



MAJOR SUBDIVISION – FINAL PLAN - REVIEW APPLICATION

FEES FOR MAJOR SUBDIVISION FINAL PLAN REVIEW		APPLICATION FEE: AMENDED	<input checked="" type="checkbox"/> \$350.00	AMOUNT PAID: <u>\$ 100.00</u>					
		APPLICATION FEE: REVIEW ESCROW:	<input type="checkbox"/> \$350.00	DATE: _____					
<input type="checkbox"/> Amended Major Subdivision Each Lot / Revision		REVIEW ESCROW: AMENDED	<input checked="" type="checkbox"/> \$250.00	Office Use: _____	Office Stamp: _____				
		REVIEW ESCROW:	<input type="checkbox"/> \$250.00						
PROPERTY DESCRIPTION		Parcel ID	Map(s) #	Meredith Way LLC	Lot(s) #	Meredith Drive	Zoning District(s)	Steve Roberge	Total Land Area SF:
		# Lots/dwelling units:	207-242-6248	Total Distr. >1Ac.	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N			Est. Road Length(ft):
		Physical Address:	Steve@sjreng.com				Watershed:	Black Brook	
PROPERTY OWNER'S INFORMATION		Name:	38-E02				Name of Business:		
		Phone:	SJR Engineering Inc., 16 Thurston Drive,				Mailing Address:	190 US Route 1, Box 11	
		Fax or Cell:	207-415-8723					Falmouth, Maine 04105	
		Email:	laurie@mainedevelopmentgroup.com						
APPLICANT'S INFORMATION (IF DIFFERENT FROM OWNER)		Name:					Name of Business:		
		Phone:					Mailing Address:		
		Fax or Cell:							
		Email:							
APPLICANT'S AGENT INFORMATION		Name:	Steve Roberge				Name of Business:	SJR Engineering Inc	
		Phone:					Mailing Address:	16 Thurston Drive	
		Fax or Cell:	207-242-6248					Monmouth, Maine 04259	
		Email:	steve@sjreng.com						
PROJECT INFORMATION	Existing Land Use (Use extra paper, if necessary): Raw undeveloped forested land except for the roughed in ROW driveway to the parcel.								
	Provide a narrative description of the Proposed Project (Use extra paper, if necessary): The project is to develop a subdivision with 5 new residential lots. The roughly 750' access to the site will be created into a new private road that will end in a cul-de-sac. The subdivision has been created using the conservation subdivision criteria. A net residential density calculation shows that 12 lots could be allowed. Due to the LUO restriction of 30 lots on a dead end without a second access point, the project is limited to 5 lots. The five lots will be roughly 30,000 sf in size, and have public water, private septic systems, and underground power. Stormwater management will capture road runoff in Catches Basins and ditches. It will then be diverted to the proposed soil filter pond behind lot 5.								
	Provide a narrative description of construction constraints (wetlands, shoreland zone, flood plain, non-conformance, etc.): Access to the project is limited to a 50' wide strip of land off Meredith Road that will be turned into a private road for access to the 5 lots. Significant wetlands are located (and protected) within the immediate area. A significant stream (Black Brook) crosses the parcel creating no viable access to the remaining land (Open Space). A net residential density plan has been created that depicts constraints identified on the site. These consist of wetlands, stream, flood plain, and steep slopes.								

MAJOR SUBDIVISION - FINAL PLAN - REVIEW APPLICATION REQUIREMENTS

Section 910 of the Land Use Ordinance

The submission shall contain, five (5) copies of the following information, including full plan sets. Along with one (1) electronic version of the entire submission unless a waiver of a submission requirement is granted.

The Major Plan document/map:

- A) Plan size: 24" X 36"
- B) Plan Scale: No greater 1":100'
- C) Title block: Applicant's name and address
 - Name of the preparer of plans with professional information
 - Parcel's tax map identification (map and lot) and street address, if available

- Complete application submission deadline: three (3) weeks prior to the desired Staff Review Committee meeting.
 - Five copies of the application and plans
 - Application Payment and Review Escrow
- A pre-submission meeting with the Town staff is required.
- Contact information:

Windham Planning Department (207) 894-5960, ext. 2
 Steve Puleo, Town Planner spuleo@windhammaine.us
 Amanda Lessard, Planning Director allessard@windhammaine.us

APPLICANT/PLANNER'S CHECKLIST FOR MAJOR SUBDIVISION REVIEW

SUBMITTALS THAT THE TOWN PLANNER DEEMS SUFFICIENTLY LACKING IN CONTENT WILL NOT BE SCHEDULED FOR PLANNING BOARD REVIEW.

The following checklist includes items generally required for development by the Town of Windham's LAND USE ORDINANCE, Sections 907.B., 910.C., & 911. Due to projects specifics, are required to provide a complete and accurate set of plans, reports, and supporting documentation (as listed in the checklist below).

IT IS THE RESPONSIBILITY OF THE APPLICANT TO PRESENT A CLEAR UNDERSTANDING OF THE PROJECT.

Final Plan - Major Subdivision - Submission Requirements:	Applicant	Staff	B. Mandatory Plan Information	Applicant	Staff
A. Written information – submitted in a bound report.					
1. A fully executed application form.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. All information presented on the Preliminary Plan, and any amendments suggested or required by the Board.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Evidence that the escrow account balance is greater than 25% of the initial Preliminary Plan deposit.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. Map and lot numbers for all lots as assigned by the Town of Windham Assessing Department.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. If public open space is to be provided, written offers of cession to the Town of Windham shall be provided.	<input type="checkbox"/> NA	<input type="checkbox"/>	3. Seal of the Maine Licensed Professional who prepared the plan.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. If the subdivider reserves title to spaces within the subdivision, provide copies of agreements or other documents.	<input type="checkbox"/> NA	<input type="checkbox"/>	4. All public open spaces for which offers of cession are made by the subdivider and those spaces to which title is reserved by the subdivider.	<input type="checkbox"/> NA	<input type="checkbox"/>
5. Copies of any outside agency approvals.	<input type="checkbox"/> NEEDS SW-PBR	<input type="checkbox"/>	5. Location of all permanent monuments.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. Statement from the Maine Inland Fisheries & Wildlife that no significant wildlife habitat exists on the site.	<input checked="" type="checkbox"/> BEG WITH HABITAT	<input type="checkbox"/>	PDF\Electronic Submission.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. Digital transfer of subdivision plan data (GIS format).	<input checked="" type="checkbox"/> PREVIOUSLY SUBMITTED	<input type="checkbox"/>			

The undersigned hereby makes an application to the Town of Windham for approval of the proposed project and declares the foregoing to be true and accurate to the best of his/her knowledge.

Stephen Robeyc
APPICANT OR AGENT'S SIGNATURE

10-06-2025

DATE

STEPHEN ROBEYCE

PLEASE TYPE OR PRINT THE NAME

October 4, 2025

Laurie Bachelder
Meredith Way LLC
366 Route 1
Falmouth, Maine 04105



Re: Quality Percentages, Meredith Woods Subdivision, Windham, Me

Dear Laurie,

At the last Planning Board meeting, the Planning Board directed us to perform additional stormwater calculations to depict storm quantity and quality for the lots and Monty Way as required in the Land Use Ordinance. I have spoken with Mark Arenti and have confirmed we can use the linear type project for Monty Way (75% impervious treatment, 50% disturbed treatment). The lots would need to meet the DEP Chapter 500 standards which are 95% impervious treatment and 80% disturbed area treatment. He also confirmed we could use the Mystic Woods Open Space for wooded buffer treatment.

We have created a table on the subdivision plan that breaks down the types of land cover for each lot. The treated area is 100% of the developed area as shown on the plan. In summary, the lots drain to the soil filter and/or a 100' wooded buffer area for treatment. In addition, we have proposed all buildings to have a roof drip strip that would infiltrate roof water through a soil filter prior to being discharged from the underdrain system.

Monty Way (ROW) has a total of 21,400 sf of impervious area (pavement and shoulder). The impervious area from station 2+00 to the end of cul-de-sac is treated and has 17,300 sf of area. This calculates to 80.8% impervious treatment. Similarly, Monty Way (ROW) has 47,464 sf of disturbed area. The disturbed area from station 2+00 to the end of cul-de-sac is treated and has 38,146 sf of area. Both calculations meet the required percentages.

Please contact me if you have any questions.

Sincerely yours,
Stephen Roberge
Stephen Roberge, PE
for SJR Engineering Inc

October 4, 2025

Laurie Bachelder
Meredith Way LLC
366 Route 1
Falmouth, Maine 04105



Re: Stormwater Quantity/Quality Narrative, Meredith Woods Subdivision, Windham, Me (updated from prior report)

Dear Laurie,

Meredith Way, LLC owns a parcel of land off Meredith Road in Windham, Maine. You are proposing to construct a new 5 lot subdivision to be named Meredith Woods Subdivision with a new access road and stormwater facility. The lots will utilize underground electricity, telephone, private sewer and public water supply. It is anticipated that this projects site infrastructure will be started in 2025.

The site is identified as Tax Map 6 Lot 38-E02 of the Town's Tax Map. The total parcel size is 23.64 acres. The subdivision is designed to Town of Windham Conservation Subdivision standards. Each of the 5 lots will have roughly 30,000 sf of developed area with the remaining area dedicated to Conservation "Open Space". An upgraded 750' long Betty Lane will have a cul-de-sac turnaround at the end. The road is to be private and paved with ditches on both sides of the road except around the cul-de-sac where curbing will redirect stormwater to catch basins. Road drainage will be diverted into a soil filter pond near the back of lot 5 and the open space. The parcel lies within the Farm Zoning District.

Existing Site Conditions

The existing site consists mostly of existing woods with several large delineated wetland areas. The topography of the proposed developed site is shown at two-foot contour interval that have been taken from the MeGIS website. The slope of the property varies from 1% along the flatter areas to 30% along the banks of the steeper slopes of the property. Wetland areas have been reviewed and re-delineated by Mark Cenci in 2025 and are shown on the plan.

Adjacent Areas

Adjacent areas and land uses are similar in nature to that being proposed (residential). Much of the area is currently being used for residential properties or remains undeveloped. Runoff from the property enters into large wetland areas which eventually flows into the Black Brook watershed.

We have prepared an erosion control narrative under separate cover. This narrative is to address stormwater quantity/quality control during (and after) the construction of the project.

Soils

Soils delineation was taken from the medium intensity soils maps of the Cumberland County Soil Survey. I have overlaid the proposed developed site onto this map. Soils are identified as being Lamoine (hydro group "C/D", K= 0.32), Scantic (hydro group "D", K= 0.32), Windsor (hydro group "A", K= 0.17) and Nicholville (hydro group "C", K= 0.49) within the parcel.

Summary Overview

We have prepared stormwater quantity and quality analysis in order to properly evaluate existing and proposed stormwater quantity impacts from the development. The Maine DEP Chapter 500 rules of the Maine DEP stormwater rules require proposed flow rates for 2/10/25 year storm events to be the same or less than existing flows at the property line of the parcel. We have designed this project to meet these standards by use of a combined soil filter pond/detention pond to be constructed with the project infrastructure.

Runoff from the developed portions of the parcel (see stormwater plan for proposed watershed boundaries) are directed to a proposed soil filter pond along the rear of Lot 5. Stormwater runoff is captured and treatment is provided within the pond. Discharge from the pond eventually enters a wetland area that combines with Black Brook within the project site in the open space.

We have designed the soil filter/detention pond to provide water quantity/quality enhancement. The pond will function as a detention pond to limit flows to approximate pre-construction flow rates. Proposed soil filter/detention ponds are necessary to control flows to pre-existing

**Stormwater Quantity/Quality Analysis
Meredith Woods Subdivision, Windham, Me.**

conditions and to treat the stormwater quality within the pond.

The existing/proposed flow rates are as follows at the Design Point indicated on the watershed plan:

Stormwater Summary at Design Point A

	2 year storm (cfs)	10 year storm (cfs)	25 year storm (cfs)
Existing flows	2.79	7.17	11.13
Proposed flows	1.78	5.21	8.45

Stormwater Summary at Design Point B

	2 year storm (cfs)	10 year storm (cfs)	25 year storm (cfs)
Existing flows	0.00	0.00	0.00
Proposed flows	0.05	0.00	0.00

Stormwater Summary at Design Point C

	2 year storm (cfs)	10 year storm (cfs)	25 year storm (cfs)
Existing flows	0.00	0.02	0.09
Proposed flows	0.00	0.00	0.01

Stormwater Summary at Design Point D

	2 year storm (cfs)	10 year storm (cfs)	25 year storm (cfs)
Existing flows	1.98	4.82	7.33
Proposed flows	2.06	4.87	7.33

Stormwater flows will be attenuated by diverting and capturing stormwater flows from the new construction into the new soil filter/detention pond with a stormwater control outlet being utilized to control runoff water discharges to pre-existing conditions as well as providing stormwater quality treatment for the developed runoff water. In summary, the proposed stormwater flows will be insignificant relative to the existing condition. No significant downstream impacts from stormwater flows are expected with this proposal.

Approximately 9,780 sf of new impervious surface (roads and driveways) will be treated during proposed construction improvements. Proposed impervious surfaces will be treated through the soil filter ponds. In addition, we have provided notation that requires all building to incorporate roof drip strip infiltration for lot construction. Building roof water will be infiltrated into 3' wide stone drip edges for water quantity/quality treatment within the lots.

Stormwater Quantity

I have reviewed the drainage characteristics of the watershed area which includes impervious areas, lawn areas, and woods, as well upslope watershed areas. The analysis requires post construction stormwater flow rates to be approximately equal to or less than the existing stormwater rates.

I have used the SCS TR-20 (HydroCad 10.2 computer model) method of computing stormwater runoff peak flow rates. This method accounts for soil types, existing land uses, topography, vegetative cover, and proposed land use for the parcel to be developed. The proposed conditions were analyzed using data for Cumberland County type III, 24-hour storm distribution (Northeast Regional Climate Center June 2014) with a design frequency of occurrence of 2/10/25/100 years. One day precipitation values of 3.19"/4.77"/6.01"/8.54" have been used for each respective event. All supporting calculations and data are submitted with this report.

The existing and proposed site conditions were analyzed using information taken from existing/proposed topographic plan of the parcel to be developed. Impervious areas, lawns, meadows, and woods areas for each hydrological soil condition were measured within AutoCad in order to calculate a weighted curve number that typifies the drainage condition of the site.

Watershed calculations (pre and post construction)

Please see the attached stormwater plans for both the existing and proposed conditions to help determine location of each watershed and drainage flow path.

The project has one larger watershed area within the developed parcel that will be captured to control runoff and provide water quality enhancement. Watershed "1A" consists of the land area that will be disturbed with road/driveway construction and flows into the soil filter pond. Watershed 1B

is the remaining land area that also drains to the Design Point. We have designated the Design Point of interest on the plan as being the beginning of the open space area.

Soil Filter Ponds:

In the proposed development condition, the watershed area has significant increases in impervious and developed areas as compared with the existing condition. The increased flows are captured in the soil filter/detention pond within the parcel. Runoff water within the soil filter pond will be detained and treated in the pond.

The soil filter pond has been sized to accommodate and store flows for stormwater quantity and quality functions and to control flows to pre-development runoff conditions. We have calculated increases in flow rates in the developed portion of the project for the 2/10/25 year storm events. However, by constructing the soil filter/detention pond and sizing the inlets within the stormwater control structure, stormwater flows are captured and contained. These increased flows are then stored (detained and treatment provided) within the pond for short periods of time (24-48 hours) allowing existing peak flow rates to remain approximately the same.

Design Point A - Rear of Lot 5

The stormwater existing/proposed Design Point A is located along the rear property line of Lot 5. We have calculated the existing flows with the proper land surface cover and soils hydrological group in order to compare these flows with the proposed flows. Existing flows at this design point location have been calculated to be 2.79/7.17/11.13 cfs for the 2/10/25 year storm events.

Soil Filter Pond: Our analysis indicates that the incoming flow rates to the Soil Filter Pond 1 are 0.31/0.80/1.26 cfs and are reduced to 0.02/0.18/0.34 cfs for the 2/10/25 year storm events at the outlet from the soil filter pond control structure. The soil filter ground elevation is set at elevation 164.0. The water elevation within the pond is expected to peak at elevations 165.43/165.65/166.18 for the 2/10/25 year storm events.

Pond construction Control structure

Pond 1: The soil filter pond will need to be configured with a control manhole structure that has a 15" diameter outlet pipe at invert 161.15. The control structure has inlet connection to the 6" diameter underdrain pipe within the

pond filter area at elev 161.50. The manhole has a 48" wide by 12" tall orifice cut into the manhole structure on the pond side at elevation 165.5 to allow water into the structure. The control structure has a steel panel installed along the center of the structure with a 1" tall by 12" wide orifice cut at elevation 161.40. No water will flow from the pond (except filtered water within the filter media underdrain) until the water elevation reaches 165.5 (top of steel plate). A 10' wide emergency spillway is to be constructed at elevation 166.88. The top of the berm is to be constructed to elevation 168.11. We have checked the spillway design for a 25-year storm event with the control structure plugged (ie all flows through the spillway). Calculated flows reach elevation 166.93. The top of berm is 14" higher than this water surface. We have also checked the spillway design for a 100-year storm event. Calculated flows reach elevation 167.11. The top of berm is 12" higher than this water surface.

Water quality - Soil Filter Pond

The Maine DEP Chapter 500 rules of the Maine DEP stormwater rules require a 75% impervious surface stormwater treatment and an 50% disturbed area stormwater treatment for linear type projects (subdivision roads). We have designed this project to meet and exceed these standards by use of a combined soil filter pond/detention pond to be constructed with the project infrastructure. Roof drip edges for residential structures have also been designed into the project that will also treat stormwater runoff from the building roof surfaces.

Soil Filter Pond 1: We have designed the project to redirect impervious and lawn areas runoff into a soil filter pond downslope from the developed areas. We have identified watershed A will be captured and diverted to the soil filter pond. The total disturbed area draining to the pond 1 is 33,515 sf. We have calculated 9,780 sf of the new impervious area (portion of street and driveways) and 23,735 sf of the grassed area of the project would be treated through the proposed soil filter pond.

The soil filter/detention pond is designed to act such that initial and ending runoff flows are captured and infiltrated through the soil filter media within the pond. The higher flows will be bypassed through the pond control structure and emergency riprap spillway.

The soil filter pond is to be constructed to a ground elevation of 164.0 (top of

ground surface for filtering system). The pond is to be sized such that the surface area meets (or exceeds) 5% of the impervious area plus 2% of the landscape area that drains to the pond. As noted above, we have calculated 9,780 sf of impervious area runoff and 23,735 sf of landscape area runoff will enter the pond. Therefore, we are required to have a minimum of 964 sf of surface filter area. We have provided 996 sf of available area within contour 164.0.

In addition, a minimum treatment volume must be contained such that the required volume contained is less than 18" deep over the surface filter area. The channel protection volume is based on 1" of impervious surface area and .4" of vegetative area entering the pond. Using the same impervious and landscape areas noted above, we are required to have 1606 cf of pond storage above the soil filter surface area. Our design has provided 1657 cf of storage area at elevation 165.4 (17" deep).

Pond 1 is controlled by a stormwater control manhole that has a steel plate (or concrete panel) with specific holes cut into the control panel to limit flows leaving the ponds and provide adequate holding time to be treated by the filter media. Water quality enhancement flows are detained within the soil filter pond by restricting the discharge flow through a small 1" orifice control in the control structure steel plate at invert elevation 161.50. The hole has been sized using the DEP orifice Regression Equation for both filter area and quality area sizing requirements. Holes smaller than this size are susceptible to plugging frequently.

We have provided concept building locations as required by the ordinance, but this should not be interpreted as being the only development that can be located on the project. We have noted that each building be constructed with a roof drip edge that runoff will be infiltrated through a filter media and drain to an underdrain to daylight.

The proposed development of the parcel can be constructed utilizing the soil filter pond as designed to the berm height and control structure in the ponds as noted above.

Summary

Please feel free to contact me if you have any questions concerning the calculations of stormwater from this project. It is important to note that

**Stormwater Quantity/Quality Analysis
Meredith Woods Subdivision, Windham, Me.**

proper erosion control and revegetation of disturbed areas are essential for the proper operation of the stormwater facilities. Maintenance of the yard impervious areas, careful attention to the pavement/seeded interface, and continued maintenance to the pond system must be a top priority in order for the system to function properly. Thank you for involving this firm on your project.

Sincerely yours,

Stephen Roberge

Stephen Roberge, PE
for SJR Engineering Inc.



Region A



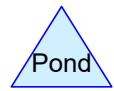
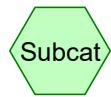
Region B



Region C



Region D



Routing Diagram for Existing DP ABCD
Prepared by SJR Engineering, Printed 10/5/2025
HydroCAD® 10.20-3h s/n 00591 © 2024 HydroCAD Software Solutions LLC

Existing DP ABCD

Prepared by SJR Engineering

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-Year	NRCC 24-hr	D	Default	24.00	1	3.19	2
2	10-Year	NRCC 24-hr	D	Default	24.00	1	4.77	2
3	25-Year	NRCC 24-hr	D	Default	24.00	1	6.01	2

Existing DP ABCD

Prepared by SJR Engineering

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.736	30	Woods, Good, HSG A (1S, 2S, 3S, 4S)
8.355	70	Woods, Good, HSG C (1S, 3S, 4S)
2.995	77	Woods, Good, HSG D (1S, 4S)
14.086	64	TOTAL AREA

Existing DP ABCD

Prepared by SJR Engineering

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
2.736	HSG A	1S, 2S, 3S, 4S
0.000	HSG B	
8.355	HSG C	1S, 3S, 4S
2.995	HSG D	1S, 4S
0.000	Other	
14.086		TOTAL AREA

Existing DP ABCD

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
2.736	0.000	8.355	2.995	0.000	14.086	Woods, Good	1S, 2S, 3S, 4S
2.736	0.000	8.355	2.995	0.000	14.086	TOTAL AREA	

Summary for Subcatchment 1S: Region A

Runoff = 2.79 cfs @ 12.35 hrs, Volume= 0.333 af, Depth> 0.65"

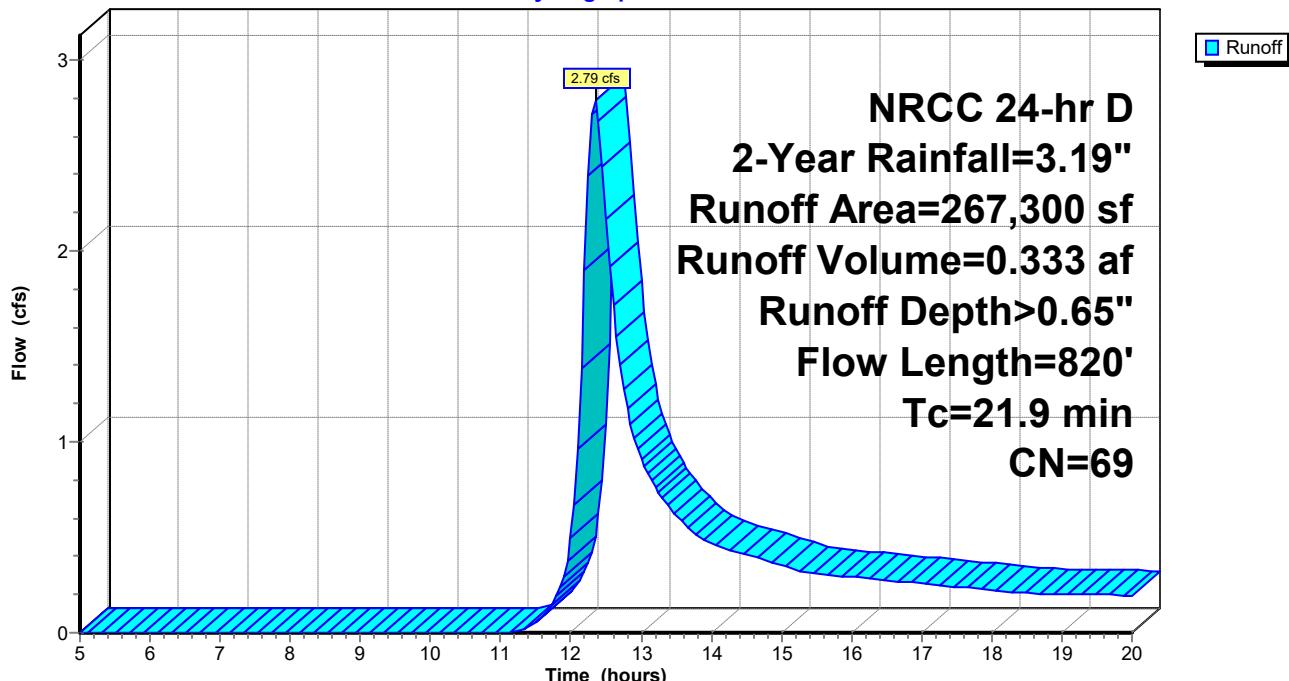
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.19"

