

MINNESTRISTA WTP – 100% DESIGN



Minnetrista, Minnesota

Stormwater Management Plan

October 2, 2025

~~September 5, 2025~~

~~June 16, 2025~~

Project Number P05355-2023-002

MINNESTRISTA WTP – 100% DESIGN STORMWATER MANAGEMENT PLAN

October 2025

Professional Certification

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.



Name: _____

Company: _____ Advanced Engineering and Environmental Services, LLC. (AE2S)

Date: October 2, 2025 Registration Number: 63479

Prepared By:

Advanced Engineering and Environmental Services, LLC. (AE2S)

Water Tower Place Business Center
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Section 1 Introduction and Background

1.1 Project Background

The Minnetrista Water Treatment Plant (WTP) is approximately a 6± acre development within the city limits of Minnetrista, MN. The site is located south of Halstead's Bay on Lake Minnetonka and north of Highway 7 (see **Appendix A, Figure 1** for site location map). The site is just southeast of, and adjacent to, Woodland Cove Development.

This plan, prepared by Advanced Engineering and Environmental Services, LLC (AE2S), is to document the basis of the stormwater management design for the WTP to meet the stormwater management requirements.

1.2 Data Used

The following data were used in this analysis:

- NRCS Soil Survey (Accessed May 2025), **Appendix B**
- Geotechnical Exploration Report (May 2025), **Appendix B**
- Aerial Imagery (MnGeo WMS Service, 2020 7-county)
- Existing Topography (MnDNR, MnTOPO, Accessed May 2025)
- Minnetrista Woodland Cove WTP Project Plans (AE2S, October 2025)
- Woodland Cove 4th Addition SWMP and Plans (December 2023)
- NOAA Atlas-14 Precipitation Data

Section 2 Stormwater Management Requirements

The following section describes the rules and regulations used to design this stormwater management plan.

2.1 City of Minnetrista

The project site is in the City of Minnetrista. The applicable stormwater management rules are detailed below.

Subd. 1. *General criteria.* A stormwater management plan shall be required of all new development, redevelopment, and land disturbance projects greater than one acre in parcel size or part of a greater plan of development. This plan shall be designed to reduce or minimize the impervious area of the site, control the peak flow rate, and minimize the volume of stormwater runoff from the same as required in this section. Plans must be submitted to the city for review and approval prior to the start of construction. Each project must construct, implement, and maintain all best management practices (BMP) that are deemed necessary to achieve the goals of this section, including post-construction stormwater management BMPs. Prior to the start of construction, all projects shall be in possession of any and all permits required for the project including, Minnehaha Creek Watershed District or Pioneer-Sarah Creek Watershed District, and the Minnesota Pollution Control Agency.

Projects smaller than one acre in size are encouraged to implement BMPs that will promote infiltration and contribute to improved water quality.

Subd. 2. *Post-construction stormwater management BMPs must meet the following criteria:*

- (a) They must be designed with accepted engineering practices and in accordance with Part 3.d of the Regulatory Mechanism Guidance and Item 20.4 of the permit.
- (b) They must treat the water quality volume on any project where the sum of the new impervious surface and the fully reconstructed impervious surface equals one or more acres in accordance with Item 20.5 of the permit.
- (c) For non-linear projects, water quality volume (calculated as an instantaneous volume) must be calculated as one-inch times the sum of the new and the fully reconstructed impervious surface in accordance with Item 20.6 of the permit.
- (d) For linear projects, water quality volume (calculated as an instantaneous volume) must be calculated as the larger of one-inch times the new impervious surface or one-half inch times the sum of the new and the fully reconstructed impervious surface. Where the entire water quality volume cannot be treated within the existing right-of-way, a reasonable attempt to obtain additional right-of-way, easement, or other permission to treat the stormwater during the project planning process must be made. Volume reduction practices must be considered first, as described in Section 3.b.v of the

Regulatory Mechanism Guidance. If additional right-of-way, easements, or other permission cannot be obtained, the owner/operator of construction activity must maximize the treatment of the water quality volume prior to discharge from the city's MS4 in accordance with Item 20.7 of the permit.

- (e) Volume reduction practices (e.g., infiltration or other) to retain the water quality volume on-site must be considered first when designing the permanent stormwater treatment system. Wet sedimentation basins and filtration systems are not considered volume reduction practices. If infiltration is prohibited, as described in Part 3.d.i.15 of the Regulatory Mechanism Guidance, other volume reduction practices, a wet sedimentation basin, or a filtration basin may be considered in accordance with Item 20.8 of the permit.

2.2 Minnehaha Creek Watershed District

The project site is in the Minnehaha Creek Watershed District (MCWD). The applicable stormwater management rules are detailed below.

- For purposes of both volume and phosphorus control, an applicant subject to this rule must provide volume reduction equal to the following
 - For Development, one inch times the area of impervious surface stated in Table 1.
- Volume reduction practices must be used to meet the subsection 3.a standard, to the extent feasible. An infiltration practice is prohibited in the following circumstances:
 - Soils are predominantly Hydrologic Soil Group D (clay) or otherwise unreliable for infiltration.
- If the required volume reduction cannot feasibly be provided by volume reduction practices listed in Appendix A (excerpt from Appendix A of MCWD Rules included below), the applicant must incorporate filtration or other non- volume-reduction practices to achieve phosphorous control in an amount equivalent to that which would be achieved through the required volume reduction. Equivalent phosphorus control may be demonstrated by any technically accepted method, including use of a removal rate stated in the Minnesota Stormwater manual. For a filtration practice, in place of specific demonstration, an applicant may treat twice the required volume reduction, as calculated in accordance with Appendix A to this rule.
- An action may not increase the peak runoff rate from the site, in aggregate, for design storm events. An applicant proposing to increase peak runoff at a specific point of site discharge must demonstrate no adverse local impact on water resource values or infrastructure. Aggregate compliance for all site boundary discharge will be determined with respect to runoff not managed in a regional facility.
- There must be two feet of vertical separation between the 100-year high water elevation of a waterbody or stormwater practice and the low opening of any structure, unless the structure opening is hydraulically disconnected from the waterbody or practice.

Excerpt from Appendix A of MCWD Stormwater Rules:

**APPENDIX A:
Volume Reduction Practice Credit Schedule**

Practice	Design Guidance	Volume Control (VC) Credit	Calculation Methods
Surface Infiltration Basin	Minnesota Stormwater Manual	Volume provided	VC= Volume below overflow elevation ⁽¹⁾
Underground Infiltration Trench	Minnesota Stormwater Manual	Void volume provided	VC = Volume below overflow elevation ⁽¹⁾
Capture and Reuse of Stormwater	Submit pump design plans and hydrologic calculations	Volume capacity to capture and reuse runoff from a 1- inch rainfall event	Submit operating plan and calculations for reuse system to document annual volume reuse during dry, wet, and average years
Permeable Surface	Minnesota Stormwater Manual	1-inch credit over the surface area	VC = 1/12 x area of permeable surface
Soil Amendment(s) ⁽²⁾	Minnesota Stormwater Manual	0.5-inch credit over the area of soil amendment area ⁽³⁾	VC = 0.5/12 x area of soil amendment

Non-Volume-Reduction Practice Credit Schedule⁽⁴⁾

Practice	Design Guidance	Phosphorus Control (PC) Credit	Calculation Methods
Filtration	Minnesota Stormwater Manual	Volume provided (must be twice the required volume reduction) ⁽⁵⁾	PC = Volume below overflow elevation (filtered volume is not considered)

⁽¹⁾ Volume infiltrated during a rainfall event shall not be credited towards the volume reduction requirement. This is a simple approach for designers and for reviewers to verify conformance to the standard; a stormwater model is not needed for calculations. This is a conservative assumption because infiltration of stormwater in Minnesota is an evolving practice. MCWD will continue to research current trends, collect and analyze monitoring data, and utilize modeling and engineering methods to assess the effectiveness of the standards to achieve the water quality goals of the District.

