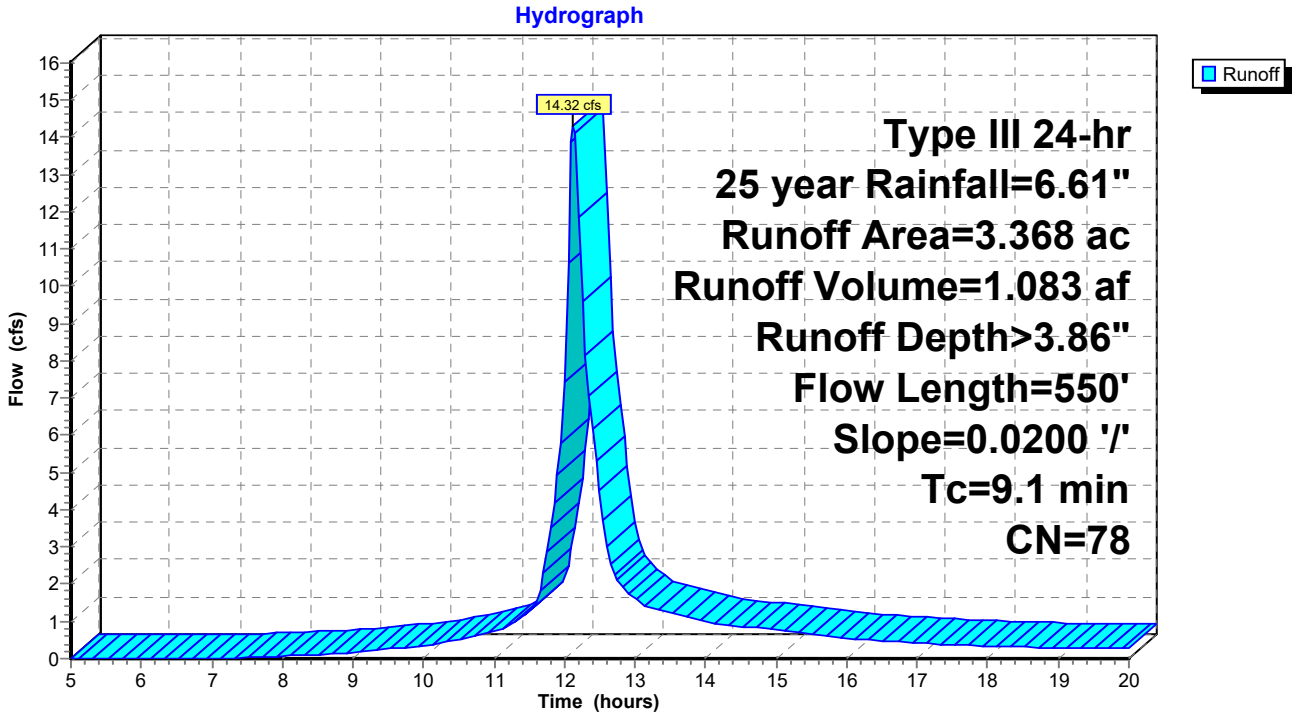
Runoff = 14.32 cfs @ 12.13 hrs, Volume= 1.083 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

Area (ac)	CN	Description
0.064	74	>75% Grass cover, Good, HSG C
0.170	85	Row crops, straight row, Good, HSG C
3.134	78	Row crops, straight row, Good, HSG B
3.368	78	Weighted Average
3.368		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
6.5	500	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.1	550	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

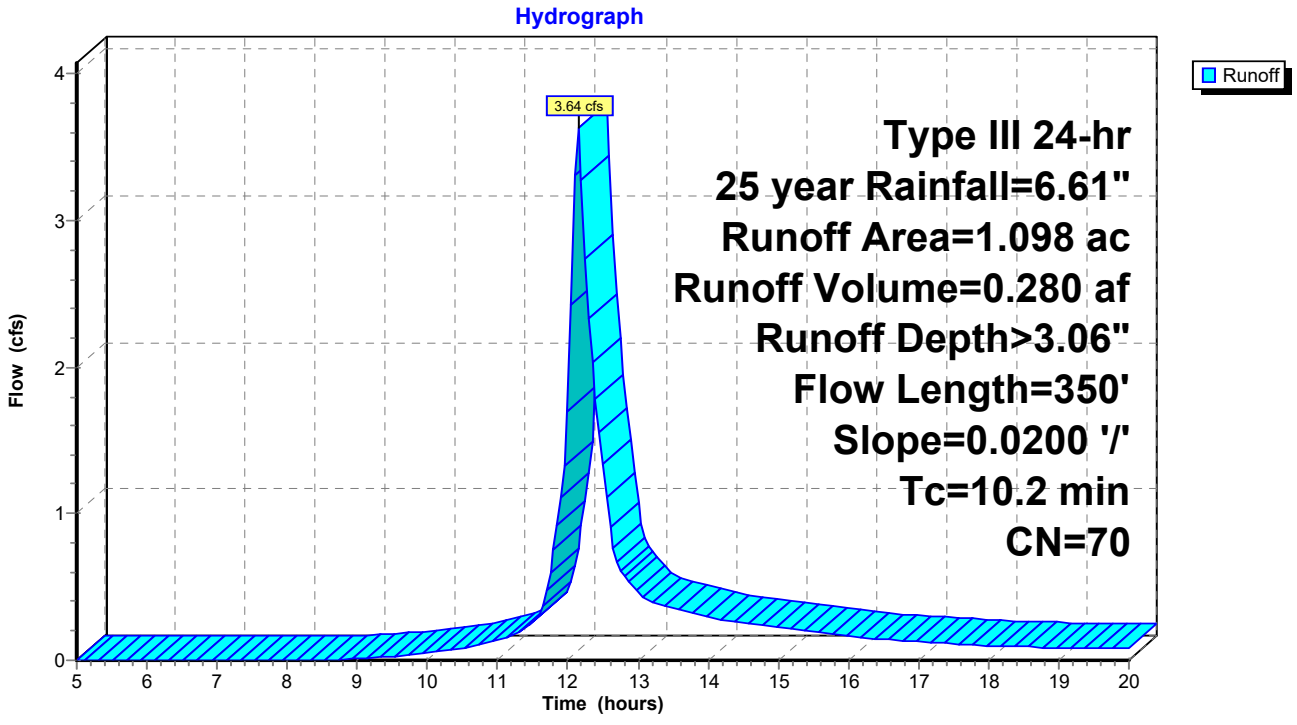
Runoff = 3.64 cfs @ 12.15 hrs, Volume= 0.280 af, Depth> 3.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

Area (ac)	CN	Description
0.594	78	Row crops, straight row, Good, HSG B
0.504	61	>75% Grass cover, Good, HSG B
1.098	70	Weighted Average
1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.9	230	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	70	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.2	350	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

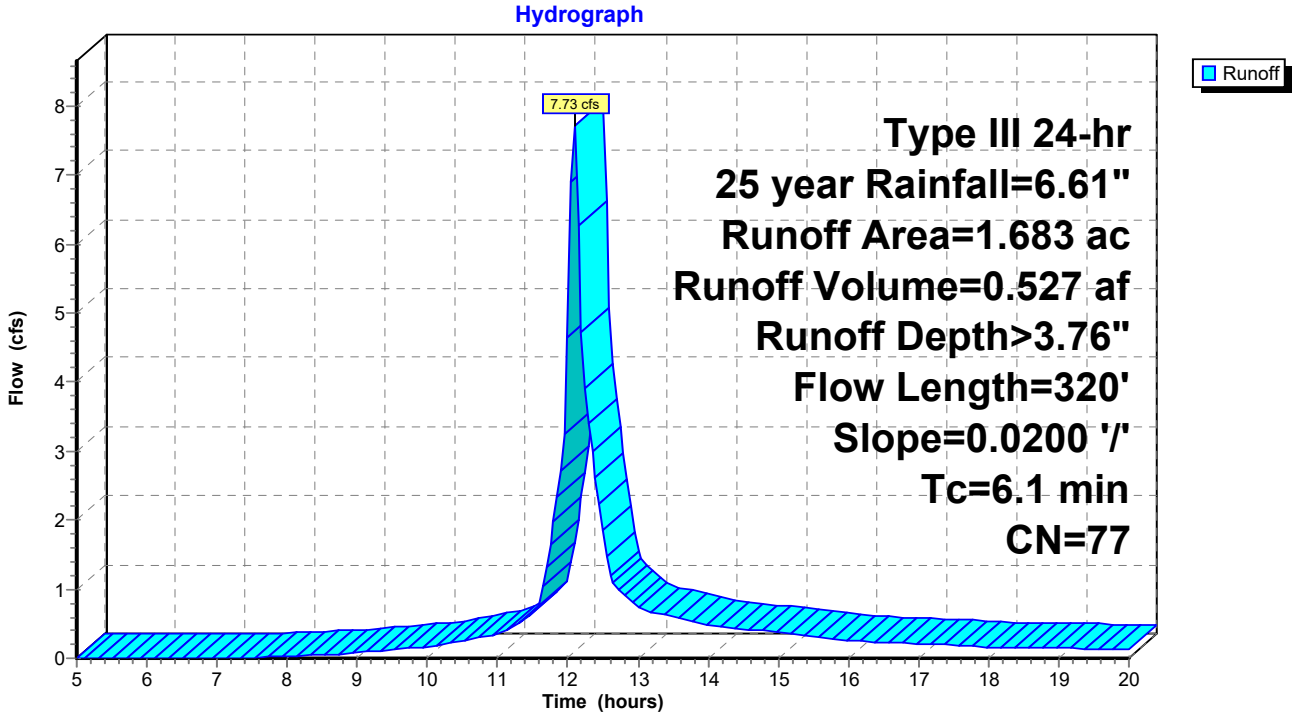
Runoff = 7.73 cfs @ 12.09 hrs, Volume= 0.527 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

Area (ac)	CN	Description
0.054	61	>75% Grass cover, Good, HSG B
1.629	78	Row crops, straight row, Good, HSG B
1.683	77	Weighted Average
1.683		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
3.5	270	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.1	320	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

[49] Hint: Tc<2dt may require smaller dt

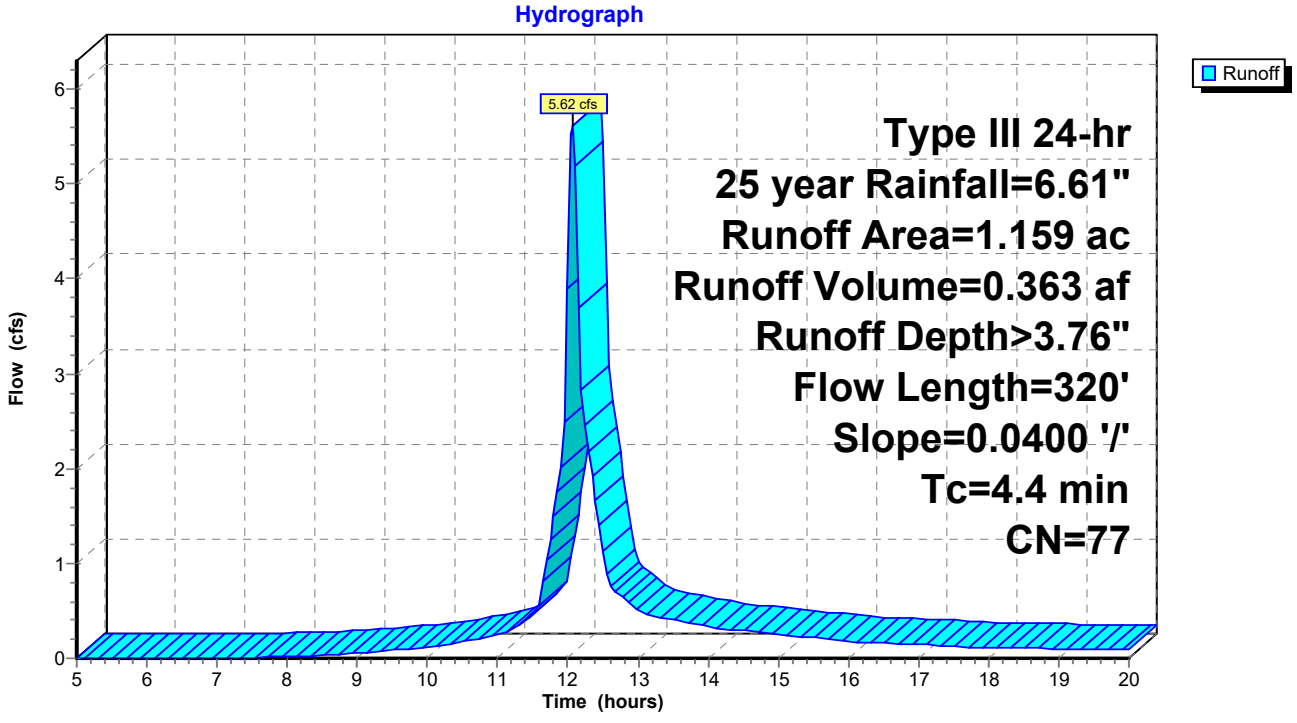
Runoff = 5.62 cfs @ 12.07 hrs, Volume= 0.363 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

Area (ac)	CN	Description
0.057	61	>75% Grass cover, Good, HSG B
1.102	78	Row crops, straight row, Good, HSG B
1.159	77	Weighted Average
1.159		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	50	0.0400	0.43		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
2.5	270	0.0400	1.80		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
4.4	320	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

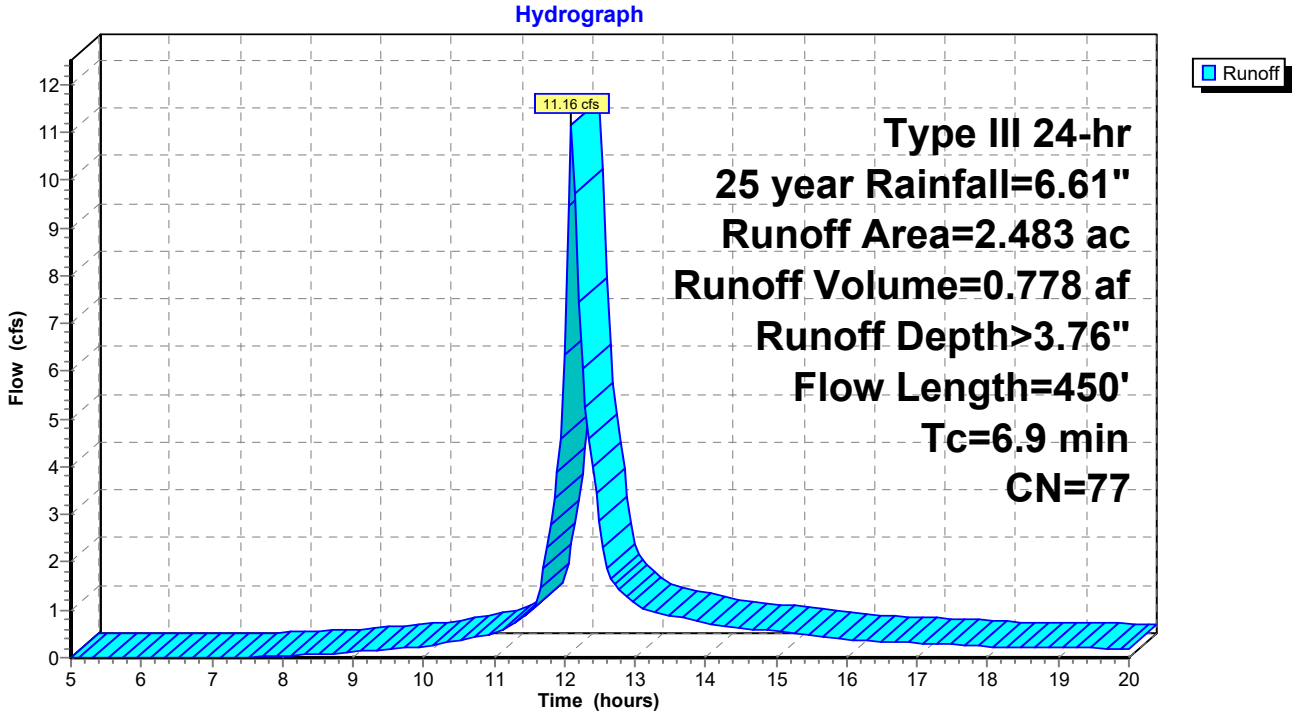
Runoff = 11.16 cfs @ 12.10 hrs, Volume= 0.778 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

Area (ac)	CN	Description
0.215	61	>75% Grass cover, Good, HSG B
2.104	78	Row crops, straight row, Good, HSG B
0.164	89	Row crops, straight row, Good, HSG D
2.483	77	Weighted Average
2.483		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
2.6	200	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.7	200	0.0500	2.01		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.9	450	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

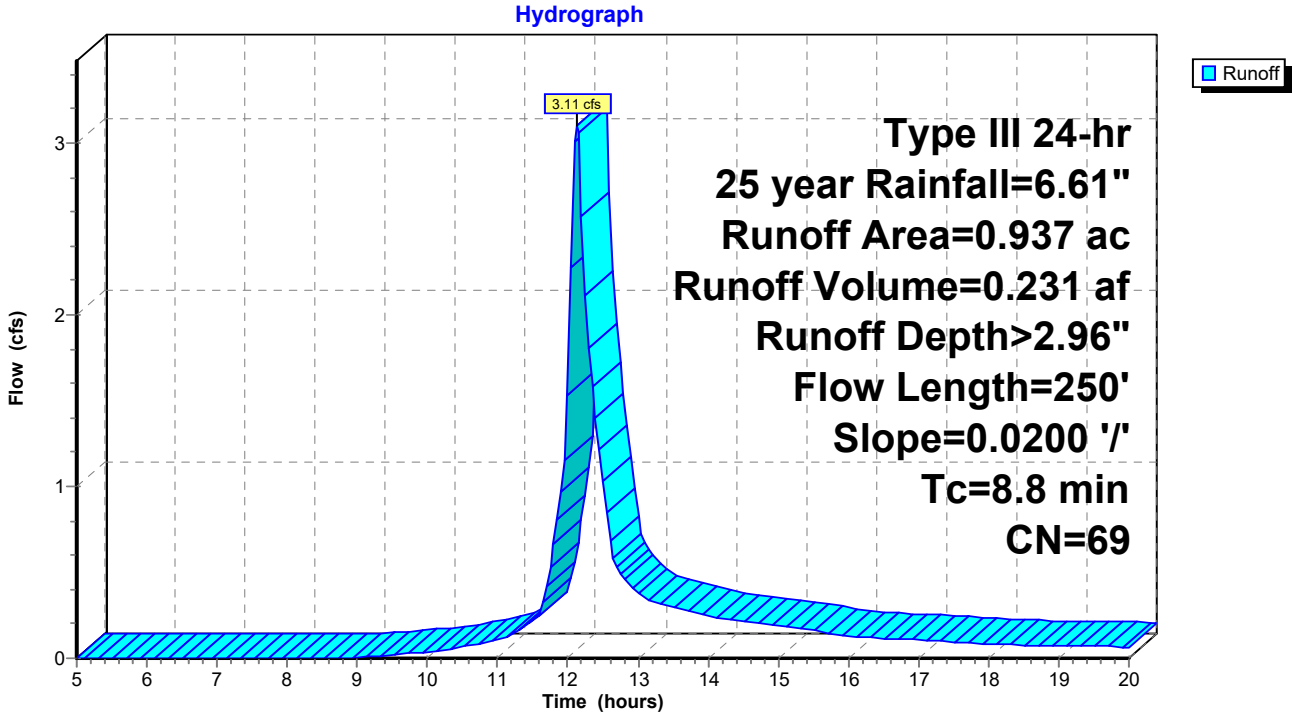
Runoff = 3.11 cfs @ 12.13 hrs, Volume= 0.231 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

Area (ac)	CN	Description
0.493	61	>75% Grass cover, Good, HSG B
0.444	78	Row crops, straight row, Good, HSG B
0.937	69	Weighted Average
0.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	250	Total			

Subcatchment 6: Subcat 6



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.368 ac 0.00% Impervious Runoff Depth>4.62"
Flow Length=550' Slope=0.0200 '/' Tc=9.1 min CN=78 Runoff=17.03 cfs 1.296 af

Subcatchment2: Subcat 2 Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>3.75"
Flow Length=350' Slope=0.0200 '/' Tc=10.2 min CN=70 Runoff=4.46 cfs 0.343 af

Subcatchment3: Subcat 3 Runoff Area=1.683 ac 0.00% Impervious Runoff Depth>4.51"
Flow Length=320' Slope=0.0200 '/' Tc=6.1 min CN=77 Runoff=9.22 cfs 0.633 af

Subcatchment4: Subcat 4 Runoff Area=1.159 ac 0.00% Impervious Runoff Depth>4.51"
Flow Length=320' Slope=0.0400 '/' Tc=4.4 min CN=77 Runoff=6.71 cfs 0.436 af

Subcatchment5: Subcat 5 Runoff Area=2.483 ac 0.00% Impervious Runoff Depth>4.51"
Flow Length=450' Tc=6.9 min CN=77 Runoff=13.31 cfs 0.933 af

Subcatchment6: Subcat 6 Runoff Area=0.937 ac 0.00% Impervious Runoff Depth>3.64"
Flow Length=250' Slope=0.0200 '/' Tc=8.8 min CN=69 Runoff=3.83 cfs 0.284 af

Total Runoff Area = 10.728 ac Runoff Volume = 3.925 af Average Runoff Depth = 4.39"
100.00% Pervious = 10.728 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

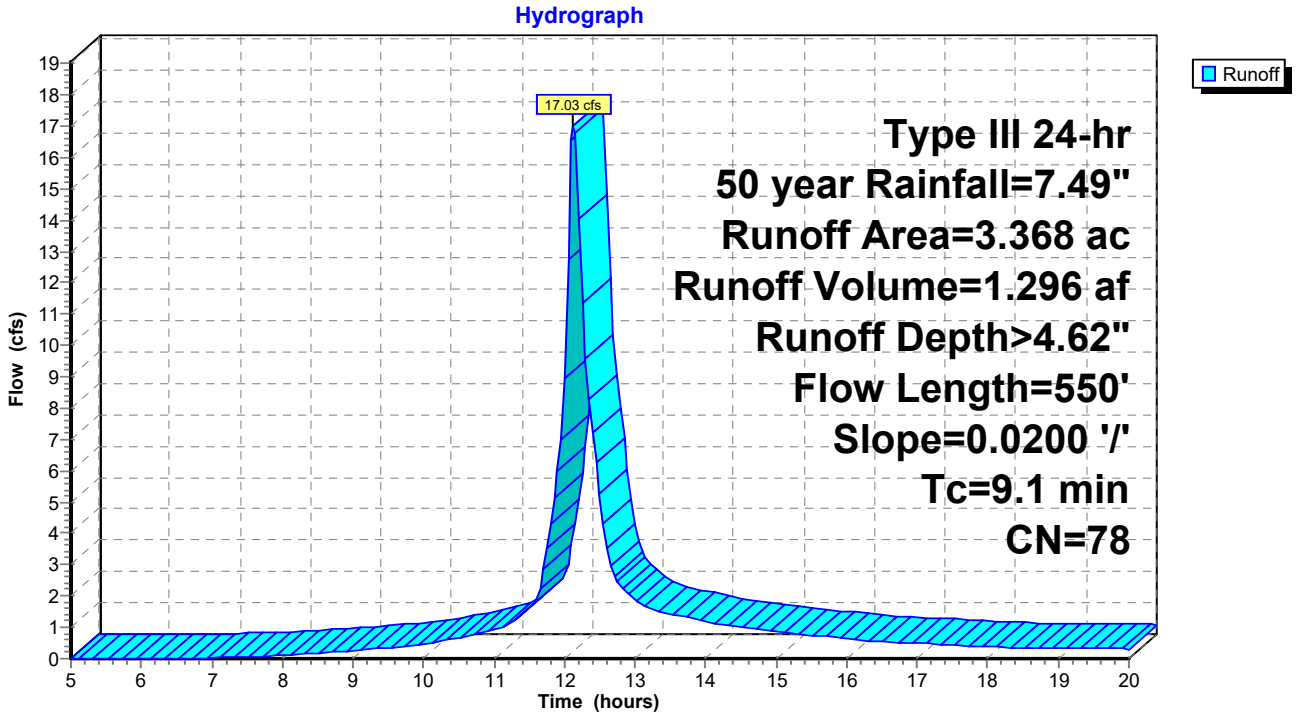
Runoff = 17.03 cfs @ 12.13 hrs, Volume= 1.296 af, Depth> 4.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

Area (ac)	CN	Description
0.064	74	>75% Grass cover, Good, HSG C
0.170	85	Row crops, straight row, Good, HSG C
3.134	78	Row crops, straight row, Good, HSG B
3.368	78	Weighted Average
3.368		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
6.5	500	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.1	550	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

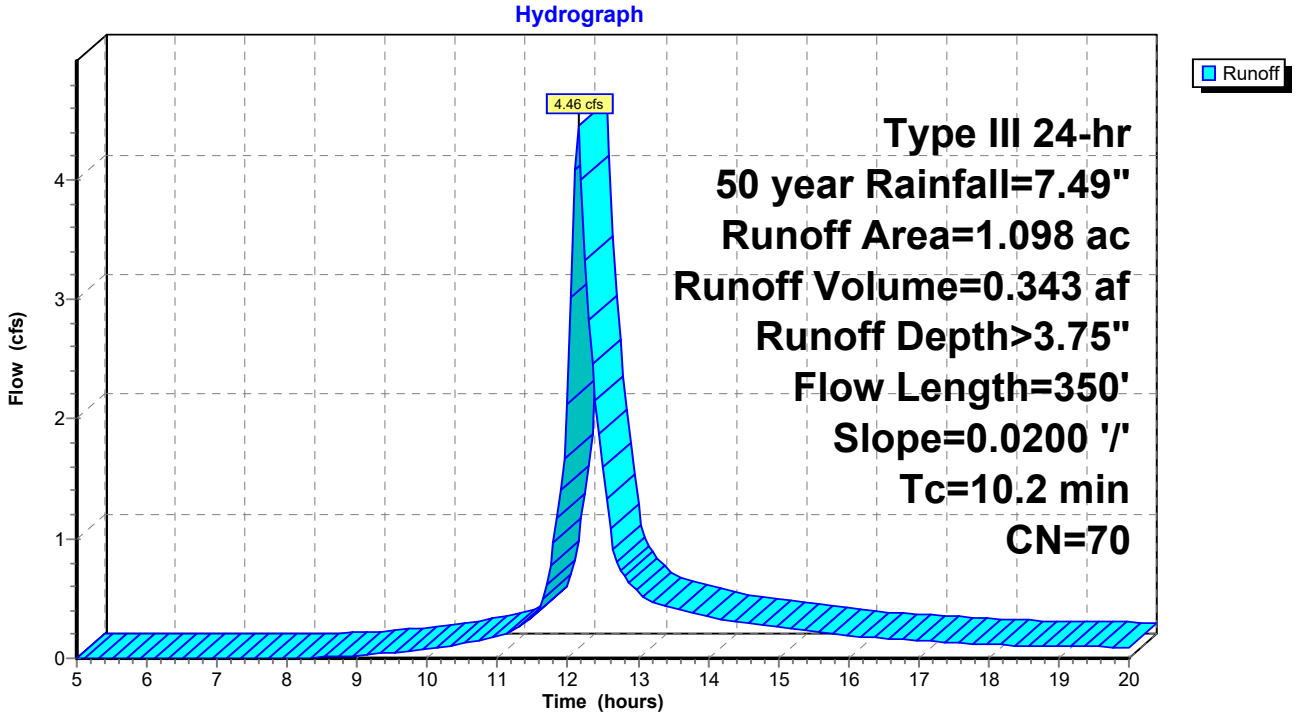
Runoff = 4.46 cfs @ 12.15 hrs, Volume= 0.343 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

Area (ac)	CN	Description
0.594	78	Row crops, straight row, Good, HSG B
0.504	61	>75% Grass cover, Good, HSG B
1.098	70	Weighted Average
1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.9	230	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	70	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.2	350	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

