Appendix F

STORMWATER MANAGEMENT REPORT

PROPOSED

SOUTHINGTON SOLAR ONE, LLC

SOLAR PROJECT

1012 EAST STREET
SOUTHINGTON, CONNECTICUT
HARTFORD COUNTY

Prepared for:

Southington Solar One, LLC
150 Trumbull Street, 4th Floor
Hartford, CT

Prepared by:

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June 2020

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Introduction

At the request of Southington Solar One, LLC, All-Points Technology Corporation, P.C. ("APT") has completed a hydrological analysis to assess potential stormwater effects from a proposed 7.3 MW DC solar electric generating facility in Southington, Connecticut ("Project"). The Project, referred to as Southington Solar One, LLC, involves the installation of solar panels and associated equipment west of East Street in Southington, Connecticut ("Site").

The purpose of this report is to provide an analysis of the potential stormwater drainage impacts associated with the Project, as well as a description of the design to mitigate such potential stormwater drainage impacts. The design is intended to comply with the State and Town regulations while taking prevailing site conditions and practical factors into account.

Existing Site Conditions

The Site is a privately-owned irregular shaped parcel located at 1012 East Street in Southington, Connecticut, that consists of approximately 102.45 acres of land. The property is owned by the Catholic Cemeteries Association of the Archdiocese of Hartford, Inc. and is currently used for agricultural purposes, primarily as hay field. There is an existing farm access drive from East Street that extends approximately 900-ft into the parcel. Two existing culverts convey drainage north under the existing access road.

The terrain has gradual slopes with the highest elevations through the western portion of the project area (~El. 210') decreasing in elevation to the south and east (~El. 190'). Aside from a small area in the northeast corner of the project area, which has slopes between 10 and 15%, the project area generally has slopes less than 5%.

Significant wetland areas are located to the eastern side of the project area, with streams, wetlands, vernal pools, and FEMA mapped floodplain present.

Developed Site Conditions

The Project will be constructed in the central portion of the Site, outside of all documented resource areas. Access to the Site will be provided via the existing gravel access road, which will have minor improvements to replenish the gravel surface, and the addition of new gravel access roads throughout the project. The Project includes the installation of 18,798 solar panels (3,120 Risen RSM144-6 380W and 15,678 Trina TSM-DE15MC 390W modules) and associated fencing, access road, utility and stormwater management features, within 33.7± acres of the Site. The entire acreage within the Project limits of disturbance is in existing brush/fields and will require minimal clearing. The grading plan for the site was developed to balance all earthwork within the project area. Aside from importing gravel for the proposed access roads no export or import of material is expected.

The proposed solar panels will be installed on a post driven ground mounted racking system, with minimal changes to the existing grades. As a result, the post-development site conditions will mimic the pre-developed site conditions. Areas of clearing and grubbing and any existing

ground cover that is disturbed during construction will be reseeded with a low growth seed mix. To address State stormwater management rules four (4) grass-lined stormwater management basins are proposed around the perimeter of the proposed Project area.

Stormwater Management

Analysis Methodology

The hydrologic analysis was performed using the HydroCAD stormwater modeling system computer program developed by HydroCAD Software Solutions, LLC.

Hydrographs for each watershed were developed using the SCS Synthetic Unit Hydrograph Method with a Type III rainfall distribution. Hydrographs were developed for the NOAA Atlas 14, Volume 10, Version 2 Precipitation 2-, 25-, 50-, and 100-year storm event with rainfall depths of 3.4, 6.6, 7.5, and 8.5 inches respectively.

The existing and proposed drainage areas used in the calculations are illustrated on the Existing and Proposed Drainage Area Plans (EDA-1 & PDA-1). These maps and the corresponding HydroCAD output are attached.

Utilizing Appendix I, Stormwater Management at Solar Array Construction Projects, provided by Connecticut Department of Energy & Environmental Projection ("CT DEEP"), this hydrologic analysis will reflect a reduction of the Hydrologic Soil Group ("HSG") present on-site by one (1) step (e.g. soils of HSG A shall be considered HSG B). This reduction, as indicated by CT DEEP, is intended to account for the supposed compaction of soils that results from extensive machinery traffic during construction of the array. The Water Quality Volume ("WQV") for the site will be calculated assuming that the roadways, gravel surfaces, and equipment pads are effective impervious cover. See Appendix F.

Existing Drainage Patterns

The proposed Project area generally drains from the center of the site outward. The wetlands and intermittent watercourse to the east are receiving waters with some drainage leaving the southwest and northwest portions of the project area as overland flow.

The Site was modeled at five (5) Analysis Points ("AP-1" to "AP-5"). AP-1, 2, & 5 are tributary to the stream and wetland on the eastern portion of the site. AP-3 flows offsite as overland flow to the north, and AP-4 flows offsite as overland flow to the south. Peak discharges have been computed at the points of study for the 2-, 25-, 50-, and 100-year storm events.

Soils within the proposed project area as identified by the United States Department of Agriculture (USDA) Natural Resources Conservation Service consist of:

Map Unit #12 - Raypol silt loam [HSG C/D]
Map Unit #20A - Ellington silt loam, 0-5% [HSG B]

Map Unit #33A - Hartford sandy loam, 0-3% [HSG A]
Map Unit #33B - Hartford sandy loam, 3-8% [HSG A]
Map Unit #37C - Manchester gravelly sandy loam, 0-3% [HSG A]

Soil types with a dual rated hydrologic soil group (i.e. C/D) were modeled in their undrained condition. Time of concentration roughness coefficients and land use areas were based on existing ground cover, as assessed by site visits and review of aerial photography. Curve Numbers and Time of Concentration values for the existing conditions scenario are summarized on Sheet EDA-1. The predicted peak discharge rates at each Analysis Point are presented in Table 1-1, along with the site total.

Table 1-1

Analysis Point	**Existing Conditions Flows (cfs)**			
	2-year	**25-year**	**50-year**	**100-year**
AP-1	0.7	5.1	6.6	8.4
AP-2	0.1	5.6	9.4	14.4
AP-3	0.0	0.6	1.2	2.1
AP-4	0.0	4.2	7.7	12.6
AP-5	0.0	1.9	3.5	5.9
Site	0.8	17.4	28.4	43.4

Proposed Drainage Patterns

The array area will not require major clearing and grubbing since the project area is unforested. The existing root structure and vegetation in the hay fields will be preserved to the extent practicable. The entire area will be seeded with a low growing forbs and grass mix following installation of the necessary utilities, access road, and stormwater management features. Overall, hydrologically, the post-developed condition is designed to mimic the pre-developed condition.

To account for an increase in runoff conditions predicted by initial modeling calculations four (4) grass lined stormwater basins are proposed around the perimeter of the site. These will have culvert outlets and overflow weirs for outlet structures. Their proposed grading was set to provide sufficient water quality volume and peak flow attenuation.

Since the proposed development mimics the existing conditions, the post-development condition was modeled using the same Analysis Points. Peak discharges have been computed at the point of study for the 2-year, 25-year, 50-year, and 100-year storm events. The post-development discharges at each point of study are tabulated in Table 1-2, along with the site total and change compared to the existing conditions scenario. A slight increase is predicted in subwatershed 2.3 for proposed conditions in the 2-year design event (0.1 cfs), but this is considered approximately equal to existing conditions. All other analysis points and deisgn events show a significant reduction in flows leaving the site.

Table 1-2

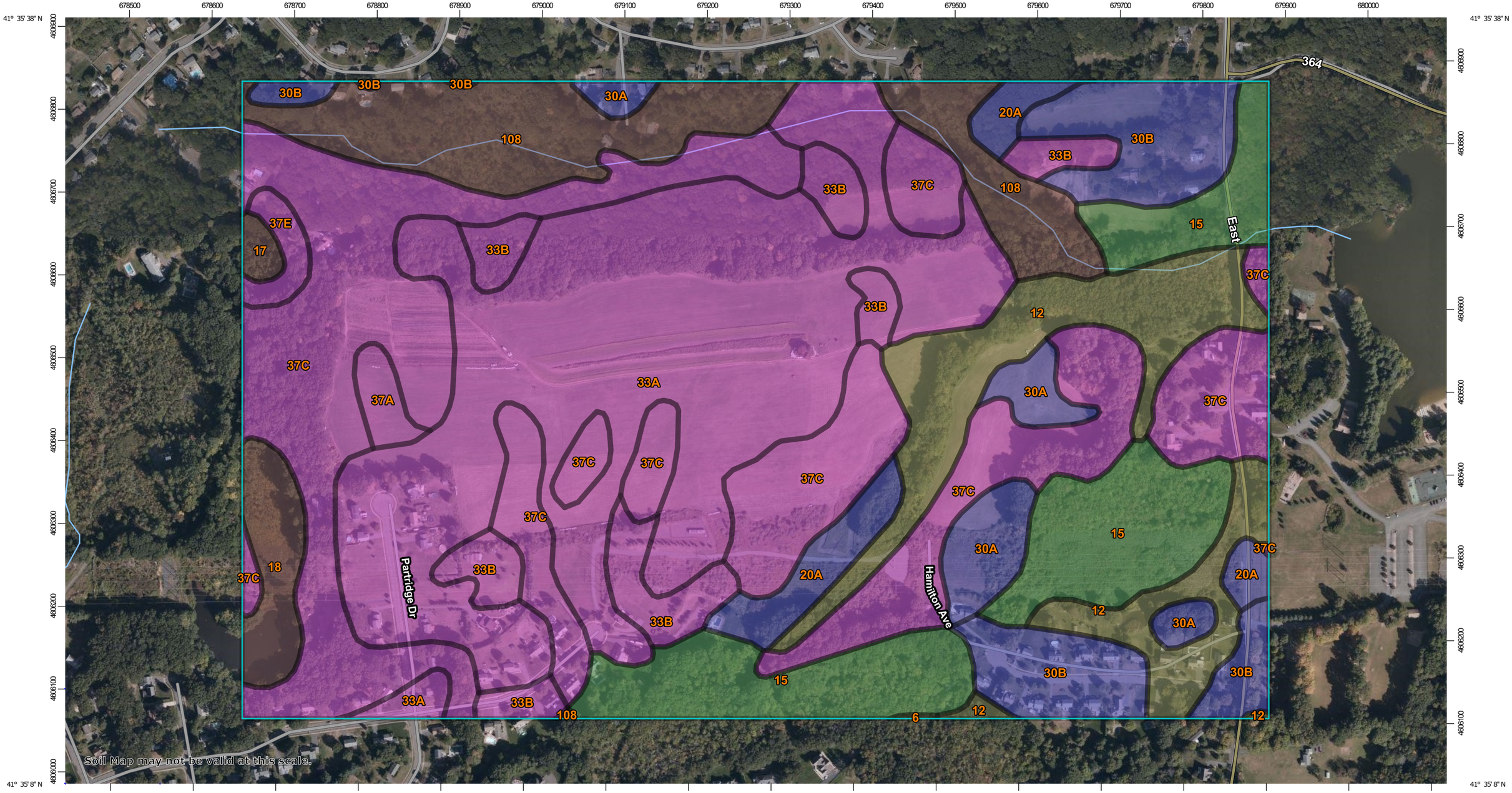
Analysis Point	**Proposed Conditions Flows (cfs)**			
	2-year	**25-year**	**50-year**	**100-year**
AP-1	0.7	5.0	6.5	8.2
AP-2	0.2	4.8	6.7	9.1
AP-3	0.0	0.3	0.5	1.1
AP-4	0.0	1.6	2.6	5.5
AP-5	0.0	0.9	1.8	3.4
Site	0.9	12.6	18.1	27.3
Change	+0.1	-4.8	-10.3	-16.1

Conclusion

The stormwater management for the proposed site has been designed such that the post-development peak discharges to the waters of the State of Connecticut for the 2-, 25-, 50-, and 100- year storm events are less than the pre-development peak discharges. As a result, the proposed solar array is not anticipated to result in adverse conditions to the surrounding areas and properties.

APPENDIX A: NRCS SOIL SURVEY

Hydrologic Soil Group—State of Connecticut
(590170)



41° 35' 38" N
72° 51' 33" W
41° 35' 8" N
72° 50' 20" W

678500 678600 678700 678800 678900 679000 679100 679200 679300 679400 679500 679600 679700 679800 679900 680000 680100

4606900 4606800 4606700 4606600 4606500 4606400 4606300 4606200 4606100 4606000

Map Scale: 1:4,510 if printed on B landscape (17" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

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

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

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

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

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

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6	Wilbraham and Menlo soils, 0 to 8 percent slopes, extremely stony	C/D	0.1	0.0%
12	Raypol silt loam	C/D	19.9	8.4%
15	Scarboro muck, 0 to 3 percent slopes	A/D	24.7	10.4%
17	Timakwa and Natchaug soils, 0 to 2 percent slopes	B/D	0.8	0.3%
18	Catden and Freetown soils, 0 to 2 percent slopes	B/D	4.5	1.9%
20A	Ellington silt loam, 0 to 5 percent slopes	B	6.0	2.5%
30A	Branford silt loam, 0 to 3 percent slopes	B	6.7	2.8%
30B	Branford silt loam, 3 to 8 percent slopes	B	15.3	6.5%
33A	Hartford sandy loam, 0 to 3 percent slopes	A	62.3	26.3%
33B	Hartford sandy loam, 3 to 8 percent slopes	A	11.0	4.6%
37A	Manchester gravelly sandy loam, 0 to 3 percent slopes	A	1.5	0.6%
37C	Manchester gravelly sandy loam, 3 to 15 percent slopes	A	63.0	26.6%
37E	Manchester gravelly sandy loam, 15 to 45 percent slopes	A	1.6	0.7%
108	Saco silt loam	B/D	20.0	8.4%
Totals for Area of Interest			**237.2**	**100.0%**

Description

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

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

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

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

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

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

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

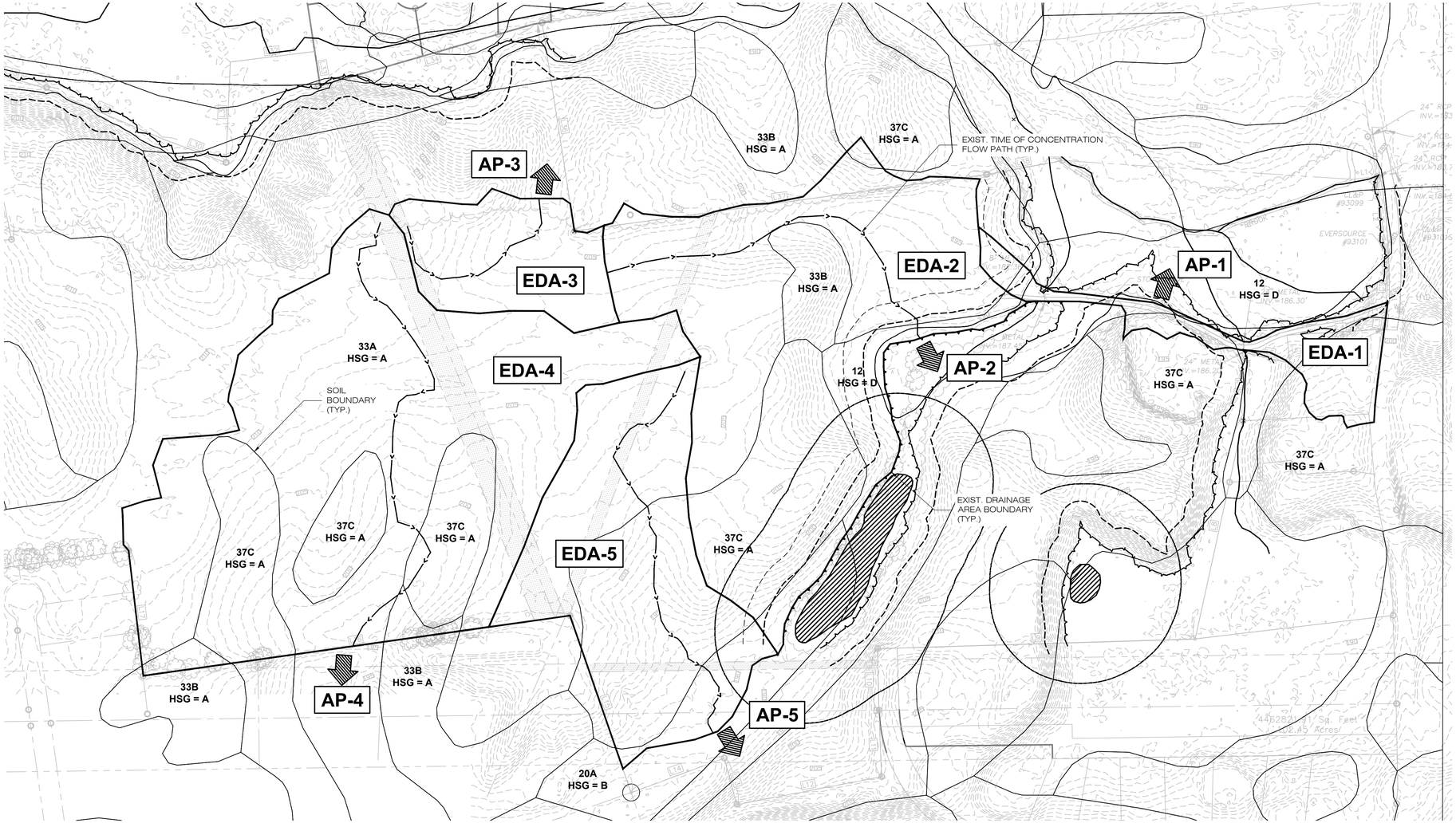
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX B: EXISTING DRAINAGE AREA MAP (EDA-1) & HYDROLOGIC COMPUTATION (HYDROCAD)



EXISTING DRAINAGE AREAS

WATERSHED	TOTAL AREA (ACRES)	COMPOSITE CN	TC (MINS.)
EDA-1	2.118	60	8
EDA-2	14.305	42	23
EDA-3	3.137	37	14
EDA-4	19.703	39	34
EDA-5	8.132	39	25
SITE	47.395	41	-

EXISTING CONDITIONS FLOWS

DISCH. POINT	2-YEAR (CFS)	25-YEAR (CFS)	50-YEAR (CFS)	100-YEAR (CFS)
AP-1	0.7	5.1	6.6	8.4
AP-2	0.1	5.6	9.4	14.4
AP-3	0.0	0.6	1.2	2.1
AP-4	0.0	4.2	7.7	12.6
AP-5	0.0	1.9	3.5	5.9
SITE	0.8	17.4	28.4	43.4

1 / EDA-1 **EXISTING DRAINAGE AREA PLAN**
SCALE : 1-IN = 150-FT

150 0 75 150 300
(IN FEET) 1 inch = 150 ft.

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHAUL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

PERMIT SET

NO	DATE	REVISION
0		
1		
2		
3		
4		
5		
6		

NOT FOR CONSTRUCTION

DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: CATHOLIC CEMETERIES OF ARHDIOCESE OF HARTFORD
ADDRESS: 700 MIDDLETOWN AVENUE NORTH HAVEN, CT 06473

SOUTHINGTON SOLAR ONE, LLC

SITE ADDRESS: 1012 EAST STREET SOUTHINGTON, CT

APT FILING NUMBER: CT590170

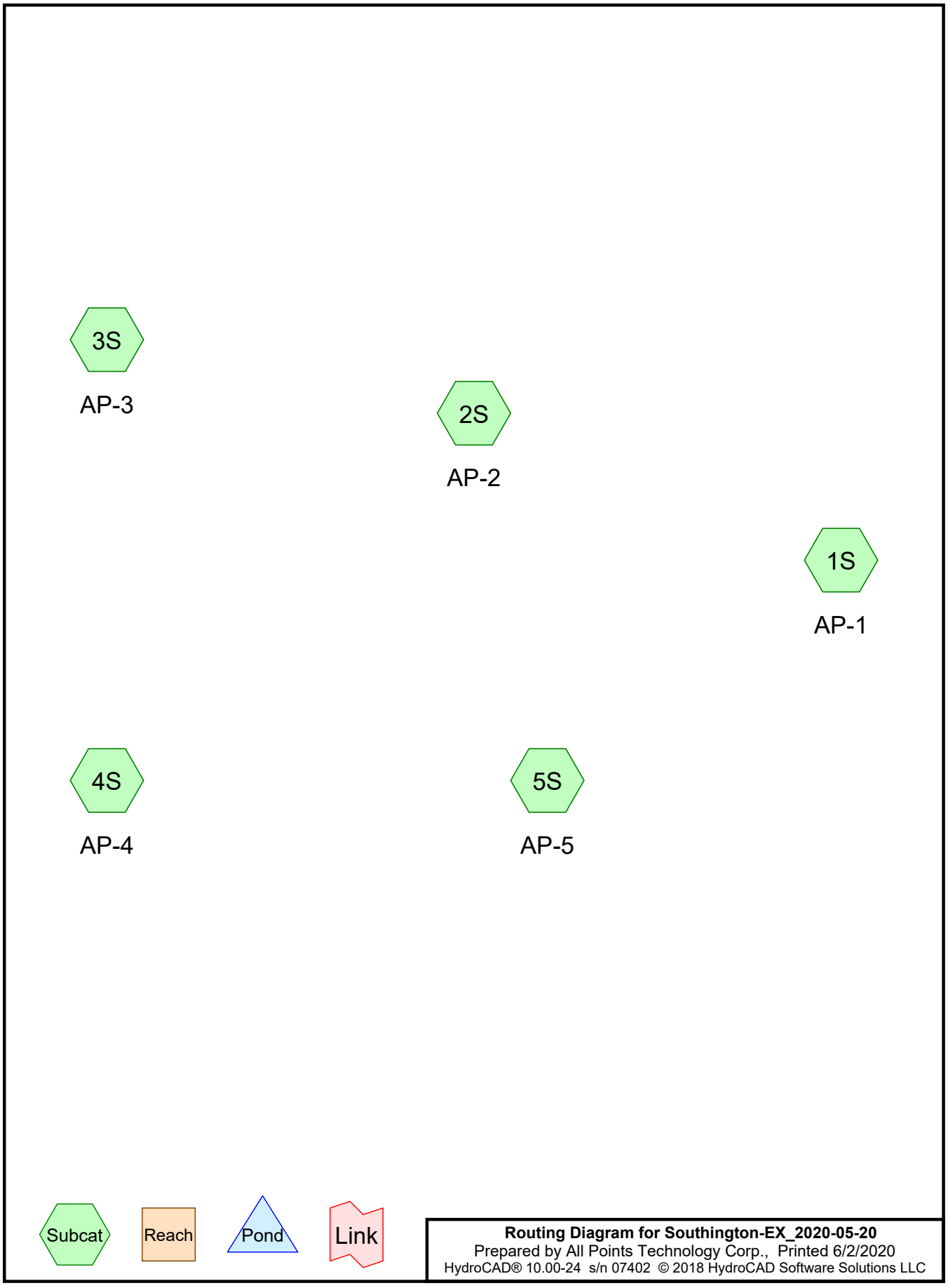
DRAWN BY: KAM

DATE: 06/02/20

CHECKED BY: BJP

SHEET TITLE:
EXISTING CONDITIONS HYDROLOGY PLAN

SHEET NUMBER:
EDA-1



Routing Diagram for Southington-EX_2020-05-20
Prepared by All Points Technology Corp., Printed 6/2/2020

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
38,399	51	1 acre lots, 20% imp, HSG A (1S)
5,161	84	1 acre lots, 20% imp, HSG D (1S)
91,872	30	Brush, Good, HSG A (2S, 5S)
27,913	48	Brush, Good, HSG B (2S, 5S)
521	73	Brush, Good, HSG D (2S)
1,860	96	Gravel surface, HSG A (1S)
7,762	96	Gravel surface, HSG D (1S)
1,653,656	39	Pasture/grassland/range, Good, HSG A (1S, 2S, 3S, 4S, 5S)
27,576	61	Pasture/grassland/range, Good, HSG B (2S, 5S)
62,591	80	Pasture/grassland/range, Good, HSG D (1S, 2S)
120,273	30	Woods, Good, HSG A (2S, 3S, 4S, 5S)
10,229	32	Woods/grass comb., Good, HSG A (1S)
16,703	79	Woods/grass comb., Good, HSG D (1S)
2,064,516	**41**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
1,916,289	HSG A	1S, 2S, 3S, 4S, 5S
55,489	HSG B	2S, 5S
0	HSG C	
92,738	HSG D	1S, 2S
0	Other	
2,064,516		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
38,399	0	0	5,161	0	43,560	1 acre lots, 20% imp
91,872	27,913	0	521	0	120,306	Brush, Good
1,860	0	0	7,762	0	9,622	Gravel surface
1,653,656	27,576	0	62,591	0	1,743,823	Pasture/grassland /range, Good
120,273	0	0	0	0	120,273	Woods, Good
10,229	0	0	16,703	0	26,932	Woods/grass comb., Good
1,916,289	**55,489**	**0**	**92,738**	**0**	**2,064,516**	**TOTAL AREA**

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: AP-1 Runoff Area=92,270 sf 9.44% Impervious Runoff Depth=0.49"
Tc=8.0 min CN=60 Runoff=0.72 cfs 3,760 cf

Subcatchment 2S: AP-2 Runoff Area=623,113 sf 0.00% Impervious Runoff Depth=0.03"
Flow Length=990' Slope=0.0160 '/' Tc=23.0 min CN=42 Runoff=0.05 cfs 1,463 cf

Subcatchment 3S: AP-3 Runoff Area=136,655 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=520' Slope=0.0170 '/' Tc=13.8 min CN=37 Runoff=0.00 cfs 0 cf

Subcatchment 4S: AP-4 Runoff Area=858,248 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,360' Slope=0.0125 '/' Tc=33.8 min CN=39 Runoff=0.02 cfs 332 cf

Subcatchment 5S: AP-5 Runoff Area=354,230 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=1,120' Slope=0.0160 '/' Tc=25.4 min CN=39 Runoff=0.01 cfs 137 cf

Total Runoff Area = 2,064,516 sf Runoff Volume = 5,693 cf Average Runoff Depth = 0.03"
99.58% Pervious = 2,055,804 sf 0.42% Impervious = 8,712 sf

Summary for Subcatchment 1S: AP-1

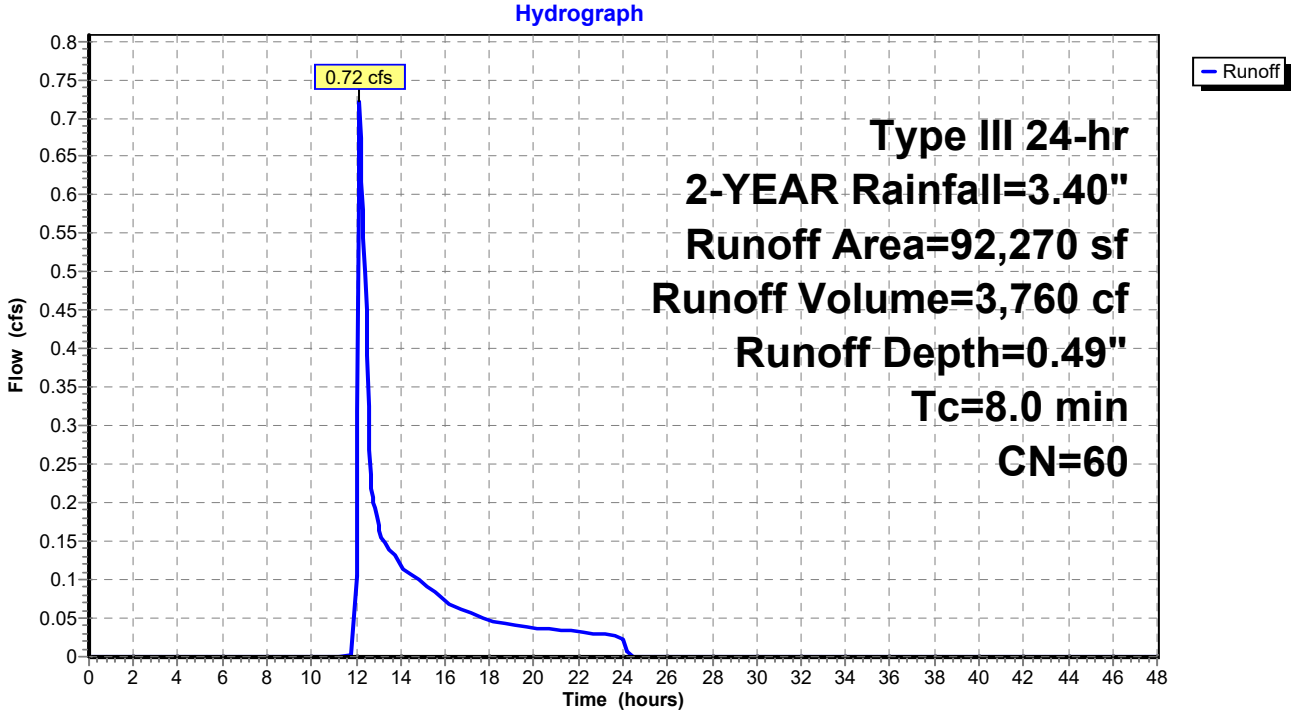
Runoff = 0.72 cfs @ 12.16 hrs, Volume= 3,760 cf, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
38,399	51	1 acre lots, 20% imp, HSG A
5,161	84	1 acre lots, 20% imp, HSG D
8,688	39	Pasture/grassland/range, Good, HSG A
3,468	80	Pasture/grassland/range, Good, HSG D
1,860	96	Gravel surface, HSG A
7,762	96	Gravel surface, HSG D
10,229	32	Woods/grass comb., Good, HSG A
16,703	79	Woods/grass comb., Good, HSG D
92,270	60	Weighted Average
83,558		90.56% Pervious Area
8,712		9.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Subcatchment 1S: AP-1



Summary for Subcatchment 2S: AP-2

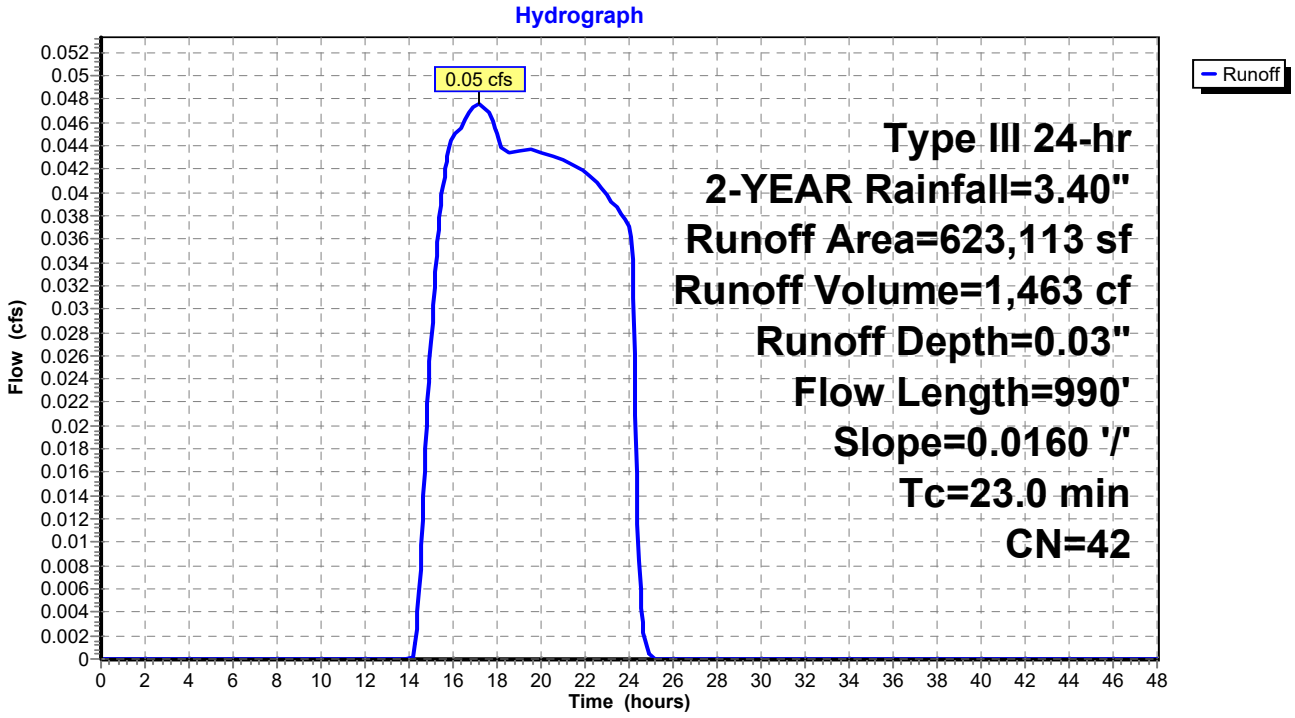
Runoff = 0.05 cfs @ 17.17 hrs, Volume= 1,463 cf, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
473,298	39	Pasture/grassland/range, Good, HSG A
37,422	30	Woods, Good, HSG A
36,202	30	Brush, Good, HSG A
4,870	48	Brush, Good, HSG B
11,677	61	Pasture/grassland/range, Good, HSG B
521	73	Brush, Good, HSG D
59,123	80	Pasture/grassland/range, Good, HSG D
623,113	42	Weighted Average
623,113		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
17.7	940	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.0	990	Total			

Subcatchment 2S: AP-2



Summary for Subcatchment 3S: AP-3

[45] Hint: Runoff=Zero

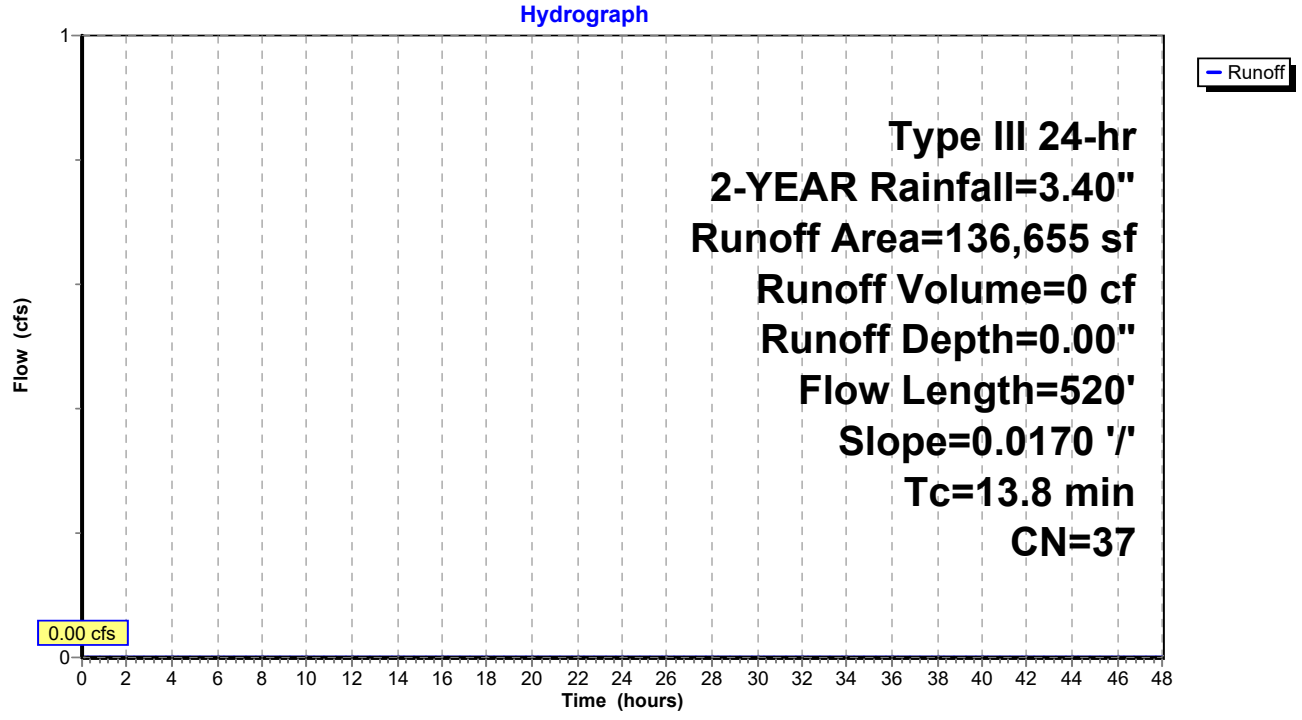
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
105,908	39	Pasture/grassland/range, Good, HSG A
30,747	30	Woods, Good, HSG A
136,655	37	Weighted Average
136,655		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0170	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.6	470	0.0170	0.91		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.8	520	Total			

Subcatchment 3S: AP-3



Summary for Subcatchment 4S: AP-4

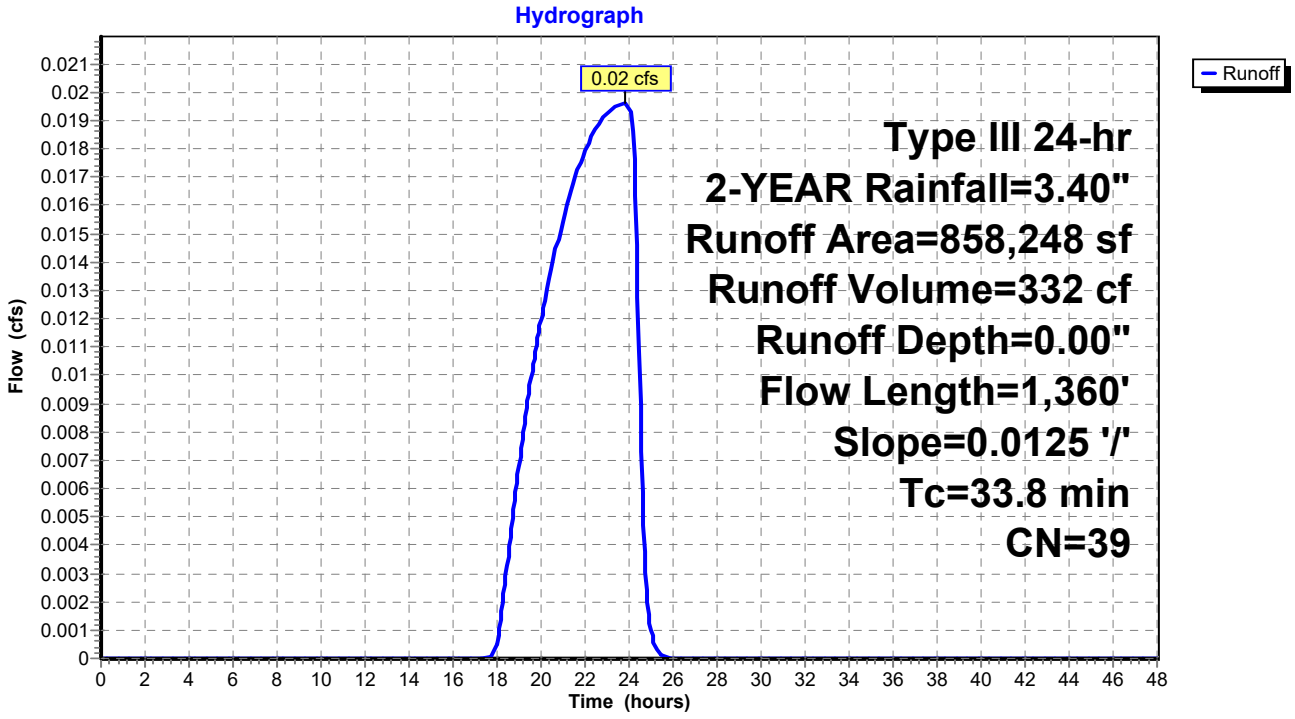
Runoff = 0.02 cfs @ 23.85 hrs, Volume= 332 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
811,241	39	Pasture/grassland/range, Good, HSG A
47,007	30	Woods, Good, HSG A
858,248	39	Weighted Average
858,248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.0125	0.14		**Sheet Flow,** Range n= 0.130 P2= 3.40"
27.9	1,310	0.0125	0.78		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
33.8	1,360	Total			

Subcatchment 4S: AP-4



Summary for Subcatchment 5S: AP-5

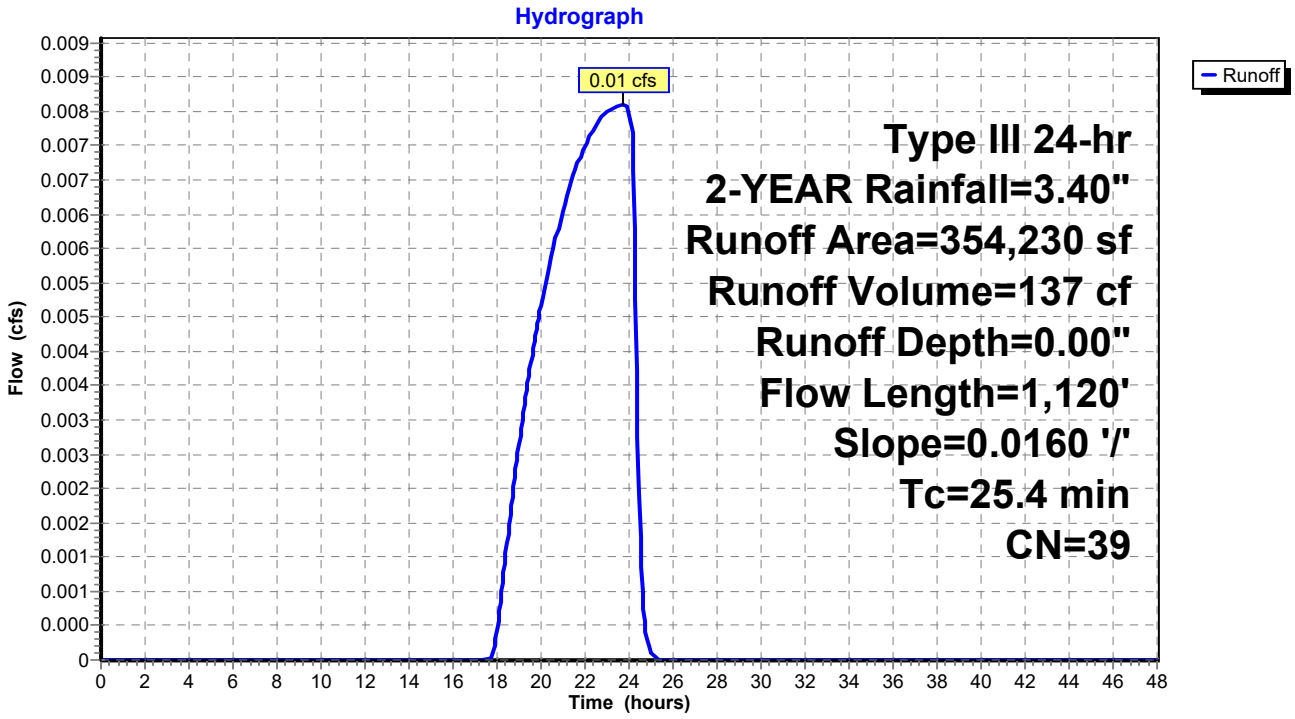
Runoff = 0.01 cfs @ 23.76 hrs, Volume= 137 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
254,521	39	Pasture/grassland/range, Good, HSG A
5,097	30	Woods, Good, HSG A
55,670	30	Brush, Good, HSG A
15,899	61	Pasture/grassland/range, Good, HSG B
23,043	48	Brush, Good, HSG B
354,230	39	Weighted Average
354,230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
20.1	1,070	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.4	1,120	Total			

Subcatchment 5S: AP-5



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: AP-1 Runoff Area=92,270 sf 9.44% Impervious Runoff Depth=2.32"
Tc=8.0 min CN=60 Runoff=5.10 cfs 17,873 cf

Subcatchment 2S: AP-2 Runoff Area=623,113 sf 0.00% Impervious Runoff Depth=0.83"
Flow Length=990' Slope=0.0160 '/' Tc=23.0 min CN=42 Runoff=5.60 cfs 43,344 cf

Subcatchment 3S: AP-3 Runoff Area=136,655 sf 0.00% Impervious Runoff Depth=0.50"
Flow Length=520' Slope=0.0170 '/' Tc=13.8 min CN=37 Runoff=0.59 cfs 5,747 cf

Subcatchment 4S: AP-4 Runoff Area=858,248 sf 0.00% Impervious Runoff Depth=0.63"
Flow Length=1,360' Slope=0.0125 '/' Tc=33.8 min CN=39 Runoff=4.15 cfs 45,104 cf

Subcatchment 5S: AP-5 Runoff Area=354,230 sf 0.00% Impervious Runoff Depth=0.63"
Flow Length=1,120' Slope=0.0160 '/' Tc=25.4 min CN=39 Runoff=1.92 cfs 18,616 cf

Total Runoff Area = 2,064,516 sf Runoff Volume = 130,684 cf Average Runoff Depth = 0.76"
99.58% Pervious = 2,055,804 sf 0.42% Impervious = 8,712 sf

Summary for Subcatchment 1S: AP-1

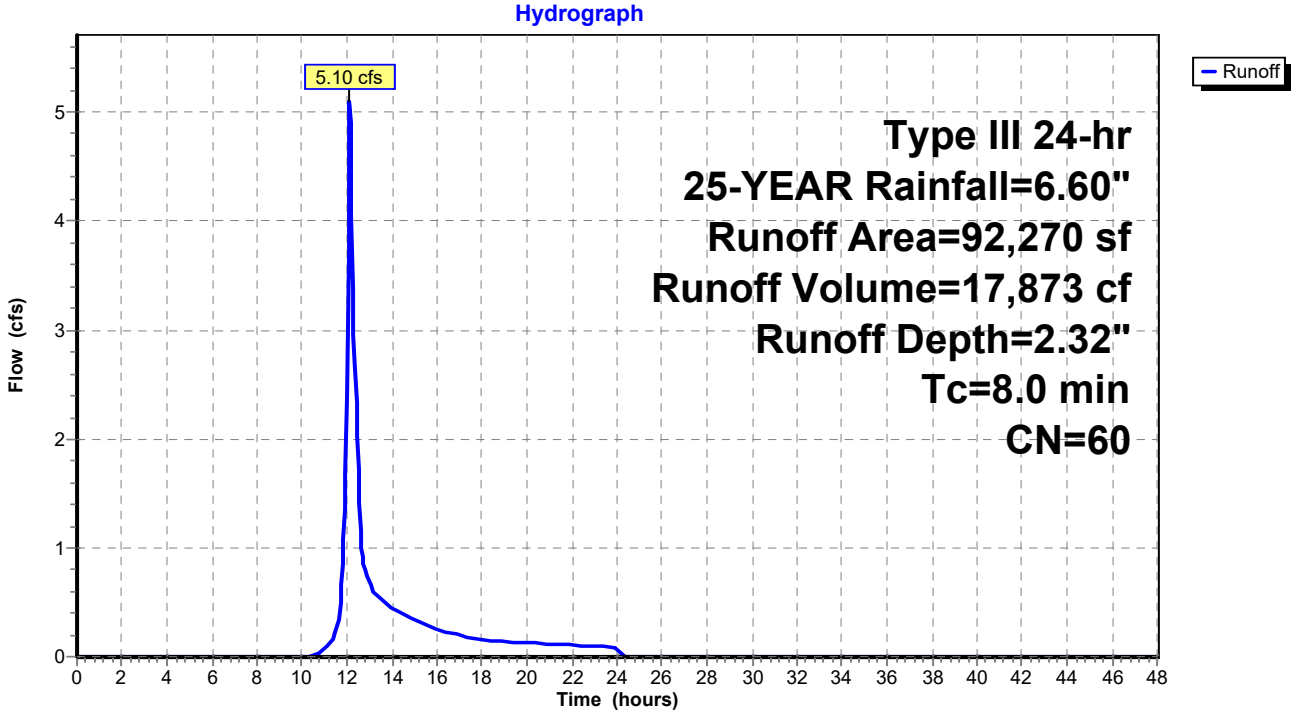
Runoff = 5.10 cfs @ 12.12 hrs, Volume= 17,873 cf, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
38,399	51	1 acre lots, 20% imp, HSG A
5,161	84	1 acre lots, 20% imp, HSG D
8,688	39	Pasture/grassland/range, Good, HSG A
3,468	80	Pasture/grassland/range, Good, HSG D
1,860	96	Gravel surface, HSG A
7,762	96	Gravel surface, HSG D
10,229	32	Woods/grass comb., Good, HSG A
16,703	79	Woods/grass comb., Good, HSG D
92,270	60	Weighted Average
83,558		90.56% Pervious Area
8,712		9.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Subcatchment 1S: AP-1



Summary for Subcatchment 2S: AP-2

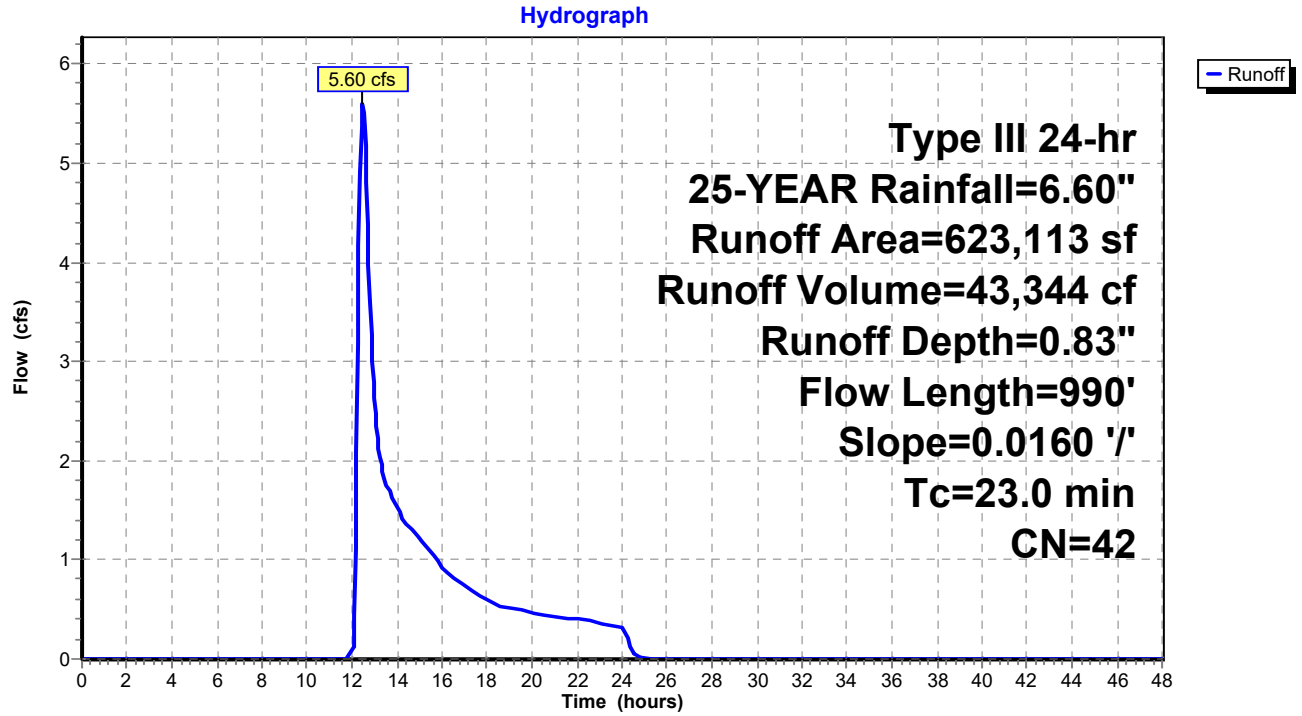
Runoff = 5.60 cfs @ 12.47 hrs, Volume= 43,344 cf, Depth= 0.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
473,298	39	Pasture/grassland/range, Good, HSG A
37,422	30	Woods, Good, HSG A
36,202	30	Brush, Good, HSG A
4,870	48	Brush, Good, HSG B
11,677	61	Pasture/grassland/range, Good, HSG B
521	73	Brush, Good, HSG D
59,123	80	Pasture/grassland/range, Good, HSG D
623,113	42	Weighted Average
623,113		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
17.7	940	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.0	990	Total			

Subcatchment 2S: AP-2



Summary for Subcatchment 3S: AP-3

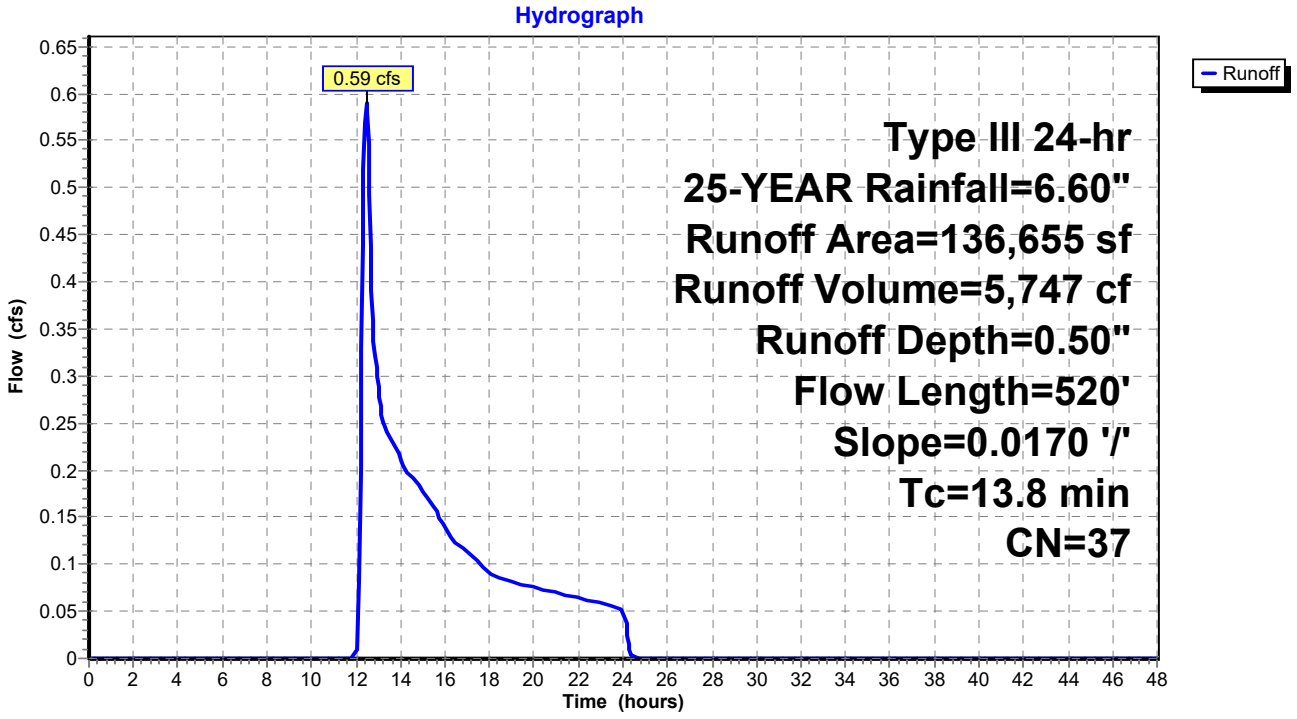
Runoff = 0.59 cfs @ 12.46 hrs, Volume= 5,747 cf, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
105,908	39	Pasture/grassland/range, Good, HSG A
30,747	30	Woods, Good, HSG A
136,655	37	Weighted Average
136,655		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0170	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.6	470	0.0170	0.91		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.8	520	Total			