⁽²⁾ This method is considered as a volume reduction practice only for an application that proposes less than an acre of new or fully reconstructed impervious area.

⁽³⁾ For SCS TR-55 cover type "open space (lawns)," compacted soil (HSG C, curve number 74) begins to generate runoff with a 0.9-inch rainfall. A HSG B soil (curve number 61) begins to generate runoff with a 1.5-inch rainfall. Therefore, preserving the infiltration capacity of HSG B soil through the use of soil amendments yields an approximate 0.5-inch volume reduction credit.

⁽⁴⁾ Other non-volume-reduction practices not listed in this table may be used. Equivalent phosphorus control must be demonstrated in accordance with subsection 3(c) of this rule.

⁽⁵⁾ The Minnesota Stormwater Manual reports that nutrient removal (total phosphorus) is approximately half as effective for filtration as infiltration.

2.3 Minnesota Pollution Control Agency

The Minnesota Pollution Control Agency (MPCA) regulates stormwater runoff by administering the National Pollution Discharge Elimination System (NPDES) Permit. The NPDES Permit is required for any projects that disturb more than one (1.0) acre of area. The permanent stormwater management requirements of the Permit are triggered if the project proposes to increase the impervious surface area by more than one acre.

The overall project disturbance is over one acre; therefore, a Stormwater Pollution Prevention Plan (SWPPP) will need to be prepared and a NPDES Permit obtained through the MPCA. The proposed BMP(s) must be capable of retaining on site one (1) inch of runoff from the new impervious surfaces created by the project. If onsite retention is not possible based on contaminated soils, proximity to groundwater, bedrock depth or impermeable soils, the water quality volume shall be treated using other best management practices outlined in the Permit.

Section 3 Methodology

The following section describes the methodology used to complete the stormwater management plan.

3.1 Hydrology

The site was analyzed using HydroCAD for pre- and post-development conditions. Runoff generation was estimated using TR-20 methodology.

Runoff from pervious and impervious areas was calculated separately. **Table 3.1** summarizes the rainfall depths that were used in the peak discharge analysis. Note that all 24 hour events used the MSE-3 distribution.

Table 3.1 Summary of NOAA Atlas 14 24-Hour Rainfall Depths (inches)

2-Year	10-Year	100-Year
2.85	4.21	7.24

Time of concentration (Tc) for existing conditions was calculated using the TR-55 methodology. For proposed conditions subwatersheds, Tc was recalculated for newly developed areas. For unchanged subwatersheds the Tc was kept the same as existing conditions.

Curve numbers (CN) were selected for each subwatershed based on the land use, soil conditions and impervious surface area. These parameters were used to select the appropriate CN using TR-55 methodology.

3.2 Hydraulics

Hydraulic routing within HydroCAD was computed using the Dyn-Stor-Ind methodology.

Section 4 Analysis

4.1 Existing Conditions

The following is a summary of the information used for the existing conditions analysis.

4.1.1 Site Topography

The project site is approximately 5 acres with elevations between 994' and 1010'. Most of the site drains west to the existing large pond constructed as part of the Woodland Cove Development. The northwest side of the site, which is primarily the proposed access road, drains offsite to the east into a large wetland complex.

4.1.2 Soils

Soils throughout the site were classified Hydrologic Soil Group (HSG) Type C and D based on the soil borings taken on the site (see Appendix B).

4.1.3 Land Use

Existing subcatchments were delineated based on existing topography (MnTOPO) and survey data. Weighted curve numbers were computed based on land use and the soil borings results. Curve numbers for each land use and soil class are summarized in **Table 4.1**. Subcatchment parameters are summarized in **Table 4.2**.

Table 4.1 Summary of Existing CN Values

CN Descriptions	Assumptions	CN	Total Area (ac)	% of Total Area
Grass	Good Condition, HSG C	74	2.8	9.5
Grass	Good Condition, HSG D	80	4.2	14.2
Woods	Good Condition, HSG C	70	11.2	37.8
Woods	Good Condition, HSG D	77	8.6	29.1
Existing Impervious	Existing streets and homes	98	0.9	3.0
Wetland	Impervious	98	1.9	6.4
		Total	29.6	100

Table 4.2 Existing Subcatchment Parameters

Subcatchment	Pervious CN	Impervious % ¹	Total Area (ac)	Tc (min)
EX1	78	4.5	4.5	18.6
EX2	75	12.3	17.8	24.7
EX3	70	4.2	6.8	22.6
EX4	76	22.1	0.5	15.1
		Total	29.6	-

- 1) Pond/water/wetland area included in the impervious percentage

4.2 Proposed Conditions

The following is a summary of the information used for the proposed conditions analysis.

4.2.1 Site Topography

The site topography in proposed conditions generally matches existing conditions with the two main drainage patterns. The entire east side of the study area (what drains to the wetland) is unchanged.

4.2.2 Soils

Soils are unchanged between existing and proposed conditions.

4.2.3 Land Use

The site will be developed for a water treatment plant. The new impervious area of the site reflects what's added for the plant, access road, and additional impervious such as generator pad, parking, etc. The proposed land use and curve numbers used are shown in **Table 4.3**. The parcel being developed is approximately 6.2 acres, of which 0.85 acres (14%) is new impervious surface.

Proposed subcatchments were delineated based on proposed grading and storm sewer routing. Plans and grading from the adjacent development, the Woodland Cove 4th Addition, were used to delineate the drainage areas along the Woodland Cove 4th Addition/WTP Site boundary.

Table 4.4 summarizes proposed subcatchment runoff parameters. **Figure 3** shows the proposed site grading, storm sewer, and subcatchments. Subcatchments that were left undisturbed and not altered during construction used the calculated time of concentration values from existing conditions (which is the entire east side of the study area/what drains to the wetland).

Table 4.3 Summary of Proposed CN Values

CN Descriptions	Assumptions	CN	Total Area (ac)	% of Total Area
Grass	Good Condition, HSG C	74	2.7	9.1
Grass	Good Condition, HSG D	80	3.3	11.1
Woods	Good Condition, HSG C	70	11.2	37.8
Woods	Good Condition, HSG D	77	8.6	29.1
Existing Impervious	Existing streets and homes	98	0.8	2.7
New Impervious	WTP and related impervious	98	0.9	3.1
Pond	Impervious	98	0.2	0.7
Wetland	Impervious	98	1.9	6.4
		Total	29.6	100

Table 4.4 Proposed Subcatchment Parameters

Subcatchment	Pervious CN	Impervious % ¹	Total Area (ac)	Tc (min)
PR1	80	55.8	1.3	6.0
PR2	75	12.3	17.8	24.7
PR3	77	8.2	1.3	15.9
PR4	80	24.7	0.2	11.5
PR5	76	5.0	1.3	16.2
PR6	75	47.8	0.5	6.0
PR7	70	4.2	6.7	22.6
PR8	76	22.1	0.5	15.1
		Total	29.6	-

1) Pond/water/wetland area included in the impervious percentage

4.2.4 Basin Summary and Routing

The project is proposing to construct one new stormwater pond with a filtration shelf (Pond 1) and one small raingarden (Basin 2) to meet the stormwater regulations. Both Pond 1 and Basin 2 will route west to the existing pond of the Woodland Cove Development. The HOA of the Woodland Cove development has approved of the onsite pond discharging into their existing pond. The site is graded to drain as much site impervious as possible to the pond.