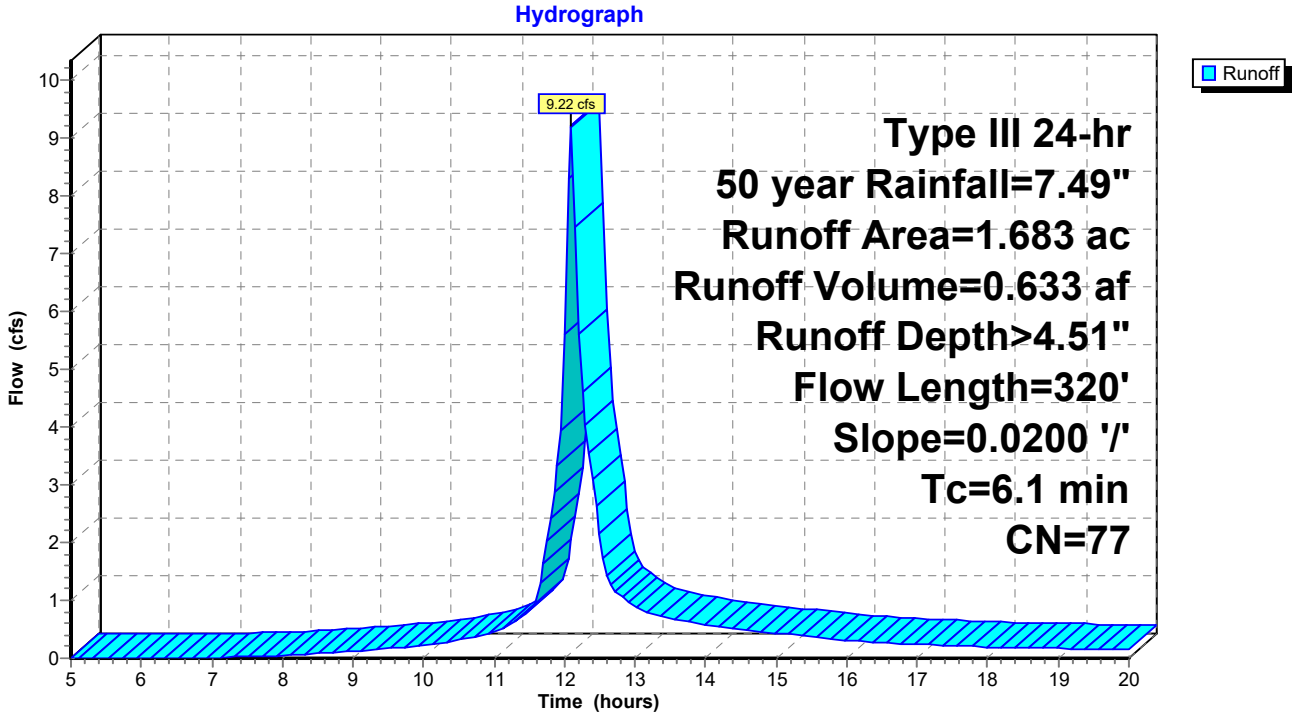
Runoff = 9.22 cfs @ 12.09 hrs, Volume= 0.633 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

Area (ac)	CN	Description
0.054	61	>75% Grass cover, Good, HSG B
1.629	78	Row crops, straight row, Good, HSG B
1.683	77	Weighted Average
1.683		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
3.5	270	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.1	320	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

[49] Hint: Tc<2dt may require smaller dt

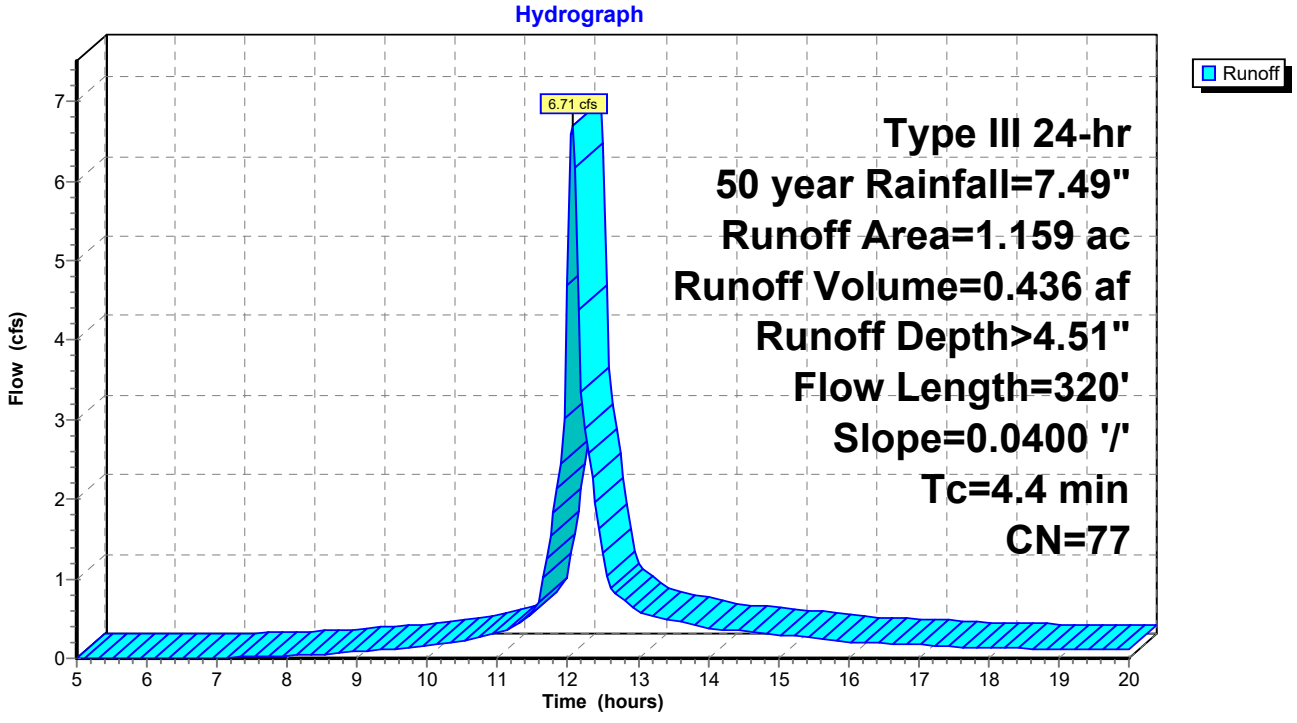
Runoff = 6.71 cfs @ 12.07 hrs, Volume= 0.436 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

Area (ac)	CN	Description
0.057	61	>75% Grass cover, Good, HSG B
1.102	78	Row crops, straight row, Good, HSG B
1.159	77	Weighted Average
1.159		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	50	0.0400	0.43		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
2.5	270	0.0400	1.80		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
4.4	320	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

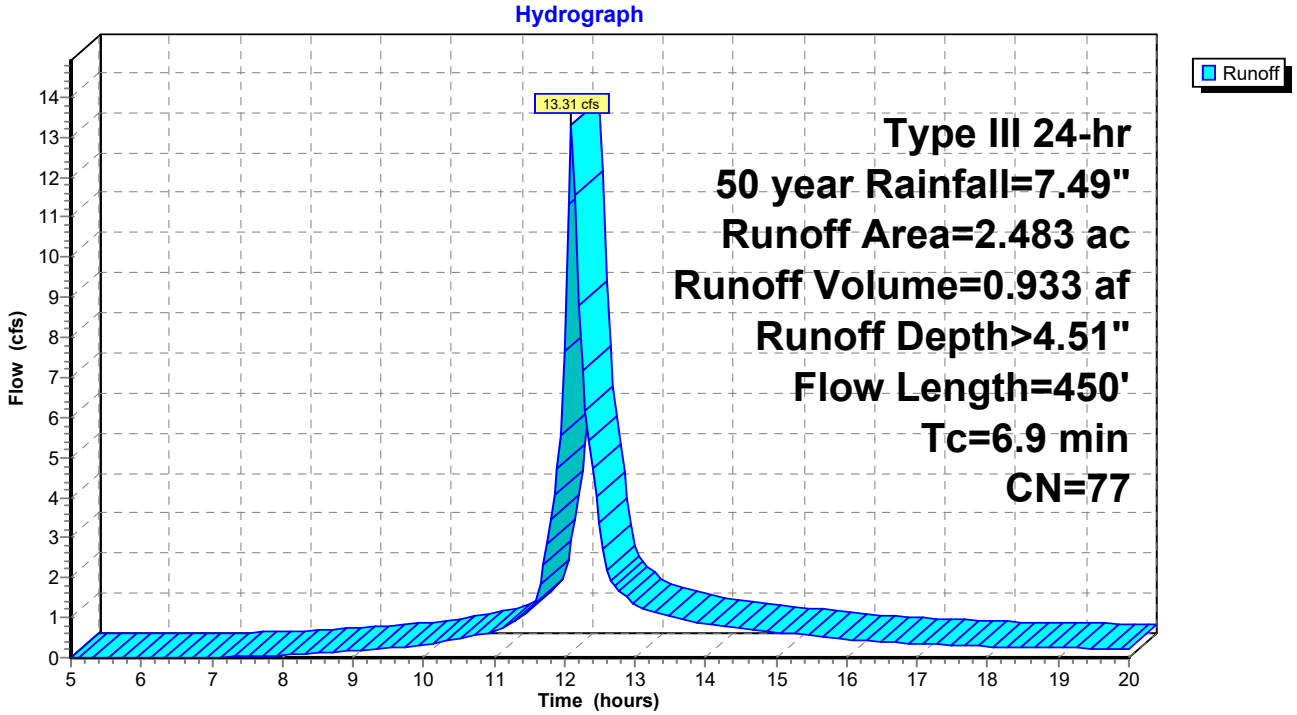
Runoff = 13.31 cfs @ 12.10 hrs, Volume= 0.933 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

Area (ac)	CN	Description
0.215	61	>75% Grass cover, Good, HSG B
2.104	78	Row crops, straight row, Good, HSG B
0.164	89	Row crops, straight row, Good, HSG D
2.483	77	Weighted Average
2.483		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
2.6	200	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.7	200	0.0500	2.01		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.9	450	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

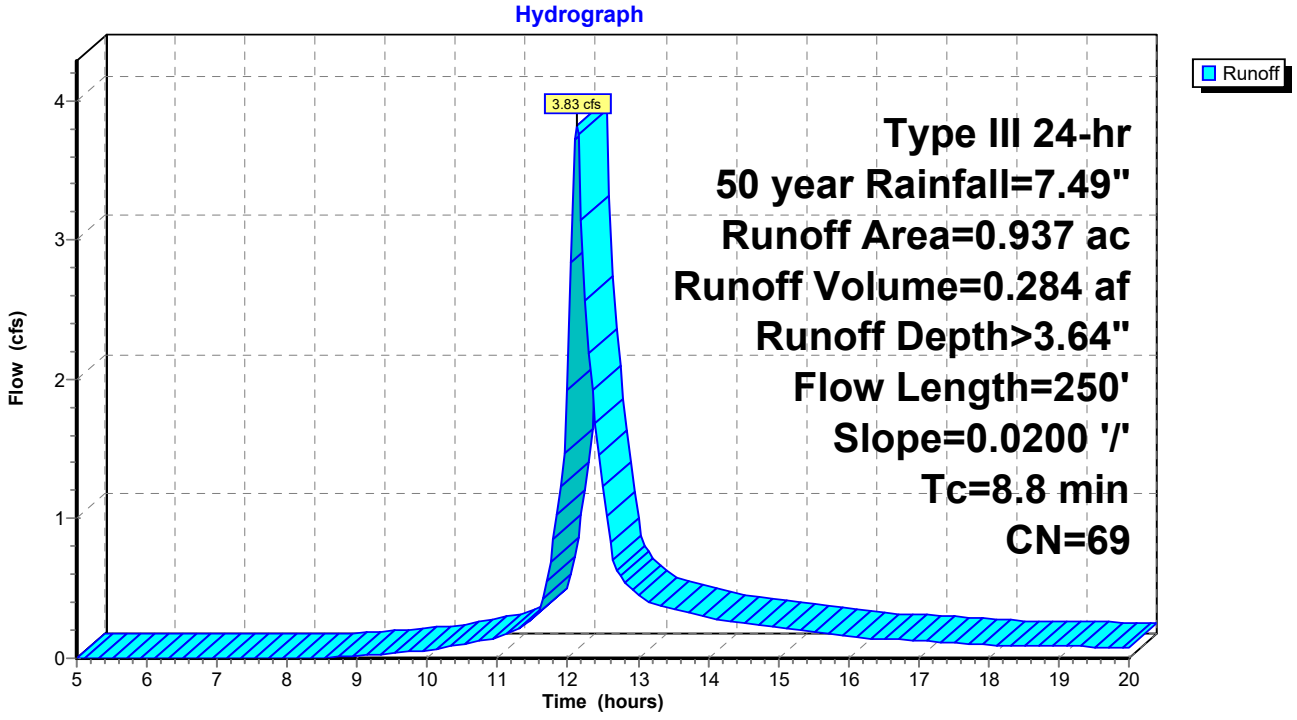
Runoff = 3.83 cfs @ 12.13 hrs, Volume= 0.284 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

Area (ac)	CN	Description
0.493	61	>75% Grass cover, Good, HSG B
0.444	78	Row crops, straight row, Good, HSG B
0.937	69	Weighted Average
0.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	250	Total			

Subcatchment 6: Subcat 6



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.368 ac 0.00% Impervious Runoff Depth>5.44"
Flow Length=550' Slope=0.0200 '/' Tc=9.1 min CN=78 Runoff=19.93 cfs 1.527 af

Subcatchment2: Subcat 2 Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>4.51"
Flow Length=350' Slope=0.0200 '/' Tc=10.2 min CN=70 Runoff=5.35 cfs 0.413 af

Subcatchment3: Subcat 3 Runoff Area=1.683 ac 0.00% Impervious Runoff Depth>5.33"
Flow Length=320' Slope=0.0200 '/' Tc=6.1 min CN=77 Runoff=10.82 cfs 0.747 af

Subcatchment4: Subcat 4 Runoff Area=1.159 ac 0.00% Impervious Runoff Depth>5.33"
Flow Length=320' Slope=0.0400 '/' Tc=4.4 min CN=77 Runoff=7.87 cfs 0.515 af

Subcatchment5: Subcat 5 Runoff Area=2.483 ac 0.00% Impervious Runoff Depth>5.33"
Flow Length=450' Tc=6.9 min CN=77 Runoff=15.63 cfs 1.102 af

Subcatchment6: Subcat 6 Runoff Area=0.937 ac 0.00% Impervious Runoff Depth>4.40"
Flow Length=250' Slope=0.0200 '/' Tc=8.8 min CN=69 Runoff=4.61 cfs 0.343 af

Total Runoff Area = 10.728 ac Runoff Volume = 4.648 af Average Runoff Depth = 5.20"
100.00% Pervious = 10.728 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1: Subcat 1

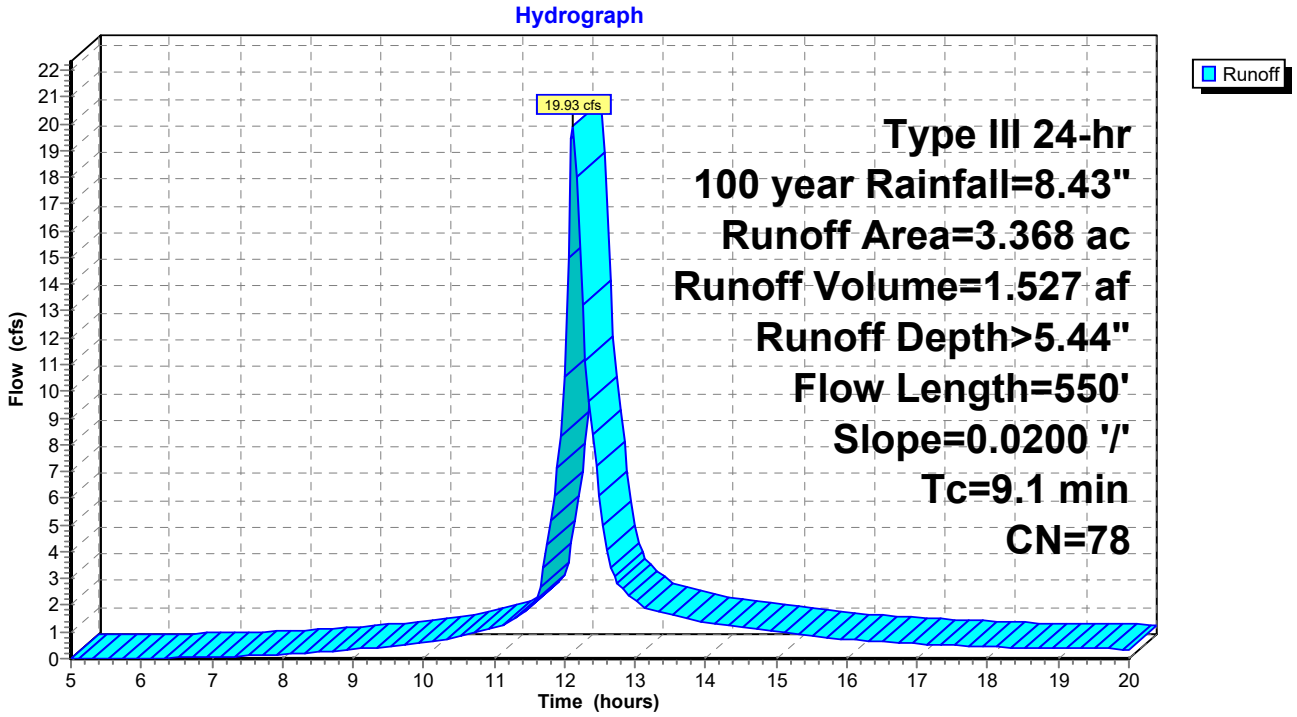
Runoff = 19.93 cfs @ 12.13 hrs, Volume= 1.527 af, Depth> 5.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

Area (ac)	CN	Description
0.064	74	>75% Grass cover, Good, HSG C
0.170	85	Row crops, straight row, Good, HSG C
3.134	78	Row crops, straight row, Good, HSG B
3.368	78	Weighted Average
3.368		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
6.5	500	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
9.1	550	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

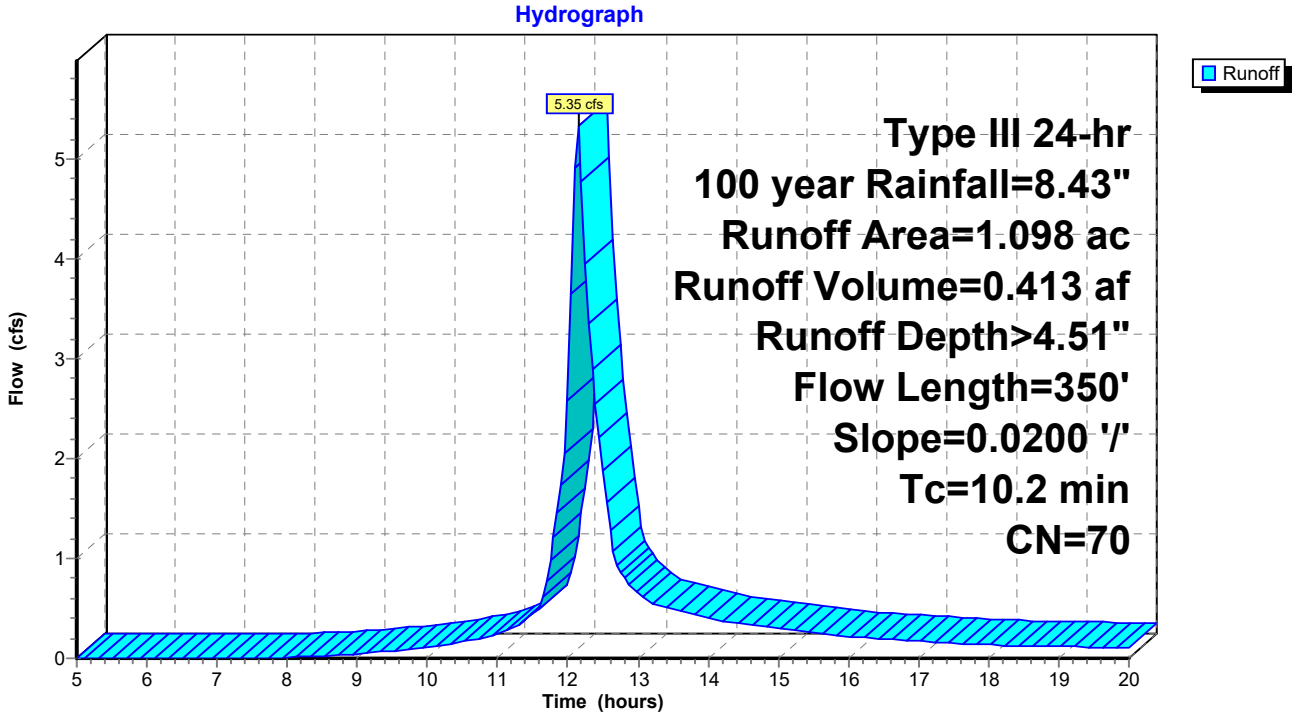
Runoff = 5.35 cfs @ 12.15 hrs, Volume= 0.413 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

Area (ac)	CN	Description
0.594	78	Row crops, straight row, Good, HSG B
0.504	61	>75% Grass cover, Good, HSG B
1.098	70	Weighted Average
1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.9	230	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
0.9	70	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
10.2	350	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

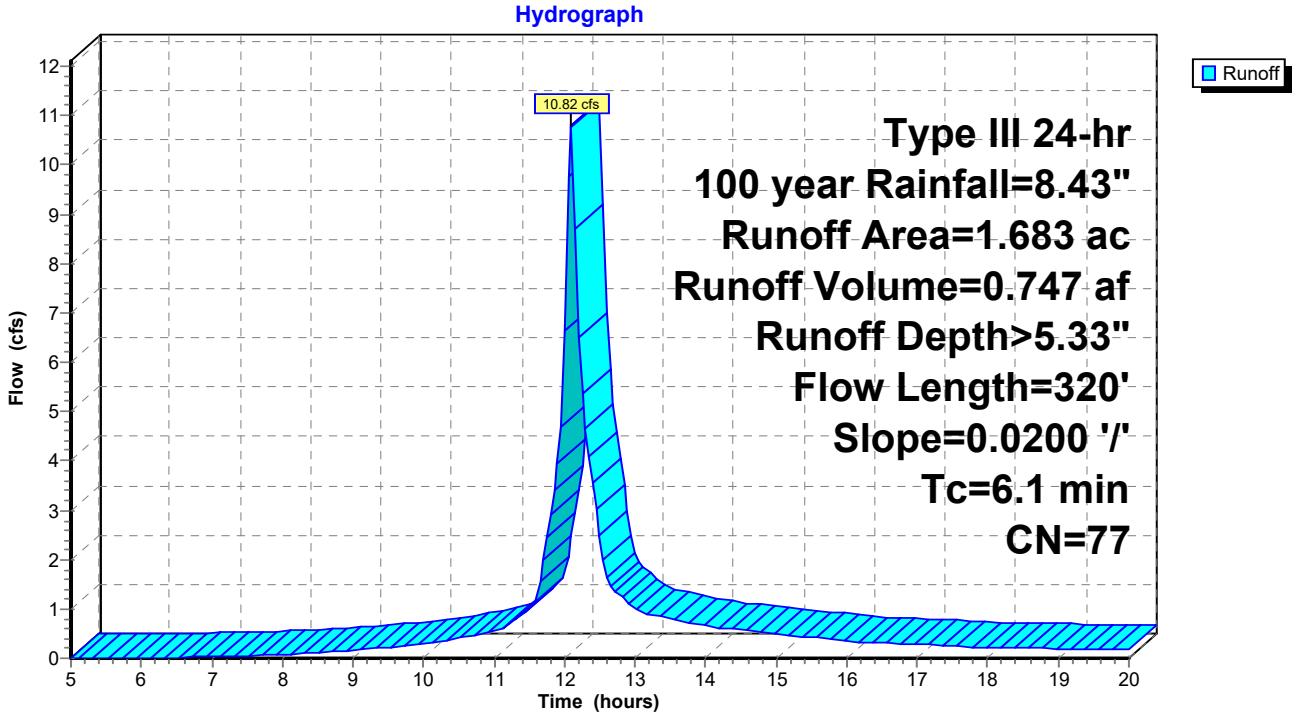
Runoff = 10.82 cfs @ 12.09 hrs, Volume= 0.747 af, Depth> 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

Area (ac)	CN	Description
0.054	61	>75% Grass cover, Good, HSG B
1.629	78	Row crops, straight row, Good, HSG B
1.683	77	Weighted Average
1.683		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
3.5	270	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.1	320	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

[49] Hint: Tc<2dt may require smaller dt

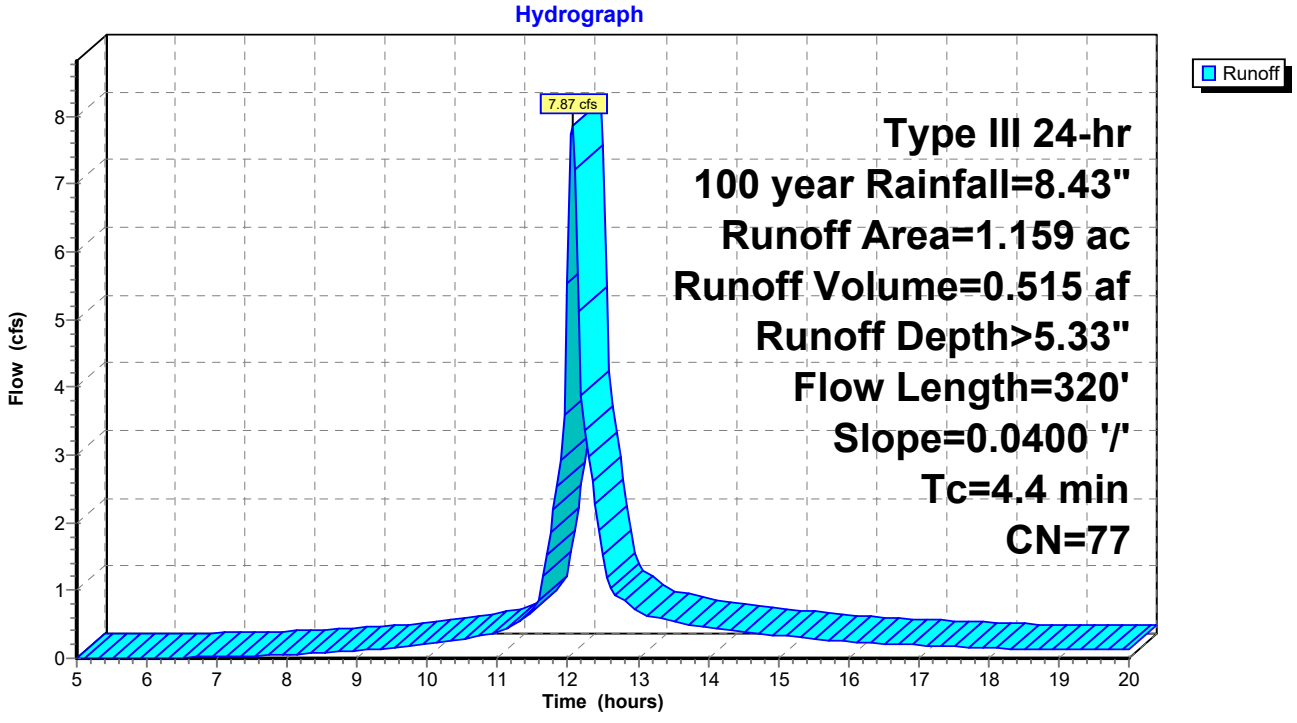
Runoff = 7.87 cfs @ 12.07 hrs, Volume= 0.515 af, Depth> 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

Area (ac)	CN	Description
0.057	61	>75% Grass cover, Good, HSG B
1.102	78	Row crops, straight row, Good, HSG B
1.159	77	Weighted Average
1.159		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	50	0.0400	0.43		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
2.5	270	0.0400	1.80		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
4.4	320	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

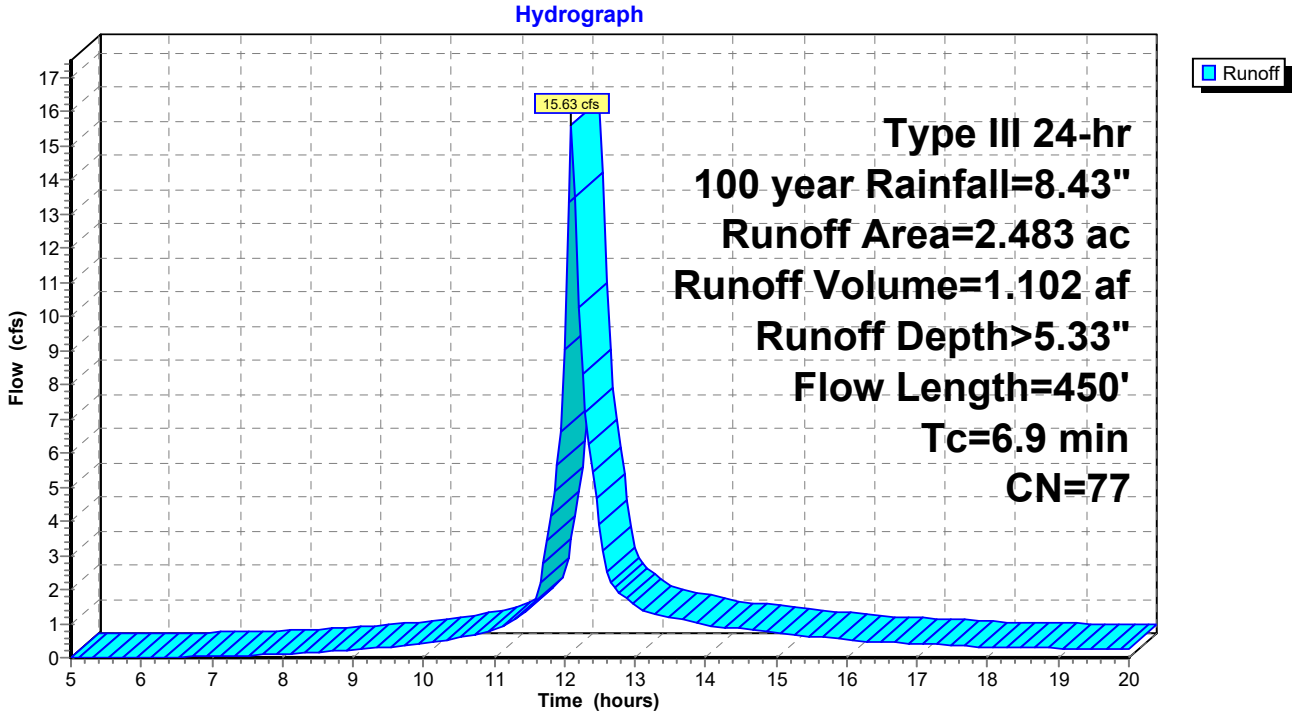
Runoff = 15.63 cfs @ 12.10 hrs, Volume= 1.102 af, Depth> 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