Area (sf)	CN	Description
19,800	30	Woods, Good, HSG A
170,000	70	Woods, Good, HSG C
77,500	77	Woods, Good, HSG D
267,300	69	Weighted Average
267,300		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.1	100	0.1700	0.18		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
9.3	500	0.0320	0.89		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.2	100	0.0800	1.41		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.3	120	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
21.9	820				Total

Subcatchment 1S: Region A

Hydrograph



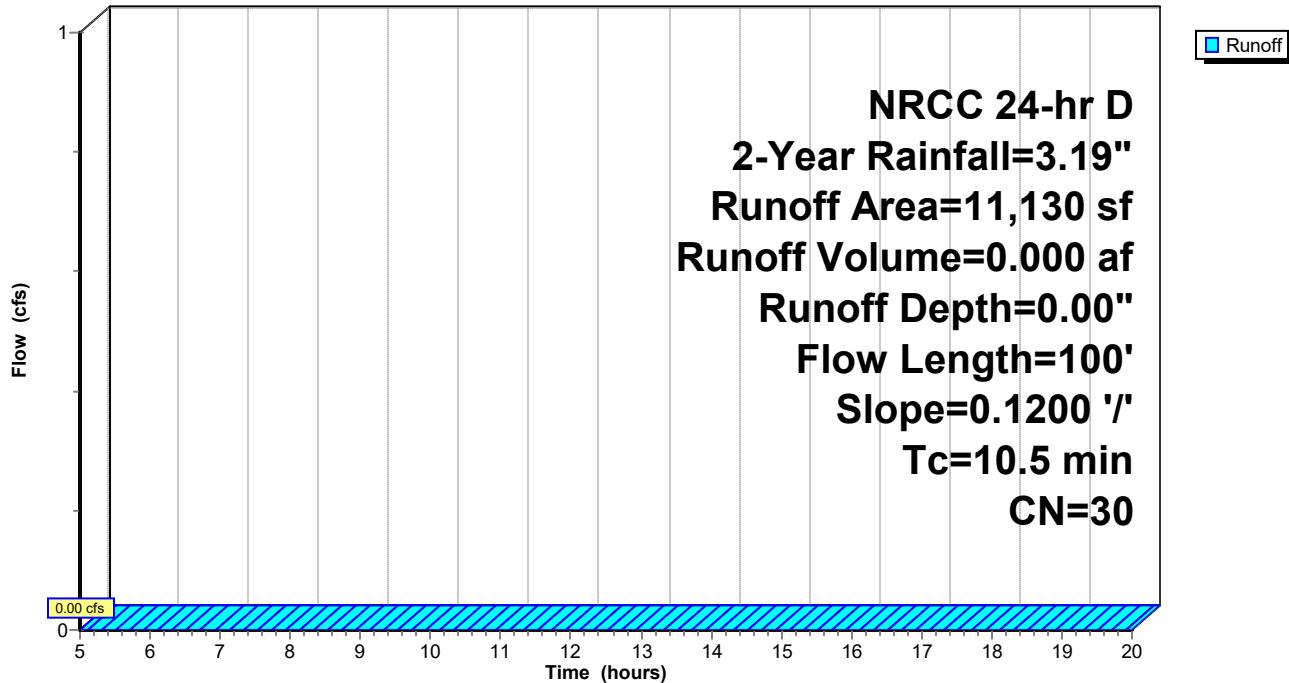
Summary for Subcatchment 2S: Region B

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
NRCC 24-hr D 2-Year Rainfall=3.19"

Area (sf)	CN	Description
11,130	30	Woods, Good, HSG A
11,130		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.1200	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"

Subcatchment 2S: Region B**Hydrograph**

Summary for Subcatchment 3S: Region C

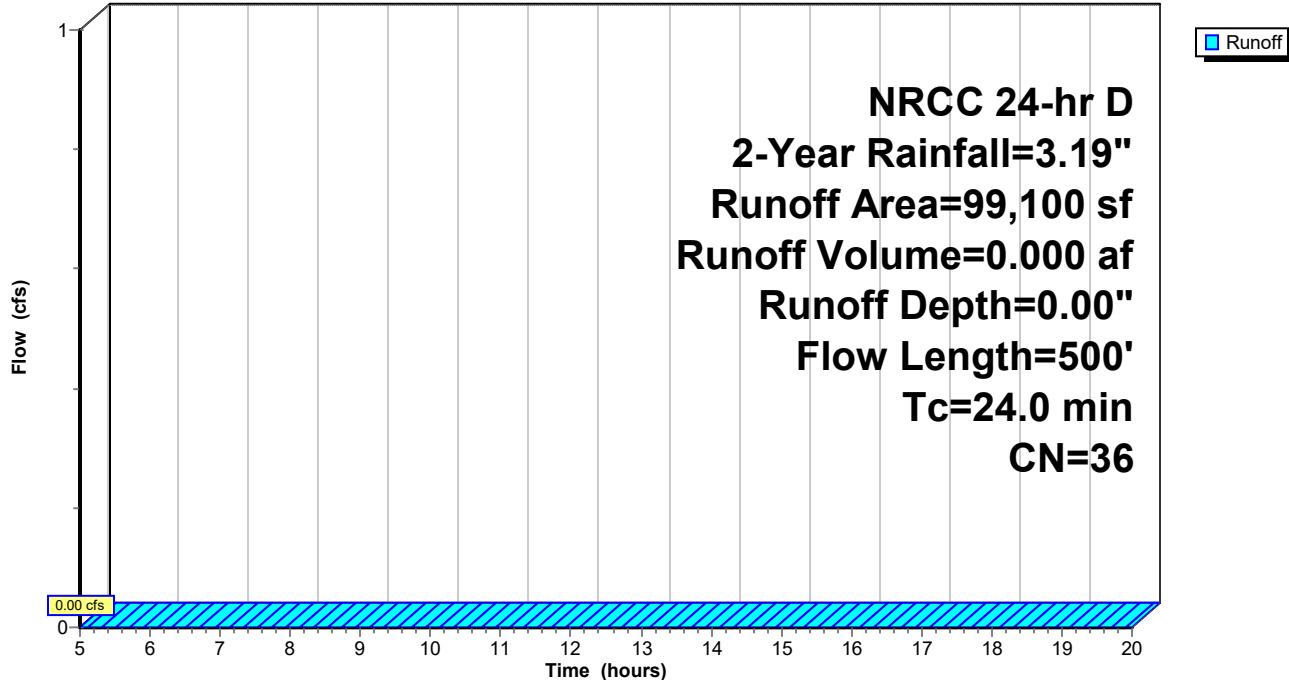
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.19"

Area (sf)	CN	Description
83,200	30	Woods, Good, HSG A
15,900	70	Woods, Good, HSG C

99,100	36	Weighted Average
99,100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	100	0.0400	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
7.7	400	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.0	500	Total			

Subcatchment 3S: Region C**Hydrograph**

Summary for Subcatchment 4S: Region D

Runoff = 1.98 cfs @ 12.64 hrs, Volume= 0.329 af, Depth> 0.73"

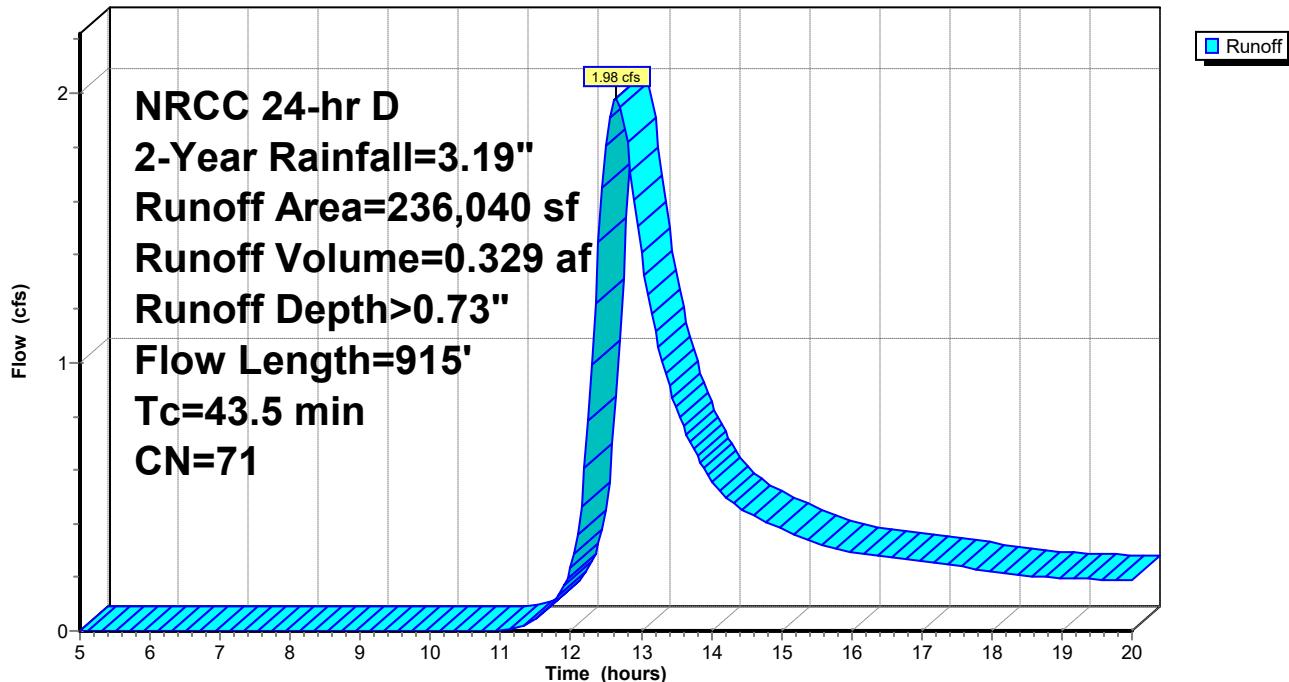
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.19"

Area (sf)	CN	Description
5,050	30	Woods, Good, HSG A
178,040	70	Woods, Good, HSG C
52,950	77	Woods, Good, HSG D
236,040	71	Weighted Average
236,040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	100	0.0300	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
3.6	235	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
21.6	580	0.0080	0.45		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
43.5	915	Total			

Subcatchment 4S: Region D

Hydrograph



Summary for Subcatchment 1S: Region A

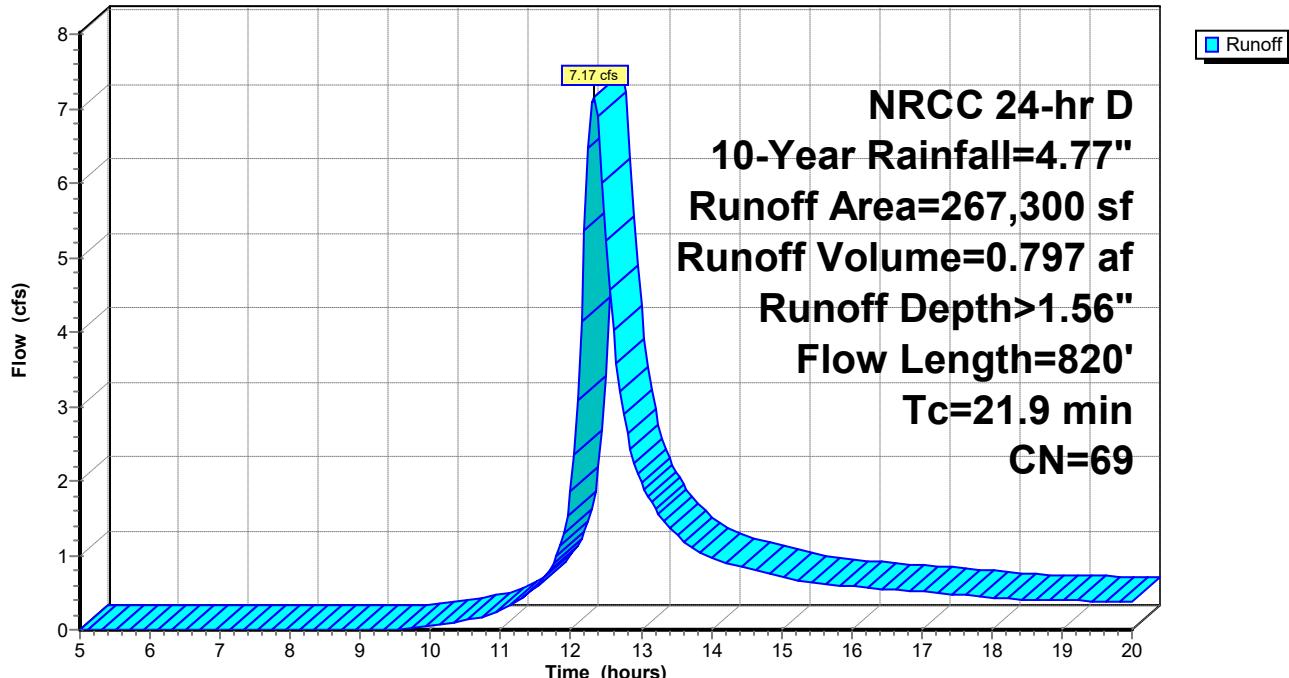
Runoff = 7.17 cfs @ 12.33 hrs, Volume= 0.797 af, Depth> 1.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description		
19,800	30	Woods, Good, HSG A		
170,000	70	Woods, Good, HSG C		
77,500	77	Woods, Good, HSG D		
267,300	69	Weighted Average		
267,300		100.00% Pervious Area		
Tc (min)	Length (feet)	Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description		
9.1	100	0.1700	0.18	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
9.3	500	0.0320	0.89	Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.2	100	0.0800	1.41	Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.3	120	0.0300	0.87	Shallow Concentrated Flow, Woodland Kv= 5.0 fps
21.9	820			Total

Subcatchment 1S: Region A

Hydrograph



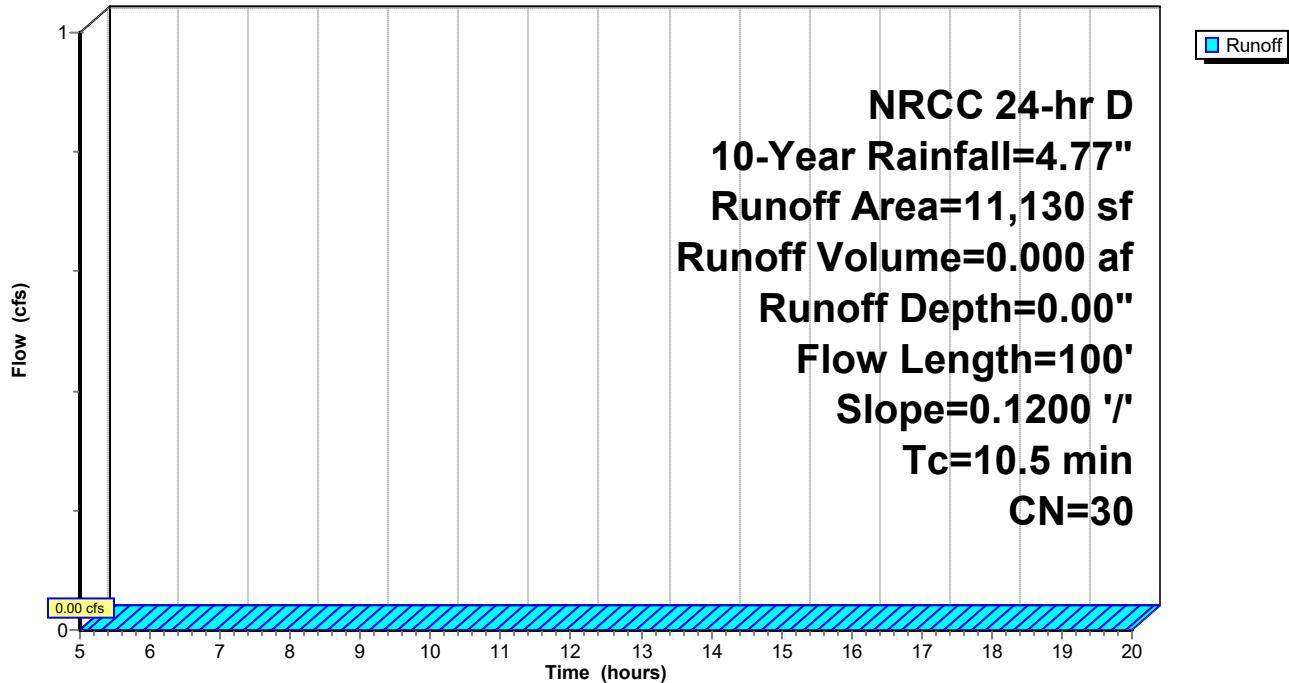
Summary for Subcatchment 2S: Region B

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
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
11,130	30	Woods, Good, HSG A
11,130		100.00% Pervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
10.5	100	0.1200	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"

Subcatchment 2S: Region B**Hydrograph**

Summary for Subcatchment 3S: Region C

Runoff = 0.02 cfs @ 20.00 hrs, Volume= 0.008 af, Depth> 0.04"

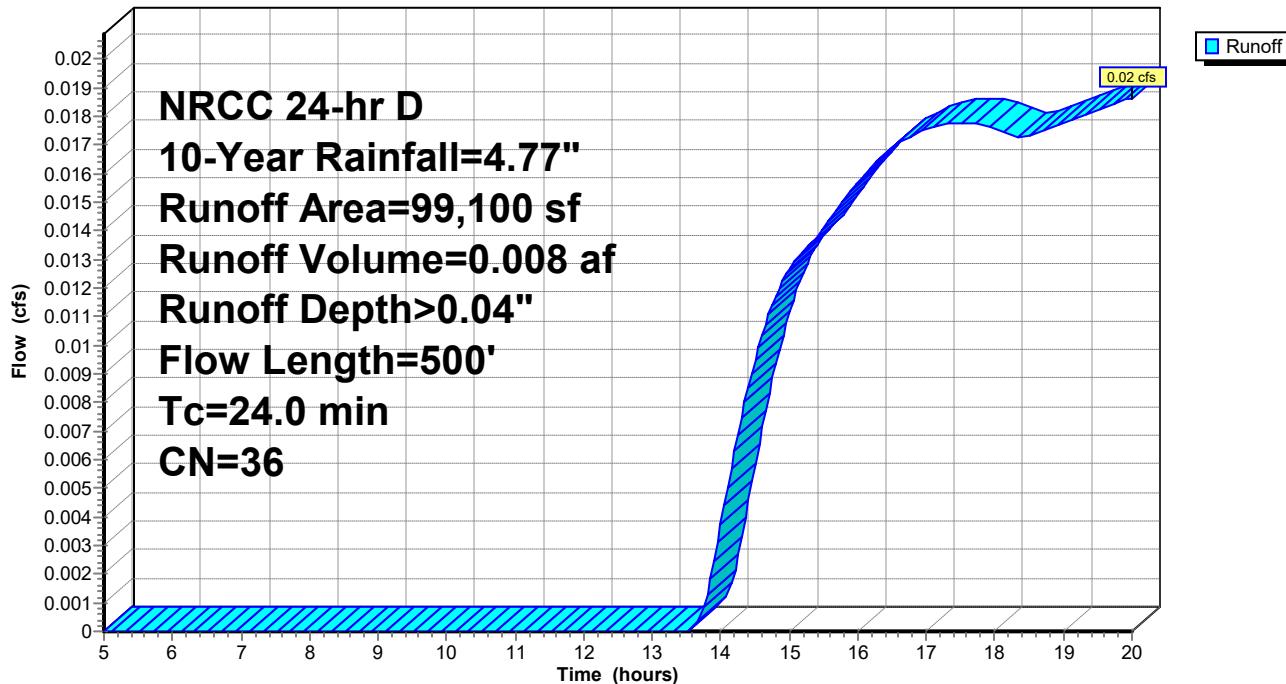
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
83,200	30	Woods, Good, HSG A
15,900	70	Woods, Good, HSG C
99,100	36	Weighted Average
99,100		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	100	0.0400	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
7.7	400	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.0	500	Total			

Subcatchment 3S: Region C

Hydrograph



Summary for Subcatchment 4S: Region D

Runoff = 4.82 cfs @ 12.61 hrs, Volume= 0.758 af, Depth> 1.68"

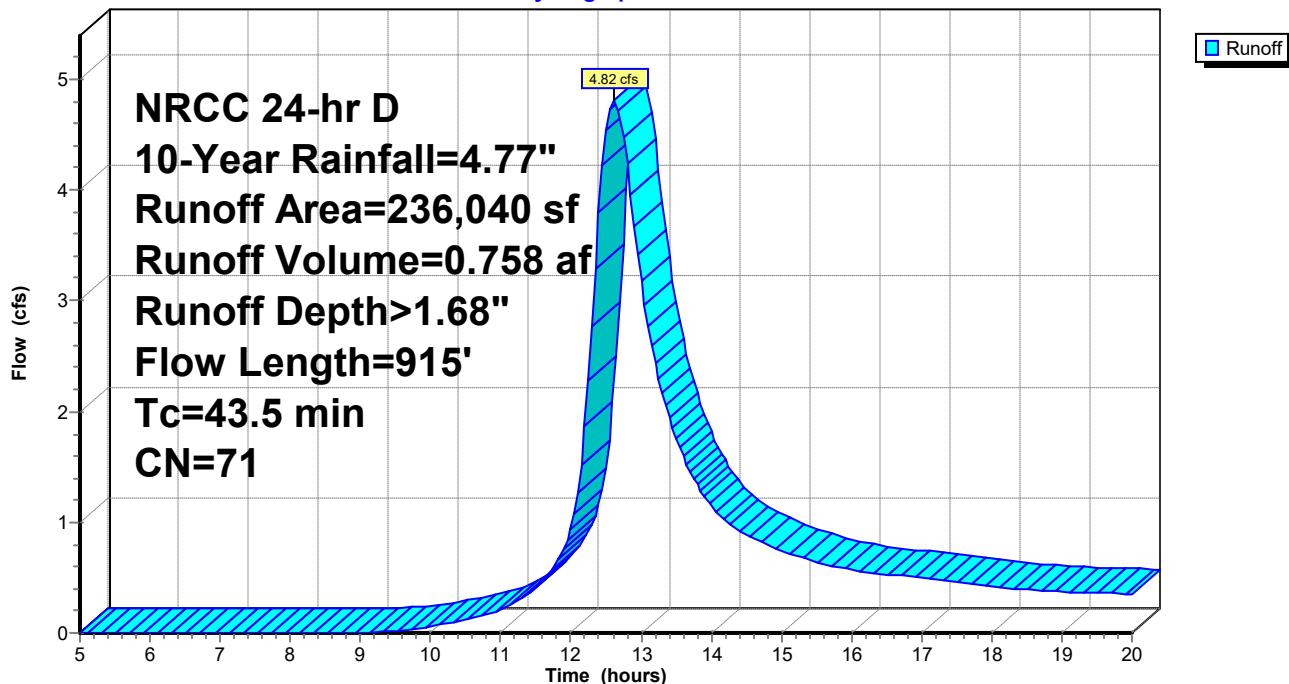
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
5,050	30	Woods, Good, HSG A
178,040	70	Woods, Good, HSG C
52,950	77	Woods, Good, HSG D
236,040	71	Weighted Average
236,040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	100	0.0300	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
3.6	235	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
21.6	580	0.0080	0.45		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
43.5	915	Total			