Both BMP's will have pretreatment. Pond 1 serves as its own pretreatment in providing sufficient dead storage. The raingarden, Basin 2, will be pretreated by the grassed swale area upstream.

Section 5 Results

The following is a summary of the results of the analysis and the project's compliance with stormwater regulations.

5.1 Basin High Water Levels

Table 5.1 summarizes the performance of the basins including 100-year HWL's and freeboard from the lowest nearby structure. The basins were designed to meet the freeboard requirements for low floor and low entry. The basins were designed to meet 2 feet of freeboard between the structure and the HWL. Note that the finished floor elevation of the WTP is 1010.0 but the homes of the adjacent Woodland Cove development to the north are lower (1008.0) and are what's reported for Basin 2.

Table 5.1 Stormwater Basin Performance

Location	Normal Water Level/Top of Sand	100-Year HWL	Lowest Nearby Structure Elev.	Freeboard (ft)
Pond 1	1002.0	1004.2	1010.0	5.8
Basin 2	1003.0	1004.9	1008.0	3.1

1) All structure elevations reported are part of the Woodland Cove Development

Table 5.2 summarizes the HWLs in existing and proposed conditions for the wetland complex to show that the development does not adversely affect flood concerns in this area.

Table 5.2 Wetland 1 Water Level Summary (feet)

Condition	2-Year	10-Year	100-Year
Existing	988.7	989.0	989.5
Proposed	988.7	989.0	989.5
Difference	0.0	0.0	0.0

5.2 Rate Control

The site was analyzed to determine the pre- and post-development runoff rates discharging from the site. The site has two main discharge points: west to the Woodland Cove Pond and east to the wetland complex. Ultimately both discharge points flow into Lake Minnetonka. **Table 5.3-5.4** show the existing and proposed discharge at each of these sites. See **Appendix C** for the pre- and post-development HydroCAD summaries.

Table 5.3 Site Discharge: East (cfs)

Condition	2-Year	10-Year	100-Year
Existing	17.1	36.3	83.4
Proposed	17.1	36.3	83.4
Difference	0.0	0.0	0.0

Table 5.4 Site Discharge: West (cfs)

Condition	2-Year	10-Year	100-Year
Existing	6.3	12.6	27.9
Proposed	4.0	11.3	21.2
Difference	-2.3	-1.3	-6.7

5.3 Water Quality Volume

MCWD requires that projects provide a water quality treatment volume onsite in the amount equivalent to one inch (1.0") of runoff generated by the total site impervious surface, which is both new and existing onsite impervious. The project is proposing to meet its water quality treatment volume using filtration given the poor soils on the site, therefore the abstraction volume required must be doubled per MCWD regulation in order to meet phosphorus control standards. With this doubling, the MCWD regulation is more strict than the City regulation (which is 1.0" of runoff regardless of BMP), therefore the site was designed for the MCWD regulation. **Table 5.5** summarizes the site impervious, and the required abstraction volume.

Table 5.5 Abstraction Requirements

Total Site Impervious Area (ac)	Standard WQ Runoff Depth Required (in)	WQ Runoff Depth Required (in) [When Using Filtration]	Required Abstraction Volume (ac-ft)	Required Abstraction Volume (cf)
0.99	1.0	2.0	0.17	7,200

Two filtration systems are used to meet the site's requirements for water quality volume: the filtration shelf of Pond 1 and the standalone filtration basin (Basin 2). **Table 5.6** summarizes the filtration systems' water quality provided and **Table 5.7** summarizes the total abstraction from both systems. Seen in **Table 5.7** the site is meeting the required filtration abstraction volume therefore the volume and phosphorous control requirements are met.

Table 5.6 Filtration Basin Summary

BMP	Top of Sand	Sand Area (sq.ft.)	Filtration Zone	Design Filtration Rate (in/hr)	Filtration Zone Volume Provided (cf)	Drawdown time (hr)
Pond 1	1002.0	2,100	1002-1003	1.0	7,700	44
Basin 2	1003.0	300	1003-1003.9	1.0	470	19

Table 5.7 Abstraction Summary

BMP	Abstraction Volume Credit (cf)
Pond 1	7,700
Basin 1/Ditch	470
Total Abstraction Volume Provided	8,170
Total Abstraction Volume Needed	7,200
Surplus Abstraction Volume	+930

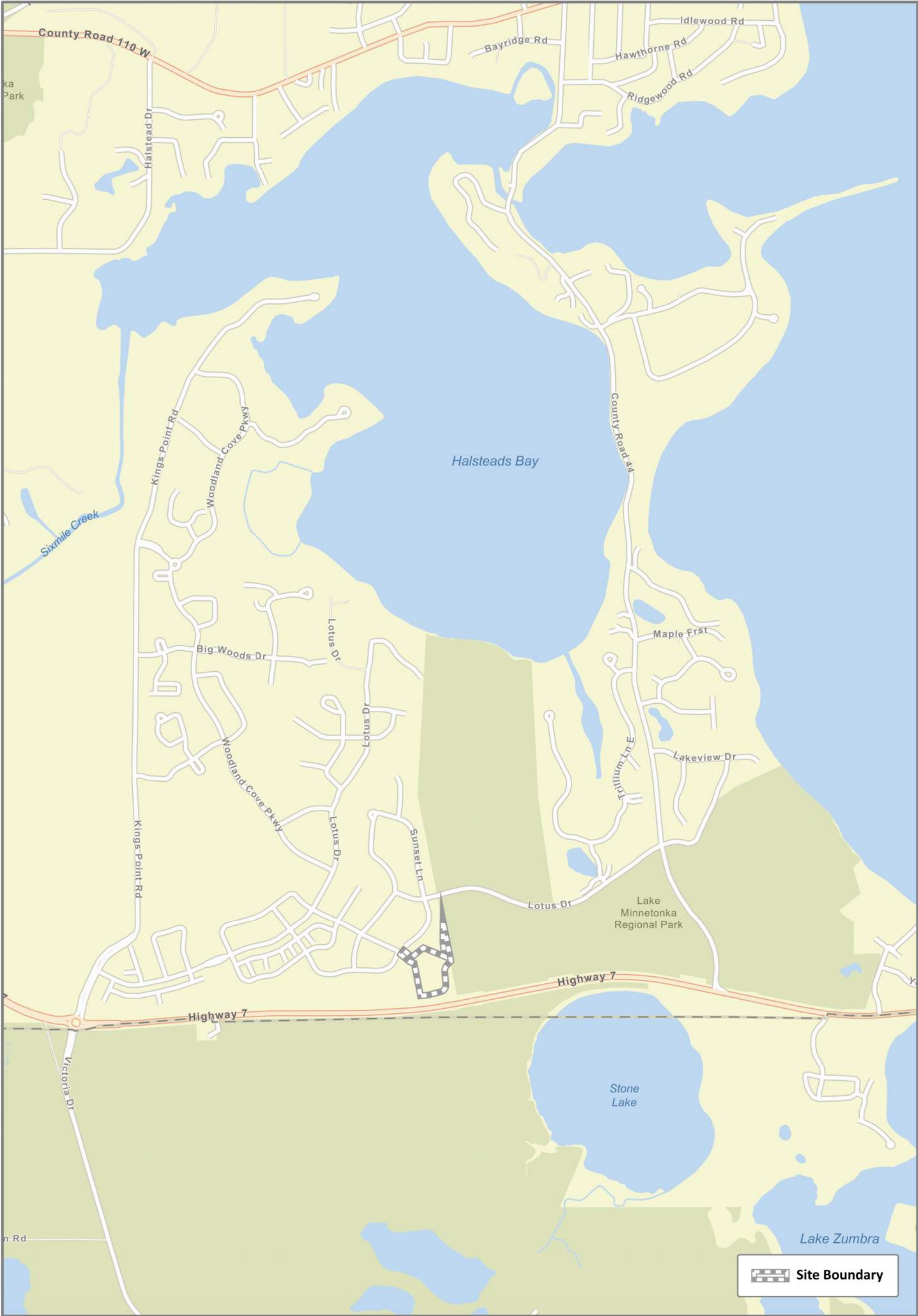
5.4 Department of Labor and Industry Rule

Storm sewer entering ponds must be a certain height above the pond normal water level. A rule from the MN Department of Labor and Industry states this height is the depth in the pond where the live storage is 1800 cubic feet per acre of incoming drainage area in addition to the volume from 1 inch of rainfall over incoming impervious surface. **Table 5.8** summarizes these volumes and the storm pipe elevations for Pond 1 and the offsite pond into which Pond 1 discharges.