Area (ac)	CN	Description
0.215	61	>75% Grass cover, Good, HSG B
2.104	78	Row crops, straight row, Good, HSG B
0.164	89	Row crops, straight row, Good, HSG D
2.483	77	Weighted Average
2.483		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.0200	0.32		**Sheet Flow,** Cultivated: Residue<=20% n= 0.060 P2= 3.54"
2.6	200	0.0200	1.27		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
1.7	200	0.0500	2.01		**Shallow Concentrated Flow,** Cultivated Straight Rows Kv= 9.0 fps
6.9	450	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

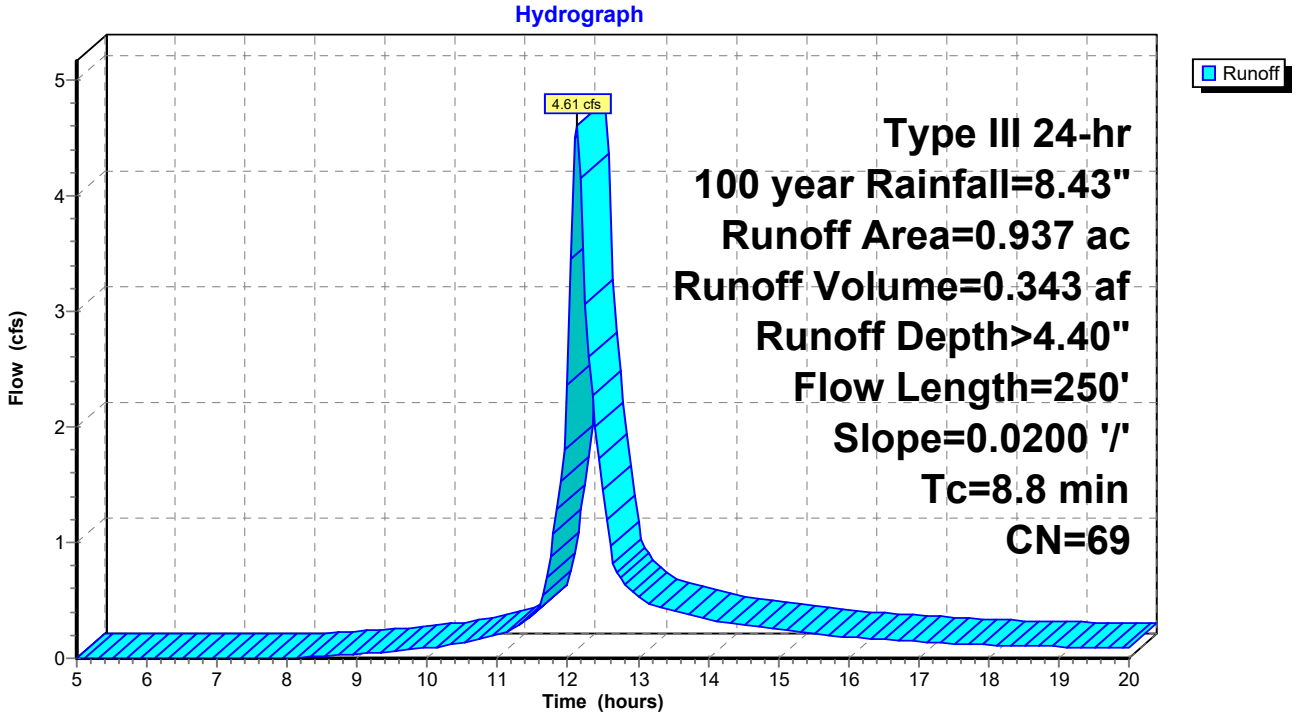
Runoff = 4.61 cfs @ 12.13 hrs, Volume= 0.343 af, Depth> 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

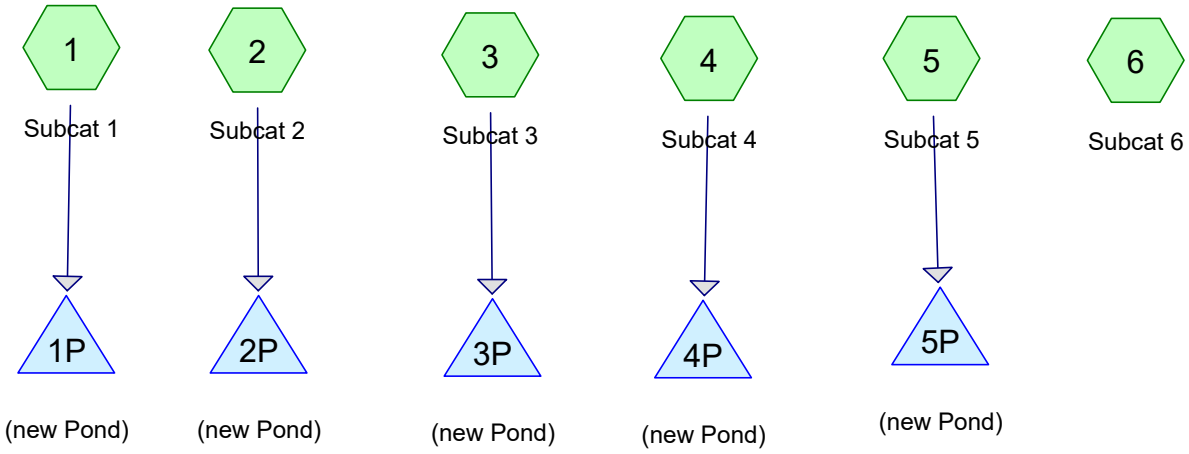
Area (ac)	CN	Description
0.493	61	>75% Grass cover, Good, HSG B
0.444	78	Row crops, straight row, Good, HSG B
0.937	69	Weighted Average
0.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	250	Total			

Subcatchment 6: Subcat 6



HydroCAD Analysis: Proposed Conditions



Subcat Reach Pond Link

Routing Diagram for 42707.00 - Proposed Conditions2
Prepared by VHB, Printed 9/29/2021

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2 year	Type III 24-hr		Default	24.00	1	3.54	2
2	25 year	Type III 24-hr		Default	24.00	1	6.61	2
3	50 year	Type III 24-hr		Default	24.00	1	7.49	2
4	100 year	Type III 24-hr		Default	24.00	1	8.43	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
6.580	74	50-75% Grass cover, Fair, HSG B-C (1, 2, 3, 4, 5, 6)
3.429	61	>75% Grass cover, Good, HSG B (1, 2, 3, 4, 5, 6)
0.228	74	>75% Grass cover, Good, HSG C (1)
0.164	80	>75% Grass cover, Good, HSG D (5)
0.060	98	Equipment pad (1, 5)
0.267	96	Gravel surface, HSG B (1, 3, 5)
10.728	**71**	**TOTAL AREA**

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.368 ac 0.59% Impervious Runoff Depth>1.10"
Flow Length=550' Slope=0.0200 '/' Tc=13.8 min CN=73 Runoff=3.52 cfs 0.308 af

Subcatchment2: Subcat 2 Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>0.78"
Flow Length=350' Slope=0.0200 '/' Tc=10.5 min CN=67 Runoff=0.84 cfs 0.072 af

Subcatchment3: Subcat 3 Runoff Area=1.683 ac 0.00% Impervious Runoff Depth>0.88"
Flow Length=320' Slope=0.0200 '/' Tc=9.9 min CN=69 Runoff=1.52 cfs 0.124 af

Subcatchment4: Subcat 4 Runoff Area=1.159 ac 0.00% Impervious Runoff Depth>0.99"
Flow Length=320' Slope=0.0400 '/' Tc=7.3 min CN=71 Runoff=1.31 cfs 0.096 af

Subcatchment5: Subcat 5 Runoff Area=2.483 ac 1.61% Impervious Runoff Depth>1.04"
Flow Length=450' Tc=10.9 min CN=72 Runoff=2.66 cfs 0.216 af

Subcatchment6: Subcat 6 Runoff Area=0.937 ac 0.00% Impervious Runoff Depth>0.74"
Flow Length=250' Slope=0.0200 '/' Tc=8.8 min CN=66 Runoff=0.69 cfs 0.058 af

Pond 1P: (new Pond) Peak Elev=153.62' Storage=0.263 af Inflow=3.52 cfs 0.308 af
Outflow=2.02 cfs 0.210 af

Pond 2P: (new Pond) Peak Elev=155.53' Storage=0.087 af Inflow=0.84 cfs 0.072 af
Outflow=0.12 cfs 0.035 af

Pond 3P: (new Pond) Peak Elev=152.05' Storage=0.094 af Inflow=1.52 cfs 0.124 af
Outflow=0.28 cfs 0.066 af

Pond 4P: (new Pond) Peak Elev=149.60' Storage=0.053 af Inflow=1.31 cfs 0.096 af
Outflow=0.76 cfs 0.069 af

Pond 5P: (new Pond) Peak Elev=148.57' Storage=0.112 af Inflow=2.66 cfs 0.216 af
Outflow=0.45 cfs 0.107 af

Total Runoff Area = 10.728 ac Runoff Volume = 0.873 af Average Runoff Depth = 0.98"
99.44% Pervious = 10.668 ac 0.56% Impervious = 0.060 ac

Summary for Subcatchment 1: Subcat 1

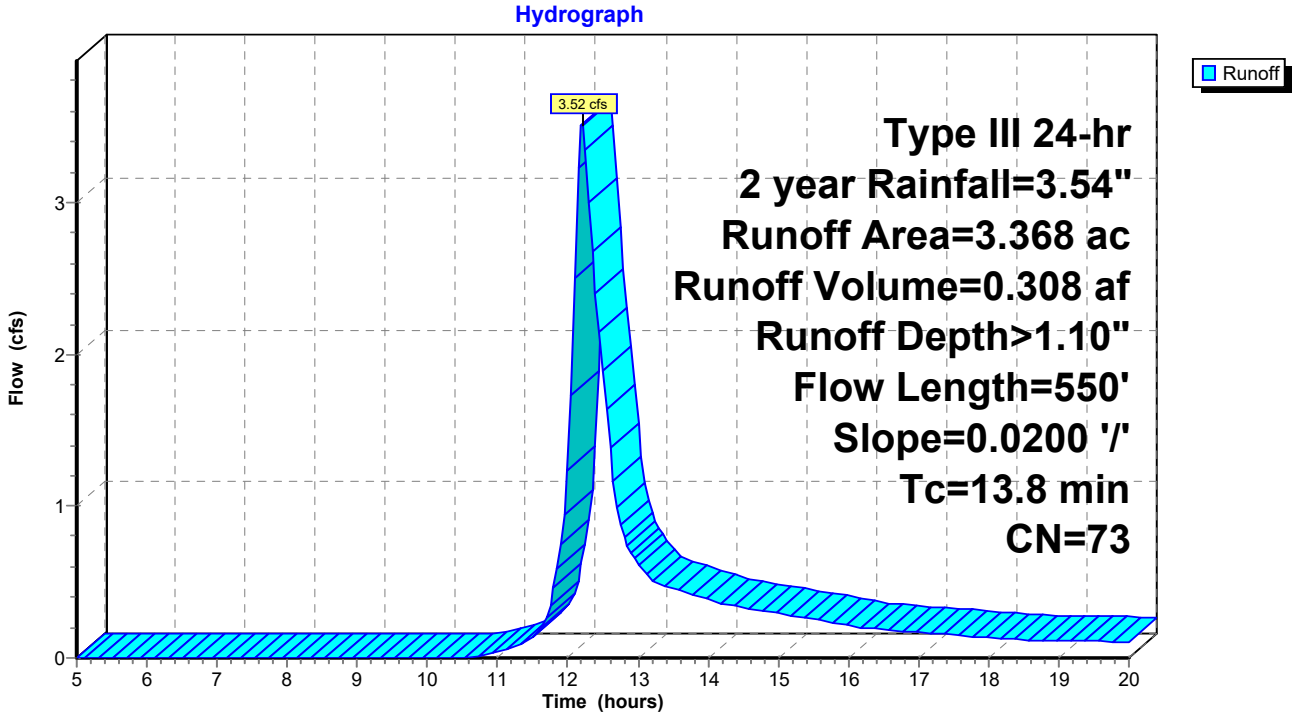
Runoff = 3.52 cfs @ 12.21 hrs, Volume= 0.308 af, Depth> 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

	Area (ac)	CN	Description
	0.478	61	>75% Grass cover, Good, HSG B
	0.228	74	>75% Grass cover, Good, HSG C
*	2.572	74	50-75% Grass cover, Fair, HSG B-C
	0.070	96	Gravel surface, HSG B
*	0.020	98	Equipment pad
	3.368	73	Weighted Average
	3.348		99.41% Pervious Area
	0.020		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
8.4	500	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.8	550	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

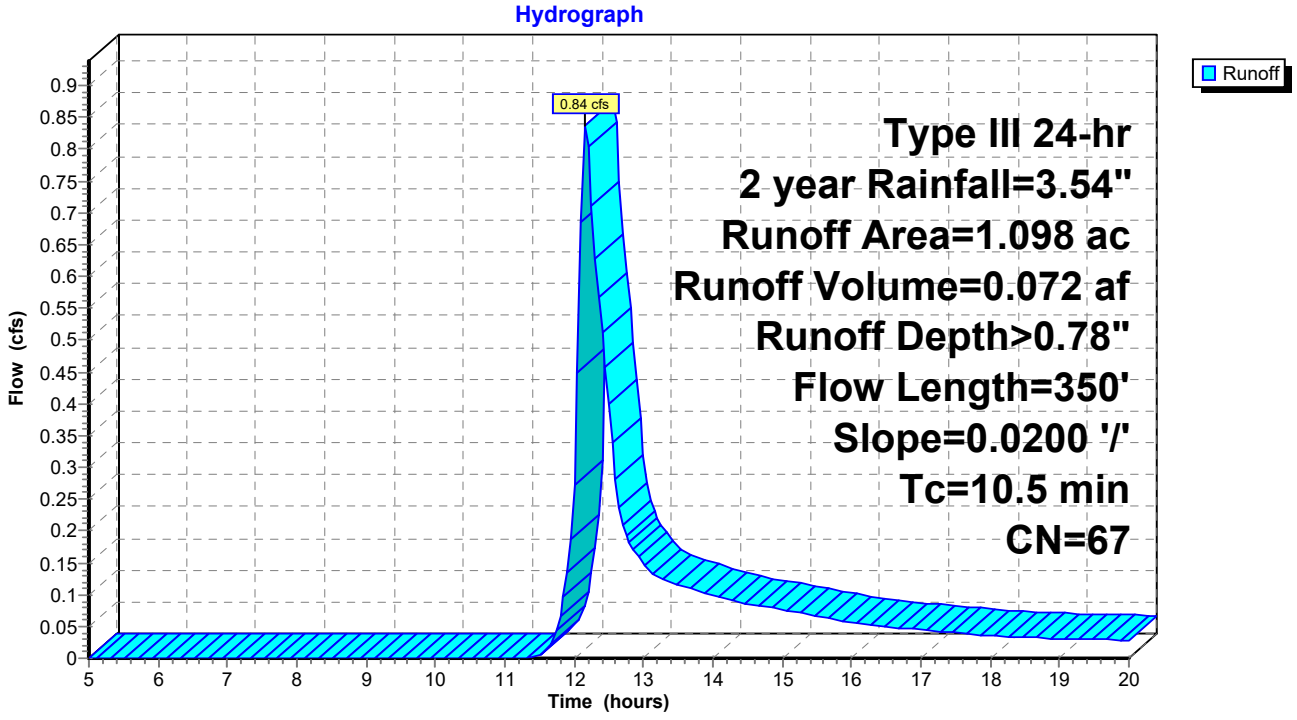
Runoff = 0.84 cfs @ 12.17 hrs, Volume= 0.072 af, Depth> 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

	Area (ac)	CN	Description
	0.605	61	>75% Grass cover, Good, HSG B
*	0.493	74	50-75% Grass cover, Fair, HSG B-C
	1.098	67	Weighted Average
	1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
5.1	300	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.5	350	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

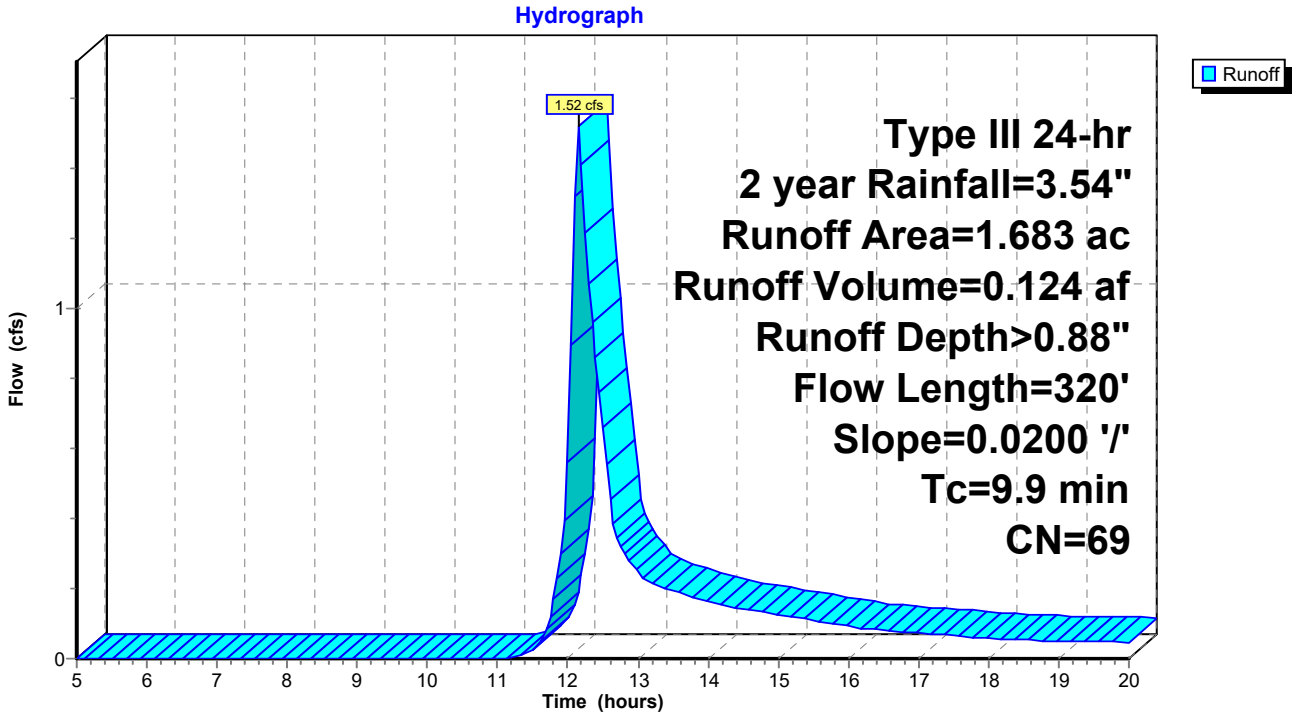
Runoff = 1.52 cfs @ 12.16 hrs, Volume= 0.124 af, Depth> 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

	Area (ac)	CN	Description
*	0.810	74	50-75% Grass cover, Fair, HSG B-C
	0.075	96	Gravel surface, HSG B
	0.798	61	>75% Grass cover, Good, HSG B
	1.683	69	Weighted Average
	1.683		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
4.5	270	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.9	320	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

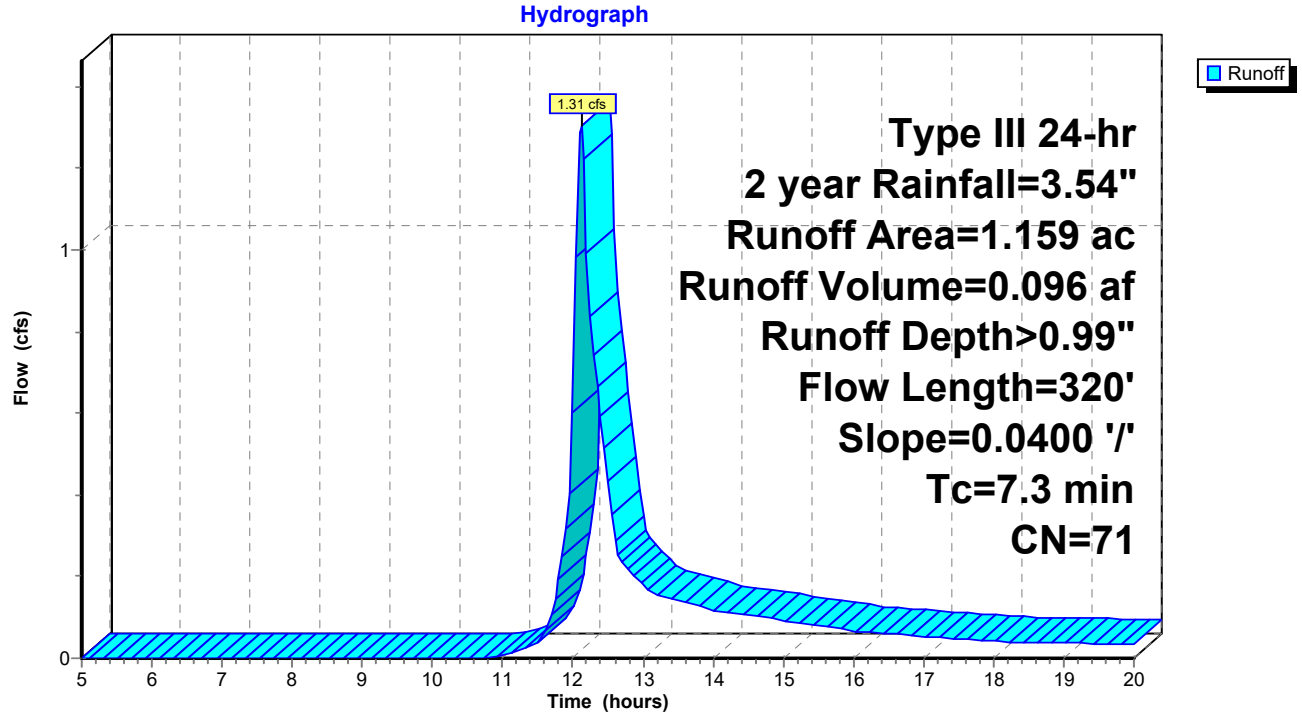
Runoff = 1.31 cfs @ 12.12 hrs, Volume= 0.096 af, Depth> 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

	Area (ac)	CN	Description
	0.263	61	>75% Grass cover, Good, HSG B
*	0.896	74	50-75% Grass cover, Fair, HSG B-C
	1.159	71	Weighted Average
	1.159		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.2	270	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.3	320	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

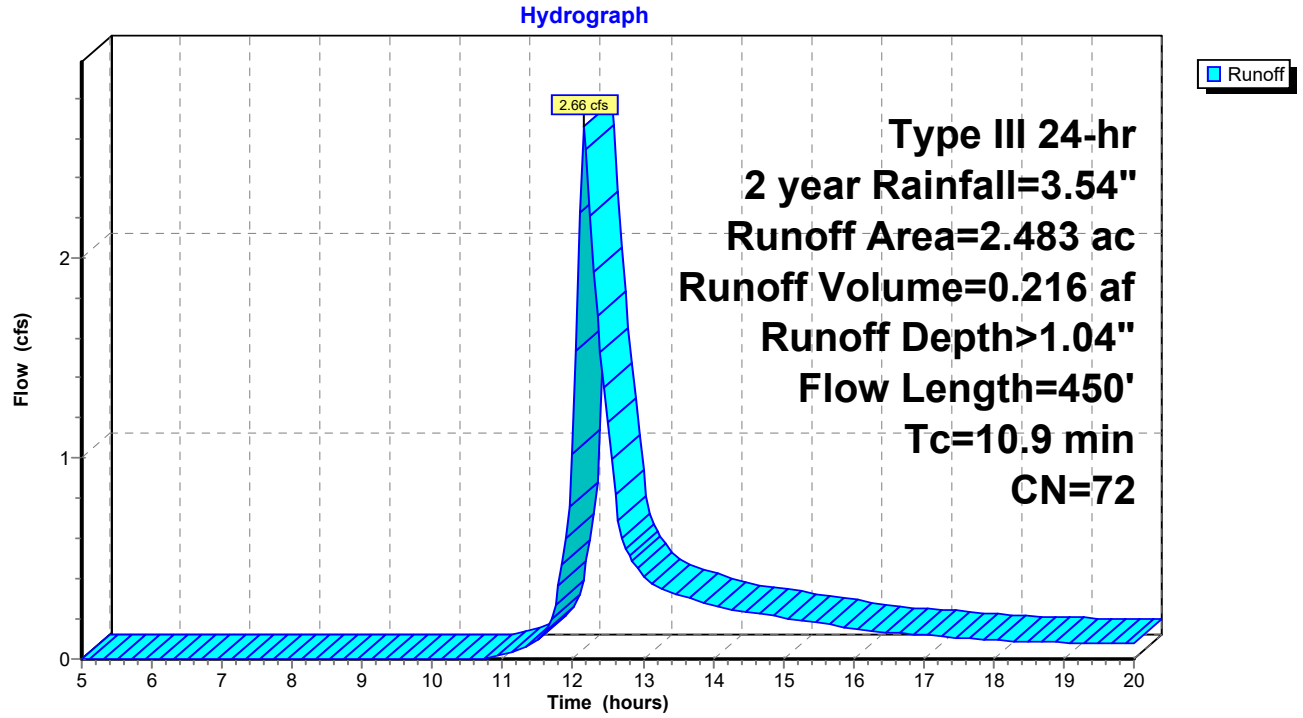
Runoff = 2.66 cfs @ 12.17 hrs, Volume= 0.216 af, Depth> 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

	Area (ac)	CN	Description
	0.713	61	>75% Grass cover, Good, HSG B
	0.122	96	Gravel surface, HSG B
*	0.040	98	Equipment pad
*	1.444	74	50-75% Grass cover, Fair, HSG B-C
	0.164	80	>75% Grass cover, Good, HSG D
	2.483	72	Weighted Average
	2.443		98.39% Pervious Area
	0.040		1.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	200	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	450	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

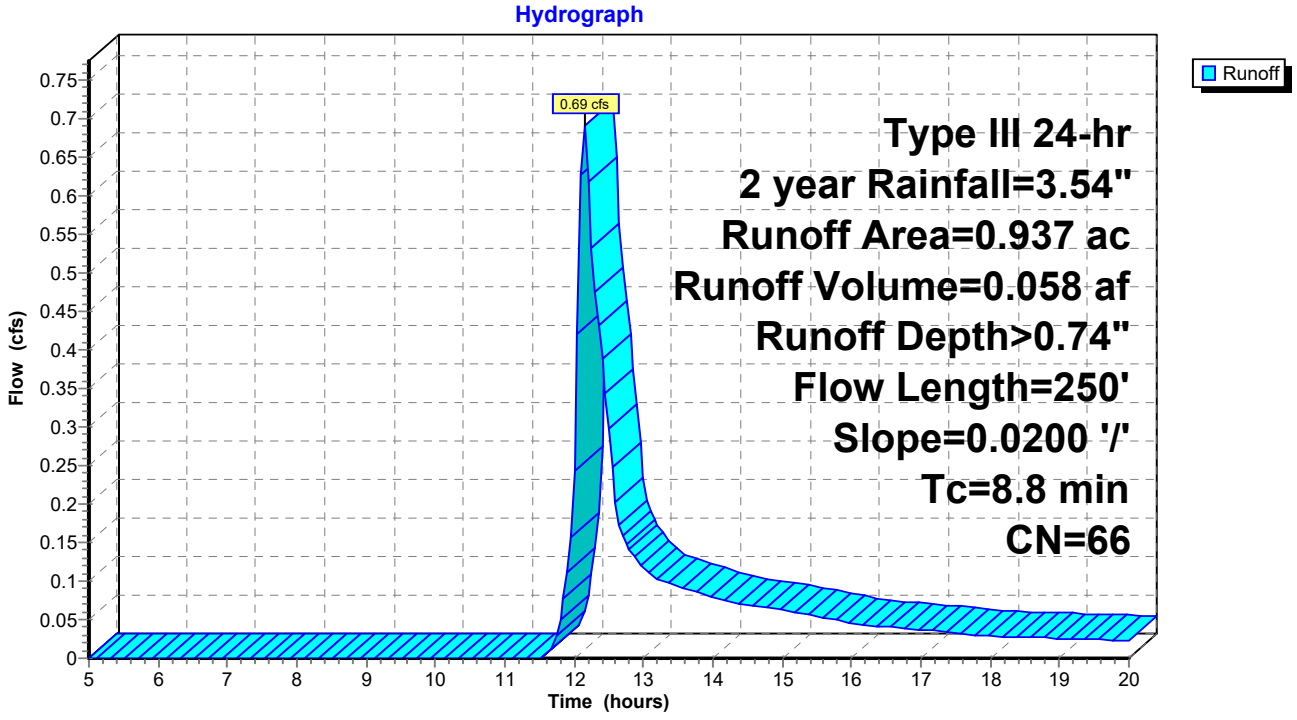
Runoff = 0.69 cfs @ 12.15 hrs, Volume= 0.058 af, Depth> 0.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 year Rainfall=3.54"