Subcatchment 4S: Region D

Hydrograph



Summary for Subcatchment 1S: Region A

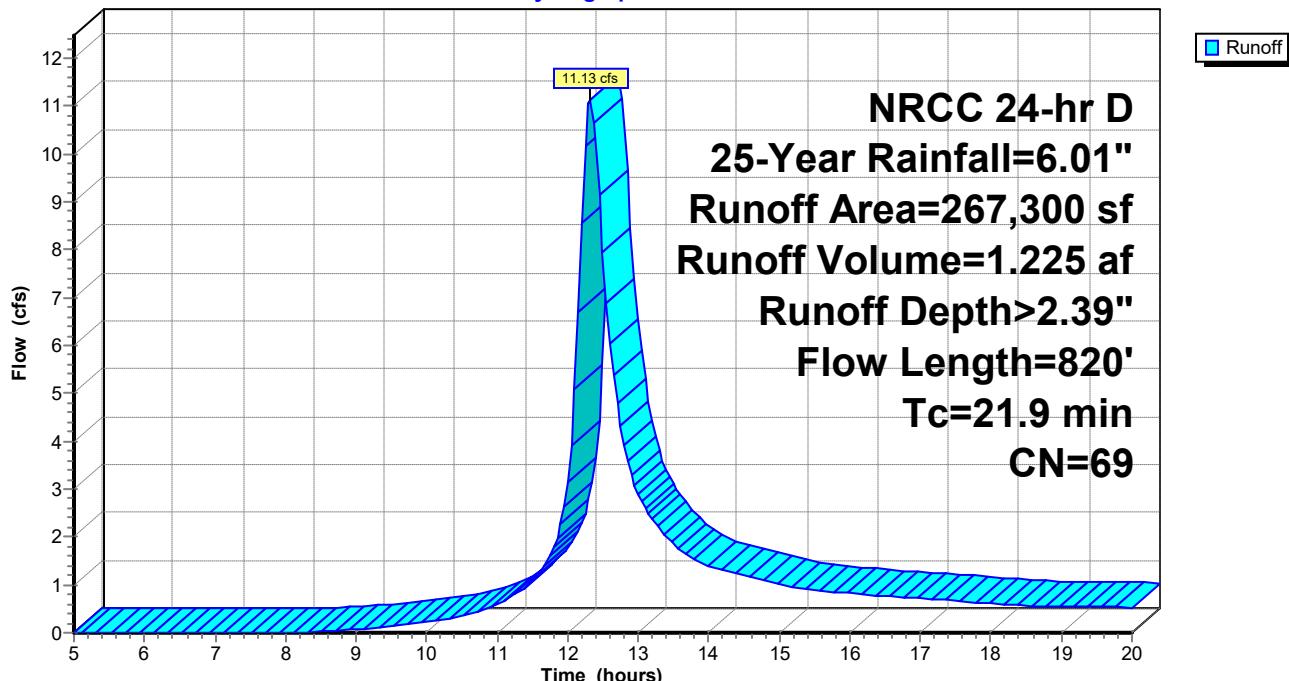
Runoff = 11.13 cfs @ 12.32 hrs, Volume= 1.225 af, Depth> 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.01"

Area (sf)	CN	Description		
19,800	30	Woods, Good, HSG A		
170,000	70	Woods, Good, HSG C		
77,500	77	Woods, Good, HSG D		
267,300	69	Weighted Average		
267,300		100.00% Pervious Area		
Tc (min)	Length (feet)	Slope (ft/ft) Velocity (ft/sec) Capacity (cfs) Description		
9.1	100	0.1700	0.18	Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
9.3	500	0.0320	0.89	Shallow Concentrated Flow, Woodland Kv= 5.0 fps
1.2	100	0.0800	1.41	Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.3	120	0.0300	0.87	Shallow Concentrated Flow, Woodland Kv= 5.0 fps
21.9	820			Total

Subcatchment 1S: Region A

Hydrograph



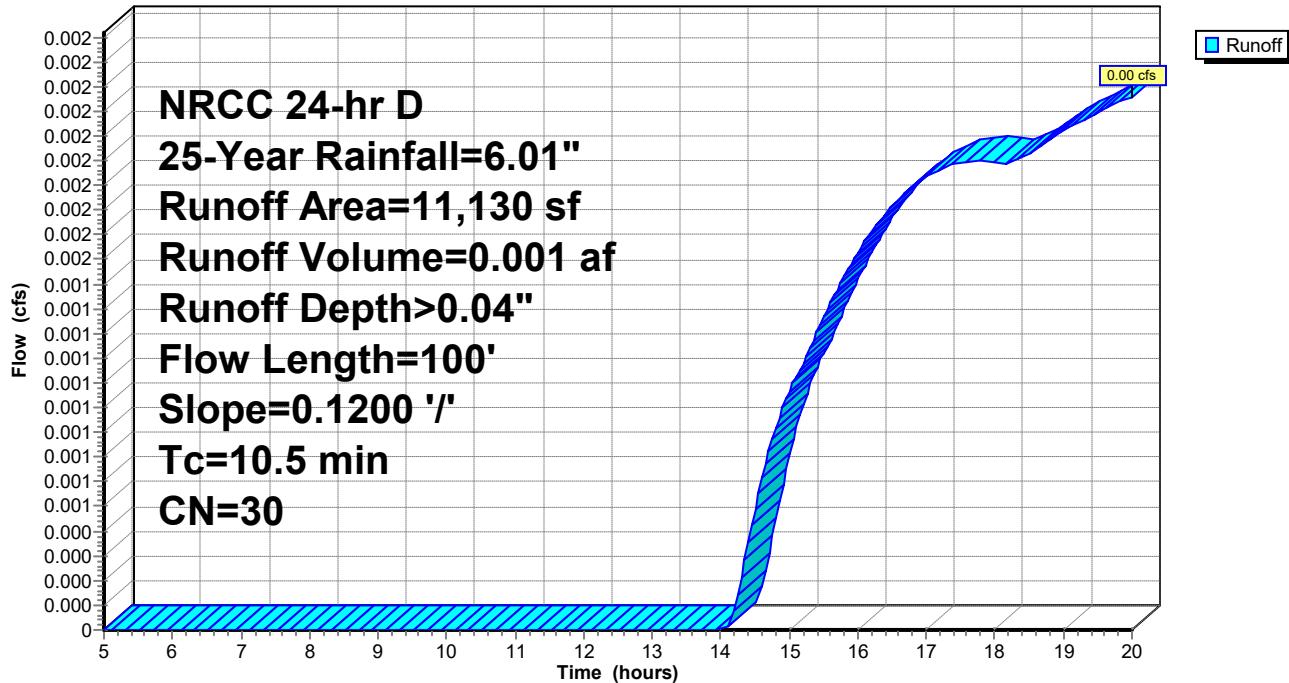
Summary for Subcatchment 2S: Region B

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.001 af, Depth> 0.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.01"

Area (sf)	CN	Description
11,130	30	Woods, Good, HSG A
11,130		100.00% Pervious Area

Tc	Length	Slope	Velocity	Capacity	Description
(min)	(feet)	(ft/ft)	(ft/sec)	(cfs)	
10.5	100	0.1200	0.16		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"

Subcatchment 2S: Region B**Hydrograph**

Summary for Subcatchment 3S: Region C

Runoff = 0.09 cfs @ 13.22 hrs, Volume= 0.039 af, Depth> 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.01"

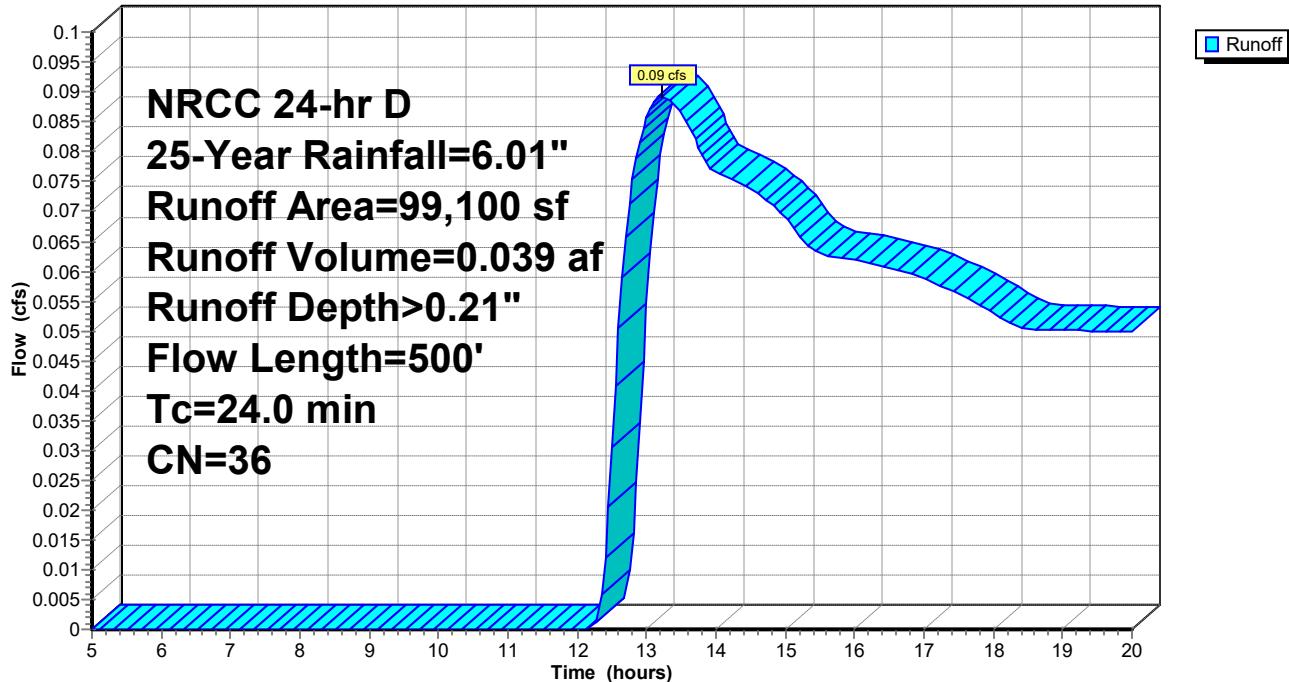
Area (sf)	CN	Description
83,200	30	Woods, Good, HSG A
15,900	70	Woods, Good, HSG C

99,100	36	Weighted Average
99,100		100.00% Pervious Area

Tc	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	100	0.0400	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
7.7	400	0.0300	0.87		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.0	500				Total

Subcatchment 3S: Region C

Hydrograph



Summary for Subcatchment 4S: Region D

Runoff = 7.33 cfs @ 12.60 hrs, Volume= 1.147 af, Depth> 2.54"

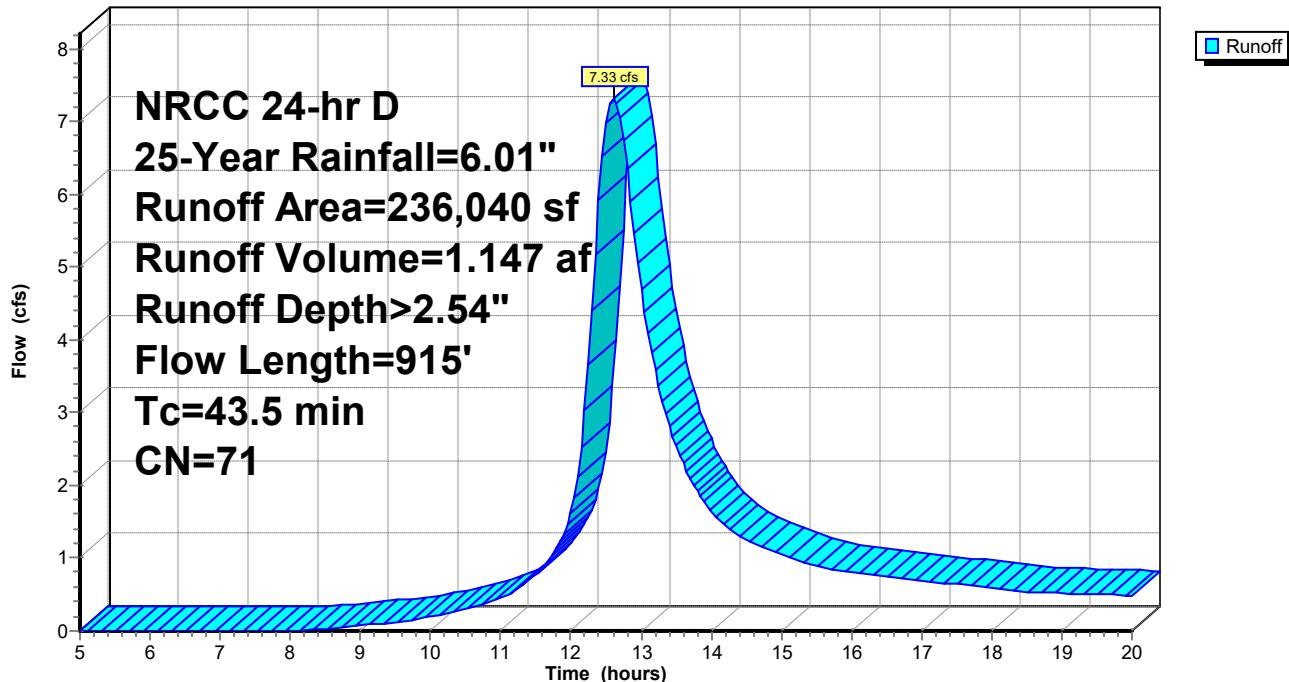
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.01"

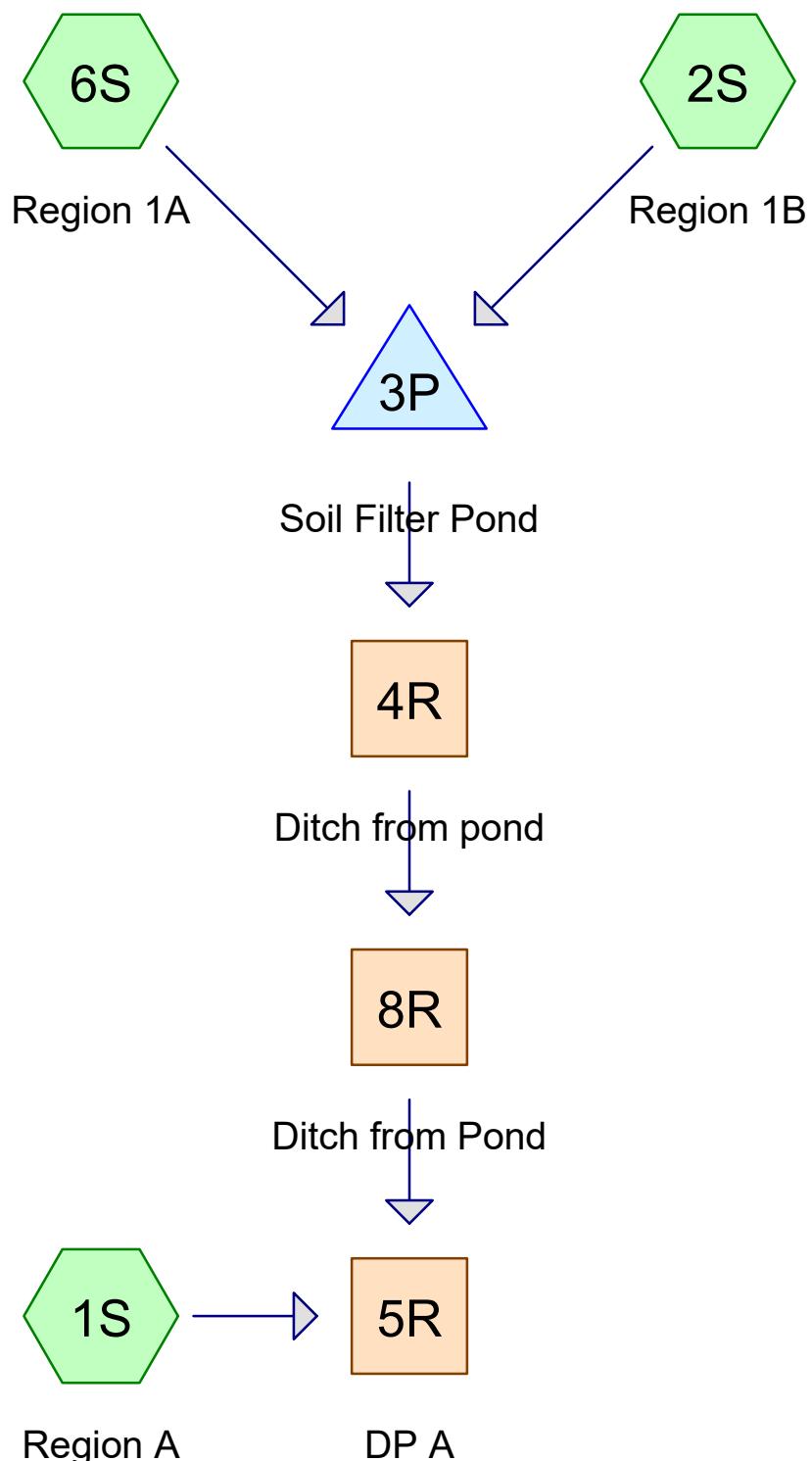
Area (sf)	CN	Description
5,050	30	Woods, Good, HSG A
178,040	70	Woods, Good, HSG C
52,950	77	Woods, Good, HSG D
236,040	71	Weighted Average
236,040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	100	0.0300	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
3.6	235	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
21.6	580	0.0080	0.45		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
43.5	915	Total			

Subcatchment 4S: Region D

Hydrograph





Routing Diagram for Proposed DP A
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Proposed DP A

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.774	39	>75% Grass cover, Good, HSG A (1S, 2S, 6S)
0.201	74	>75% Grass cover, Good, HSG C (2S, 6S)
0.211	30	Meadow, non-grazed, HSG A (1S, 2S)
0.264	71	Meadow, non-grazed, HSG C (1S, 2S)
0.220	98	Paved parking, HSG A (6S)
0.181	98	Paved roads w/curbs & sewers, HSG A (1S)
0.005	98	Unconnected roofs, HSG A (2S)
0.465	30	Woods, Good, HSG A (1S)
3.391	70	Woods, Good, HSG C (1S)
1.775	77	Woods, Good, HSG D (1S)
7.487	67	TOTAL AREA

Proposed DP A

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
1.856	HSG A	1S, 2S, 6S
0.000	HSG B	
3.856	HSG C	1S, 2S, 6S
1.775	HSG D	1S
0.000	Other	
7.487		TOTAL AREA

Proposed DP A

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.774	0.000	0.201	0.000	0.000	0.974	>75% Grass cover, Good	1S,
							2S, 6S
0.211	0.000	0.264	0.000	0.000	0.475	Meadow, non-grazed	1S, 2S
0.220	0.000	0.000	0.000	0.000	0.220	Paved parking	6S
0.181	0.000	0.000	0.000	0.000	0.181	Paved roads w/curbs & sewers	1S
0.005	0.000	0.000	0.000	0.000	0.005	Unconnected roofs	2S
0.465	0.000	3.391	1.775	0.000	5.631	Woods, Good	1S
1.856	0.000	3.856	1.775	0.000	7.487	TOTAL AREA	

Proposed DP A

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NRCC 24-hr D 2-Year Rainfall=3.19"

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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

Subcatchment 1S: Region ARunoff Area=292,610 sf 2.70% Impervious Runoff Depth>0.52"
Flow Length=1,255' Tc=35.6 min CN=66 Runoff=1.78 cfs 0.293 af**Subcatchment 2S: Region 1B**Runoff Area=16,875 sf 1.27% Impervious Runoff Depth>0.32"
Flow Length=331' Tc=24.0 min UI Adjusted CN=60 Runoff=0.06 cfs 0.010 af**Subcatchment 6S: Region 1A**Runoff Area=16,640 sf 57.48% Impervious Runoff Depth>0.94"
Flow Length=537' Tc=24.4 min CN=75 Runoff=0.25 cfs 0.030 af**Reach 4R: Ditch from pond**Avg. Flow Depth=0.02' Max Vel=0.38 fps Inflow=0.02 cfs 0.001 af
n=0.080 L=100.0' S=0.0700 '/' Capacity=222.35 cfs Outflow=0.02 cfs 0.001 af**Reach 5R: DP A**Inflow=1.78 cfs 0.293 af
Outflow=1.78 cfs 0.293 af**Reach 8R: Ditch from Pond**Avg. Flow Depth=0.02' Max Vel=0.51 fps Inflow=0.02 cfs 0.001 af
n=0.035 L=265.0' S=0.0300 '/' Capacity=332.71 cfs Outflow=0.02 cfs 0.001 af**Pond 3P: Soil Filter Pond**Peak Elev=165.43' Storage=1,699 cf Inflow=0.31 cfs 0.040 af
Outflow=0.02 cfs 0.001 af**Total Runoff Area = 7.487 ac Runoff Volume = 0.333 af Average Runoff Depth = 0.53"**
94.58% Pervious = 7.081 ac 5.42% Impervious = 0.406 ac

Proposed DP A

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NRCC 24-hr D 2-Year Rainfall=3.19"

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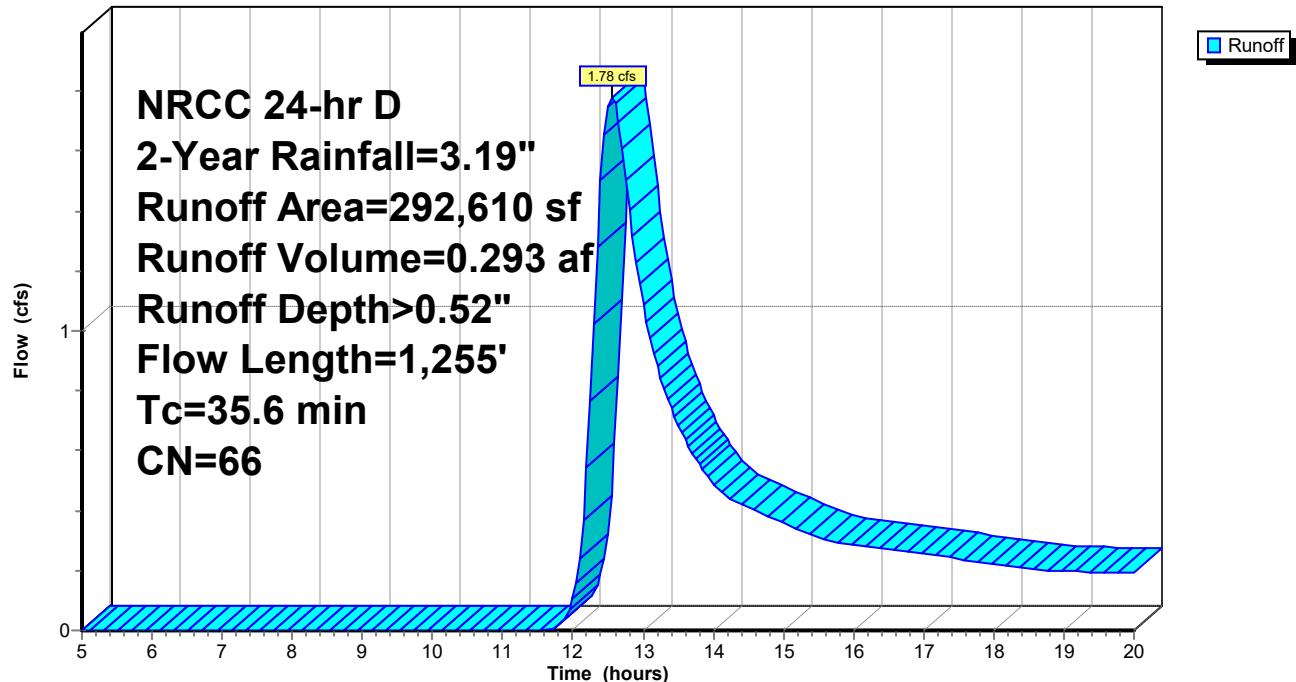
Summary for Subcatchment 1S: Region A

Runoff = 1.78 cfs @ 12.56 hrs, Volume= 0.293 af, Depth> 0.52"
 Routed to Reach 5R : DP A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 2-Year Rainfall=3.19"

Area (sf)	CN	Description
7,900	98	Paved roads w/curbs & sewers, HSG A
20,275	30	Woods, Good, HSG A
147,700	70	Woods, Good, HSG C
77,330	77	Woods, Good, HSG D
5,755	30	Meadow, non-grazed, HSG A
7,760	71	Meadow, non-grazed, HSG C
25,890	39	>75% Grass cover, Good, HSG A
292,610	66	Weighted Average
284,710		97.30% Pervious Area
7,900		2.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	100	0.0400	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
1.6	700	0.0100	7.16	114.62	Trap/Vee/Rect Channel Flow, Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.022 Earth, clean & straight
11.3	100	0.1000	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
1.2	90	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.0	115	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.2	150	0.0250	0.79		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
35.6	1,255	Total			

Subcatchment 1S: Region A**Hydrograph**

Proposed DP A

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NRCC 24-hr D 2-Year Rainfall=3.19"

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Summary for Subcatchment 2S: Region 1B

