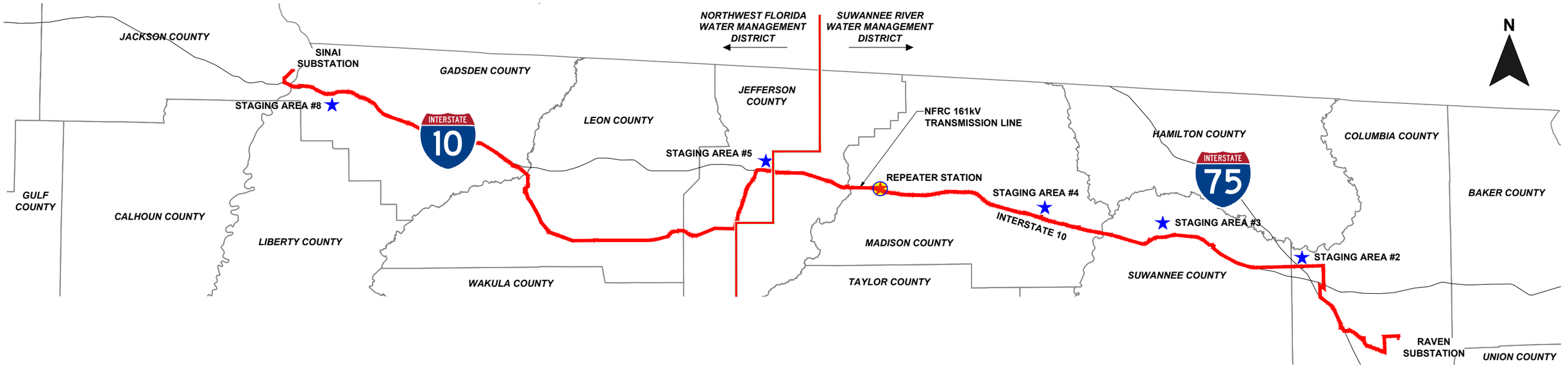
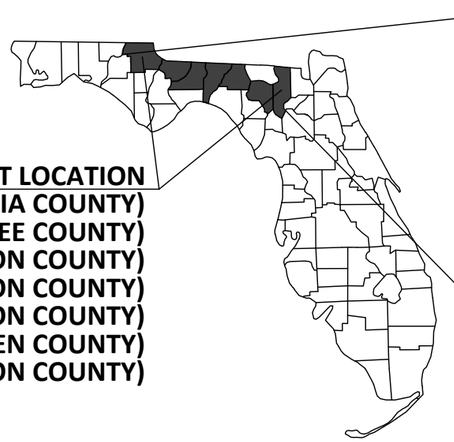
GULF POWER COMPANY

NFRC TRANSMISSION LINE PROJECT 2

REPEATER STATION

SITE PLAN EXHIBIT





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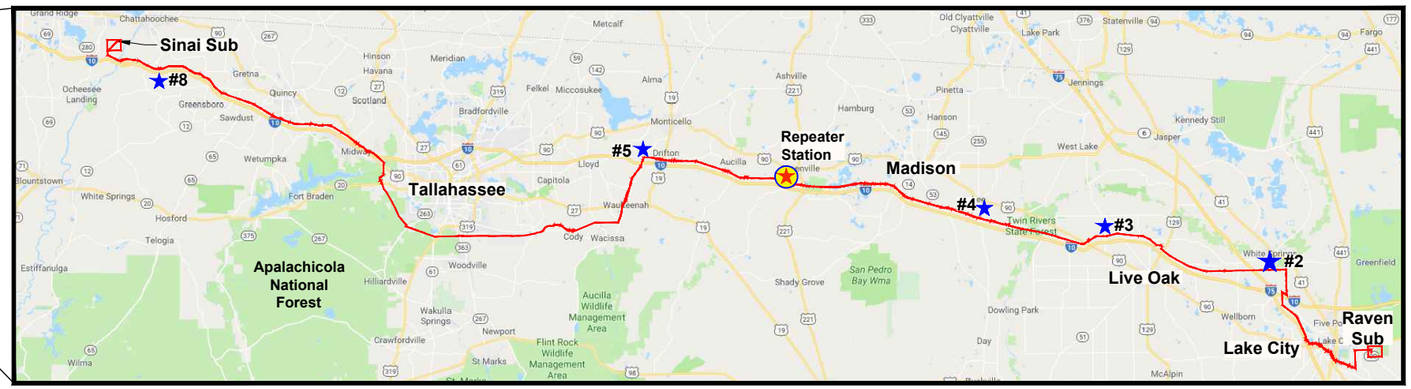

2 **LEGEND**

- PROPOSED STAGING AREAS & REPEATER STATION

Know what's **below.** before you dig.

C O N T E N T S

2

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CA #31323 LB #364

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STATE OF FLORIDA — PROFESSIONAL ENGINEER — MICHAEL K. LEAHY — No 45287

03-18-20

MICHAEL K. LEAHY
FLORIDA LICENSED PROFESSIONAL ENGINEER No. 45287
PROFESSIONAL SURVEYOR & MAPPER No. 5658

Michael Leahy, P.E., P.S.M.
Digitally signed by Michael Leahy, P.E., P.S.M.
Date: 2020.03.17 22:30:57 -04'00'

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2	3/18/20	REVISIONS, CLARIFICATIONS FOR RAI#2 RESPONSE 12-20-19	GCC	JJB	MKL
1	11/22/19	REVISIONS, CLARIFICATIONS FOR RAI RESPONSE 11-22-19	GCC	JJB	MKL

TRANSMISSION ENGINEERING DEPARTMENT

NORTH FLORIDA RESILIENCY CONNECTION (NFRC)
REPEATER STATION SITE PLAN EXHIBIT
FOR TEMPORARY USE AS LAYDOWN YARDS

SCALE: N.T.S.	ENGINEER: MKL	SECTION: AS SHOWN	
DRAFTER: GCC	CHECKED: JJB	COUNTY: MADISON	
SHEET: 1 OF 3		FILE NAME: NFRC_EXH_REPEATER_R02.dwg	

Gulf Power

REPEATER STATION SITE PLAN EXHIBIT

CAD FILE: S:\Projects\108_Gulf Power\19-108-1002_Roven-Sinai 161kV Line Detailed Engineering\Drawings\Staging Areas Exhibit\NFRC_Exh_Repeater_R02.dwg PLOT DATE/TIME: 3/17/2020 - 5:15pm BY: Guido Controni

Repeater Station - Madison County - SRWMD
SW Overstreet Avenue, Greensville, FL
PID 32-1N-07-2601-000-000

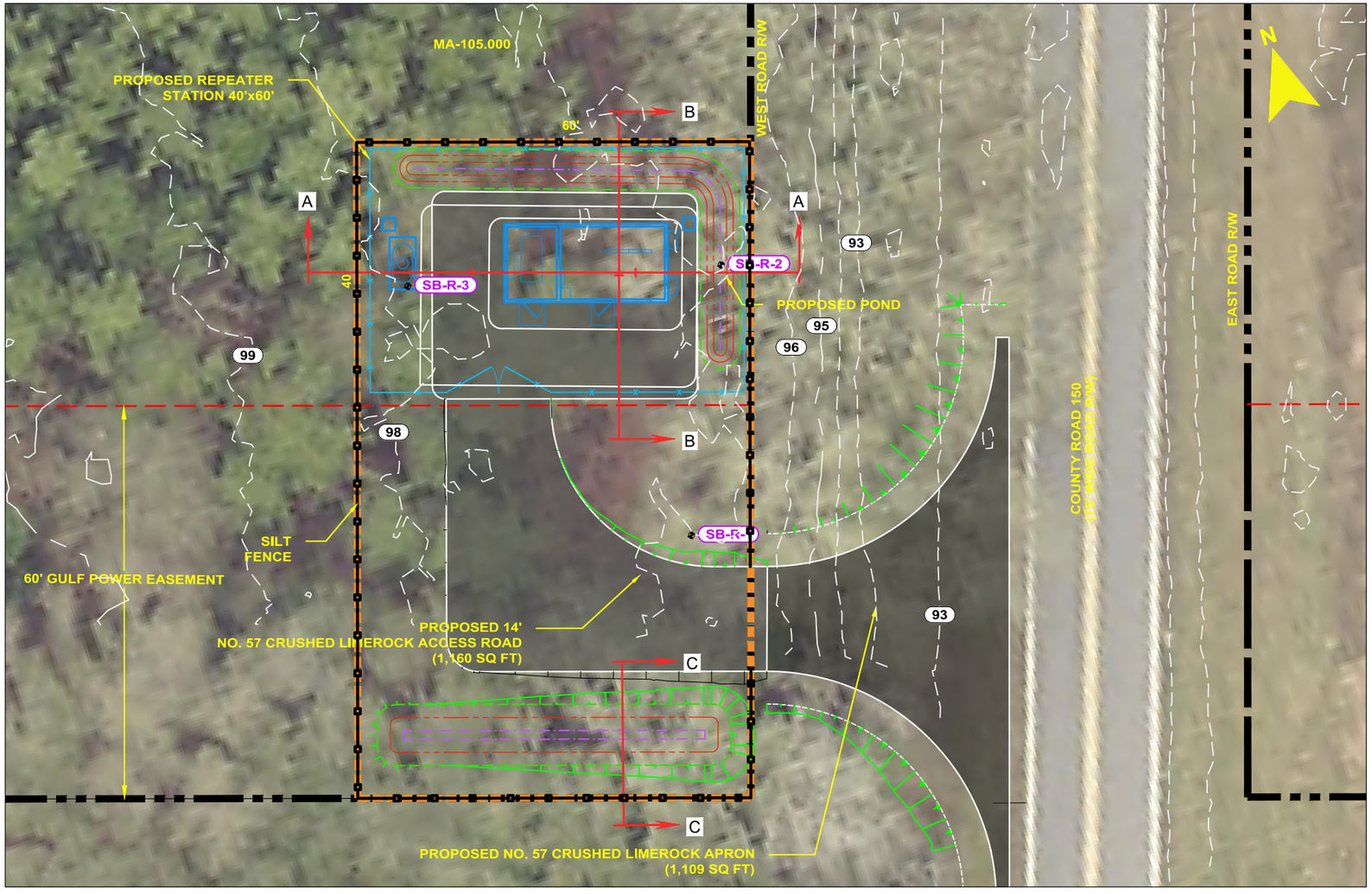
SEE SHEET 3 FOR TYPICAL CONSTRUCTION DETAILS DETAILS

Table 3: Pond Storage Data

Basin No.	Elevation (ft, NAVD 88)		Area (ac)	Provided Volume (acft)	Required Volume (acft)	Provided Discharge at Weir (cfs)
I.1 South	Top of Pond	98.0	0.003	0.101	0.019	0.53
	Peak Water Elev.	96.0				
	Weir Elev.	97.0				
	Bottom of Pond	96.0	0.001			
I.2 North	Top of Pond	98.0	0.004	0.034	0.033	1.26
	Peak Water Elev.	97.0				
	Weir Elev.	96.9				
	Bottom of Pond	96.5	0.002			

Table 4: Summary of Treatment Volume and Recovery

Basin No.	Treatment Volume Required (acft)	Treatment Volume Provided (acft)		Recovery Time (hrs)
		Rock Voids	Water Quality Basins	
I	0.006	0.004	Not Required for Treatment	2



FLOOD ZONE NOTES:

1. FLOOD ZONE INFORMATION BASED ON THE GADSDEN COUNTY, FLORIDA FLOOD INSURANCE RATE MAPS:

   MAP NUMBER 12079C0235C (DATED 05-03-10)

2. APPLICABLE FLOOD ZONE DELINEATIONS PER THE ABOVE REFERENCED FLOOD INSURANCE RATE MAP ARE AS FOLLOWS:

   ZONE X AREA OUTSIDE THE 100-YEAR FLOOD PLAIN

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L E G E N D

PROPOSED TEMPORARY STAGING AREA MATERIALS
- L AT-GRADE ROCK LAYDOWN
- R AT-GRADE GEOWEB ROAD
- C CRUSHED ROCK APRON
- ×139.5 PROPOSED GRADE

PROPOSED PONDS & DITCHES
- TOP OF BANK
- GRADE BREAK
- TOE OF SLOPE
- P/D PROPOSED POND/DITCH

WETLAND AREAS
- WETLAND AREA
- SURFACE WATER AREA
- 139.5 EXISTING GRADE
- DRAINAGE BASIN AREA BOUNDARY

PROPOSED FENCE & GATES
- PROPOSED GATE
- PROPOSED FENCE

EXISTING BOUNDARIES
- FEMA 100-YEAR FLOOD PLAIN LINE
- EASEMENT
- PROPERTY LINE
- SECTION LINE
- RIGHT-OF-WAY LINE
- EXISTING FENCE
- PROPOSED SILT FENCE

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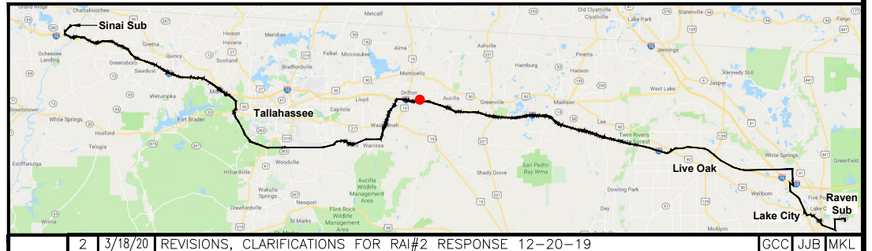
STATE OF FLORIDA PROFESSIONAL ENGINEER MICHAEL K. LEAHY No 45287 PROFESSIONAL SURVEYOR

03-18-20

MICHAEL K. LEAHY
FLORIDA LICENSED PROFESSIONAL ENGINEER No. 45287
PROFESSIONAL SURVEYOR & MAPPER No. 5658

0 100 200
1 INCH = 200 FEET



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TRANSMISSION ENGINEERING DEPARTMENT

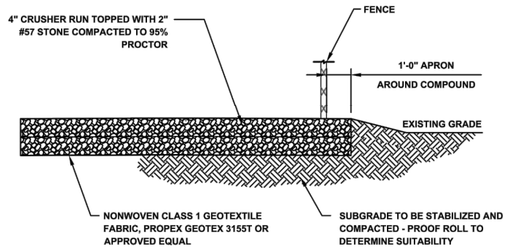
NORTH FLORIDA RESILIENCY CONNECTION (NFRC)
REPEATER STATION SITE PLAN EXHIBIT
SHOWING EXISTING BORINGS AND SITE PLAN REFERENCE

SCALE: N.T.S.	ENGINEER: MKL	SECTION: AS SHOWN	
DRAFTER: GCC	CHECKED: JJB	COUNTY: MADISON	
SHEET: 2 OF 3		FILE NAME: NFRC_EXH_SA02_R02.dwg	

Gulf Power

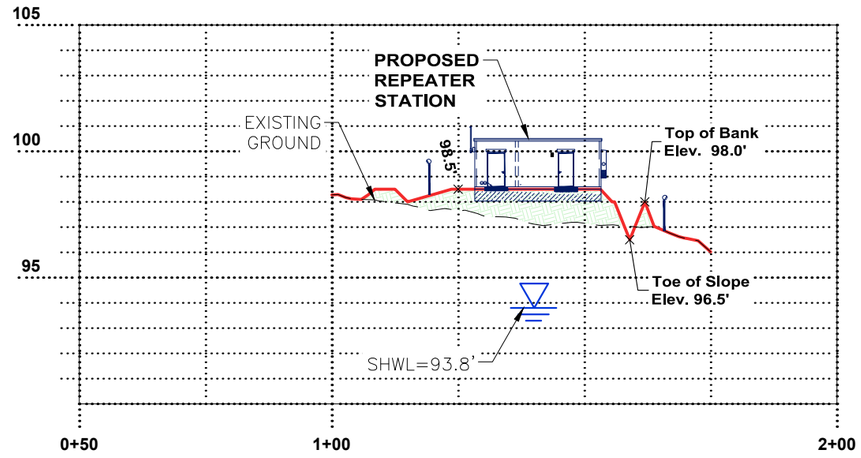
NFRC REPEATER STATION EXHIBIT

Repeater Station - Madison County - SRWMD
SW Overstreet Avenue, Greensville, FL
PID 32-1N-07-2601-000-000

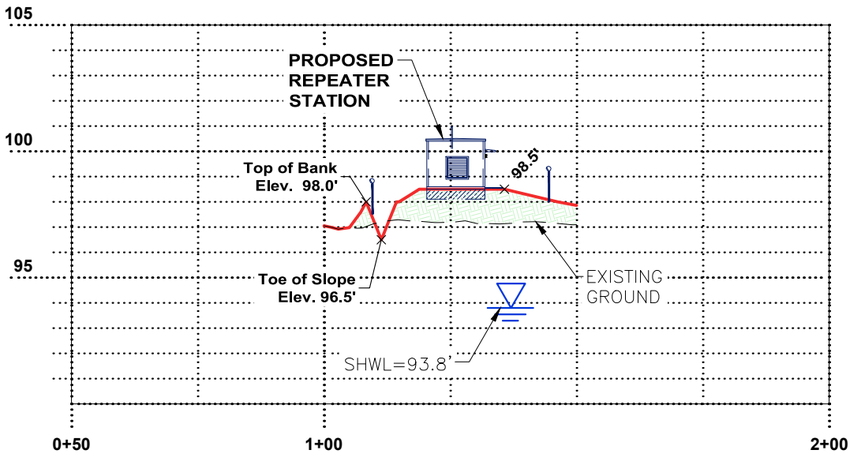


TYPICAL COMPOUND SECTION

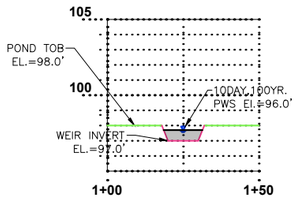
DETAIL 2 / NTS -



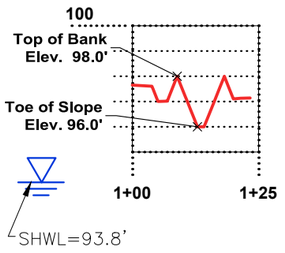
SITE BASIN I
CROSS SECTION VEIW A-A
LOOKING SOUTHEAST
HORZ. SCALE = 1" = 30'
VERT. SCALE = 1" = 6'



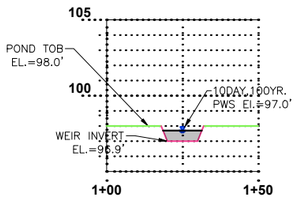
SITE BASIN I
CROSS SECTION VEIW B-B
LOOKING SOUTHEAST
HORZ. SCALE = 1" = 30'
VERT. SCALE = 1" = 6'



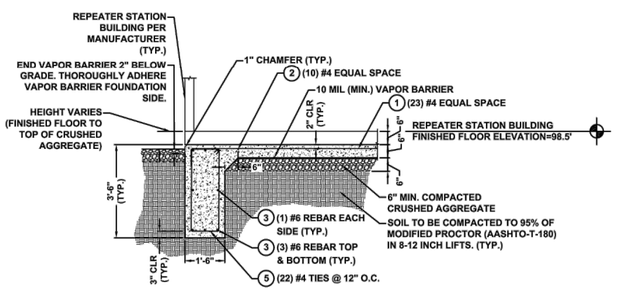
SITE BASIN I
WEIR CROSS SECTION
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10



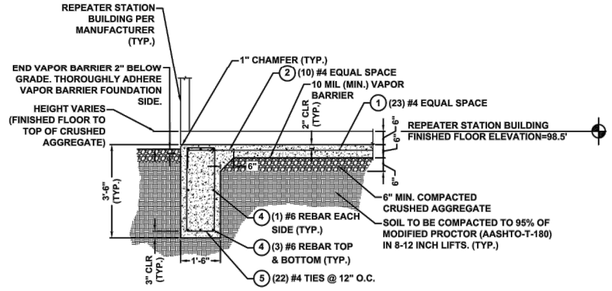
SITE BASIN I
CROSS SECTION VEIW C-C
LOOKING EAST
HORZ. SCALE = 1" = 30'
VERT. SCALE = 1" = 6'



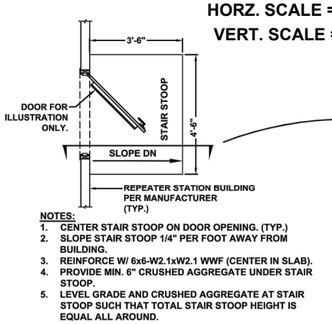
SITE BASIN I
WEIR CROSS SECTION
HORZ. SCALE = 1" = 50'
VERT. SCALE = 1" = 10



SECTION A - FOUNDATION DETAIL
N.T.S.

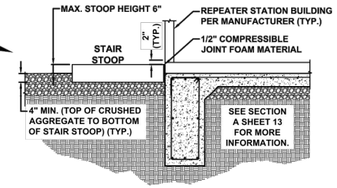


SECTION B - FOUNDATION DETAIL
N.T.S.

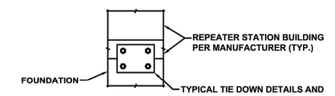


NOTES:
1. CENTER STAIR STOOP ON DOOR OPENING. (TYP.)
2. SLOPE STAIR STOOP 1/4" PER FOOT AWAY FROM BUILDING.
3. REINFORCE W/ 6x6-W2.1xW2.1 WWF (CENTER IN SLAB).
4. PROVIDE MIN. 6" CRUSHED AGGREGATE UNDER STAIR STOOP.
5. LEVEL GRADE AND CRUSHED AGGREGATE AT STAIR STOOP SUCH THAT TOTAL STAIR STOOP HEIGHT IS EQUAL ALL AROUND.

TYPICAL STAIR STOOP PLANS
N.T.S.



TYPICAL STAIR STOOP DETAIL
N.T.S.



NOTE:
BUILDING MANUFACTURER SHALL USE ANCHORS THAT DO NOT CONFLICT WITH THE CONCRETE REINFORCEMENT DURING INSTALLATION.

SECTION C - TYPICAL BUILDING TIE DOWN
N.T.S.

LEGEND

EXISTING GROUND
PROPOSED GROUND

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STATE OF FLORIDA
03-18-20
MICHAEL J. LEAHY
FLORIDA LICENSED PROFESSIONAL ENGINEER No. 45287
PROFESSIONAL SURVEYOR & MAPPER No. 5658

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TRANSMISSION ENGINEERING DEPARTMENT

NORTH FLORIDA RESILIENCY CONNECTION (NFRC)
REPEATER STATION SITE PLAN EXHIBIT

SCALE: N.T.S.	ENGINEER: MKL	SECTION: AS SHOWN	
DRAFTER: GCC	CHECKED: JJB	COUNTY: MADISON	
SHEET: 3 OF 3		FILE NAME: NFRC_EXH_SA02_R02.dwg	

Gulf Power

NFRC REPEATER STATION EXHIBIT

Repeater Station

Stormwater Calculations

for the

North Florida Resiliency Connection Project

Gulf Power
15430 Endeavor Drive
Jupiter, FL 33478

Prepared by:

Pickett and Associates, Inc.
5025 W. Grace Street
Tampa, FL 33607

Table of Contents

1.0 Site Data

Madison County – SRWMD
SW Overstreet Ave., Greensville, FL
PID 32-1N-07-2601-000-000
Basin Area = 0.55 acres
Developed Area = 0.15 acres
Flood Zone X per FRIM Map 12079C0235C effective 05-03-10
Design Storm, Non Ag: 100 year, SCS Type II Distribution. 1-, 2-, 4-, 8-, 24-hour and 3-, 7-, and 10-day duration.
Recovery (Attenuation)

1. Provide treatment volumes within 72 hours following the end of the design storm event.

2.0 Project Narrative

Temporary Staging Area #2 will stage and store construction materials (poles, conductor, insulators, etc.) and equipment (drill rigs, line trucks, cranes, etc.). The developed area will consist of an at grade #57 crushed limerock surface to facilitate the storage of poles and equipment along with a perimeter road to facilitate access. The site has been reviewed to ensure that existing surface water flow will not be impeded and existing water quality will not be adversely impacted. All proposed semi-pervious material will be installed at the existing natural ground elevation throughout the site to prevent impedance of the existing watershed.

The staging area will use the void space between the #57 crushed limerock for storage for the first 1" of runoff. Gulf Power has done extensive testing on this void ratio and has determined that a 35% void ratio provides a good conservative value. In addition to utilizing the voids for storage, each site will have a swale / berm constructed on the low side(s) of each to ensure no stormwater runoff escapes to adjacent properties. Each site will also have a dry retention pond to account for attenuation. The ponds will be designed to recover within 72 hours. Soil Borings and Double Ring Infiltrometer Testing have been performed at each site to facilitate the design of each dry pond. The site will use the interior uncompacted gravel as additional area for recovery by incorporating the use of a check dam system. Since the site has a slight grade change, an impervious, flexible water barrier (CR-PE12-20) will be installed along each contour line to slow the progression of water over the site to allow recovery within 72 hours. This is detailed in the construction drawings.

The staging area will remain in place for the duration of the project. At the conclusion of the project, each staging area will be returned to its pre-construction state. The anticipated duration is approximately 12 – 18 months.

Construction and maintenance access to each staging area will be gained via existing road right-of-way. Connector aprons will be constructed in accordance with county / state requirements.

Deliveries and active use of staging areas will be consistent with construction hours.

No tree removal will be necessary to facilitate construction of staging area #2.

3.0 Repeater Design Criteria

The SCS TR-20 method was used to calculate the pre and post-development peak runoff. The time of concentration was generated from the sheet, shallow concentrated flow and Lag/CN method. A complete list of the procedure follows.

Assumptions and Methodology

The SRWMD requires that the difference between the 100-year pre-developed and post-developed storm volume be stored on-site with the maximum release rate not exceed the pre developed flow, Q. Per the SRWMD Handbook, the 100-year storm shall be evaluated for the greatest of the 1, 2, 4, 8, and 24 hour, 3, 7, and 10 days storms.

- Storm Frequency – Type II 100 Year, 1, 2, 4, 8, and 24 hour, 3, 7, and 10 day storms
- Runoff Curve Number – Weighted Curve Numbers were calculated for each area
    - Existing Conditions Curve Number Range: 73
    - Post-Developed Condition Curve Number Range: 75-98
- Calculation of Time of Concentrations
    - Lag/CN Method – Which is used for areas of 2000 acres or less. The formula is provided below:
        - $T_c = 0.00526 \times L^{0.8}(1000/CN-9)^{0.7} \times S^{-0.5}$
- Peak Flow Rate Calculations – HydroCAD Version 10.0
- Pond Recovery Calculations – PONDS Version 3.3

Pre-Development Summary

The Repeater Station has mild slopes of up to 2% and generally consists of grasses and small shrubs. Table 1 below includes the results of the pre-development drainage area runoff calculations for the peak flow. These were developed using the topography which can be seen on the plan set and HydroCAD (Appendix B). Table 1 summarizes the peak flows for the various 100-year design storm in the pre-developed condition. The storm with the greatest runoff volume was used in the calculations. In this case, the 100-year, 10-day storm generated the greatest runoff and thus was used as the design storm.

Table 1: Pre-Developed Peak Discharge

Sub-Basin	Area (Acre)	Weighted CN	Time of Concentration (Min.)	Type II, 100-Year Storm, Q_{100} (CFS)							
				1 HR	2 HR	4 HR	8 HR	24 HR	3 DAY	7 DAY	10 DAY
I	0.55	60	7.4	0.00	0.00	0.00	0.07	1.10	1.59	1.89	2.30

Post-Development Summary

Upon completion of construction, the Repeater Station will consist of uncompacted gravel yard with compacted gravel drives and the repeater station shelter. Water quality basins will be generally located at low points in each sub-basin within the site. Table 2 below includes the results of the post-development calculations for the 100-year, 1, 2, 4, 8, and 24 hour, 3, 7, and 10 day peak flows. These

were developed using the topography which can be seen on the plan set and HydroCAD (Appendix B). The difference between the pre-development and post-development storm will be contained within the pond, and anything greater will be conveyed through the outflow weir per the Suwannee River Management District Design Requirement. The storm with the greatest runoff volume was used in the calculations. Again, in this case, the 100-year, 10-day storm generated the greatest runoff and thus was used as the design storm.

Table 2: Post-Developed Peak Discharge											
Sub-Basin	Area (Acre)	Weighted CN	Time of Concentration (Min.)	Type II, 100-Year Storm, Q_{100} (CFS)							
				1 HR	2 HR	4 HR	8 HR	24 HR	3 DAY	7 DAY	10 DAY
I	0.55	73	9.4	0.00	0.00	0.00	0.09	1.36	1.84	2.13	2.52

Table 3 below summarizes the stormwater quality basin design and key pond elevations with required and provided volumes. It shows that each basin provides the required amount of freeboard (1-foot) and storage required to retain the peak runoff. Peak water surface elevation calculations for detention ponds were developed using HydroCAD (Appendix B).

Table 3: Pond Storage Data						
Basin No.	Elevation (ft, NAVD 88)		Area (ac)	Provided Volume (acft)	Required Volume (acft)	Provided Discharge at Weir (cfs)
I.1 South	Top of Pond	98.0	0.003	0.101	0.019	0.53
	Peak Water Elev.	96.0				
	Weir Elev.	97.0				
	Bottom of Pond	96.0	0.001			
I.2 North	Top of Pond	98.0	0.004	0.034	0.033	1.26
	Peak Water Elev.	97.0				
	Weir Elev.	96.9				
	Bottom of Pond	96.5	0.002			

Water Quality/Treatment Methodology

The SRWMD Handbook requires that all stormwater management systems provide the minimum state water quality treatment requirements. The method utilized for this project consists of one or a combination of percolation in the existing soils within the rock voids of the laydown storage and/or percolation within the stormwater quality basin. To determine the treatment runoff volume, the first 1.0-inch of rainfall was used along with the composite runoff coefficient for each sub-basin. This was compared with the volume from the first 0.5-inch rainfall without the coefficient. The greater volume was used for treatment evaluation and recovery. The calculations can be found starting on Page 7.

Recovery was calculated utilizing the PONDS software, as approved by the district. The rate of recovery was calculated within both the rock voids and if needed, the water quality basins. To model the rock voids, we calculated the available void space within the laydown area using a 35% uncompacted void ratio. An adjusted stage-storage table was input into the PONDS model utilizing a one-half foot

increment stage, which corresponds to the height of the check dam. All treatment volumes must recover within 72-hours. See Table 4 for a summary of treatment volumes and recovery times for each sub-basin within the staging area.

Table 4: Summary of Treatment Volume and Recovery

Basin No.	Treatment Volume Required (acft)	Treatment Volume Provided (acft)		Recovery Time (hrs)
		Rock Voids	Water Quality Basins	
I	0.006	0.004	Not Required for Treatment	2

Water Quality Recovery Volume Calculations

BASIN I:

Areas:

$$Total\ Area = (6{,}326\ S.F.) \times \left(\frac{1Ac.}{43{,}560\ S.F.}\right) = 0.15\ Ac.$$

$$Crushed\ Rock\ for\ Laydown\ Area = (973\ S.F.) \times \left(\frac{1Ac.}{43{,}560\ S.F.}\right) = 0.02\ Ac.$$

$$Crushed\ Rock\ Road\ Area\ = (1{,}283\ S.F.) \times \left(\frac{1Ac.}{43{,}560\ S.F.}\right) = 0.03Ac.$$

$$Pond\ Area = (284\ S.F.) \times \left(\frac{1Ac.}{43{,}560\ S.F.}\right) = 0.007\ Ac.$$

$$Building\ Area/\ Concrete = (397\ S.F.) \times \left(\frac{1Ac.}{43{,}560\ S.F.}\right) = .009\ Ac.$$

$$Grass\ Area = 0.015\ Ac. - 0.02\ Ac. - 0.03\ Ac. - 0.007\ Ac. - 0.009\ Ac. = 0.084\ Ac.$$

Composite Runoff Coefficient:

$$C\ = \frac{[(C_{rock\ laydown}\ x\ Area) + (C_{rock\ road\ area}\ x\ Area) + (C_{pond\ area}\ x\ Area) + (C_{building} x\ Area)\ +\ (C_{grass}\ x\ Area)]}{Total\ Project\ Area}$$

$$C\ = \frac{[(0.5\ x\ 0.02\ Ac.)\ +\ (0.7\ x\ 0.03\ Ac.)\ +\ (1.0\ x\ 0.007\ Ac.) + (1.0\ x\ 0.009Ac.)\ +\ (0.17\ x\ 0.084\ Ac.)]}{.15}$$

$$= 0.28$$

Total Treatment Volume from 1 inch of Rainfall:

$$Treatment\ Volume\ = (C) \times\ (1\ inch) \times\ (Project\ Contributing\ area)$$

$$Treatment\ Volume\ =\ (.28) \times\ (1\ in.) \times\ (0.15Ac.) \times \left(\frac{1Ft.}{12\ in.}\right) = 0.0035\ Ac. - Ft.$$

Total Treatment Volume from ½ inch of Rainfall:

$$Treatment\ Volume\ = (0.5\ inch) \times\ (Project\ Contributing\ area)$$

$$Treatment\ Volume\ =\ (0.5in.) \times\ (0.15Ac.) \times \left(\frac{1Ft.}{12\ in.}\right) = 0.006Ac. - Ft.$$

The treatment volume for the project is the larger value, **0.006 Ac.-Ft**.

Appendix A – Geotechnical Investigation

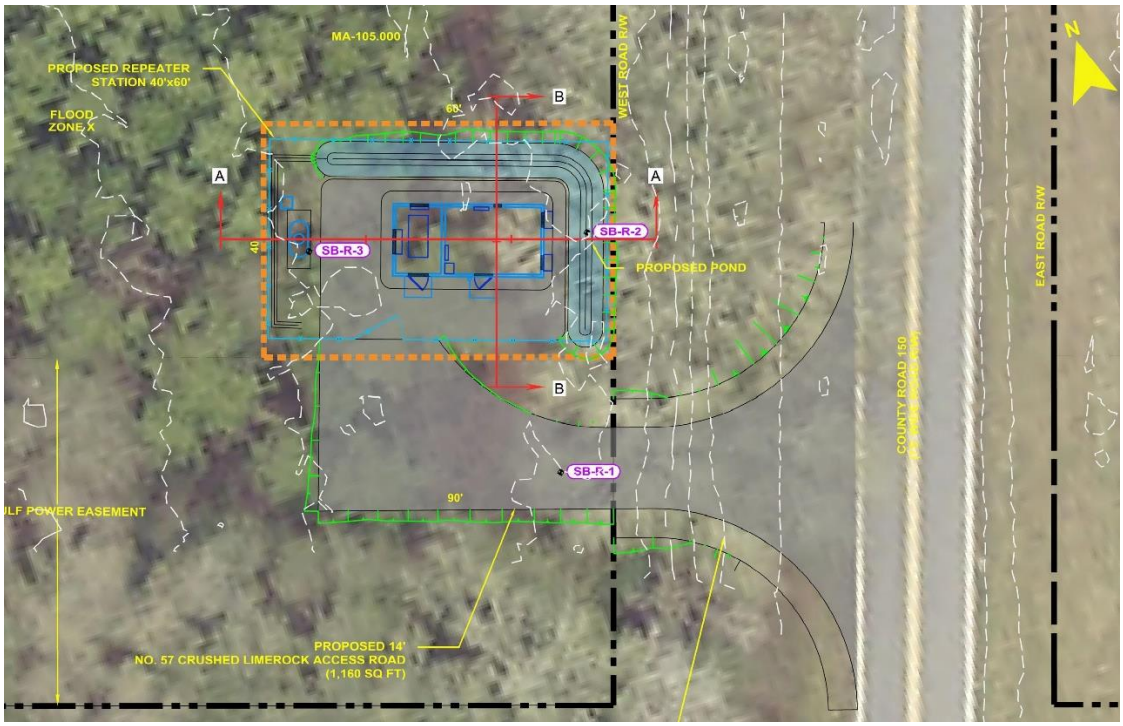
BJ ROCK GEOENGINEERING

GEOTECHNICAL REPORT

PICKETT SURVEYING • ENGINEERING

Gulf Power®

NFRC REPEATER STATION MA-105



MADISON COUNTY, FLORIDA

MARCH 2020

BJR 19-198B

March 13, 2020

Mike Leahy, P.E.
Pickett & Associates
5025 W. Grace Street
Tampa, FL 33607

Geotechnical Exploration Report
NFRC Repeater Station MA-105
Madison County, Florida
BJR No. 19-198B

Dear Mr. Leahy:

BJ Rock, LLC (BJR) has completed the geotechnical exploration for the referenced project as authorized by Pickett & Associates for Gulf Power. The purposes of this study were to explore general subsurface conditions for the proposed staging areas and to use the data obtained to develop engineering recommendations to guide the design of the planned ponds/swales. This report describes our exploration procedure, presents the data obtained, and presents our conclusions and recommendations regarding the geotechnical engineering aspects of the design.

BJR appreciates the opportunity to participate in this project and we trust that the information included in this report is sufficient for your design. If you have any questions or comments concerning the contents of this report, please contact us.

Sincerely,

BJ Rock, LLC
BJR FL Certificate of Authorization No. 29100

JOHN CHANNING PEAK LICENSE No. 57018 STATE OF FLORIDA PROFESSIONAL ENGINEER
03/13/2020

John C. Peak, P.E.
Sr. Geotechnical Engineer
FL P.E. License No. 57018

TABLE OF CONTENTS

ATTACHMENTS

PROJECT INFORMATION

Existing Site

Based on the information provided for our review from Pickett & Associates, we understand a repeater station area is planned off CR150, north of I-10 in Madison County, Florida (Figure 1).

Project Approach

The objective of the geotechnical investigation for the proposed project was to obtain information concerning the subsurface conditions in order to make geotechnical engineering estimates and recommendations in each of the following areas:

- Soil stratigraphy at the boring locations and the development of the approximate soil profile.
- General location and description of potentially deleterious materials which may interfere with construction or new structure performance, including buried or surficial existing fills, organics, construction debris, etc.
- Identification of some critical design or construction details, including present groundwater levels, estimated wet season levels, and seasonal fluctuations in the specified areas.

Scope of Work

In order to address the above objectives, our scope of work for this project included the following:

- Reviewed available published information on the site, including the United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) soil survey data for Madison County.
- Conducted a subsurface exploration program consisting of the advancement of auger borings with DRI / field permeability testing for the pond/swales, subsurface sampling, and field testing.
- Measured the stabilized groundwater levels at the boring locations.
- Reviewed and visually classified the recovered soils in the laboratory using the Unified Soil Classification System (ASTM D 2487). Developed the general soil stratigraphy at the boring locations.
- Performed geotechnical engineering studies and analyses in order to develop geotechnical engineering recommendations for each of the objectives previously discussed for the proposed project.
- Performed stormwater pond recovery analysis per referenced staging area. Analysis performed by our subconsultant, Native GeoSciences, Inc.
- Prepared a geotechnical report that summarizes the course of our study, the field and laboratory data generated, the subsurface conditions encountered, stormwater pond recovery analysis results and our geotechnical engineering recommendations for the proposed project.

Soil Survey Review

According to the USDA NRCS "Soil Survey of Madison County", the soil types generally present on the site are attached in the appendix and are generalized as follows: *Blanton sand, Albany sand and Plummer sand and Dorovan and Pamlico soils depressional.*

SUBSURFACE EXPLORATION

Field Exploration Procedures

The procedures used by BJ Rock, LLC for field sampling and testing are in general accordance with industry standards of care and established geotechnical engineering practice. BJR performed 3 auger borings to approximate depths of up to 5 feet each with 3 field permeability tests at the proposed locations.

Our staff located the staked borings in the field per the plans and field information provided by Pickett & Associates. The approximate testing locations are noted on the provided Field Test Location Plan (Figure 1) in the Appendix. The standards and procedures for the Standard Penetration Test (SPT) Boring and soil sample handling and classification are described in our Field Testing Standards and Procedures in the Appendix.

Field Exploration Results

Subsurface Conditions

The auger borings generally encountered fine to silty fine sands and sandy clays to an approximate depth of 5 feet below existing grade. The soil testing results are shown on the attached Soil Boring Logs (Figure 2) in the Appendix.

Field Permeability Test

The field permeability falling head tests were performed at the specified location on the site as shown on Figure 2 in the Appendix. The tests were performed at approximate depth of $1^{+/-}$ feet below existing grade. The tests were performed utilizing slotted casing seated in a uniform soil condition. The results of the tests are as follows:

Recommended Existing Groundwater Parameters for Pond Design				
STAGING AREAS - NFRC TRANSMISSION LINE FPL				
Test	**Test Depth (ft)**	**Vertical Infiltration (ft/day)**	**Estimated Horizontal Infiltration (ft/day)***	**Recommended SHGWL Depth (ft)**
R-1	1	0.6	1.2	3
R-2	1	0.9	1.8	3
R-3	1	0.4	0.8	2
*	Estimated horizontal permeability rate is 2x the vertical permeability test result.			
Note:	Horizontal and vertical permeability rates do not include a factor of safety.			

Groundwater

Groundwater was not encountered to an approximate depth of 5 feet below existing ground surface in the soil test borings performed in January 2020. Based on our past site experience, the results of our investigation, and our review of the NRCS soil survey, it is our opinion that the seasonal high

groundwater table will be encountered at an approximate depth of 2 to $3^{+/-}$ feet below existing ground surface in the areas of borings performed. Significant fluctuations in the groundwater levels should be expected due to seasonal variations in rainfall, runoff, and other site-specific factors across the site such as shallow perched conditions due to encountered clayey soils.

Stormwater Pond Recovery Analysis

Native GeoSciences (NGS) completed the stormwater pond recovery analysis for the staging area(s). NGS utilized the commercially available software PONDS (version 3.3) to perform the stormwater pond recovery analysis. The analysis included recovery of the treatment volume within 30 days. The description of the input parameters and a Copy of the PONDS software outputs are included in the Attachments in the Appendix.

SITE PREPARATION RECOMMENDATIONS

Site Stripping

Prior to any construction, the site must be properly prepared. To prepare the site for construction, all existing topsoil, muck, debris, vegetation, and large roots down to finger-size should be removed, including a 5-foot margin in a horizontal direction away from the footprints of the structures. The resulting excavations should be backfilled with soils as discussed in the structural fill section of this report.

Proofrolling

Following site stripping and any related excavation activity, and prior to any fill placement, proofrolling of the on-site soils should be performed. We recommend using a vibratory roller having a static weight of at least ten tons. Placement of fill materials may then proceed. Compaction of the fill materials should continue until the roller has made at least ten passes over all areas of the site and the soils appear to be relatively firm and unyielding. Half of the roller passes should be perpendicular to the direction of travel of the other passes. Proofrolling should be closely monitored by our engineering technician to look for unusual deflection of the soils beneath the compacting equipment. If unusual or excessive deflection is observed, the areas should be undercut to firm soils and backfilled with structural fill placed in maximum one-foot thick lifts. Backfill soils should be of the same composition and should be compacted to the same criteria as structural fill soils.

Structural Fill

Definition

Soil used for structural fill can be defined as clean fine sand containing less than twelve percent material by weight that is finer than a number 200 sieve (fines) (material conforming to SP to SP-SM in the Unified Soil Classification System) and less than 5 percent organics by weight. However, materials containing up to 25 percent fines (materials conforming to SC or SM in the Unified Soil Classification System) may be utilized as structural fill, if their plasticity index is less than 20 and the working subgrade is at least 2 feet above water or groundwater level.

If fill material with higher fines content is used (< 25 percent fines), the material will require the use of compaction equipment designed for clayey soils. This includes a sheeps foot or vibratory pad foot roller. In addition, a disk could be required to assist with drying the clayey soils in order to place them at or near their optimum moisture content. These materials must be placed in 6-inch thick maximum lifts so that they can be effectively compacted with a vibratory pad foot roller.

Soil Suitability Recommendations

Based on the results of the auger borings in Figure 3, the soil materials encountered in the borings appear to be acceptable general and/or structural fill from ground surface to 2 to 3^+ feet below existing grade excluding any organic material, clays and unsuitable rock/shell/limestone, etc. Stratum 1 (SP/SP-SM) can be utilized as structural fill material. Stratum 2 (SM/SC) can be utilized as general fill material.

Placement

Fill should be placed in lifts not to exceed one foot thick. The fill material should be compacted to at least 95 percent of its modified Proctor maximum dry density (ASTM D 1557). Confined areas, such as utility trenches, should be compacted with manually operated vibratory compaction equipment.

TESTING AND MONITORING

Construction monitoring and testing are essential to proper site construction and performance. Compliance with the recommended foundation specification must be verified by our engineering technician familiar with the project construction. Observation of site preparation work is an integral part of the engineering recommendations contained in this report.

Safe working conditions are necessary. Temporary excavations should be sloped and/or braced as required by applicable local, state, and federal safety regulations, as well as the current Occupational Safety and Health Organization (OSHA) Excavation and Trench Safety Standards. Generally, the grading contractor is responsible for constructing stable, temporary excavations that are dewatered, shored, sloped and/or benched to maintain stability of the sides and bottom of the trench.

LIMITATIONS

This report has been prepared for the exclusive use of **Pickett & Associates and Gulf Power** for the specific application to the project previously discussed. Our conclusions and recommendations have been rendered using generally accepted standards of geotechnical engineering geology practice in the state of Florida. No other warranty is expressed or implied.

Our conclusions and recommendations are based on the design information furnished to us, the data obtained from the previously described subsurface exploration, and our experience. They do not reflect variations in the subsurface conditions that are likely to exist in the region of our boring and in unexplored areas of the site. These variations are due to the inherent variability of the subsurface conditions in this geologic region. Should variations become apparent during construction, it will be necessary to re-evaluate our conclusions and recommendations based upon our on-site observations of the conditions.