Subcatchment 3S: AP-3



Summary for Subcatchment 4S: AP-4

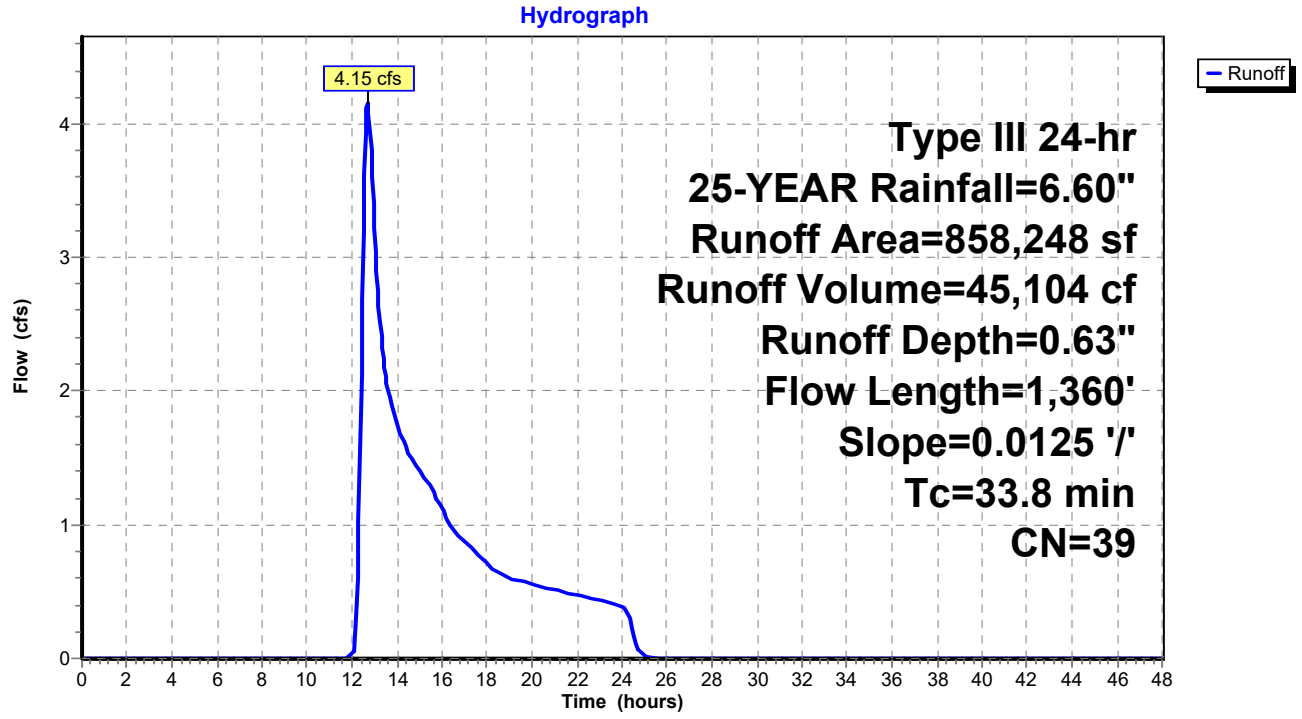
Runoff = 4.15 cfs @ 12.70 hrs, Volume= 45,104 cf, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
811,241	39	Pasture/grassland/range, Good, HSG A
47,007	30	Woods, Good, HSG A
858,248	39	Weighted Average
858,248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.0125	0.14		**Sheet Flow,** Range n= 0.130 P2= 3.40"
27.9	1,310	0.0125	0.78		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
33.8	1,360	Total			

Subcatchment 4S: AP-4



Summary for Subcatchment 5S: AP-5

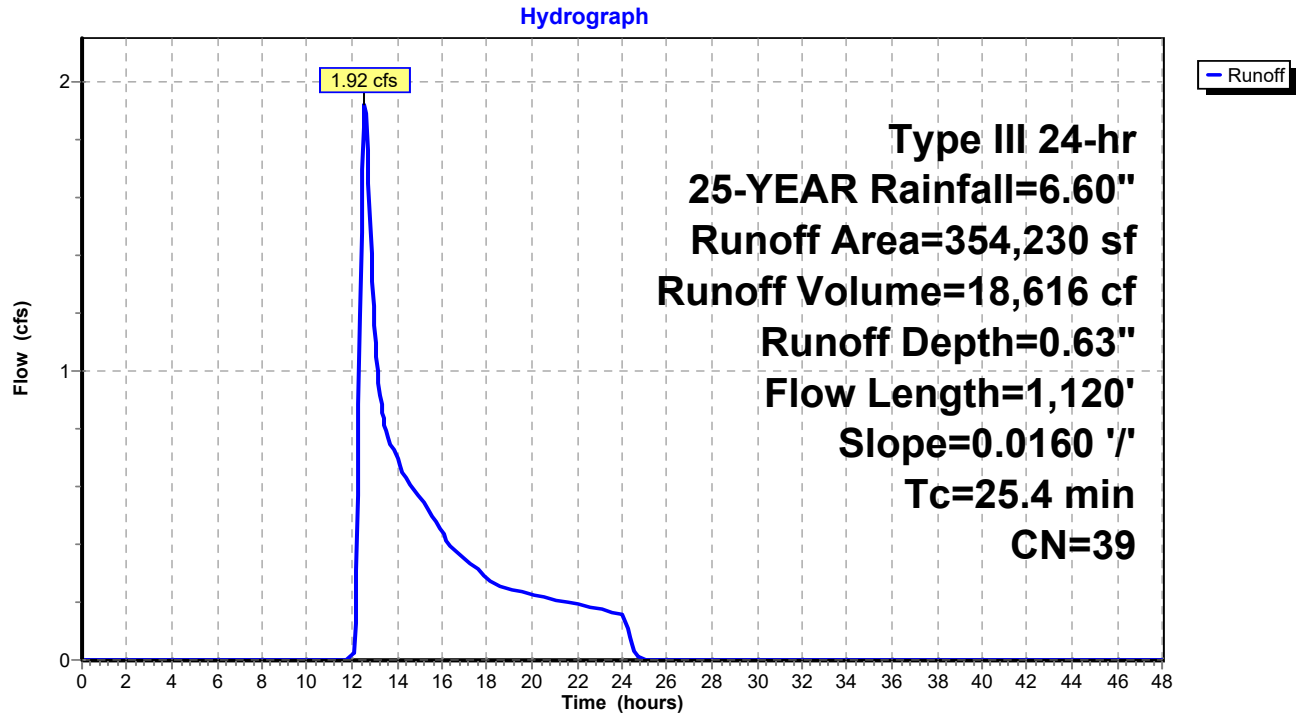
Runoff = 1.92 cfs @ 12.58 hrs, Volume= 18,616 cf, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
254,521	39	Pasture/grassland/range, Good, HSG A
5,097	30	Woods, Good, HSG A
55,670	30	Brush, Good, HSG A
15,899	61	Pasture/grassland/range, Good, HSG B
23,043	48	Brush, Good, HSG B
354,230	39	Weighted Average
354,230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
20.1	1,070	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.4	1,120	Total			

Subcatchment 5S: AP-5



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: AP-1 Runoff Area=92,270 sf 9.44% Impervious Runoff Depth=2.96"
Tc=8.0 min CN=60 Runoff=6.62 cfs 22,785 cf

Subcatchment 2S: AP-2 Runoff Area=623,113 sf 0.00% Impervious Runoff Depth=1.21"
Flow Length=990' Slope=0.0160 '/' Tc=23.0 min CN=42 Runoff=9.39 cfs 62,850 cf

Subcatchment 3S: AP-3 Runoff Area=136,655 sf 0.00% Impervious Runoff Depth=0.79"
Flow Length=520' Slope=0.0170 '/' Tc=13.8 min CN=37 Runoff=1.17 cfs 9,039 cf

Subcatchment 4S: AP-4 Runoff Area=858,248 sf 0.00% Impervious Runoff Depth=0.96"
Flow Length=1,360' Slope=0.0125 '/' Tc=33.8 min CN=39 Runoff=7.66 cfs 68,303 cf

Subcatchment 5S: AP-5 Runoff Area=354,230 sf 0.00% Impervious Runoff Depth=0.96"
Flow Length=1,120' Slope=0.0160 '/' Tc=25.4 min CN=39 Runoff=3.54 cfs 28,191 cf

Total Runoff Area = 2,064,516 sf Runoff Volume = 191,169 cf Average Runoff Depth = 1.11"
99.58% Pervious = 2,055,804 sf 0.42% Impervious = 8,712 sf

Summary for Subcatchment 1S: AP-1

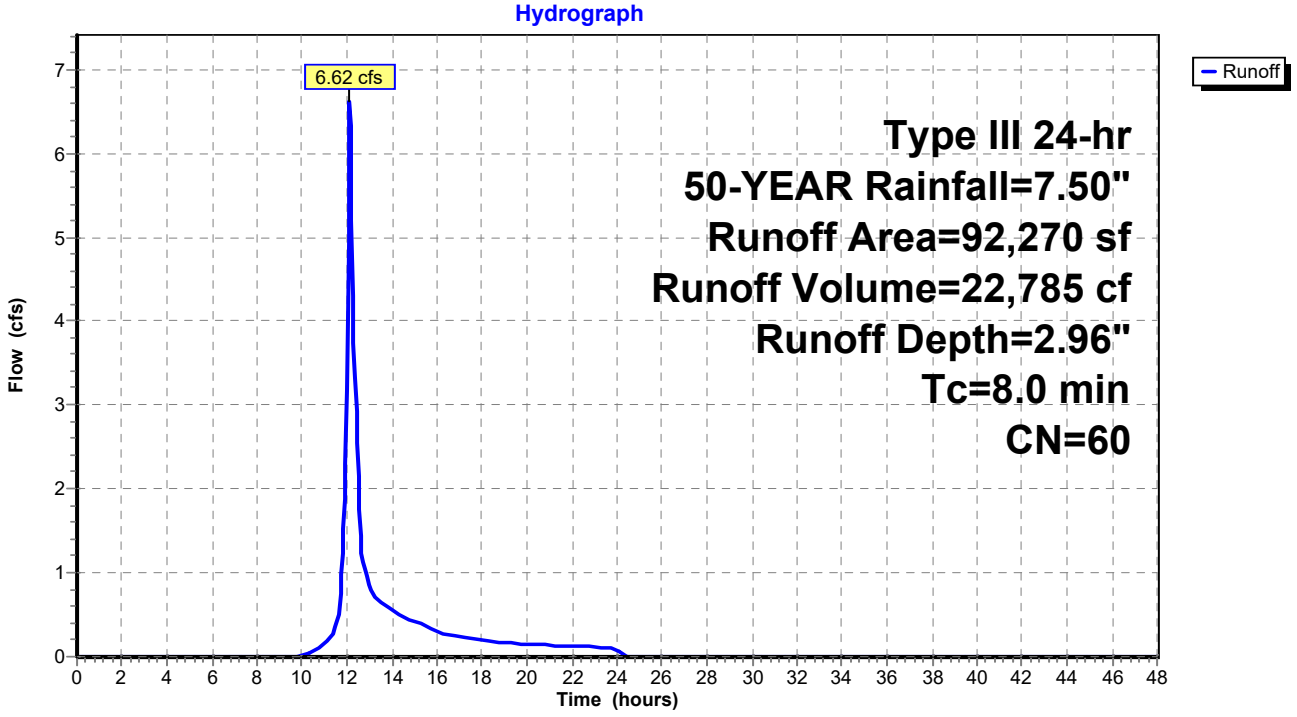
Runoff = 6.62 cfs @ 12.12 hrs, Volume= 22,785 cf, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
38,399	51	1 acre lots, 20% imp, HSG A
5,161	84	1 acre lots, 20% imp, HSG D
8,688	39	Pasture/grassland/range, Good, HSG A
3,468	80	Pasture/grassland/range, Good, HSG D
1,860	96	Gravel surface, HSG A
7,762	96	Gravel surface, HSG D
10,229	32	Woods/grass comb., Good, HSG A
16,703	79	Woods/grass comb., Good, HSG D
92,270	60	Weighted Average
83,558		90.56% Pervious Area
8,712		9.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Subcatchment 1S: AP-1



Summary for Subcatchment 2S: AP-2

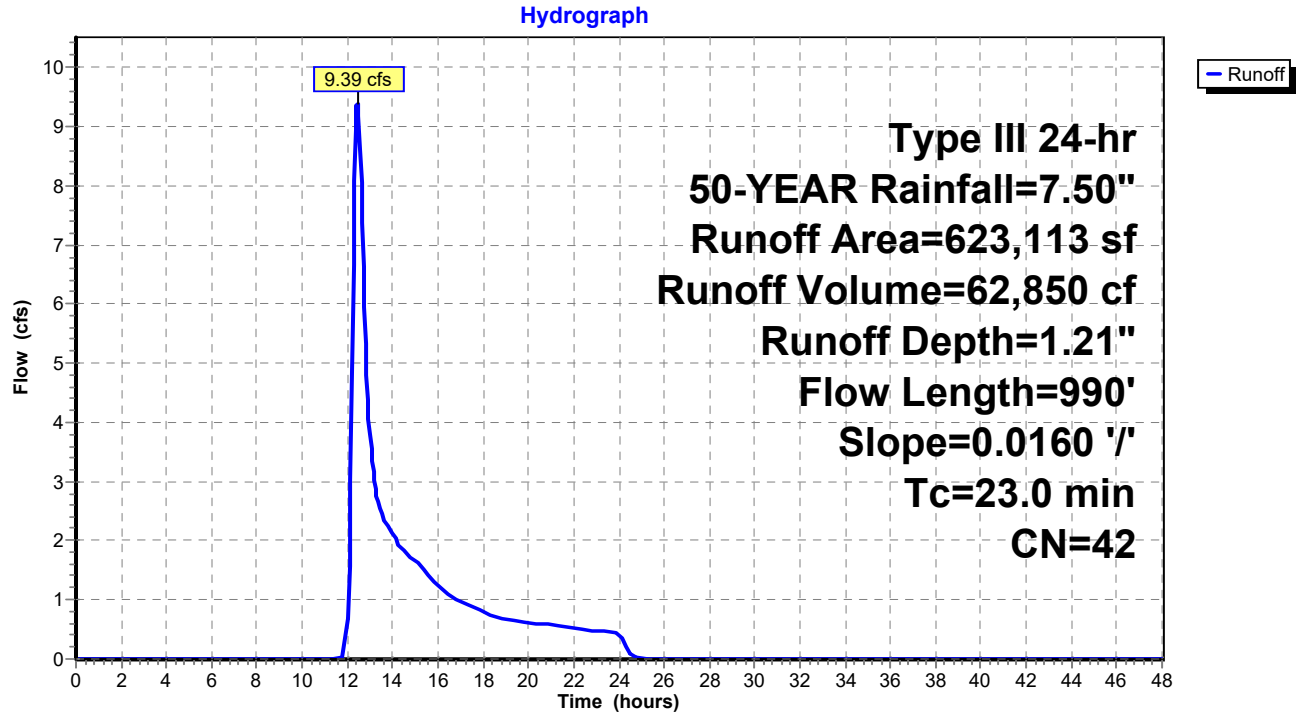
Runoff = 9.39 cfs @ 12.42 hrs, Volume= 62,850 cf, Depth= 1.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
473,298	39	Pasture/grassland/range, Good, HSG A
37,422	30	Woods, Good, HSG A
36,202	30	Brush, Good, HSG A
4,870	48	Brush, Good, HSG B
11,677	61	Pasture/grassland/range, Good, HSG B
521	73	Brush, Good, HSG D
59,123	80	Pasture/grassland/range, Good, HSG D
623,113	42	Weighted Average
623,113		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
17.7	940	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.0	990	Total			

Subcatchment 2S: AP-2



Summary for Subcatchment 3S: AP-3

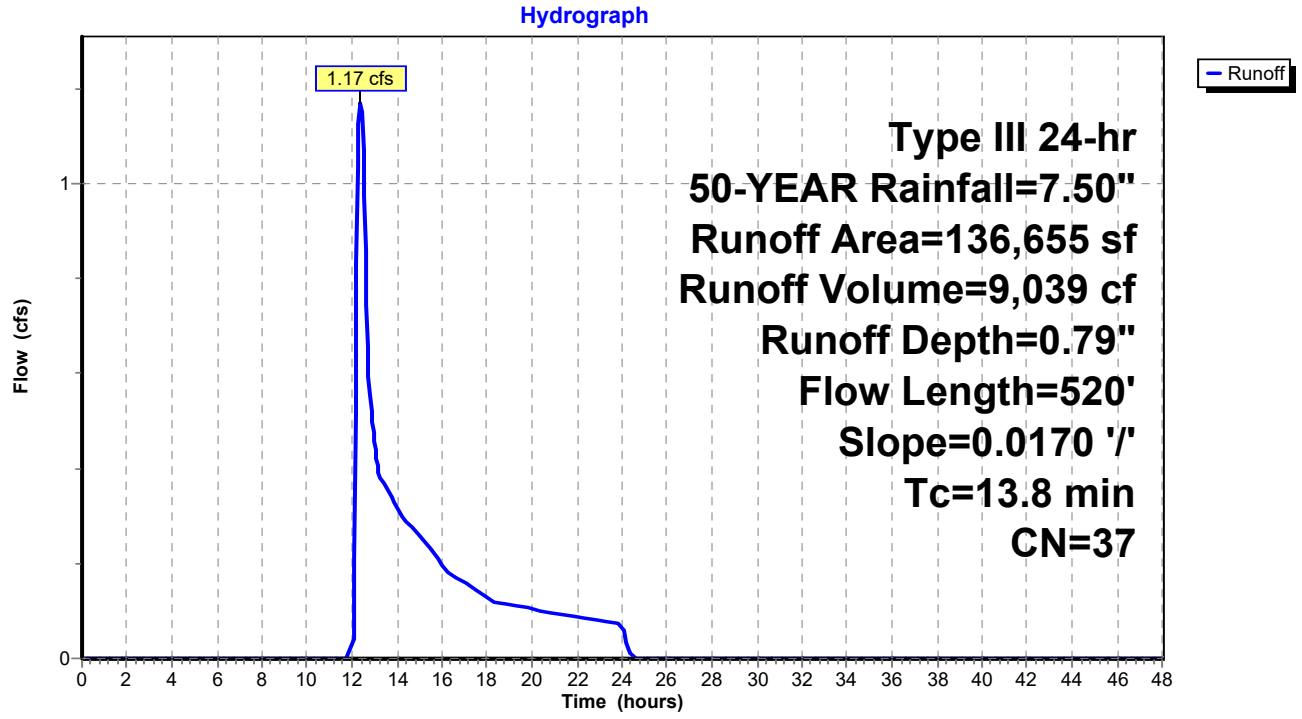
Runoff = 1.17 cfs @ 12.38 hrs, Volume= 9,039 cf, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
105,908	39	Pasture/grassland/range, Good, HSG A
30,747	30	Woods, Good, HSG A
136,655	37	Weighted Average
136,655		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0170	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.6	470	0.0170	0.91		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.8	520	Total			

Subcatchment 3S: AP-3



Summary for Subcatchment 4S: AP-4

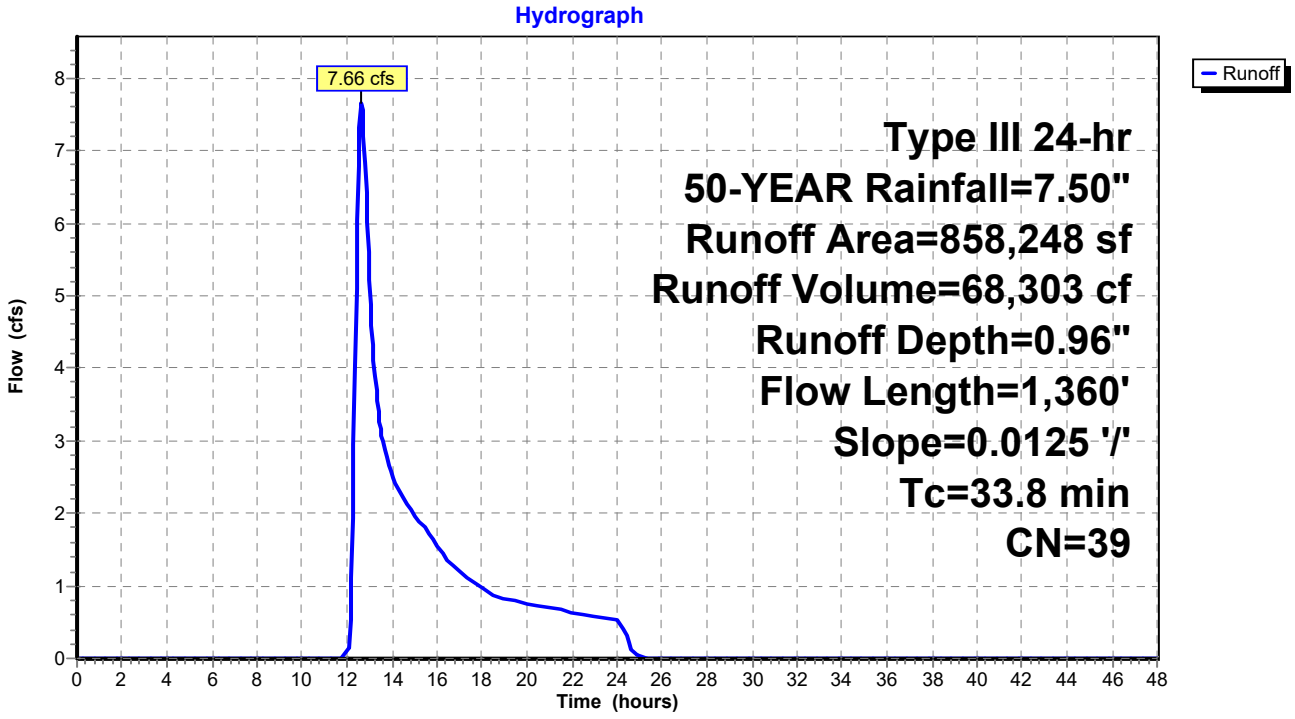
Runoff = 7.66 cfs @ 12.64 hrs, Volume= 68,303 cf, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
811,241	39	Pasture/grassland/range, Good, HSG A
47,007	30	Woods, Good, HSG A
858,248	39	Weighted Average
858,248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.0125	0.14		**Sheet Flow,** Range n= 0.130 P2= 3.40"
27.9	1,310	0.0125	0.78		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
33.8	1,360	Total			

Subcatchment 4S: AP-4



Summary for Subcatchment 5S: AP-5

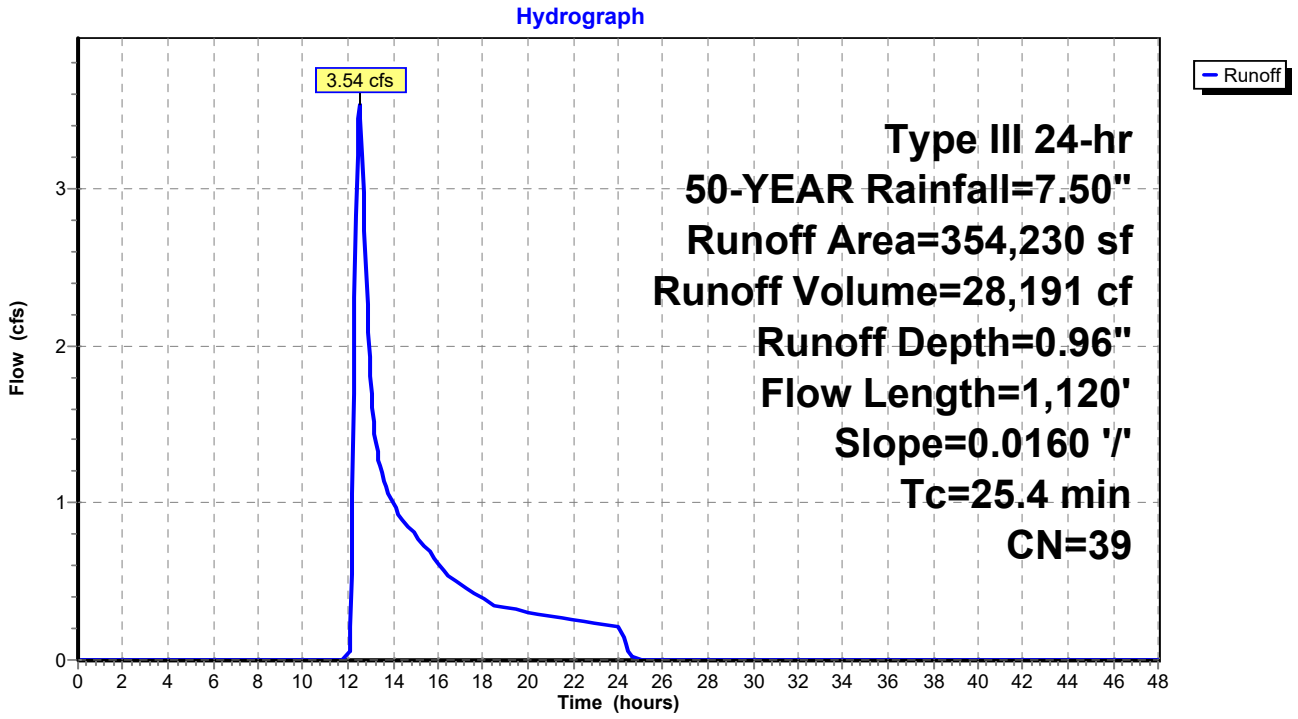
Runoff = 3.54 cfs @ 12.51 hrs, Volume= 28,191 cf, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
254,521	39	Pasture/grassland/range, Good, HSG A
5,097	30	Woods, Good, HSG A
55,670	30	Brush, Good, HSG A
15,899	61	Pasture/grassland/range, Good, HSG B
23,043	48	Brush, Good, HSG B
354,230	39	Weighted Average
354,230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
20.1	1,070	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.4	1,120	Total			

Subcatchment 5S: AP-5



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: AP-1 Runoff Area=92,270 sf 9.44% Impervious Runoff Depth=3.71"
Tc=8.0 min CN=60 Runoff=8.39 cfs 28,549 cf

Subcatchment 2S: AP-2 Runoff Area=623,113 sf 0.00% Impervious Runoff Depth=1.68"
Flow Length=990' Slope=0.0160 '/' Tc=23.0 min CN=42 Runoff=14.44 cfs 87,464 cf

Subcatchment 3S: AP-3 Runoff Area=136,655 sf 0.00% Impervious Runoff Depth=1.17"
Flow Length=520' Slope=0.0170 '/' Tc=13.8 min CN=37 Runoff=2.09 cfs 13,361 cf

Subcatchment 4S: AP-4 Runoff Area=858,248 sf 0.00% Impervious Runoff Depth=1.37"
Flow Length=1,360' Slope=0.0125 '/' Tc=33.8 min CN=39 Runoff=12.59 cfs 98,217 cf

Subcatchment 5S: AP-5 Runoff Area=354,230 sf 0.00% Impervious Runoff Depth=1.37"
Flow Length=1,120' Slope=0.0160 '/' Tc=25.4 min CN=39 Runoff=5.85 cfs 40,538 cf

Total Runoff Area = 2,064,516 sf Runoff Volume = 268,128 cf Average Runoff Depth = 1.56"
99.58% Pervious = 2,055,804 sf 0.42% Impervious = 8,712 sf

Summary for Subcatchment 1S: AP-1

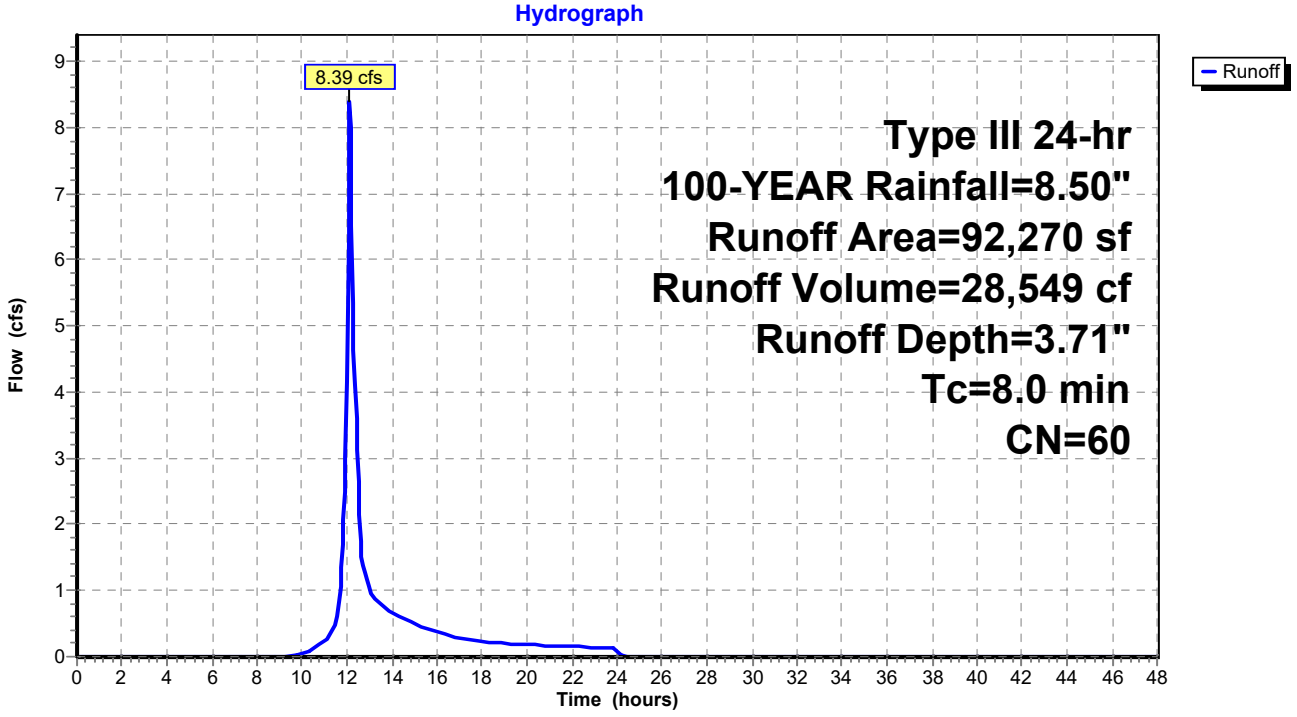
Runoff = 8.39 cfs @ 12.12 hrs, Volume= 28,549 cf, Depth= 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
38,399	51	1 acre lots, 20% imp, HSG A
5,161	84	1 acre lots, 20% imp, HSG D
8,688	39	Pasture/grassland/range, Good, HSG A
3,468	80	Pasture/grassland/range, Good, HSG D
1,860	96	Gravel surface, HSG A
7,762	96	Gravel surface, HSG D
10,229	32	Woods/grass comb., Good, HSG A
16,703	79	Woods/grass comb., Good, HSG D
92,270	60	Weighted Average
83,558		90.56% Pervious Area
8,712		9.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Subcatchment 1S: AP-1



Summary for Subcatchment 2S: AP-2

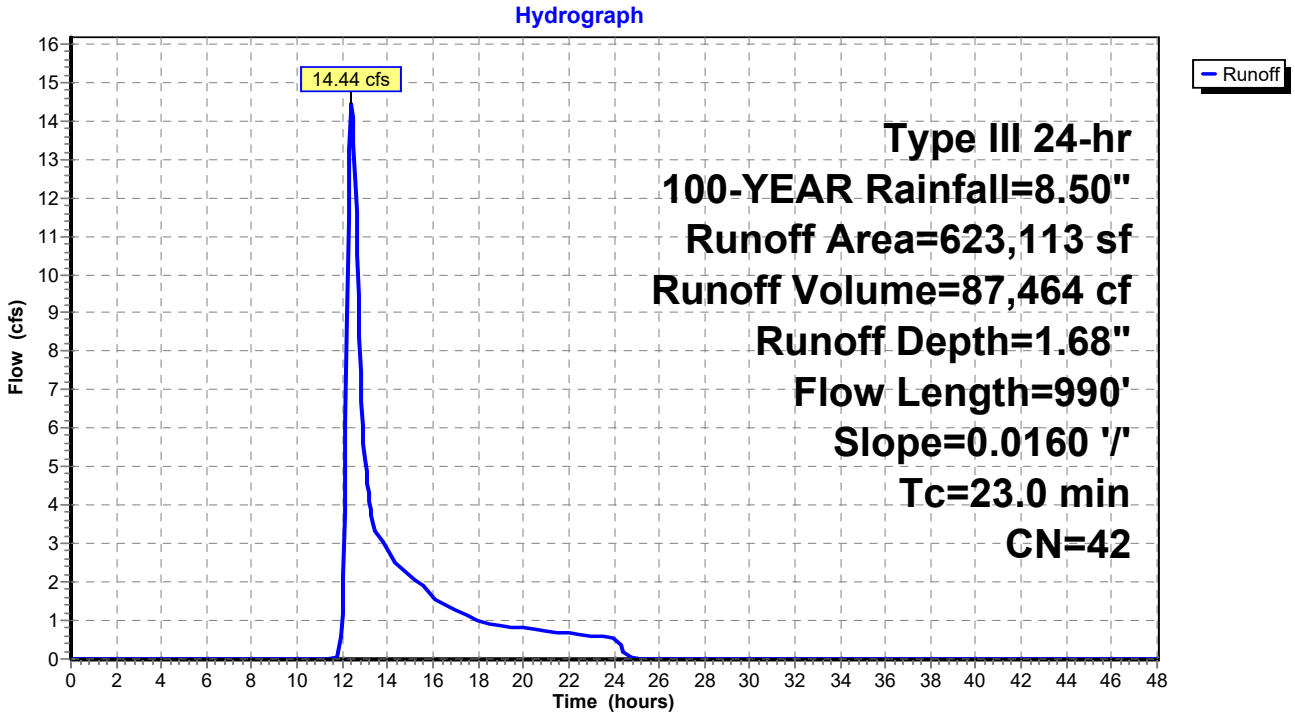
Runoff = 14.44 cfs @ 12.39 hrs, Volume= 87,464 cf, Depth= 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
473,298	39	Pasture/grassland/range, Good, HSG A
37,422	30	Woods, Good, HSG A
36,202	30	Brush, Good, HSG A
4,870	48	Brush, Good, HSG B
11,677	61	Pasture/grassland/range, Good, HSG B
521	73	Brush, Good, HSG D
59,123	80	Pasture/grassland/range, Good, HSG D
623,113	42	Weighted Average
623,113		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
17.7	940	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.0	990	Total			

Subcatchment 2S: AP-2



Summary for Subcatchment 3S: AP-3

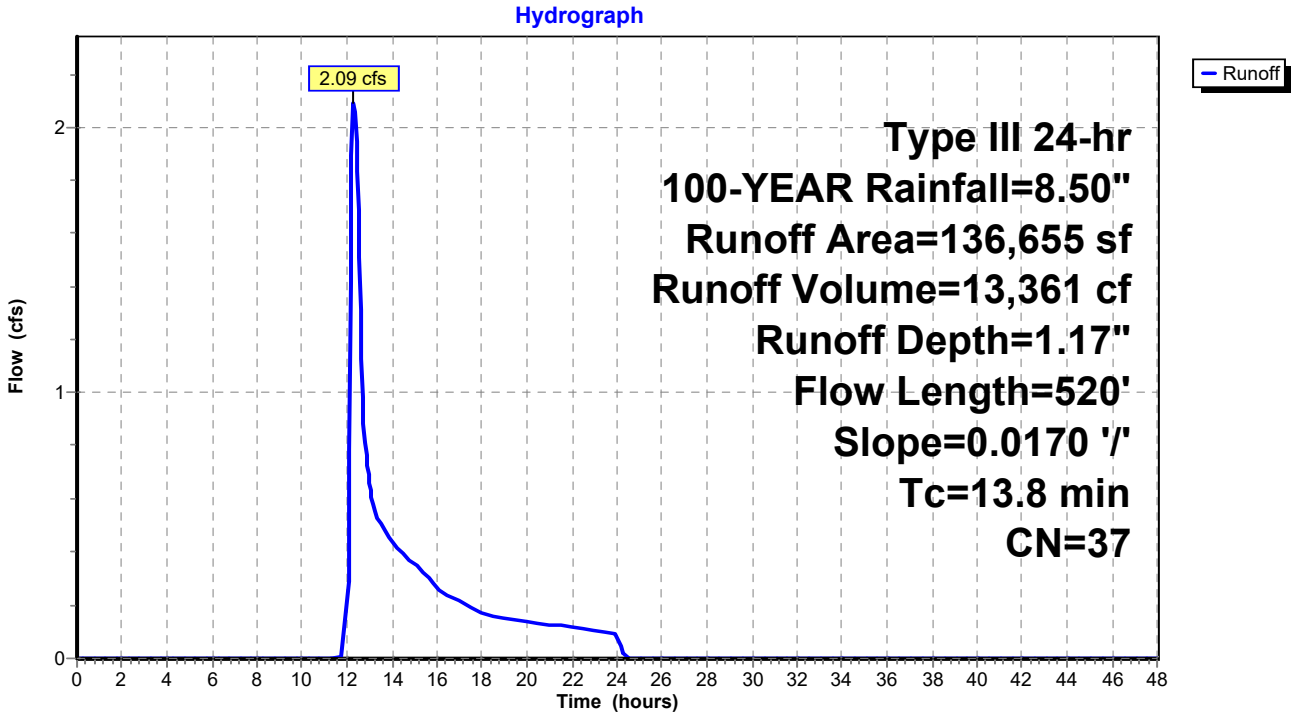
Runoff = 2.09 cfs @ 12.28 hrs, Volume= 13,361 cf, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
105,908	39	Pasture/grassland/range, Good, HSG A
30,747	30	Woods, Good, HSG A
136,655	37	Weighted Average
136,655		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.2	50	0.0170	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.6	470	0.0170	0.91		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.8	520	Total			

Subcatchment 3S: AP-3



Summary for Subcatchment 4S: AP-4

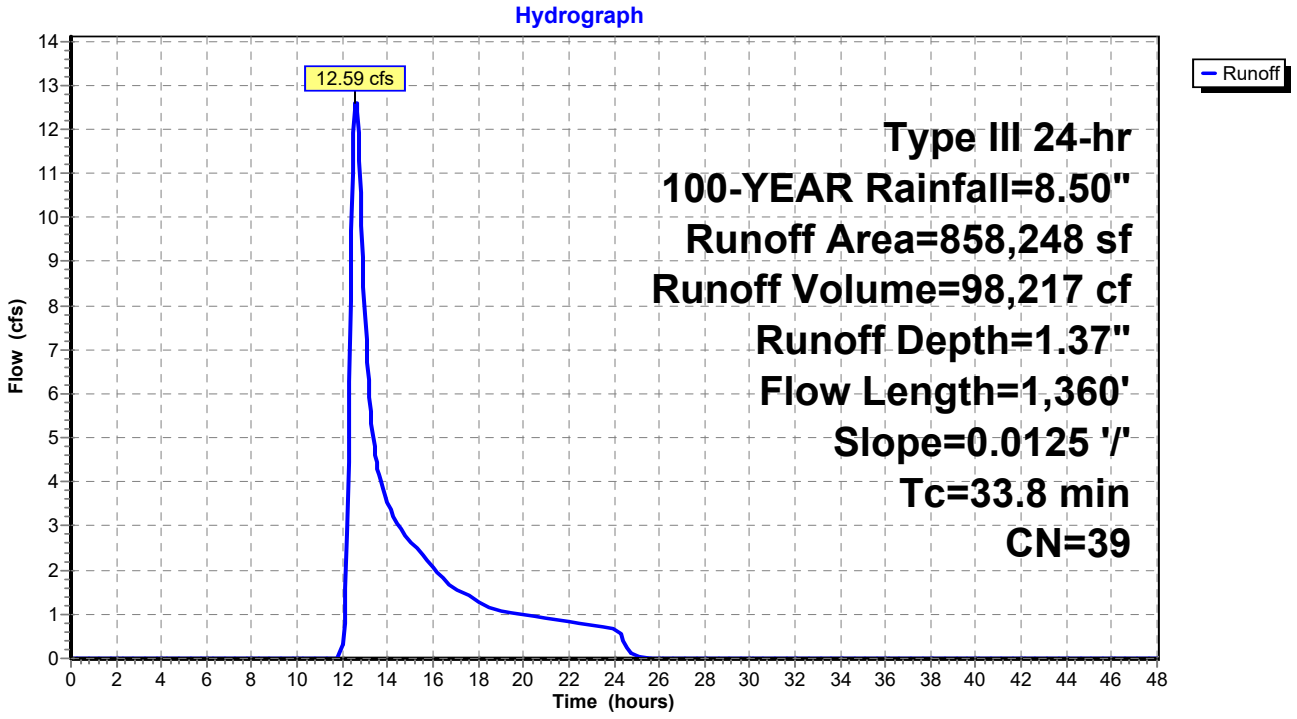
Runoff = 12.59 cfs @ 12.60 hrs, Volume= 98,217 cf, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
811,241	39	Pasture/grassland/range, Good, HSG A
47,007	30	Woods, Good, HSG A
858,248	39	Weighted Average
858,248		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.0125	0.14		**Sheet Flow,** Range n= 0.130 P2= 3.40"
27.9	1,310	0.0125	0.78		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
33.8	1,360	Total			

Subcatchment 4S: AP-4



Summary for Subcatchment 5S: AP-5

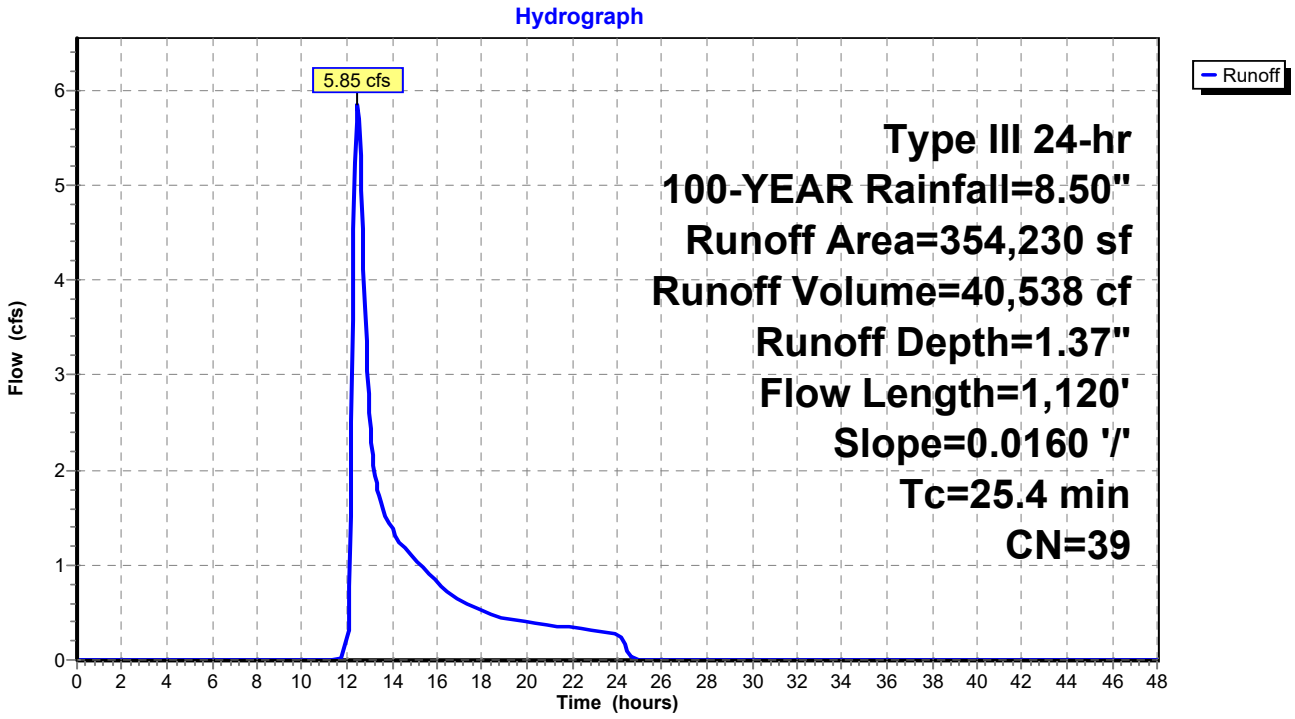
Runoff = 5.85 cfs @ 12.46 hrs, Volume= 40,538 cf, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

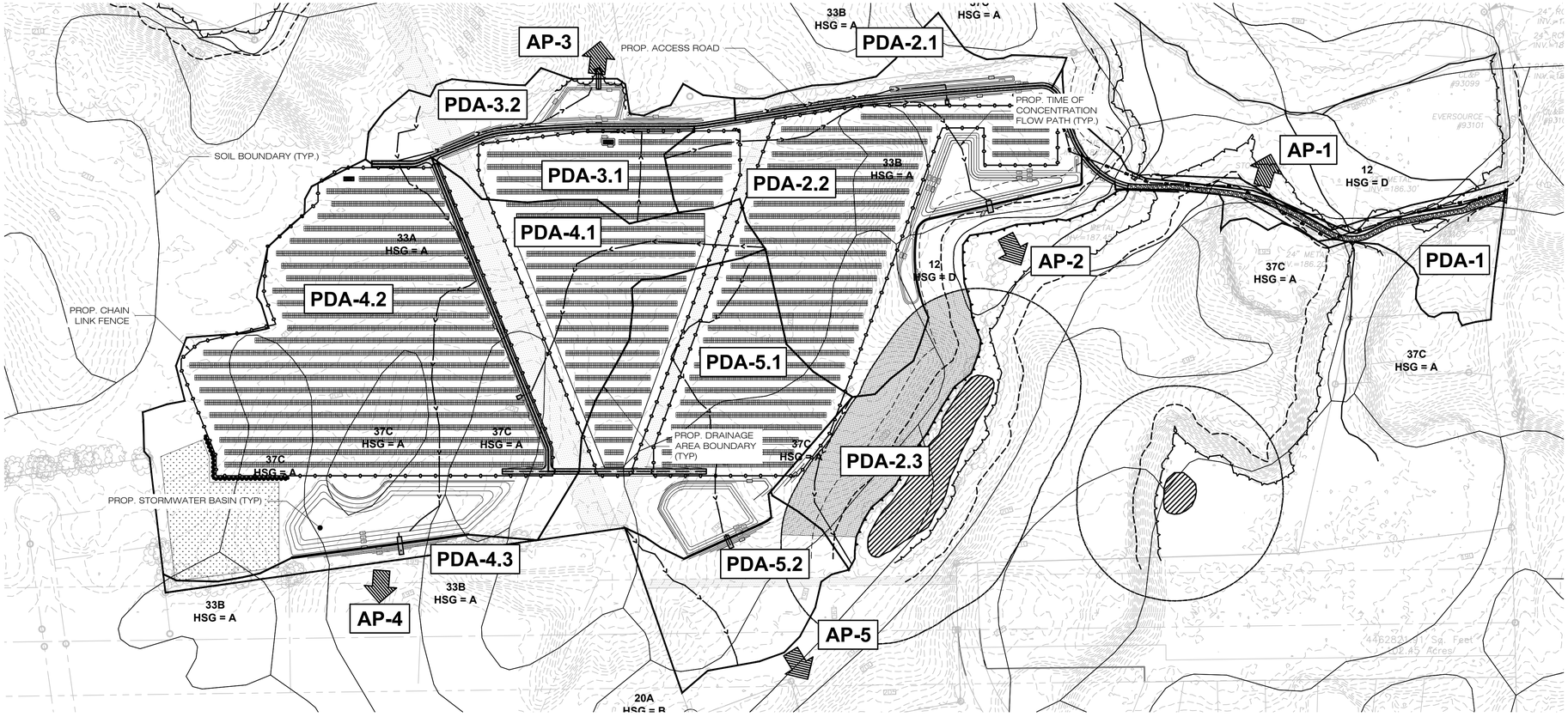
Area (sf)	CN	Description
254,521	39	Pasture/grassland/range, Good, HSG A
5,097	30	Woods, Good, HSG A
55,670	30	Brush, Good, HSG A
15,899	61	Pasture/grassland/range, Good, HSG B
23,043	48	Brush, Good, HSG B
354,230	39	Weighted Average
354,230		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
20.1	1,070	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
25.4	1,120	Total			

Subcatchment 5S: AP-5



APPENDIX C: PROPOSED DRAINAGE AREA MAP (PDA-1) & HYDROLOGIC COMPUTATION (HYDROCAD)



PROPOSED DRAINAGE AREAS

WATERSHED	TOTAL AREA (ACRES)	COMPOSITE CN	TC (MINS.)
PDA-1	2.069	60	8
PDA-2.1	1.303	35	13
PDA-2.2	8.068	51	21
PDA-2.3	3.435	51	9
PDA-3.1	2.011	56	17
PDA-3.2	2.065	34	19
PDA-4.1	4.627	51	23
PDA-4.2	13.998	50	25
PDA-4.3	0.538	30	5
PDA-5.1	6.554	50	19
PDA-5.2	2.727	37	9
SITE	47.395	49	-

PROPOSED CONDITIONS FLOWS

DISCH. POINT	2-YEAR (CFS)	25-YEAR (CFS)	50-YEAR (CFS)	100-YEAR (CFS)
AP-1	0.7	5.0	6.5	8.2
AP-2	0.2	4.8	6.7	9.1
AP-3	0.0	0.3	0.5	1.1
AP-4	0.0	1.6	2.6	5.5
AP-5	0.0	0.9	1.8	3.4
SITE	0.9	12.6	18.1	27.3
CHANGE	+0.1	-4.8	-10.3	-16.1

1 / PDA-1 **PROPOSED DRAINAGE AREA PLAN**

SCALE : 1-IN = 100-FT

150 0 75 150 300

(IN FEET) 1 inch = 150 ft.