Table 5.8 DOLI Storm Sewer Elevation Summary

Location	Drainage Area (ac)	Impervious Area (ac)	1800 cf/ac Volume (cf)	1" Impervious Runoff Volume (cf)	Total DOLI Volume (cf)	Pond NWL	Minimum Storm Sewer Elevation
Pond 1	2.0	0.6	3,600	3,000	6,600	1002.0	1002.9
Woodland Cove Pond 2	52.5	16.9	94,500	61,300	155,800	997.4	999.1
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Appendix A: Figures



Information depicted may include data unverified by AE2S. Any reliance upon such data is at the user's own risk. AE2S does not warrant this map or its features are either spatially or temporally accurate.
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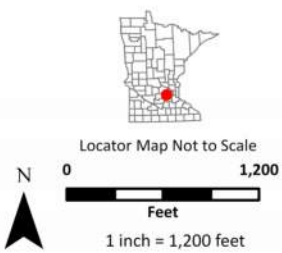
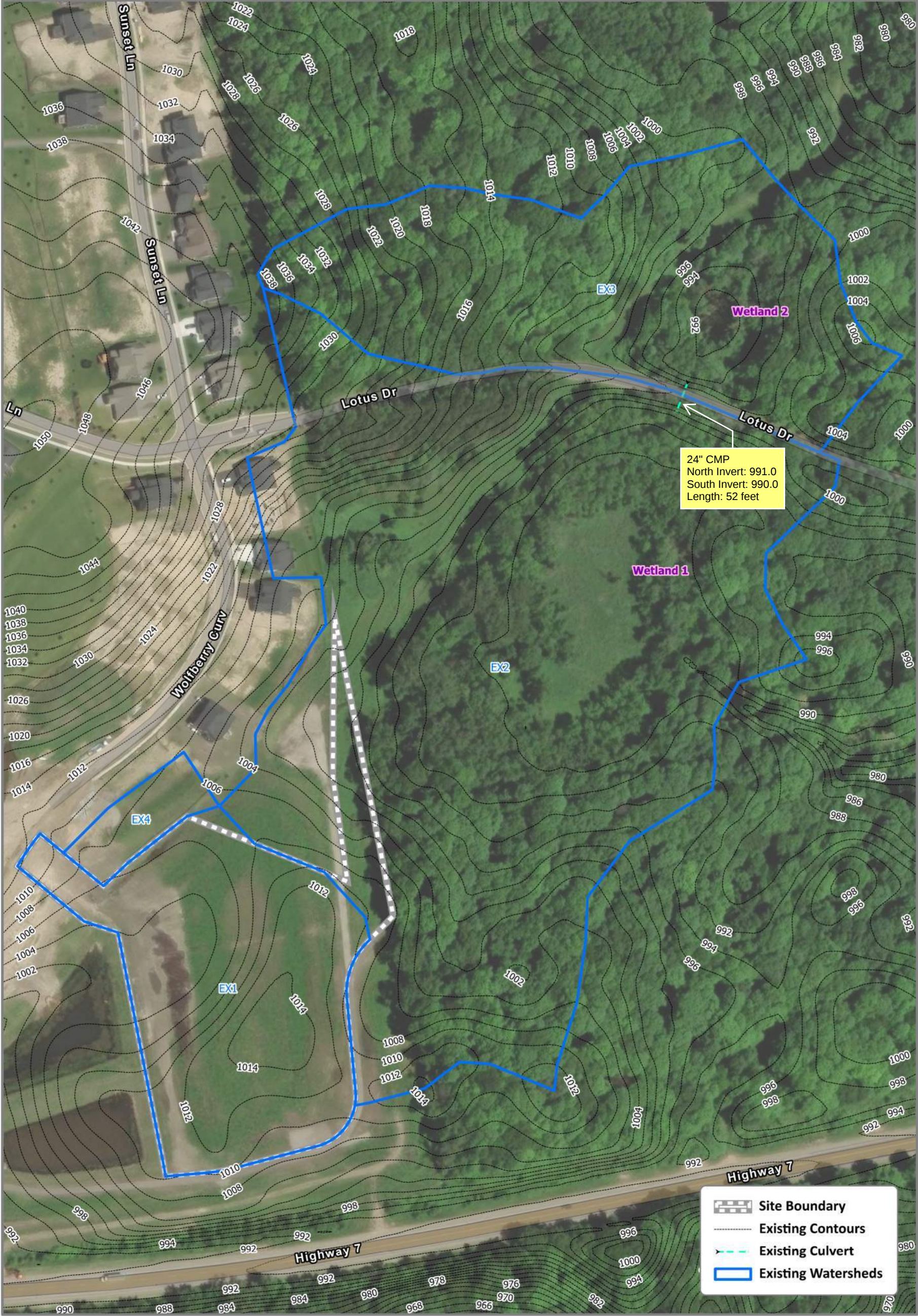