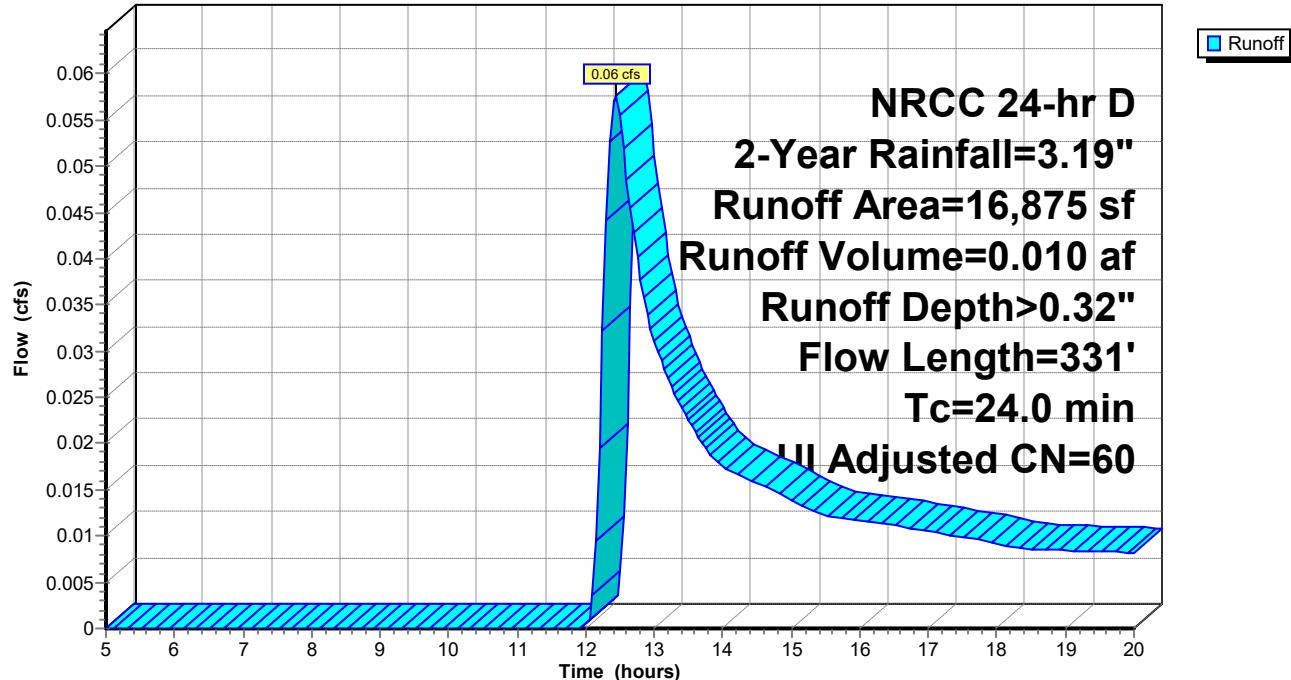
Runoff = 0.06 cfs @ 12.44 hrs, Volume= 0.010 af, Depth> 0.32"
 Routed to Pond 3P : Soil Filter Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 2-Year Rainfall=3.19"

Area (sf)	CN	Adj	Description
215	98		Unconnected roofs, HSG A
3,430	30		Meadow, non-grazed, HSG A
1,950	39		>75% Grass cover, Good, HSG A
3,760	71		Meadow, non-grazed, HSG C
7,520	74		>75% Grass cover, Good, HSG C

16,875	61	60	Weighted Average, UI Adjusted
16,660			98.73% Pervious Area
215			1.27% Impervious Area
215			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	6	0.0200	0.78		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.19"
5.2	35	0.0300	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.19"
2.0	240	0.0170	1.96		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
16.7	50	0.0010	0.05		Sheet Flow, Range n= 0.130 P2= 3.19"
24.0	331	Total			

Subcatchment 2S: Region 1B**Hydrograph**

Proposed DP A

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NRCC 24-hr D 2-Year Rainfall=3.19"

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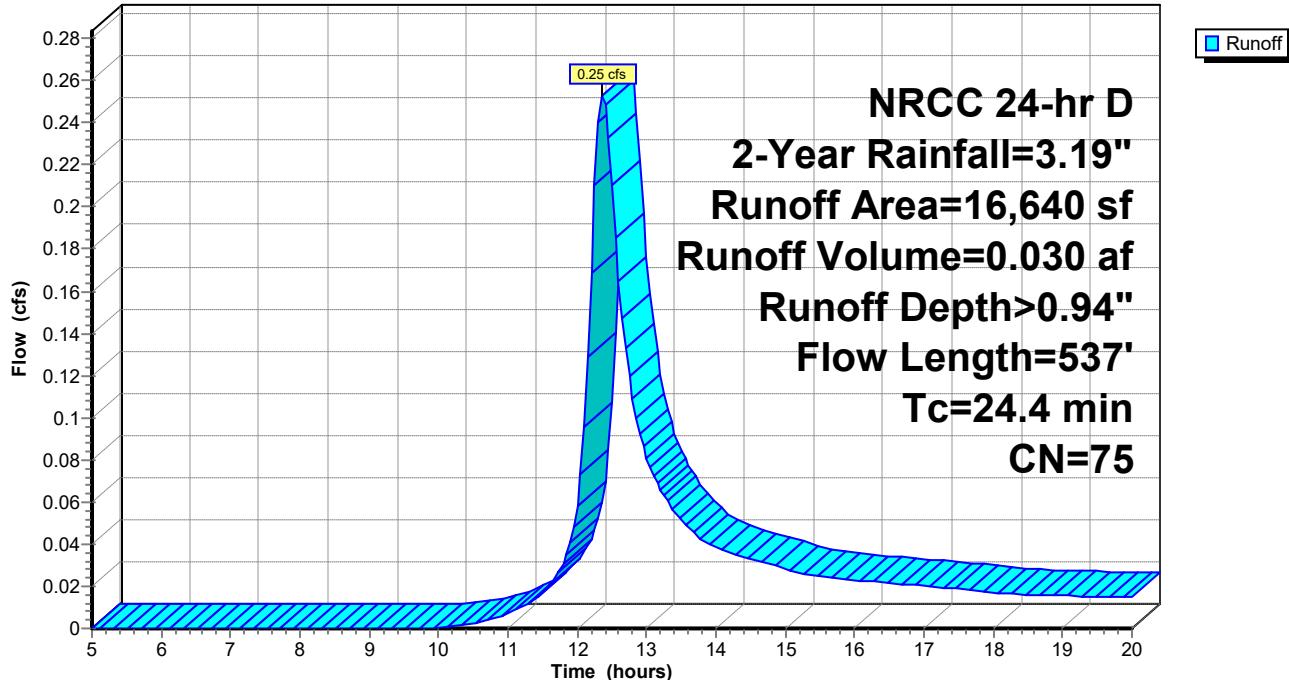
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Summary for Subcatchment 6S: Region 1A

Runoff = 0.25 cfs @ 12.36 hrs, Volume= 0.030 af, Depth> 0.94"
 Routed to Pond 3P : Soil Filter Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 2-Year Rainfall=3.19"

Area (sf)	CN	Description			
9,565	98	Paved parking, HSG A			
1,215	74	>75% Grass cover, Good, HSG C			
5,860	39	>75% Grass cover, Good, HSG A			
16,640	75	Weighted Average			
7,075		42.52% Pervious Area			
9,565		57.48% Impervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	60	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.19"
1.1	150	0.0125	2.27		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.8	277	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
16.7	50	0.0010	0.05		Sheet Flow, Range n= 0.130 P2= 3.19"
24.4	537	Total			

Subcatchment 6S: Region 1A**Hydrograph**

Summary for Reach 4R: Ditch from pond

Inflow Area = 0.769 ac, 29.18% Impervious, Inflow Depth > 0.02" for 2-Year event

Inflow = 0.02 cfs @ 20.00 hrs, Volume= 0.001 af

Outflow = 0.02 cfs @ 20.00 hrs, Volume= 0.001 af, Atten= 4%, Lag= 0.0 min

Routed to Reach 8R : Ditch from Pond

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.38 fps, Min. Travel Time= 4.4 min

Avg. Velocity = 0.35 fps, Avg. Travel Time= 4.7 min

Peak Storage= 5 cf @ 20.00 hrs

Average Depth at Peak Storage= 0.02' , Surface Width= 2.45'

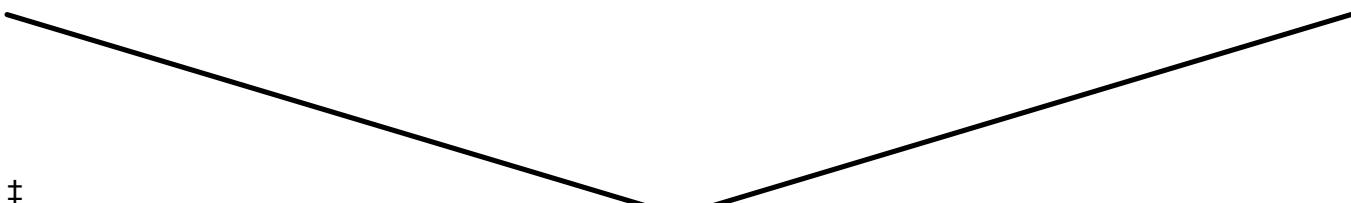
Bank-Full Depth= 2.00' Flow Area= 44.0 sf, Capacity= 222.35 cfs

2.00' x 2.00' deep channel, n= 0.080 Earth, long dense weeds

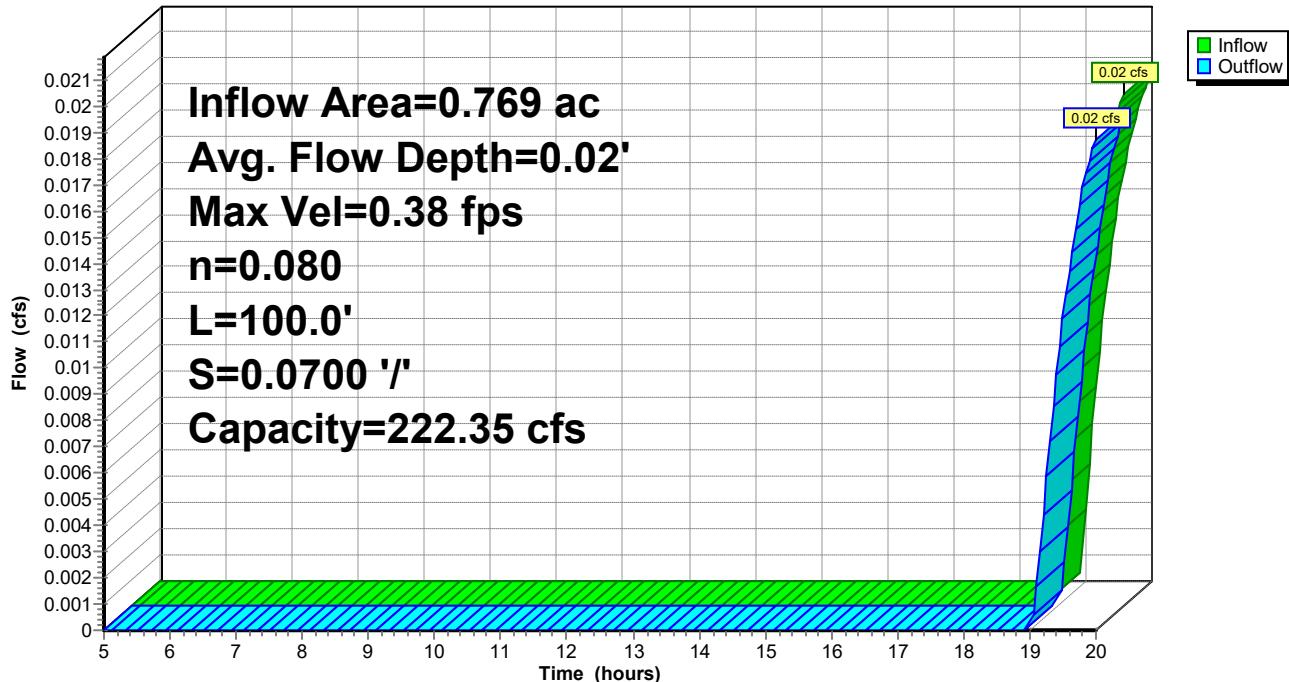
Side Slope Z-value= 10.0 '/' Top Width= 42.00'

Length= 100.0' Slope= 0.0700 '/'

Inlet Invert= 0.00', Outlet Invert= -7.00'



‡

Reach 4R: Ditch from pond**Hydrograph**

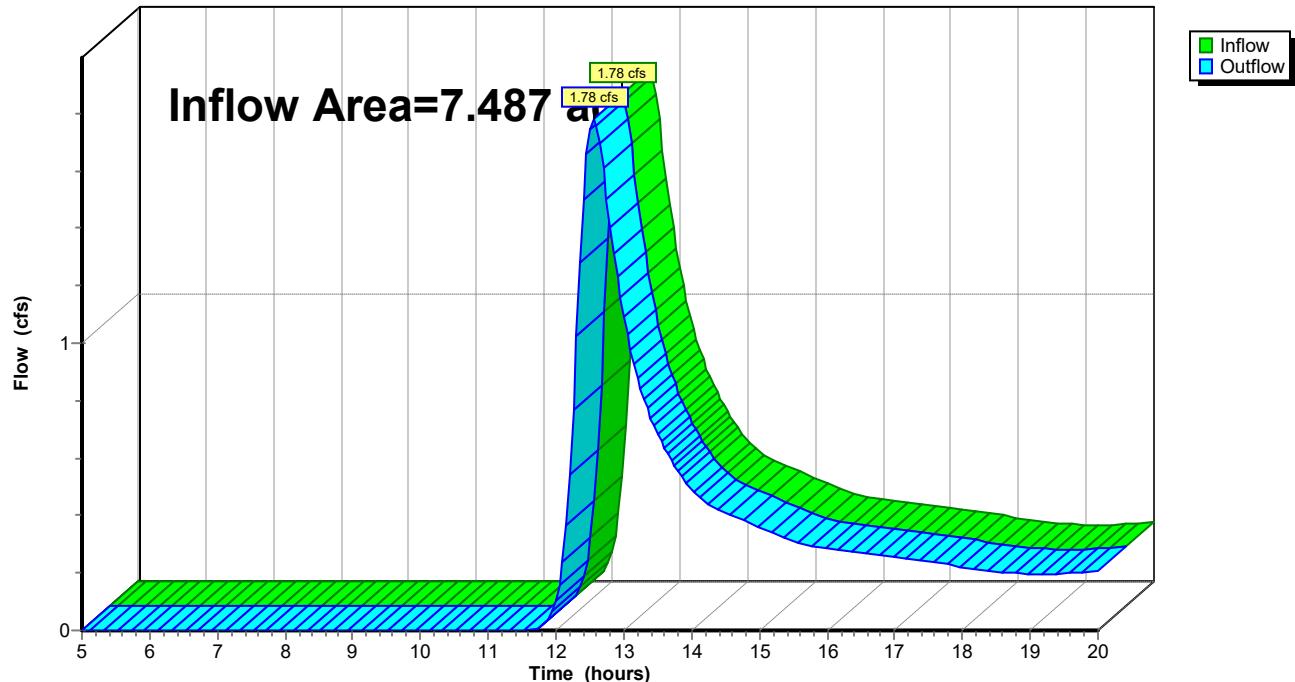
Summary for Reach 5R: DP A

Inflow Area = 7.487 ac, 5.42% Impervious, Inflow Depth > 0.47" for 2-Year event

Inflow = 1.78 cfs @ 12.56 hrs, Volume= 0.293 af

Outflow = 1.78 cfs @ 12.56 hrs, Volume= 0.293 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: DP A**Hydrograph**

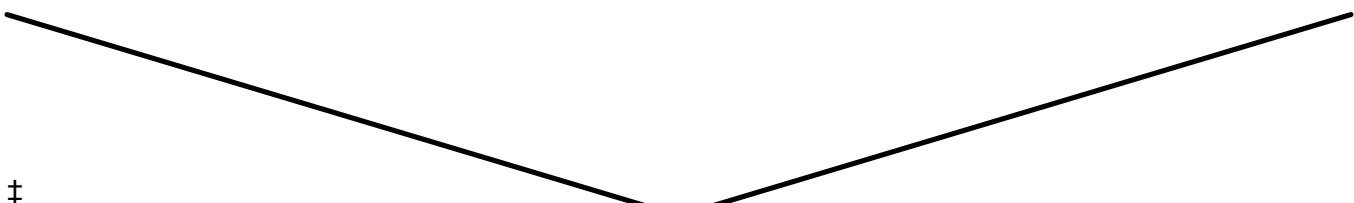
Summary for Reach 8R: Ditch from Pond

Inflow Area = 0.769 ac, 29.18% Impervious, Inflow Depth > 0.01" for 2-Year event
Inflow = 0.02 cfs @ 20.00 hrs, Volume= 0.001 af
Outflow = 0.02 cfs @ 20.00 hrs, Volume= 0.001 af, Atten= 18%, Lag= 0.0 min
Routed to Reach 5R : DP A

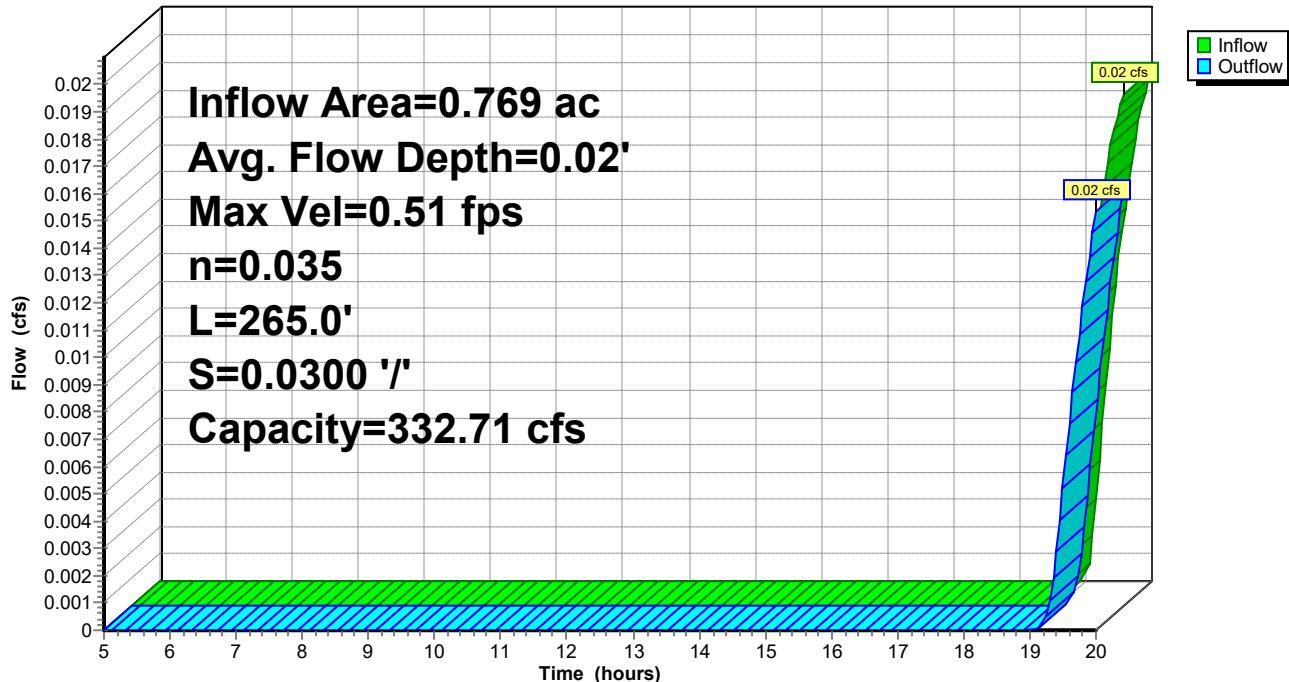
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.51 fps, Min. Travel Time= 8.6 min
Avg. Velocity = 0.51 fps, Avg. Travel Time= 8.6 min

Peak Storage= 9 cf @ 20.00 hrs
Average Depth at Peak Storage= 0.02' , Surface Width= 2.31'
Bank-Full Depth= 2.00' Flow Area= 44.0 sf, Capacity= 332.71 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 42.00'
Length= 265.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -7.95'



‡

Reach 8R: Ditch from Pond**Hydrograph**

Summary for Pond 3P: Soil Filter Pond

Inflow Area = 0.769 ac, 29.18% Impervious, Inflow Depth > 0.63" for 2-Year event
 Inflow = 0.31 cfs @ 12.38 hrs, Volume= 0.040 af
 Outflow = 0.02 cfs @ 20.00 hrs, Volume= 0.001 af, Atten= 94%, Lag= 457.4 min
 Primary = 0.02 cfs @ 20.00 hrs, Volume= 0.001 af

Routed to Reach 4R : Ditch from pond

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 165.43' @ 20.00 hrs Surf.Area= 1,387 sf Storage= 1,699 cf

Plug-Flow detention time= 497.1 min calculated for 0.001 af (3% of inflow)
 Center-of-Mass det. time= 322.2 min (1,176.5 - 854.3)

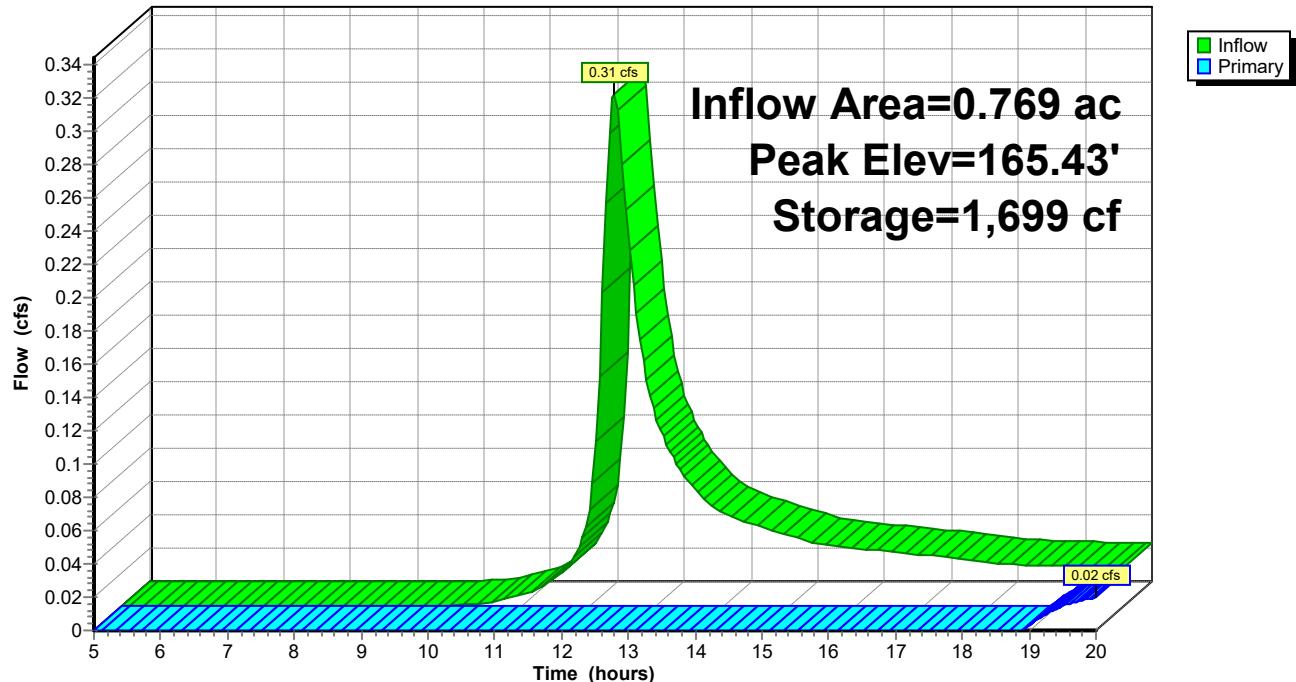
Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	6,287 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
164.00	996	0	0
165.00	1,262	1,129	1,129
166.00	1,553	1,408	2,537
167.00	1,869	1,711	4,248
168.00	2,210	2,040	6,287

Device	Routing	Invert	Outlet Devices
#1	Primary	161.15'	15.0" Round Culvert L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 161.15' / 161.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	165.40'	12.0" W x 1.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.02 cfs @ 20.00 hrs HW=165.43' (Free Discharge)

↑ 1=Culvert (Passes 0.02 cfs of 8.92 cfs potential flow)

↑ 2=Orifice/Grate (Orifice Controls 0.02 cfs @ 0.56 fps)

Pond 3P: Soil Filter Pond**Hydrograph**

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

Subcatchment 1S: Region A

Runoff Area=292,610 sf 2.70% Impervious Runoff Depth>1.34"
Flow Length=1,255' Tc=35.6 min CN=66 Runoff=5.21 cfs 0.752 af

Subcatchment 2S: Region 1B

Runoff Area=16,875 sf 1.27% Impervious Runoff Depth>0.98"
Flow Length=331' Tc=24.0 min UI Adjusted CN=60 Runoff=0.26 cfs 0.032 af

Subcatchment 6S: Region 1A

Runoff Area=16,640 sf 57.48% Impervious Runoff Depth>2.00"
Flow Length=537' Tc=24.4 min CN=75 Runoff=0.55 cfs 0.064 af

Reach 4R: Ditch from pond

Avg. Flow Depth=0.08' Max Vel=0.78 fps Inflow=0.18 cfs 0.055 af
n=0.080 L=100.0' S=0.0700 '/' Capacity=222.35 cfs Outflow=0.18 cfs 0.055 af

Reach 5R: DP A

Inflow=5.21 cfs 0.806 af
Outflow=5.21 cfs 0.806 af

Reach 8R: Ditch from Pond

Avg. Flow Depth=0.07' Max Vel=1.04 fps Inflow=0.18 cfs 0.055 af
n=0.035 L=265.0' S=0.0300 '/' Capacity=332.71 cfs Outflow=0.18 cfs 0.054 af

