STORMWATER MANAGEMENT PLAN

Northwest Church of Christ

New Hope, Minnesota

January 12, 2017
REVISED March 3, 2017

THE GREGORY GROUP, INC.
Land Surveyors and Civil Engineers

I hereby certify that this Plan, Specification or Report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Jeffrey A. Prasch, PE	52706	01-12-17
	Lic. No.	Date

The Gregory Group, Inc.
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Brooklyn Park, MN 55428

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SUMMARY OF RESULTS

OVERVIEW

The Northwest Church of Christ (NWCC) is located in the northeast quadrant of Boone Avenue and 50th Avenue North in the City of New Hope. The site and the adjacent site to the north will be redeveloped to include an addition to the NWCC building with associated parking. The existing property to the north is currently zoned residential. NWCC removed the existing improvements on the residential property in preparation for the redevelopment of the property. The east side and north side of the combined properties will consist of the parking lot while an expansion to the north side of the existing NWCC building will be completed. Bio-filtration basins will be constructed on the west side of the addition and in the northeast corner of the site. The proposed construction activity is planned for only the north half of the site. The bio-filtration basins are designed to meet the requirements for the newly constructed portion of the site.

Currently, a majority of the two sites drains to the east where a shared storm sewer system collects and conveys the water to the City storm sewer system along 50th Avenue North. The storm sewer along 50th Avenue North does not outlet to a regional facility but instead drains to the sag in 50th Avenue North immediately south of the NWCC property. The current City storm sewer immediately south of the NWCC property contains a 12" diameter pipe outlet. The City has stated that it does not expect NWCC to improve the City storm sewer since it was recently constructed in 2015 and is adequately sized for its intended purposes. Drain tile is connected to the City storm sewer manholes on 50th Avenue North and extends east and west along the curb lines of 50th Avenue North. The shared storm sewer system on NWCC's property also receives water from two catch basins in the private residential development to the east of their property. The storm sewer in the private residential development was constructed in 1993. A small portion of the site drains onto Boone Avenue.

DESIGN CONSIDERATIONS

The City of New Hope and Shingle Creek Watershed Management Commission (SCWMC) dictate the rate, volume and water quality requirements for the site. The storm water system design is based on their guidelines. The HydroCAD 10.0 modeling software was used to analyze the site. The MSE 24-hour Type III rainfall distribution was used in the model as well as the NOAA Atlas 14 rainfall data. The precipitation data is summarized in **Figure 3** for this site location.

RATE CONTROL

The SCWMC requires that the post-development discharge rates must be equal to or less than the pre-development discharge rates. The governing storm events outlined by the SCWMC include the 2-year, 10-year, and 100-year events. Two bio-filtration basins are being used to control the discharge rate leaving the site and will be located west of the proposed building addition and in the North end of the site. **Table 1** summarizes the drainage areas draining to the Boone Avenue and 50th Avenue North storm sewer systems.

Table 1 – Drainage Area Summary

Condition	Impervious Area [acres]	Area to Storm Sewer System		Total Area
		Boone Avenue	50th Avenue North	
Existing	0.71	0.23	2.14	**2.37**
Proposed	1.08	0.31	2.06	**2.37**

The discharge rates for each storm event are summarized in **Table 2**.

Table 2 – Discharge Rate Summary

Discharge Node	Discharge Rate [cfs]		
	Storm Event		
	2-Year	10-Year	100-Year
Existing Conditions			
BOONE	0.58	1.04	2.09
CB 101	4.91	9.00	16.26
Total	**5.49**	**10.04**	**18.35**
Proposed Conditions			
BOONE	1.07	1.69	3.07
CB 101	3.94	7.29	15.22
Total	**5.01**	**8.98**	**18.29**

As shown, the discharge rates from the existing to proposed conditions decrease for the 2-, 10-, 100-year storm events. The rate control results are included in **Sections 1-6**.

VOLUME CONTROL

The SCWMC also regulates the volume of water discharged from the site. The requirement is that one (1) inch of runoff from all new impervious surfaces must be abstracted. Due to the in-

situ soils classification within the Hydrologic Soil Group D, infiltration is infeasible for this project. Therefore, abstraction must be provided through filtration or other means. The volume abstracted for this project includes the volume filtered through the bio-filtration basins. **Table 3** shows the results of these calculations.

Table 3 – Abstracted Volume Summary

Abstraction Facility	New Impervious Area [acres]	Required Abstracted Volume [cf]	Actual Abstracted Volume [cf]	Drawdown time [hr]
Biofiltration Basin 1	0.25	908	1,525	42
Biofiltraton Basin 2	0.12	436	1,509	39

As shown above, the actual abstracted volume meets the required abstracted volume.

The discharged volume from the site is summarized below in **Table 4**.

Table 4 – Discharge Volume Summary

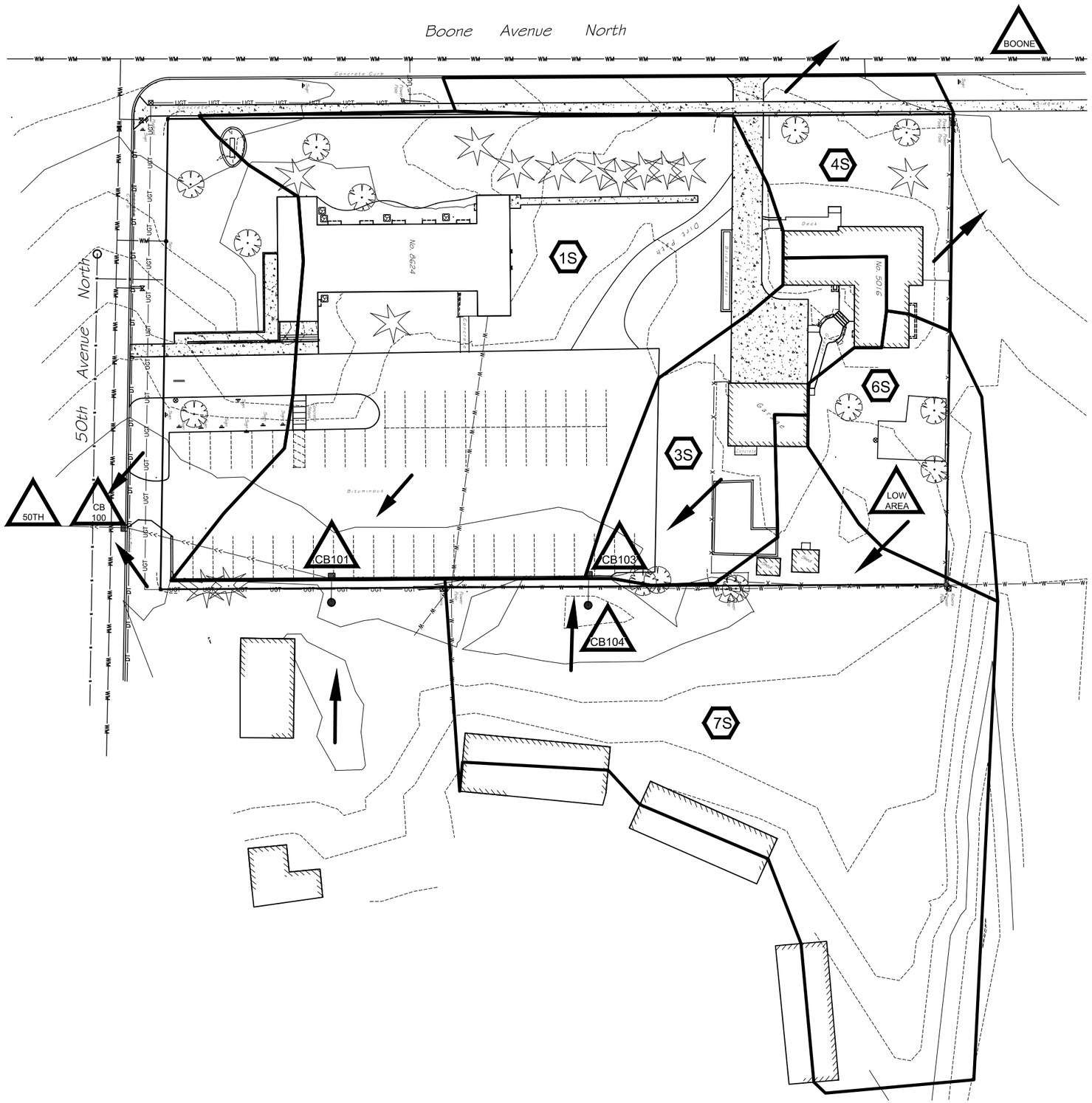
Discharge Node	Discharge Volume [ac-ft]		
	Storm Event		
	2-Year	10-Year	100-Year
Existing Conditions			
BOONE	0.03	0.05	.11
CB 101	0.28	0.50	1.01
Total	**0.31**	**0.55**	**1.12**
Proposed Conditions			
BOONE	0.06	0.09	0.17
CB 101	0.30	0.51	1.01
Total	**0.36**	**0.60**	**1.18**

Because there is a concern for flooding within 50th Avenue, the volume discharged to 50th Avenue from the site was limited to the pre-development volume for the 100-year storm event. By limiting the volume discharge to 50th Avenue, a greater volume is proposed to discharge to Boone Avenue which will minimize flooding.

WATER QUALITY

Because the site does not drain to a regional pond or treatment facility, treatment of the water quality volume is required on site. The SCWMC requires that 60 percent of Total Phosphorous (TP) and 85 percent of Total Suspended Solids (TSS) shall be removed. With the absence of infiltration on site, the stormwater will be treated by a combination of grass strips, a Rain Guardian structure and bio-filtration basins. P8 Urban Catchment Model Version 3.5 was used to determine the annual removal efficiency of the proposed features. The model assumes a watershed size based on the amount of new impervious area on the site. The model also does not account for any removal by the Rain Guardian structure. The results of the model are shown in **Section 7**. The model shows a TSS removal rate of ninety-one point four percent (91.4%) and TP removal of sixty point six percent (60.6%) which meets the requirements.

FIGURES



LEGEND

- 7S — SUBCATCHMENT NUMBER
- LOW AREA — POND/CATCH BASIN NUMBER
- DRAINAGE ARROW

0 50 100
SCALE IN FEET

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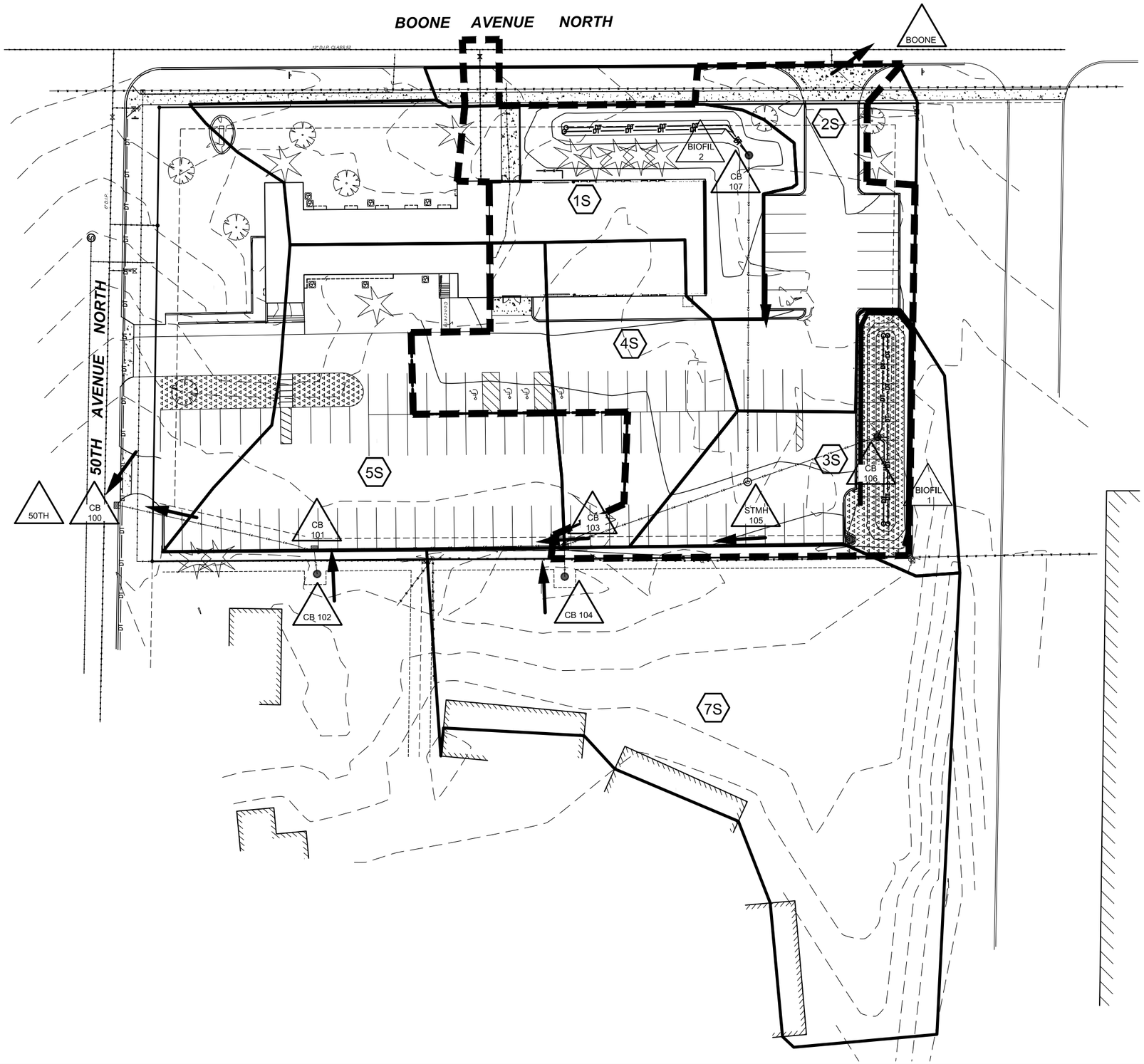
NORTHWEST CHURCH OF CHRIST

NEW HOPE, MN

DRAINAGE AREAS EXISTING CONDITIONS

FIGURE 1

1.12.2017



LEGEND

- 7S — SUBCATCHMENT NUMBER
- CBMH 103 — POND/CATCH BASIN NUMBER
- DRAINAGE ARROW

0 50 100
SCALE IN FEET

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NORTHWEST CHURCH OF CHRIST

NEW HOPE, MN

DRAINAGE AREAS
PROPOSED CONDITIONS

FIGURE 2

1.12.2017

Figure 3: Rational Storm Sewer Design

Calculated By: Jeffrey Prasch
The Gregory Group, Inc

DATE: 1/12/2017

PROJECT: Northwest Church of Christ
City of New Hope, Minnesota

STORM FREQUENCY: **10-YEAR**
10-YEAR EVENT INTENSITY, (in/hr): 4.29
TYPE OF PIPE: HDPE
MANNINGS ROUGNESS COEFFICIENT,(n): 0.0090

Required Flow Based on Rational Method - 10 Year Storm Event

STRUCTURE		INCREMENTAL				SUM	LOCAL	PIPE	TOTAL	INTENSITY	RUNOFF	SLOPE	SIZE	CAPACITY	VELOCITY
FROM	TO	Length (ft)	AREA (ac)	COEFF	C x A	C x A	T.C. (min)	TIME (min)	T.C. (min)	(in/hr)	Q (cfs)	(ft/ft)	(inch)	(cfs)	FULL (fps)
CB 107	STMH 105	151	0.38	0.90	0.34	0.34	7.00	0.60	7.60	4.29	1.47	0.0030	15.00	5.12	4.17
CB 106	STMH 105	64	0.23	0.90	0.21	0.21	7.00	0.26	7.26	4.29	2.36	0.0030	15.00	5.12	4.17
STMH105	CB 103	30	0.11	0.90	0.10	0.64*	7.00	0.12	7.12	4.29	4.02	0.0030	15.00	5.12	4.17

* SUM INCLUDES ALL CxA DIRECTED INTO CB 103

FIGURE 4 - RAINFALL DATA

NOAA Atlas 14, Volume 8, Version 2
Location name: Minneapolis, Minnesota, US*
Latitude: 45.0479°, Longitude: -93.3901°
Elevation: 924 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

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	0.353 (0.283-0.447)	0.418 (0.335-0.529)	0.528 (0.421-0.669)	0.622 (0.494-0.792)	0.758 (0.585-0.994)	0.868 (0.655-1.15)	0.981 (0.717-1.32)	1.10 (0.773-1.51)	1.26 (0.855-1.76)	1.39 (0.918-1.96)
10-min	0.518 (0.415-0.655)	0.612 (0.490-0.775)	0.772 (0.617-0.980)	0.911 (0.724-1.16)	1.11 (0.857-1.46)	1.27 (0.959-1.68)	1.44 (1.05-1.93)	1.61 (1.13-2.21)	1.85 (1.25-2.58)	2.04 (1.34-2.87)
15-min	0.631 (0.506-0.799)	0.746 (0.598-0.945)	0.942 (0.752-1.20)	1.11 (0.882-1.41)	1.35 (1.04-1.77)	1.55 (1.17-2.05)	1.75 (1.28-2.35)	1.97 (1.38-2.69)	2.26 (1.53-3.15)	2.49 (1.64-3.50)
30-min	0.899 (0.721-1.14)	1.07 (0.856-1.35)	1.35 (1.08-1.72)	1.60 (1.27-2.04)	1.96 (1.51-2.56)	2.24 (1.69-2.95)	2.53 (1.85-3.40)	2.83 (1.99-3.88)	3.25 (2.20-4.54)	3.58 (2.36-5.04)
60-min	1.17 (0.940-1.48)	1.39 (1.11-1.75)	1.76 (1.41-2.24)	2.11 (1.67-2.68)	2.62 (2.04-3.46)	3.05 (2.31-4.05)	3.51 (2.57-4.74)	4.00 (2.82-5.51)	4.70 (3.19-6.60)	5.27 (3.47-7.42)
2-hr	1.45 (1.17-1.82)	1.70 (1.37-2.14)	2.17 (1.75-2.74)	2.61 (2.09-3.30)	3.29 (2.58-4.34)	3.87 (2.95-5.12)	4.49 (3.32-6.05)	5.17 (3.67-7.09)	6.15 (4.21-8.60)	6.95 (4.62-9.73)
3-hr	1.61 (1.30-2.01)	1.89 (1.53-2.36)	2.41 (1.95-3.02)	2.92 (2.34-3.67)	3.72 (2.94-4.91)	4.41 (3.39-5.85)	5.18 (3.85-6.98)	6.03 (4.31-8.27)	7.27 (5.00-10.1)	8.29 (5.53-11.6)
6-hr	1.89 (1.54-2.34)	2.20 (1.79-2.73)	2.82 (2.29-3.51)	3.42 (2.76-4.27)	4.40 (3.51-5.79)	5.26 (4.07-6.93)	6.21 (4.66-8.32)	7.28 (5.24-9.92)	8.84 (6.13-12.3)	10.1 (6.80-14.0)
12-hr	2.15 (1.76-2.65)	2.52 (2.07-3.11)	3.23 (2.64-3.99)	3.91 (3.18-4.84)	4.97 (3.98-6.46)	5.90 (4.59-7.69)	6.91 (5.21-9.16)	8.03 (5.82-10.9)	9.66 (6.74-13.3)	11.0 (7.43-15.1)
24-hr	2.49 (2.06-3.04)	2.87 (2.37-3.51)	3.59 (2.95-4.40)	4.29 (3.50-5.26)	5.38 (4.33-6.92)	6.32 (4.96-8.18)	7.37 (5.59-9.69)	8.52 (6.21-11.4)	10.2 (7.16-13.9)	11.6 (7.88-15.8)
2-day	2.91 (2.42-3.53)	3.26 (2.71-3.96)	3.95 (3.27-4.80)	4.63 (3.81-5.64)	5.72 (4.65-7.32)	6.68 (5.28-8.59)	7.76 (5.93-10.1)	8.96 (6.59-11.9)	10.7 (7.59-14.6)	12.2 (8.35-16.5)
3-day	3.18 (2.65-3.84)	3.54 (2.95-4.27)	4.23 (3.52-5.12)	4.92 (4.06-5.97)	6.02 (4.91-7.66)	7.00 (5.55-8.95)	8.08 (6.20-10.5)	9.30 (6.86-12.3)	11.1 (7.87-15.0)	12.6 (8.64-17.0)
4-day	3.39 (2.83-4.07)	3.77 (3.15-4.54)	4.50 (3.75-5.43)	5.21 (4.32-6.31)	6.34 (5.17-8.02)	7.33 (5.82-9.32)	8.41 (6.47-10.9)	9.62 (7.12-12.7)	11.4 (8.11-15.3)	12.8 (8.86-17.3)
7-day	3.89 (3.27-4.65)	4.39 (3.69-5.25)	5.28 (4.42-6.32)	6.08 (5.07-7.31)	7.29 (5.94-9.09)	8.31 (6.61-10.4)	9.39 (7.23-12.0)	10.6 (7.83-13.8)	12.2 (8.73-16.3)	13.6 (9.41-18.2)
10-day	4.38 (3.69-5.21)	4.96 (4.18-5.91)	5.96 (5.00-7.11)	6.83 (5.71-8.18)	8.10 (6.60-10.0)	9.13 (7.27-11.4)	10.2 (7.88-13.0)	11.4 (8.43-14.7)	12.9 (9.26-17.1)	14.2 (9.89-19.0)
20-day	5.95 (5.05-7.02)	6.66 (5.65-7.87)	7.85 (6.64-9.29)	8.84 (7.44-10.5)	10.2 (8.35-12.4)	11.3 (9.04-13.9)	12.4 (9.61-15.6)	13.5 (10.1-17.3)	15.0 (10.8-19.7)	16.2 (11.4-21.5)
30-day	7.34 (6.26-8.62)	8.18 (6.96-9.61)	9.53 (8.10-11.2)	10.6 (8.99-12.6)	12.2 (9.95-14.7)	13.3 (10.7-16.3)	14.4 (11.2-18.0)	15.6 (11.7-19.8)	17.1 (12.3-22.2)	18.2 (12.8-24.0)
45-day	9.14 (7.83-10.7)	10.2 (8.71-11.9)	11.8 (10.1-13.9)	13.2 (11.2-15.5)	14.9 (12.2-17.8)	16.2 (13.0-19.6)	17.4 (13.5-21.5)	18.6 (13.9-23.4)	20.0 (14.5-25.9)	21.1 (14.9-27.7)
60-day	10.7 (9.19-12.5)	12.0 (10.3-14.0)	13.9 (11.9-16.3)	15.5 (13.2-18.2)	17.5 (14.3-20.8)	18.9 (15.2-22.7)	20.2 (15.7-24.8)	21.4 (16.0-26.9)	22.8 (16.5-29.4)	23.8 (16.9-31.2)

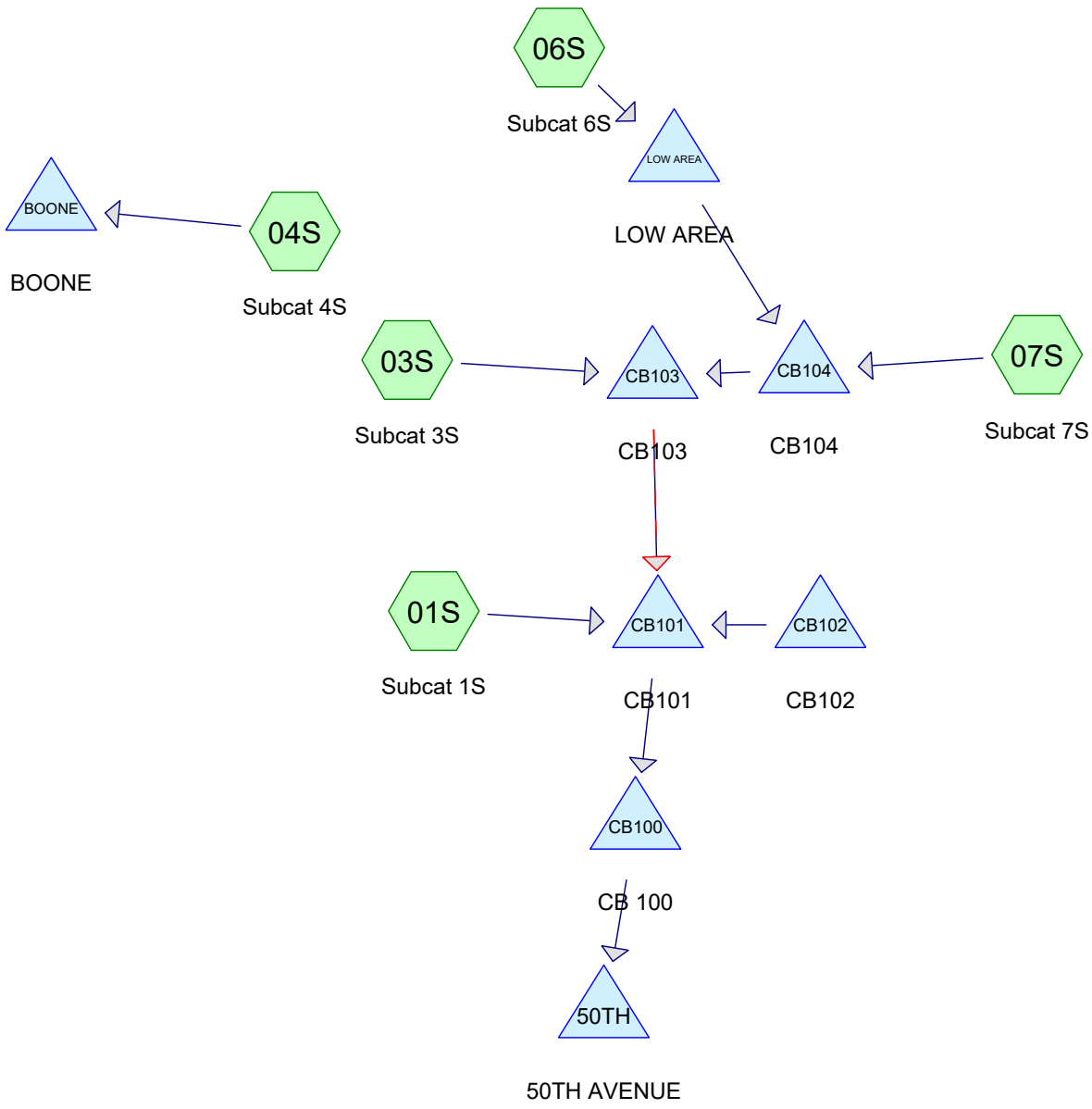
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

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.

SECTION 1

EXISTING CONDITIONS 2-YEAR SUMMARY



Subcat Reach Pond Link

Routing Diagram for NWCC Existing North Site
Prepared by The Gregory Group, Inc., Printed 1/11/2017

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.658	80	>75% Grass cover, Good, HSG D (01S, 03S, 04S, 06S, 07S)
0.474	98	Paved parking, HSG D (01S, 03S, 04S)
0.209	98	Roofs, HSG D (01S, 03S, 04S, 06S, 07S)
0.031	98	Unconnected pavement, HSG D (01S, 04S)
2.371	85	TOTAL AREA

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 01S: Subcat 1S
Runoff Area=0.914 ac 53.50% Impervious Runoff Depth=1.95"
Flow Length=390' Tc=8.3 min CN=80/98 Runoff=2.72 cfs 0.148 af

Subcatchment 03S: Subcat 3S
Runoff Area=0.221 ac 46.39% Impervious Runoff Depth=1.84"
Tc=7.0 min CN=80/98 Runoff=0.66 cfs 0.034 af

Subcatchment 04S: Subcat 4S
Runoff Area=0.227 ac 25.99% Impervious Runoff Depth=1.54"
Tc=7.0 min CN=80/98 Runoff=0.58 cfs 0.029 af

Subcatchment 06S: Subcat 6S
Runoff Area=0.164 ac 2.47% Impervious Runoff Depth=1.19"
Tc=7.0 min CN=80/98 Runoff=0.34 cfs 0.016 af

Subcatchment 07S: Subcat 7S
Runoff Area=0.845 ac 6.92% Impervious Runoff Depth=1.26"
Flow Length=300' Tc=10.0 min CN=80/98 Runoff=1.61 cfs 0.088 af

Pond 50TH: 50TH AVENUE
Inflow=4.90 cfs 0.281 af
Primary=4.90 cfs 0.281 af

Pond BOONE: BOONE
Inflow=0.58 cfs 0.029 af
Primary=0.58 cfs 0.029 af

Pond CB100: CB 100
Peak Elev=915.77' Storage=13 cf Inflow=4.91 cfs 0.281 af
12.0" Round Culvert n=0.013 L=32.0' S=0.0300 '/' Outflow=4.90 cfs 0.281 af

Pond CB101: CB101
Peak Elev=917.77' Storage=13 cf Inflow=4.91 cfs 0.281 af
Outflow=4.91 cfs 0.281 af

Pond CB102: CB102
Peak Elev=0.00' Storage=0 cf
12.0" Round Culvert n=0.009 L=8.0' S=0.0362 '/' Primary=0.00 cfs 0.000 af

Pond CB103: CB103
Peak Elev=916.87' Storage=7 cf Inflow=2.21 cfs 0.133 af
Primary=2.21 cfs 0.133 af Secondary=0.00 cfs 0.000 af Outflow=2.21 cfs 0.133 af

Pond CB104: CB104
Peak Elev=916.63' Storage=5 cf Inflow=1.61 cfs 0.099 af
12.0" Round Culvert n=0.009 L=12.0' S=0.0075 '/' Outflow=1.61 cfs 0.099 af

Pond LOW AREA: LOW AREA
Peak Elev=920.82' Storage=0.007 af Inflow=0.34 cfs 0.016 af
Outflow=0.09 cfs 0.010 af

Total Runoff Area = 2.371 ac Runoff Volume = 0.316 af Average Runoff Depth = 1.60"
69.92% Pervious = 1.658 ac 30.08% Impervious = 0.713 ac

Summary for Subcatchment 01S: Subcat 1S

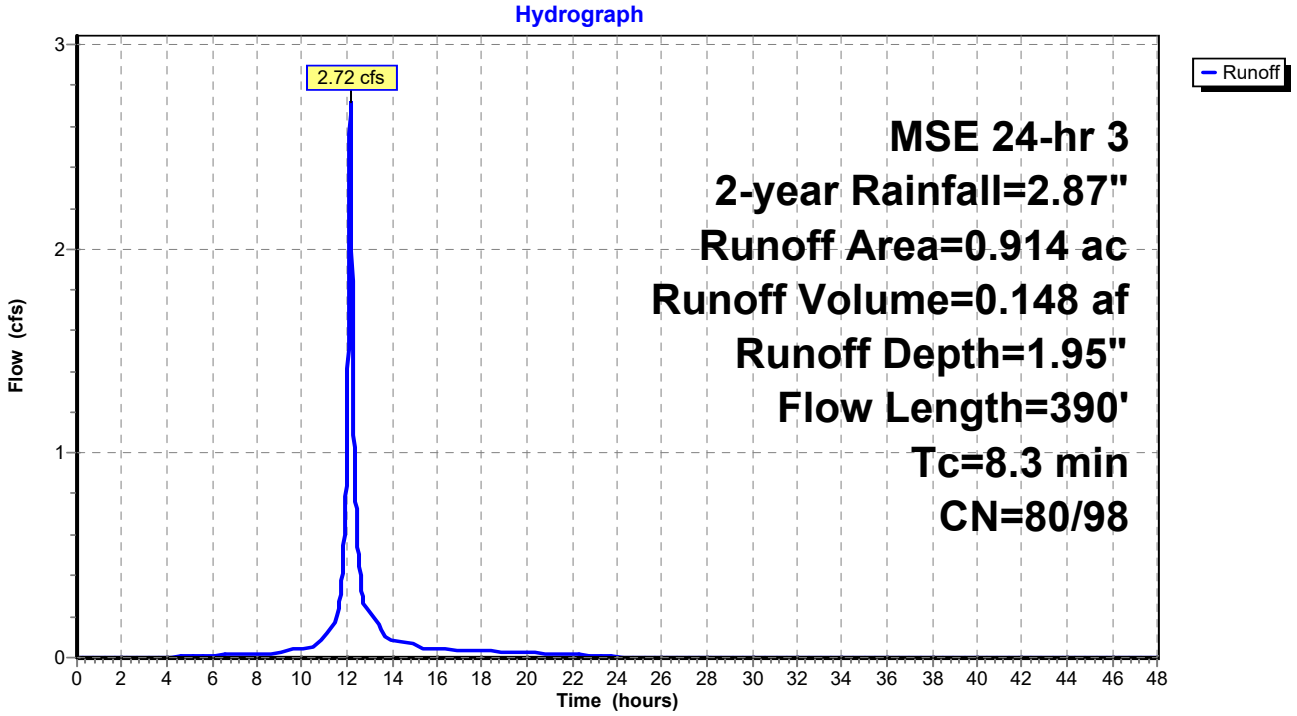
Runoff = 2.72 cfs @ 12.16 hrs, Volume= 0.148 af, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.425	80	>75% Grass cover, Good, HSG D
0.077	98	Roofs, HSG D
0.003	98	Unconnected pavement, HSG D
0.409	98	Paved parking, HSG D
0.914	90	Weighted Average
0.425	80	46.50% Pervious Area
0.489	98	53.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 2.87"
1.2	190	0.0300	2.60		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.2	150	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
8.3	390	Total			

Subcatchment 01S: Subcat 1S



Summary for Subcatchment 03S: Subcat 3S

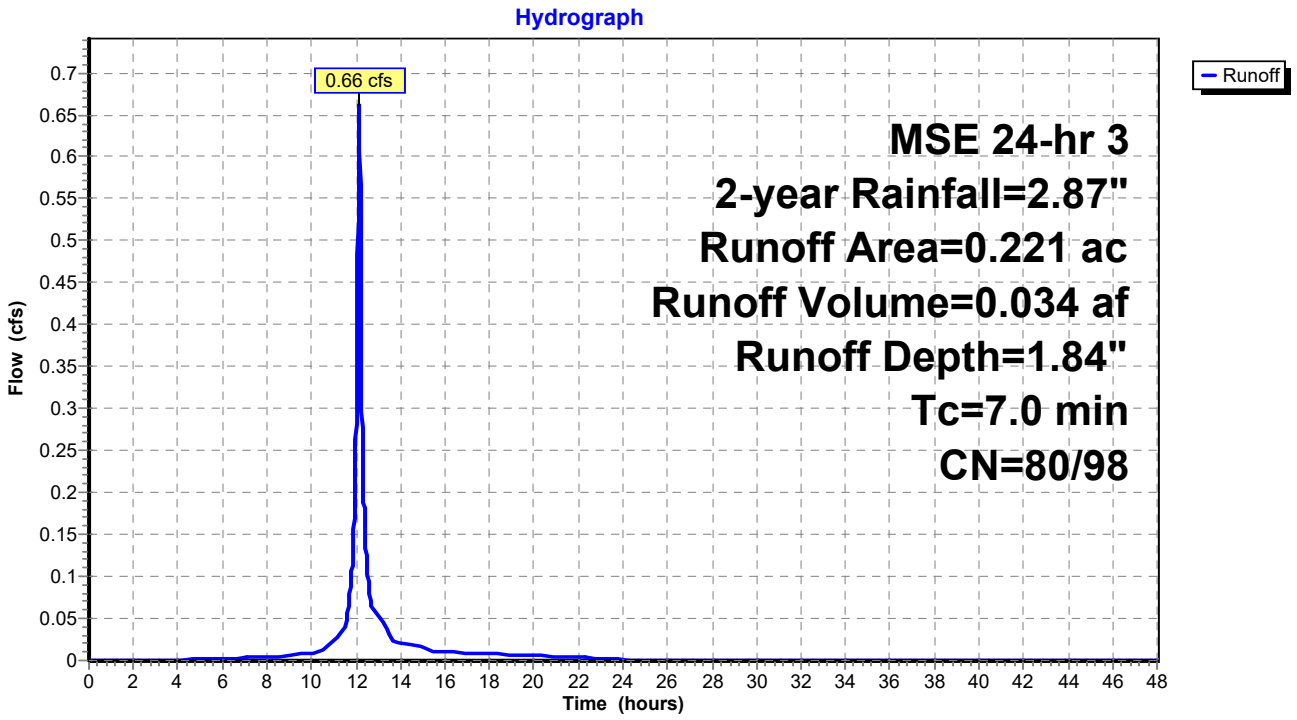
Runoff = 0.66 cfs @ 12.14 hrs, Volume= 0.034 af, Depth= 1.84"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.119	80	>75% Grass cover, Good, HSG D
0.060	98	Paved parking, HSG D
0.043	98	Roofs, HSG D
0.221	88	Weighted Average
0.119	80	53.61% Pervious Area
0.103	98	46.39% Impervious Area

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

Subcatchment 03S: Subcat 3S



Summary for Subcatchment 04S: Subcat 4S

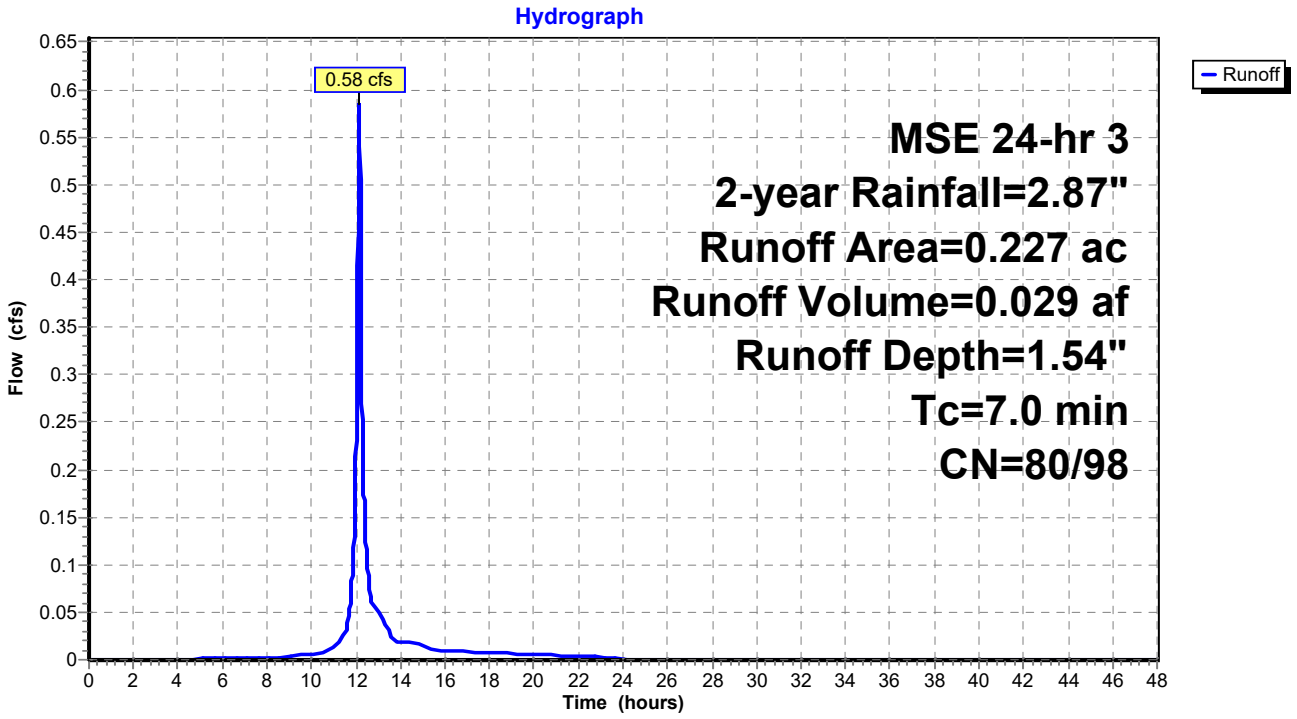
Runoff = 0.58 cfs @ 12.14 hrs, Volume= 0.029 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.168	80	>75% Grass cover, Good, HSG D
0.005	98	Paved parking, HSG D
0.026	98	Roofs, HSG D
0.028	98	Unconnected pavement, HSG D
0.227	85	Weighted Average
0.168	80	74.01% Pervious Area
0.059	98	25.99% Impervious Area

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

Subcatchment 04S: Subcat 4S



Summary for Subcatchment 06S: Subcat 6S

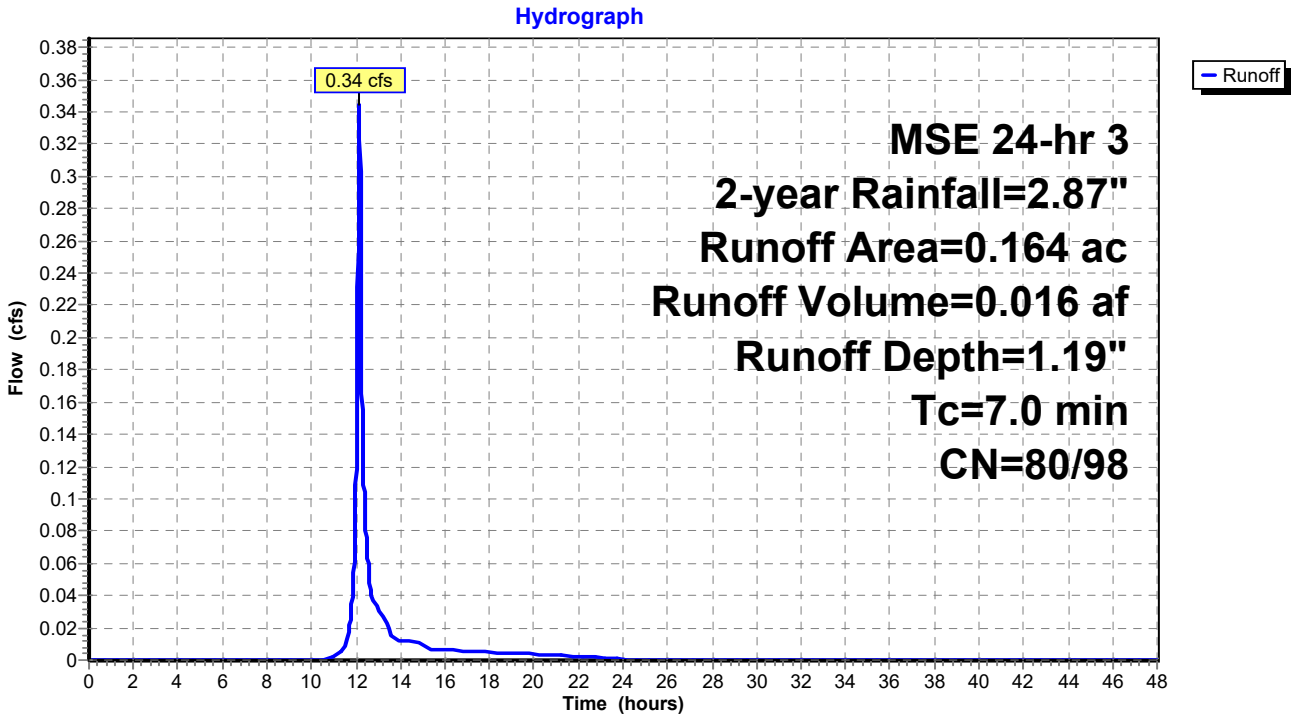
Runoff = 0.34 cfs @ 12.15 hrs, Volume= 0.016 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.160	80	>75% Grass cover, Good, HSG D
0.004	98	Roofs, HSG D
0.164	80	Weighted Average
0.160	80	97.53% Pervious Area
0.004	98	2.47% Impervious Area

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

Subcatchment 06S: Subcat 6S



Summary for Subcatchment 07S: Subcat 7S

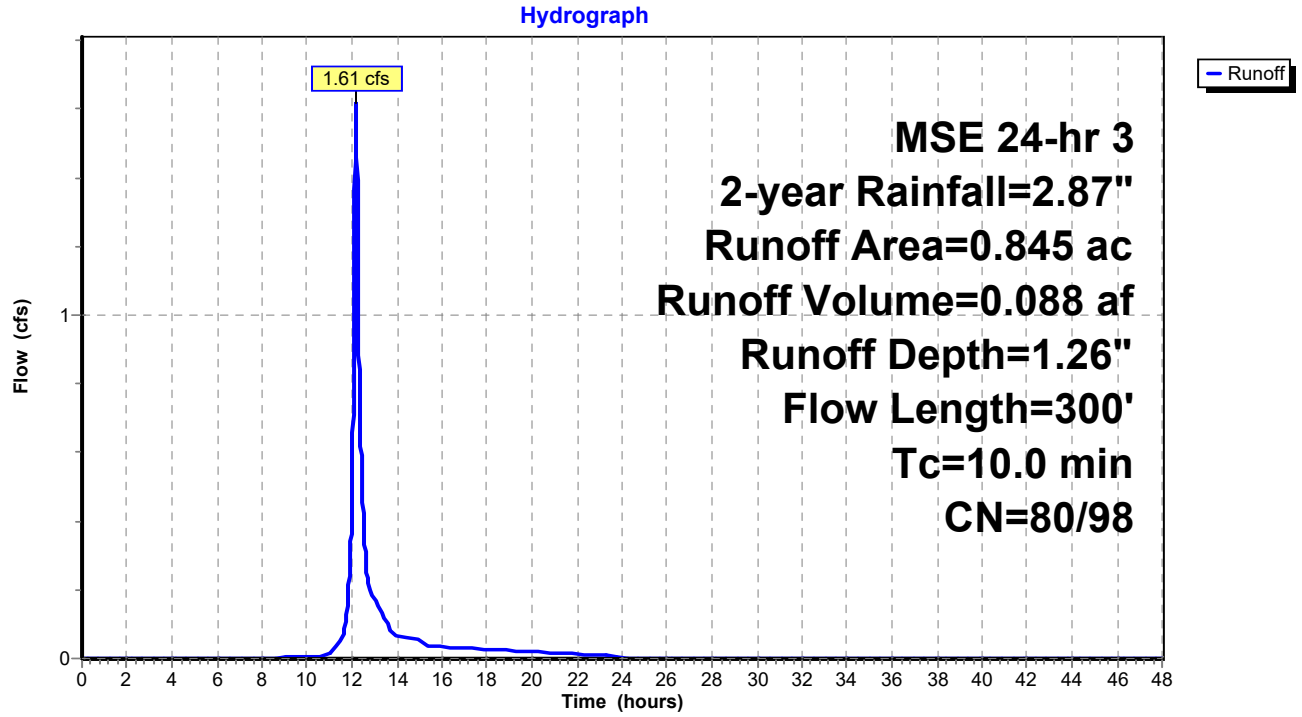
Runoff = 1.61 cfs @ 12.18 hrs, Volume= 0.088 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.786	80	>75% Grass cover, Good, HSG D
0.058	98	Roofs, HSG D
0.845	81	Weighted Average
0.786	80	93.08% Pervious Area
0.058	98	6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 2.87"
1.3	250	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	300	Total			

Subcatchment 07S: Subcat 7S

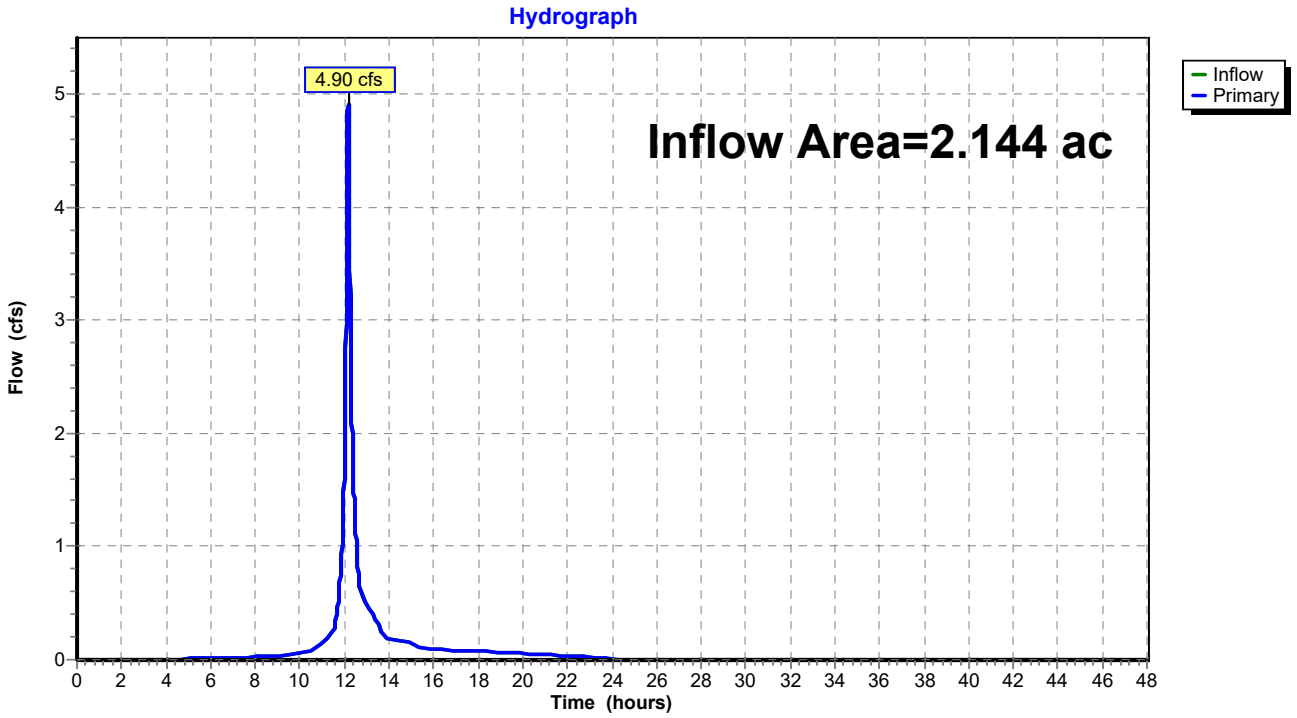


Summary for Pond 50TH: 50TH AVENUE

Inflow Area = 2.144 ac, 30.51% Impervious, Inflow Depth = 1.57" for 2-year event
Inflow = 4.90 cfs @ 12.16 hrs, Volume= 0.281 af
Primary = 4.90 cfs @ 12.16 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 50TH: 50TH AVENUE