	Area (ac)	CN	Description
*	0.365	74	50-75% Grass cover, Fair, HSG B-C
	0.572	61	>75% Grass cover, Good, HSG B
	0.937	66	Weighted Average
	0.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	250	Total			

Subcatchment 6: Subcat 6



Summary for Pond 1P: (new Pond)

Inflow Area = 3.368 ac, 0.59% Impervious, Inflow Depth > 1.10" for 2 year event
Inflow = 3.52 cfs @ 12.21 hrs, Volume= 0.308 af
Outflow = 2.02 cfs @ 12.48 hrs, Volume= 0.210 af, Atten= 43%, Lag= 16.4 min
Primary = 2.02 cfs @ 12.48 hrs, Volume= 0.210 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 152.50' Surf.Area= 0.086 ac Storage= 0.153 af
Peak Elev= 153.62' @ 12.48 hrs Surf.Area= 0.111 ac Storage= 0.263 af (0.110 af above start)

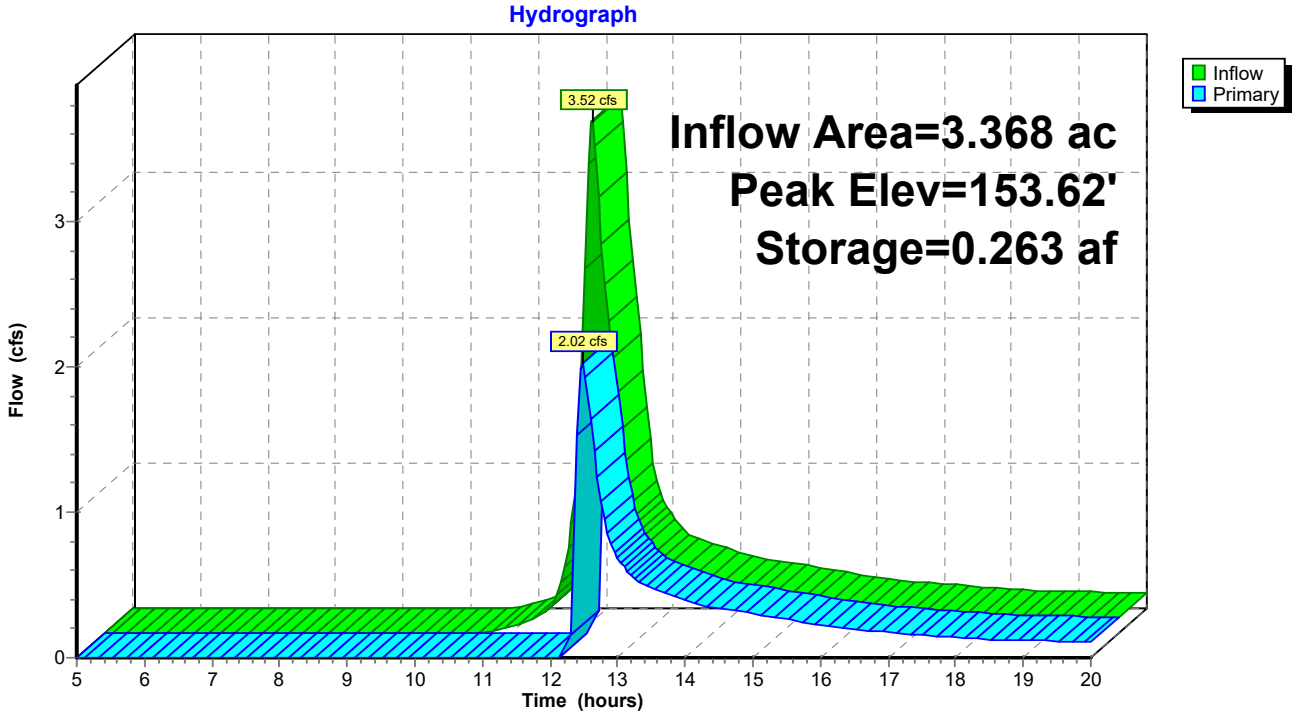
Plug-Flow detention time= 332.3 min calculated for 0.057 af (18% of inflow)
Center-of-Mass det. time= 49.8 min (871.7 - 822.0)

Volume	Invert	Avail.Storage	Storage Description
#1	150.00'	0.307 af	**15.00'W x 110.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	153.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=1.98 cfs @ 12.48 hrs HW=153.62' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 1.98 cfs @ 0.82 fps)

Pond 1P: (new Pond)



Summary for Pond 2P: (new Pond)

Inflow Area = 1.098 ac, 0.00% Impervious, Inflow Depth > 0.78" for 2 year event
Inflow = 0.84 cfs @ 12.17 hrs, Volume= 0.072 af
Outflow = 0.12 cfs @ 13.28 hrs, Volume= 0.035 af, Atten= 85%, Lag= 66.6 min
Primary = 0.12 cfs @ 13.28 hrs, Volume= 0.035 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 154.50' Surf.Area= 0.031 ac Storage= 0.050 af
Peak Elev= 155.53' @ 13.28 hrs Surf.Area= 0.042 ac Storage= 0.087 af (0.038 af above start)

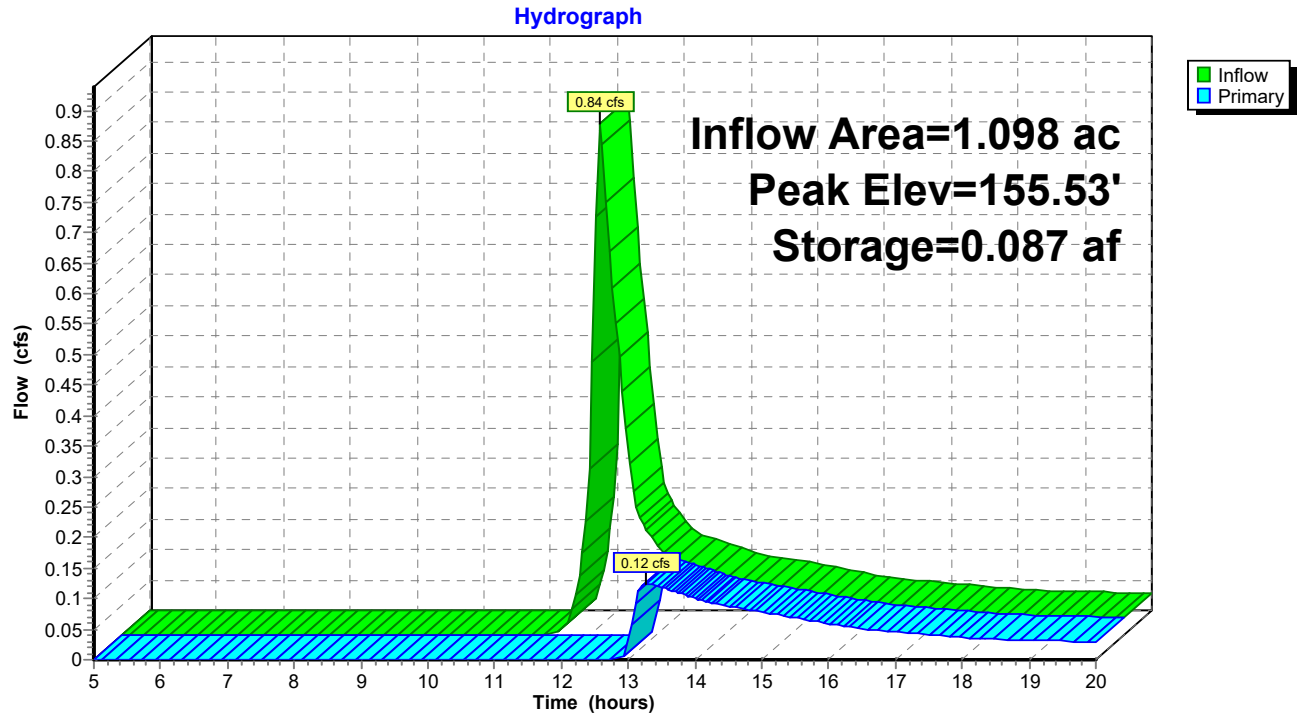
Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 103.2 min (937.0 - 833.9)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	0.109 af	**15.00'W x 30.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	155.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.11 cfs @ 13.28 hrs HW=155.53' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.11 cfs @ 0.39 fps)

Pond 2P: (new Pond)



Summary for Pond 3P: (new Pond)

Inflow Area = 1.683 ac, 0.00% Impervious, Inflow Depth > 0.88" for 2 year event
Inflow = 1.52 cfs @ 12.16 hrs, Volume= 0.124 af
Outflow = 0.28 cfs @ 12.89 hrs, Volume= 0.066 af, Atten= 82%, Lag= 44.0 min
Primary = 0.28 cfs @ 12.89 hrs, Volume= 0.066 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 150.50' Surf.Area= 0.030 ac Storage= 0.033 af
Peak Elev= 152.05' @ 12.89 hrs Surf.Area= 0.048 ac Storage= 0.094 af (0.060 af above start)

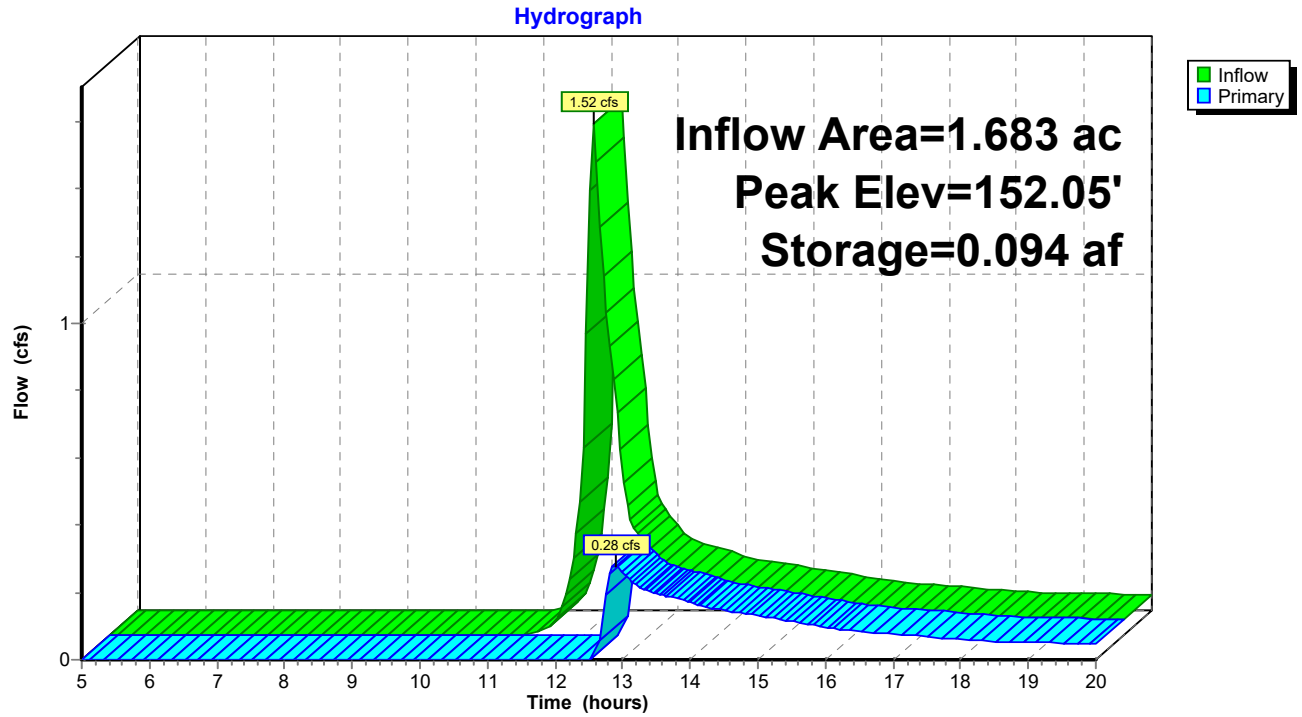
Plug-Flow detention time= 292.8 min calculated for 0.032 af (26% of inflow)
Center-of-Mass det. time= 87.8 min (916.3 - 828.4)

Volume	Invert	Avail.Storage	Storage Description
#1	149.00'	0.146 af	**15.00'W x 45.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.27 cfs @ 12.89 hrs HW=152.05' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.27 cfs @ 0.53 fps)

Pond 3P: (new Pond)



Summary for Pond 4P: (new Pond)

Inflow Area = 1.159 ac, 0.00% Impervious, Inflow Depth > 0.99" for 2 year event
Inflow = 1.31 cfs @ 12.12 hrs, Volume= 0.096 af
Outflow = 0.76 cfs @ 12.31 hrs, Volume= 0.069 af, Atten= 42%, Lag= 11.8 min
Primary = 0.76 cfs @ 12.31 hrs, Volume= 0.069 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 148.50' Surf.Area= 0.021 ac Storage= 0.023 af
Peak Elev= 149.60' @ 12.31 hrs Surf.Area= 0.032 ac Storage= 0.053 af (0.029 af above start)

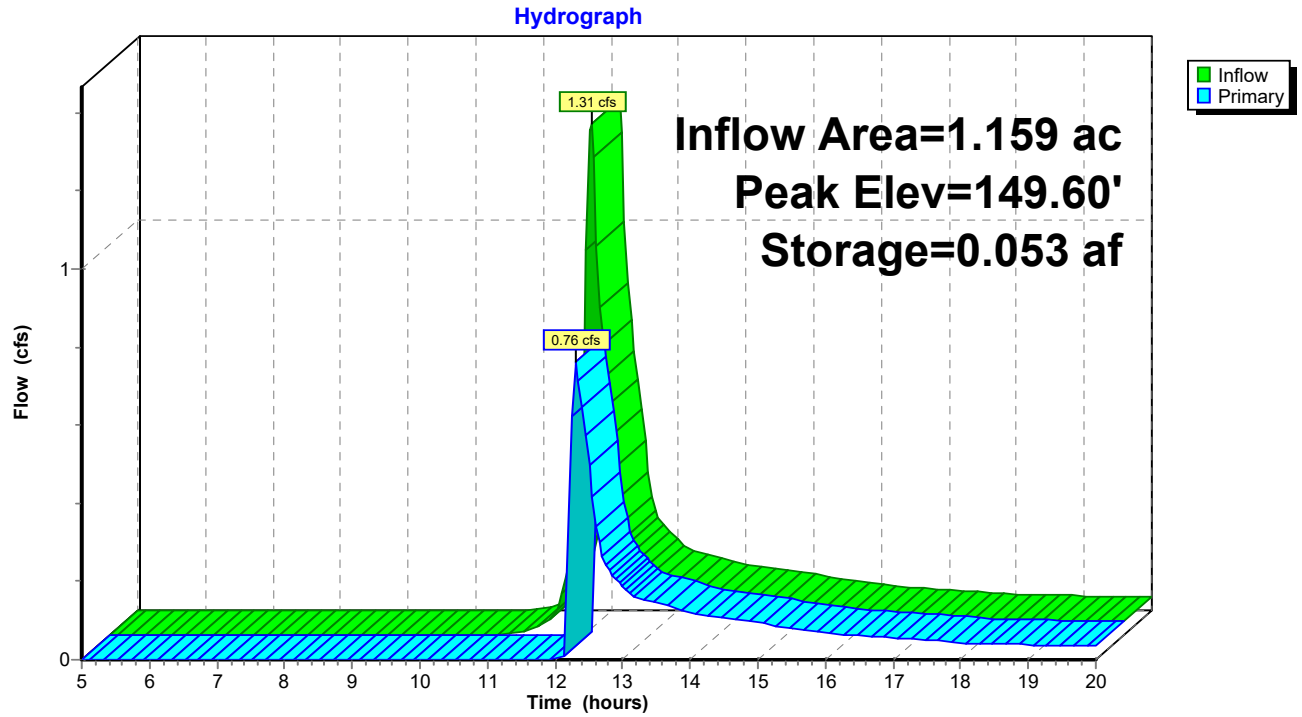
Plug-Flow detention time= 193.6 min calculated for 0.046 af (48% of inflow)
Center-of-Mass det. time= 41.6 min (863.2 - 821.7)

Volume	Invert	Avail.Storage	Storage Description
#1	147.00'	0.109 af	**15.00'W x 30.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	149.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.74 cfs @ 12.31 hrs HW=149.60' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.74 cfs @ 0.74 fps)

Pond 4P: (new Pond)



Summary for Pond 5P: (new Pond)

Inflow Area = 2.483 ac, 1.61% Impervious, Inflow Depth > 1.04" for 2 year event
Inflow = 2.66 cfs @ 12.17 hrs, Volume= 0.216 af
Outflow = 0.45 cfs @ 12.94 hrs, Volume= 0.107 af, Atten= 83%, Lag= 46.3 min
Primary = 0.45 cfs @ 12.94 hrs, Volume= 0.107 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 148.57' @ 12.94 hrs Surf.Area= 0.063 ac Storage= 0.112 af

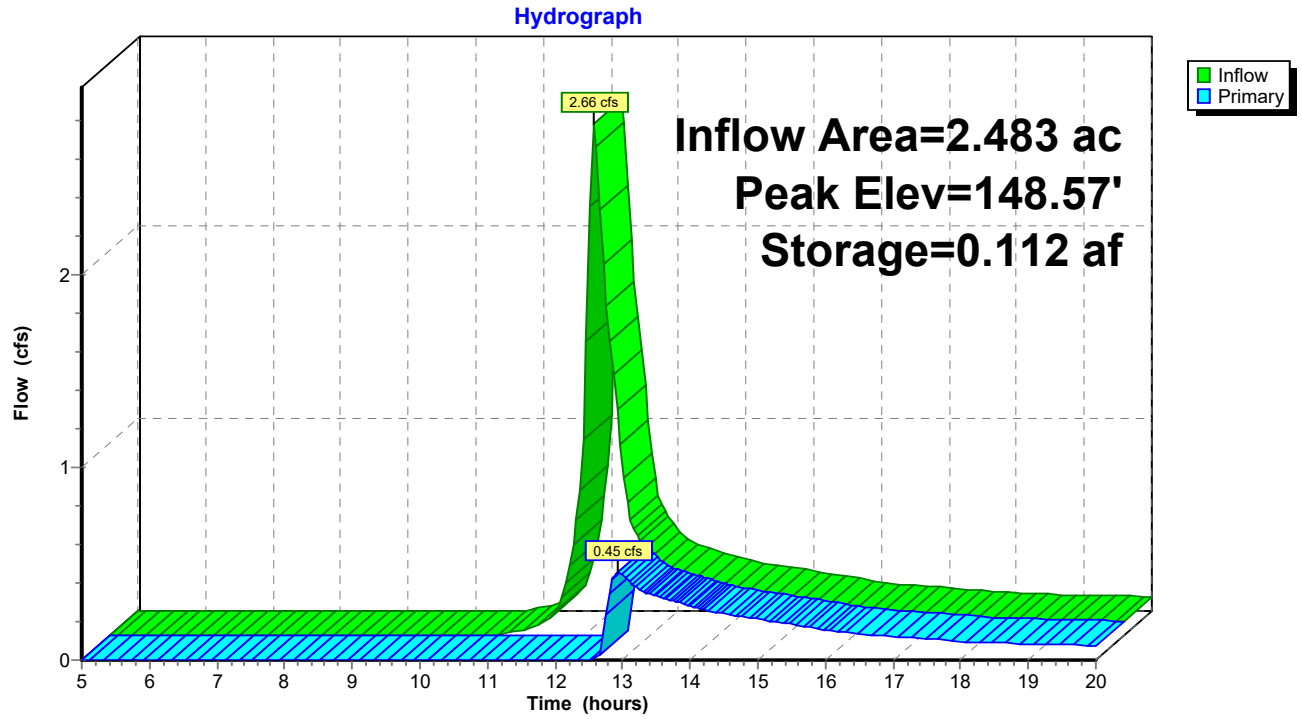
Plug-Flow detention time= 184.6 min calculated for 0.107 af (50% of inflow)
Center-of-Mass det. time= 94.8 min (916.8 - 822.1)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	0.220 af	**15.00'W x 75.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	148.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.44 cfs @ 12.94 hrs HW=148.57' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.44 cfs @ 0.62 fps)

Pond 5P: (new Pond)



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.368 ac 0.59% Impervious Runoff Depth>3.35"
Flow Length=550' Slope=0.0200 '/' Tc=13.8 min CN=73 Runoff=11.03 cfs 0.939 af

Subcatchment2: Subcat 2 Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>2.77"
Flow Length=350' Slope=0.0200 '/' Tc=10.5 min CN=67 Runoff=3.26 cfs 0.253 af

Subcatchment3: Subcat 3 Runoff Area=1.683 ac 0.00% Impervious Runoff Depth>2.96"
Flow Length=320' Slope=0.0200 '/' Tc=9.9 min CN=69 Runoff=5.44 cfs 0.415 af

Subcatchment4: Subcat 4 Runoff Area=1.159 ac 0.00% Impervious Runoff Depth>3.16"
Flow Length=320' Slope=0.0400 '/' Tc=7.3 min CN=71 Runoff=4.35 cfs 0.305 af

Subcatchment5: Subcat 5 Runoff Area=2.483 ac 1.61% Impervious Runoff Depth>3.25"
Flow Length=450' Tc=10.9 min CN=72 Runoff=8.58 cfs 0.673 af

Subcatchment6: Subcat 6 Runoff Area=0.937 ac 0.00% Impervious Runoff Depth>2.68"
Flow Length=250' Slope=0.0200 '/' Tc=8.8 min CN=66 Runoff=2.80 cfs 0.209 af

Pond 1P: (new Pond) Peak Elev=153.86' Storage=0.290 af Inflow=11.03 cfs 0.939 af
Outflow=10.73 cfs 0.839 af

Pond 2P: (new Pond) Peak Elev=155.76' Storage=0.097 af Inflow=3.26 cfs 0.253 af
Outflow=3.13 cfs 0.216 af

Pond 3P: (new Pond) Peak Elev=152.36' Storage=0.109 af Inflow=5.44 cfs 0.415 af
Outflow=5.28 cfs 0.356 af

Pond 4P: (new Pond) Peak Elev=149.81' Storage=0.060 af Inflow=4.35 cfs 0.305 af
Outflow=4.21 cfs 0.278 af

Pond 5P: (new Pond) Peak Elev=148.97' Storage=0.139 af Inflow=8.58 cfs 0.673 af
Outflow=8.26 cfs 0.563 af

Total Runoff Area = 10.728 ac Runoff Volume = 2.795 af Average Runoff Depth = 3.13"
99.44% Pervious = 10.668 ac 0.56% Impervious = 0.060 ac

Summary for Subcatchment 1: Subcat 1

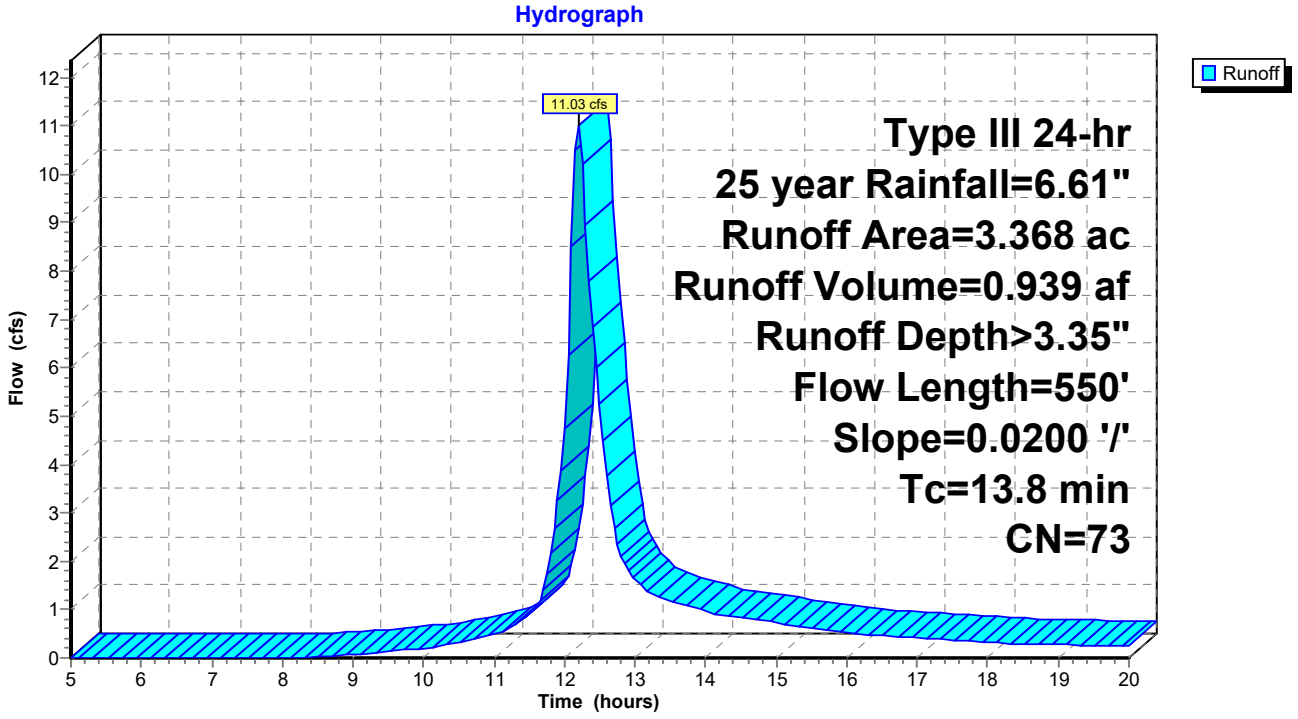
Runoff = 11.03 cfs @ 12.19 hrs, Volume= 0.939 af, Depth> 3.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

	Area (ac)	CN	Description
	0.478	61	>75% Grass cover, Good, HSG B
	0.228	74	>75% Grass cover, Good, HSG C
*	2.572	74	50-75% Grass cover, Fair, HSG B-C
	0.070	96	Gravel surface, HSG B
*	0.020	98	Equipment pad
	3.368	73	Weighted Average
	3.348		99.41% Pervious Area
	0.020		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
8.4	500	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.8	550	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

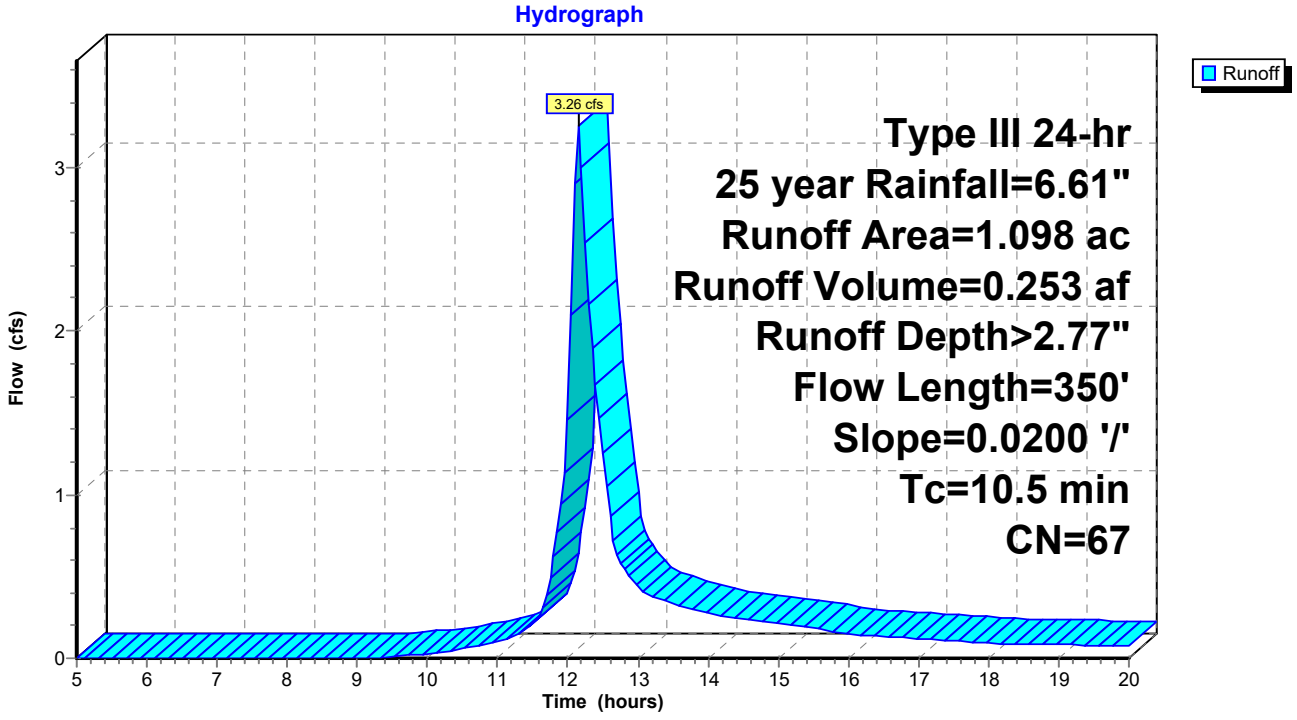
Runoff = 3.26 cfs @ 12.15 hrs, Volume= 0.253 af, Depth> 2.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