Pond 3P: Soil Filter Pond

Peak Elev=165.65' Storage=2,008 cf Inflow=0.80 cfs 0.095 af
Outflow=0.18 cfs 0.055 af

Total Runoff Area = 7.487 ac Runoff Volume = 0.847 af Average Runoff Depth = 1.36"
94.58% Pervious = 7.081 ac 5.42% Impervious = 0.406 ac

Proposed DP A

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NRCC 24-hr D 10-Year Rainfall=4.77"

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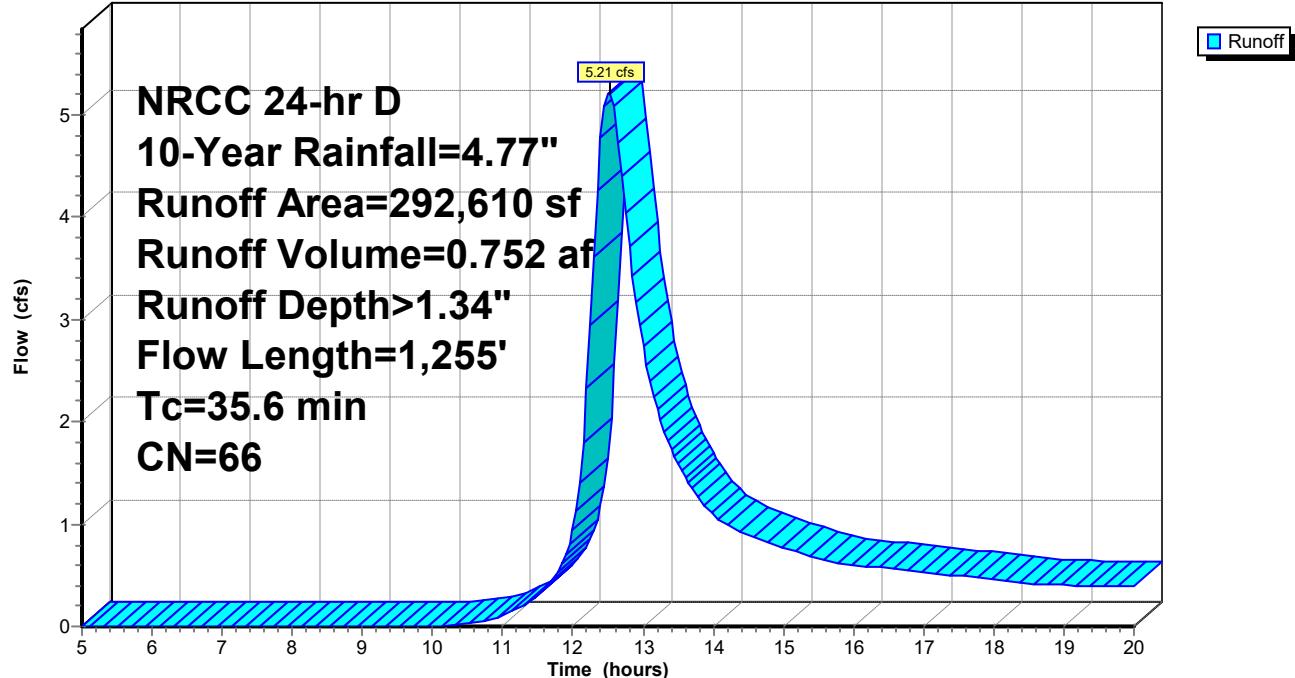
Summary for Subcatchment 1S: Region A

Runoff = 5.21 cfs @ 12.51 hrs, Volume= 0.752 af, Depth> 1.34"
 Routed to Reach 5R : DP A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
7,900	98	Paved roads w/curbs & sewers, HSG A
20,275	30	Woods, Good, HSG A
147,700	70	Woods, Good, HSG C
77,330	77	Woods, Good, HSG D
5,755	30	Meadow, non-grazed, HSG A
7,760	71	Meadow, non-grazed, HSG C
25,890	39	>75% Grass cover, Good, HSG A
292,610	66	Weighted Average
284,710		97.30% Pervious Area
7,900		2.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	100	0.0400	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
1.6	700	0.0100	7.16	114.62	Trap/Vee/Rect Channel Flow, Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.022 Earth, clean & straight
11.3	100	0.1000	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
1.2	90	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.0	115	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.2	150	0.0250	0.79		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
35.6	1,255	Total			

Subcatchment 1S: Region A**Hydrograph**

Proposed DP A

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Summary for Subcatchment 2S: Region 1B

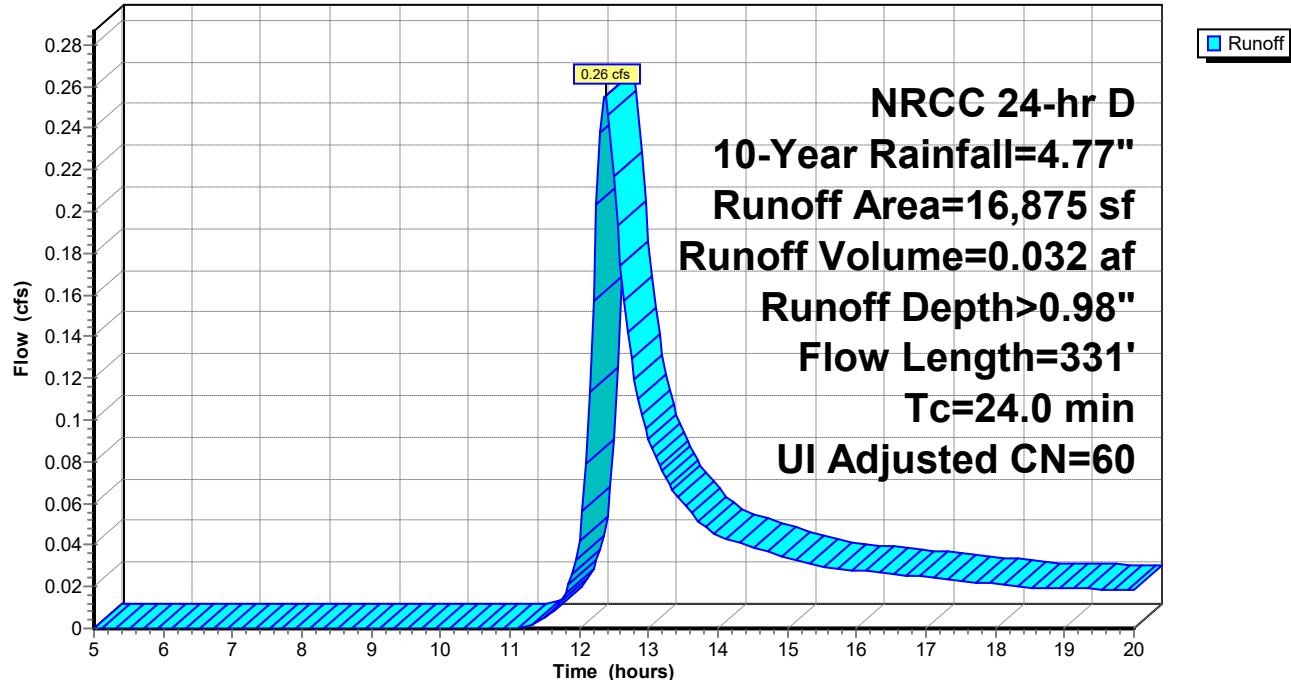
Runoff = 0.26 cfs @ 12.37 hrs, Volume= 0.032 af, Depth> 0.98"
 Routed to Pond 3P : Soil Filter Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Adj	Description
215	98		Unconnected roofs, HSG A
3,430	30		Meadow, non-grazed, HSG A
1,950	39		>75% Grass cover, Good, HSG A
3,760	71		Meadow, non-grazed, HSG C
7,520	74		>75% Grass cover, Good, HSG C

16,875	61	60	Weighted Average, UI Adjusted
16,660			98.73% Pervious Area
215			1.27% Impervious Area
215			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	6	0.0200	0.78		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.19"
5.2	35	0.0300	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.19"
2.0	240	0.0170	1.96		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
16.7	50	0.0010	0.05		Sheet Flow, Range n= 0.130 P2= 3.19"
24.0	331	Total			

Subcatchment 2S: Region 1B**Hydrograph**

Proposed DP A

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NRCC 24-hr D 10-Year Rainfall=4.77"

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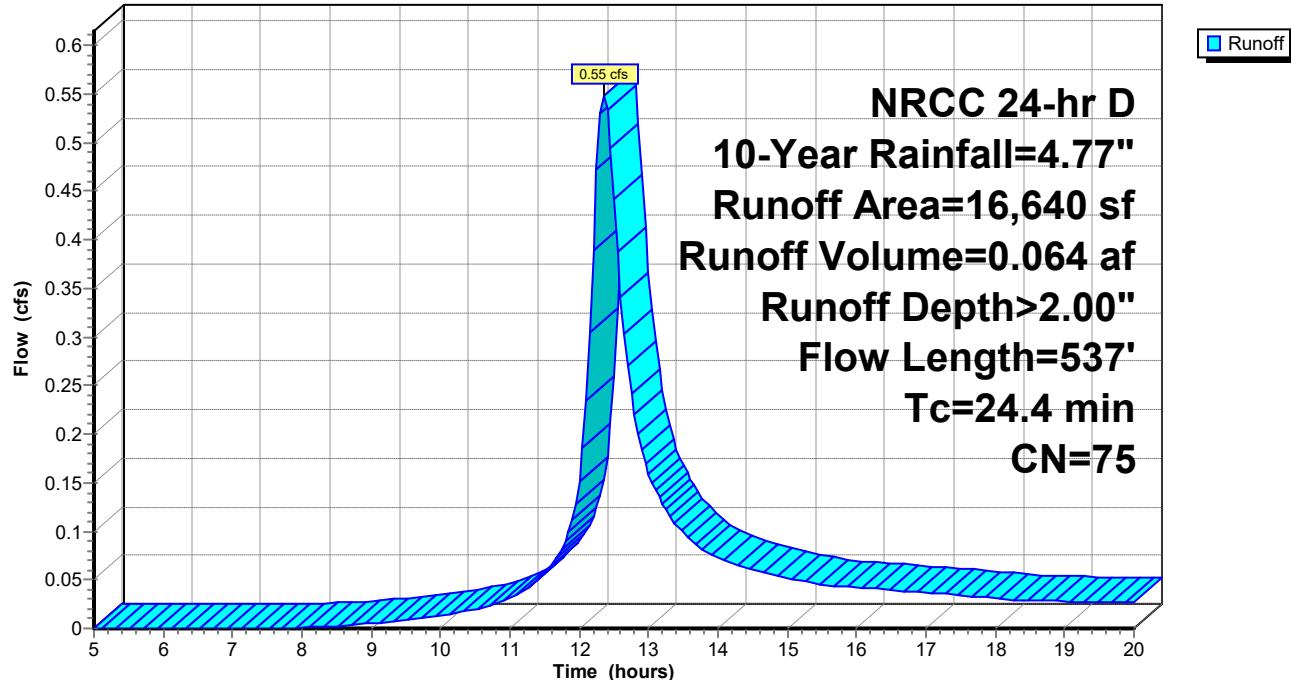
Summary for Subcatchment 6S: Region 1A

Runoff = 0.55 cfs @ 12.35 hrs, Volume= 0.064 af, Depth> 2.00"
 Routed to Pond 3P : Soil Filter Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
9,565	98	Paved parking, HSG A
1,215	74	>75% Grass cover, Good, HSG C
5,860	39	>75% Grass cover, Good, HSG A
16,640	75	Weighted Average
7,075		42.52% Pervious Area
9,565		57.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	60	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.19"
1.1	150	0.0125	2.27		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.8	277	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
16.7	50	0.0010	0.05		Sheet Flow, Range n= 0.130 P2= 3.19"
24.4	537	Total			

Subcatchment 6S: Region 1A**Hydrograph**

Summary for Reach 4R: Ditch from pond

Inflow Area = 0.769 ac, 29.18% Impervious, Inflow Depth > 0.86" for 10-Year event

Inflow = 0.18 cfs @ 13.32 hrs, Volume= 0.055 af

Outflow = 0.18 cfs @ 13.38 hrs, Volume= 0.055 af, Atten= 0%, Lag= 3.7 min

Routed to Reach 8R : Ditch from Pond

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.78 fps, Min. Travel Time= 2.1 min

Avg. Velocity = 0.62 fps, Avg. Travel Time= 2.7 min

Peak Storage= 23 cf @ 13.35 hrs

Average Depth at Peak Storage= 0.08' , Surface Width= 3.64'

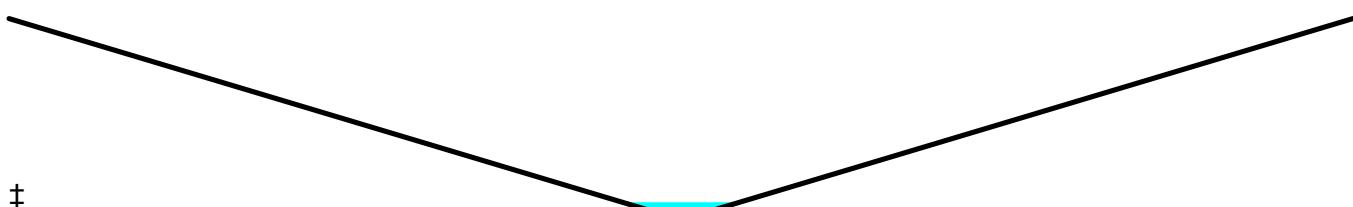
Bank-Full Depth= 2.00' Flow Area= 44.0 sf, Capacity= 222.35 cfs

2.00' x 2.00' deep channel, n= 0.080 Earth, long dense weeds

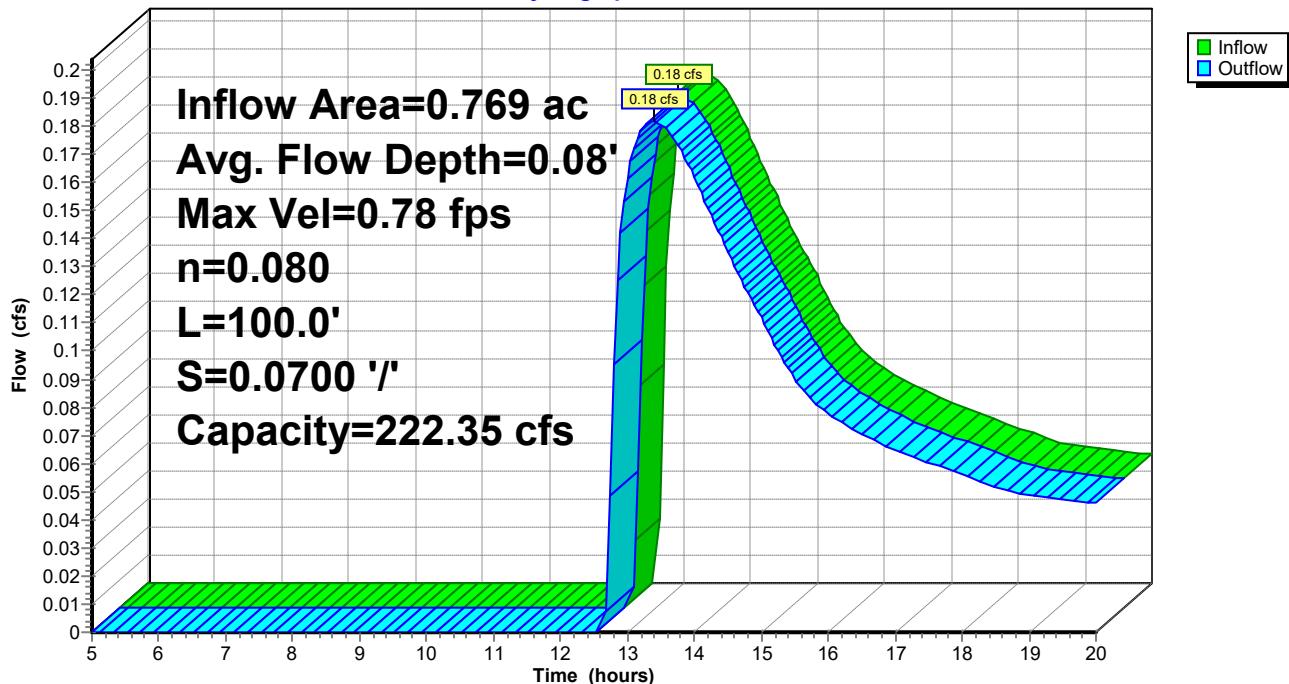
Side Slope Z-value= 10.0 '/' Top Width= 42.00'

Length= 100.0' Slope= 0.0700 '/'

Inlet Invert= 0.00', Outlet Invert= -7.00'



‡

Reach 4R: Ditch from pond**Hydrograph**

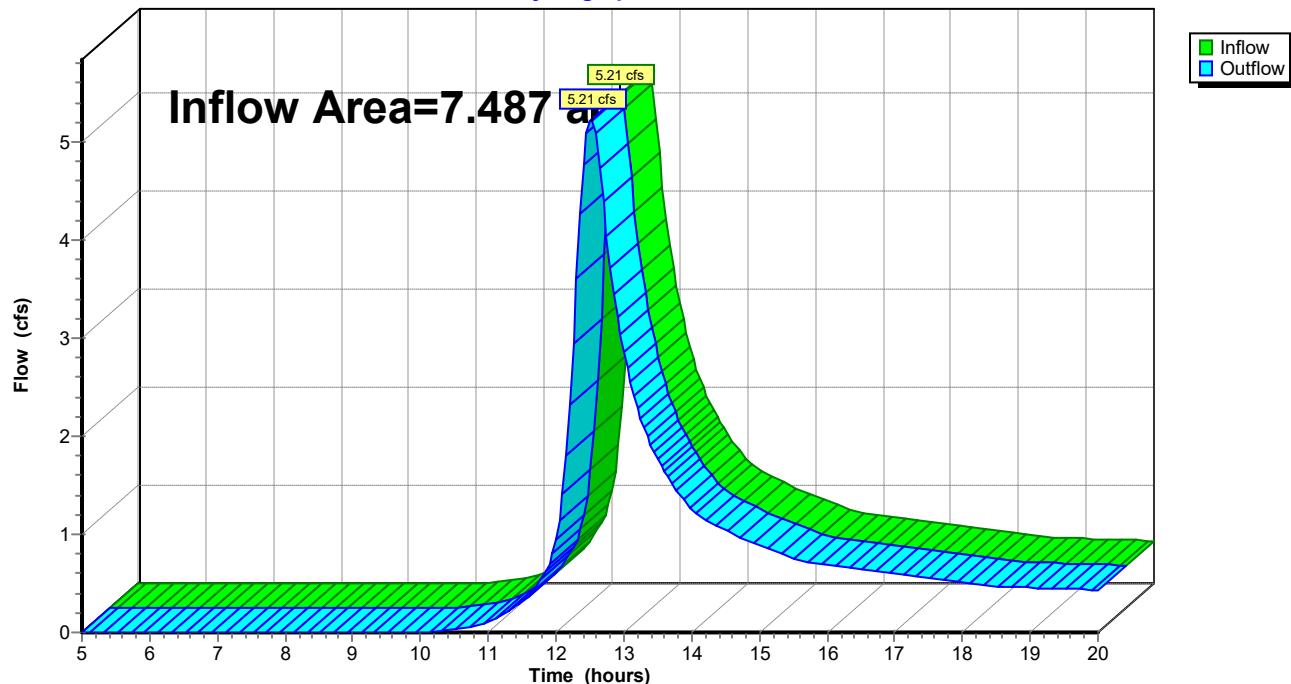
Summary for Reach 5R: DP A

Inflow Area = 7.487 ac, 5.42% Impervious, Inflow Depth > 1.29" for 10-Year event

Inflow = 5.21 cfs @ 12.51 hrs, Volume= 0.806 af

Outflow = 5.21 cfs @ 12.51 hrs, Volume= 0.806 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: DP A**Hydrograph**

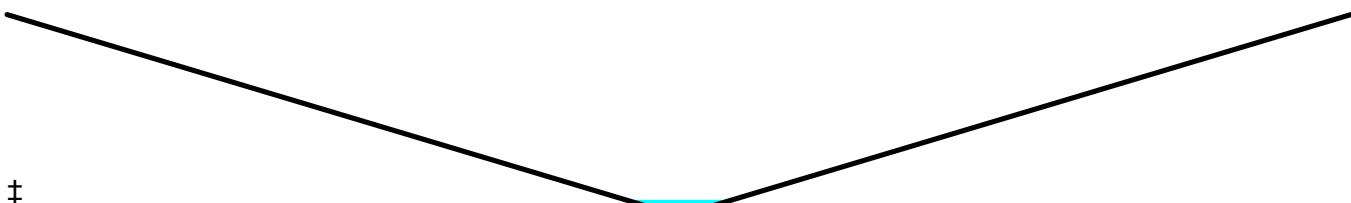
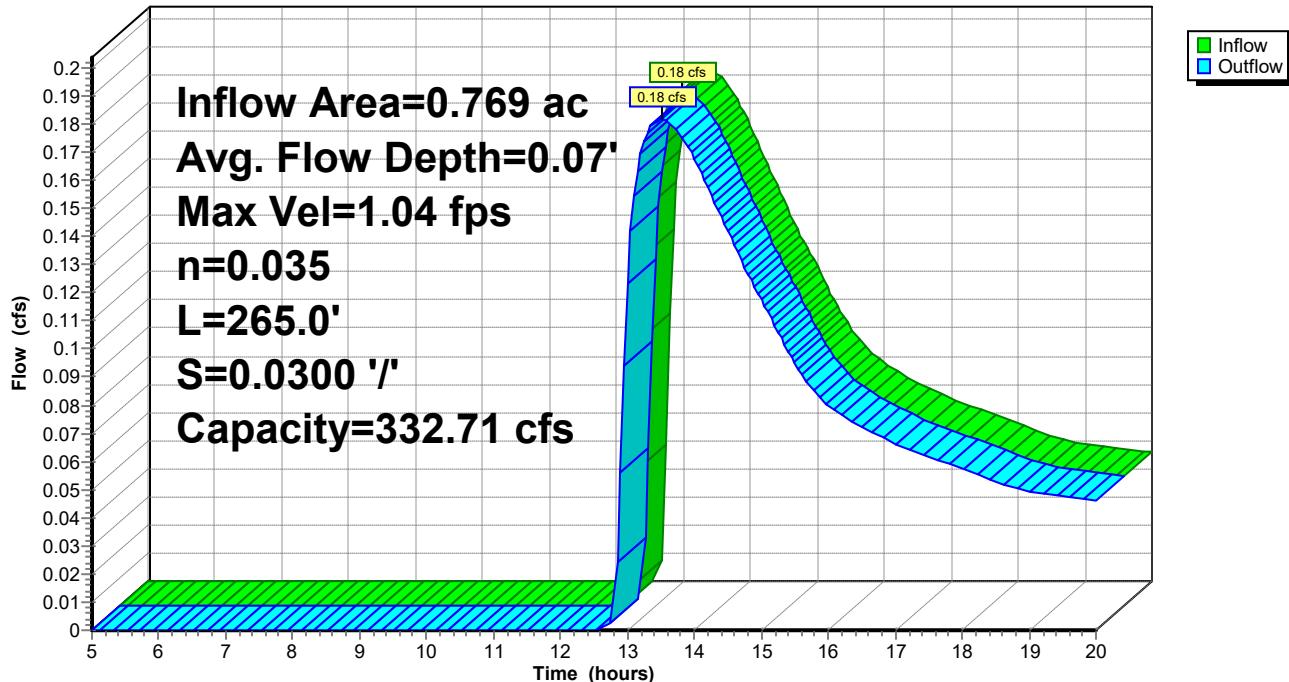
Summary for Reach 8R: Ditch from Pond

Inflow Area = 0.769 ac, 29.18% Impervious, Inflow Depth > 0.86" for 10-Year event
Inflow = 0.18 cfs @ 13.38 hrs, Volume= 0.055 af
Outflow = 0.18 cfs @ 13.51 hrs, Volume= 0.054 af, Atten= 0%, Lag= 7.4 min
Routed to Reach 5R : DP A

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.04 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 5.4 min

Peak Storage= 46 cf @ 13.44 hrs
Average Depth at Peak Storage= 0.07' , Surface Width= 3.31'
Bank-Full Depth= 2.00' Flow Area= 44.0 sf, Capacity= 332.71 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 42.00'
Length= 265.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -7.95'

**Reach 8R: Ditch from Pond****Hydrograph**

Summary for Pond 3P: Soil Filter Pond

Inflow Area = 0.769 ac, 29.18% Impervious, Inflow Depth > 1.49" for 10-Year event
 Inflow = 0.80 cfs @ 12.36 hrs, Volume= 0.095 af
 Outflow = 0.18 cfs @ 13.32 hrs, Volume= 0.055 af, Atten= 77%, Lag= 57.9 min
 Primary = 0.18 cfs @ 13.32 hrs, Volume= 0.055 af