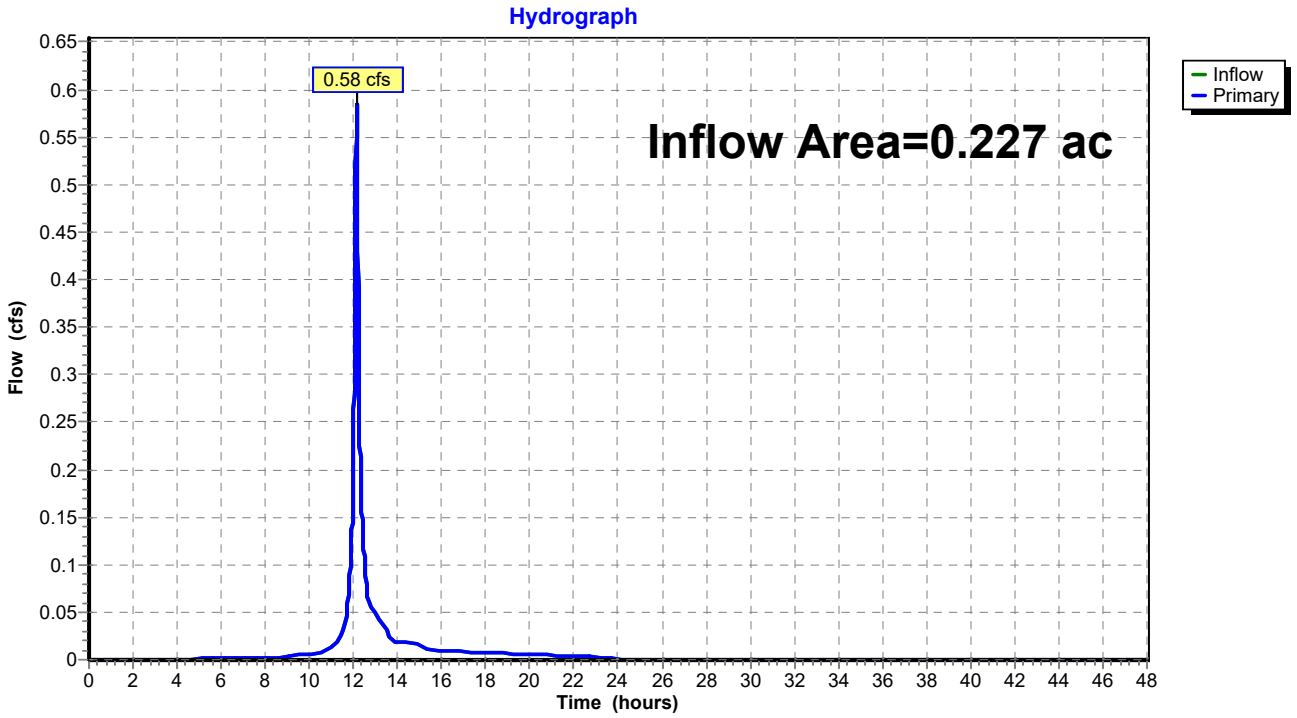


Summary for Pond BOONE: BOONE

Inflow Area = 0.227 ac, 25.99% Impervious, Inflow Depth = 1.54" for 2-year event
Inflow = 0.58 cfs @ 12.14 hrs, Volume= 0.029 af
Primary = 0.58 cfs @ 12.14 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond BOONE: BOONE



Summary for Pond CB100: CB 100

Inflow Area = 2.144 ac, 30.51% Impervious, Inflow Depth = 1.57" for 2-year event
Inflow = 4.91 cfs @ 12.16 hrs, Volume= 0.281 af
Outflow = 4.90 cfs @ 12.16 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.1 min
Primary = 4.90 cfs @ 12.16 hrs, Volume= 0.281 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 915.77' @ 12.16 hrs Surf.Area= 6 sf Storage= 13 cf

Plug-Flow detention time= 0.1 min calculated for 0.281 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (790.7 - 790.6)

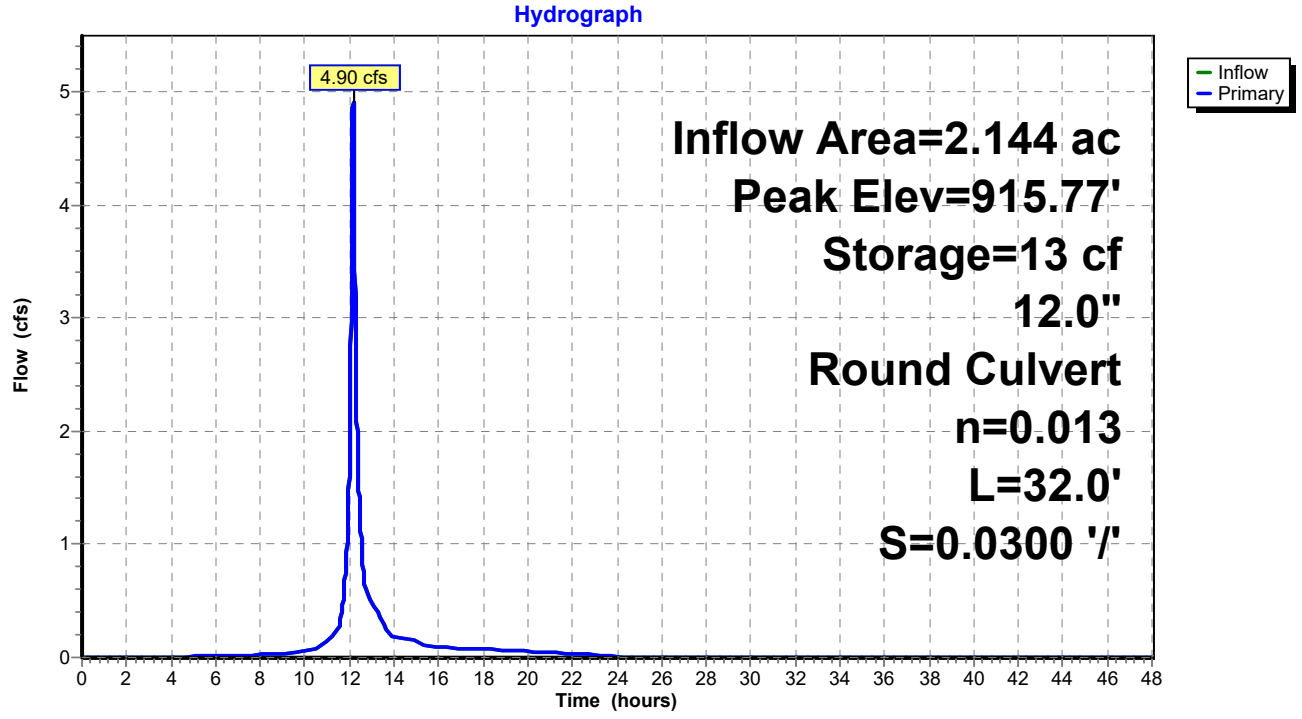
Volume	Invert	Avail.Storage	Storage Description
#1	913.59'	15,777 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.59	6	0	0
918.49	6	29	29
919.00	600	155	184
920.00	3,743	2,172	2,355
921.00	6,250	4,997	7,352
922.00	10,600	8,425	15,777

Device	Routing	Invert	Outlet Devices
#1	Primary	913.59'	12.0" Round Culvert L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 913.59' / 912.63' S= 0.0300 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=4.90 cfs @ 12.16 hrs HW=915.77' (Free Discharge)
└1=Culvert (Inlet Controls 4.90 cfs @ 6.24 fps)

Pond CB100: CB 100



Summary for Pond CB101: CB101

Inflow Area = 2.144 ac, 30.51% Impervious, Inflow Depth = 1.57" for 2-year event
Inflow = 4.91 cfs @ 12.16 hrs, Volume= 0.281 af
Outflow = 4.91 cfs @ 12.16 hrs, Volume= 0.281 af, Atten= 0%, Lag= 0.1 min
Primary = 4.91 cfs @ 12.16 hrs, Volume= 0.281 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 917.77' @ 12.16 hrs Surf.Area= 6 sf Storage= 13 cf

Plug-Flow detention time= 0.1 min calculated for 0.281 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (790.6 - 790.5)

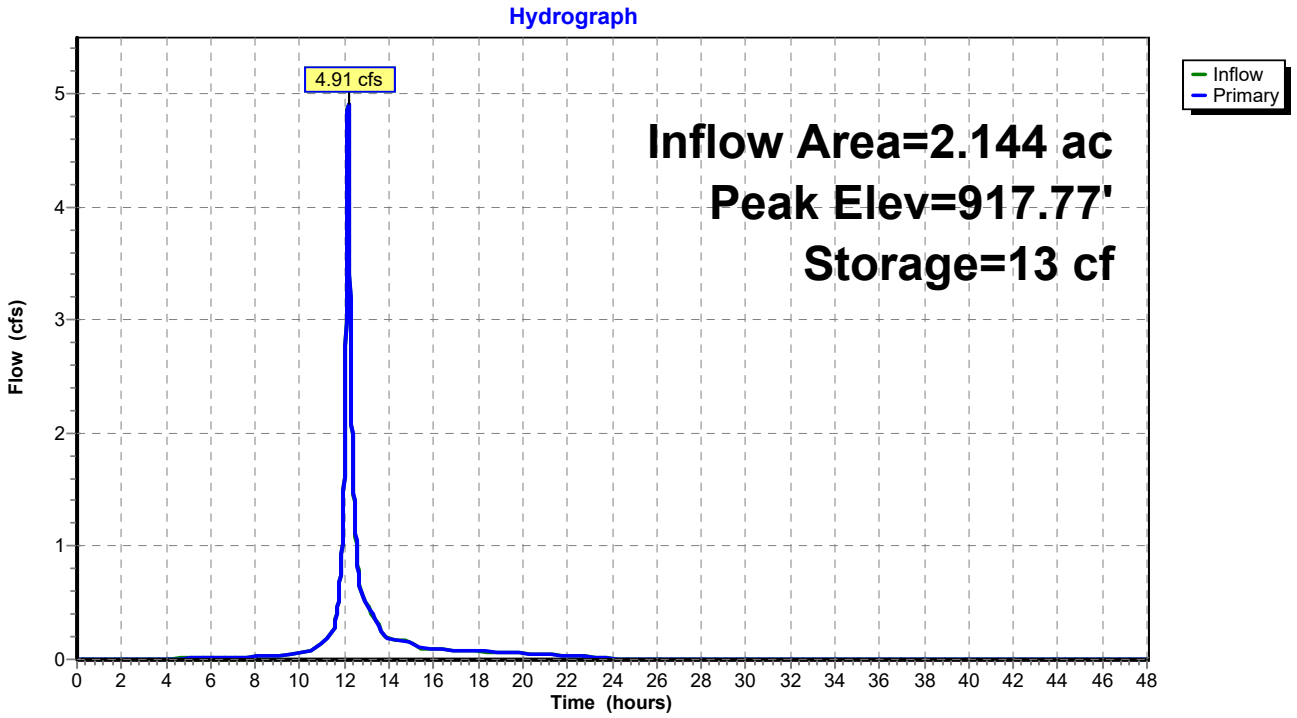
Volume	Invert	Avail.Storage	Storage Description
#1	915.58'	11,693 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.58	6	0	0
919.86	6	26	26
920.00	4,960	348	373
921.00	17,680	11,320	11,693

Device	Routing	Invert	Outlet Devices
#1	Primary	915.58'	12.0" Round Culvert L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.58' / 914.66' S= 0.0096 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	919.53'	12.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=4.91 cfs @ 12.16 hrs HW=917.76' (Free Discharge)
└1=Culvert (Inlet Controls 4.91 cfs @ 6.25 fps)
└2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond CB101: CB101



Summary for Pond CB102: CB102

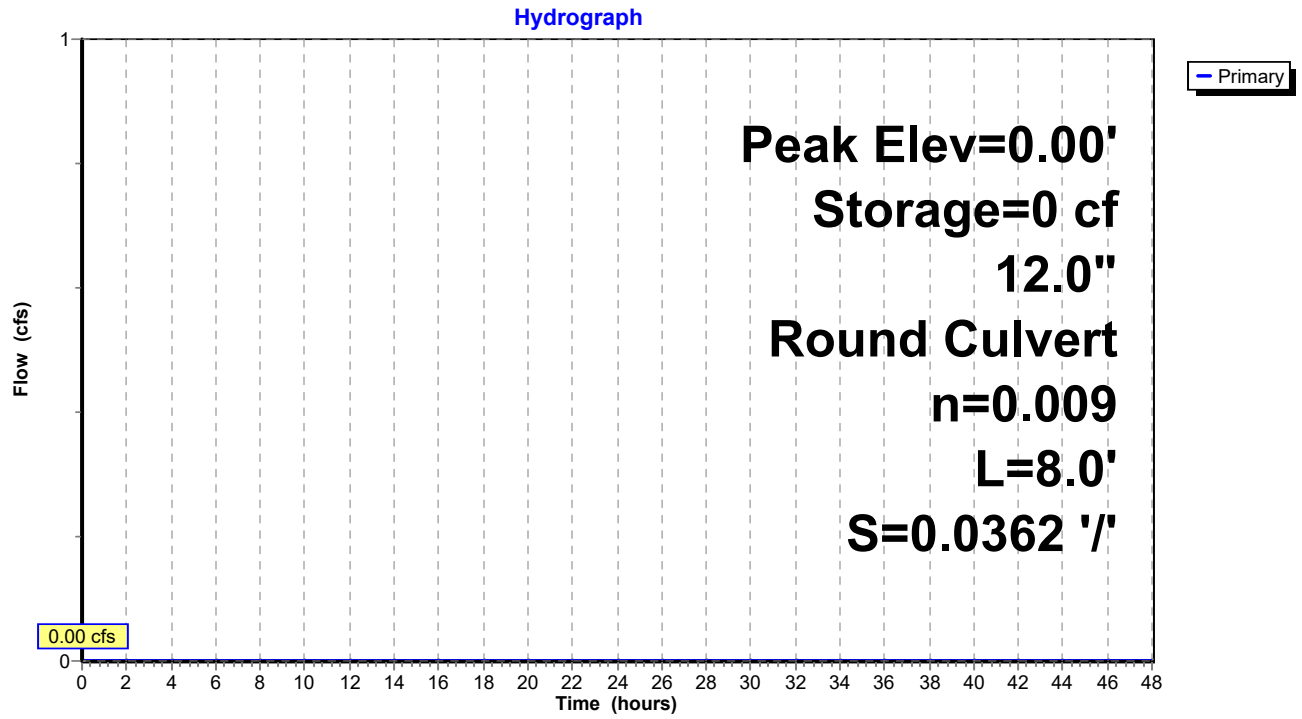
Volume	Invert	Avail.Storage	Storage Description
#1	916.02'	5,352 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.02	6	0	0
919.25	6	19	19
920.00	2,360	887	907
921.00	6,530	4,445	5,352

Device	Routing	Invert	Outlet Devices
#1	Primary	916.02'	**12.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 916.02' / 915.73' S= 0.0362 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf

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

Pond CB102: CB102



Summary for Pond CB103: CB103

Inflow Area = 1.230 ac, 13.43% Impervious, Inflow Depth = 1.29" for 2-year event
Inflow = 2.21 cfs @ 12.17 hrs, Volume= 0.133 af
Outflow = 2.21 cfs @ 12.17 hrs, Volume= 0.133 af, Atten= 0%, Lag= 0.0 min
Primary = 2.21 cfs @ 12.17 hrs, Volume= 0.133 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 916.87' @ 12.17 hrs Surf.Area= 6 sf Storage= 7 cf

Plug-Flow detention time= 0.2 min calculated for 0.133 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (809.3 - 809.1)

Volume	Invert	Avail.Storage	Storage Description
#1	915.75'	2,724 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

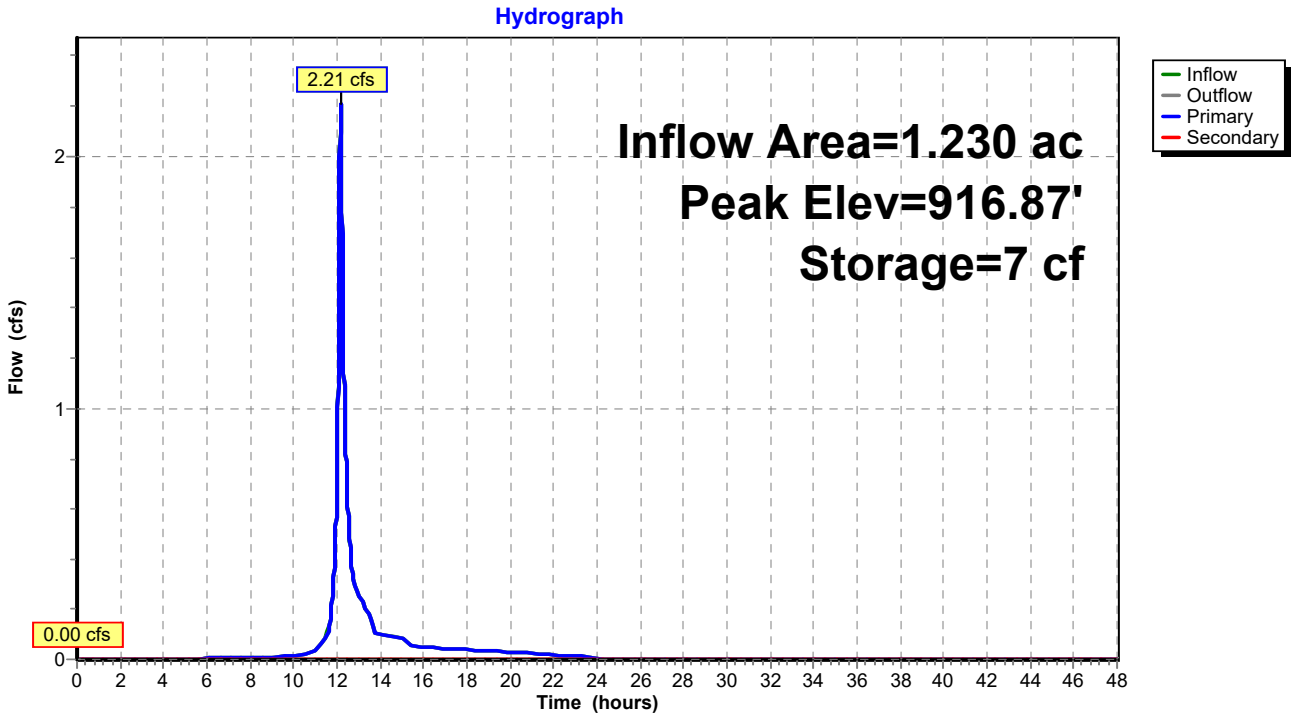
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.75	6	0	0
919.52	6	23	23
920.00	362	88	111
921.00	4,865	2,614	2,724

Device	Routing	Invert	Outlet Devices
#1	Primary	915.75'	12.0" Round Culvert L= 115.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.75' / 915.60' S= 0.0013 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	919.52'	2.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.21 cfs @ 12.17 hrs HW=916.87' (Free Discharge)
└1=Culvert (Barrel Controls 2.21 cfs @ 3.13 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=915.75' (Free Discharge)
└2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond CB103: CB103



Summary for Pond CB104: CB104

Inflow Area = 1.009 ac, 6.20% Impervious, Inflow Depth = 1.17" for 2-year event
Inflow = 1.61 cfs @ 12.18 hrs, Volume= 0.099 af
Outflow = 1.61 cfs @ 12.18 hrs, Volume= 0.099 af, Atten= 0%, Lag= 0.0 min
Primary = 1.61 cfs @ 12.18 hrs, Volume= 0.099 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 916.63' @ 12.18 hrs Surf.Area= 6 sf Storage= 5 cf

Plug-Flow detention time= 0.1 min calculated for 0.099 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (820.5 - 820.3)

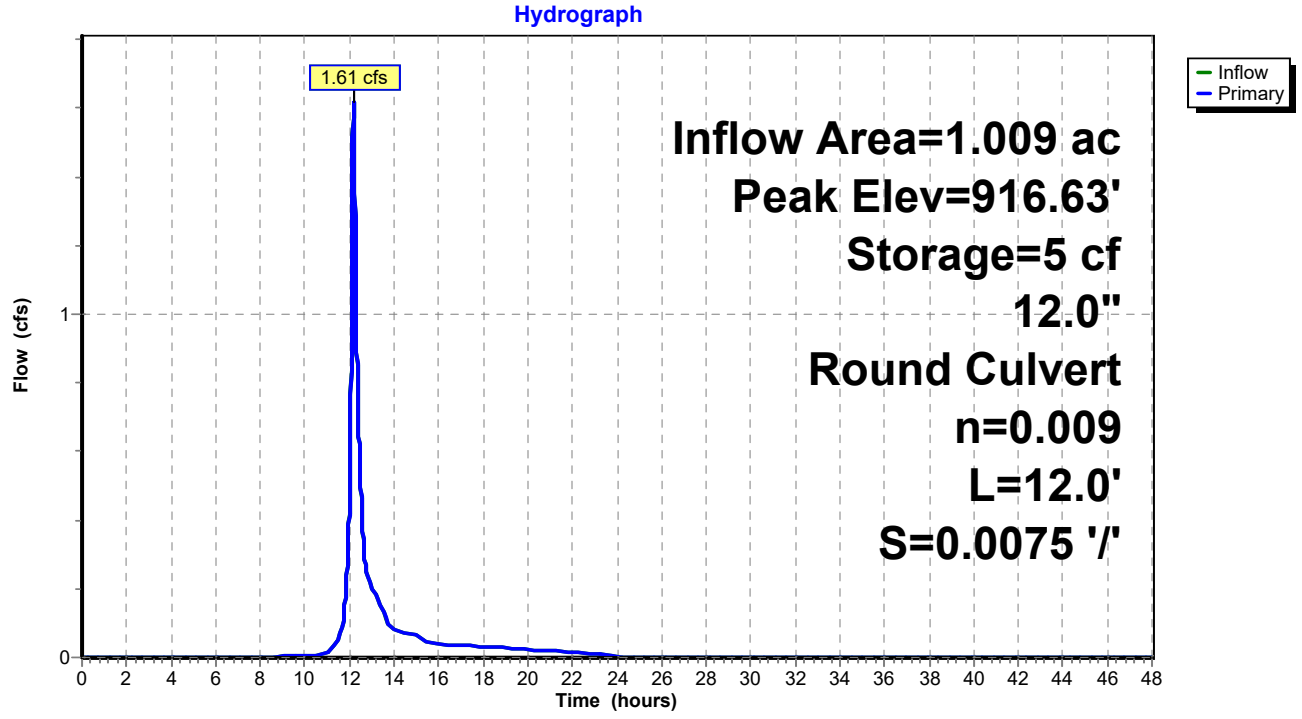
Volume	Invert	Avail.Storage	Storage Description
#1	915.84'	8,727 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.84	6	0	0
918.48	6	16	16
919.00	310	82	98
920.00	3,091	1,701	1,798
921.00	10,767	6,929	8,727

Device	Routing	Invert	Outlet Devices
#1	Primary	915.84'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.84' / 915.75' S= 0.0075 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.61 cfs @ 12.18 hrs HW=916.63' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 1.61 cfs @ 3.34 fps)

Pond CB104: CB104



Summary for Pond LOW AREA: LOW AREA

Inflow Area = 0.164 ac, 2.47% Impervious, Inflow Depth = 1.19" for 2-year event
Inflow = 0.34 cfs @ 12.15 hrs, Volume= 0.016 af
Outflow = 0.09 cfs @ 12.39 hrs, Volume= 0.010 af, Atten= 73%, Lag= 14.7 min
Primary = 0.09 cfs @ 12.39 hrs, Volume= 0.010 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 920.82' @ 12.39 hrs Surf.Area= 0.061 ac Storage= 0.007 af

Plug-Flow detention time= 157.2 min calculated for 0.010 af (62% of inflow)
Center-of-Mass det. time= 70.6 min (886.4 - 815.8)

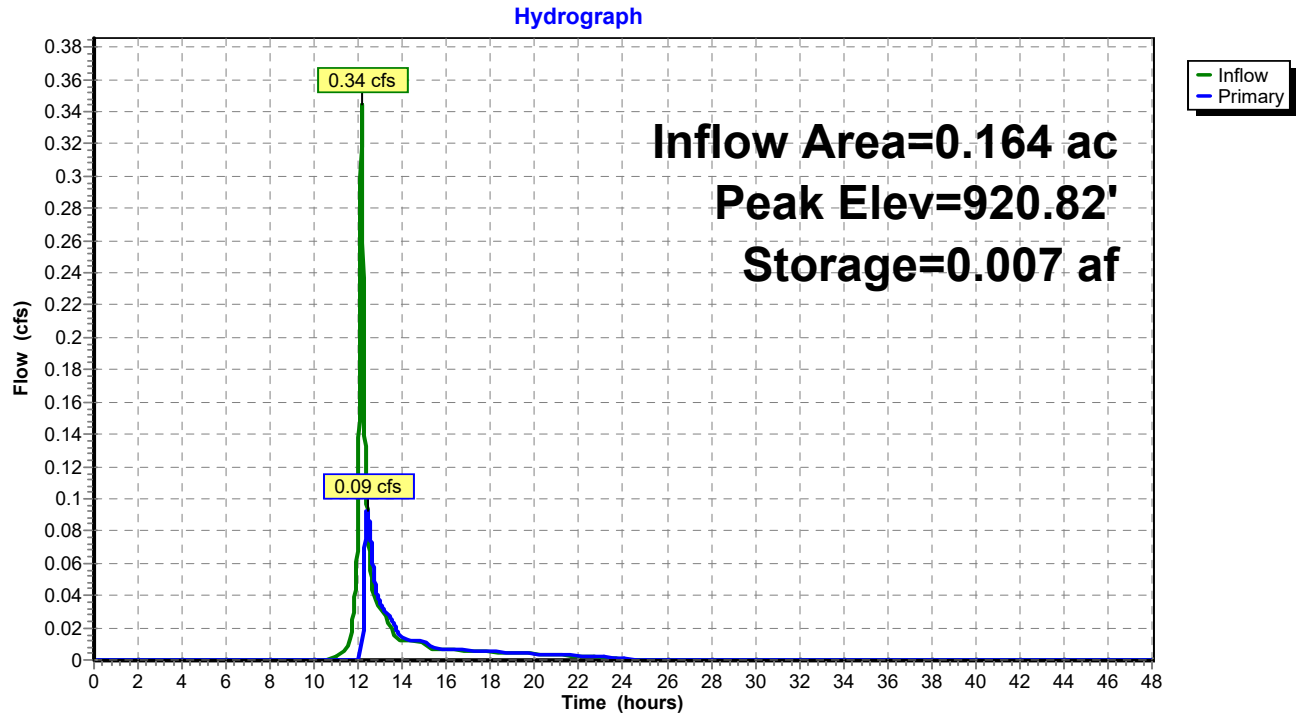
Volume	Invert	Avail.Storage	Storage Description
#1	920.60'	0.133 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.60	0.005	0.000	0.000
921.00	0.107	0.022	0.022
922.00	0.114	0.110	0.133

Device	Routing	Invert	Outlet Devices
#1	Primary	920.80'	12.0' long x 20.0' 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

Primary OutFlow Max=0.09 cfs @ 12.39 hrs HW=920.82' (Free Discharge)
└1=Broad-Crested Rectangular Weir (Weir Controls 0.09 cfs @ 0.38 fps)

Pond LOW AREA: LOW AREA



SECTION 2

EXISTING CONDITIONS 10-YEAR SUMMARY

Summary for Subcatchment 01S: Subcat 1S

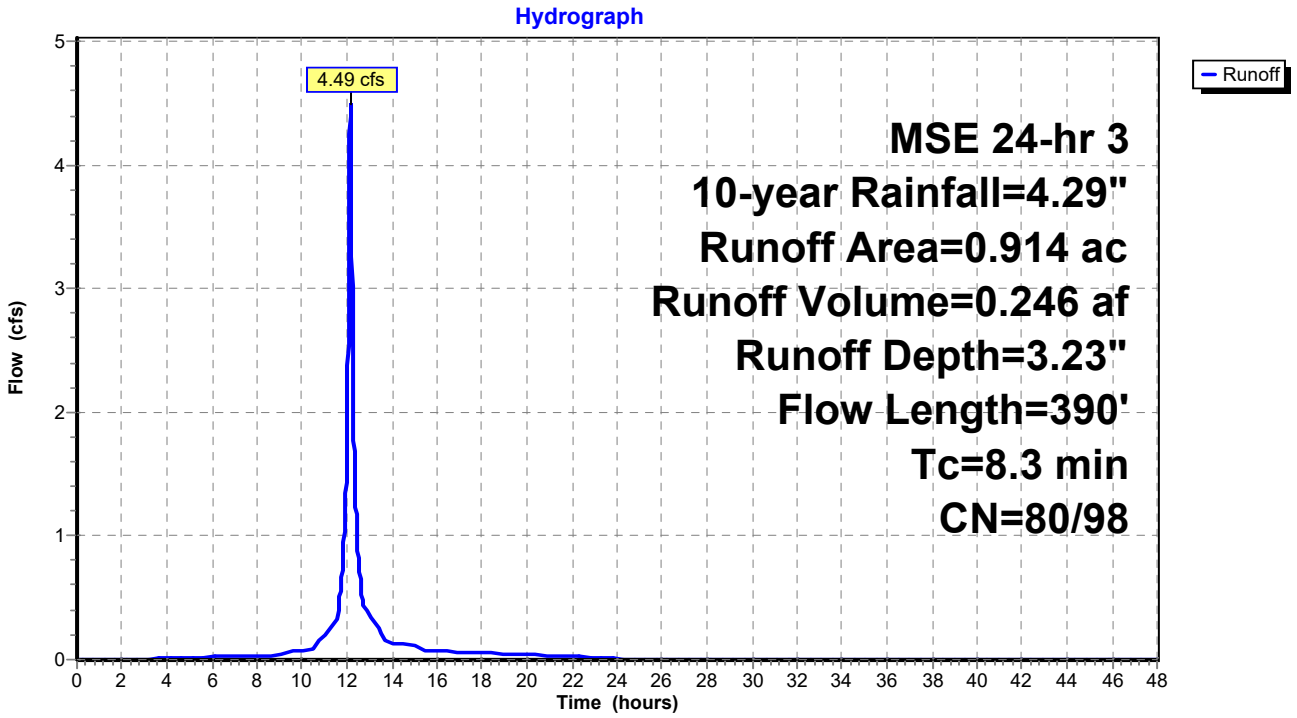
Runoff = 4.49 cfs @ 12.16 hrs, Volume= 0.246 af, Depth= 3.23"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.425	80	>75% Grass cover, Good, HSG D
0.077	98	Roofs, HSG D
0.003	98	Unconnected pavement, HSG D
0.409	98	Paved parking, HSG D
0.914	90	Weighted Average
0.425	80	46.50% Pervious Area
0.489	98	53.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 2.87"
1.2	190	0.0300	2.60		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.2	150	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
8.3	390	Total			

Subcatchment 01S: Subcat 1S



Summary for Subcatchment 03S: Subcat 3S

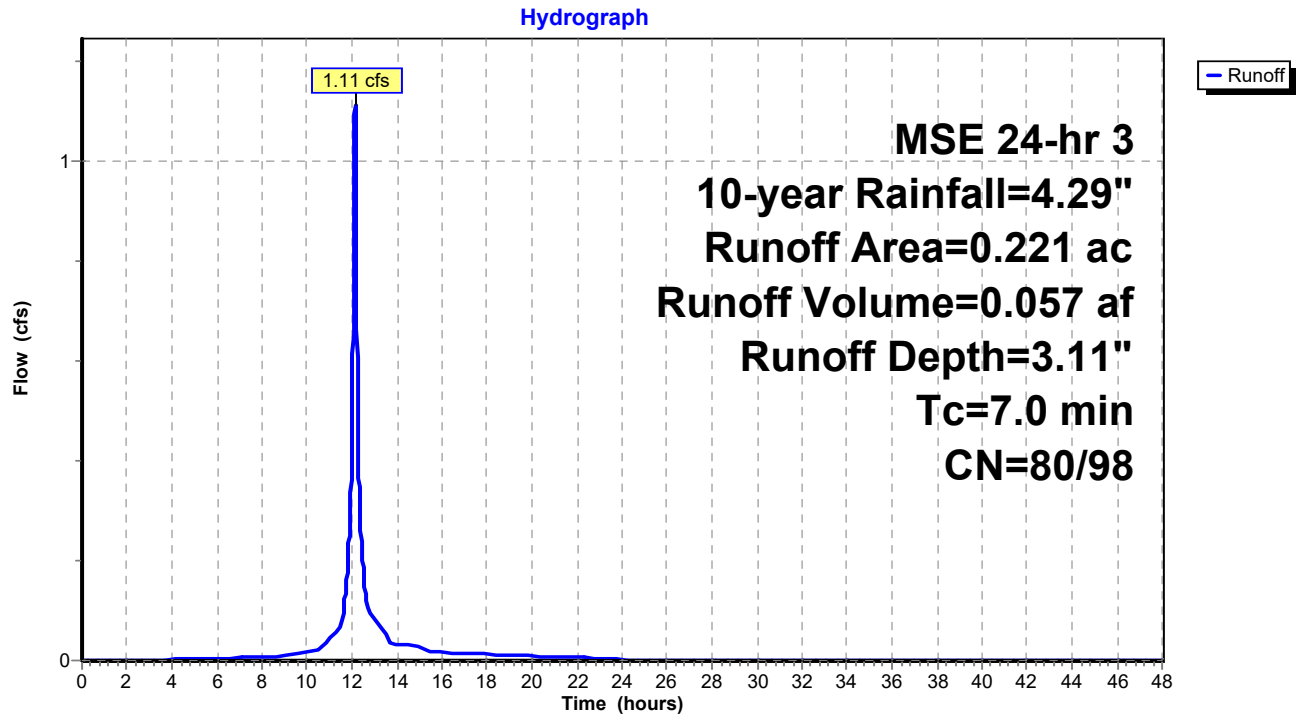
Runoff = 1.11 cfs @ 12.14 hrs, Volume= 0.057 af, Depth= 3.11"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.119	80	>75% Grass cover, Good, HSG D
0.060	98	Paved parking, HSG D
0.043	98	Roofs, HSG D
0.221	88	Weighted Average
0.119	80	53.61% Pervious Area
0.103	98	46.39% Impervious Area

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

Subcatchment 03S: Subcat 3S



Summary for Subcatchment 04S: Subcat 4S

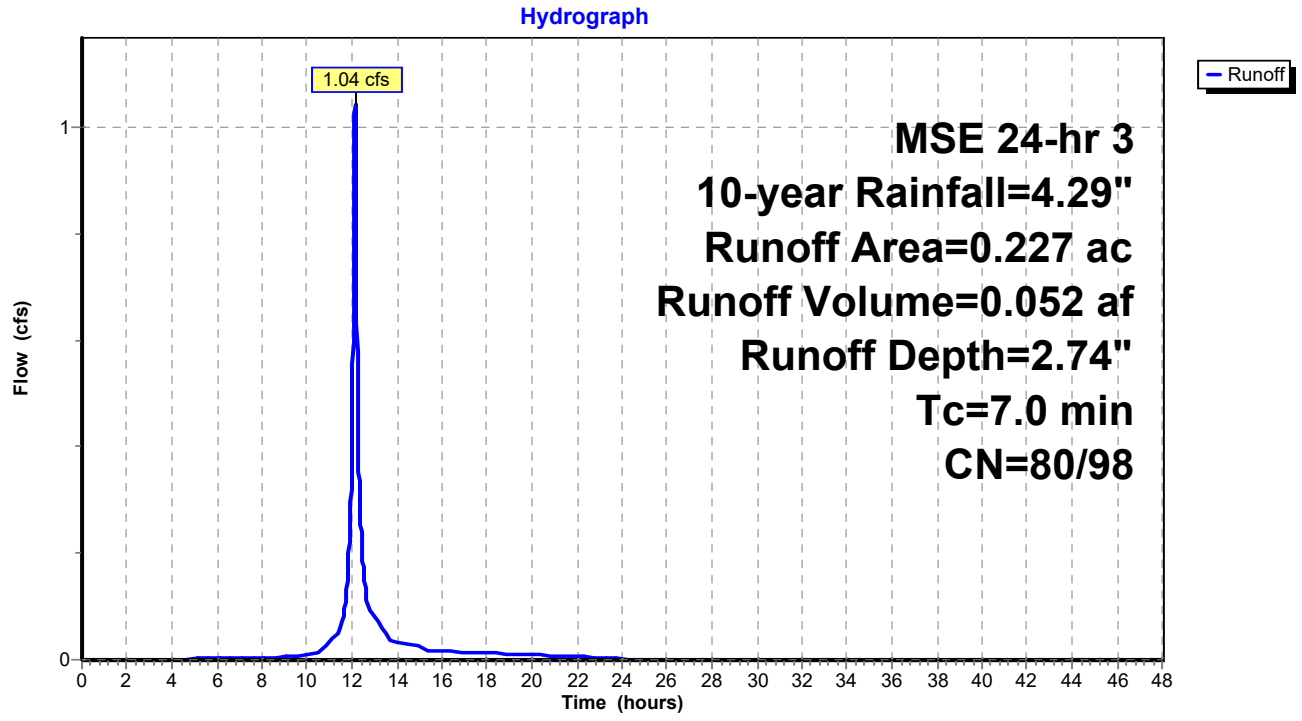
Runoff = 1.04 cfs @ 12.14 hrs, Volume= 0.052 af, Depth= 2.74"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.168	80	>75% Grass cover, Good, HSG D
0.005	98	Paved parking, HSG D
0.026	98	Roofs, HSG D
0.028	98	Unconnected pavement, HSG D
0.227	85	Weighted Average
0.168	80	74.01% Pervious Area
0.059	98	25.99% Impervious Area

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

Subcatchment 04S: Subcat 4S



Summary for Subcatchment 06S: Subcat 6S

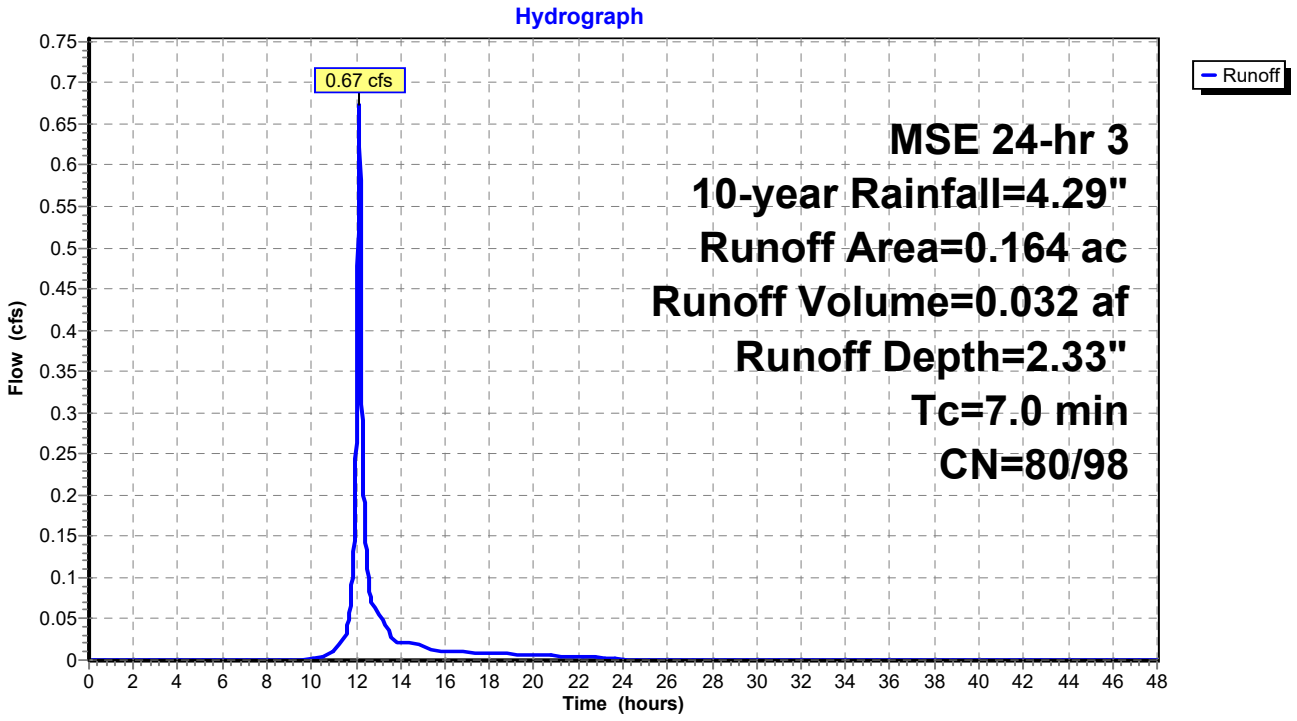
Runoff = 0.67 cfs @ 12.14 hrs, Volume= 0.032 af, Depth= 2.33"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.160	80	>75% Grass cover, Good, HSG D
0.004	98	Roofs, HSG D
0.164	80	Weighted Average
0.160	80	97.53% Pervious Area
0.004	98	2.47% Impervious Area

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

Subcatchment 06S: Subcat 6S



Summary for Subcatchment 07S: Subcat 7S

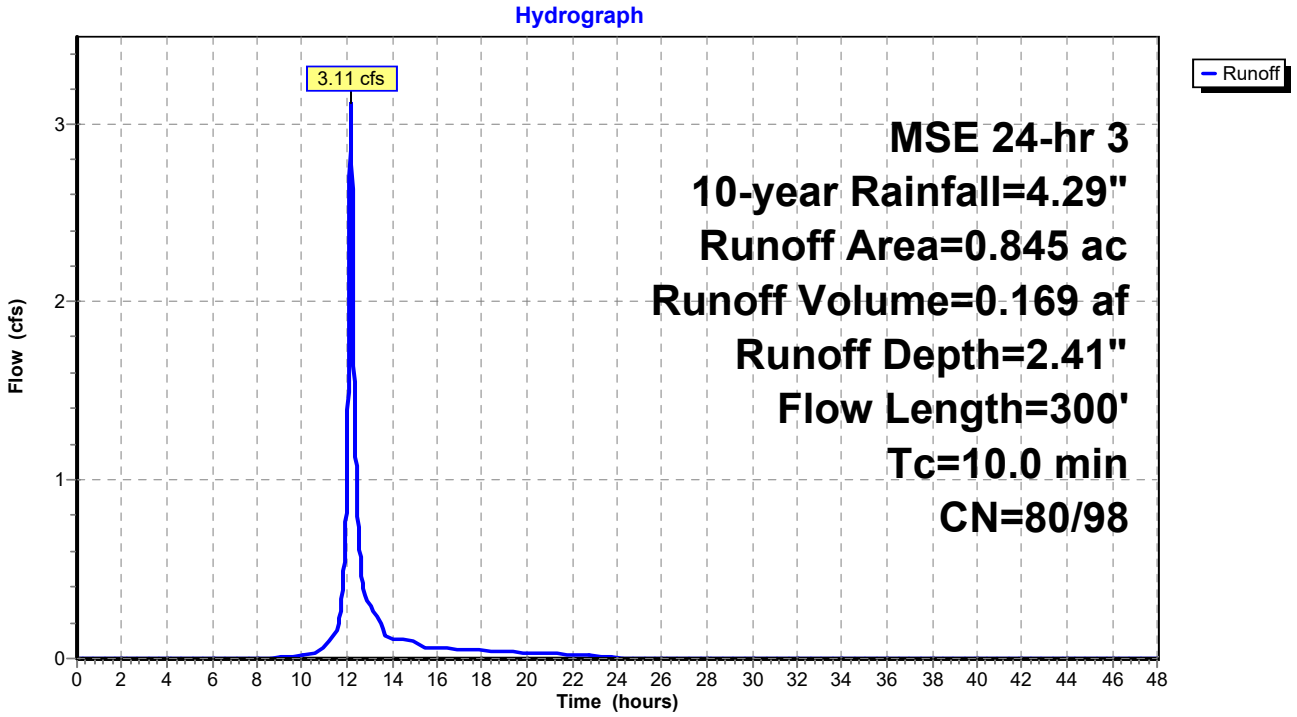
Runoff = 3.11 cfs @ 12.18 hrs, Volume= 0.169 af, Depth= 2.41"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.786	80	>75% Grass cover, Good, HSG D
0.058	98	Roofs, HSG D
0.845	81	Weighted Average
0.786	80	93.08% Pervious Area
0.058	98	6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 2.87"
1.3	250	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	300	Total			

Subcatchment 07S: Subcat 7S

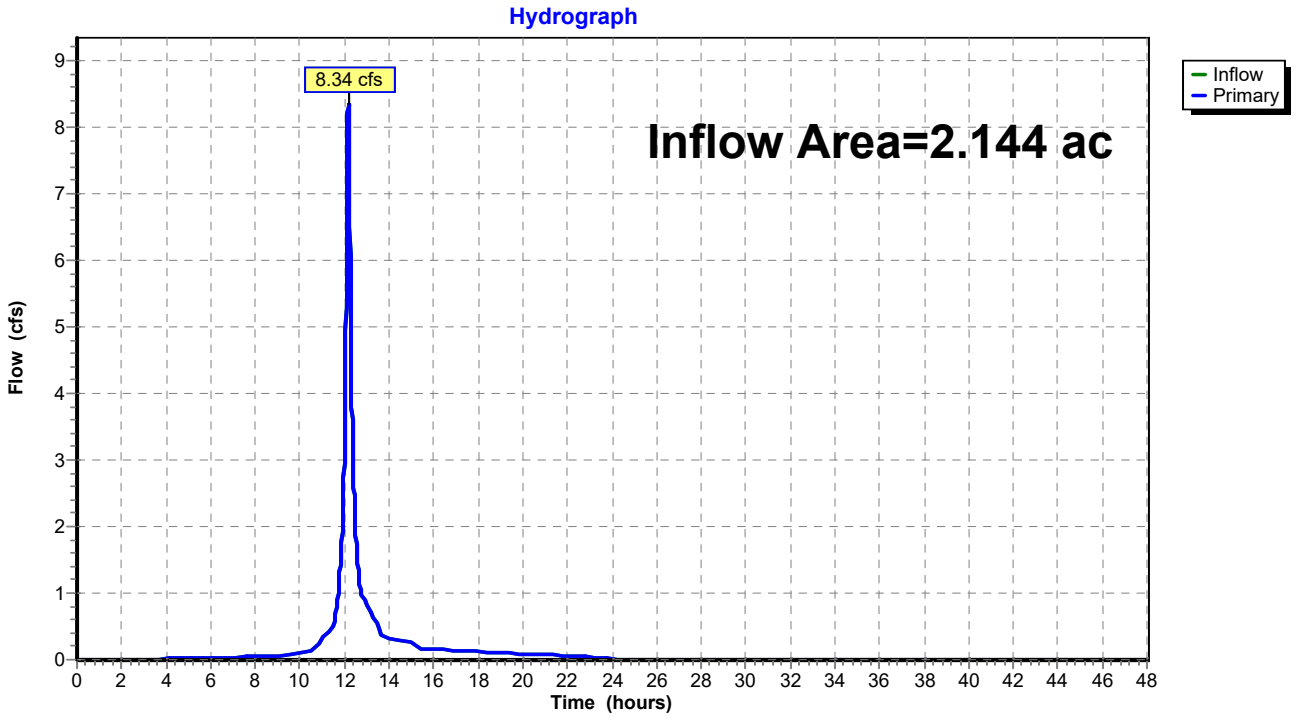


Summary for Pond 50TH: 50TH AVENUE

Inflow Area = 2.144 ac, 30.51% Impervious, Inflow Depth = 2.79" for 10-year event
Inflow = 8.34 cfs @ 12.19 hrs, Volume= 0.498 af
Primary = 8.34 cfs @ 12.19 hrs, Volume= 0.498 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 50TH: 50TH AVENUE