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHAUL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

PERMIT SET

NO	DATE	REVISION
0		
1		
2		
3		
4		
5		
6		

NOT FOR CONSTRUCTION

DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: CATHOLIC CEMETERIES OF ARHDIOCESE OF HARTFORD
ADDRESS: 700 MIDDLETOWN AVENUE NORTH HAVEN, CT 06473

SOUTHINGTON SOLAR ONE, LLC

SITE ADDRESS: 1012 EAST STREET SOUTHINGTON, CT

APT FILING NUMBER: CT590170

DRAWN BY: KAM

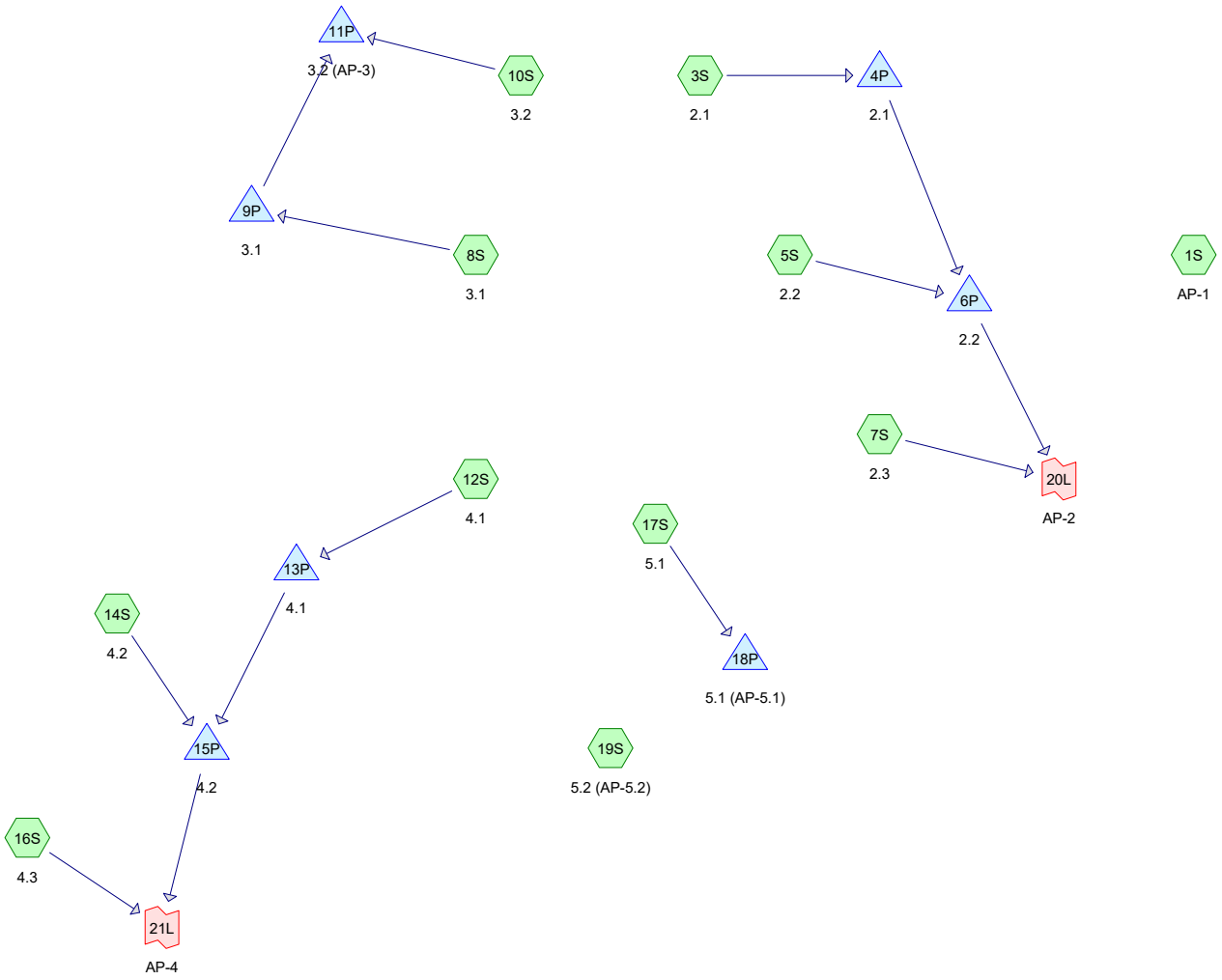
DATE: 06/02/20 CHECKED BY: BJP

SHEET TITLE:

PROPOSED CONDITIONS HYDROLOGY PLAN

SHEET NUMBER:

PDA-1



Subcat Reach Pond Link

Routing Diagram for Southington-PR_2020-05-20
Prepared by All Points Technology Corp., Printed 6/2/2020

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
38,399	51	1 acre lots, 20% imp, HSG A (1S)
5,161	84	1 acre lots, 20% imp, HSG D (1S)
29,898	30	Brush, Good, HSG A (19S)
23,040	48	Brush, Good, HSG B (19S)
38,185	96	Gravel surface, HSG A (1S, 3S, 5S, 7S, 8S, 10S, 12S, 14S, 17S)
8,038	96	Gravel surface, HSG D (1S, 7S)
646,629	30	Meadow, non-grazed, HSG A (1S, 3S, 5S, 7S, 8S, 10S, 12S, 14S, 17S, 19S)
1,087,802	58	Meadow, non-grazed, HSG B (5S, 7S, 8S, 12S, 14S, 17S, 19S)
79,159	78	Meadow, non-grazed, HSG D (1S, 5S, 7S)
960	98	Unconnected roofs, HSG B (5S, 8S, 14S)
107,245	30	Woods, Good, HSG A (3S, 10S, 14S, 16S, 17S)
2,064,516	**49**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
860,356	HSG A	1S, 3S, 5S, 7S, 8S, 10S, 12S, 14S, 16S, 17S, 19S
1,111,802	HSG B	5S, 7S, 8S, 12S, 14S, 17S, 19S
0	HSG C	
92,358	HSG D	1S, 5S, 7S
0	Other	
2,064,516		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatc Numbers
38,399	0	0	5,161	0	43,560	1 acre lots, 20% imp	
29,898	23,040	0	0	0	52,938	Brush, Good	
38,185	0	0	8,038	0	46,223	Gravel surface	
646,629	1,087,802	0	79,159	0	1,813,590	Meadow, non-grazed	
0	960	0	0	0	960	Unconnected roofs	
107,245	0	0	0	0	107,245	Woods, Good	
860,356	**1,111,802**	**0**	**92,358**	**0**	**2,064,516**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	4P	195.00	194.00	30.0	0.0333	0.013	12.0	0.0	0.0
2	6P	190.00	190.00	24.0	0.0000	0.013	8.0	0.0	0.0
3	11P	201.33	201.00	40.0	0.0083	0.013	8.0	0.0	0.0
4	13P	201.00	201.00	24.0	0.0000	0.013	12.0	0.0	0.0
5	15P	197.00	196.00	40.0	0.0250	0.013	12.0	0.0	0.0
6	18P	197.00	196.00	32.0	0.0313	0.013	12.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: AP-1 Runoff Area=90,105 sf 9.67% Impervious Runoff Depth=0.49"
Tc=8.0 min CN=60 Runoff=0.70 cfs 3,672 cf

Subcatchment 3S: 2.1 Runoff Area=56,747 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=500' Slope=0.0180 '/' Tc=13.1 min CN=35 Runoff=0.00 cfs 0 cf

Subcatchment 5S: 2.2 Runoff Area=351,424 sf 0.14% Impervious Runoff Depth=0.20"
Flow Length=905' Slope=0.0160 '/' Tc=21.4 min CN=51 Runoff=0.40 cfs 5,774 cf

Subcatchment 7S: 2.3 Runoff Area=149,622 sf 0.00% Impervious Runoff Depth=0.20"
Flow Length=420' Slope=0.0350 '/' Tc=8.6 min CN=51 Runoff=0.21 cfs 2,458 cf

Subcatchment 8S: 3.1 Runoff Area=87,591 sf 0.27% Impervious Runoff Depth=0.35"
Flow Length=335' Slope=0.0060 '/' Tc=16.7 min CN=56 Runoff=0.31 cfs 2,520 cf

Subcatchment 10S: 3.2 Runoff Area=89,970 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=650' Slope=0.0120 '/' Tc=19.0 min CN=34 Runoff=0.00 cfs 0 cf

Subcatchment 12S: 4.1 Runoff Area=201,561 sf 0.00% Impervious Runoff Depth=0.20"
Flow Length=755' Slope=0.0100 '/' Tc=23.2 min CN=51 Runoff=0.22 cfs 3,312 cf

Subcatchment 14S: 4.2 Runoff Area=609,733 sf 0.04% Impervious Runoff Depth=0.17"
Flow Length=1,000' Slope=0.0140 '/' Tc=24.7 min CN=50 Runoff=0.48 cfs 8,736 cf

Subcatchment 16S: 4.3 Runoff Area=23,434 sf 0.00% Impervious Runoff Depth=0.00"
Tc=5.0 min CN=30 Runoff=0.00 cfs 0 cf

Subcatchment 17S: 5.1 Runoff Area=285,491 sf 0.00% Impervious Runoff Depth=0.17"
Flow Length=735' Slope=0.0150 '/' Tc=18.8 min CN=50 Runoff=0.25 cfs 4,090 cf

Subcatchment 19S: 5.2 (AP-5.2) Runoff Area=118,838 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=425' Slope=0.0330 '/' Tc=8.9 min CN=37 Runoff=0.00 cfs 0 cf

Pond 4P: 2.1 Peak Elev=194.00' Storage=0 cf Inflow=0.00 cfs 0 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0333 '/' Outflow=0.00 cfs 0 cf

Pond 6P: 2.2 Peak Elev=189.39' Storage=5,774 cf Inflow=0.40 cfs 5,774 cf
Outflow=0.00 cfs 0 cf

Pond 9P: 3.1 Peak Elev=204.32' Storage=2,520 cf Inflow=0.31 cfs 2,520 cf
Outflow=0.00 cfs 0 cf

Pond 11P: 3.2 (AP-3) Peak Elev=201.00' Storage=0 cf Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond 13P: 4.1 Peak Elev=201.29' Storage=274 cf Inflow=0.22 cfs 3,312 cf
12.0" Round Culvert n=0.013 L=24.0' S=0.0000 '/' Outflow=0.15 cfs 3,312 cf

Pond 15P: 4.2 Peak Elev=196.43' Storage=12,046 cf Inflow=0.59 cfs 12,048 cf
Outflow=0.00 cfs 0 cf

Pond 18P: 5.1 (AP-5.1) Peak Elev=196.23' Storage=4,090 cf Inflow=0.25 cfs 4,090 cf
Outflow=0.00 cfs 0 cf

Link 20L: AP-2 Inflow=0.21 cfs 2,458 cf
Primary=0.21 cfs 2,458 cf

Link 21L: AP-4 Inflow=0.00 cfs 0 cf
Primary=0.00 cfs 0 cf

Total Runoff Area = 2,064,516 sf Runoff Volume = 30,562 cf Average Runoff Depth = 0.18"
99.53% Pervious = 2,054,844 sf 0.47% Impervious = 9,672 sf

Summary for Subcatchment 1S: AP-1

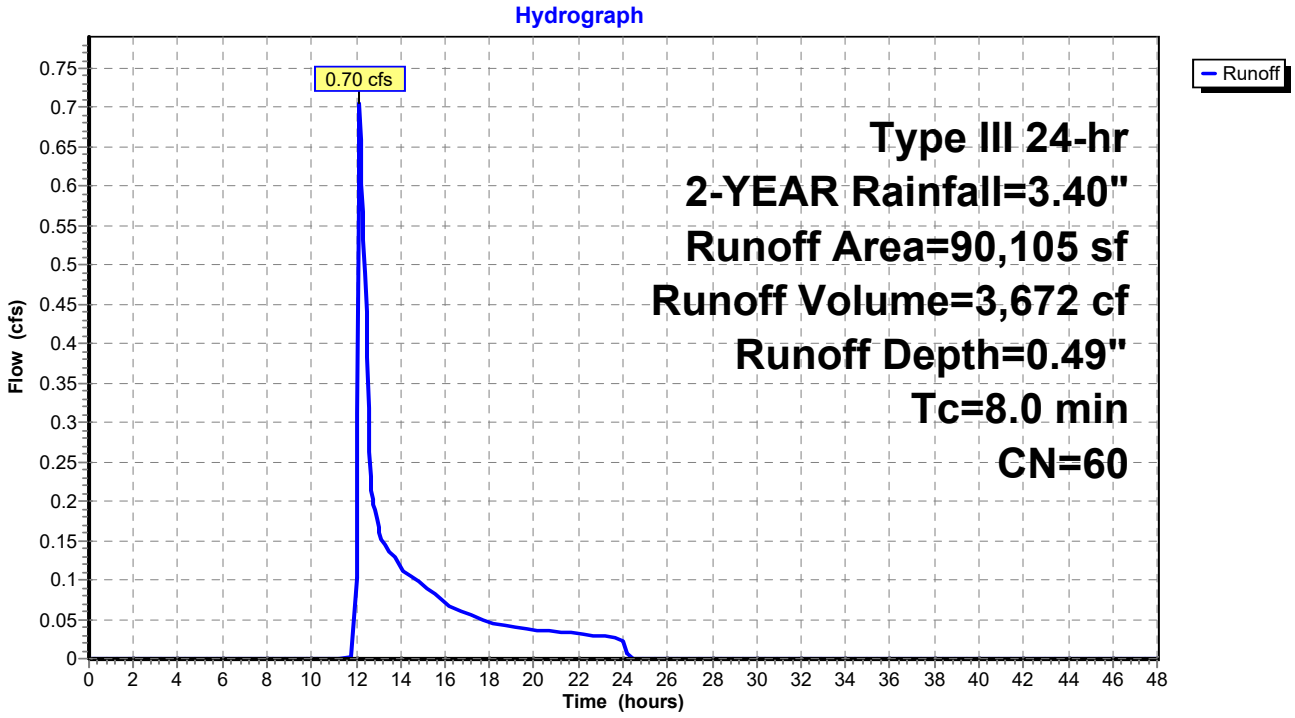
Runoff = 0.70 cfs @ 12.16 hrs, Volume= 3,672 cf, Depth= 0.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
38,399	51	1 acre lots, 20% imp, HSG A
5,161	84	1 acre lots, 20% imp, HSG D
2,850	96	Gravel surface, HSG A
7,762	96	Gravel surface, HSG D
16,607	30	Meadow, non-grazed, HSG A
19,326	78	Meadow, non-grazed, HSG D
90,105	60	Weighted Average
81,393		90.33% Pervious Area
8,712		9.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Subcatchment 1S: AP-1



Summary for Subcatchment 3S: 2.1

[45] Hint: Runoff=Zero

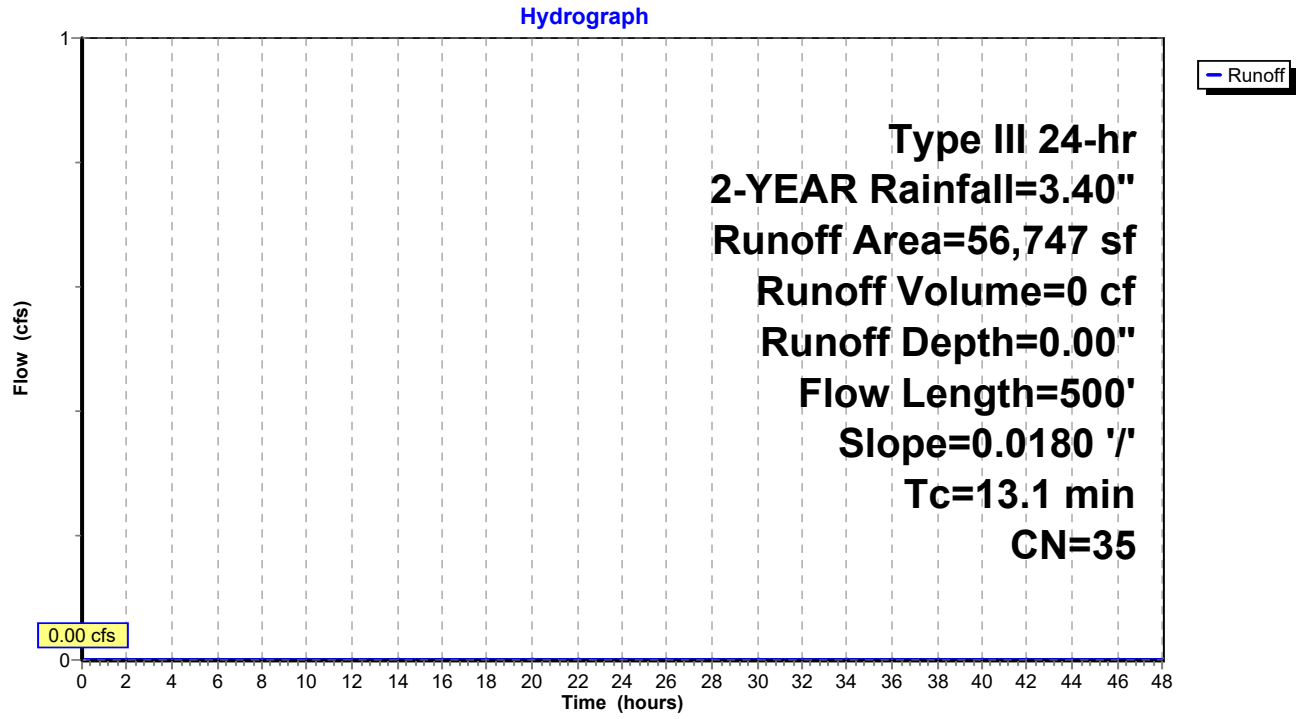
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
29,966	30	Woods, Good, HSG A
22,363	30	Meadow, non-grazed, HSG A
4,418	96	Gravel surface, HSG A
56,747	35	Weighted Average
56,747		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0180	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.0	450	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.1	500	Total			

Subcatchment 3S: 2.1



Summary for Subcatchment 5S: 2.2

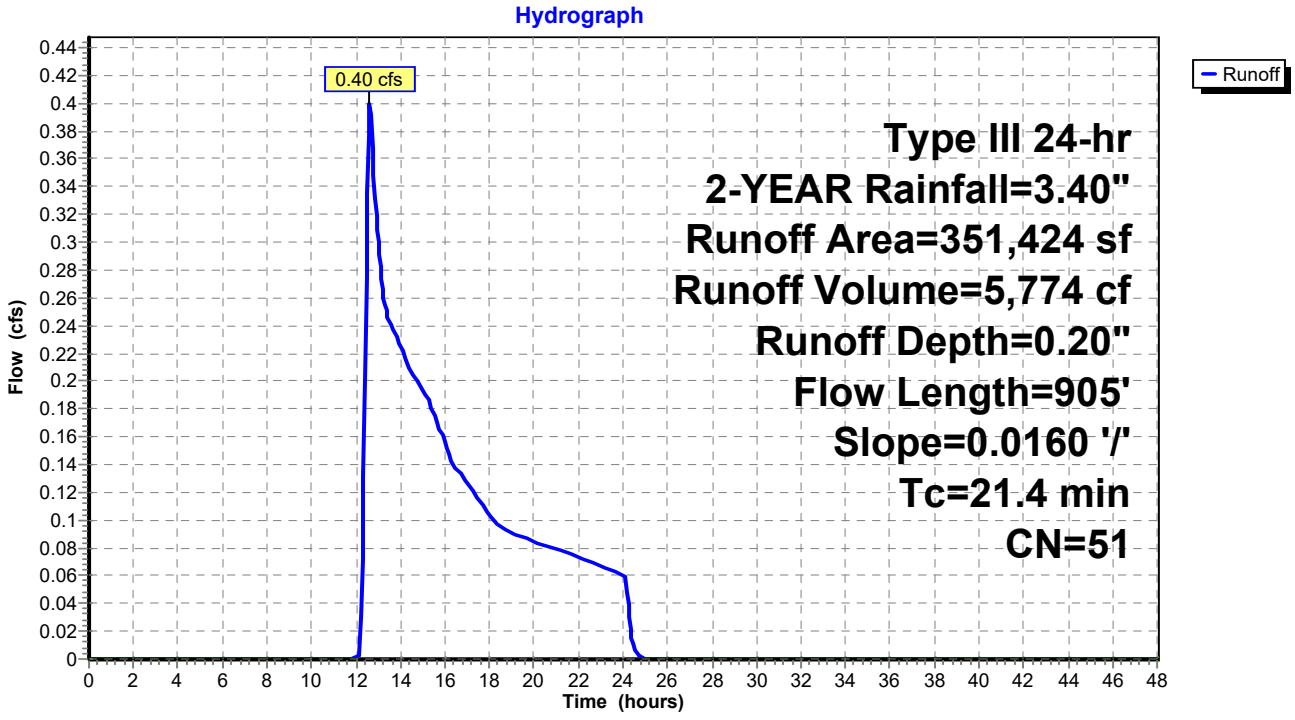
Runoff = 0.40 cfs @ 12.63 hrs, Volume= 5,774 cf, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
6,360	78	Meadow, non-grazed, HSG D
480	98	Unconnected roofs, HSG B
242,615	58	Meadow, non-grazed, HSG B
95,975	30	Meadow, non-grazed, HSG A
5,994	96	Gravel surface, HSG A
351,424	51	Weighted Average
350,944		99.86% Pervious Area
480		0.14% Impervious Area
480		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
16.1	855	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.4	905	Total			

Subcatchment 5S: 2.2



Summary for Subcatchment 7S: 2.3

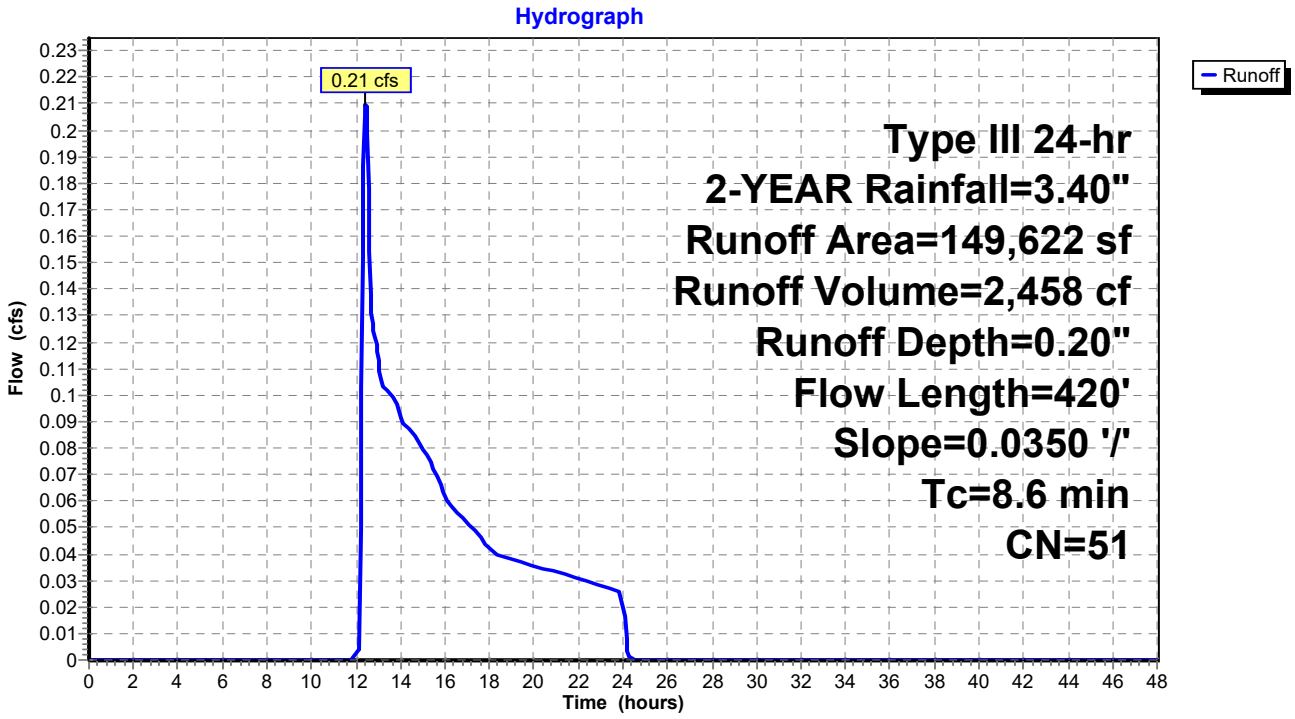
Runoff = 0.21 cfs @ 12.44 hrs, Volume= 2,458 cf, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
328	96	Gravel surface, HSG A
276	96	Gravel surface, HSG D
78,998	30	Meadow, non-grazed, HSG A
16,547	58	Meadow, non-grazed, HSG B
53,473	78	Meadow, non-grazed, HSG D
149,622	51	Weighted Average
149,622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0350	0.21		**Sheet Flow,** Range n= 0.130 P2= 3.40"
4.7	370	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	420	Total			

Subcatchment 7S: 2.3



Summary for Subcatchment 8S: 3.1

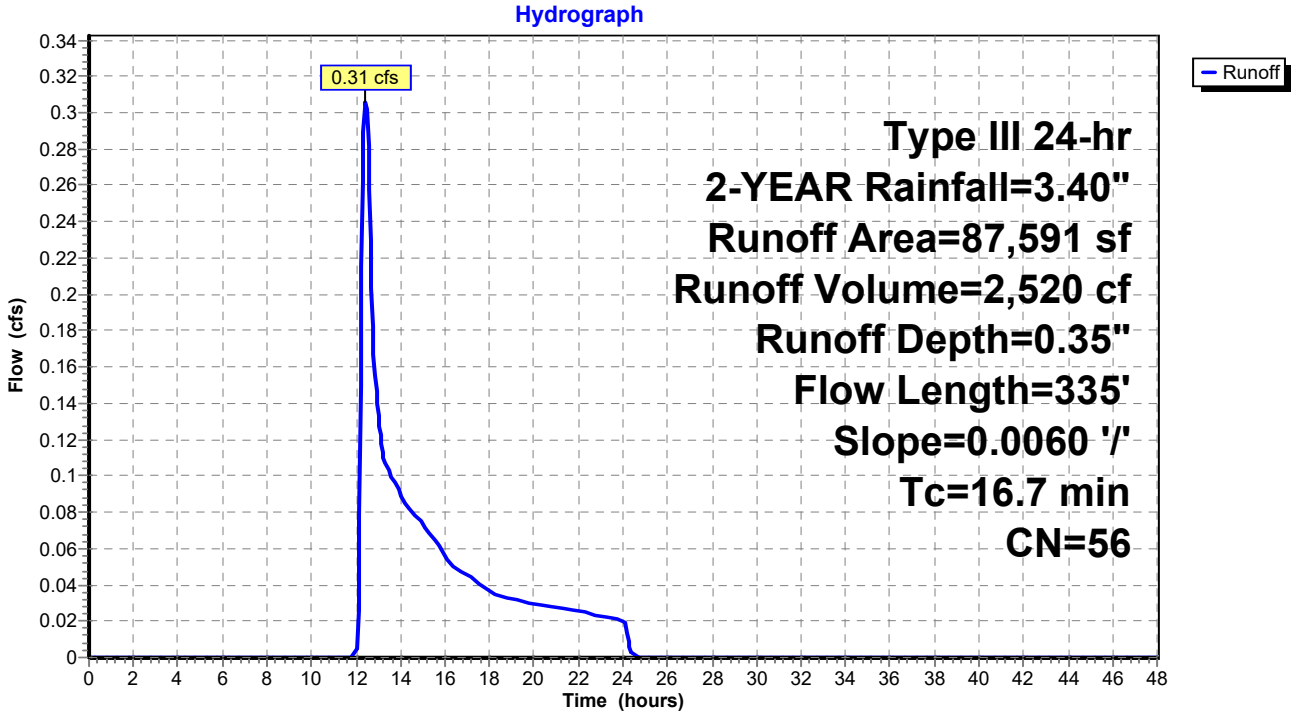
Runoff = 0.31 cfs @ 12.44 hrs, Volume= 2,520 cf, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
240	98	Unconnected roofs, HSG B
73,156	58	Meadow, non-grazed, HSG B
10,475	30	Meadow, non-grazed, HSG A
3,720	96	Gravel surface, HSG A
87,591	56	Weighted Average
87,351		99.73% Pervious Area
240		0.27% Impervious Area
240		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0060	0.11		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.8	285	0.0060	0.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.7	335	Total			

Subcatchment 8S: 3.1



Summary for Subcatchment 10S: 3.2

[45] Hint: Runoff=Zero

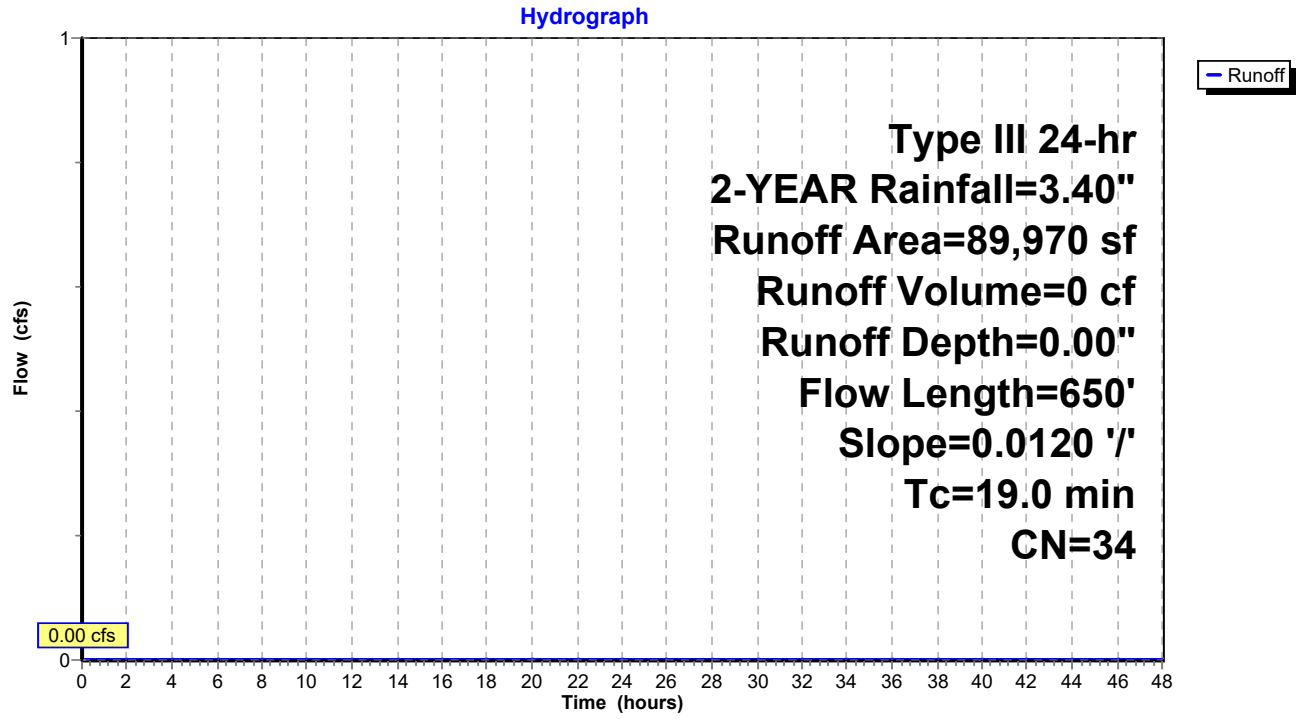
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
32,262	30	Woods, Good, HSG A
52,598	30	Meadow, non-grazed, HSG A
5,110	96	Gravel surface, HSG A
89,970	34	Weighted Average
89,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0120	0.14		**Sheet Flow,** Range n= 0.130 P2= 3.40"
13.0	600	0.0120	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.0	650	Total			

Subcatchment 10S: 3.2



Summary for Subcatchment 12S: 4.1

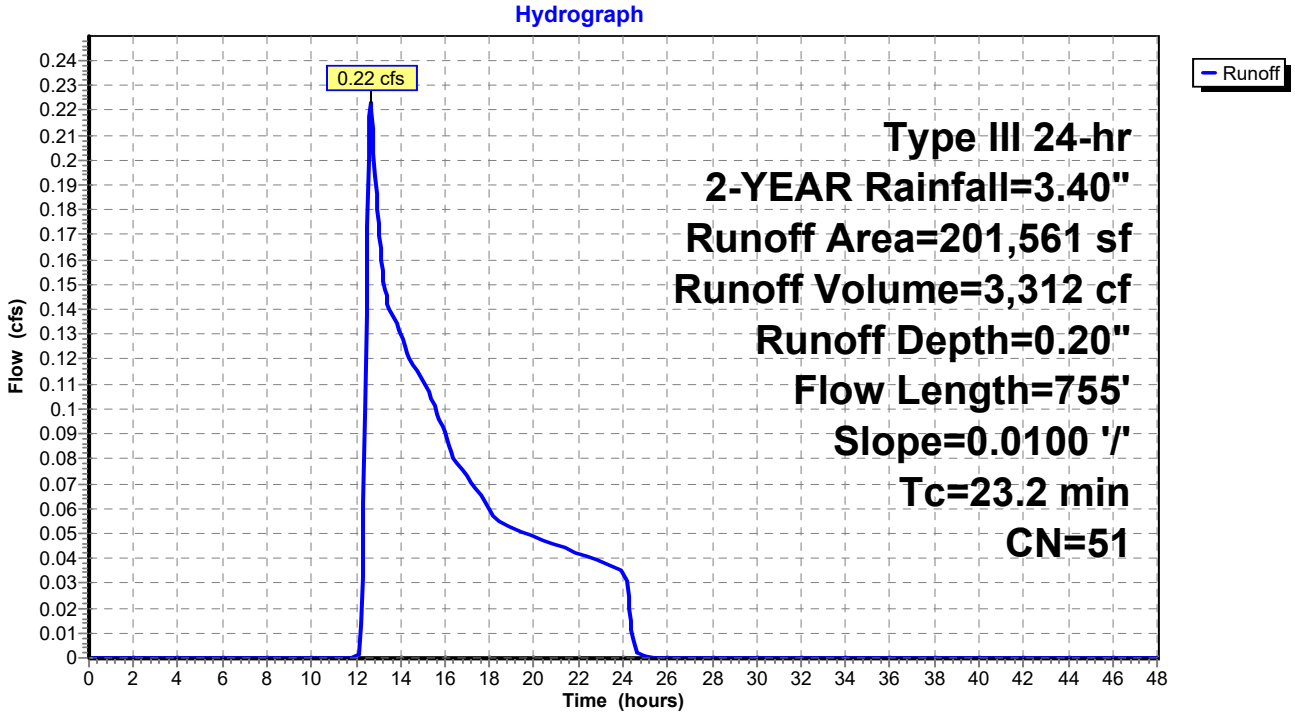
Runoff = 0.22 cfs @ 12.66 hrs, Volume= 3,312 cf, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
57,023	30	Meadow, non-grazed, HSG A
5,058	96	Gravel surface, HSG A
139,480	58	Meadow, non-grazed, HSG B
201,561	51	Weighted Average
201,561		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0100	0.13		**Sheet Flow,** Range n= 0.130 P2= 3.40"
16.8	705	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.2	755	Total			

Subcatchment 12S: 4.1



Summary for Subcatchment 14S: 4.2

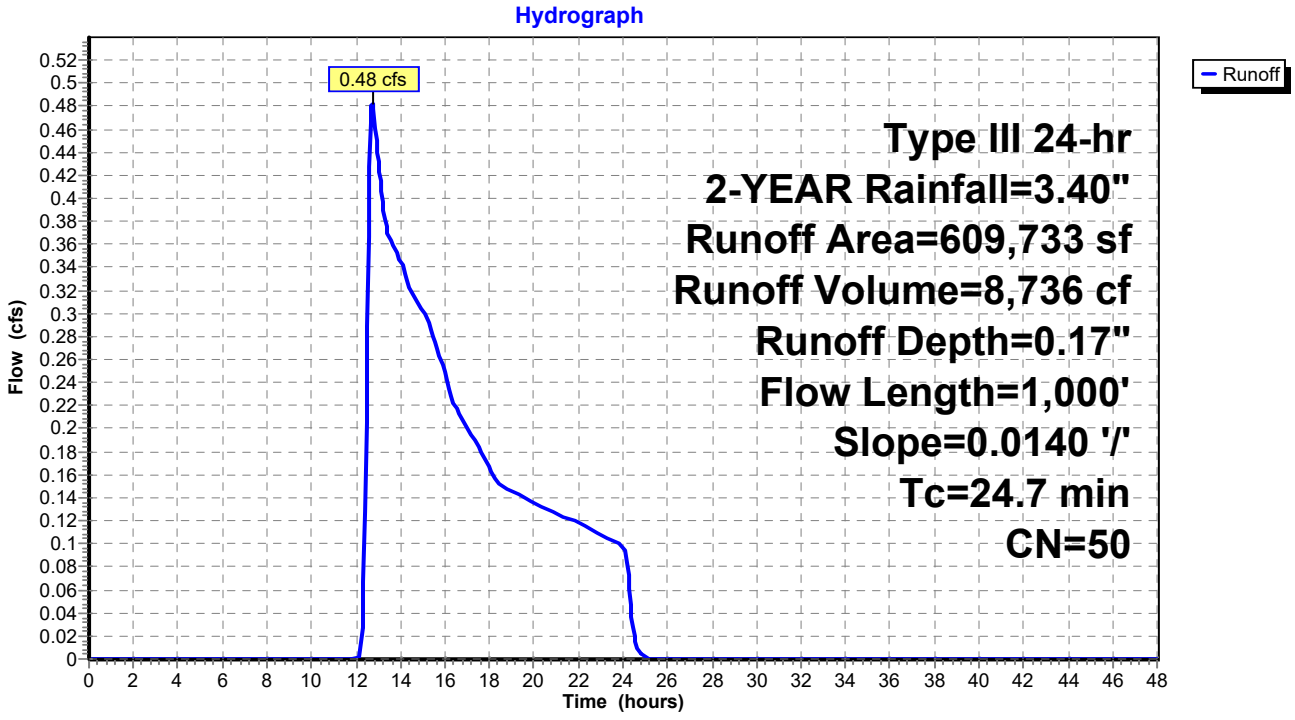
Runoff = 0.48 cfs @ 12.73 hrs, Volume= 8,736 cf, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
17,270	30	Woods, Good, HSG A
177,697	30	Meadow, non-grazed, HSG A
7,180	96	Gravel surface, HSG A
407,346	58	Meadow, non-grazed, HSG B
240	98	Unconnected roofs, HSG B
609,733	50	Weighted Average
609,493		99.96% Pervious Area
240		0.04% Impervious Area
240		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0140	0.15		**Sheet Flow,** Range n= 0.130 P2= 3.40"
19.1	950	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.7	1,000	Total			

Subcatchment 14S: 4.2



Summary for Subcatchment 16S: 4.3

[49] Hint: Tc<2dt may require smaller dt
[45] Hint: Runoff=Zero

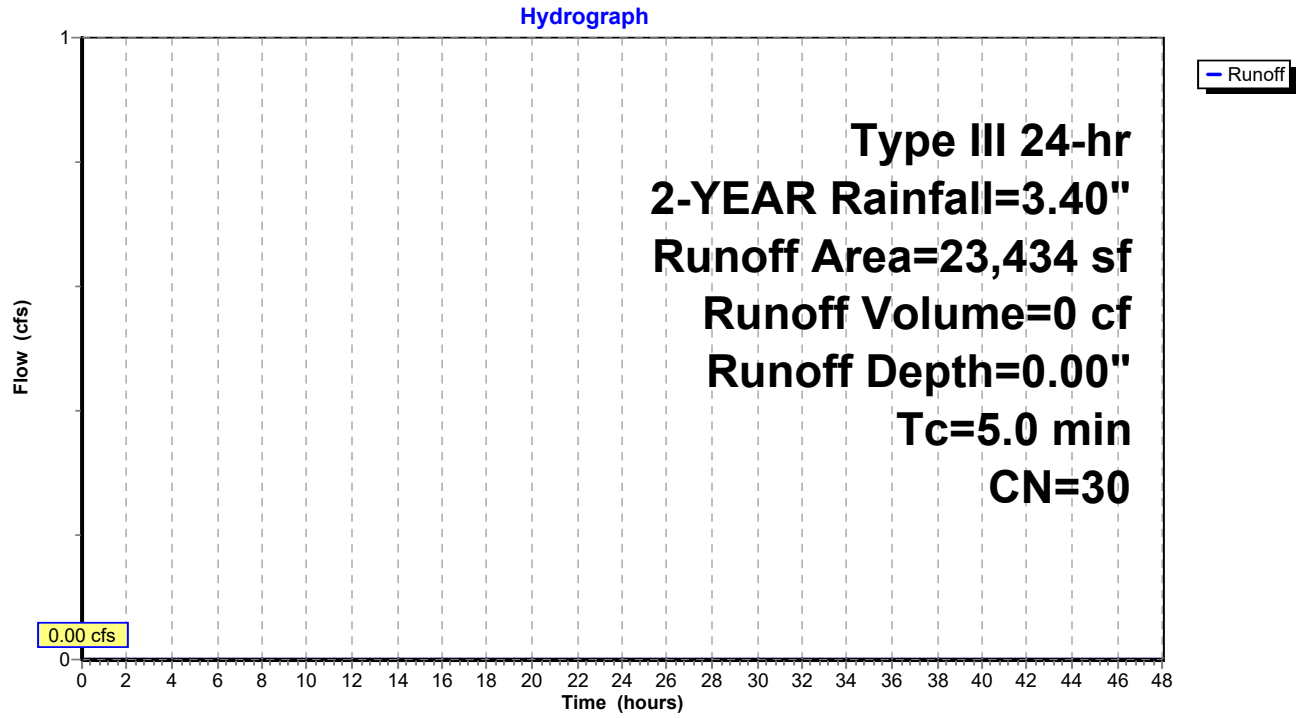
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
23,434	30	Woods, Good, HSG A
23,434		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 16S: 4.3



Summary for Subcatchment 17S: 5.1

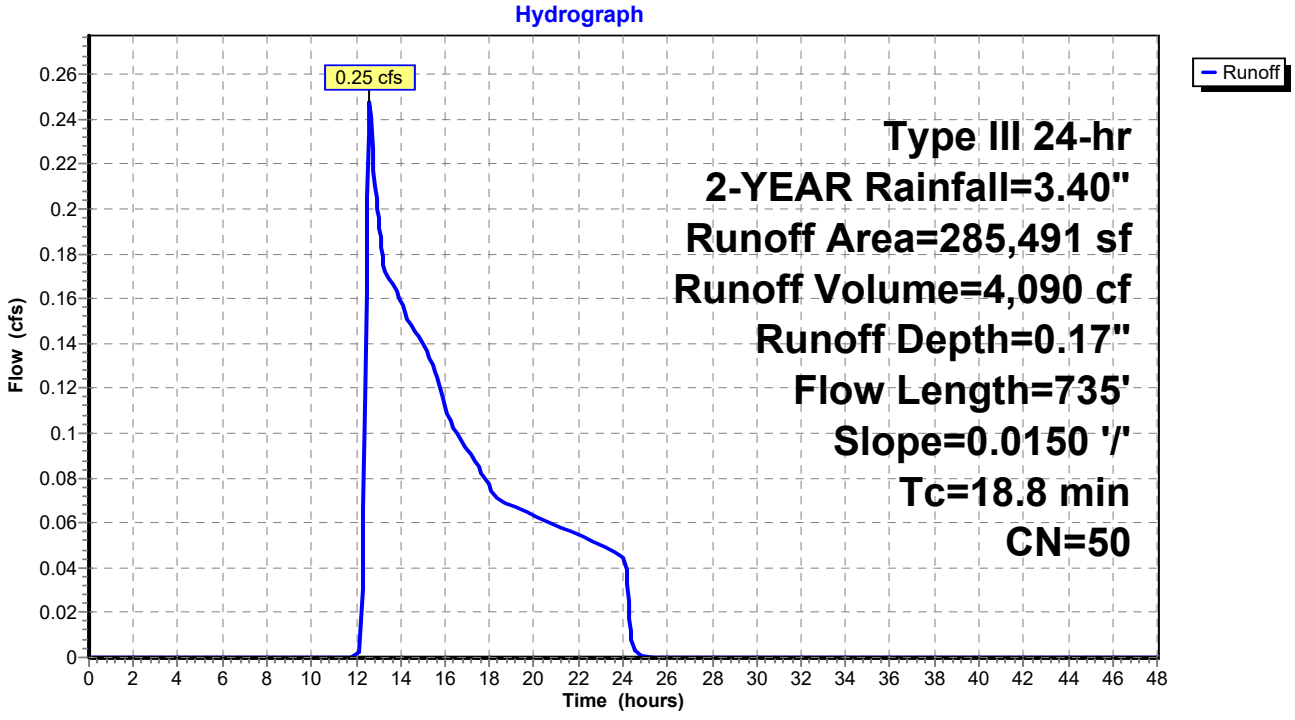
Runoff = 0.25 cfs @ 12.62 hrs, Volume= 4,090 cf, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
84,913	30	Meadow, non-grazed, HSG A
192,738	58	Meadow, non-grazed, HSG B
3,527	96	Gravel surface, HSG A
4,313	30	Woods, Good, HSG A
285,491	50	Weighted Average
285,491		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0150	0.15		**Sheet Flow,** Range n= 0.130 P2= 3.40"
13.3	685	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
18.8	735	Total			

Subcatchment 17S: 5.1



Summary for Subcatchment 19S: 5.2 (AP-5.2)

[45] Hint: Runoff=Zero

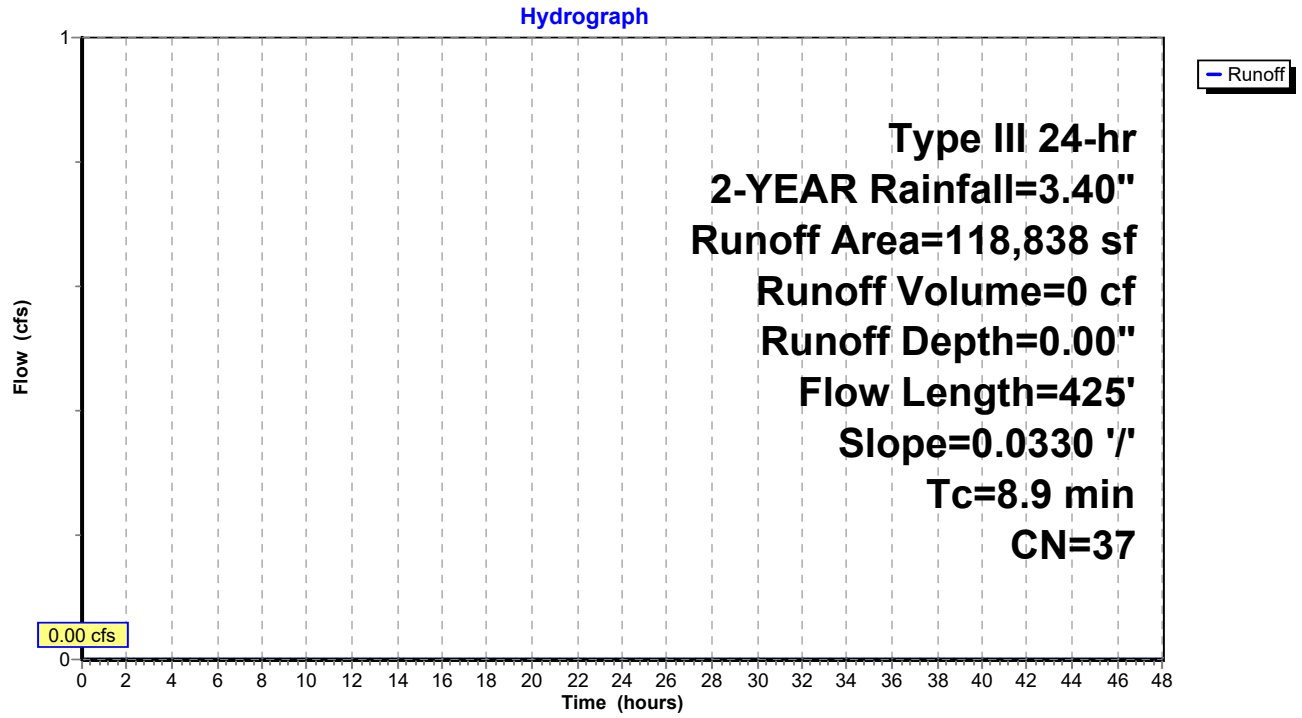
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.40"

Area (sf)	CN	Description
49,980	30	Meadow, non-grazed, HSG A
15,920	58	Meadow, non-grazed, HSG B
29,898	30	Brush, Good, HSG A
23,040	48	Brush, Good, HSG B
118,838	37	Weighted Average
118,838		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.0330	0.21		**Sheet Flow,** Range n= 0.130 P2= 3.40"
4.9	375	0.0330	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	425	Total			

Subcatchment 19S: 5.2 (AP-5.2)



Summary for Pond 4P: 2.1

Inflow Area = 56,747 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 194.00' @ 0.00 hrs Surf.Area= 1,685 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

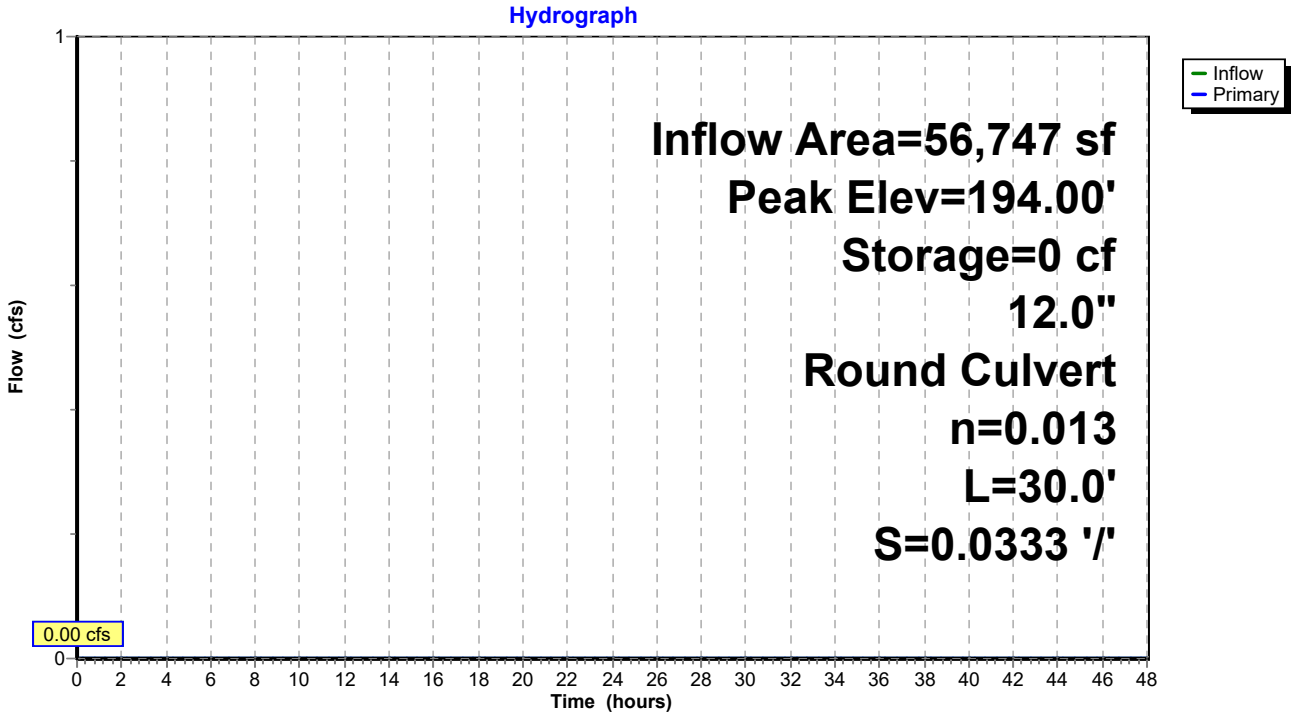
Volume	Invert	Avail.Storage	Storage Description
#1	194.00'	8,346 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.00	1,685	0	0
195.00	3,435	2,560	2,560
196.00	8,137	5,786	8,346

Device	Routing	Invert	Outlet Devices
#1	Primary	195.00'	**12.0" Round Culvert** L= 30.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 195.00' / 194.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=194.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Pond 4P: 2.1


Hydrograph
Inflow
Primary
Inflow Area=56,747 sf
Peak Elev=194.00'
Storage=0 cf
12.0"
Round Culvert
n=0.013
L=30.0'
S=0.0333 '/'
0.00 cfs
Flow (cfs)
Time (hours)
0
1
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 6P: 2.2

Inflow Area = 408,171 sf, 0.12% Impervious, Inflow Depth = 0.17" for 2-YEAR event
Inflow = 0.40 cfs @ 12.63 hrs, Volume= 5,774 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 189.39' @ 25.25 hrs Surf.Area= 15,791 sf Storage= 5,774 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

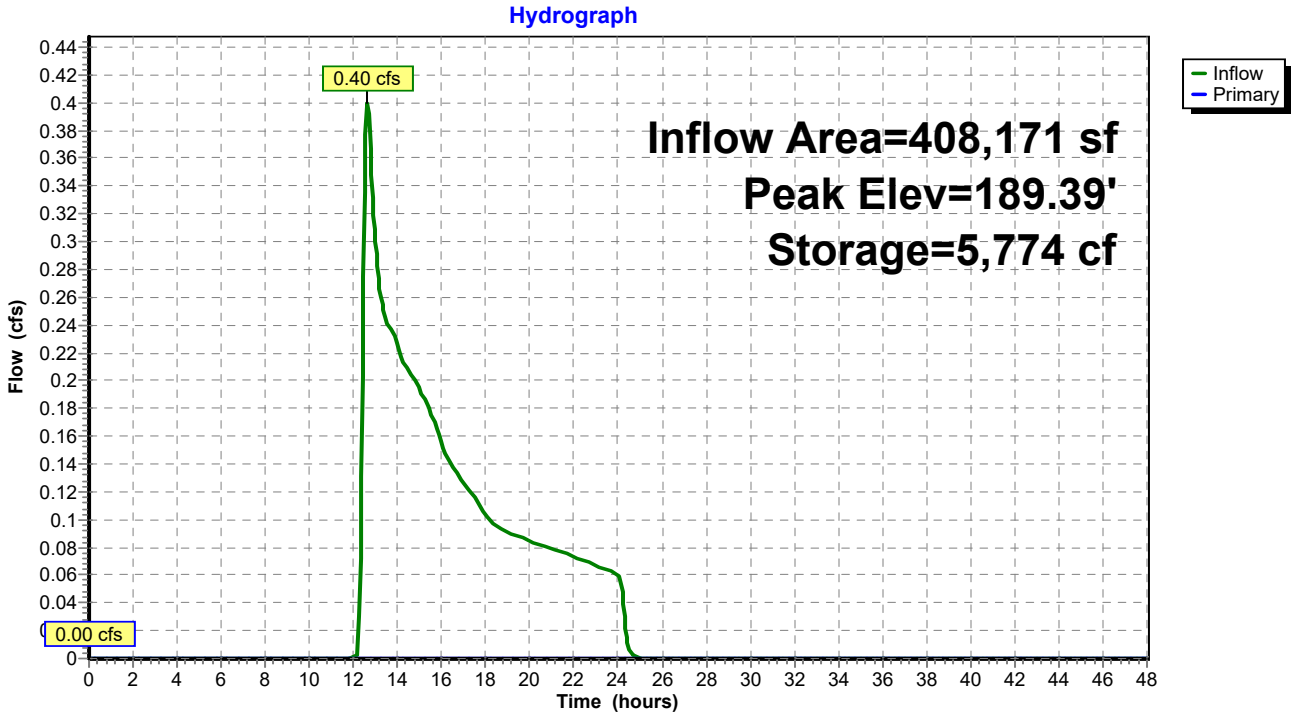
Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	71,615 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
189.00	13,767	0	0
190.00	18,949	16,358	16,358
191.00	28,052	23,501	39,859
192.00	35,460	31,756	71,615

Device	Routing	Invert	Outlet Devices
#1	Primary	190.75'	**10.0' long x 12.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#2	Primary	190.00'	**8.0" Round Culvert X 3.00** L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 190.00' / 190.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=189.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
2=Culvert (Controls 0.00 cfs)

Pond 6P: 2.2


Hydrograph
Inflow Area=408,171 sf
Peak Elev=189.39'
Storage=5,774 cf
0.40 cfs
0.00 cfs
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 9P: 3.1

Inflow Area = 87,591 sf, 0.27% Impervious, Inflow Depth = 0.35" for 2-YEAR event
Inflow = 0.31 cfs @ 12.44 hrs, Volume= 2,520 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 204.32' @ 25.00 hrs Surf.Area= 12,129 sf Storage= 2,520 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

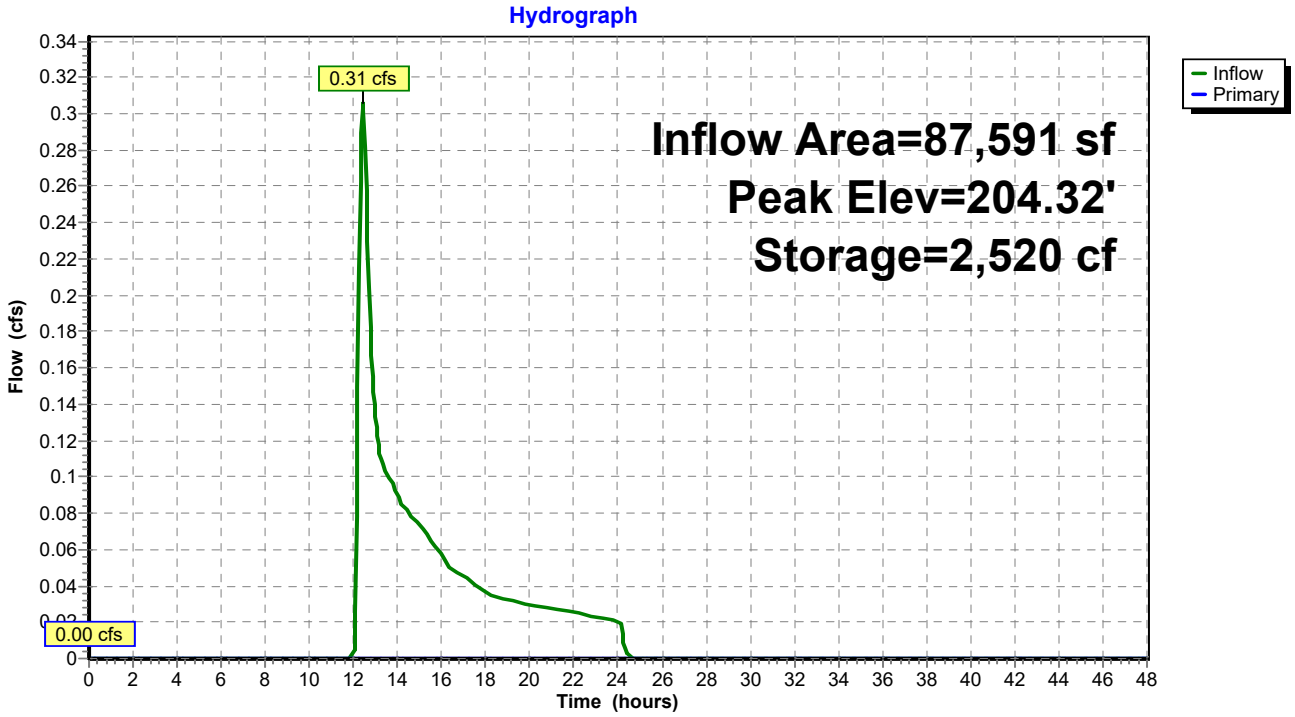
Volume	Invert	Avail.Storage	Storage Description
#1	204.00'	16,930 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
204.00	3,670	0	0
205.00	30,190	16,930	16,930

Device	Routing	Invert	Outlet Devices
#1	Primary	204.50'	**40.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=204.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 9P: 3.1


Hydrograph
Inflow Area=87,591 sf
Peak Elev=204.32'
Storage=2,520 cf
0.31 cfs
0.00 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0.34
0.32
0.3
0.28
0.26
0.24
0.22
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 11P: 3.2 (AP-3)

Inflow Area = 177,561 sf, 0.14% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 201.00' @ 0.00 hrs Surf.Area= 8,685 sf Storage= 0 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no inflow)