	Area (ac)	CN	Description
	0.605	61	>75% Grass cover, Good, HSG B
*	0.493	74	50-75% Grass cover, Fair, HSG B-C
	1.098	67	Weighted Average
	1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
5.1	300	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.5	350	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

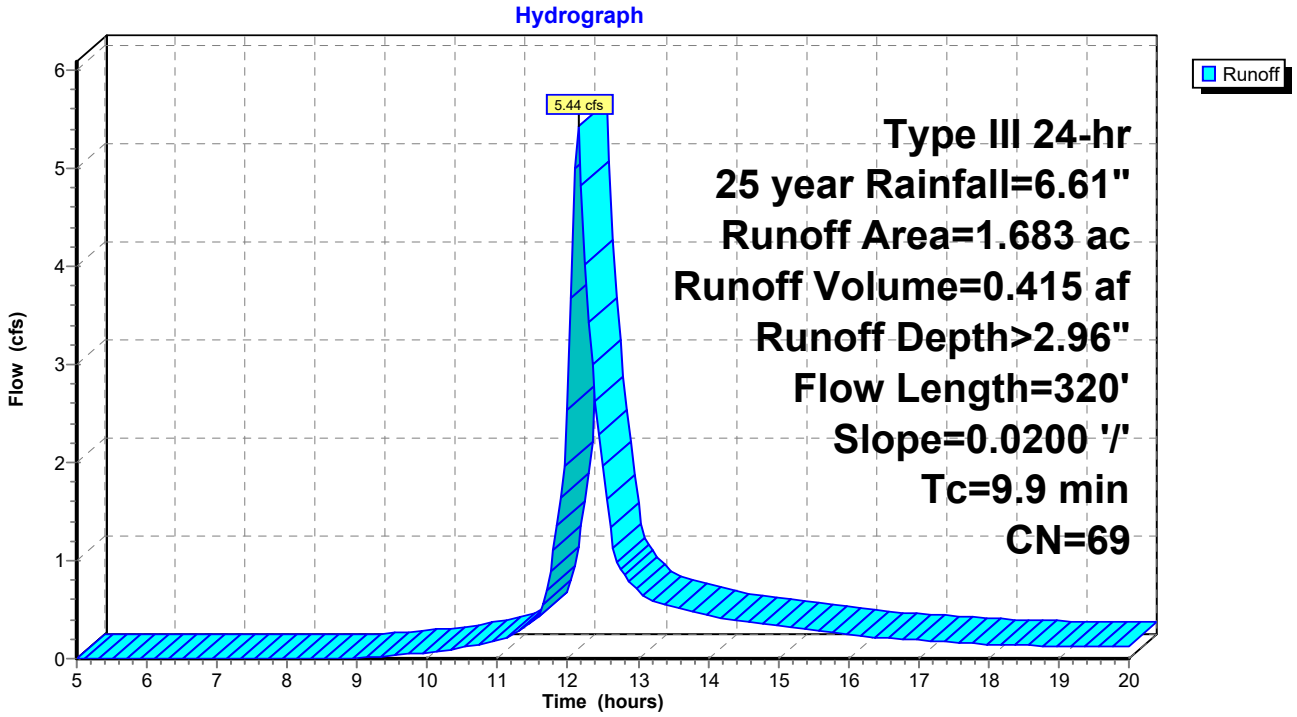
Runoff = 5.44 cfs @ 12.15 hrs, Volume= 0.415 af, Depth> 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

	Area (ac)	CN	Description
*	0.810	74	50-75% Grass cover, Fair, HSG B-C
	0.075	96	Gravel surface, HSG B
	0.798	61	>75% Grass cover, Good, HSG B
	1.683	69	Weighted Average
	1.683		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
4.5	270	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.9	320	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

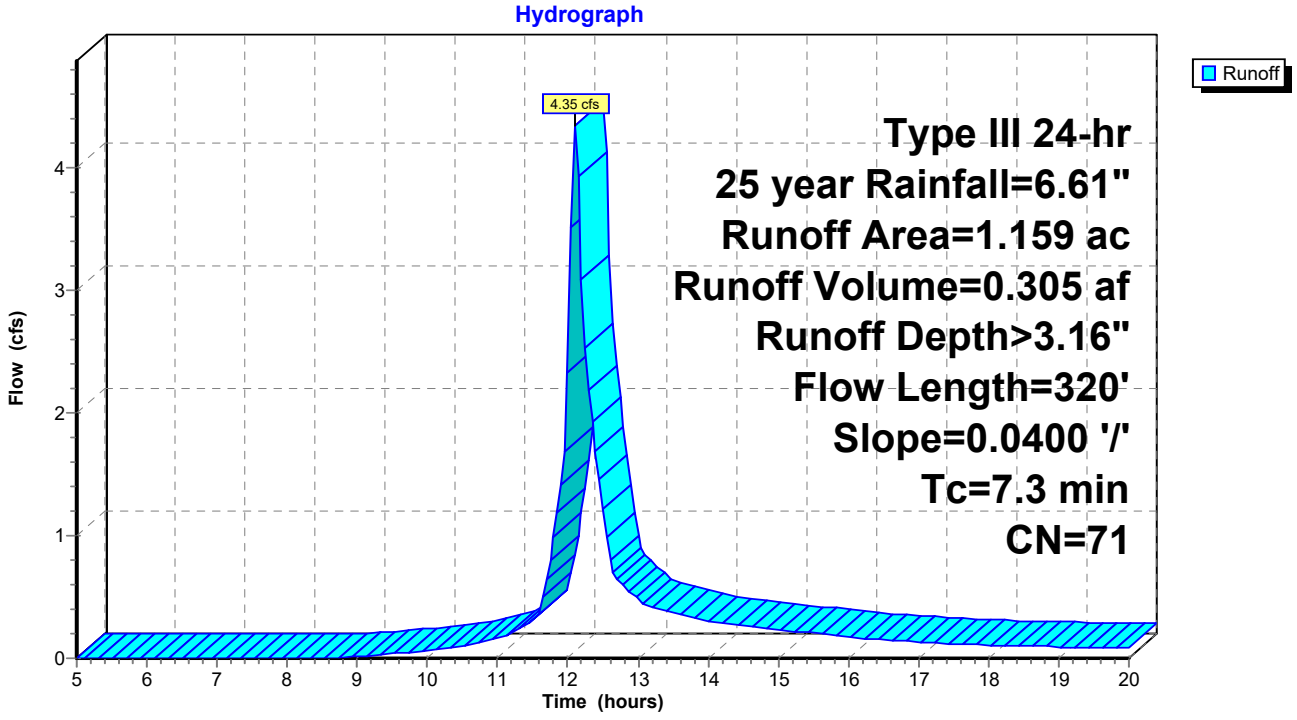
Runoff = 4.35 cfs @ 12.11 hrs, Volume= 0.305 af, Depth> 3.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

	Area (ac)	CN	Description
	0.263	61	>75% Grass cover, Good, HSG B
*	0.896	74	50-75% Grass cover, Fair, HSG B-C
	1.159	71	Weighted Average
	1.159		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.2	270	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.3	320	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

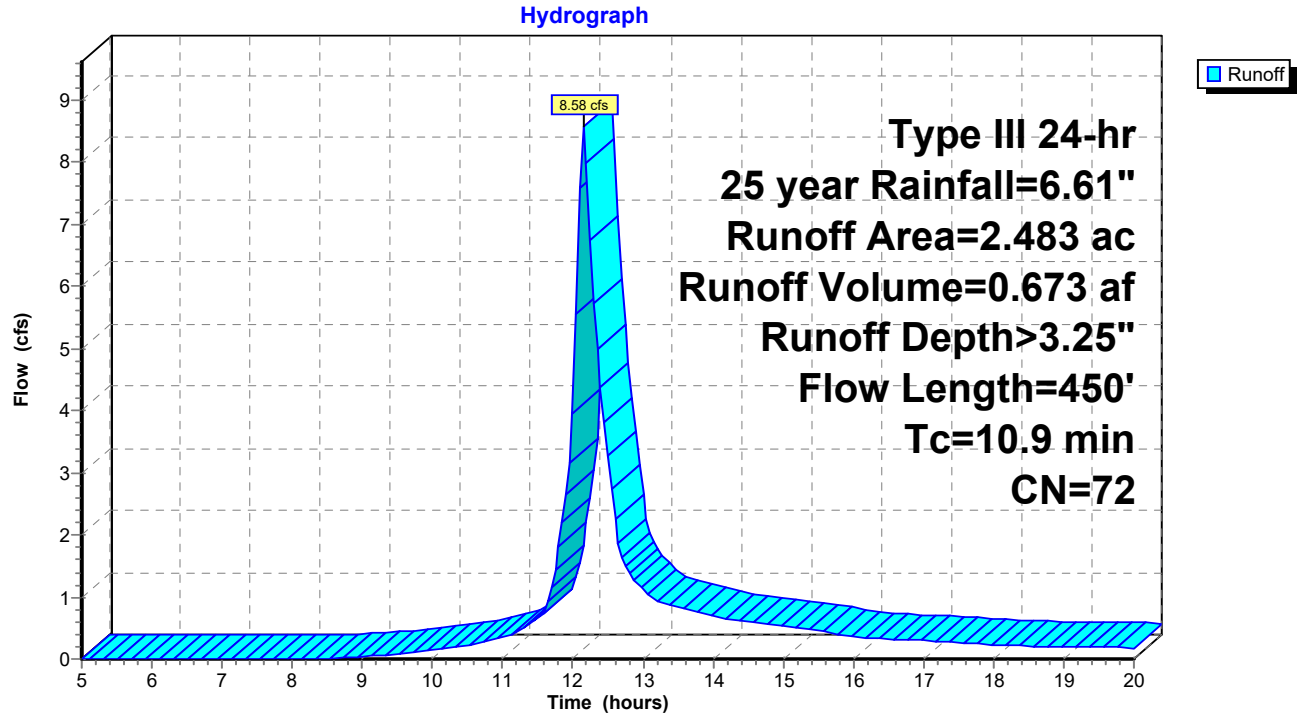
Runoff = 8.58 cfs @ 12.16 hrs, Volume= 0.673 af, Depth> 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

	Area (ac)	CN	Description
	0.713	61	>75% Grass cover, Good, HSG B
	0.122	96	Gravel surface, HSG B
*	0.040	98	Equipment pad
*	1.444	74	50-75% Grass cover, Fair, HSG B-C
	0.164	80	>75% Grass cover, Good, HSG D
	2.483	72	Weighted Average
	2.443		98.39% Pervious Area
	0.040		1.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	200	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	450	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

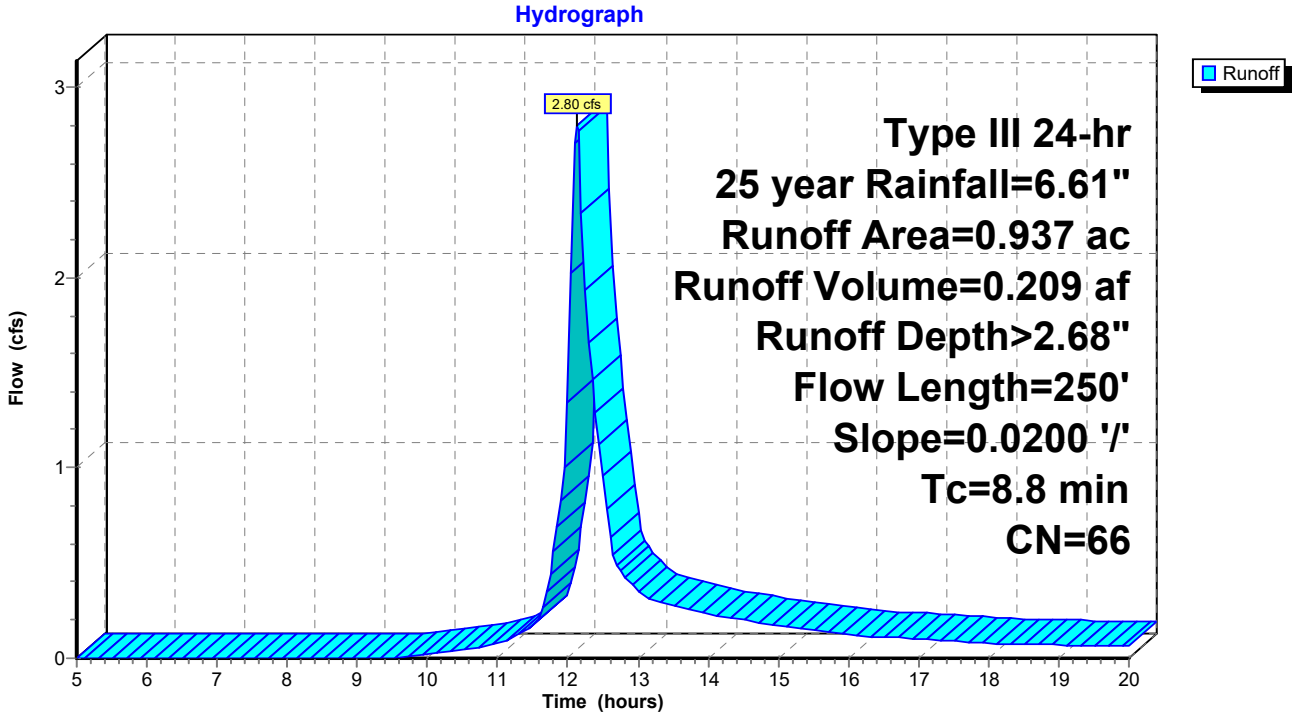
Runoff = 2.80 cfs @ 12.13 hrs, Volume= 0.209 af, Depth> 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 year Rainfall=6.61"

	Area (ac)	CN	Description
*	0.365	74	50-75% Grass cover, Fair, HSG B-C
	0.572	61	>75% Grass cover, Good, HSG B
	0.937	66	Weighted Average
	0.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	250	Total			

Subcatchment 6: Subcat 6



Summary for Pond 1P: (new Pond)

Inflow Area = 3.368 ac, 0.59% Impervious, Inflow Depth > 3.35" for 25 year event
Inflow = 11.03 cfs @ 12.19 hrs, Volume= 0.939 af
Outflow = 10.73 cfs @ 12.23 hrs, Volume= 0.839 af, Atten= 3%, Lag= 1.8 min
Primary = 10.73 cfs @ 12.23 hrs, Volume= 0.839 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 152.50' Surf.Area= 0.086 ac Storage= 0.153 af
Peak Elev= 153.86' @ 12.23 hrs Surf.Area= 0.117 ac Storage= 0.290 af (0.138 af above start)

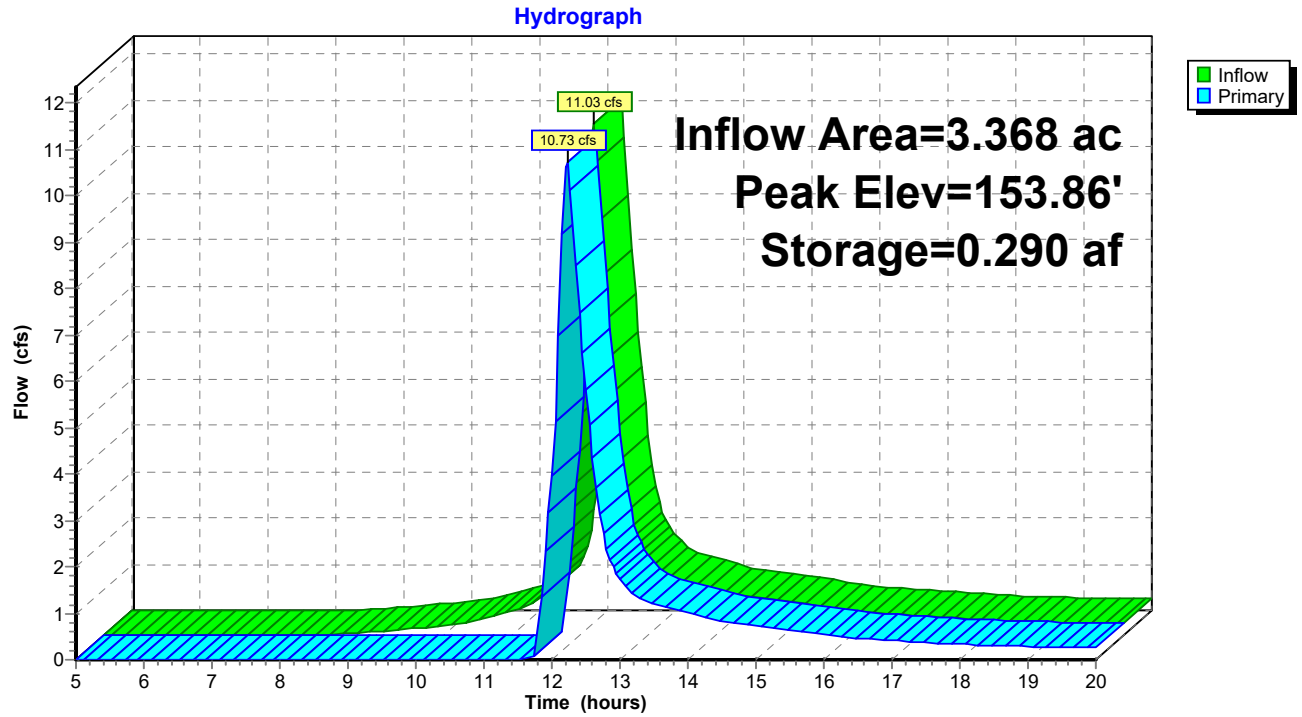
Plug-Flow detention time= 102.6 min calculated for 0.684 af (73% of inflow)
Center-of-Mass det. time= 19.6 min (816.8 - 797.2)

Volume	Invert	Avail.Storage	Storage Description
#1	150.00'	0.307 af	**15.00'W x 110.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	153.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=10.59 cfs @ 12.23 hrs HW=153.86' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 10.59 cfs @ 1.48 fps)

Pond 1P: (new Pond)



Summary for Pond 2P: (new Pond)

Inflow Area = 1.098 ac, 0.00% Impervious, Inflow Depth > 2.77" for 25 year event
Inflow = 3.26 cfs @ 12.15 hrs, Volume= 0.253 af
Outflow = 3.13 cfs @ 12.19 hrs, Volume= 0.216 af, Atten= 4%, Lag= 2.1 min
Primary = 3.13 cfs @ 12.19 hrs, Volume= 0.216 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 154.50' Surf.Area= 0.031 ac Storage= 0.050 af
Peak Elev= 155.76' @ 12.19 hrs Surf.Area= 0.045 ac Storage= 0.097 af (0.048 af above start)

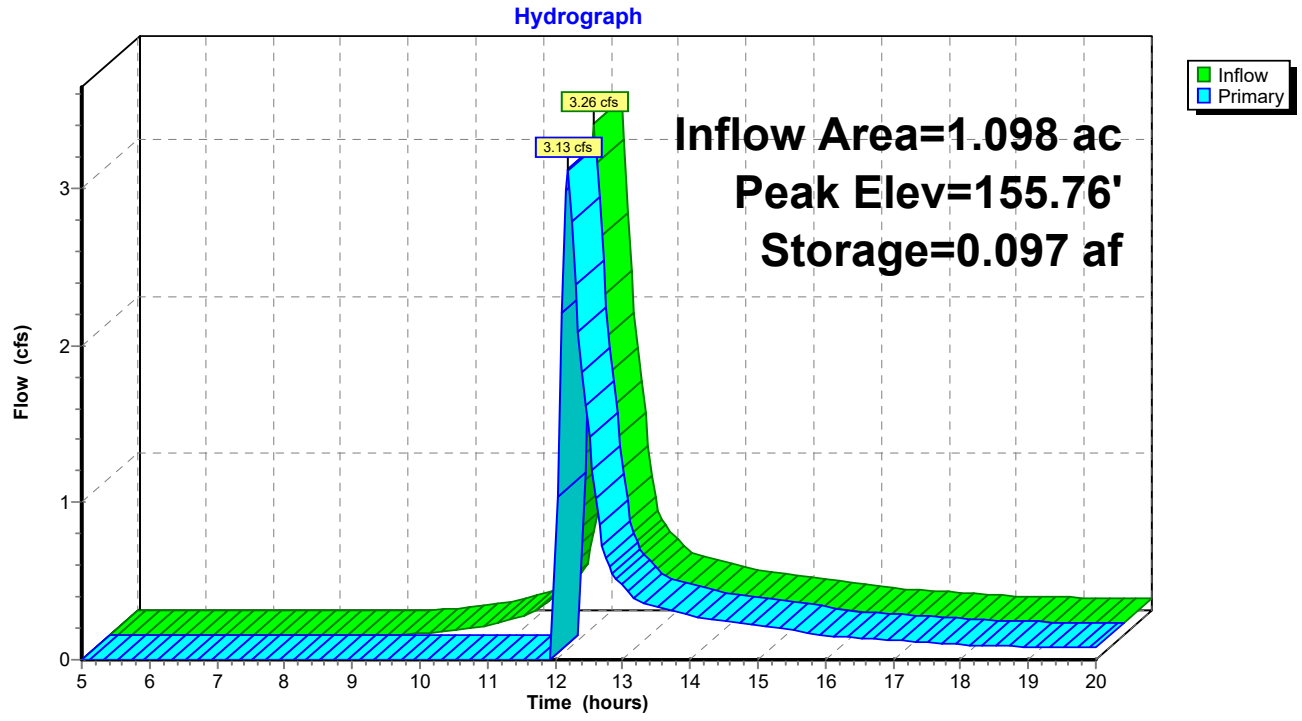
Plug-Flow detention time= 123.6 min calculated for 0.166 af (66% of inflow)
Center-of-Mass det. time= 22.2 min (827.5 - 805.3)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	0.109 af	**15.00'W x 30.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	155.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.09 cfs @ 12.19 hrs HW=155.76' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 3.09 cfs @ 1.21 fps)

Pond 2P: (new Pond)



Summary for Pond 3P: (new Pond)

Inflow Area = 1.683 ac, 0.00% Impervious, Inflow Depth > 2.96" for 25 year event
Inflow = 5.44 cfs @ 12.15 hrs, Volume= 0.415 af
Outflow = 5.28 cfs @ 12.17 hrs, Volume= 0.356 af, Atten= 3%, Lag= 1.7 min
Primary = 5.28 cfs @ 12.17 hrs, Volume= 0.356 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 150.50' Surf.Area= 0.030 ac Storage= 0.033 af
Peak Elev= 152.36' @ 12.17 hrs Surf.Area= 0.053 ac Storage= 0.109 af (0.076 af above start)

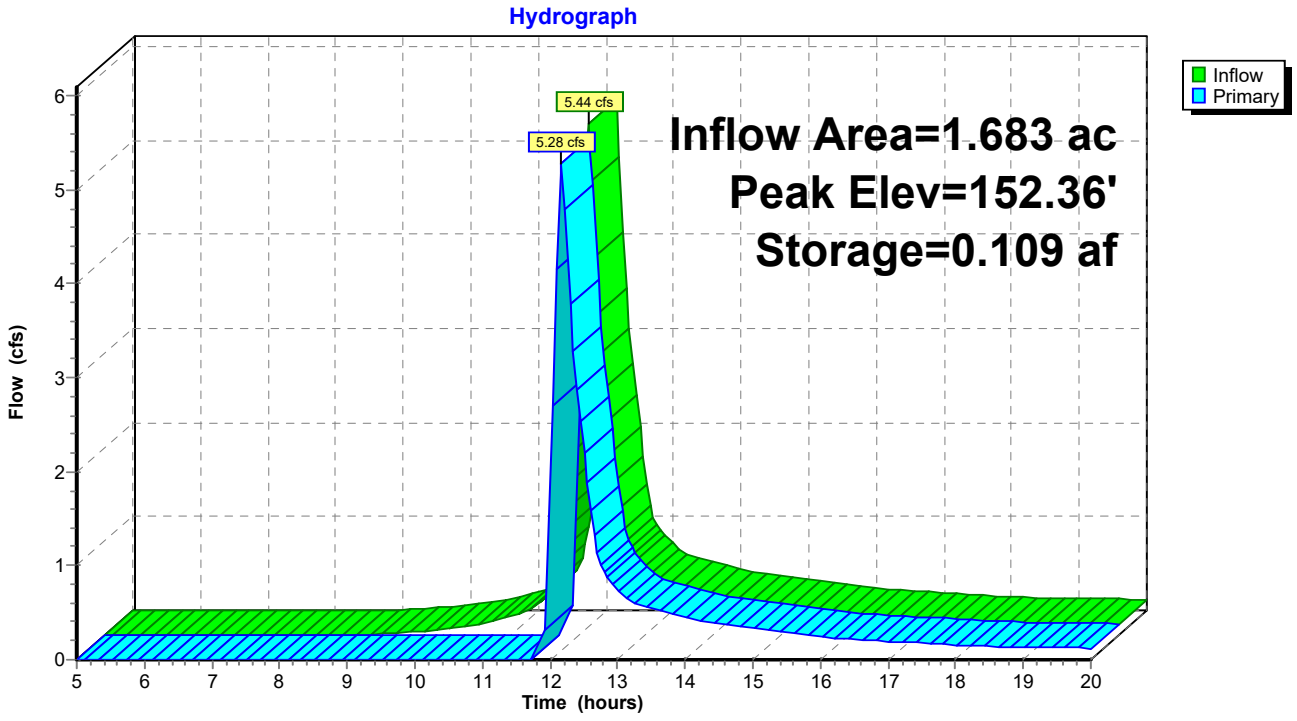
Plug-Flow detention time= 89.2 min calculated for 0.322 af (78% of inflow)
Center-of-Mass det. time= 22.2 min (823.5 - 801.3)

Volume	Invert	Avail.Storage	Storage Description
#1	149.00'	0.146 af	**15.00'W x 45.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5.14 cfs @ 12.17 hrs HW=152.35' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 5.14 cfs @ 1.46 fps)

Pond 3P: (new Pond)



Summary for Pond 4P: (new Pond)

Inflow Area = 1.159 ac, 0.00% Impervious, Inflow Depth > 3.16" for 25 year event
Inflow = 4.35 cfs @ 12.11 hrs, Volume= 0.305 af
Outflow = 4.21 cfs @ 12.13 hrs, Volume= 0.278 af, Atten= 3%, Lag= 1.4 min
Primary = 4.21 cfs @ 12.13 hrs, Volume= 0.278 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 148.50' Surf.Area= 0.021 ac Storage= 0.023 af
Peak Elev= 149.81' @ 12.13 hrs Surf.Area= 0.034 ac Storage= 0.060 af (0.036 af above start)

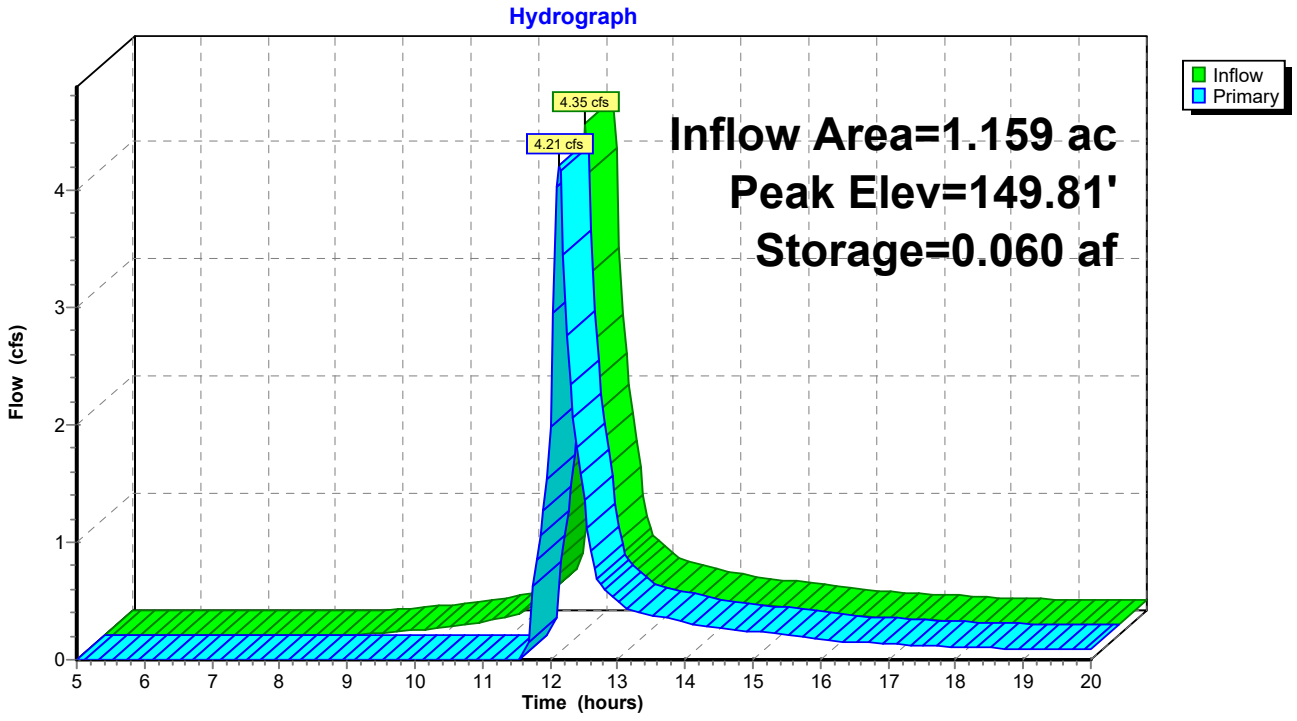
Plug-Flow detention time= 72.0 min calculated for 0.255 af (84% of inflow)
Center-of-Mass det. time= 15.6 min (811.3 - 795.7)