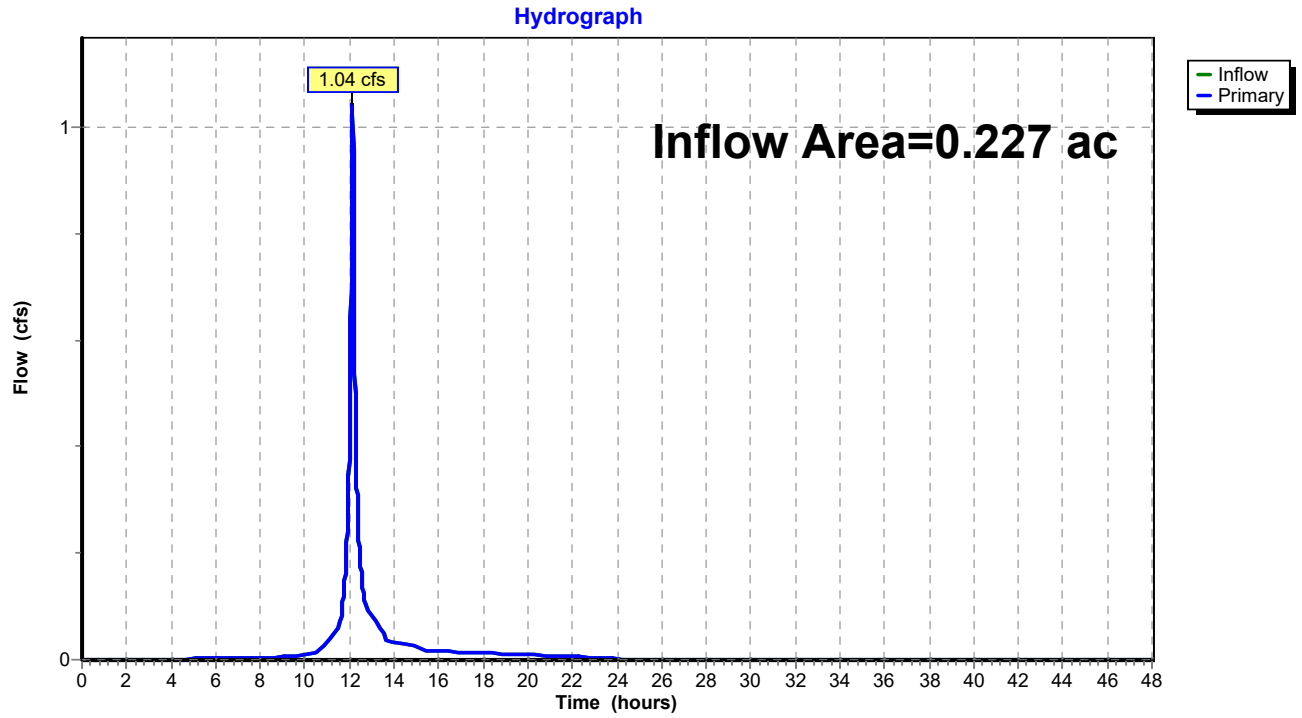


Summary for Pond BOONE: BOONE

Inflow Area = 0.227 ac, 25.99% Impervious, Inflow Depth = 2.74" for 10-year event
Inflow = 1.04 cfs @ 12.14 hrs, Volume= 0.052 af
Primary = 1.04 cfs @ 12.14 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond BOONE: BOONE



Summary for Pond CB100: CB 100

Inflow Area = 2.144 ac, 30.51% Impervious, Inflow Depth = 2.79" for 10-year event
Inflow = 9.00 cfs @ 12.16 hrs, Volume= 0.498 af
Outflow = 8.34 cfs @ 12.19 hrs, Volume= 0.498 af, Atten= 7%, Lag= 1.9 min
Primary = 8.34 cfs @ 12.19 hrs, Volume= 0.498 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 918.95' @ 12.19 hrs Surf.Area= 541 sf Storage= 155 cf

Plug-Flow detention time= 0.7 min calculated for 0.498 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (783.6 - 783.5)

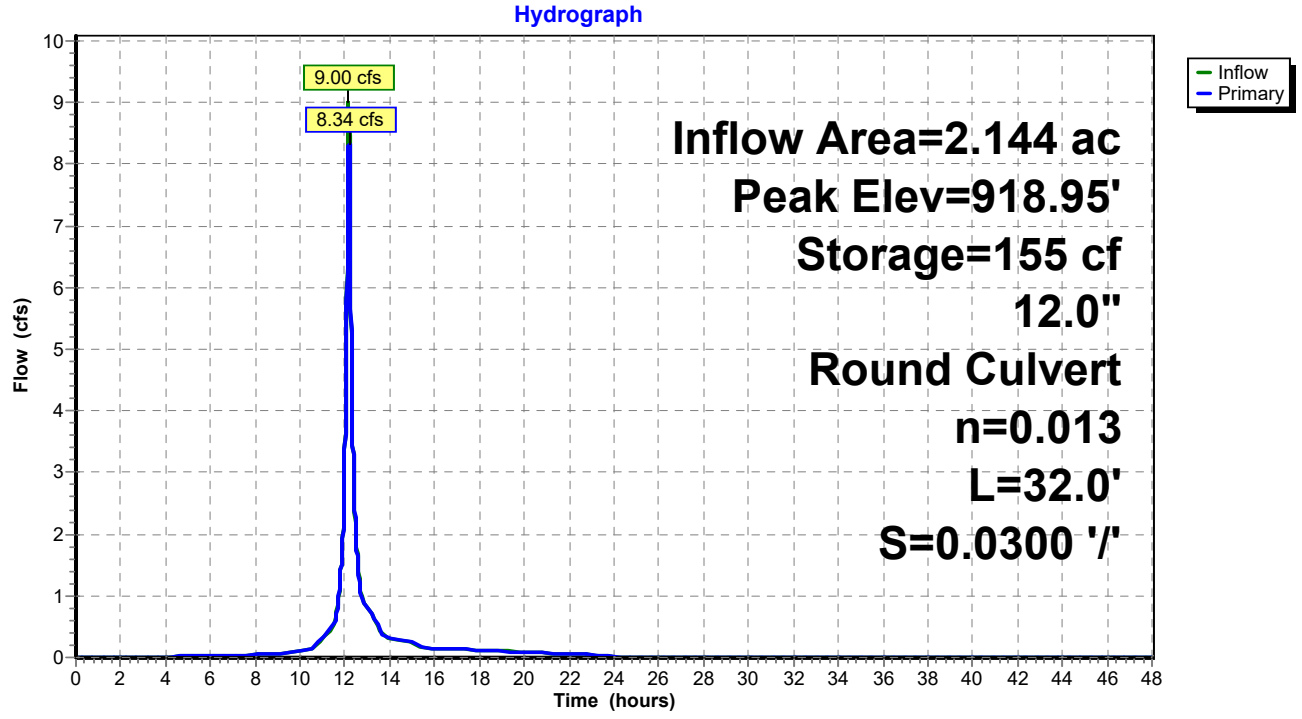
Volume	Invert	Avail.Storage	Storage Description
#1	913.59'	15,777 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.59	6	0	0
918.49	6	29	29
919.00	600	155	184
920.00	3,743	2,172	2,355
921.00	6,250	4,997	7,352
922.00	10,600	8,425	15,777

Device	Routing	Invert	Outlet Devices
#1	Primary	913.59'	12.0" Round Culvert L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 913.59' / 912.63' S= 0.0300 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=8.33 cfs @ 12.19 hrs HW=918.95' (Free Discharge)
└1=Culvert (Inlet Controls 8.33 cfs @ 10.61 fps)

Pond CB100: CB 100



Summary for Pond CB101: CB101

Inflow Area = 2.144 ac, 30.51% Impervious, Inflow Depth = 2.79" for 10-year event
Inflow = 9.00 cfs @ 12.16 hrs, Volume= 0.498 af
Outflow = 9.00 cfs @ 12.16 hrs, Volume= 0.498 af, Atten= 0%, Lag= 0.0 min
Primary = 9.00 cfs @ 12.16 hrs, Volume= 0.498 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 919.68' @ 12.16 hrs Surf.Area= 6 sf Storage= 25 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (783.5 - 783.4)

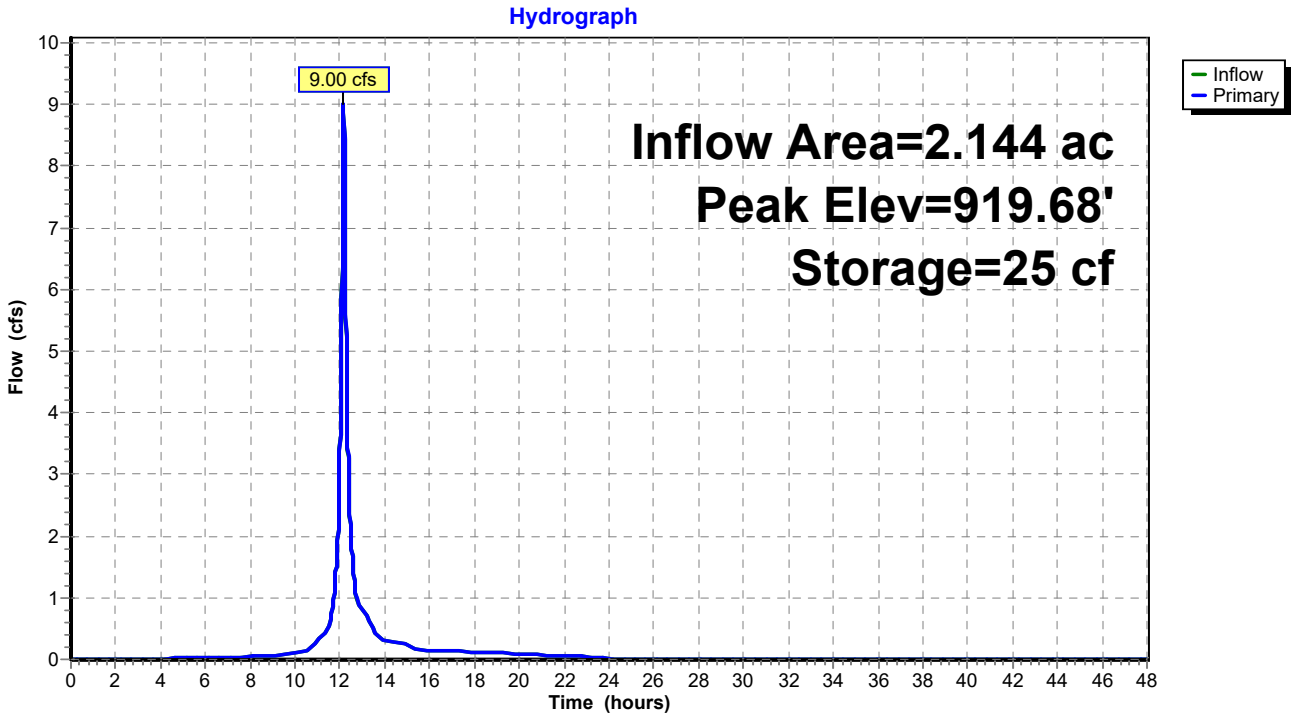
Volume	Invert	Avail.Storage	Storage Description
#1	915.58'	11,693 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.58	6	0	0
919.86	6	26	26
920.00	4,960	348	373
921.00	17,680	11,320	11,693

Device	Routing	Invert	Outlet Devices
#1	Primary	915.58'	12.0" Round Culvert L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.58' / 914.66' S= 0.0096 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	919.53'	12.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=8.97 cfs @ 12.16 hrs HW=919.68' (Free Discharge)
└1=Culvert (Inlet Controls 7.18 cfs @ 9.14 fps)
└2=Broad-Crested Rectangular Weir (Weir Controls 1.80 cfs @ 0.99 fps)

Pond CB101: CB101



Summary for Pond CB102: CB102

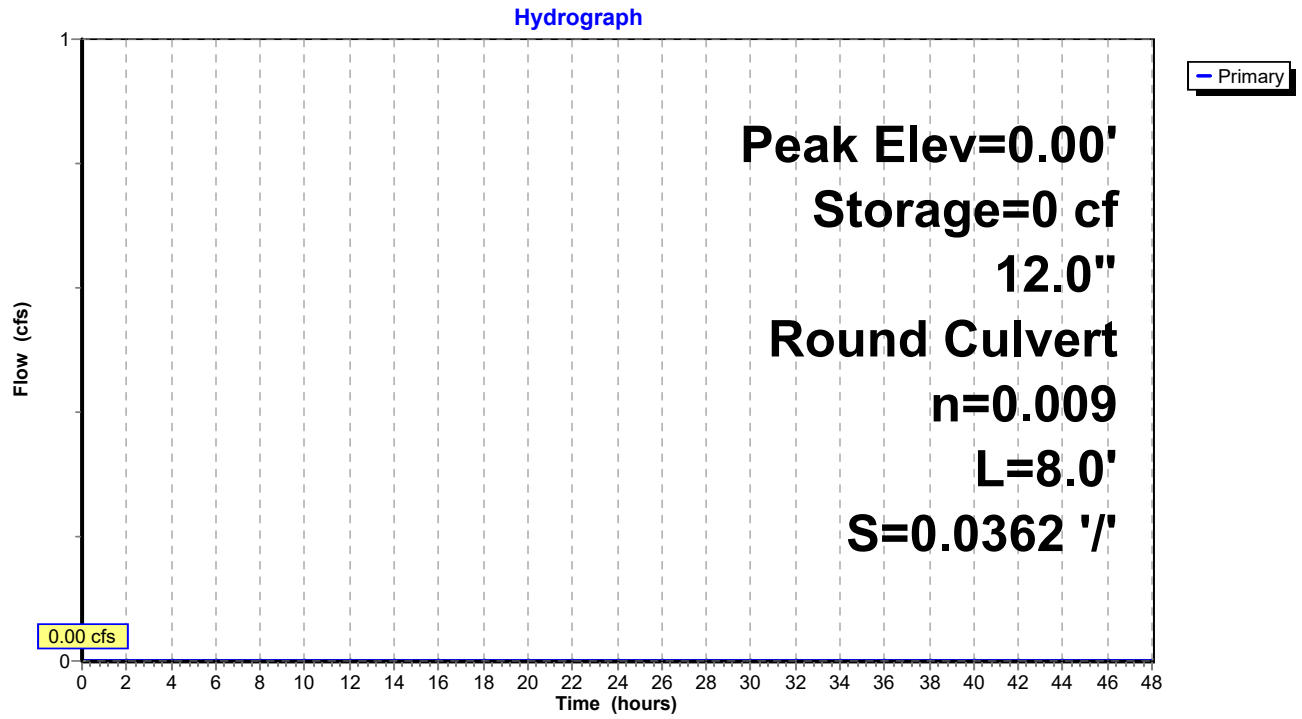
Volume	Invert	Avail.Storage	Storage Description
#1	916.02'	5,352 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.02	6	0	0
919.25	6	19	19
920.00	2,360	887	907
921.00	6,530	4,445	5,352

Device	Routing	Invert	Outlet Devices
#1	Primary	916.02'	**12.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 916.02' / 915.73' S= 0.0362 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf

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

Pond CB102: CB102



Summary for Pond CB103: CB103

Inflow Area = 1.230 ac, 13.43% Impervious, Inflow Depth = 2.46" for 10-year event
Inflow = 4.56 cfs @ 12.17 hrs, Volume= 0.252 af
Outflow = 4.56 cfs @ 12.17 hrs, Volume= 0.252 af, Atten= 0%, Lag= 0.1 min
Primary = 4.56 cfs @ 12.17 hrs, Volume= 0.252 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 918.29' @ 12.17 hrs Surf.Area= 6 sf Storage= 15 cf

Plug-Flow detention time= 0.2 min calculated for 0.252 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (798.3 - 798.1)

Volume	Invert	Avail.Storage	Storage Description
#1	915.75'	2,724 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

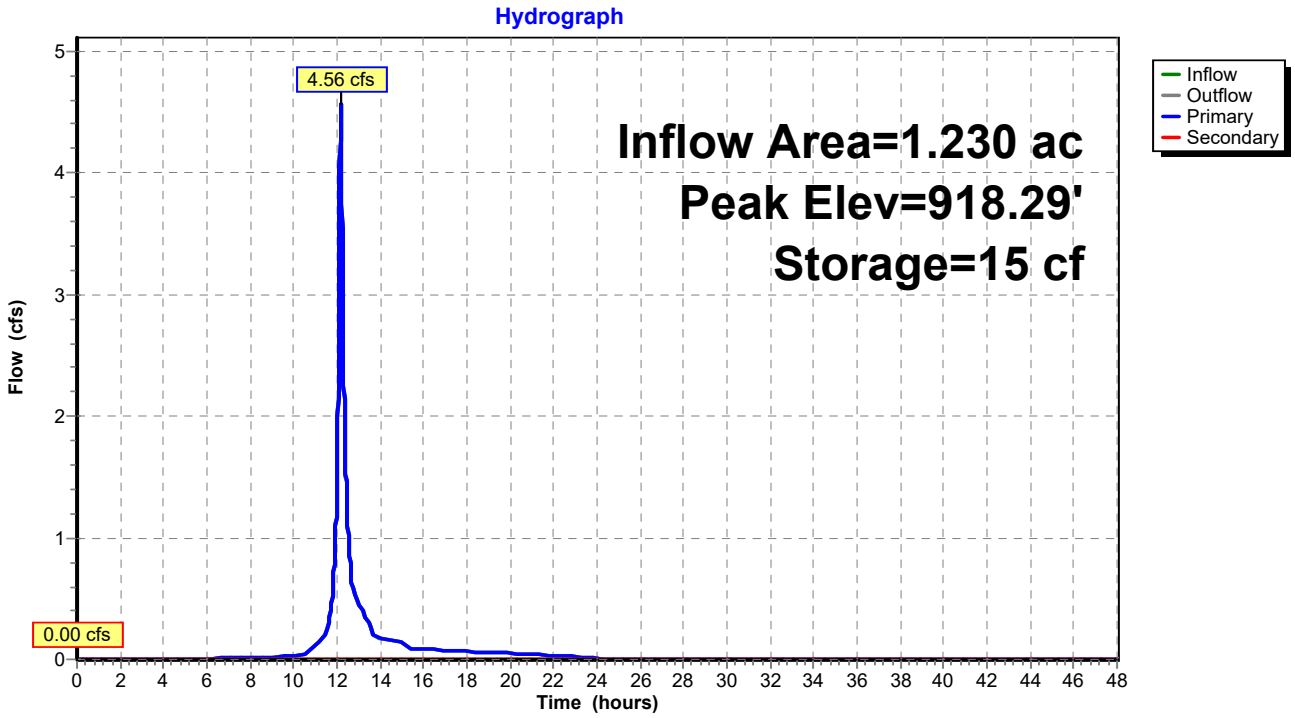
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.75	6	0	0
919.52	6	23	23
920.00	362	88	111
921.00	4,865	2,614	2,724

Device	Routing	Invert	Outlet Devices
#1	Primary	915.75'	12.0" Round Culvert L= 115.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.75' / 915.60' S= 0.0013 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	919.52'	2.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.56 cfs @ 12.17 hrs HW=918.29' (Free Discharge)
└1=Culvert (Barrel Controls 4.56 cfs @ 5.80 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=915.75' (Free Discharge)
└2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond CB103: CB103



Summary for Pond CB104: CB104

Inflow Area = 1.009 ac, 6.20% Impervious, Inflow Depth = 2.32" for 10-year event
Inflow = 3.58 cfs @ 12.18 hrs, Volume= 0.195 af
Outflow = 3.57 cfs @ 12.18 hrs, Volume= 0.195 af, Atten= 0%, Lag= 0.0 min
Primary = 3.57 cfs @ 12.18 hrs, Volume= 0.195 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 917.29' @ 12.18 hrs Surf.Area= 6 sf Storage= 9 cf

Plug-Flow detention time= 0.1 min calculated for 0.195 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (806.2 - 806.1)

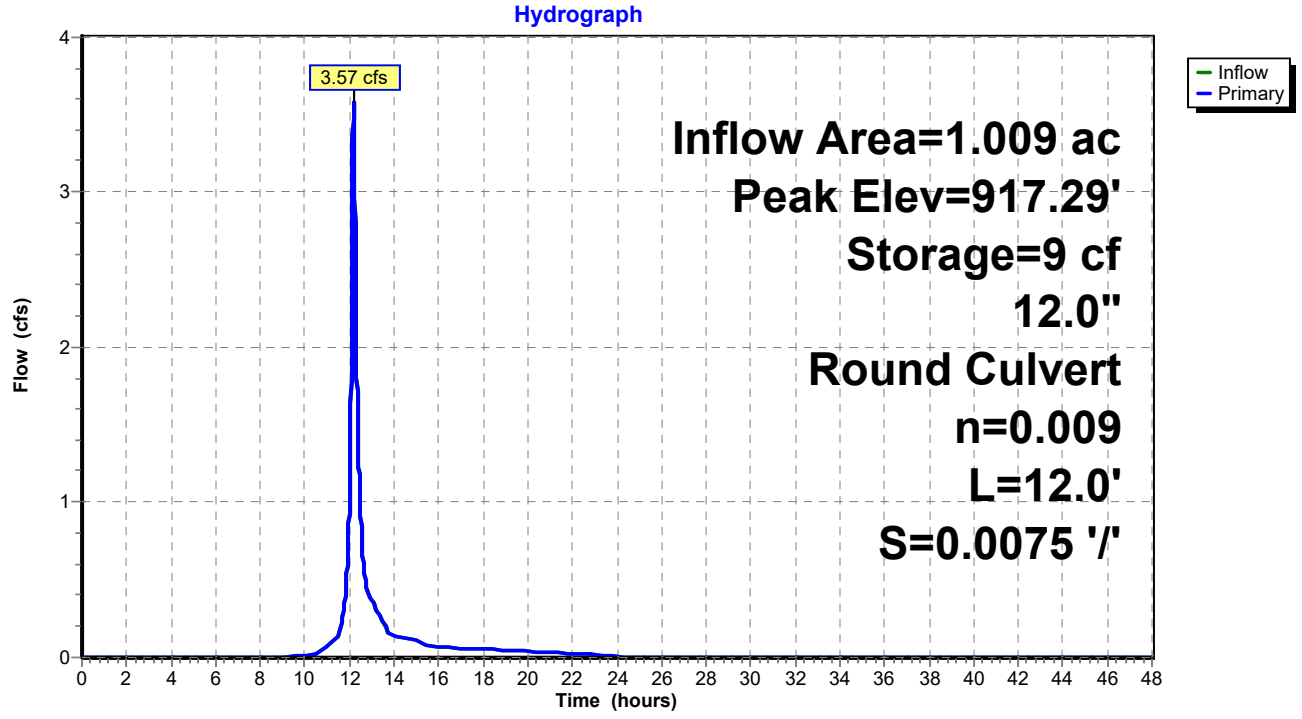
Volume	Invert	Avail.Storage	Storage Description
#1	915.84'	8,727 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.84	6	0	0
918.48	6	16	16
919.00	310	82	98
920.00	3,091	1,701	1,798
921.00	10,767	6,929	8,727

Device	Routing	Invert	Outlet Devices
#1	Primary	915.84'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.84' / 915.75' S= 0.0075 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=3.57 cfs @ 12.18 hrs HW=917.29' (Free Discharge)
└1=Culvert (Barrel Controls 3.57 cfs @ 4.55 fps)

Pond CB104: CB104



Summary for Pond LOW AREA: LOW AREA

Inflow Area = 0.164 ac, 2.47% Impervious, Inflow Depth = 2.33" for 10-year event
Inflow = 0.67 cfs @ 12.14 hrs, Volume= 0.032 af
Outflow = 0.48 cfs @ 12.20 hrs, Volume= 0.026 af, Atten= 28%, Lag= 3.5 min
Primary = 0.48 cfs @ 12.20 hrs, Volume= 0.026 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 920.86' @ 12.20 hrs Surf.Area= 0.071 ac Storage= 0.010 af

Plug-Flow detention time= 97.9 min calculated for 0.026 af (81% of inflow)
Center-of-Mass det. time= 34.5 min (837.3 - 802.7)

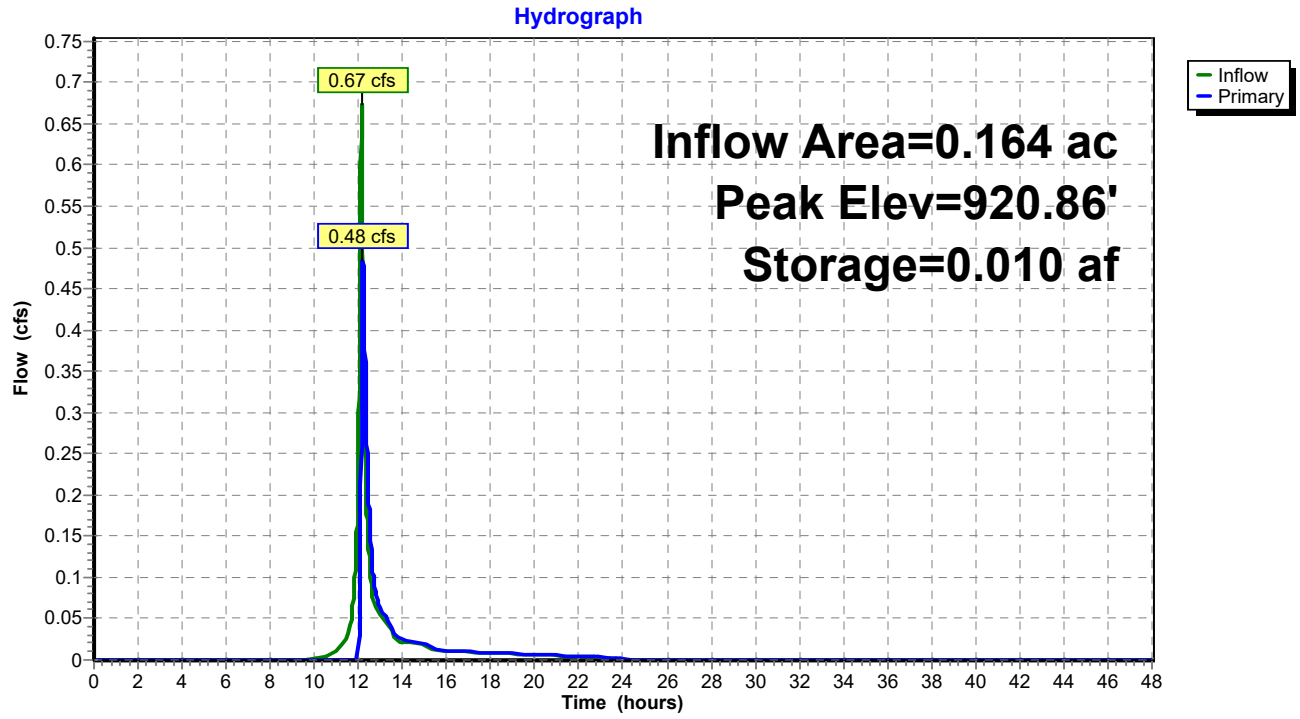
Volume	Invert	Avail.Storage	Storage Description
#1	920.60'	0.133 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.60	0.005	0.000	0.000
921.00	0.107	0.022	0.022
922.00	0.114	0.110	0.133

Device	Routing	Invert	Outlet Devices
#1	Primary	920.80'	12.0' long x 20.0' 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

Primary OutFlow Max=0.48 cfs @ 12.20 hrs HW=920.86' (Free Discharge)
└1=Broad-Crested Rectangular Weir (Weir Controls 0.48 cfs @ 0.66 fps)

Pond LOW AREA: LOW AREA



SECTION 3

EXISTING CONDITIONS 100-YEAR SUMMARY

Summary for Subcatchment 01S: Subcat 1S

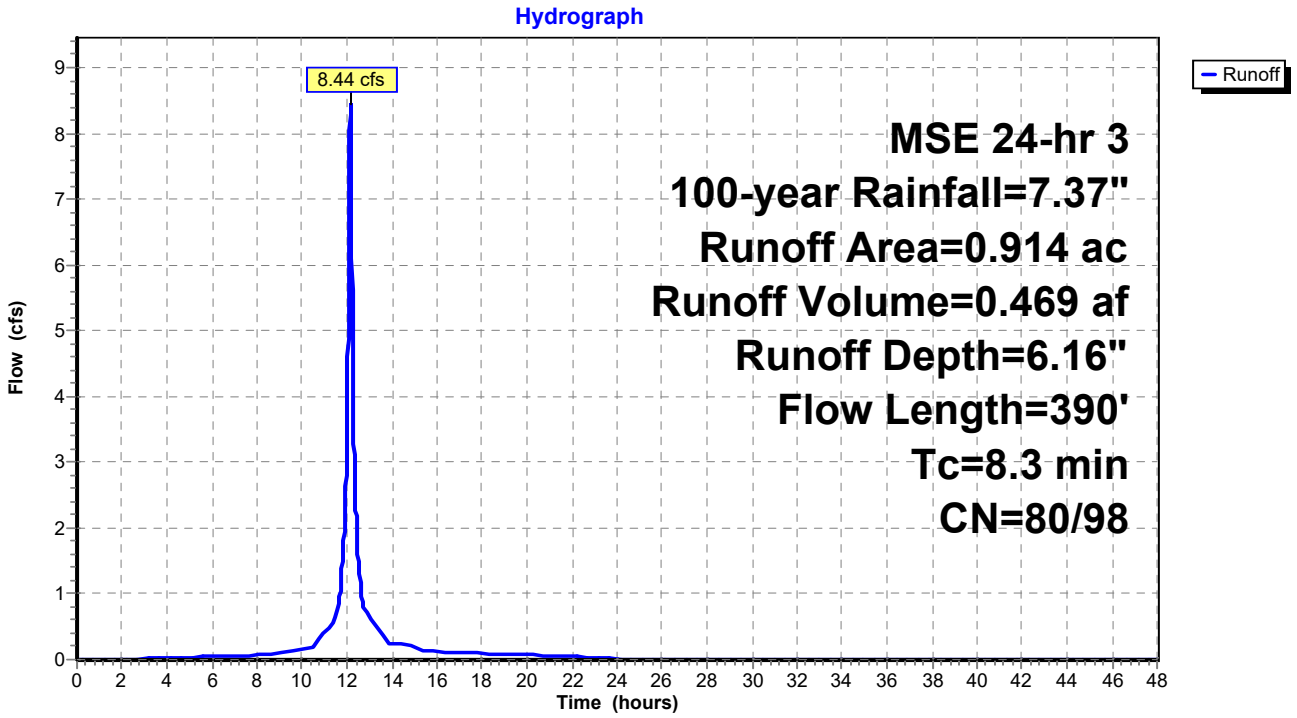
Runoff = 8.44 cfs @ 12.15 hrs, Volume= 0.469 af, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.425	80	>75% Grass cover, Good, HSG D
0.077	98	Roofs, HSG D
0.003	98	Unconnected pavement, HSG D
0.409	98	Paved parking, HSG D
0.914	90	Weighted Average
0.425	80	46.50% Pervious Area
0.489	98	53.50% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.9	50	0.0200	0.14		Sheet Flow, Grass: Short n= 0.150 P2= 2.87"
1.2	190	0.0300	2.60		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
1.2	150	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
8.3	390	Total			

Subcatchment 01S: Subcat 1S



Summary for Subcatchment 03S: Subcat 3S

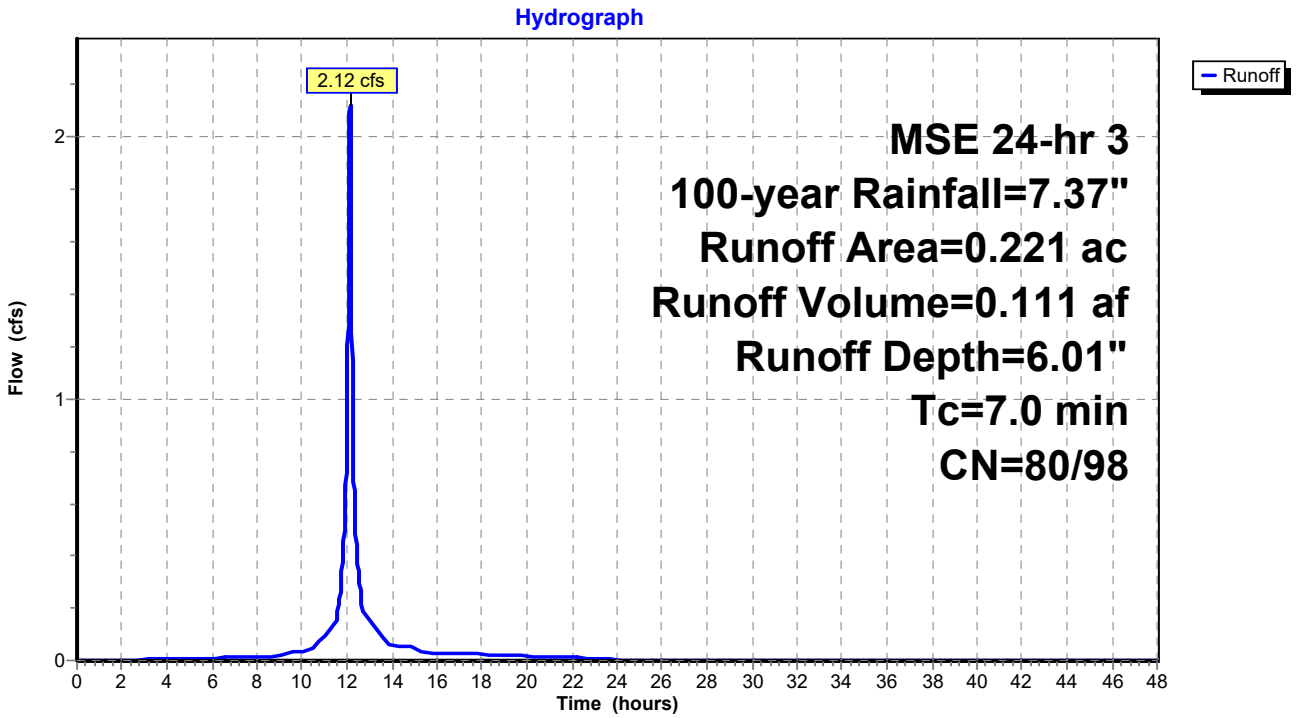
Runoff = 2.12 cfs @ 12.14 hrs, Volume= 0.111 af, Depth= 6.01"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.119	80	>75% Grass cover, Good, HSG D
0.060	98	Paved parking, HSG D
0.043	98	Roofs, HSG D
0.221	88	Weighted Average
0.119	80	53.61% Pervious Area
0.103	98	46.39% Impervious Area

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

Subcatchment 03S: Subcat 3S



Summary for Subcatchment 04S: Subcat 4S

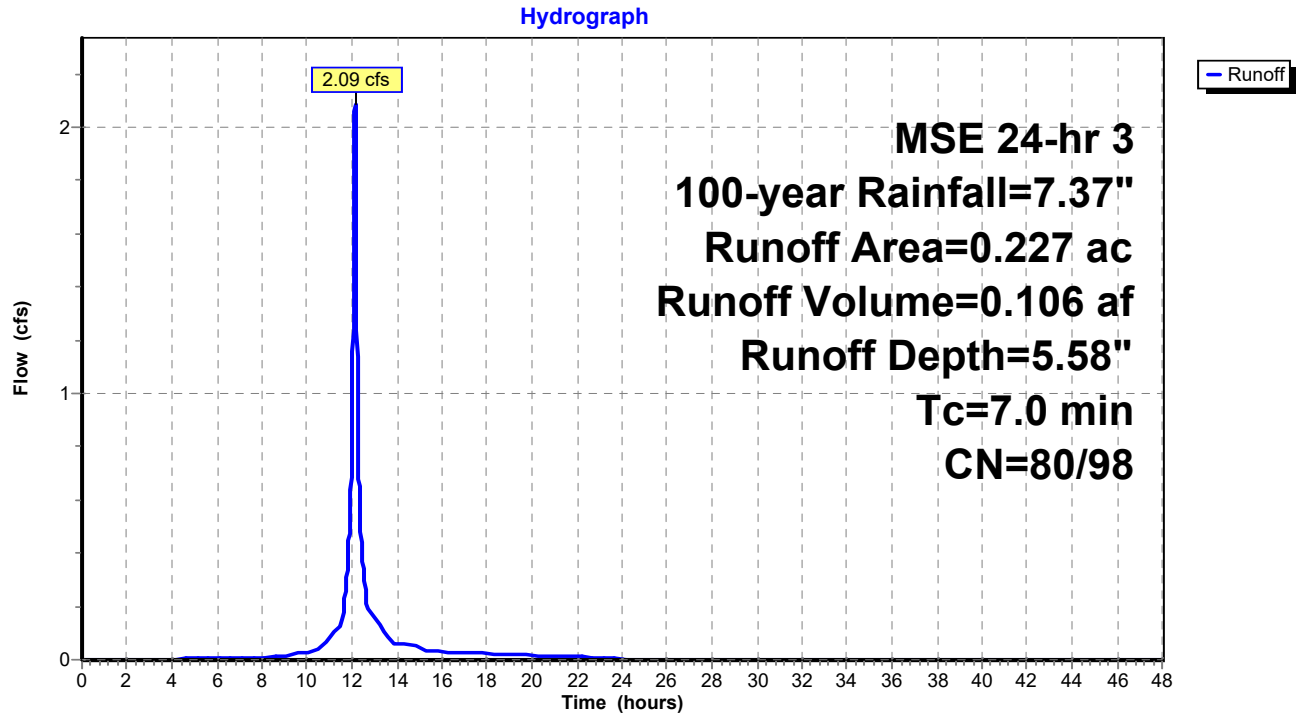
Runoff = 2.09 cfs @ 12.14 hrs, Volume= 0.106 af, Depth= 5.58"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.168	80	>75% Grass cover, Good, HSG D
0.005	98	Paved parking, HSG D
0.026	98	Roofs, HSG D
0.028	98	Unconnected pavement, HSG D
0.227	85	Weighted Average
0.168	80	74.01% Pervious Area
0.059	98	25.99% Impervious Area

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

Subcatchment 04S: Subcat 4S



Summary for Subcatchment 06S: Subcat 6S

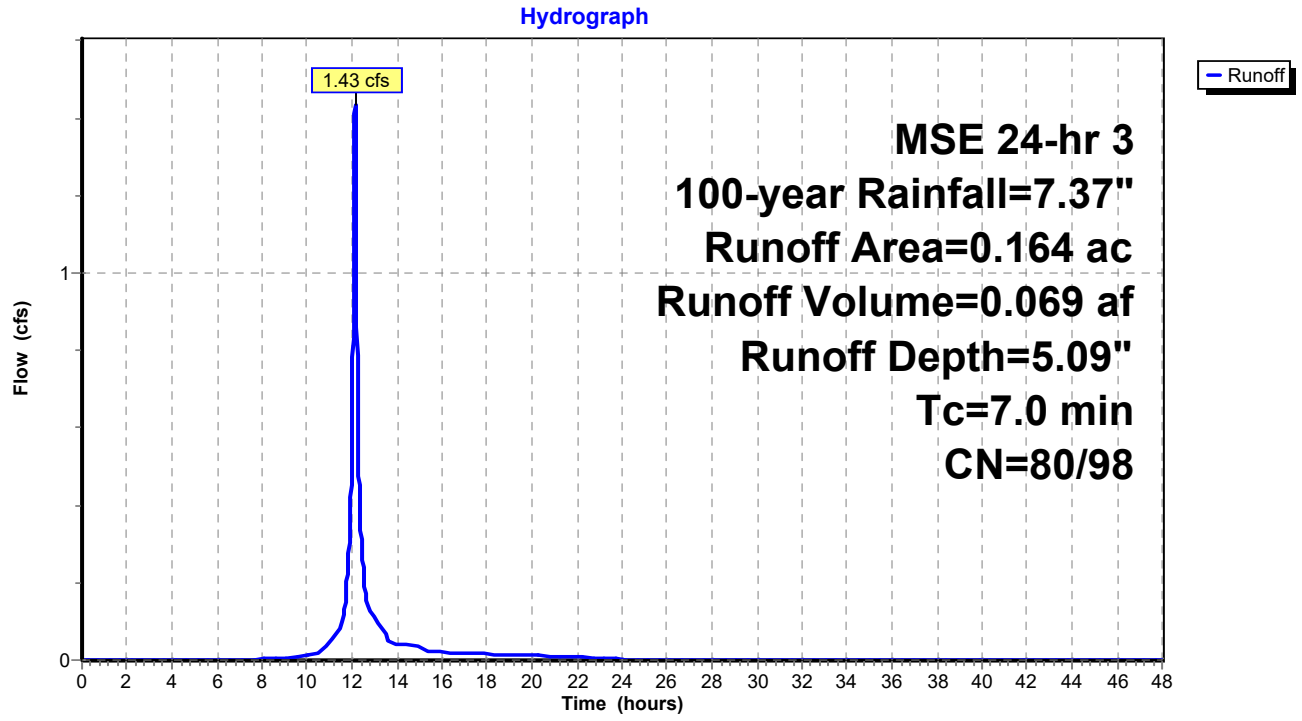
Runoff = 1.43 cfs @ 12.14 hrs, Volume= 0.069 af, Depth= 5.09"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.160	80	>75% Grass cover, Good, HSG D
0.004	98	Roofs, HSG D
0.164	80	Weighted Average
0.160	80	97.53% Pervious Area
0.004	98	2.47% Impervious Area

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

Subcatchment 06S: Subcat 6S



Summary for Subcatchment 07S: Subcat 7S

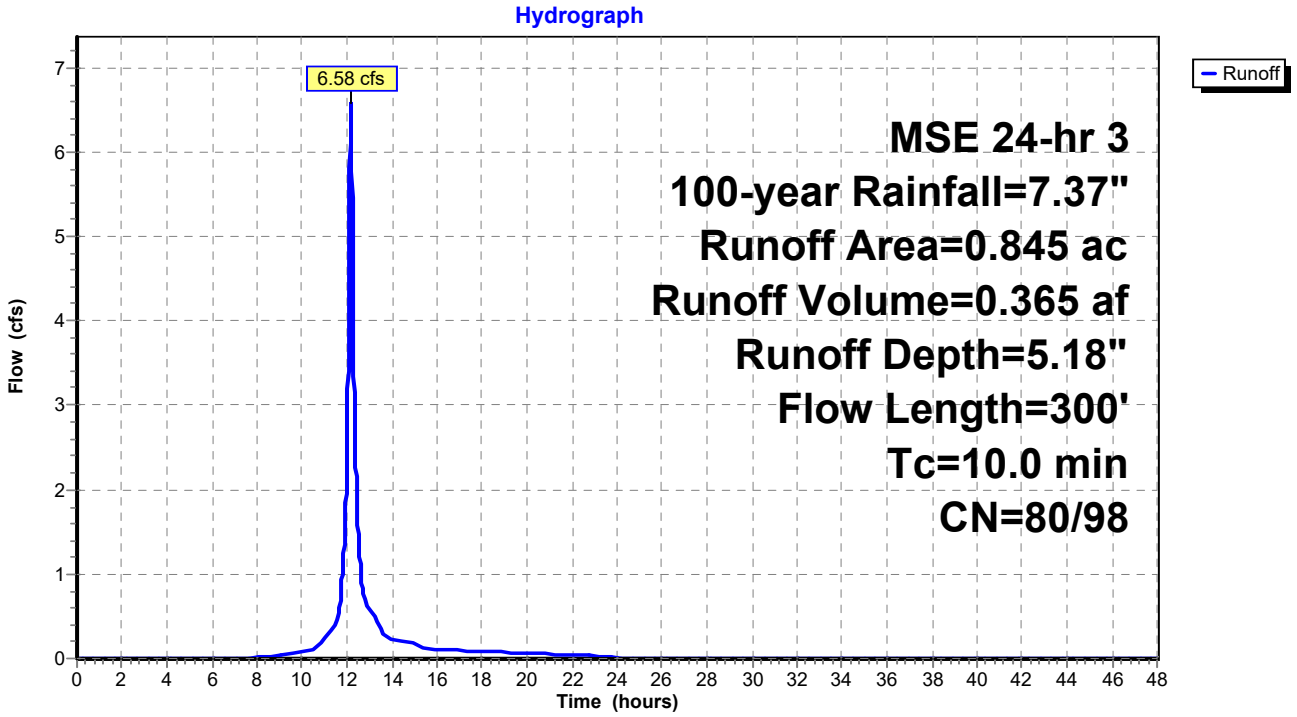
Runoff = 6.58 cfs @ 12.17 hrs, Volume= 0.365 af, Depth= 5.18"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.786	80	>75% Grass cover, Good, HSG D
0.058	98	Roofs, HSG D
0.845	81	Weighted Average
0.786	80	93.08% Pervious Area
0.058	98	6.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 2.87"
1.3	250	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	300	Total			

Subcatchment 07S: Subcat 7S

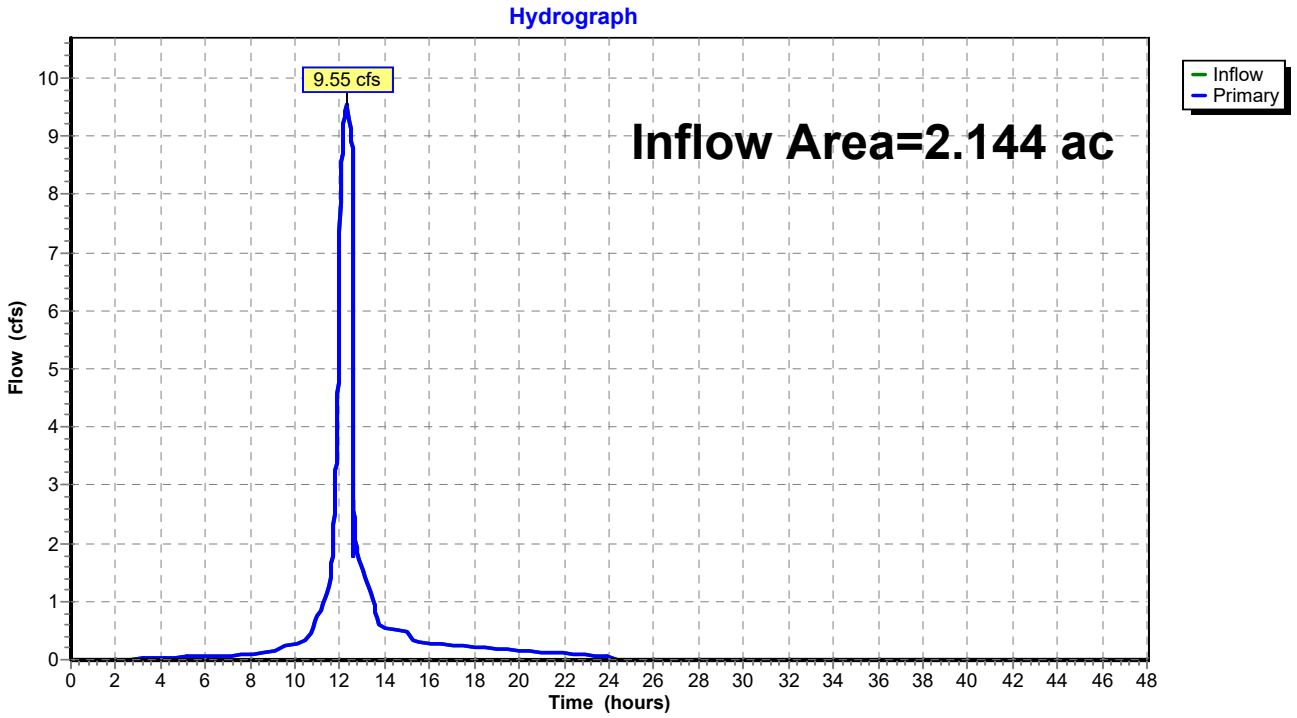


Summary for Pond 50TH: 50TH AVENUE

Inflow Area = 2.144 ac, 30.51% Impervious, Inflow Depth = 5.63" for 100-year event
Inflow = 9.55 cfs @ 12.31 hrs, Volume= 1.006 af
Primary = 9.55 cfs @ 12.31 hrs, Volume= 1.006 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 50TH: 50TH AVENUE

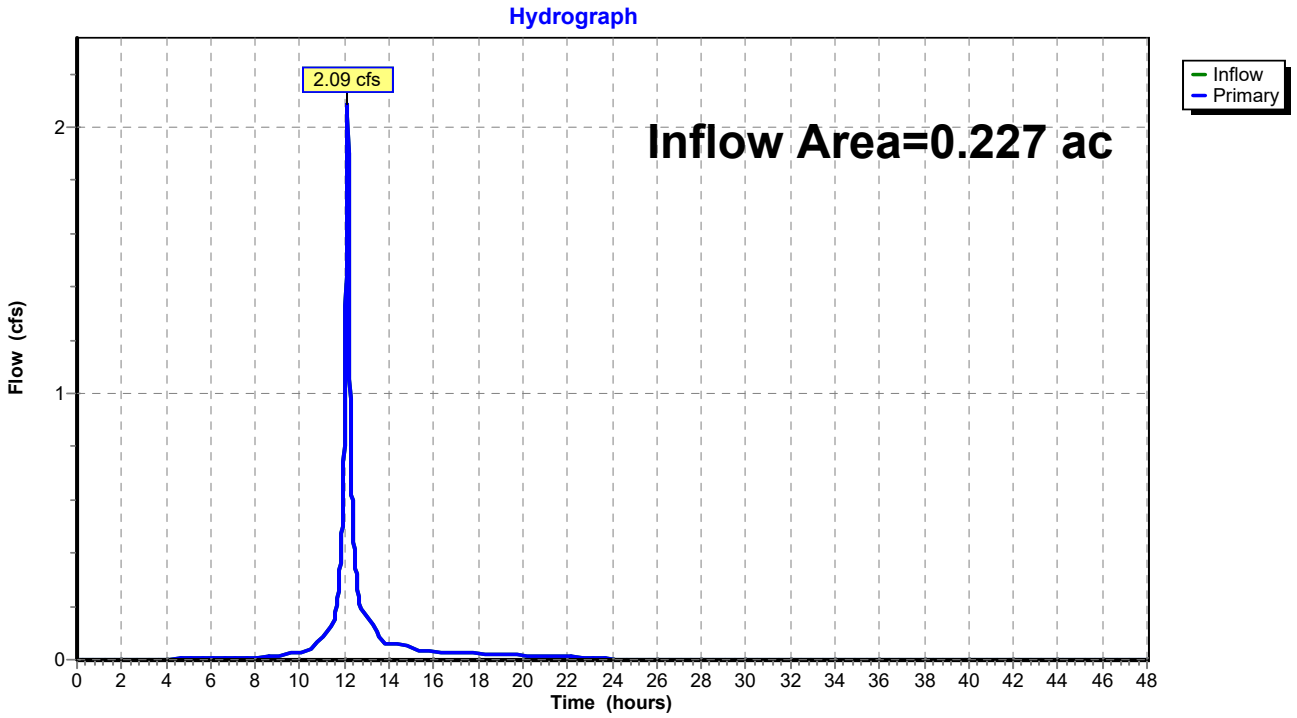


Summary for Pond BOONE: BOONE

Inflow Area = 0.227 ac, 25.99% Impervious, Inflow Depth = 5.58" for 100-year event
Inflow = 2.09 cfs @ 12.14 hrs, Volume= 0.106 af
Primary = 2.09 cfs @ 12.14 hrs, Volume= 0.106 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond BOONE: BOONE