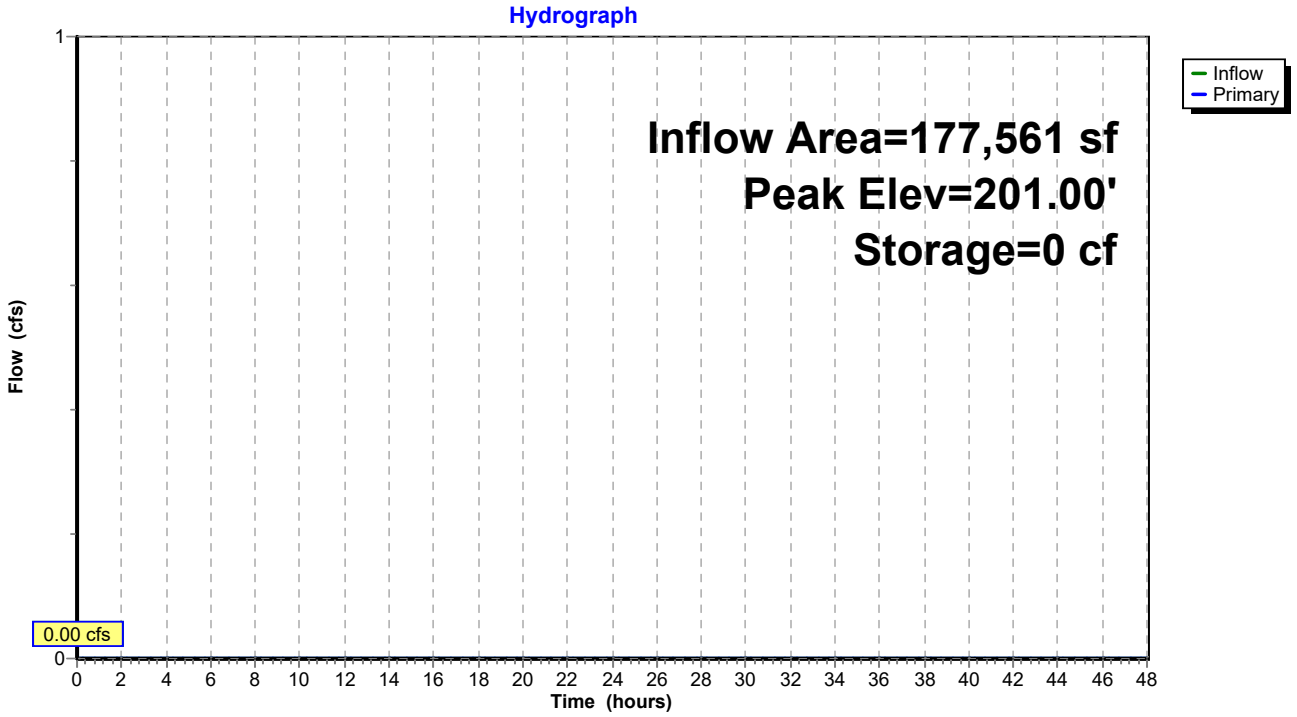
Volume	Invert	Avail.Storage	Storage Description
#1	201.00'	19,994 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.00	8,685	0	0
202.00	9,977	9,331	9,331
203.00	11,349	10,663	19,994

Device	Routing	Invert	Outlet Devices
#1	Primary	201.83'	**10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78
#2	Primary	201.33'	**8.0" Round Culvert** L= 40.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 201.33' / 201.00' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=201.00' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**2=Culvert** (Controls 0.00 cfs)

Pond 11P: 3.2 (AP-3)



Summary for Pond 13P: 4.1

Inflow Area = 201,561 sf, 0.00% Impervious, Inflow Depth = 0.20" for 2-YEAR event
Inflow = 0.22 cfs @ 12.66 hrs, Volume= 3,312 cf
Outflow = 0.15 cfs @ 13.28 hrs, Volume= 3,312 cf, Atten= 33%, Lag= 37.6 min
Primary = 0.15 cfs @ 13.28 hrs, Volume= 3,312 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 201.29' @ 13.28 hrs Surf.Area= 1,820 sf Storage= 274 cf

Plug-Flow detention time= 33.8 min calculated for 3,308 cf (100% of inflow)
Center-of-Mass det. time= 34.2 min (1,029.3 - 995.1)

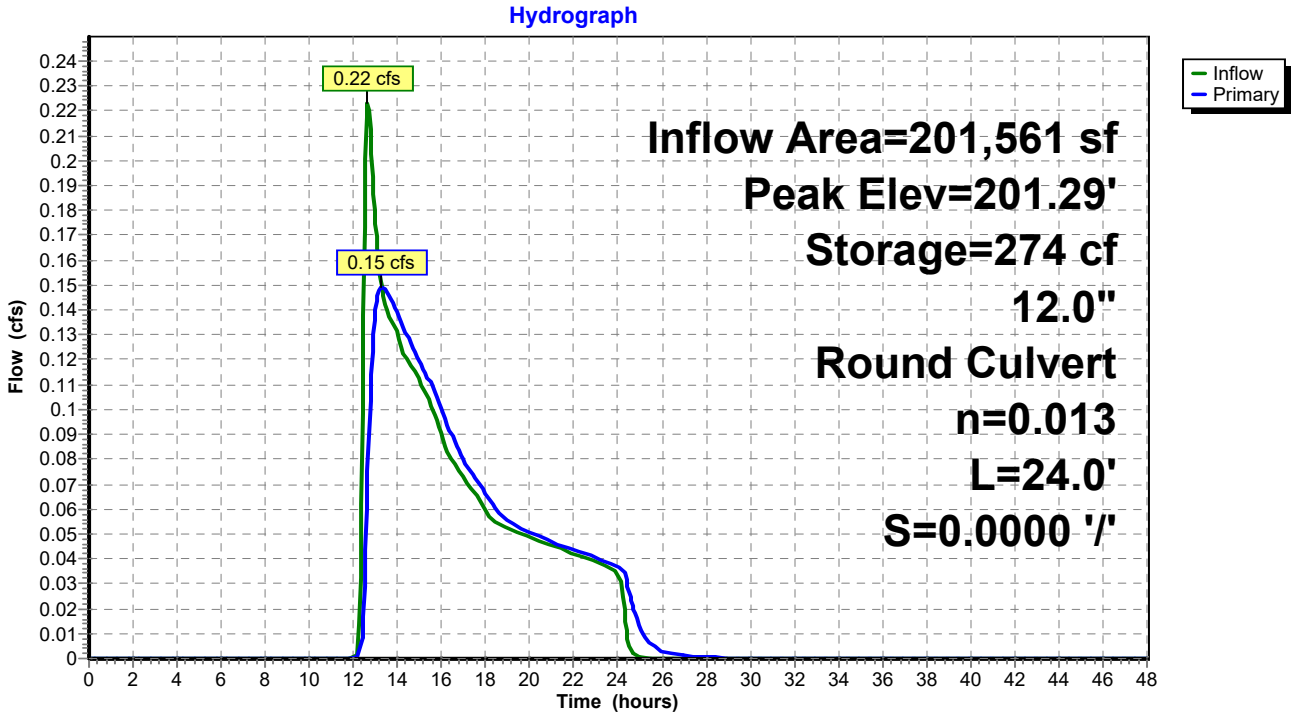
Volume	Invert	Avail.Storage	Storage Description
#1	201.00'	15,505 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.00	50	0	0
202.00	6,090	3,070	3,070
203.00	18,780	12,435	15,505

Device	Routing	Invert	Outlet Devices
#1	Primary	201.00'	**12.0" Round Culvert** L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 201.00' / 201.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.15 cfs @ 13.28 hrs HW=201.29' (Free Discharge)
1=Culvert (Barrel Controls 0.15 cfs @ 1.16 fps)

Pond 13P: 4.1


Hydrograph
Inflow
Primary
0.22 cfs
0.15 cfs
Inflow Area=201,561 sf
Peak Elev=201.29'
Storage=274 cf
12.0"
Round Culvert
n=0.013
L=24.0'
S=0.0000 '/'
Flow (cfs)
Time (hours)

Summary for Pond 15P: 4.2

Inflow Area = 811,294 sf, 0.03% Impervious, Inflow Depth = 0.18" for 2-YEAR event
Inflow = 0.59 cfs @ 12.80 hrs, Volume= 12,048 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 196.43' @ 48.00 hrs Surf.Area= 30,028 sf Storage= 12,046 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

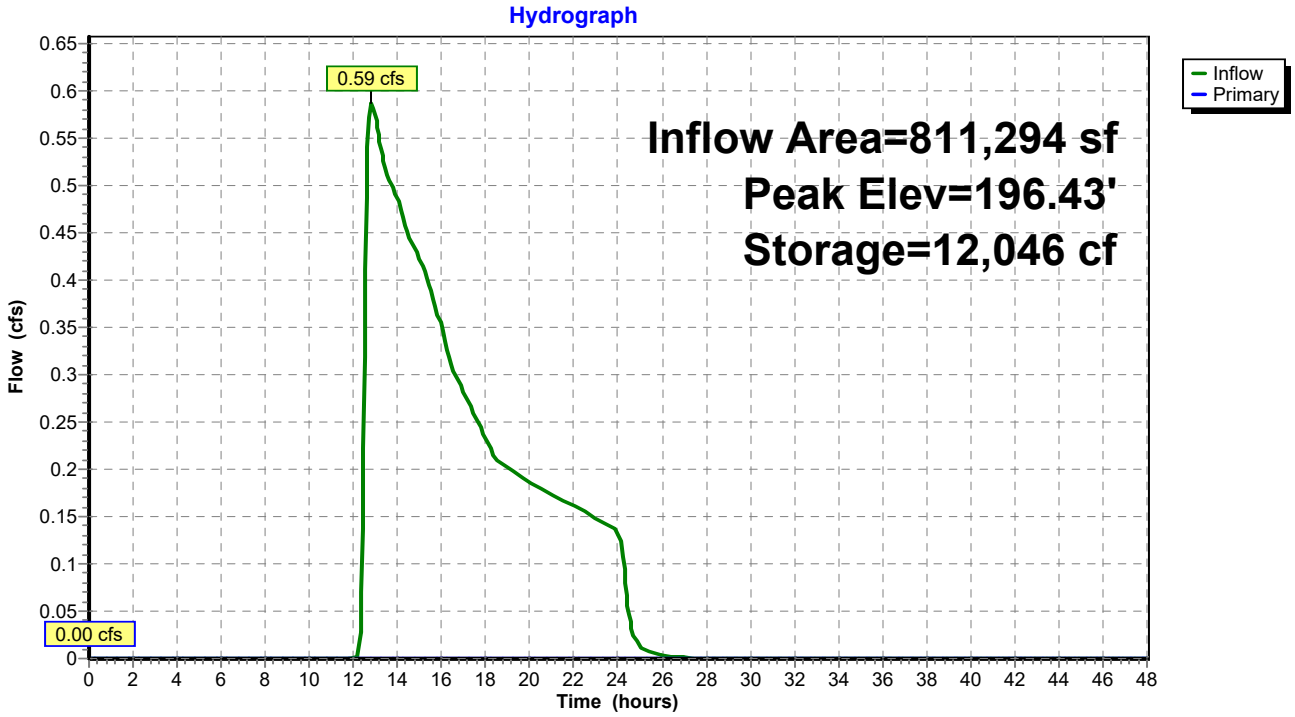
Volume	Invert	Avail.Storage	Storage Description
#1	196.00'	186,402 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
196.00	25,553	0	0
197.00	35,876	30,715	30,715
198.00	47,131	41,504	72,218
199.00	59,178	53,155	125,373
200.00	62,880	61,029	186,402

Device	Routing	Invert	Outlet Devices
#1	Primary	198.00'	**10.0' long x 31.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	197.00'	**12.0" Round Culvert** L= 40.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 197.00' / 196.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=196.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
2=Culvert (Controls 0.00 cfs)

Pond 15P: 4.2


Hydrograph
Inflow Area=811,294 sf
Peak Elev=196.43'
Storage=12,046 cf
0.59 cfs
0.00 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 18P: 5.1 (AP-5.1)

Inflow Area = 285,491 sf, 0.00% Impervious, Inflow Depth = 0.17" for 2-YEAR event
Inflow = 0.25 cfs @ 12.62 hrs, Volume= 4,090 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 196.23' @ 25.10 hrs Surf.Area= 17,801 sf Storage= 4,090 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

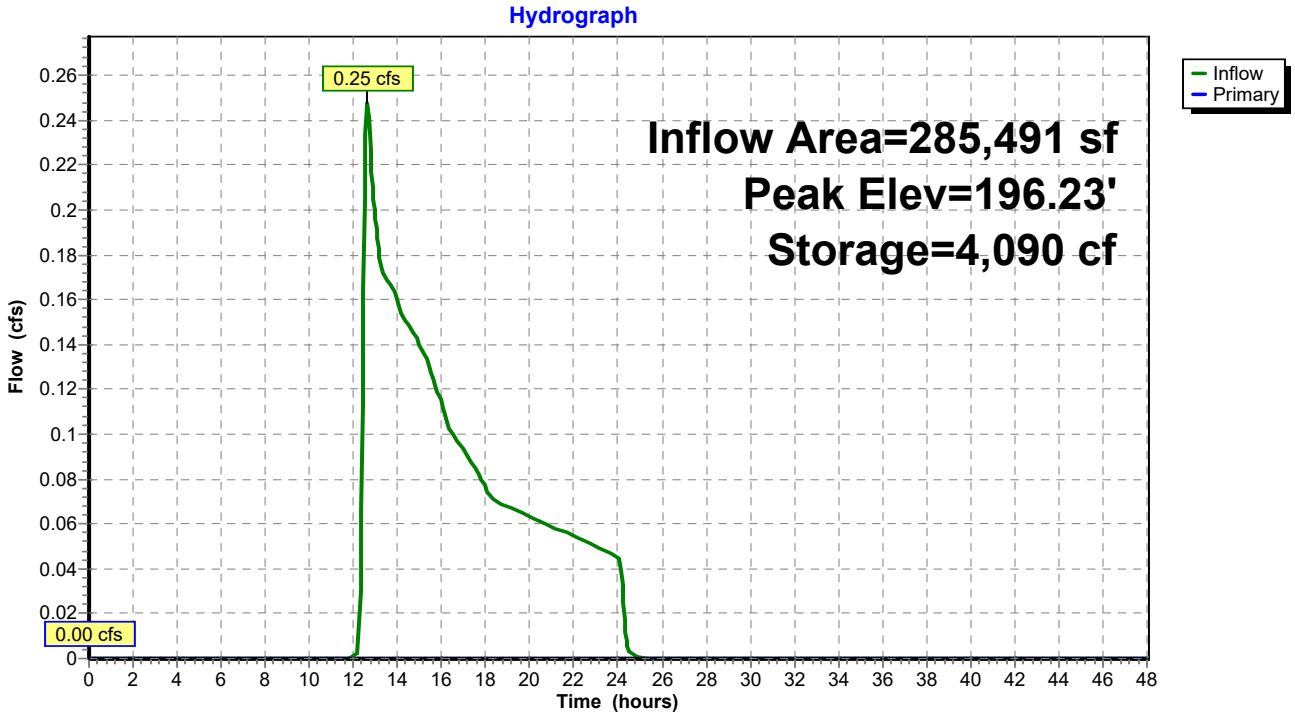
Volume	Invert	Avail.Storage	Storage Description
#1	196.00'	65,346 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
196.00	17,045	0	0
197.00	20,264	18,655	18,655
198.00	23,764	22,014	40,669
199.00	25,591	24,678	65,346

Device	Routing	Invert	Outlet Devices
#1	Primary	197.75'	**10.0' long x 18.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	197.00'	**12.0" Round Culvert** L= 32.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 197.00' / 196.00' S= 0.0313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=196.00' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
2=Culvert (Controls 0.00 cfs)

Pond 18P: 5.1 (AP-5.1)

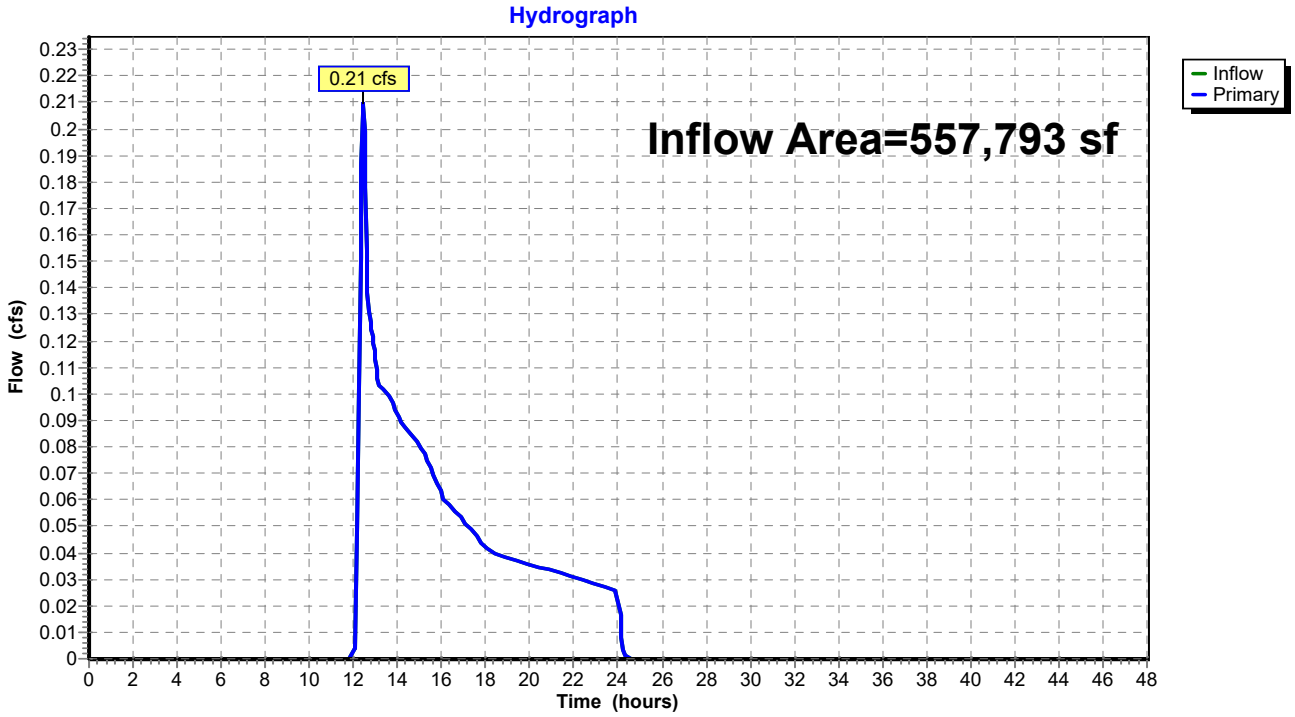


Summary for Link 20L: AP-2

Inflow Area = 557,793 sf, 0.09% Impervious, Inflow Depth = 0.05" for 2-YEAR event
Inflow = 0.21 cfs @ 12.44 hrs, Volume= 2,458 cf
Primary = 0.21 cfs @ 12.44 hrs, Volume= 2,458 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 20L: AP-2

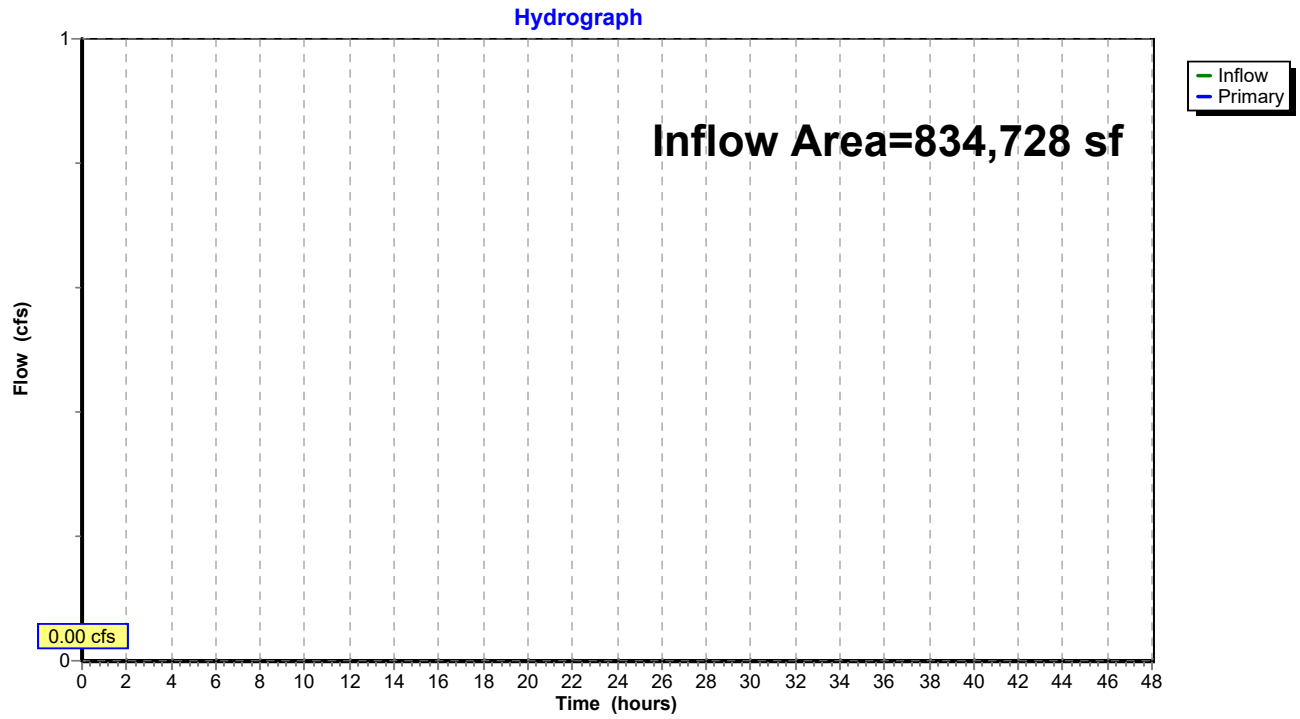


Summary for Link 21L: AP-4

Inflow Area = 834,728 sf, 0.03% Impervious, Inflow Depth = 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 21L: AP-4



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: AP-1 Runoff Area=90,105 sf 9.67% Impervious Runoff Depth=2.32"
Tc=8.0 min CN=60 Runoff=4.98 cfs 17,453 cf

Subcatchment 3S: 2.1 Runoff Area=56,747 sf 0.00% Impervious Runoff Depth=0.39"
Flow Length=500' Slope=0.0180 '/' Tc=13.1 min CN=35 Runoff=0.15 cfs 1,835 cf

Subcatchment 5S: 2.2 Runoff Area=351,424 sf 0.14% Impervious Runoff Depth=1.53"
Flow Length=905' Slope=0.0160 '/' Tc=21.4 min CN=51 Runoff=8.12 cfs 44,867 cf

Subcatchment 7S: 2.3 Runoff Area=149,622 sf 0.00% Impervious Runoff Depth=1.53"
Flow Length=420' Slope=0.0350 '/' Tc=8.6 min CN=51 Runoff=4.76 cfs 19,103 cf

Subcatchment 8S: 3.1 Runoff Area=87,591 sf 0.27% Impervious Runoff Depth=1.96"
Flow Length=335' Slope=0.0060 '/' Tc=16.7 min CN=56 Runoff=3.08 cfs 14,324 cf

Subcatchment 10S: 3.2 Runoff Area=89,970 sf 0.00% Impervious Runoff Depth=0.33"
Flow Length=650' Slope=0.0120 '/' Tc=19.0 min CN=34 Runoff=0.15 cfs 2,502 cf

Subcatchment 12S: 4.1 Runoff Area=201,561 sf 0.00% Impervious Runoff Depth=1.53"
Flow Length=755' Slope=0.0100 '/' Tc=23.2 min CN=51 Runoff=4.51 cfs 25,734 cf

Subcatchment 14S: 4.2 Runoff Area=609,733 sf 0.04% Impervious Runoff Depth=1.45"
Flow Length=1,000' Slope=0.0140 '/' Tc=24.7 min CN=50 Runoff=12.35 cfs 73,641 cf

Subcatchment 16S: 4.3 Runoff Area=23,434 sf 0.00% Impervious Runoff Depth=0.15"
Tc=5.0 min CN=30 Runoff=0.01 cfs 289 cf

Subcatchment 17S: 5.1 Runoff Area=285,491 sf 0.00% Impervious Runoff Depth=1.45"
Flow Length=735' Slope=0.0150 '/' Tc=18.8 min CN=50 Runoff=6.42 cfs 34,481 cf

Subcatchment 19S: 5.2 (AP-5.2) Runoff Area=118,838 sf 0.00% Impervious Runoff Depth=0.50"
Flow Length=425' Slope=0.0330 '/' Tc=8.9 min CN=37 Runoff=0.54 cfs 4,998 cf

Pond 4P: 2.1 Peak Elev=194.78' Storage=1,835 cf Inflow=0.15 cfs 1,835 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0333 '/' Outflow=0.00 cfs 0 cf

Pond 6P: 2.2 Peak Elev=190.46' Storage=25,925 cf Inflow=8.12 cfs 44,867 cf
Outflow=0.85 cfs 27,307 cf

Pond 9P: 3.1 Peak Elev=204.54' Storage=5,854 cf Inflow=3.08 cfs 14,324 cf
Outflow=0.83 cfs 9,174 cf

Pond 11P: 3.2 (AP-3) Peak Elev=201.63' Storage=5,761 cf Inflow=0.96 cfs 11,676 cf
Outflow=0.25 cfs 8,438 cf

Pond 13P: 4.1 Peak Elev=202.26' Storage=5,070 cf Inflow=4.51 cfs 25,734 cf
12.0" Round Culvert n=0.013 L=24.0' S=0.0000 '/' Outflow=2.27 cfs 25,734 cf

Pond 15P: 4.2 Peak Elev=197.73' Storage=59,687 cf Inflow=14.11 cfs 99,375 cf
Outflow=1.56 cfs 65,148 cf

Pond 18P: 5.1 (AP-5.1) Peak Elev=197.31' Storage=25,190 cf Inflow=6.42 cfs 34,481 cf
Outflow=0.36 cfs 14,816 cf

Link 20L: AP-2 Inflow=4.76 cfs 46,410 cf
Primary=4.76 cfs 46,410 cf

Link 21L: AP-4 Inflow=1.57 cfs 65,437 cf
Primary=1.57 cfs 65,437 cf

Total Runoff Area = 2,064,516 sf Runoff Volume = 239,227 cf Average Runoff Depth = 1.39"
99.53% Pervious = 2,054,844 sf 0.47% Impervious = 9,672 sf

Summary for Subcatchment 1S: AP-1

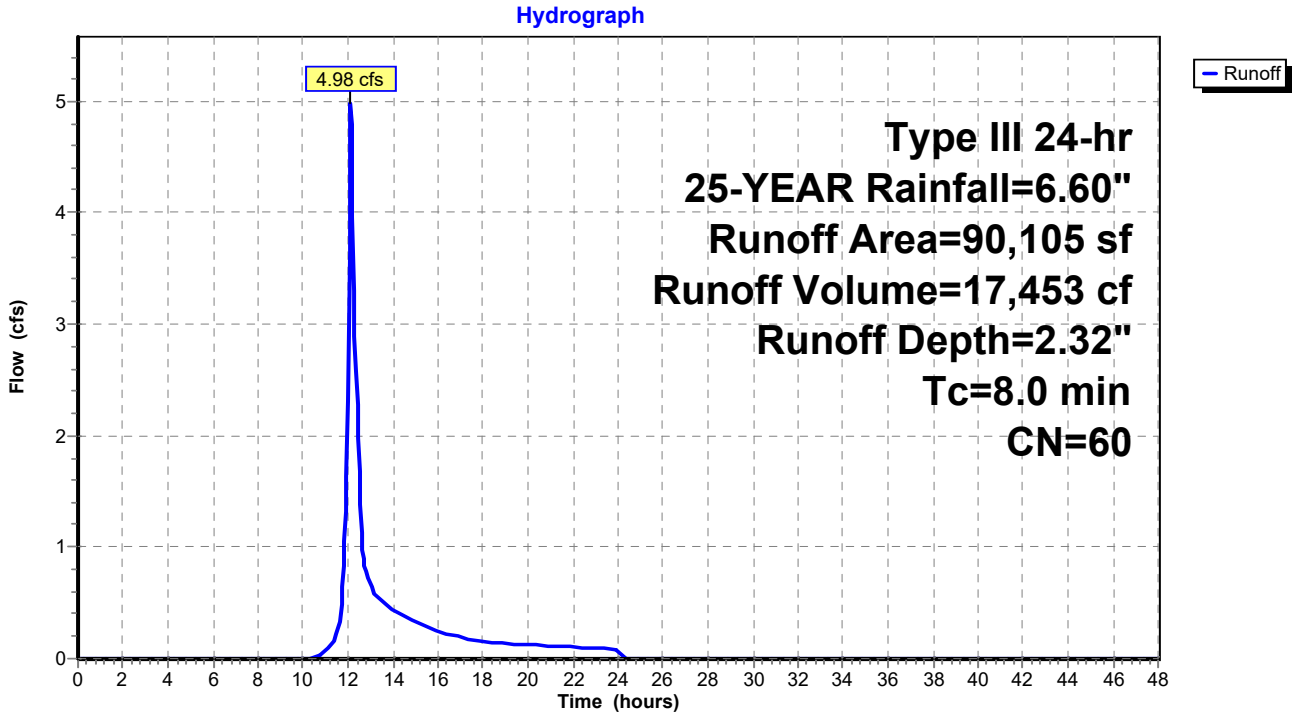
Runoff = 4.98 cfs @ 12.12 hrs, Volume= 17,453 cf, Depth= 2.32"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
38,399	51	1 acre lots, 20% imp, HSG A
5,161	84	1 acre lots, 20% imp, HSG D
2,850	96	Gravel surface, HSG A
7,762	96	Gravel surface, HSG D
16,607	30	Meadow, non-grazed, HSG A
19,326	78	Meadow, non-grazed, HSG D
90,105	60	Weighted Average
81,393		90.33% Pervious Area
8,712		9.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Subcatchment 1S: AP-1



Summary for Subcatchment 3S: 2.1

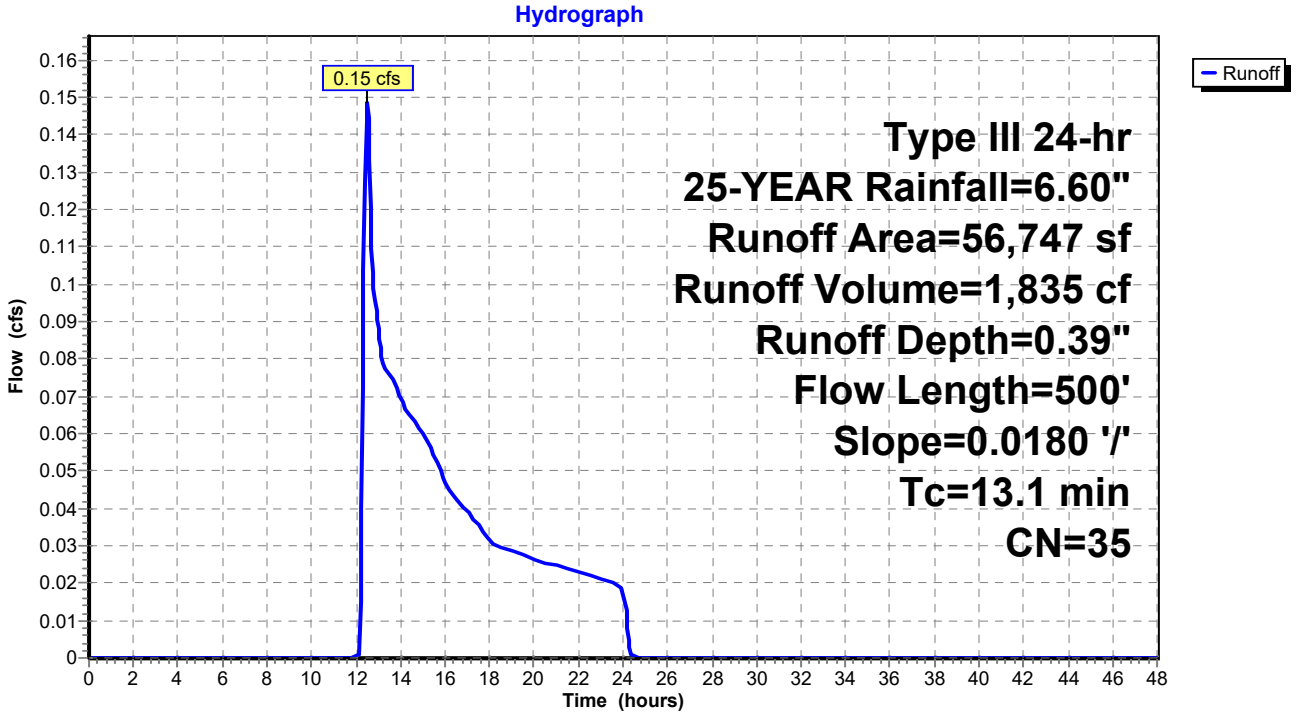
Runoff = 0.15 cfs @ 12.50 hrs, Volume= 1,835 cf, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
29,966	30	Woods, Good, HSG A
22,363	30	Meadow, non-grazed, HSG A
4,418	96	Gravel surface, HSG A
56,747	35	Weighted Average
56,747		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0180	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.0	450	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.1	500	Total			

Subcatchment 3S: 2.1



Summary for Subcatchment 5S: 2.2

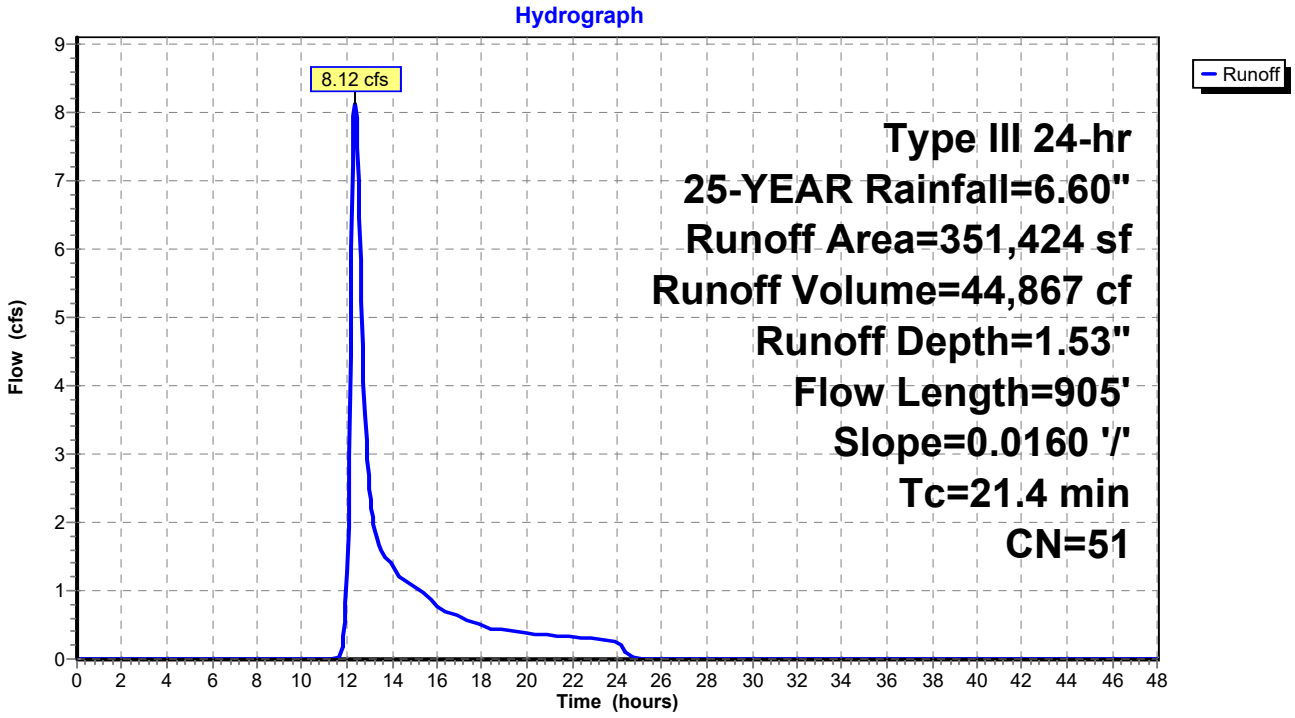
Runoff = 8.12 cfs @ 12.35 hrs, Volume= 44,867 cf, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
6,360	78	Meadow, non-grazed, HSG D
480	98	Unconnected roofs, HSG B
242,615	58	Meadow, non-grazed, HSG B
95,975	30	Meadow, non-grazed, HSG A
5,994	96	Gravel surface, HSG A
351,424	51	Weighted Average
350,944		99.86% Pervious Area
480		0.14% Impervious Area
480		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
16.1	855	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.4	905	Total			

Subcatchment 5S: 2.2



Summary for Subcatchment 7S: 2.3

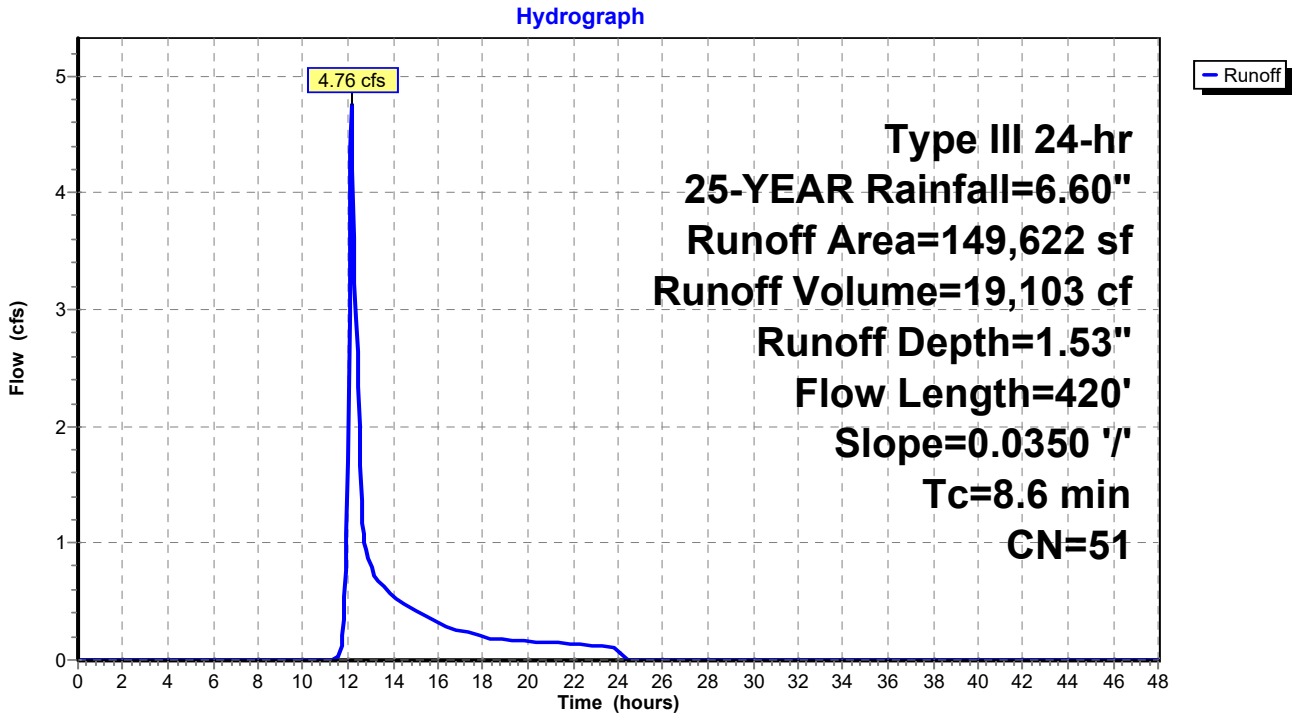
Runoff = 4.76 cfs @ 12.15 hrs, Volume= 19,103 cf, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
328	96	Gravel surface, HSG A
276	96	Gravel surface, HSG D
78,998	30	Meadow, non-grazed, HSG A
16,547	58	Meadow, non-grazed, HSG B
53,473	78	Meadow, non-grazed, HSG D
149,622	51	Weighted Average
149,622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0350	0.21		**Sheet Flow,** Range n= 0.130 P2= 3.40"
4.7	370	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	420	Total			

Subcatchment 7S: 2.3



Summary for Subcatchment 8S: 3.1

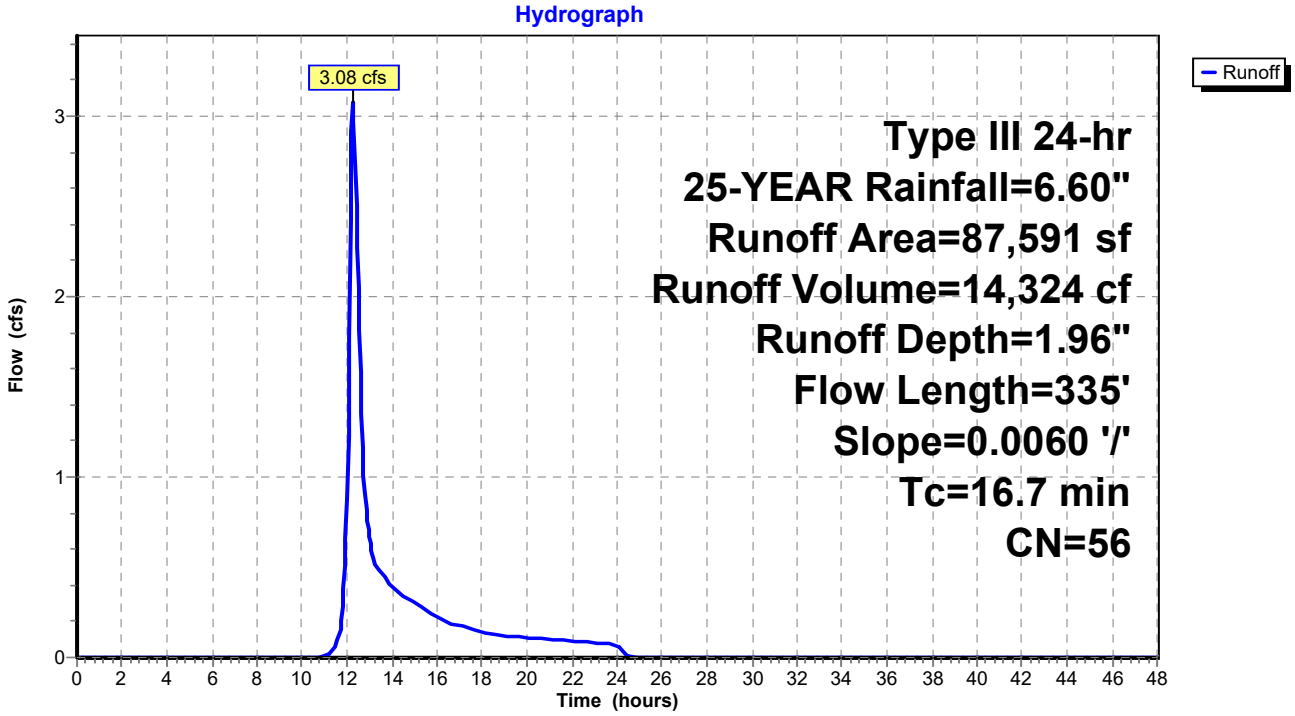
Runoff = 3.08 cfs @ 12.26 hrs, Volume= 14,324 cf, Depth= 1.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
240	98	Unconnected roofs, HSG B
73,156	58	Meadow, non-grazed, HSG B
10,475	30	Meadow, non-grazed, HSG A
3,720	96	Gravel surface, HSG A
87,591	56	Weighted Average
87,351		99.73% Pervious Area
240		0.27% Impervious Area
240		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0060	0.11		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.8	285	0.0060	0.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.7	335	Total			

Subcatchment 8S: 3.1



Summary for Subcatchment 10S: 3.2

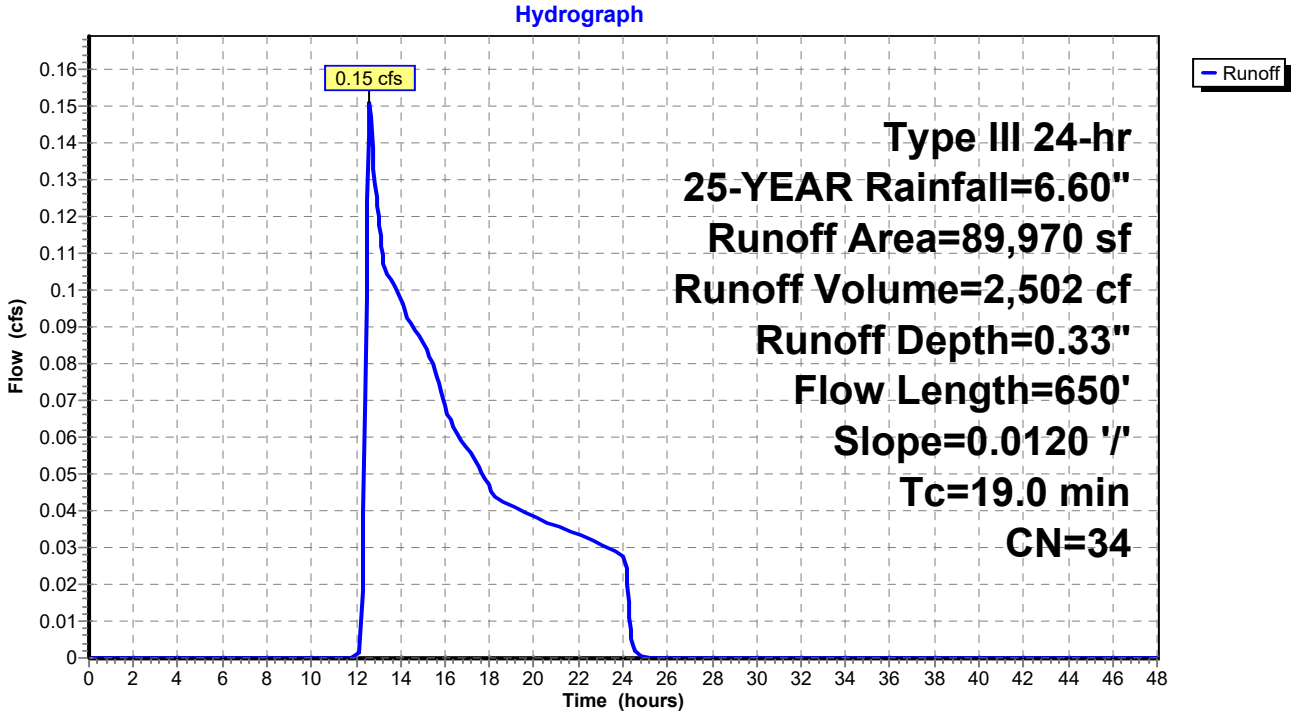
Runoff = 0.15 cfs @ 12.62 hrs, Volume= 2,502 cf, Depth= 0.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
32,262	30	Woods, Good, HSG A
52,598	30	Meadow, non-grazed, HSG A
5,110	96	Gravel surface, HSG A
89,970	34	Weighted Average
89,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0120	0.14		**Sheet Flow,** Range n= 0.130 P2= 3.40"
13.0	600	0.0120	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.0	650	Total			

Subcatchment 10S: 3.2



Summary for Subcatchment 12S: 4.1

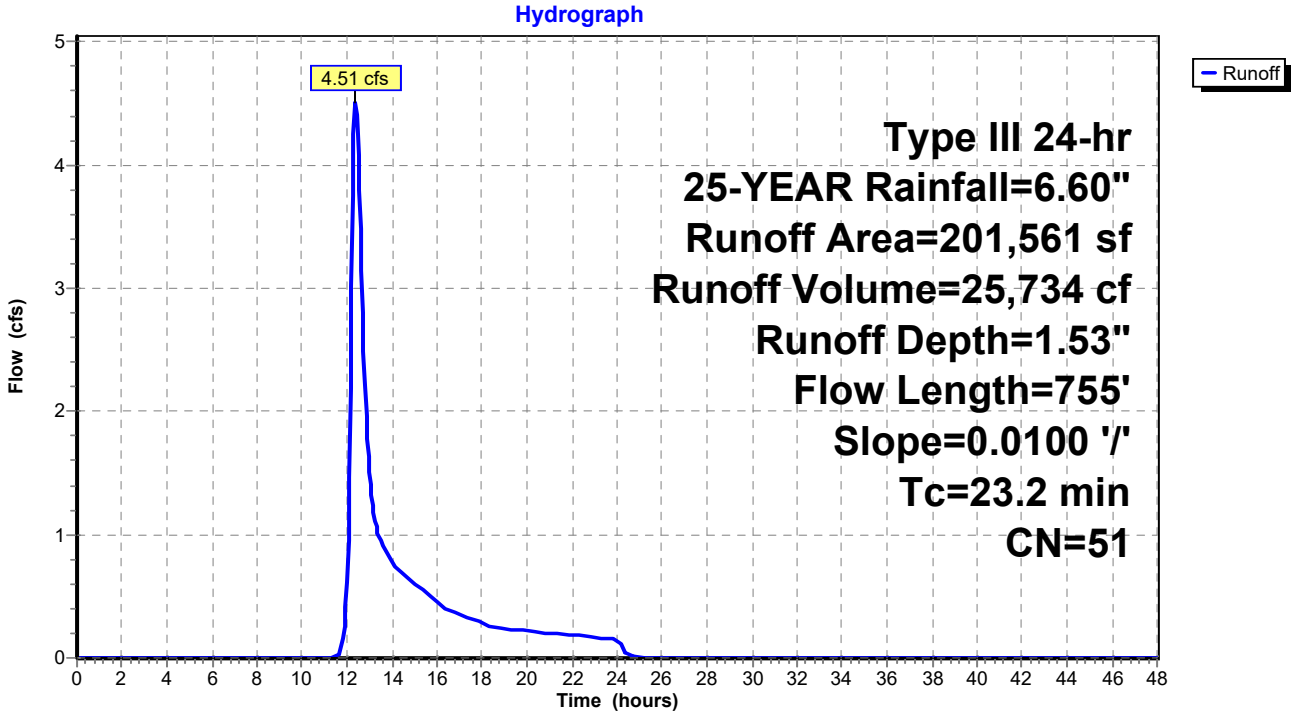
Runoff = 4.51 cfs @ 12.38 hrs, Volume= 25,734 cf, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
57,023	30	Meadow, non-grazed, HSG A
5,058	96	Gravel surface, HSG A
139,480	58	Meadow, non-grazed, HSG B
201,561	51	Weighted Average
201,561		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0100	0.13		**Sheet Flow,** Range n= 0.130 P2= 3.40"
16.8	705	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.2	755	Total			

Subcatchment 12S: 4.1



Summary for Subcatchment 14S: 4.2

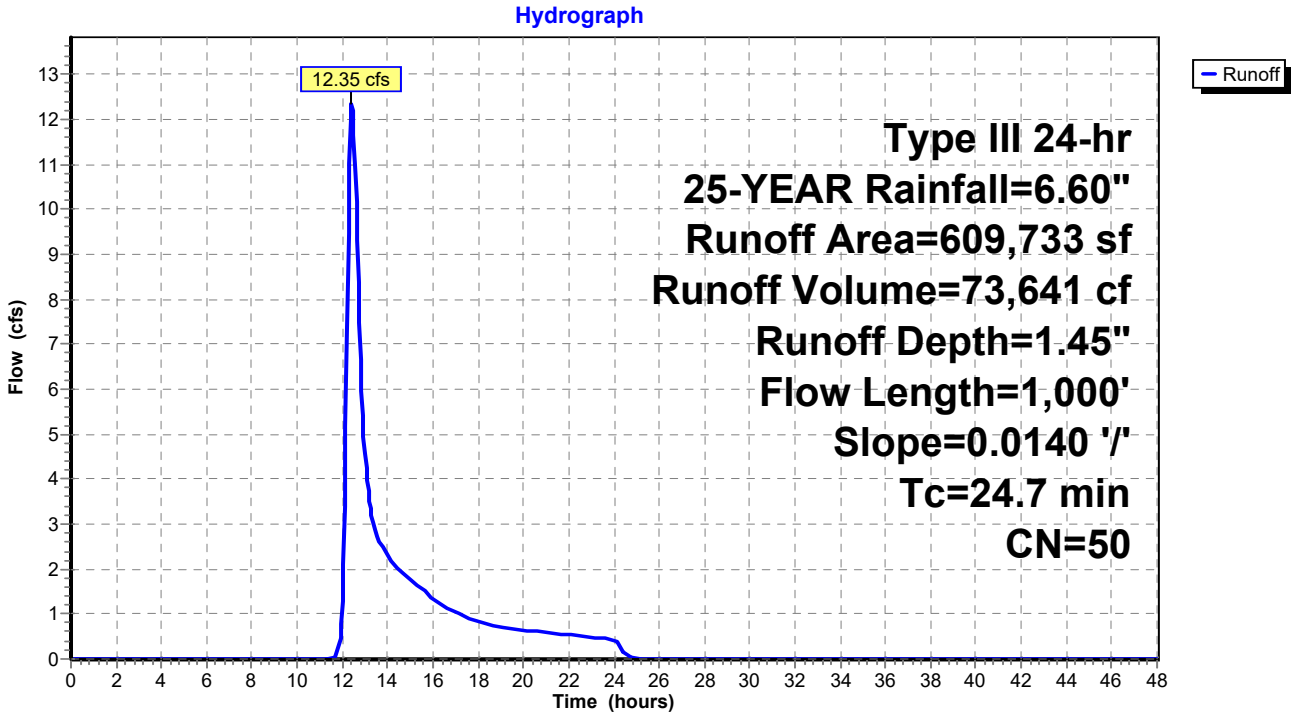
Runoff = 12.35 cfs @ 12.41 hrs, Volume= 73,641 cf, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
17,270	30	Woods, Good, HSG A
177,697	30	Meadow, non-grazed, HSG A
7,180	96	Gravel surface, HSG A
407,346	58	Meadow, non-grazed, HSG B
240	98	Unconnected roofs, HSG B
609,733	50	Weighted Average
609,493		99.96% Pervious Area
240		0.04% Impervious Area
240		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0140	0.15		**Sheet Flow,** Range n= 0.130 P2= 3.40"
19.1	950	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.7	1,000	Total			

Subcatchment 14S: 4.2



Summary for Subcatchment 16S: 4.3

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

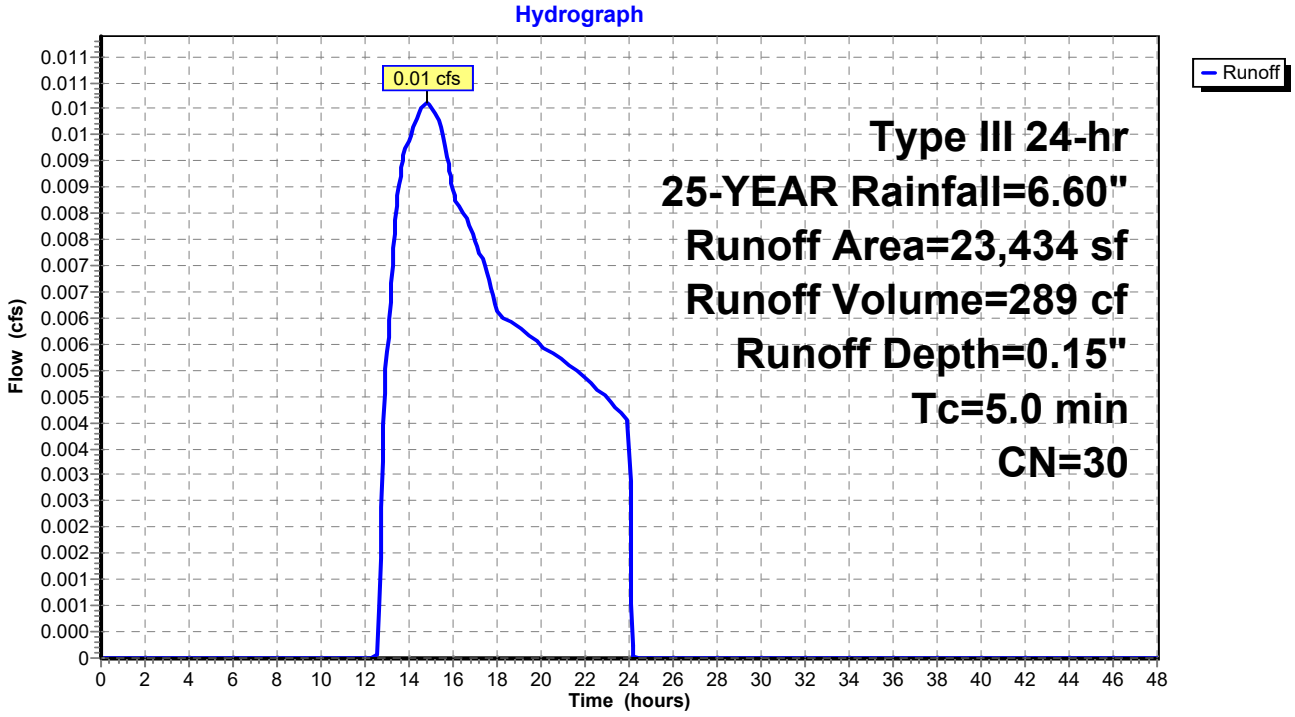
Runoff = 0.01 cfs @ 14.80 hrs, Volume= 289 cf, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
23,434	30	Woods, Good, HSG A
23,434		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 16S: 4.3