Figure 1
SITE LOCATION MAP

WOODLAND COVE WTP/CITY OF MINNETRISTA
Minnetrista | Hennepin County, MN



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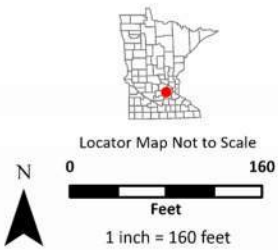
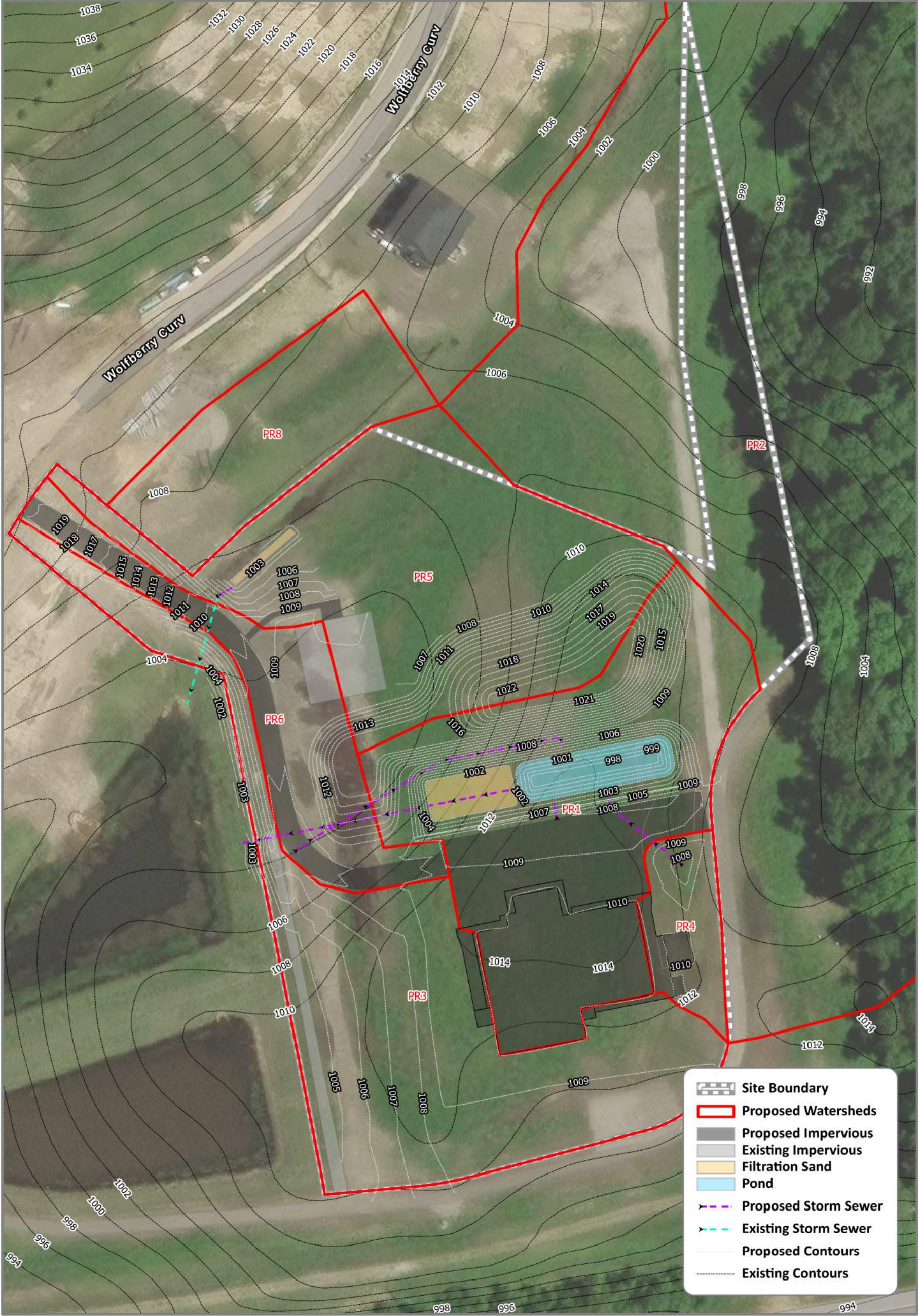


Figure 2
EXISTING CONDITIONS MAP

WOODLAND COVE WTP / CITY OF MINNETRISTA
Minnetrista | Hennepin County, MN



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Figure 3
PROPOSED CONDITIONS MAP

WOODLAND COVE WTP / CITY OF MINNETRISTA
Minnetrista | Hennepin County, MN



Date: 9/30/2025

Appendix B: Geotechnical Information



GEOTECHNICAL REPORT

WOODLAND COVE – WATER TREATMENT PLANT

MINNETRISTA, MINNESOTA

March 31, 2025

Prepared for:
City of Minnetrista
7701 County Road 110 W
Minnetrista, MN 55364

WSB PROJECT NO. 026658-000



GEOTECHNICAL REPORT

WOODLAND COVE – WATER TREATMENT PLANT

**FOR
CITY OF MINNETRISTA**

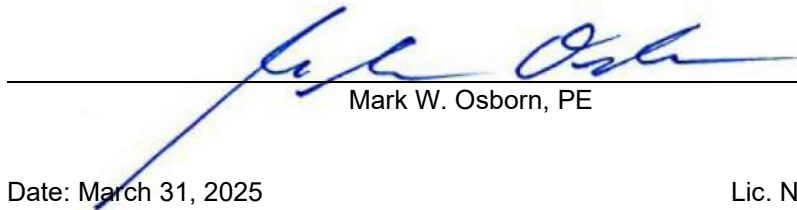
March 31, 2025



GEOTECHNICAL REPORT

CERTIFICATION

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



Mark W. Osborn, PE

Date: March 31, 2025

Lic. No. 41362



March 31, 2025

Gary Peters
Public Works Director
City of Minnetrista
7701 County Road 110 West
Minnetrista, MN 55364

Re: Geotechnical Report
Woodland Cove – Water Treatment Plant
WSB Project No.: 026658-000

We have conducted a geotechnical subsurface exploration program for the above-mentioned project. This report contains our soil boring logs, an evaluation of the conditions encountered in the borings and our recommendations for dewatering, suitable foundation type, allowable soil bearing pressure for footing design, subgrade improvements, underground utilities, pavement design, and other geotechnical related design and construction considerations.

If you have questions concerning this report or our recommendations, or regarding construction material testing for this project, please call us at 952.737.4660.

Sincerely,

WSB

A handwritten signature in blue ink, appearing to read "Mark Osborn".

Mark Osborn, PE
Senior Geotechnical Engineer

Attachment:
Geotechnical Report

MWO/ams

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Appendix A

Soil Boring Exhibit

Logs of Test Borings

Symbols and Terminology on Test Boring Log

Notice to Report Users Boring Log Information

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Unified Soil Classification System (USCS)

1. INTRODUCTION

1.1 Project Location

The site is in the southern half of Outlot B of the 11th Addition of Woodland Cove in Hennepin County. The nearby address is 4662 Wolfberry Curve, Minnetrista, Minnesota. The approximate soil boring locations can be found on the Soil Boring Exhibit in **Appendix A**.

1.2 Project Description

It is proposed to construct a new water treatment facility along with a paved surface parking lot.

The following structural loads were provided on the Request for Proposal by AE2S, prepared by Aaron Volmer, dated May 24, 2024: point loads of 300 kips, wall loads of 7.5 kips per lineal foot, and mat slab loadings of 2250 psf.

WSB has developed foundation recommendations for this project in consideration of the proposed layout, loadings, and structural configurations as understood at this time. When the designer develops additional information about final design structural loadings, building configuration, or other significant factors, the recommendations presented herein may no longer apply. WSB should be made aware of the revised or additional information in order to evaluate the recommendations for continued applicability.

1.3 Purpose and Project Scope of Services

Gary Peters with The City of Minnetrista authorized this scope of service. In order to assist the design team in preparing plans and specifications, we have developed recommendations for designing utilities, foundations, slabs, and pavements. As such, we have completed a subsurface exploration program and prepared a geotechnical report for the referenced site. This stated purpose was a significant factor in determining the scope and level of service provided. Should the purpose of the report change the report immediately ceases to be valid and use of it without WSB's prior review and written authorization should be at the user's sole risk.

Our authorized scope of work has been limited to:

1. Clearing underground utilities utilizing Gopher State One Call.
2. Mobilization / demobilization of an all-terrain track mounted drill rig and a truck mounted drill rig.
3. Drilling 1 standard penetration borings to 100-foot depth, or auger refusal.
4. Drilling 6 standard penetration borings to about 45-foot depths.
5. Drilling 3 standard penetration borings to about 20-foot depths.
6. Sealing the borings per Minnesota Department of Health procedures.
7. Perform soil classification and analysis.
8. Review of available project information and geologic data.
9. Providing this geotechnical report containing:
 - a. Summary of our findings.
 - b. Discussion of subsurface soil and groundwater conditions and how they may affect the proposed utilities and pavements.
 - c. Estimated allowable bearing capacity of the soils.
 - d. Estimated excavation depths to suitable soils.
 - e. Estimated R-value of the soils.
 - f. Recommended pavement section.
 - g. A discussion of soils for use as structural fill and site fill.

2. PROCEDURES

2.1 Boring Layout and Soil Sampling Procedures

WSB completed 10 standard penetration soil borings at the project site. AE2S recommended the boring depths and selected the desired locations. Our field crew staked the borings using the supplied site plan. The approximate boring locations are shown on the Soil Boring Exhibit in **Appendix A** which is an aerial photo.