Summary for Pond CB100: CB 100

Inflow Area = 2.144 ac, 30.51% Impervious, Inflow Depth = 5.64" for 100-year event
Inflow = 16.26 cfs @ 12.18 hrs, Volume= 1.007 af
Outflow = 9.55 cfs @ 12.31 hrs, Volume= 1.006 af, Atten= 41%, Lag= 8.0 min
Primary = 9.55 cfs @ 12.31 hrs, Volume= 1.006 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 920.46' @ 12.31 hrs Surf.Area= 4,902 sf Storage= 4,353 cf

Plug-Flow detention time= 2.9 min calculated for 1.006 af (100% of inflow)
Center-of-Mass det. time= 1.9 min (776.0 - 774.1)

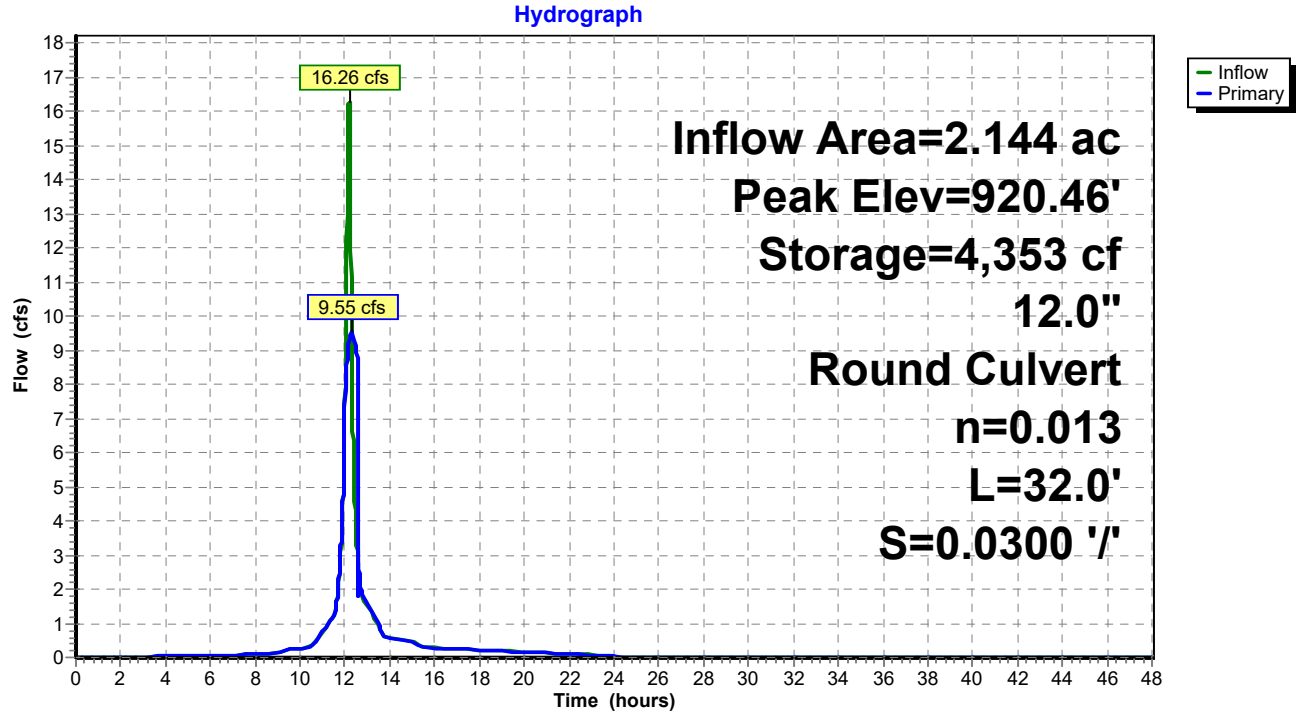
Volume	Invert	Avail.Storage	Storage Description
#1	913.59'	15,777 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.59	6	0	0
918.49	6	29	29
919.00	600	155	184
920.00	3,743	2,172	2,355
921.00	6,250	4,997	7,352
922.00	10,600	8,425	15,777

Device	Routing	Invert	Outlet Devices
#1	Primary	913.59'	12.0" Round Culvert L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 913.59' / 912.63' S= 0.0300 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

Primary OutFlow Max=9.55 cfs @ 12.31 hrs HW=920.46' (Free Discharge)
└1=Culvert (Inlet Controls 9.55 cfs @ 12.15 fps)

Pond CB100: CB 100



Summary for Pond CB101: CB101

Inflow Area = 2.144 ac, 30.51% Impervious, Inflow Depth = 5.64" for 100-year event
Inflow = 16.68 cfs @ 12.16 hrs, Volume= 1.007 af
Outflow = 16.26 cfs @ 12.18 hrs, Volume= 1.007 af, Atten= 3%, Lag= 1.2 min
Primary = 16.26 cfs @ 12.18 hrs, Volume= 1.007 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 919.96' @ 12.18 hrs Surf.Area= 3,515 sf Storage= 200 cf

Plug-Flow detention time= 0.3 min calculated for 1.007 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (774.1 - 774.1)

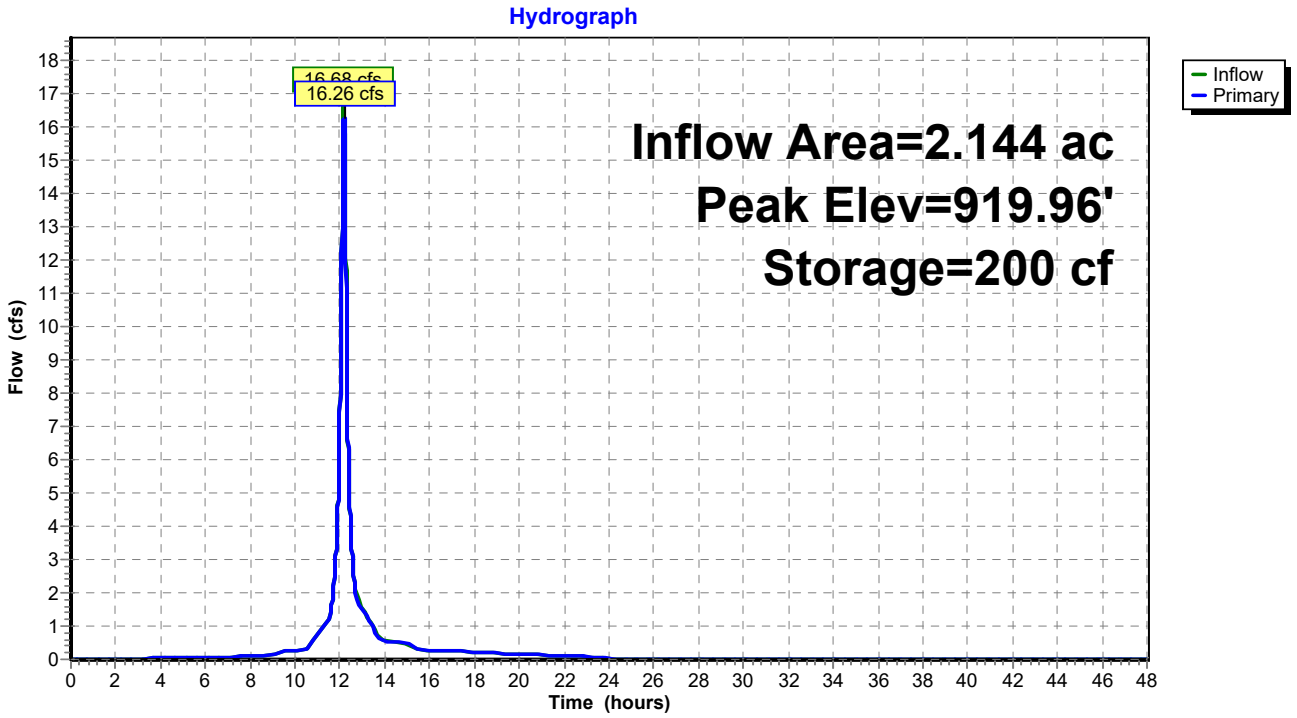
Volume	Invert	Avail.Storage	Storage Description
#1	915.58'	11,693 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.58	6	0	0
919.86	6	26	26
920.00	4,960	348	373
921.00	17,680	11,320	11,693

Device	Routing	Invert	Outlet Devices
#1	Primary	915.58'	12.0" Round Culvert L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.58' / 914.66' S= 0.0096 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	919.53'	12.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=16.25 cfs @ 12.18 hrs HW=919.96' (Free Discharge)
└1=Culvert (Inlet Controls 7.45 cfs @ 9.48 fps)
└2=Broad-Crested Rectangular Weir (Weir Controls 8.80 cfs @ 1.71 fps)

Pond CB101: CB101



Summary for Pond CB102: CB102

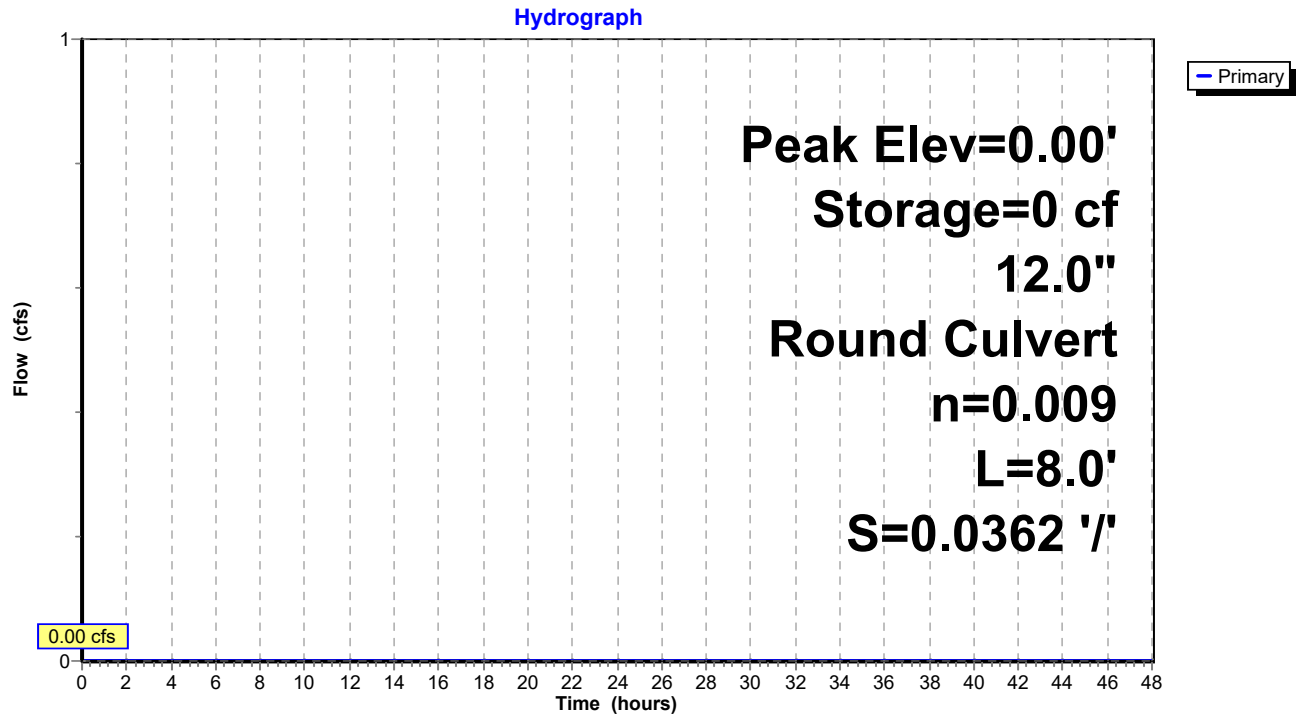
Volume	Invert	Avail.Storage	Storage Description
#1	916.02'	5,352 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.02	6	0	0
919.25	6	19	19
920.00	2,360	887	907
921.00	6,530	4,445	5,352

Device	Routing	Invert	Outlet Devices
#1	Primary	916.02'	**12.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 916.02' / 915.73' S= 0.0362 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf

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

Pond CB102: CB102



Summary for Pond CB103: CB103

Inflow Area = 1.230 ac, 13.43% Impervious, Inflow Depth = 5.25" for 100-year event
Inflow = 8.38 cfs @ 12.16 hrs, Volume= 0.538 af
Outflow = 8.31 cfs @ 12.17 hrs, Volume= 0.538 af, Atten= 1%, Lag= 1.0 min
Primary = 6.48 cfs @ 12.17 hrs, Volume= 0.513 af
Secondary = 1.82 cfs @ 12.17 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 920.02' @ 12.17 hrs Surf.Area= 432 sf Storage= 117 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (785.5 - 785.4)

Volume	Invert	Avail.Storage	Storage Description
#1	915.75'	2,724 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

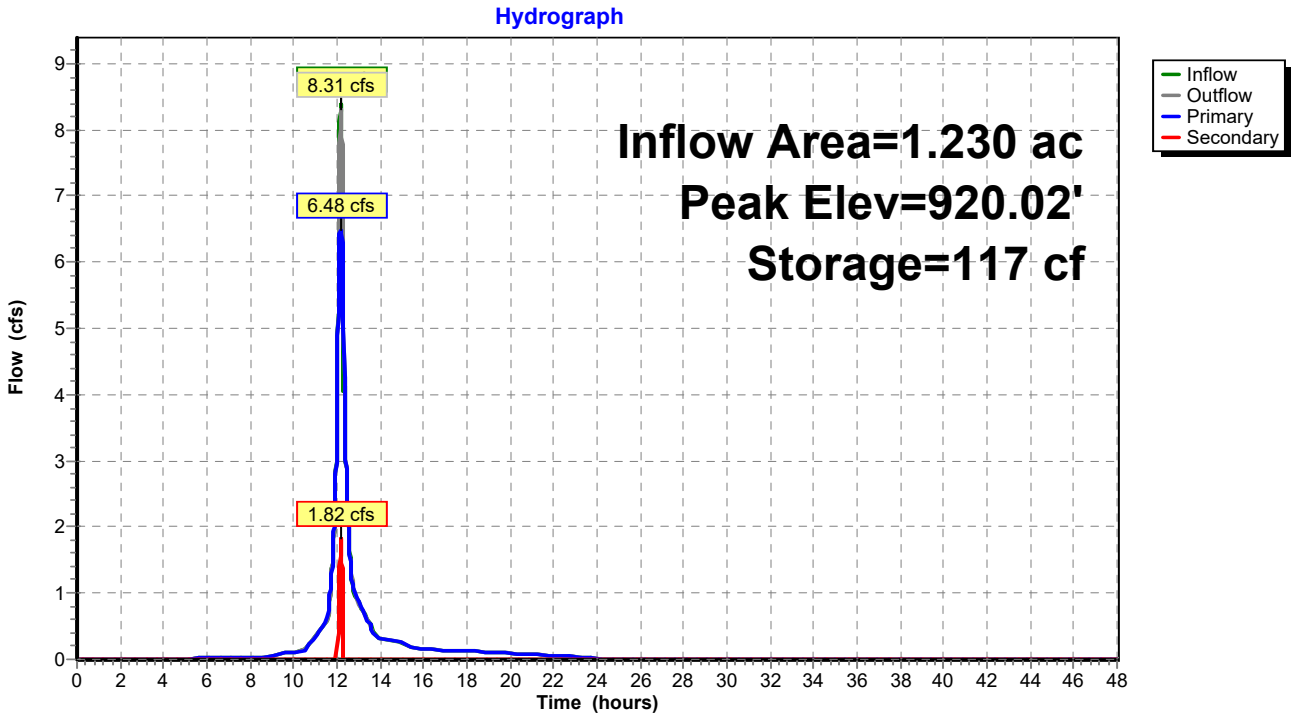
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.75	6	0	0
919.52	6	23	23
920.00	362	88	111
921.00	4,865	2,614	2,724

Device	Routing	Invert	Outlet Devices
#1	Primary	915.75'	12.0" Round Culvert L= 115.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.75' / 915.60' S= 0.0013 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	919.52'	2.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=6.48 cfs @ 12.17 hrs HW=920.01' (Free Discharge)
└1=Culvert (Barrel Controls 6.48 cfs @ 8.25 fps)

Secondary OutFlow Max=1.82 cfs @ 12.17 hrs HW=920.01' (Free Discharge)
└2=Broad-Crested Rectangular Weir (Weir Controls 1.82 cfs @ 1.84 fps)

Pond CB103: CB103



Summary for Pond CB104: CB104

Inflow Area = 1.009 ac, 6.20% Impervious, Inflow Depth = 5.09" for 100-year event
Inflow = 7.77 cfs @ 12.17 hrs, Volume= 0.428 af
Outflow = 6.58 cfs @ 12.23 hrs, Volume= 0.427 af, Atten= 15%, Lag= 3.2 min
Primary = 6.58 cfs @ 12.23 hrs, Volume= 0.427 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 919.37' @ 12.23 hrs Surf.Area= 1,343 sf Storage= 405 cf

Plug-Flow detention time= 1.6 min calculated for 0.427 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (791.3 - 790.9)

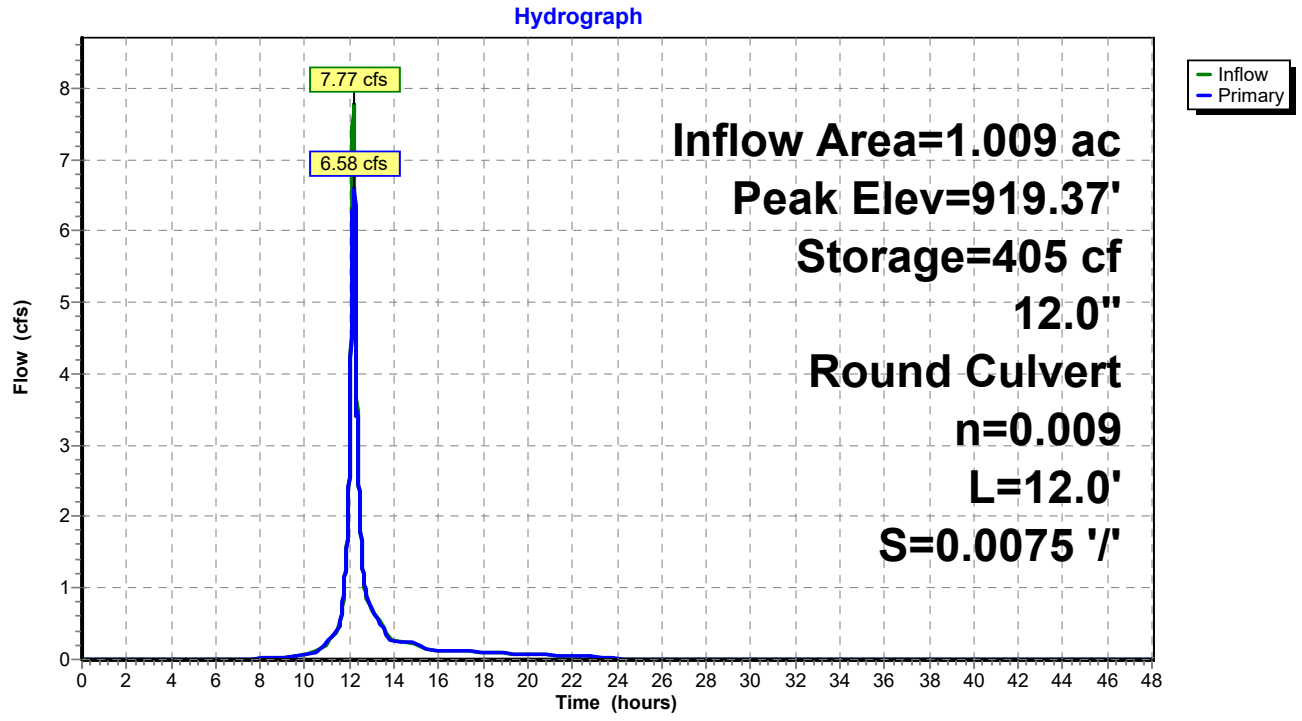
Volume	Invert	Avail.Storage	Storage Description
#1	915.84'	8,727 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.84	6	0	0
918.48	6	16	16
919.00	310	82	98
920.00	3,091	1,701	1,798
921.00	10,767	6,929	8,727

Device	Routing	Invert	Outlet Devices
#1	Primary	915.84'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.84' / 915.75' S= 0.0075 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=6.58 cfs @ 12.23 hrs HW=919.37' (Free Discharge)
↳1=**Culvert** (Inlet Controls 6.58 cfs @ 8.38 fps)

Pond CB104: CB104



Summary for Pond LOW AREA: LOW AREA

Inflow Area = 0.164 ac, 2.47% Impervious, Inflow Depth = 5.09" for 100-year event
Inflow = 1.43 cfs @ 12.14 hrs, Volume= 0.069 af
Outflow = 1.20 cfs @ 12.18 hrs, Volume= 0.063 af, Atten= 16%, Lag= 2.5 min
Primary = 1.20 cfs @ 12.18 hrs, Volume= 0.063 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 920.91' @ 12.18 hrs Surf.Area= 0.084 ac Storage= 0.014 af

Plug-Flow detention time= 61.1 min calculated for 0.063 af (91% of inflow)
Center-of-Mass det. time= 22.6 min (810.3 - 787.7)

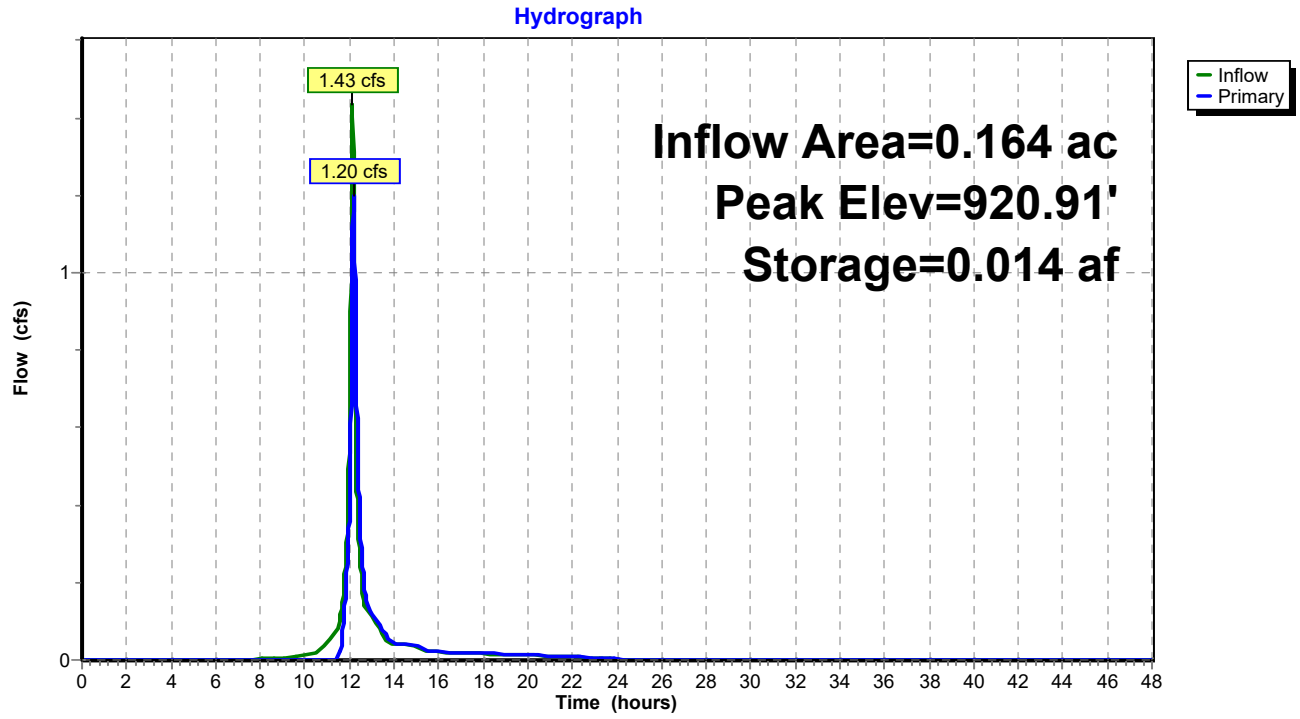
Volume	Invert	Avail.Storage	Storage Description
#1	920.60'	0.133 af	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
920.60	0.005	0.000	0.000
921.00	0.107	0.022	0.022
922.00	0.114	0.110	0.133

Device	Routing	Invert	Outlet Devices
#1	Primary	920.80'	12.0' long x 20.0' 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

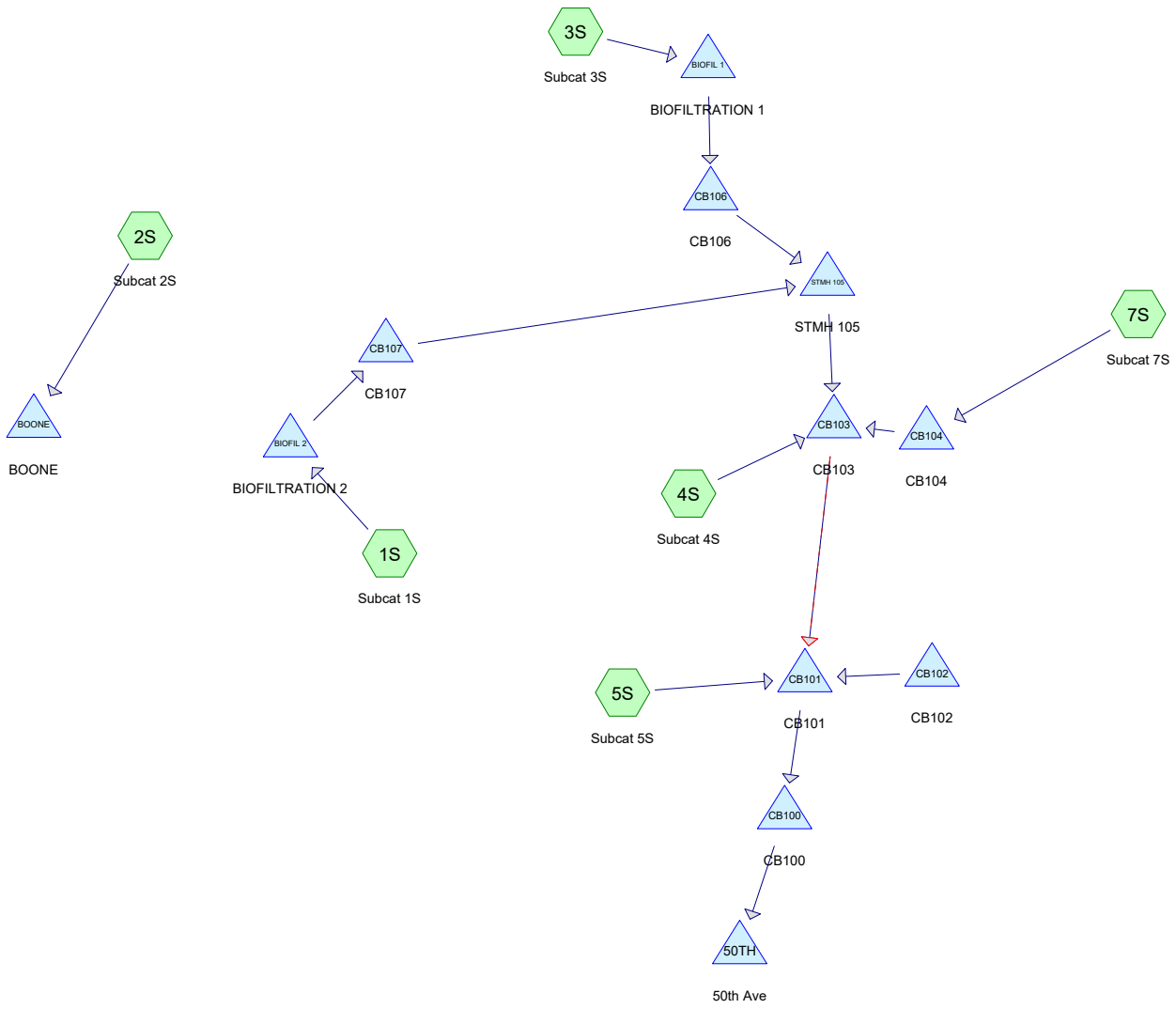
Primary OutFlow Max=1.20 cfs @ 12.18 hrs HW=920.91' (Free Discharge)
└1=Broad-Crested Rectangular Weir (Weir Controls 1.20 cfs @ 0.89 fps)

Pond LOW AREA: LOW AREA



SECTION 4

PROPOSED CONDITIONS 2-YEAR SUMMARY



Subcat Reach Pond Link

Routing Diagram for NWCC North Site Filtration ne quad
Prepared by The Gregory Group, Inc., Printed 1/11/2017

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.295	80	>75% Grass cover, Good, HSG D (1S, 2S, 3S, 4S, 5S, 7S)
0.844	98	Paved parking, HSG D (2S, 3S, 4S, 5S)
0.213	98	Roofs, HSG D (1S, 5S, 7S)
0.019	98	Unconnected pavement, HSG D (2S)
2.371	88	TOTAL AREA

Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Subcat 1S
Runoff Area=0.383 ac 29.50% Impervious Runoff Depth=1.59"
Tc=7.0 min CN=80/98 Runoff=1.01 cfs 0.051 af

Subcatchment 2S: Subcat 2S
Runoff Area=0.306 ac 70.92% Impervious Runoff Depth=2.21"
Tc=7.0 min CN=80/98 Runoff=1.07 cfs 0.056 af

Subcatchment 3S: Subcat 3S
Runoff Area=0.228 ac 48.68% Impervious Runoff Depth=1.88"
Tc=7.0 min CN=80/98 Runoff=0.69 cfs 0.036 af

Subcatchment 4S: Subcat 4S
Runoff Area=0.206 ac 91.26% Impervious Runoff Depth=2.51"
Tc=7.0 min CN=80/98 Runoff=0.80 cfs 0.043 af

Subcatchment 5S: Subcat 5S
Runoff Area=0.458 ac 86.90% Impervious Runoff Depth=2.44"
Tc=7.0 min CN=80/98 Runoff=1.74 cfs 0.093 af

Subcatchment 7S: Subcat 7S
Runoff Area=0.790 ac 6.20% Impervious Runoff Depth=1.25"
Flow Length=300' Tc=10.0 min CN=80/98 Runoff=1.50 cfs 0.082 af

Pond 50TH: 50th Ave
Inflow=3.94 cfs 0.295 af
Primary=3.94 cfs 0.295 af

Pond BIOFIL 1: BIOFILTRATION 1
Peak Elev=918.15' Storage=964 cf Inflow=0.69 cfs 0.036 af
Outflow=0.02 cfs 0.036 af

Pond BIOFIL 2: BIOFILTRATION 2
Peak Elev=920.91' Storage=1,396 cf Inflow=1.01 cfs 0.051 af
Outflow=0.09 cfs 0.041 af

Pond BOONE: BOONE
Inflow=1.07 cfs 0.056 af
Primary=1.07 cfs 0.056 af

Pond CB100: CB100
Peak Elev=915.17' Storage=10 cf Inflow=3.94 cfs 0.295 af
12.0" Round Culvert n=0.013 L=32.0' S=0.0300 '/' Outflow=3.94 cfs 0.295 af

Pond CB101: CB101
Peak Elev=917.17' Storage=10 cf Inflow=3.94 cfs 0.295 af
Outflow=3.94 cfs 0.295 af

Pond CB102: CB102
Peak Elev=0.00' Storage=0 cf
12.0" Round Culvert n=0.009 L=8.0' S=0.0362 '/' Primary=0.00 cfs 0.000 af

Pond CB103: CB103
Peak Elev=916.89' Storage=7 cf Inflow=2.25 cfs 0.202 af
Primary=2.25 cfs 0.202 af Secondary=0.00 cfs 0.000 af Outflow=2.25 cfs 0.202 af

Pond CB104: CB104
Peak Elev=916.59' Storage=5 cf Inflow=1.50 cfs 0.082 af
12.0" Round Culvert n=0.009 L=12.0' S=0.0075 '/' Outflow=1.50 cfs 0.082 af

Pond CB106: CB106
Peak Elev=918.90' Storage=0 cf Inflow=0.02 cfs 0.036 af
15.0" Round Culvert n=0.009 L=64.0' S=0.0030 '/' Outflow=0.02 cfs 0.036 af

Pond CB107: CB107
Peak Elev=916.63' Storage=1 cf Inflow=0.09 cfs 0.041 af
15.0" Round Culvert n=0.009 L=151.0' S=0.0030 '/' Outflow=0.09 cfs 0.041 af

Pond STMH 105: STMH 105
Peak Elev=916.19' Storage=1 cf Inflow=0.11 cfs 0.077 af
15.0" Round Culvert n=0.009 L=90.0' S=0.0030 '/' Outflow=0.11 cfs 0.077 af

Total Runoff Area = 2.371 ac Runoff Volume = 0.361 af Average Runoff Depth = 1.83"
54.62% Pervious = 1.295 ac 45.38% Impervious = 1.076 ac

Summary for Subcatchment 1S: Subcat 1S

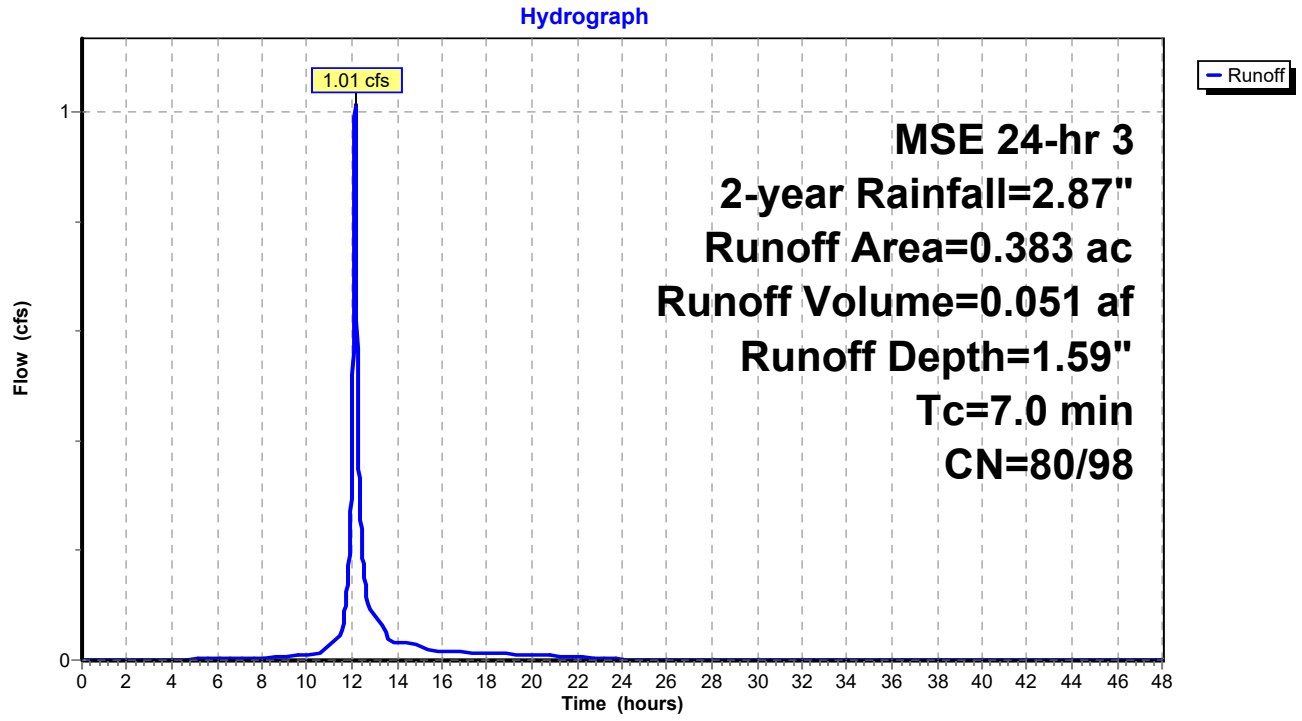
Runoff = 1.01 cfs @ 12.14 hrs, Volume= 0.051 af, Depth= 1.59"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
0.113	98	Roofs, HSG D
0.383	85	Weighted Average
0.270	80	70.50% Pervious Area
0.113	98	29.50% Impervious Area

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

Subcatchment 1S: Subcat 1S



Summary for Subcatchment 2S: Subcat 2S

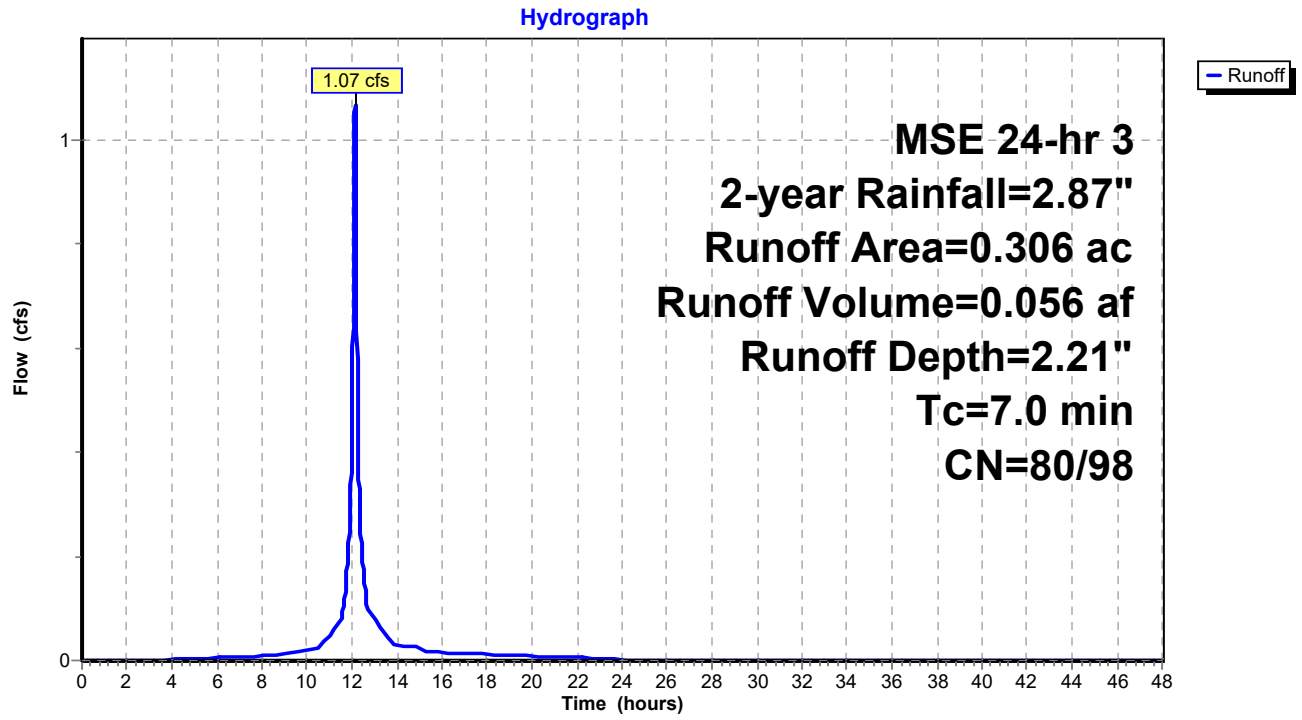
Runoff = 1.07 cfs @ 12.14 hrs, Volume= 0.056 af, Depth= 2.21"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.089	80	>75% Grass cover, Good, HSG D
0.198	98	Paved parking, HSG D
0.019	98	Unconnected pavement, HSG D
0.306	93	Weighted Average
0.089	80	29.08% Pervious Area
0.217	98	70.92% Impervious Area

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

Subcatchment 2S: Subcat 2S



Summary for Subcatchment 3S: Subcat 3S

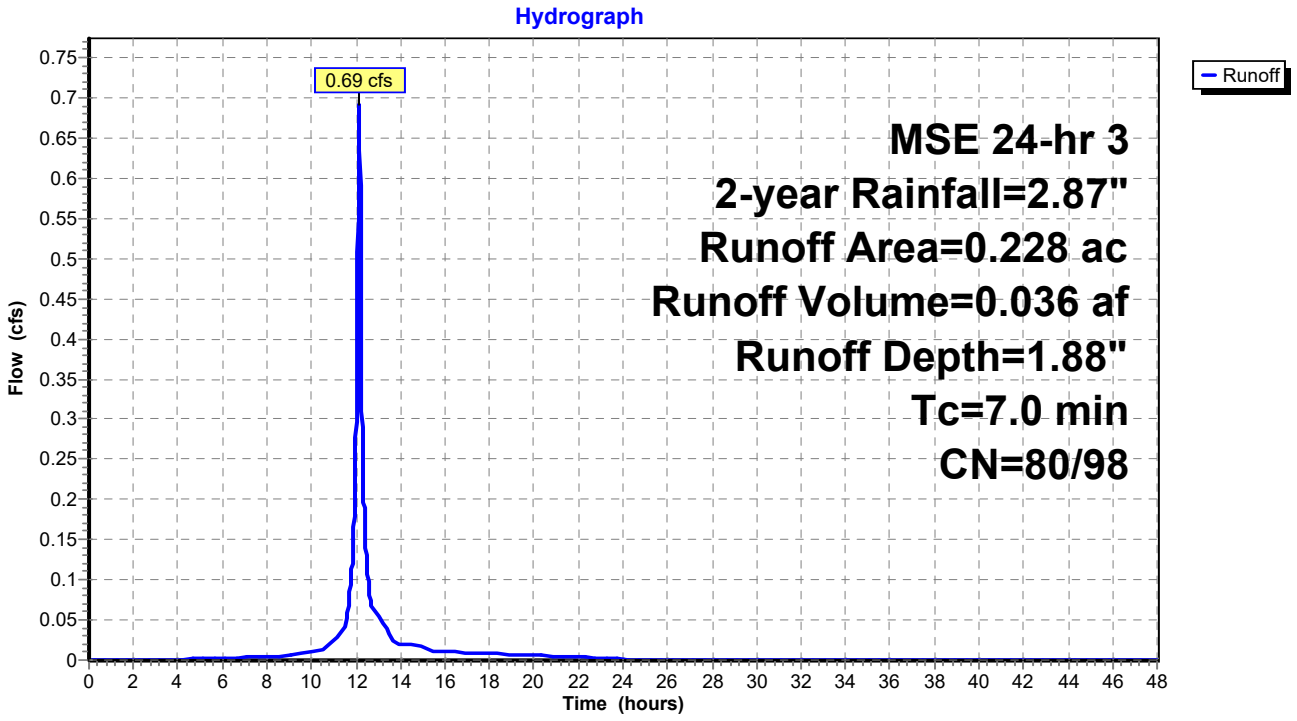
Runoff = 0.69 cfs @ 12.14 hrs, Volume= 0.036 af, Depth= 1.88"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.117	80	>75% Grass cover, Good, HSG D
0.111	98	Paved parking, HSG D
0.228	89	Weighted Average
0.117	80	51.32% Pervious Area
0.111	98	48.68% Impervious Area

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

Subcatchment 3S: Subcat 3S



Summary for Subcatchment 4S: Subcat 4S

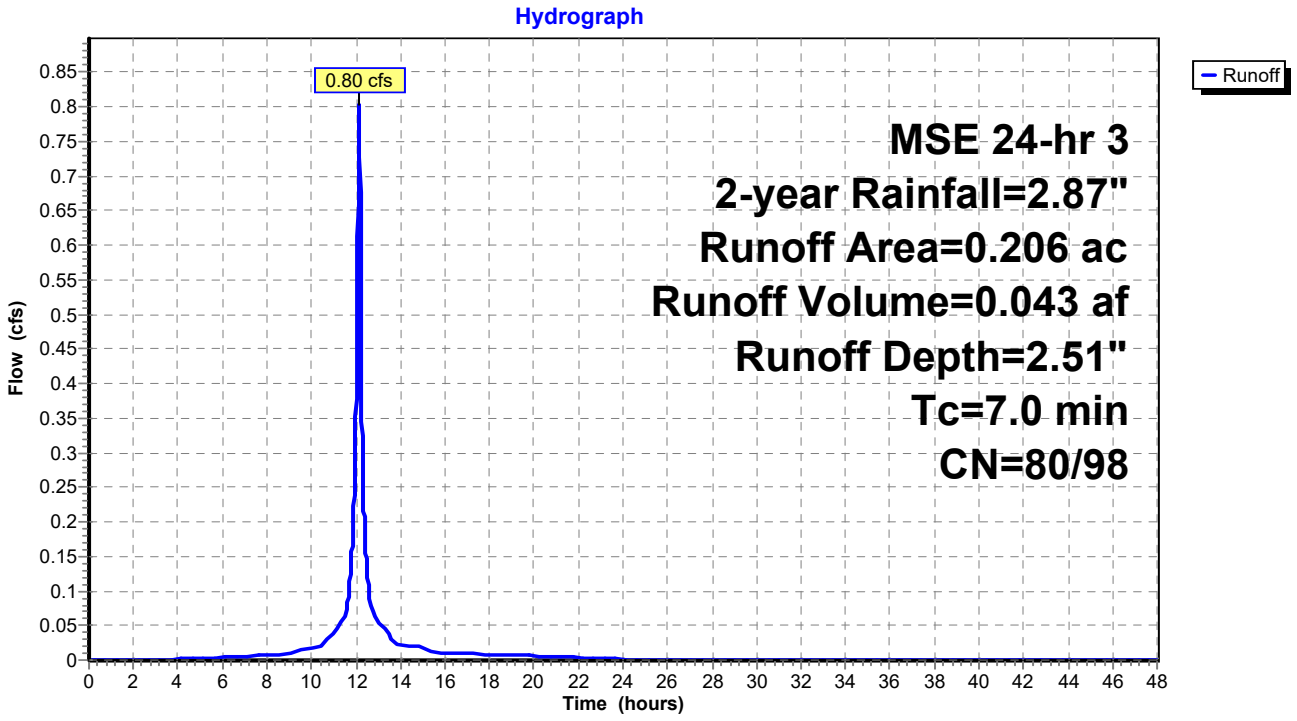
Runoff = 0.80 cfs @ 12.14 hrs, Volume= 0.043 af, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.018	80	>75% Grass cover, Good, HSG D
0.188	98	Paved parking, HSG D
0.206	96	Weighted Average
0.018	80	8.74% Pervious Area
0.188	98	91.26% Impervious Area

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

Subcatchment 4S: Subcat 4S



Summary for Subcatchment 5S: Subcat 5S

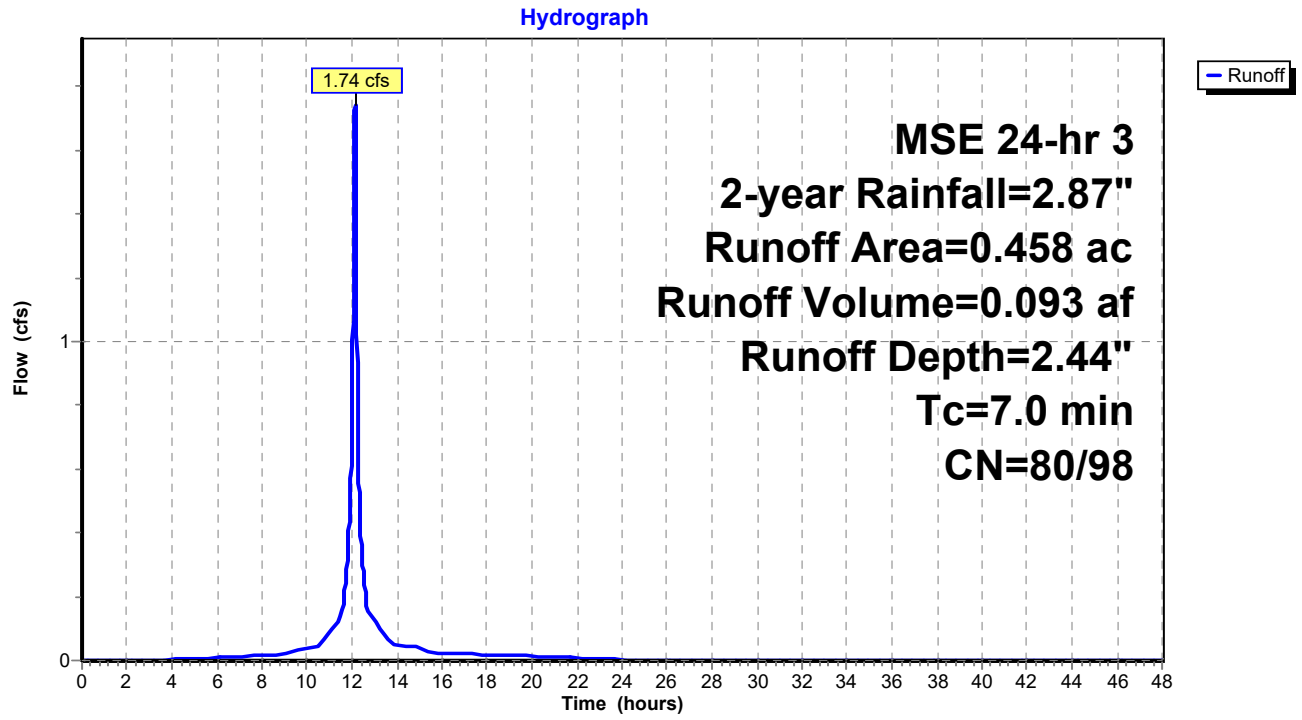
Runoff = 1.74 cfs @ 12.14 hrs, Volume= 0.093 af, Depth= 2.44"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
0.347	98	Paved parking, HSG D
0.051	98	Roofs, HSG D
0.458	96	Weighted Average
0.060	80	13.10% Pervious Area
0.398	98	86.90% Impervious Area