Volume	Invert	Avail.Storage	Storage Description
#1	147.00'	0.109 af	**15.00'W x 30.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	149.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.11 cfs @ 12.13 hrs HW=149.81' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 4.11 cfs @ 1.34 fps)

Pond 4P: (new Pond)



Summary for Pond 5P: (new Pond)

Inflow Area = 2.483 ac, 1.61% Impervious, Inflow Depth > 3.25" for 25 year event
Inflow = 8.58 cfs @ 12.16 hrs, Volume= 0.673 af
Outflow = 8.26 cfs @ 12.19 hrs, Volume= 0.563 af, Atten= 4%, Lag= 2.1 min
Primary = 8.26 cfs @ 12.19 hrs, Volume= 0.563 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 148.97' @ 12.19 hrs Surf.Area= 0.070 ac Storage= 0.139 af

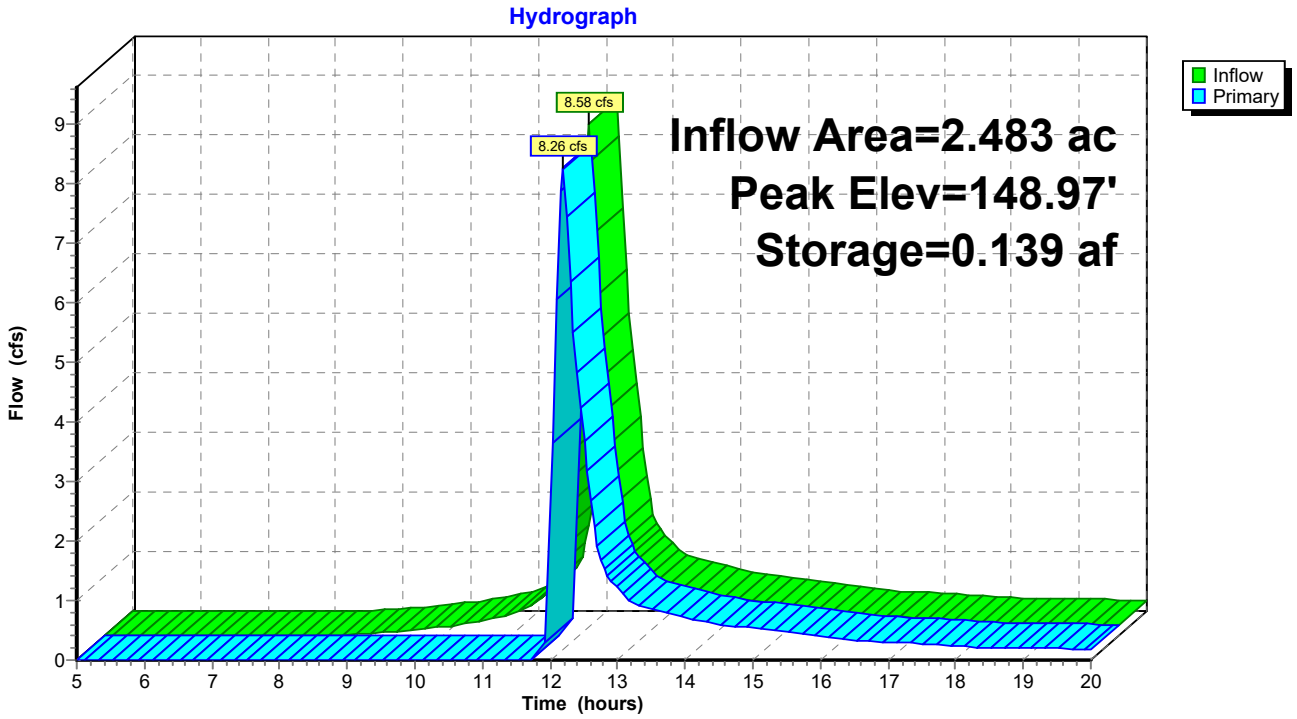
Plug-Flow detention time= 71.3 min calculated for 0.561 af (83% of inflow)
Center-of-Mass det. time= 26.1 min (822.8 - 796.7)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	0.220 af	**15.00'W x 75.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	148.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=8.17 cfs @ 12.19 hrs HW=148.97' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 8.17 cfs @ 1.75 fps)

Pond 5P: (new Pond)



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.368 ac 0.59% Impervious Runoff Depth>4.06"
Flow Length=550' Slope=0.0200 '/' Tc=13.8 min CN=73 Runoff=13.35 cfs 1.141 af

Subcatchment2: Subcat 2 Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>3.43"
Flow Length=350' Slope=0.0200 '/' Tc=10.5 min CN=67 Runoff=4.05 cfs 0.314 af

Subcatchment3: Subcat 3 Runoff Area=1.683 ac 0.00% Impervious Runoff Depth>3.64"
Flow Length=320' Slope=0.0200 '/' Tc=9.9 min CN=69 Runoff=6.69 cfs 0.511 af

Subcatchment4: Subcat 4 Runoff Area=1.159 ac 0.00% Impervious Runoff Depth>3.86"
Flow Length=320' Slope=0.0400 '/' Tc=7.3 min CN=71 Runoff=5.31 cfs 0.373 af

Subcatchment5: Subcat 5 Runoff Area=2.483 ac 1.61% Impervious Runoff Depth>3.96"
Flow Length=450' Tc=10.9 min CN=72 Runoff=10.43 cfs 0.819 af

Subcatchment6: Subcat 6 Runoff Area=0.937 ac 0.00% Impervious Runoff Depth>3.33"
Flow Length=250' Slope=0.0200 '/' Tc=8.8 min CN=66 Runoff=3.50 cfs 0.260 af

Pond 1P: (new Pond) Peak Elev=153.91' Storage=0.296 af Inflow=13.35 cfs 1.141 af
Outflow=13.12 cfs 1.040 af

Pond 2P: (new Pond) Peak Elev=155.80' Storage=0.099 af Inflow=4.05 cfs 0.314 af
Outflow=3.91 cfs 0.276 af

Pond 3P: (new Pond) Peak Elev=152.41' Storage=0.112 af Inflow=6.69 cfs 0.511 af
Outflow=6.53 cfs 0.452 af

Pond 4P: (new Pond) Peak Elev=149.85' Storage=0.061 af Inflow=5.31 cfs 0.373 af
Outflow=5.14 cfs 0.346 af

Pond 5P: (new Pond) Peak Elev=149.03' Storage=0.143 af Inflow=10.43 cfs 0.819 af
Outflow=10.08 cfs 0.709 af

Total Runoff Area = 10.728 ac Runoff Volume = 3.417 af Average Runoff Depth = 3.82"
99.44% Pervious = 10.668 ac 0.56% Impervious = 0.060 ac

Summary for Subcatchment 1: Subcat 1

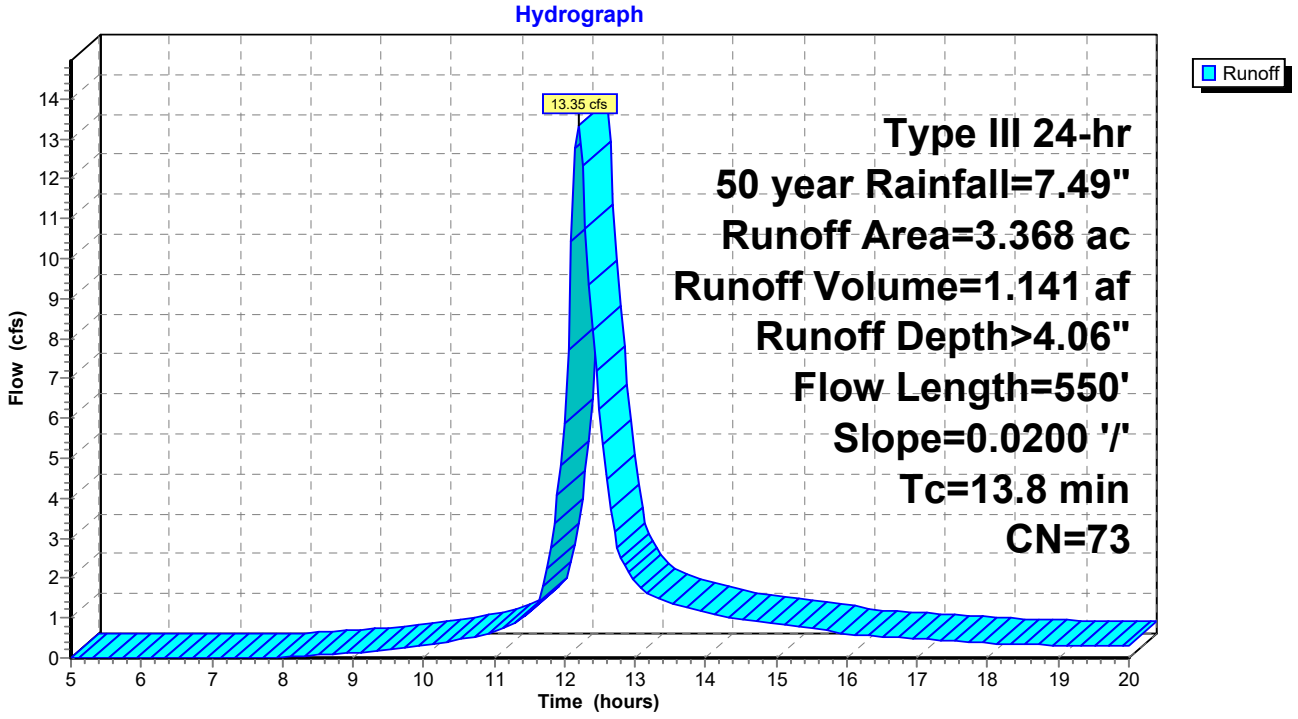
Runoff = 13.35 cfs @ 12.19 hrs, Volume= 1.141 af, Depth> 4.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

	Area (ac)	CN	Description
	0.478	61	>75% Grass cover, Good, HSG B
	0.228	74	>75% Grass cover, Good, HSG C
*	2.572	74	50-75% Grass cover, Fair, HSG B-C
	0.070	96	Gravel surface, HSG B
*	0.020	98	Equipment pad
	3.368	73	Weighted Average
	3.348		99.41% Pervious Area
	0.020		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
8.4	500	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.8	550	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

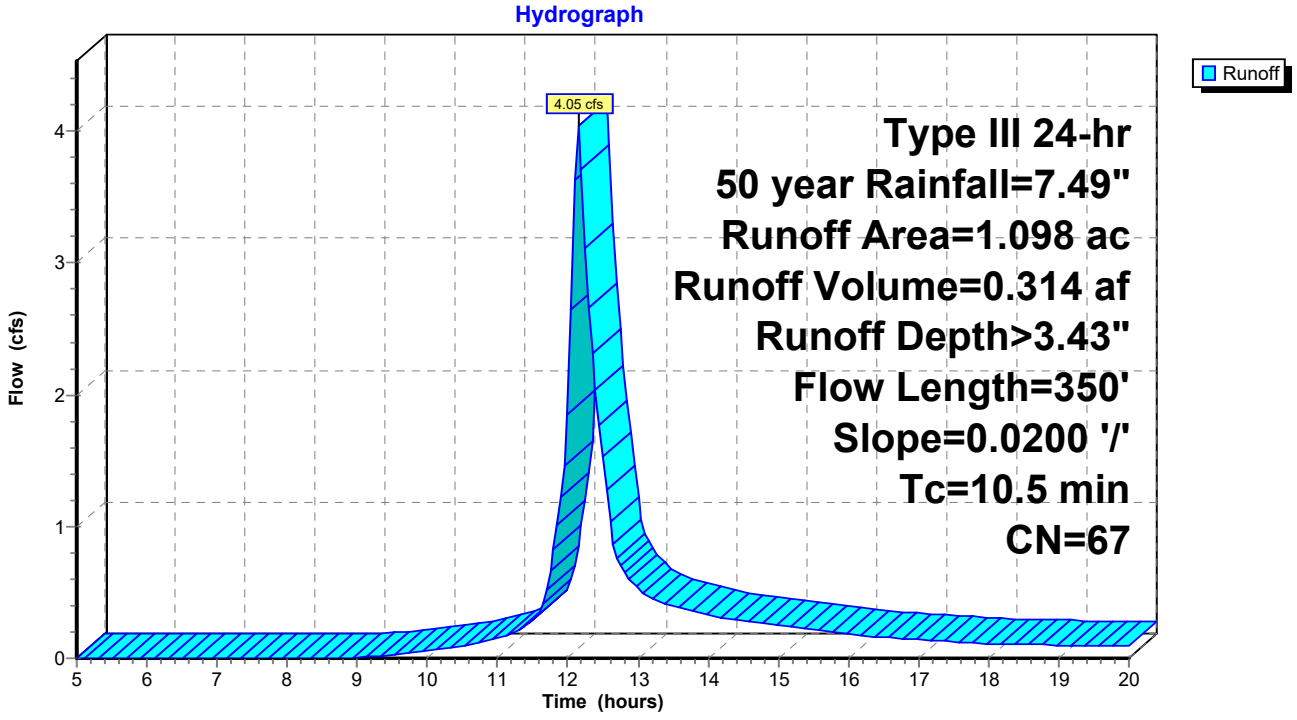
Runoff = 4.05 cfs @ 12.15 hrs, Volume= 0.314 af, Depth> 3.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

	Area (ac)	CN	Description
	0.605	61	>75% Grass cover, Good, HSG B
*	0.493	74	50-75% Grass cover, Fair, HSG B-C
	1.098	67	Weighted Average
	1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
5.1	300	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.5	350	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

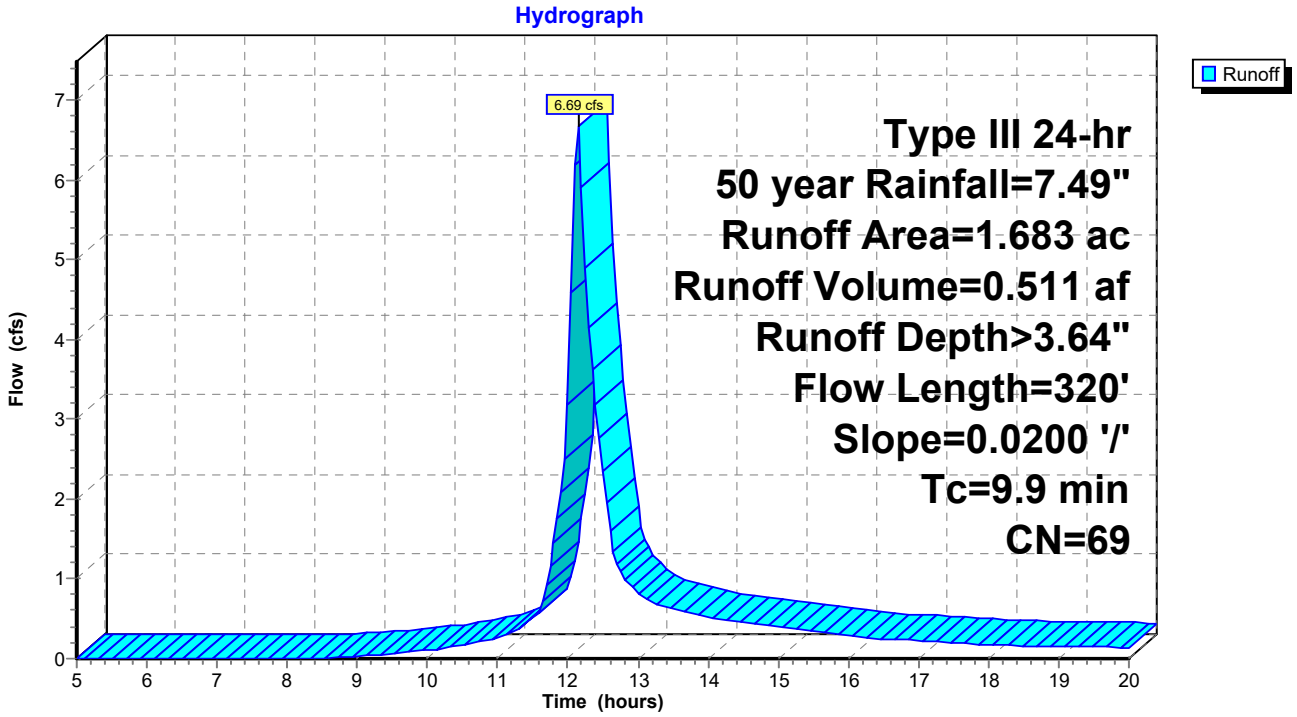
Runoff = 6.69 cfs @ 12.14 hrs, Volume= 0.511 af, Depth> 3.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

	Area (ac)	CN	Description
*	0.810	74	50-75% Grass cover, Fair, HSG B-C
	0.075	96	Gravel surface, HSG B
	0.798	61	>75% Grass cover, Good, HSG B
	1.683	69	Weighted Average
	1.683		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
4.5	270	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.9	320	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

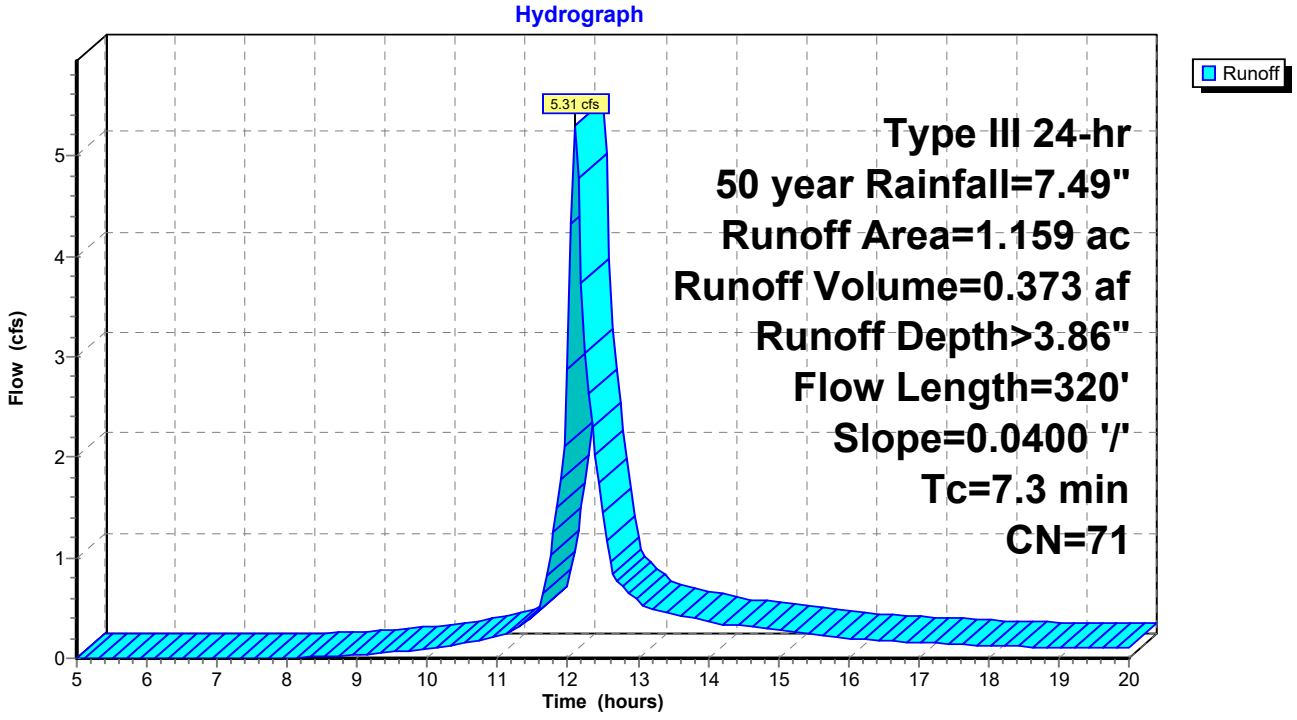
Runoff = 5.31 cfs @ 12.11 hrs, Volume= 0.373 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

	Area (ac)	CN	Description
	0.263	61	>75% Grass cover, Good, HSG B
*	0.896	74	50-75% Grass cover, Fair, HSG B-C
	1.159	71	Weighted Average
	1.159		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.2	270	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.3	320	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

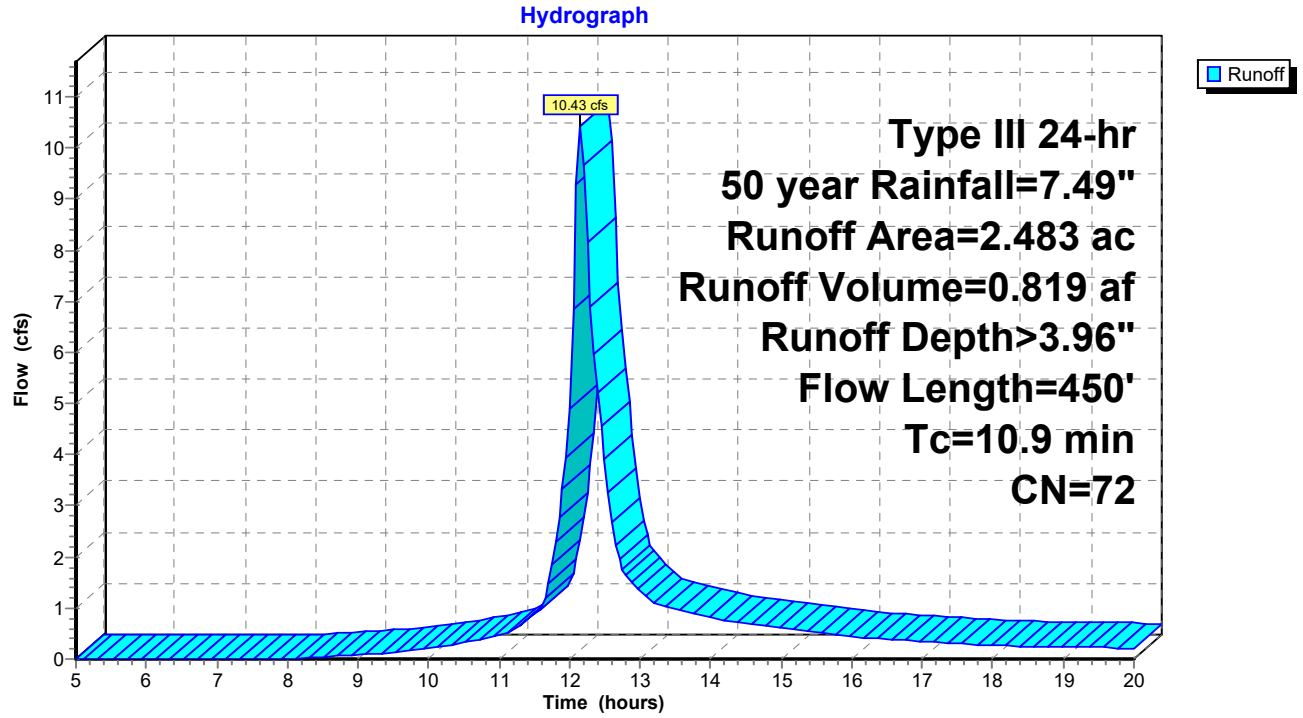
Runoff = 10.43 cfs @ 12.15 hrs, Volume= 0.819 af, Depth> 3.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

	Area (ac)	CN	Description
	0.713	61	>75% Grass cover, Good, HSG B
	0.122	96	Gravel surface, HSG B
*	0.040	98	Equipment pad
*	1.444	74	50-75% Grass cover, Fair, HSG B-C
	0.164	80	>75% Grass cover, Good, HSG D
	2.483	72	Weighted Average
	2.443		98.39% Pervious Area
	0.040		1.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	200	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	450	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

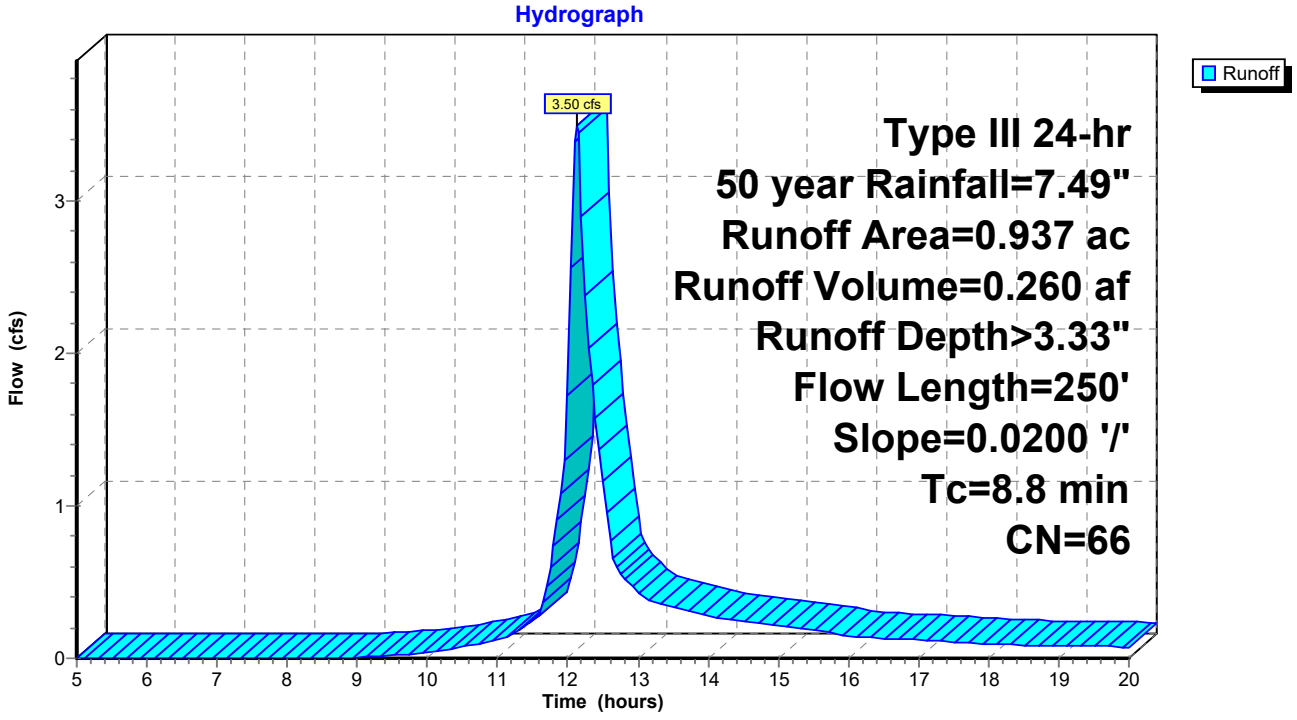
Runoff = 3.50 cfs @ 12.13 hrs, Volume= 0.260 af, Depth> 3.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 year Rainfall=7.49"

	Area (ac)	CN	Description
*	0.365	74	50-75% Grass cover, Fair, HSG B-C
	0.572	61	>75% Grass cover, Good, HSG B
	0.937	66	Weighted Average
	0.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	250	Total			

Subcatchment 6: Subcat 6



Summary for Pond 1P: (new Pond)

Inflow Area = 3.368 ac, 0.59% Impervious, Inflow Depth > 4.06" for 50 year event
Inflow = 13.35 cfs @ 12.19 hrs, Volume= 1.141 af
Outflow = 13.12 cfs @ 12.22 hrs, Volume= 1.040 af, Atten= 2%, Lag= 1.7 min
Primary = 13.12 cfs @ 12.22 hrs, Volume= 1.040 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 152.50' Surf.Area= 0.086 ac Storage= 0.153 af
Peak Elev= 153.91' @ 12.22 hrs Surf.Area= 0.118 ac Storage= 0.296 af (0.143 af above start)