Routed to Reach 4R : Ditch from pond

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 165.65' @ 13.32 hrs Surf.Area= 1,451 sf Storage= 2,008 cf

Plug-Flow detention time= 181.1 min calculated for 0.055 af (58% of inflow)
 Center-of-Mass det. time= 90.2 min (923.3 - 833.2)

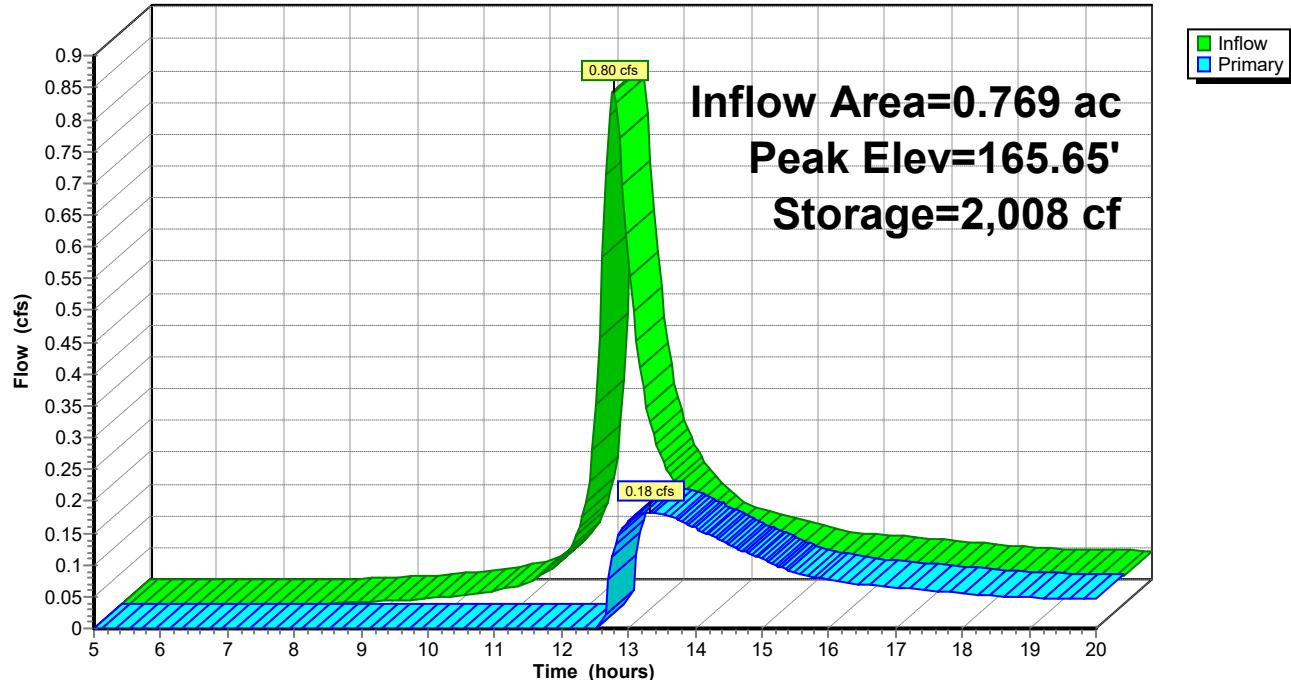
Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	6,287 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
164.00	996	0	0
165.00	1,262	1,129	1,129
166.00	1,553	1,408	2,537
167.00	1,869	1,711	4,248
168.00	2,210	2,040	6,287

Device	Routing	Invert	Outlet Devices
#1	Primary	161.15'	15.0" Round Culvert L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 161.15' / 161.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	165.40'	12.0" W x 1.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.18 cfs @ 13.32 hrs HW=165.65' (Free Discharge)

↑ 1=Culvert (Passes 0.18 cfs of 0.18 cfs potential flow)

↑ 2=Orifice/Grate (Orifice Controls 0.18 cfs @ 2.18 fps)

Pond 3P: Soil Filter Pond**Hydrograph**

Proposed DP A

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NRCC 24-hr D 25-Year Rainfall=6.01"

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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

Subcatchment 1S: Region ARunoff Area=292,610 sf 2.70% Impervious Runoff Depth>2.12"
Flow Length=1,255' Tc=35.6 min CN=66 Runoff=8.40 cfs 1.188 af**Subcatchment 2S: Region 1B**Runoff Area=16,875 sf 1.27% Impervious Runoff Depth>1.66"
Flow Length=331' Tc=24.0 min UI Adjusted CN=60 Runoff=0.45 cfs 0.053 af**Subcatchment 6S: Region 1A**Runoff Area=16,640 sf 57.48% Impervious Runoff Depth>2.93"
Flow Length=537' Tc=24.4 min CN=75 Runoff=0.80 cfs 0.093 af**Reach 4R: Ditch from pond**Avg. Flow Depth=0.12' Max Vel=0.95 fps Inflow=0.34 cfs 0.106 af
n=0.080 L=100.0' S=0.0700 '/' Capacity=222.35 cfs Outflow=0.34 cfs 0.106 af**Reach 5R: DP A**Inflow=8.45 cfs 1.293 af
Outflow=8.45 cfs 1.293 af**Reach 8R: Ditch from Pond**Avg. Flow Depth=0.09' Max Vel=1.26 fps Inflow=0.34 cfs 0.106 af
n=0.035 L=265.0' S=0.0300 '/' Capacity=332.71 cfs Outflow=0.34 cfs 0.105 af**Pond 3P: Soil Filter Pond**Peak Elev=166.18' Storage=2,814 cf Inflow=1.26 cfs 0.147 af
Outflow=0.34 cfs 0.106 af**Total Runoff Area = 7.487 ac Runoff Volume = 1.335 af Average Runoff Depth = 2.14"
94.58% Pervious = 7.081 ac 5.42% Impervious = 0.406 ac**

Proposed DP A

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NRCC 24-hr D 25-Year Rainfall=6.01"

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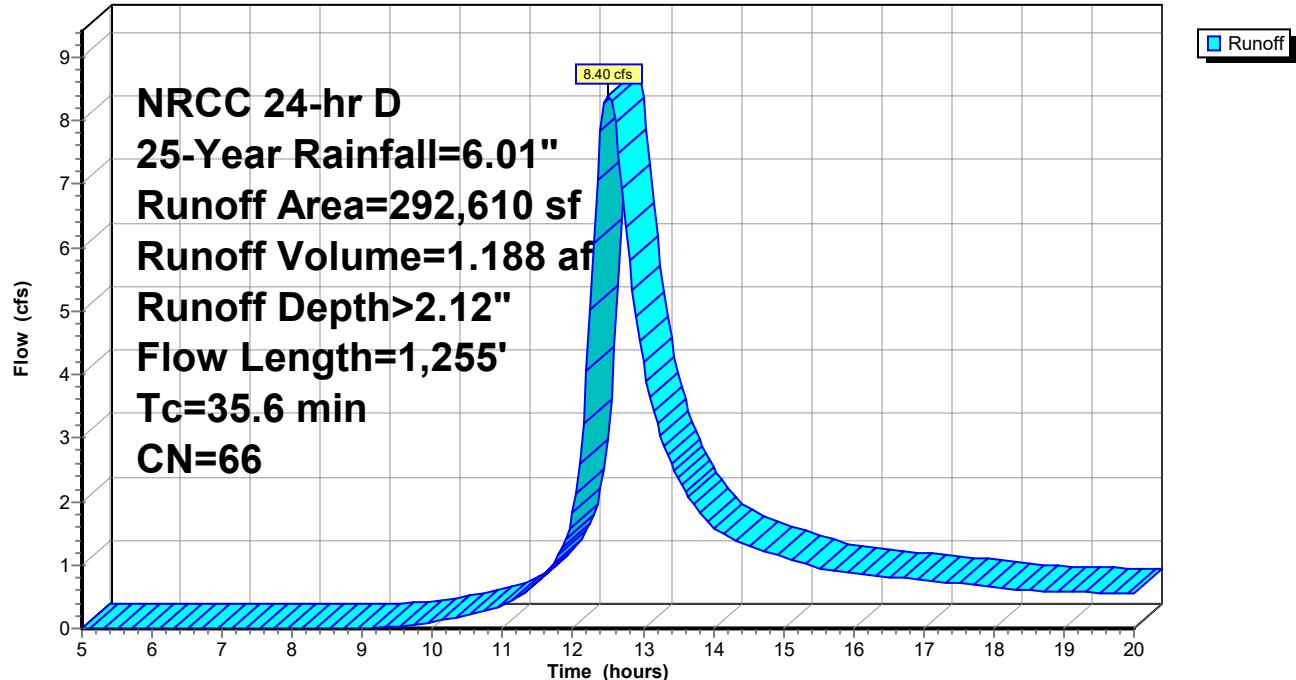
Summary for Subcatchment 1S: Region A

Runoff = 8.40 cfs @ 12.50 hrs, Volume= 1.188 af, Depth> 2.12"
 Routed to Reach 5R : DP A

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 25-Year Rainfall=6.01"

Area (sf)	CN	Description
7,900	98	Paved roads w/curbs & sewers, HSG A
20,275	30	Woods, Good, HSG A
147,700	70	Woods, Good, HSG C
77,330	77	Woods, Good, HSG D
5,755	30	Meadow, non-grazed, HSG A
7,760	71	Meadow, non-grazed, HSG C
25,890	39	>75% Grass cover, Good, HSG A
292,610	66	Weighted Average
284,710		97.30% Pervious Area
7,900		2.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.3	100	0.0400	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
1.6	700	0.0100	7.16	114.62	Trap/Vee/Rect Channel Flow, Bot.W=2.00' D=2.00' Z= 3.0 '/' Top.W=14.00' n= 0.022 Earth, clean & straight
11.3	100	0.1000	0.15		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
1.2	90	0.0600	1.22		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
2.0	115	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.2	150	0.0250	0.79		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
35.6	1,255	Total			

Subcatchment 1S: Region A**Hydrograph**

Proposed DP A

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NRCC 24-hr D 25-Year Rainfall=6.01"

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Summary for Subcatchment 2S: Region 1B

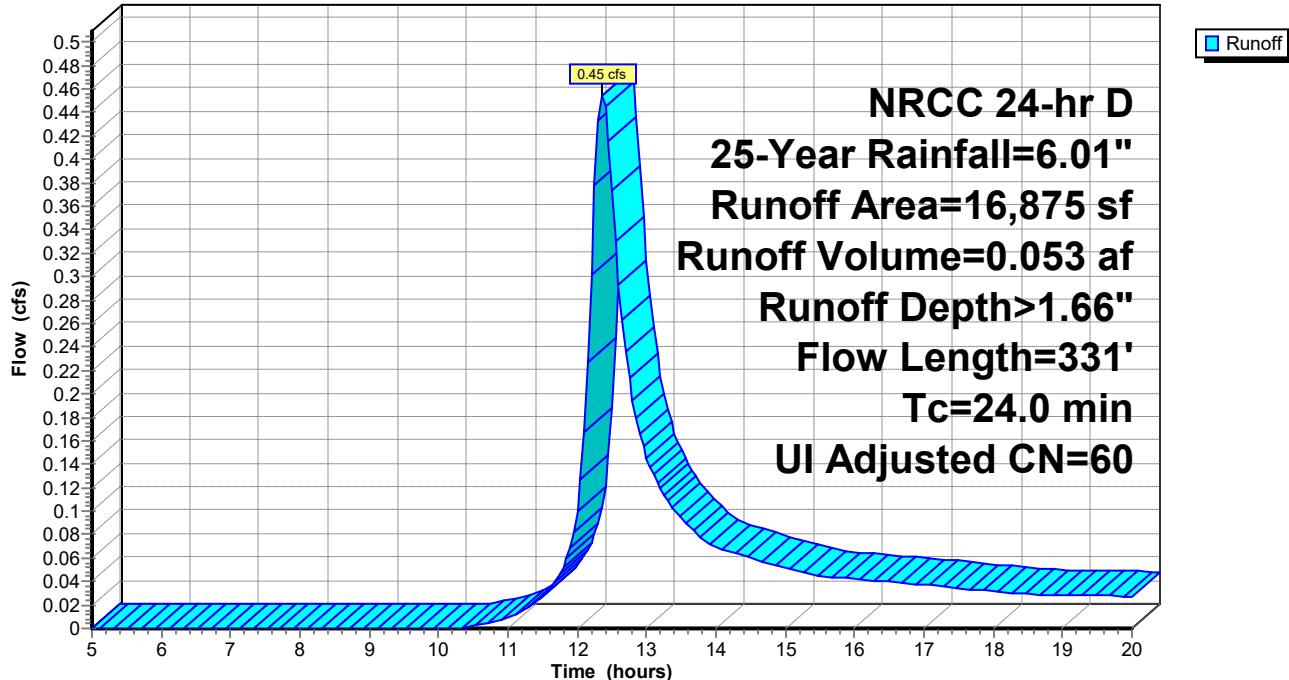
Runoff = 0.45 cfs @ 12.36 hrs, Volume= 0.053 af, Depth> 1.66"
 Routed to Pond 3P : Soil Filter Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 25-Year Rainfall=6.01"

Area (sf)	CN	Adj	Description
215	98		Unconnected roofs, HSG A
3,430	30		Meadow, non-grazed, HSG A
1,950	39		>75% Grass cover, Good, HSG A
3,760	71		Meadow, non-grazed, HSG C
7,520	74		>75% Grass cover, Good, HSG C

16,875	61	60	Weighted Average, UI Adjusted
16,660			98.73% Pervious Area
215			1.27% Impervious Area
215			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.1	6	0.0200	0.78		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.19"
5.2	35	0.0300	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 3.19"
2.0	240	0.0170	1.96		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
16.7	50	0.0010	0.05		Sheet Flow, Range n= 0.130 P2= 3.19"
24.0	331	Total			

Subcatchment 2S: Region 1B**Hydrograph**

Proposed DP A

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NRCC 24-hr D 25-Year Rainfall=6.01"

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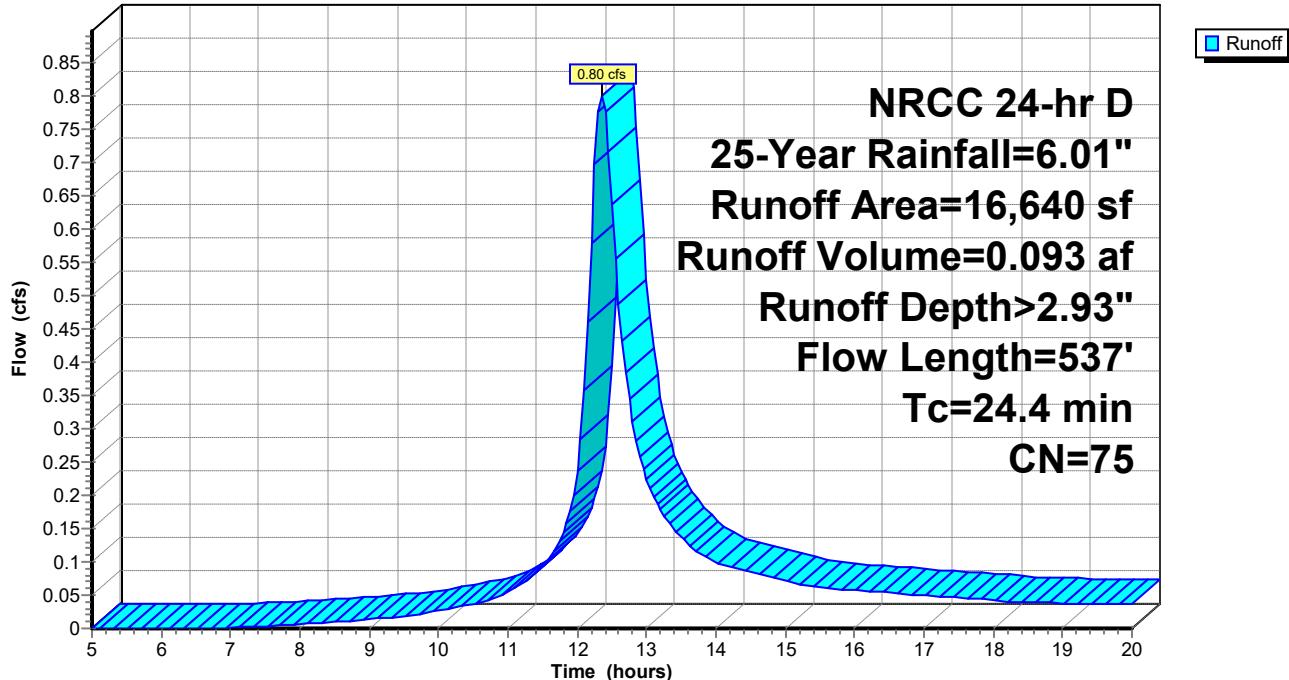
Summary for Subcatchment 6S: Region 1A

Runoff = 0.80 cfs @ 12.35 hrs, Volume= 0.093 af, Depth> 2.93"
 Routed to Pond 3P : Soil Filter Pond

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 NRCC 24-hr D 25-Year Rainfall=6.01"

Area (sf)	CN	Description
9,565	98	Paved parking, HSG A
1,215	74	>75% Grass cover, Good, HSG C
5,860	39	>75% Grass cover, Good, HSG A
16,640	75	Weighted Average
7,075		42.52% Pervious Area
9,565		57.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.8	60	0.0700	0.17		Sheet Flow, Grass: Dense n= 0.240 P2= 3.19"
1.1	150	0.0125	2.27		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.8	277	0.0100	5.70	7.00	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.012
16.7	50	0.0010	0.05		Sheet Flow, Range n= 0.130 P2= 3.19"
24.4	537	Total			

Subcatchment 6S: Region 1A**Hydrograph**

Summary for Reach 4R: Ditch from pond

Inflow Area = 0.769 ac, 29.18% Impervious, Inflow Depth > 1.66" for 25-Year event

Inflow = 0.34 cfs @ 13.06 hrs, Volume= 0.106 af

Outflow = 0.34 cfs @ 13.11 hrs, Volume= 0.106 af, Atten= 0%, Lag= 3.1 min

Routed to Reach 8R : Ditch from Pond

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 0.95 fps, Min. Travel Time= 1.8 min

Avg. Velocity = 0.73 fps, Avg. Travel Time= 2.3 min

Peak Storage= 36 cf @ 13.08 hrs

Average Depth at Peak Storage= 0.12' , Surface Width= 4.30'

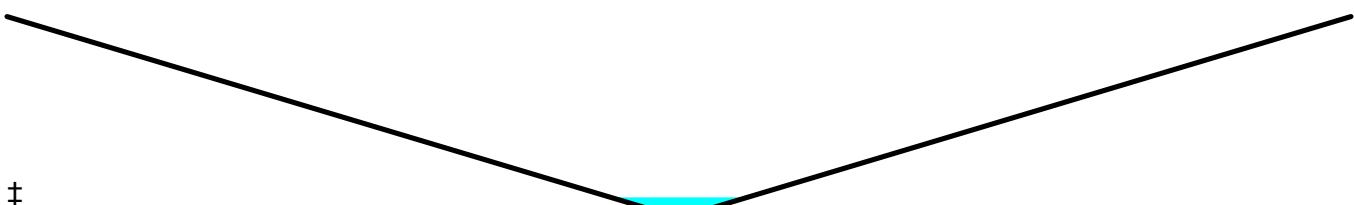
Bank-Full Depth= 2.00' Flow Area= 44.0 sf, Capacity= 222.35 cfs

2.00' x 2.00' deep channel, n= 0.080 Earth, long dense weeds

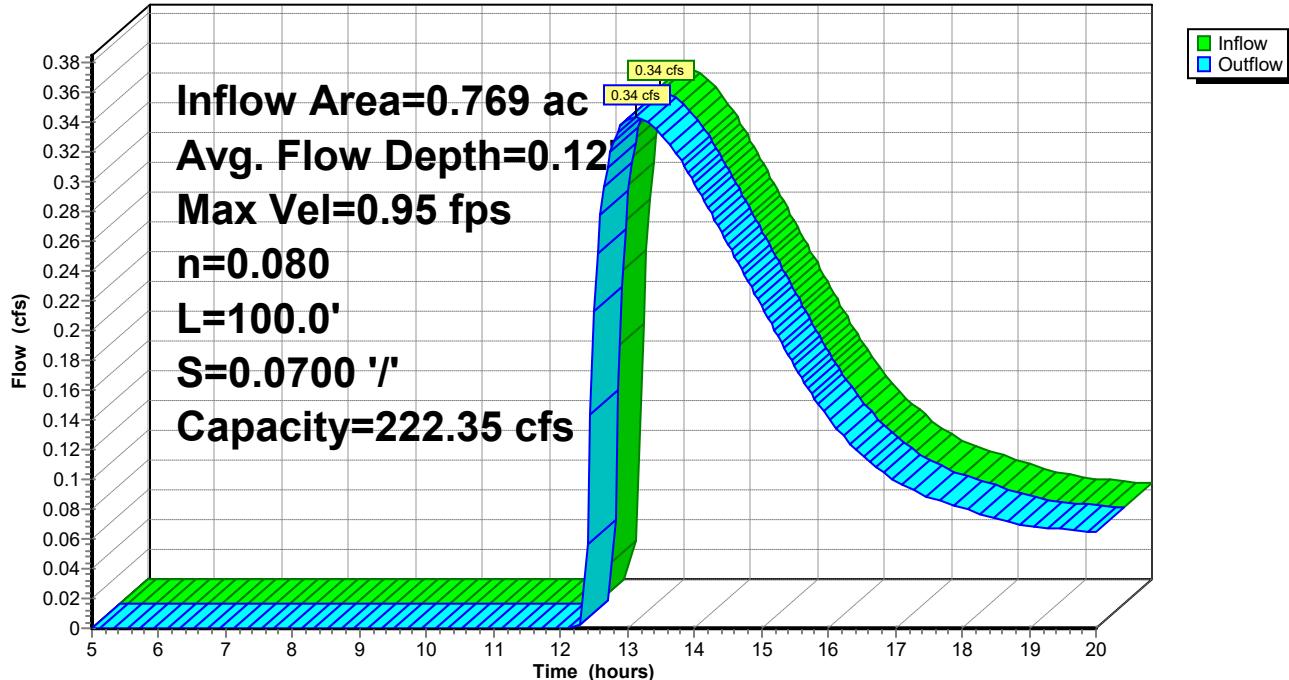
Side Slope Z-value= 10.0 '/' Top Width= 42.00'

Length= 100.0' Slope= 0.0700 '/'

Inlet Invert= 0.00', Outlet Invert= -7.00'



‡

Reach 4R: Ditch from pond**Hydrograph**

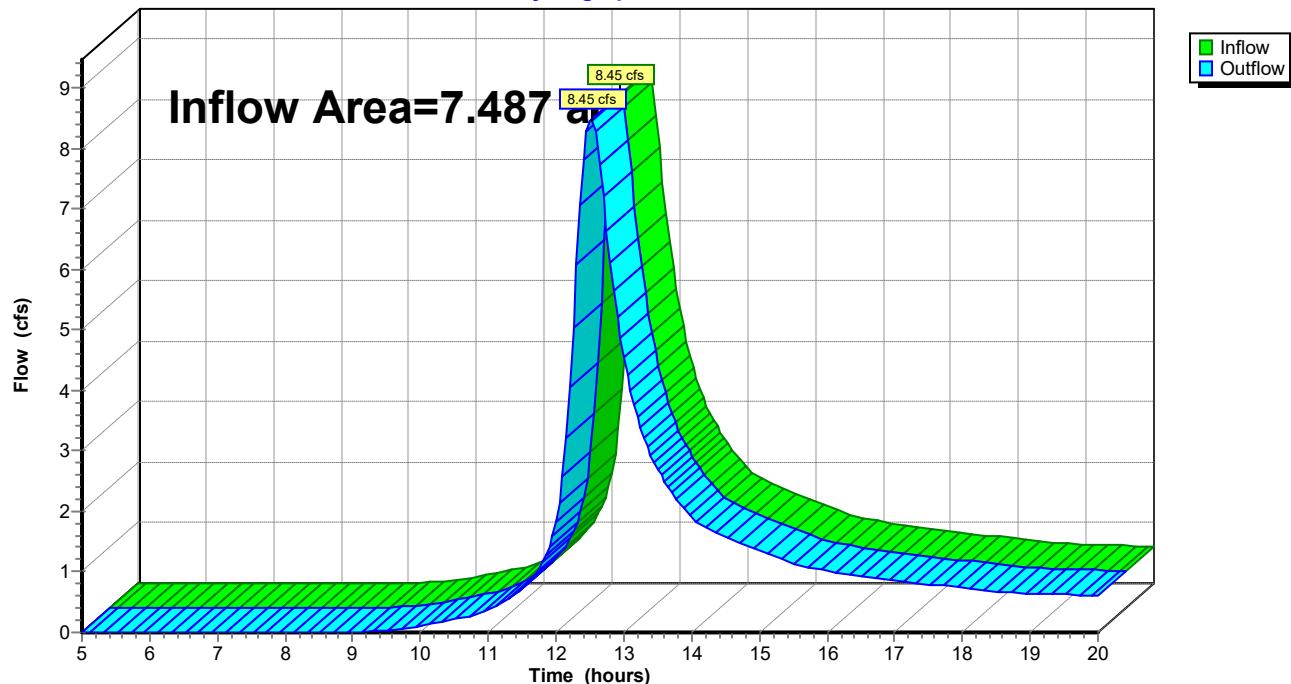
Summary for Reach 5R: DP A

Inflow Area = 7.487 ac, 5.42% Impervious, Inflow Depth > 2.07" for 25-Year event

Inflow = 8.45 cfs @ 12.52 hrs, Volume= 1.293 af

Outflow = 8.45 cfs @ 12.52 hrs, Volume= 1.293 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Reach 5R: DP A**Hydrograph**