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

Subcatchment 5S: Subcat 5S



Summary for Subcatchment 7S: Subcat 7S

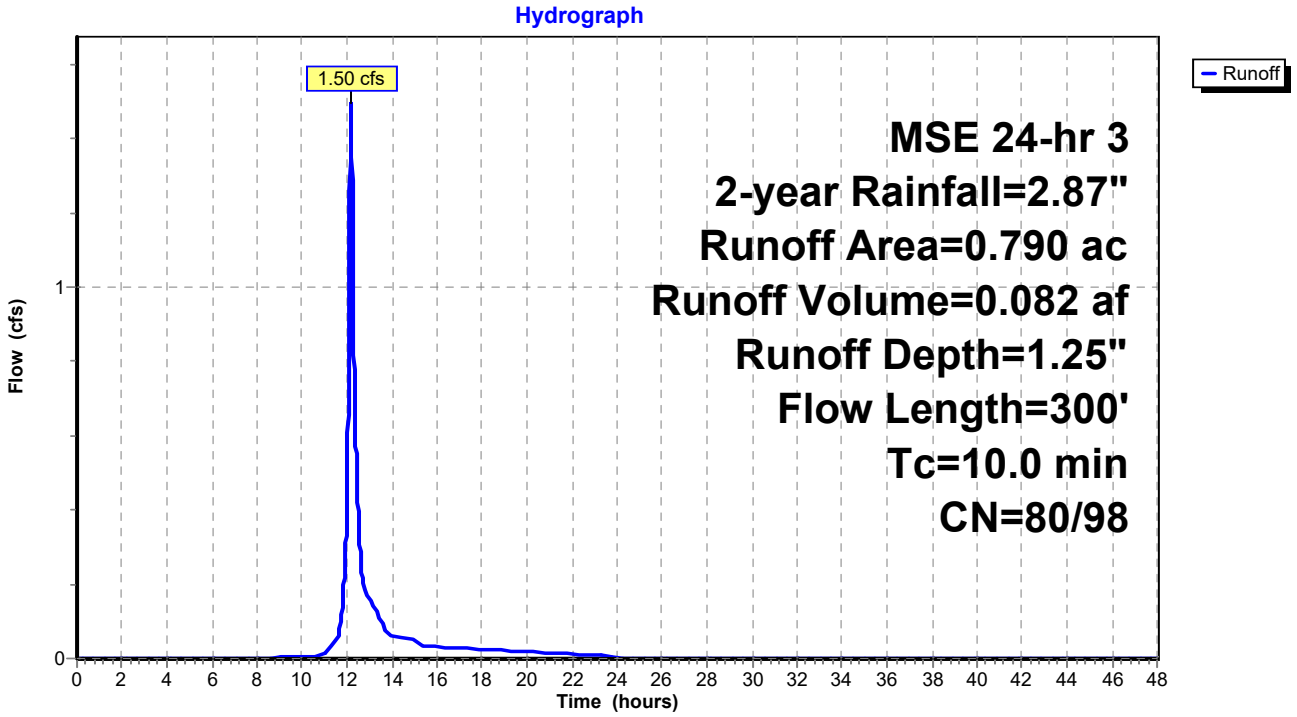
Runoff = 1.50 cfs @ 12.18 hrs, Volume= 0.082 af, Depth= 1.25"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2-year Rainfall=2.87"

Area (ac)	CN	Description
0.741	80	>75% Grass cover, Good, HSG D
0.049	98	Roofs, HSG D
0.790	81	Weighted Average
0.741	80	93.80% Pervious Area
0.049	98	6.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 2.87"
1.3	250	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	300	Total			

Subcatchment 7S: Subcat 7S

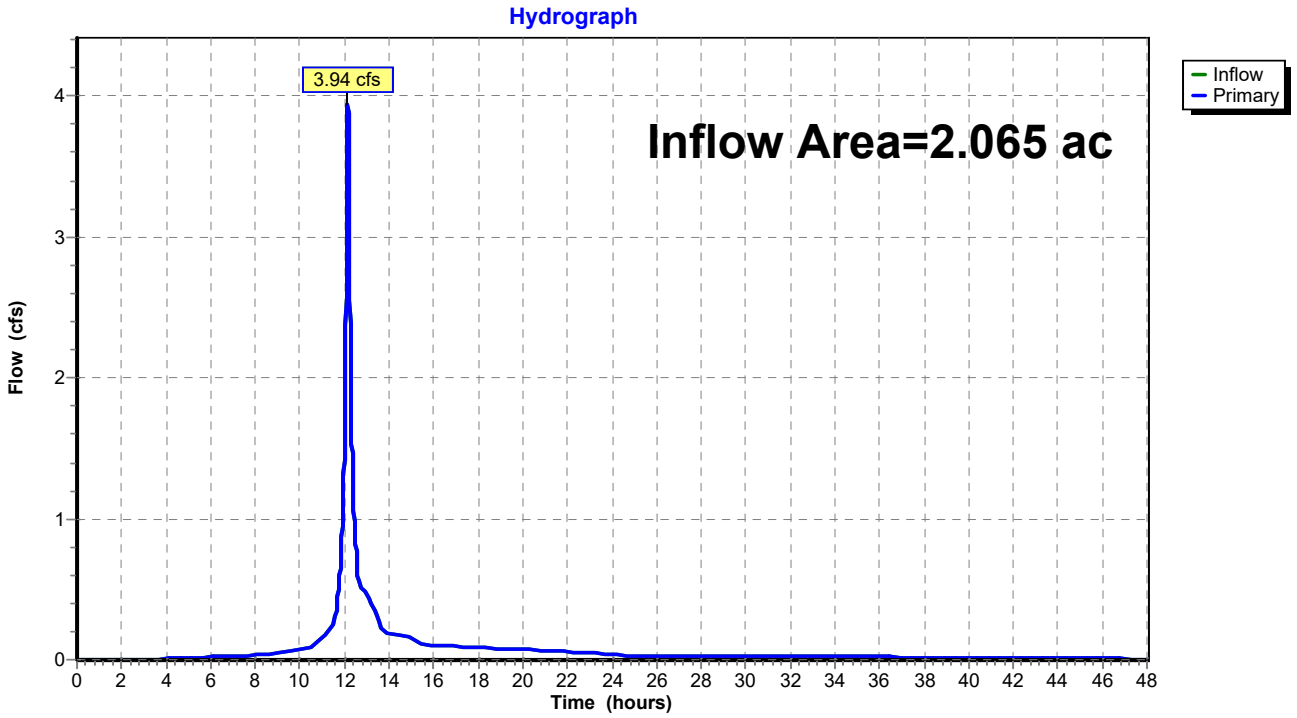


Summary for Pond 50TH: 50th Ave

Inflow Area = 2.065 ac, 41.60% Impervious, Inflow Depth > 1.72" for 2-year event
Inflow = 3.94 cfs @ 12.15 hrs, Volume= 0.295 af
Primary = 3.94 cfs @ 12.15 hrs, Volume= 0.295 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 50TH: 50th Ave



Summary for Pond BIOFIL 1: BIOFILTRATION 1

Inflow Area = 0.228 ac, 48.68% Impervious, Inflow Depth = 1.88" for 2-year event
Inflow = 0.69 cfs @ 12.14 hrs, Volume= 0.036 af
Outflow = 0.02 cfs @ 13.64 hrs, Volume= 0.036 af, Atten= 97%, Lag= 89.8 min
Primary = 0.02 cfs @ 13.64 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 918.15' @ 13.64 hrs Surf.Area= 1,023 sf Storage= 964 cf

Plug-Flow detention time= 483.0 min calculated for 0.036 af (100% of inflow)
Center-of-Mass det. time= 483.0 min (1,258.1 - 775.0)

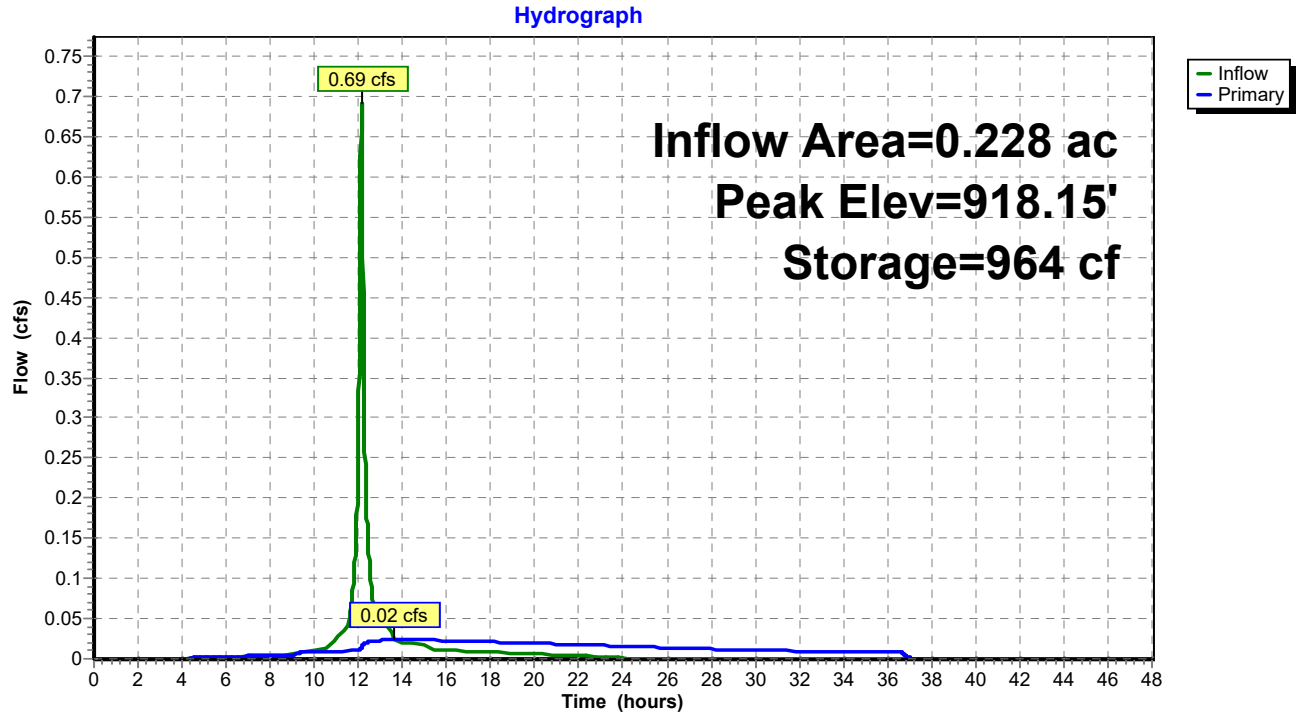
Volume	Invert	Avail.Storage	Storage Description
#1	916.25'	3,715 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.25	424	0.0	0	0
917.40	424	40.0	195	195
918.90	1,617	100.0	1,531	1,726
920.00	2,000	100.0	1,989	3,715

Device	Routing	Invert	Outlet Devices
#1	Primary	916.25'	1.000 in/hr Exfiltration over Surface area
#2	Primary	918.90'	Special & User-Defined Head (feet) 0.00 0.10 0.20 0.30 0.40 Disch. (cfs) 0.000 0.630 1.770 3.250 5.010

Primary OutFlow Max=0.02 cfs @ 13.64 hrs HW=918.15' (Free Discharge)
└1=Exfiltration (Exfiltration Controls 0.02 cfs)
└2=Special & User-Defined (Controls 0.00 cfs)

Pond BIOFIL 1: BIOFILTRATION 1



Summary for Pond BIOFIL 2: BIOFILTRATION 2

Inflow Area = 0.383 ac, 29.50% Impervious, Inflow Depth = 1.59" for 2-year event
Inflow = 1.01 cfs @ 12.14 hrs, Volume= 0.051 af
Outflow = 0.09 cfs @ 12.88 hrs, Volume= 0.041 af, Atten= 91%, Lag= 44.1 min
Primary = 0.09 cfs @ 12.88 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 920.91' @ 12.88 hrs Surf.Area= 1,552 sf Storage= 1,396 cf

Plug-Flow detention time= 749.0 min calculated for 0.041 af (82% of inflow)
Center-of-Mass det. time= 686.3 min (1,474.0 - 787.7)

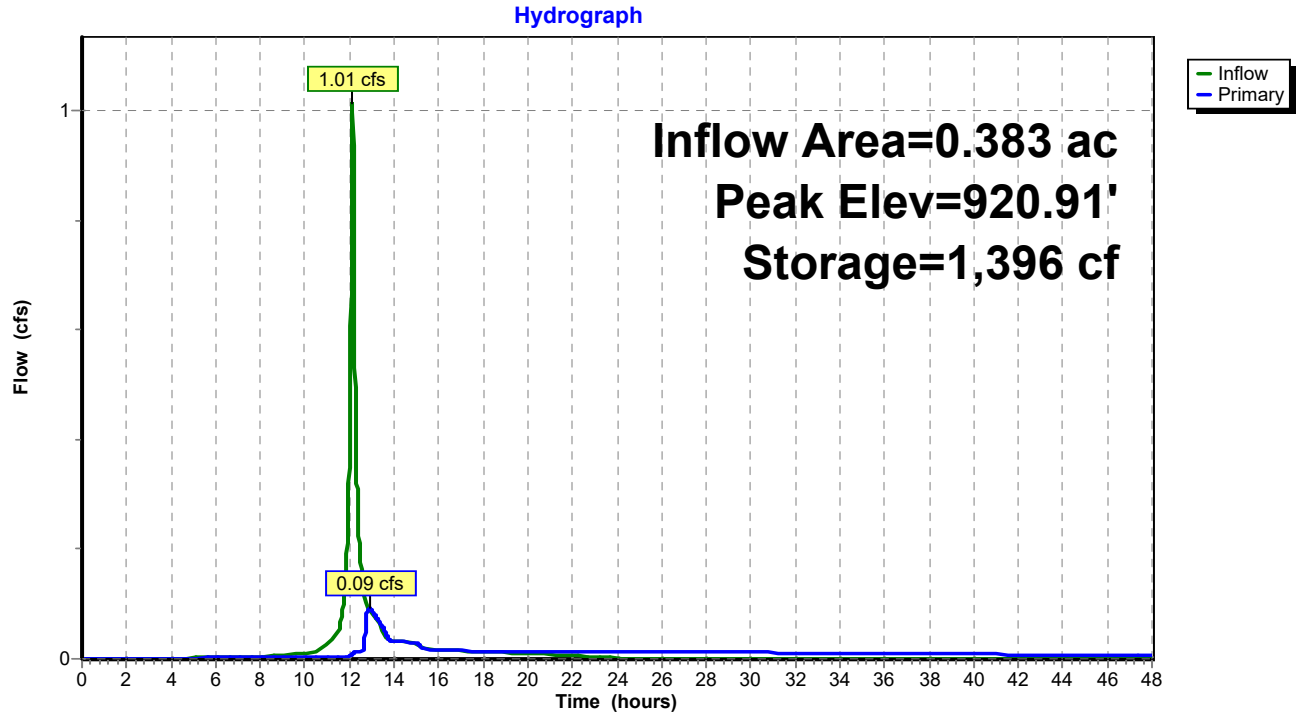
Volume	Invert	Avail.Storage	Storage Description
#1	917.00'	3,345 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
917.00	223	0.0	0	0
919.60	223	40.0	232	232
921.10	1,742	100.0	1,474	1,706
922.00	1,900	100.0	1,639	3,345

Device	Routing	Invert	Outlet Devices
#1	Primary	917.00'	0.400 in/hr Exfiltration over Surface area
#2	Primary	920.90'	Special & User-Defined
			Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60
			Disch. (cfs) 0.000 0.630 1.770 3.250 5.010 7.000 9.000

Primary OutFlow Max=0.09 cfs @ 12.88 hrs HW=920.91' (Free Discharge)
└1=Exfiltration (Exfiltration Controls 0.01 cfs)
└2=Special & User-Defined (Custom Controls 0.08 cfs)

Pond BIOFIL 2: BIOFILTRATION 2

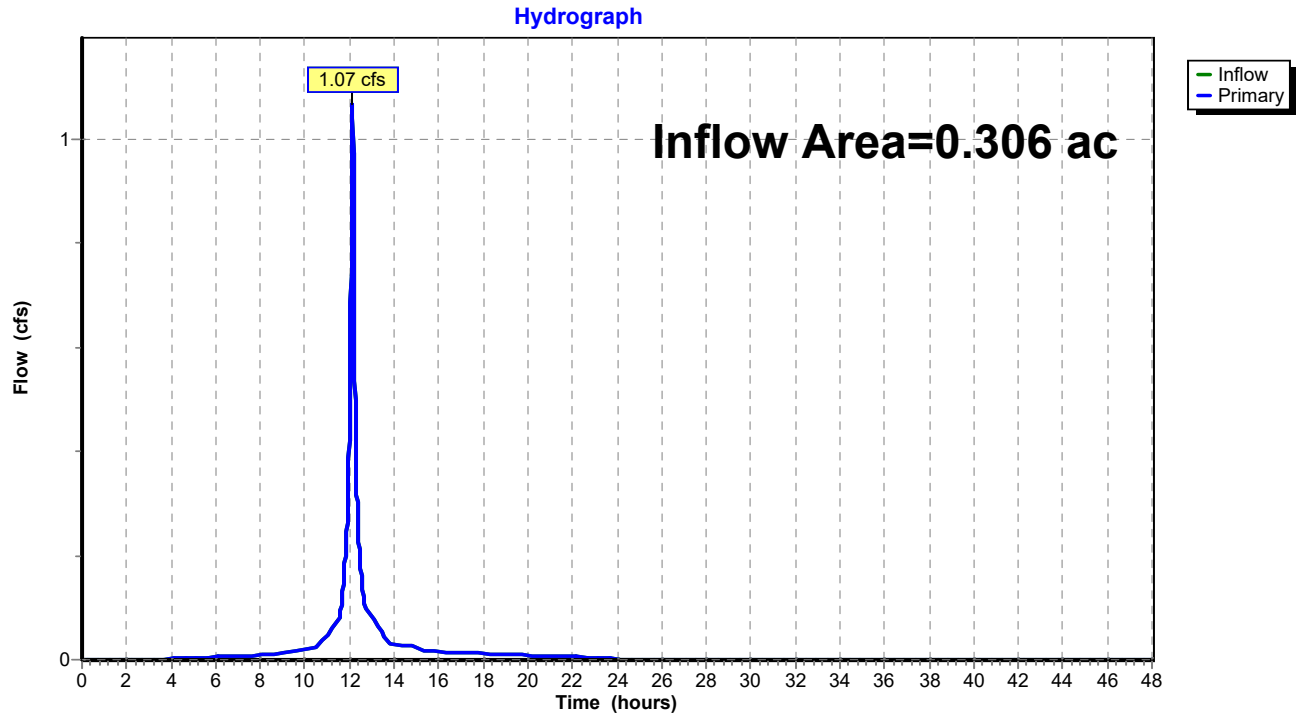


Summary for Pond BOONE: BOONE

Inflow Area = 0.306 ac, 70.92% Impervious, Inflow Depth = 2.21" for 2-year event
Inflow = 1.07 cfs @ 12.14 hrs, Volume= 0.056 af
Primary = 1.07 cfs @ 12.14 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond BOONE: BOONE



Summary for Pond CB100: CB100

Inflow Area = 2.065 ac, 41.60% Impervious, Inflow Depth > 1.72" for 2-year event
Inflow = 3.94 cfs @ 12.15 hrs, Volume= 0.295 af
Outflow = 3.94 cfs @ 12.15 hrs, Volume= 0.295 af, Atten= 0%, Lag= 0.1 min
Primary = 3.94 cfs @ 12.15 hrs, Volume= 0.295 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 915.17' @ 12.15 hrs Surf.Area= 6 sf Storage= 10 cf

Plug-Flow detention time= 0.2 min calculated for 0.295 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (934.7 - 934.6)

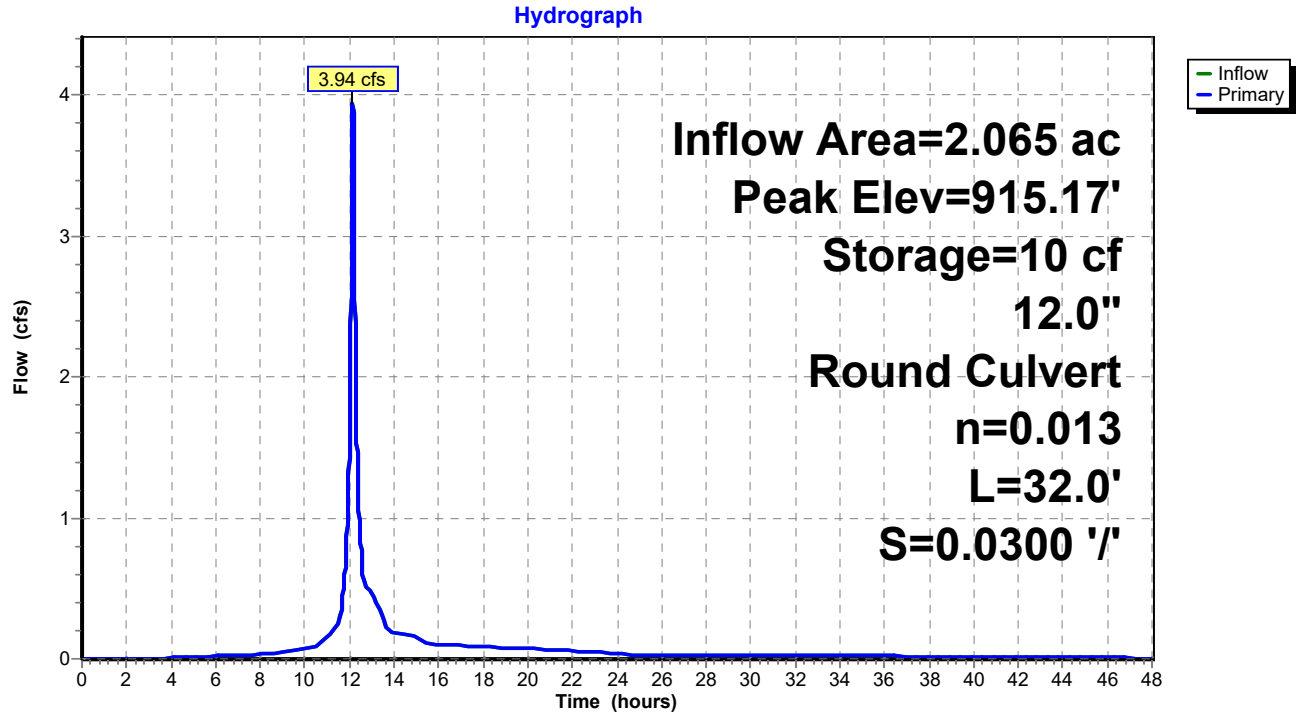
Volume	Invert	Avail.Storage	Storage Description
#1	913.59'	15,777 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.59	6	0	0
918.49	6	29	29
919.00	600	155	184
920.00	3,743	2,172	2,355
921.00	6,250	4,997	7,352
922.00	10,600	8,425	15,777

Device	Routing	Invert	Outlet Devices
#1	Primary	913.59'	12.0" Round Culvert L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 913.59' / 912.63' S= 0.0300 '/' Cc= 0.900 n= 0.013 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf

Primary OutFlow Max=3.93 cfs @ 12.15 hrs HW=915.17' (Free Discharge)
└1=Culvert (Inlet Controls 3.93 cfs @ 5.01 fps)

Pond CB100: CB100



Summary for Pond CB101: CB101

Inflow Area = 2.065 ac, 41.60% Impervious, Inflow Depth > 1.72" for 2-year event
Inflow = 3.94 cfs @ 12.15 hrs, Volume= 0.295 af
Outflow = 3.94 cfs @ 12.15 hrs, Volume= 0.295 af, Atten= 0%, Lag= 0.1 min
Primary = 3.94 cfs @ 12.15 hrs, Volume= 0.295 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 917.17' @ 12.15 hrs Surf.Area= 6 sf Storage= 10 cf

Plug-Flow detention time= 0.2 min calculated for 0.295 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (934.6 - 934.5)

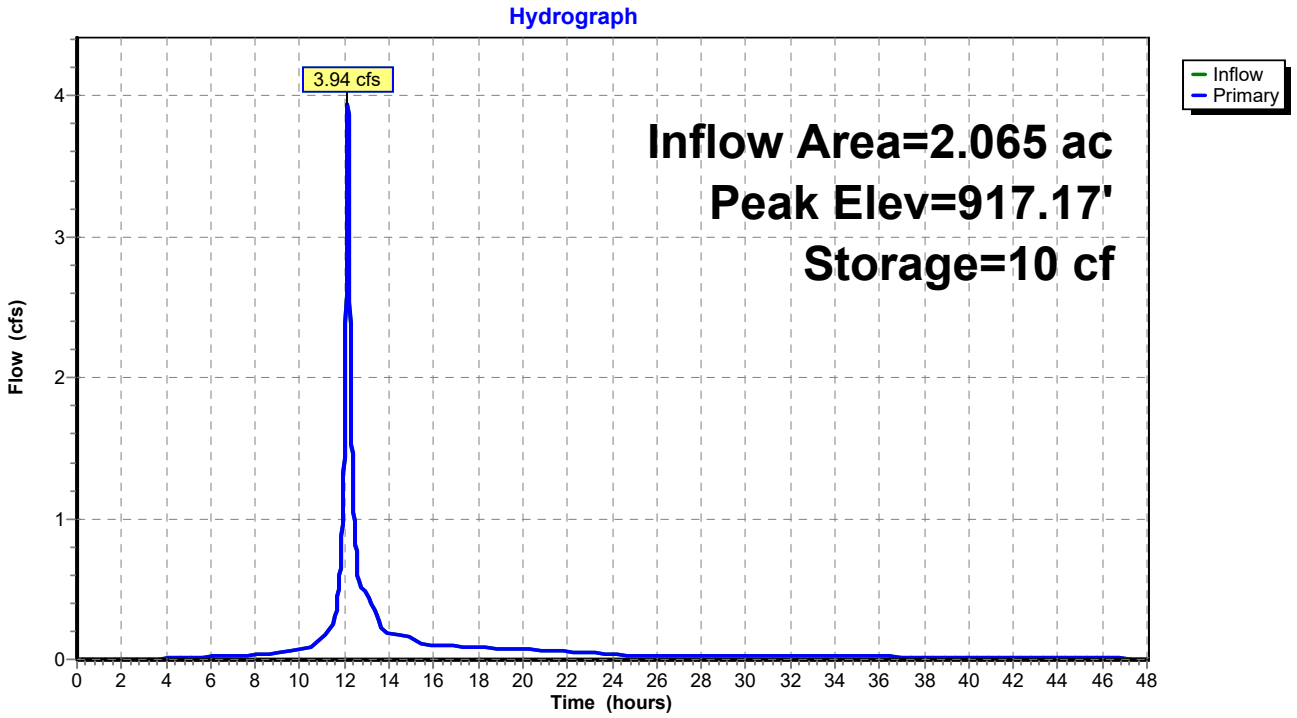
Volume	Invert	Avail.Storage	Storage Description
#1	915.58'	11,693 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.58	6	0	0
919.86	6	26	26
920.00	4,960	348	373
921.00	17,680	11,320	11,693

Device	Routing	Invert	Outlet Devices
#1	Primary	915.58'	12.0" Round Culvert L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.58' / 914.66' S= 0.0096 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	919.53'	12.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=3.94 cfs @ 12.15 hrs HW=917.16' (Free Discharge)
└1=Culvert (Inlet Controls 3.94 cfs @ 5.01 fps)
└2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond CB101: CB101



Summary for Pond CB102: CB102

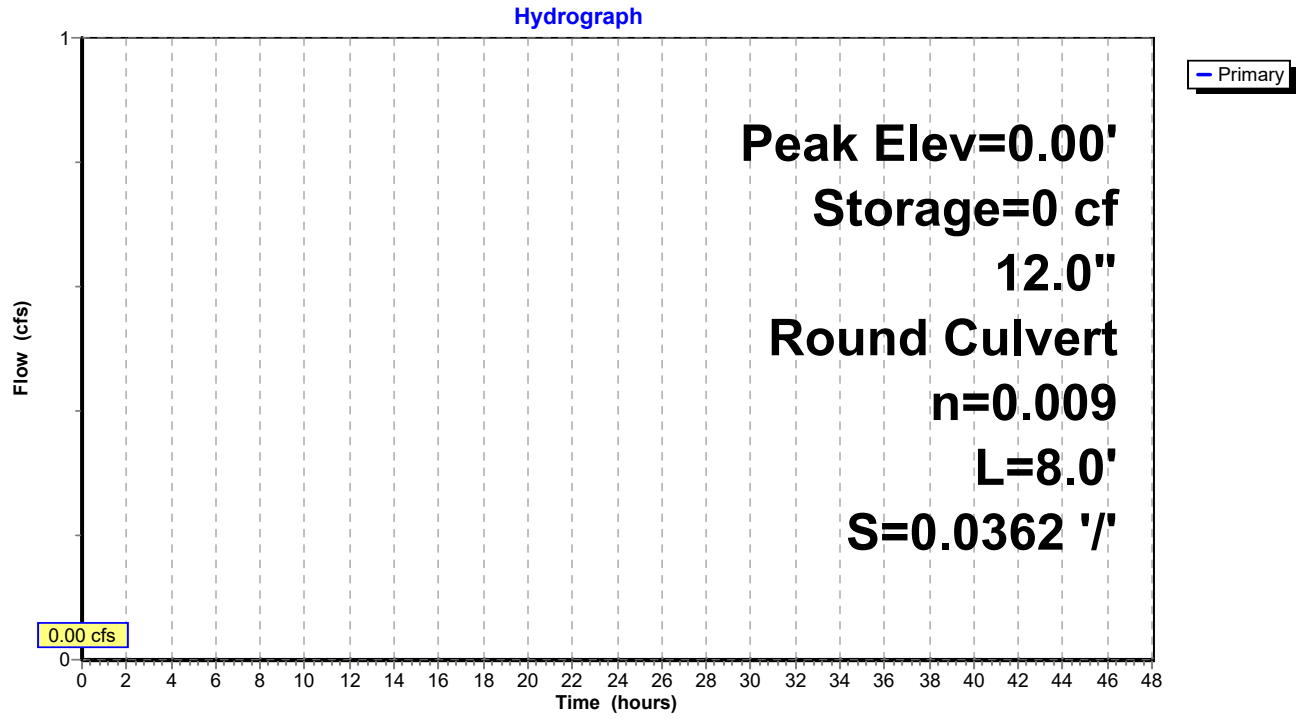
Volume	Invert	Avail.Storage	Storage Description
#1	916.02'	5,352 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.02	6	0	0
919.25	6	19	19
920.00	2,360	887	907
921.00	6,530	4,445	5,352

Device	Routing	Invert	Outlet Devices
#1	Primary	916.02'	**12.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 916.02' / 915.73' S= 0.0362 '/' Cc= 0.900 n= 0.009, Flow Area= 0.79 sf

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

Pond CB102: CB102



Summary for Pond CB103: CB103

Inflow Area = 1.607 ac, 28.69% Impervious, Inflow Depth > 1.51" for 2-year event
Inflow = 2.25 cfs @ 12.16 hrs, Volume= 0.202 af
Outflow = 2.25 cfs @ 12.16 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.0 min
Primary = 2.25 cfs @ 12.16 hrs, Volume= 0.202 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 916.89' @ 12.16 hrs Surf.Area= 6 sf Storage= 7 cf

Plug-Flow detention time= 0.2 min calculated for 0.202 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (1,015.7 - 1,015.5)

Volume	Invert	Avail.Storage	Storage Description
#1	915.75'	1,792 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

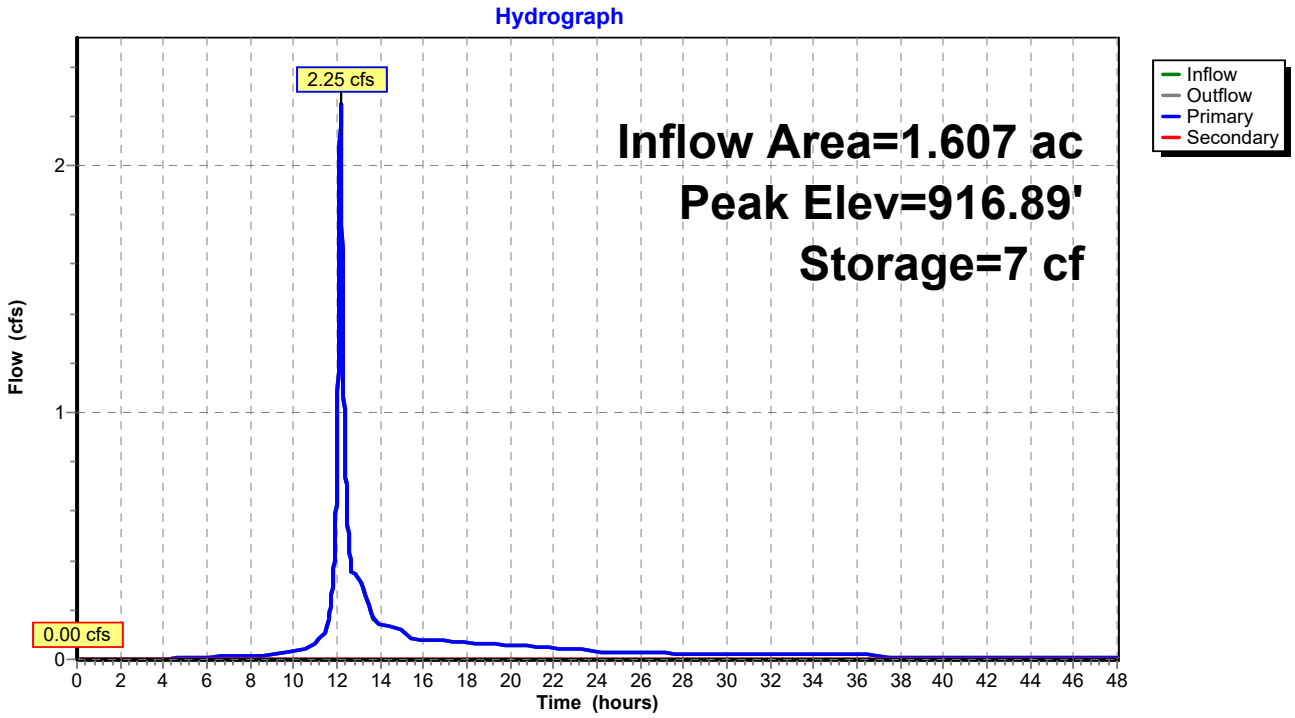
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.75	6	0	0
919.52	6	23	23
920.00	362	88	111
921.00	3,000	1,681	1,792

Device	Routing	Invert	Outlet Devices
#1	Primary	915.75'	12.0" Round Culvert L= 115.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.75' / 915.60' S= 0.0013 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	919.52'	2.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.24 cfs @ 12.16 hrs HW=916.89' (Free Discharge)
└1=Culvert (Barrel Controls 2.24 cfs @ 3.14 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=915.75' (Free Discharge)
└2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond CB103: CB103



Summary for Pond CB104: CB104

Inflow Area = 0.790 ac, 6.20% Impervious, Inflow Depth = 1.25" for 2-year event
Inflow = 1.50 cfs @ 12.18 hrs, Volume= 0.082 af
Outflow = 1.50 cfs @ 12.18 hrs, Volume= 0.082 af, Atten= 0%, Lag= 0.0 min
Primary = 1.50 cfs @ 12.18 hrs, Volume= 0.082 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 916.59' @ 12.18 hrs Surf.Area= 6 sf Storage= 5 cf

Plug-Flow detention time= 0.1 min calculated for 0.082 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (813.8 - 813.6)

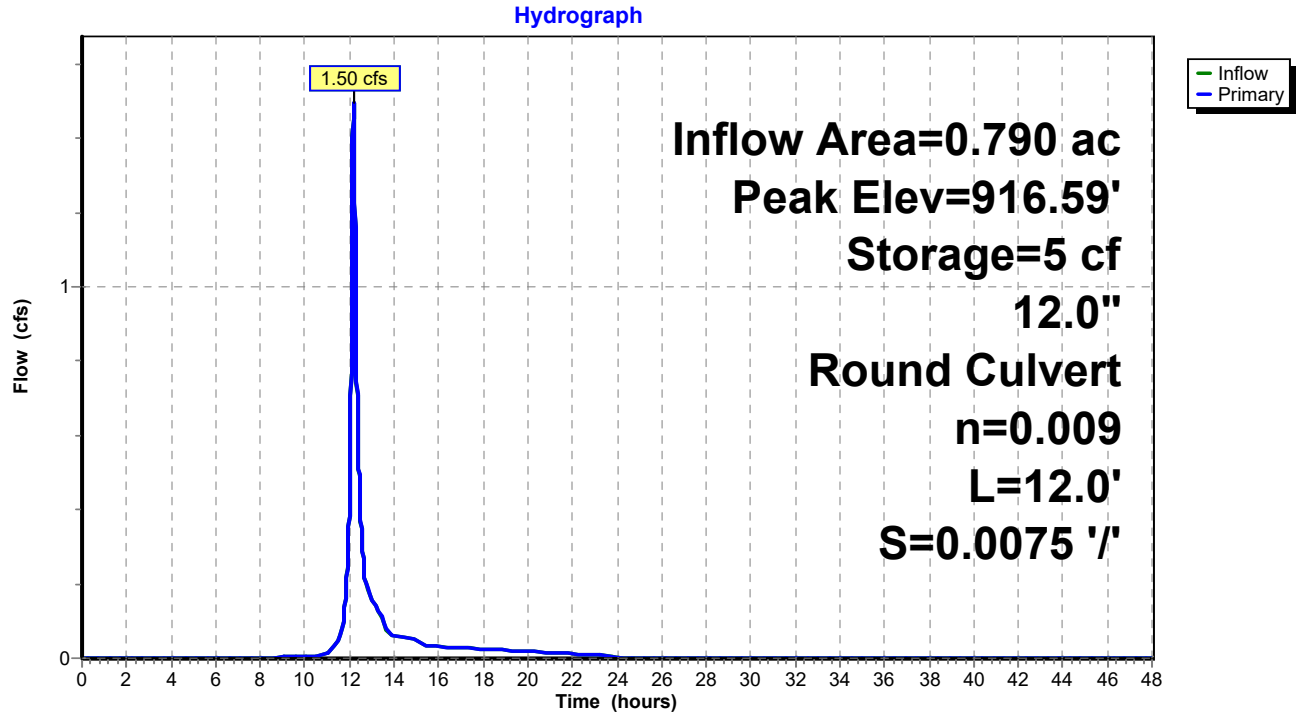
Volume	Invert	Avail.Storage	Storage Description
#1	915.84'	8,724 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.84	6	0	0
918.50	6	16	16
919.00	310	79	95
920.00	3,091	1,701	1,795
921.00	10,767	6,929	8,724

Device	Routing	Invert	Outlet Devices
#1	Primary	915.84'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.84' / 915.75' S= 0.0075 '/' Cc= 0.900 n= 0.009, Flow Area= 0.79 sf

Primary OutFlow Max=1.50 cfs @ 12.18 hrs HW=916.59' (Free Discharge)
↑—1=**Culvert** (Barrel Controls 1.50 cfs @ 3.28 fps)

Pond CB104: CB104



Summary for Pond CB106: CB106

Inflow Area = 0.228 ac, 48.68% Impervious, Inflow Depth = 1.88" for 2-year event
Inflow = 0.02 cfs @ 13.64 hrs, Volume= 0.036 af
Outflow = 0.02 cfs @ 13.64 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
Primary = 0.02 cfs @ 13.64 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 918.90' @ 13.64 hrs Surf.Area= 1,724 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 0.036 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (1,258.1 - 1,258.1)

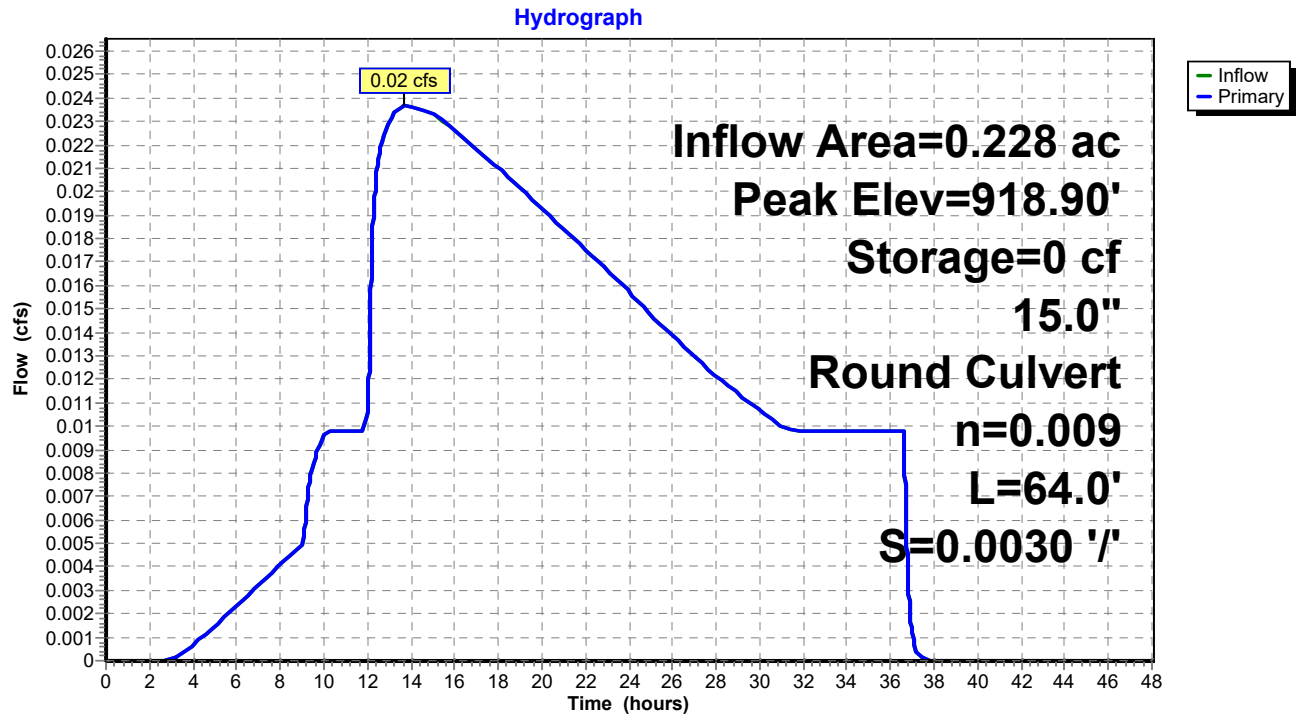
Volume	Invert	Avail.Storage	Storage Description
#1	918.90'	974 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
918.90	1,724	0	0
919.37	2,420	974	974

Device	Routing	Invert	Outlet Devices
#1	Primary	916.21'	15.0" Round Culvert L= 64.0' Ke= 0.500 Inlet / Outlet Invert= 916.21' / 916.02' S= 0.0030 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=8.45 cfs @ 13.64 hrs HW=918.90' (Free Discharge)
└1=Culvert (Barrel Controls 8.45 cfs @ 6.88 fps)

Pond CB106: CB106



Summary for Pond CB107: CB107

Inflow Area = 0.383 ac, 29.50% Impervious, Inflow Depth > 1.30" for 2-year event
Inflow = 0.09 cfs @ 12.88 hrs, Volume= 0.041 af
Outflow = 0.09 cfs @ 12.88 hrs, Volume= 0.041 af, Atten= 0%, Lag= 0.1 min
Primary = 0.09 cfs @ 12.88 hrs, Volume= 0.041 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 916.63' @ 12.88 hrs Surf.Area= 6 sf Storage= 1 cf

Plug-Flow detention time= 1.0 min calculated for 0.041 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (1,474.6 - 1,474.0)

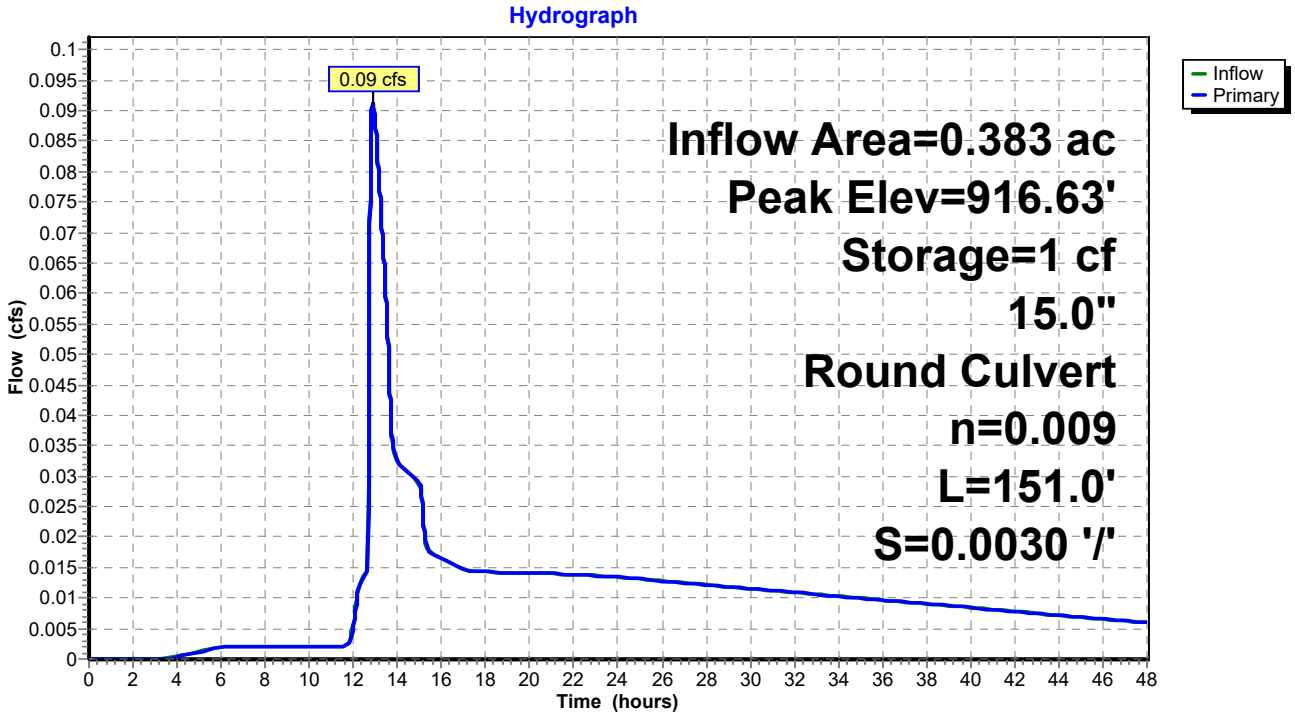
Volume	Invert	Avail.Storage	Storage Description
#1	916.40'	507 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.40	6	0	0
921.50	6	31	31
922.00	1,900	477	507

Device	Routing	Invert	Outlet Devices
#1	Primary	916.47'	15.0" Round Culvert L= 151.0' Ke= 0.500 Inlet / Outlet Invert= 916.47' / 916.02' S= 0.0030 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=0.09 cfs @ 12.88 hrs HW=916.63' (Free Discharge)
└1=Culvert (Barrel Controls 0.09 cfs @ 1.56 fps)

Pond CB107: CB107



Summary for Pond STMH 105: STMH 105

Inflow Area = 0.611 ac, 36.66% Impervious, Inflow Depth > 1.51" for 2-year event
Inflow = 0.11 cfs @ 12.88 hrs, Volume= 0.077 af
Outflow = 0.11 cfs @ 12.88 hrs, Volume= 0.077 af, Atten= 0%, Lag= 0.1 min
Primary = 0.11 cfs @ 12.88 hrs, Volume= 0.077 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 916.19' @ 12.88 hrs Surf.Area= 6 sf Storage= 1 cf

Plug-Flow detention time= 0.3 min calculated for 0.077 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (1,374.6 - 1,374.4)