Summary for Subcatchment 17S: 5.1

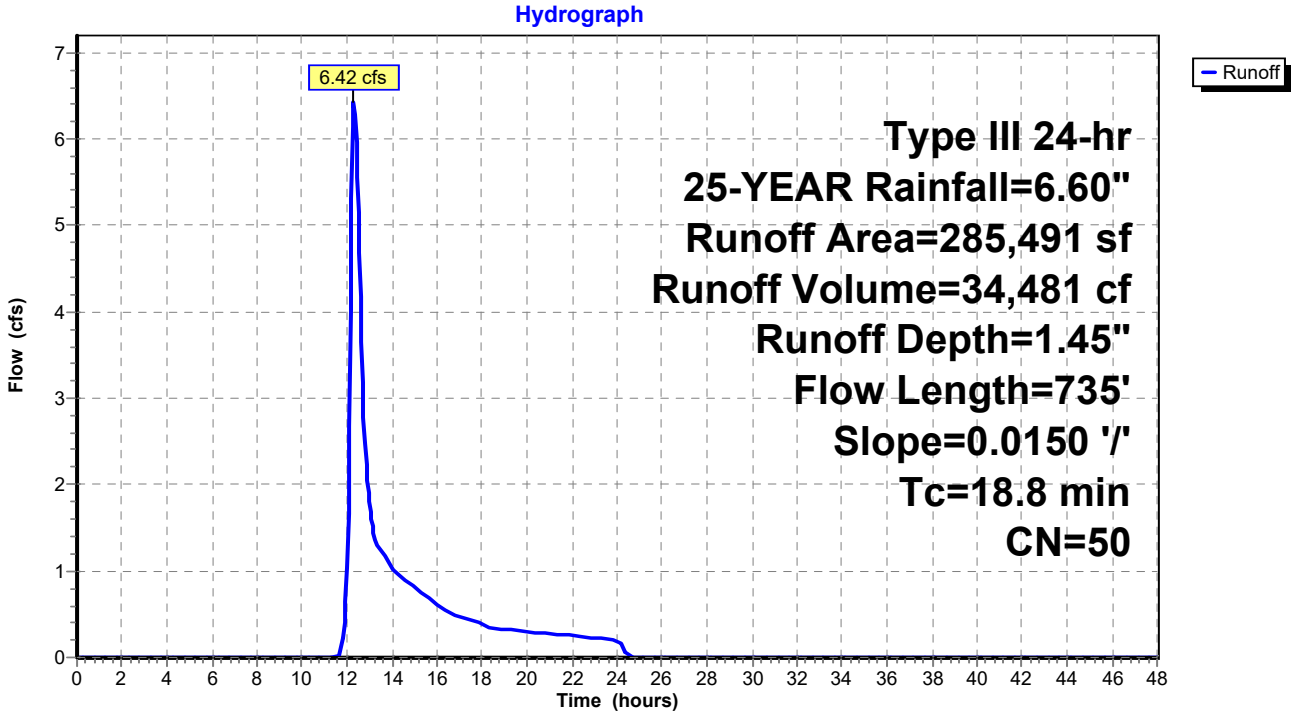
Runoff = 6.42 cfs @ 12.31 hrs, Volume= 34,481 cf, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
84,913	30	Meadow, non-grazed, HSG A
192,738	58	Meadow, non-grazed, HSG B
3,527	96	Gravel surface, HSG A
4,313	30	Woods, Good, HSG A
285,491	50	Weighted Average
285,491		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0150	0.15		**Sheet Flow,** Range n= 0.130 P2= 3.40"
13.3	685	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
18.8	735	Total			

Subcatchment 17S: 5.1



Summary for Subcatchment 19S: 5.2 (AP-5.2)

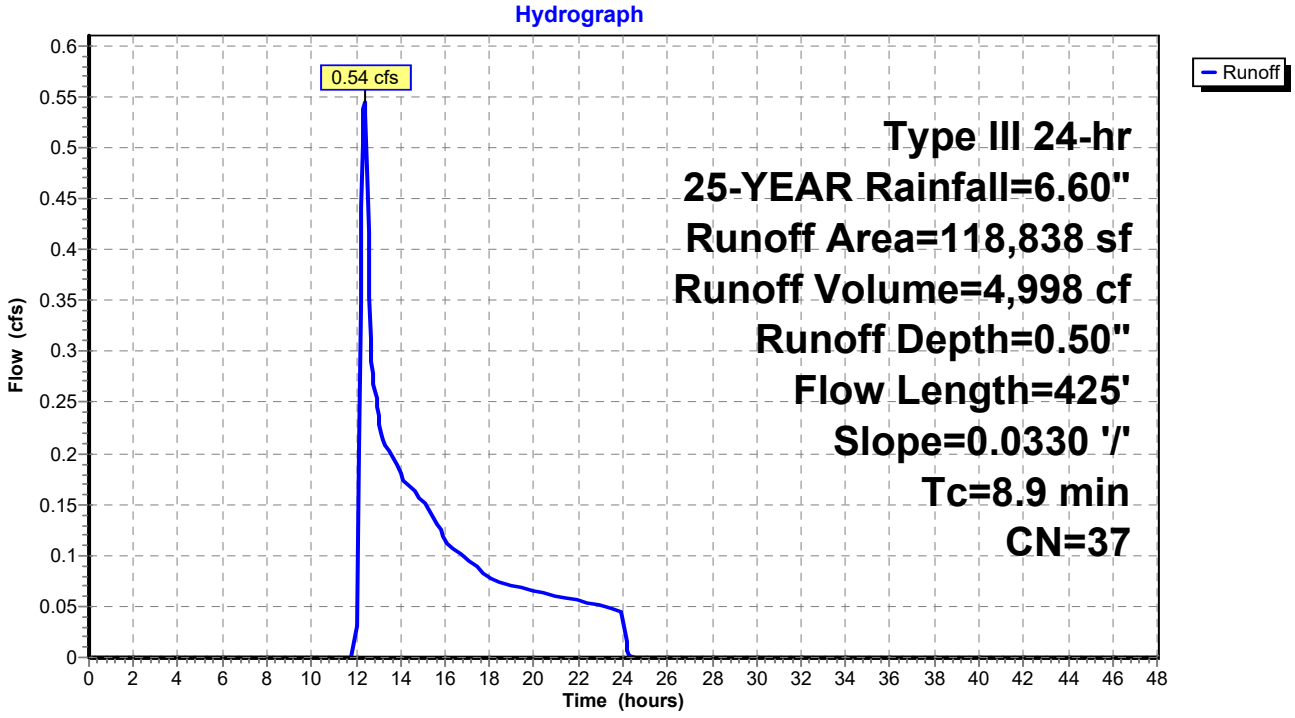
Runoff = 0.54 cfs @ 12.38 hrs, Volume= 4,998 cf, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-YEAR Rainfall=6.60"

Area (sf)	CN	Description
49,980	30	Meadow, non-grazed, HSG A
15,920	58	Meadow, non-grazed, HSG B
29,898	30	Brush, Good, HSG A
23,040	48	Brush, Good, HSG B
118,838	37	Weighted Average
118,838		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.0330	0.21		**Sheet Flow,** Range n= 0.130 P2= 3.40"
4.9	375	0.0330	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	425	Total			

Subcatchment 19S: 5.2 (AP-5.2)



Summary for Pond 4P: 2.1

Inflow Area = 56,747 sf, 0.00% Impervious, Inflow Depth = 0.39" for 25-YEAR event
Inflow = 0.15 cfs @ 12.50 hrs, Volume= 1,835 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 194.78' @ 24.80 hrs Surf.Area= 3,043 sf Storage= 1,835 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

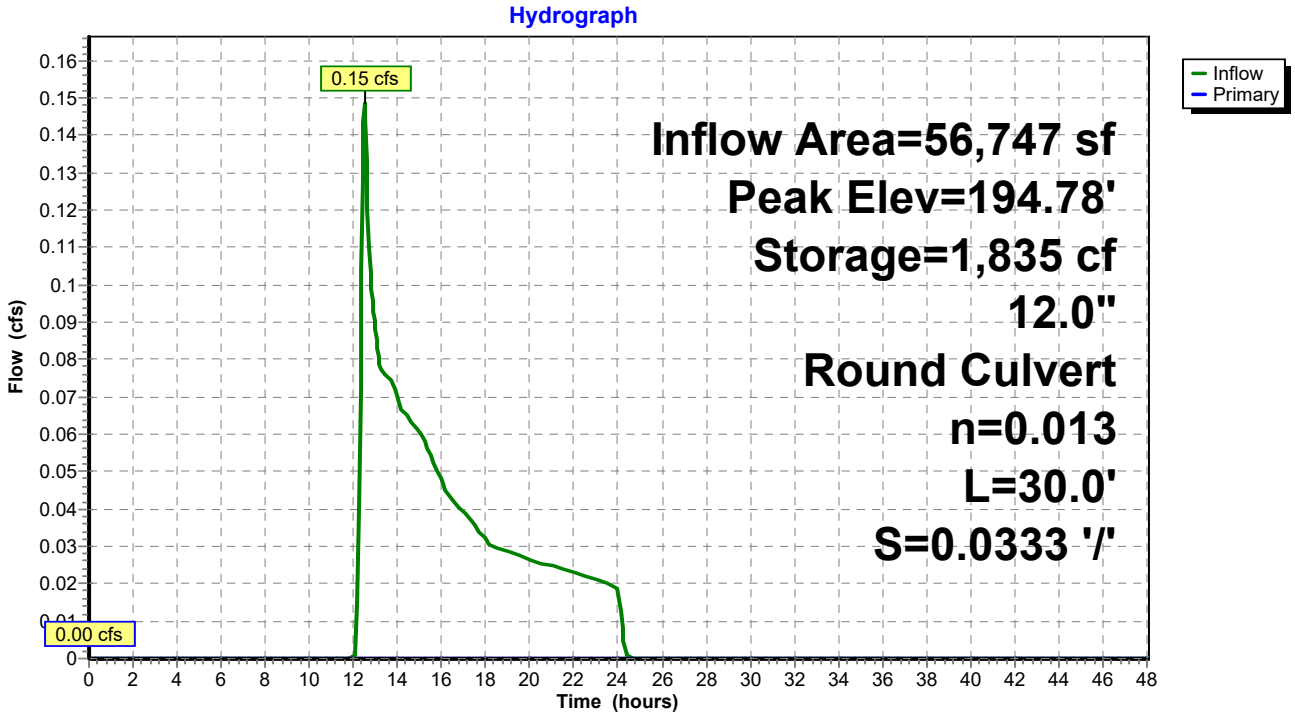
Volume	Invert	Avail.Storage	Storage Description
#1	194.00'	8,346 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.00	1,685	0	0
195.00	3,435	2,560	2,560
196.00	8,137	5,786	8,346

Device	Routing	Invert	Outlet Devices
#1	Primary	195.00'	**12.0" Round Culvert** L= 30.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 195.00' / 194.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=194.00' (Free Discharge)
1=Culvert (Controls 0.00 cfs)

Pond 4P: 2.1


Hydrograph
Inflow
Primary
0.15 cfs
0.00 cfs
Inflow Area=56,747 sf
Peak Elev=194.78'
Storage=1,835 cf
12.0"
Round Culvert
n=0.013
L=30.0'
S=0.0333 '/'
Flow (cfs)
Time (hours)
0 0.01 0.02 0.03 0.04 0.05 0.06 0.07 0.08 0.09 0.1 0.11 0.12 0.13 0.14 0.15 0.16
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 6P: 2.2

Inflow Area = 408,171 sf, 0.12% Impervious, Inflow Depth = 1.32" for 25-YEAR event
Inflow = 8.12 cfs @ 12.35 hrs, Volume= 44,867 cf
Outflow = 0.85 cfs @ 15.77 hrs, Volume= 27,307 cf, Atten= 90%, Lag= 205.5 min
Primary = 0.85 cfs @ 15.77 hrs, Volume= 27,307 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 190.46' @ 15.77 hrs Surf.Area= 23,092 sf Storage= 25,925 cf

Plug-Flow detention time= 435.3 min calculated for 27,307 cf (61% of inflow)
Center-of-Mass det. time= 309.4 min (1,205.9 - 896.6)

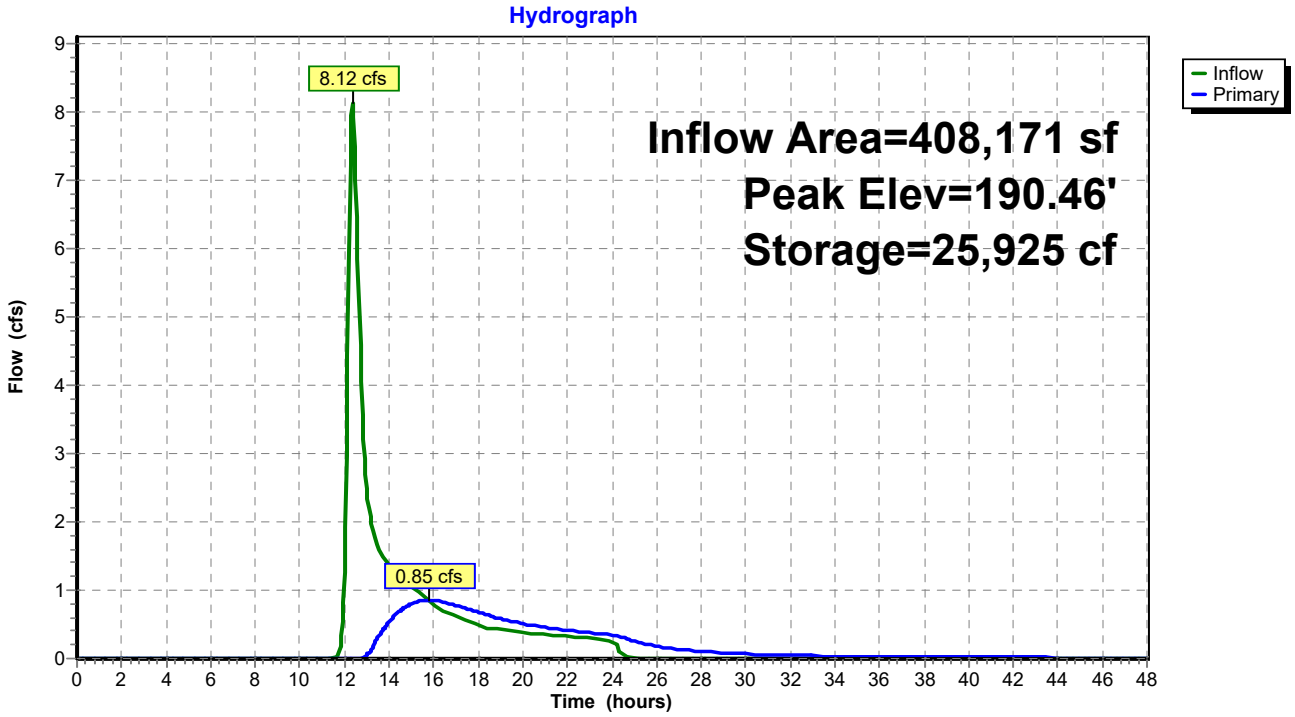
Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	71,615 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
189.00	13,767	0	0
190.00	18,949	16,358	16,358
191.00	28,052	23,501	39,859
192.00	35,460	31,756	71,615

Device	Routing	Invert	Outlet Devices
#1	Primary	190.75'	**10.0' long x 12.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#2	Primary	190.00'	**8.0" Round Culvert X 3.00** L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 190.00' / 190.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.85 cfs @ 15.77 hrs HW=190.46' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**2=Culvert** (Barrel Controls 0.85 cfs @ 1.57 fps)

Pond 6P: 2.2


Hydrograph
Inflow Area=408,171 sf
Peak Elev=190.46'
Storage=25,925 cf
8.12 cfs
0.85 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 9P: 3.1

Inflow Area = 87,591 sf, 0.27% Impervious, Inflow Depth = 1.96" for 25-YEAR event
Inflow = 3.08 cfs @ 12.26 hrs, Volume= 14,324 cf
Outflow = 0.83 cfs @ 12.85 hrs, Volume= 9,174 cf, Atten= 73%, Lag= 35.6 min
Primary = 0.83 cfs @ 12.85 hrs, Volume= 9,174 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 204.54' @ 12.85 hrs Surf.Area= 17,998 sf Storage= 5,854 cf

Plug-Flow detention time= 216.4 min calculated for 9,164 cf (64% of inflow)
Center-of-Mass det. time= 100.7 min (978.0 - 877.3)

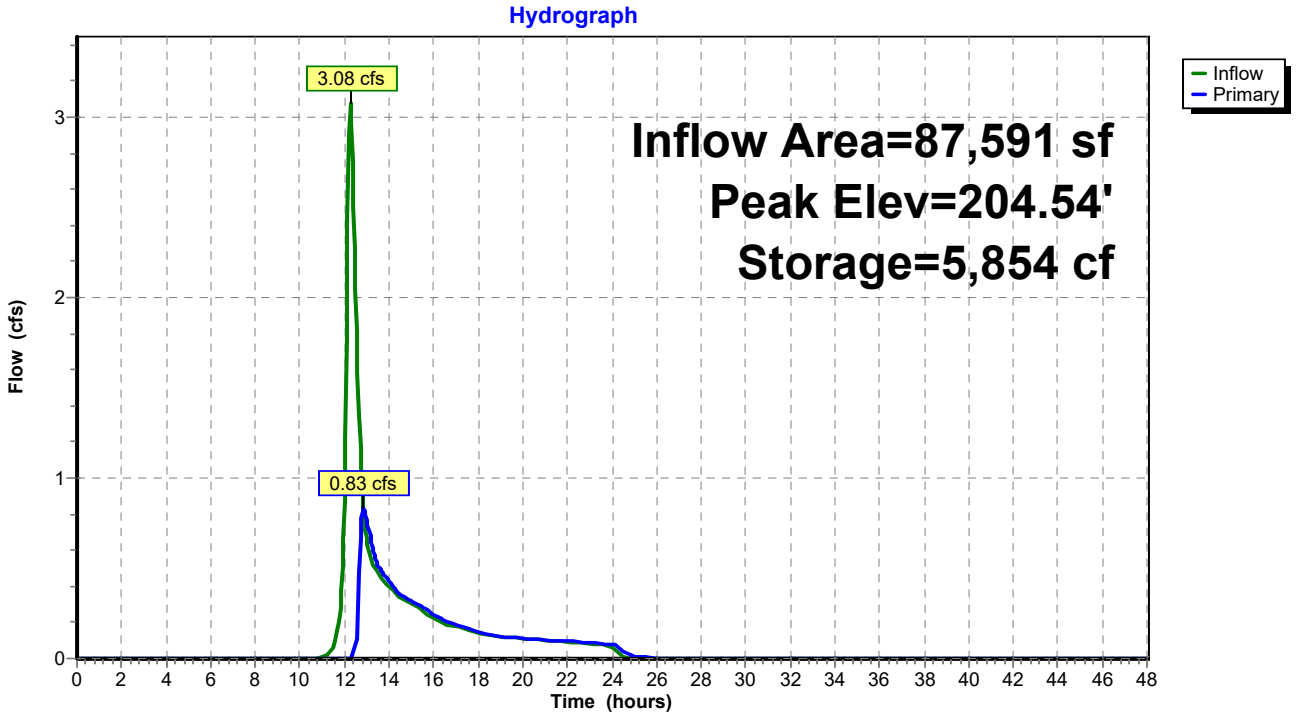
Volume	Invert	Avail.Storage	Storage Description
#1	204.00'	16,930 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
204.00	3,670	0	0
205.00	30,190	16,930	16,930

Device	Routing	Invert	Outlet Devices
#1	Primary	204.50'	**40.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=0.83 cfs @ 12.85 hrs HW=204.54' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.83 cfs @ 0.52 fps)

Pond 9P: 3.1


Hydrograph
3.08 cfs
0.83 cfs
Inflow Area=87,591 sf
Peak Elev=204.54'
Storage=5,854 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 11P: 3.2 (AP-3)

Inflow Area = 177,561 sf, 0.14% Impervious, Inflow Depth = 0.79" for 25-YEAR event
Inflow = 0.96 cfs @ 12.84 hrs, Volume= 11,676 cf
Outflow = 0.25 cfs @ 16.94 hrs, Volume= 8,438 cf, Atten= 74%, Lag= 246.0 min
Primary = 0.25 cfs @ 16.94 hrs, Volume= 8,438 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 201.63' @ 16.94 hrs Surf.Area= 9,503 sf Storage= 5,761 cf

Plug-Flow detention time= 396.1 min calculated for 8,438 cf (72% of inflow)
Center-of-Mass det. time= 289.3 min (1,272.6 - 983.2)

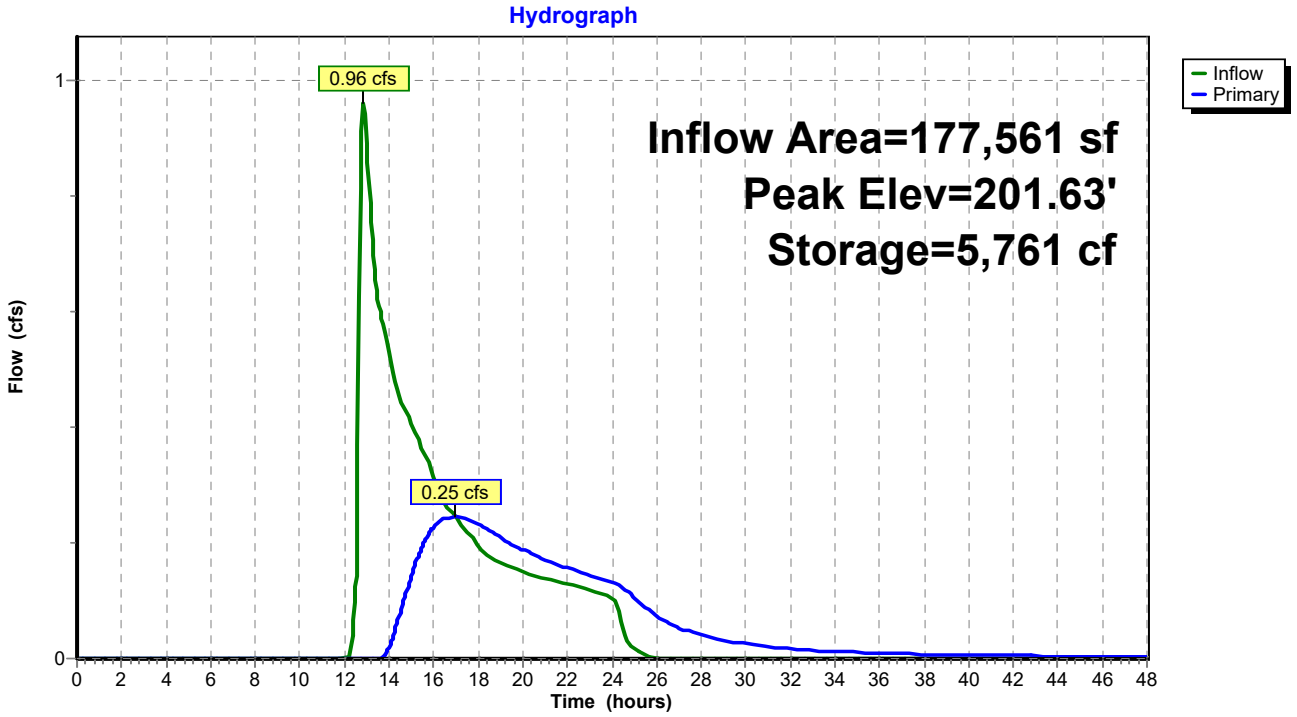
Volume	Invert	Avail.Storage	Storage Description
#1	201.00'	19,994 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.00	8,685	0	0
202.00	9,977	9,331	9,331
203.00	11,349	10,663	19,994

Device	Routing	Invert	Outlet Devices
#1	Primary	201.83'	**10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78
#2	Primary	201.33'	**8.0" Round Culvert** L= 40.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 201.33' / 201.00' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.25 cfs @ 16.94 hrs HW=201.63' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**2=Culvert** (Barrel Controls 0.25 cfs @ 2.33 fps)

Pond 11P: 3.2 (AP-3)



Summary for Pond 13P: 4.1

Inflow Area = 201,561 sf, 0.00% Impervious, Inflow Depth = 1.53" for 25-YEAR event
Inflow = 4.51 cfs @ 12.38 hrs, Volume= 25,734 cf
Outflow = 2.27 cfs @ 12.79 hrs, Volume= 25,734 cf, Atten= 50%, Lag= 24.8 min
Primary = 2.27 cfs @ 12.79 hrs, Volume= 25,734 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 202.26' @ 12.79 hrs Surf.Area= 9,372 sf Storage= 5,070 cf

Plug-Flow detention time= 31.4 min calculated for 25,734 cf (100% of inflow)
Center-of-Mass det. time= 30.8 min (929.1 - 898.2)

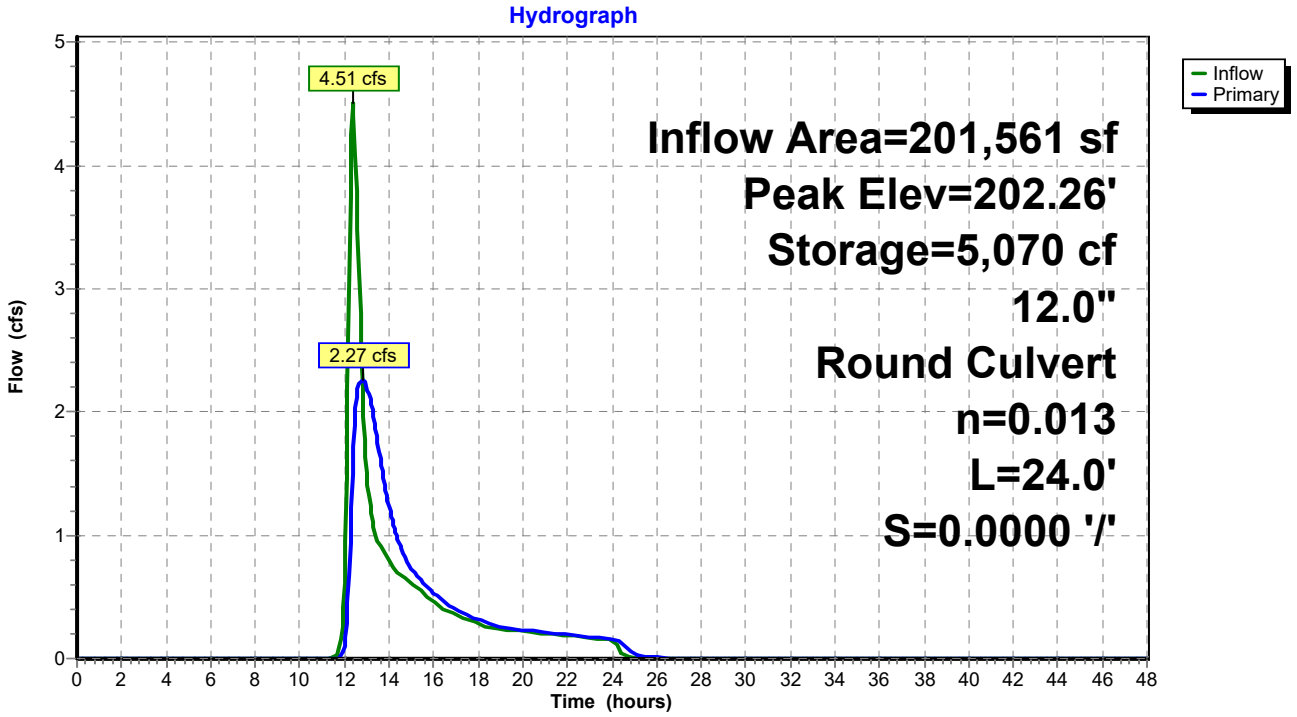
Volume	Invert	Avail.Storage	Storage Description
#1	201.00'	15,505 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.00	50	0	0
202.00	6,090	3,070	3,070
203.00	18,780	12,435	15,505

Device	Routing	Invert	Outlet Devices
#1	Primary	201.00'	**12.0" Round Culvert** L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 201.00' / 201.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.27 cfs @ 12.79 hrs HW=202.26' (Free Discharge)
1=Culvert (Barrel Controls 2.27 cfs @ 2.95 fps)

Pond 13P: 4.1


Hydrograph
4.51 cfs
2.27 cfs
Inflow Area=201,561 sf
Peak Elev=202.26'
Storage=5,070 cf
12.0"
Round Culvert
n=0.013
L=24.0'
S=0.0000 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 15P: 4.2

Inflow Area = 811,294 sf, 0.03% Impervious, Inflow Depth = 1.47" for 25-YEAR event
Inflow = 14.11 cfs @ 12.43 hrs, Volume= 99,375 cf
Outflow = 1.56 cfs @ 16.60 hrs, Volume= 65,148 cf, Atten= 89%, Lag= 250.5 min
Primary = 1.56 cfs @ 16.60 hrs, Volume= 65,148 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 197.73' @ 16.60 hrs Surf.Area= 44,037 sf Storage= 59,687 cf

Plug-Flow detention time= 507.7 min calculated for 65,148 cf (66% of inflow)
Center-of-Mass det. time= 389.4 min (1,299.1 - 909.8)

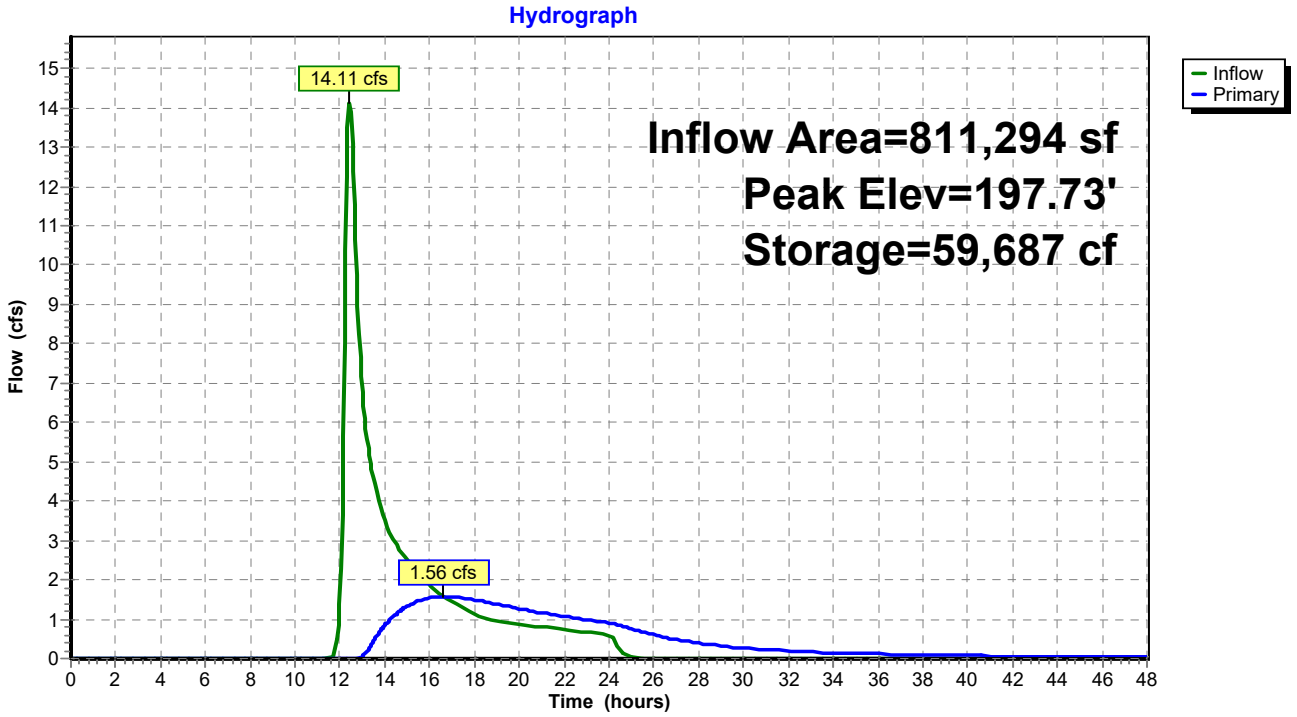
Volume	Invert	Avail.Storage	Storage Description
#1	196.00'	186,402 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
196.00	25,553	0	0
197.00	35,876	30,715	30,715
198.00	47,131	41,504	72,218
199.00	59,178	53,155	125,373
200.00	62,880	61,029	186,402

Device	Routing	Invert	Outlet Devices
#1	Primary	198.00'	**10.0' long x 31.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	197.00'	**12.0" Round Culvert** L= 40.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 197.00' / 196.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.56 cfs @ 16.60 hrs HW=197.73' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**2=Culvert** (Inlet Controls 1.56 cfs @ 2.56 fps)

Pond 15P: 4.2


Hydrograph
14.11 cfs
1.56 cfs
Inflow Area=811,294 sf
Peak Elev=197.73'
Storage=59,687 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 18P: 5.1 (AP-5.1)

Inflow Area = 285,491 sf, 0.00% Impervious, Inflow Depth = 1.45" for 25-YEAR event
Inflow = 6.42 cfs @ 12.31 hrs, Volume= 34,481 cf
Outflow = 0.36 cfs @ 18.24 hrs, Volume= 14,816 cf, Atten= 94%, Lag= 355.6 min
Primary = 0.36 cfs @ 18.24 hrs, Volume= 14,816 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 197.31' @ 18.24 hrs Surf.Area= 21,363 sf Storage= 25,190 cf

Plug-Flow detention time= 624.5 min calculated for 14,800 cf (43% of inflow)
Center-of-Mass det. time= 476.2 min (1,373.7 - 897.5)

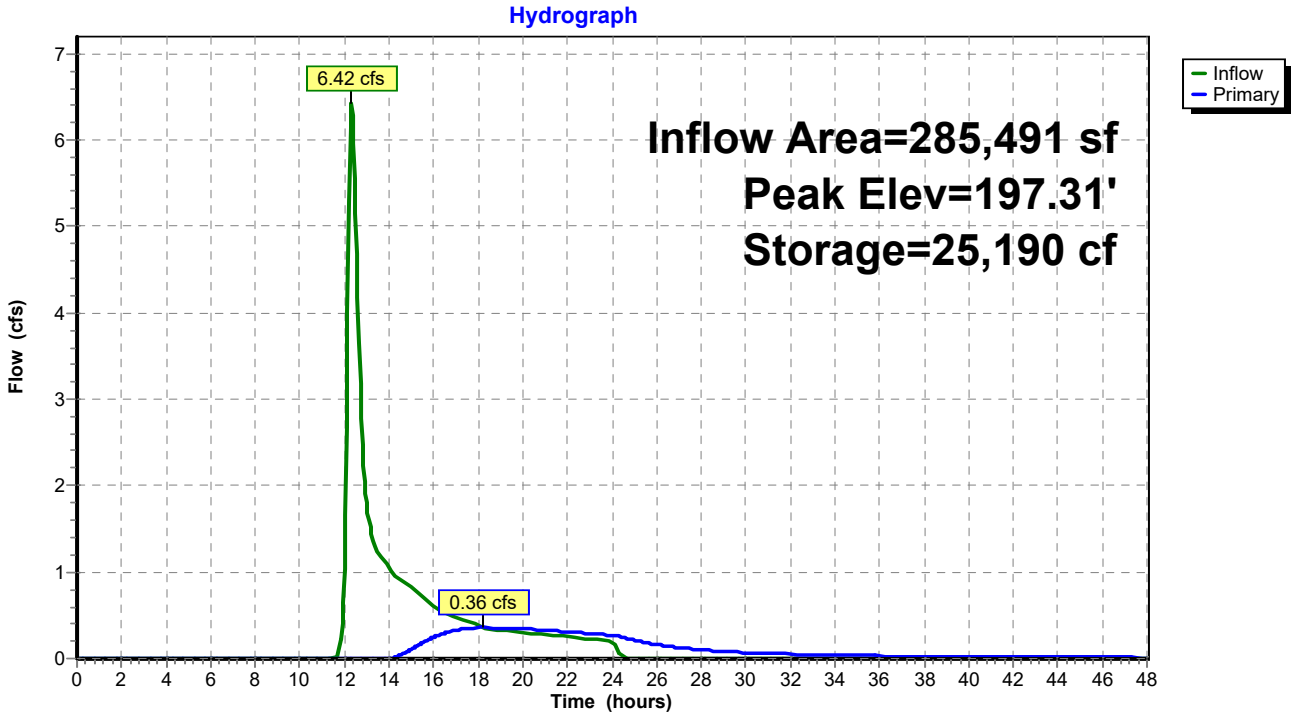
Volume	Invert	Avail.Storage	Storage Description
#1	196.00'	65,346 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
196.00	17,045	0	0
197.00	20,264	18,655	18,655
198.00	23,764	22,014	40,669
199.00	25,591	24,678	65,346

Device	Routing	Invert	Outlet Devices
#1	Primary	197.75'	**10.0' long x 18.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	197.00'	**12.0" Round Culvert** L= 32.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 197.00' / 196.00' S= 0.0313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.36 cfs @ 18.24 hrs HW=197.31' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
2=Culvert (Inlet Controls 0.36 cfs @ 1.68 fps)

Pond 18P: 5.1 (AP-5.1)

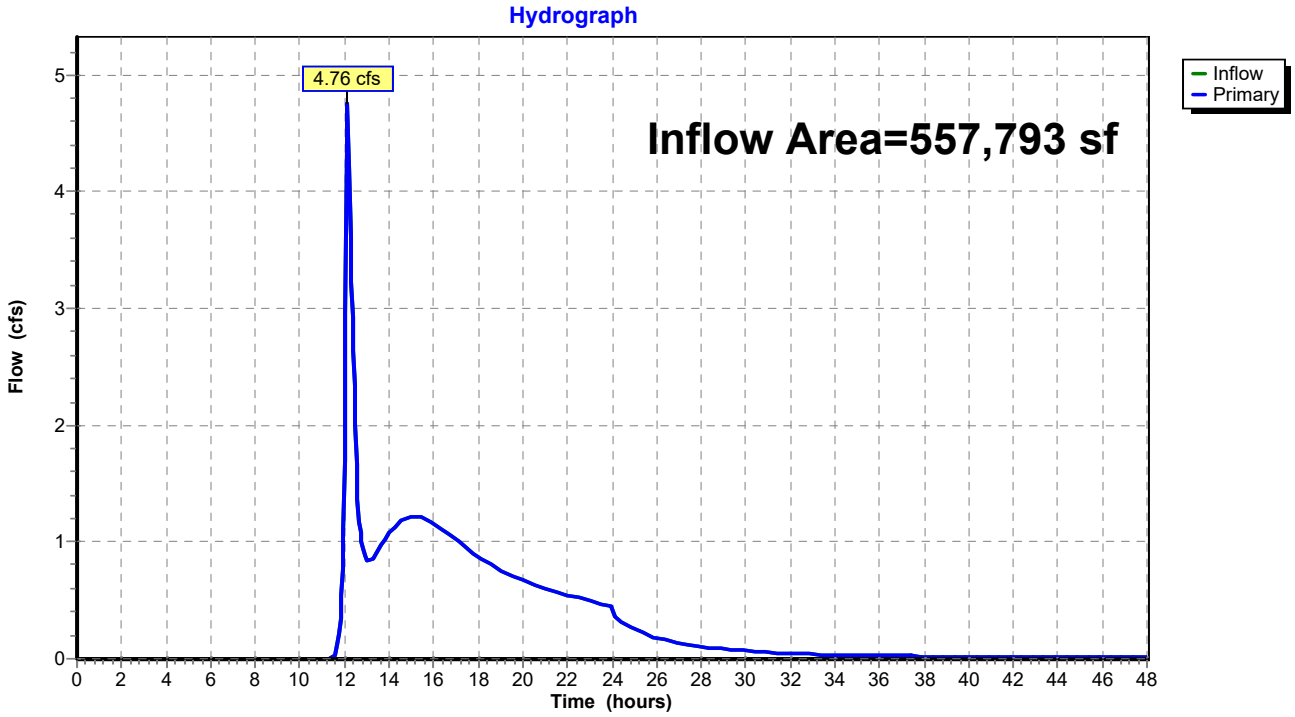


Summary for Link 20L: AP-2

Inflow Area = 557,793 sf, 0.09% Impervious, Inflow Depth > 1.00" for 25-YEAR event
Inflow = 4.76 cfs @ 12.15 hrs, Volume= 46,410 cf
Primary = 4.76 cfs @ 12.15 hrs, Volume= 46,410 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 20L: AP-2

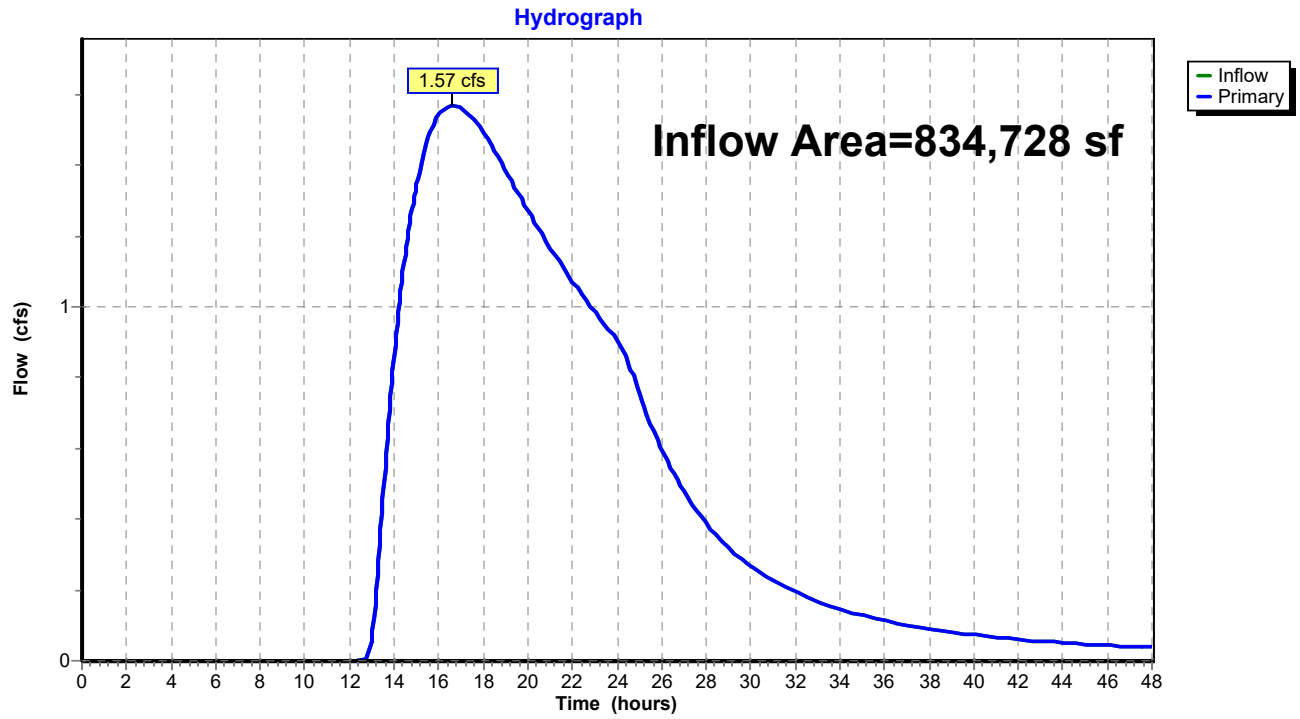


Summary for Link 21L: AP-4

Inflow Area = 834,728 sf, 0.03% Impervious, Inflow Depth > 0.94" for 25-YEAR event
Inflow = 1.57 cfs @ 16.59 hrs, Volume= 65,437 cf
Primary = 1.57 cfs @ 16.59 hrs, Volume= 65,437 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 21L: AP-4



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: AP-1 Runoff Area=90,105 sf 9.67% Impervious Runoff Depth=2.96"
Tc=8.0 min CN=60 Runoff=6.46 cfs 22,250 cf

Subcatchment 3S: 2.1 Runoff Area=56,747 sf 0.00% Impervious Runoff Depth=0.64"
Flow Length=500' Slope=0.0180 '/' Tc=13.1 min CN=35 Runoff=0.34 cfs 3,031 cf

Subcatchment 5S: 2.2 Runoff Area=351,424 sf 0.14% Impervious Runoff Depth=2.05"
Flow Length=905' Slope=0.0160 '/' Tc=21.4 min CN=51 Runoff=11.43 cfs 60,010 cf

Subcatchment 7S: 2.3 Runoff Area=149,622 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=420' Slope=0.0350 '/' Tc=8.6 min CN=51 Runoff=6.71 cfs 25,550 cf

Subcatchment 8S: 3.1 Runoff Area=87,591 sf 0.27% Impervious Runoff Depth=2.55"
Flow Length=335' Slope=0.0060 '/' Tc=16.7 min CN=56 Runoff=4.12 cfs 18,610 cf

Subcatchment 10S: 3.2 Runoff Area=89,970 sf 0.00% Impervious Runoff Depth=0.57"
Flow Length=650' Slope=0.0120 '/' Tc=19.0 min CN=34 Runoff=0.40 cfs 4,261 cf

Subcatchment 12S: 4.1 Runoff Area=201,561 sf 0.00% Impervious Runoff Depth=2.05"
Flow Length=755' Slope=0.0100 '/' Tc=23.2 min CN=51 Runoff=6.36 cfs 34,419 cf

Subcatchment 14S: 4.2 Runoff Area=609,733 sf 0.04% Impervious Runoff Depth=1.95"
Flow Length=1,000' Slope=0.0140 '/' Tc=24.7 min CN=50 Runoff=17.59 cfs 99,164 cf

Subcatchment 16S: 4.3 Runoff Area=23,434 sf 0.00% Impervious Runoff Depth=0.31"
Tc=5.0 min CN=30 Runoff=0.03 cfs 599 cf

Subcatchment 17S: 5.1 Runoff Area=285,491 sf 0.00% Impervious Runoff Depth=1.95"
Flow Length=735' Slope=0.0150 '/' Tc=18.8 min CN=50 Runoff=9.18 cfs 46,431 cf

Subcatchment 19S: 5.2 (AP-5.2) Runoff Area=118,838 sf 0.00% Impervious Runoff Depth=0.79"
Flow Length=425' Slope=0.0330 '/' Tc=8.9 min CN=37 Runoff=1.07 cfs 7,861 cf

Pond 4P: 2.1 Peak Elev=195.08' Storage=2,838 cf Inflow=0.34 cfs 3,031 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0333 '/' Outflow=0.02 cfs 451 cf

Pond 6P: 2.2 Peak Elev=190.62' Storage=29,820 cf Inflow=11.43 cfs 60,461 cf
Outflow=1.48 cfs 42,843 cf

Pond 9P: 3.1 Peak Elev=204.57' Storage=6,451 cf Inflow=4.12 cfs 18,610 cf
Outflow=2.02 cfs 13,460 cf

Pond 11P: 3.2 (AP-3) Peak Elev=201.78' Storage=7,167 cf Inflow=2.40 cfs 17,721 cf
Outflow=0.48 cfs 14,478 cf

Pond 13P: 4.1 Peak Elev=202.51' Storage=7,804 cf Inflow=6.36 cfs 34,419 cf
12.0" Round Culvert n=0.013 L=24.0' S=0.0000 '/' Outflow=2.87 cfs 34,419 cf

Pond 15P: 4.2 Peak Elev=198.03' Storage=73,667 cf Inflow=19.82 cfs 133,583 cf
Outflow=2.59 cfs 99,203 cf

Pond 18P: 5.1 (AP-5.1) Peak Elev=197.48' Storage=28,689 cf Inflow=9.18 cfs 46,431 cf
Outflow=0.76 cfs 26,738 cf

Link 20L: AP-2 Inflow=6.71 cfs 68,393 cf
Primary=6.71 cfs 68,393 cf

Link 21L: AP-4 Inflow=2.61 cfs 99,802 cf
Primary=2.61 cfs 99,802 cf

Total Runoff Area = 2,064,516 sf Runoff Volume = 322,185 cf Average Runoff Depth = 1.87"
99.53% Pervious = 2,054,844 sf 0.47% Impervious = 9,672 sf

Summary for Subcatchment 1S: AP-1

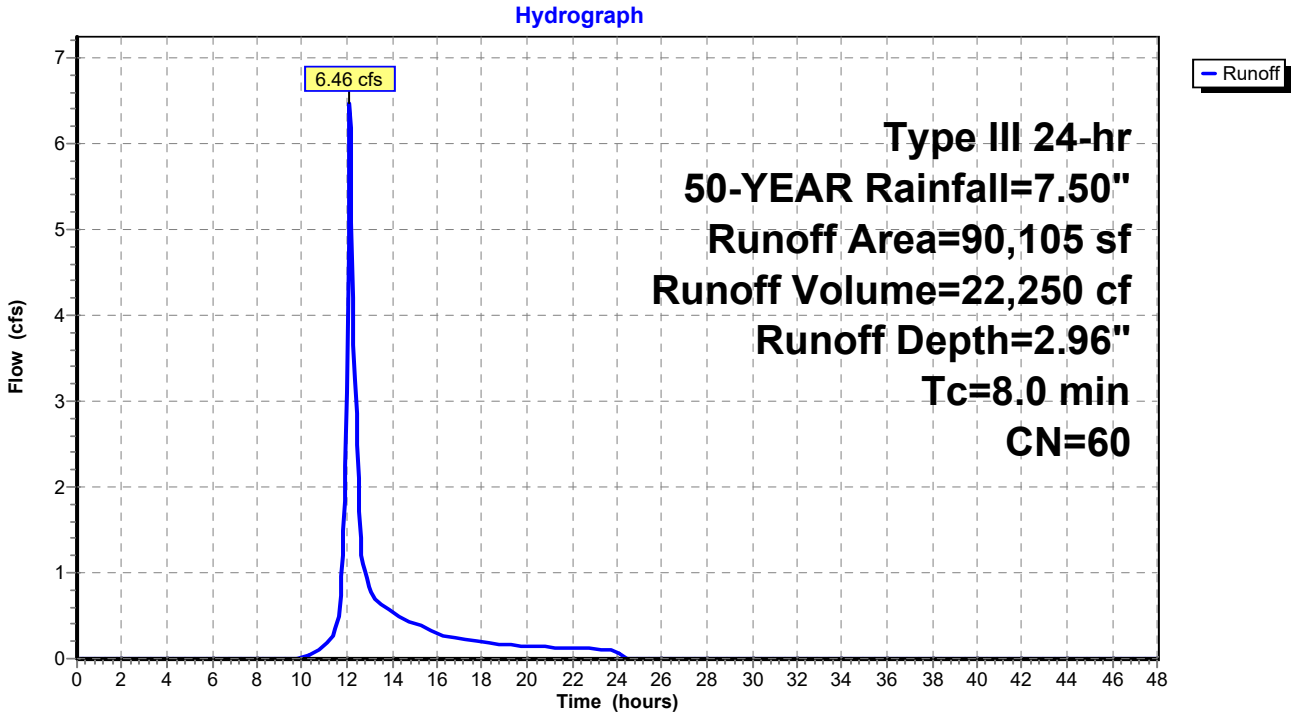
Runoff = 6.46 cfs @ 12.12 hrs, Volume= 22,250 cf, Depth= 2.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
38,399	51	1 acre lots, 20% imp, HSG A
5,161	84	1 acre lots, 20% imp, HSG D
2,850	96	Gravel surface, HSG A
7,762	96	Gravel surface, HSG D
16,607	30	Meadow, non-grazed, HSG A
19,326	78	Meadow, non-grazed, HSG D
90,105	60	Weighted Average
81,393		90.33% Pervious Area
8,712		9.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Subcatchment 1S: AP-1



Summary for Subcatchment 3S: 2.1

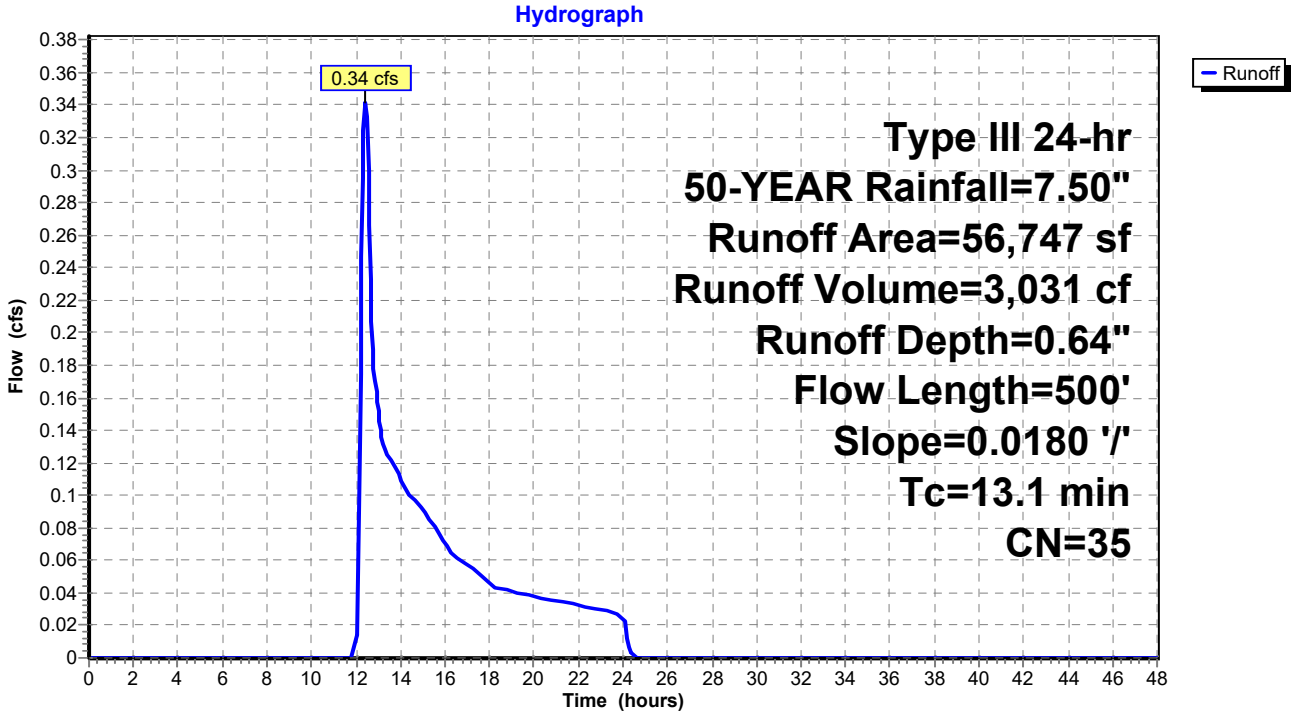
Runoff = 0.34 cfs @ 12.43 hrs, Volume= 3,031 cf, Depth= 0.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
29,966	30	Woods, Good, HSG A
22,363	30	Meadow, non-grazed, HSG A
4,418	96	Gravel surface, HSG A
56,747	35	Weighted Average
56,747		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0180	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.0	450	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.1	500	Total			