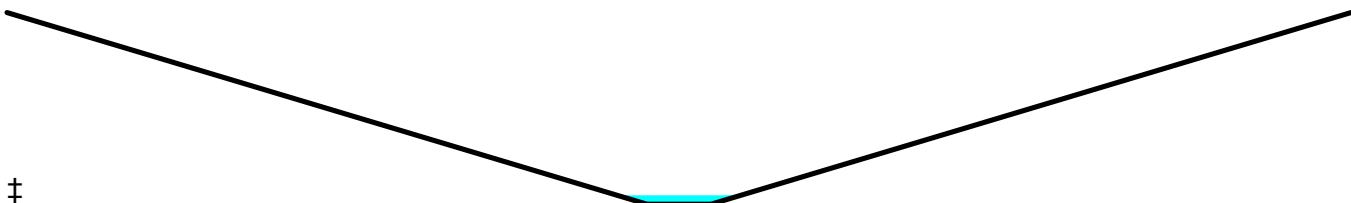
Summary for Reach 8R: Ditch from Pond

Inflow Area = 0.769 ac, 29.18% Impervious, Inflow Depth > 1.65" for 25-Year event
Inflow = 0.34 cfs @ 13.11 hrs, Volume= 0.106 af
Outflow = 0.34 cfs @ 13.22 hrs, Volume= 0.105 af, Atten= 0%, Lag= 6.2 min
Routed to Reach 5R : DP A

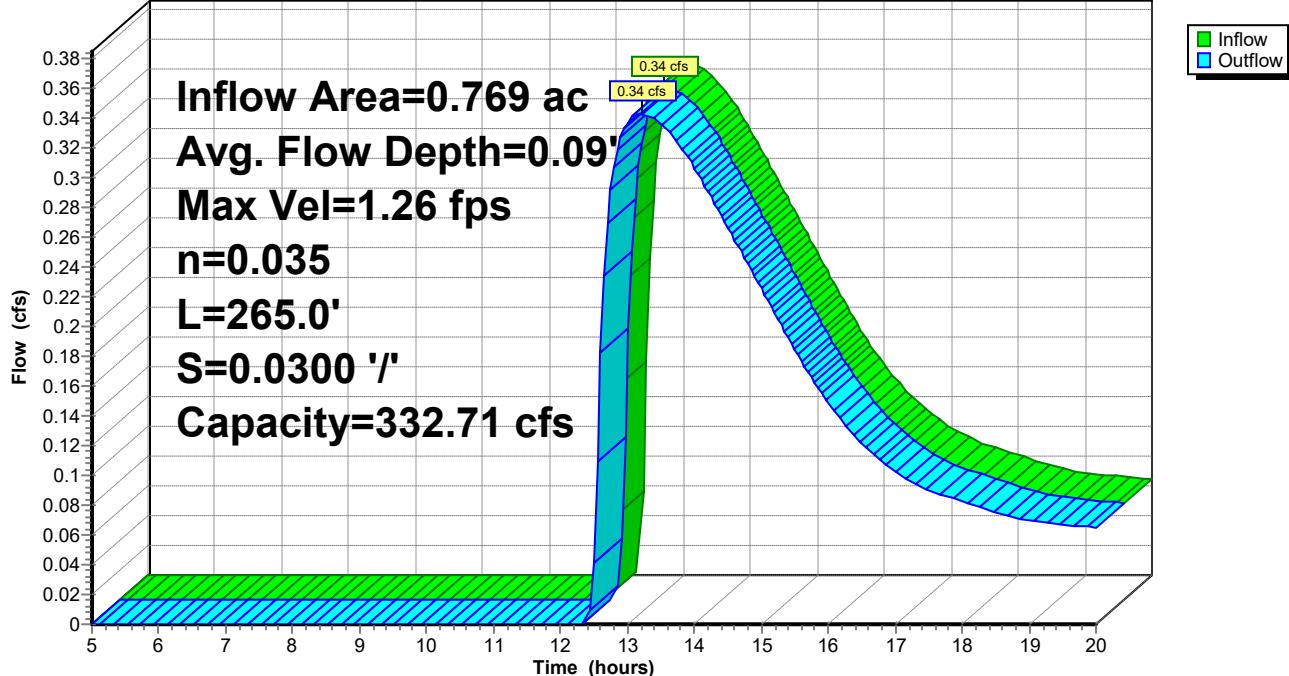
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 1.26 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 0.97 fps, Avg. Travel Time= 4.6 min

Peak Storage= 72 cf @ 13.16 hrs
Average Depth at Peak Storage= 0.09', Surface Width= 3.85'
Bank-Full Depth= 2.00' Flow Area= 44.0 sf, Capacity= 332.71 cfs

2.00' x 2.00' deep channel, n= 0.035 Earth, dense weeds
Side Slope Z-value= 10.0 '/' Top Width= 42.00'
Length= 265.0' Slope= 0.0300 '/'
Inlet Invert= 0.00', Outlet Invert= -7.95'



‡

Reach 8R: Ditch from Pond**Hydrograph**

Summary for Pond 3P: Soil Filter Pond

Inflow Area = 0.769 ac, 29.18% Impervious, Inflow Depth > 2.29" for 25-Year event
 Inflow = 1.26 cfs @ 12.35 hrs, Volume= 0.147 af
 Outflow = 0.34 cfs @ 13.06 hrs, Volume= 0.106 af, Atten= 73%, Lag= 42.5 min
 Primary = 0.34 cfs @ 13.06 hrs, Volume= 0.106 af

Routed to Reach 4R : Ditch from pond

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 166.18' @ 13.06 hrs Surf.Area= 1,608 sf Storage= 2,814 cf

Plug-Flow detention time= 147.7 min calculated for 0.106 af (72% of inflow)
 Center-of-Mass det. time= 76.2 min (898.5 - 822.4)

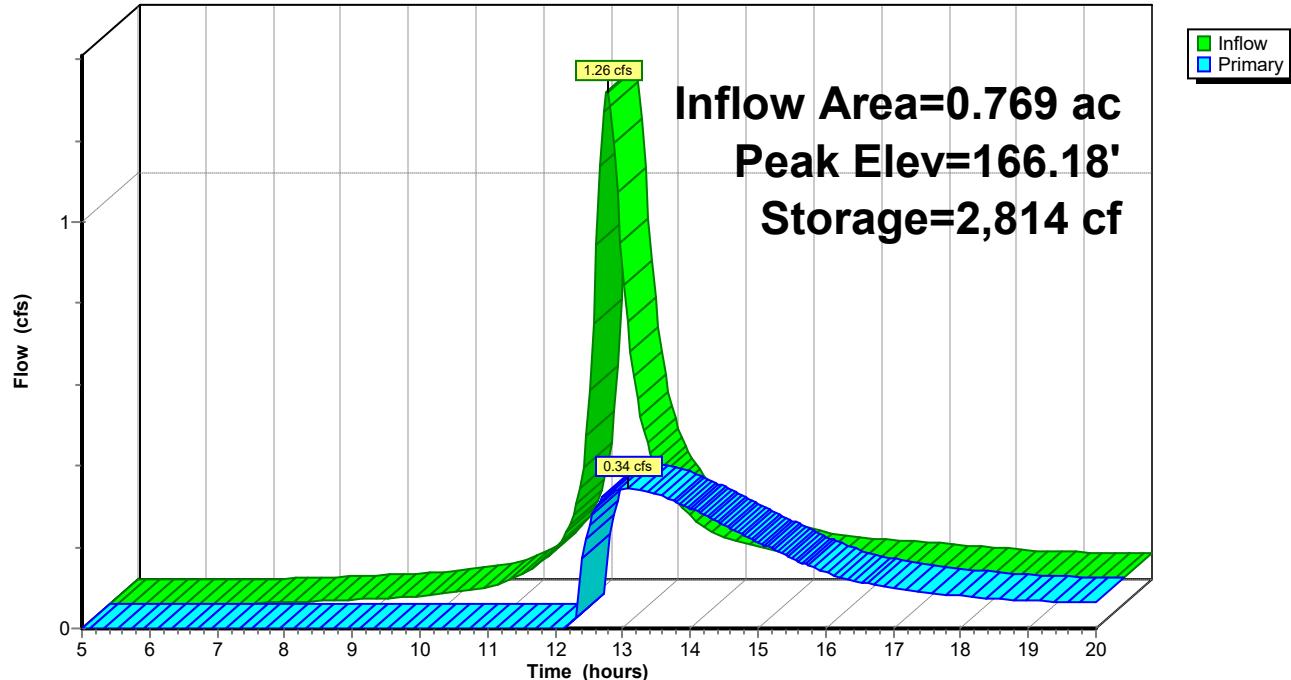
Volume	Invert	Avail.Storage	Storage Description
#1	164.00'	6,287 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
164.00	996	0	0
165.00	1,262	1,129	1,129
166.00	1,553	1,408	2,537
167.00	1,869	1,711	4,248
168.00	2,210	2,040	6,287

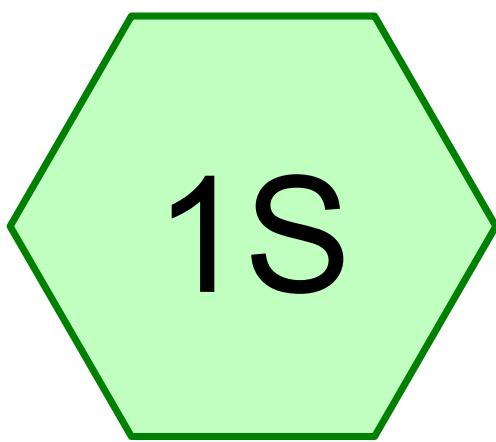
Device	Routing	Invert	Outlet Devices
#1	Primary	161.15'	15.0" Round Culvert L= 15.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 161.15' / 161.00' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	165.40'	12.0" W x 1.0" H Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.34 cfs @ 13.06 hrs HW=166.18' (Free Discharge)

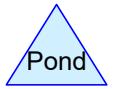
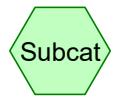
↑ 1=Culvert (Passes 0.34 cfs of 9.79 cfs potential flow)

↑ 2=Orifice/Grate (Orifice Controls 0.34 cfs @ 4.12 fps)

Pond 3P: Soil Filter Pond**Hydrograph**



Region B



Routing Diagram for Proposed DP B
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Proposed DP B

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Page 2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.206	30	Woods, Good, HSG A (1S)
0.206	30	TOTAL AREA

Proposed DP B

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.206	HSG A	1S
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.206		TOTAL AREA

Proposed DP B

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Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.206	0.000	0.000	0.000	0.000	0.206	Woods, Good	1S
0.206	0.000	0.000	0.000	0.000	0.206	TOTAL AREA	

Summary for Subcatchment 1S: Region B

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

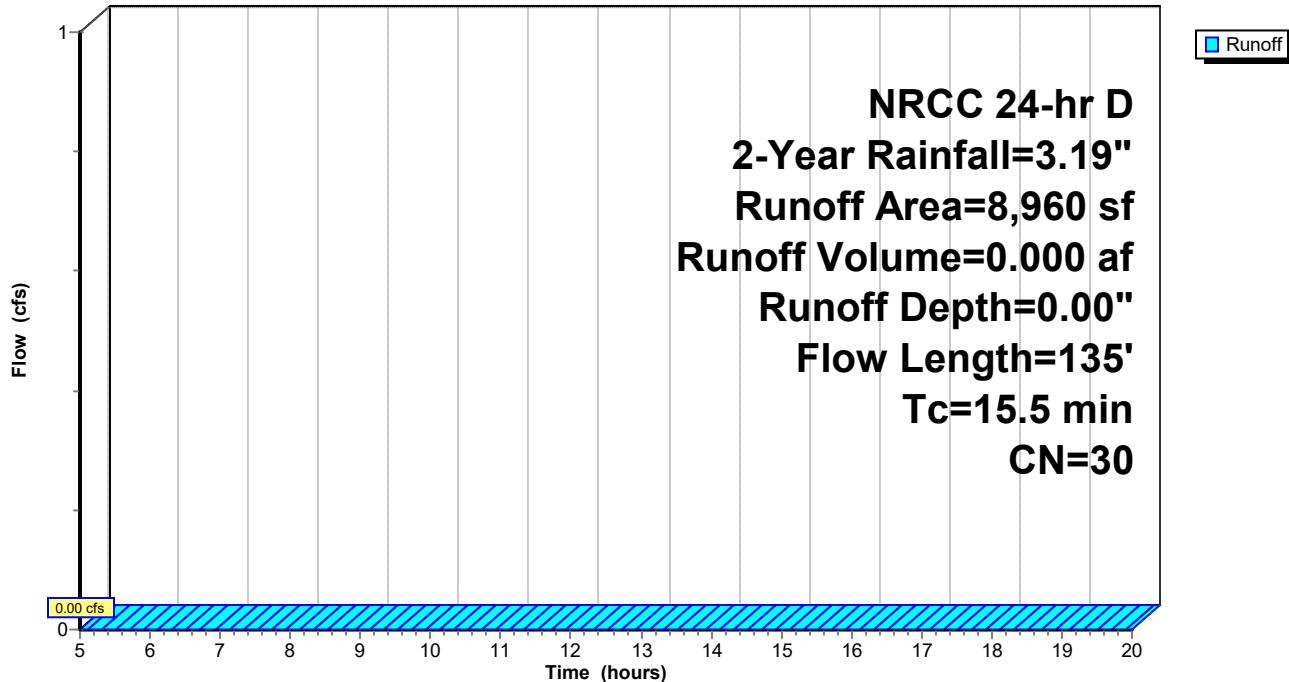
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.19"

Area (sf)	CN	Description
8,960	30	Woods, Good, HSG A
8,960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
0.6	35	0.0330	0.91		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.5	135				Total

Subcatchment 1S: Region B

Hydrograph



Summary for Subcatchment 1S: Region B

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

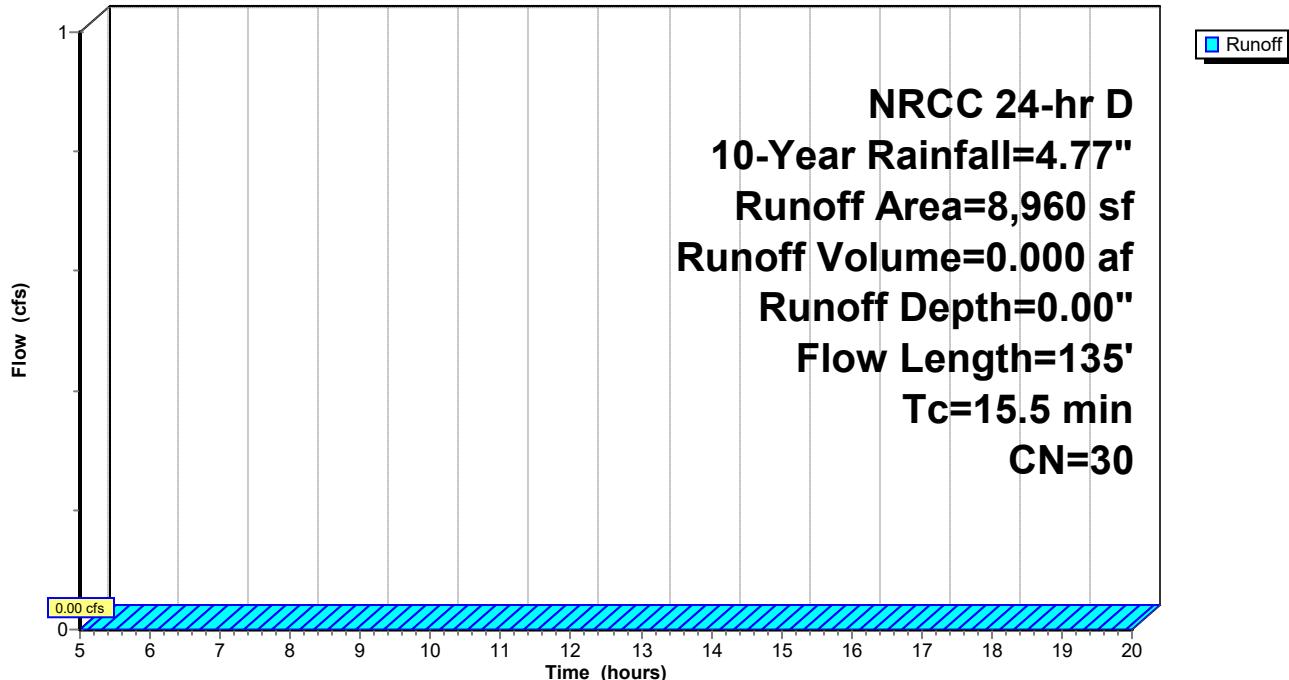
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
8,960	30	Woods, Good, HSG A
8,960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
0.6	35	0.0330	0.91		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.5	135				Total

Subcatchment 1S: Region B

Hydrograph



Summary for Subcatchment 1S: Region B

Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.001 af, Depth> 0.04"

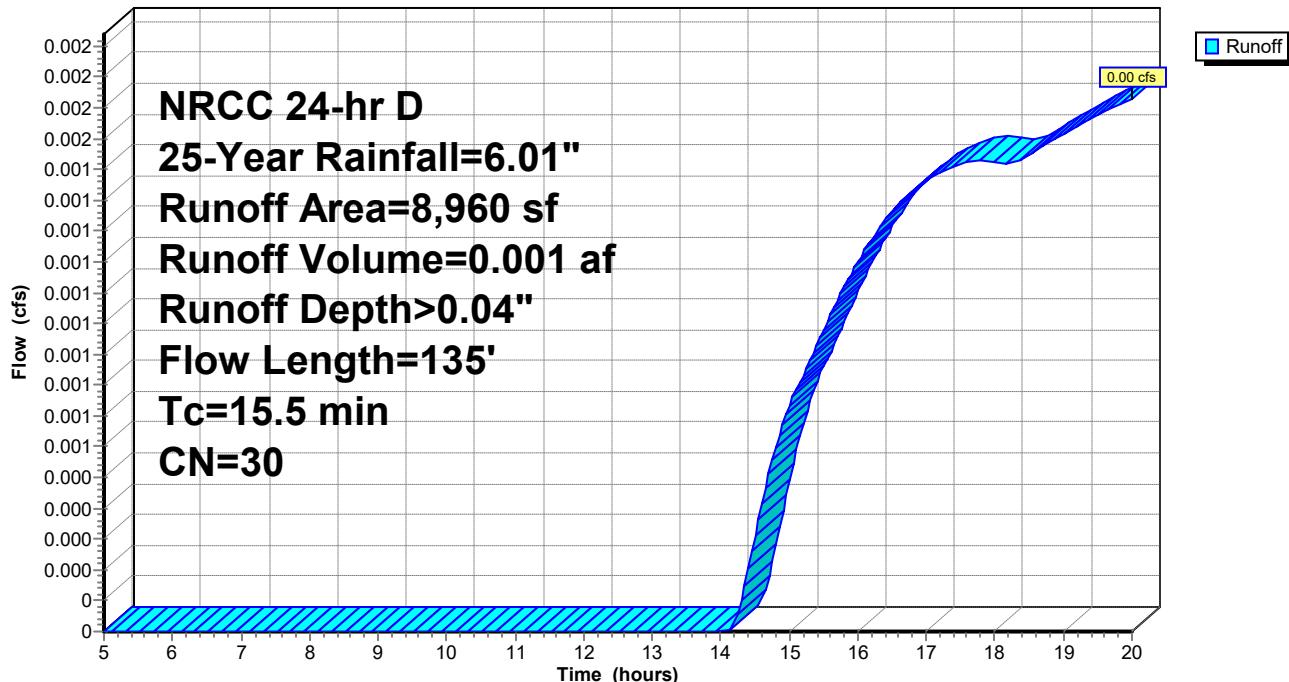
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.01"

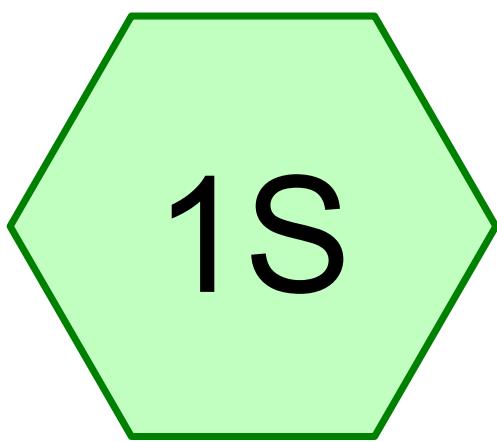
Area (sf)	CN	Description
8,960	30	Woods, Good, HSG A
8,960		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
0.6	35	0.0330	0.91		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
15.5	135				Total

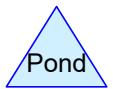
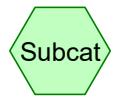
Subcatchment 1S: Region B

Hydrograph





Region C



Routing Diagram for Proposed DP C
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Proposed DP C

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.601	30	Woods, Good, HSG A (1S)
0.009	70	Woods, Good, HSG C (1S)
0.610	31	TOTAL AREA

Proposed DP C

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.601	HSG A	1S
0.000	HSG B	
0.009	HSG C	1S
0.000	HSG D	
0.000	Other	
0.610		TOTAL AREA

Proposed DP C

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Ground Covers (all nodes)

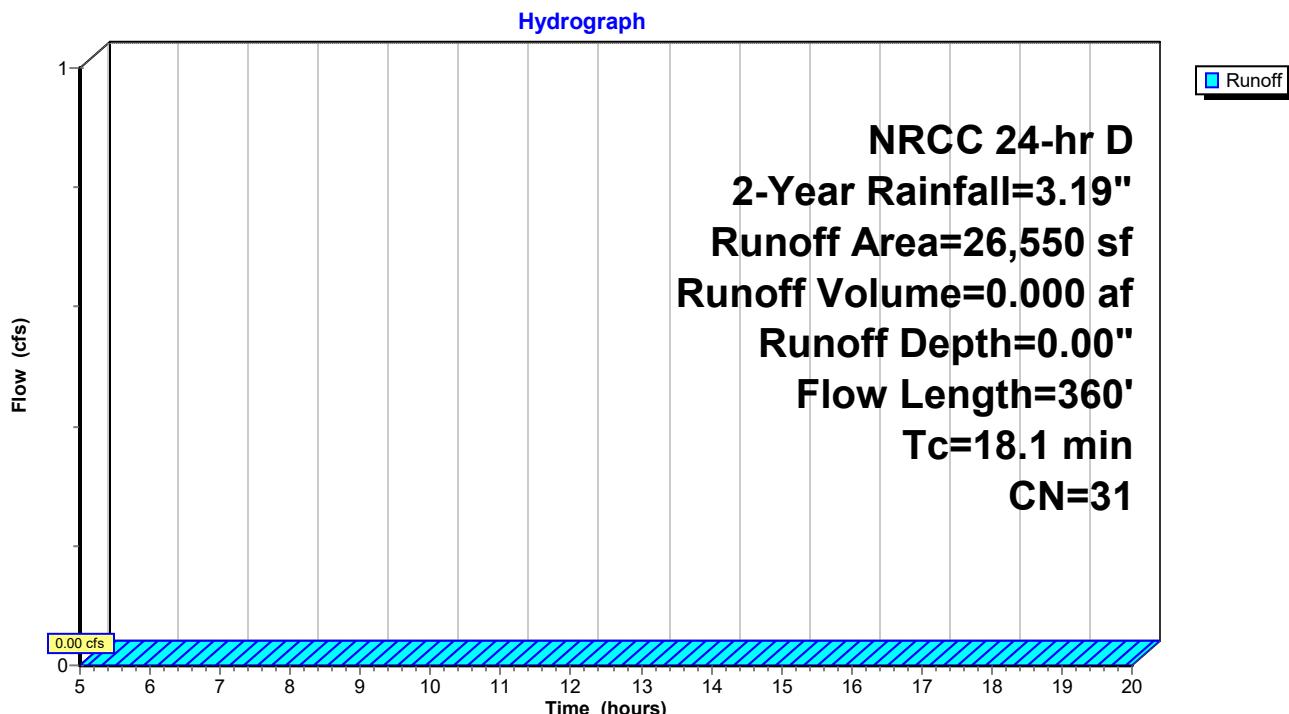
HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.601	0.000	0.009	0.000	0.000	0.610	Woods, Good	1S
0.601	0.000	0.009	0.000	0.000	0.610	TOTAL AREA	