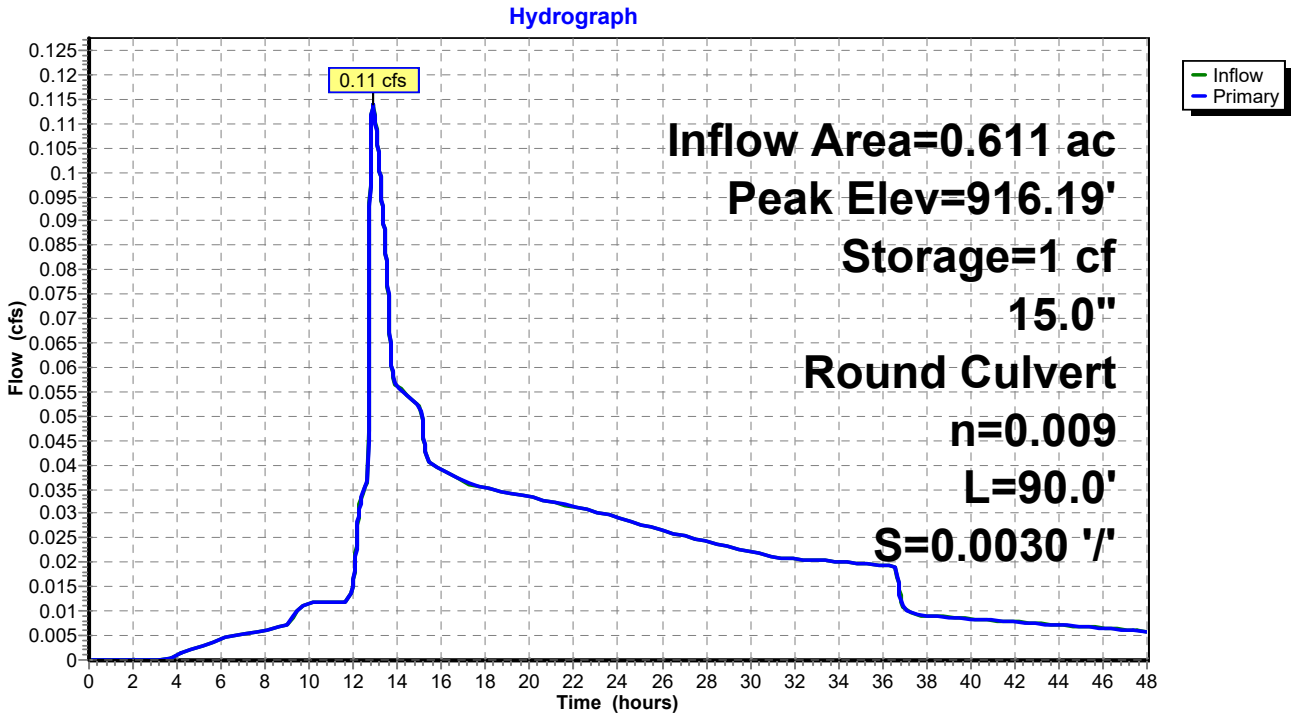
Volume	Invert	Avail.Storage	Storage Description
#1	916.03'	3,179 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.03	6	0	0
920.80	6	29	29
921.00	1,500	151	179
922.00	4,500	3,000	3,179

Device	Routing	Invert	Outlet Devices
#1	Primary	916.02'	**15.0" Round Culvert** L= 90.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 916.02' / 915.75' S= 0.0030 '/' Cc= 0.900 n= 0.009, Flow Area= 1.23 sf

Primary OutFlow Max=0.11 cfs @ 12.88 hrs HW=916.19' (Free Discharge)
↳1=Culvert (Barrel Controls 0.11 cfs @ 1.65 fps)

Pond STMH 105: STMH 105



SECTION 5

PROPOSED CONDITIONS 10-YEAR SUMMARY

Summary for Subcatchment 1S: Subcat 1S

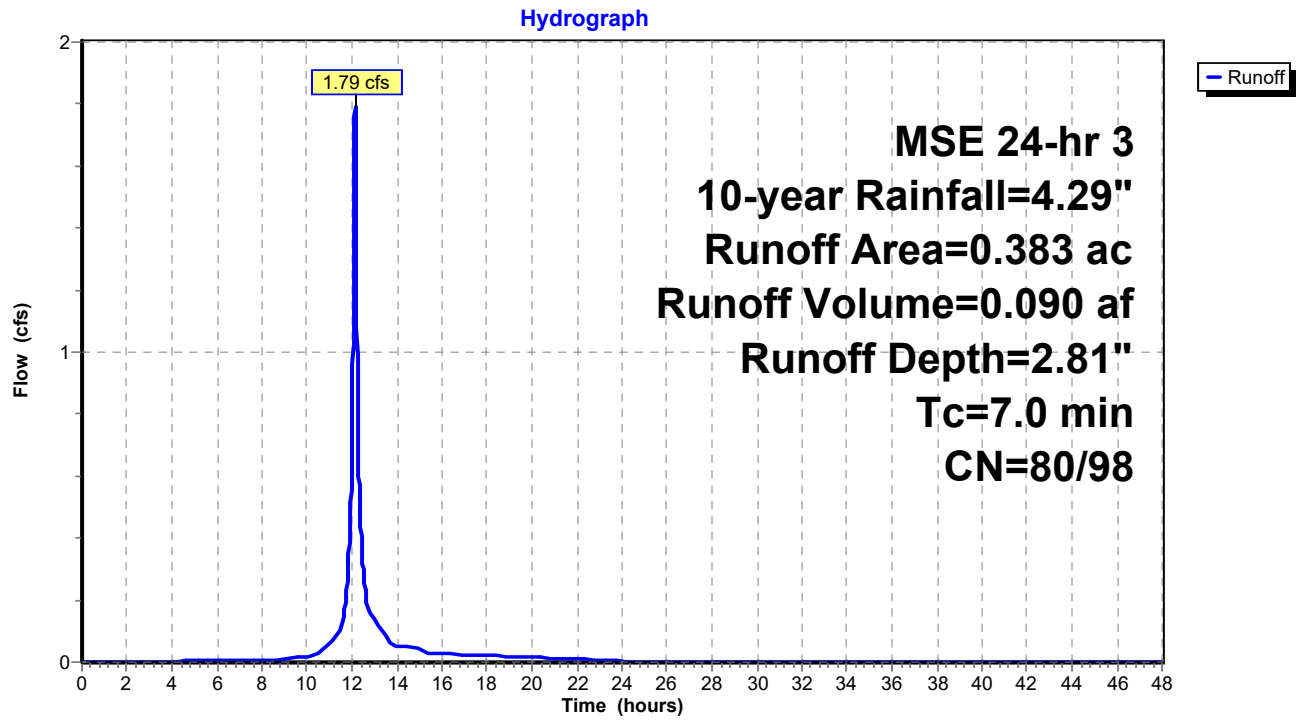
Runoff = 1.79 cfs @ 12.14 hrs, Volume= 0.090 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
0.113	98	Roofs, HSG D
0.383	85	Weighted Average
0.270	80	70.50% Pervious Area
0.113	98	29.50% Impervious Area

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

Subcatchment 1S: Subcat 1S



Summary for Subcatchment 2S: Subcat 2S

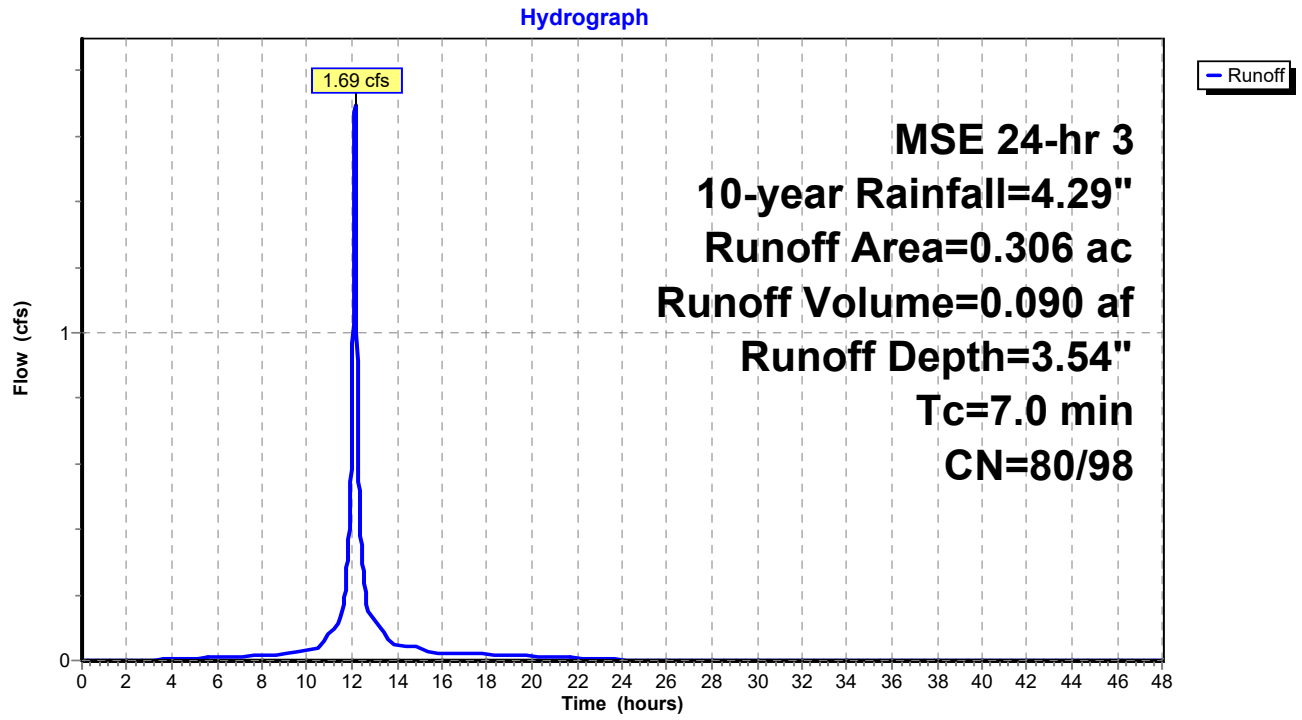
Runoff = 1.69 cfs @ 12.14 hrs, Volume= 0.090 af, Depth= 3.54"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.089	80	>75% Grass cover, Good, HSG D
0.198	98	Paved parking, HSG D
0.019	98	Unconnected pavement, HSG D
0.306	93	Weighted Average
0.089	80	29.08% Pervious Area
0.217	98	70.92% Impervious Area

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

Subcatchment 2S: Subcat 2S



Summary for Subcatchment 3S: Subcat 3S

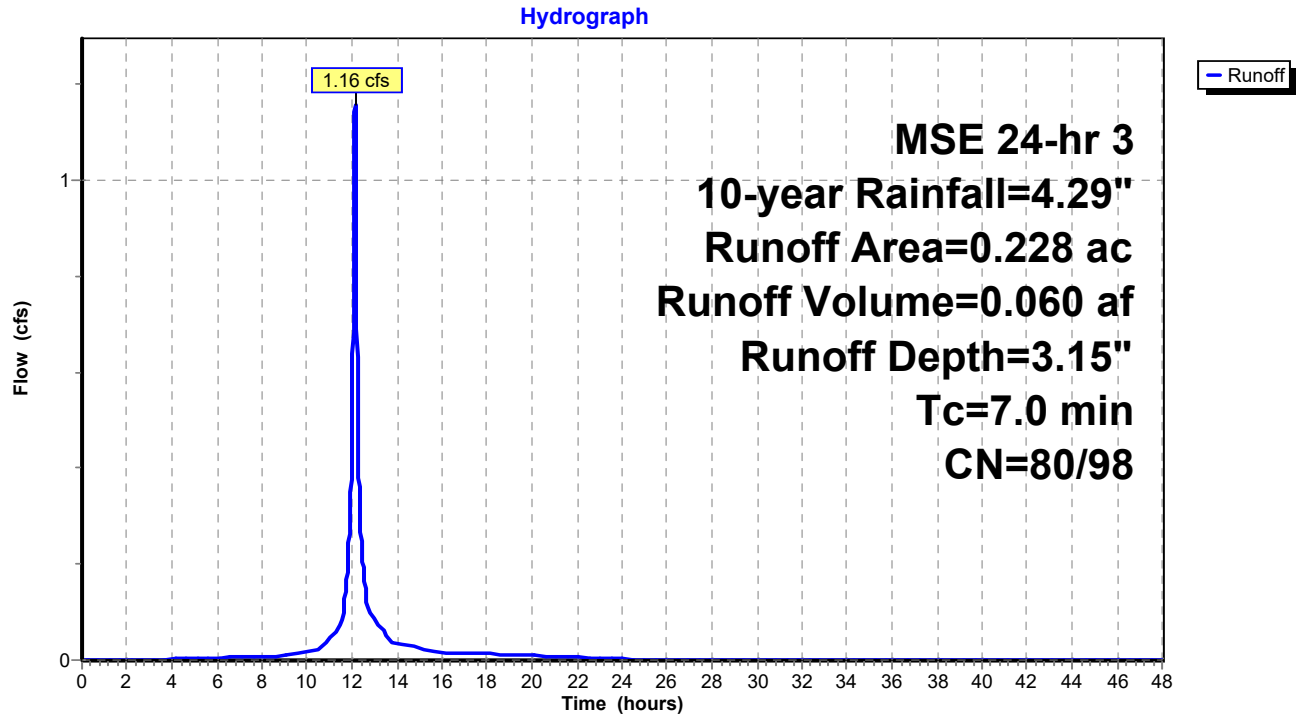
Runoff = 1.16 cfs @ 12.14 hrs, Volume= 0.060 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.117	80	>75% Grass cover, Good, HSG D
0.111	98	Paved parking, HSG D
0.228	89	Weighted Average
0.117	80	51.32% Pervious Area
0.111	98	48.68% Impervious Area

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

Subcatchment 3S: Subcat 3S



Summary for Subcatchment 4S: Subcat 4S

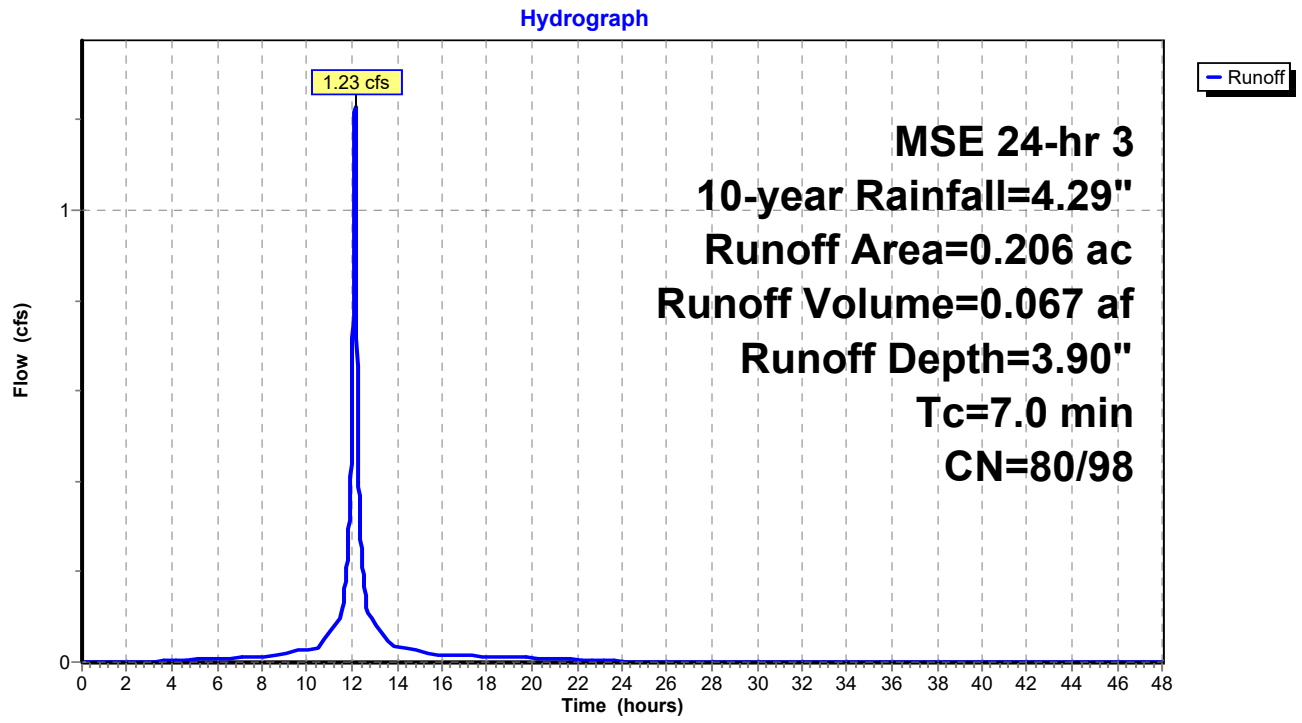
Runoff = 1.23 cfs @ 12.14 hrs, Volume= 0.067 af, Depth= 3.90"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.018	80	>75% Grass cover, Good, HSG D
0.188	98	Paved parking, HSG D
0.206	96	Weighted Average
0.018	80	8.74% Pervious Area
0.188	98	91.26% Impervious Area

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

Subcatchment 4S: Subcat 4S



Summary for Subcatchment 5S: Subcat 5S

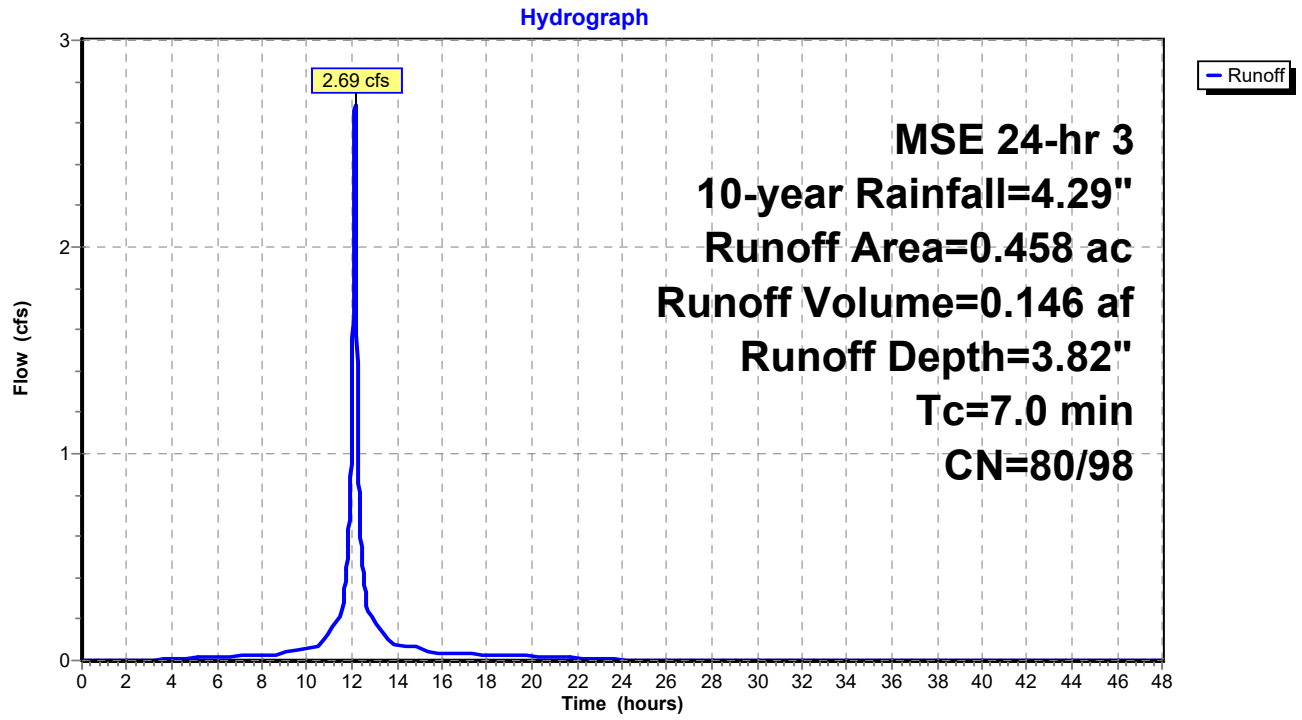
Runoff = 2.69 cfs @ 12.14 hrs, Volume= 0.146 af, Depth= 3.82"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
0.347	98	Paved parking, HSG D
0.051	98	Roofs, HSG D
0.458	96	Weighted Average
0.060	80	13.10% Pervious Area
0.398	98	86.90% Impervious Area

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

Subcatchment 5S: Subcat 5S



Summary for Subcatchment 7S: Subcat 7S

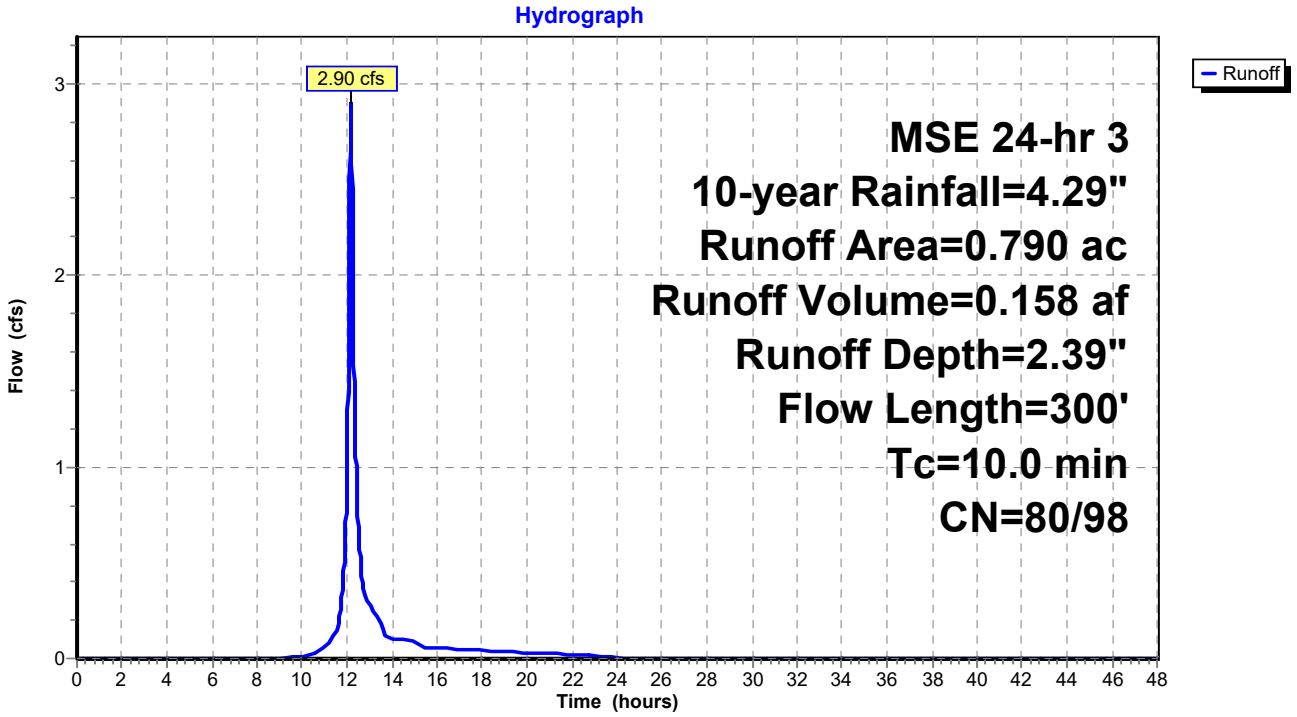
Runoff = 2.90 cfs @ 12.18 hrs, Volume= 0.158 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10-year Rainfall=4.29"

Area (ac)	CN	Description
0.741	80	>75% Grass cover, Good, HSG D
0.049	98	Roofs, HSG D
0.790	81	Weighted Average
0.741	80	93.80% Pervious Area
0.049	98	6.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 2.87"
1.3	250	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	300	Total			

Subcatchment 7S: Subcat 7S

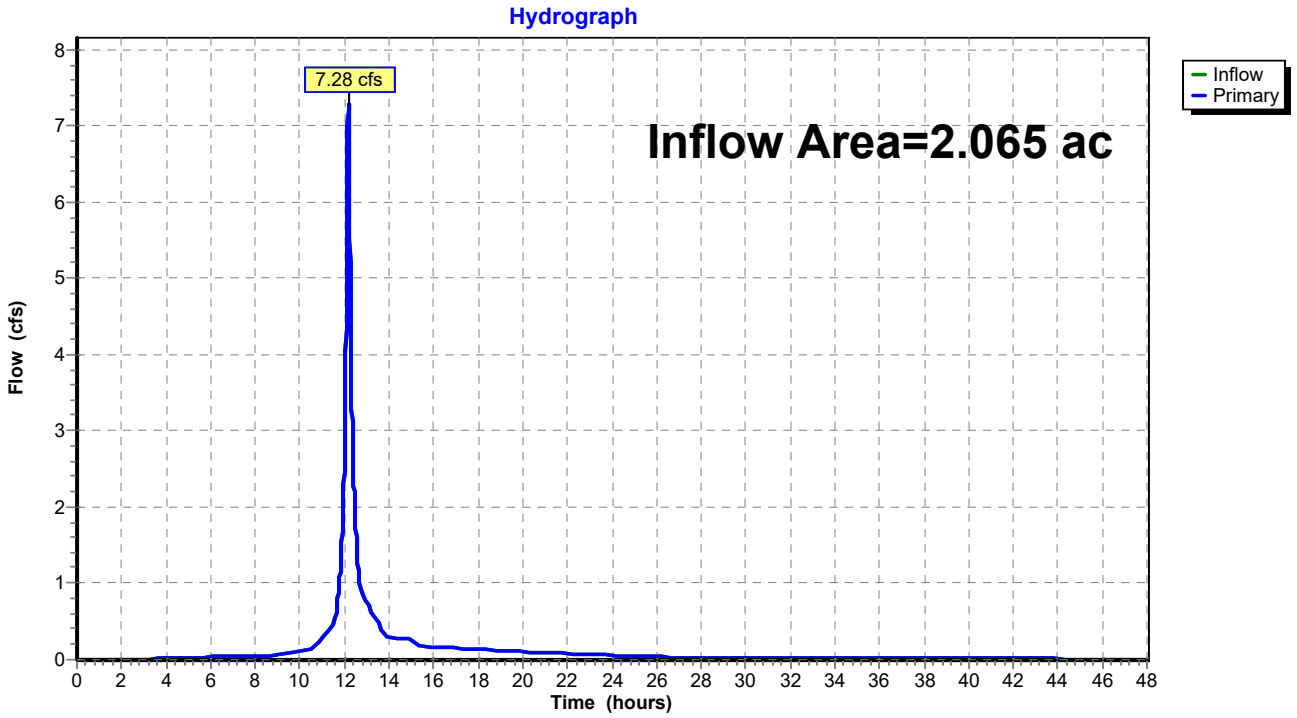


Summary for Pond 50TH: 50th Ave

Inflow Area = 2.065 ac, 41.60% Impervious, Inflow Depth > 2.96" for 10-year event
Inflow = 7.28 cfs @ 12.17 hrs, Volume= 0.510 af
Primary = 7.28 cfs @ 12.17 hrs, Volume= 0.510 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 50TH: 50th Ave



Summary for Pond BIOFIL 1: BIOFILTRATION 1

Inflow Area = 0.228 ac, 48.68% Impervious, Inflow Depth = 3.15" for 10-year event
Inflow = 1.16 cfs @ 12.14 hrs, Volume= 0.060 af
Outflow = 0.04 cfs @ 13.65 hrs, Volume= 0.060 af, Atten= 97%, Lag= 90.8 min
Primary = 0.04 cfs @ 13.65 hrs, Volume= 0.060 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 918.88' @ 13.65 hrs Surf.Area= 1,598 sf Storage= 1,702 cf

Plug-Flow detention time= 588.9 min calculated for 0.060 af (100% of inflow)
Center-of-Mass det. time= 589.0 min (1,358.5 - 769.5)

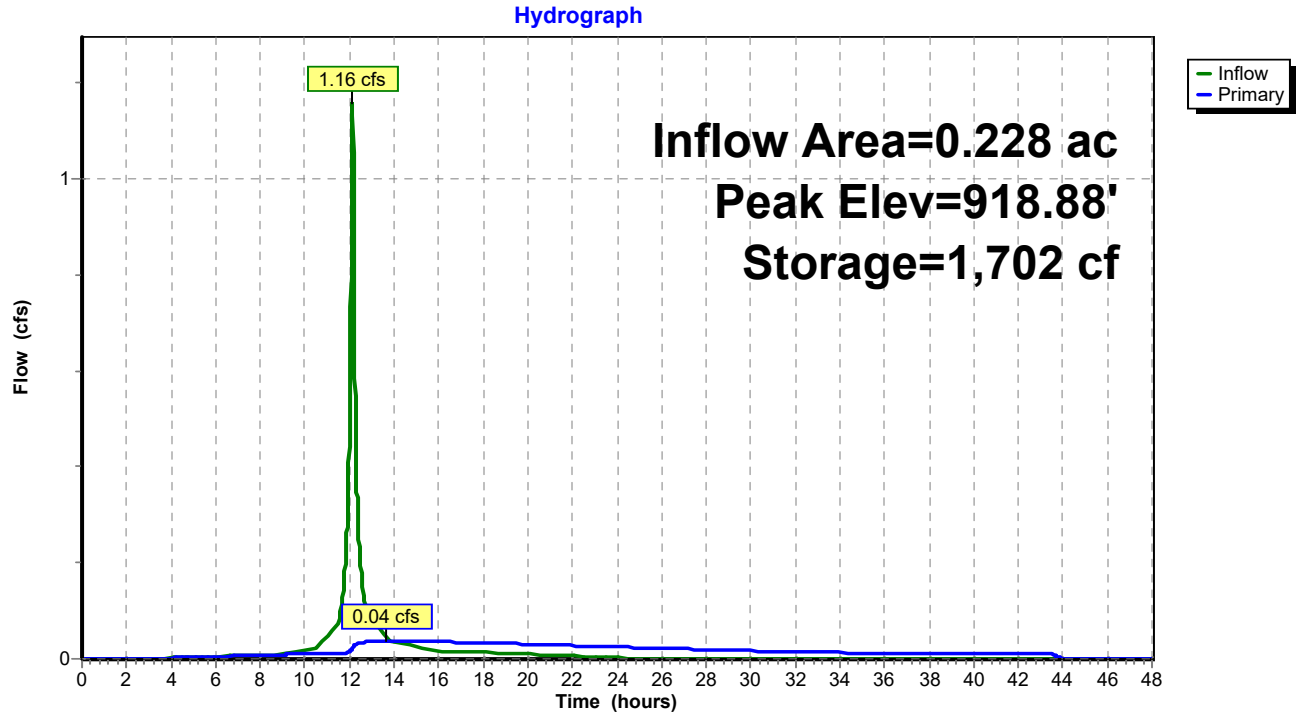
Volume	Invert	Avail.Storage	Storage Description
#1	916.25'	3,715 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.25	424	0.0	0	0
917.40	424	40.0	195	195
918.90	1,617	100.0	1,531	1,726
920.00	2,000	100.0	1,989	3,715

Device	Routing	Invert	Outlet Devices
#1	Primary	916.25'	1.000 in/hr Exfiltration over Surface area
#2	Primary	918.90'	Special & User-Defined Head (feet) 0.00 0.10 0.20 0.30 0.40 Disch. (cfs) 0.000 0.630 1.770 3.250 5.010

Primary OutFlow Max=0.04 cfs @ 13.65 hrs HW=918.88' (Free Discharge)
└1=Exfiltration (Exfiltration Controls 0.04 cfs)
└2=Special & User-Defined (Controls 0.00 cfs)

Pond BIOFIL 1: BIOFILTRATION 1



Summary for Pond BIOFIL 2: BIOFILTRATION 2

Inflow Area = 0.383 ac, 29.50% Impervious, Inflow Depth = 2.81" for 10-year event
Inflow = 1.79 cfs @ 12.14 hrs, Volume= 0.090 af
Outflow = 1.19 cfs @ 12.21 hrs, Volume= 0.079 af, Atten= 33%, Lag= 4.0 min
Primary = 1.19 cfs @ 12.21 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 921.05' @ 12.21 hrs Surf.Area= 1,690 sf Storage= 1,617 cf

Plug-Flow detention time= 422.2 min calculated for 0.079 af (89% of inflow)
Center-of-Mass det. time= 375.6 min (1,156.5 - 780.9)

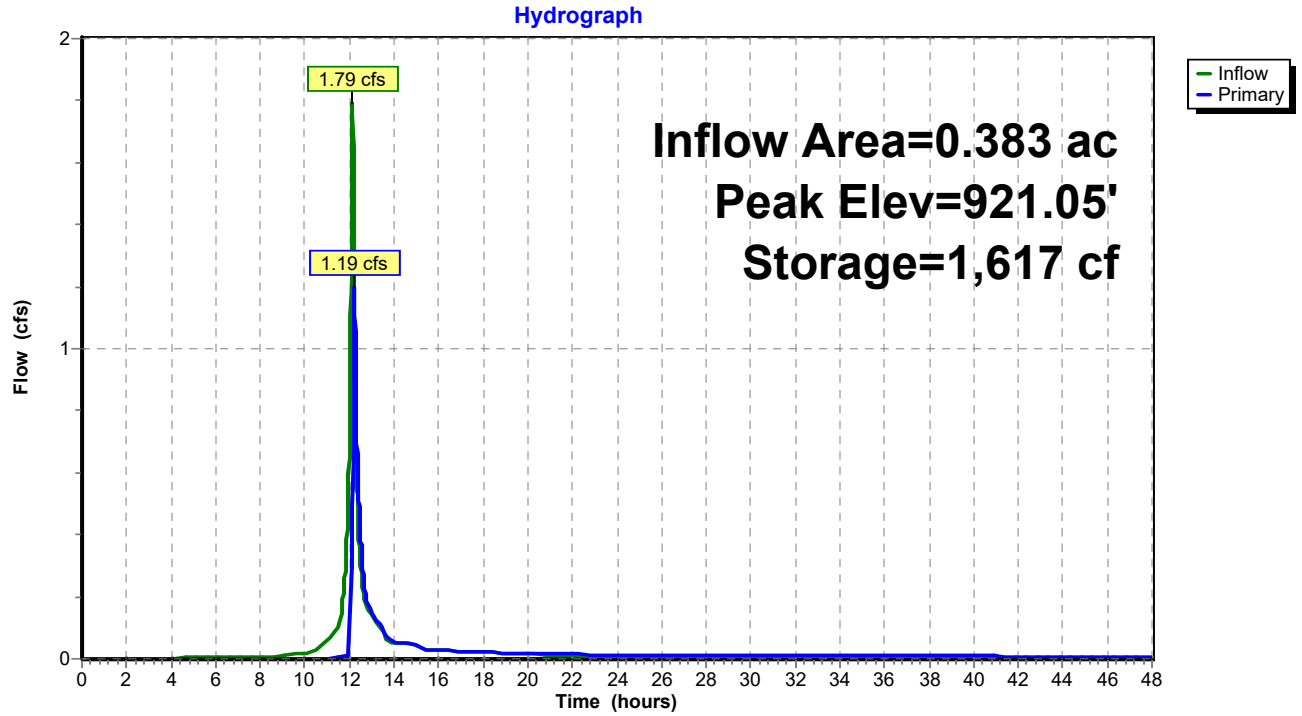
Volume	Invert	Avail.Storage	Storage Description
#1	917.00'	3,345 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
917.00	223	0.0	0	0
919.60	223	40.0	232	232
921.10	1,742	100.0	1,474	1,706
922.00	1,900	100.0	1,639	3,345

Device	Routing	Invert	Outlet Devices
#1	Primary	917.00'	0.400 in/hr Exfiltration over Surface area
#2	Primary	920.90'	Special & User-Defined
			Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60
			Disch. (cfs) 0.000 0.630 1.770 3.250 5.010 7.000 9.000

Primary OutFlow Max=1.19 cfs @ 12.21 hrs HW=921.05' (Free Discharge)
└1=Exfiltration (Exfiltration Controls 0.02 cfs)
└2=Special & User-Defined (Custom Controls 1.18 cfs)

Pond BIOFIL 2: BIOFILTRATION 2

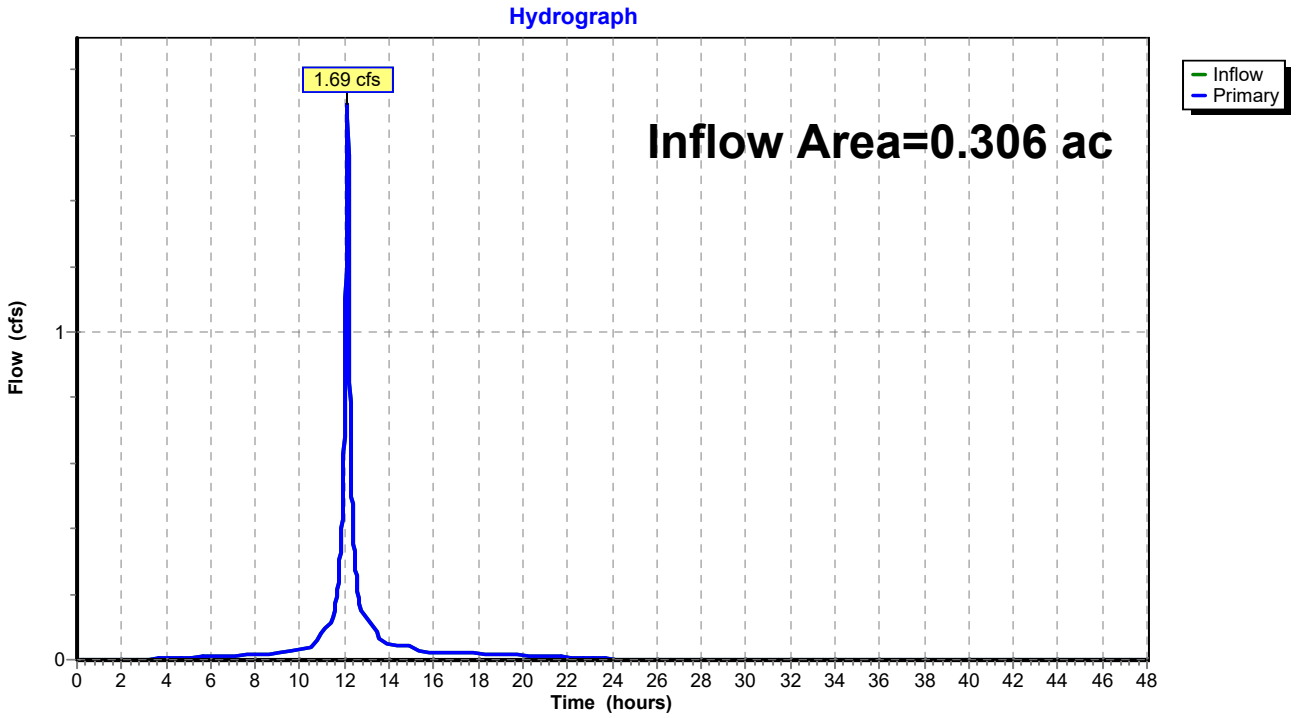


Summary for Pond BOONE: BOONE

Inflow Area = 0.306 ac, 70.92% Impervious, Inflow Depth = 3.54" for 10-year event
Inflow = 1.69 cfs @ 12.14 hrs, Volume= 0.090 af
Primary = 1.69 cfs @ 12.14 hrs, Volume= 0.090 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond BOONE: BOONE



Summary for Pond CB100: CB100

Inflow Area = 2.065 ac, 41.60% Impervious, Inflow Depth > 2.96" for 10-year event
Inflow = 7.29 cfs @ 12.17 hrs, Volume= 0.510 af
Outflow = 7.28 cfs @ 12.17 hrs, Volume= 0.510 af, Atten= 0%, Lag= 0.1 min
Primary = 7.28 cfs @ 12.17 hrs, Volume= 0.510 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 917.80' @ 12.17 hrs Surf.Area= 6 sf Storage= 25 cf

Plug-Flow detention time= 0.2 min calculated for 0.509 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (902.1 - 902.0)

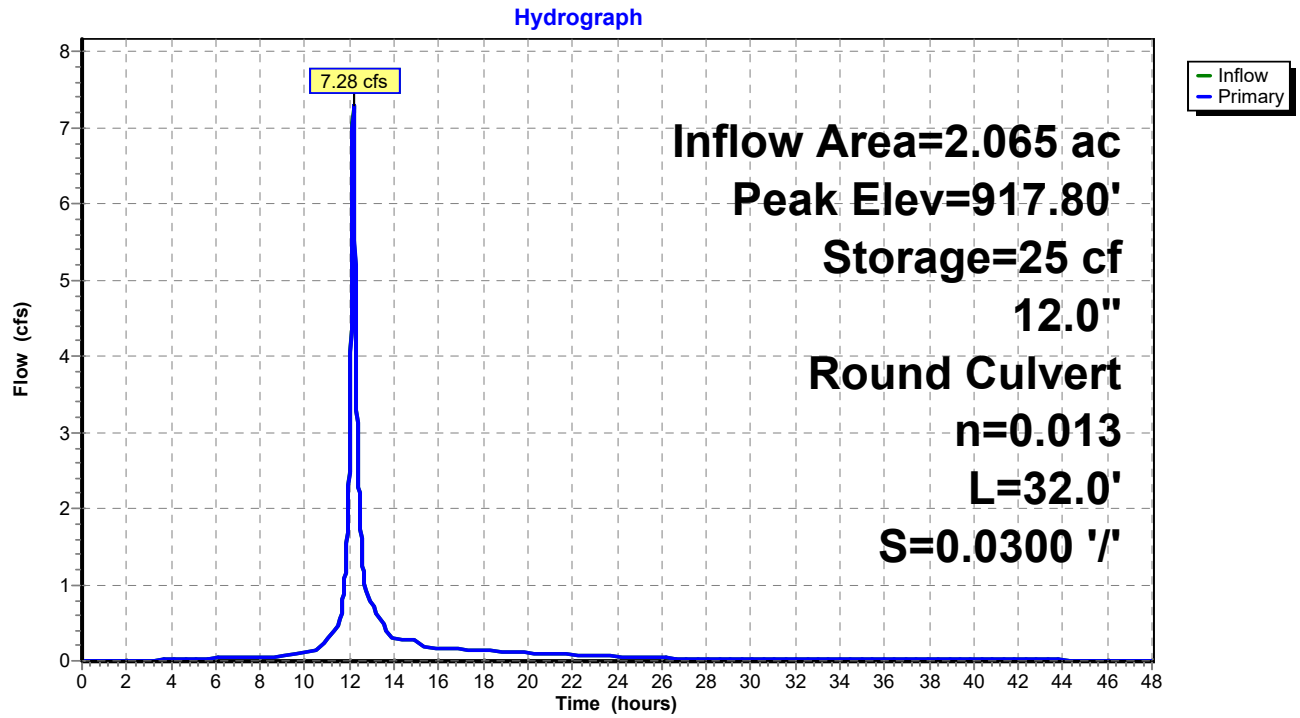
Volume	Invert	Avail.Storage	Storage Description
#1	913.59'	15,777 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.59	6	0	0
918.49	6	29	29
919.00	600	155	184
920.00	3,743	2,172	2,355
921.00	6,250	4,997	7,352
922.00	10,600	8,425	15,777

Device	Routing	Invert	Outlet Devices
#1	Primary	913.59'	12.0" Round Culvert L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 913.59' / 912.63' S= 0.0300 '/' Cc= 0.900 n= 0.013 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf

Primary OutFlow Max=7.27 cfs @ 12.17 hrs HW=917.79' (Free Discharge)
└1=Culvert (Inlet Controls 7.27 cfs @ 9.26 fps)

Pond CB100: CB100



Summary for Pond CB101: CB101

Inflow Area = 2.065 ac, 41.60% Impervious, Inflow Depth > 2.96" for 10-year event
Inflow = 7.30 cfs @ 12.17 hrs, Volume= 0.510 af
Outflow = 7.29 cfs @ 12.17 hrs, Volume= 0.510 af, Atten= 0%, Lag= 0.0 min
Primary = 7.29 cfs @ 12.17 hrs, Volume= 0.510 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 919.56' @ 12.17 hrs Surf.Area= 6 sf Storage= 24 cf

Plug-Flow detention time= 0.1 min calculated for 0.509 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (902.0 - 901.9)

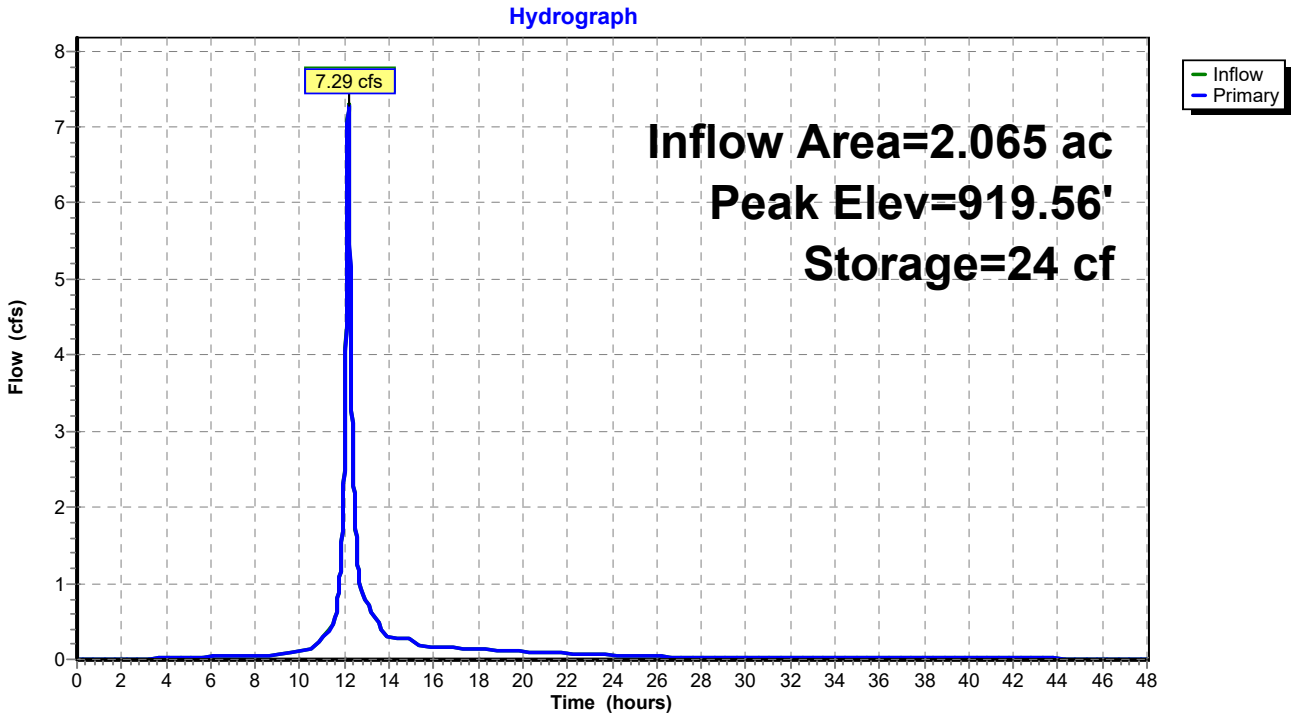
Volume	Invert	Avail.Storage	Storage Description
#1	915.58'	11,693 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.58	6	0	0
919.86	6	26	26
920.00	4,960	348	373
921.00	17,680	11,320	11,693

Device	Routing	Invert	Outlet Devices
#1	Primary	915.58'	12.0" Round Culvert L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.58' / 914.66' S= 0.0096 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	919.53'	12.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=7.24 cfs @ 12.17 hrs HW=919.56' (Free Discharge)
└1=Culvert (Inlet Controls 7.06 cfs @ 8.99 fps)
└2=Broad-Crested Rectangular Weir (Weir Controls 0.18 cfs @ 0.46 fps)

Pond CB101: CB101



Summary for Pond CB102: CB102

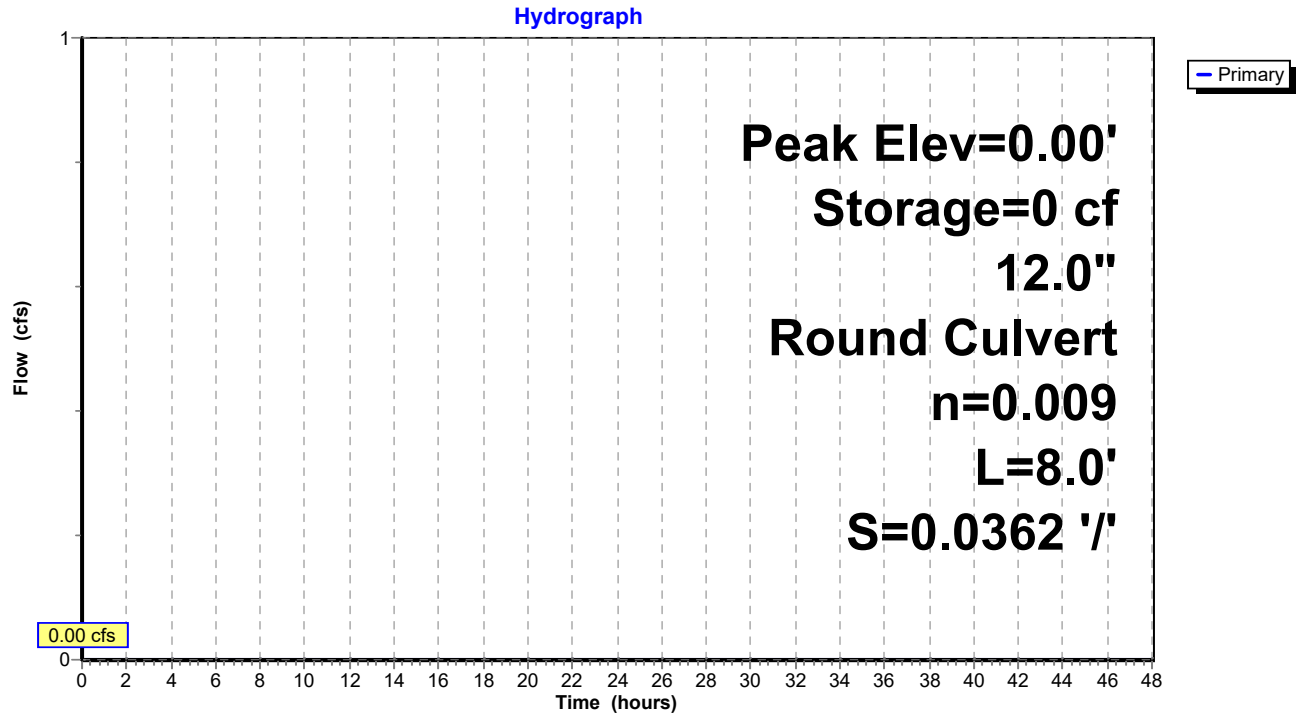
Volume	Invert	Avail.Storage	Storage Description
#1	916.02'	5,352 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.02	6	0	0
919.25	6	19	19
920.00	2,360	887	907
921.00	6,530	4,445	5,352