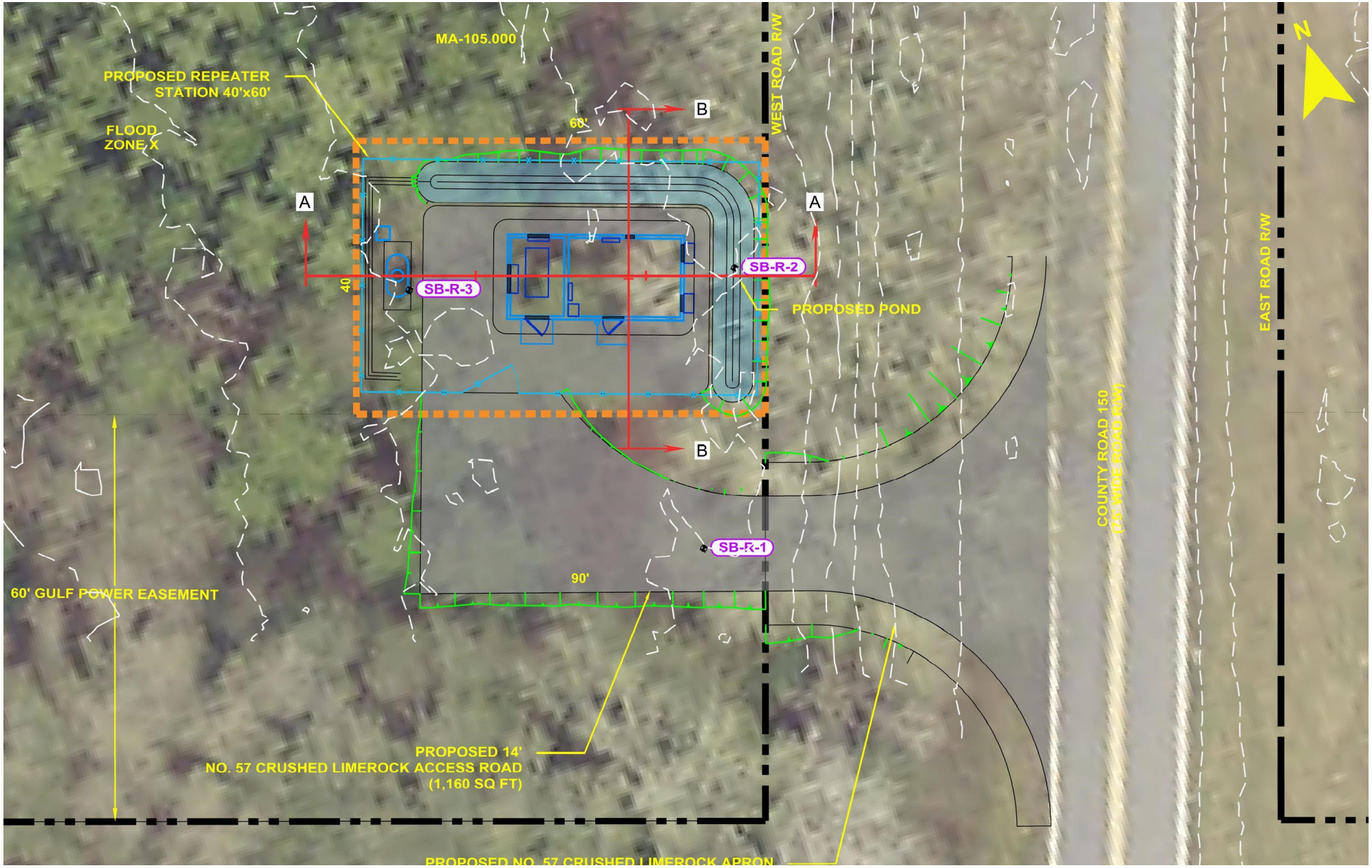
The site is underlain by limestone bedrock that is susceptible to dissolution and the subsequent development of karst features such as voids and sinkholes in the natural soil overburden. Construction in a sinkhole prone area is therefore accompanied by some risk that internal soil erosion and ground subsidence could affect new structures in the future. It is not possible to investigate or design to completely eliminate the possibility of future sinkhole-related problems. In any event, the Owner must understand and accept this risk.

The scope of our services does not include any environmental assessments or investigations for the possible presence of hazardous or toxic substances in the soil, groundwater, or surface water

within or in the general vicinity of the site studied. Any statements made in this report or shown on the test boring log regarding unusual subsurface conditions and/or composition, odor, staining, origin, or other characteristics of the surface and/or subsurface materials are strictly for the information of our client and may or may not be indicative of an environmental problem.

If changes are made in the overall design or the location of the proposed structure(s), the recommendations presented in this report must not be considered valid unless the changes are reviewed by our firm and recommendations modified or verified in writing. We should be given the opportunity to review the foundation plan and the applicable portions of the project specifications when the design is finalized. This review will allow us to check whether these documents are consistent with the intent of our recommendations.

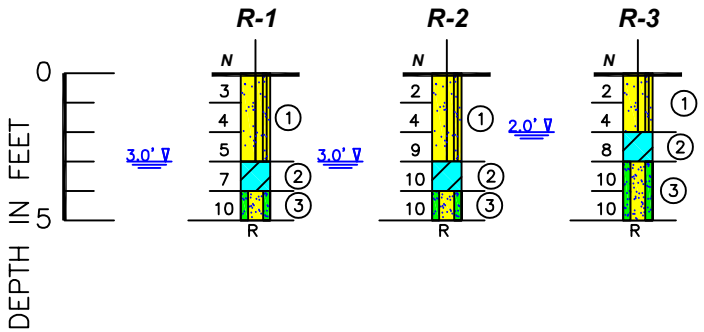
APPENDIX



BJ ROCK GEOENGINEERING

NFRC REPEATER STATION MA-105
FIELD TEST LOCATION PLAN
MADISON COUNTY, FLORIDA

DATE: 03/10/20	SCALE: NOT TO SCALE	JOB NO. 19-198B
DRAWN BY: J. PEAK		FIGURE 1
CK'D BY: B. JORY		



LEGEND

① = TAN, BROWN, ORANGE/BROWN FINE TO SLIGHTLY SILTY FINE SANDS (SP)/(SP–SM)

② = ORANGE, BROWN SANDY CLAY (CL)

③ = DARK ORANGE, BROWN SILTY CEMENTED SANDS (SM)

(SP) = UNIFIED SOIL CLASSIFICATION GROUP SYMBOL

N = CORRELATED "N"–VALUE FROM CPT DEVICE

R = REFUSAL MATERIAL (CEMENTED SANDS)

0.0' = ESTIMATED SEASONAL HIGH GROUNDWATER LEVEL

NOTES: HAND AUGER WITH CPT BORINGS PERFORMED JANUARY 21, 2020.

EXISTING GROUNDWATER LEVEL NOT ENCOUNTERED TO 5 FEET.

BJ ROCK GEOENGINEERING

NFRC REPEATER STATION MA-105
SOIL BORING LOGS
MADISON COUNTY, FL

DATE:	SCALE:	JOB NO.
1-23-20	AS SHOWN	19-198A

DRAWN BY: E. COLO'N

CK'D BY: J. PEAK

FIGURE 2
SHEET 1 OF 1

March 13, 2020

Re: Stormwater Pond Recovery Analysis
NFRC Repeater Station
Madison County, Florida
BJR Job No: 19-198(B)

As authorized, BJ Rock, LLC (BJR) has completed the stormwater pond recovery analysis for the above-referenced repeater station. The project site is located on SW Overstreet Avenue in Madison County, Florida.

We understand that one crushed rock area will be constructed along with one dry stormwater management pond within the proposed project. The pond will be constructed along the north and east boundaries of the project. The Repeater Station consists of one drainage basin (I).

We used soil and groundwater information collected during the geotechnical exploration on the site and provided in the BJR Geotechnical data. In addition, we used site survey data, crushed rock area design, and stormwater pond design information provided by Pickett Surveying and Engineering. We utilized the commercially available software PONDS (version 3.3) to perform the stormwater recovery analysis. Copies of the PONDS software outputs are included in the Attachments.

The PONDS software is generally limited to analyzing flat bottom stormwater ponds. Since the rock area is planned to be constructed at or above existing grade and will be sloping, it was necessary to analyze the area as a flat basin using average soil and groundwater parameters. We understand that you plan to utilize CR-PE Multi-Purpose Root & Water Barrier Molded Rolls by Century Products (or similar) to retain water within the rock area for recharge before discharging excess water to the pond. Based on this plan, it is our opinion that using average soil and groundwater parameters for this analysis is appropriate. Please note that the treatment volume was recovered within the rock basin area within 72 hours. Therefore, discharge and recovery within the stormwater pond was not needed.

Below are Average Soil and Groundwater Calculations and Model Input Parameters for the basin. We assumed a Base of Aquifer depth below the Seasonal High Water Table (SHWT) of 2 feet or less. This depth is generally conservative based on our experience with similar projects in soils with relatively high silt/clay content. The actual Base of Aquifer is likely deeper.

Lastly, we assumed a porosity of 35% for the crushed rock for void space storage.

Stormwater Recovery Analysis – Repeater – Basin I

Average Soil and Groundwater Calculations

Below are the average soil and groundwater calculations for the stormwater pond recovery analysis.

Repeater		
Basin I		
Crushed Rock Elevation		
Low El. (ft)	**High El. (ft)**	**Average El. (ft.)**
97	98	**97.5**
Boring	**Horizontal Saturated Hydraulic Conductivity (ft/day)***	**Depth to SHWT (ft)**
R-1	0.6	3
R-2	0.9	3
R-3	0.4	2
AVG.	**0.63**	**2.67**
Average SHWT Elevation (ft)		**94.8**
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.		

Model Input Parameters

Below are the input parameters used for the stormwater pond recovery analysis.

Aquifer and Geometry Data

Input Parameter	REPEATER - BASIN I
Base of Aquifer Elevation (feet)	93.8
Water Table Elevation (feet)	94.8
Horizontal Saturated Hydraulic Conductivity (ft/day)*	0.63
Fillable Porosity (%)	25
Unsaturated Vertical Infiltration Rate (ft/day)*,**	0.316
Maximum Area for Unsaturated Infiltration (ft^2)	340.6
Equivalent Pond Length (ft)	34
Equivalent Pond Width (ft)	10
* Hydraulic conductivity values include a factor of safety of 2 based on the field test results.	
** Unsaturated vertical Infiltration rate is 1/2 the field tested Horizontal Saturated Hydraulic Conductivity rate.	

Stage vs Area Data for REPEATER – BASIN I

Stage (ft)	Area (ft^2)
97.5	340.6
98	340.6

Stormwater Input Data

REPEATER BASIN I	**Hydrograph Type**	slug load
	Treatment Volume (ft^3)	261.36

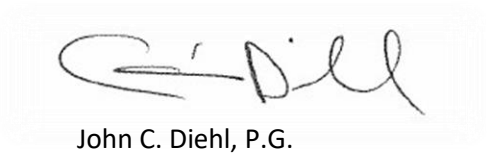
Results

Based on the results of this analysis, the proposed crushed rock area recovers the associated treatment volume within 72 hours.

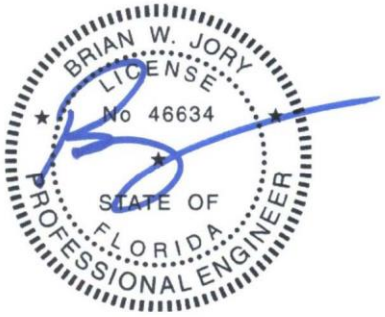
Closing

We appreciate the opportunity to be of service to you on this project and look forward to a continued relationship. Should you have any questions or concerns regarding this report, please feel free to call us at (407) 342-1443.

Sincerely,
Native Geoscience, Inc.
Certificate of Authorization No. 30474



John C. Diehl, P.G.
Principal Geologist
P.G. 2460



Brian W. Jory, P.E.
Principal Engineer
P.E. 46634
3/13/20

Attachments:

- PONDS Output – Repeater Station – Basin I – Rock Voids (7 pages)

PONDS Version 3.3.0278
Retention Pond Recovery - Refined Method
Copyright 2012
Devo Seereeram, Ph.D., P.E.

Project Data

Project Name:	NFRC Staging Area
Simulation Description:	Repeater Station - Basin I - Rock Voids
Project Number:	BJR 19-198A
Engineer :	CW
Supervising Engineer:	JCD
Date:	03-12-2020

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	93.80
Water Table Elevation, [WT] (ft datum):	94.80
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	0.63
Fillable Porosity, [n] (%):	25.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	0.316
Maximum Area For Unsaturated Infiltration, [Av] (ft²):	340.6

Geometry Data

Equivalent Pond Length, [L] (ft):	34.0
Equivalent Pond Width, [W] (ft):	10.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft²)
97.50	340.6
98.00	340.6

Ditch Data

Ditch (or interceptor trench) parallel to length axis is inactive

Ditch (or interceptor trench) parallel to width axis is inactive

Discharge Structures

Discharge Structure #1 is inactive

Discharge Structure #2 is inactive

Discharge Structures (cont'd.)

Discharge Structure #3 is inactive

Scenario Input Data

Scenario 1 :: 261.36 ft³ slug load

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 261.36

Initial ground water level (ft datum) 94.80 (default)

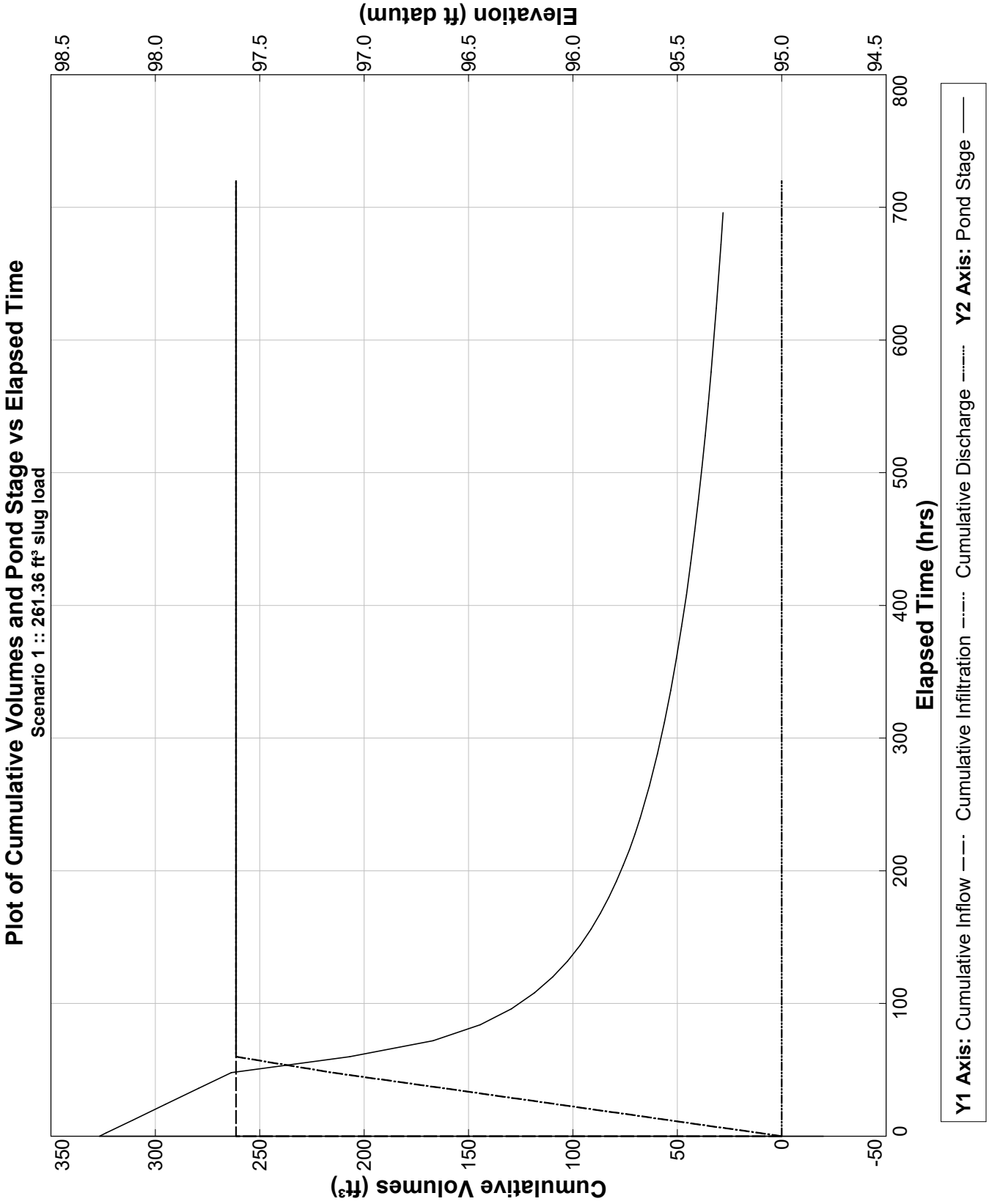
Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.100	4.000	8.500	16.000	25.000
0.250	4.500	9.000	17.000	26.000
0.500	5.000	9.500	18.000	27.000
1.000	5.500	10.000	19.000	28.000
1.500	6.000	11.000	20.000	29.000
2.000	6.500	12.000	21.000	30.000
2.500	7.000	13.000	22.000	
3.000	7.500	14.000	23.000	
3.500	8.000	15.000	24.000	

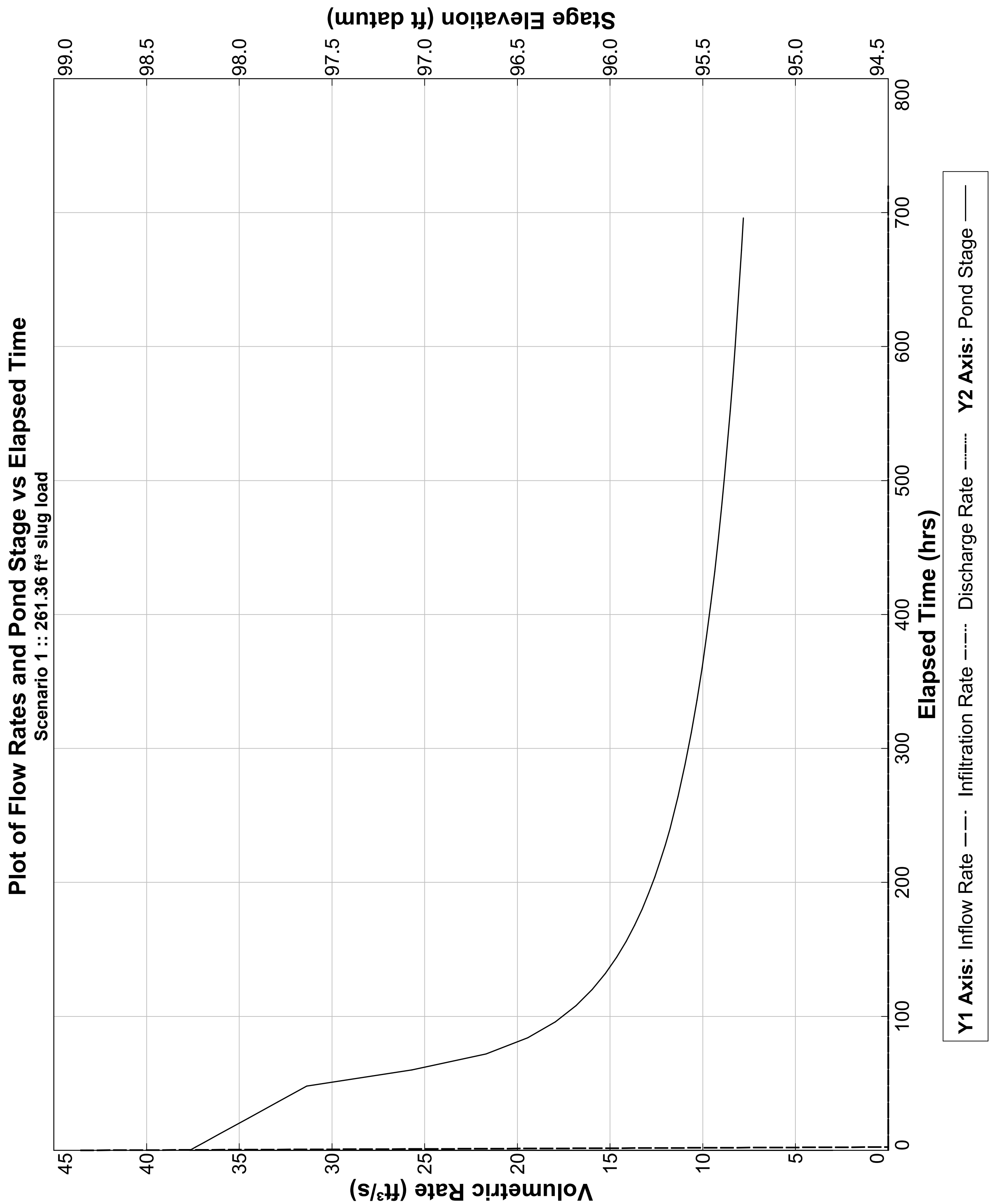
Detailed Results *:: Scenario 1 :: 261.36 ft³ slug load*

Elapsed Time (hours)	Instantaneous Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Combined Instantaneous Discharge Rate (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Combined Cumulative Discharge (ft³)	Flow Type
0.000	43.5600	0.00000	94.80000	0.00000	0	0.000	0.0	0	N.A.
0.002	43.5600	0.00000	98.26744	0.00125	0	261.360	0.0	0	U/P
2.400	0.0000	0.00000	98.23586	0.00125	0	261.360	10.8	0	U/P
6.000	0.0000	0.00000	98.18846	0.00125	0	261.360	26.9	0	U/P
12.000	0.0000	0.00000	98.10947	0.00125	0	261.360	53.8	0	U/P
24.000	0.0000	0.00000	97.95146	0.00125	0	261.360	107.6	0	U/P
36.000	0.0000	0.00000	97.79346	0.00125	0	261.360	161.4	0	U/P
48.000	0.0000	0.00000	97.63547	0.00116	0	261.360	215.2	0	U/P
60.000	0.0000	0.00000	97.06869	0.00053	0	261.360	261.4	0	U/S
72.000	0.0000	0.00000	96.66942	0.00000	0	261.360	261.4	0	S
84.000	0.0000	0.00000	96.44394	0.00000	0	261.360	261.4	0	S
96.000	0.0000	0.00000	96.29443	0.00000	0	261.360	261.4	0	S
108.000	0.0000	0.00000	96.18405	0.00000	0	261.360	261.4	0	S
120.000	0.0000	0.00000	96.09710	0.00000	0	261.360	261.4	0	S
132.000	0.0000	0.00000	96.02574	0.00000	0	261.360	261.4	0	S
144.000	0.0000	0.00000	95.96549	0.00000	0	261.360	261.4	0	S
156.000	0.0000	0.00000	95.91357	0.00000	0	261.360	261.4	0	S
168.000	0.0000	0.00000	95.86810	0.00000	0	261.360	261.4	0	S
180.000	0.0000	0.00000	95.82778	0.00000	0	261.360	261.4	0	S
192.000	0.0000	0.00000	95.79166	0.00000	0	261.360	261.4	0	S
204.000	0.0000	0.00000	95.75903	0.00000	0	261.360	261.4	0	S
216.000	0.0000	0.00000	95.72931	0.00000	0	261.360	261.4	0	S
228.000	0.0000	0.00000	95.70209	0.00000	0	261.360	261.4	0	S
240.000	0.0000	0.00000	95.67701	0.00000	0	261.360	261.4	0	S
264.000	0.0000	0.00000	95.63358	0.00000	0	261.360	261.4	0	S
288.000	0.0000	0.00000	95.59546	0.00000	0	261.360	261.4	0	S
312.000	0.0000	0.00000	95.56165	0.00000	0	261.360	261.4	0	S
336.000	0.0000	0.00000	95.53137	0.00000	0	261.360	261.4	0	S
360.000	0.0000	0.00000	95.50408	0.00000	0	261.360	261.4	0	S
384.000	0.0000	0.00000	95.47925	0.00000	0	261.360	261.4	0	S
408.000	0.0000	0.00000	95.45646	0.00000	0	261.360	261.4	0	S
432.000	0.0000	0.00000	95.43568	0.00000	0	261.360	261.4	0	S
456.000	0.0000	0.00000	95.41640	0.00000	0	261.360	261.4	0	S
480.000	0.0000	0.00000	95.39864	0.00000	0	261.360	261.4	0	S
504.000	0.0000	0.00000	95.38205	0.00000	0	261.360	261.4	0	S
528.000	0.0000	0.00000	95.36664	0.00000	0	261.360	261.4	0	S
552.000	0.0000	0.00000	95.35211	0.00000	0	261.360	261.4	0	S
576.000	0.0000	0.00000	95.33855	0.00000	0	261.360	261.4	0	S
600.000	0.0000	0.00000	95.32574	0.00000	0	261.360	261.4	0	S
624.000	0.0000	0.00000	95.31371	0.00000	0	261.360	261.4	0	S
648.000	0.0000	0.00000	95.30229	0.00000	0	261.360	261.4	0	S
672.000	0.0000	0.00000	95.29151	0.00000	0	261.360	261.4	0	S
696.000	0.0000	0.00000	95.28124	0.00000	0	261.360	261.4	0	S
720.000	0.0000	0.00000	95.27152	----	----	261.360	261.4	0	N.A.

Summary of Results *:: Scenario 1 :: 261.36 ft³ slug load*

	Time (hours)	Stage (ft datum)	Rate (ft³/s)	Volume (ft³)
Stage				
Minimum	0.000	94.80		
Maximum	0.002	98.27		
Inflow				
Rate - Maximum - Positive	0.002		43.5600	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			261.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	720.000			261.4
Infiltration				
Rate - Maximum - Positive	0.002		0.0012	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	60.000			261.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	720.000			261.4
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	720.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	97.79		161.4
72 Hour Stage and Infiltration Volume	72.000	96.67		261.4


Plot of Cumulative Volumes and Pond Stage vs Elapsed Time
Scenario 1 :: 261.36 ft³ slug load
Cumulative Volumes (ft³)
Elevation (ft datum)
Elapsed Time (hrs)
350
300
250
200
150
100
50
0
-50
98.5
98.0
97.5
97.0
96.5
96.0
95.5
95.0
94.5
0
100
200
300
400
500
600
700
800
Y1 Axis: Cumulative Inflow
Cumulative Infiltration
Cumulative Discharge
Y2 Axis: Pond Stage


Plot of Flow Rates and Pond Stage vs Elapsed Time
Scenario 1 :: 261.36 ft³ slug load
Stage Elevation (ft datum)
99.0
98.5
98.0
97.5
97.0
96.5
96.0
95.5
95.0
94.5
Volumetric Rate (ft³/s)
45
40
35
30
25
20
15
10
5
0
Elapsed Time (hrs)
0
100
200
300
400
500
600
700
800
Y1 Axis: Inflow Rate
Infiltration Rate
Discharge Rate
Y2 Axis: Pond Stage

Map Scale: 1:5,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

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

Special Point Features

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

Water Features

- Streams and Canals

Transportation

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

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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

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

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

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

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

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

Soil Survey Area: Madison County, Florida
Survey Area Data: Version 14, Sep 17, 2019

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

Date(s) aerial images were photographed: Dec 16, 2014—Dec 9, 2017

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Albany sand, 0 to 5 percent slopes	4.5	8.1%
5	Blanton sand, 0 to 5 percent slopes	10.7	19.0%
23	Plummer sand	14.0	24.9%
26	Troup sand, 0 to 5 percent slopes	0.2	0.4%
65	Lovett sand, 0 to 5 percent slopes	0.1	0.1%
74	Dorovan and Pamlico soils, depressional	26.7	47.5%
Totals for Area of Interest		**56.2**	**100.0%**

Madison County, Florida

2—Albany sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w4gt
Elevation: 20 to 350 feet
Mean annual precipitation: 49 to 63 inches
Mean annual air temperature: 63 to 73 degrees F
Frost-free period: 241 to 306 days
Farmland classification: Not prime farmland

Map Unit Composition

Albany and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Albany

Setting

Landform: Knolls on marine terraces, rises on marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 10 inches: sand
E - 10 to 50 inches: sand
Bt - 50 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 1.98 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: A/D

Forage suitability group: Sandy soils on rises and knolls of mesic uplands (G133AA131FL)
Hydric soil rating: No

Minor Components

Blanton
Percent of map unit: 5 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Plummer
Percent of map unit: 5 percent
Landform: Drainageways on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Concave, linear
Across-slope shape: Linear
Hydric soil rating: No

Data Source Information

Soil Survey Area: Madison County, Florida
Survey Area Data: Version 14, Sep 17, 2019

Madison County, Florida

5—Blanton sand, 0 to 5 percent slopes

Map Unit Setting

National map unit symbol: 2w4gr
Elevation: 100 to 400 feet
Mean annual precipitation: 40 to 69 inches
Mean annual air temperature: 52 to 72 degrees F
Frost-free period: 190 to 310 days
Farmland classification: Not prime farmland

Map Unit Composition

Blanton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blanton

Setting

Landform: Knolls on marine terraces, interfluves, ridges on marine terraces
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

Ap - 0 to 12 inches: sand
E1 - 12 to 37 inches: sand
E2 - 37 to 53 inches: sand
E3 - 53 to 69 inches: sand
Bt - 69 to 80 inches: sandy loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: About 48 to 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Forage suitability group: Sandy soils on rises, knolls, and ridges of mesic uplands (G133AA121FL)
Hydric soil rating: No

Minor Components

Albany
Percent of map unit: 5 percent
Landform: Flats, interfluves
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Fuquay
Percent of map unit: 5 percent
Landform: Interfluves
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Bonifay
Percent of map unit: 4 percent
Landform: Knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Alpin
Percent of map unit: 3 percent
Landform: Flats on marine terraces, knolls on marine terraces, ridges on marine terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Ocilla
Percent of map unit: 3 percent
Landform: Stream terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Convex
Across-slope shape: Linear

Hydric soil rating: No

Data Source Information

Soil Survey Area: Madison County, Florida
Survey Area Data: Version 14, Sep 17, 2019

Madison County, Florida

23—Plummer sand

Map Unit Setting

National map unit symbol: 1hbb4
Elevation: 20 to 400 feet
Mean annual precipitation: 49 to 57 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 262 to 292 days
Farmland classification: Not prime farmland

Map Unit Composition

Plummer and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Plummer

Setting

Landform: Flats on marine terraces, drainageways on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Sandy and loamy marine deposits

Typical profile

A - 0 to 7 inches: sand
E - 7 to 57 inches: sand
Btg - 57 to 80 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D

Forage suitability group: sandy soils on flats of mesic or hydric lowlands (G133AA141FL)
Hydric soil rating: No

Minor Components

Chipley
Percent of map unit: 5 percent
Landform: Flats on marine terraces, knolls on marine terraces, rises on marine terraces
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Surrency, depressional
Percent of map unit: 5 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Madison County, Florida
Survey Area Data: Version 14, Sep 17, 2019

Madison County, Florida

74—Dorovan and Pamlico soils, depressional

Map Unit Setting

National map unit symbol: 1hbc3
Elevation: 10 to 450 feet
Mean annual precipitation: 49 to 57 inches
Mean annual air temperature: 64 to 72 degrees F
Frost-free period: 262 to 292 days
Farmland classification: Not prime farmland

Map Unit Composition

Dorovan and similar soils: 58 percent
Pamlico and similar soils: 31 percent
Minor components: 11 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dorovan

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Organic material over sandy marine deposits

Typical profile

Oe - 0 to 6 inches: muck
Oa - 6 to 70 inches: muck
C - 70 to 80 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very high (about 20.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: B/D

Forage suitability group: Organic soils in depressions and on flood plains (G133AA645FL)
Hydric soil rating: Yes

Description of Pamlico

Setting

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Herbaceous organic material over sandy marine deposits

Typical profile

Oa - 0 to 33 inches: muck
C1 - 33 to 60 inches: sand
C2 - 60 to 80 inches: sandy clay loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: Very high (about 12.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7w
Hydrologic Soil Group: A/D
Forage suitability group: Organic soils in depressions and on flood plains (G133AA645FL)
Hydric soil rating: Yes

Minor Components

Sapelo, hydric

Percent of map unit: 4 percent
Landform: Flats on marine terraces
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Plummer, depressional

Percent of map unit: 4 percent

Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Surrency, depressional

Percent of map unit: 3 percent
Landform: Depressions on marine terraces
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Madison County, Florida
Survey Area Data: Version 14, Sep 17, 2019

FIELD TESTING STANDARDS AND PROCEDURES

Standard Penetration Test (SPT) Boring

The SPT borings were advanced by means of a truck or track mounted drill rig employing wet rotary drilling techniques. The SPT testing was performed continuously in the upper ten feet and at five-foot intervals thereafter. The soil samples were obtained at the depths where the SPT testing was performed. The soil samples were then classified in the field, placed in sealed containers, and returned to our laboratory for further evaluation by a geotechnical engineer.

The SPT borings were performed in general compliance with standard field penetration test procedures (ASTM D 1586-99). After drilling to the sampling depth and flushing the borehole, the standard two-inch O.D. split-barrel sampler was seated by driving it six inches into the undisturbed soil at the bottom of the borehole. The sampler was then driven an additional 12 inches by a 140-pound hammer falling 30 inches. The number of blows required to produce the 12 inches of penetration is recorded as the standard penetration test value (N). These values are plotted on the left side of the boring log Figure 3.

In the upper ten feet sampling was performed by driving the split-barrel sampler 24 inches and the blows required to drive the sampler the middle two 6-inch increments were recorded as the "N" value. Through this technique, the upper ten feet of the soil was sampled continuously. Detailed descriptions of the soils encountered during the advancement of the SPT boring are presented in the Boring Logs.

Soil Sample Handling and Classification

The soil samples obtained from the SPT borings were placed in sealed containers to retain moisture and returned to our laboratory. The samples were then reviewed by a geotechnical engineer to confirm classifications, visually estimate the relative percentages of the soil's constituents (sand, clay, etc.), and identify pertinent structural features. We visually classified the soils according to the Unified Soil Classification System (ASTM D 2487). The stratification lines shown on the boring logs in Figure 3 represent our interpretation of approximate boundaries between soil types. The transition between strata may be gradual. Our classifications are based on a visual estimation of the soil properties and our engineering experience with the soils found in this geologic area.

The SPT "N" values are presented adjacent along the left side of the boring logs. The correlation of the SPT "N" values with relative density, unconfined compressive strength, and consistency are provided in the following table:

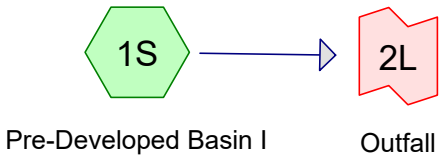
Coarse-Grained Soils		**Fine Grained Soils**		
Penetration Resistance N (blows/ft)	Relative Density of Sand	Penetration Resistance N (blows/ft)	Unconfined Compressive Strength of Clay (tons/ft^2)	Consistency of Clay
0-4	Very Loose	<2	<0.25	Very Soft
4-10	Loose	2-4	0.25-0.50	Soft
10-30	Medium-Dense	4-8	0.50-1.00	Medium
30-50	Dense	8-15	1.00-2.00	Stiff
>50	Very Dense	15-30	2.00-4.00	Very Stiff
		>30	>4.00	Hard

Hand Auger Borings

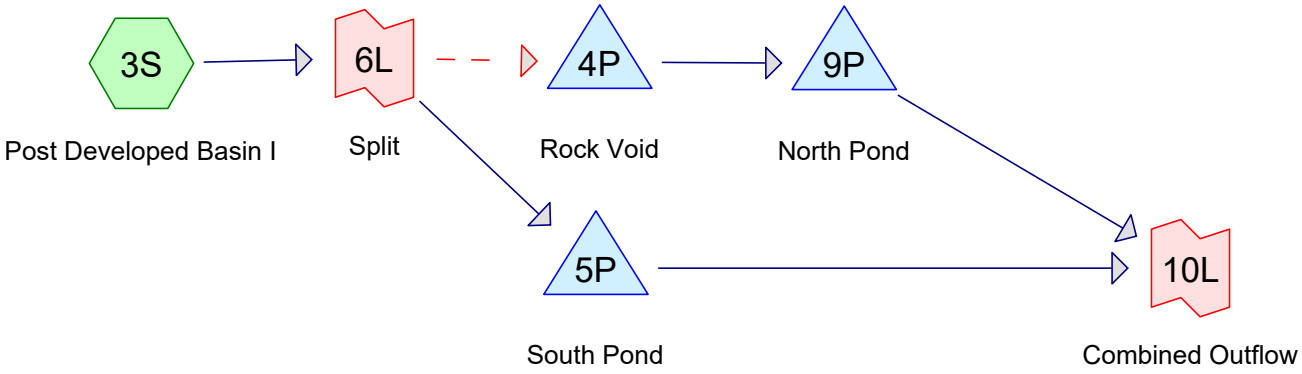
The auger borings were performed with a manually advanced hand auger. The auger was advanced by rotating it into the ground in approximate 6-inch increments. After each incremental penetration, the auger was retracted, and the soils collected in the auger bucket were placed in sealed containers. The samples were then reviewed by a geotechnical engineer and classified as described above. Detailed descriptions of the soils encountered in the auger borings are presented in the Auger Boring Logs.

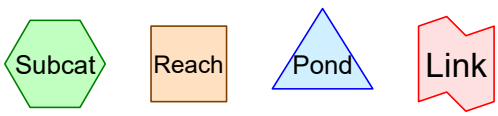
Appendix B – HydroCAD Report

PRE-DEVELOPED SITE



POST DEVELOPED SITE





Routing Diagram for Repeater Station Basin I
Prepared by HP Inc., Printed 3/16/2020

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

Subcatchment1S: Pre-Developed Basin I Runoff Area=6,026 sf 0.00% Impervious Runoff Depth>6.39"
Flow Length=103' Slope=0.0147 '/' Tc=7.4 min CN=60 Runoff=1.59 cfs 0.074 af

Subcatchment3S: Post Developed Basin I Runoff Area=6,026 sf 6.59% Impervious Runoff Depth>8.27"
Flow Length=150' Slope=0.0083 '/' Tc=9.4 min CN=73 Runoff=1.84 cfs 0.095 af

Pond 4P: Rock Void Peak Elev=98.04' Storage=170 cf Inflow=0.92 cfs 0.048 af
Outflow=0.91 cfs 0.044 af

Pond 5P: South Pond Peak Elev=96.00' Storage=0.046 af Inflow=0.92 cfs 0.048 af
Outflow=0.00 cfs 0.000 af

Pond 9P: North Pond Peak Elev=97.03' Storage=59 cf Inflow=0.91 cfs 0.044 af
Outflow=0.91 cfs 0.043 af

Link 2L: Outfall Inflow=1.59 cfs 0.074 af
Primary=1.59 cfs 0.074 af

Link 6L: Split x 0.50 Inflow=1.84 cfs 0.095 af
Primary=0.92 cfs 0.048 af Secondary=0.92 cfs 0.048 af

Link 10L: Combined Outflow Inflow=0.91 cfs 0.043 af
Primary=0.91 cfs 0.043 af

Summary for Subcatchment 1S: Pre-Developed Basin I

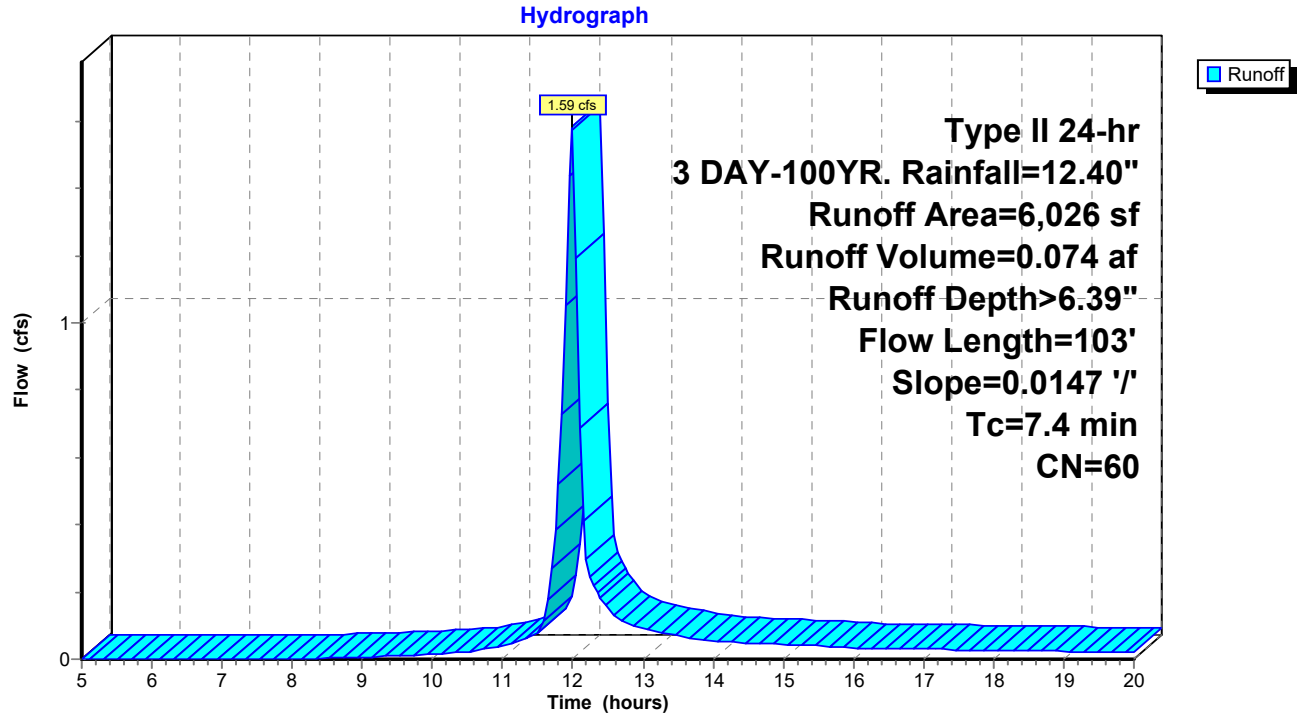
Runoff = 1.59 cfs @ 11.99 hrs, Volume= 0.074 af, Depth> 6.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

	Area (sf)	CN	Description
*	6,026	60	Woods/grass comb., Poor, HSG B
	6,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	103	0.0147	0.23		**Lag/CN Method, Woods**

Subcatchment 1S: Pre-Developed Basin I



Summary for Subcatchment 3S: Post Developed Basin I

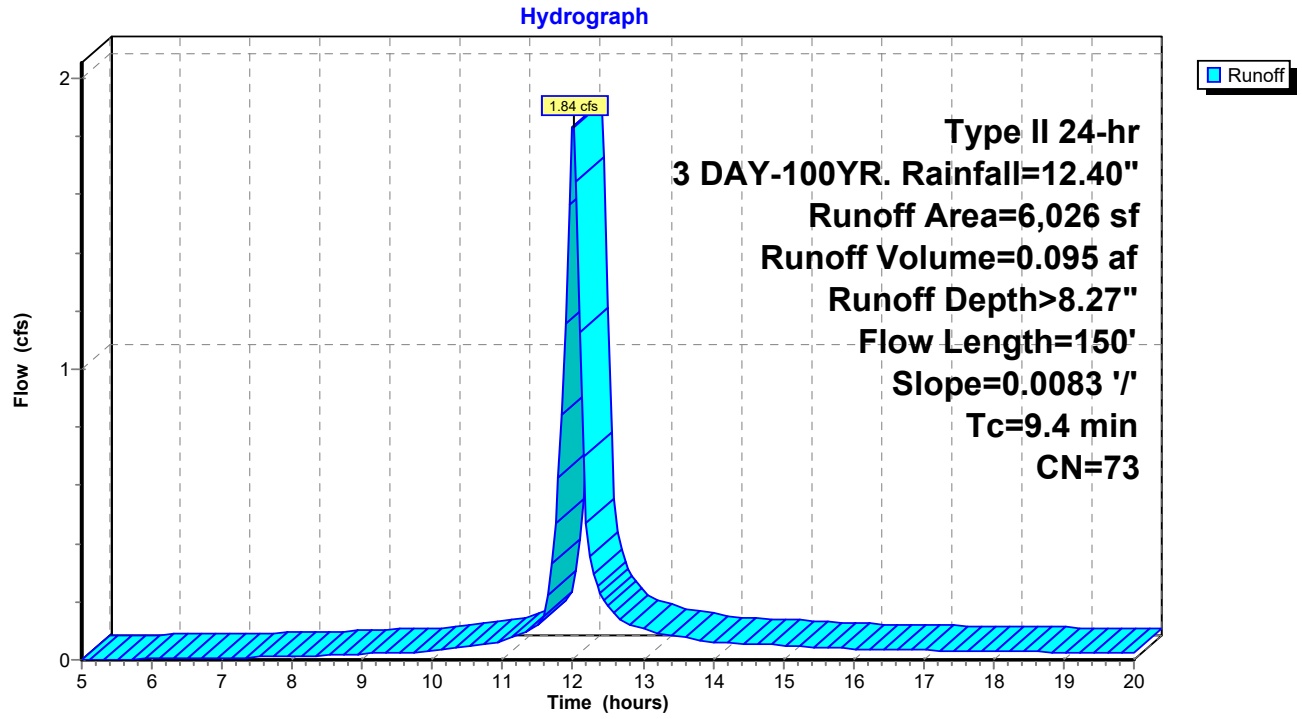
Runoff = 1.84 cfs @ 12.00 hrs, Volume= 0.095 af, Depth> 8.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 3 DAY-100YR. Rainfall=12.40"

	Area (sf)	CN	Description
	300	98	Roofs, HSG B
	97	98	Paved parking, HSG B
*	973	65	Uncompacted Gravel 35% Void
	1,283	85	Gravel roads, HSG B
	3,373	67	Brush, Poor, HSG B
	6,026	73	Weighted Average
	5,629		93.41% Pervious Area
	397		6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	150	0.0083	0.27		**Lag/CN Method,**

Subcatchment 3S: Post Developed Basin I



Summary for Pond 4P: Rock Void

Inflow = 0.92 cfs @ 12.00 hrs, Volume= 0.048 af
Outflow = 0.91 cfs @ 12.01 hrs, Volume= 0.044 af, Atten= 1%, Lag= 0.1 min
Primary = 0.91 cfs @ 12.01 hrs, Volume= 0.044 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.04' @ 12.01 hrs Surf.Area= 973 sf Storage= 170 cf

Plug-Flow detention time= 47.0 min calculated for 0.044 af (91% of inflow)
Center-of-Mass det. time= 18.0 min (782.9 - 764.8)