Summary for Subcatchment 1S: Region C

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
NRCC 24-hr D 2-Year Rainfall=3.19"

Area (sf)	CN	Description
26,170	30	Woods, Good, HSG A
380	70	Woods, Good, HSG C
26,550	31	Weighted Average
26,550		100.00% Pervious Area
Tc (min)	Length (feet)	Slope (ft/ft)
12.7	110	0.0900
5.4	250	0.0240
18.1	360	Total
Velocity (ft/sec)	Capacity (cfs)	Description
0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps

Subcatchment 1S: Region C

Summary for Subcatchment 1S: Region C

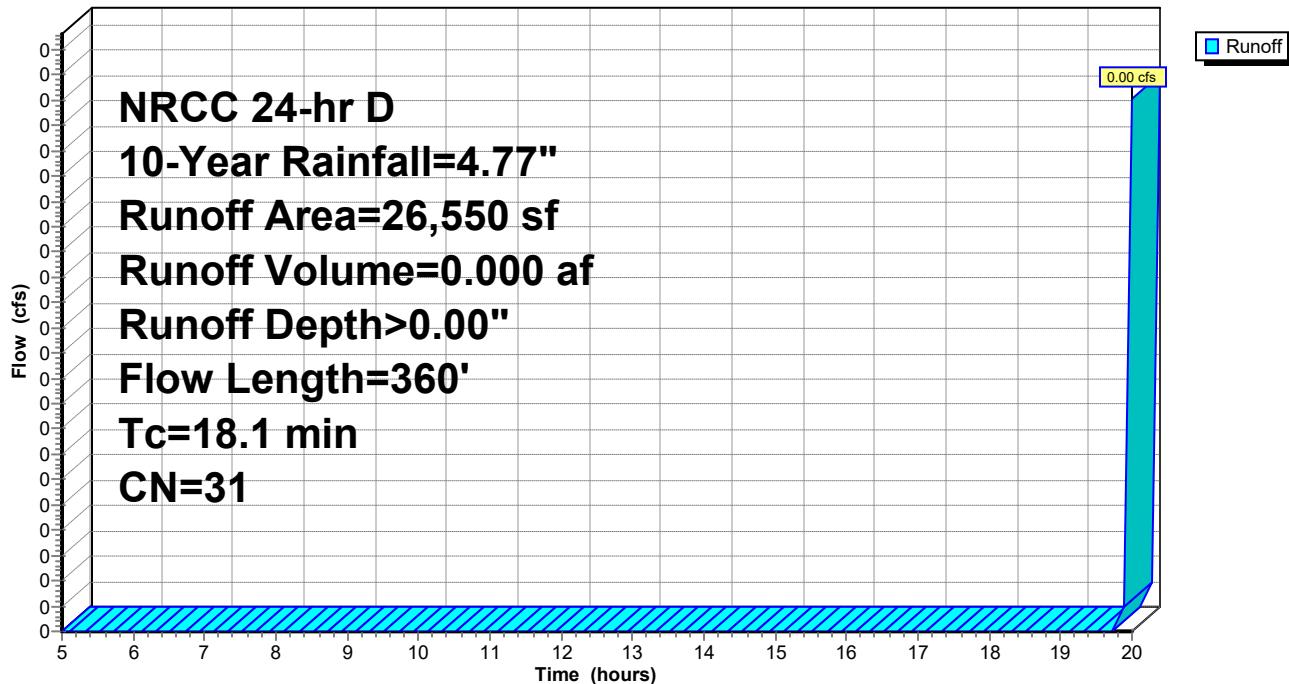
Runoff = 0.00 cfs @ 20.00 hrs, Volume= 0.000 af, Depth> 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
26,170	30	Woods, Good, HSG A
380	70	Woods, Good, HSG C

26,550	31	Weighted Average
26,550		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	110	0.0900	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
5.4	250	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.1	360				Total

Subcatchment 1S: Region C**Hydrograph**

Summary for Subcatchment 1S: Region C

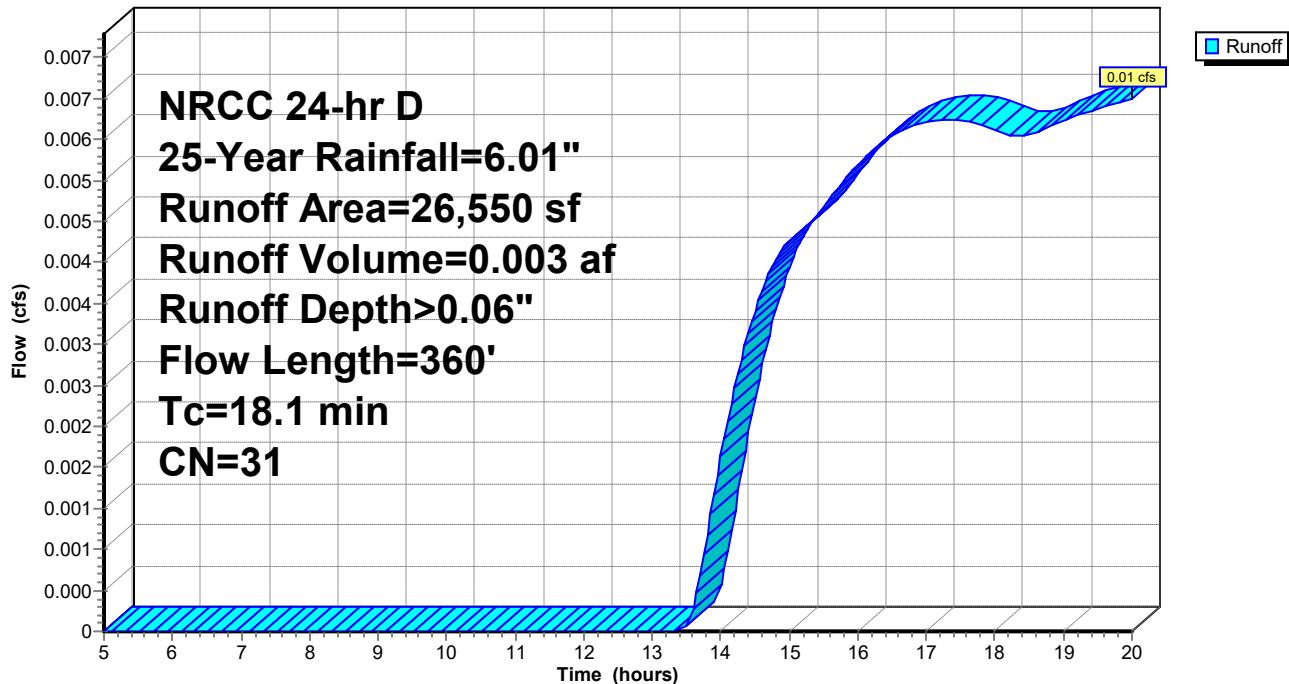
Runoff = 0.01 cfs @ 20.00 hrs, Volume= 0.003 af, Depth> 0.06"

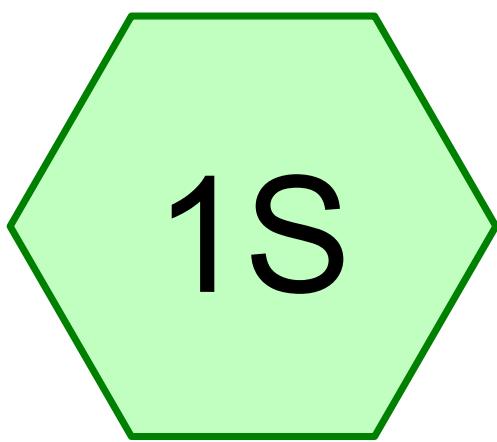
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.01"

Area (sf)	CN	Description			
26,170	30	Woods, Good, HSG A			
380	70	Woods, Good, HSG C			
26,550	31	Weighted Average			
26,550		100.00% Pervious Area			
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.7	110	0.0900	0.14		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
5.4	250	0.0240	0.77		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
18.1	360				Total

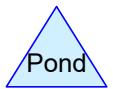
Subcatchment 1S: Region C

Hydrograph





Region D



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Proposed DP D

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.072	39	>75% Grass cover, Good, HSG A (1S)
0.193	74	>75% Grass cover, Good, HSG C (1S)
0.138	71	Meadow, non-grazed, HSG C (1S)
0.106	98	Paved parking, HSG A (1S)
0.016	30	Woods, Good, HSG A (1S)
3.724	70	Woods, Good, HSG C (1S)
1.216	77	Woods, Good, HSG D (1S)
5.464	72	TOTAL AREA

Proposed DP D

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.194	HSG A	1S
0.000	HSG B	
4.055	HSG C	1S
1.216	HSG D	1S
0.000	Other	
5.464		TOTAL AREA

Proposed DP D

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Page 4

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.072	0.000	0.193	0.000	0.000	0.265	>75% Grass cover, Good	1S
0.000	0.000	0.138	0.000	0.000	0.138	Meadow, non-grazed	1S
0.106	0.000	0.000	0.000	0.000	0.106	Paved parking	1S
0.016	0.000	3.724	1.216	0.000	4.955	Woods, Good	1S
0.194	0.000	4.055	1.216	0.000	5.464	TOTAL AREA	

Proposed DP D

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NRCC 24-hr D 2-Year Rainfall=3.19"

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Summary for Subcatchment 1S: Region D

Runoff = 2.06 cfs @ 12.68 hrs, Volume= 0.353 af, Depth> 0.77"

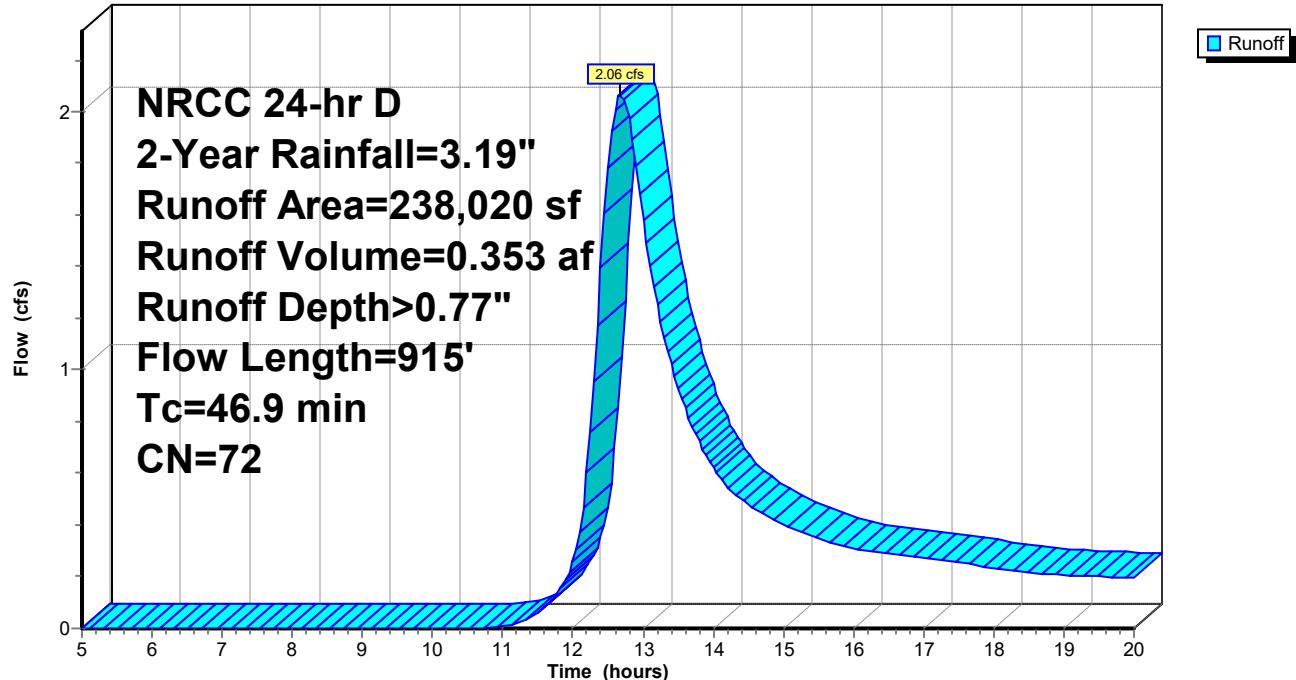
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 2-Year Rainfall=3.19"

Area (sf)	CN	Description
4,620	98	Paved parking, HSG A
3,125	39	>75% Grass cover, Good, HSG A
700	30	Woods, Good, HSG A
6,025	71	Meadow, non-grazed, HSG C
8,400	74	>75% Grass cover, Good, HSG C
162,200	70	Woods, Good, HSG C
52,950	77	Woods, Good, HSG D
238,020	72	Weighted Average
233,400		98.06% Pervious Area
4,620		1.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	100	0.0300	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
3.6	235	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
25.0	580	0.0060	0.39		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
46.9	915	Total			

Subcatchment 1S: Region D

Hydrograph



Proposed DP D

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NRCC 24-hr D 10-Year Rainfall=4.77"

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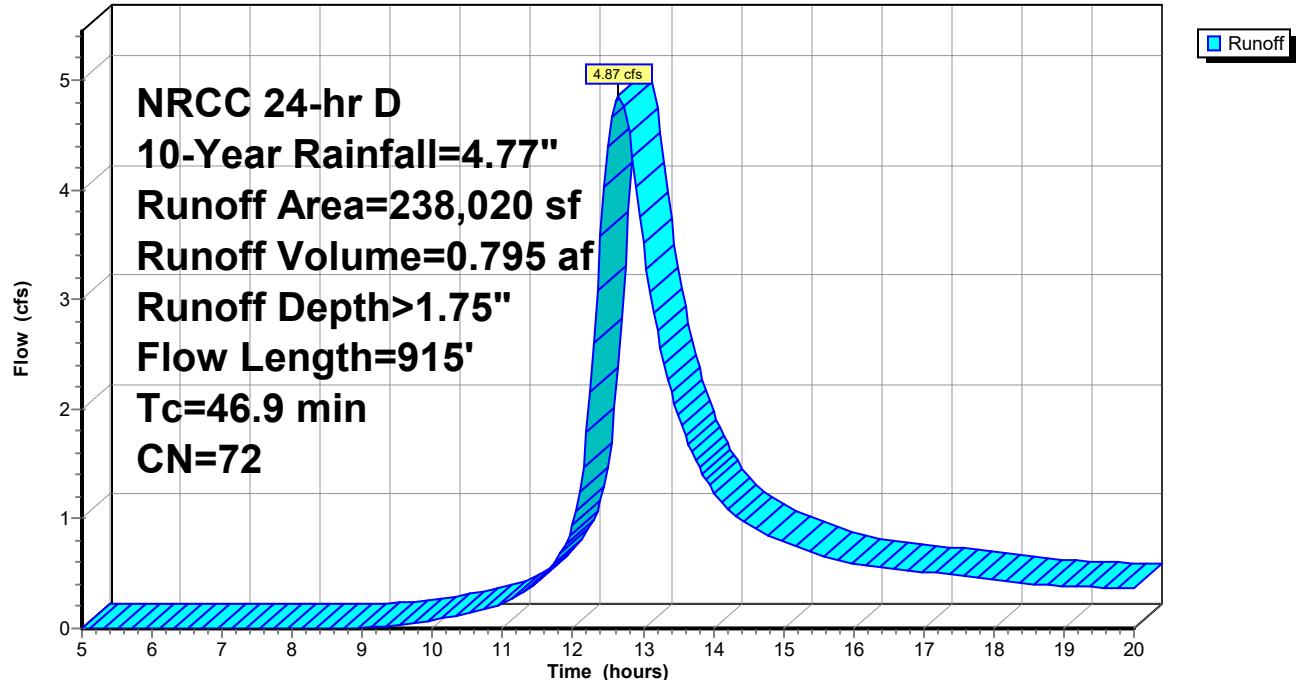
Summary for Subcatchment 1S: Region D

Runoff = 4.87 cfs @ 12.65 hrs, Volume= 0.795 af, Depth> 1.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 10-Year Rainfall=4.77"

Area (sf)	CN	Description
4,620	98	Paved parking, HSG A
3,125	39	>75% Grass cover, Good, HSG A
700	30	Woods, Good, HSG A
6,025	71	Meadow, non-grazed, HSG C
8,400	74	>75% Grass cover, Good, HSG C
162,200	70	Woods, Good, HSG C
52,950	77	Woods, Good, HSG D
238,020	72	Weighted Average
233,400		98.06% Pervious Area
4,620		1.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	100	0.0300	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
3.6	235	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
25.0	580	0.0060	0.39		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
46.9	915	Total			

Subcatchment 1S: Region D**Hydrograph**

Proposed DP D

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NRCC 24-hr D 25-Year Rainfall=6.01"

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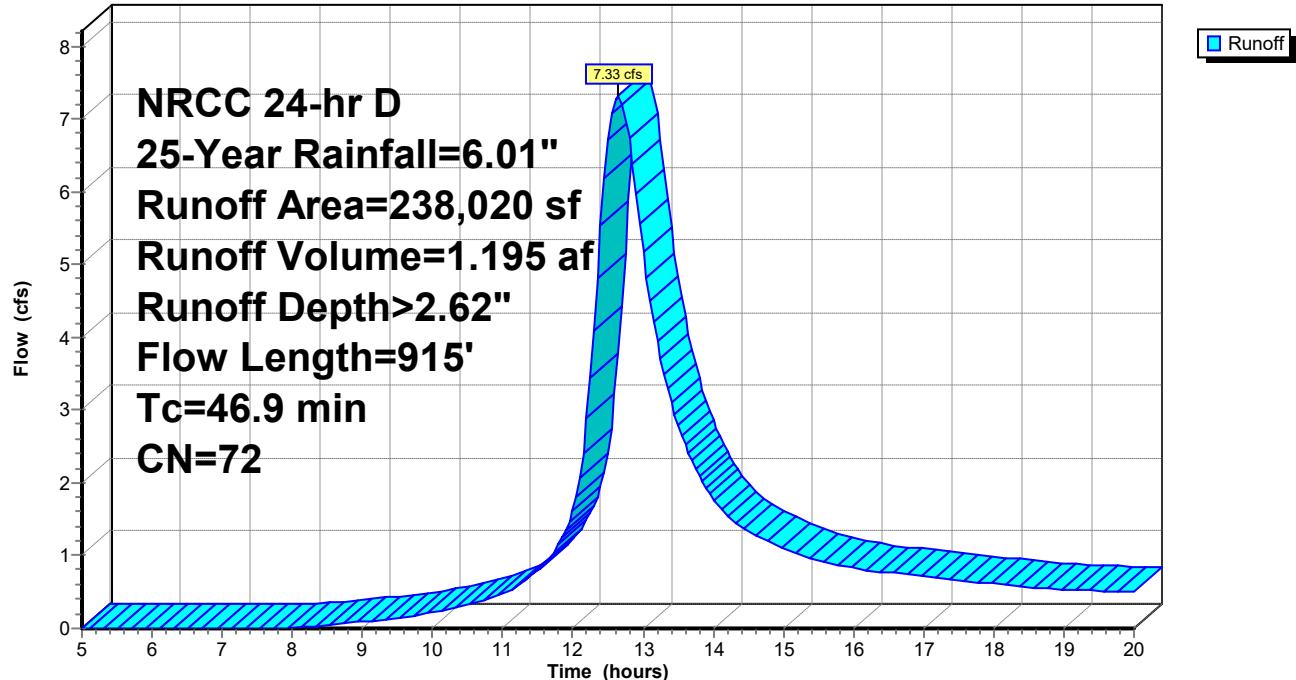
Summary for Subcatchment 1S: Region D

Runoff = 7.33 cfs @ 12.64 hrs, Volume= 1.195 af, Depth> 2.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
NRCC 24-hr D 25-Year Rainfall=6.01"

Area (sf)	CN	Description
4,620	98	Paved parking, HSG A
3,125	39	>75% Grass cover, Good, HSG A
700	30	Woods, Good, HSG A
6,025	71	Meadow, non-grazed, HSG C
8,400	74	>75% Grass cover, Good, HSG C
162,200	70	Woods, Good, HSG C
52,950	77	Woods, Good, HSG D
238,020	72	Weighted Average
233,400		98.06% Pervious Area
4,620		1.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.3	100	0.0300	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.19"
3.6	235	0.0470	1.08		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
25.0	580	0.0060	0.39		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
46.9	915	Total			

Subcatchment 1S: Region D**Hydrograph**

Proposed DP A

Prepared by SJR Engineering

HydroCAD® 10.20-3h s/n 00591 © 2024 HydroCAD Software Solutions LLC

NRCC 24-hr D 2-Year Rainfall=3.19"

Printed 10/3/2025

Stage-Area-Storage for Pond 3P: Soil Filter Pond

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
164.00	996	0	166.60	1,743	3,525
164.05	1,009	50	166.65	1,758	3,613
164.10	1,023	101	166.70	1,774	3,701
164.15	1,036	152	166.75	1,790	3,790
164.20	1,049	205	166.80	1,806	3,880
164.25	1,063	257	166.85	1,822	3,971
164.30	1,076	311	166.90	1,837	4,062
164.35	1,089	365	166.95	1,853	4,154
164.40	1,102	420	167.00	1,869	4,248
164.45	1,116	475	167.05	1,886	4,341
164.50	1,129	531	167.10	1,903	4,436
164.55	1,142	588	167.15	1,920	4,532
164.60	1,156	645	167.20	1,937	4,628
164.65	1,169	704	167.25	1,954	4,725
164.70	1,182	762	167.30	1,971	4,824
164.75	1,196	822	167.35	1,988	4,923
164.80	1,209	882	167.40	2,005	5,022
164.85	1,222	943	167.45	2,022	5,123
164.90	1,235	1,004	167.50	2,040	5,225
164.95	1,249	1,066	167.55	2,057	5,327
165.00	1,262	1,129	167.60	2,074	5,430
165.05	1,277	1,192	167.65	2,091	5,534
165.10	1,291	1,257	167.70	2,108	5,639
165.15	1,306	1,322	167.75	2,125	5,745
165.20	1,320	1,387	167.80	2,142	5,852
165.25	1,335	1,454	167.85	2,159	5,959
165.30	1,349	1,521	167.90	2,176	6,068
165.35	1,364	1,589	167.95	2,193	6,177
165.40	1,378	1,657	168.00	2,210	6,287
165.45	1,393	1,726			
165.50	1,408	1,796			
165.55	1,422	1,867			
165.60	1,437	1,939			
165.65	1,451	2,011			
165.70	1,466	2,084			
165.75	1,480	2,157			
165.80	1,495	2,232			
165.85	1,509	2,307			
165.90	1,524	2,383			
165.95	1,538	2,459			
166.00	1,553	2,537			
166.05	1,569	2,615			
166.10	1,585	2,693			
166.15	1,600	2,773			
166.20	1,616	2,853			
166.25	1,632	2,935			
166.30	1,648	3,017			
166.35	1,664	3,099			
166.40	1,679	3,183			
166.45	1,695	3,267			
166.50	1,711	3,353			
166.55	1,727	3,438			





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Subject: POND DESIGN (SFP 1)

Job #: _____

(A) SOIL FILTER DESIGN (POND 1)

$$\begin{aligned}
 \text{TOTAL TREATED} &= \\
 \text{IMPERVIOUS} &= 9780 \text{ SF} \\
 \text{VEGETATION} &= 23735 \text{ SF}
 \end{aligned}$$

(1) REQUIRED SIZING (SURFACE)

$$9780(.05) + 23735(.02) = 964 \text{ SF}$$

996 SF PROVIDED ELEV 164.0

(OK)

(2) REQUIRED TREATMENT VOLUME (18" MAXIMUM STORABLE)

$$\begin{aligned}
 9780(1/12) + 23735(.4/12) &= \\
 815 + 791 &= 1606 \text{ CF} \\
 &1657 \text{ CF PROVIDED @ EL 165.40}
 \end{aligned}$$

(OK)

(3) ORIFICE SIZING (DEP REGRESSION EQUATION)

$$\text{FILTER AREA: } 0.035(996)^{0.4599} = .84''$$

$$\text{QUALITY VOL: } 0.0137(1657)^{0.5372} = .73''$$

MINIMUM SIZE
USE 1" HOLE
(@ EL 161.50)