We completed the borings between January 5 and February 7, 2025, with a truck-mounted CME-55 drill rig and an all-terrain track-mounted CME-55 drill rig, operated by a two-person crew. The drill crew advanced the borings using continuous hollow stem augers. The drilling information is provided on the boring logs.

The drill crew sampled the soil in advance of the auger tip at two and one-half (2 ½) foot intervals to a depth of 20 feet and then at five (5) foot intervals thereafter to the termination depth of the boring. The soil samples were obtained using a split-barrel sampler which was driven into the ground during standard penetration tests in accordance with ASTM D 1586, Standard Method of Penetration Test and Split-Barrel Sampling of Soils. The materials encountered were described on field logs and representative samples were containerized and transported to our laboratory for further observation and testing.

The samples were visually observed to estimate the distribution of grain sizes, plasticity, consistency, moisture condition, color, presence of lenses and seams, and apparent geologic origin. We classified the soils according to type using the Unified Soil Classification System (USCS). A chart describing the USCS is included in **Appendix A**.

2.2 Groundwater Measurements and Borehole Abandonment

The drill crew observed the borings for free groundwater while drilling and after completion of the borings. These observations and measurements are noted on the boring logs. The crew then backfilled the borings to comply with Minnesota Department of Health regulations.

2.3 Boring Log Procedures and Qualifications

The subsurface conditions encountered by the borings are illustrated on the Logs of Test Borings in **Appendix A**. Similar soils were grouped into the strata shown on the boring logs, and the appropriate estimated USCS classification symbols were also added. The depths and thickness of the subsurface strata indicated on the boring logs were estimated from the drilling results.

The transition between materials (horizontal and vertical) is approximate and is usually far more gradual than shown. Information on actual subsurface conditions exists only at the specific locations indicated and is relevant only to the time the exploration was performed. Subsurface conditions and groundwater levels at other locations may differ from conditions found at the indicated locations. The nature and extent of these conditions would not become evident until exposed by construction excavation. These stratification lines were used for our analytical purposes and due to the aforementioned limitations, should not be used as a basis of design or construction cost estimates.

3. EXPLORATION RESULTS

3.1 Site and Geology

The site was partially covered with snow at the time of drilling. This site is currently a new development under residential construction.

Boring elevations ranged from 999.0 to 1009.0 feet. Online topographical maps indicate the site is sloped downwards to the east and south.

Geologic origins can be difficult to determine solely from boring samples. We referenced online geologic data of the area and used our experience to help determine geologic origin of the soils, however only a detailed geologic exploration would accurately determine the geologic history of the site.

The Hennepin County Geologic Atlas indicates the surficial geology of the area is mostly glacial deposits consisting of unsorted mixtures of sands, silts, and clays with scattered cobbles.

3.2 Subsurface Soil and Groundwater Conditions

The boring profile generally consisted of topsoil materials overlying fill, followed by glacial deposits.

Topsoil

The topsoil encountered in the borings consisted of 4 – 6 inches of lean clays.

Fills

The fills encountered in the borings generally consisted of a mixture of lean clays and clayey sands and were 2 – 7 feet in thickness where encountered.

Organics

Organic, or potentially organic, soils were encountered in Borings B-4, B-7, and B-10. Multiple Organic Content tests were performed. The results from Boring B-7 and B-10 were 3% and 6%, respectively. According to the MnDOT Geotechnical Manual, 2 – 5% Organic Content is considered slightly organic and 6 – 10% is considered organic. The organic soils were dark brown in color and ranged from 2 to 4 feet in thickness.

Please note that the slightly organic and organic soils encountered were limited to the fills.

Glacial

The glacial deposits encountered consisted of lean clays, clayey sands, silts, and sands. The lean clays and clayey sands were shades of brown and gray with red laminations and were moist to wet. The silts were light brown and were moist. The sands were brown in color and were waterbearing.

Boring B-1 encountered auger refusal. Auger refusal occurs when the auger can no longer advance with the soil drilling technique being used, primarily due to boulders or bedrock, or other foreign debris.

Boring Profiles

Table 1 below presents the existing subgrade profiles.

Table 1: Existing Profiles

Boring No.	Topsoil Thickness (inches)	Subgrade Soils (Upper 4 feet)
B-1	4	Clayey Sand (fill), Clayey Sand
B-2	5	Lean Clay (fill), Clayey Sand (fill)
B-3	5	Clayey Sand (fill)
B-4	5	Lean Clay (fill), Lean Clay
B-5	5	Lean Clay (fill), Clayey Sand
B-6	5	Lean Clay (fill), Lean Clay (fill)
B-7	4	Lean Clay (fill)
B-8	4	Lean Clay (fill), Lean Clay (fill)
B-9	6	Lean Clay (fill), Lean Clay
B-10	5	Organic Lean Clay (fill)

3.3 Strength Characteristics

The penetration resistance N-values of the materials encountered were recorded during drilling and are indicated as blows per foot (BPF). Those values provide an indication of soil strength characteristics and are located on the boring log sheets. Also, visual-manual classification techniques and apparent moisture contents were also utilized to make an engineering judgment of the consistency of the materials.

Table 2 presents a summary of the penetration resistances (N-value which are indicated by Blows Per Foot BPF) in the soils for the borings completed and remarks regarding the material strengths of the soils.

Table 2: Penetration Resistances

Soil Type	Classification	Penetration Resistances	Remarks
Fill (cohesionless)	SC	13 – 16 BPF	Medium dense
Fill (cohesive)	CL, OL	7 – 12 BPF	Loose to medium dense
Glacial (cohesionless)	SP, SC, ML	9 – 24 BPF**	Loose to medium dense
Glacial (cohesive)	CL	6 – 22 BPF**	Soft to hard

** Potentially frozen soils resulting in artificially high N-values.

The preceding is a generalized description of soil conditions at this site. Variations from the generalized profile exist and should be assessed from the boring logs, the normal geologic character of the deposits, and the soils uncovered during site excavation.

3.4 Groundwater Conditions

WSB took groundwater level readings in the exploratory borings, reviewed the data obtained, and discussed its interpretation of the data in the text of the report. Note that groundwater levels may fluctuate due to seasonal variations (e.g., precipitation, snowmelt, and rainfall) and/or other factors not evident at the time of measurement.

Table 3 below is a summary of the estimated water levels at our borings.

Table 3: Groundwater Measurements

Boring No.	Ground Surface Elevation	Estimated Depth to Groundwater	Estimated Depth of Gray Colored Soils	Estimated Groundwater Elevation
B-1	1007.5	66	4.5	941.5
B-2	1006.0	n/a	7	Below 960.0
B-3	1006.5	19	13	993.5
B-4	1007.0	18	2	989.0
B-5	1007.0	19	2.5	988.0
B-6	1008.0	n/a	13	Below 962.0
B-7	1009.0	n/a	9	Below 963.0
B-8	1007.0	17	4	990.0
B-9	999.0	n/a	3.5	Below 978.0
B-10	999.0	4	4	995.0

n/a – indicates ground water was not encountered. Elevations are rounded to the highest ½ foot.

Gray colored soils were encountered in each boring. Gray colored soils can be an indication of long-term saturation conditions and could show potential groundwater elevations. The shallow groundwater could present an issue to excavations and placement of foundations and for utility installation. It is our opinion that wet soils, waterbearing sand lenses, and perched groundwater could be encountered at this site and could affect construction of foundations and utilities.

Stone Lake is located approximately ½ mile to the southeast of the project. According to online data from the Minnesota Department of Natural Resources, Stone Lake has an ordinary high-water level of 945.0 feet.

The bore holes were only left open for a short period of time, and groundwater levels may not have stabilized.