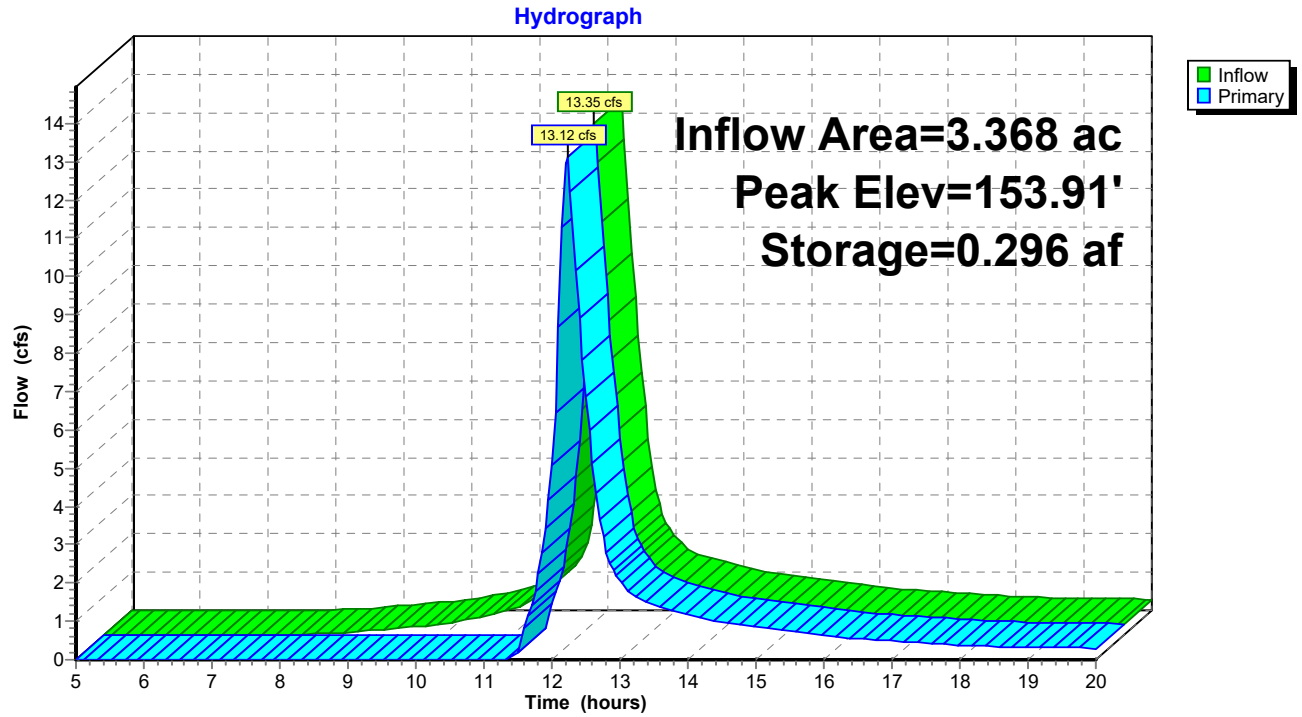
Plug-Flow detention time= 91.0 min calculated for 0.887 af (78% of inflow)
Center-of-Mass det. time= 18.3 min (811.0 - 792.7)

Volume	Invert	Avail.Storage	Storage Description
#1	150.00'	0.307 af	**15.00'W x 110.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	153.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=12.87 cfs @ 12.22 hrs HW=153.90' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 12.87 cfs @ 1.59 fps)

Pond 1P: (new Pond)



Summary for Pond 2P: (new Pond)

Inflow Area = 1.098 ac, 0.00% Impervious, Inflow Depth > 3.43" for 50 year event
Inflow = 4.05 cfs @ 12.15 hrs, Volume= 0.314 af
Outflow = 3.91 cfs @ 12.18 hrs, Volume= 0.276 af, Atten= 4%, Lag= 1.8 min
Primary = 3.91 cfs @ 12.18 hrs, Volume= 0.276 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 154.50' Surf.Area= 0.031 ac Storage= 0.050 af
Peak Elev= 155.80' @ 12.18 hrs Surf.Area= 0.046 ac Storage= 0.099 af (0.049 af above start)

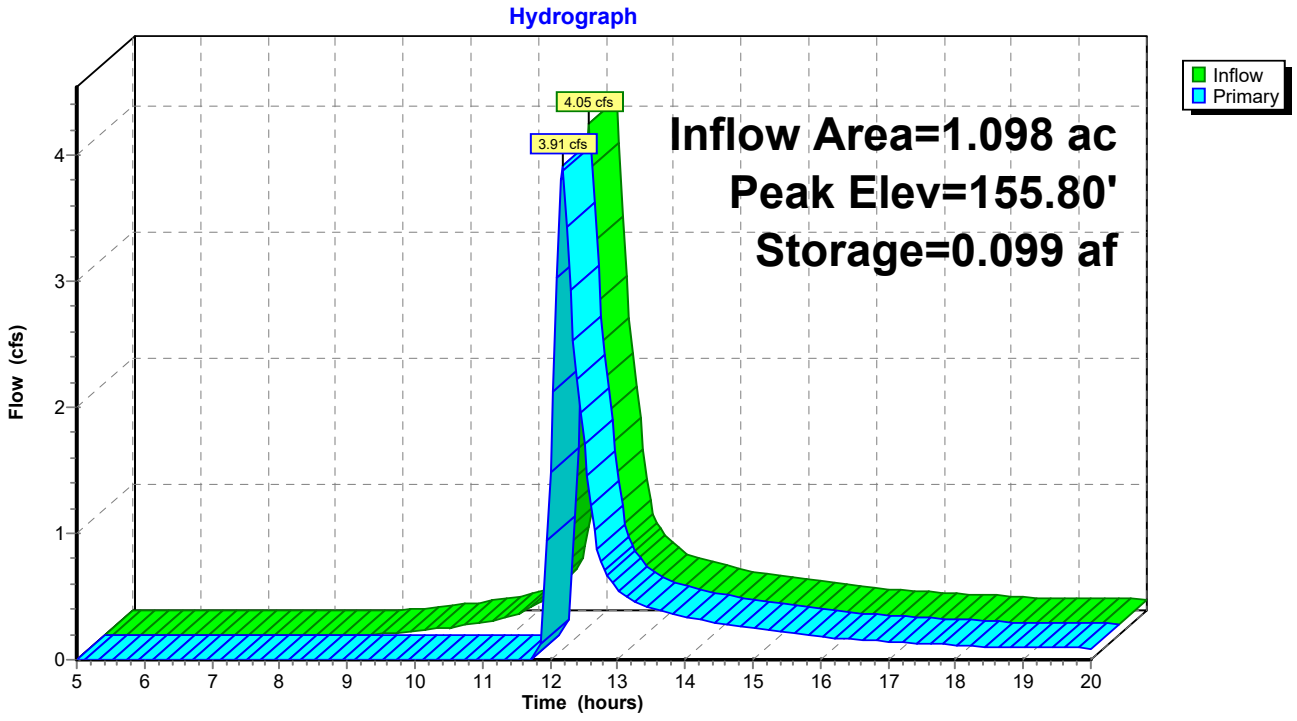
Plug-Flow detention time= 105.4 min calculated for 0.227 af (72% of inflow)
Center-of-Mass det. time= 19.5 min (820.0 - 800.5)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	0.109 af	**15.00'W x 30.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	155.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=3.84 cfs @ 12.18 hrs HW=155.79' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 3.84 cfs @ 1.31 fps)

Pond 2P: (new Pond)



Summary for Pond 3P: (new Pond)

Inflow Area = 1.683 ac, 0.00% Impervious, Inflow Depth > 3.64" for 50 year event
Inflow = 6.69 cfs @ 12.14 hrs, Volume= 0.511 af
Outflow = 6.53 cfs @ 12.17 hrs, Volume= 0.452 af, Atten= 2%, Lag= 1.5 min
Primary = 6.53 cfs @ 12.17 hrs, Volume= 0.452 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 150.50' Surf.Area= 0.030 ac Storage= 0.033 af
Peak Elev= 152.41' @ 12.17 hrs Surf.Area= 0.053 ac Storage= 0.112 af (0.078 af above start)

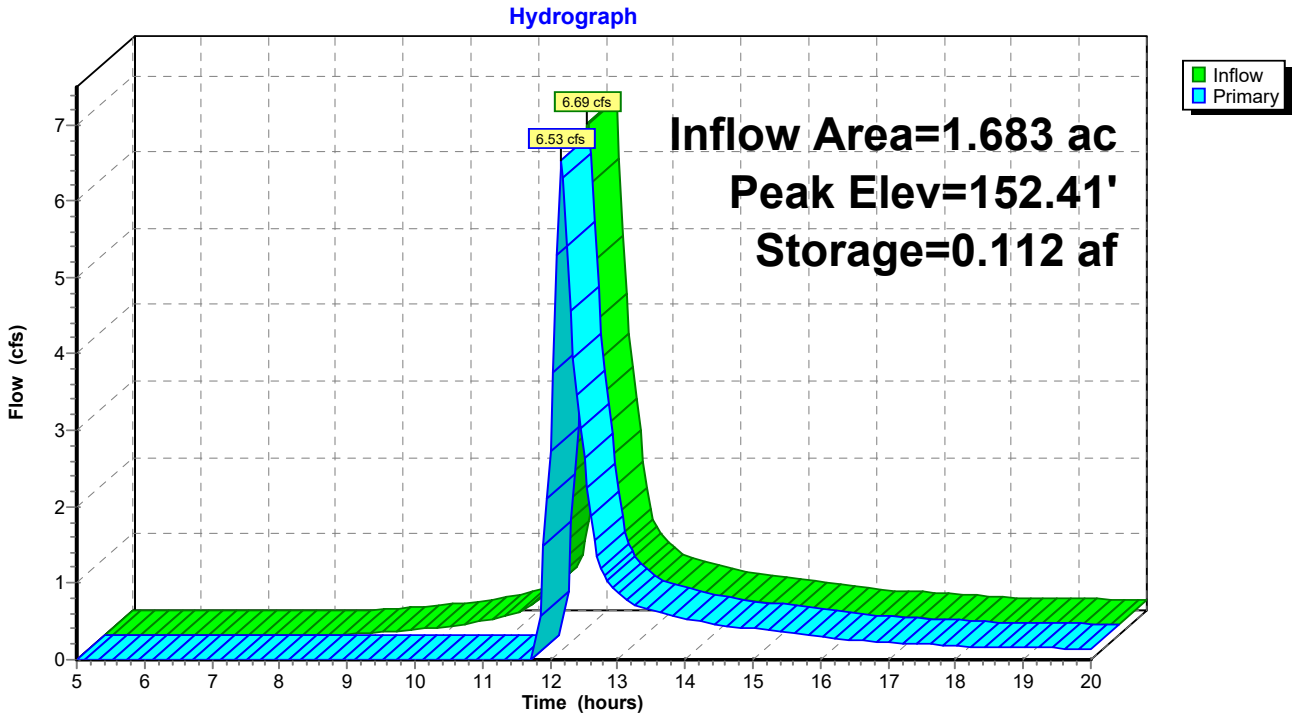
Plug-Flow detention time= 77.1 min calculated for 0.417 af (82% of inflow)
Center-of-Mass det. time= 19.8 min (816.4 - 796.6)

Volume	Invert	Avail.Storage	Storage Description
#1	149.00'	0.146 af	**15.00'W x 45.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6.37 cfs @ 12.17 hrs HW=152.40' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 6.37 cfs @ 1.59 fps)

Pond 3P: (new Pond)



Summary for Pond 4P: (new Pond)

Inflow Area = 1.159 ac, 0.00% Impervious, Inflow Depth > 3.86" for 50 year event
Inflow = 5.31 cfs @ 12.11 hrs, Volume= 0.373 af
Outflow = 5.14 cfs @ 12.13 hrs, Volume= 0.346 af, Atten= 3%, Lag= 1.3 min
Primary = 5.14 cfs @ 12.13 hrs, Volume= 0.346 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 148.50' Surf.Area= 0.021 ac Storage= 0.023 af
Peak Elev= 149.85' @ 12.13 hrs Surf.Area= 0.035 ac Storage= 0.061 af (0.038 af above start)

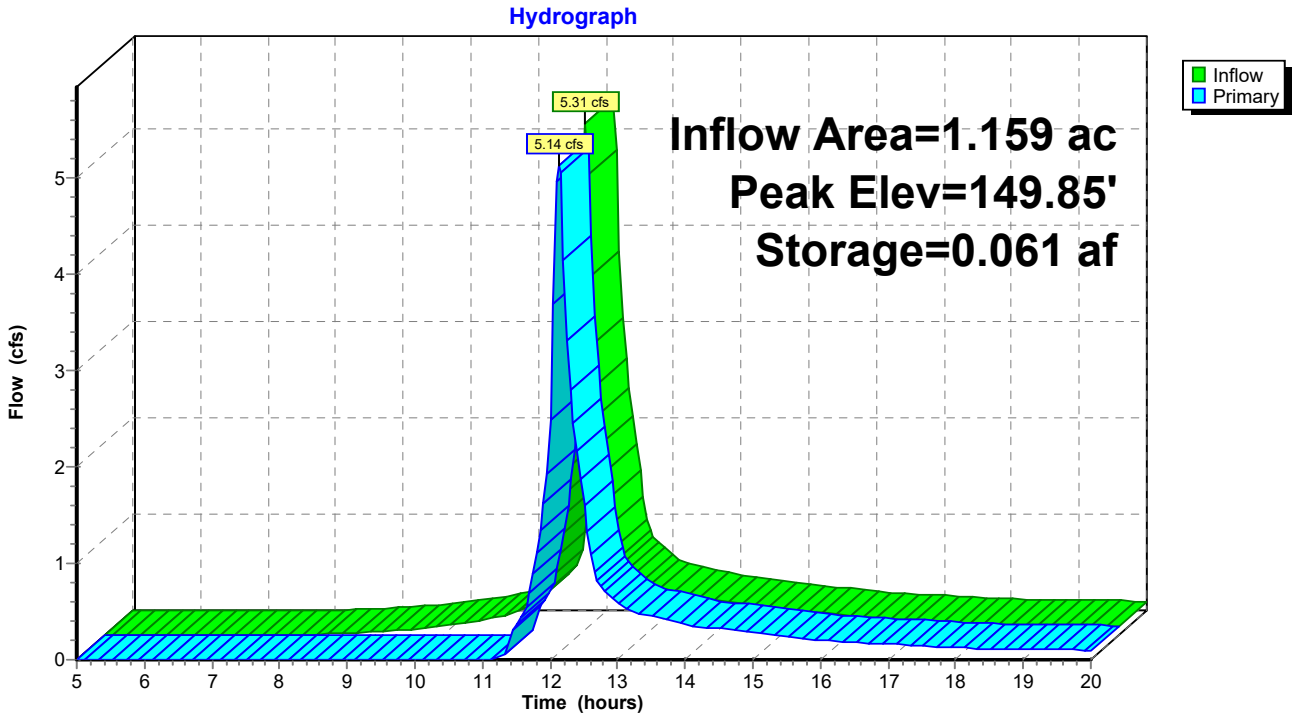
Plug-Flow detention time= 62.5 min calculated for 0.321 af (86% of inflow)
Center-of-Mass det. time= 14.5 min (805.6 - 791.1)

Volume	Invert	Avail.Storage	Storage Description
#1	147.00'	0.109 af	**15.00'W x 30.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	149.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=5.01 cfs @ 12.13 hrs HW=149.85' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 5.01 cfs @ 1.45 fps)

Pond 4P: (new Pond)



Summary for Pond 5P: (new Pond)

Inflow Area = 2.483 ac, 1.61% Impervious, Inflow Depth > 3.96" for 50 year event
Inflow = 10.43 cfs @ 12.15 hrs, Volume= 0.819 af
Outflow = 10.08 cfs @ 12.19 hrs, Volume= 0.709 af, Atten= 3%, Lag= 1.8 min
Primary = 10.08 cfs @ 12.19 hrs, Volume= 0.709 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 149.03' @ 12.19 hrs Surf.Area= 0.071 ac Storage= 0.143 af

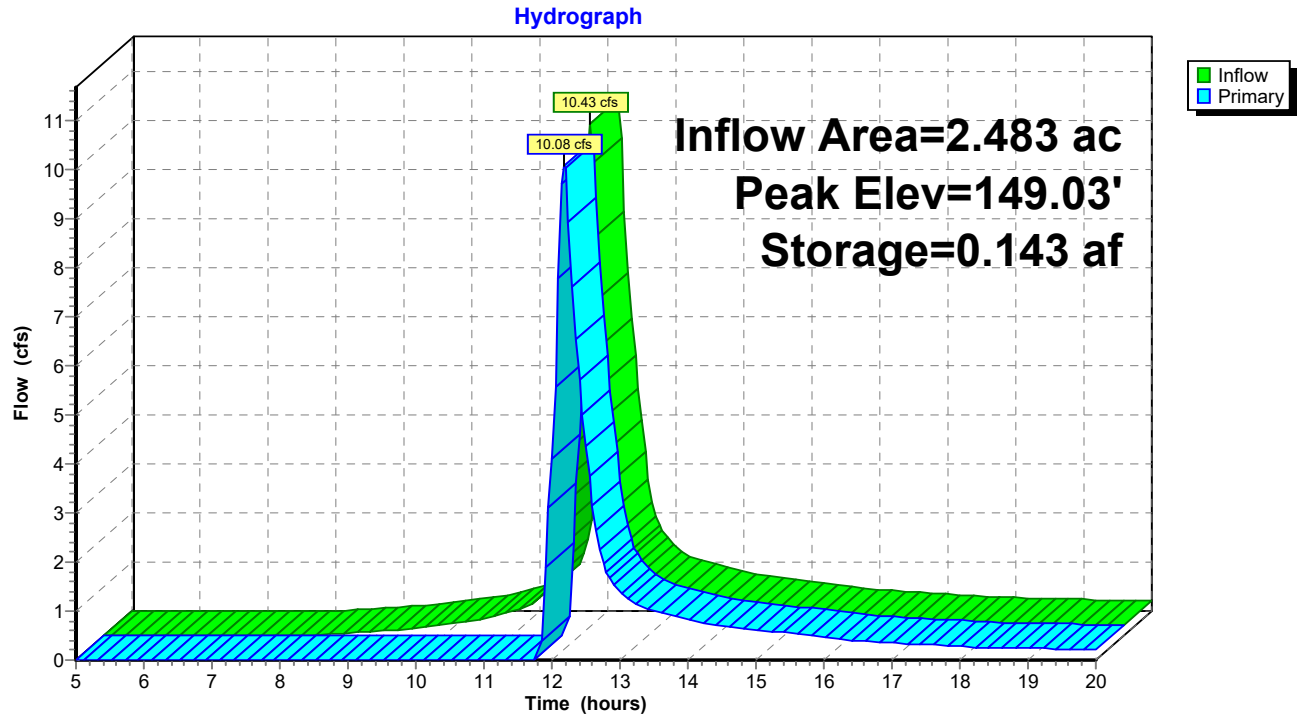
Plug-Flow detention time= 62.8 min calculated for 0.707 af (86% of inflow)
Center-of-Mass det. time= 23.5 min (815.7 - 792.2)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	0.220 af	**15.00'W x 75.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	148.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=9.93 cfs @ 12.19 hrs HW=149.02' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 9.93 cfs @ 1.90 fps)

Pond 5P: (new Pond)



Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=3.368 ac 0.59% Impervious Runoff Depth>4.85"
Flow Length=550' Slope=0.0200 '/' Tc=13.8 min CN=73 Runoff=15.87 cfs 1.362 af

Subcatchment2: Subcat 2 Runoff Area=1.098 ac 0.00% Impervious Runoff Depth>4.16"
Flow Length=350' Slope=0.0200 '/' Tc=10.5 min CN=67 Runoff=4.91 cfs 0.381 af

Subcatchment3: Subcat 3 Runoff Area=1.683 ac 0.00% Impervious Runoff Depth>4.40"
Flow Length=320' Slope=0.0200 '/' Tc=9.9 min CN=69 Runoff=8.06 cfs 0.616 af

Subcatchment4: Subcat 4 Runoff Area=1.159 ac 0.00% Impervious Runoff Depth>4.63"
Flow Length=320' Slope=0.0400 '/' Tc=7.3 min CN=71 Runoff=6.35 cfs 0.447 af

Subcatchment5: Subcat 5 Runoff Area=2.483 ac 1.61% Impervious Runoff Depth>4.74"
Flow Length=450' Tc=10.9 min CN=72 Runoff=12.44 cfs 0.981 af

Subcatchment6: Subcat 6 Runoff Area=0.937 ac 0.00% Impervious Runoff Depth>4.05"
Flow Length=250' Slope=0.0200 '/' Tc=8.8 min CN=66 Runoff=4.26 cfs 0.316 af

Pond 1P: (new Pond) Peak Elev=153.95' Storage=0.301 af Inflow=15.87 cfs 1.362 af
Outflow=15.65 cfs 1.261 af

Pond 2P: (new Pond) Peak Elev=155.84' Storage=0.101 af Inflow=4.91 cfs 0.381 af
Outflow=4.75 cfs 0.344 af

Pond 3P: (new Pond) Peak Elev=152.46' Storage=0.114 af Inflow=8.06 cfs 0.616 af
Outflow=7.90 cfs 0.557 af

Pond 4P: (new Pond) Peak Elev=149.89' Storage=0.063 af Inflow=6.35 cfs 0.447 af
Outflow=6.15 cfs 0.420 af

Pond 5P: (new Pond) Peak Elev=149.09' Storage=0.147 af Inflow=12.44 cfs 0.981 af
Outflow=12.05 cfs 0.870 af

Total Runoff Area = 10.728 ac Runoff Volume = 4.103 af Average Runoff Depth = 4.59"
99.44% Pervious = 10.668 ac 0.56% Impervious = 0.060 ac

Summary for Subcatchment 1: Subcat 1

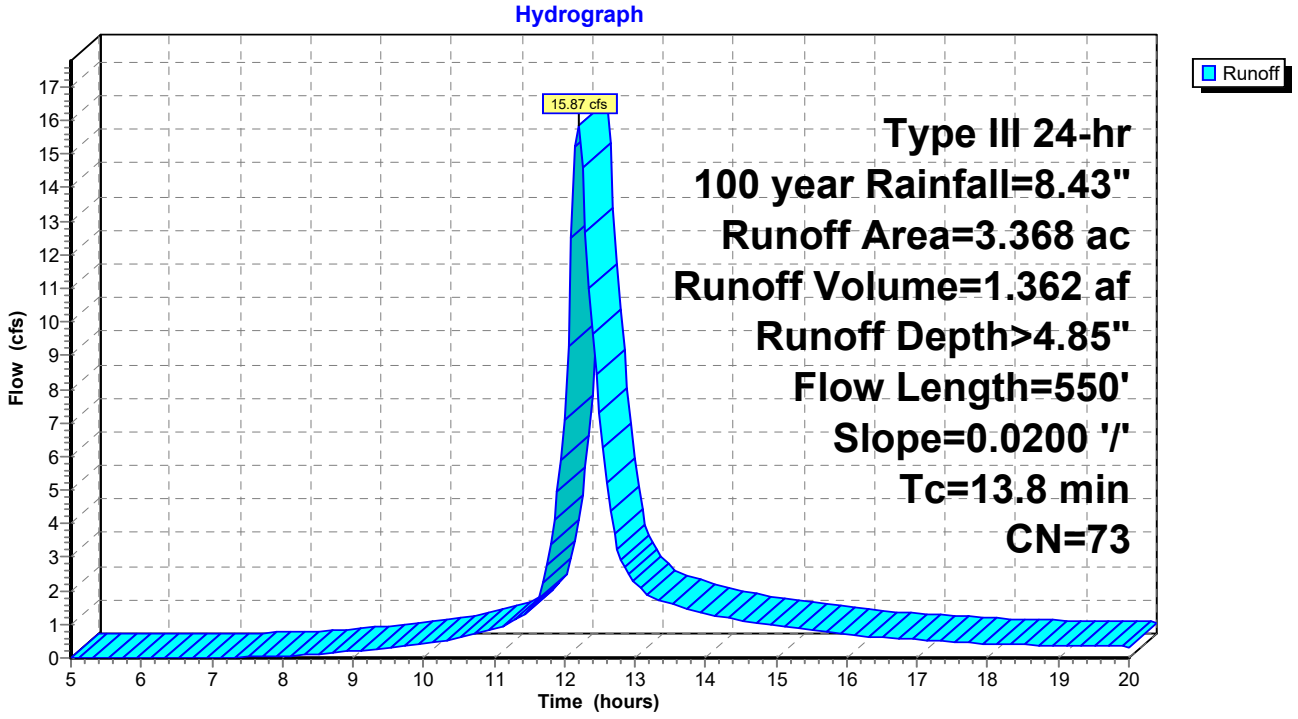
Runoff = 15.87 cfs @ 12.19 hrs, Volume= 1.362 af, Depth> 4.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

	Area (ac)	CN	Description
	0.478	61	>75% Grass cover, Good, HSG B
	0.228	74	>75% Grass cover, Good, HSG C
*	2.572	74	50-75% Grass cover, Fair, HSG B-C
	0.070	96	Gravel surface, HSG B
*	0.020	98	Equipment pad
	3.368	73	Weighted Average
	3.348		99.41% Pervious Area
	0.020		0.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
8.4	500	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.8	550	Total			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

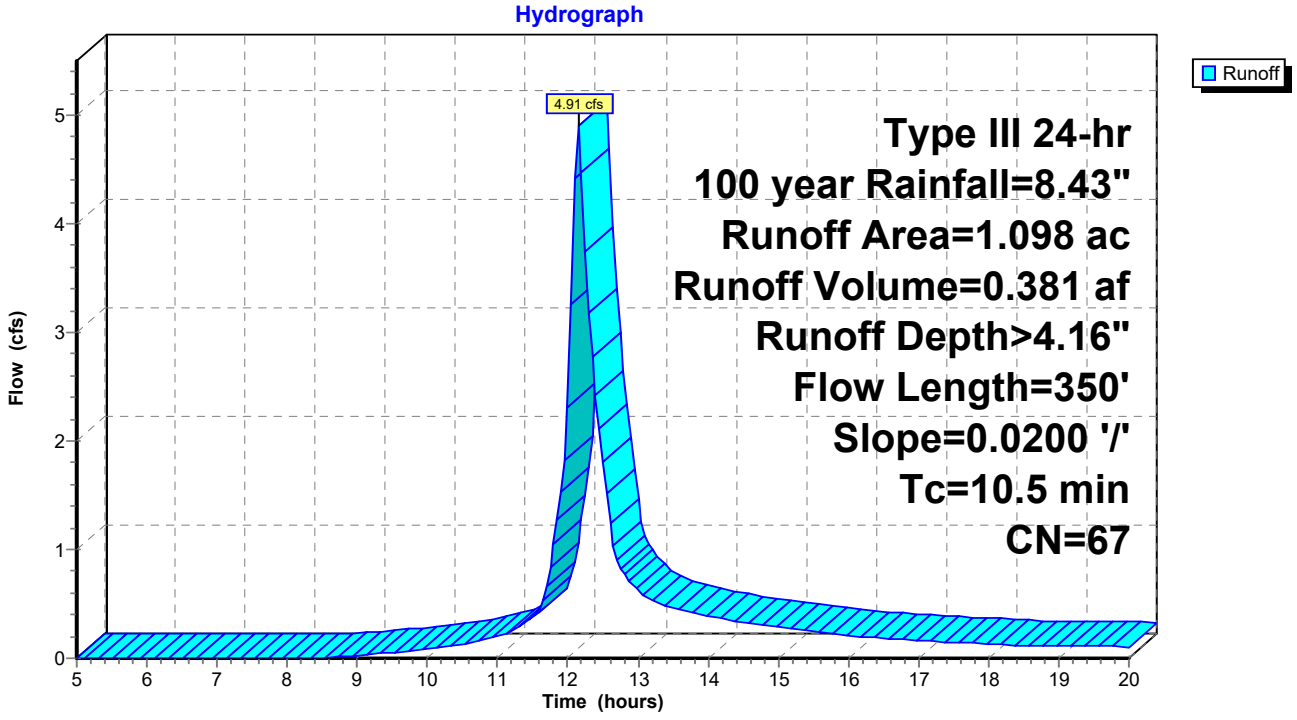
Runoff = 4.91 cfs @ 12.15 hrs, Volume= 0.381 af, Depth> 4.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

	Area (ac)	CN	Description
	0.605	61	>75% Grass cover, Good, HSG B
*	0.493	74	50-75% Grass cover, Fair, HSG B-C
	1.098	67	Weighted Average
	1.098		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
5.1	300	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.5	350	Total			

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

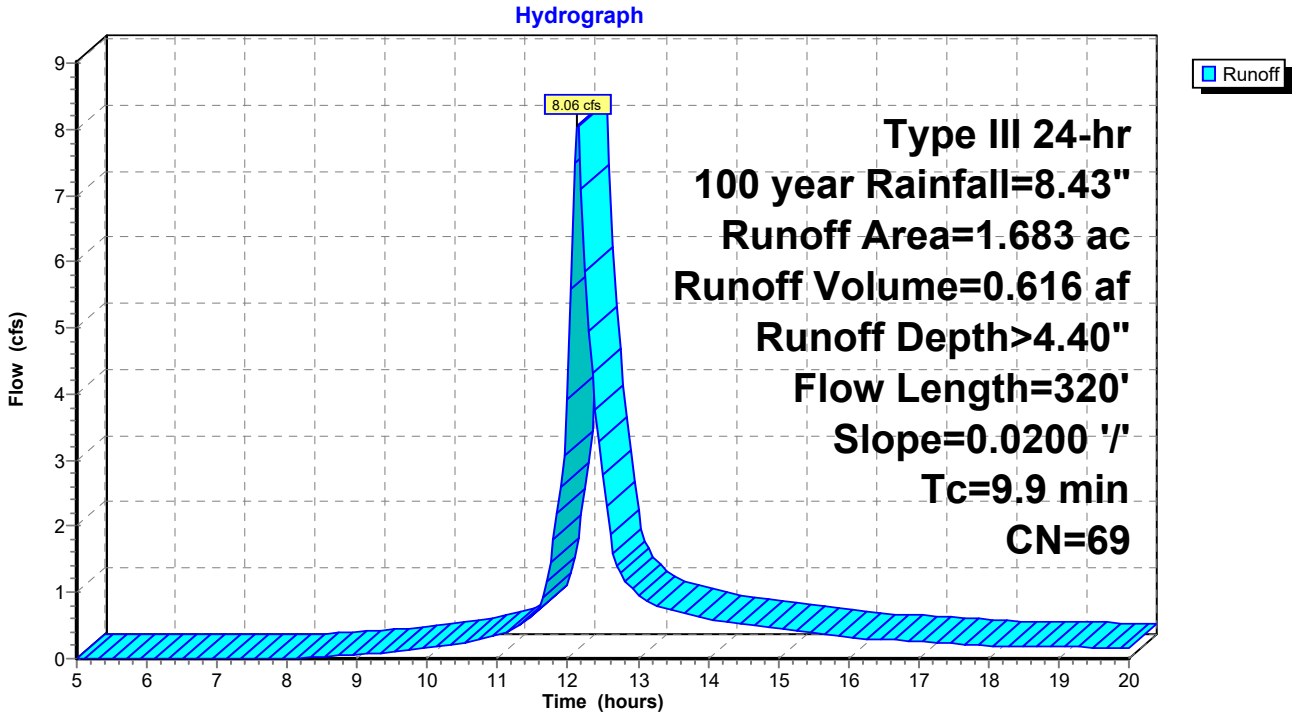
Runoff = 8.06 cfs @ 12.14 hrs, Volume= 0.616 af, Depth> 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