Device	Routing	Invert	Outlet Devices
#1	Primary	916.02'	**12.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 916.02' / 915.73' S= 0.0362 '/' Cc= 0.900 n= 0.009, Flow Area= 0.79 sf

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

Pond CB102: CB102



Summary for Pond CB103: CB103

Inflow Area = 1.607 ac, 28.69% Impervious, Inflow Depth > 2.72" for 10-year event
Inflow = 4.99 cfs @ 12.18 hrs, Volume= 0.364 af
Outflow = 4.98 cfs @ 12.19 hrs, Volume= 0.364 af, Atten= 0%, Lag= 0.1 min
Primary = 4.98 cfs @ 12.19 hrs, Volume= 0.364 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 918.62' @ 12.19 hrs Surf.Area= 6 sf Storage= 17 cf

Plug-Flow detention time= 0.1 min calculated for 0.364 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (961.8 - 961.7)

Volume	Invert	Avail.Storage	Storage Description
#1	915.75'	1,792 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

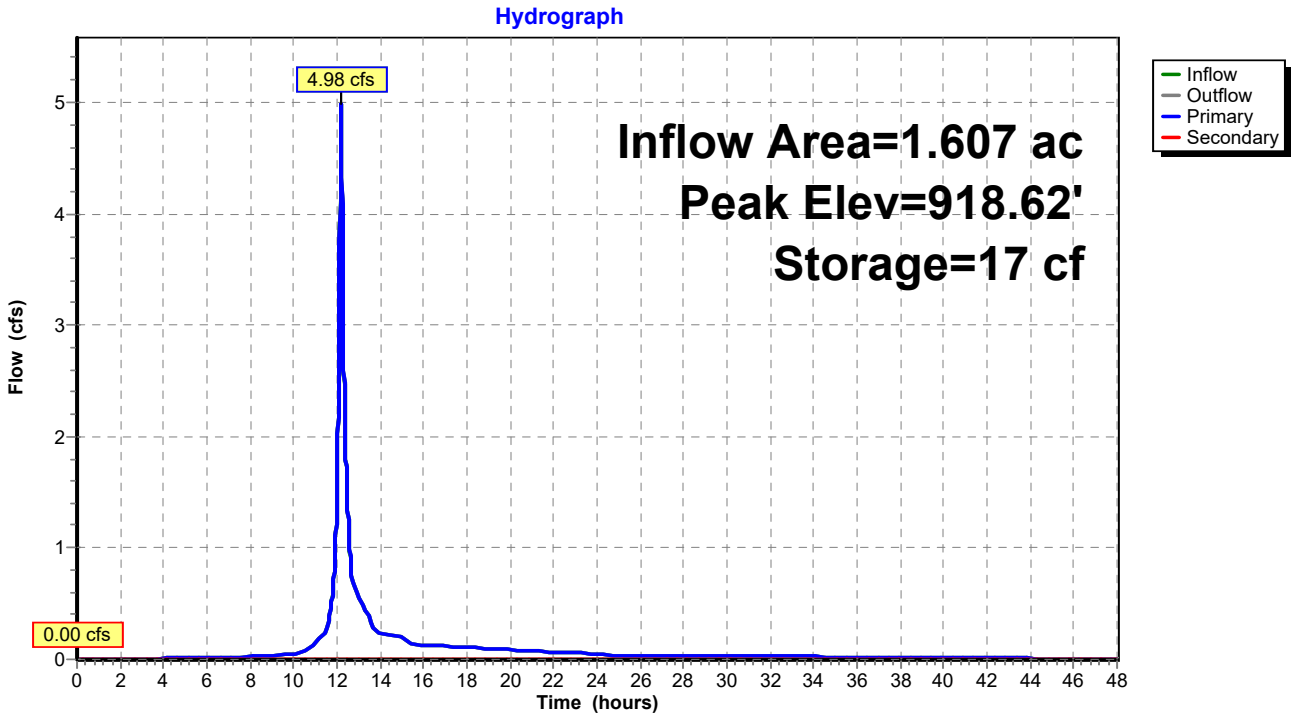
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.75	6	0	0
919.52	6	23	23
920.00	362	88	111
921.00	3,000	1,681	1,792

Device	Routing	Invert	Outlet Devices
#1	Primary	915.75'	12.0" Round Culvert L= 115.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.75' / 915.60' S= 0.0013 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	919.52'	2.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=4.97 cfs @ 12.19 hrs HW=918.61' (Free Discharge)
└1=Culvert (Barrel Controls 4.97 cfs @ 6.33 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=915.75' (Free Discharge)
└2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond CB103: CB103



Summary for Pond CB104: CB104

Inflow Area = 0.790 ac, 6.20% Impervious, Inflow Depth = 2.39" for 10-year event
Inflow = 2.90 cfs @ 12.18 hrs, Volume= 0.158 af
Outflow = 2.90 cfs @ 12.18 hrs, Volume= 0.158 af, Atten= 0%, Lag= 0.0 min
Primary = 2.90 cfs @ 12.18 hrs, Volume= 0.158 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 917.04' @ 12.18 hrs Surf.Area= 6 sf Storage= 7 cf

Plug-Flow detention time= 0.1 min calculated for 0.158 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (802.1 - 802.0)

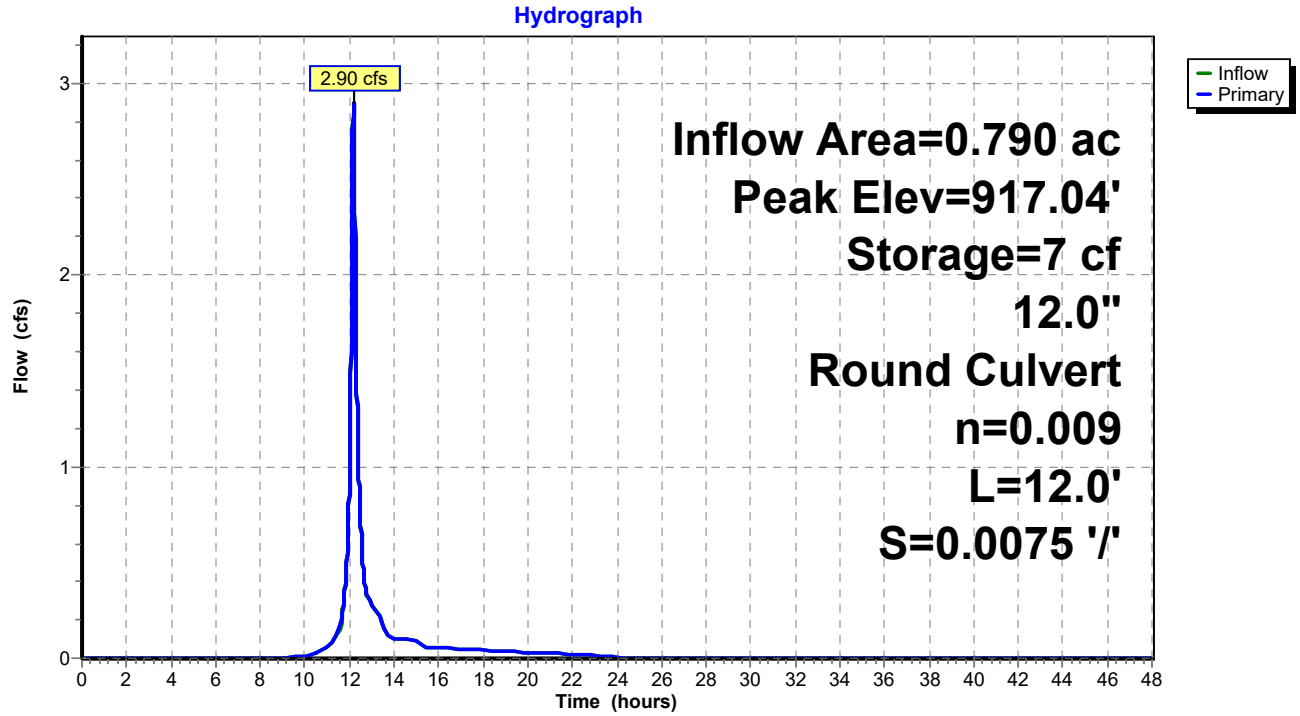
Volume	Invert	Avail.Storage	Storage Description
#1	915.84'	8,724 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.84	6	0	0
918.50	6	16	16
919.00	310	79	95
920.00	3,091	1,701	1,795
921.00	10,767	6,929	8,724

Device	Routing	Invert	Outlet Devices
#1	Primary	915.84'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.84' / 915.75' S= 0.0075 '/' Cc= 0.900 n= 0.009, Flow Area= 0.79 sf

Primary OutFlow Max=2.90 cfs @ 12.18 hrs HW=917.03' (Free Discharge)
↑—1=Culvert (Barrel Controls 2.90 cfs @ 3.90 fps)

Pond CB104: CB104



Summary for Pond CB106: CB106

Inflow Area = 0.228 ac, 48.68% Impervious, Inflow Depth = 3.15" for 10-year event
Inflow = 0.04 cfs @ 13.65 hrs, Volume= 0.060 af
Outflow = 0.04 cfs @ 13.66 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.0 min
Primary = 0.04 cfs @ 13.66 hrs, Volume= 0.060 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 918.90' @ 13.66 hrs Surf.Area= 1,724 sf Storage= 0 cf

Plug-Flow detention time= 0.0 min calculated for 0.060 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (1,358.5 - 1,358.5)

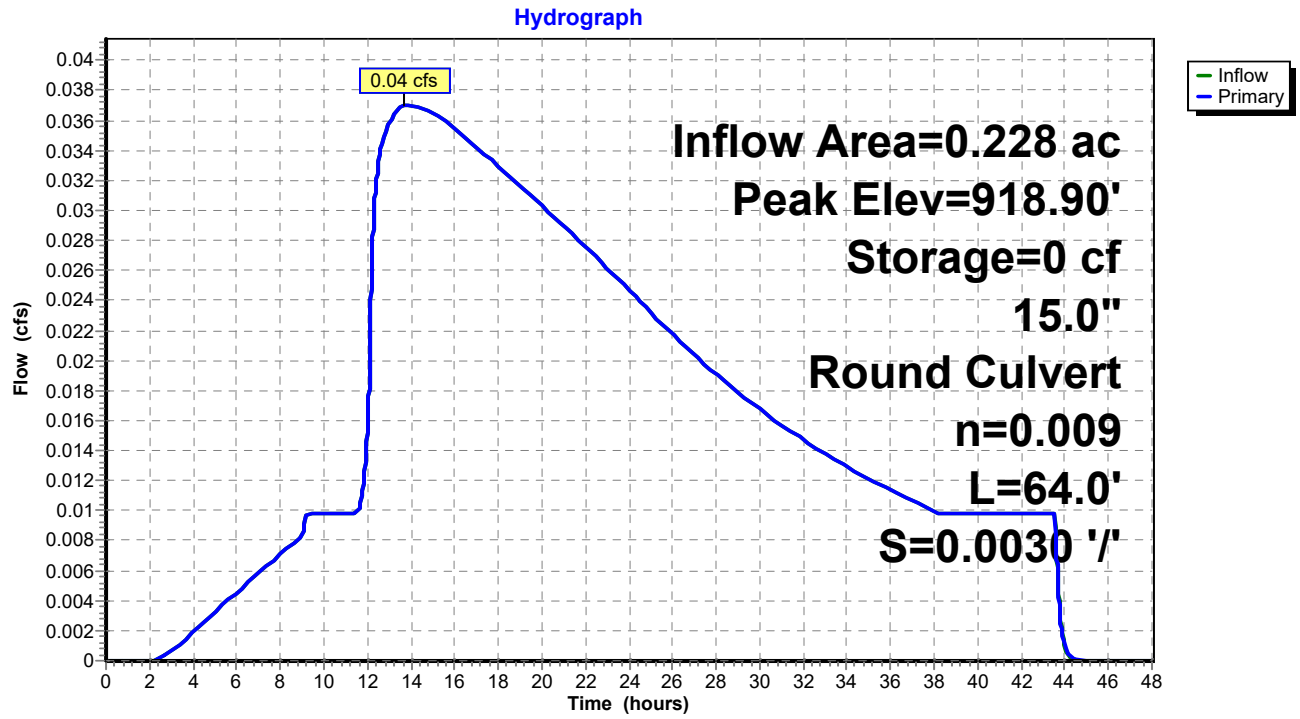
Volume	Invert	Avail.Storage	Storage Description
#1	918.90'	974 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
918.90	1,724	0	0
919.37	2,420	974	974

Device	Routing	Invert	Outlet Devices
#1	Primary	916.21'	15.0" Round Culvert L= 64.0' Ke= 0.500 Inlet / Outlet Invert= 916.21' / 916.02' S= 0.0030 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=8.45 cfs @ 13.66 hrs HW=918.90' (Free Discharge)
└1=Culvert (Barrel Controls 8.45 cfs @ 6.88 fps)

Pond CB106: CB106



Summary for Pond CB107: CB107

Inflow Area = 0.383 ac, 29.50% Impervious, Inflow Depth > 2.49" for 10-year event
Inflow = 1.19 cfs @ 12.21 hrs, Volume= 0.079 af
Outflow = 1.20 cfs @ 12.21 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min
Primary = 1.20 cfs @ 12.21 hrs, Volume= 0.079 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 917.05' @ 12.21 hrs Surf.Area= 6 sf Storage= 4 cf

Plug-Flow detention time= 0.6 min calculated for 0.079 af (100% of inflow)
Center-of-Mass det. time= 0.3 min (1,156.8 - 1,156.5)

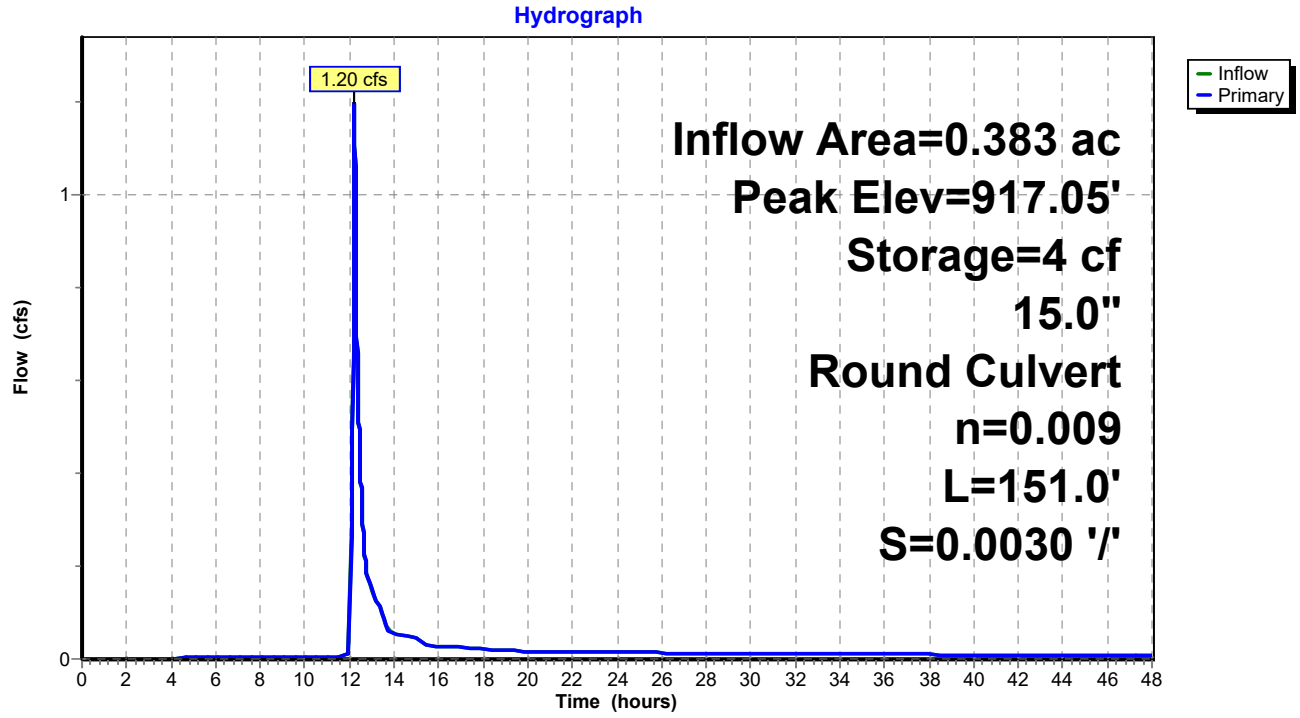
Volume	Invert	Avail.Storage	Storage Description
#1	916.40'	507 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.40	6	0	0
921.50	6	31	31
922.00	1,900	477	507

Device	Routing	Invert	Outlet Devices
#1	Primary	916.47'	15.0" Round Culvert L= 151.0' Ke= 0.500 Inlet / Outlet Invert= 916.47' / 916.02' S= 0.0030 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=1.19 cfs @ 12.21 hrs HW=917.05' (Free Discharge)
↳1=Culvert (Barrel Controls 1.19 cfs @ 3.14 fps)

Pond CB107: CB107



Summary for Pond STMH 105: STMH 105

Inflow Area = 0.611 ac, 36.66% Impervious, Inflow Depth > 2.73" for 10-year event
Inflow = 1.22 cfs @ 12.21 hrs, Volume= 0.139 af
Outflow = 1.22 cfs @ 12.21 hrs, Volume= 0.139 af, Atten= 0%, Lag= 0.0 min
Primary = 1.22 cfs @ 12.21 hrs, Volume= 0.139 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 916.62' @ 12.21 hrs Surf.Area= 6 sf Storage= 4 cf

Plug-Flow detention time= 0.2 min calculated for 0.139 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (1,243.6 - 1,243.4)

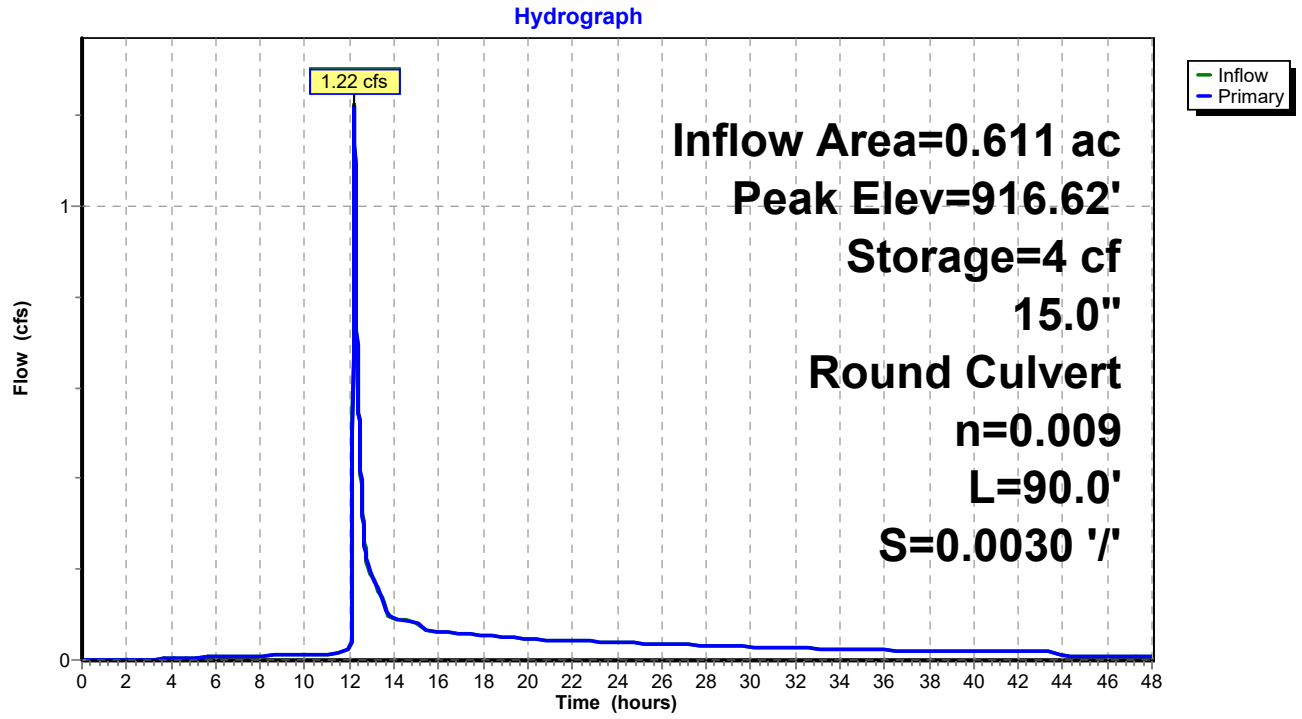
Volume	Invert	Avail.Storage	Storage Description
#1	916.03'	3,179 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.03	6	0	0
920.80	6	29	29
921.00	1,500	151	179
922.00	4,500	3,000	3,179

Device	Routing	Invert	Outlet Devices
#1	Primary	916.02'	**15.0" Round Culvert** L= 90.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 916.02' / 915.75' S= 0.0030 '/' Cc= 0.900 n= 0.009, Flow Area= 1.23 sf

Primary OutFlow Max=1.22 cfs @ 12.21 hrs HW=916.62' (Free Discharge)
↳1=**Culvert** (Barrel Controls 1.22 cfs @ 3.07 fps)

Pond STMH 105: STMH 105



SECTION 6

PROPOSED CONDITIONS 100-YEAR SUMMARY

Summary for Subcatchment 1S: Subcat 1S

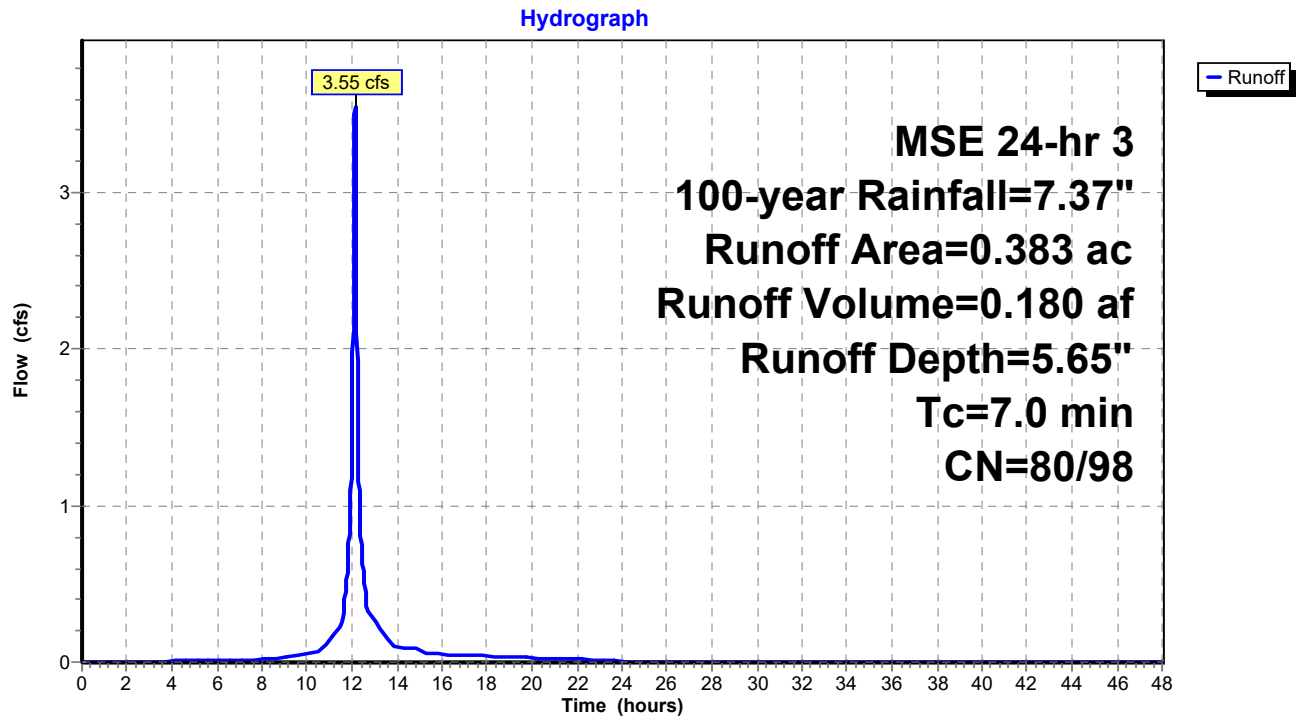
Runoff = 3.55 cfs @ 12.14 hrs, Volume= 0.180 af, Depth= 5.65"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.270	80	>75% Grass cover, Good, HSG D
0.113	98	Roofs, HSG D
0.383	85	Weighted Average
0.270	80	70.50% Pervious Area
0.113	98	29.50% Impervious Area

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

Subcatchment 1S: Subcat 1S



Summary for Subcatchment 2S: Subcat 2S

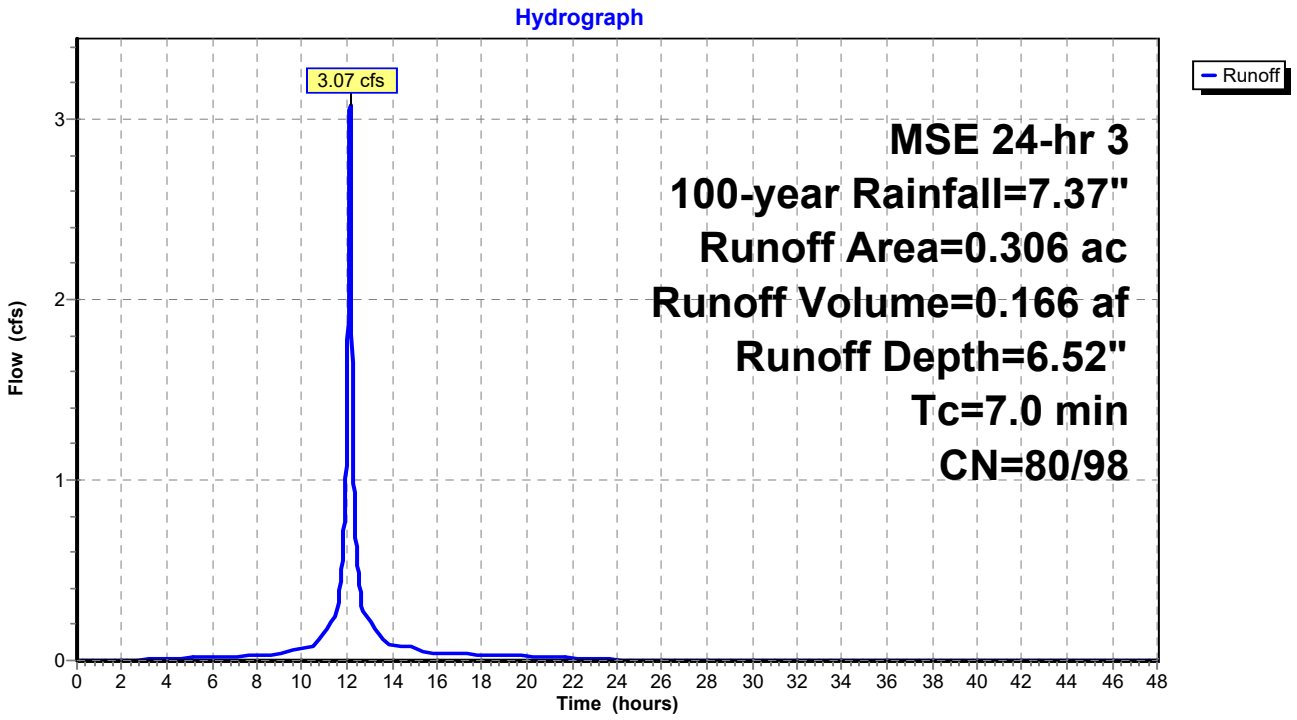
Runoff = 3.07 cfs @ 12.14 hrs, Volume= 0.166 af, Depth= 6.52"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.089	80	>75% Grass cover, Good, HSG D
0.198	98	Paved parking, HSG D
0.019	98	Unconnected pavement, HSG D
0.306	93	Weighted Average
0.089	80	29.08% Pervious Area
0.217	98	70.92% Impervious Area

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

Subcatchment 2S: Subcat 2S



Summary for Subcatchment 3S: Subcat 3S

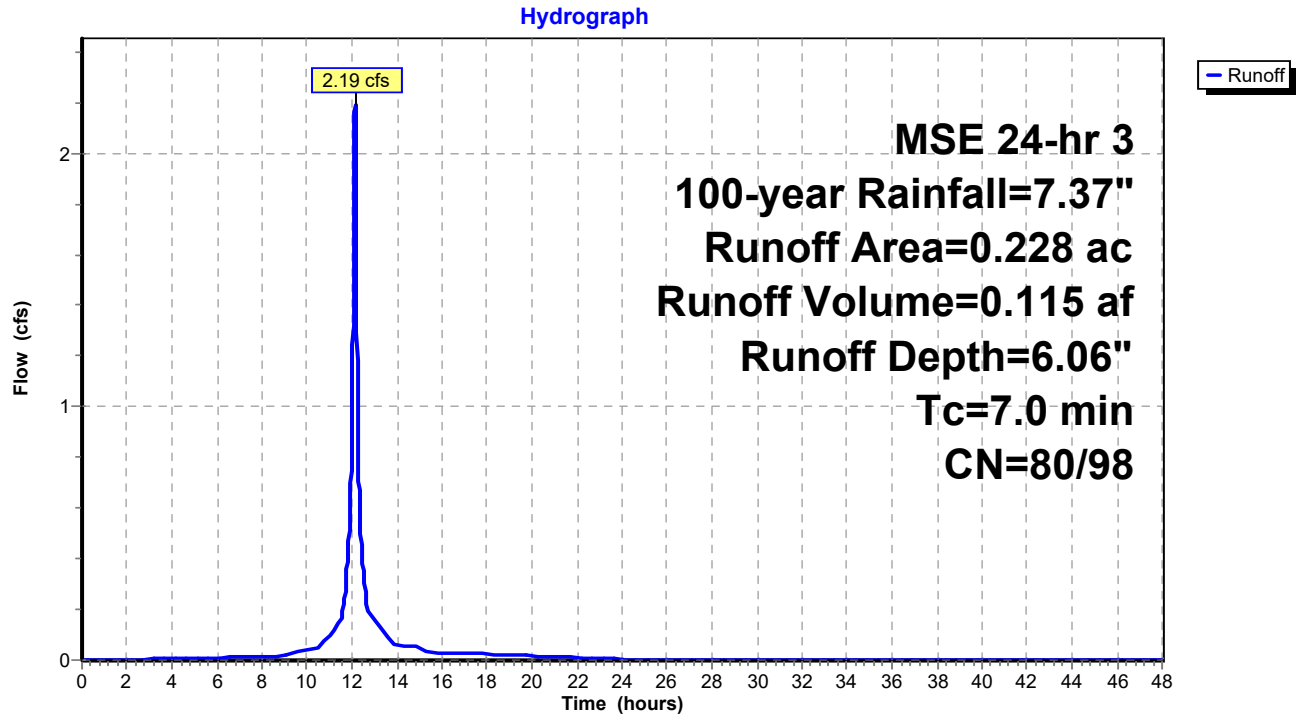
Runoff = 2.19 cfs @ 12.14 hrs, Volume= 0.115 af, Depth= 6.06"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.117	80	>75% Grass cover, Good, HSG D
0.111	98	Paved parking, HSG D
0.228	89	Weighted Average
0.117	80	51.32% Pervious Area
0.111	98	48.68% Impervious Area

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

Subcatchment 3S: Subcat 3S



Summary for Subcatchment 4S: Subcat 4S

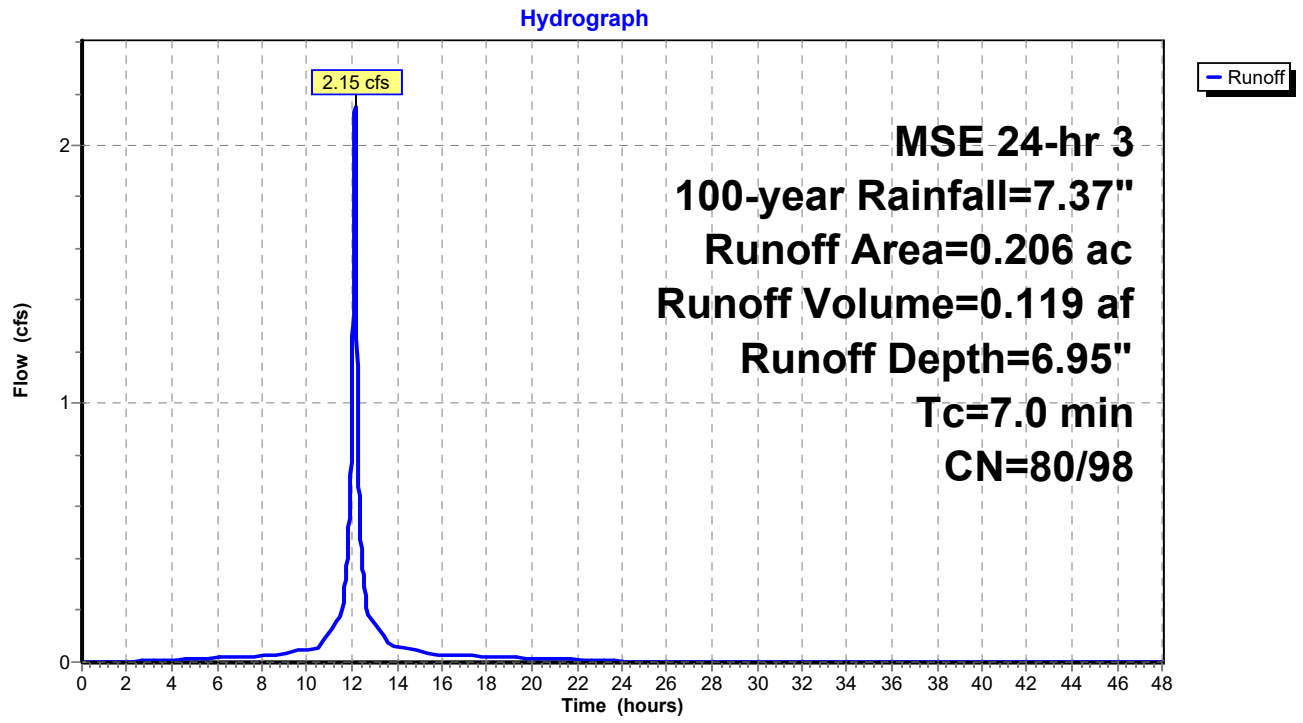
Runoff = 2.15 cfs @ 12.14 hrs, Volume= 0.119 af, Depth= 6.95"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.018	80	>75% Grass cover, Good, HSG D
0.188	98	Paved parking, HSG D
0.206	96	Weighted Average
0.018	80	8.74% Pervious Area
0.188	98	91.26% Impervious Area

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

Subcatchment 4S: Subcat 4S



Summary for Subcatchment 5S: Subcat 5S

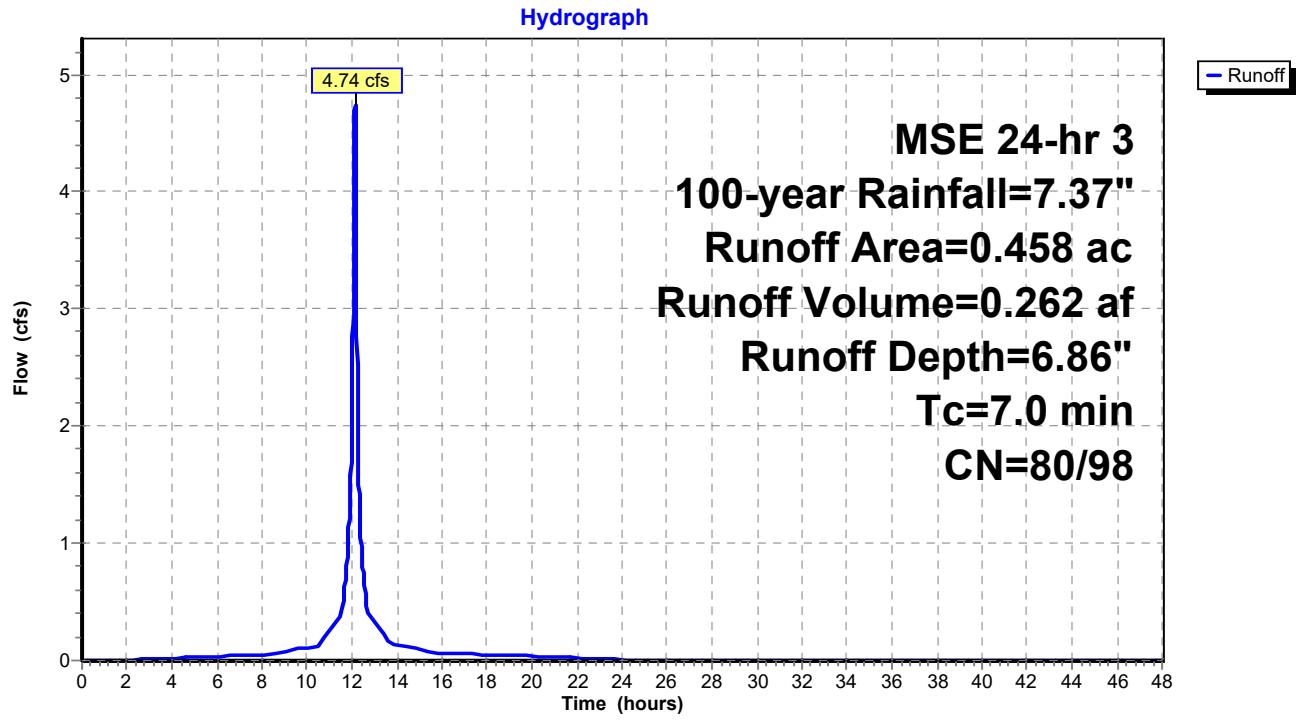
Runoff = 4.74 cfs @ 12.14 hrs, Volume= 0.262 af, Depth= 6.86"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.060	80	>75% Grass cover, Good, HSG D
0.347	98	Paved parking, HSG D
0.051	98	Roofs, HSG D
0.458	96	Weighted Average
0.060	80	13.10% Pervious Area
0.398	98	86.90% Impervious Area

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

Subcatchment 5S: Subcat 5S



Summary for Subcatchment 7S: Subcat 7S

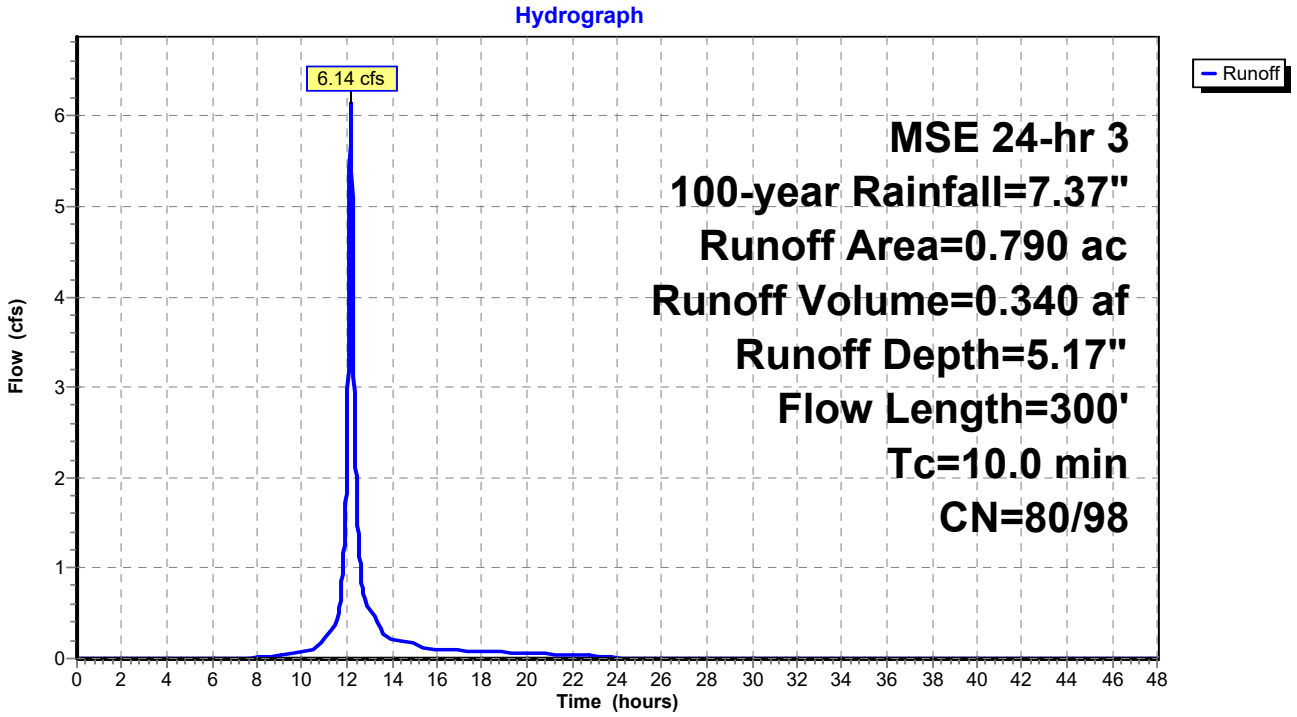
Runoff = 6.14 cfs @ 12.17 hrs, Volume= 0.340 af, Depth= 5.17"

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 100-year Rainfall=7.37"

Area (ac)	CN	Description
0.741	80	>75% Grass cover, Good, HSG D
0.049	98	Roofs, HSG D
0.790	81	Weighted Average
0.741	80	93.80% Pervious Area
0.049	98	6.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	50	0.0200	0.10		Sheet Flow, Grass: Dense n= 0.240 P2= 2.87"
1.3	250	0.0400	3.22		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
10.0	300	Total			

Subcatchment 7S: Subcat 7S

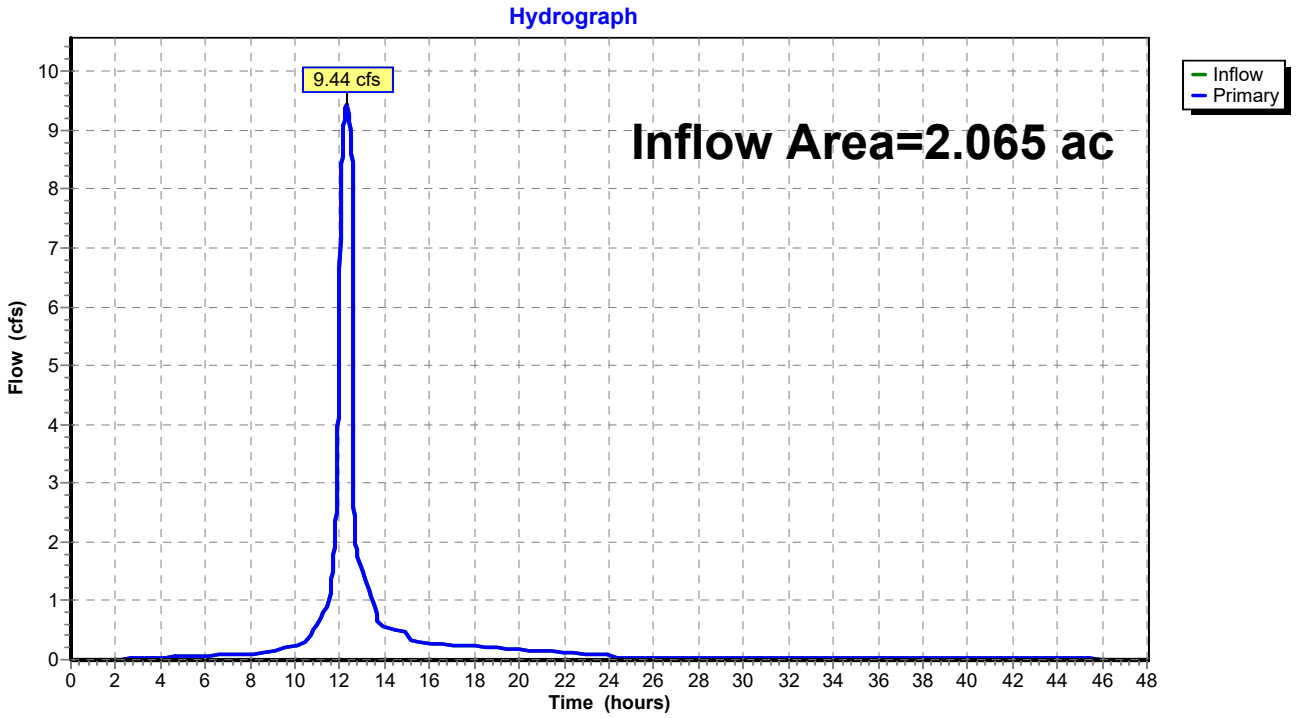


Summary for Pond 50TH: 50th Ave

Inflow Area = 2.065 ac, 41.60% Impervious, Inflow Depth > 5.85" for 100-year event
Inflow = 9.44 cfs @ 12.30 hrs, Volume= 1.007 af
Primary = 9.44 cfs @ 12.30 hrs, Volume= 1.007 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond 50TH: 50th Ave



Summary for Pond BIOFIL 1: BIOFILTRATION 1

Inflow Area = 0.228 ac, 48.68% Impervious, Inflow Depth = 6.06" for 100-year event
Inflow = 2.19 cfs @ 12.14 hrs, Volume= 0.115 af
Outflow = 1.58 cfs @ 12.20 hrs, Volume= 0.115 af, Atten= 28%, Lag= 3.5 min
Primary = 1.58 cfs @ 12.20 hrs, Volume= 0.115 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 919.08' @ 12.20 hrs Surf.Area= 1,680 sf Storage= 2,051 cf

Plug-Flow detention time= 370.4 min calculated for 0.115 af (100% of inflow)
Center-of-Mass det. time= 370.5 min (1,132.4 - 761.9)

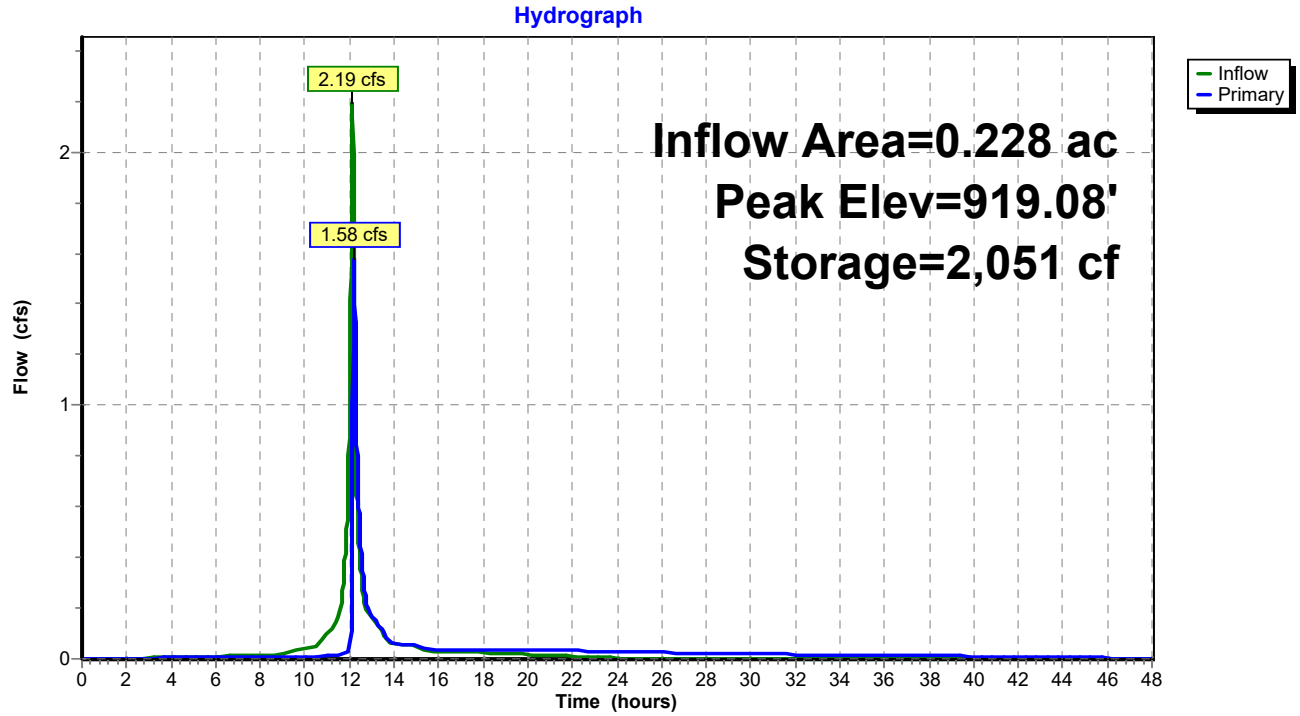
Volume	Invert	Avail.Storage	Storage Description
#1	916.25'	3,715 cf	Custom Stage Data (Prismatic) Listed below