It should be noted that groundwater readings are difficult to obtain in cohesive soils such as the lean clays indicated in the boring logs. These soils have a low permeability and take a long period of time to obtain groundwater readings in. If more accurate subsurface water levels are needed, we recommend piezometers be installed to determine the groundwater level over several months. Monitoring groundwater table elevation could occur up to the time of construction. This work was outside our scope of services.

4. ENGINEERING ANALYSIS AND RECOMMENDATIONS

4.1 Discussion

Organic soils and vegetated root zones are not suitable for structural support and should be removed from the construction areas.

Many of the soils encountered were wet. Wet soils encountered in our borings will likely be wet when excavated and require significant drying prior to reuse as structural backfill and fill. Drying of wet clayey soils is generally accomplished via discing and drying which requires time and an area to place and spread the wet soils. Considering utility trenches typically need to be backfilled shortly after placing the utilities, time is a factor and many project sites do not plan an area for drying or have the room to spread the soils. In addition, construction during wet and cooler times of the year will inhibit the effectiveness of this method. In such conditions excavation and replacement of wet soils or chemical stabilization/drying such as the use of lime may be considered. We suggest the contractors bidding on the work have a soil moisture conditioning plan to allow for reuse of as much onsite soils as possible and to reduce import of sand. A cost for removal and replacement of wet clays should also be provided.

No information was provided to us regarding density tests or excavation observations for the existing fills encountered at the boring locations. Generally, fills that are not documented are recommended for removal and replacement with an engineered fill. Construction on existing fills has a higher risk of differential settlement. The best option would be complete removal of the existing fill materials, and replacement with engineered fill.

General

Based on the results of our borings, the glacially deposited soils generally appear capable of supporting the structures. However, some of the silty soils are locally wet and loose. Wet silt soils in combination with construction traffic may become unstable and require partial removal.

It is our opinion that groundwater could be encountered by excavations at this site and could affect construction of foundations and utilities. It is possible that groundwater levels could rise above the planned lower floor and foundation elevations. Consideration should be given to raising the lowest level floors to account for fluctuations in groundwater.

Generally, the soils in the upper 4 feet of the subgrade influence pavement performance the most. The soils within the pavement subgrade consist of clays, which are frost susceptible soils. Consideration should be given to partially subcutting these soils and replacing them with a non-frost susceptible granular fill to reduce the potential frost heave below the pavement section.

4.2 Building Area Preparation

We recommend the removal of the fill and organics from the construction area if encountered. Loose/loosened sands either at bottom of footing or slab subgrade elevations should be surface compacted with a large vibratory roller having a drum diameter of at least five feet (5') and a static dead weight of at least ten (10) tons prior to placement of engineered fill and backfill or concrete.

Based on the borings, recommended excavation depths are indicated in Table 4.

Table 4: Estimated Excavation Depths

Boring	Surface Elevation	Estimated Excavation Depth to Suitable Soils	Estimated Bottom of Excavation Elevation*
B-1	1007.0	2.5	1004.5
B-2	1006.0	4	1002.0
B-3	1006.5	4.5	1002.0
B-4	1007.0	2	1005.0
B-5	1007.0	3	1004.0
B-6	1008.0	5	1003.0
B-7	1009.0	7	1002.0

* Estimated Bottom of Excavation Elevations were rounded to the lowest ½ foot.

Excavations for removal of unsuitable soil may be deeper than indicated in our boring locations noted above, and depths will vary between the boring locations.

As discussed, the fills are recommended for removal and replacement with a suitable granular fill. If the owner is willing to accept higher risks of settlement, the onsite granular fills may be relied upon for support of the retaining walls. We recommend the granular fills be observed for any detrimental materials and surface compacted with a minimum of 2 passes to provide a uniform subgrade. Based on the fills encountered in the borings, the additional risk for this alternate option is fairly low.

Where unsuitable soils (organics, wet clays, or silts) are encountered in the fills or glacial deposits, we recommend they be subcut an additional 2 feet and replaced with an engineered fill.

At the base of footing excavations, if wet silt or clay soils are loose/soft or become loose/soft under construction traffic they should be partially subcut. We recommend the wet, loose/soft silt or clay soils be subcut two feet (2') below the base of wall footings and below column footings to a depth of half (1/2) the width of the column footings. The sub-excavations should be oversized by at least one foot (1') beyond the edge of footings for each foot of depth below the bottom of footing elevations (1-horizontal to 1-vertical lateral oversizing). Because the depth and lateral extent of the sub-excavations will vary away from our borings, we recommend a qualified engineering technician working under the direction of a registered professional geotechnical engineer observe and evaluate the excavation bases during construction. Alternately, a lean concrete backfill could be placed from the bottom of sub-excavation to the bottom of footing and should be at least as wide as the footing.

Based on the borings, it appears that the on-site soil can generally be reused as structural backfill provided it is moisture conditioned and can be compacted to project specifications. However, silt soils will be difficult to place and compact especially when wet. We recommend they be used in landscaped areas.

The site should be graded to prevent water from ponding on clayey soils and potentially softening them. Furthermore, it should be noted that it has been our experience that fine-grained, relatively clean, sands and silts such as those encountered on this site will likely not provide adequate support to construction traffic. As such, we recommend consideration be given to using six inches (6") of crushed aggregates to stabilize construction roads, entrances, and staging areas.

4.3 Foundation Recommendations

We recommend that the building in this development be supported on conventional spread footings bearing on naturally occurring firm clay or medium dense clayey sand or clean sand, or on engineered fill.

Based on the borings, it is our opinion the footings throughout may be designed for a net allowable soil bearing pressure not to exceed 3,000 pounds per square foot (psf).

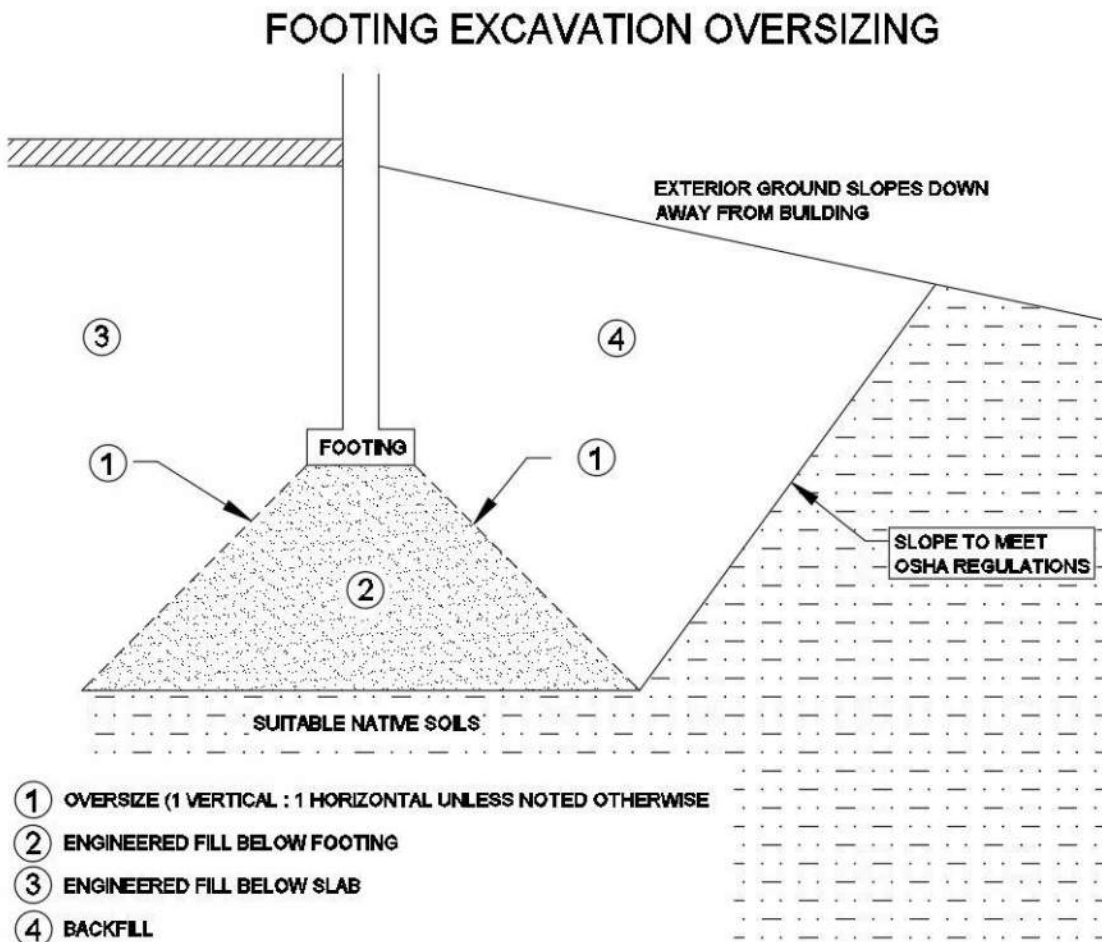
The allowable foundation bearing pressures apply to dead loads with design live load conditions. The design bearing pressure may be increased by one-third when considering transient loads which include wind or seismic conditions.