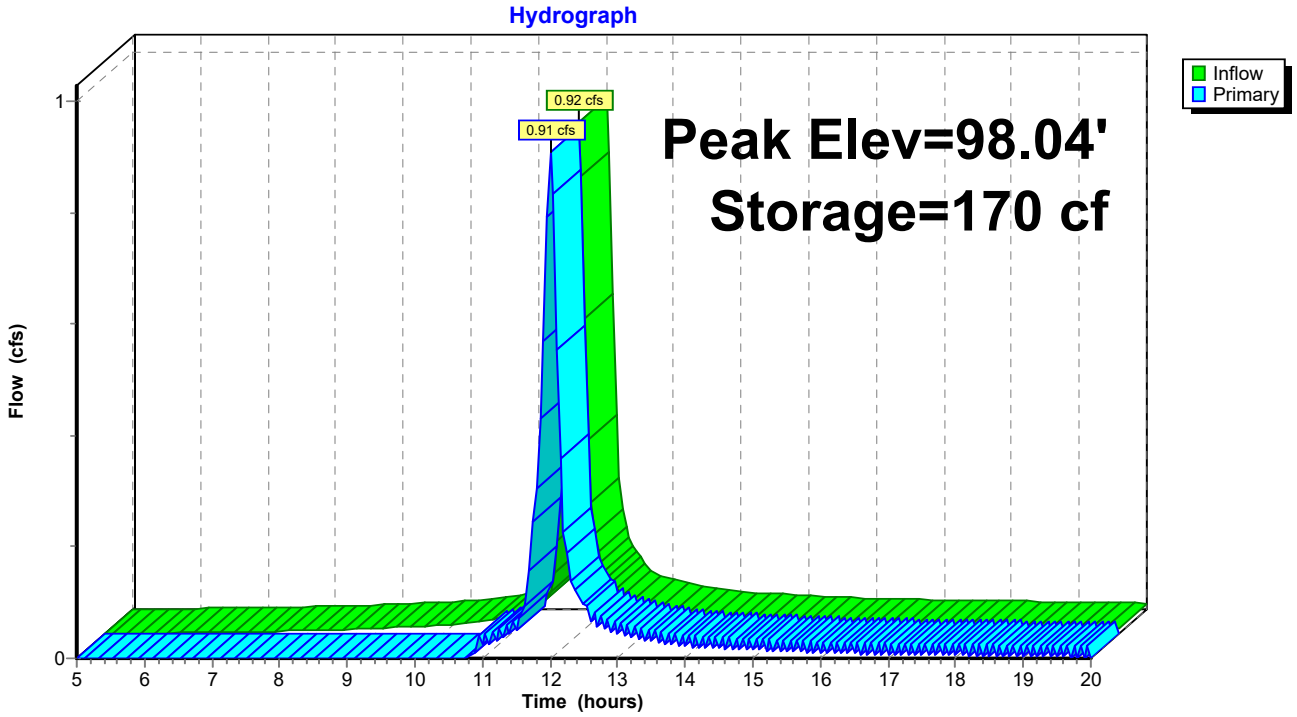
Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	170 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 487 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	973	0	0
98.00	973	487	487

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**45.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.90 cfs @ 12.01 hrs HW=98.04' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.90 cfs @ 0.54 fps)

Pond 4P: Rock Void



Summary for Pond 5P: South Pond

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 4.14" for 3 DAY-100YR. event
Inflow = 0.92 cfs @ 12.00 hrs, Volume= 0.048 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.00' @ 20.00 hrs Surf.Area= 61.115 ac Storage= 0.046 af

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

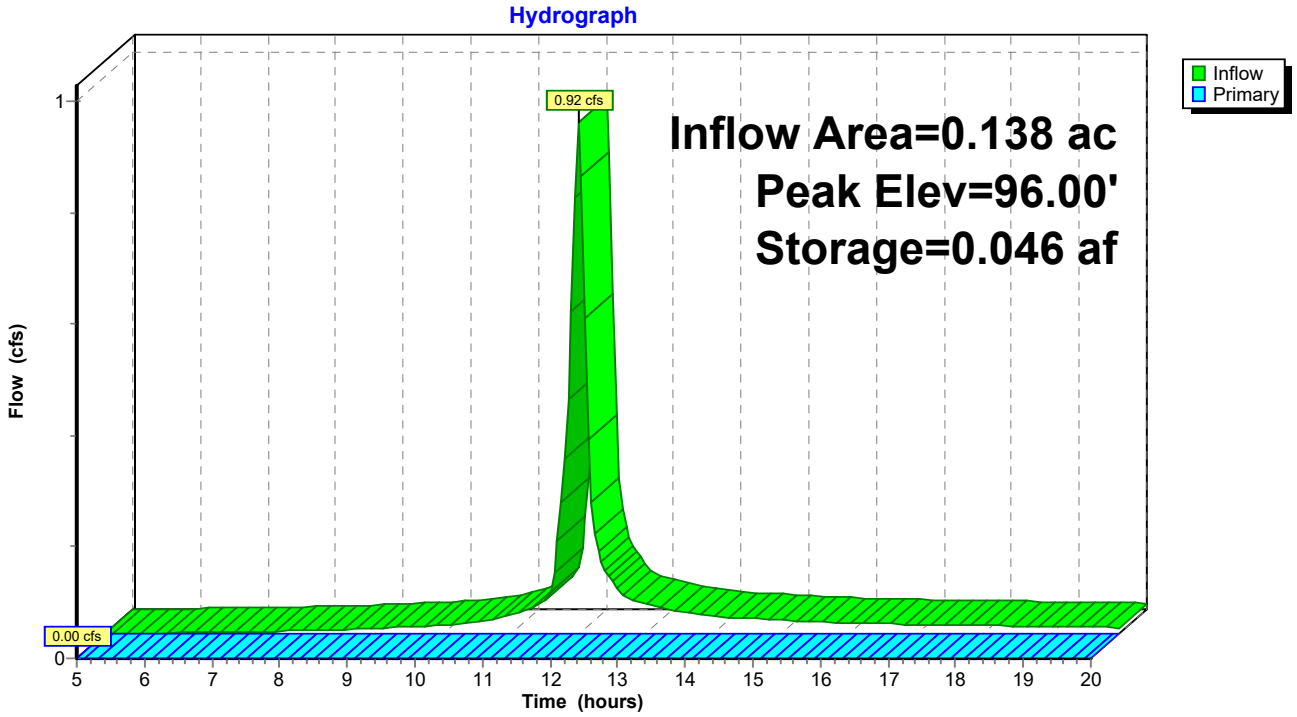
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	356.830 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
96.00	60.960	0.000	0.000
97.00	265.600	163.280	163.280
98.00	121.500	193.550	356.830

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	**100.0 deg x 8.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 5P: South Pond



Summary for Pond 9P: North Pond

Inflow = 0.91 cfs @ 12.01 hrs, Volume= 0.044 af
Outflow = 0.91 cfs @ 12.01 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.2 min
Primary = 0.91 cfs @ 12.01 hrs, Volume= 0.043 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.03' @ 12.01 hrs Surf.Area= 147 sf Storage= 59 cf

Plug-Flow detention time= 11.7 min calculated for 0.043 af (98% of inflow)
Center-of-Mass det. time= 3.3 min (786.2 - 782.9)

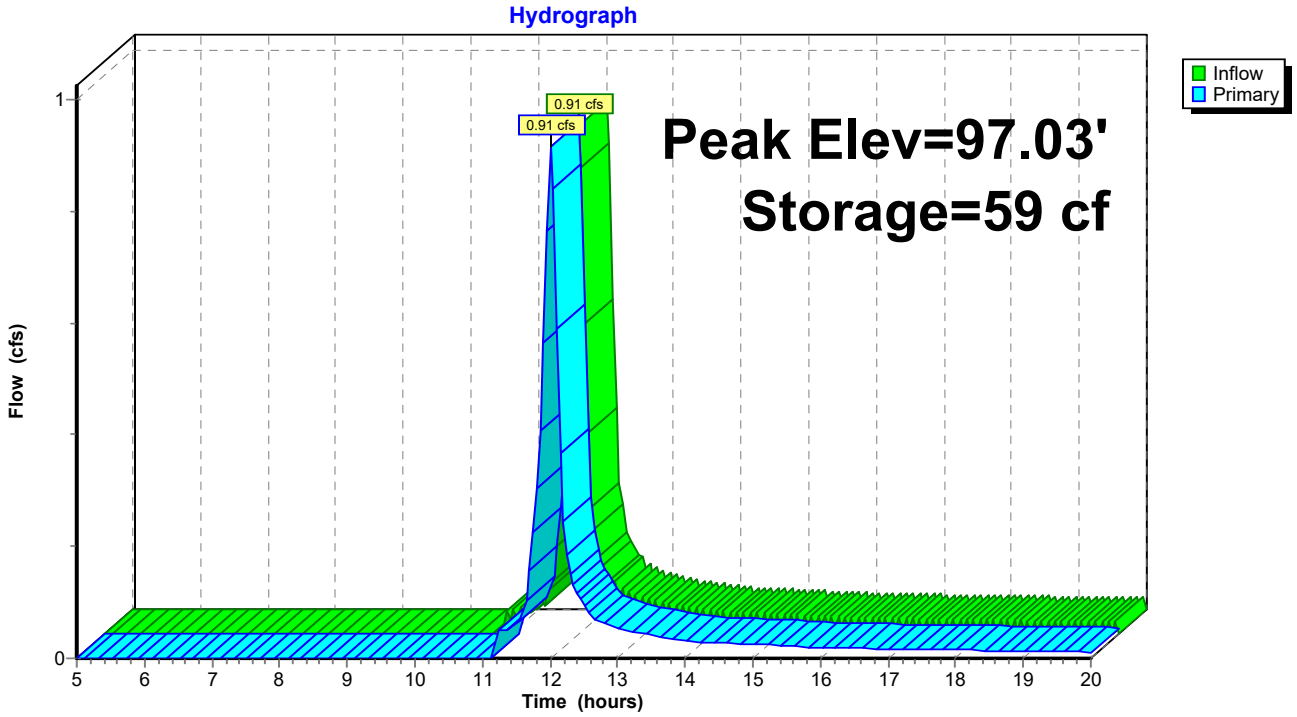
Volume	Invert	Avail.Storage	Storage Description
#1	96.50'	209 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.50	72	0	0
97.00	147	55	55
98.00	162	155	209

Device	Routing	Invert	Outlet Devices
#1	Primary	96.90'	**100.0 deg x 6.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.90 cfs @ 12.01 hrs HW=97.03' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.90 cfs @ 1.12 fps)

Pond 9P: North Pond

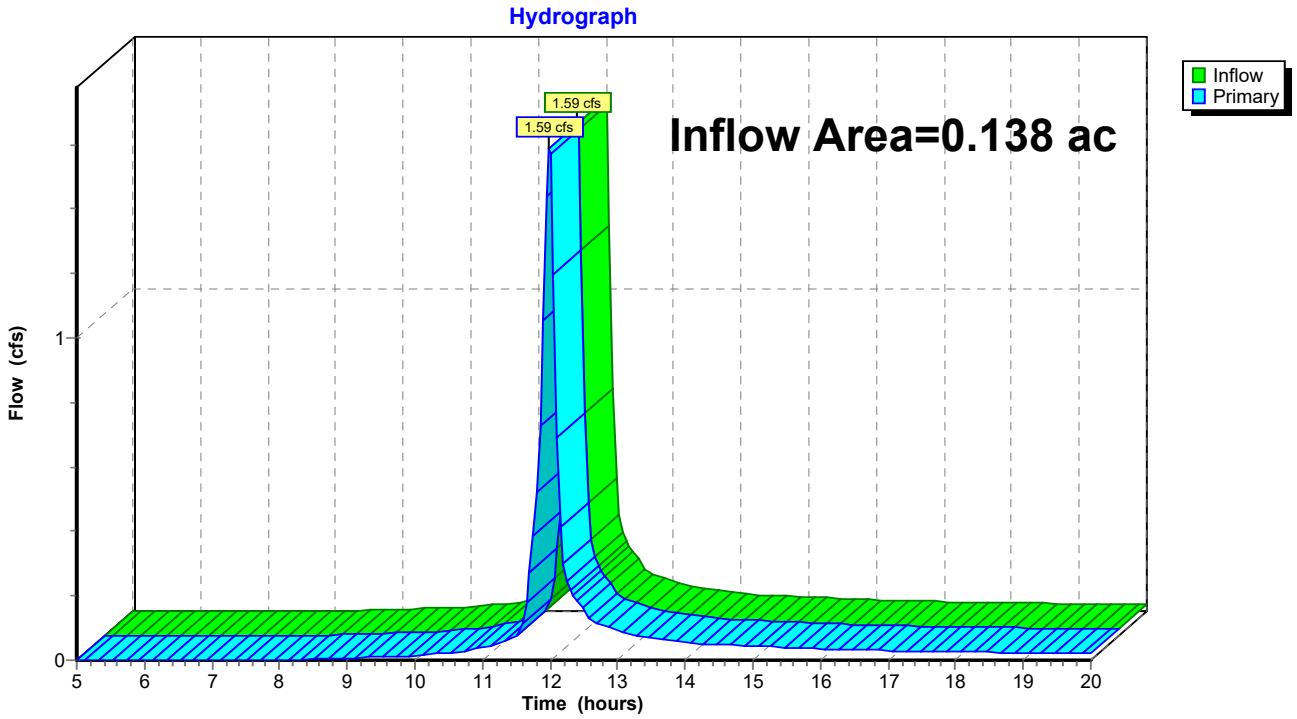


Summary for Link 2L: Outfall

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth > 6.39" for 3 DAY-100YR. event
Inflow = 1.59 cfs @ 11.99 hrs, Volume= 0.074 af
Primary = 1.59 cfs @ 11.99 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: Outfall

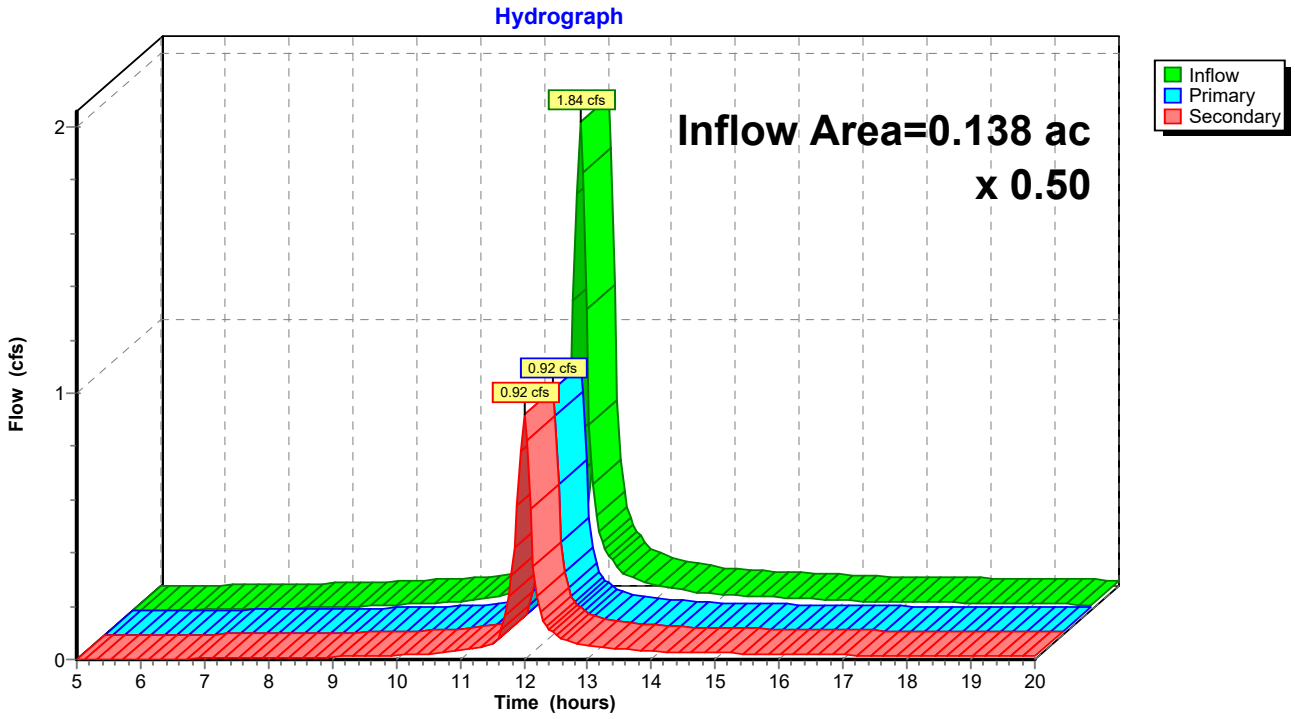


Summary for Link 6L: Split

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 8.27" for 3 DAY-100YR. event
Inflow = 1.84 cfs @ 12.00 hrs, Volume= 0.095 af
Primary = 0.92 cfs @ 12.00 hrs, Volume= 0.048 af, Atten= 50%, Lag= 0.0 min
Secondary = 0.92 cfs @ 12.00 hrs, Volume= 0.048 af

Primary outflow = Inflow x 0.50, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 6L: Split

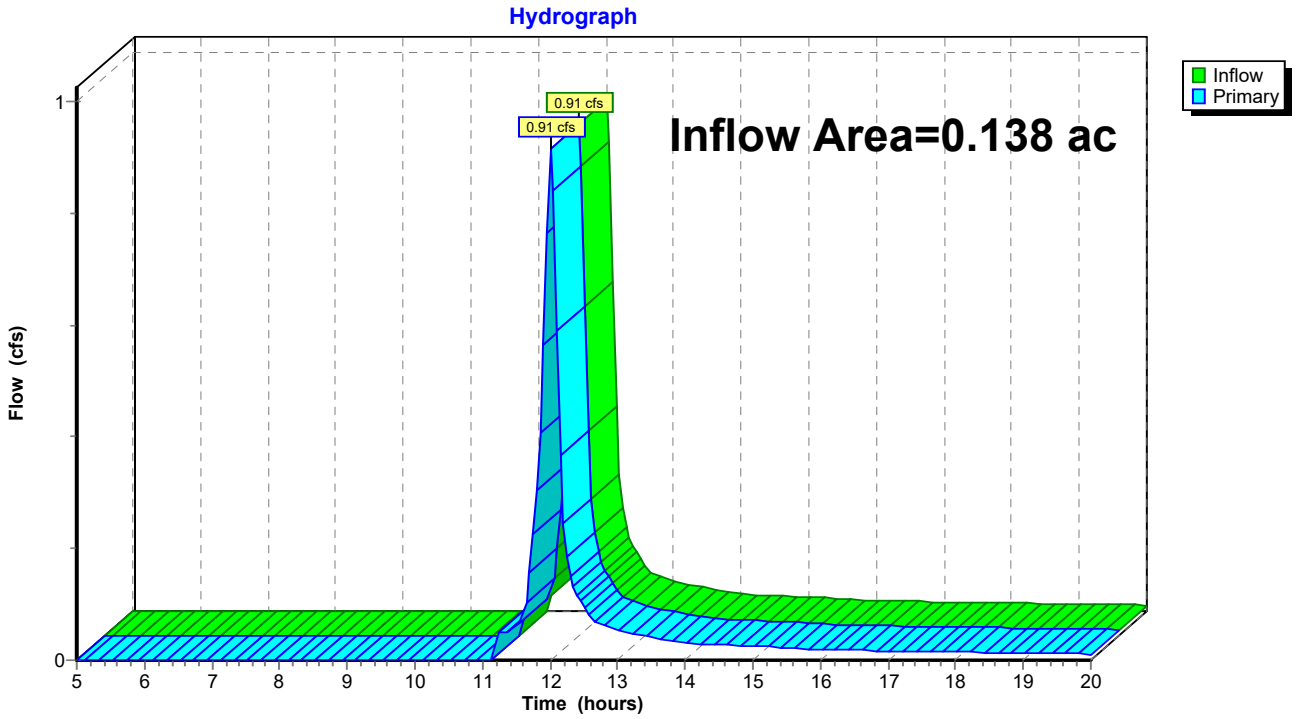


Summary for Link 10L: Combined Outflow

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 3.72" for 3 DAY-100YR. event
Inflow = 0.91 cfs @ 12.01 hrs, Volume= 0.043 af
Primary = 0.91 cfs @ 12.01 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 10L: Combined Outflow



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

Subcatchment1S: Pre-Developed Basin I Runoff Area=6,026 sf 0.00% Impervious Runoff Depth>7.70"
Flow Length=103' Slope=0.0147 '/' Tc=7.4 min CN=60 Runoff=1.89 cfs 0.089 af

Subcatchment3S: Post Developed Basin I Runoff Area=6,026 sf 6.59% Impervious Runoff Depth>9.71"
Flow Length=150' Slope=0.0083 '/' Tc=9.4 min CN=73 Runoff=2.13 cfs 0.112 af

Pond 4P: Rock Void Peak Elev=98.04' Storage=170 cf Inflow=1.07 cfs 0.056 af
Outflow=1.06 cfs 0.052 af

Pond 5P: South Pond Peak Elev=96.00' Storage=0.054 af Inflow=1.07 cfs 0.056 af
Outflow=0.00 cfs 0.000 af

Pond 9P: North Pond Peak Elev=97.05' Storage=61 cf Inflow=1.06 cfs 0.052 af
Outflow=1.06 cfs 0.051 af

Link 2L: Outfall Inflow=1.89 cfs 0.089 af
Primary=1.89 cfs 0.089 af

Link 6L: Split x 0.50 Inflow=2.13 cfs 0.112 af
Primary=1.07 cfs 0.056 af Secondary=1.07 cfs 0.056 af

Link 10L: Combined Outflow Inflow=1.06 cfs 0.051 af
Primary=1.06 cfs 0.051 af

Summary for Subcatchment 1S: Pre-Developed Basin I

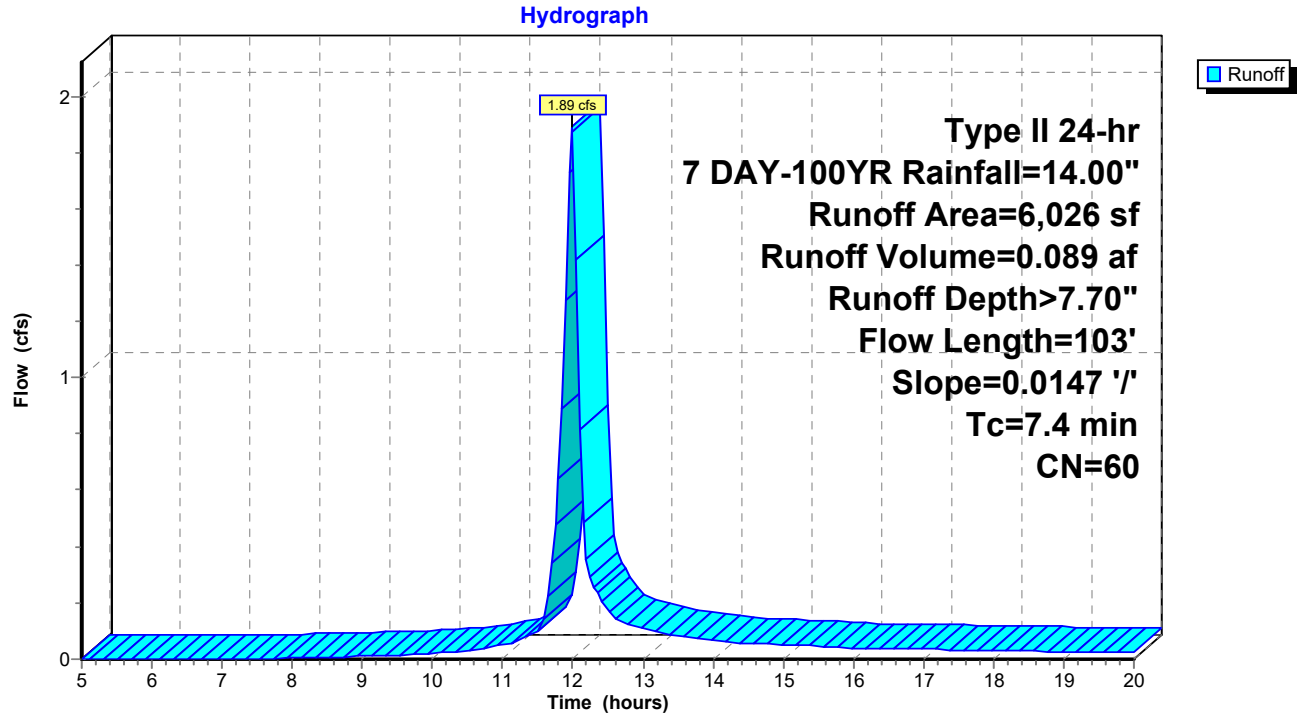
Runoff = 1.89 cfs @ 11.99 hrs, Volume= 0.089 af, Depth> 7.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

	Area (sf)	CN	Description
*	6,026	60	Woods/grass comb., Poor, HSG B
	6,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	103	0.0147	0.23		**Lag/CN Method, Woods**

Subcatchment 1S: Pre-Developed Basin I



Summary for Subcatchment 3S: Post Developed Basin I

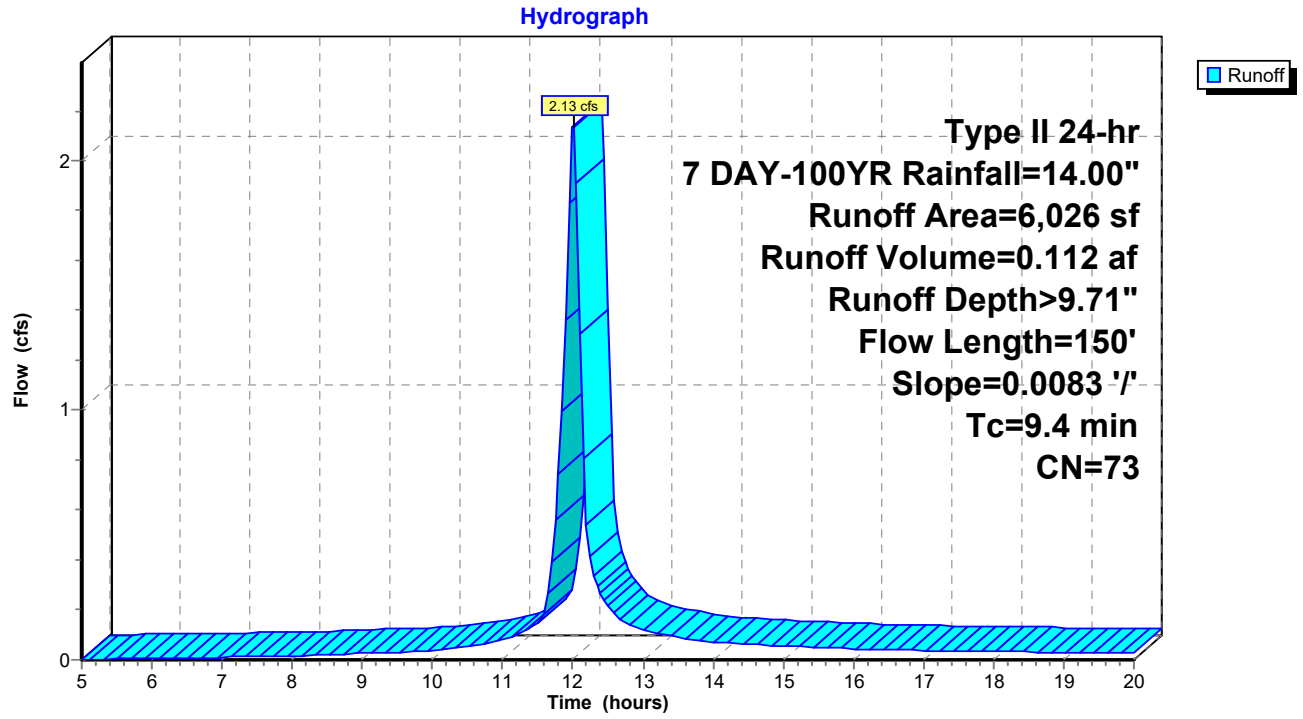
Runoff = 2.13 cfs @ 12.00 hrs, Volume= 0.112 af, Depth> 9.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 7 DAY-100YR Rainfall=14.00"

	Area (sf)	CN	Description
	300	98	Roofs, HSG B
	97	98	Paved parking, HSG B
*	973	65	Uncompacted Gravel 35% Void
	1,283	85	Gravel roads, HSG B
	3,373	67	Brush, Poor, HSG B
	6,026	73	Weighted Average
	5,629		93.41% Pervious Area
	397		6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	150	0.0083	0.27		**Lag/CN Method,**

Subcatchment 3S: Post Developed Basin I



Summary for Pond 4P: Rock Void

Inflow = 1.07 cfs @ 12.00 hrs, Volume= 0.056 af
Outflow = 1.06 cfs @ 12.00 hrs, Volume= 0.052 af, Atten= 0%, Lag= 0.0 min
Primary = 1.06 cfs @ 12.00 hrs, Volume= 0.052 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.04' @ 12.00 hrs Surf.Area= 973 sf Storage= 170 cf

Plug-Flow detention time= 42.9 min calculated for 0.052 af (93% of inflow)
Center-of-Mass det. time= 17.5 min (778.7 - 761.2)

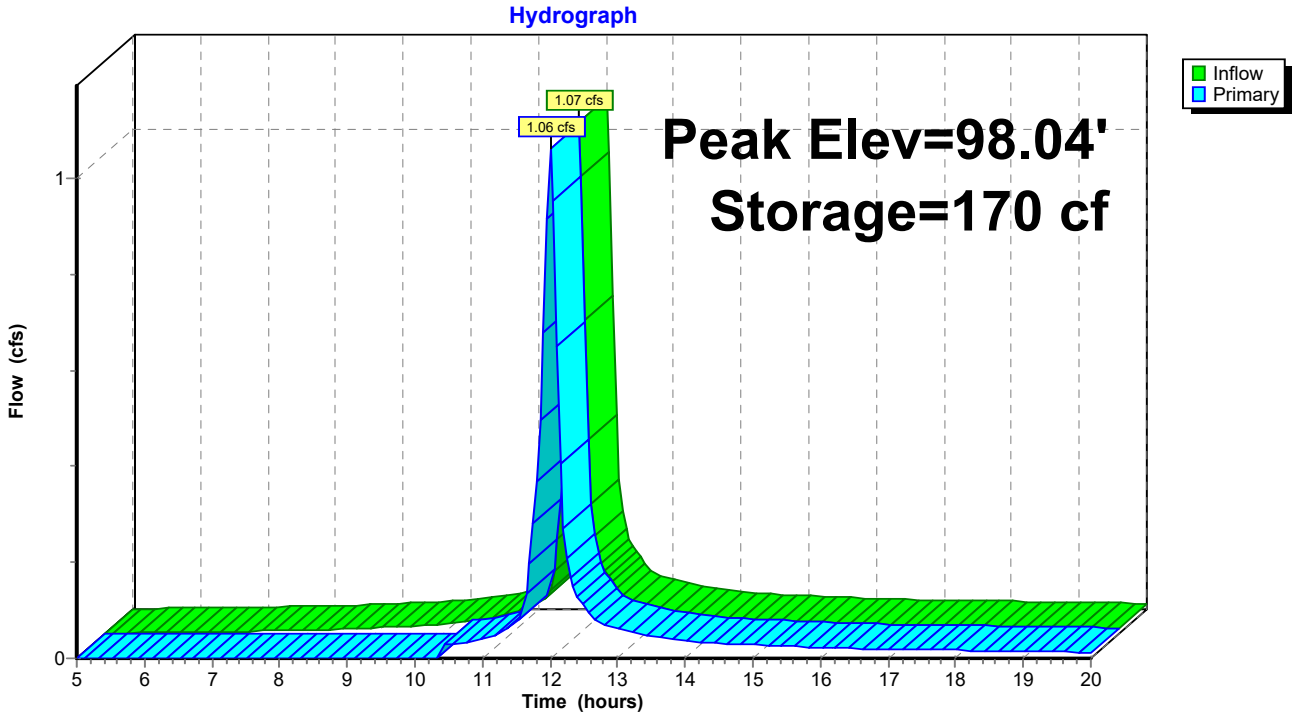
Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	170 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 487 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	973	0	0
98.00	973	487	487

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**45.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.05 cfs @ 12.00 hrs HW=98.04' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.05 cfs @ 0.57 fps)

Pond 4P: Rock Void



Summary for Pond 5P: South Pond

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 4.85" for 7 DAY-100YR event
Inflow = 1.07 cfs @ 12.00 hrs, Volume= 0.056 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.00' @ 20.00 hrs Surf.Area= 61.142 ac Storage= 0.054 af

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

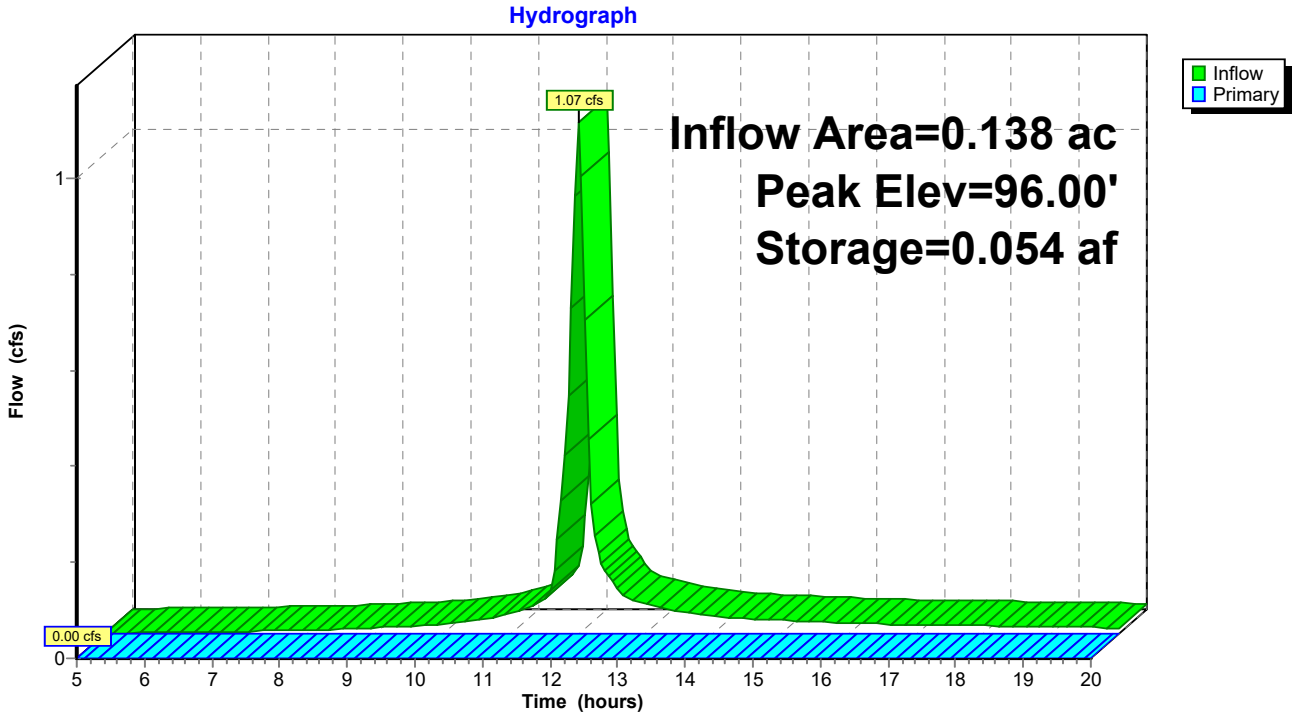
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	356.830 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
96.00	60.960	0.000	0.000
97.00	265.600	163.280	163.280
98.00	121.500	193.550	356.830

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	**100.0 deg x 8.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 5P: South Pond



Summary for Pond 9P: North Pond

Inflow = 1.06 cfs @ 12.00 hrs, Volume= 0.052 af
Outflow = 1.06 cfs @ 12.01 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.2 min
Primary = 1.06 cfs @ 12.01 hrs, Volume= 0.051 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.05' @ 12.01 hrs Surf.Area= 148 sf Storage= 61 cf

Plug-Flow detention time= 10.4 min calculated for 0.051 af (98% of inflow)
Center-of-Mass det. time= 3.1 min (781.8 - 778.7)

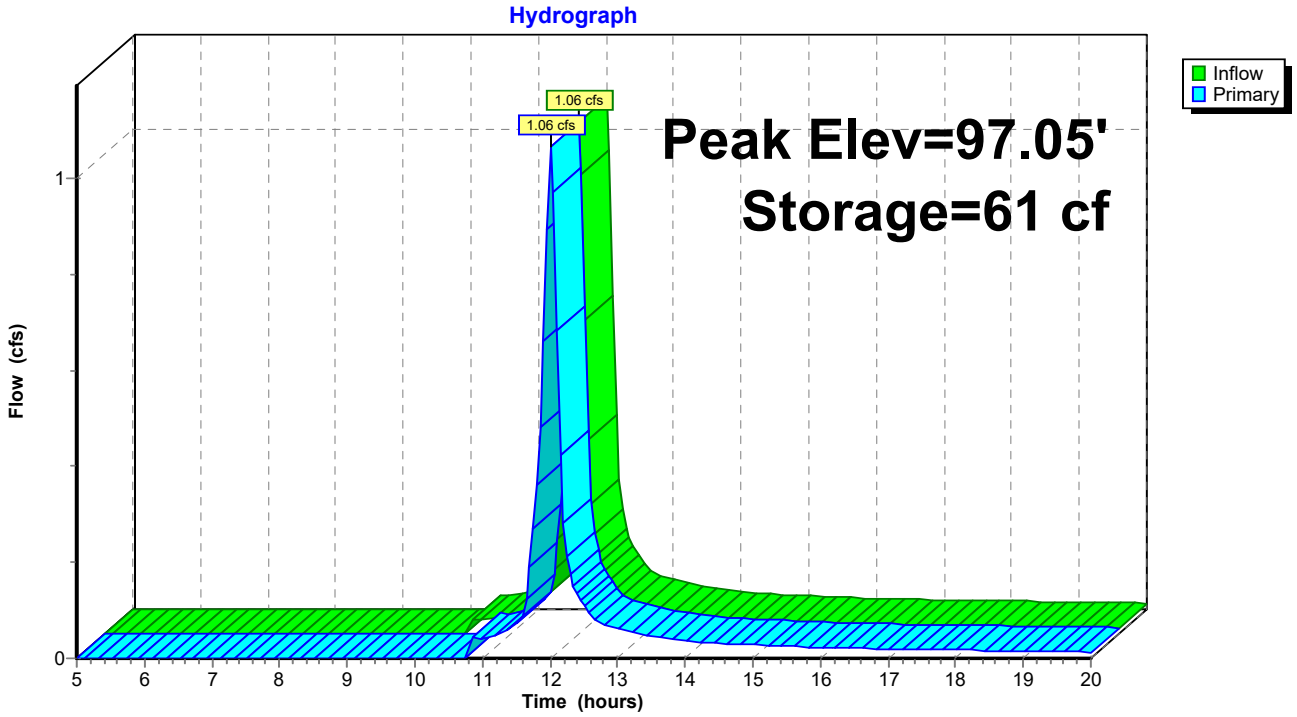
Volume	Invert	Avail.Storage	Storage Description
#1	96.50'	209 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.50	72	0	0
97.00	147	55	55
98.00	162	155	209

Device	Routing	Invert	Outlet Devices
#1	Primary	96.90'	**100.0 deg x 6.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=1.05 cfs @ 12.01 hrs HW=97.04' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.05 cfs @ 1.18 fps)

Pond 9P: North Pond

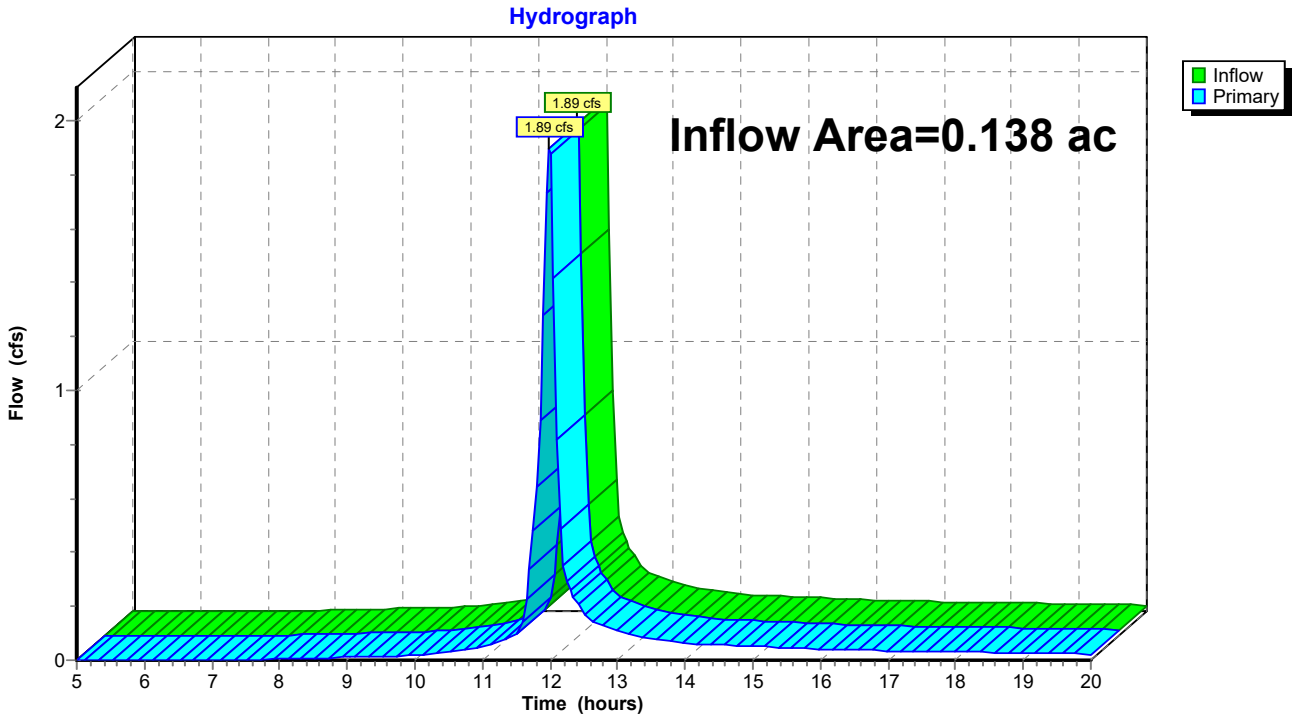


Summary for Link 2L: Outfall

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth > 7.70" for 7 DAY-100YR event
Inflow = 1.89 cfs @ 11.99 hrs, Volume= 0.089 af
Primary = 1.89 cfs @ 11.99 hrs, Volume= 0.089 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: Outfall

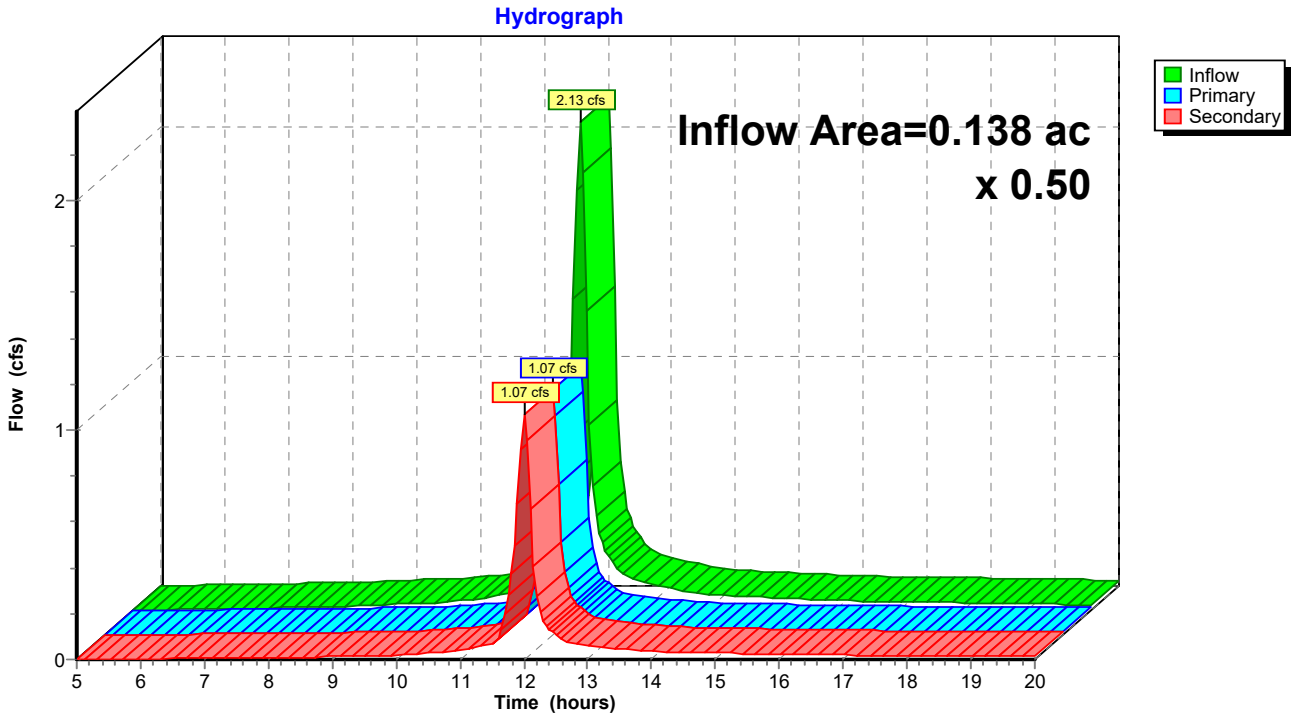


Summary for Link 6L: Split

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 9.71" for 7 DAY-100YR event
Inflow = 2.13 cfs @ 12.00 hrs, Volume= 0.112 af
Primary = 1.07 cfs @ 12.00 hrs, Volume= 0.056 af, Atten= 50%, Lag= 0.0 min
Secondary = 1.07 cfs @ 12.00 hrs, Volume= 0.056 af

Primary outflow = Inflow x 0.50, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 6L: Split