Subcatchment 3S: 2.1



Summary for Subcatchment 5S: 2.2

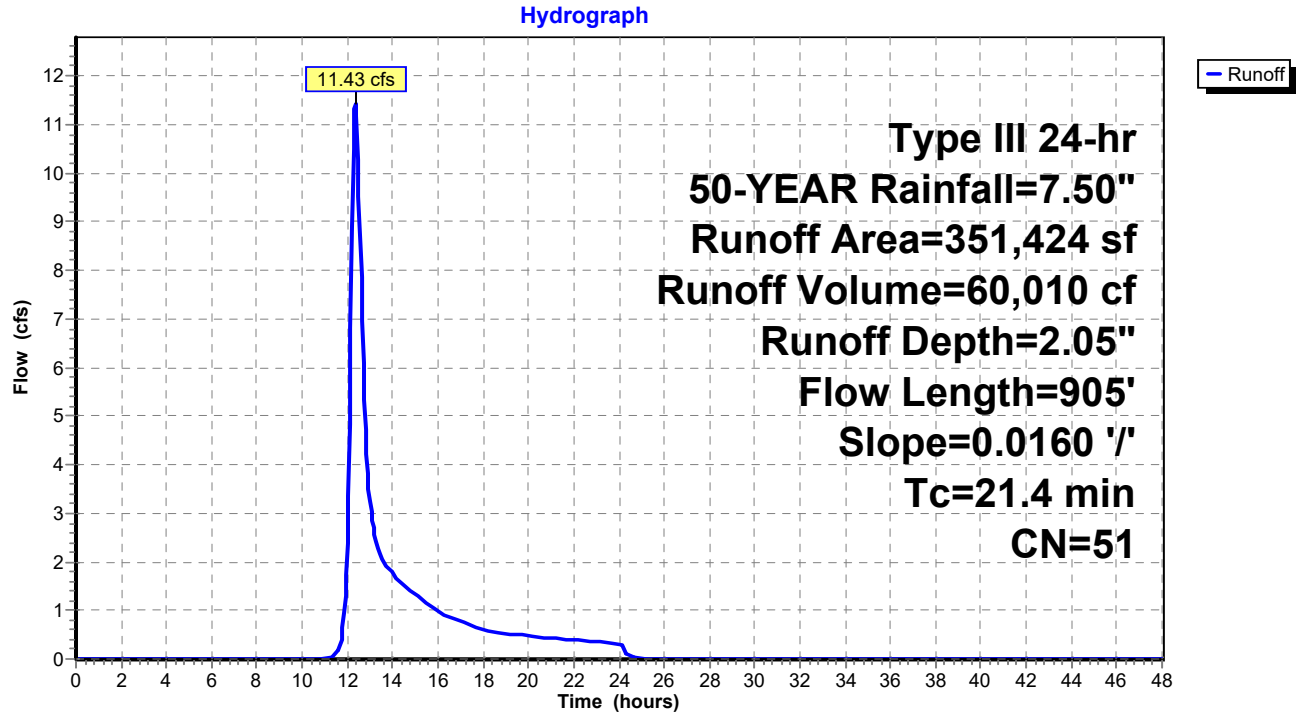
Runoff = 11.43 cfs @ 12.33 hrs, Volume= 60,010 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
6,360	78	Meadow, non-grazed, HSG D
480	98	Unconnected roofs, HSG B
242,615	58	Meadow, non-grazed, HSG B
95,975	30	Meadow, non-grazed, HSG A
5,994	96	Gravel surface, HSG A
351,424	51	Weighted Average
350,944		99.86% Pervious Area
480		0.14% Impervious Area
480		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
16.1	855	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.4	905	Total			

Subcatchment 5S: 2.2



Summary for Subcatchment 7S: 2.3

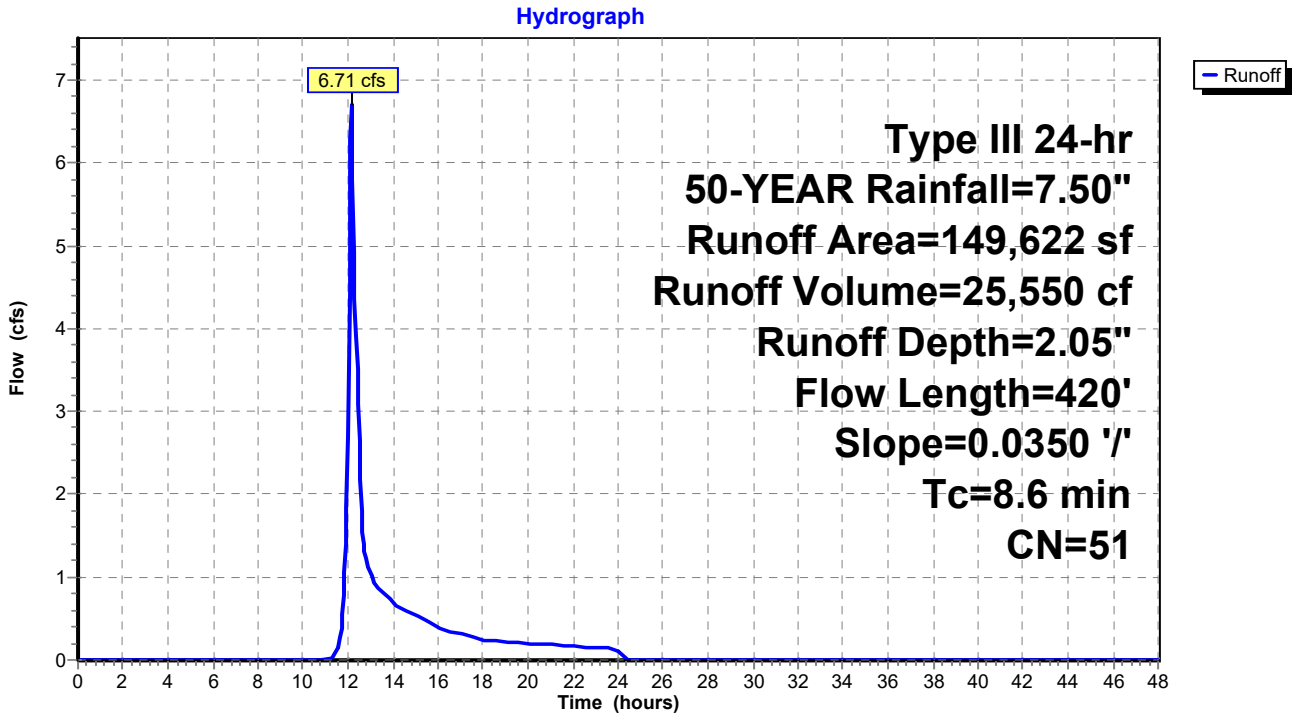
Runoff = 6.71 cfs @ 12.14 hrs, Volume= 25,550 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
328	96	Gravel surface, HSG A
276	96	Gravel surface, HSG D
78,998	30	Meadow, non-grazed, HSG A
16,547	58	Meadow, non-grazed, HSG B
53,473	78	Meadow, non-grazed, HSG D
149,622	51	Weighted Average
149,622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0350	0.21		**Sheet Flow,** Range n= 0.130 P2= 3.40"
4.7	370	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	420	Total			

Subcatchment 7S: 2.3



Summary for Subcatchment 8S: 3.1

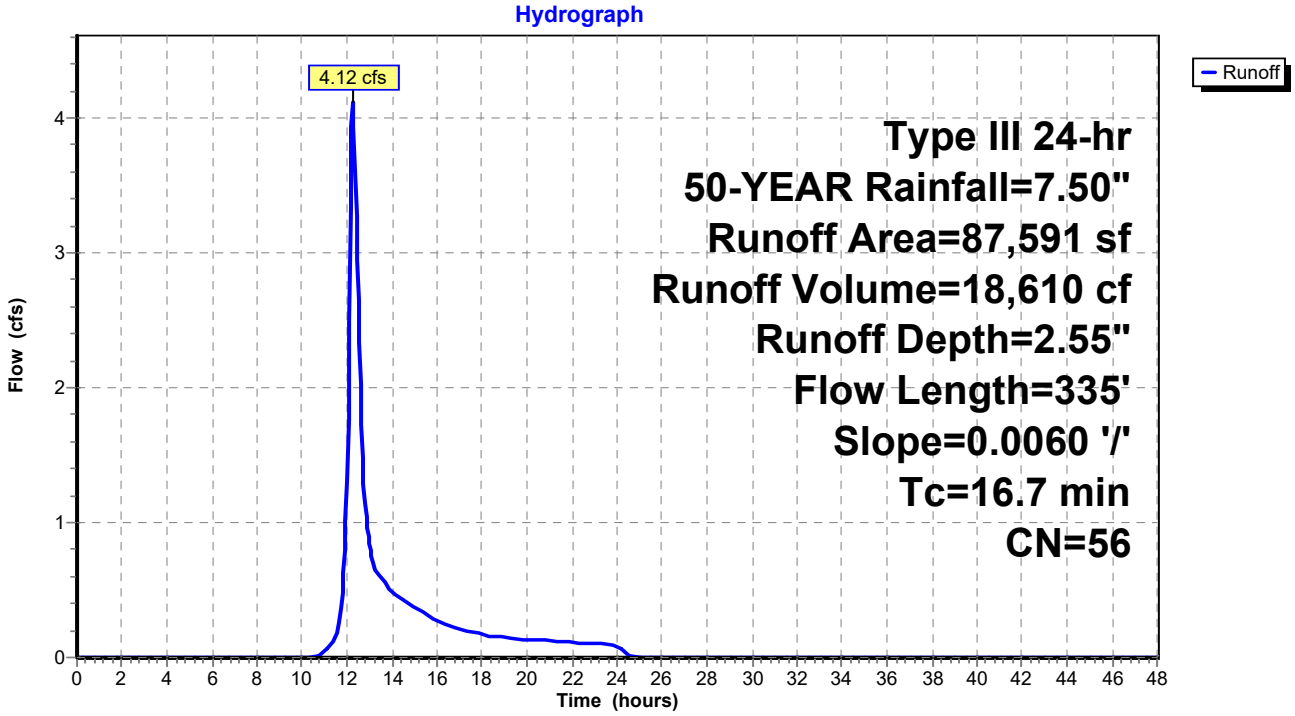
Runoff = 4.12 cfs @ 12.25 hrs, Volume= 18,610 cf, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
240	98	Unconnected roofs, HSG B
73,156	58	Meadow, non-grazed, HSG B
10,475	30	Meadow, non-grazed, HSG A
3,720	96	Gravel surface, HSG A
87,591	56	Weighted Average
87,351		99.73% Pervious Area
240		0.27% Impervious Area
240		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0060	0.11		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.8	285	0.0060	0.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.7	335	Total			

Subcatchment 8S: 3.1



Summary for Subcatchment 10S: 3.2

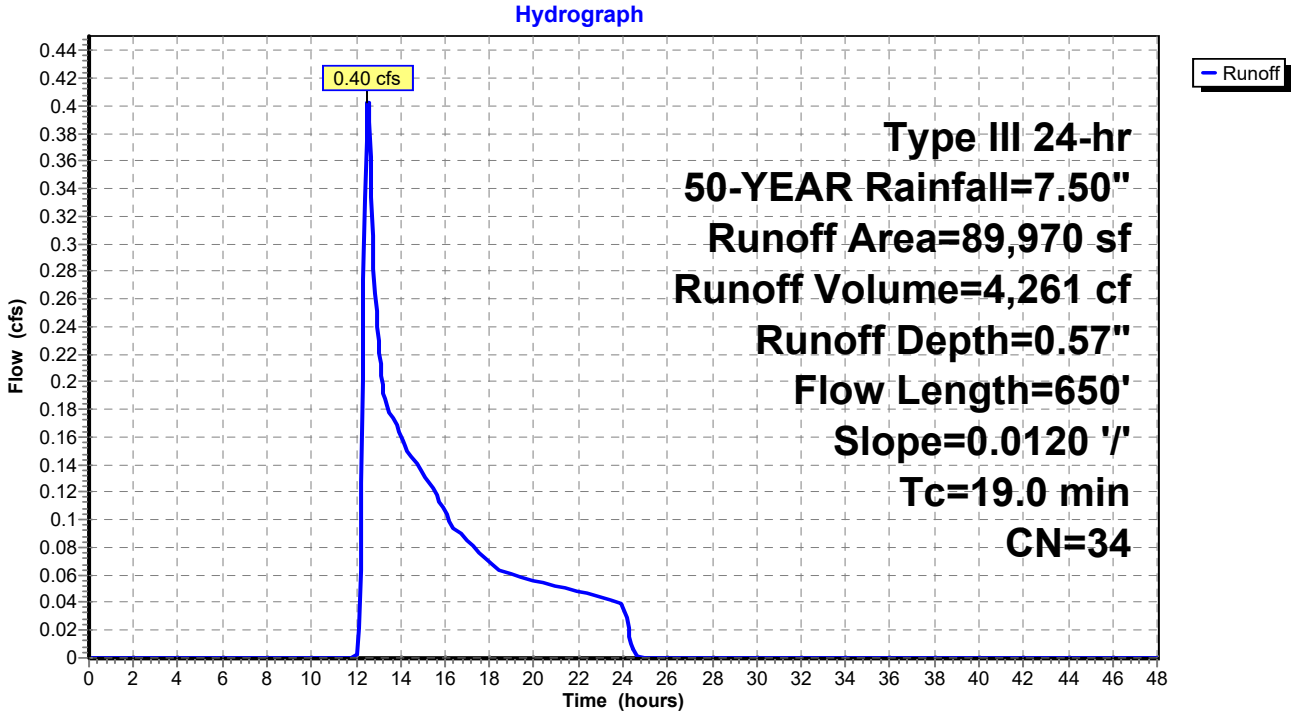
Runoff = 0.40 cfs @ 12.54 hrs, Volume= 4,261 cf, Depth= 0.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
32,262	30	Woods, Good, HSG A
52,598	30	Meadow, non-grazed, HSG A
5,110	96	Gravel surface, HSG A
89,970	34	Weighted Average
89,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0120	0.14		**Sheet Flow,** Range n= 0.130 P2= 3.40"
13.0	600	0.0120	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.0	650	Total			

Subcatchment 10S: 3.2



Summary for Subcatchment 12S: 4.1

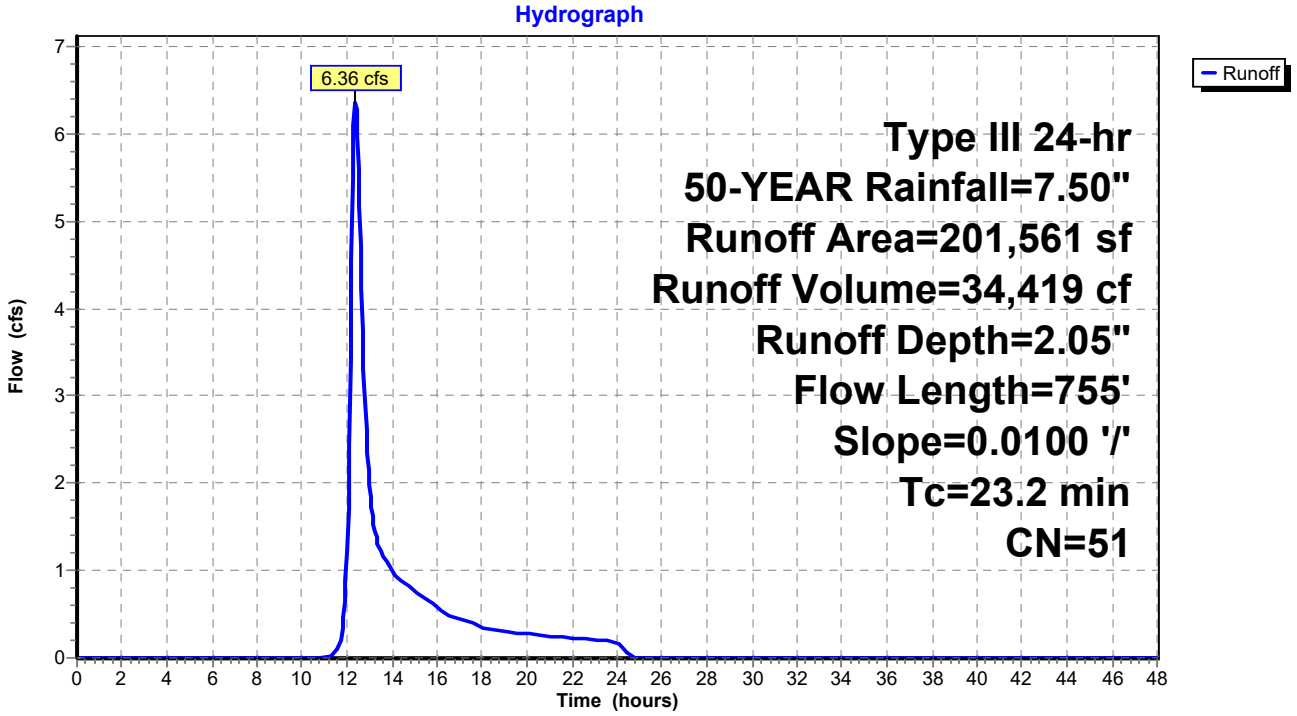
Runoff = 6.36 cfs @ 12.36 hrs, Volume= 34,419 cf, Depth= 2.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
57,023	30	Meadow, non-grazed, HSG A
5,058	96	Gravel surface, HSG A
139,480	58	Meadow, non-grazed, HSG B
201,561	51	Weighted Average
201,561		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0100	0.13		**Sheet Flow,** Range n= 0.130 P2= 3.40"
16.8	705	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.2	755	Total			

Subcatchment 12S: 4.1



Summary for Subcatchment 14S: 4.2

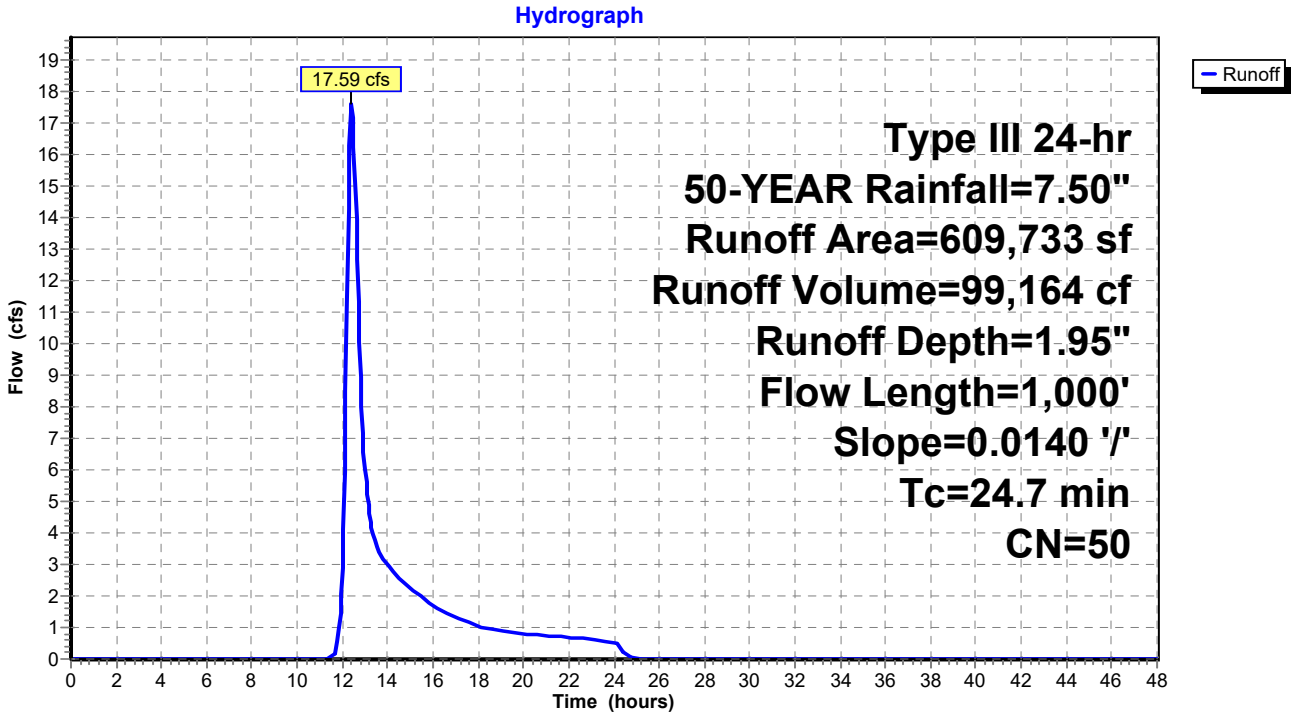
Runoff = 17.59 cfs @ 12.39 hrs, Volume= 99,164 cf, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
17,270	30	Woods, Good, HSG A
177,697	30	Meadow, non-grazed, HSG A
7,180	96	Gravel surface, HSG A
407,346	58	Meadow, non-grazed, HSG B
240	98	Unconnected roofs, HSG B
609,733	50	Weighted Average
609,493		99.96% Pervious Area
240		0.04% Impervious Area
240		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0140	0.15		**Sheet Flow,** Range n= 0.130 P2= 3.40"
19.1	950	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.7	1,000	Total			

Subcatchment 14S: 4.2



Summary for Subcatchment 16S: 4.3

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

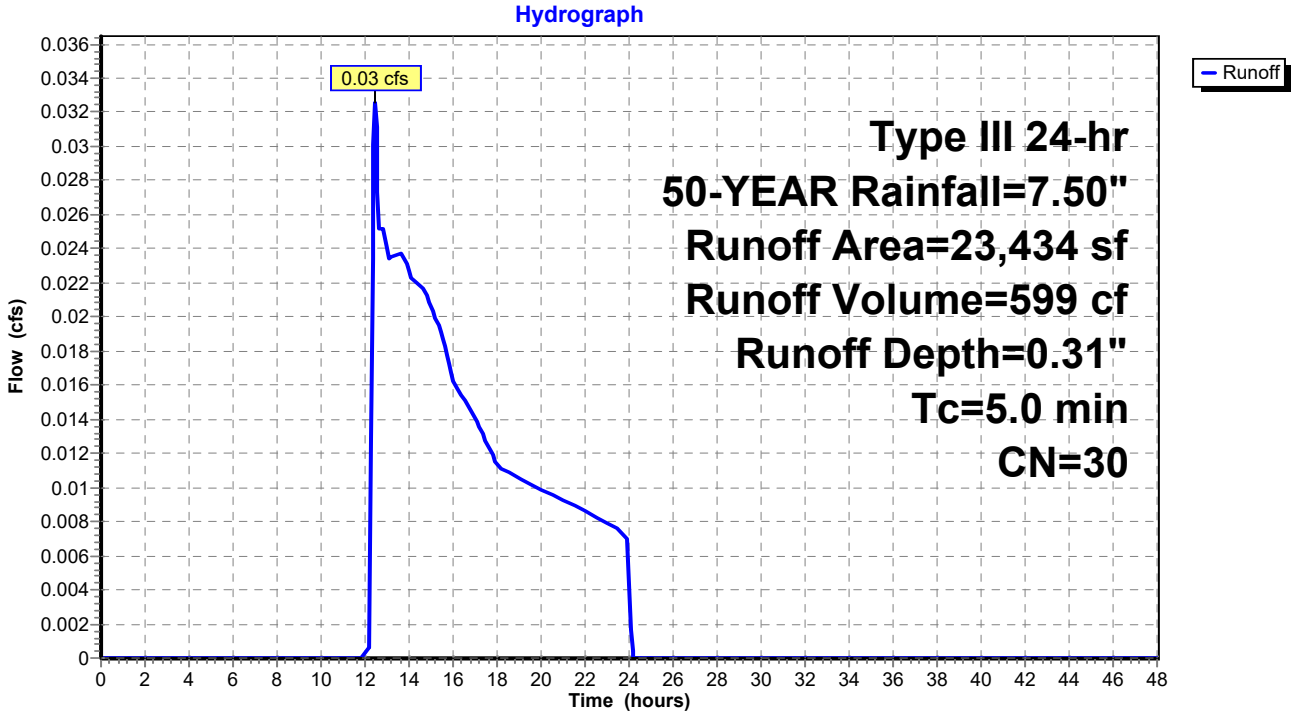
Runoff = 0.03 cfs @ 12.46 hrs, Volume= 599 cf, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
23,434	30	Woods, Good, HSG A
23,434		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 16S: 4.3



Summary for Subcatchment 17S: 5.1

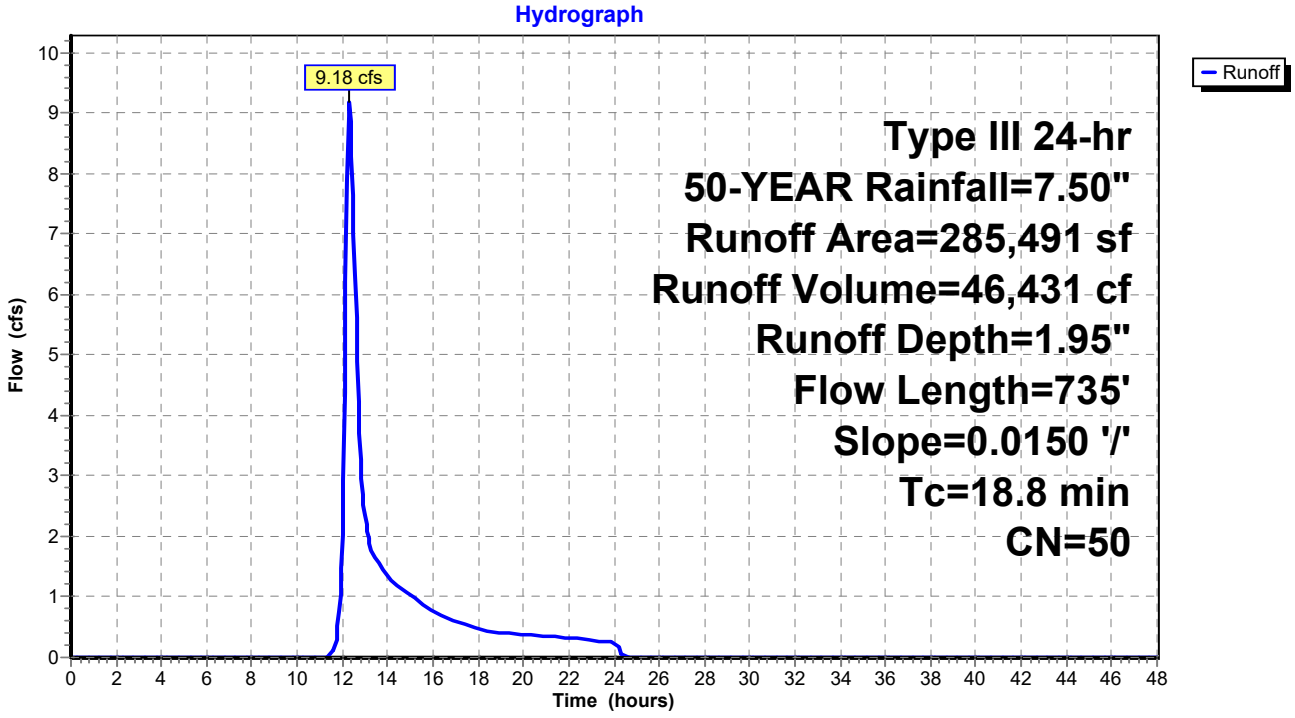
Runoff = 9.18 cfs @ 12.30 hrs, Volume= 46,431 cf, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
84,913	30	Meadow, non-grazed, HSG A
192,738	58	Meadow, non-grazed, HSG B
3,527	96	Gravel surface, HSG A
4,313	30	Woods, Good, HSG A
285,491	50	Weighted Average
285,491		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0150	0.15		**Sheet Flow,** Range n= 0.130 P2= 3.40"
13.3	685	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
18.8	735	Total			

Subcatchment 17S: 5.1



Summary for Subcatchment 19S: 5.2 (AP-5.2)

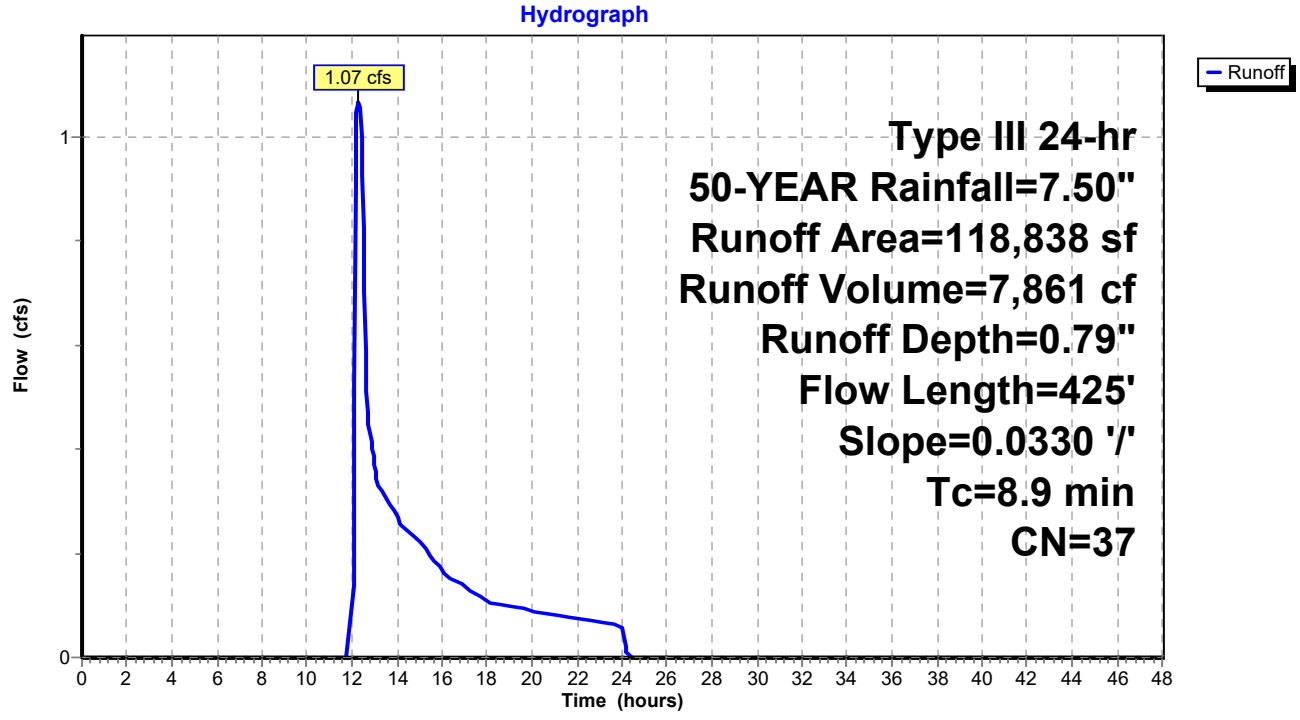
Runoff = 1.07 cfs @ 12.28 hrs, Volume= 7,861 cf, Depth= 0.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-YEAR Rainfall=7.50"

Area (sf)	CN	Description
49,980	30	Meadow, non-grazed, HSG A
15,920	58	Meadow, non-grazed, HSG B
29,898	30	Brush, Good, HSG A
23,040	48	Brush, Good, HSG B
118,838	37	Weighted Average
118,838		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.0330	0.21		**Sheet Flow,** Range n= 0.130 P2= 3.40"
4.9	375	0.0330	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	425	Total			

Subcatchment 19S: 5.2 (AP-5.2)



Summary for Pond 4P: 2.1

Inflow Area = 56,747 sf, 0.00% Impervious, Inflow Depth = 0.64" for 50-YEAR event
Inflow = 0.34 cfs @ 12.43 hrs, Volume= 3,031 cf
Outflow = 0.02 cfs @ 24.09 hrs, Volume= 451 cf, Atten= 93%, Lag= 700.0 min
Primary = 0.02 cfs @ 24.09 hrs, Volume= 451 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 195.08' @ 24.09 hrs Surf.Area= 3,796 sf Storage= 2,838 cf

Plug-Flow detention time= 844.0 min calculated for 451 cf (15% of inflow)
Center-of-Mass det. time= 633.0 min (1,588.4 - 955.5)

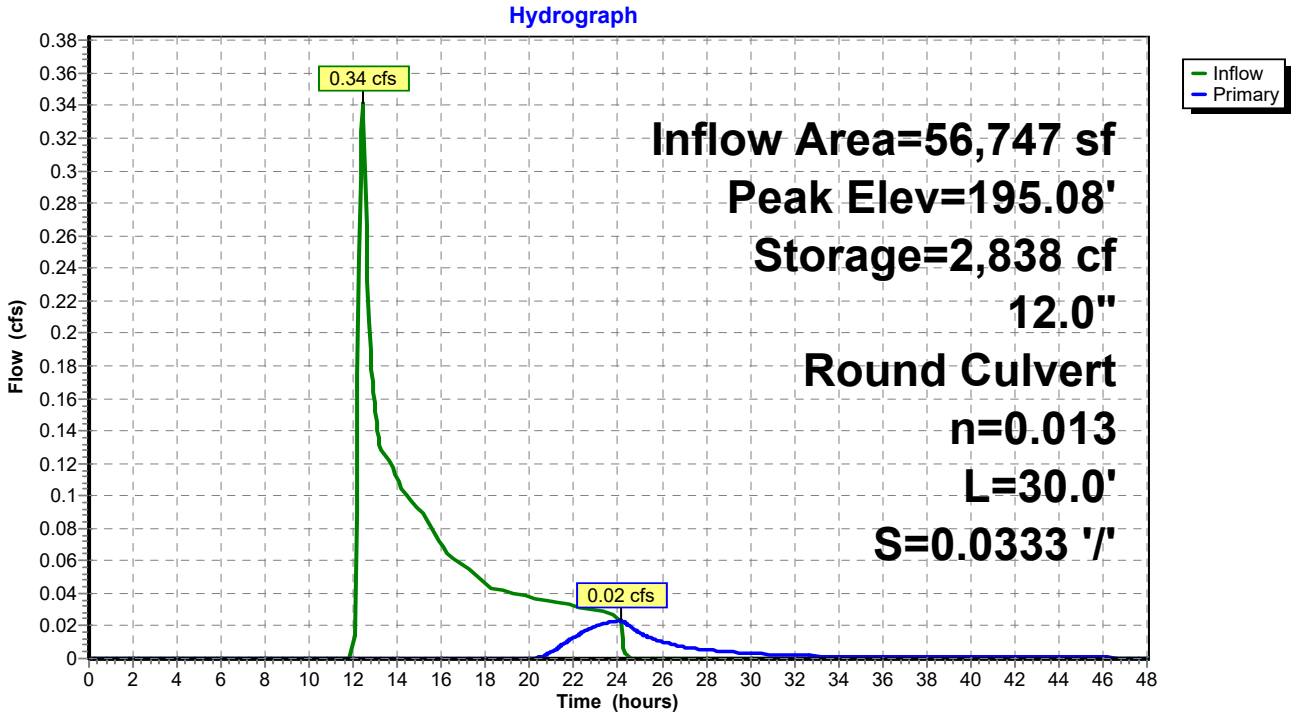
Volume	Invert	Avail.Storage	Storage Description
#1	194.00'	8,346 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.00	1,685	0	0
195.00	3,435	2,560	2,560
196.00	8,137	5,786	8,346

Device	Routing	Invert	Outlet Devices
#1	Primary	195.00'	**12.0" Round Culvert** L= 30.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 195.00' / 194.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.02 cfs @ 24.09 hrs HW=195.08' (Free Discharge)
1=Culvert (Inlet Controls 0.02 cfs @ 0.83 fps)

Pond 4P: 2.1


Hydrograph
Inflow
Primary
0.34 cfs
0.02 cfs
Inflow Area=56,747 sf
Peak Elev=195.08'
Storage=2,838 cf
12.0"
Round Culvert
n=0.013
L=30.0'
S=0.0333 '/'
Flow (cfs)
Time (hours)
0 0.02 0.04 0.06 0.08 0.1 0.12 0.14 0.16 0.18 0.2 0.22 0.24 0.26 0.28 0.3 0.32 0.34 0.36 0.38
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 6P: 2.2

Inflow Area = 408,171 sf, 0.12% Impervious, Inflow Depth = 1.78" for 50-YEAR event
Inflow = 11.43 cfs @ 12.33 hrs, Volume= 60,461 cf
Outflow = 1.48 cfs @ 14.52 hrs, Volume= 42,843 cf, Atten= 87%, Lag= 131.2 min
Primary = 1.48 cfs @ 14.52 hrs, Volume= 42,843 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 190.62' @ 14.52 hrs Surf.Area= 24,580 sf Storage= 29,820 cf

Plug-Flow detention time= 348.4 min calculated for 42,798 cf (71% of inflow)
Center-of-Mass det. time= 241.1 min (1,133.1 - 892.0)

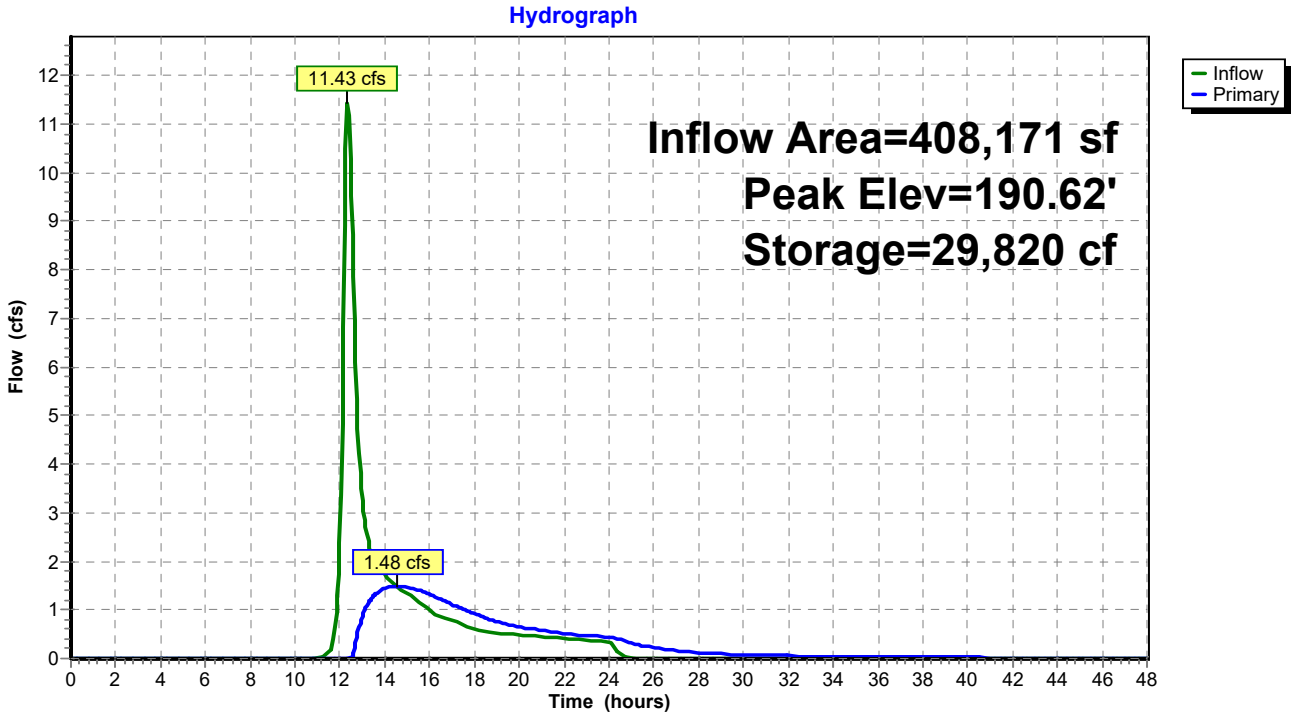
Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	71,615 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
189.00	13,767	0	0
190.00	18,949	16,358	16,358
191.00	28,052	23,501	39,859
192.00	35,460	31,756	71,615

Device	Routing	Invert	Outlet Devices
#1	Primary	190.75'	**10.0' long x 12.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#2	Primary	190.00'	**8.0" Round Culvert X 3.00** L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 190.00' / 190.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.48 cfs @ 14.52 hrs HW=190.62' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
2=Culvert (Barrel Controls 1.48 cfs @ 1.91 fps)

Pond 6P: 2.2


Hydrograph
11.43 cfs
1.48 cfs
Inflow Area=408,171 sf
Peak Elev=190.62'
Storage=29,820 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 9P: 3.1

Inflow Area = 87,591 sf, 0.27% Impervious, Inflow Depth = 2.55" for 50-YEAR event
Inflow = 4.12 cfs @ 12.25 hrs, Volume= 18,610 cf
Outflow = 2.02 cfs @ 12.61 hrs, Volume= 13,460 cf, Atten= 51%, Lag= 21.4 min
Primary = 2.02 cfs @ 12.61 hrs, Volume= 13,460 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 204.57' @ 12.61 hrs Surf.Area= 18,858 sf Storage= 6,451 cf

Plug-Flow detention time= 171.8 min calculated for 13,460 cf (72% of inflow)
Center-of-Mass det. time= 72.3 min (941.4 - 869.1)

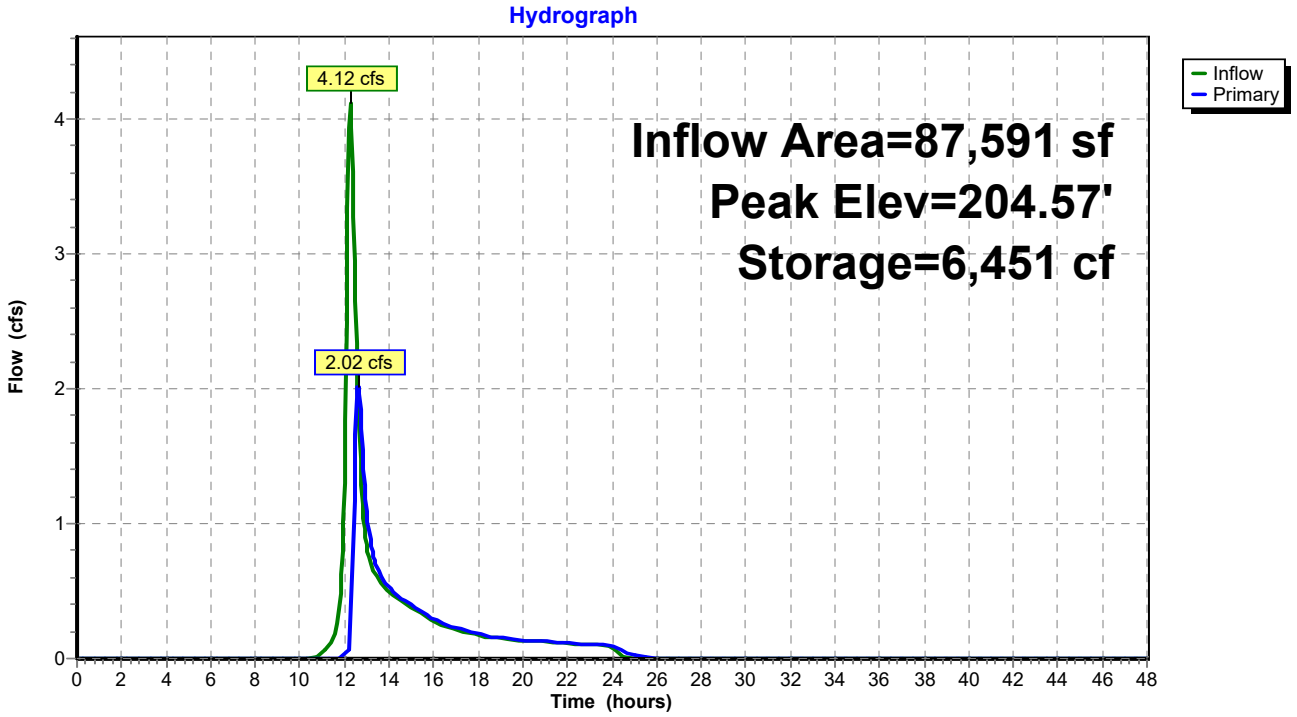
Volume	Invert	Avail.Storage	Storage Description
#1	204.00'	16,930 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
204.00	3,670	0	0
205.00	30,190	16,930	16,930

Device	Routing	Invert	Outlet Devices
#1	Primary	204.50'	**40.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=2.01 cfs @ 12.61 hrs HW=204.57' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 2.01 cfs @ 0.69 fps)

Pond 9P: 3.1


Hydrograph
Inflow Area=87,591 sf
Peak Elev=204.57'
Storage=6,451 cf
4.12 cfs
2.02 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 11P: 3.2 (AP-3)

Inflow Area = 177,561 sf, 0.14% Impervious, Inflow Depth = 1.20" for 50-YEAR event
Inflow = 2.40 cfs @ 12.60 hrs, Volume= 17,721 cf
Outflow = 0.48 cfs @ 15.38 hrs, Volume= 14,478 cf, Atten= 80%, Lag= 167.0 min
Primary = 0.48 cfs @ 15.38 hrs, Volume= 14,478 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 201.78' @ 15.38 hrs Surf.Area= 9,693 sf Storage= 7,167 cf

Plug-Flow detention time= 295.3 min calculated for 14,462 cf (82% of inflow)
Center-of-Mass det. time= 217.9 min (1,166.2 - 948.3)

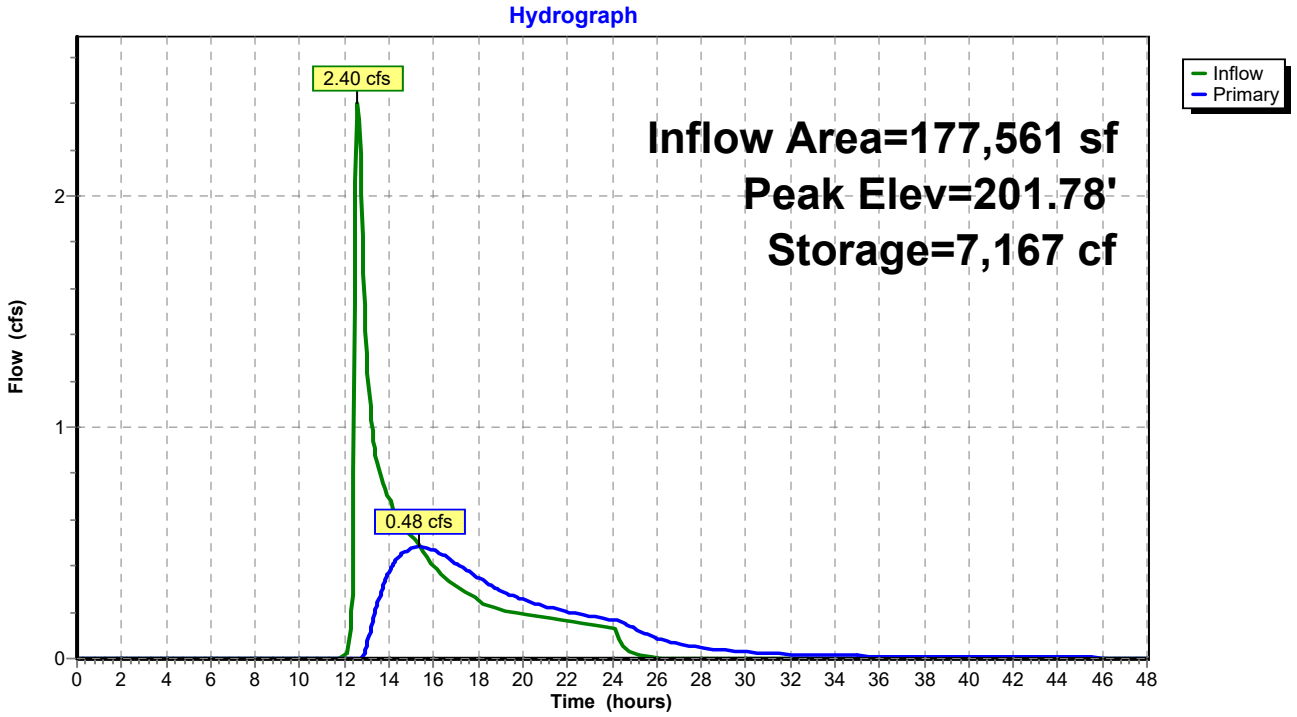
Volume	Invert	Avail.Storage	Storage Description
#1	201.00'	19,994 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.00	8,685	0	0
202.00	9,977	9,331	9,331
203.00	11,349	10,663	19,994

Device	Routing	Invert	Outlet Devices
#1	Primary	201.83'	**10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78
#2	Primary	201.33'	**8.0" Round Culvert** L= 40.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 201.33' / 201.00' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=0.48 cfs @ 15.38 hrs HW=201.78' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
└**2=Culvert** (Barrel Controls 0.48 cfs @ 2.73 fps)

Pond 11P: 3.2 (AP-3)



Summary for Pond 13P: 4.1

Inflow Area = 201,561 sf, 0.00% Impervious, Inflow Depth = 2.05" for 50-YEAR event
Inflow = 6.36 cfs @ 12.36 hrs, Volume= 34,419 cf
Outflow = 2.87 cfs @ 12.81 hrs, Volume= 34,419 cf, Atten= 55%, Lag= 26.8 min
Primary = 2.87 cfs @ 12.81 hrs, Volume= 34,419 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 202.51' @ 12.81 hrs Surf.Area= 12,539 sf Storage= 7,804 cf

Plug-Flow detention time= 34.8 min calculated for 34,419 cf (100% of inflow)
Center-of-Mass det. time= 34.2 min (922.6 - 888.4)

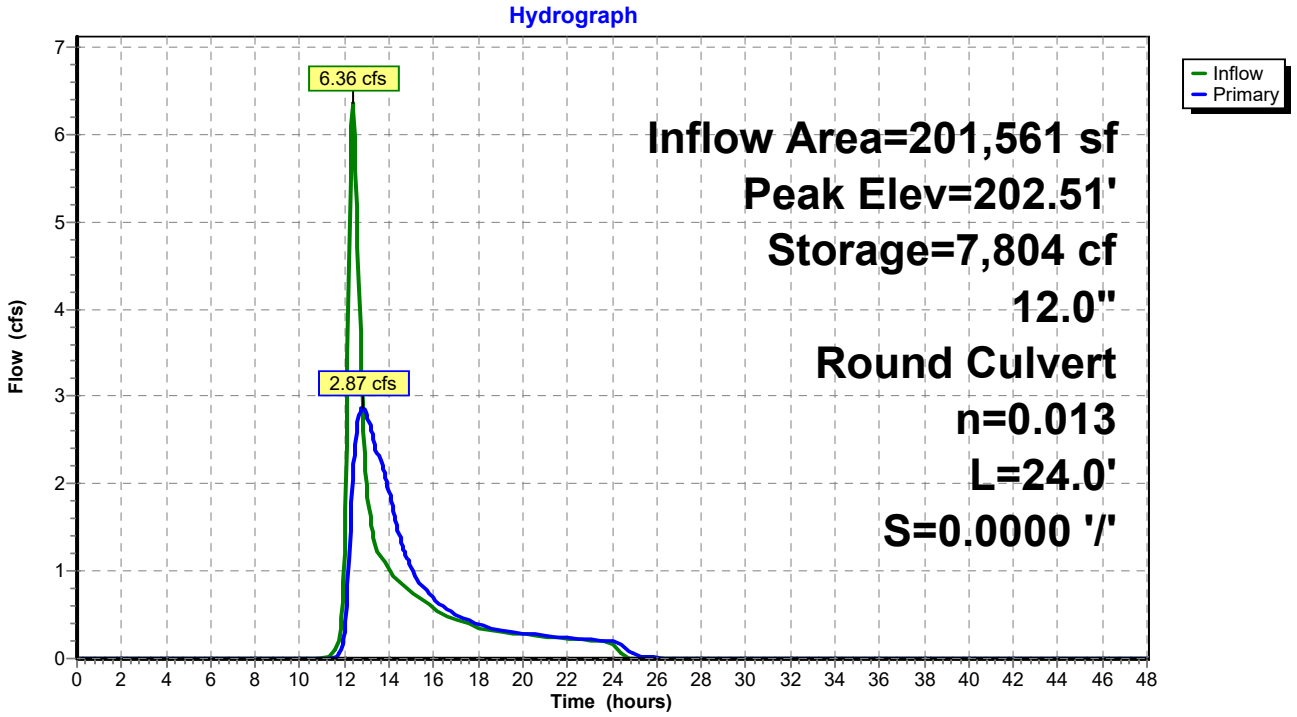
Volume	Invert	Avail.Storage	Storage Description
#1	201.00'	15,505 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.00	50	0	0
202.00	6,090	3,070	3,070
203.00	18,780	12,435	15,505

Device	Routing	Invert	Outlet Devices
#1	Primary	201.00'	**12.0" Round Culvert** L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 201.00' / 201.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.87 cfs @ 12.81 hrs HW=202.51' (Free Discharge)
1=Culvert (Barrel Controls 2.87 cfs @ 3.65 fps)

Pond 13P: 4.1


Hydrograph
6.36 cfs
2.87 cfs
Inflow Area=201,561 sf
Peak Elev=202.51'
Storage=7,804 cf
12.0"
Round Culvert
n=0.013
L=24.0'
S=0.0000 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 15P: 4.2

Inflow Area = 811,294 sf, 0.03% Impervious, Inflow Depth = 1.98" for 50-YEAR event
Inflow = 19.82 cfs @ 12.40 hrs, Volume= 133,583 cf
Outflow = 2.59 cfs @ 15.76 hrs, Volume= 99,203 cf, Atten= 87%, Lag= 201.4 min
Primary = 2.59 cfs @ 15.76 hrs, Volume= 99,203 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 198.03' @ 15.76 hrs Surf.Area= 47,500 sf Storage= 73,667 cf

Plug-Flow detention time= 432.4 min calculated for 99,100 cf (74% of inflow)
Center-of-Mass det. time= 336.4 min (1,236.9 - 900.4)