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.25	424	0.0	0	0
917.40	424	40.0	195	195
918.90	1,617	100.0	1,531	1,726
920.00	2,000	100.0	1,989	3,715

Device	Routing	Invert	Outlet Devices
#1	Primary	916.25'	1.000 in/hr Exfiltration over Surface area
#2	Primary	918.90'	Special & User-Defined Head (feet) 0.00 0.10 0.20 0.30 0.40 Disch. (cfs) 0.000 0.630 1.770 3.250 5.010

Primary OutFlow Max=1.58 cfs @ 12.20 hrs HW=919.08' (Free Discharge)
└1=Exfiltration (Exfiltration Controls 0.04 cfs)
└2=Special & User-Defined (Custom Controls 1.54 cfs)

Pond BIOFIL 1: BIOFILTRATION 1



Summary for Pond BIOFIL 2: BIOFILTRATION 2

Inflow Area = 0.383 ac, 29.50% Impervious, Inflow Depth = 5.65" for 100-year event
Inflow = 3.55 cfs @ 12.14 hrs, Volume= 0.180 af
Outflow = 3.31 cfs @ 12.17 hrs, Volume= 0.170 af, Atten= 7%, Lag= 1.5 min
Primary = 3.31 cfs @ 12.17 hrs, Volume= 0.170 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 921.20' @ 12.17 hrs Surf.Area= 1,760 sf Storage= 1,885 cf

Plug-Flow detention time= 217.9 min calculated for 0.170 af (94% of inflow)
Center-of-Mass det. time= 188.9 min (960.4 - 771.5)

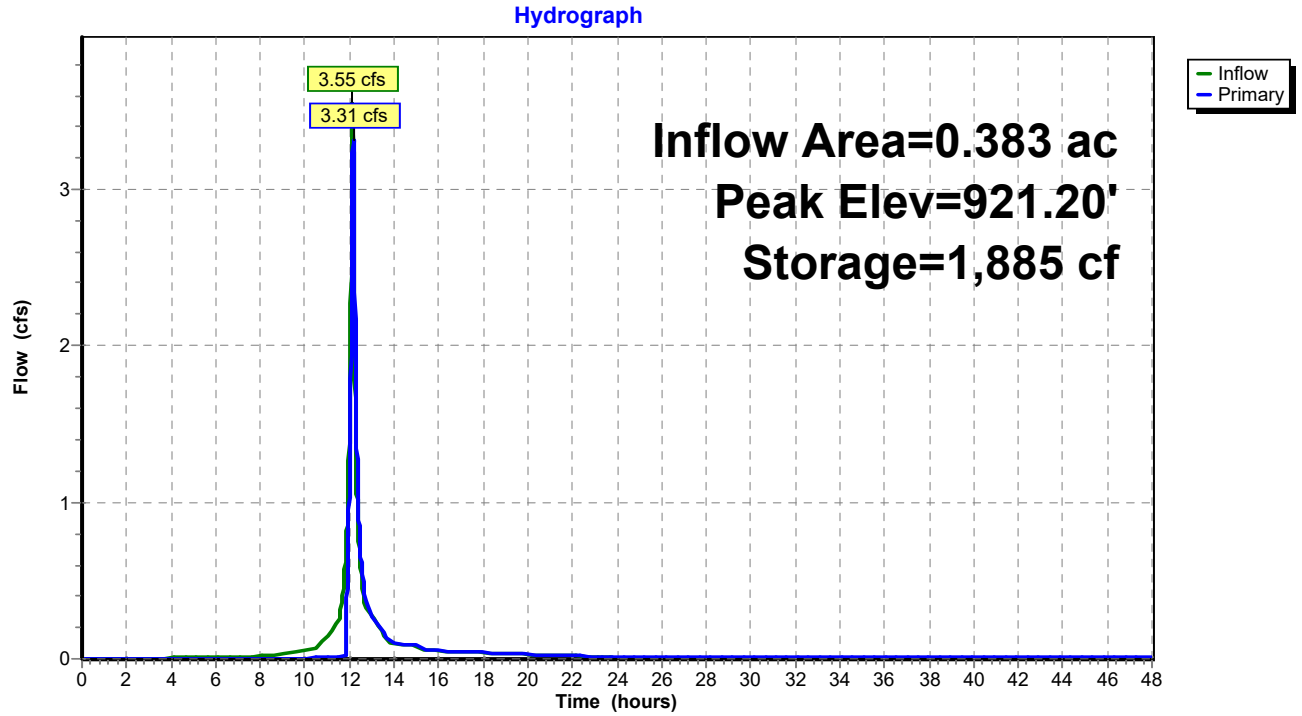
Volume	Invert	Avail.Storage	Storage Description
#1	917.00'	3,345 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
917.00	223	0.0	0	0
919.60	223	40.0	232	232
921.10	1,742	100.0	1,474	1,706
922.00	1,900	100.0	1,639	3,345

Device	Routing	Invert	Outlet Devices
#1	Primary	917.00'	0.400 in/hr Exfiltration over Surface area
#2	Primary	920.90'	Special & User-Defined Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 Disch. (cfs) 0.000 0.630 1.770 3.250 5.010 7.000 9.000

Primary OutFlow Max=3.30 cfs @ 12.17 hrs HW=921.20' (Free Discharge)
└1=Exfiltration (Exfiltration Controls 0.02 cfs)
└2=Special & User-Defined (Custom Controls 3.28 cfs)

Pond BIOFIL 2: BIOFILTRATION 2

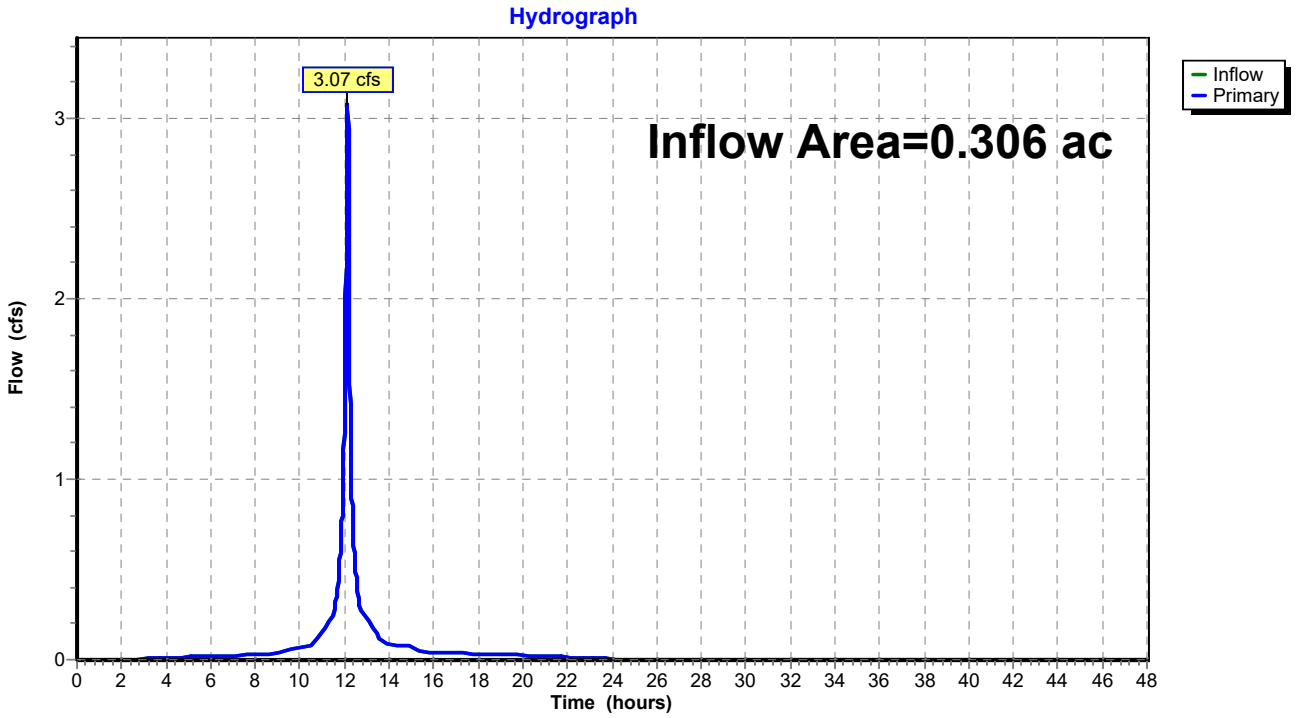


Summary for Pond BOONE: BOONE

Inflow Area = 0.306 ac, 70.92% Impervious, Inflow Depth = 6.52" for 100-year event
Inflow = 3.07 cfs @ 12.14 hrs, Volume= 0.166 af
Primary = 3.07 cfs @ 12.14 hrs, Volume= 0.166 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs

Pond BOONE: BOONE



Summary for Pond CB100: CB100

Inflow Area = 2.065 ac, 41.60% Impervious, Inflow Depth > 5.85" for 100-year event
Inflow = 15.22 cfs @ 12.19 hrs, Volume= 1.006 af
Outflow = 9.44 cfs @ 12.30 hrs, Volume= 1.007 af, Atten= 38%, Lag= 6.5 min
Primary = 9.44 cfs @ 12.30 hrs, Volume= 1.007 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 920.32' @ 12.30 hrs Surf.Area= 4,554 sf Storage= 3,698 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.4 min (842.1 - 840.7)

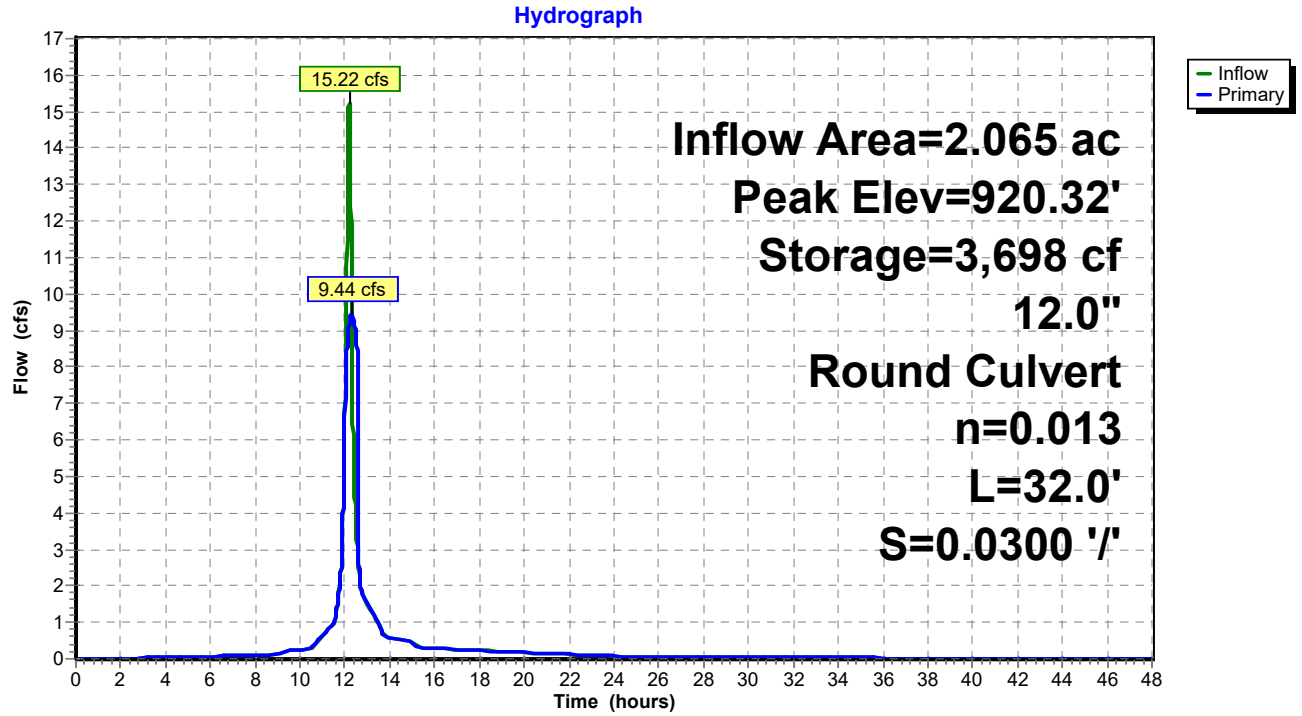
Volume	Invert	Avail.Storage	Storage Description
#1	913.59'	15,777 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
913.59	6	0	0
918.49	6	29	29
919.00	600	155	184
920.00	3,743	2,172	2,355
921.00	6,250	4,997	7,352
922.00	10,600	8,425	15,777

Device	Routing	Invert	Outlet Devices
#1	Primary	913.59'	12.0" Round Culvert L= 32.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 913.59' / 912.63' S= 0.0300 '/' Cc= 0.900 n= 0.013 Concrete sewer w/manholes & inlets, Flow Area= 0.79 sf

Primary OutFlow Max=9.44 cfs @ 12.30 hrs HW=920.32' (Free Discharge)
└1=Culvert (Inlet Controls 9.44 cfs @ 12.02 fps)

Pond CB100: CB100



Summary for Pond CB101: CB101

Inflow Area = 2.065 ac, 41.60% Impervious, Inflow Depth > 5.85" for 100-year event
Inflow = 15.41 cfs @ 12.17 hrs, Volume= 1.006 af
Outflow = 15.22 cfs @ 12.19 hrs, Volume= 1.006 af, Atten= 1%, Lag= 1.1 min
Primary = 15.22 cfs @ 12.19 hrs, Volume= 1.006 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 3
Peak Elev= 919.93' @ 12.19 hrs Surf.Area= 2,341 sf Storage= 103 cf

Plug-Flow detention time= 0.3 min calculated for 1.006 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (840.7 - 840.7)

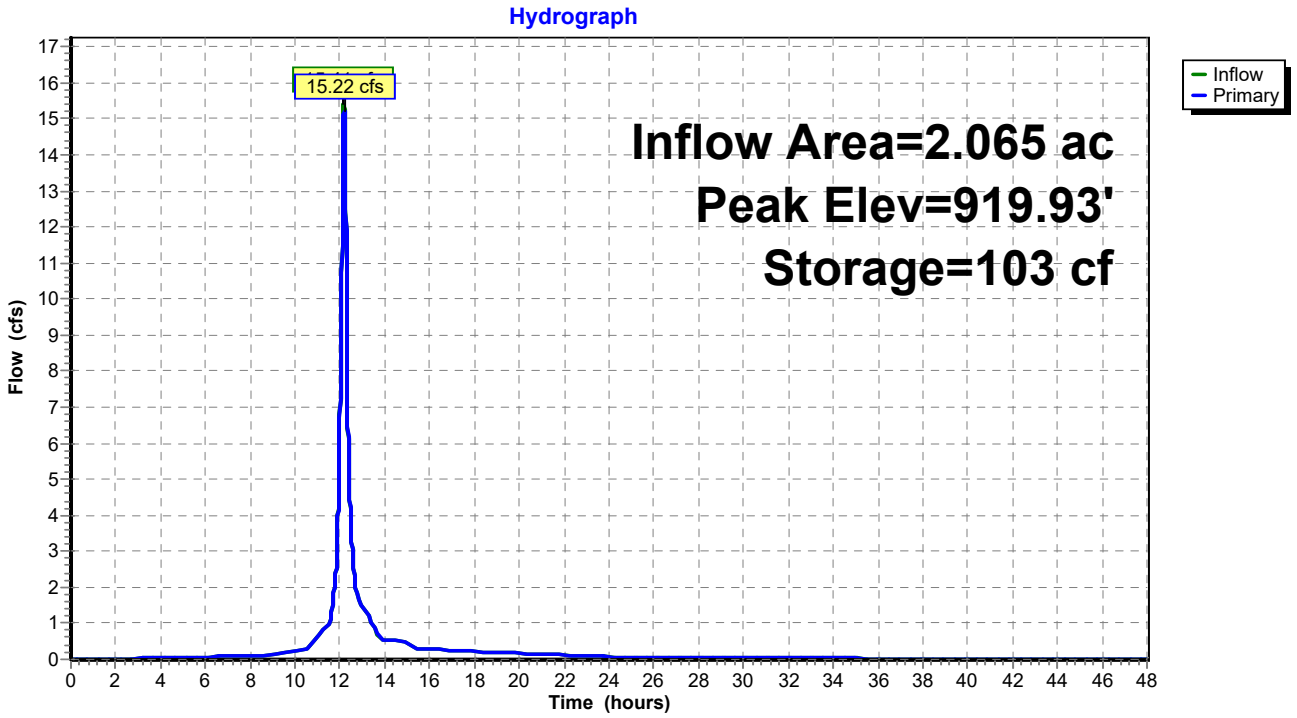
Volume	Invert	Avail.Storage	Storage Description
#1	915.58'	11,693 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.58	6	0	0
919.86	6	26	26
920.00	4,960	348	373
921.00	17,680	11,320	11,693

Device	Routing	Invert	Outlet Devices
#1	Primary	915.58'	12.0" Round Culvert L= 96.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.58' / 914.66' S= 0.0096 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	919.53'	12.0' long x 2.0' 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 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=15.22 cfs @ 12.19 hrs HW=919.93' (Free Discharge)
└1=Culvert (Inlet Controls 7.42 cfs @ 9.44 fps)
└2=Broad-Crested Rectangular Weir (Weir Controls 7.80 cfs @ 1.64 fps)

Pond CB101: CB101



Summary for Pond CB102: CB102

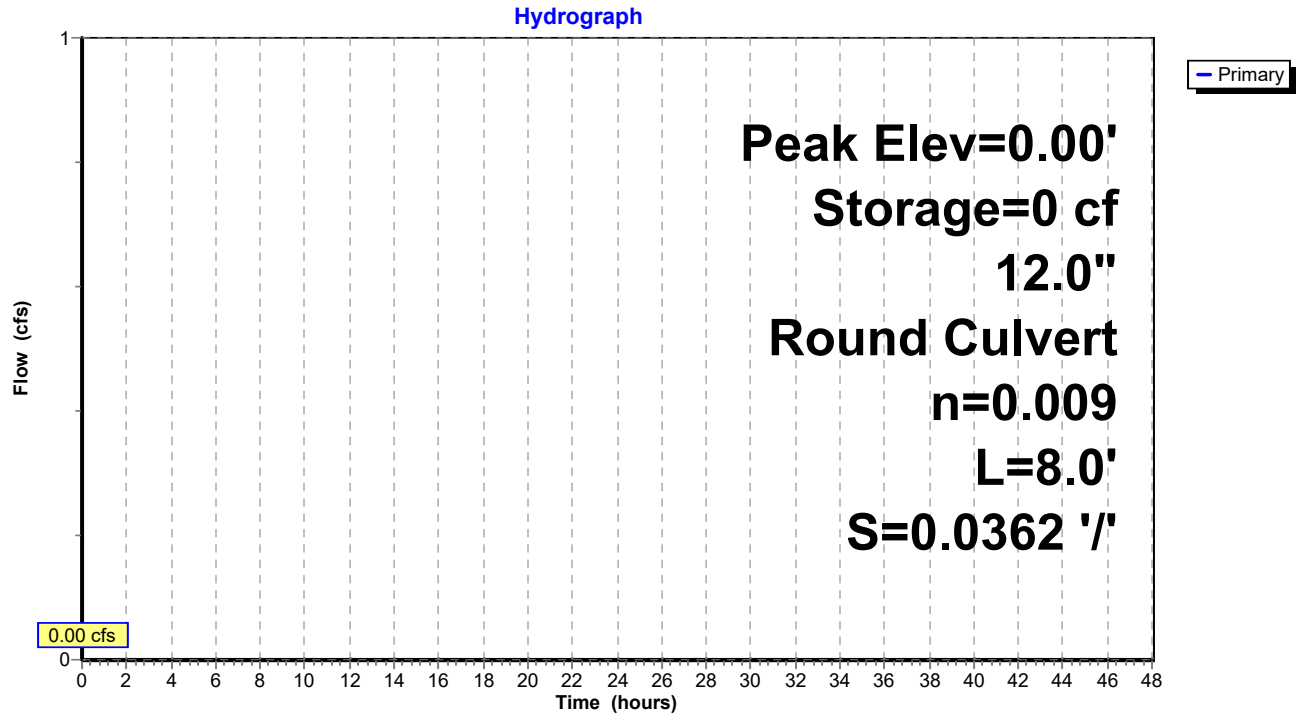
Volume	Invert	Avail.Storage	Storage Description
#1	916.02'	5,352 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.02	6	0	0
919.25	6	19	19
920.00	2,360	887	907
921.00	6,530	4,445	5,352

Device	Routing	Invert	Outlet Devices
#1	Primary	916.02'	**12.0" Round Culvert** L= 8.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 916.02' / 915.73' S= 0.0362 '/' Cc= 0.900 n= 0.009, Flow Area= 0.79 sf

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

Pond CB102: CB102



Summary for Pond CB103: CB103

Inflow Area = 1.607 ac, 28.69% Impervious, Inflow Depth > 5.56" for 100-year event
Inflow = 12.53 cfs @ 12.17 hrs, Volume= 0.744 af
Outflow = 11.73 cfs @ 12.21 hrs, Volume= 0.744 af, Atten= 6%, Lag= 2.2 min
Primary = 6.89 cfs @ 12.21 hrs, Volume= 0.680 af
Secondary = 4.84 cfs @ 12.21 hrs, Volume= 0.065 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 920.46' @ 12.21 hrs Surf.Area= 1,564 sf Storage= 550 cf

Plug-Flow detention time= 0.4 min calculated for 0.744 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (873.9 - 873.7)

Volume	Invert	Avail.Storage	Storage Description
#1	915.75'	1,792 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

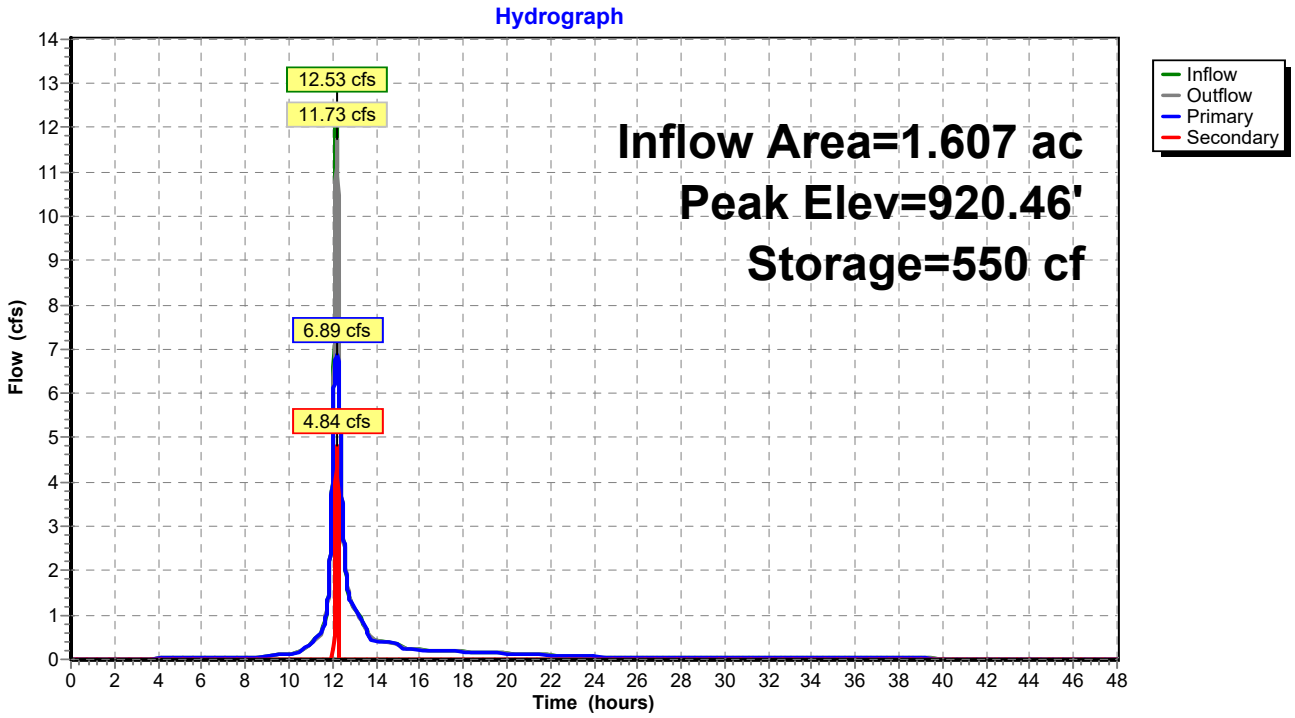
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.75	6	0	0
919.52	6	23	23
920.00	362	88	111
921.00	3,000	1,681	1,792

Device	Routing	Invert	Outlet Devices
#1	Primary	915.75'	12.0" Round Culvert L= 115.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.75' / 915.60' S= 0.0013 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	919.52'	2.0' long x 4.0' 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) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=6.89 cfs @ 12.21 hrs HW=920.46' (Free Discharge)
└1=Culvert (Barrel Controls 6.89 cfs @ 8.77 fps)

Secondary OutFlow Max=4.84 cfs @ 12.21 hrs HW=920.46' (Free Discharge)
└2=Broad-Crested Rectangular Weir (Weir Controls 4.84 cfs @ 2.59 fps)

Pond CB103: CB103



Summary for Pond CB104: CB104

Inflow Area = 0.790 ac, 6.20% Impervious, Inflow Depth = 5.17" for 100-year event
Inflow = 6.14 cfs @ 12.17 hrs, Volume= 0.340 af
Outflow = 5.97 cfs @ 12.19 hrs, Volume= 0.340 af, Atten= 3%, Lag= 1.2 min
Primary = 5.97 cfs @ 12.19 hrs, Volume= 0.340 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 918.83' @ 12.19 hrs Surf.Area= 208 sf Storage= 51 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (788.1 - 788.0)

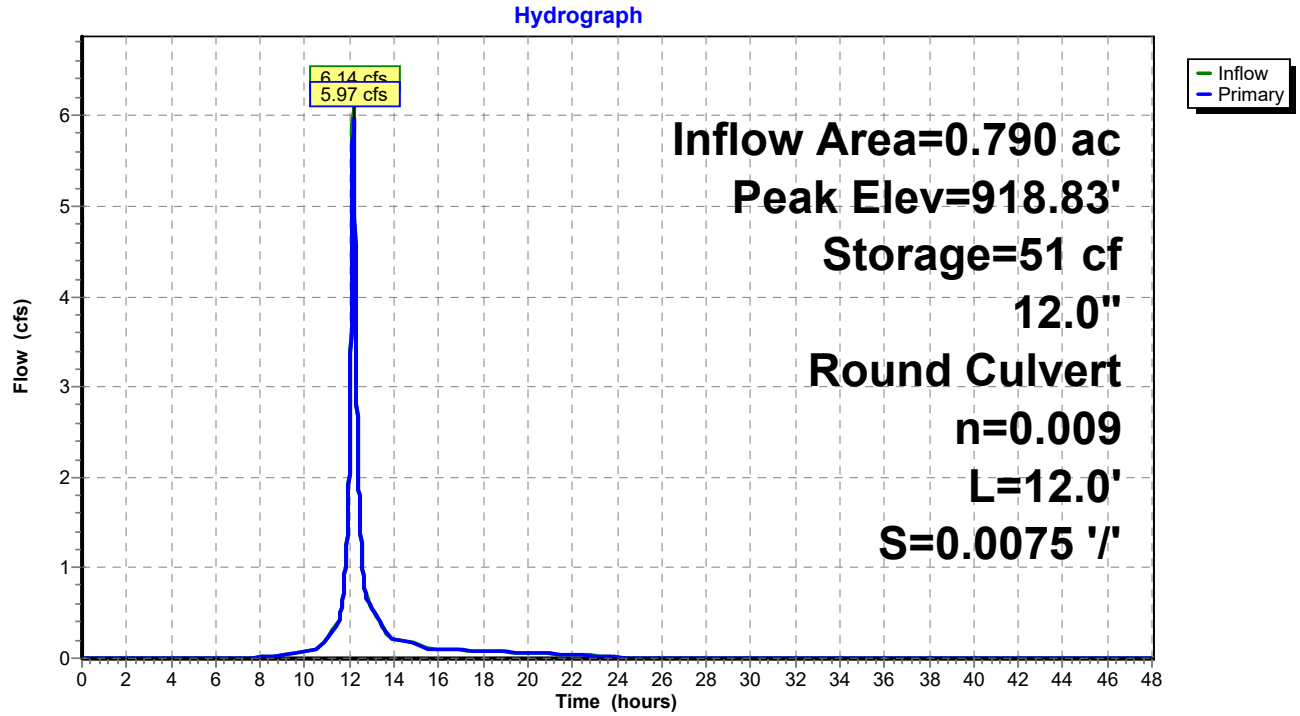
Volume	Invert	Avail.Storage	Storage Description
#1	915.84'	8,724 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
915.84	6	0	0
918.50	6	16	16
919.00	310	79	95
920.00	3,091	1,701	1,795
921.00	10,767	6,929	8,724

Device	Routing	Invert	Outlet Devices
#1	Primary	915.84'	**12.0" Round Culvert** L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 915.84' / 915.75' S= 0.0075 '/' Cc= 0.900 n= 0.009, Flow Area= 0.79 sf

Primary OutFlow Max=5.97 cfs @ 12.19 hrs HW=918.83' (Free Discharge)
↑—1=**Culvert** (Inlet Controls 5.97 cfs @ 7.60 fps)

Pond CB104: CB104



Summary for Pond CB106: CB106

Inflow Area = 0.228 ac, 48.68% Impervious, Inflow Depth = 6.06" for 100-year event
Inflow = 1.58 cfs @ 12.20 hrs, Volume= 0.115 af
Outflow = 1.58 cfs @ 12.20 hrs, Volume= 0.115 af, Atten= 0%, Lag= 0.0 min
Primary = 1.58 cfs @ 12.20 hrs, Volume= 0.115 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 918.90' @ 12.20 hrs Surf.Area= 1,725 sf Storage= 2 cf

Plug-Flow detention time= 0.0 min calculated for 0.115 af (100% of inflow)
Center-of-Mass det. time= 0.0 min (1,132.4 - 1,132.4)

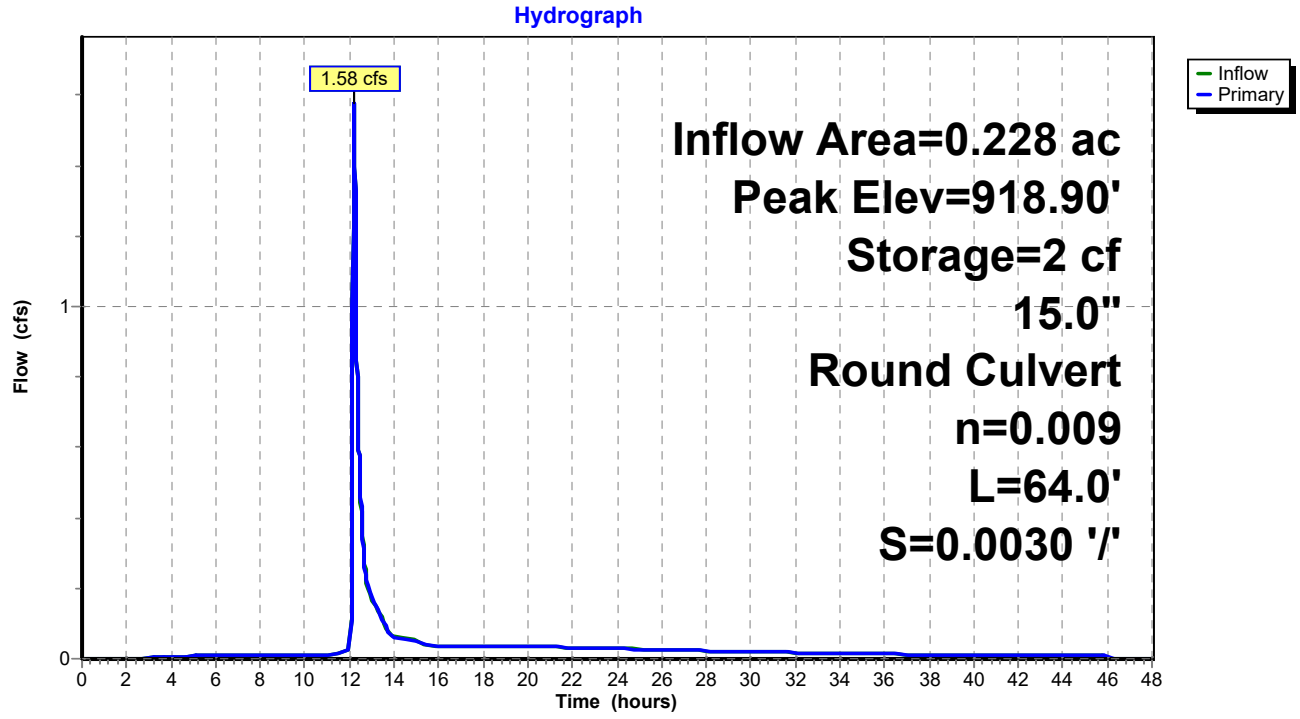
Volume	Invert	Avail.Storage	Storage Description
#1	918.90'	974 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
918.90	1,724	0	0
919.37	2,420	974	974

Device	Routing	Invert	Outlet Devices
#1	Primary	916.21'	15.0" Round Culvert L= 64.0' Ke= 0.500 Inlet / Outlet Invert= 916.21' / 916.02' S= 0.0030 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=8.45 cfs @ 12.20 hrs HW=918.90' (Free Discharge)
└1=Culvert (Barrel Controls 8.45 cfs @ 6.89 fps)

Pond CB106: CB106



Summary for Pond CB107: CB107

Inflow Area = 0.383 ac, 29.50% Impervious, Inflow Depth > 5.32" for 100-year event
Inflow = 3.31 cfs @ 12.17 hrs, Volume= 0.170 af
Outflow = 3.31 cfs @ 12.17 hrs, Volume= 0.170 af, Atten= 0%, Lag= 0.0 min
Primary = 3.31 cfs @ 12.17 hrs, Volume= 0.170 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 917.54' @ 12.17 hrs Surf.Area= 6 sf Storage= 7 cf

Plug-Flow detention time= 0.3 min calculated for 0.170 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (960.5 - 960.4)

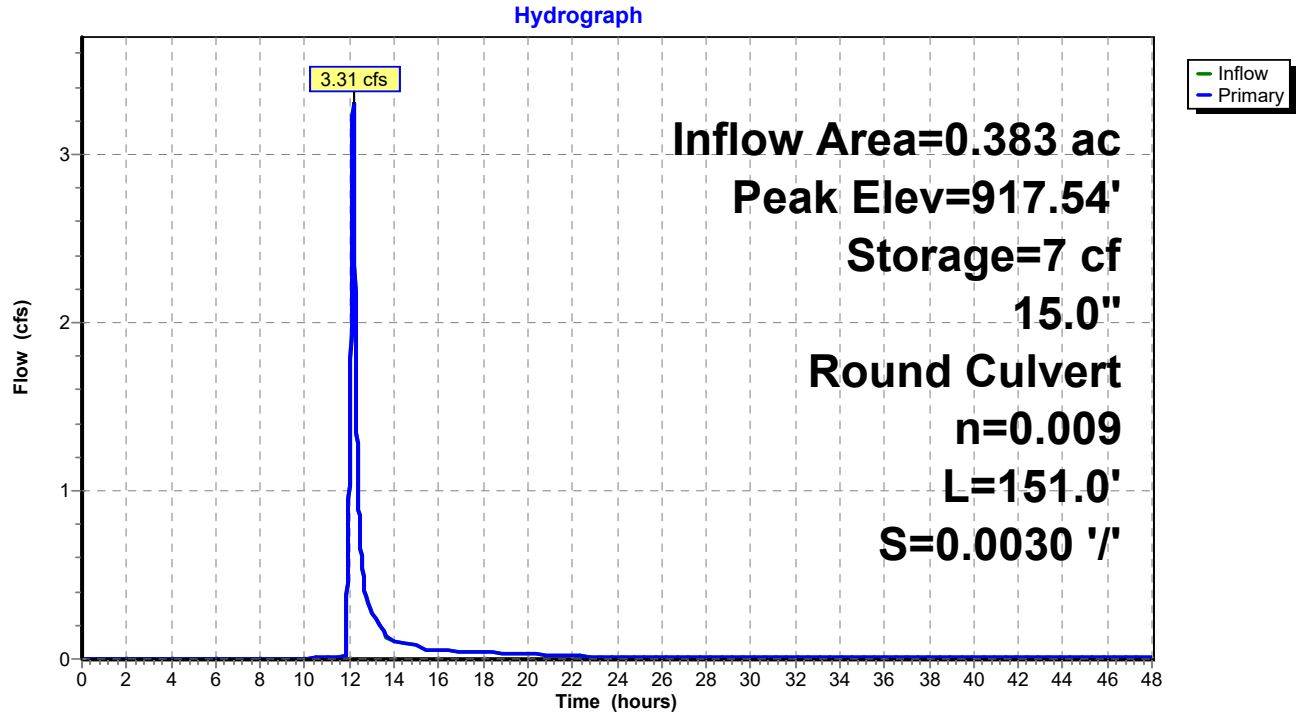
Volume	Invert	Avail.Storage	Storage Description
#1	916.40'	507 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.40	6	0	0
921.50	6	31	31
922.00	1,900	477	507

Device	Routing	Invert	Outlet Devices
#1	Primary	916.47'	15.0" Round Culvert L= 151.0' Ke= 0.500 Inlet / Outlet Invert= 916.47' / 916.02' S= 0.0030 '/' Cc= 0.900 n= 0.009 Corrugated PE, smooth interior, Flow Area= 1.23 sf

Primary OutFlow Max=3.30 cfs @ 12.17 hrs HW=917.54' (Free Discharge)
└1=Culvert (Barrel Controls 3.30 cfs @ 3.98 fps)

Pond CB107: CB107



Summary for Pond STMH 105: STMH 105

Inflow Area = 0.611 ac, 36.66% Impervious, Inflow Depth > 5.59" for 100-year event
Inflow = 4.75 cfs @ 12.18 hrs, Volume= 0.285 af
Outflow = 4.75 cfs @ 12.18 hrs, Volume= 0.285 af, Atten= 0%, Lag= 0.0 min
Primary = 4.75 cfs @ 12.18 hrs, Volume= 0.285 af

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 917.46' @ 12.18 hrs Surf.Area= 6 sf Storage= 9 cf

Plug-Flow detention time= 0.1 min calculated for 0.285 af (100% of inflow)
Center-of-Mass det. time= 0.1 min (1,030.0 - 1,029.9)

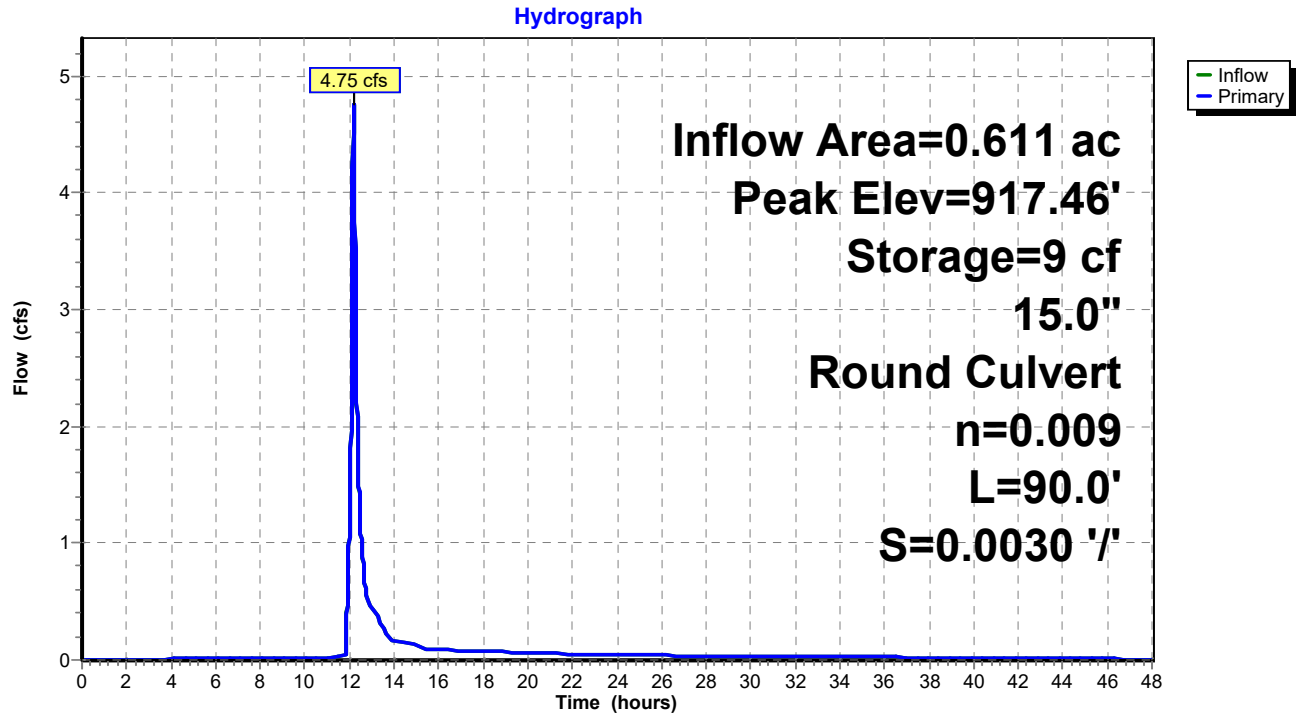
Volume	Invert	Avail.Storage	Storage Description
#1	916.03'	3,179 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
916.03	6	0	0
920.80	6	29	29
921.00	1,500	151	179
922.00	4,500	3,000	3,179

Device	Routing	Invert	Outlet Devices
#1	Primary	916.02'	**15.0" Round Culvert** L= 90.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 916.02' / 915.75' S= 0.0030 '/' Cc= 0.900 n= 0.009, Flow Area= 1.23 sf

Primary OutFlow Max=4.74 cfs @ 12.18 hrs HW=917.46' (Free Discharge)
└1=**Culvert** (Barrel Controls 4.74 cfs @ 4.22 fps)

Pond STMH 105: STMH 105



SECTION 7

WATER QUALITY SUMMARY

P8 Urban Catchment Model, Version 3.5				Run Date	01/11/17
Case	NWCC Water Quality.p8c	FirstDate	01/01/80	Precip(in)	294.6
Title	NWCC-New Hope	LastDate	08/31/89	Rain(in)	250.38
PrecFile	msp_4989.pcp	Events	696	Snow(in)	44.22
PartFile	nurp50.p8p	TotalHrs	84456	TotalYrs	9.63

Case Title	NWCC-New Hope
Case Data File	NWCC Water Quality.p8c
Path	F:\survey\northwest church addition - hennepin\1-2-1\SMP\170112\
Case Notes:	simple startup case one device (wet pond)
Storm Data File	msp_4989.pcp
Particle File	nurp50.p8p
Air Temp File File	msp_4889.tem

Time Steps Per Hour	4
Minimum Inter-Event Time (hrs)	10
Maximum Continuity Error %	2
Rainfall Breakpoint (inches)	0.8
Precipitation Scale Factor	1
Air Temp Offset (deg-F)	0
Loops Thru Storm File	1
Simulation Dates	
Start	1/1/1979
Keep	1/1/1980
Stop	8/31/1989

Max Snowfall Temperature (deg-f)	32.0
SnowMelt Temperature (deg-f)	32.0
Snowmelt Coef (in/degF-Day)	0.06
Soil Freeze Temp (deg-F)	32.0
Snowmelt Abstraction Factor	1.00
Evapo-Trans. Calibration Factor	1.00
Growing Season Start Month	5
Growing Season End Month	10

5-Day Antecedent Rainfall + Runoff (inches)		
CN Antecedent Moisture Condition	AMC-II	AMC-III
Growing Season	1.40	2.10
NonGrowing Season	0.50	1.10

Watershed Data		
Watershed Name	Watershed Basin 1	Watershed Basin 2
Runoff to Device	Grass Filter	Biofiltration Basin 2
Infiltration to Device		

Watershed Area	0.14	0.23
SCS Curve Number (Pervious)	80	80
Scale Factor for Pervious Runoff Load	1	1
Indirectly Connected Imperv Fraction	0	0
UnSwept Impervious Fraction	1	1
UnSwept Depression Storage (inches)	0.02	0.02
UnSwept Imperv. Runoff Coefficient	1	1
UnSwept Scale Factor for Particle Loads	1	1
Swept Impervious Fraction	0	0
Swept Depression Storage (inches)	0.02	0.02
Swept Imperv. Runoff Coefficient	1	1
Swept Scale Factor for Particle Loads	1	1
Sweeping Frequency	0	0
Sweeping Efficiency	1	1
Sweeping Start Date (MMDD)	101	101
Sweeping Stop Date (MMDD)	1231	1231

Device Data Device Name	Biofiltration Basin 1	Biofiltration Basin 2	Grass Filter
Device Type	INF_BASIN	INF_BASIN	SWALE
Infiltration Outlet			
Normal Outlet			Biofiltration Basin 1
Spillway Outlet			Biofiltration Basin 1
Particle Removal Scale Factor	0.7	0.7	1
Bottom Elevation (ft)	0	0	0
Bottom Area (acres)	0.009	0.005	
Permanent Pool Area (acres)			
Permanent Pool Volume (ac-ft)			
Perm Pool Infilt Rate (in/hr)			
Flood Pool Area (acres)	0.037	0.04	
Flood Pool Volume (ac-ft)	0.035	0.034	
Flood Pool Infilt Rate (in/hr)	0	0	0
Infilt Basin Void Fraction (%)	100	100	
Detention Pond Outlet Parameters			
Outlet Type			
Outlet Orifice Diameter (in)			
Orifice Discharge Coef			
Outlet Weir Length (ft)			
Weir Discharge Coef			
Perforated Riser Height (ft)			
Number of Holes in Riser			
Holes Diameter			
Flood Pool Drain Time (hrs)			
Swale Parameters			
Length of Flow Path (ft)			6

Slope of Flow Path %			2
Bottom Width (ft)			50
Side Slope (ft-v/ft-h)			0.02
Maximum Depth of Flow (ft)			0.5
Mannings n Constant			0.25
Hydraulic Model			0
Pipe, Splitter, Aquifer Parameter			
Hydraulic Res. Time (hrs)			

Particle Data					
Particle File	nurp50.p8p				
Particle Class	P0%	P10%	P30%	P50%	P80%
Filtration Efficiency (%)	90	100	100	100	100
Settling Velocity (ft/hr)	0	0.03	0.3	1.5	15
First Order Decay Rate (1/day)	0	0	0	0	0
2nd Order Decay (1/day-ppm)	0	0	0	0	0
Impervious Runoff Conc (ppm)	1	0	0	0	0
Pervious Runoff Conc (ppm)	1	100	100	100	200
Pervious Conc Exponent	0	1	1	1	1
Accum. Rate (lbs-ac-day)	0	1.75	1.75	1.75	3.5
Particle Removal Rate (1/day)	0	0.25	0.25	0.25	0.25
Washoff Coefficient	0	20	20	20	20
Washoff Exponent	0	2	2	2	2
Sweeper Efficiency	0	0	0	5	15

Water Quality Component Data							
Component Name	TSS	TP	TKN	CU	PB	ZN	HC
Water Quality Criteria (ppm)							
Level 1	5	0.025	2	2	0.02	5	0.1
Level 2	10	0.05	1	0.0048	0.014	0.0362	0.5
Level 3	20	0.1	0.5	0.02	0.15	0.38	1
Content Scale Factor	1	1	1	1	1	1	1
Particle Composition (mg/kg)							
P0%	0	99000	600000	13600	2000	64000	250000
P10%	1000000	3850	15000	340	180	1600	22500
P30%	1000000	3850	15000	340	180	1600	22500
P50%	1000000	3850	15000	340	180	1600	22500
P80%	1000000	0	0	340	180	0	22500

P8 Urban Catchment Model, Version 3.5				Run Date	01/11/17
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PartFile	nurp50.p8p	TotalHrs	84456	TotalYrs	9.63

Removal Efficiency (%)

Device	Type	QoMeancfs	QVolAcft	P0%	P10%	P30%	P50%	P80%	TSS	TP
OVERALL	NONE	0.00	9.1	0.00	76.13	87.77	94.51	99.27	91.39	60.64
Biofiltration Basin 2	INF_BASIN	0.00	5.4	0.00	72.95	84.75	92.53	98.90	89.61	58.72
Grass Filter	SWALE	0.00	3.7	0.00	13.49	49.48	76.94	96.01	66.39	32.83
Biofiltration Basin 1	INF_BASIN	0.00	3.7	0.00	79.14	85.99	90.57	97.16	83.63	46.27