	Area (ac)	CN	Description
*	0.810	74	50-75% Grass cover, Fair, HSG B-C
	0.075	96	Gravel surface, HSG B
	0.798	61	>75% Grass cover, Good, HSG B
	1.683	69	Weighted Average
	1.683		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
4.5	270	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
9.9	320	Total			

Subcatchment 3: Subcat 3



Summary for Subcatchment 4: Subcat 4

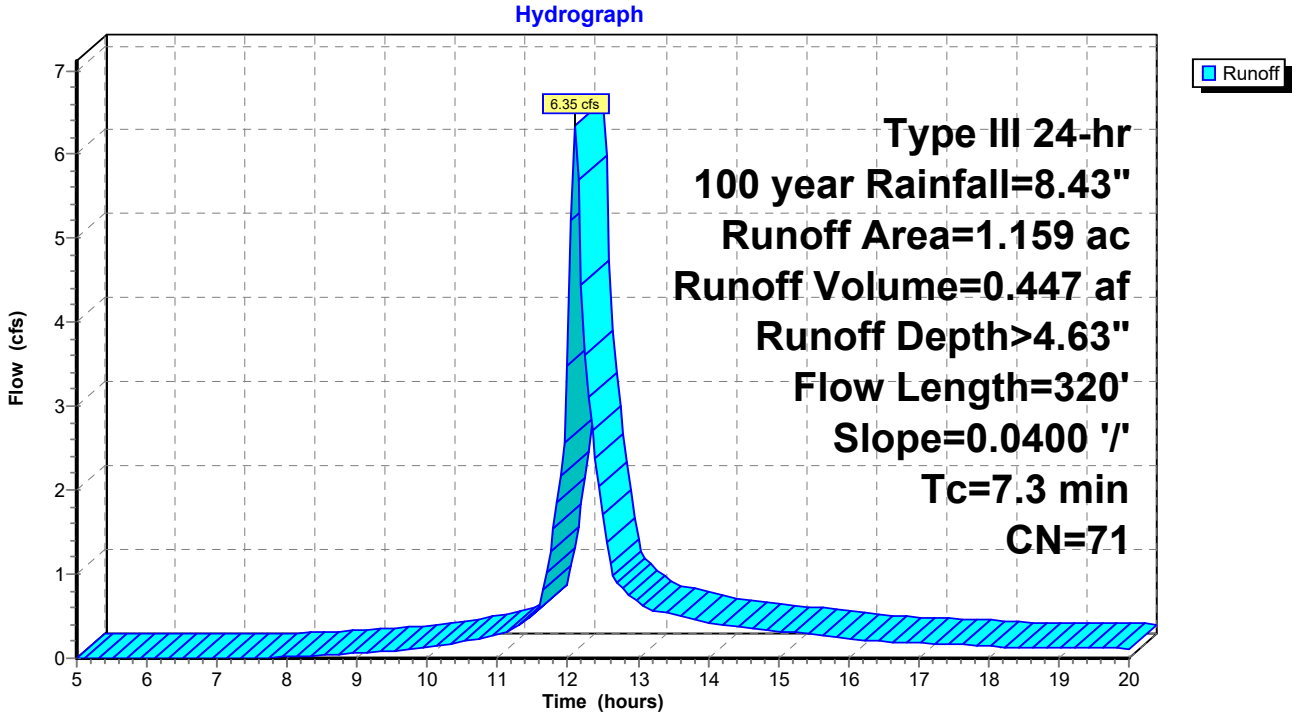
Runoff = 6.35 cfs @ 12.11 hrs, Volume= 0.447 af, Depth> 4.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

	Area (ac)	CN	Description
	0.263	61	>75% Grass cover, Good, HSG B
*	0.896	74	50-75% Grass cover, Fair, HSG B-C
	1.159	71	Weighted Average
	1.159		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.1	50	0.0400	0.21		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.2	270	0.0400	1.40		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
7.3	320	Total			

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

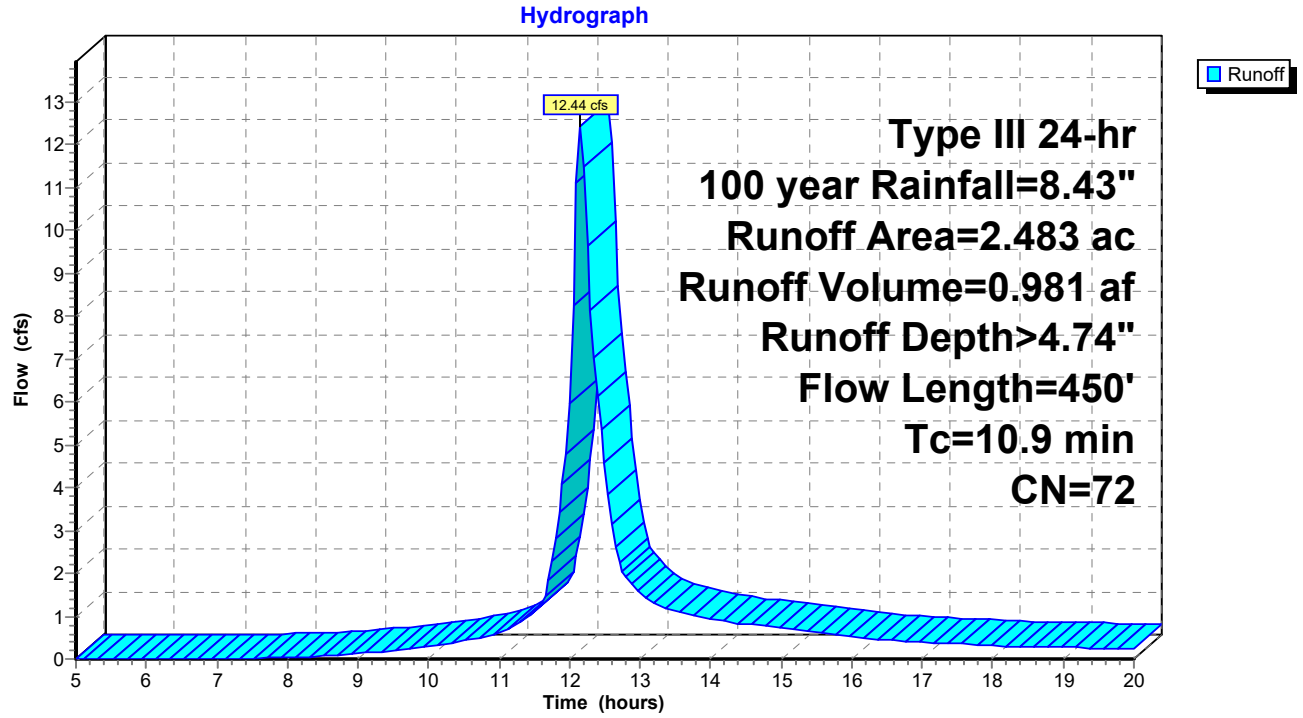
Runoff = 12.44 cfs @ 12.15 hrs, Volume= 0.981 af, Depth> 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

	Area (ac)	CN	Description
	0.713	61	>75% Grass cover, Good, HSG B
	0.122	96	Gravel surface, HSG B
*	0.040	98	Equipment pad
*	1.444	74	50-75% Grass cover, Fair, HSG B-C
	0.164	80	>75% Grass cover, Good, HSG D
	2.483	72	Weighted Average
	2.443		98.39% Pervious Area
	0.040		1.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
2.1	200	0.0500	1.57		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
10.9	450	Total			

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

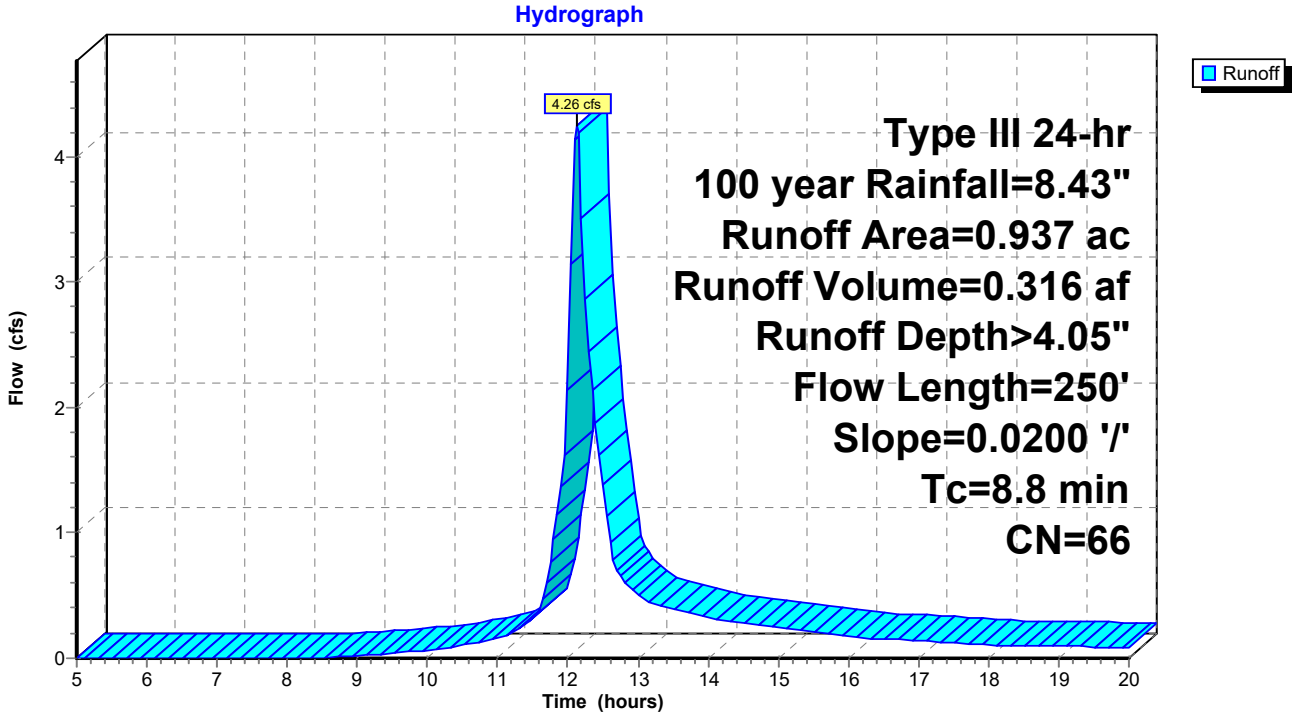
Runoff = 4.26 cfs @ 12.13 hrs, Volume= 0.316 af, Depth> 4.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 year Rainfall=8.43"

	Area (ac)	CN	Description
*	0.365	74	50-75% Grass cover, Fair, HSG B-C
	0.572	61	>75% Grass cover, Good, HSG B
	0.937	66	Weighted Average
	0.937		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.4	50	0.0200	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.54"
3.4	200	0.0200	0.99		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.8	250	Total			

Subcatchment 6: Subcat 6



Summary for Pond 1P: (new Pond)

Inflow Area = 3.368 ac, 0.59% Impervious, Inflow Depth > 4.85" for 100 year event
Inflow = 15.87 cfs @ 12.19 hrs, Volume= 1.362 af
Outflow = 15.65 cfs @ 12.22 hrs, Volume= 1.261 af, Atten= 1%, Lag= 1.6 min
Primary = 15.65 cfs @ 12.22 hrs, Volume= 1.261 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 152.50' Surf.Area= 0.086 ac Storage= 0.153 af
Peak Elev= 153.95' @ 12.22 hrs Surf.Area= 0.119 ac Storage= 0.301 af (0.149 af above start)

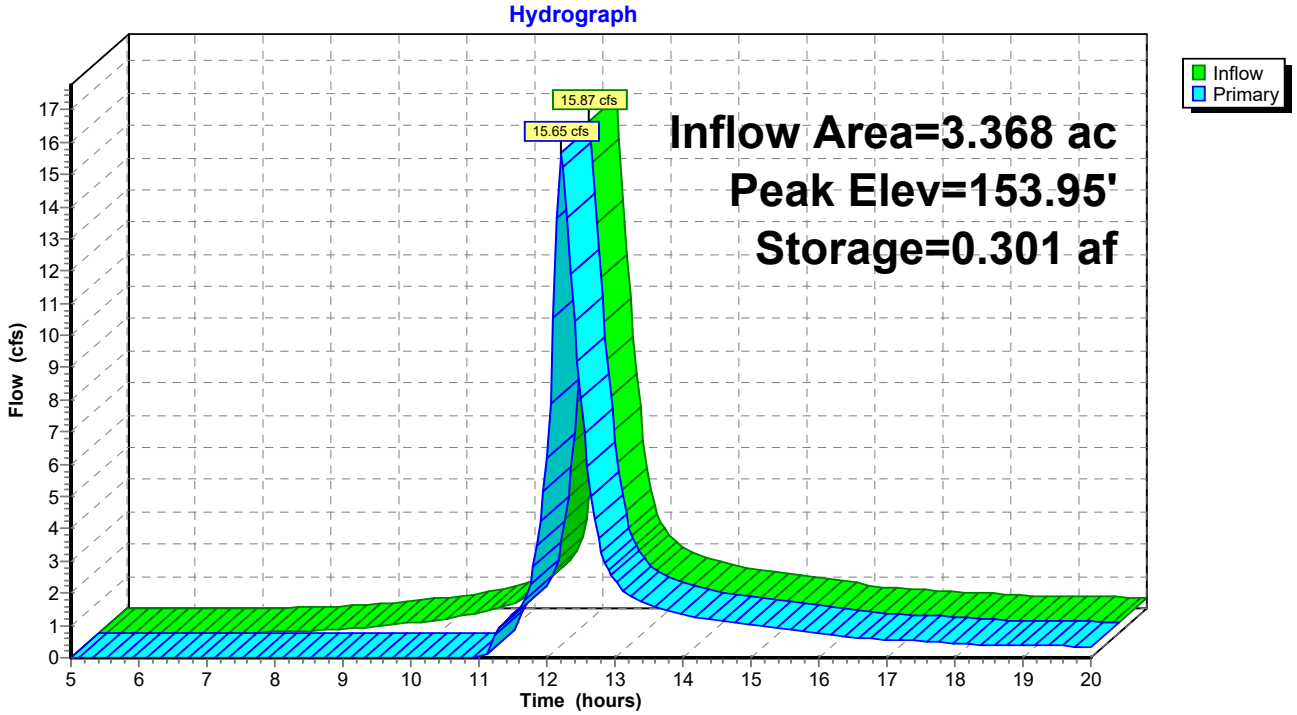
Plug-Flow detention time= 80.7 min calculated for 1.104 af (81% of inflow)
Center-of-Mass det. time= 17.2 min (805.9 - 788.7)

Volume	Invert	Avail.Storage	Storage Description
#1	150.00'	0.307 af	**15.00'W x 110.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	153.50'	**20.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=15.39 cfs @ 12.22 hrs HW=153.95' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 15.39 cfs @ 1.71 fps)

Pond 1P: (new Pond)



Summary for Pond 2P: (new Pond)

Inflow Area = 1.098 ac, 0.00% Impervious, Inflow Depth > 4.16" for 100 year event
Inflow = 4.91 cfs @ 12.15 hrs, Volume= 0.381 af
Outflow = 4.75 cfs @ 12.18 hrs, Volume= 0.344 af, Atten= 3%, Lag= 1.6 min
Primary = 4.75 cfs @ 12.18 hrs, Volume= 0.344 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 154.50' Surf.Area= 0.031 ac Storage= 0.050 af
Peak Elev= 155.84' @ 12.18 hrs Surf.Area= 0.046 ac Storage= 0.101 af (0.051 af above start)

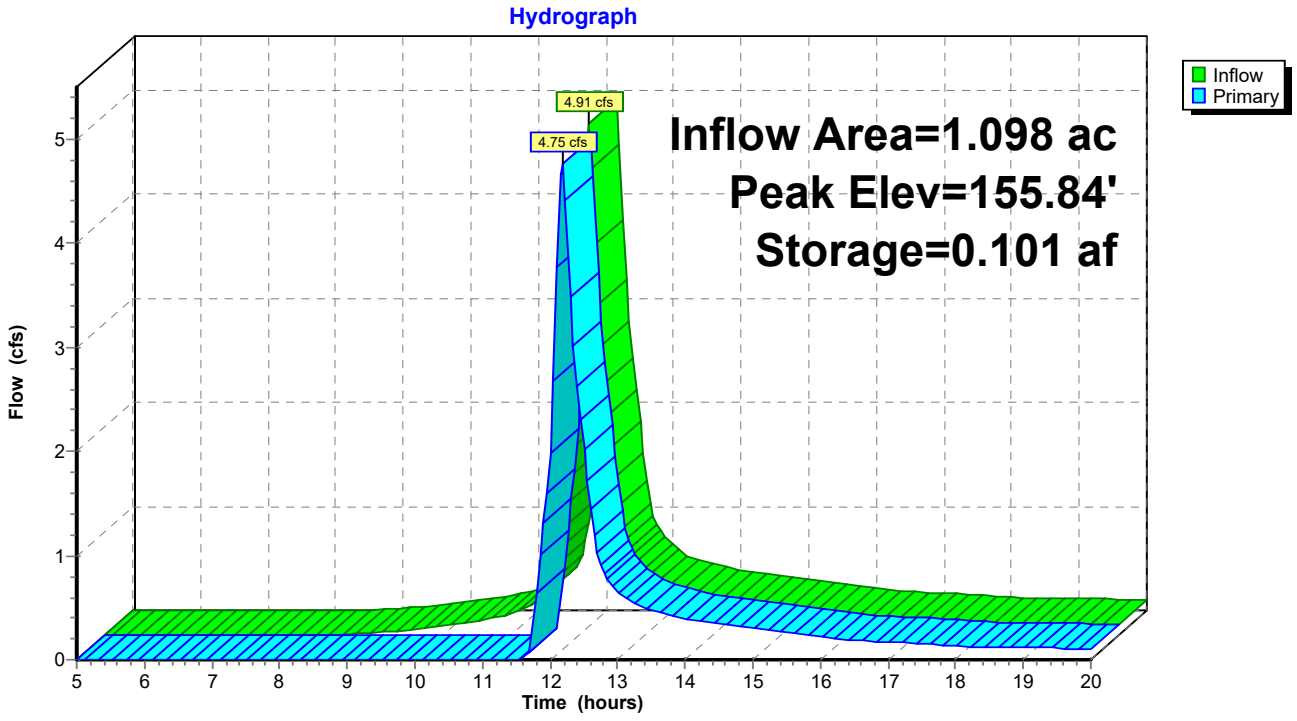
Plug-Flow detention time= 90.9 min calculated for 0.293 af (77% of inflow)
Center-of-Mass det. time= 17.8 min (814.0 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	152.00'	0.109 af	**15.00'W x 30.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	155.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.67 cfs @ 12.18 hrs HW=155.83' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 4.67 cfs @ 1.41 fps)

Pond 2P: (new Pond)



Summary for Pond 3P: (new Pond)

Inflow Area = 1.683 ac, 0.00% Impervious, Inflow Depth > 4.40" for 100 year event
Inflow = 8.06 cfs @ 12.14 hrs, Volume= 0.616 af
Outflow = 7.90 cfs @ 12.17 hrs, Volume= 0.557 af, Atten= 2%, Lag= 1.4 min
Primary = 7.90 cfs @ 12.17 hrs, Volume= 0.557 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 150.50' Surf.Area= 0.030 ac Storage= 0.033 af
Peak Elev= 152.46' @ 12.17 hrs Surf.Area= 0.054 ac Storage= 0.114 af (0.081 af above start)

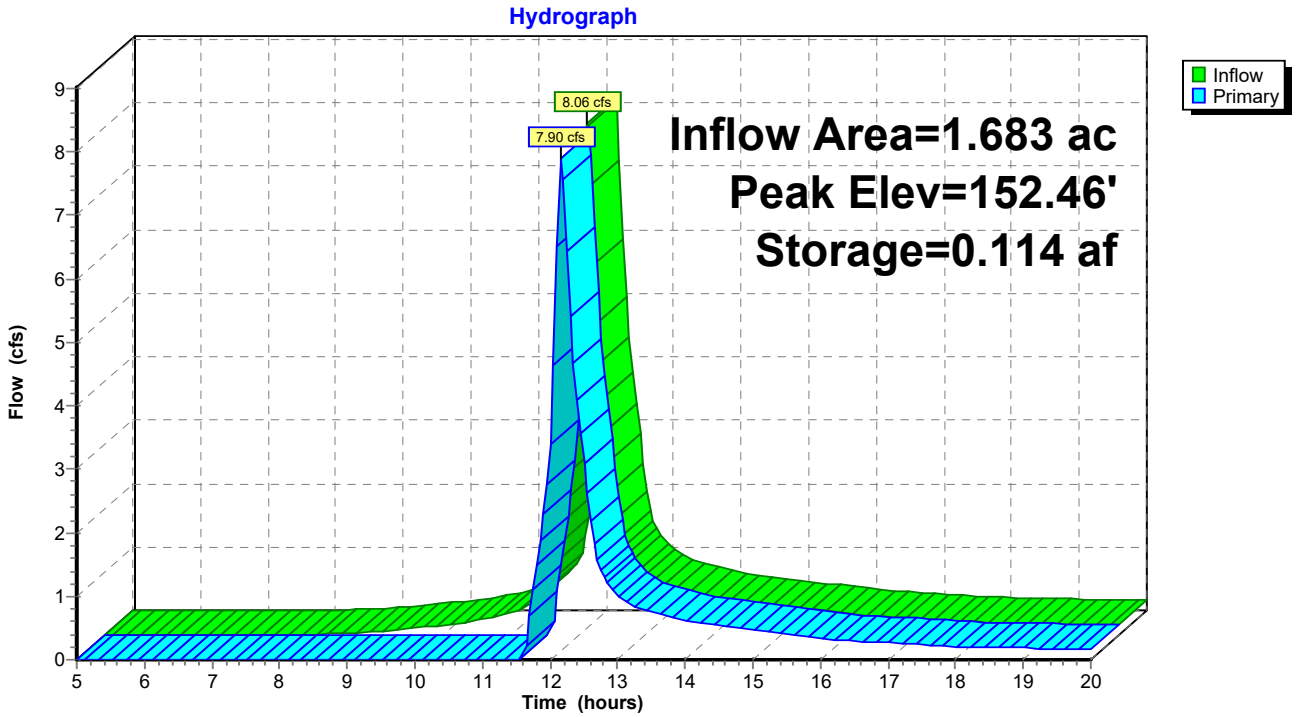
Plug-Flow detention time= 68.1 min calculated for 0.522 af (85% of inflow)
Center-of-Mass det. time= 18.3 min (810.6 - 792.4)

Volume	Invert	Avail.Storage	Storage Description
#1	149.00'	0.146 af	**15.00'W x 45.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	152.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=7.72 cfs @ 12.17 hrs HW=152.45' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 7.72 cfs @ 1.71 fps)

Pond 3P: (new Pond)



Summary for Pond 4P: (new Pond)

Inflow Area = 1.159 ac, 0.00% Impervious, Inflow Depth > 4.63" for 100 year event
Inflow = 6.35 cfs @ 12.11 hrs, Volume= 0.447 af
Outflow = 6.15 cfs @ 12.13 hrs, Volume= 0.420 af, Atten= 3%, Lag= 1.2 min
Primary = 6.15 cfs @ 12.13 hrs, Volume= 0.420 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 148.50' Surf.Area= 0.021 ac Storage= 0.023 af
Peak Elev= 149.89' @ 12.13 hrs Surf.Area= 0.035 ac Storage= 0.063 af (0.039 af above start)

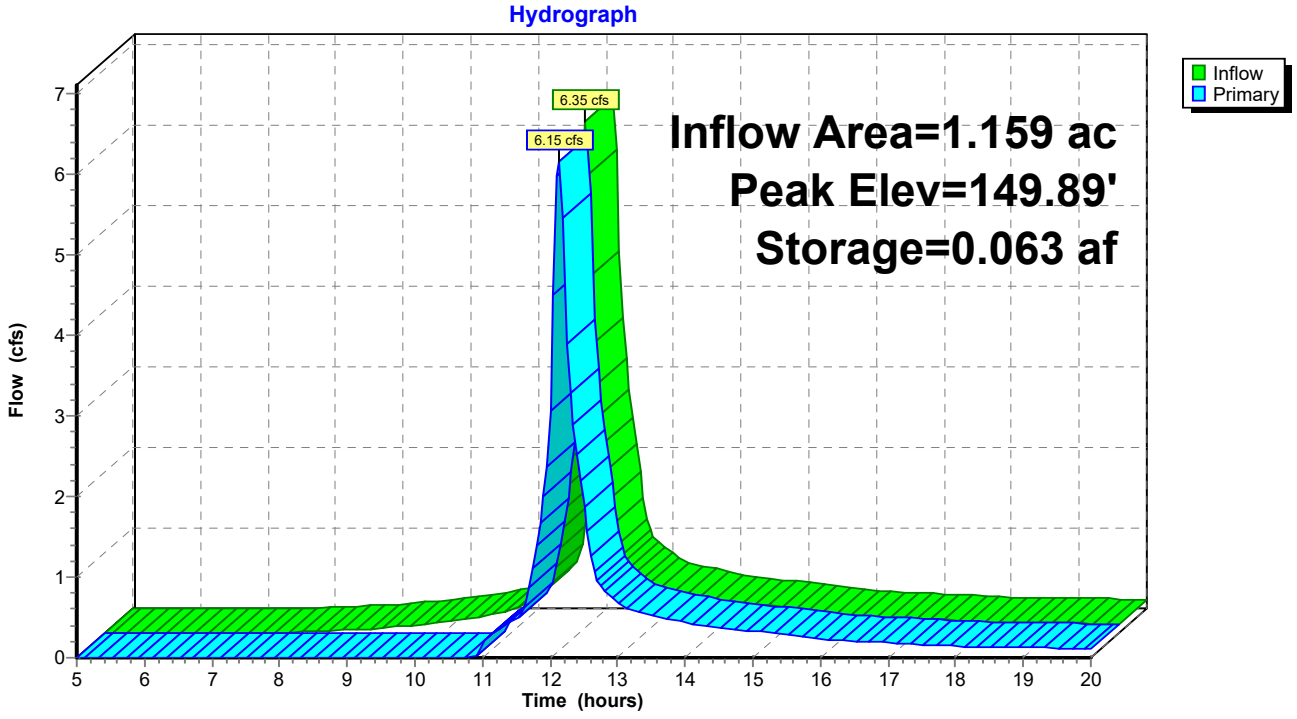
Plug-Flow detention time= 56.4 min calculated for 0.397 af (89% of inflow)
Center-of-Mass det. time= 13.6 min (800.5 - 786.9)

Volume	Invert	Avail.Storage	Storage Description
#1	147.00'	0.109 af	**15.00'W x 30.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	149.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=6.00 cfs @ 12.13 hrs HW=149.89' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 6.00 cfs @ 1.55 fps)

Pond 4P: (new Pond)



Summary for Pond 5P: (new Pond)

Inflow Area = 2.483 ac, 1.61% Impervious, Inflow Depth > 4.74" for 100 year event
Inflow = 12.44 cfs @ 12.15 hrs, Volume= 0.981 af
Outflow = 12.05 cfs @ 12.18 hrs, Volume= 0.870 af, Atten= 3%, Lag= 1.7 min
Primary = 12.05 cfs @ 12.18 hrs, Volume= 0.870 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 149.09' @ 12.18 hrs Surf.Area= 0.072 ac Storage= 0.147 af

Plug-Flow detention time= 56.9 min calculated for 0.870 af (89% of inflow)
Center-of-Mass det. time= 21.8 min (809.9 - 788.1)

Volume	Invert	Avail.Storage	Storage Description
#1	146.00'	0.220 af	**15.00'W x 75.00'L x 4.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	148.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=11.87 cfs @ 12.18 hrs HW=149.08' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 11.87 cfs @ 2.04 fps)

Pond 5P: (new Pond)