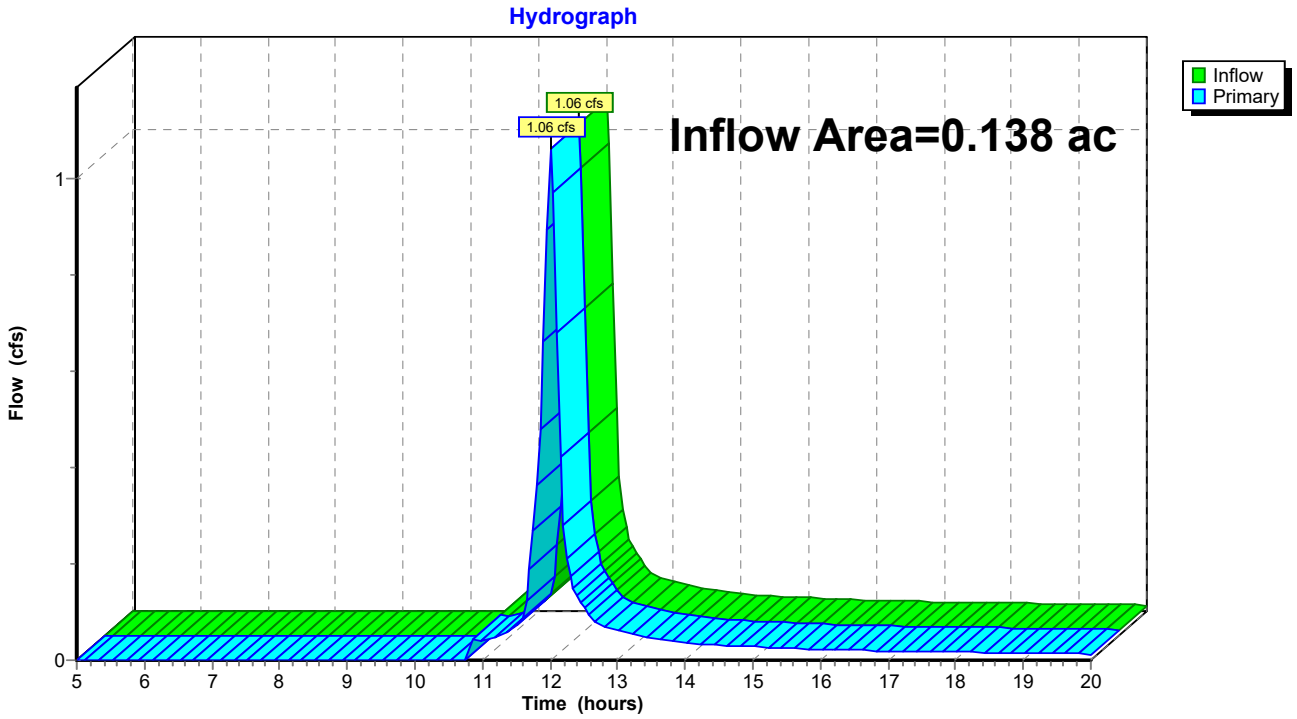


Summary for Link 10L: Combined Outflow

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 4.43" for 7 DAY-100YR event
Inflow = 1.06 cfs @ 12.01 hrs, Volume= 0.051 af
Primary = 1.06 cfs @ 12.01 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 10L: Combined Outflow



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

Subcatchment1S: Pre-Developed Basin I Runoff Area=6,026 sf 0.00% Impervious Runoff Depth>9.46"
Flow Length=103' Slope=0.0147 '/' Tc=7.4 min CN=60 Runoff=2.30 cfs 0.109 af

Subcatchment3S: Post Developed Basin I Runoff Area=6,026 sf 6.59% Impervious Runoff Depth>11.60"
Flow Length=150' Slope=0.0083 '/' Tc=9.4 min CN=73 Runoff=2.52 cfs 0.134 af

Pond 4P: Rock Void Peak Elev=98.05' Storage=170 cf Inflow=1.26 cfs 0.067 af
Outflow=1.26 cfs 0.063 af

Pond 5P: South Pond Peak Elev=96.00' Storage=0.065 af Inflow=1.26 cfs 0.067 af
Outflow=0.00 cfs 0.000 af

Pond 9P: North Pond Peak Elev=97.06' Storage=64 cf Inflow=1.26 cfs 0.063 af
Outflow=1.26 cfs 0.062 af

Link 2L: Outfall Inflow=2.30 cfs 0.109 af
Primary=2.30 cfs 0.109 af

Link 6L: Split x 0.50 Inflow=2.52 cfs 0.134 af
Primary=1.26 cfs 0.067 af Secondary=1.26 cfs 0.067 af

Link 10L: Combined Outflow Inflow=1.26 cfs 0.062 af
Primary=1.26 cfs 0.062 af

Summary for Subcatchment 1S: Pre-Developed Basin I

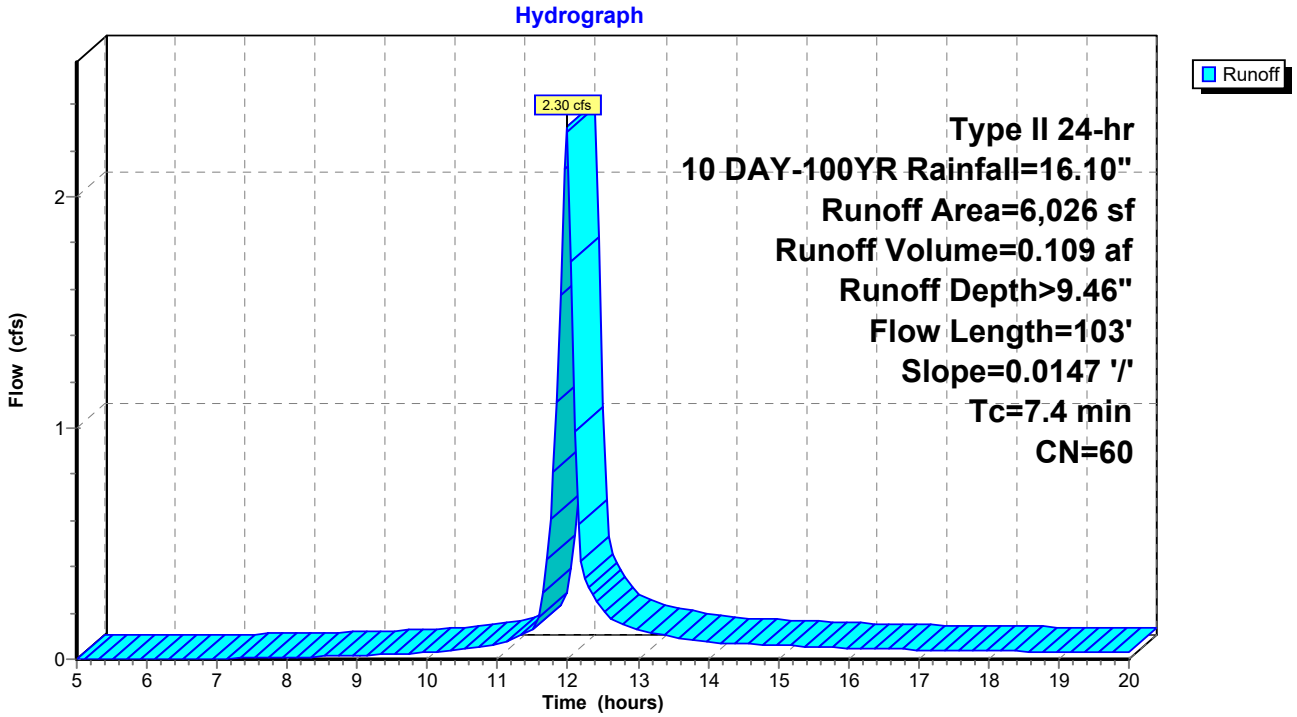
Runoff = 2.30 cfs @ 11.99 hrs, Volume= 0.109 af, Depth> 9.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

	Area (sf)	CN	Description
*	6,026	60	Woods/grass comb., Poor, HSG B
	6,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	103	0.0147	0.23		**Lag/CN Method, Woods**

Subcatchment 1S: Pre-Developed Basin I



Summary for Subcatchment 3S: Post Developed Basin I

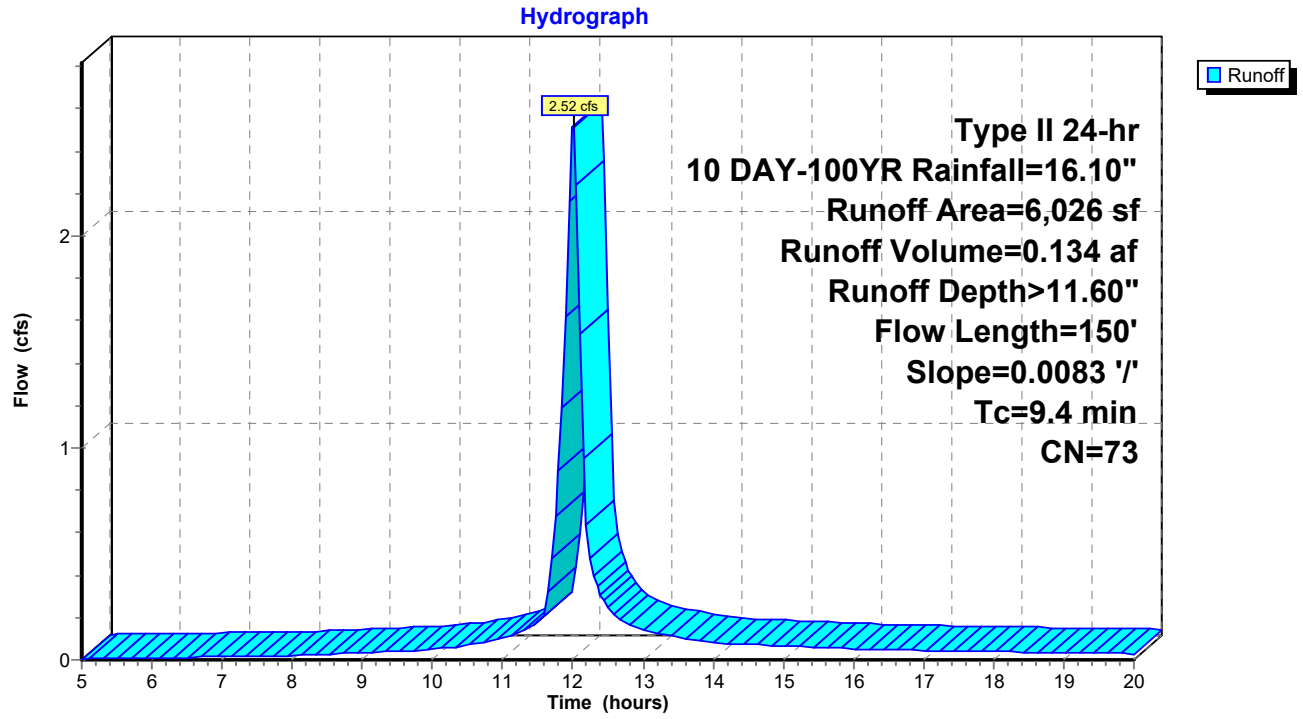
Runoff = 2.52 cfs @ 12.00 hrs, Volume= 0.134 af, Depth>11.60"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10 DAY-100YR Rainfall=16.10"

	Area (sf)	CN	Description
	300	98	Roofs, HSG B
	97	98	Paved parking, HSG B
*	973	65	Uncompacted Gravel 35% Void
	1,283	85	Gravel roads, HSG B
	3,373	67	Brush, Poor, HSG B
	6,026	73	Weighted Average
	5,629		93.41% Pervious Area
	397		6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	150	0.0083	0.27		**Lag/CN Method,**

Subcatchment 3S: Post Developed Basin I



Summary for Pond 4P: Rock Void

Inflow = 1.26 cfs @ 12.00 hrs, Volume= 0.067 af
Outflow = 1.26 cfs @ 12.00 hrs, Volume= 0.063 af, Atten= 0%, Lag= 0.0 min
Primary = 1.26 cfs @ 12.00 hrs, Volume= 0.063 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.05' @ 12.00 hrs Surf.Area= 973 sf Storage= 170 cf

Plug-Flow detention time= 38.8 min calculated for 0.063 af (94% of inflow)
Center-of-Mass det. time= 16.5 min (773.8 - 757.4)

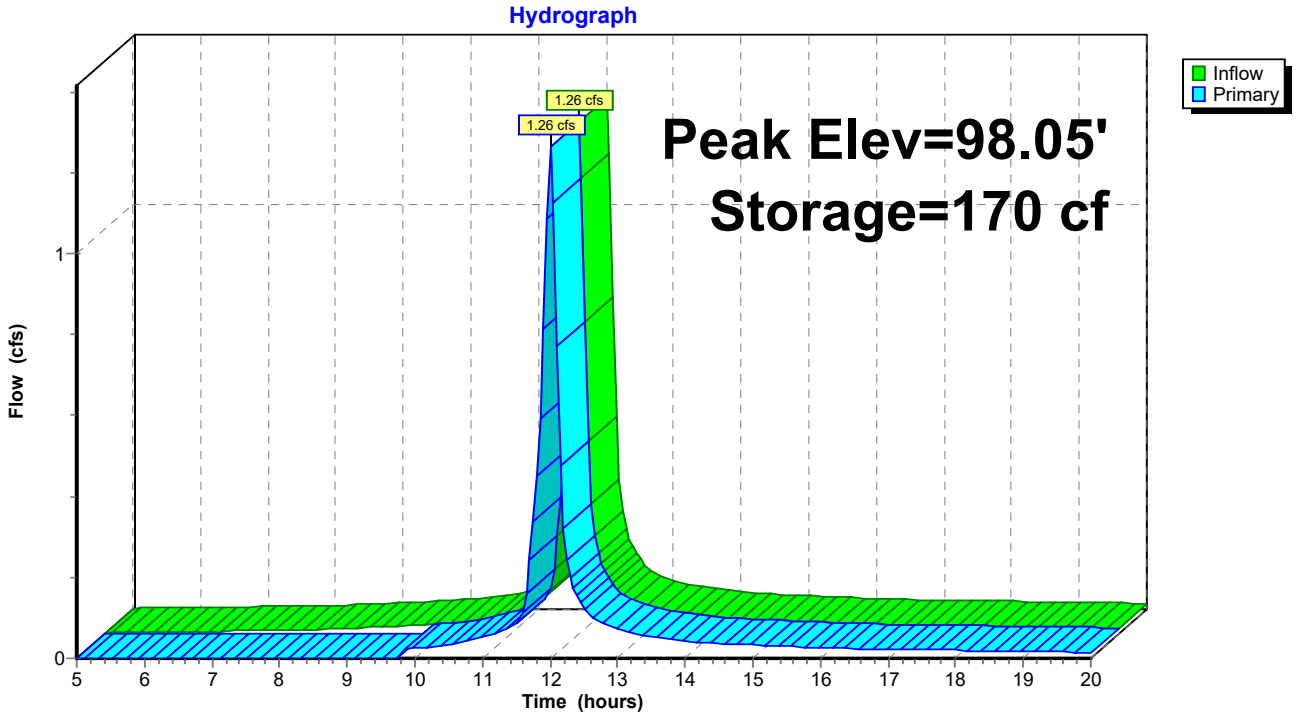
Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	170 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 487 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	973	0	0
98.00	973	487	487

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**45.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.25 cfs @ 12.00 hrs HW=98.05' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 1.25 cfs @ 0.60 fps)

Pond 4P: Rock Void



Summary for Pond 5P: South Pond

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 5.80" for 10 DAY-100YR event
Inflow = 1.26 cfs @ 12.00 hrs, Volume= 0.067 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.00' @ 20.00 hrs Surf.Area= 61.177 ac Storage= 0.065 af

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

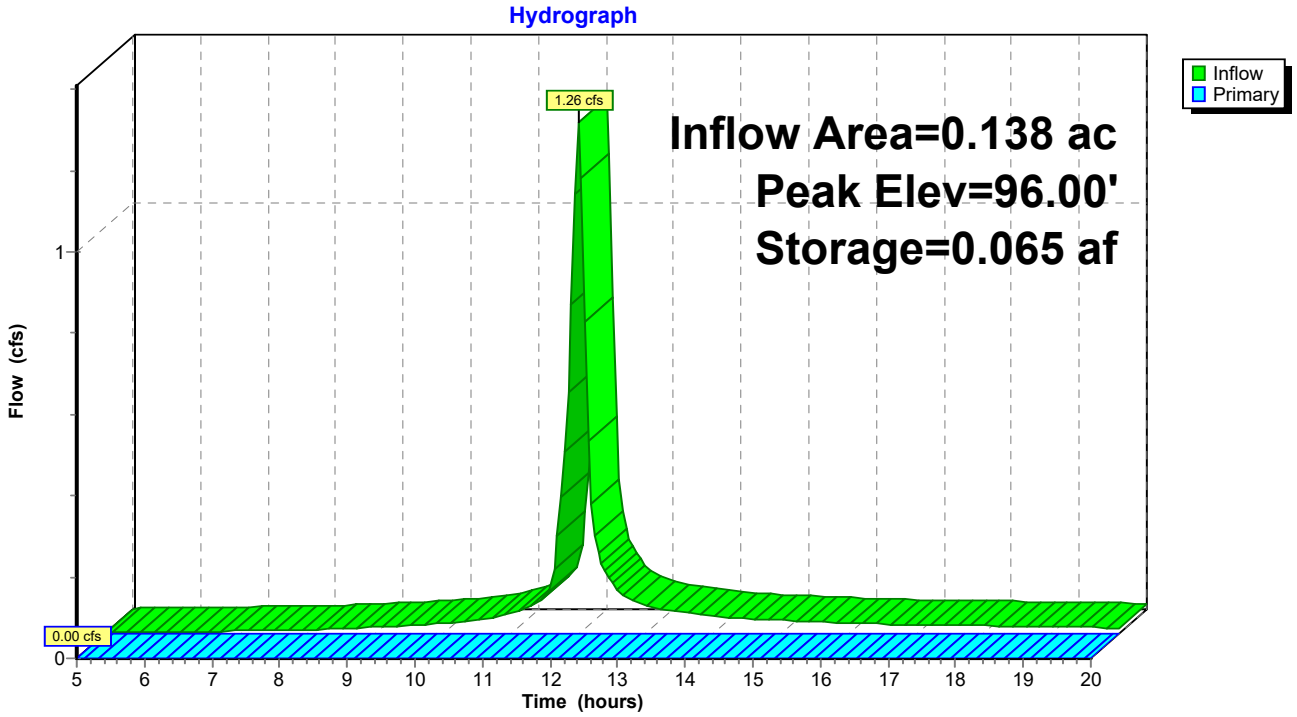
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	356.830 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
96.00	60.960	0.000	0.000
97.00	265.600	163.280	163.280
98.00	121.500	193.550	356.830

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	**100.0 deg x 8.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 5P: South Pond



Summary for Pond 9P: North Pond

Inflow = 1.26 cfs @ 12.00 hrs, Volume= 0.063 af
Outflow = 1.26 cfs @ 12.01 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.2 min
Primary = 1.26 cfs @ 12.01 hrs, Volume= 0.062 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.06' @ 12.01 hrs Surf.Area= 148 sf Storage= 64 cf

Plug-Flow detention time= 9.1 min calculated for 0.062 af (98% of inflow)
Center-of-Mass det. time= 3.0 min (776.8 - 773.8)

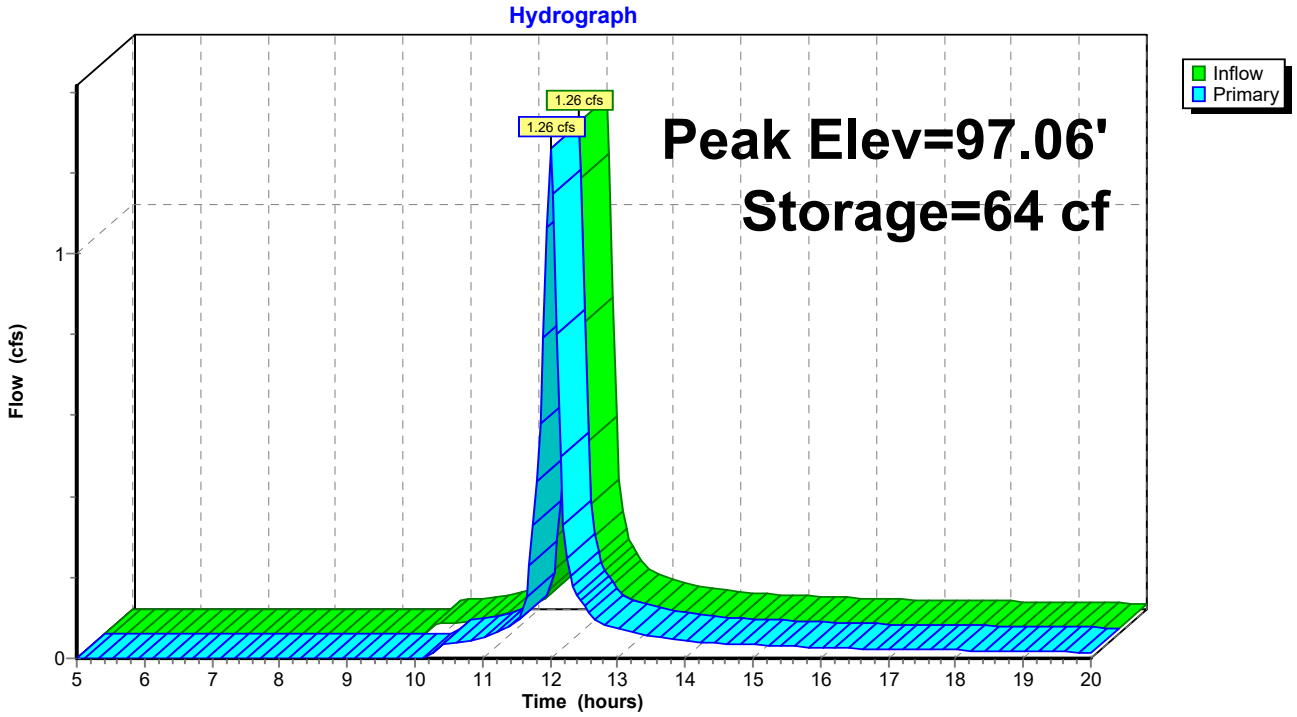
Volume	Invert	Avail.Storage	Storage Description
#1	96.50'	209 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.50	72	0	0
97.00	147	55	55
98.00	162	155	209

Device	Routing	Invert	Outlet Devices
#1	Primary	96.90'	**100.0 deg x 6.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=1.24 cfs @ 12.01 hrs HW=97.06' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 1.24 cfs @ 1.24 fps)

Pond 9P: North Pond

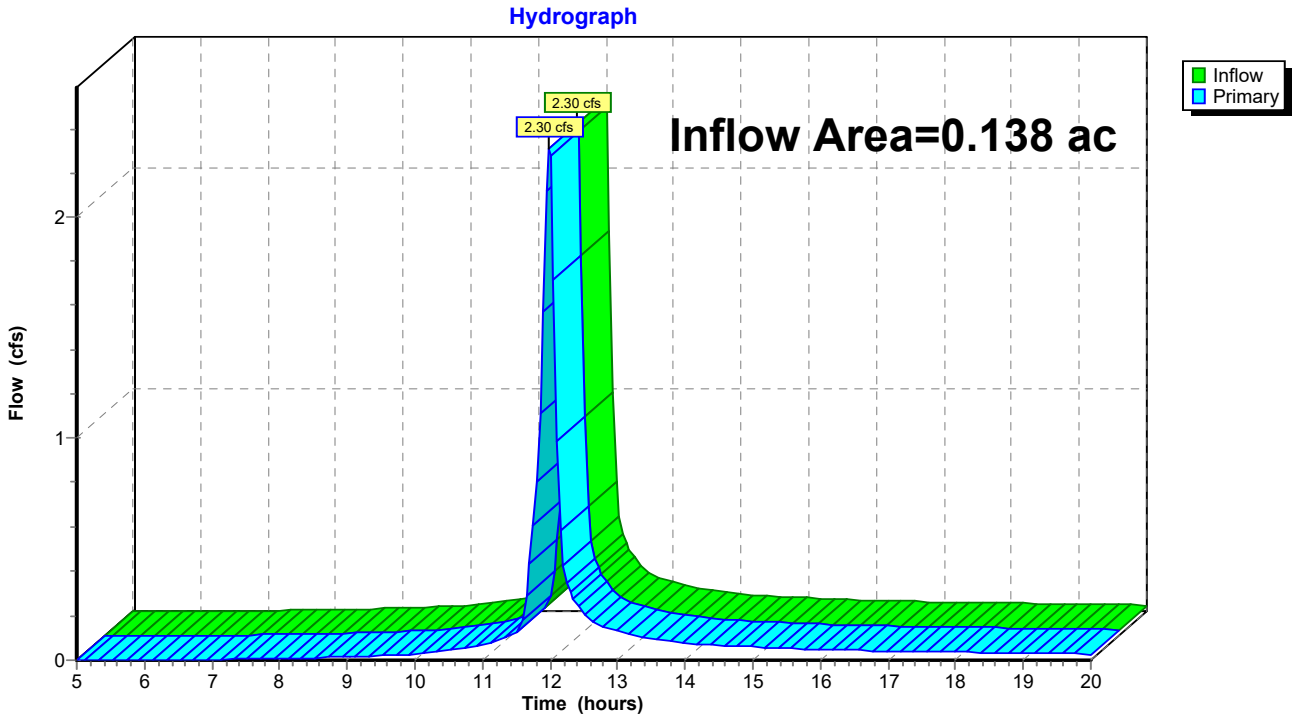


Summary for Link 2L: Outfall

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth > 9.46" for 10 DAY-100YR event
Inflow = 2.30 cfs @ 11.99 hrs, Volume= 0.109 af
Primary = 2.30 cfs @ 11.99 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: Outfall

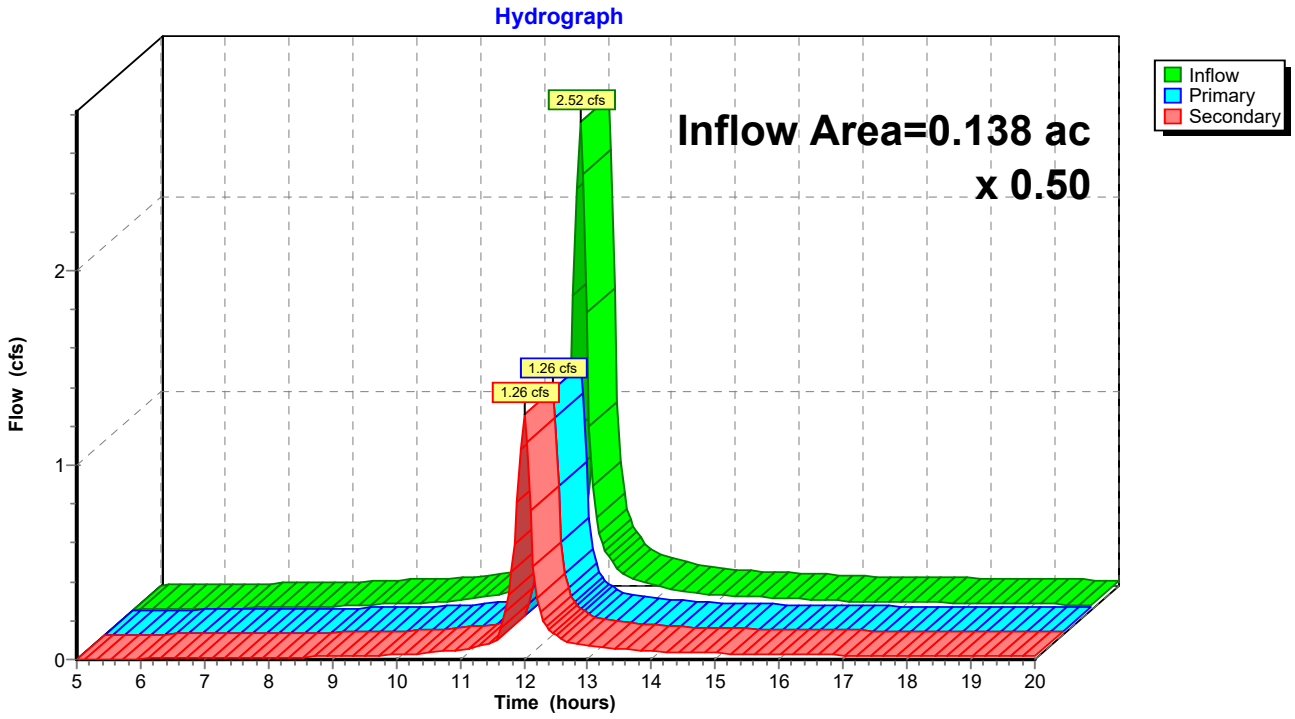


Summary for Link 6L: Split

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 11.60" for 10 DAY-100YR event
Inflow = 2.52 cfs @ 12.00 hrs, Volume= 0.134 af
Primary = 1.26 cfs @ 12.00 hrs, Volume= 0.067 af, Atten= 50%, Lag= 0.0 min
Secondary = 1.26 cfs @ 12.00 hrs, Volume= 0.067 af

Primary outflow = Inflow x 0.50, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 6L: Split

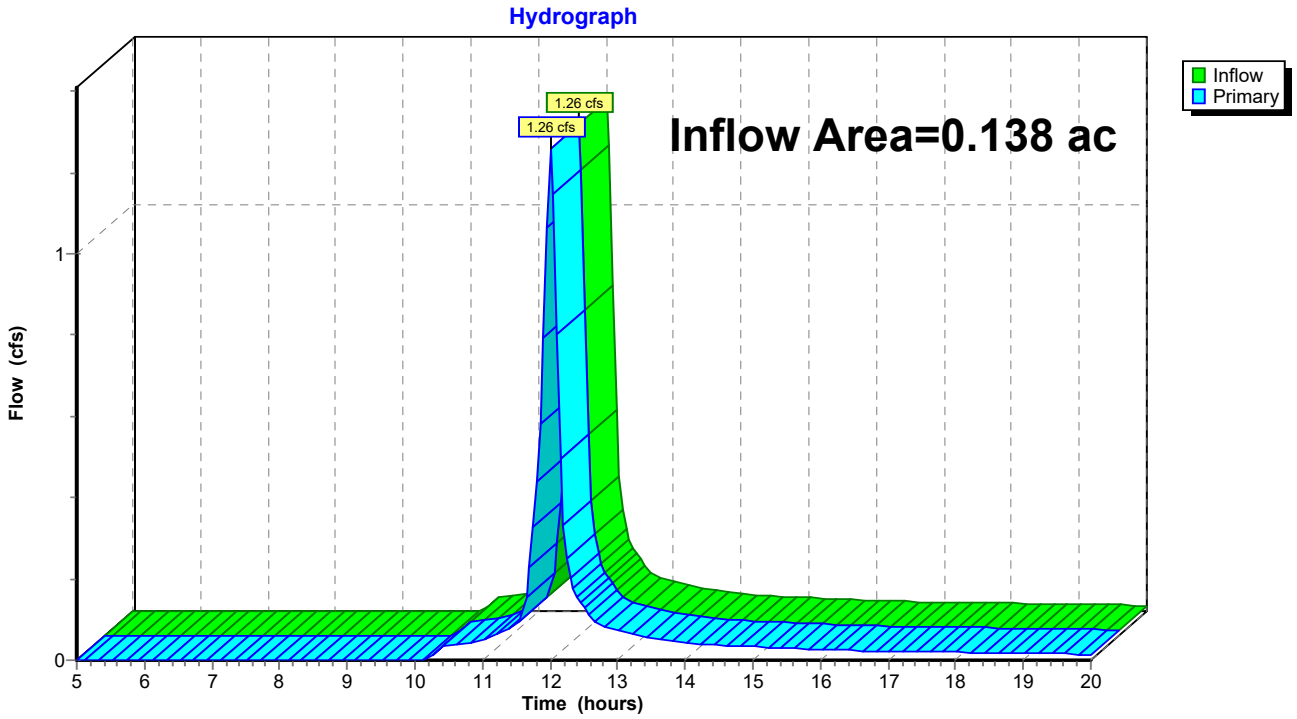


Summary for Link 10L: Combined Outflow

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 5.38" for 10 DAY-100YR event
Inflow = 1.26 cfs @ 12.01 hrs, Volume= 0.062 af
Primary = 1.26 cfs @ 12.01 hrs, Volume= 0.062 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 10L: Combined Outflow



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

Subcatchment1S: Pre-Developed Basin I Runoff Area=6,026 sf 0.00% Impervious Runoff Depth>2.18"
Flow Length=103' Slope=0.0147 '/' Tc=7.4 min CN=60 Runoff=0.55 cfs 0.025 af

Subcatchment3S: Post Developed Basin I Runoff Area=6,026 sf 6.59% Impervious Runoff Depth>3.41"
Flow Length=150' Slope=0.0083 '/' Tc=9.4 min CN=73 Runoff=0.79 cfs 0.039 af

Pond 4P: Rock Void Peak Elev=98.03' Storage=170 cf Inflow=0.40 cfs 0.020 af
Outflow=0.57 cfs 0.016 af

Pond 5P: South Pond Peak Elev=96.00' Storage=0.019 af Inflow=0.40 cfs 0.020 af
Outflow=0.00 cfs 0.000 af

Pond 9P: North Pond Peak Elev=96.99' Storage=54 cf Inflow=0.57 cfs 0.016 af
Outflow=0.53 cfs 0.015 af

Link 2L: Outfall Inflow=0.55 cfs 0.025 af
Primary=0.55 cfs 0.025 af

Link 6L: Split x 0.50 Inflow=0.79 cfs 0.039 af
Primary=0.40 cfs 0.020 af Secondary=0.40 cfs 0.020 af

Link 10L: Combined Outflow Inflow=0.53 cfs 0.015 af
Primary=0.53 cfs 0.015 af

Summary for Subcatchment 1S: Pre-Developed Basin I

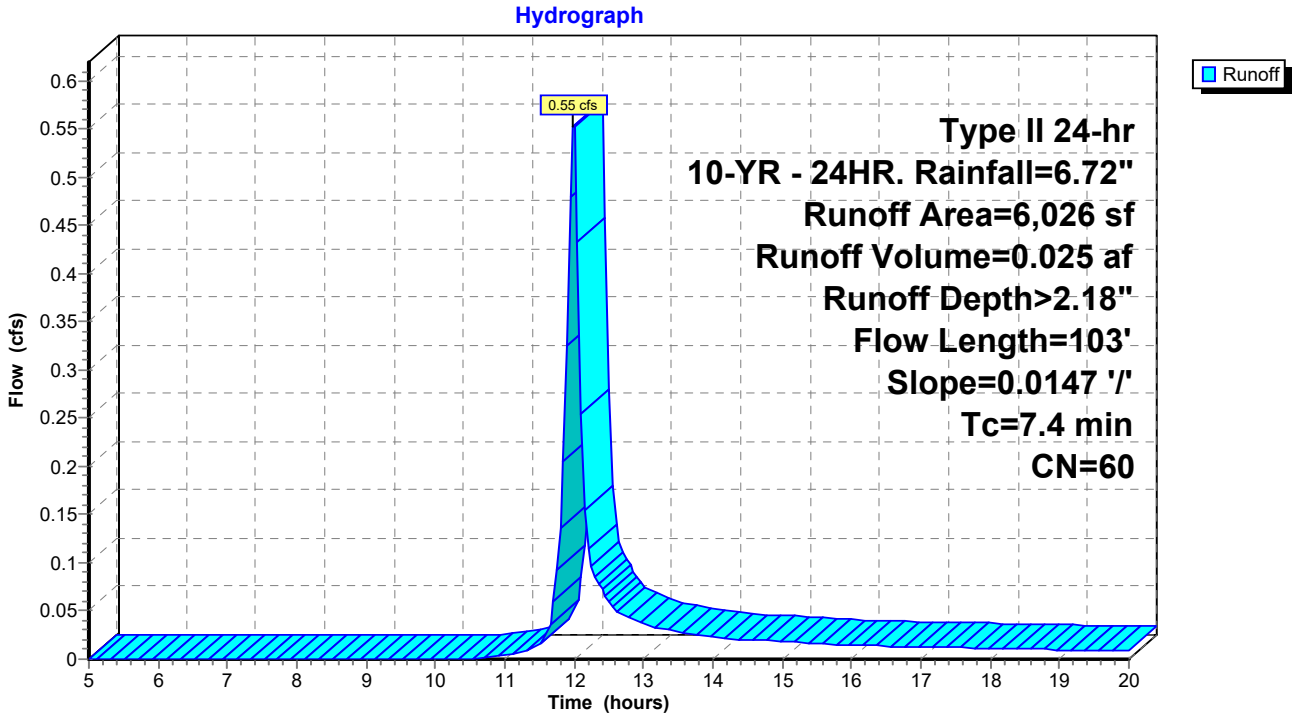
Runoff = 0.55 cfs @ 11.99 hrs, Volume= 0.025 af, Depth> 2.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

	Area (sf)	CN	Description
*	6,026	60	Woods/grass comb., Poor, HSG B
	6,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	103	0.0147	0.23		**Lag/CN Method, Woods**

Subcatchment 1S: Pre-Developed Basin I



Summary for Subcatchment 3S: Post Developed Basin I

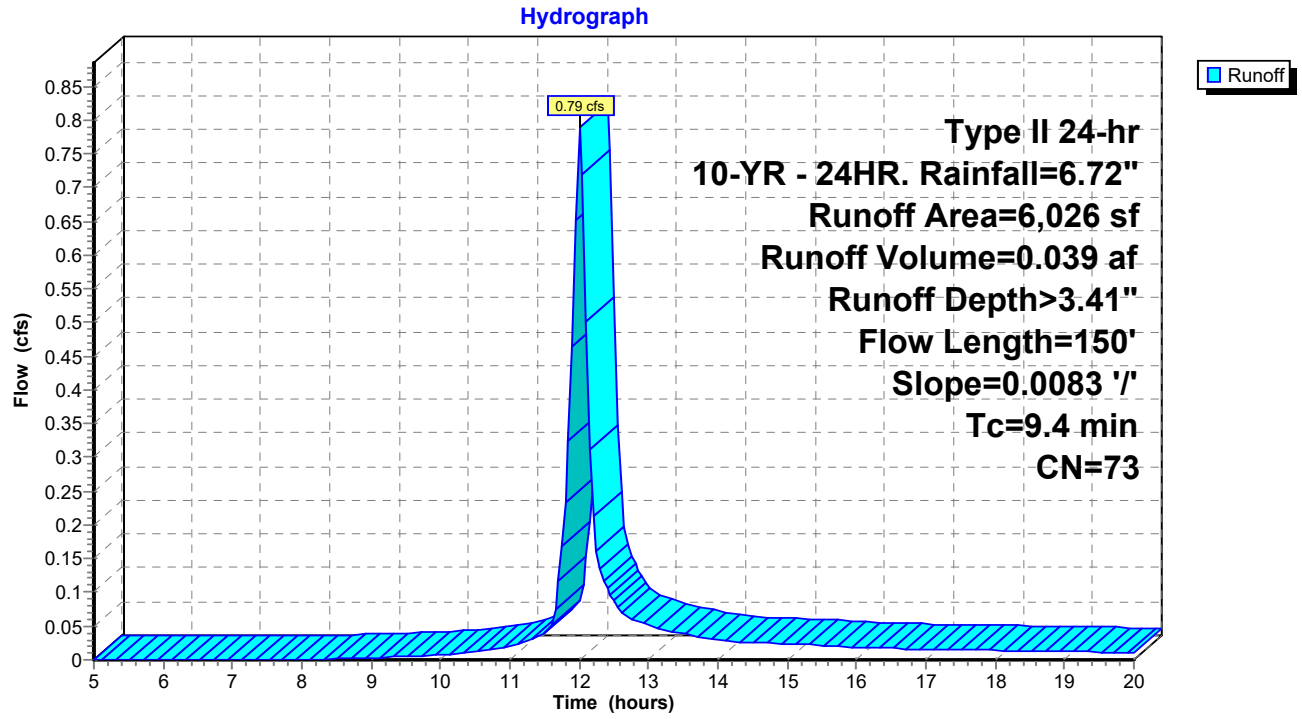
Runoff = 0.79 cfs @ 12.01 hrs, Volume= 0.039 af, Depth> 3.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-YR - 24HR. Rainfall=6.72"

	Area (sf)	CN	Description
	300	98	Roofs, HSG B
	97	98	Paved parking, HSG B
*	973	65	Uncompacted Gravel 35% Void
	1,283	85	Gravel roads, HSG B
	3,373	67	Brush, Poor, HSG B
	6,026	73	Weighted Average
	5,629		93.41% Pervious Area
	397		6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	150	0.0083	0.27		**Lag/CN Method,**

Subcatchment 3S: Post Developed Basin I



Summary for Pond 4P: Rock Void

Inflow = 0.40 cfs @ 12.01 hrs, Volume= 0.020 af
Outflow = 0.57 cfs @ 12.05 hrs, Volume= 0.016 af, Atten= 0%, Lag= 2.3 min
Primary = 0.57 cfs @ 12.05 hrs, Volume= 0.016 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.03' @ 12.04 hrs Surf.Area= 973 sf Storage= 170 cf

Plug-Flow detention time= 74.8 min calculated for 0.016 af (82% of inflow)
Center-of-Mass det. time= 23.6 min (808.5 - 784.9)

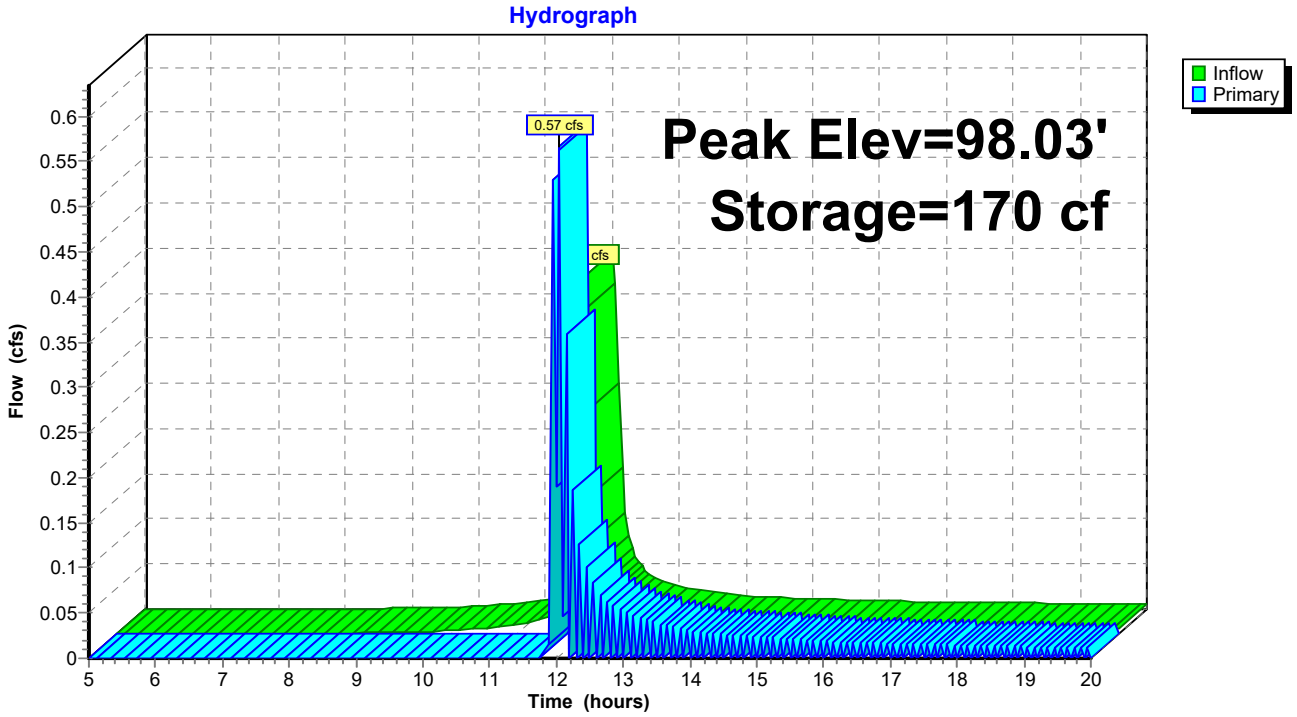
Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	170 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 487 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	973	0	0
98.00	973	487	487

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**45.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.53 cfs @ 12.05 hrs HW=98.03' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.53 cfs @ 0.45 fps)

Pond 4P: Rock Void



Summary for Pond 5P: South Pond

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 1.71" for 10-YR - 24HR. event
Inflow = 0.40 cfs @ 12.01 hrs, Volume= 0.020 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.00' @ 20.00 hrs Surf.Area= 61.024 ac Storage= 0.019 af

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

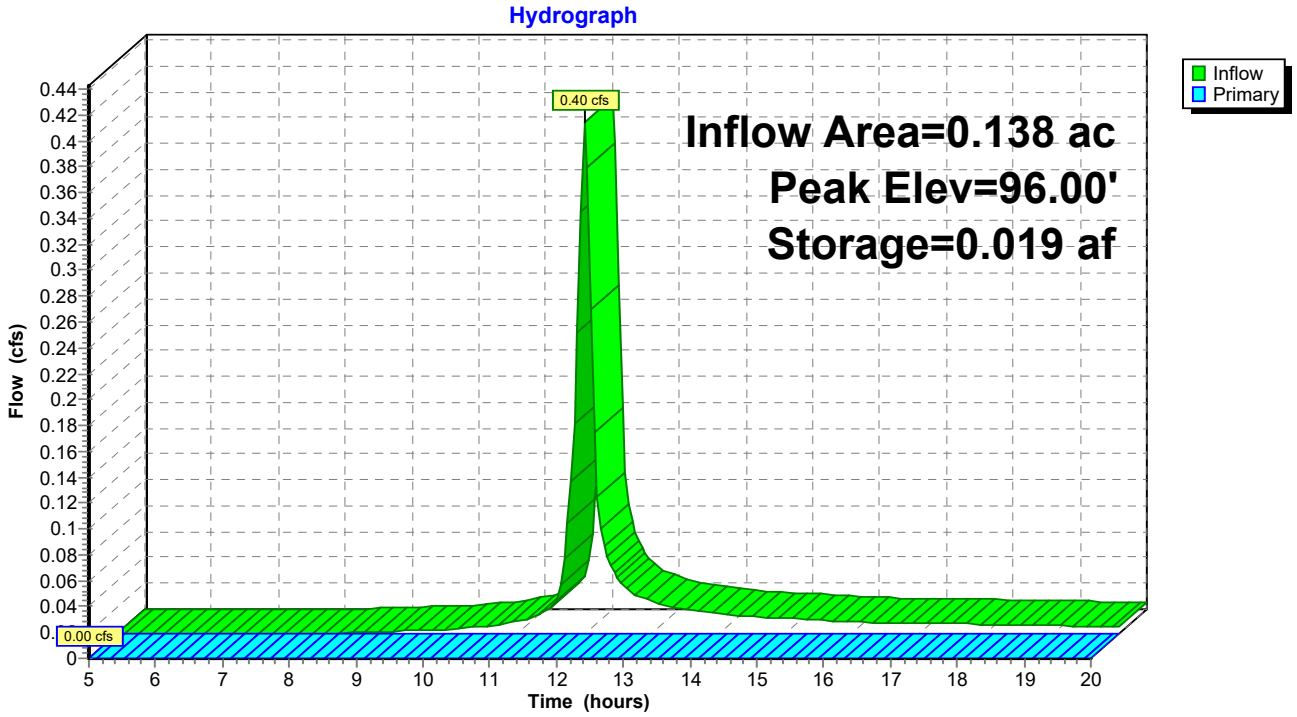
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	356.830 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
96.00	60.960	0.000	0.000
97.00	265.600	163.280	163.280
98.00	121.500	193.550	356.830