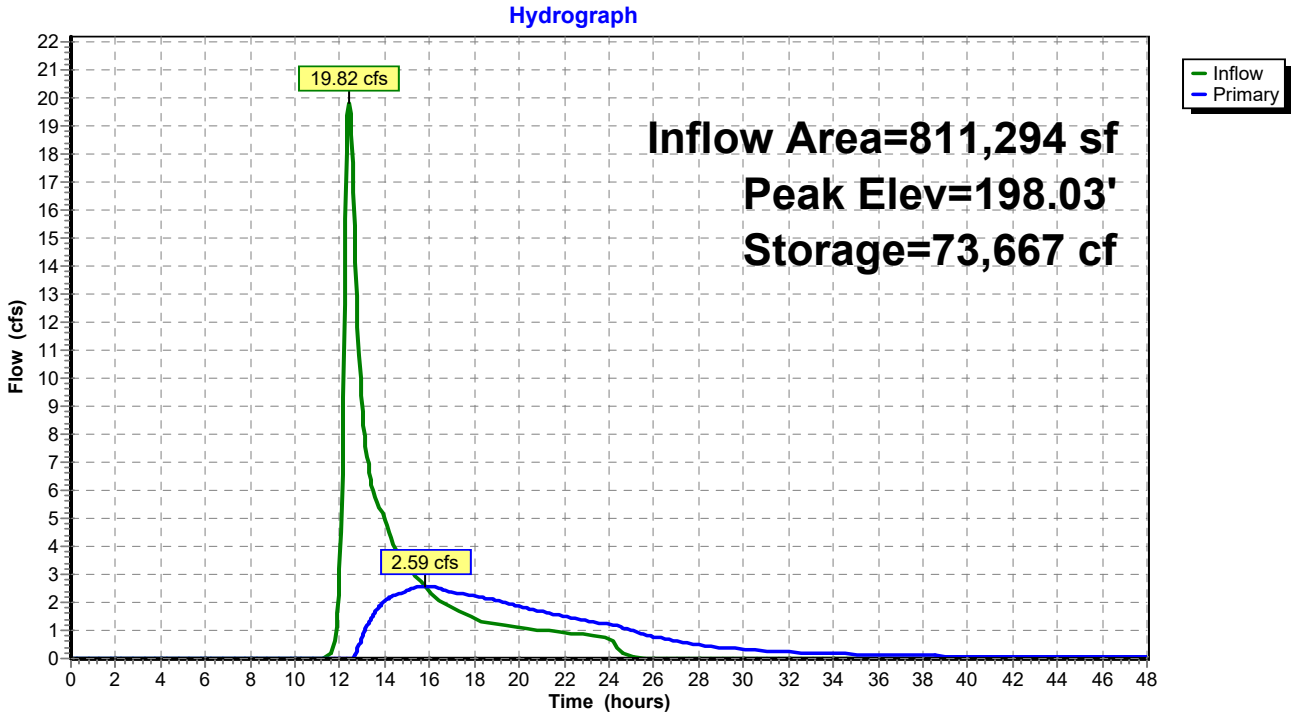
Volume	Invert	Avail.Storage	Storage Description
#1	196.00'	186,402 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
196.00	25,553	0	0
197.00	35,876	30,715	30,715
198.00	47,131	41,504	72,218
199.00	59,178	53,155	125,373
200.00	62,880	61,029	186,402

Device	Routing	Invert	Outlet Devices
#1	Primary	198.00'	**10.0' long x 31.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	197.00'	**12.0" Round Culvert** L= 40.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 197.00' / 196.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.57 cfs @ 15.76 hrs HW=198.03' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.14 cfs @ 0.47 fps)
2=Culvert (Inlet Controls 2.43 cfs @ 3.09 fps)

Pond 15P: 4.2


Hydrograph
19.82 cfs
2.59 cfs
Inflow Area=811,294 sf
Peak Elev=198.03'
Storage=73,667 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond 18P: 5.1 (AP-5.1)

Inflow Area = 285,491 sf, 0.00% Impervious, Inflow Depth = 1.95" for 50-YEAR event
Inflow = 9.18 cfs @ 12.30 hrs, Volume= 46,431 cf
Outflow = 0.76 cfs @ 16.03 hrs, Volume= 26,738 cf, Atten= 92%, Lag= 223.7 min
Primary = 0.76 cfs @ 16.03 hrs, Volume= 26,738 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 197.48' @ 16.03 hrs Surf.Area= 21,929 sf Storage= 28,689 cf

Plug-Flow detention time= 479.3 min calculated for 26,738 cf (58% of inflow)
Center-of-Mass det. time= 350.7 min (1,238.0 - 887.3)

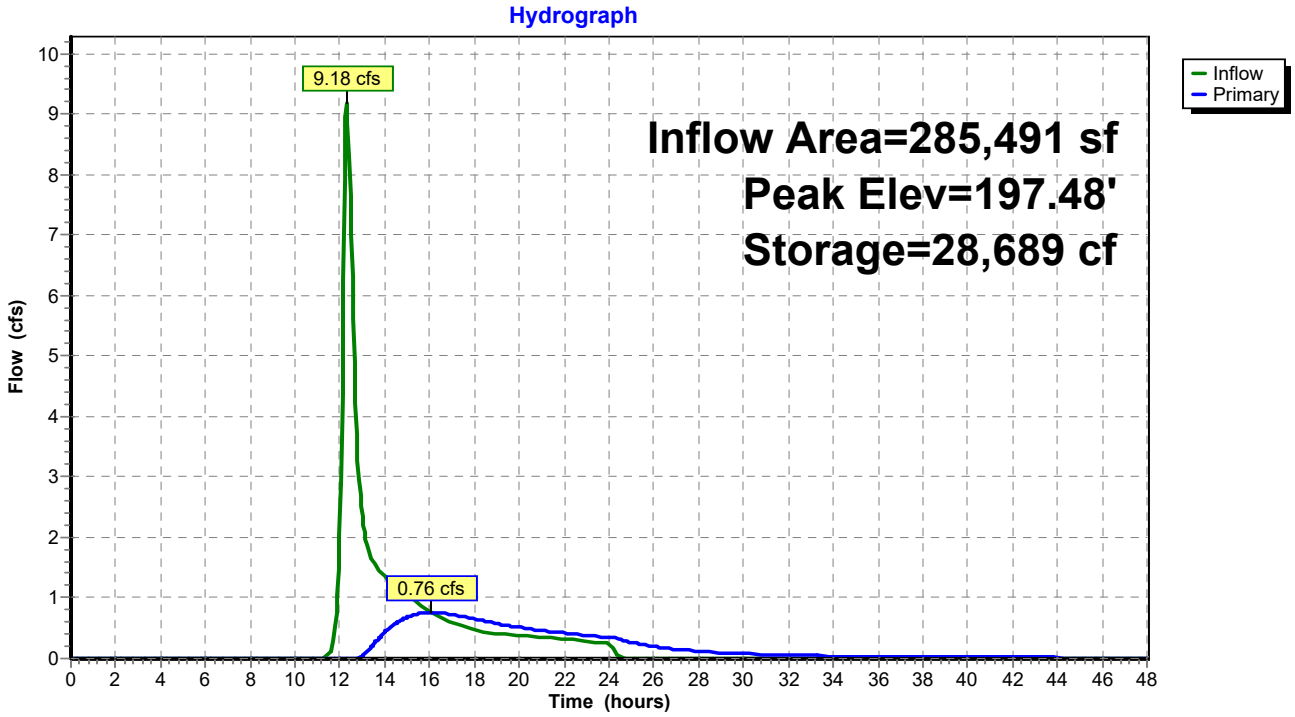
Volume	Invert	Avail.Storage	Storage Description
#1	196.00'	65,346 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
196.00	17,045	0	0
197.00	20,264	18,655	18,655
198.00	23,764	22,014	40,669
199.00	25,591	24,678	65,346

Device	Routing	Invert	Outlet Devices
#1	Primary	197.75'	**10.0' long x 18.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	197.00'	**12.0" Round Culvert** L= 32.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 197.00' / 196.00' S= 0.0313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.76 cfs @ 16.03 hrs HW=197.48' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
2=Culvert (Inlet Controls 0.76 cfs @ 2.07 fps)

Pond 18P: 5.1 (AP-5.1)

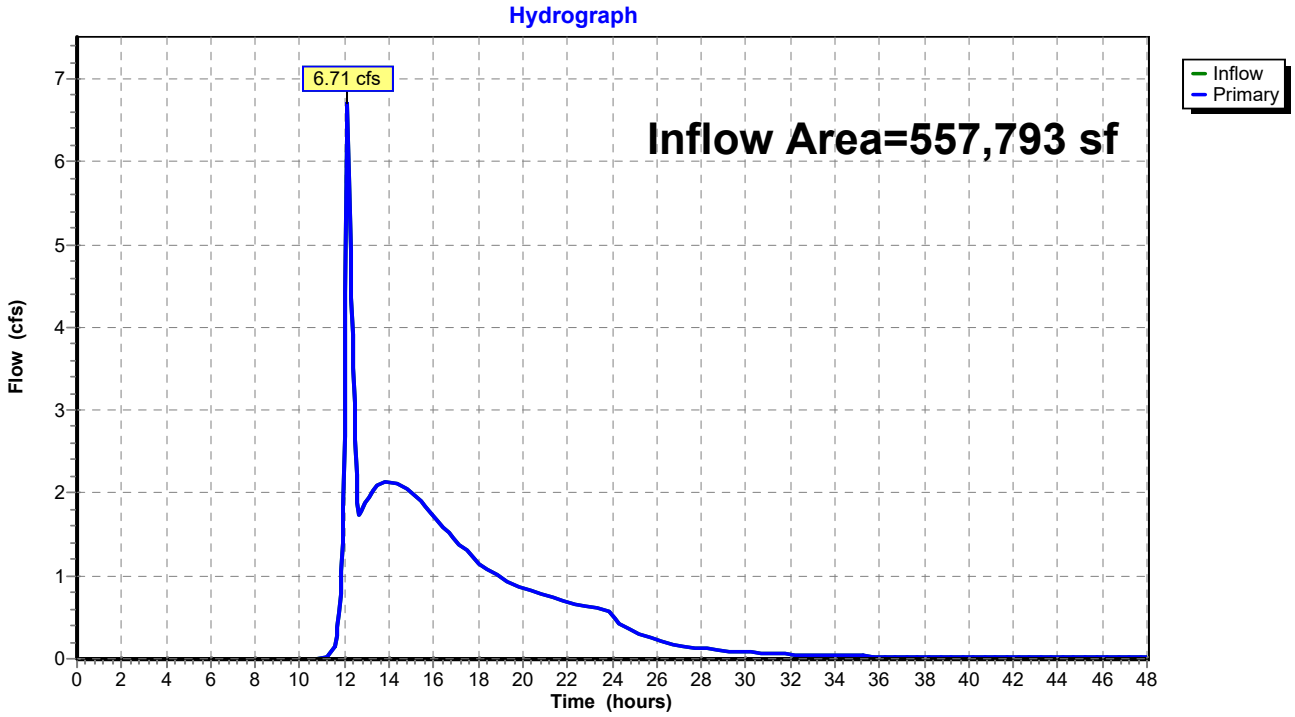


Summary for Link 20L: AP-2

Inflow Area = 557,793 sf, 0.09% Impervious, Inflow Depth > 1.47" for 50-YEAR event
Inflow = 6.71 cfs @ 12.14 hrs, Volume= 68,393 cf
Primary = 6.71 cfs @ 12.14 hrs, Volume= 68,393 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 20L: AP-2

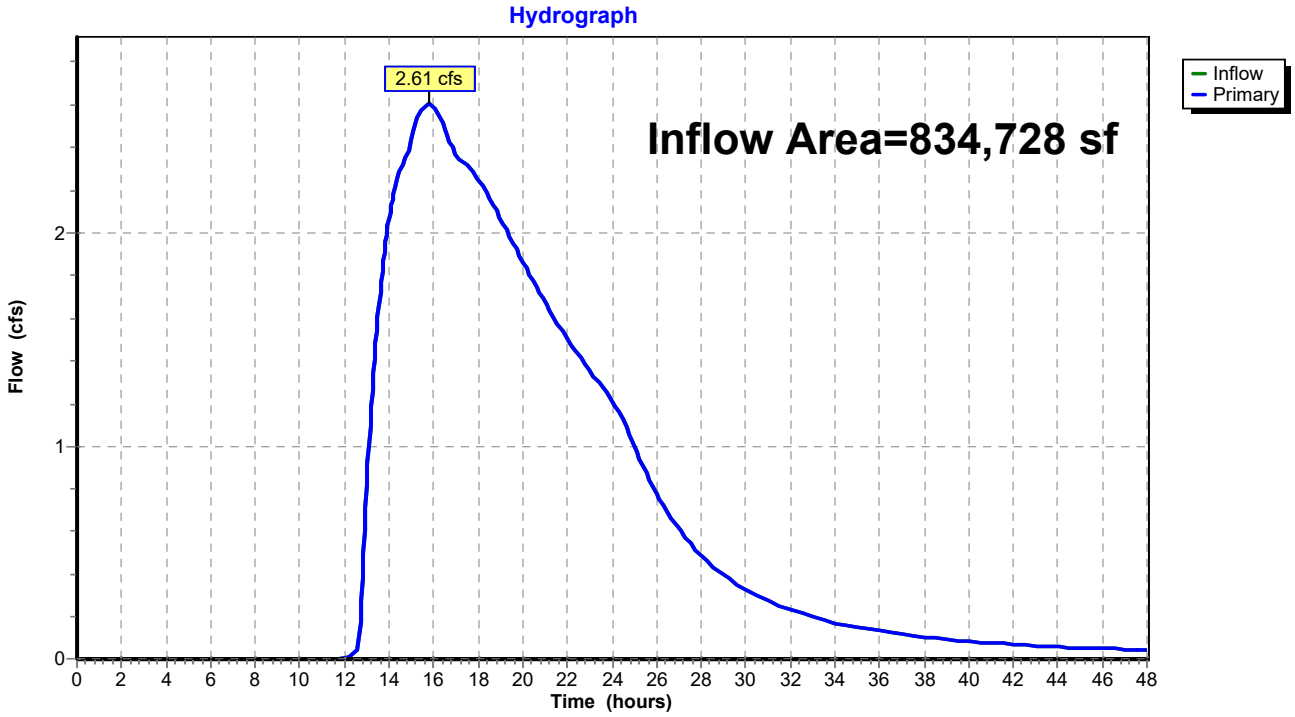


Summary for Link 21L: AP-4

Inflow Area = 834,728 sf, 0.03% Impervious, Inflow Depth > 1.43" for 50-YEAR event
Inflow = 2.61 cfs @ 15.75 hrs, Volume= 99,802 cf
Primary = 2.61 cfs @ 15.75 hrs, Volume= 99,802 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 21L: AP-4



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: AP-1 Runoff Area=90,105 sf 9.67% Impervious Runoff Depth=3.71"
Tc=8.0 min CN=60 Runoff=8.19 cfs 27,879 cf

Subcatchment 3S: 2.1 Runoff Area=56,747 sf 0.00% Impervious Runoff Depth=0.98"
Flow Length=500' Slope=0.0180 '/' Tc=13.1 min CN=35 Runoff=0.64 cfs 4,637 cf

Subcatchment 5S: 2.2 Runoff Area=351,424 sf 0.14% Impervious Runoff Depth=2.67"
Flow Length=905' Slope=0.0160 '/' Tc=21.4 min CN=51 Runoff=15.48 cfs 78,298 cf

Subcatchment 7S: 2.3 Runoff Area=149,622 sf 0.00% Impervious Runoff Depth=2.67"
Flow Length=420' Slope=0.0350 '/' Tc=8.6 min CN=51 Runoff=9.06 cfs 33,336 cf

Subcatchment 8S: 3.1 Runoff Area=87,591 sf 0.27% Impervious Runoff Depth=3.25"
Flow Length=335' Slope=0.0060 '/' Tc=16.7 min CN=56 Runoff=5.35 cfs 23,699 cf

Subcatchment 10S: 3.2 Runoff Area=89,970 sf 0.00% Impervious Runoff Depth=0.89"
Flow Length=650' Slope=0.0120 '/' Tc=19.0 min CN=34 Runoff=0.80 cfs 6,653 cf

Subcatchment 12S: 4.1 Runoff Area=201,561 sf 0.00% Impervious Runoff Depth=2.67"
Flow Length=755' Slope=0.0100 '/' Tc=23.2 min CN=51 Runoff=8.58 cfs 44,908 cf

Subcatchment 14S: 4.2 Runoff Area=609,733 sf 0.04% Impervious Runoff Depth=2.56"
Flow Length=1,000' Slope=0.0140 '/' Tc=24.7 min CN=50 Runoff=23.97 cfs 130,107 cf

Subcatchment 16S: 4.3 Runoff Area=23,434 sf 0.00% Impervious Runoff Depth=0.54"
Tc=5.0 min CN=30 Runoff=0.10 cfs 1,056 cf

Subcatchment 17S: 5.1 Runoff Area=285,491 sf 0.00% Impervious Runoff Depth=2.56"
Flow Length=735' Slope=0.0150 '/' Tc=18.8 min CN=50 Runoff=12.53 cfs 60,919 cf

Subcatchment 19S: 5.2 (AP-5.2) Runoff Area=118,838 sf 0.00% Impervious Runoff Depth=1.17"
Flow Length=425' Slope=0.0330 '/' Tc=8.9 min CN=37 Runoff=2.04 cfs 11,619 cf

Pond 4P: 2.1 Peak Elev=195.13' Storage=3,063 cf Inflow=0.64 cfs 4,637 cf
12.0" Round Culvert n=0.013 L=30.0' S=0.0333 '/' Outflow=0.07 cfs 2,055 cf

Pond 6P: 2.2 Peak Elev=190.83' Storage=35,105 cf Inflow=15.48 cfs 80,353 cf
Outflow=2.77 cfs 62,712 cf

Pond 9P: 3.1 Peak Elev=204.60' Storage=7,051 cf Inflow=5.35 cfs 23,699 cf
Outflow=3.44 cfs 18,549 cf

Pond 11P: 3.2 (AP-3) Peak Elev=201.89' Storage=8,287 cf Inflow=4.24 cfs 25,202 cf
Outflow=1.08 cfs 21,954 cf

Pond 13P: 4.1 Peak Elev=202.76' Storage=11,304 cf Inflow=8.58 cfs 44,908 cf
12.0" Round Culvert n=0.013 L=24.0' S=0.0000 '/' Outflow=3.50 cfs 44,908 cf

Pond 15P: 4.2 Peak Elev=198.21' Storage=82,587 cf Inflow=26.62 cfs 175,015 cf
Outflow=5.48 cfs 140,537 cf

Pond 18P: 5.1 (AP-5.1) Peak Elev=197.66' Storage=32,723 cf Inflow=12.53 cfs 60,919 cf
Outflow=1.33 cfs 41,206 cf

Link 20L: AP-2 Inflow=9.06 cfs 96,048 cf
Primary=9.06 cfs 96,048 cf

Link 21L: AP-4 Inflow=5.52 cfs 141,594 cf
Primary=5.52 cfs 141,594 cf

Total Runoff Area = 2,064,516 sf Runoff Volume = 423,111 cf Average Runoff Depth = 2.46"
99.53% Pervious = 2,054,844 sf 0.47% Impervious = 9,672 sf

Summary for Subcatchment 1S: AP-1

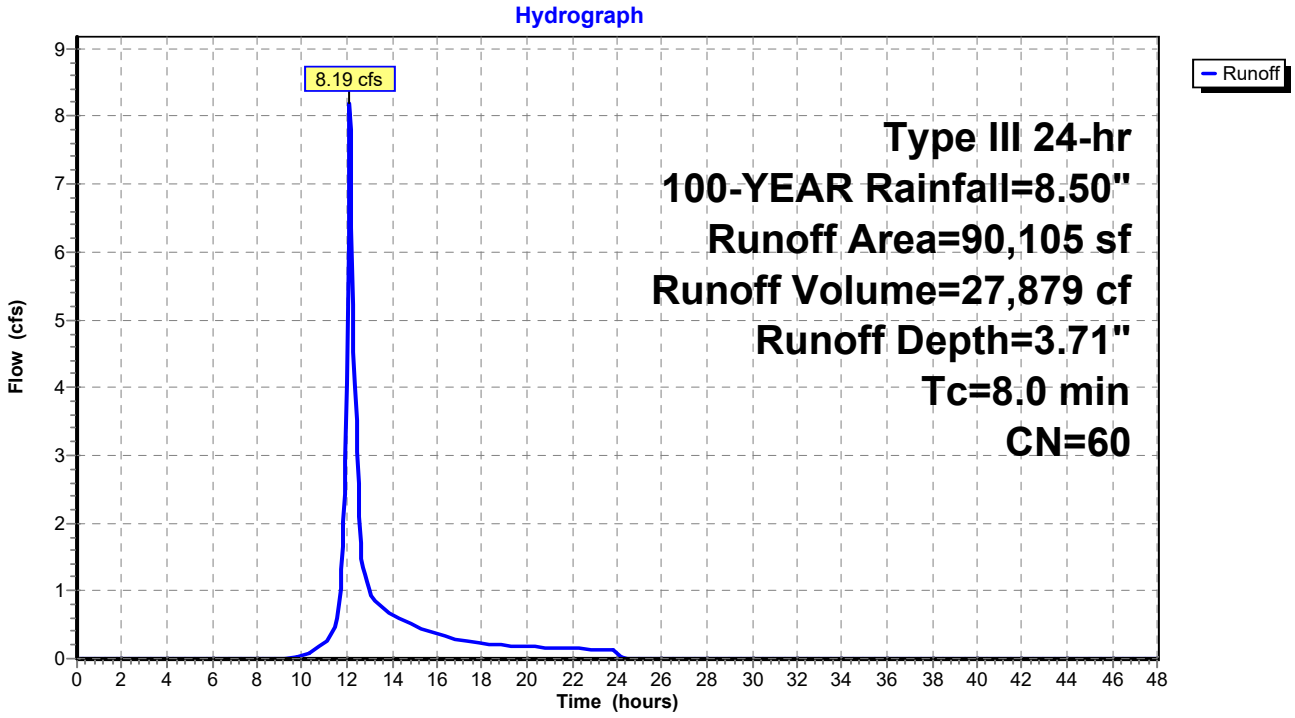
Runoff = 8.19 cfs @ 12.12 hrs, Volume= 27,879 cf, Depth= 3.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
38,399	51	1 acre lots, 20% imp, HSG A
5,161	84	1 acre lots, 20% imp, HSG D
2,850	96	Gravel surface, HSG A
7,762	96	Gravel surface, HSG D
16,607	30	Meadow, non-grazed, HSG A
19,326	78	Meadow, non-grazed, HSG D
90,105	60	Weighted Average
81,393		90.33% Pervious Area
8,712		9.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.0					**Direct Entry,**

Subcatchment 1S: AP-1



Summary for Subcatchment 3S: 2.1

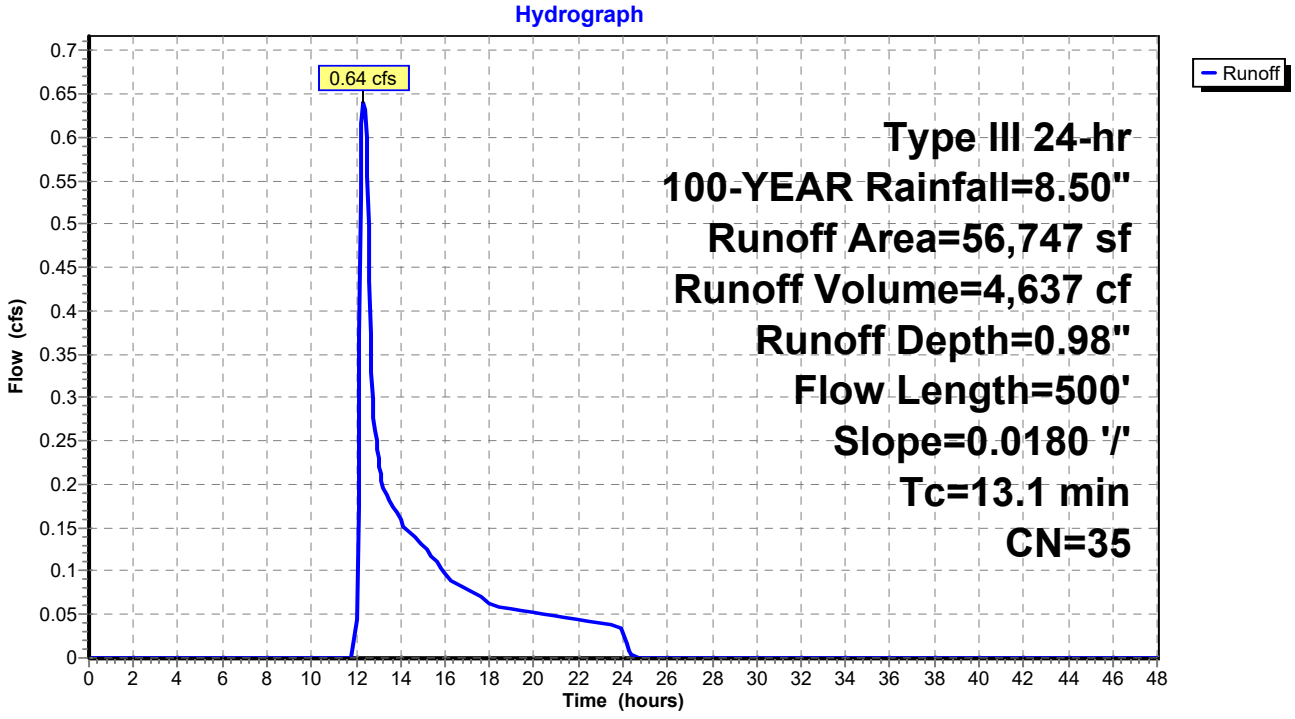
Runoff = 0.64 cfs @ 12.33 hrs, Volume= 4,637 cf, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
29,966	30	Woods, Good, HSG A
22,363	30	Meadow, non-grazed, HSG A
4,418	96	Gravel surface, HSG A
56,747	35	Weighted Average
56,747		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.1	50	0.0180	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.0	450	0.0180	0.94		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.1	500	Total			

Subcatchment 3S: 2.1



Summary for Subcatchment 5S: 2.2

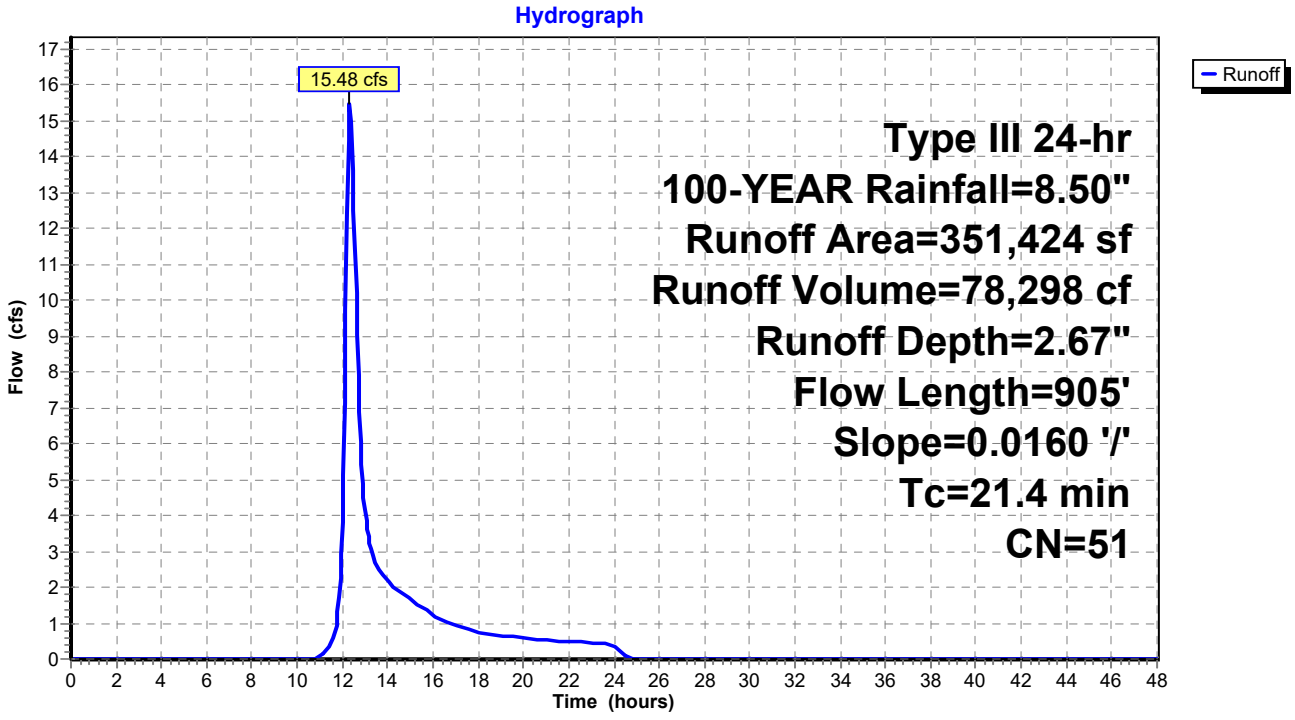
Runoff = 15.48 cfs @ 12.32 hrs, Volume= 78,298 cf, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
6,360	78	Meadow, non-grazed, HSG D
480	98	Unconnected roofs, HSG B
242,615	58	Meadow, non-grazed, HSG B
95,975	30	Meadow, non-grazed, HSG A
5,994	96	Gravel surface, HSG A
351,424	51	Weighted Average
350,944		99.86% Pervious Area
480		0.14% Impervious Area
480		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.3	50	0.0160	0.16		**Sheet Flow,** Range n= 0.130 P2= 3.40"
16.1	855	0.0160	0.89		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
21.4	905	Total			

Subcatchment 5S: 2.2



Summary for Subcatchment 7S: 2.3

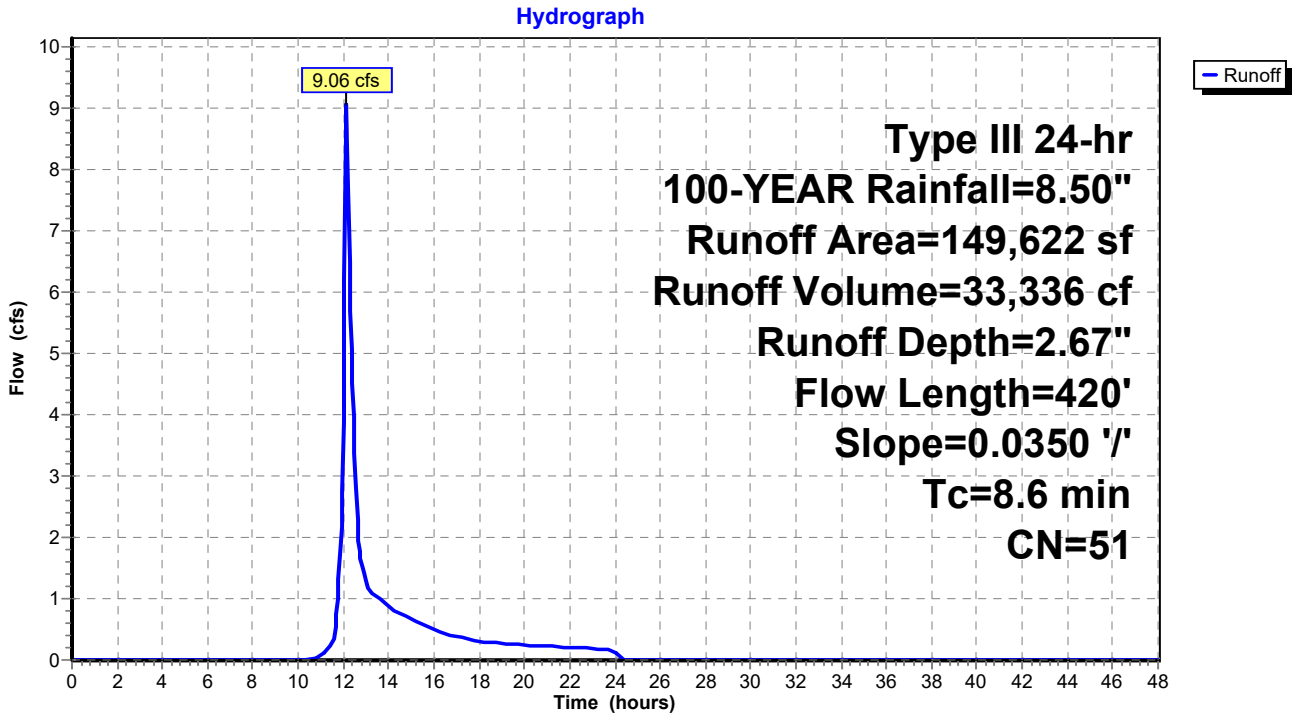
Runoff = 9.06 cfs @ 12.14 hrs, Volume= 33,336 cf, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
328	96	Gravel surface, HSG A
276	96	Gravel surface, HSG D
78,998	30	Meadow, non-grazed, HSG A
16,547	58	Meadow, non-grazed, HSG B
53,473	78	Meadow, non-grazed, HSG D
149,622	51	Weighted Average
149,622		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.9	50	0.0350	0.21		**Sheet Flow,** Range n= 0.130 P2= 3.40"
4.7	370	0.0350	1.31		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.6	420	Total			

Subcatchment 7S: 2.3



Summary for Subcatchment 8S: 3.1

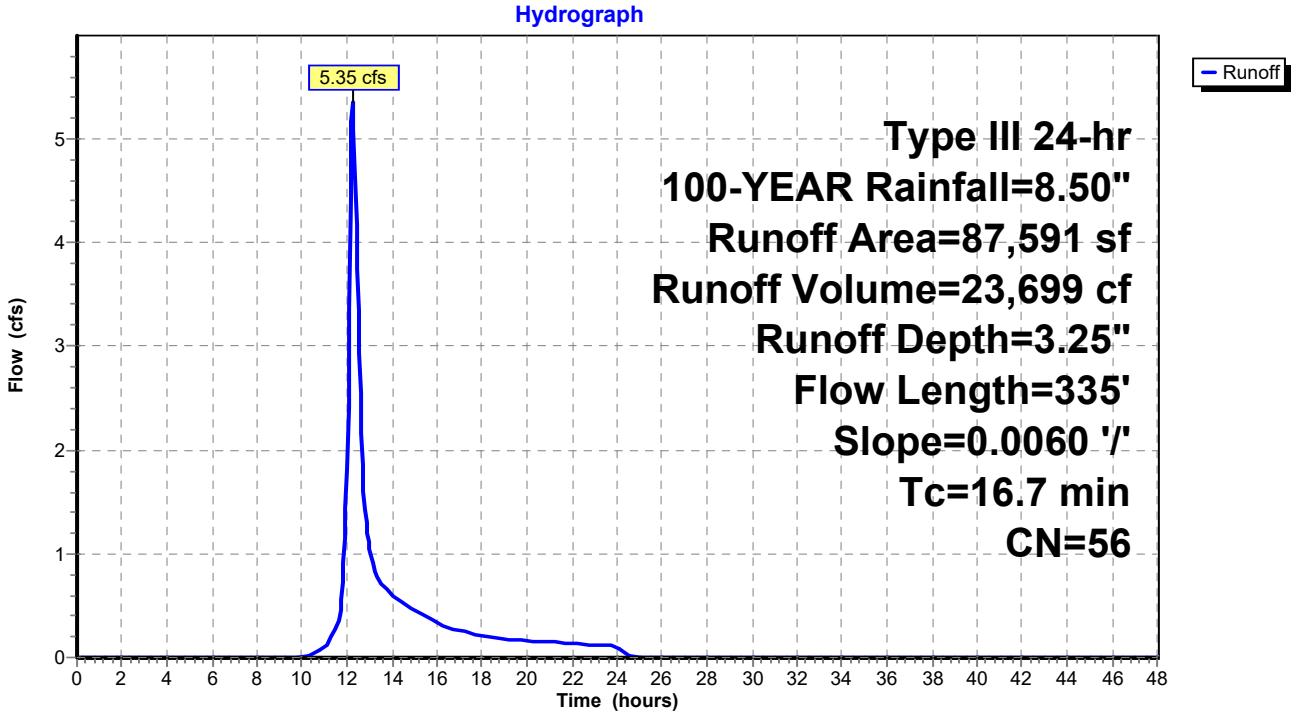
Runoff = 5.35 cfs @ 12.25 hrs, Volume= 23,699 cf, Depth= 3.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
240	98	Unconnected roofs, HSG B
73,156	58	Meadow, non-grazed, HSG B
10,475	30	Meadow, non-grazed, HSG A
3,720	96	Gravel surface, HSG A
87,591	56	Weighted Average
87,351		99.73% Pervious Area
240		0.27% Impervious Area
240		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	50	0.0060	0.11		**Sheet Flow,** Range n= 0.130 P2= 3.40"
8.8	285	0.0060	0.54		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.7	335	Total			

Subcatchment 8S: 3.1



Summary for Subcatchment 10S: 3.2

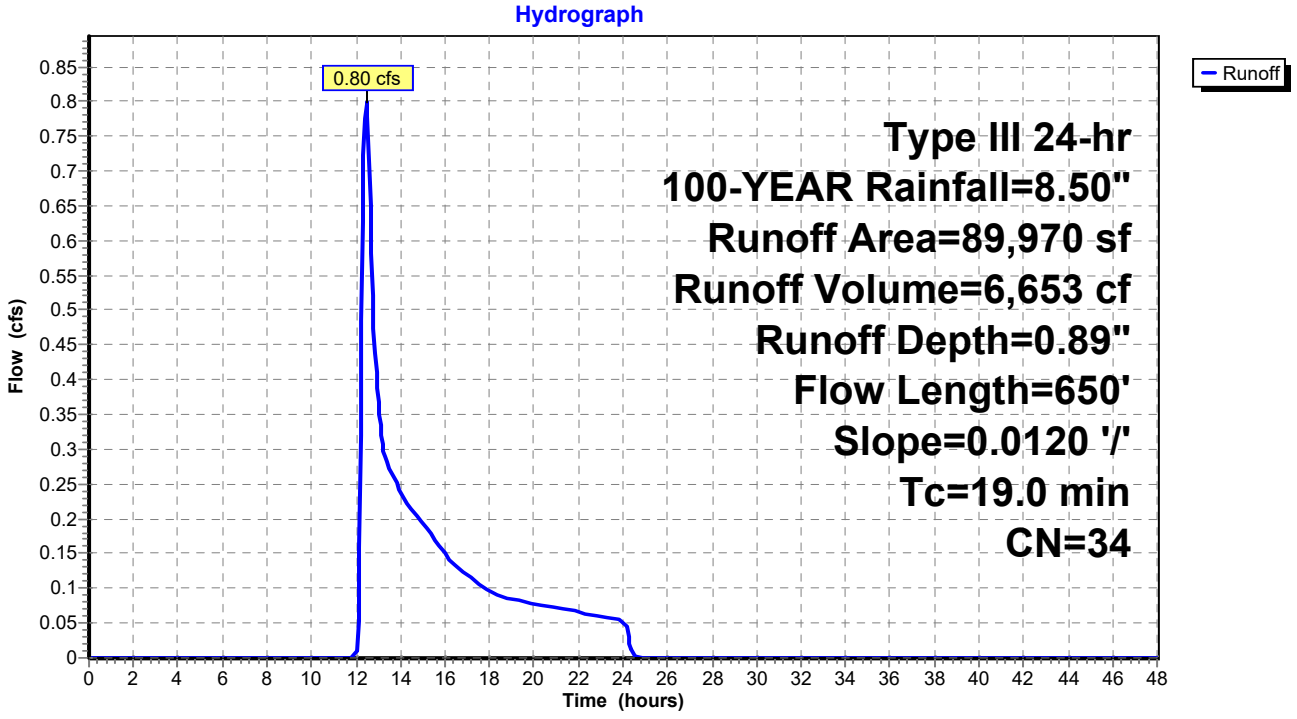
Runoff = 0.80 cfs @ 12.47 hrs, Volume= 6,653 cf, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
32,262	30	Woods, Good, HSG A
52,598	30	Meadow, non-grazed, HSG A
5,110	96	Gravel surface, HSG A
89,970	34	Weighted Average
89,970		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0	50	0.0120	0.14		**Sheet Flow,** Range n= 0.130 P2= 3.40"
13.0	600	0.0120	0.77		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
19.0	650	Total			

Subcatchment 10S: 3.2



Summary for Subcatchment 12S: 4.1

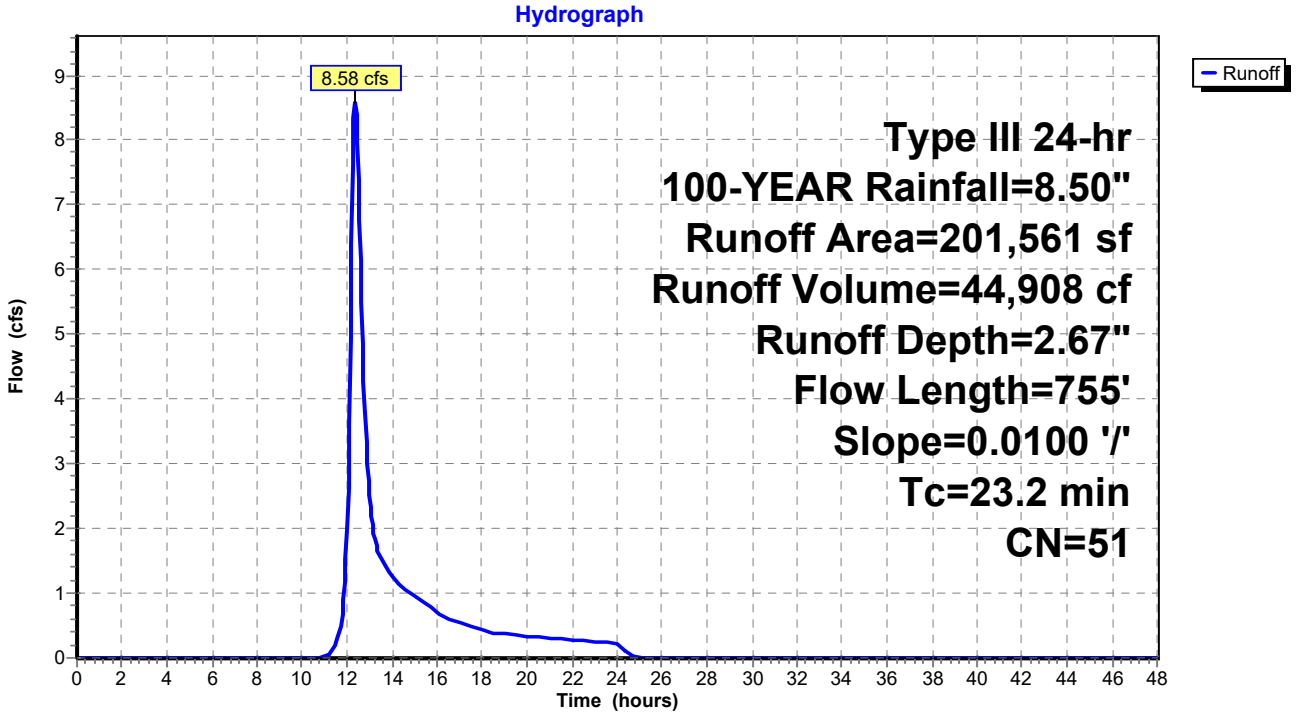
Runoff = 8.58 cfs @ 12.35 hrs, Volume= 44,908 cf, Depth= 2.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
57,023	30	Meadow, non-grazed, HSG A
5,058	96	Gravel surface, HSG A
139,480	58	Meadow, non-grazed, HSG B
201,561	51	Weighted Average
201,561		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	50	0.0100	0.13		**Sheet Flow,** Range n= 0.130 P2= 3.40"
16.8	705	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
23.2	755	Total			

Subcatchment 12S: 4.1



Summary for Subcatchment 14S: 4.2

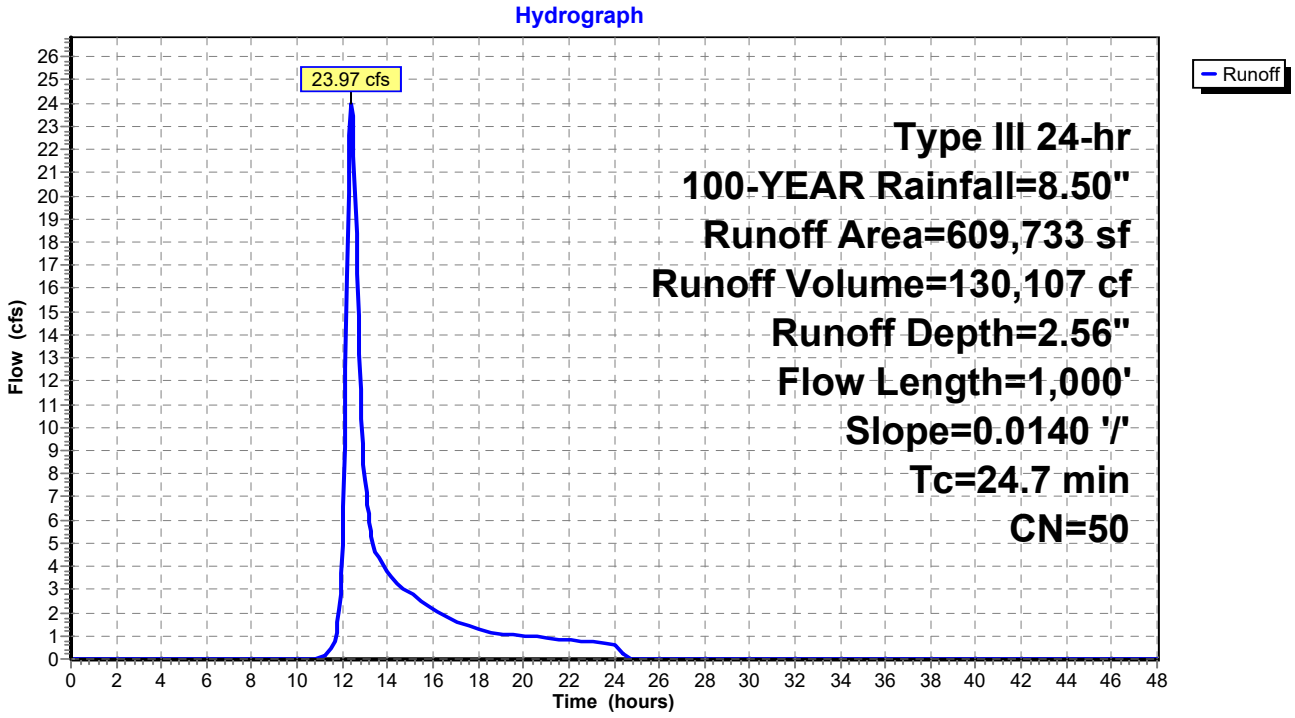
Runoff = 23.97 cfs @ 12.38 hrs, Volume= 130,107 cf, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
17,270	30	Woods, Good, HSG A
177,697	30	Meadow, non-grazed, HSG A
7,180	96	Gravel surface, HSG A
407,346	58	Meadow, non-grazed, HSG B
240	98	Unconnected roofs, HSG B
609,733	50	Weighted Average
609,493		99.96% Pervious Area
240		0.04% Impervious Area
240		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.6	50	0.0140	0.15		**Sheet Flow,** Range n= 0.130 P2= 3.40"
19.1	950	0.0140	0.83		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
24.7	1,000	Total			

Subcatchment 14S: 4.2



Summary for Subcatchment 16S: 4.3

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

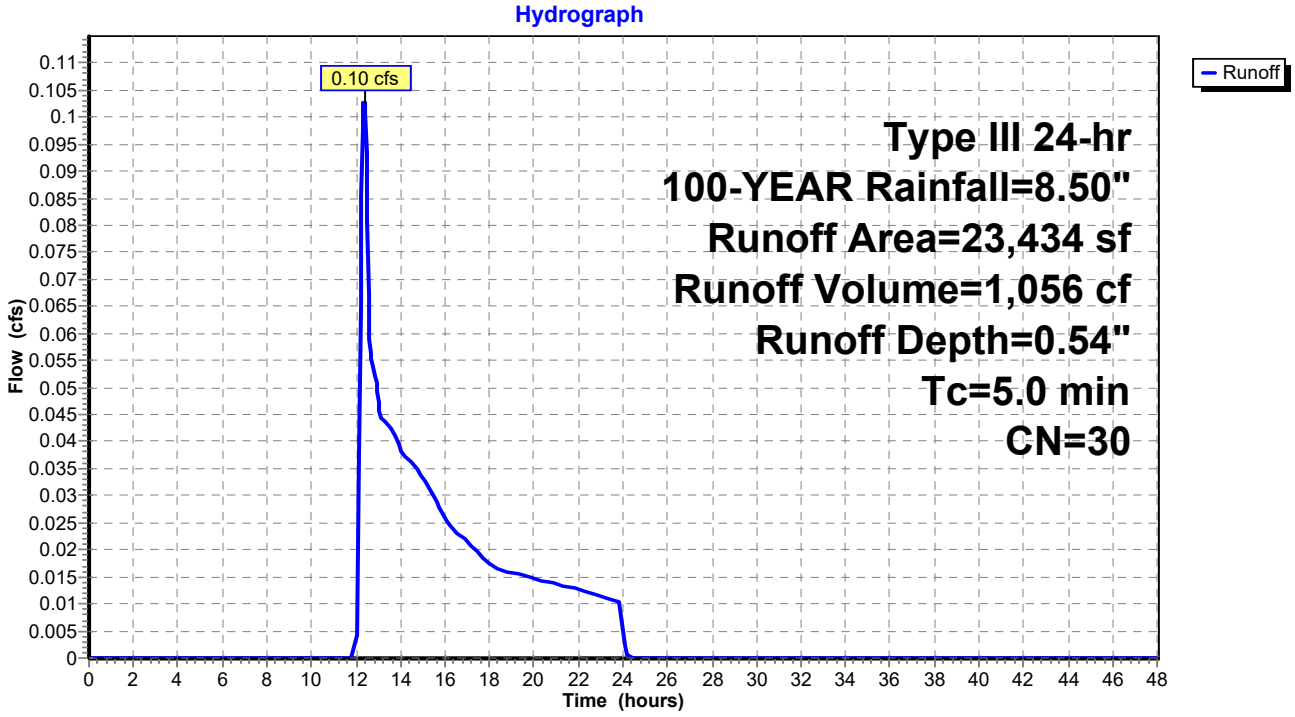
Runoff = 0.10 cfs @ 12.36 hrs, Volume= 1,056 cf, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
23,434	30	Woods, Good, HSG A
23,434		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 16S: 4.3



Summary for Subcatchment 17S: 5.1

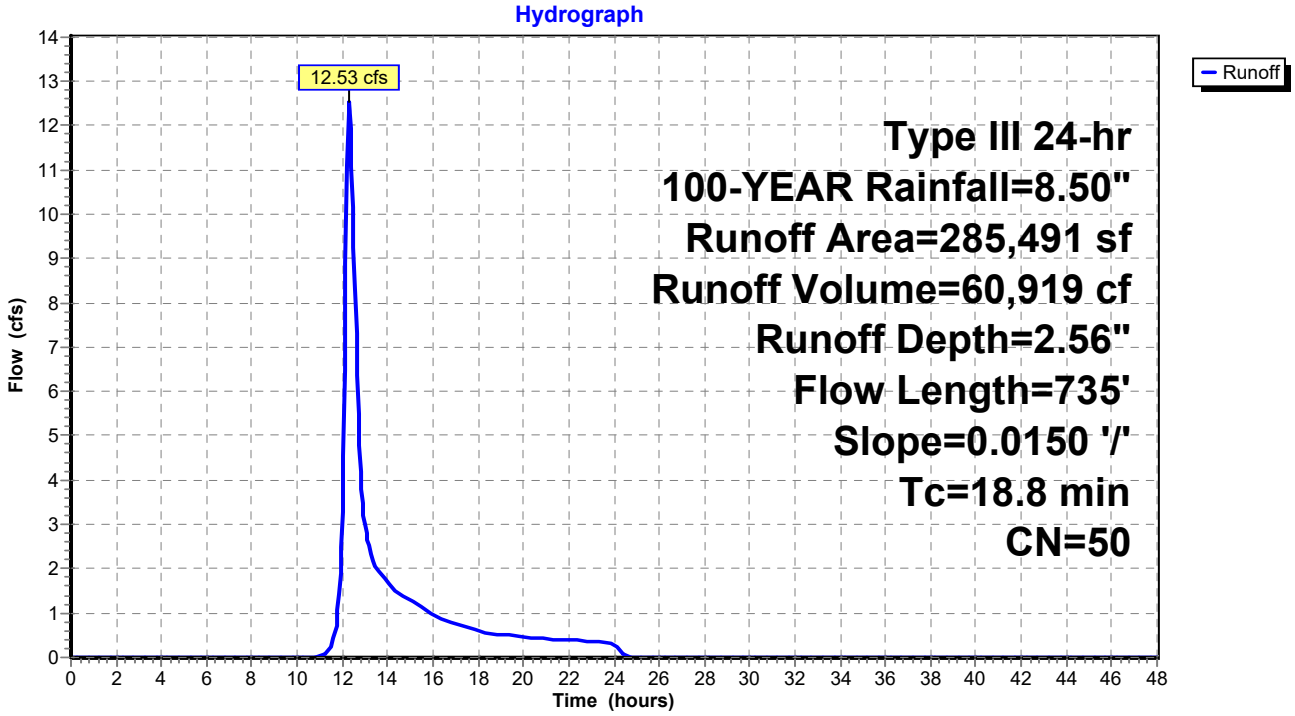
Runoff = 12.53 cfs @ 12.29 hrs, Volume= 60,919 cf, Depth= 2.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
84,913	30	Meadow, non-grazed, HSG A
192,738	58	Meadow, non-grazed, HSG B
3,527	96	Gravel surface, HSG A
4,313	30	Woods, Good, HSG A
285,491	50	Weighted Average
285,491		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.5	50	0.0150	0.15		**Sheet Flow,** Range n= 0.130 P2= 3.40"
13.3	685	0.0150	0.86		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
18.8	735	Total			

Subcatchment 17S: 5.1



Summary for Subcatchment 19S: 5.2 (AP-5.2)

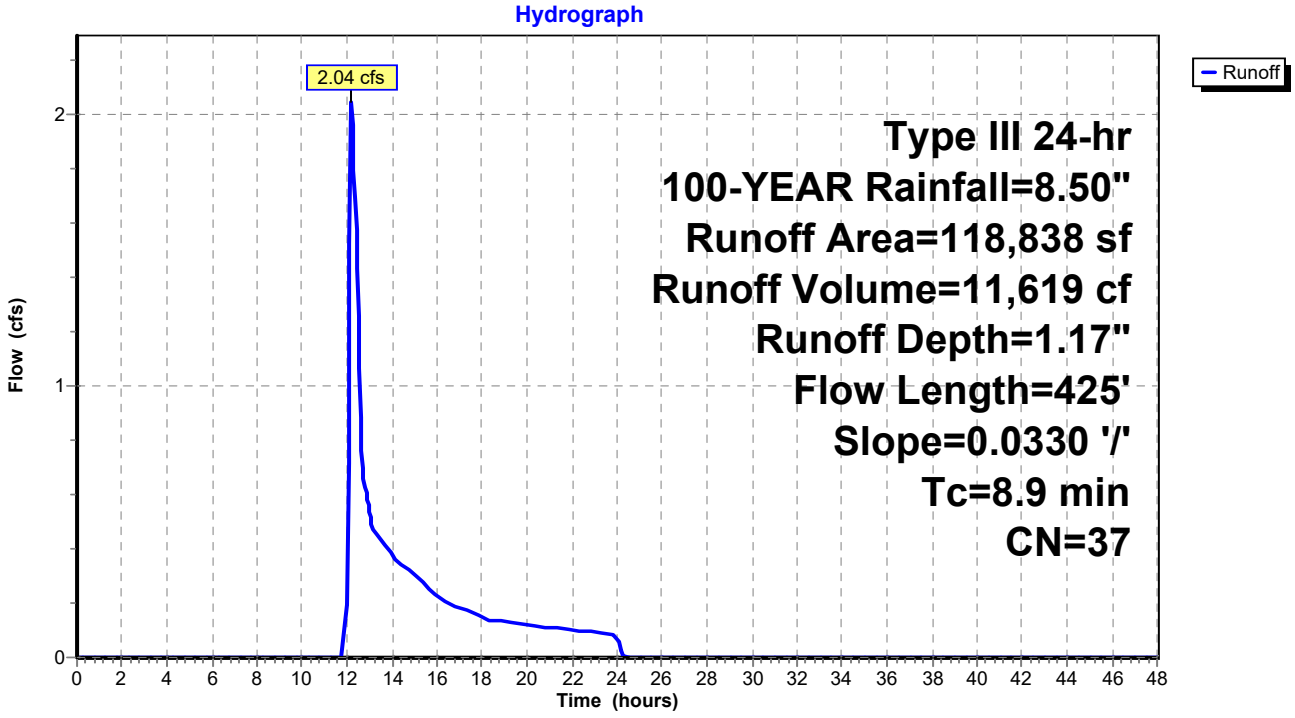
Runoff = 2.04 cfs @ 12.18 hrs, Volume= 11,619 cf, Depth= 1.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-YEAR Rainfall=8.50"