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	**100.0 deg x 8.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 5P: South Pond



Summary for Pond 9P: North Pond

Inflow = 0.57 cfs @ 12.05 hrs, Volume= 0.016 af
Outflow = 0.53 cfs @ 12.01 hrs, Volume= 0.015 af, Atten= 6%, Lag= 0.0 min
Primary = 0.53 cfs @ 12.01 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.99' @ 12.01 hrs Surf.Area= 146 sf Storage= 54 cf

Plug-Flow detention time= 27.1 min calculated for 0.015 af (94% of inflow)
Center-of-Mass det. time= 6.6 min (815.1 - 808.5)

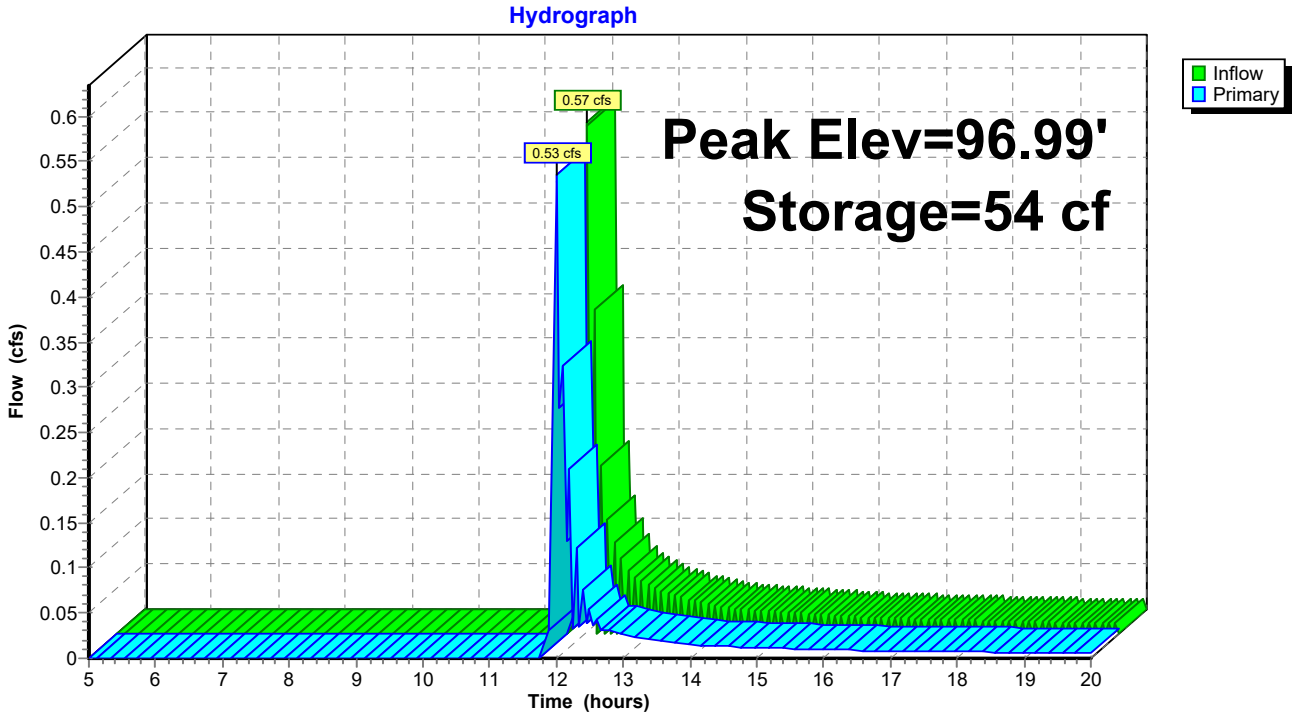
Volume	Invert	Avail.Storage	Storage Description
#1	96.50'	209 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.50	72	0	0
97.00	147	55	55
98.00	162	155	209

Device	Routing	Invert	Outlet Devices
#1	Primary	96.90'	**100.0 deg x 6.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.49 cfs @ 12.01 hrs HW=96.99' (Free Discharge)
↑**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.49 cfs @ 0.92 fps)

Pond 9P: North Pond

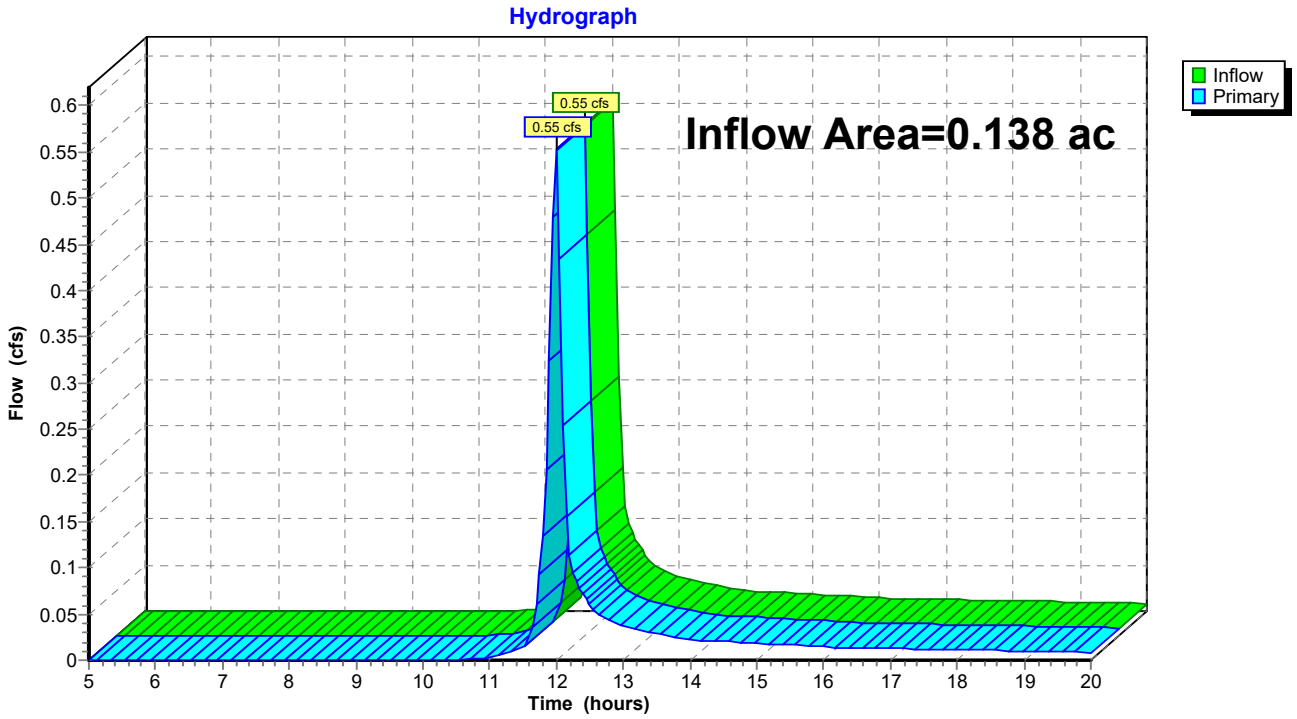


Summary for Link 2L: Outfall

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth > 2.18" for 10-YR - 24HR. event
Inflow = 0.55 cfs @ 11.99 hrs, Volume= 0.025 af
Primary = 0.55 cfs @ 11.99 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: Outfall

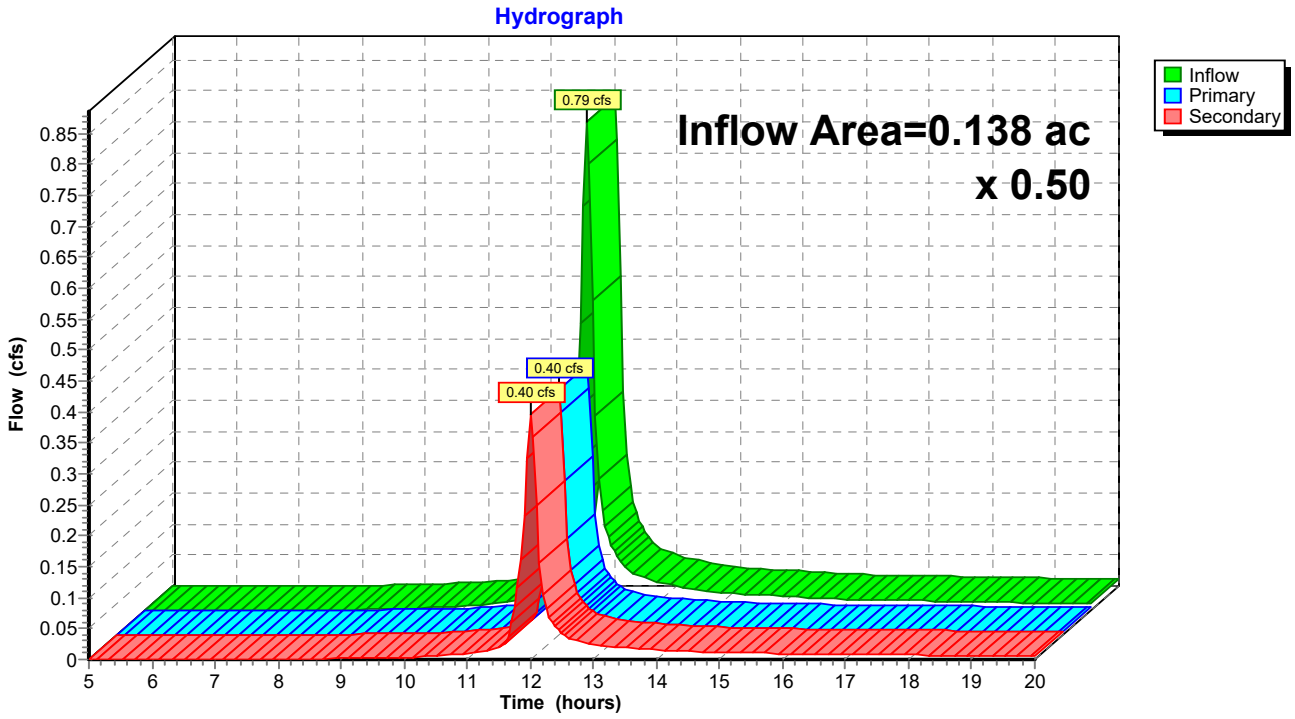


Summary for Link 6L: Split

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 3.41" for 10-YR - 24HR. event
Inflow = 0.79 cfs @ 12.01 hrs, Volume= 0.039 af
Primary = 0.40 cfs @ 12.01 hrs, Volume= 0.020 af, Atten= 50%, Lag= 0.0 min
Secondary = 0.40 cfs @ 12.01 hrs, Volume= 0.020 af

Primary outflow = Inflow x 0.50, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 6L: Split

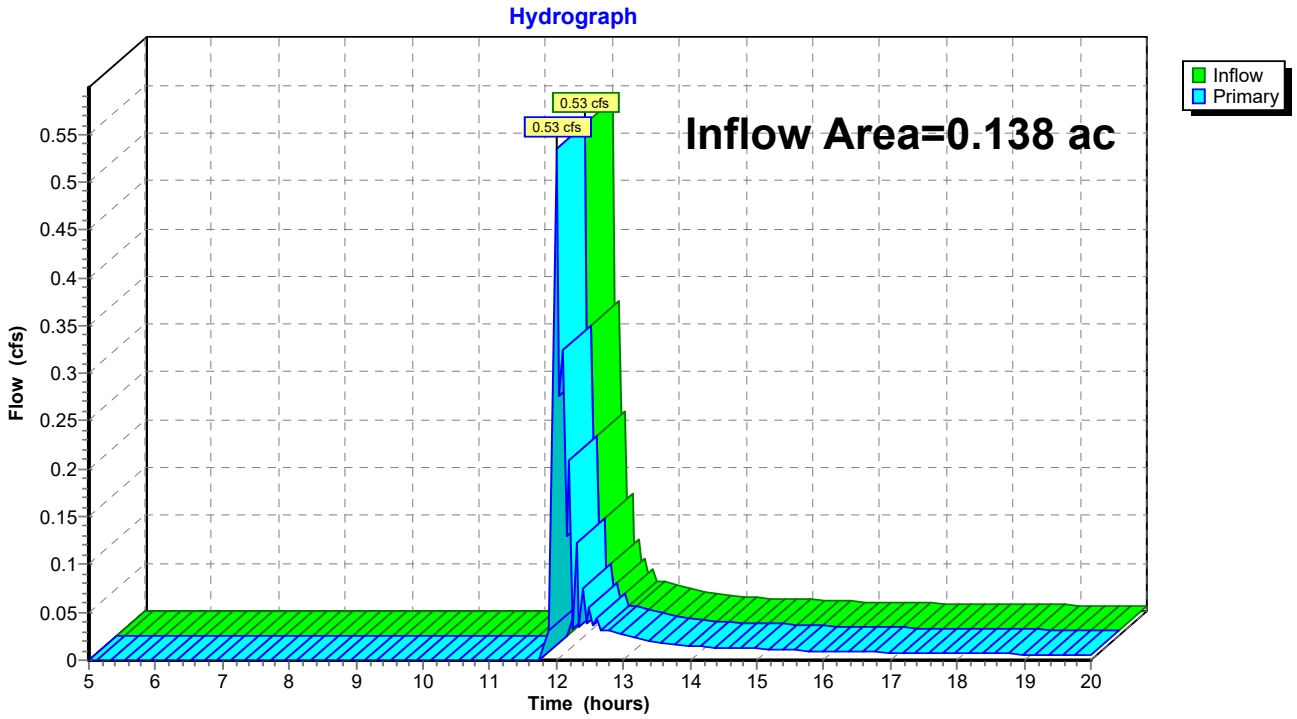


Summary for Link 10L: Combined Outflow

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 1.32" for 10-YR - 24HR. event
Inflow = 0.53 cfs @ 12.01 hrs, Volume= 0.015 af
Primary = 0.53 cfs @ 12.01 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 10L: Combined Outflow



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

Subcatchment1S: Pre-Developed Basin I Runoff Area=6,026 sf 0.00% Impervious Runoff Depth>2.99"
Flow Length=103' Slope=0.0147 '/' Tc=7.4 min CN=60 Runoff=0.76 cfs 0.034 af

Subcatchment3S: Post Developed Basin I Runoff Area=6,026 sf 6.59% Impervious Runoff Depth>4.39"
Flow Length=150' Slope=0.0083 '/' Tc=9.4 min CN=73 Runoff=1.01 cfs 0.051 af

Pond 4P: Rock Void Peak Elev=98.03' Storage=170 cf Inflow=0.50 cfs 0.025 af
Outflow=0.58 cfs 0.022 af

Pond 5P: South Pond Peak Elev=96.00' Storage=0.025 af Inflow=0.50 cfs 0.025 af
Outflow=0.00 cfs 0.000 af

Pond 9P: North Pond Peak Elev=96.99' Storage=53 cf Inflow=0.58 cfs 0.022 af
Outflow=0.50 cfs 0.021 af

Link 2L: Outfall Inflow=0.76 cfs 0.034 af
Primary=0.76 cfs 0.034 af

Link 6L: Split x 0.50 Inflow=1.01 cfs 0.051 af
Primary=0.50 cfs 0.025 af Secondary=0.50 cfs 0.025 af

Link 10L: Combined Outflow Inflow=0.50 cfs 0.021 af
Primary=0.50 cfs 0.021 af

Summary for Subcatchment 1S: Pre-Developed Basin I

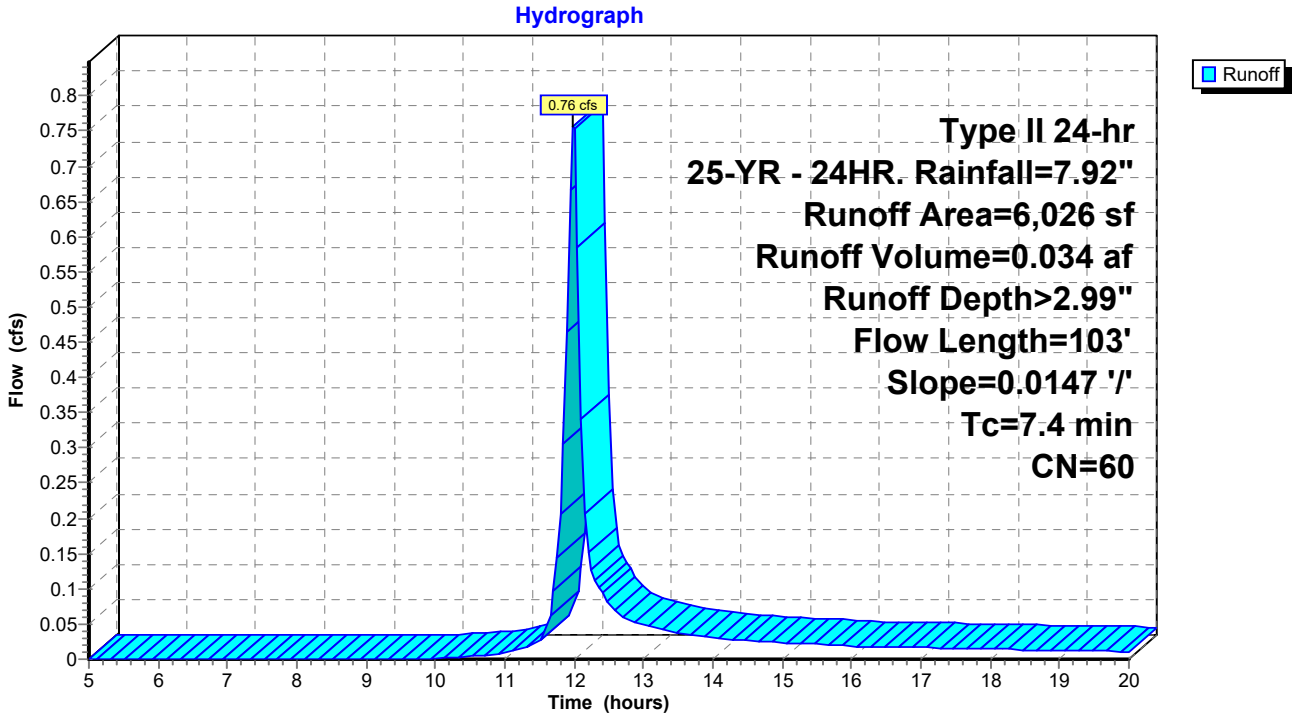
Runoff = 0.76 cfs @ 11.99 hrs, Volume= 0.034 af, Depth> 2.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

	Area (sf)	CN	Description
*	6,026	60	Woods/grass comb., Poor, HSG B
	6,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	103	0.0147	0.23		**Lag/CN Method, Woods**

Subcatchment 1S: Pre-Developed Basin I



Summary for Subcatchment 3S: Post Developed Basin I

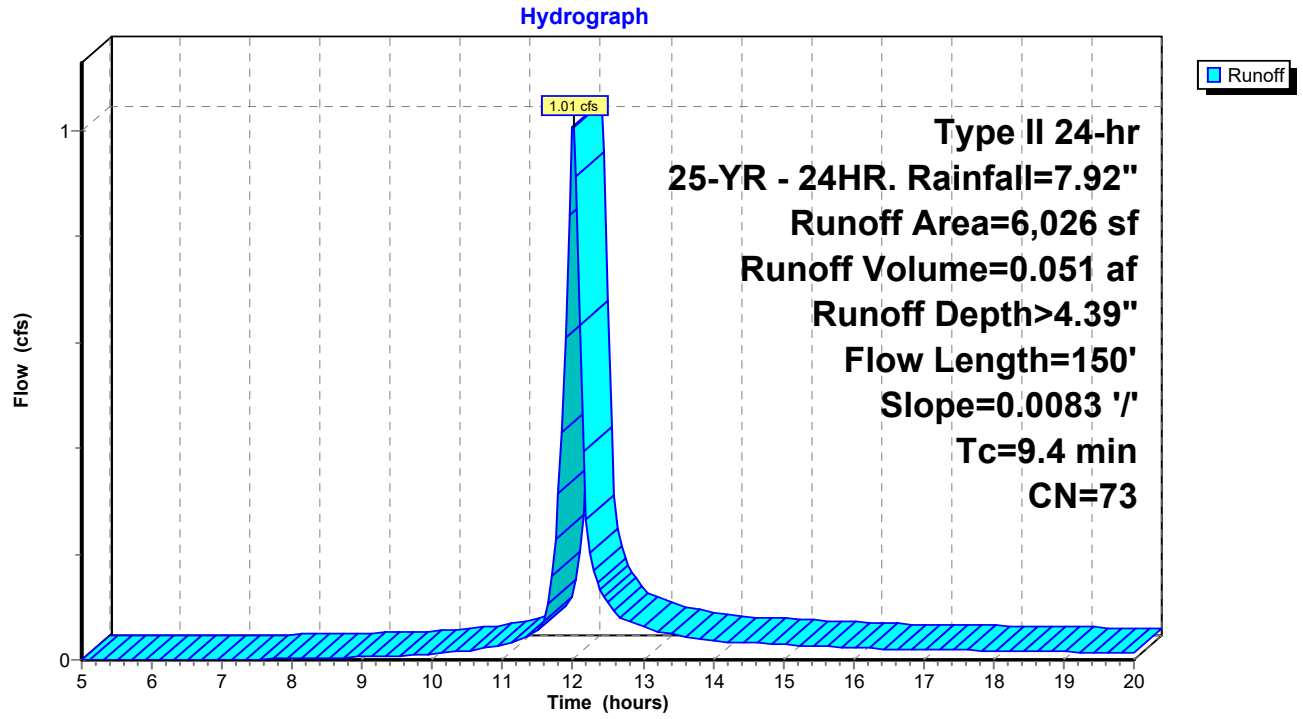
Runoff = 1.01 cfs @ 12.01 hrs, Volume= 0.051 af, Depth> 4.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-YR - 24HR. Rainfall=7.92"

	Area (sf)	CN	Description
	300	98	Roofs, HSG B
	97	98	Paved parking, HSG B
*	973	65	Uncompacted Gravel 35% Void
	1,283	85	Gravel roads, HSG B
	3,373	67	Brush, Poor, HSG B
	6,026	73	Weighted Average
	5,629		93.41% Pervious Area
	397		6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	150	0.0083	0.27		**Lag/CN Method,**

Subcatchment 3S: Post Developed Basin I



Summary for Pond 4P: Rock Void

Inflow = 0.50 cfs @ 12.01 hrs, Volume= 0.025 af
Outflow = 0.58 cfs @ 12.04 hrs, Volume= 0.022 af, Atten= 0%, Lag= 2.1 min
Primary = 0.58 cfs @ 12.04 hrs, Volume= 0.022 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.03' @ 12.04 hrs Surf.Area= 973 sf Storage= 170 cf

Plug-Flow detention time= 64.9 min calculated for 0.022 af (85% of inflow)
Center-of-Mass det. time= 21.1 min (800.5 - 779.4)

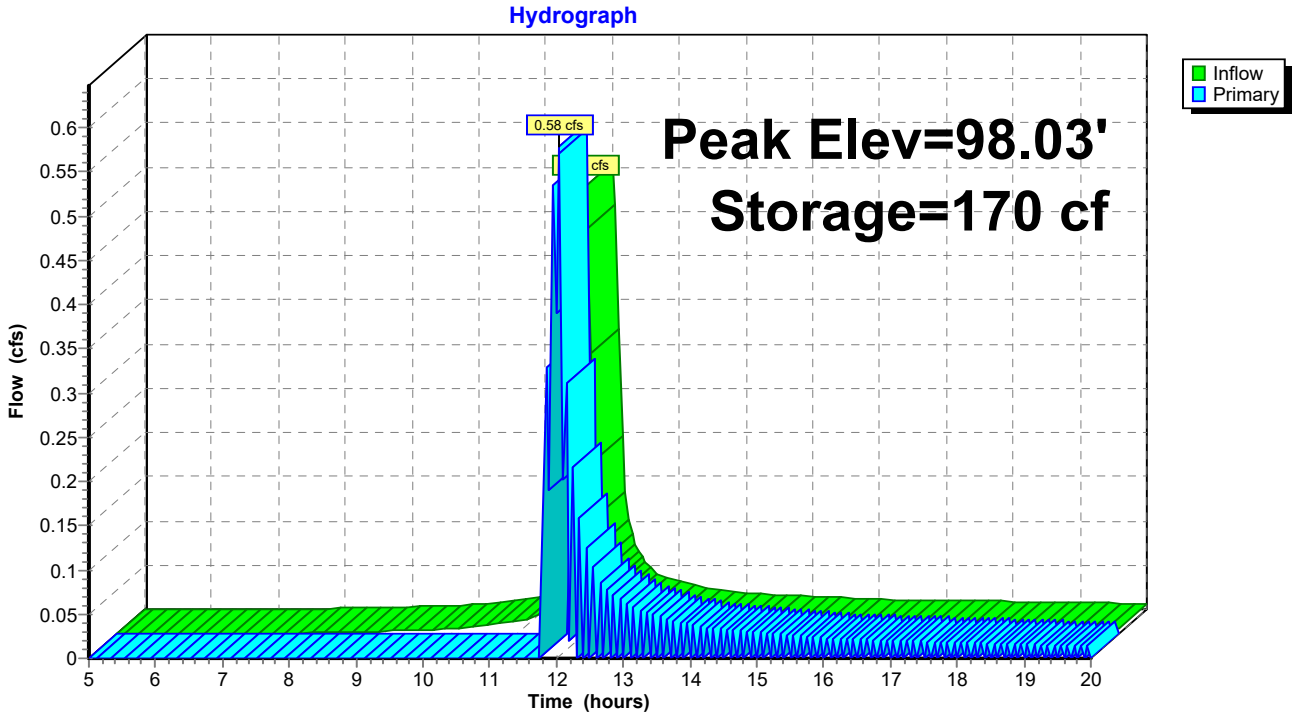
Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	170 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 487 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	973	0	0
98.00	973	487	487

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**45.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.54 cfs @ 12.04 hrs HW=98.03' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.54 cfs @ 0.45 fps)

Pond 4P: Rock Void



Summary for Pond 5P: South Pond

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 2.20" for 25-YR - 24HR. event
Inflow = 0.50 cfs @ 12.01 hrs, Volume= 0.025 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.00' @ 20.00 hrs Surf.Area= 61.042 ac Storage= 0.025 af

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

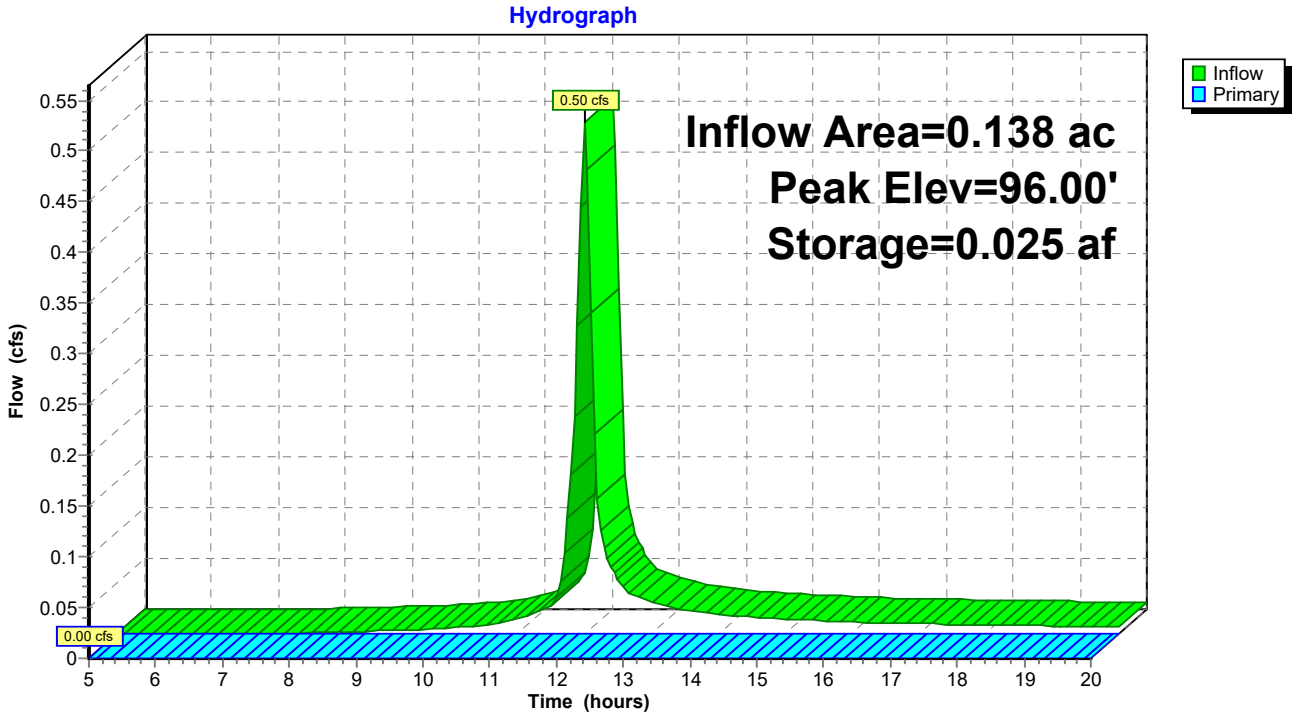
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	356.830 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
96.00	60.960	0.000	0.000
97.00	265.600	163.280	163.280
98.00	121.500	193.550	356.830

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	**100.0 deg x 8.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 5P: South Pond



Summary for Pond 9P: North Pond

Inflow = 0.58 cfs @ 12.04 hrs, Volume= 0.022 af
Outflow = 0.50 cfs @ 12.01 hrs, Volume= 0.021 af, Atten= 13%, Lag= 0.0 min
Primary = 0.50 cfs @ 12.01 hrs, Volume= 0.021 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.99' @ 12.01 hrs Surf.Area= 145 sf Storage= 53 cf

Plug-Flow detention time= 20.6 min calculated for 0.021 af (95% of inflow)
Center-of-Mass det. time= 4.8 min (805.3 - 800.5)

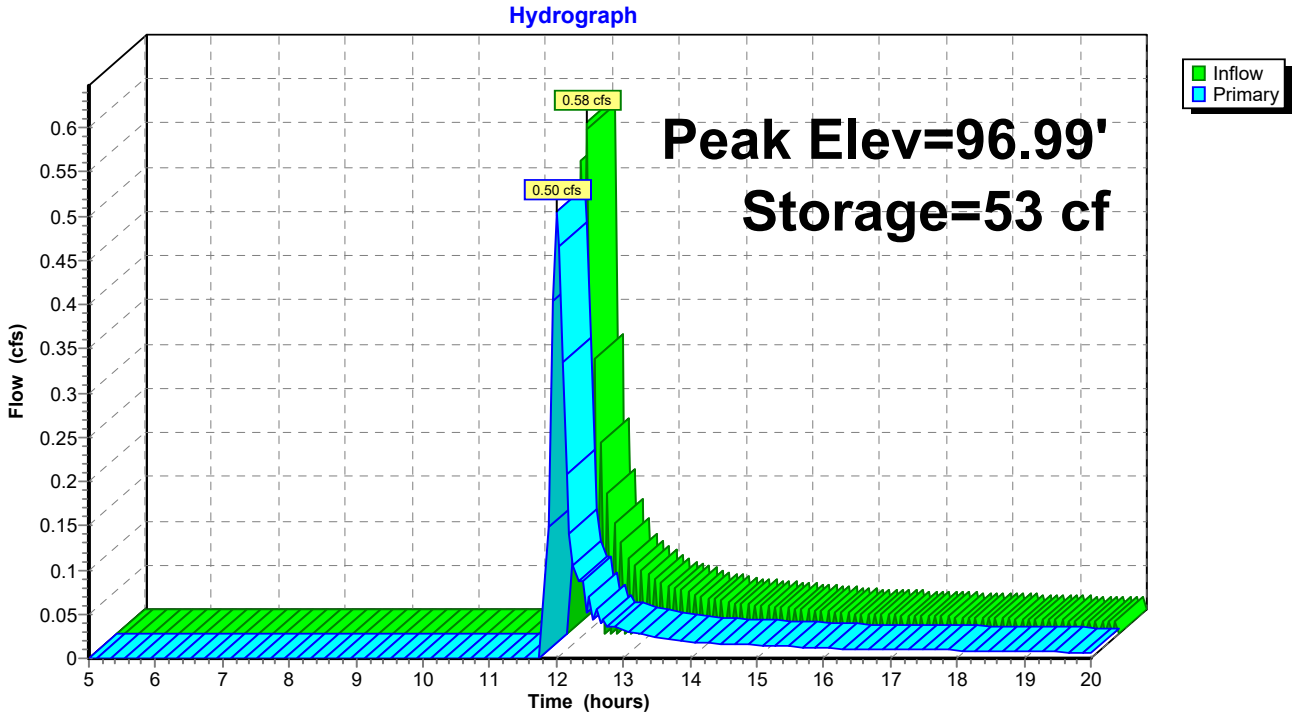
Volume	Invert	Avail.Storage	Storage Description
#1	96.50'	209 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.50	72	0	0
97.00	147	55	55
98.00	162	155	209

Device	Routing	Invert	Outlet Devices
#1	Primary	96.90'	**100.0 deg x 6.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.49 cfs @ 12.01 hrs HW=96.99' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.49 cfs @ 0.92 fps)

Pond 9P: North Pond

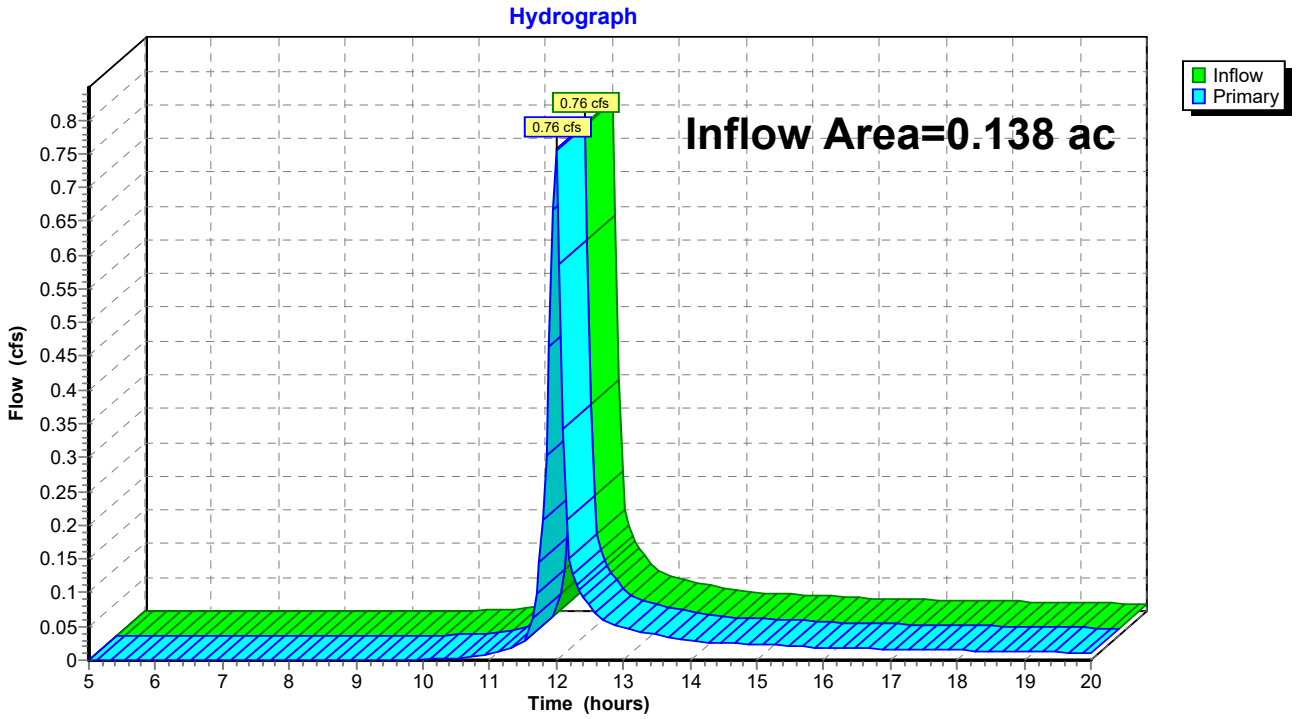


Summary for Link 2L: Outfall

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth > 2.99" for 25-YR - 24HR. event
Inflow = 0.76 cfs @ 11.99 hrs, Volume= 0.034 af
Primary = 0.76 cfs @ 11.99 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: Outfall

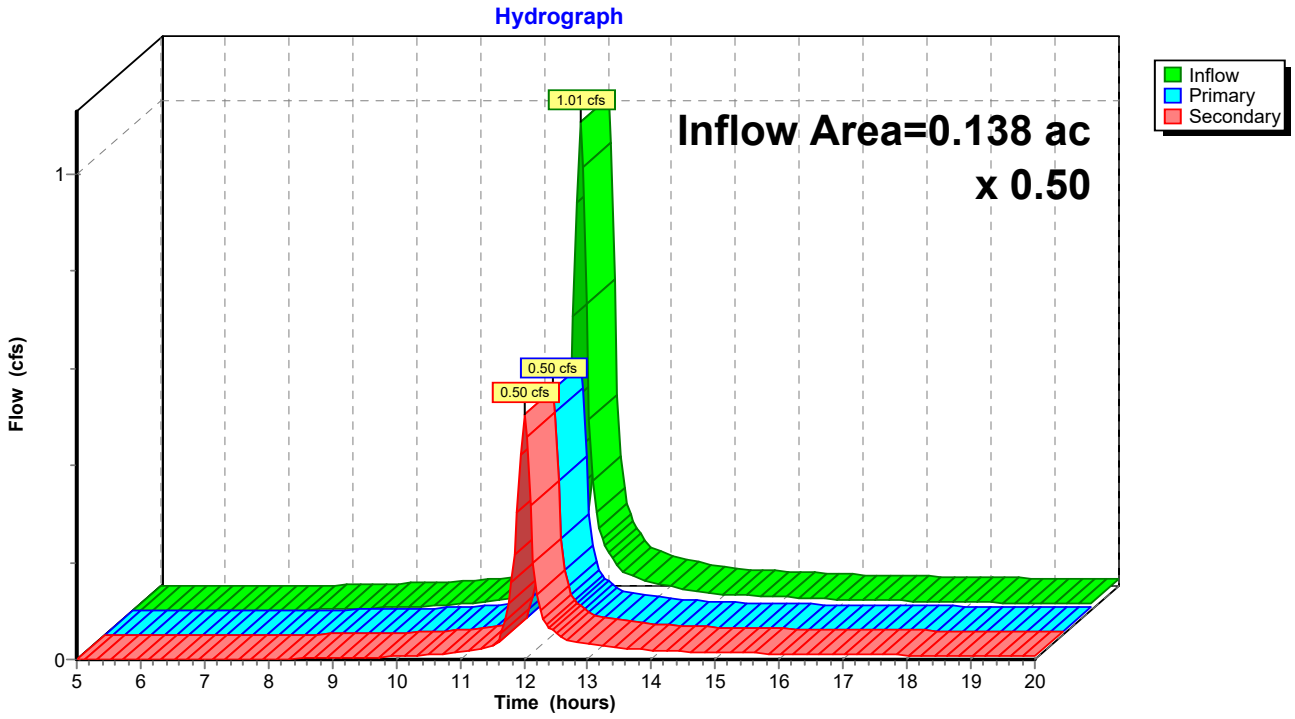


Summary for Link 6L: Split

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 4.39" for 25-YR - 24HR. event
Inflow = 1.01 cfs @ 12.01 hrs, Volume= 0.051 af
Primary = 0.50 cfs @ 12.01 hrs, Volume= 0.025 af, Atten= 50%, Lag= 0.0 min
Secondary = 0.50 cfs @ 12.01 hrs, Volume= 0.025 af

Primary outflow = Inflow x 0.50, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 6L: Split

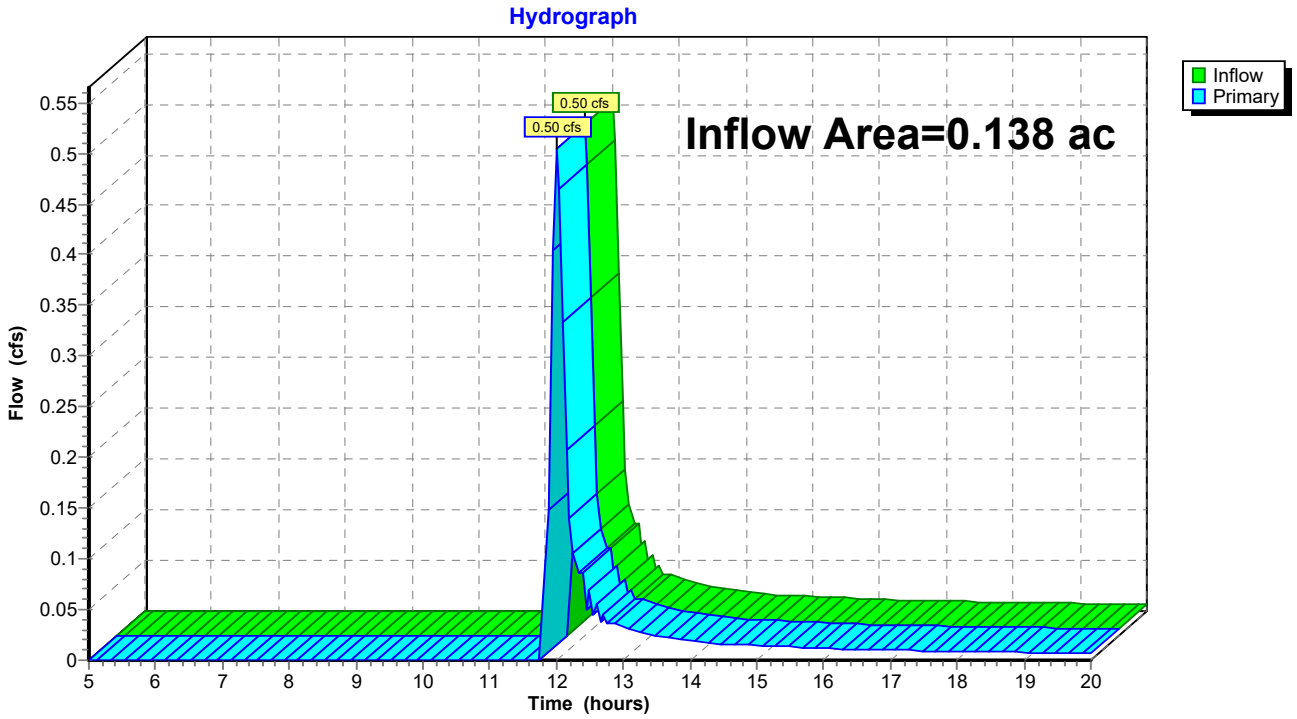


Summary for Link 10L: Combined Outflow

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 1.79" for 25-YR - 24HR. event
Inflow = 0.50 cfs @ 12.01 hrs, Volume= 0.021 af
Primary = 0.50 cfs @ 12.01 hrs, Volume= 0.021 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 10L: Combined Outflow



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

Subcatchment1S: Pre-Developed Basin I Runoff Area=6,026 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=103' Slope=0.0147 '/' Tc=7.4 min CN=60 Runoff=0.00 cfs 0.000 af

Subcatchment3S: Post Developed Basin I Runoff Area=6,026 sf 6.59% Impervious Runoff Depth=0.00"
Flow Length=150' Slope=0.0083 '/' Tc=9.4 min CN=73 Runoff=0.00 cfs 0.000 af

Pond 4P: Rock Void Peak Elev=97.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 5P: South Pond Peak Elev=96.00' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 9P: North Pond Peak Elev=96.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link 2L: Outfall Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link 6L: Split x 0.50 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af

Link 10L: Combined Outflow Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: Pre-Developed Basin I

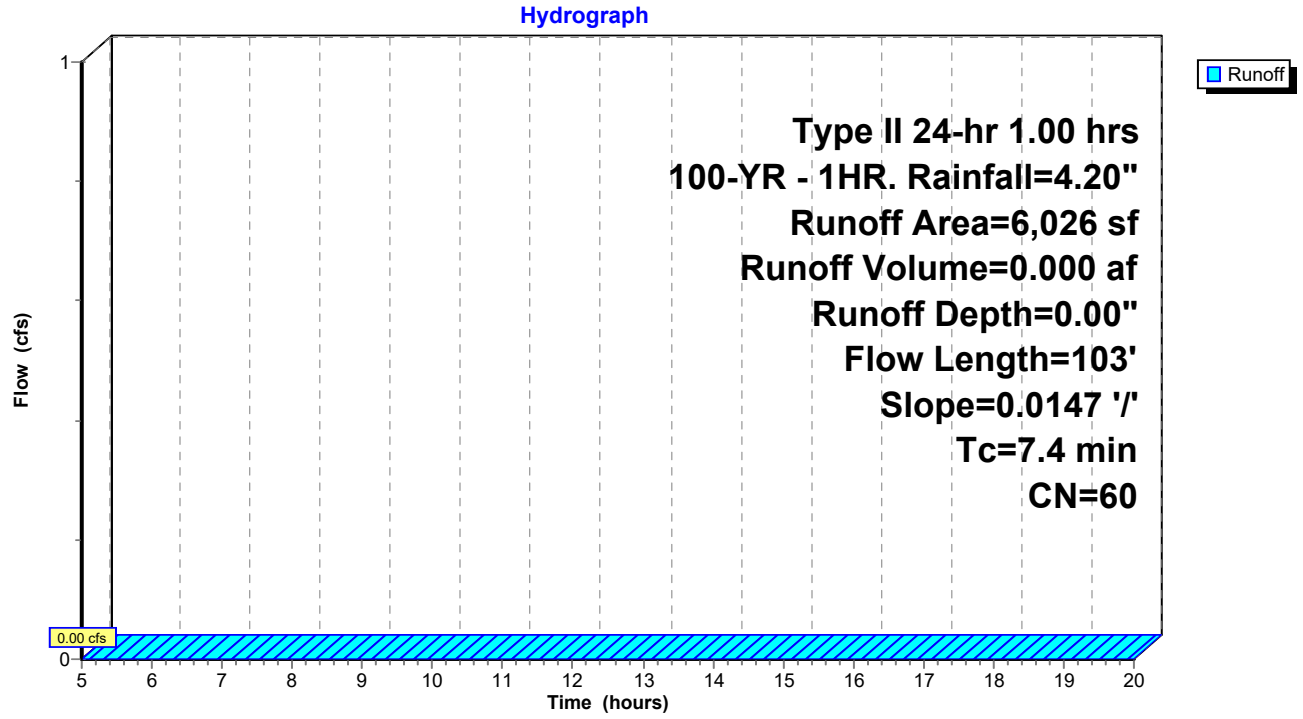
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

	Area (sf)	CN	Description
*	6,026	60	Woods/grass comb., Poor, HSG B
	6,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	103	0.0147	0.23		**Lag/CN Method, Woods**

Subcatchment 1S: Pre-Developed Basin I



Summary for Subcatchment 3S: Post Developed Basin I

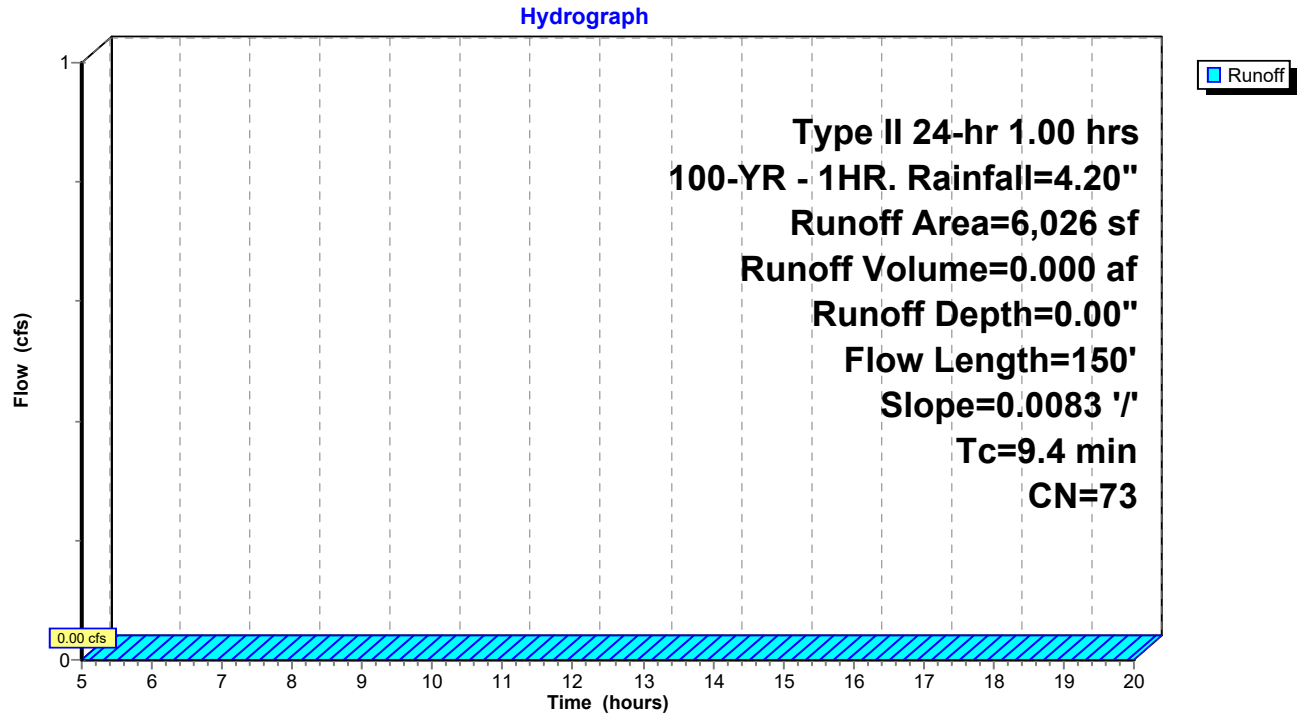
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1.00 hrs 100-YR - 1HR. Rainfall=4.20"

	Area (sf)	CN	Description
	300	98	Roofs, HSG B
	97	98	Paved parking, HSG B
*	973	65	Uncompacted Gravel 35% Void
	1,283	85	Gravel roads, HSG B
	3,373	67	Brush, Poor, HSG B
	6,026	73	Weighted Average
	5,629		93.41% Pervious Area
	397		6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	150	0.0083	0.27		**Lag/CN Method,**

Subcatchment 3S: Post Developed Basin I



Summary for Pond 4P: Rock Void

Inflow	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af
Outflow	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.50' @ 5.00 hrs Surf.Area= 973 sf Storage= 0 cf

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

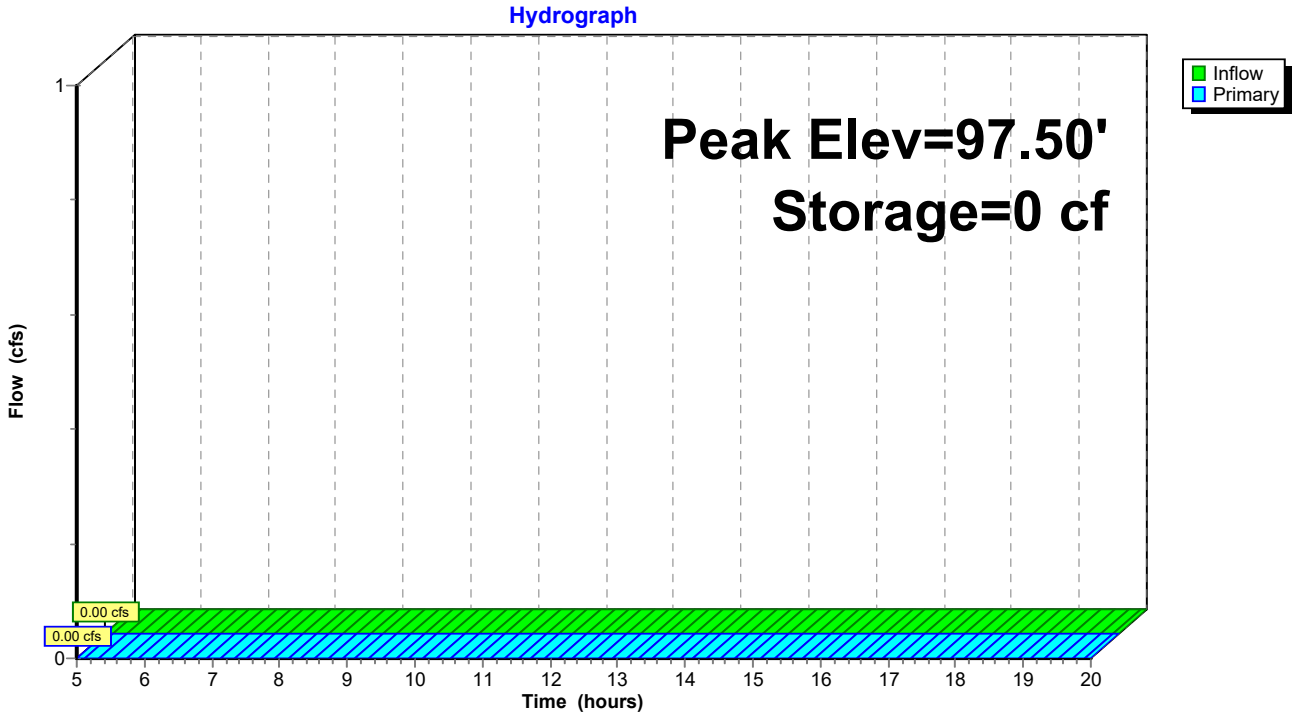
Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	170 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 487 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	973	0	0
98.00	973	487	487

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**45.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=97.50' (Free Discharge)
1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 4P: Rock Void



Summary for Pond 5P: South Pond

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.00' @ 5.00 hrs Surf.Area= 60.960 ac Storage= 0.000 af

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

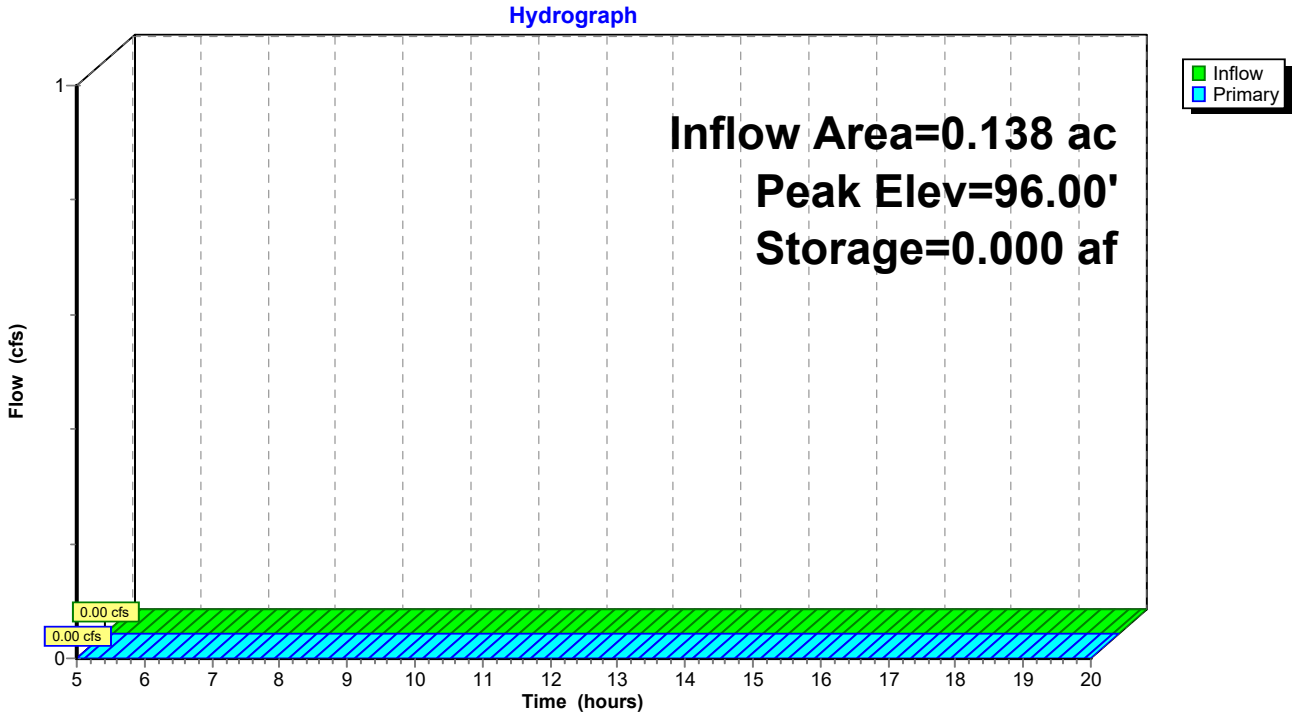
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	356.830 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
96.00	60.960	0.000	0.000
97.00	265.600	163.280	163.280
98.00	121.500	193.550	356.830

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	**100.0 deg x 8.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 5P: South Pond



Summary for Pond 9P: North Pond

Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.50' @ 5.00 hrs Surf.Area= 72 sf Storage= 0 cf

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

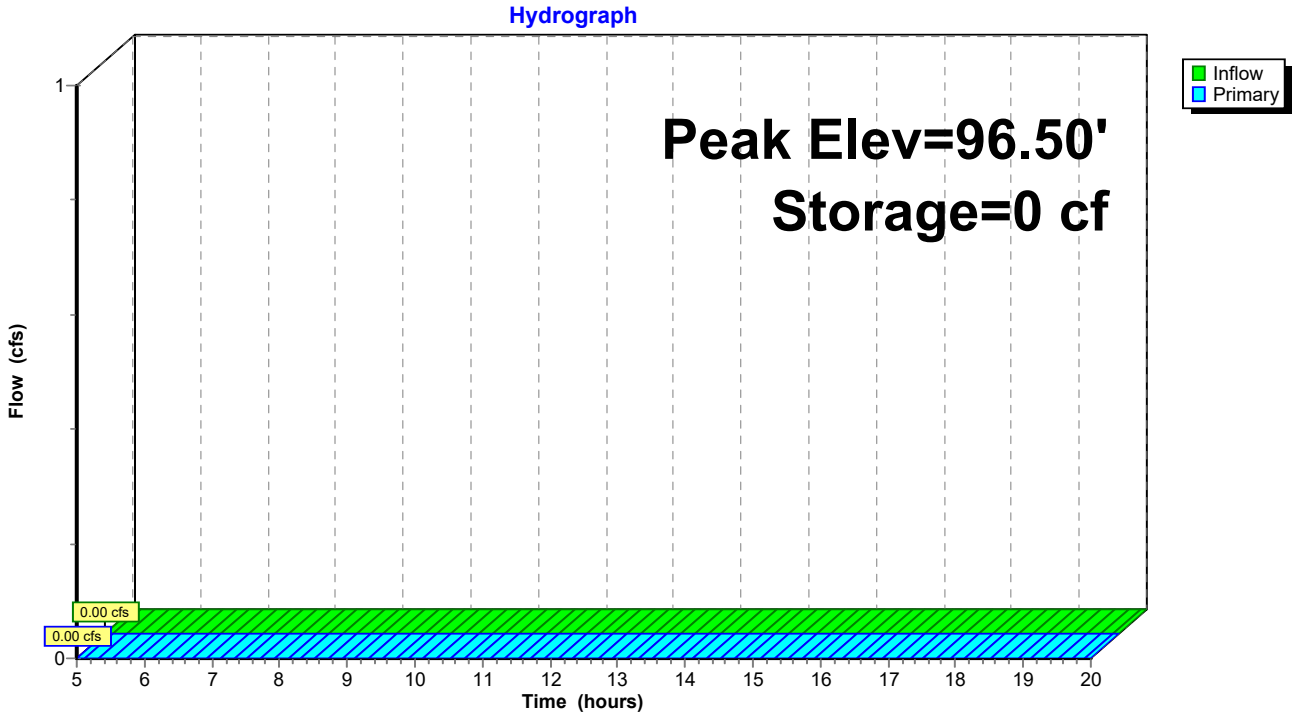
Volume	Invert	Avail.Storage	Storage Description
#1	96.50'	209 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.50	72	0	0
97.00	147	55	55
98.00	162	155	209

Device	Routing	Invert	Outlet Devices
#1	Primary	96.90'	**100.0 deg x 6.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.50' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 9P: North Pond

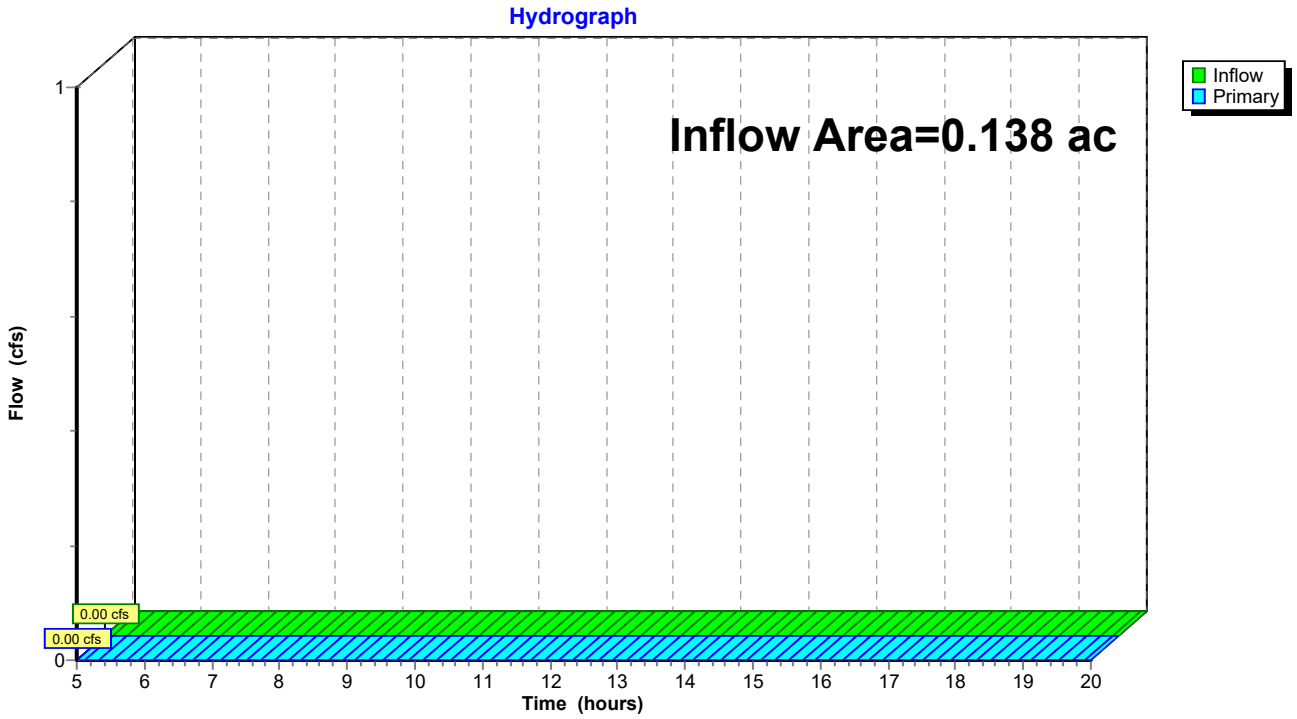


Summary for Link 2L: Outfall

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: Outfall

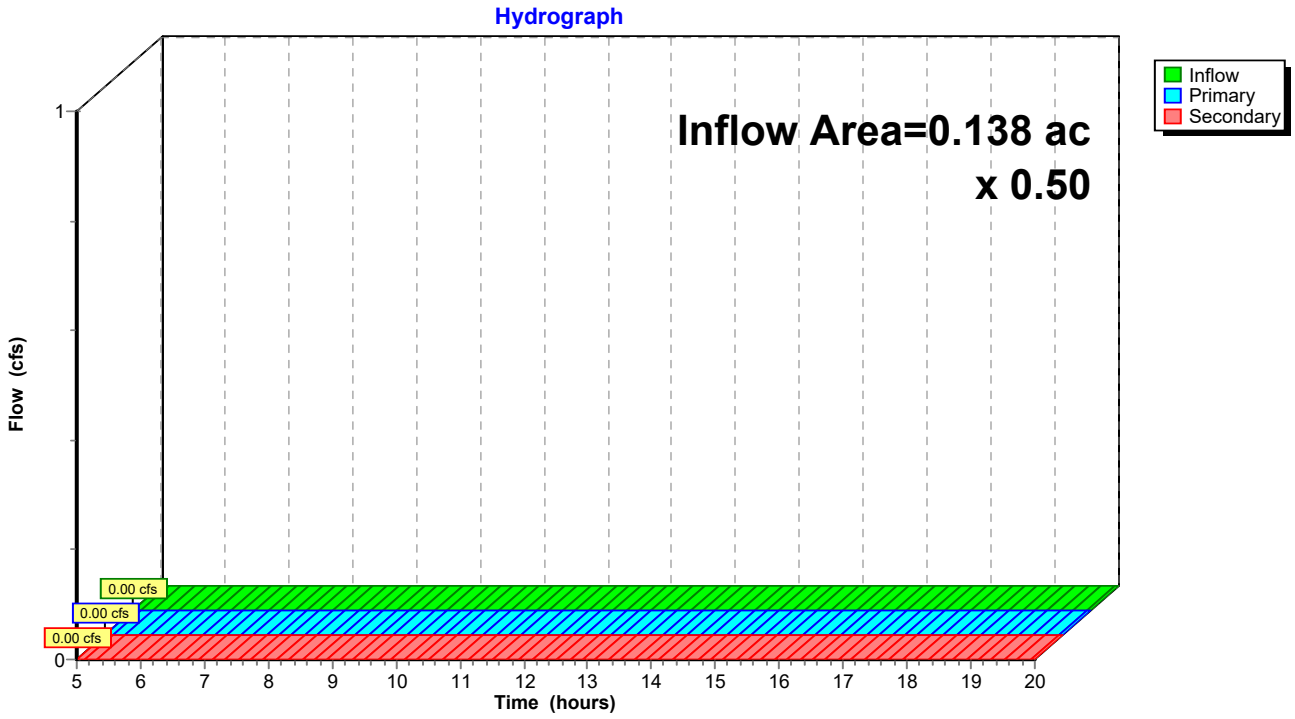


Summary for Link 6L: Split

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Primary outflow = Inflow x 0.50, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 6L: Split

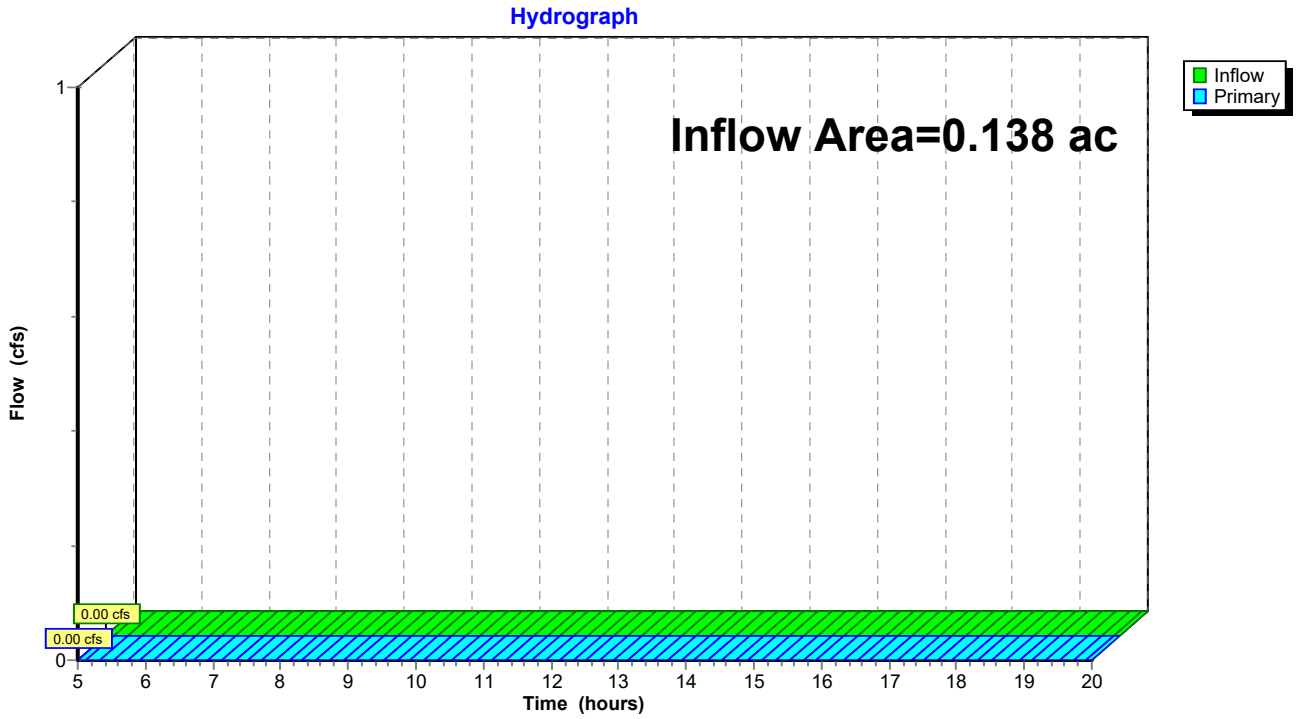


Summary for Link 10L: Combined Outflow

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth = 0.00" for 100-YR - 1HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 10L: Combined Outflow



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

Subcatchment1S: Pre-Developed Basin I Runoff Area=6,026 sf 0.00% Impervious Runoff Depth>4.38"
Flow Length=103' Slope=0.0147 '/' Tc=7.4 min CN=60 Runoff=1.10 cfs 0.051 af

Subcatchment3S: Post Developed Basin I Runoff Area=6,026 sf 6.59% Impervious Runoff Depth>6.02"
Flow Length=150' Slope=0.0083 '/' Tc=9.4 min CN=73 Runoff=1.36 cfs 0.069 af

Pond 4P: Rock Void Peak Elev=98.03' Storage=170 cf Inflow=0.68 cfs 0.035 af
Outflow=0.70 cfs 0.031 af

Pond 5P: South Pond Peak Elev=96.00' Storage=0.034 af Inflow=0.68 cfs 0.035 af
Outflow=0.00 cfs 0.000 af

Pond 9P: North Pond Peak Elev=97.01' Storage=56 cf Inflow=0.70 cfs 0.031 af
Outflow=0.68 cfs 0.030 af

Link 2L: Outfall Inflow=1.10 cfs 0.051 af
Primary=1.10 cfs 0.051 af

Link 6L: Split x 0.50 Inflow=1.36 cfs 0.069 af
Primary=0.68 cfs 0.035 af Secondary=0.68 cfs 0.035 af

Link 10L: Combined Outflow Inflow=0.68 cfs 0.030 af
Primary=0.68 cfs 0.030 af

Summary for Subcatchment 1S: Pre-Developed Basin I

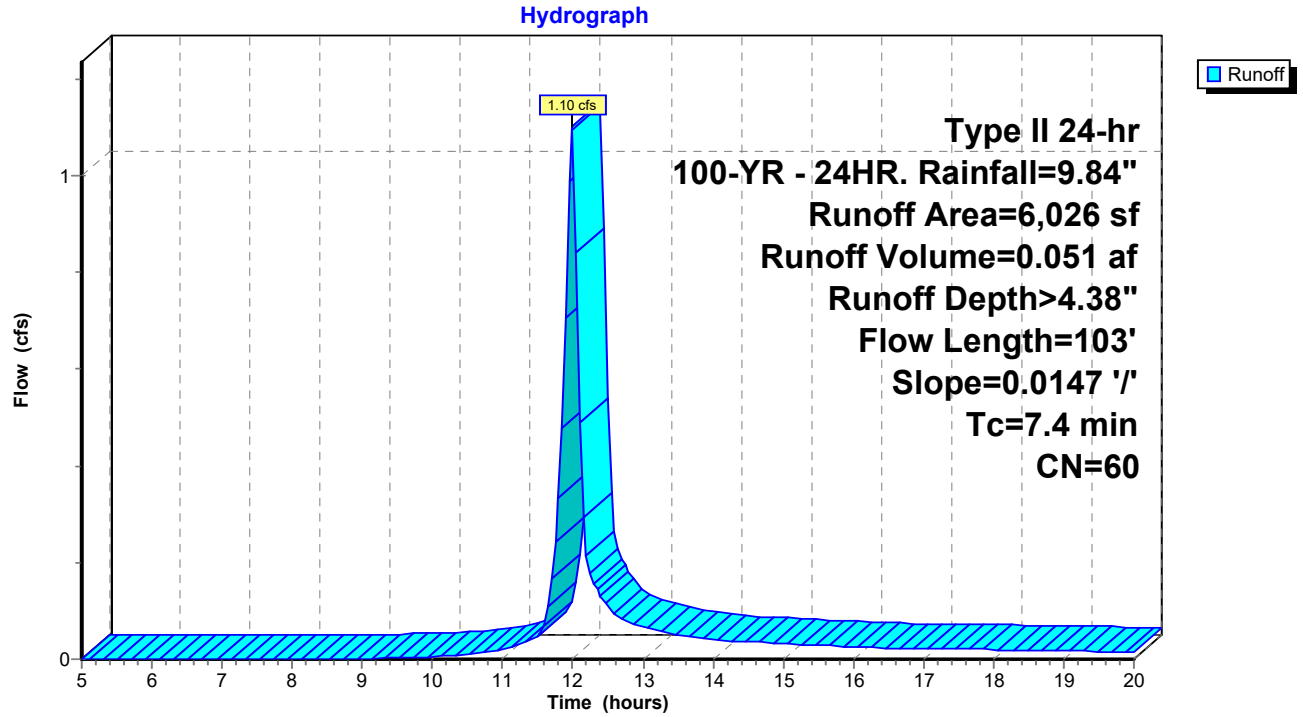
Runoff = 1.10 cfs @ 11.99 hrs, Volume= 0.051 af, Depth> 4.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

	Area (sf)	CN	Description
*	6,026	60	Woods/grass comb., Poor, HSG B
	6,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	103	0.0147	0.23		**Lag/CN Method, Woods**

Subcatchment 1S: Pre-Developed Basin I



Summary for Subcatchment 3S: Post Developed Basin I

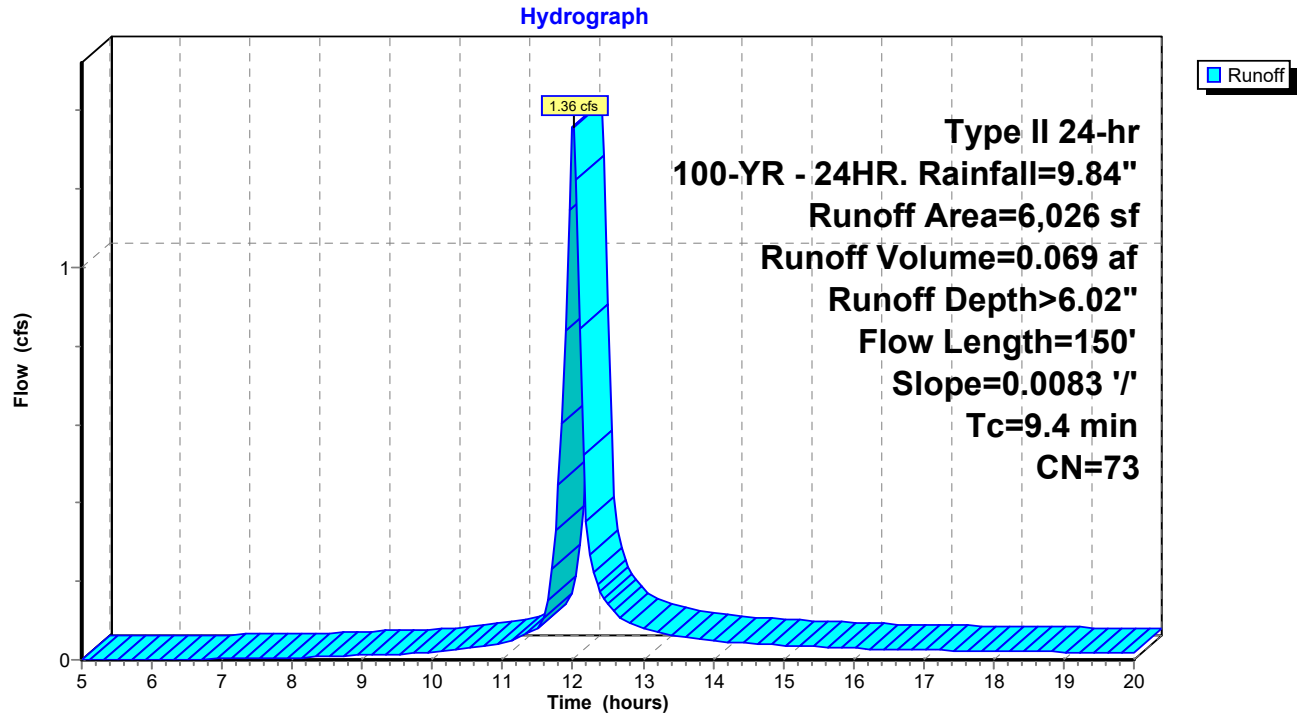
Runoff = 1.36 cfs @ 12.01 hrs, Volume= 0.069 af, Depth> 6.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-YR - 24HR. Rainfall=9.84"

	Area (sf)	CN	Description
	300	98	Roofs, HSG B
	97	98	Paved parking, HSG B
*	973	65	Uncompacted Gravel 35% Void
	1,283	85	Gravel roads, HSG B
	3,373	67	Brush, Poor, HSG B
	6,026	73	Weighted Average
	5,629		93.41% Pervious Area
	397		6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	150	0.0083	0.27		**Lag/CN Method,**

Subcatchment 3S: Post Developed Basin I



Summary for Pond 4P: Rock Void

Inflow = 0.68 cfs @ 12.01 hrs, Volume= 0.035 af
Outflow = 0.70 cfs @ 12.00 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.00 hrs, Volume= 0.031 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.03' @ 12.00 hrs Surf.Area= 973 sf Storage= 170 cf

Plug-Flow detention time= 55.7 min calculated for 0.031 af (89% of inflow)
Center-of-Mass det. time= 19.8 min (792.0 - 772.2)

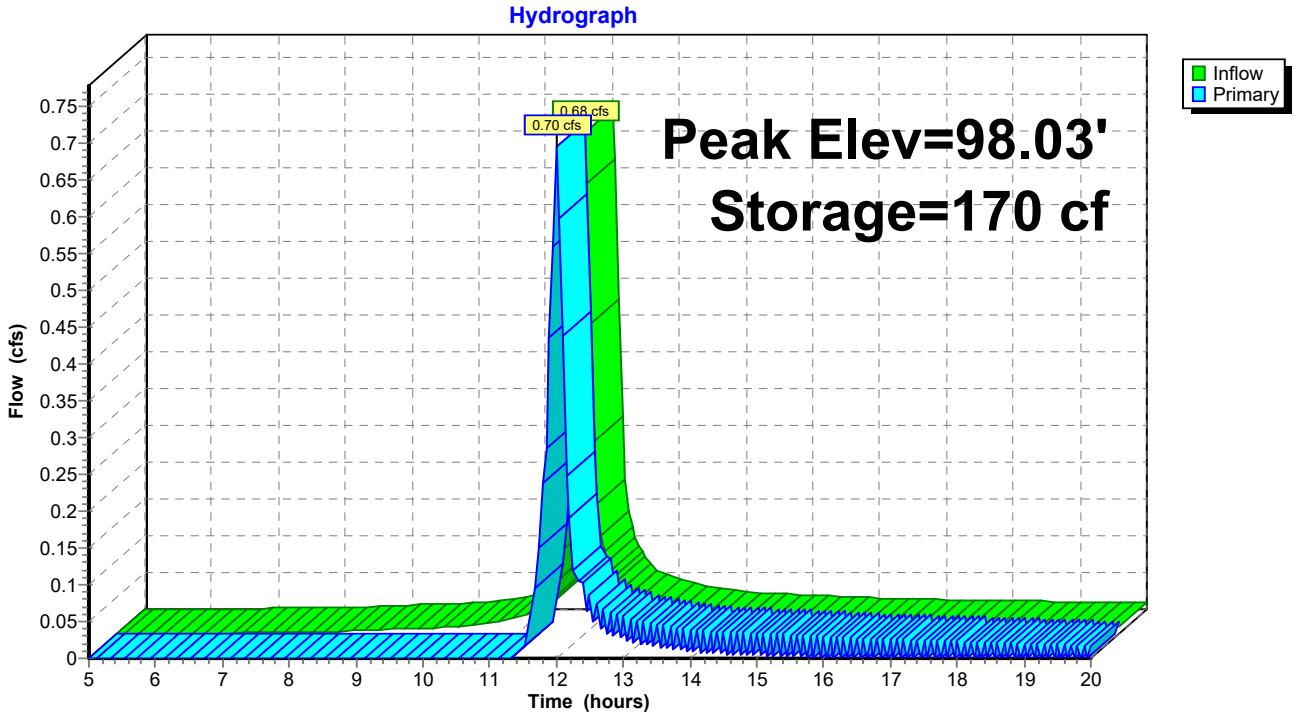
Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	170 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 487 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	973	0	0
98.00	973	487	487

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**45.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.69 cfs @ 12.00 hrs HW=98.03' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.69 cfs @ 0.49 fps)

Pond 4P: Rock Void



Summary for Pond 5P: South Pond

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 3.01" for 100-YR - 24HR. event
Inflow = 0.68 cfs @ 12.01 hrs, Volume= 0.035 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.00' @ 20.00 hrs Surf.Area= 61.073 ac Storage= 0.034 af

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

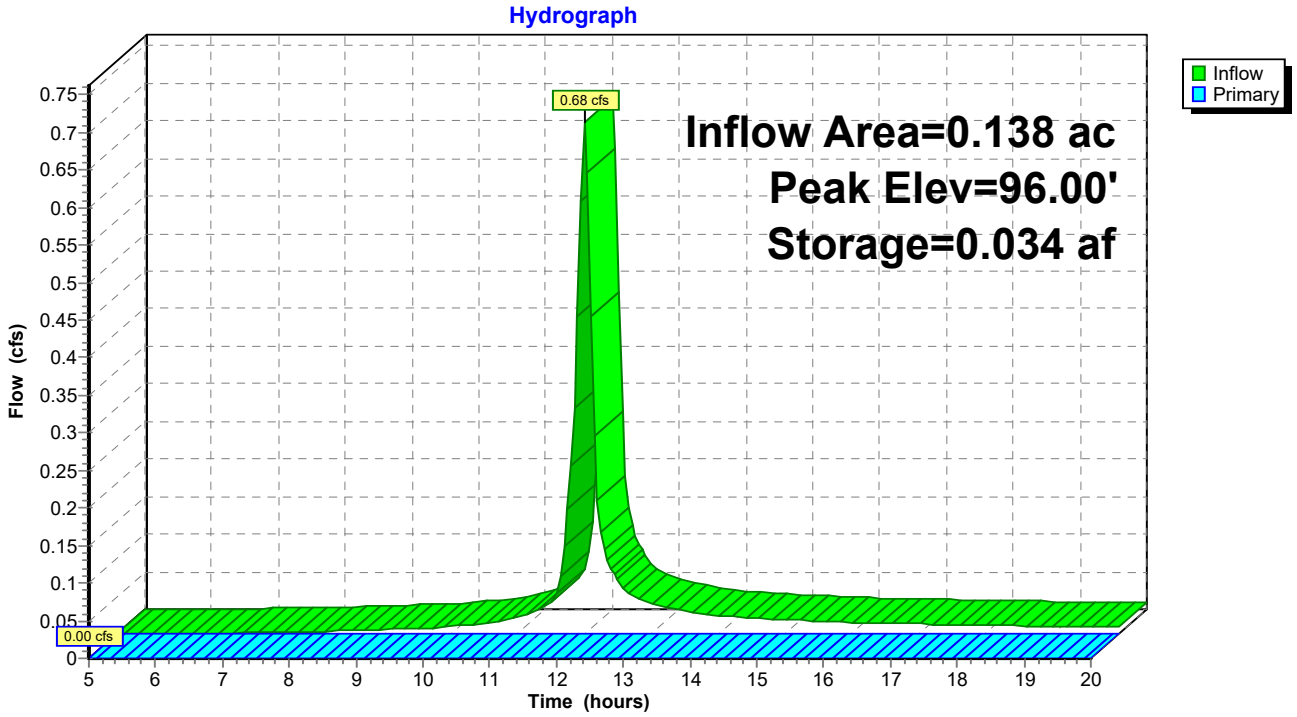
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	356.830 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
96.00	60.960	0.000	0.000
97.00	265.600	163.280	163.280
98.00	121.500	193.550	356.830

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	**100.0 deg x 8.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 5P: South Pond



Summary for Pond 9P: North Pond

Inflow = 0.70 cfs @ 12.00 hrs, Volume= 0.031 af
Outflow = 0.68 cfs @ 12.01 hrs, Volume= 0.030 af, Atten= 2%, Lag= 0.4 min
Primary = 0.68 cfs @ 12.01 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.01' @ 12.01 hrs Surf.Area= 147 sf Storage= 56 cf

Plug-Flow detention time= 15.2 min calculated for 0.030 af (97% of inflow)
Center-of-Mass det. time= 3.1 min (795.2 - 792.0)

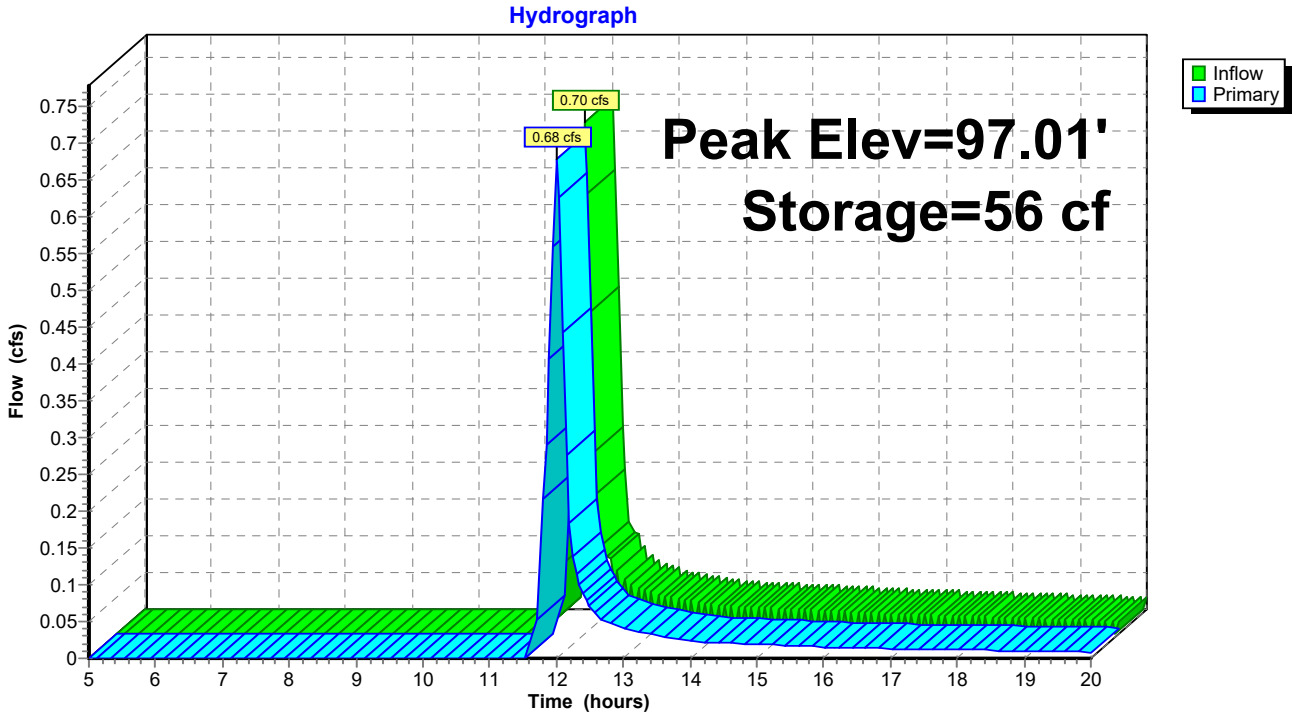
Volume	Invert	Avail.Storage	Storage Description
#1	96.50'	209 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.50	72	0	0
97.00	147	55	55
98.00	162	155	209

Device	Routing	Invert	Outlet Devices
#1	Primary	96.90'	**100.0 deg x 6.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.66 cfs @ 12.01 hrs HW=97.01' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.66 cfs @ 1.01 fps)

Pond 9P: North Pond

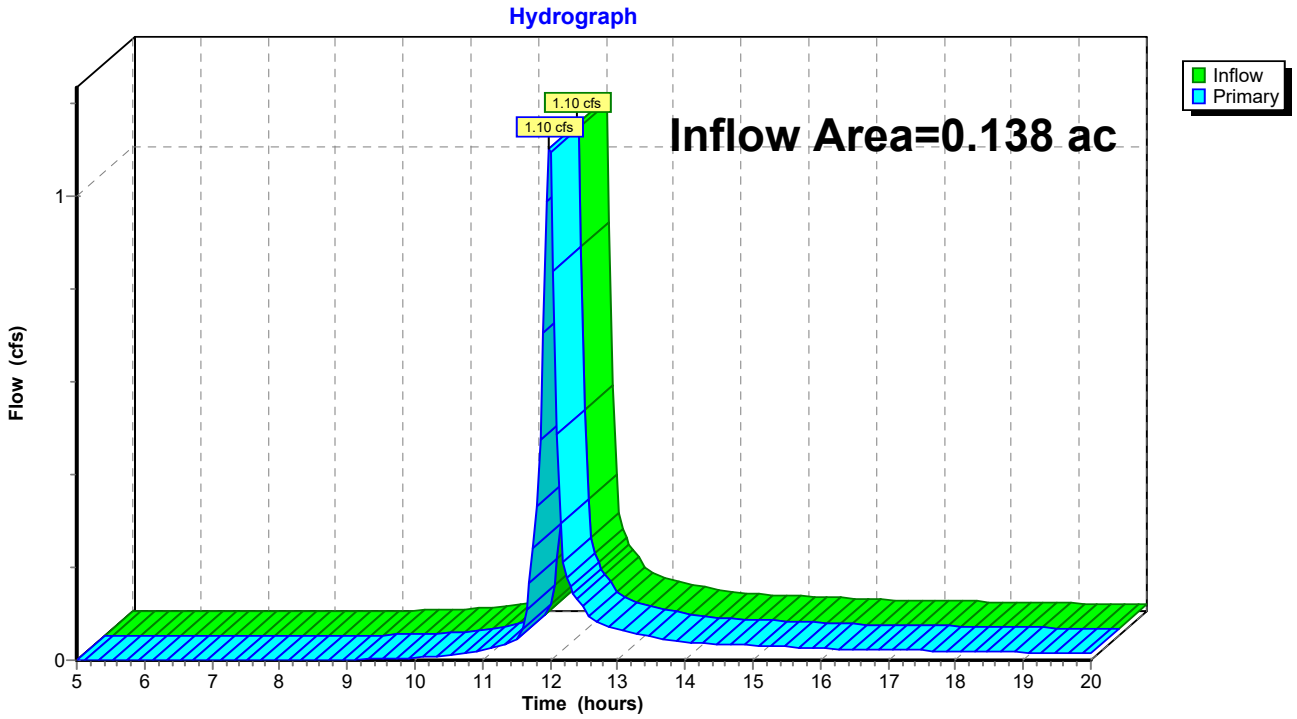


Summary for Link 2L: Outfall

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth > 4.38" for 100-YR - 24HR. event
Inflow = 1.10 cfs @ 11.99 hrs, Volume= 0.051 af
Primary = 1.10 cfs @ 11.99 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: Outfall