Area (sf)	CN	Description
49,980	30	Meadow, non-grazed, HSG A
15,920	58	Meadow, non-grazed, HSG B
29,898	30	Brush, Good, HSG A
23,040	48	Brush, Good, HSG B
118,838	37	Weighted Average
118,838		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.0	50	0.0330	0.21		**Sheet Flow,** Range n= 0.130 P2= 3.40"
4.9	375	0.0330	1.27		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.9	425	Total			

Subcatchment 19S: 5.2 (AP-5.2)



Summary for Pond 4P: 2.1

Inflow Area = 56,747 sf, 0.00% Impervious, Inflow Depth = 0.98" for 100-YEAR event
Inflow = 0.64 cfs @ 12.33 hrs, Volume= 4,637 cf
Outflow = 0.07 cfs @ 17.62 hrs, Volume= 2,055 cf, Atten= 89%, Lag= 317.2 min
Primary = 0.07 cfs @ 17.62 hrs, Volume= 2,055 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 195.13' @ 17.62 hrs Surf.Area= 4,066 sf Storage= 3,063 cf

Plug-Flow detention time= 500.4 min calculated for 2,053 cf (44% of inflow)
Center-of-Mass det. time= 335.0 min (1,268.9 - 933.9)

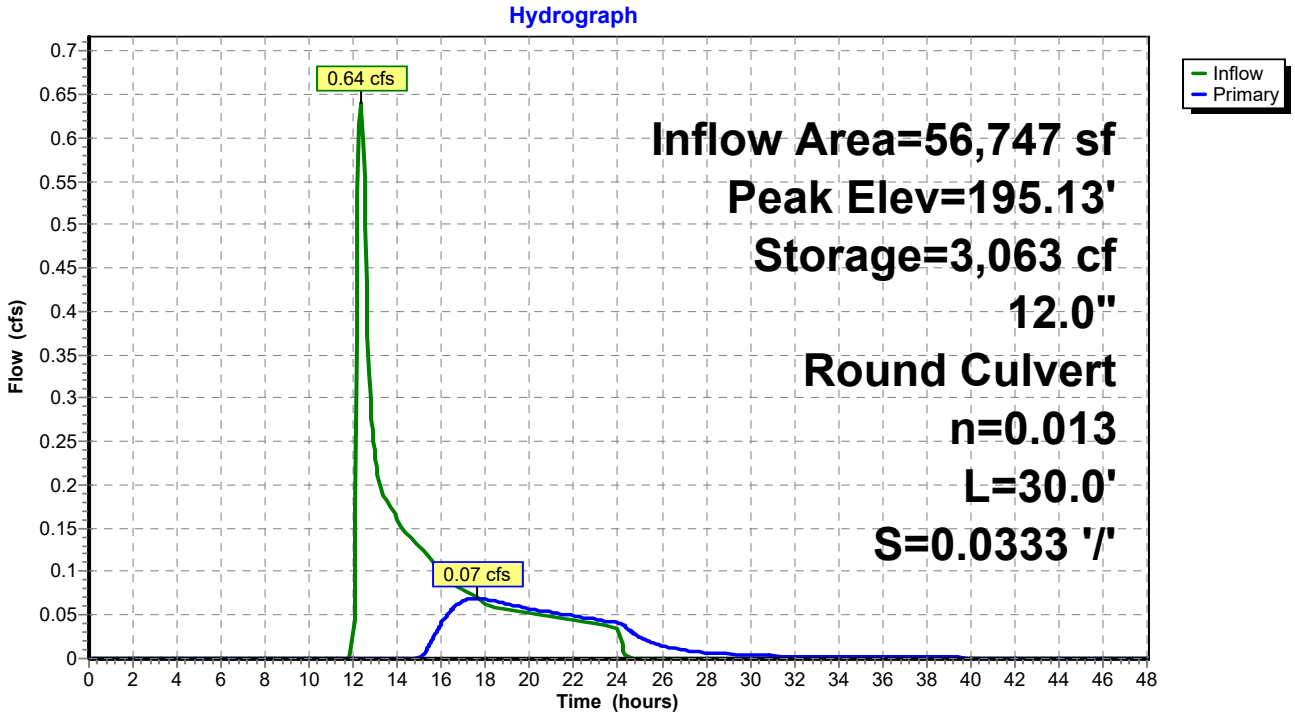
Volume	Invert	Avail.Storage	Storage Description
#1	194.00'	8,346 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
194.00	1,685	0	0
195.00	3,435	2,560	2,560
196.00	8,137	5,786	8,346

Device	Routing	Invert	Outlet Devices
#1	Primary	195.00'	**12.0" Round Culvert** L= 30.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 195.00' / 194.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=0.07 cfs @ 17.62 hrs HW=195.13' (Free Discharge)
1=Culvert (Inlet Controls 0.07 cfs @ 1.10 fps)

Pond 4P: 2.1


Hydrograph
Inflow
Primary
0.64 cfs
0.07 cfs
Inflow Area=56,747 sf
Peak Elev=195.13'
Storage=3,063 cf
12.0"
Round Culvert
n=0.013
L=30.0'
S=0.0333 '/'
Flow (cfs)
Time (hours)
0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 6P: 2.2

Inflow Area = 408,171 sf, 0.12% Impervious, Inflow Depth = 2.36" for 100-YEAR event
Inflow = 15.48 cfs @ 12.32 hrs, Volume= 80,353 cf
Outflow = 2.77 cfs @ 13.39 hrs, Volume= 62,712 cf, Atten= 82%, Lag= 63.9 min
Primary = 2.77 cfs @ 13.39 hrs, Volume= 62,712 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 190.83' @ 13.39 hrs Surf.Area= 26,465 sf Storage= 35,105 cf

Plug-Flow detention time= 289.3 min calculated for 62,712 cf (78% of inflow)
Center-of-Mass det. time= 197.6 min (1,085.8 - 888.2)

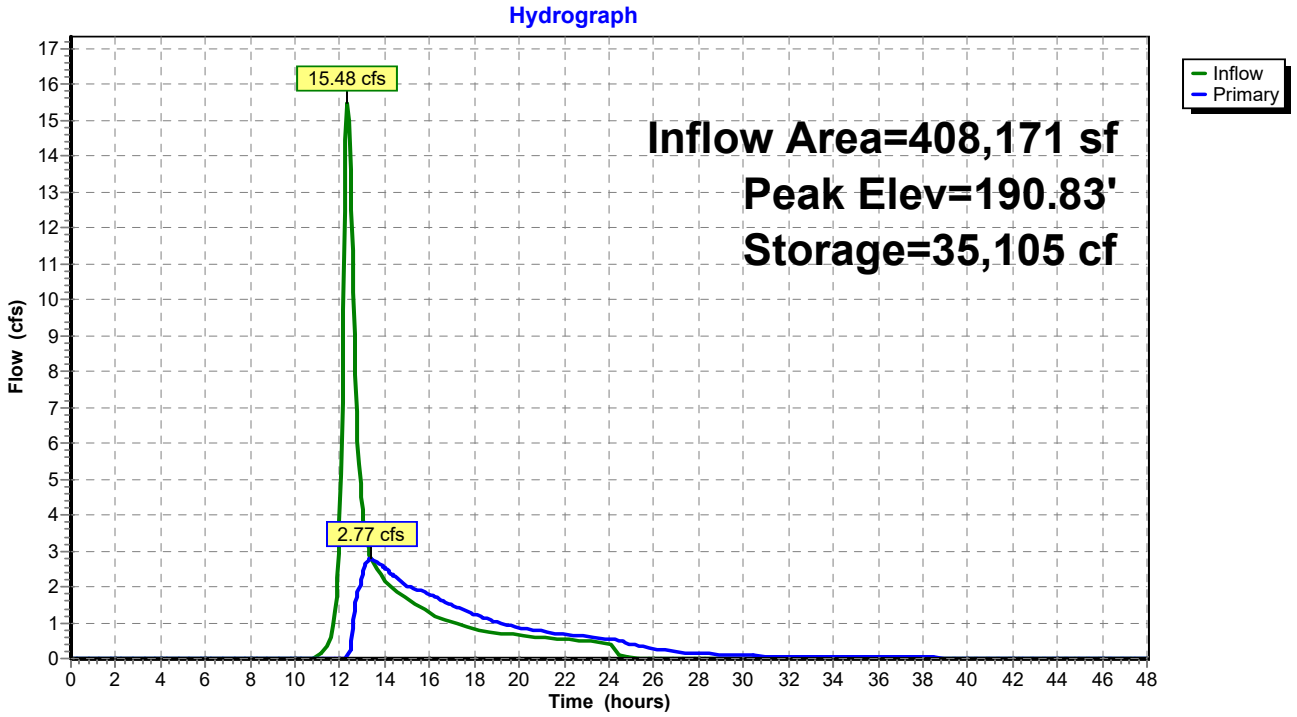
Volume	Invert	Avail.Storage	Storage Description
#1	189.00'	71,615 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
189.00	13,767	0	0
190.00	18,949	16,358	16,358
191.00	28,052	23,501	39,859
192.00	35,460	31,756	71,615

Device	Routing	Invert	Outlet Devices
#1	Primary	190.75'	**10.0' long x 12.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.58 2.63 2.70 2.67 2.66 2.67 2.66 2.63
#2	Primary	190.00'	**8.0" Round Culvert X 3.00** L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 190.00' / 190.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=2.77 cfs @ 13.39 hrs HW=190.83' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.54 cfs @ 0.71 fps)
└**2=Culvert** (Barrel Controls 2.23 cfs @ 2.20 fps)

Pond 6P: 2.2


Hydrograph
15.48 cfs
2.77 cfs
Inflow Area=408,171 sf
Peak Elev=190.83'
Storage=35,105 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 9P: 3.1

Inflow Area = 87,591 sf, 0.27% Impervious, Inflow Depth = 3.25" for 100-YEAR event
Inflow = 5.35 cfs @ 12.25 hrs, Volume= 23,699 cf
Outflow = 3.44 cfs @ 12.49 hrs, Volume= 18,549 cf, Atten= 36%, Lag= 14.9 min
Primary = 3.44 cfs @ 12.49 hrs, Volume= 18,549 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 204.60' @ 12.49 hrs Surf.Area= 19,684 sf Storage= 7,051 cf

Plug-Flow detention time= 139.9 min calculated for 18,529 cf (78% of inflow)
Center-of-Mass det. time= 55.5 min (917.2 - 861.7)

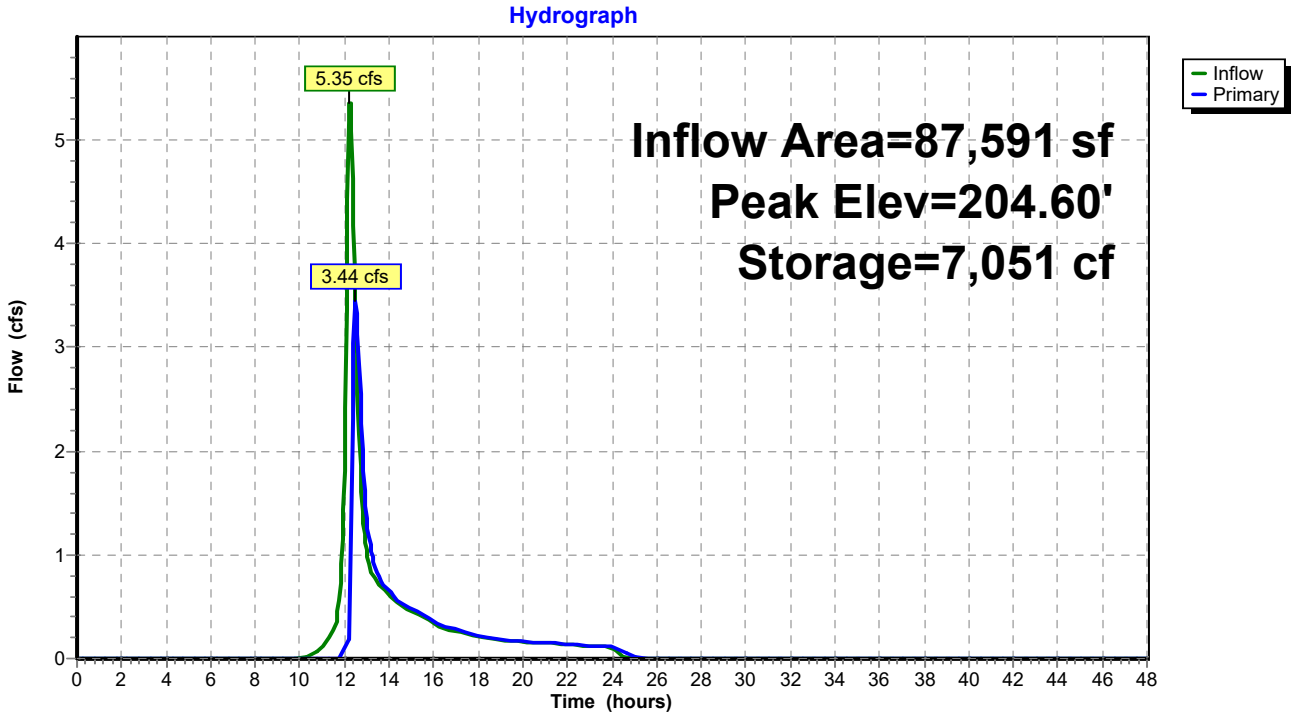
Volume	Invert	Avail.Storage	Storage Description
#1	204.00'	16,930 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
204.00	3,670	0	0
205.00	30,190	16,930	16,930

Device	Routing	Invert	Outlet Devices
#1	Primary	204.50'	**40.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=3.43 cfs @ 12.49 hrs HW=204.60' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 3.43 cfs @ 0.83 fps)

Pond 9P: 3.1


Hydrograph
5.35 cfs
3.44 cfs
Inflow Area=87,591 sf
Peak Elev=204.60'
Storage=7,051 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 11P: 3.2 (AP-3)

Inflow Area = 177,561 sf, 0.14% Impervious, Inflow Depth = 1.70" for 100-YEAR event
Inflow = 4.24 cfs @ 12.49 hrs, Volume= 25,202 cf
Outflow = 1.08 cfs @ 13.47 hrs, Volume= 21,954 cf, Atten= 74%, Lag= 58.9 min
Primary = 1.08 cfs @ 13.47 hrs, Volume= 21,954 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 201.89' @ 13.47 hrs Surf.Area= 9,841 sf Storage= 8,287 cf

Plug-Flow detention time= 228.0 min calculated for 21,954 cf (87% of inflow)
Center-of-Mass det. time= 168.1 min (1,093.1 - 924.9)

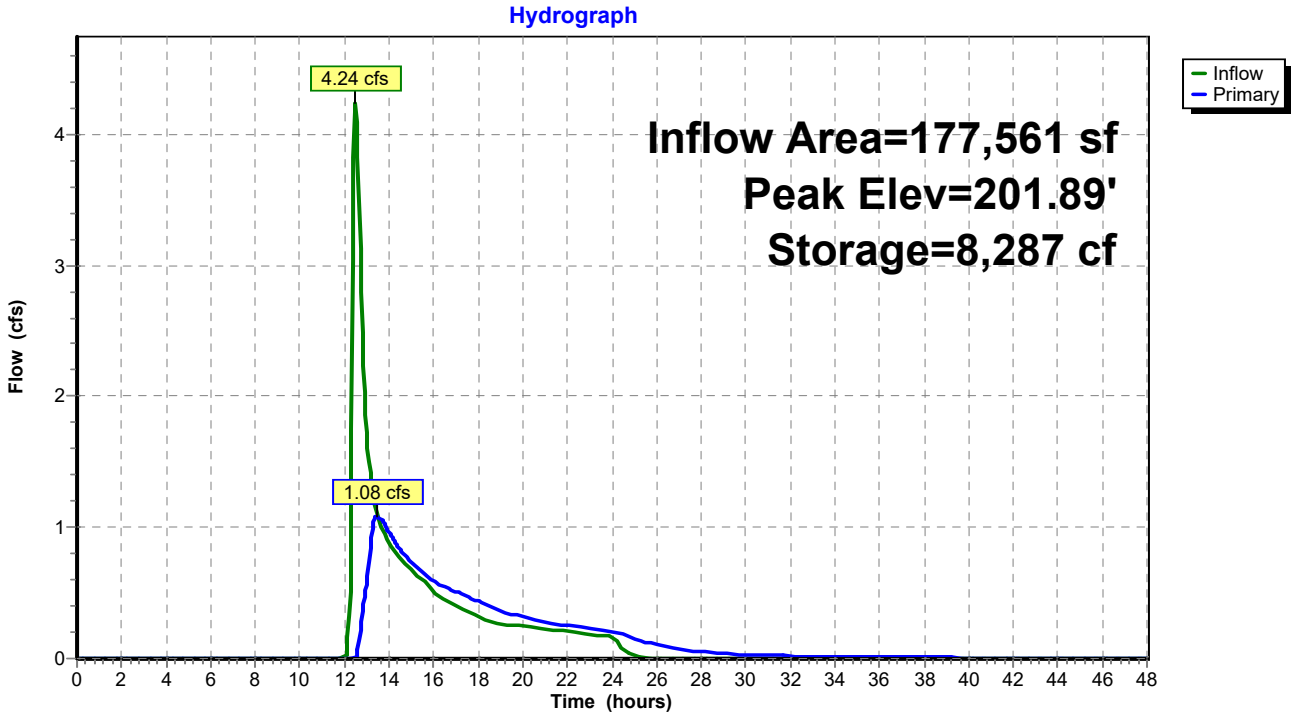
Volume	Invert	Avail.Storage	Storage Description
#1	201.00'	19,994 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.00	8,685	0	0
202.00	9,977	9,331	9,331
203.00	11,349	10,663	19,994

Device	Routing	Invert	Outlet Devices
#1	Primary	201.83'	**10.0' long x 7.0' 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) 2.40 2.52 2.70 2.68 2.68 2.67 2.66 2.65 2.65 2.65 2.66 2.65 2.66 2.68 2.70 2.73 2.78
#2	Primary	201.33'	**8.0" Round Culvert** L= 40.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 201.33' / 201.00' S= 0.0083 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.35 sf

Primary OutFlow Max=1.08 cfs @ 13.47 hrs HW=201.89' (Free Discharge)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 0.39 cfs @ 0.61 fps)
└**2=Culvert** (Barrel Controls 0.69 cfs @ 2.94 fps)

Pond 11P: 3.2 (AP-3)



Summary for Pond 13P: 4.1

Inflow Area = 201,561 sf, 0.00% Impervious, Inflow Depth = 2.67" for 100-YEAR event
Inflow = 8.58 cfs @ 12.35 hrs, Volume= 44,908 cf
Outflow = 3.50 cfs @ 12.83 hrs, Volume= 44,908 cf, Atten= 59%, Lag= 28.7 min
Primary = 3.50 cfs @ 12.83 hrs, Volume= 44,908 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 202.76' @ 12.83 hrs Surf.Area= 15,687 sf Storage= 11,304 cf

Plug-Flow detention time= 38.8 min calculated for 44,908 cf (100% of inflow)
Center-of-Mass det. time= 38.2 min (918.1 - 879.9)

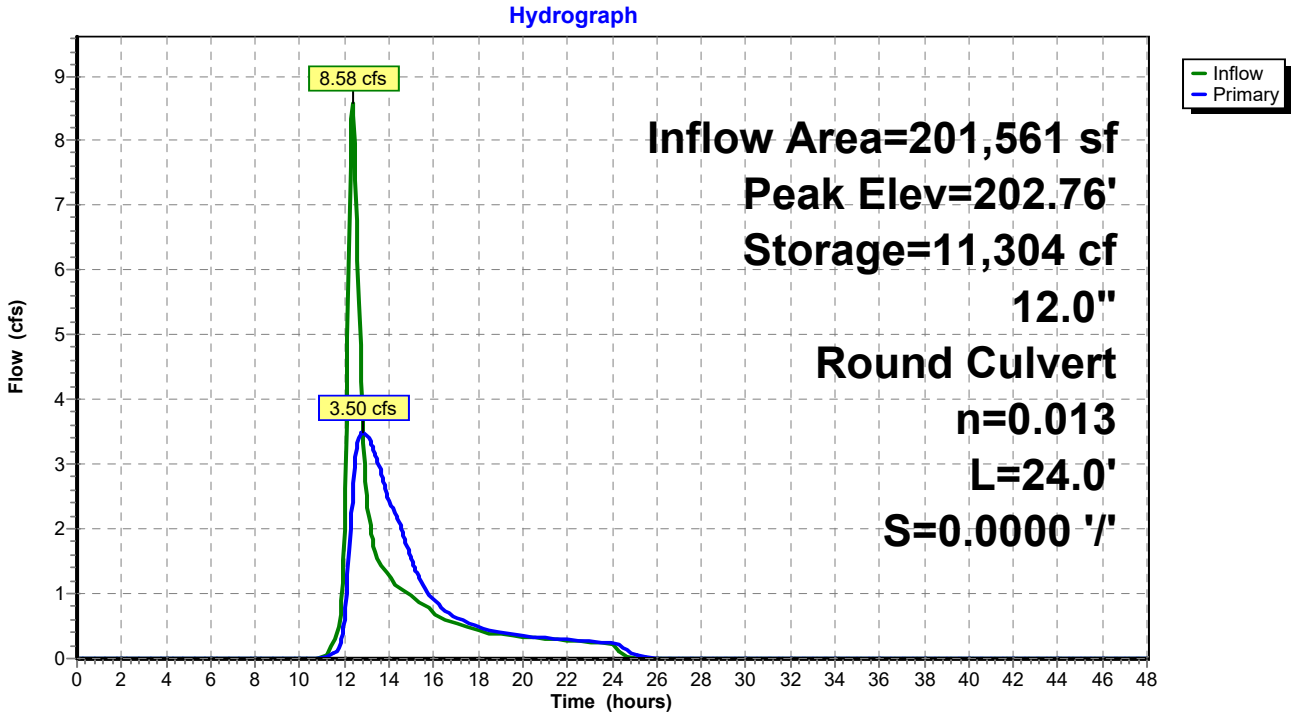
Volume	Invert	Avail.Storage	Storage Description
#1	201.00'	15,505 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
201.00	50	0	0
202.00	6,090	3,070	3,070
203.00	18,780	12,435	15,505

Device	Routing	Invert	Outlet Devices
#1	Primary	201.00'	**12.0" Round Culvert** L= 24.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 201.00' / 201.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.50 cfs @ 12.83 hrs HW=202.76' (Free Discharge)
1=Culvert (Barrel Controls 3.50 cfs @ 4.45 fps)

Pond 13P: 4.1


Hydrograph
8.58 cfs
3.50 cfs
Inflow Area=201,561 sf
Peak Elev=202.76'
Storage=11,304 cf
12.0"
Round Culvert
n=0.013
L=24.0'
S=0.0000 '/'
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond 15P: 4.2

Inflow Area = 811,294 sf, 0.03% Impervious, Inflow Depth = 2.59" for 100-YEAR event
Inflow = 26.62 cfs @ 12.39 hrs, Volume= 175,015 cf
Outflow = 5.48 cfs @ 14.36 hrs, Volume= 140,537 cf, Atten= 79%, Lag= 118.2 min
Primary = 5.48 cfs @ 14.36 hrs, Volume= 140,537 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 198.21' @ 14.36 hrs Surf.Area= 49,711 sf Storage= 82,587 cf

Plug-Flow detention time= 354.4 min calculated for 140,537 cf (80% of inflow)
Center-of-Mass det. time= 273.6 min (1,166.3 - 892.7)

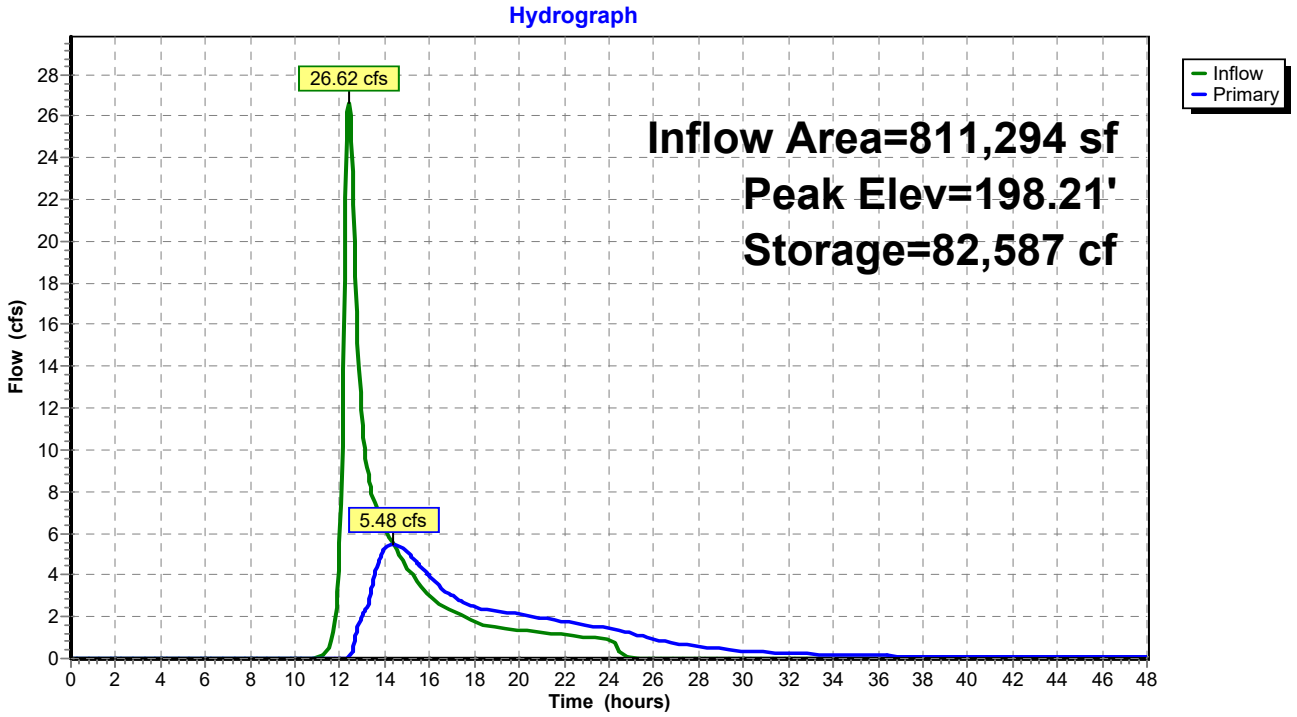
Volume	Invert	Avail.Storage	Storage Description
#1	196.00'	186,402 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
196.00	25,553	0	0
197.00	35,876	30,715	30,715
198.00	47,131	41,504	72,218
199.00	59,178	53,155	125,373
200.00	62,880	61,029	186,402

Device	Routing	Invert	Outlet Devices
#1	Primary	198.00'	**10.0' long x 31.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	197.00'	**12.0" Round Culvert** L= 40.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 197.00' / 196.00' S= 0.0250 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=5.48 cfs @ 14.36 hrs HW=198.21' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 2.66 cfs @ 1.24 fps)
2=Culvert (Inlet Controls 2.82 cfs @ 3.59 fps)

Pond 15P: 4.2


Hydrograph
Inflow Area=811,294 sf
Peak Elev=198.21'
Storage=82,587 cf
26.62 cfs
5.48 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48

Summary for Pond 18P: 5.1 (AP-5.1)

Inflow Area = 285,491 sf, 0.00% Impervious, Inflow Depth = 2.56" for 100-YEAR event
Inflow = 12.53 cfs @ 12.29 hrs, Volume= 60,919 cf
Outflow = 1.33 cfs @ 14.89 hrs, Volume= 41,206 cf, Atten= 89%, Lag= 156.0 min
Primary = 1.33 cfs @ 14.89 hrs, Volume= 41,206 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 197.66' @ 14.89 hrs Surf.Area= 22,563 sf Storage= 32,723 cf

Plug-Flow detention time= 384.8 min calculated for 41,163 cf (68% of inflow)
Center-of-Mass det. time= 276.6 min (1,155.1 - 878.4)

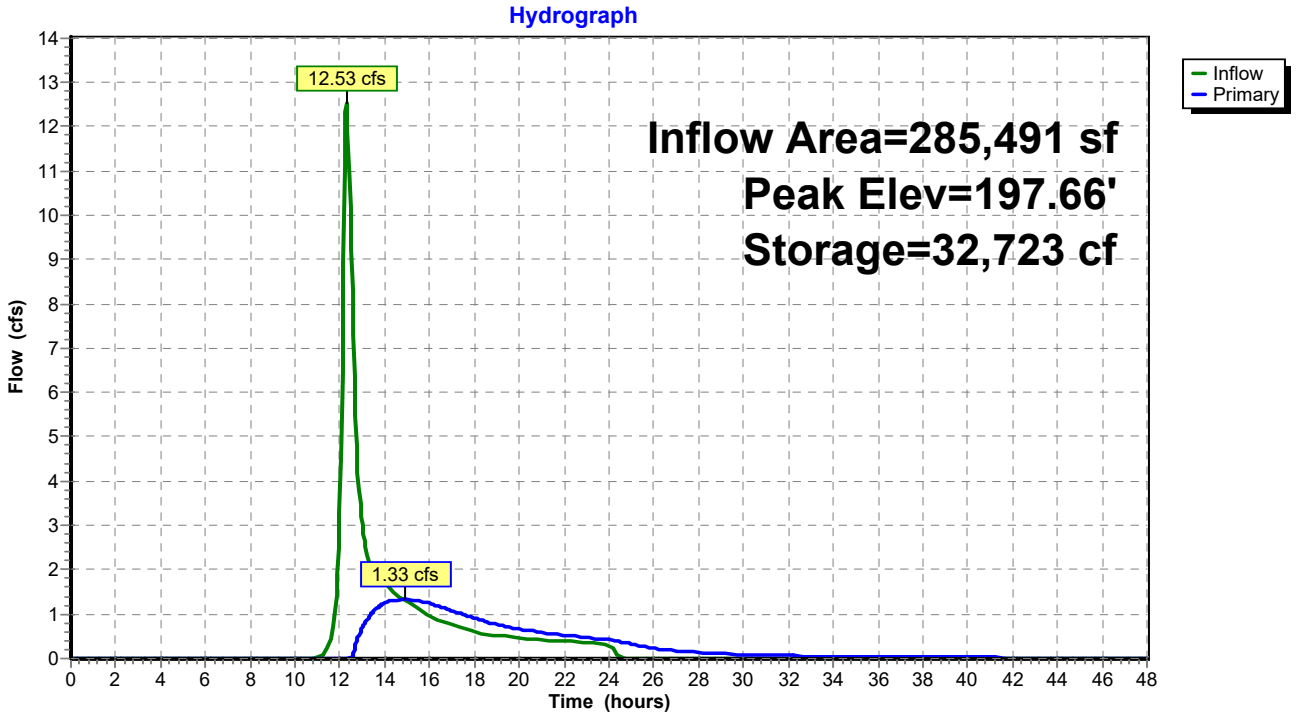
Volume	Invert	Avail.Storage	Storage Description
#1	196.00'	65,346 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
196.00	17,045	0	0
197.00	20,264	18,655	18,655
198.00	23,764	22,014	40,669
199.00	25,591	24,678	65,346

Device	Routing	Invert	Outlet Devices
#1	Primary	197.75'	**10.0' long x 18.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63
#2	Primary	197.00'	**12.0" Round Culvert** L= 32.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 197.00' / 196.00' S= 0.0313 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.33 cfs @ 14.89 hrs HW=197.66' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)
2=Culvert (Inlet Controls 1.33 cfs @ 2.43 fps)

Pond 18P: 5.1 (AP-5.1)

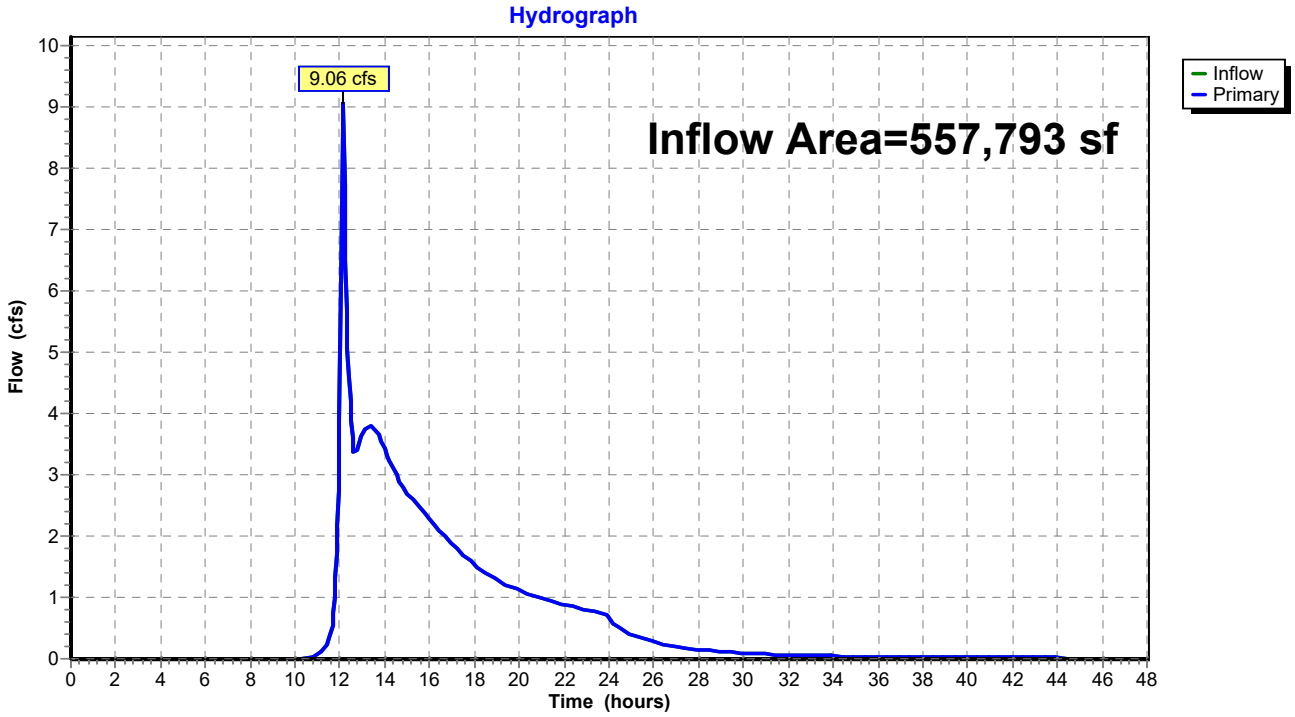


Summary for Link 20L: AP-2

Inflow Area = 557,793 sf, 0.09% Impervious, Inflow Depth > 2.07" for 100-YEAR event
Inflow = 9.06 cfs @ 12.14 hrs, Volume= 96,048 cf
Primary = 9.06 cfs @ 12.14 hrs, Volume= 96,048 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 20L: AP-2

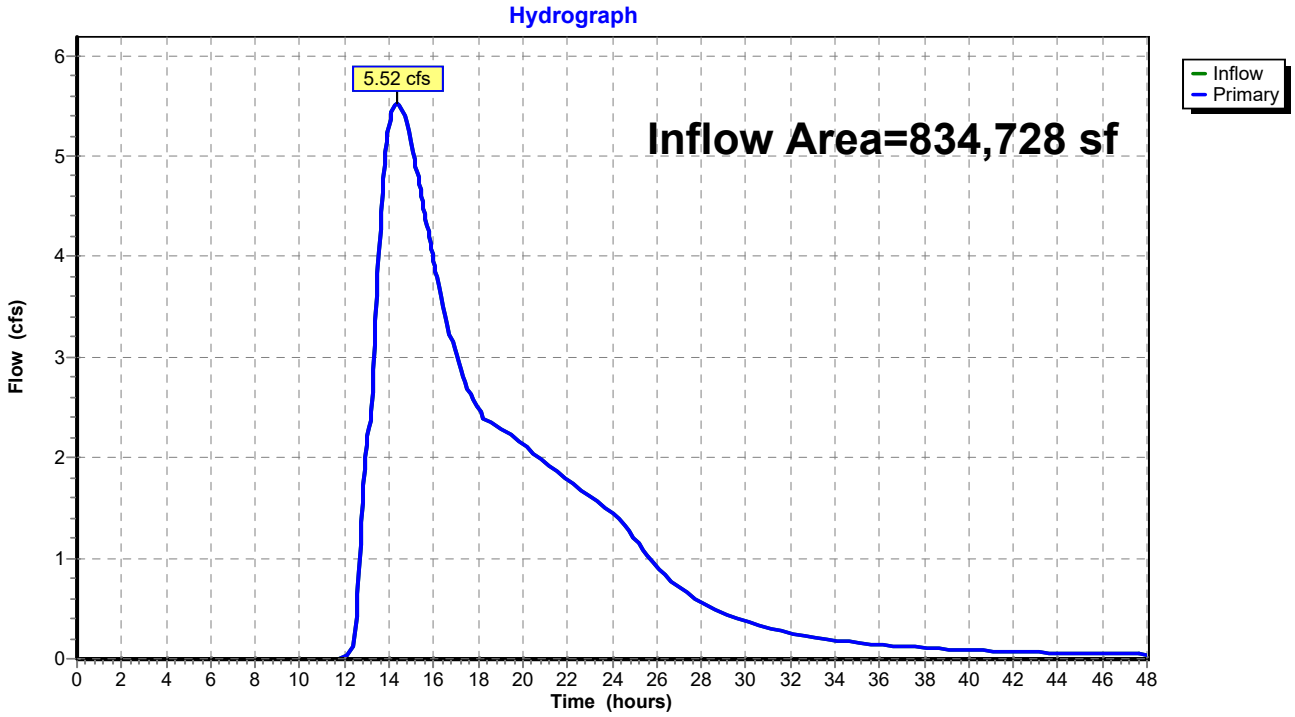


Summary for Link 21L: AP-4

Inflow Area = 834,728 sf, 0.03% Impervious, Inflow Depth > 2.04" for 100-YEAR event
Inflow = 5.52 cfs @ 14.36 hrs, Volume= 141,594 cf
Primary = 5.52 cfs @ 14.36 hrs, Volume= 141,594 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 21L: AP-4



APPENDIX D: NOAA ATLAS 14 PRECIPITATION FREQUENCY TABLE

NOAA Atlas 14, Volume 10, Version 3
Location name: Southington, Connecticut, USA*
Latitude: 41.59°, Longitude: -72.85°
Elevation: 208.17 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	0.339 (0.265-0.427)	0.410 (0.320-0.518)	0.527 (0.410-0.668)	0.623 (0.482-0.796)	0.757 (0.566-1.02)	0.858 (0.628-1.18)	0.963 (0.685-1.38)	1.08 (0.728-1.59)	1.25 (0.808-1.91)	1.38 (0.874-2.16)
10-min	0.480 (0.375-0.606)	0.581 (0.453-0.734)	0.746 (0.580-0.946)	0.884 (0.683-1.13)	1.07 (0.802-1.44)	1.22 (0.890-1.67)	1.36 (0.970-1.95)	1.53 (1.03-2.25)	1.77 (1.14-2.70)	1.96 (1.24-3.06)
15-min	0.564 (0.441-0.712)	0.684 (0.533-0.864)	0.879 (0.684-1.12)	1.04 (0.804-1.33)	1.26 (0.944-1.69)	1.43 (1.05-1.96)	1.61 (1.14-2.30)	1.80 (1.21-2.65)	2.08 (1.35-3.18)	2.30 (1.46-3.60)
30-min	0.773 (0.604-0.976)	0.933 (0.728-1.18)	1.19 (0.928-1.52)	1.41 (1.09-1.80)	1.71 (1.28-2.29)	1.93 (1.42-2.66)	2.17 (1.54-3.10)	2.43 (1.64-3.58)	2.81 (1.82-4.30)	3.11 (1.97-4.87)
60-min	0.982 (0.767-1.24)	1.18 (0.922-1.49)	1.51 (1.17-1.92)	1.78 (1.38-2.28)	2.16 (1.61-2.89)	2.44 (1.79-3.35)	2.73 (1.95-3.91)	3.06 (2.06-4.51)	3.54 (2.29-5.41)	3.93 (2.49-6.14)
2-hr	1.28 (1.01-1.61)	1.54 (1.21-1.93)	1.95 (1.53-2.46)	2.30 (1.79-2.92)	2.77 (2.09-3.70)	3.13 (2.31-4.28)	3.51 (2.52-5.01)	3.94 (2.67-5.77)	4.58 (2.98-6.97)	5.12 (3.25-7.96)
3-hr	1.49 (1.17-1.86)	1.78 (1.41-2.23)	2.27 (1.78-2.85)	2.67 (2.08-3.37)	3.22 (2.43-4.28)	3.63 (2.69-4.96)	4.07 (2.93-5.81)	4.58 (3.11-6.69)	5.35 (3.49-8.12)	6.00 (3.82-9.30)
6-hr	1.89 (1.50-2.34)	2.27 (1.80-2.82)	2.91 (2.30-3.63)	3.43 (2.70-4.31)	4.16 (3.17-5.51)	4.69 (3.50-6.39)	5.27 (3.83-7.51)	5.97 (4.06-8.65)	7.02 (4.59-10.6)	7.91 (5.05-12.2)
12-hr	2.33 (1.86-2.87)	2.84 (2.27-3.50)	3.68 (2.93-4.56)	4.37 (3.46-5.45)	5.33 (4.09-7.03)	6.04 (4.54-8.18)	6.80 (4.98-9.67)	7.74 (5.29-11.2)	9.18 (6.02-13.8)	10.4 (6.67-16.0)
24-hr	2.73 (2.20-3.34)	3.39 (2.73-4.16)	4.47 (3.58-5.50)	5.37 (4.27-6.65)	6.60 (5.10-8.68)	7.50 (5.69-10.2)	8.50 (6.29-12.1)	9.76 (6.69-14.0)	11.8 (7.73-17.5)	13.5 (8.66-20.6)
2-day	3.07 (2.49-3.73)	3.89 (3.15-4.73)	5.22 (4.21-6.38)	6.32 (5.07-7.78)	7.85 (6.11-10.3)	8.95 (6.85-12.1)	10.2 (7.63-14.6)	11.8 (8.13-16.9)	14.5 (9.57-21.6)	16.9 (10.9-25.7)
3-day	3.34 (2.71-4.04)	4.24 (3.44-5.14)	5.70 (4.62-6.94)	6.92 (5.57-8.49)	8.60 (6.73-11.3)	9.82 (7.54-13.3)	11.2 (8.42-16.0)	13.0 (8.97-18.5)	16.1 (10.6-23.8)	18.8 (12.1-28.4)
4-day	3.58 (2.92-4.33)	4.54 (3.70-5.49)	6.10 (4.95-7.41)	7.40 (5.97-9.05)	9.19 (7.20-12.0)	10.5 (8.07-14.1)	11.9 (9.01-17.0)	13.9 (9.58-19.7)	17.1 (11.3-25.3)	20.0 (12.9-30.2)
7-day	4.27 (3.50-5.13)	5.34 (4.37-6.42)	7.09 (5.78-8.55)	8.53 (6.92-10.4)	10.5 (8.28-13.6)	12.0 (9.24-16.0)	13.6 (10.3-19.2)	15.7 (10.9-22.2)	19.2 (12.7-28.2)	22.2 (14.4-33.4)
10-day	4.97 (4.09-5.95)	6.09 (5.01-7.30)	7.93 (6.50-9.55)	9.46 (7.70-11.5)	11.6 (9.11-14.9)	13.1 (10.1-17.4)	14.8 (11.1-20.6)	17.0 (11.8-23.9)	20.4 (13.6-29.9)	23.4 (15.2-35.1)
20-day	7.15 (5.93-8.50)	8.35 (6.91-9.93)	10.3 (8.49-12.3)	11.9 (9.76-14.3)	14.1 (11.2-17.9)	15.8 (12.2-20.6)	17.6 (13.1-23.9)	19.7 (13.7-27.4)	22.8 (15.2-33.1)	25.4 (16.5-37.8)
30-day	8.98 (7.47-10.6)	10.2 (8.48-12.1)	12.2 (10.1-14.5)	13.9 (11.4-16.6)	16.2 (12.8-20.3)	17.9 (13.8-23.0)	19.7 (14.6-26.4)	21.7 (15.2-30.1)	24.5 (16.4-35.4)	26.7 (17.4-39.6)
45-day	11.2 (9.39-13.3)	12.5 (10.4-14.8)	14.6 (12.1-17.3)	16.3 (13.4-19.4)	18.7 (14.8-23.2)	20.5 (15.8-26.1)	22.3 (16.5-29.5)	24.2 (17.0-33.4)	26.6 (17.9-38.4)	28.5 (18.6-42.1)
60-day	13.1 (11.0-15.4)	14.4 (12.1-17.0)	16.6 (13.8-19.6)	18.3 (15.2-21.8)	20.8 (16.5-25.7)	22.7 (17.5-28.8)	24.5 (18.2-32.2)	26.3 (18.6-36.2)	28.6 (19.3-41.0)	30.2 (19.8-44.6)

[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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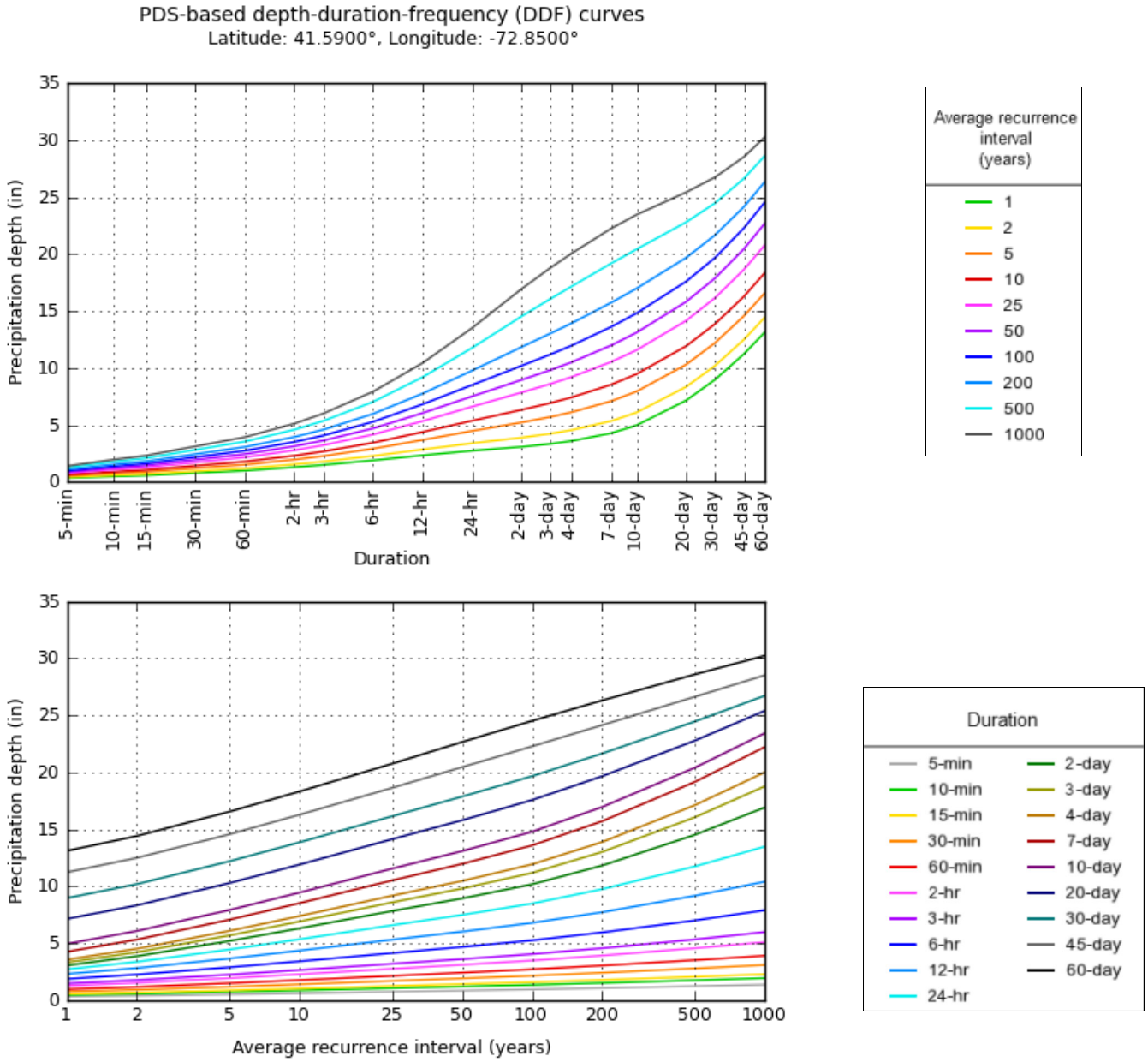
PF graphical



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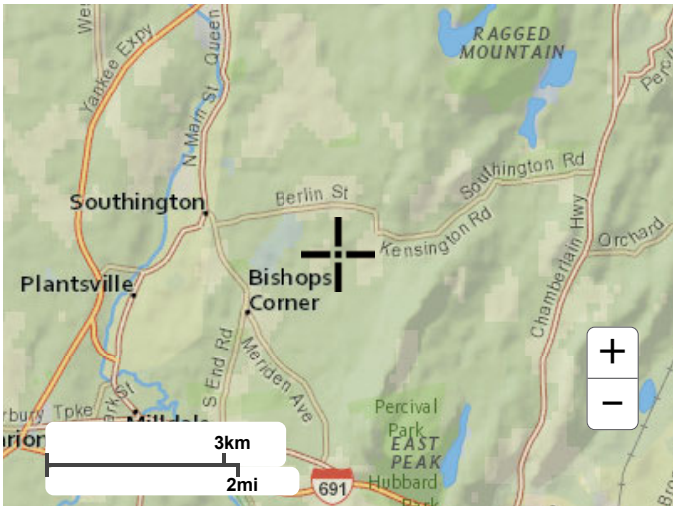
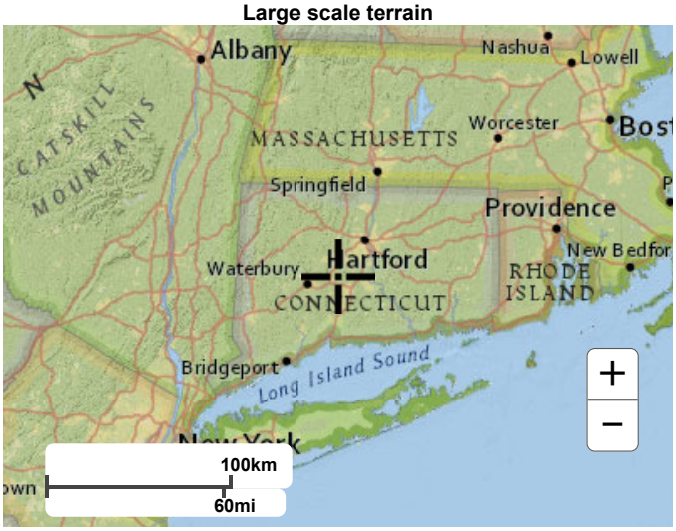
Maps & aerials

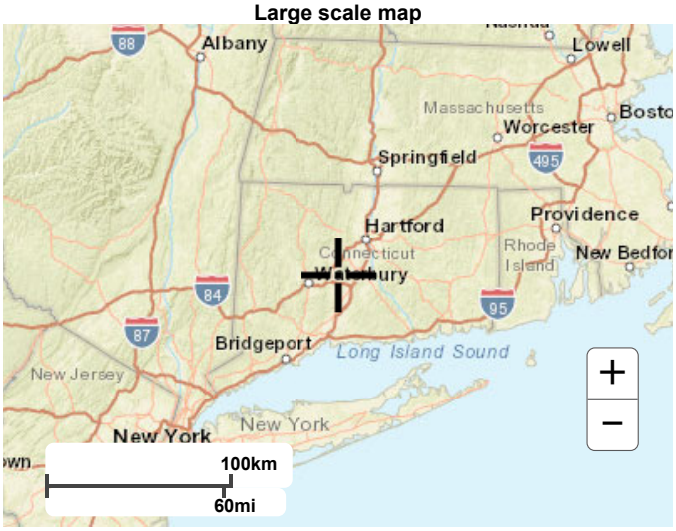
Small scale terrain



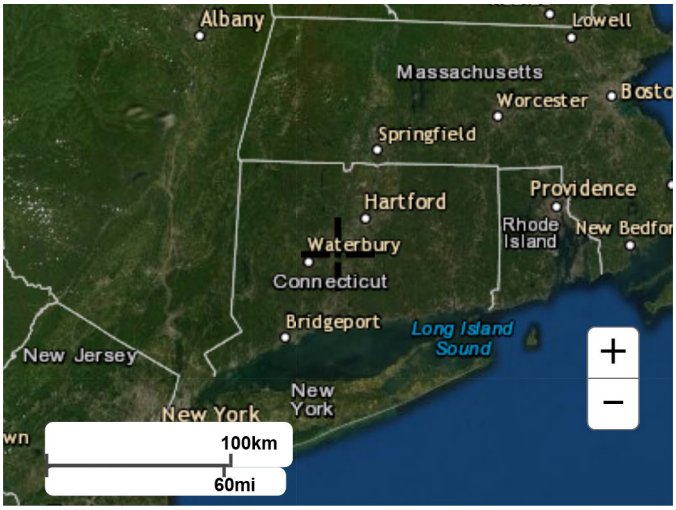
Large scale terrain



Large scale map



Large scale aerial



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APPENDIX E: WATER QUALITY VOLUME CALCULATIONS

WATER QUALITY VOLUME CALCULATIONS
FOR
SOUTHINGTON SOLAR ONE, LLC
1012 EAST STREET, SOUTHINGTON, CT

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

where: WQV = water quality volume (ac-ft)
R = volumetric runoff coefficient = 0.05+0.009(I)
I = percent impervious cover
A = site area in acres

$V=WQV+((P)(A_b)/12)$

V=required basin storage volume (ac-ft)
WQV=Water Quality Volume (ac-ft)
P= design water quality precipitation (in)
A_b=basin surface area (ac)

	Area (ac)	Pervious (ac)	Imperv. (ac)	I	R	WQV (ac-ft)	P (in)	Ab (ac)	V (ac-ft)	Total V Req. (cf)	V Provided (cf)
NE Basin	14.88	14.59	0.29	2%	0.07	0.08	1	0.266531	0.11	4,605	16,358
NW Basin	4.08	3.87	0.21	5%	0.10	0.03	1	0.266531	0.05	2,388	8,086
SW Basin	19.16	18.88	0.29	1%	0.06	0.10	1	0.266531	0.12	5,381	30,715
SE Basin	9.28	9.20	0.08	1%	0.06	0.04	1	0.266531	0.07	2,917	18,655
Total	47.40	46.54	0.86	2%	0.07	0.26	1	0.266531	0.35	15,291	73,814