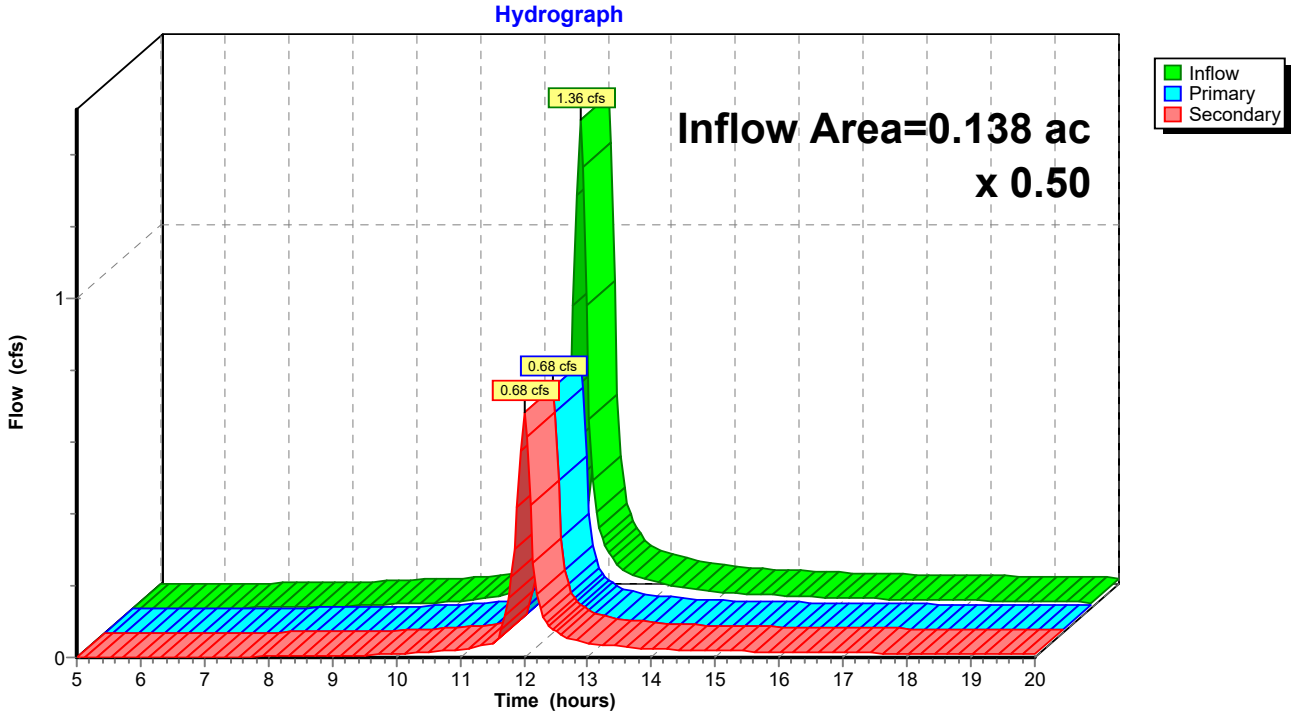


Summary for Link 6L: Split

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 6.02" for 100-YR - 24HR. event
Inflow = 1.36 cfs @ 12.01 hrs, Volume= 0.069 af
Primary = 0.68 cfs @ 12.01 hrs, Volume= 0.035 af, Atten= 50%, Lag= 0.0 min
Secondary = 0.68 cfs @ 12.01 hrs, Volume= 0.035 af

Primary outflow = Inflow x 0.50, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 6L: Split

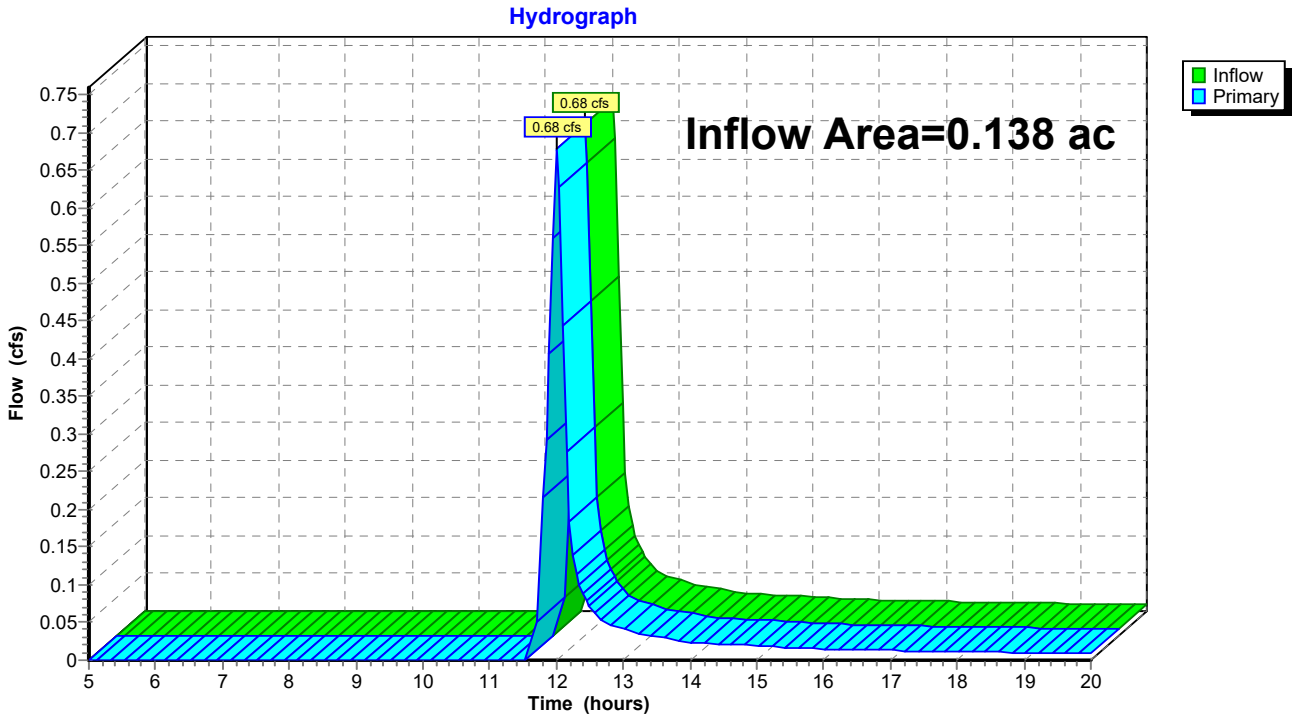


Summary for Link 10L: Combined Outflow

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 2.59" for 100-YR - 24HR. event
Inflow = 0.68 cfs @ 12.01 hrs, Volume= 0.030 af
Primary = 0.68 cfs @ 12.01 hrs, Volume= 0.030 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 10L: Combined Outflow



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

Subcatchment1S: Pre-Developed Basin I Runoff Area=6,026 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=103' Slope=0.0147 '/' Tc=7.4 min CN=60 Runoff=0.00 cfs 0.000 af

Subcatchment3S: Post Developed Basin I Runoff Area=6,026 sf 6.59% Impervious Runoff Depth=0.00"
Flow Length=150' Slope=0.0083 '/' Tc=9.4 min CN=73 Runoff=0.00 cfs 0.000 af

Pond 4P: Rock Void Peak Elev=97.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 5P: South Pond Peak Elev=96.00' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 9P: North Pond Peak Elev=96.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link 2L: Outfall Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link 6L: Split x 0.50 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af

Link 10L: Combined Outflow Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: Pre-Developed Basin I

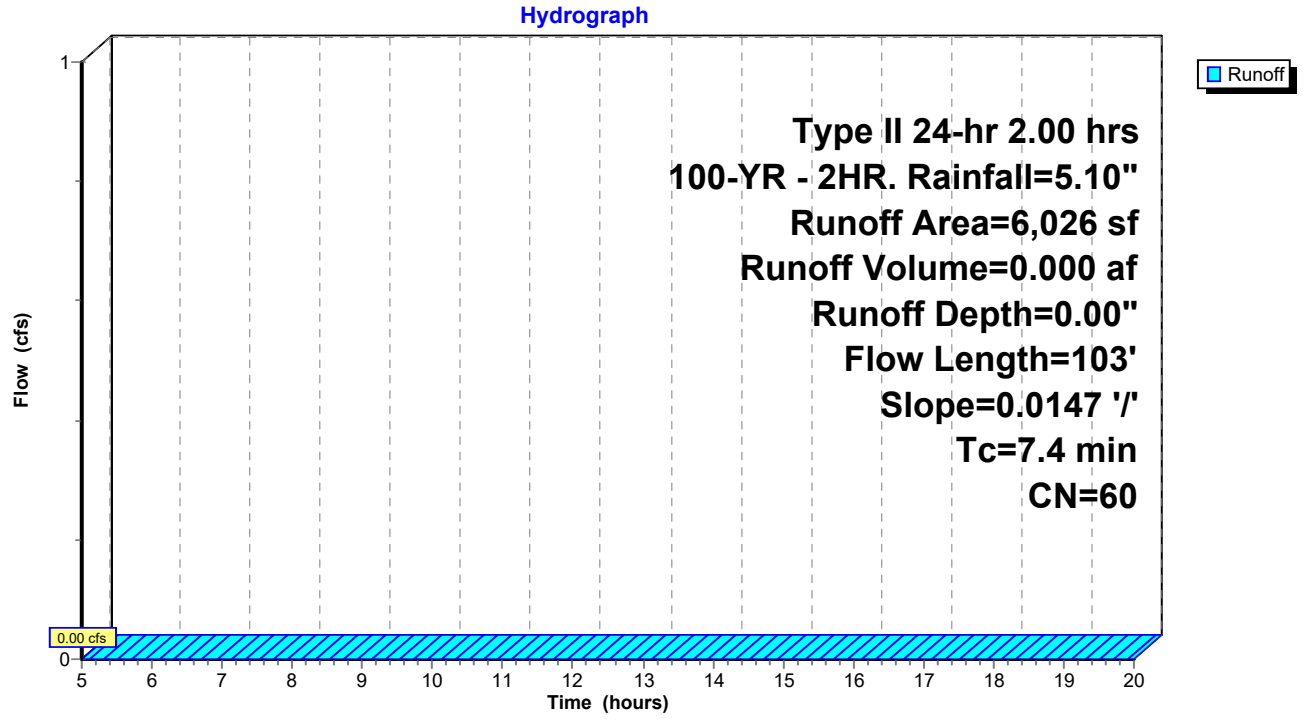
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

	Area (sf)	CN	Description
*	6,026	60	Woods/grass comb., Poor, HSG B
	6,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	103	0.0147	0.23		**Lag/CN Method, Woods**

Subcatchment 1S: Pre-Developed Basin I



Summary for Subcatchment 3S: Post Developed Basin I

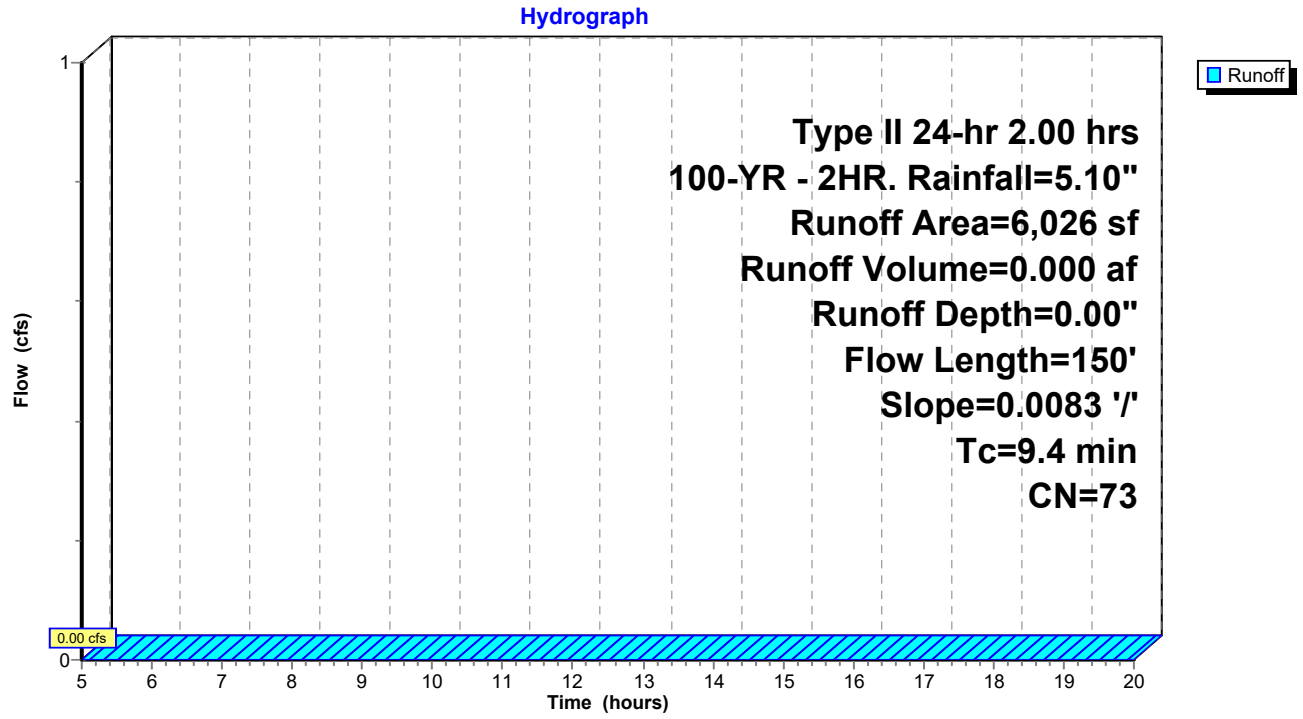
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2.00 hrs 100-YR - 2HR. Rainfall=5.10"

	Area (sf)	CN	Description
	300	98	Roofs, HSG B
	97	98	Paved parking, HSG B
*	973	65	Uncompacted Gravel 35% Void
	1,283	85	Gravel roads, HSG B
	3,373	67	Brush, Poor, HSG B
	6,026	73	Weighted Average
	5,629		93.41% Pervious Area
	397		6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	150	0.0083	0.27		**Lag/CN Method,**

Subcatchment 3S: Post Developed Basin I



Summary for Pond 4P: Rock Void

Inflow	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af
Outflow	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.50' @ 5.00 hrs Surf.Area= 973 sf Storage= 0 cf

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

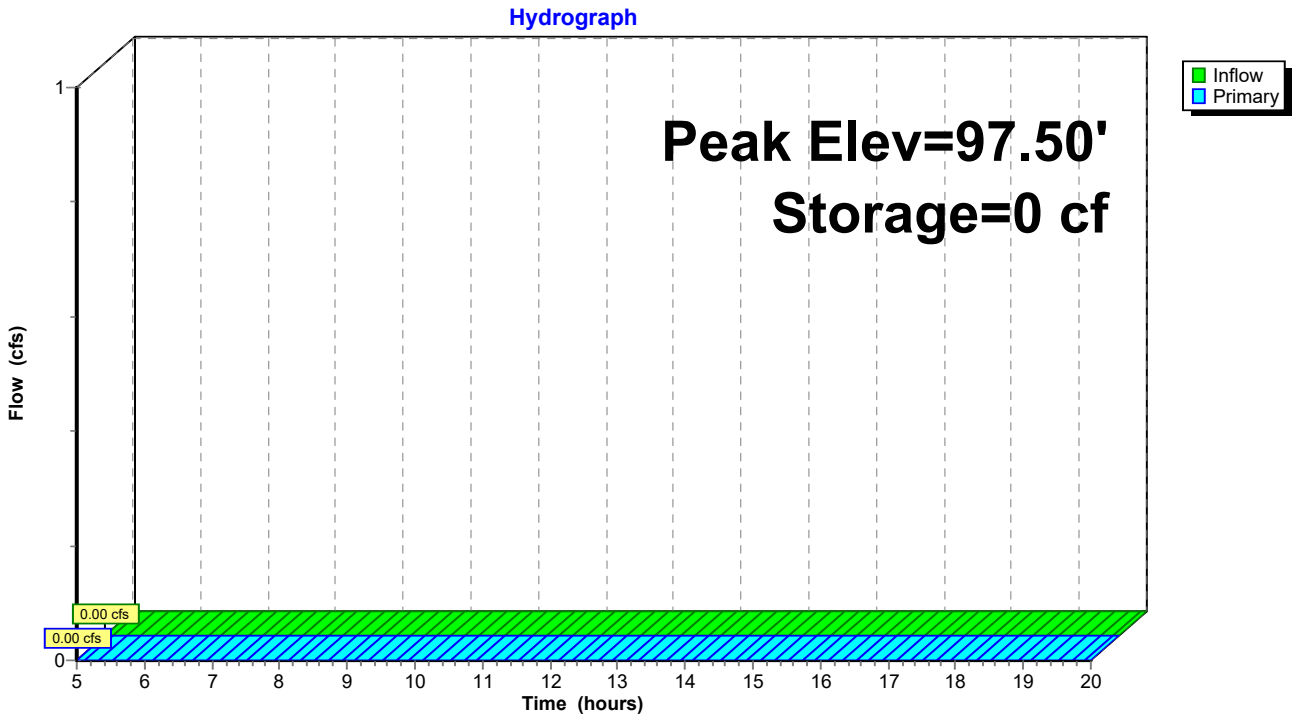
Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	170 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 487 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	973	0	0
98.00	973	487	487

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**45.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=97.50' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Rock Void



Summary for Pond 5P: South Pond

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.00' @ 5.00 hrs Surf.Area= 60.960 ac Storage= 0.000 af

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

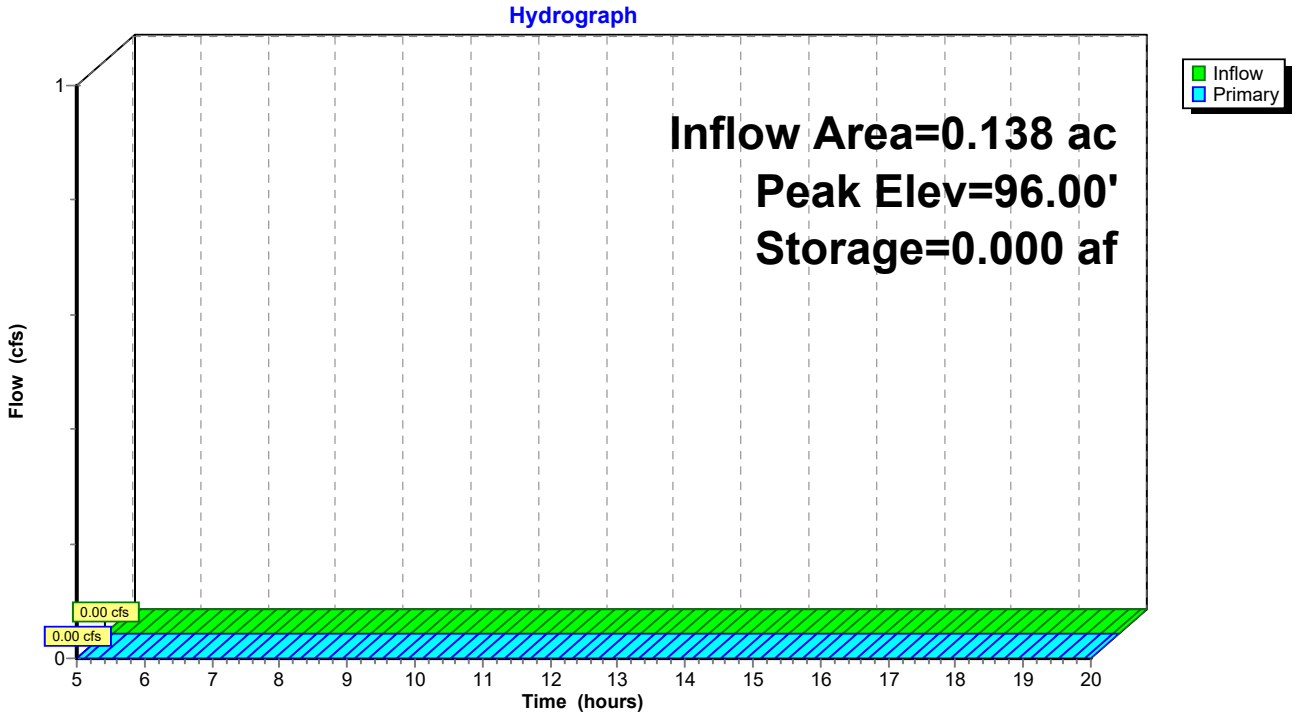
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	356.830 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
96.00	60.960	0.000	0.000
97.00	265.600	163.280	163.280
98.00	121.500	193.550	356.830

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	**100.0 deg x 8.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 5P: South Pond



Summary for Pond 9P: North Pond

Inflow	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af
Outflow	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.50' @ 5.00 hrs Surf.Area= 72 sf Storage= 0 cf

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

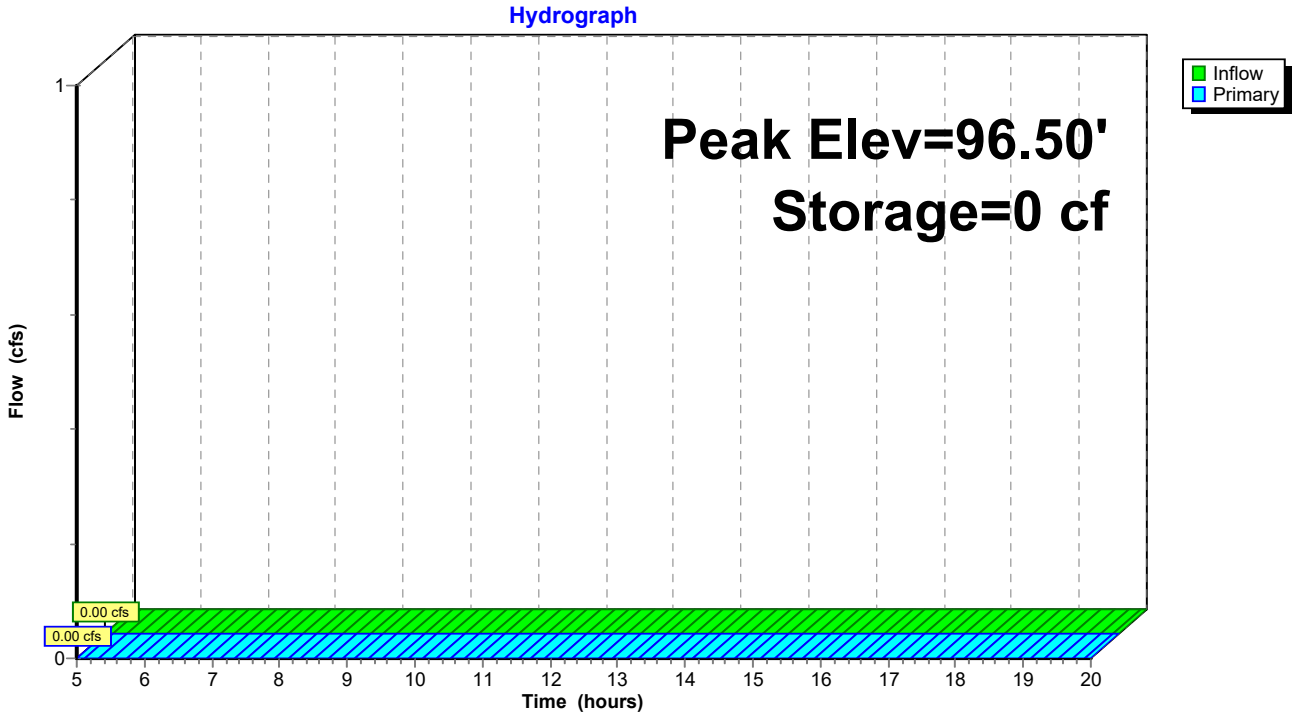
Volume	Invert	Avail.Storage	Storage Description
#1	96.50'	209 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.50	72	0	0
97.00	147	55	55
98.00	162	155	209

Device	Routing	Invert	Outlet Devices
#1	Primary	96.90'	**100.0 deg x 6.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.50' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 9P: North Pond

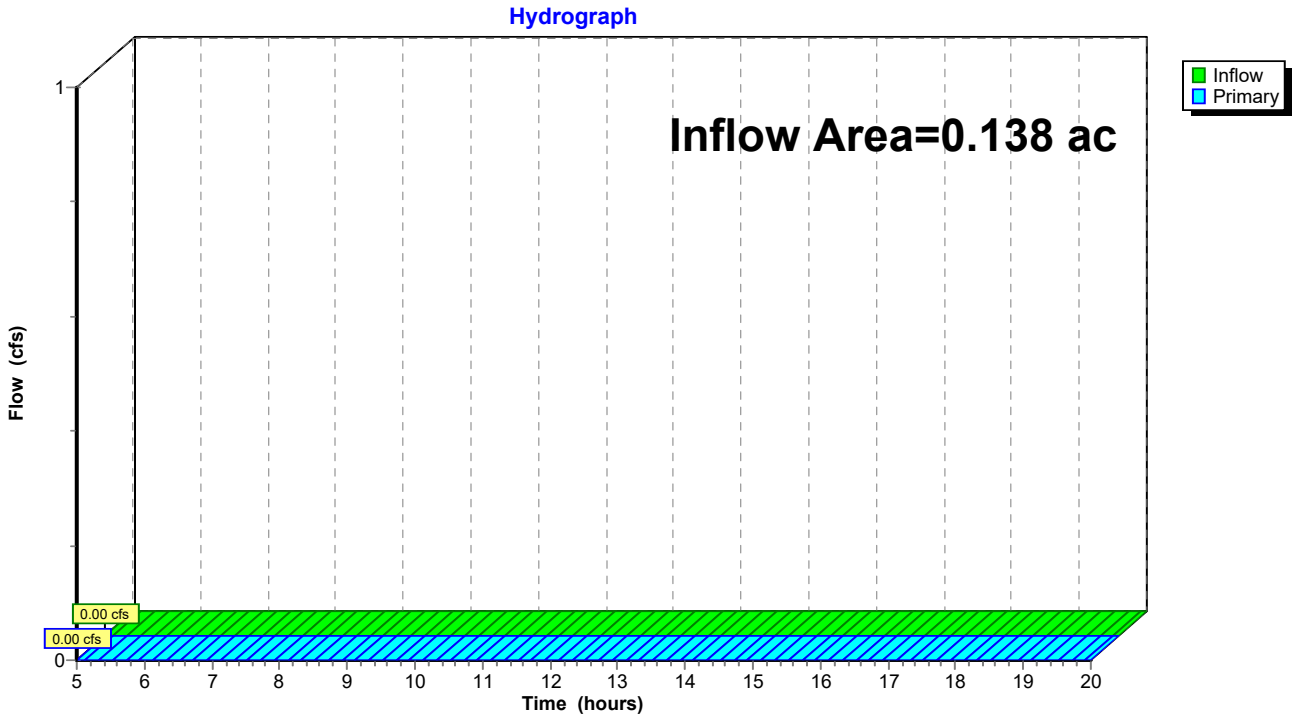


Summary for Link 2L: Outfall

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: Outfall

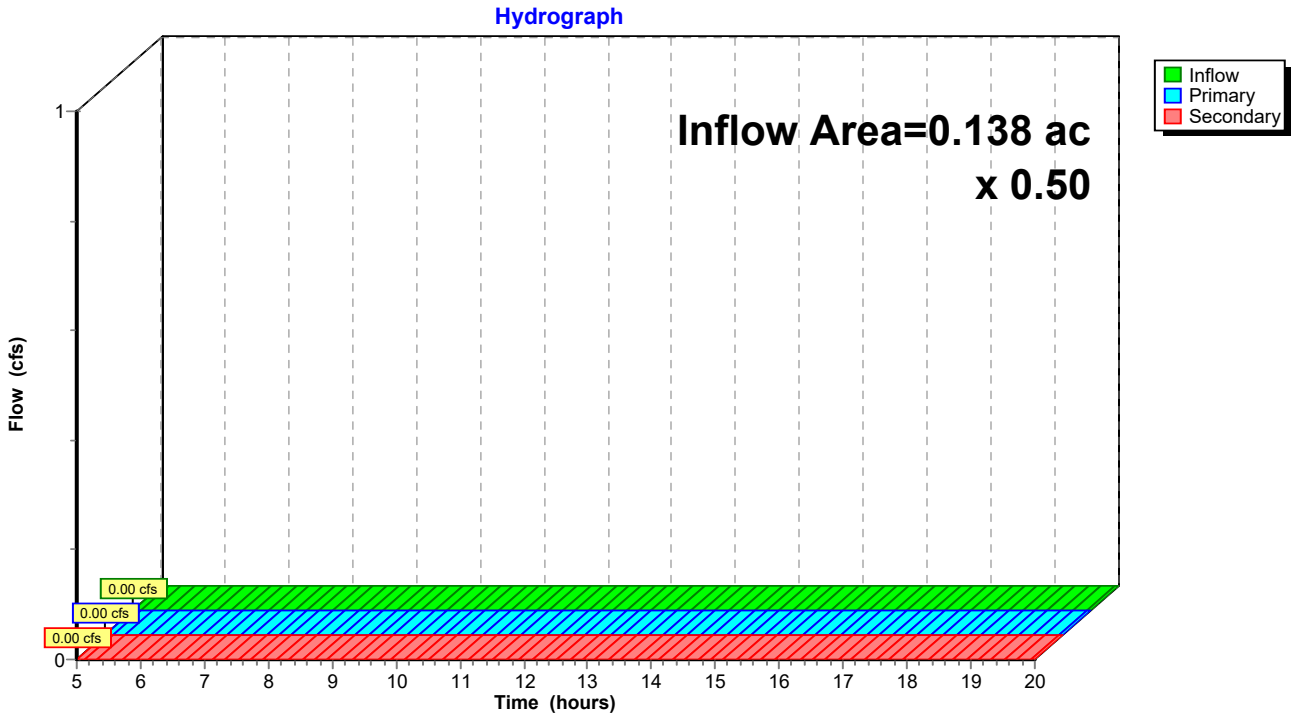


Summary for Link 6L: Split

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Primary outflow = Inflow x 0.50, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 6L: Split

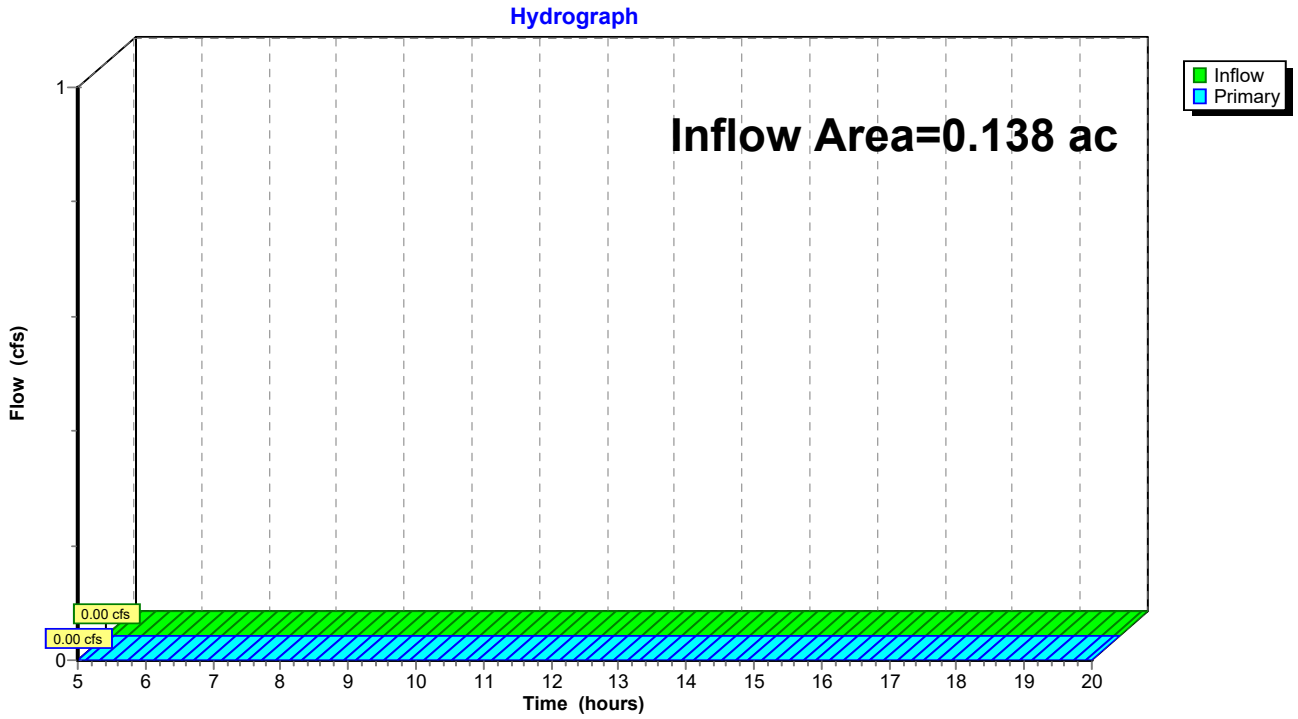


Summary for Link 10L: Combined Outflow

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth = 0.00" for 100-YR - 2HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 10L: Combined Outflow



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

Subcatchment1S: Pre-Developed Basin I Runoff Area=6,026 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=103' Slope=0.0147 '/' Tc=7.4 min CN=60 Runoff=0.00 cfs 0.000 af

Subcatchment3S: Post Developed Basin I Runoff Area=6,026 sf 6.59% Impervious Runoff Depth=0.00"
Flow Length=150' Slope=0.0083 '/' Tc=9.4 min CN=73 Runoff=0.00 cfs 0.000 af

Pond 4P: Rock Void Peak Elev=97.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 5P: South Pond Peak Elev=96.00' Storage=0.000 af Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 9P: North Pond Peak Elev=96.50' Storage=0 cf Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Link 2L: Outfall Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link 6L: Split x 0.50 Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af

Link 10L: Combined Outflow Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Summary for Subcatchment 1S: Pre-Developed Basin I

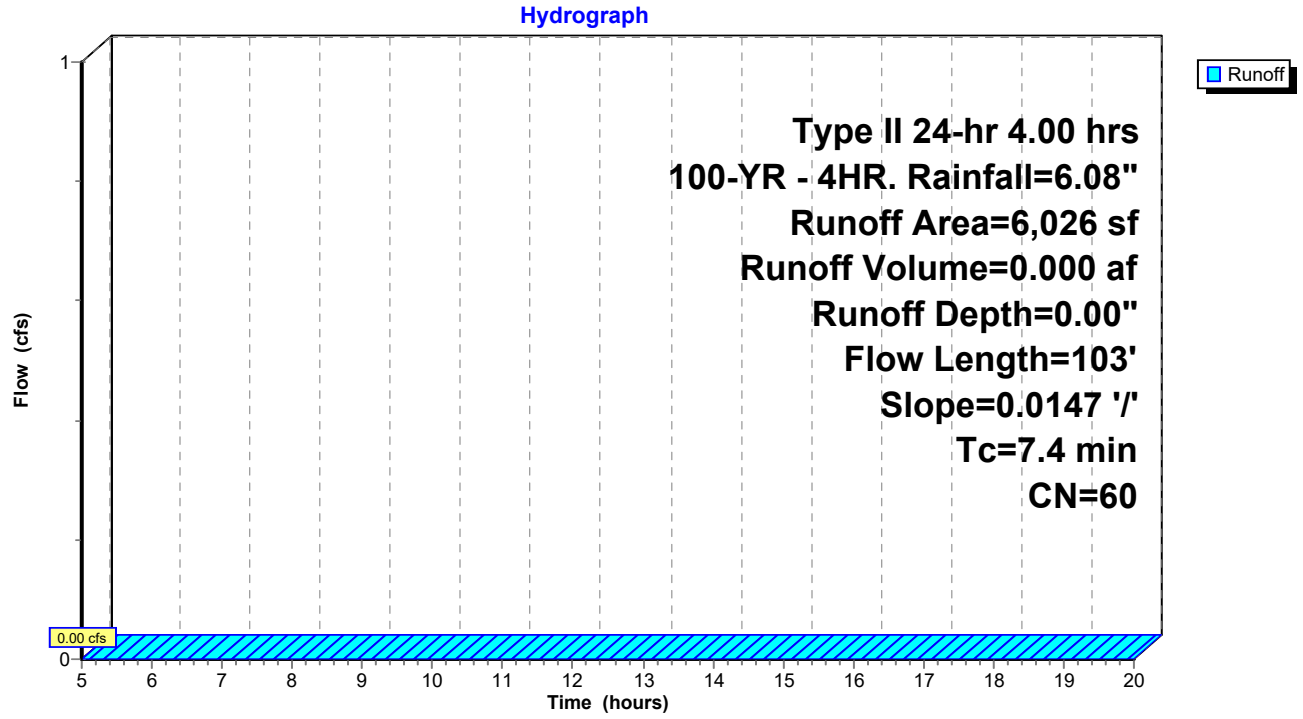
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

	Area (sf)	CN	Description
*	6,026	60	Woods/grass comb., Poor, HSG B
	6,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	103	0.0147	0.23		**Lag/CN Method, Woods**

Subcatchment 1S: Pre-Developed Basin I



Summary for Subcatchment 3S: Post Developed Basin I

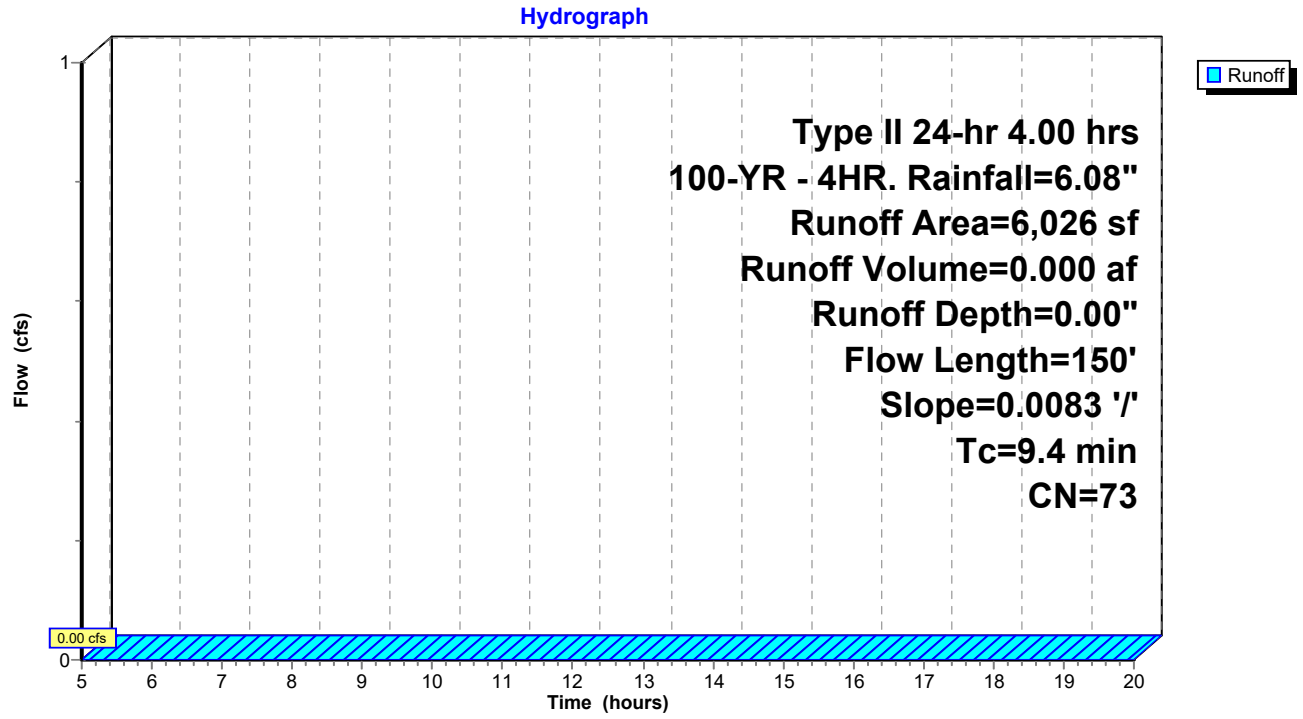
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 4.00 hrs 100-YR - 4HR. Rainfall=6.08"

	Area (sf)	CN	Description
	300	98	Roofs, HSG B
	97	98	Paved parking, HSG B
*	973	65	Uncompacted Gravel 35% Void
	1,283	85	Gravel roads, HSG B
	3,373	67	Brush, Poor, HSG B
	6,026	73	Weighted Average
	5,629		93.41% Pervious Area
	397		6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	150	0.0083	0.27		**Lag/CN Method,**

Subcatchment 3S: Post Developed Basin I



Summary for Pond 4P: Rock Void

Inflow	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af
Outflow	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 97.50' @ 5.00 hrs Surf.Area= 973 sf Storage= 0 cf

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

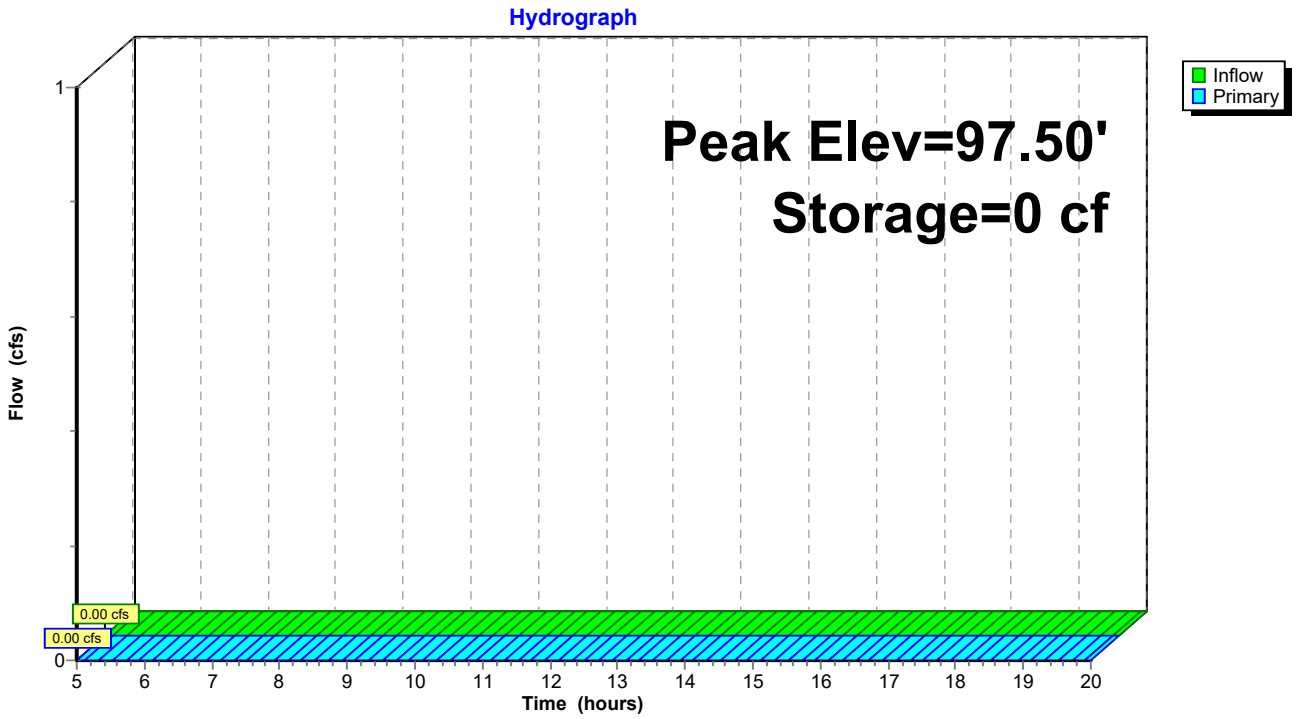
Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	170 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 487 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	973	0	0
98.00	973	487	487

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**45.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=97.50' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Rock Void



Summary for Pond 5P: South Pond

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.00' @ 5.00 hrs Surf.Area= 60.960 ac Storage= 0.000 af

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

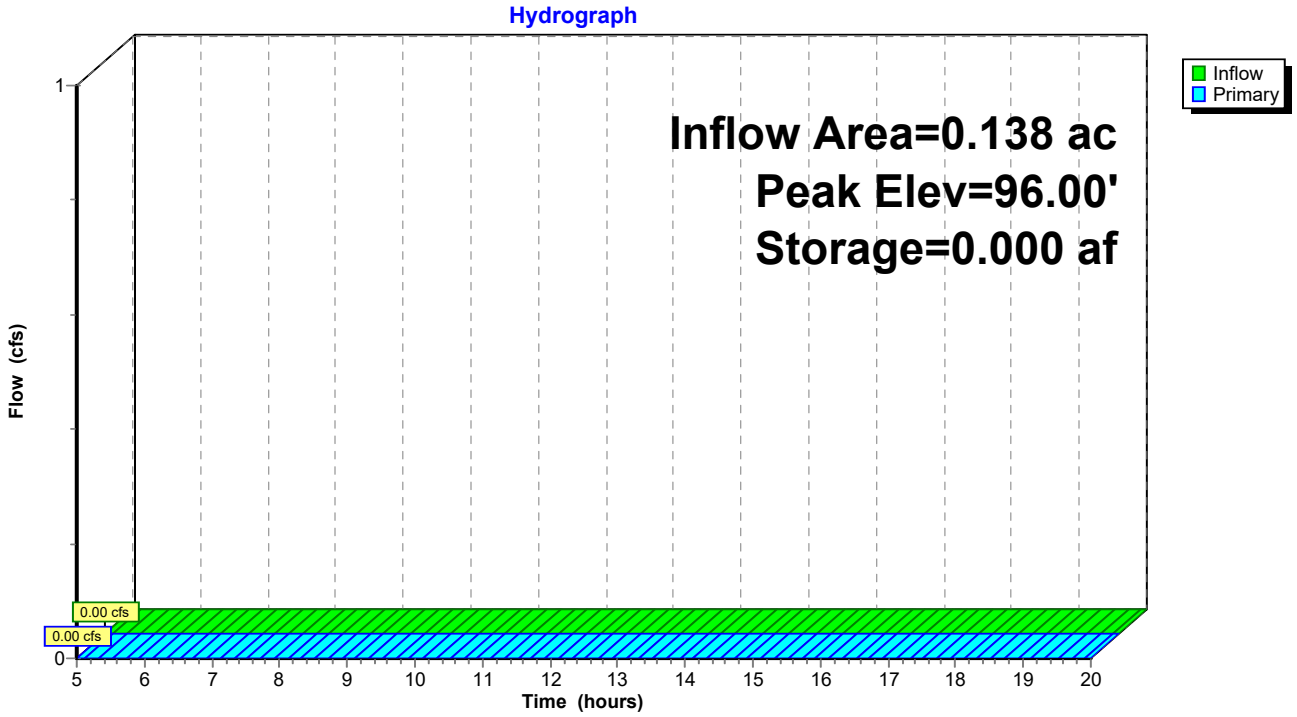
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	356.830 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
96.00	60.960	0.000	0.000
97.00	265.600	163.280	163.280
98.00	121.500	193.550	356.830

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	**100.0 deg x 8.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 5P: South Pond



Summary for Pond 9P: North Pond

Inflow	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af
Outflow	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	5.00 hrs,	Volume=	0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.50' @ 5.00 hrs Surf.Area= 72 sf Storage= 0 cf

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

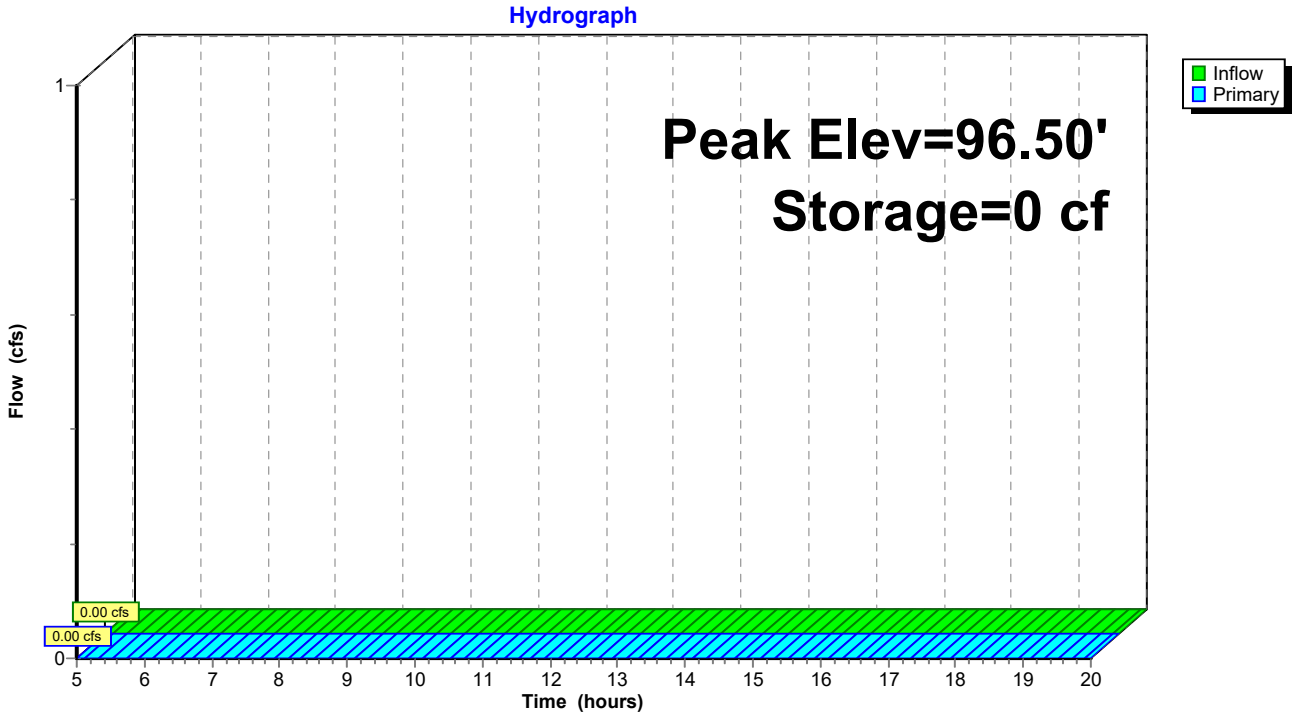
Volume	Invert	Avail.Storage	Storage Description
#1	96.50'	209 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.50	72	0	0
97.00	147	55	55
98.00	162	155	209

Device	Routing	Invert	Outlet Devices
#1	Primary	96.90'	**100.0 deg x 6.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.50' (Free Discharge)
1=Sharp-Crested Vee/Trap Weir (Controls 0.00 cfs)

Pond 9P: North Pond

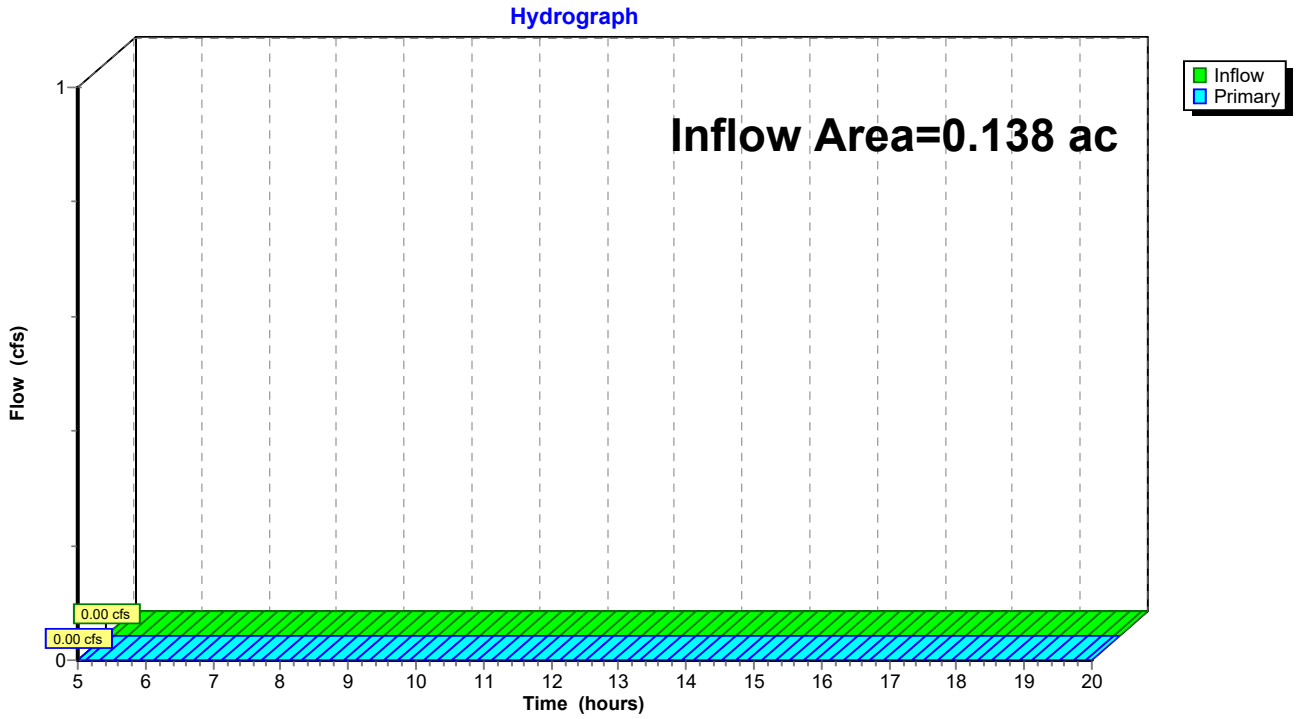


Summary for Link 2L: Outfall

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: Outfall

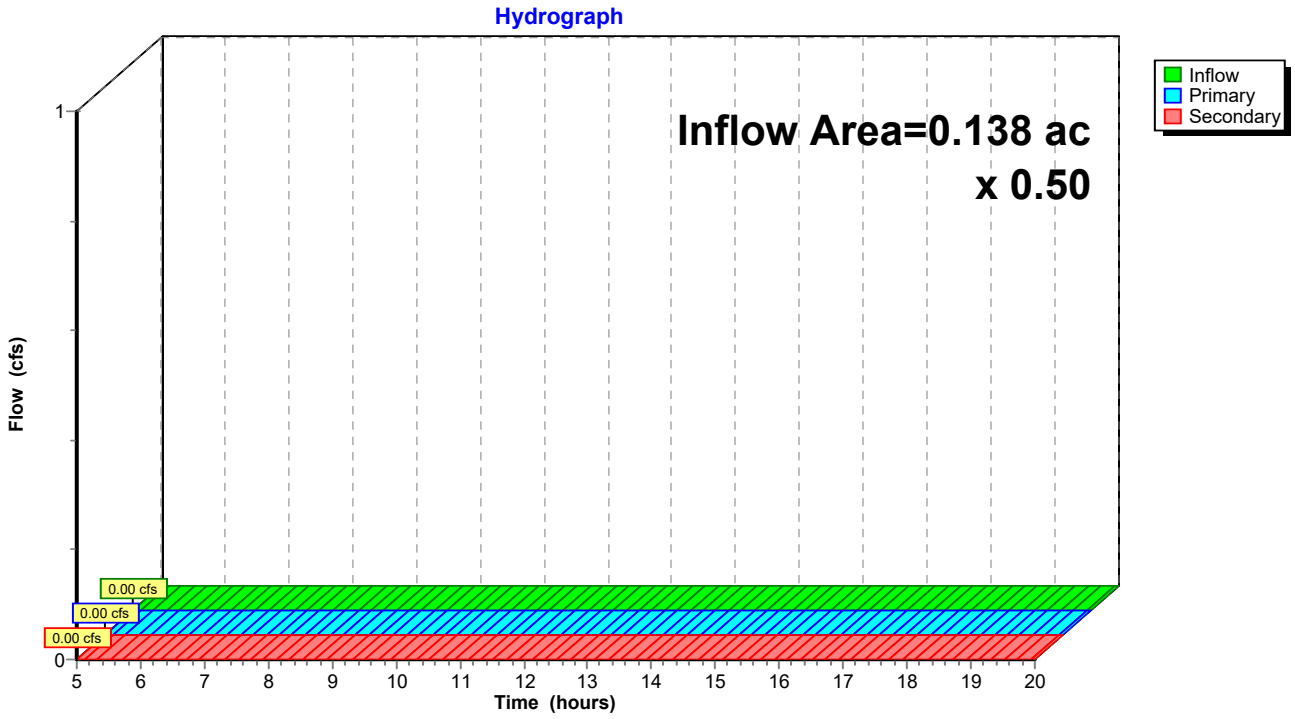


Summary for Link 6L: Split

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min
Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Primary outflow = Inflow x 0.50, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 6L: Split

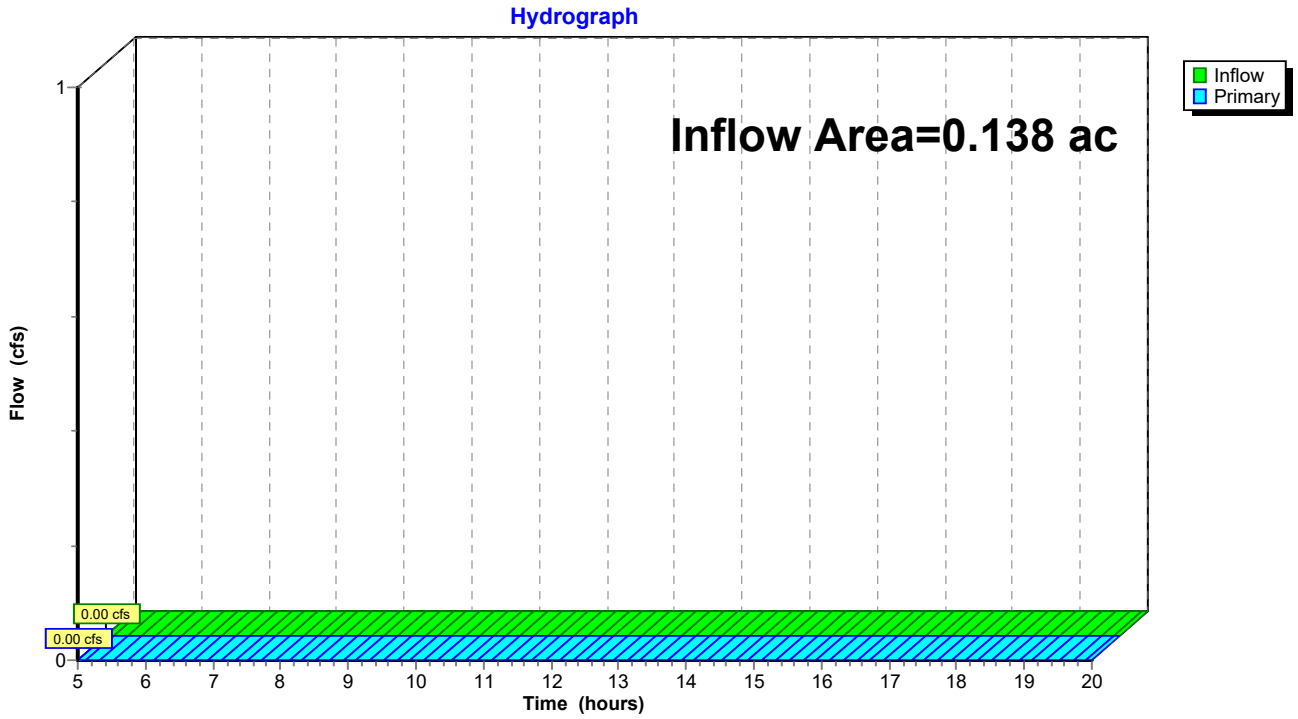


Summary for Link 10L: Combined Outflow

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth = 0.00" for 100-YR - 4HR. event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 10L: Combined Outflow



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

Subcatchment1S: Pre-Developed Basin I Runoff Area=6,026 sf 0.00% Impervious Runoff Depth>0.82"
Flow Length=103' Slope=0.0147 '/' Tc=7.4 min CN=60 Runoff=0.07 cfs 0.009 af

Subcatchment3S: Post Developed Basin I Runoff Area=6,026 sf 6.59% Impervious Runoff Depth>1.02"
Flow Length=150' Slope=0.0083 '/' Tc=9.4 min CN=73 Runoff=0.09 cfs 0.012 af

Pond 4P: Rock Void Peak Elev=98.00' Storage=170 cf Inflow=0.04 cfs 0.006 af
Outflow=0.03 cfs 0.002 af

Pond 5P: South Pond Peak Elev=96.00' Storage=0.006 af Inflow=0.04 cfs 0.006 af
Outflow=0.00 cfs 0.000 af

Pond 9P: North Pond Peak Elev=96.91' Storage=42 cf Inflow=0.03 cfs 0.002 af
Outflow=0.02 cfs 0.001 af

Link 2L: Outfall Inflow=0.07 cfs 0.009 af
Primary=0.07 cfs 0.009 af

Link 6L: Split x 0.50 Inflow=0.09 cfs 0.012 af
Primary=0.04 cfs 0.006 af Secondary=0.04 cfs 0.006 af

Link 10L: Combined Outflow Inflow=0.02 cfs 0.001 af
Primary=0.02 cfs 0.001 af

Summary for Subcatchment 1S: Pre-Developed Basin I

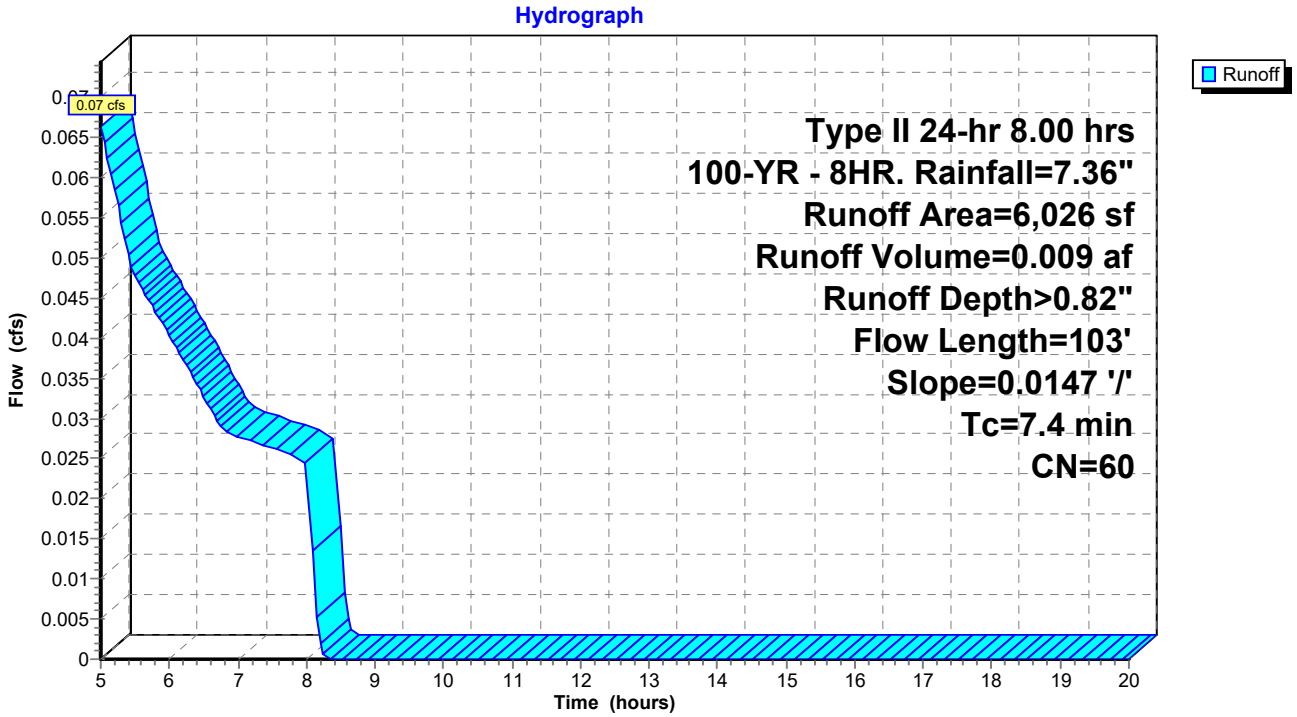
Runoff = 0.07 cfs @ 5.00 hrs, Volume= 0.009 af, Depth> 0.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

	Area (sf)	CN	Description
*	6,026	60	Woods/grass comb., Poor, HSG B
	6,026		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	103	0.0147	0.23		**Lag/CN Method, Woods**

Subcatchment 1S: Pre-Developed Basin I



Summary for Subcatchment 3S: Post Developed Basin I

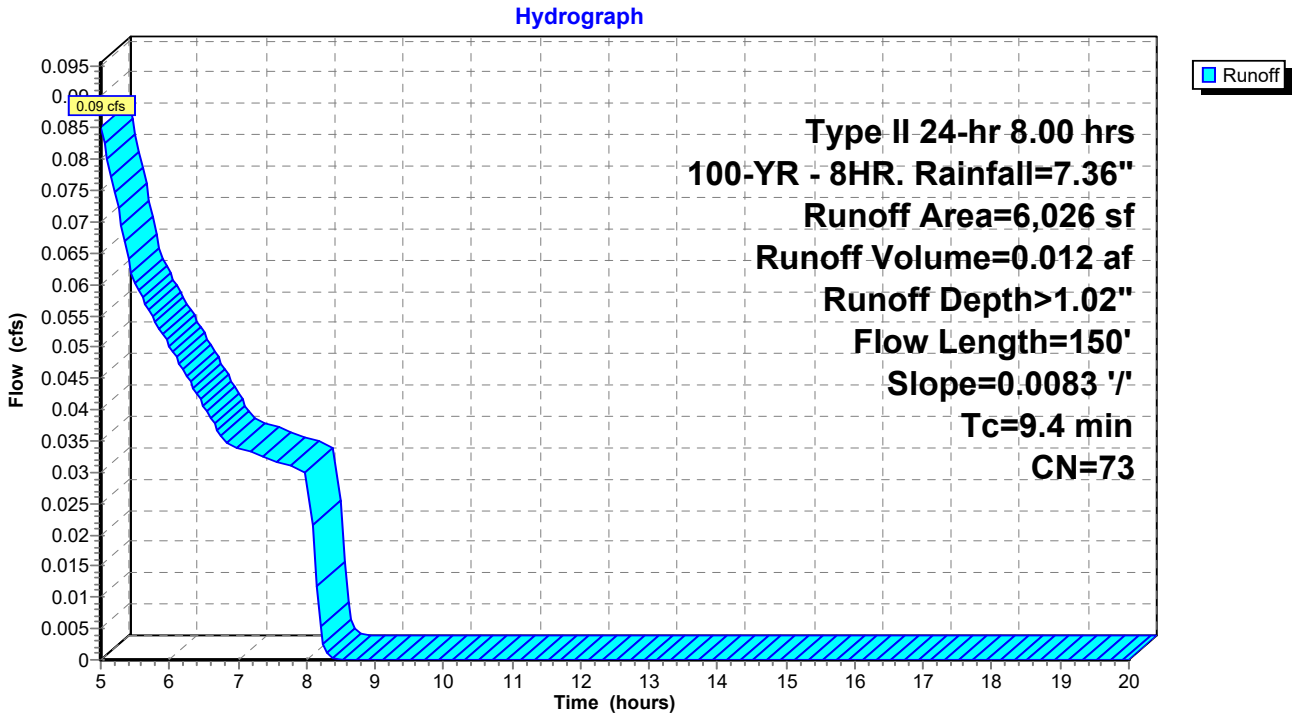
Runoff = 0.09 cfs @ 5.00 hrs, Volume= 0.012 af, Depth> 1.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 8.00 hrs 100-YR - 8HR. Rainfall=7.36"

	Area (sf)	CN	Description
	300	98	Roofs, HSG B
	97	98	Paved parking, HSG B
*	973	65	Uncompacted Gravel 35% Void
	1,283	85	Gravel roads, HSG B
	3,373	67	Brush, Poor, HSG B
	6,026	73	Weighted Average
	5,629		93.41% Pervious Area
	397		6.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4	150	0.0083	0.27		**Lag/CN Method,**

Subcatchment 3S: Post Developed Basin I



Summary for Pond 4P: Rock Void

Inflow	=	0.04 cfs @	5.00 hrs,	Volume=	0.006 af
Outflow	=	0.03 cfs @	6.70 hrs,	Volume=	0.002 af, Atten= 27%, Lag= 102.0 min
Primary	=	0.03 cfs @	6.70 hrs,	Volume=	0.002 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 98.00' @ 6.70 hrs Surf.Area= 973 sf Storage= 170 cf

Plug-Flow detention time= 128.0 min calculated for 0.002 af (33% of inflow)
Center-of-Mass det. time= 67.1 min (443.4 - 376.3)

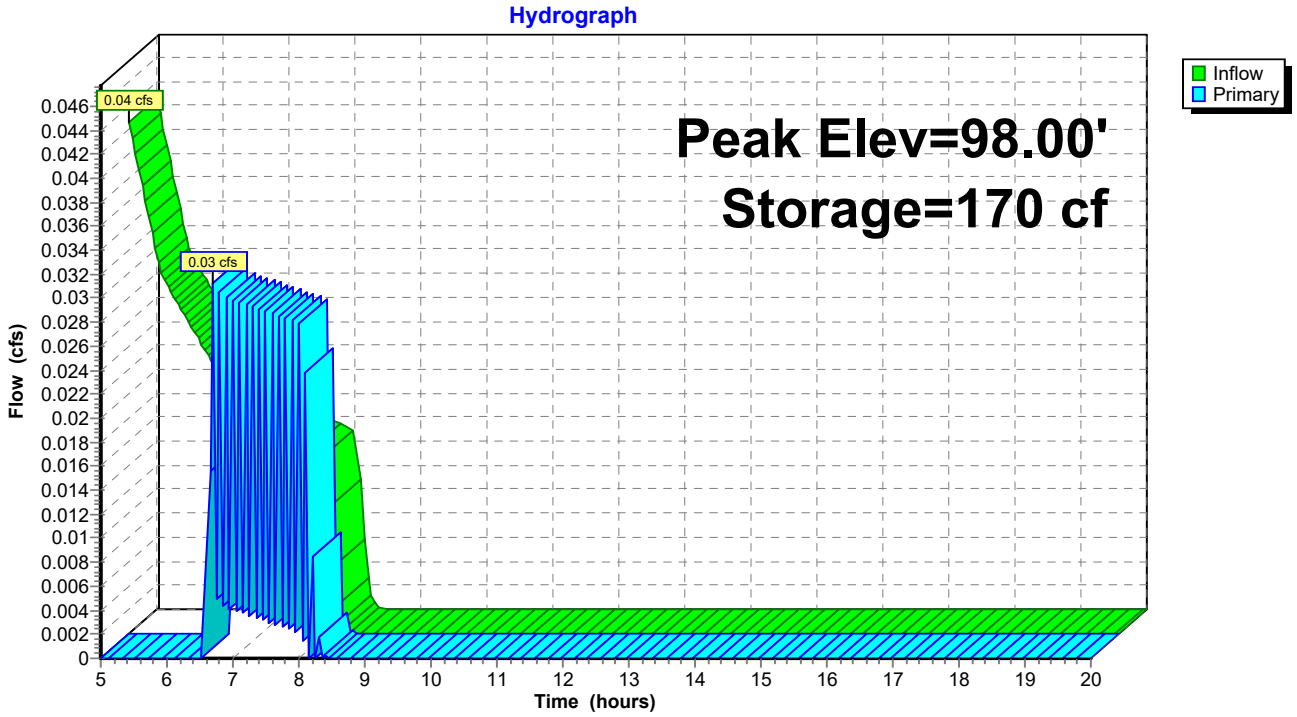
Volume	Invert	Avail.Storage	Storage Description
#1	97.50'	170 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 487 cf Overall x 35.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
97.50	973	0	0
98.00	973	487	487

Device	Routing	Invert	Outlet Devices
#1	Primary	98.00'	**45.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.03 cfs @ 6.70 hrs HW=98.00' (Free Discharge)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.03 cfs @ 0.17 fps)

Pond 4P: Rock Void



Summary for Pond 5P: South Pond

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 0.51" for 100-YR - 8HR. event
Inflow = 0.04 cfs @ 5.00 hrs, Volume= 0.006 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.00' @ 8.55 hrs Surf.Area= 60.979 ac Storage= 0.006 af

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

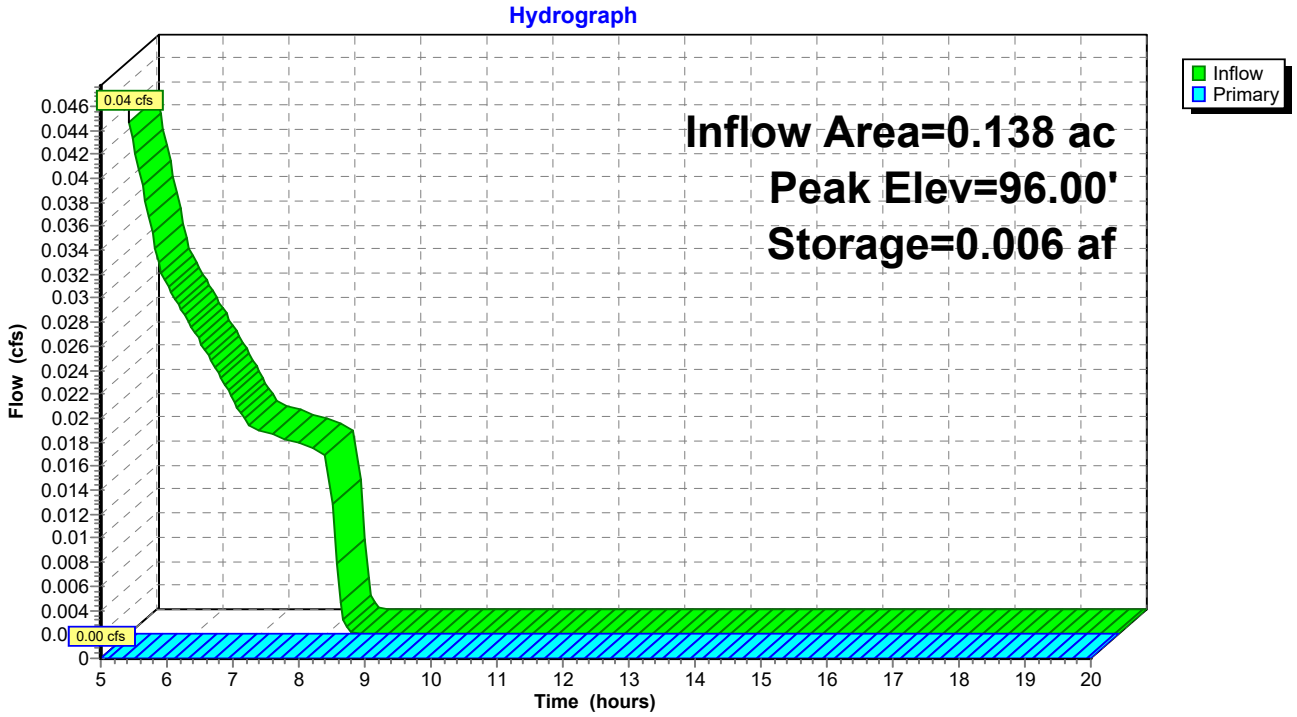
Volume	Invert	Avail.Storage	Storage Description
#1	96.00'	356.830 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
96.00	60.960	0.000	0.000
97.00	265.600	163.280	163.280
98.00	121.500	193.550	356.830

Device	Routing	Invert	Outlet Devices
#1	Primary	97.00'	**100.0 deg x 8.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=96.00' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)

Pond 5P: South Pond



Summary for Pond 9P: North Pond

Inflow	=	0.03 cfs @	6.70 hrs,	Volume=	0.002 af
Outflow	=	0.02 cfs @	7.41 hrs,	Volume=	0.001 af, Atten= 41%, Lag= 42.7 min
Primary	=	0.02 cfs @	7.41 hrs,	Volume=	0.001 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 96.91' @ 7.40 hrs Surf.Area= 133 sf Storage= 42 cf

Plug-Flow detention time= 43.3 min calculated for 0.001 af (54% of inflow)
Center-of-Mass det. time= 22.2 min (465.6 - 443.4)

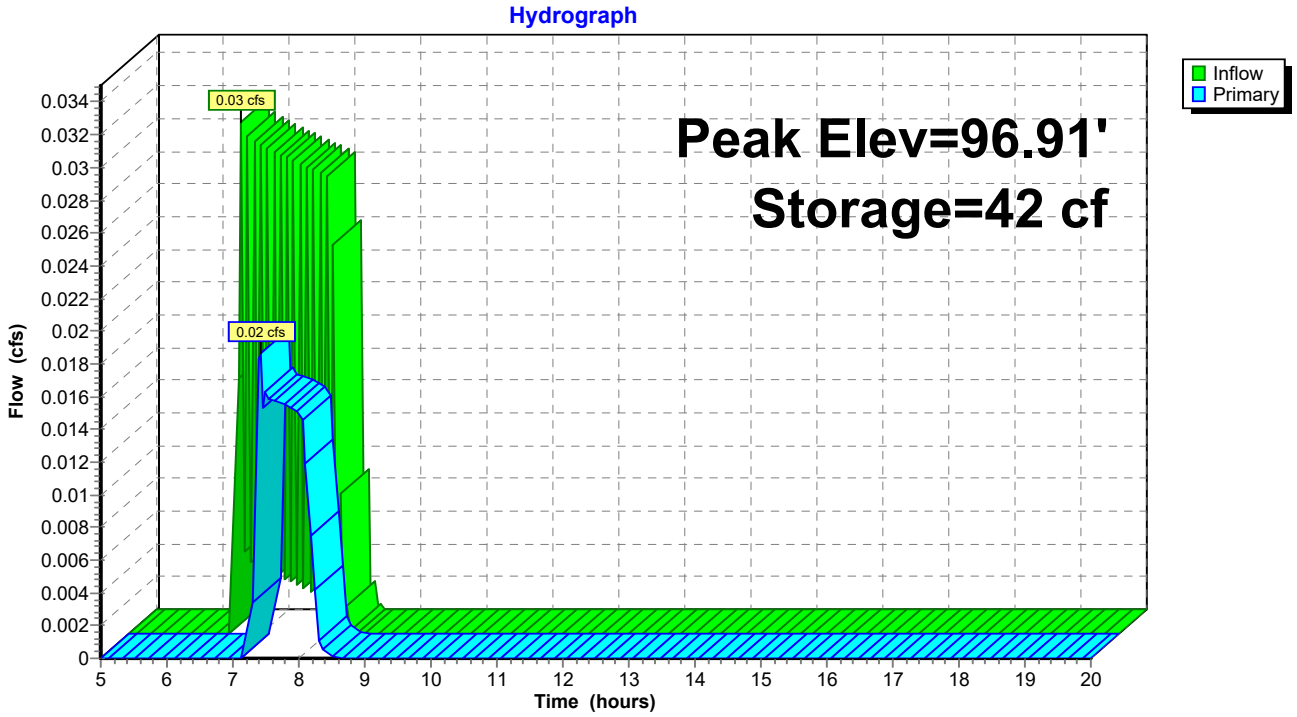
Volume	Invert	Avail.Storage	Storage Description
#1	96.50'	209 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.50	72	0	0
97.00	147	55	55
98.00	162	155	209

Device	Routing	Invert	Outlet Devices
#1	Primary	96.90'	**100.0 deg x 6.0' long x 1.00' rise Sharp-Crested Vee/Trap Weir** Cv= 2.49 (C= 3.11)

Primary OutFlow Max=0.01 cfs @ 7.41 hrs HW=96.91' (Free Discharge)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.01 cfs @ 0.29 fps)

Pond 9P: North Pond

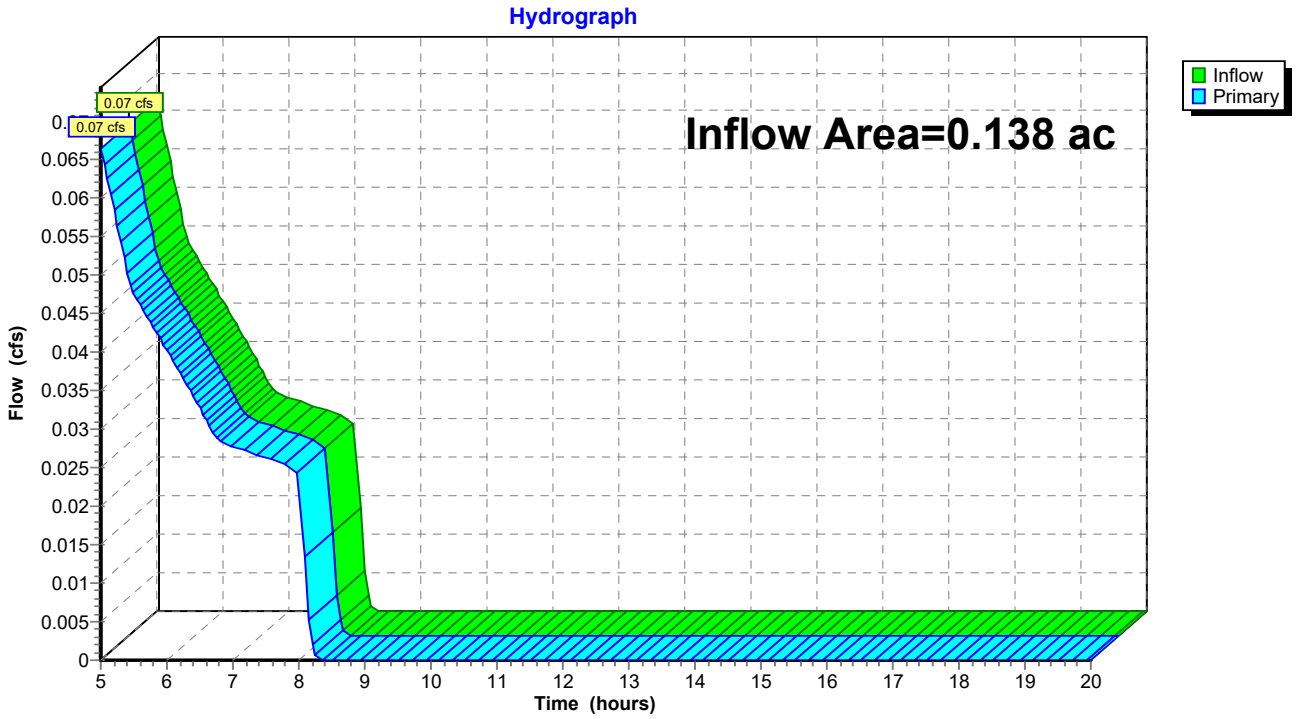


Summary for Link 2L: Outfall

Inflow Area = 0.138 ac, 0.00% Impervious, Inflow Depth > 0.82" for 100-YR - 8HR. event
Inflow = 0.07 cfs @ 5.00 hrs, Volume= 0.009 af
Primary = 0.07 cfs @ 5.00 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 2L: Outfall

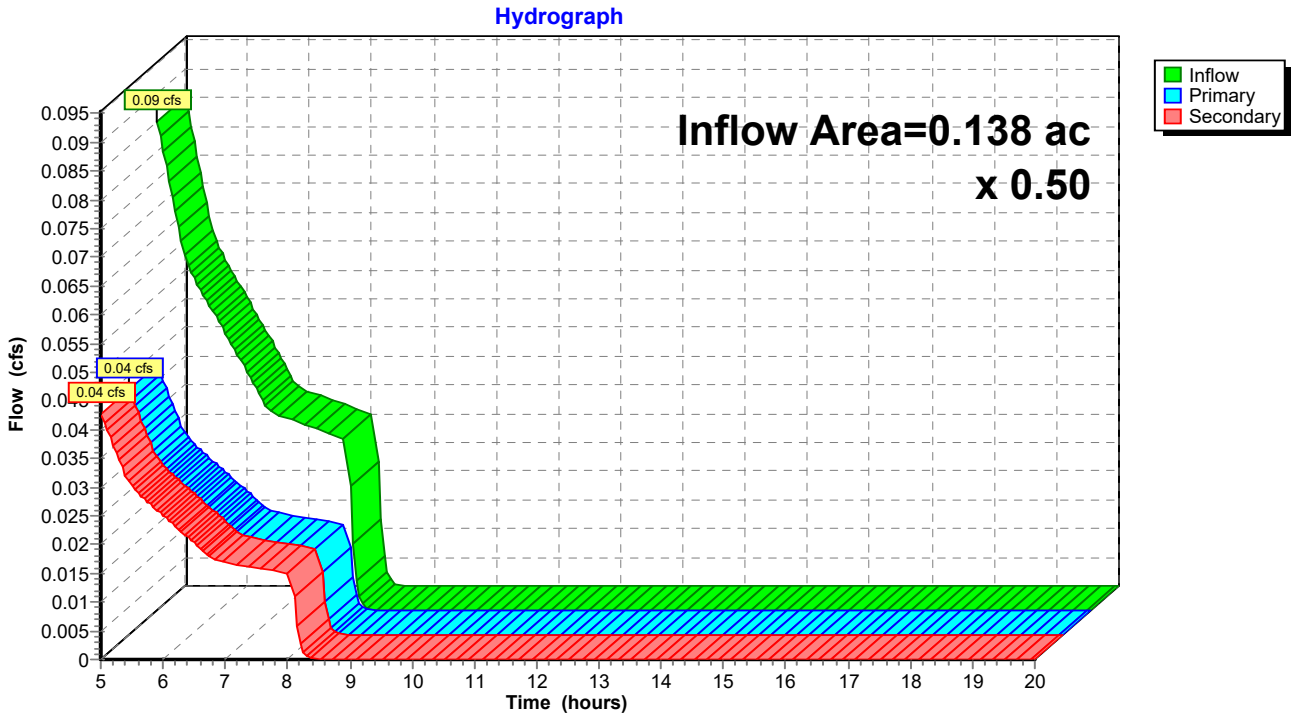


Summary for Link 6L: Split

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth > 1.02" for 100-YR - 8HR. event
Inflow = 0.09 cfs @ 5.00 hrs, Volume= 0.012 af
Primary = 0.04 cfs @ 5.00 hrs, Volume= 0.006 af, Atten= 50%, Lag= 0.0 min
Secondary = 0.04 cfs @ 5.00 hrs, Volume= 0.006 af

Primary outflow = Inflow x 0.50, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 6L: Split

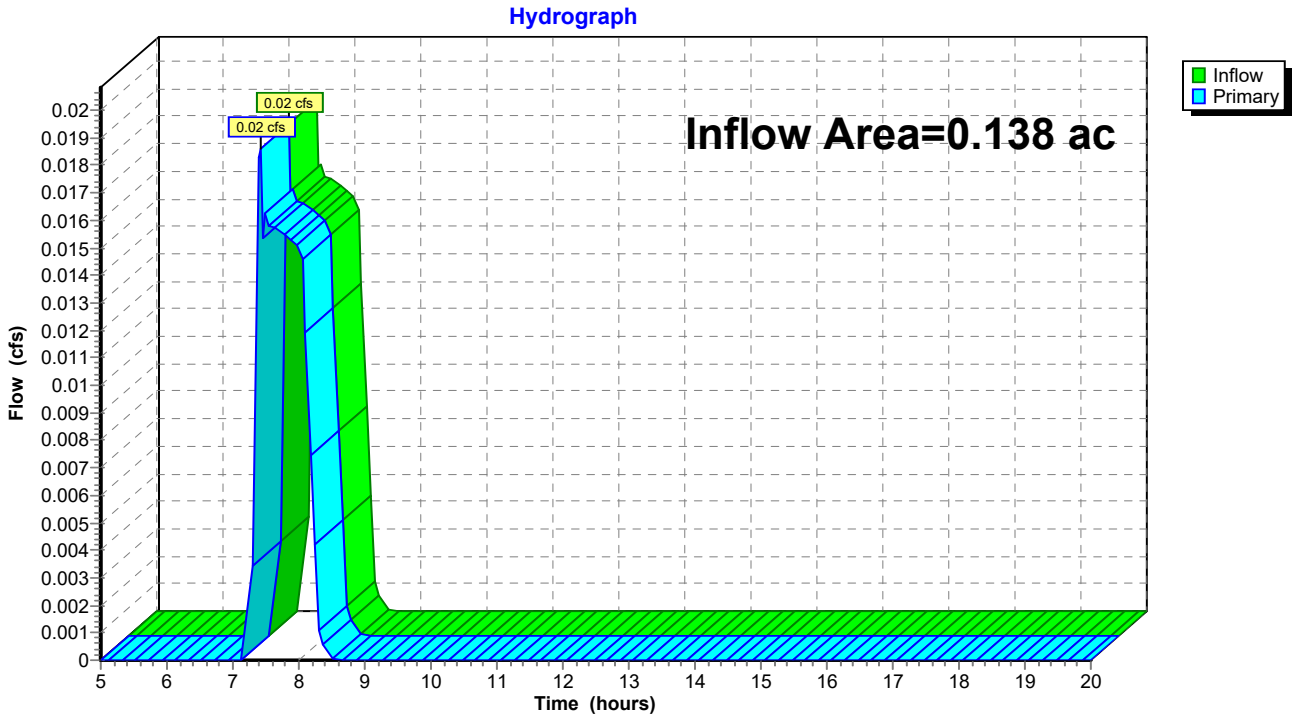


Summary for Link 10L: Combined Outflow

Inflow Area = 0.138 ac, 6.59% Impervious, Inflow Depth = 0.09" for 100-YR - 8HR. event
Inflow = 0.02 cfs @ 7.41 hrs, Volume= 0.001 af
Primary = 0.02 cfs @ 7.41 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Link 10L: Combined Outflow



Appendix C – FEMA Firm Map

National Flood Hazard Layer FIRMette

FEMA

Legend

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

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

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

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

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

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

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

N

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/13/2020 at 2:51:02 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Appendix D – Rainfall Distribution Data

Appendix D

District Rainfall Distribution Data

Values for P_{total} (inches)[1]

For the counties of Madison, Hamilton, Suwannee, Columbia, Baker and Union.

Frequency (years)	Duration (hours)							
	1	2	4	8	24	72	168	240
3	2.50	2.64	3.08	3.52	4.56	5.80	7.30	8.00
10	3.05	3.70	4.40	5.12	6.72	8.30	10.10	11.80
25	3.45	4.30	5.12	6.00	7.92	10.00	12.30	14.00
100	4.20	5.10	6.08	7.36	9.84	12.40	14.00	16.10

For the counties of Taylor, Lafayette, Dixie, Gilchrist, Levy, Alachua and Bradford.

Frequency (years)	Duration (hours)							
	1	2	4	8	24	72	168	240
3	2.60	3.20	3.80	4.48	6.00	7.60	9.50	10.80
10	3.20	4.00	4.80	5.84	7.92	8.90	11.00	12.50
25	3.60	4.40	5.28	6.56	8.64	11.00	13.00	15.00
100	4.40	5.40	6.72	8.00	11.04	13.80	16.00	18.00

1-HOUR DURATION

T(hrs)	P/P_{total}	I/P_{total}
0	0	0
.1	.020	.200
.2	.080	.600
.3	.200	1.200
.4	.410	2.100
.5	.625	2.150
.6	.805	1.800
.7	.915	1.100
.8	.985	0.700
.9	.995	0.100
1.0	1.000	0

[1] Values for durations through 24 hours were taken from Florida Department of Transportation intensity curves. Values for durations greater than 24 hours were taken from National Weather Service Technical Paper No. 49, 1964.

Appendix E – Water Management District Boundary

Part VII APPENDICES
Appendix

District Boundary