Frost protection should follow Minnesota Administrative Rules 1305.1809.

The factor of safety against shear or bearing capacity failure for this footing design would be three (3) or greater. If the site is prepared as recommended, we estimate that total and differential settlements (across a 30-foot span) corresponding to our assumed structural loads would be less than one inch (1") and one-half inch (1/2"), respectively, provided the bearing soils are not frozen or disturbed at the time of construction.

Figure 1 below indicates a graphical representation of a typical footing excavation oversizing.

FIGURE 1



4.4 At Grade Floor Slab

The mat slab loadings provided for the project are 2,250 pounds per square foot (psf). In cut areas where the floor slab will be placed upon firm to hard clays or sandy soils, a sand cushion for levelling should be sufficient. In areas where soft clays are present below the floor slab or where fills are placed to raise the

site, we recommend placement of a minimum of six inches (6") of sand below the slab to provide additional support. The sand should consist of a granular fill with less than fifty percent (50%) passing the #40 sieve and less than ten percent (10%) passing the #200 sieve.

Based on the above recommendations, it is our opinion that the modulus of subgrade reaction below the floor slab will be about 200 pounds per square inch per inch (psi/in).

If portions of the new floor slabs are to have a non-breathable covering, such as vinyl tile or linoleum, or if there is to be a room with wood flooring, we recommend that a vapor barrier be installed below those portions of the slab. If a vapor barrier is used, it should be installed in accordance with the recommendations given in the ACI Manual of Concrete Practice, Part 2, Section 302.3.2.3.

4.5 Exterior/Unheated Slabs

After removal of the vegetation and root zone, we anticipate that clayey soils will be present in the subgrades which are frost susceptible. We anticipate that heave could occur if such soils are wet and then freeze. Heaving slabs or stoops is not only an annoyance, especially in front of doorways, but can also create a tripping hazard.

In order to reduce potential frost heave at those critical areas, several options exist such as:

1. Removing the frost susceptible soils to frost depth and replacing it with relatively clean sand [not more than ten percent (10%) passing a #200 sieve] and providing sub-drainage.
2. Designing the slabs or steps to be supported on frost depth footings with a void form.
3. Placing insulating foam beneath and slightly beyond slabs.

4.6 Backfill and Fill Selection and Compaction

The on-site non-organic soils may be reused as backfill and fill, provided they are moisture conditioned and can be compacted to their specified densities. Wet soils that are excavated would need to be dried before being reused as an engineered fill. We recommend using a minimum of 2 feet of clean coarse sand with less than 50 percent passing the #40 sieve and less than 5 percent passing the #200 sieve when backfilling the bottom of a wet excavation.

Gravel or cobbles larger than 2 inches in diameter should not be placed within 2 feet of grading grade or utilities. We recommend that clayey soils be moisture conditioned to within +/-2 percent of the optimum moisture content as determined from their standard Proctor tests (ASTM D-698). Granular fills should be moisture conditioned to between -4% and +2% of the optimum moisture content. Fill should be spread in lifts of 6 inches, depending on the size and type of compaction equipment used.

Table 5 provides the recommended compaction levels.

Table 5: Recommended Level of Compaction for Backfill and Fill

Area	Percent of Standard Proctor Maximum Dry Density
Pavement: Within 3 feet of bottom of aggregate base and any area where total depth of fill exceeds 10 feet	100
Pavement: Greater than 3 feet below aggregate base	95
Utility Trench and Utility Structure Backfill	100
Landscaping (non-structural)	90
Mat Foundations (2,250 psf)	95

4.7 Corrosion Potential

Laboratory tests for corrosivity are included in Table 6 below.

Table 6: Corrosion Tests

Boring No.	Sample Depth (feet)	Sulfates (ppm)	Chlorides (ppm)	Resistivity (Ohm-cm)	pH
B-1	4.5-6	78.8	39.7	3953	8.7
B-1	14.5-15.5	59.7	25.0	2948	8.5
B-1	15.5-16	150.9	44.2	2546	8.5
B-1	27-28	322.9	37.6	1206	8.2
B-1	40-41	369.9	12.6	1139	8.1
B-1	65-66	501.2	119.3	1742	8.1
B-2	15	64.4	34.2	3364	8.4
B-3	40	316.7	37.8	1684	8.2
B-4	10	91.6	33.1	2291	8.5
B-5	30	307.9	55.4	2108	8.3
B-6	35	266.7	64.8	3948	8.1
B-7	25	207.6	19.7	3579	8.0
B-8	15	101.8	41.8	2694	8.4
B-9	15	132.4	29.7	2149	8.4
B-10	15	121.1	33.6	2333	8.5

Based on the above test results the soils would be considered corrosive to moderately corrosive to steel. Based on the lab resistivity results, corrosion protection for any steel would be recommended in the clayey soils. Topsoil and organic clays should also be considered corrosive and protection should be provided where needed.

The sulfate results ranged from 59.7 to 501.2 ppm and in areas were well above the recommended limits of 150 ppm. Based on the test results it is our opinion that alternate types of sulfate resistant concrete should be considered for this project.

The chloride results ranged from 12.6 to 119.3 ppm, which in areas were above the recommended limits of 100 ppm. The high chloride levels in the soils indicate that additional methods to protect the reinforcement will be required. This may include increasing the cover over the reinforcement bar, coating the rebar in epoxy or using cathodic protection, or using a low permeability concrete.

The above results for pH were within permissible levels of 5 to 9 as per the FHWA.

4.8 Seismicity

We referenced the 2006 International Building Code (IBC) section 1613 for seismic information.

Site class definitions are based on the average properties of the soils in the top 100 feet. Boring B-1 was drilled until auger refusal at about 89-feet. The remaining borings at this site were only extended to depths of about 20 to 46 feet below grade. Therefore, it was assumed that the soils encountered at boring termination generally represented the average soils continuing to a depth of 100 feet below grade. The N-values at termination ranged from 7 to 16, and we anticipate they would increase in depth.

Based on the assumptions of the soil profile, Table 1613.5.2 indicates the soils would generally be considered site class C or D. Without actual subsurface soil data and N-values to 100 foot depths, we would recommend using site class D.

4.9 Pavement Subgrade Preparation and Stability

We recommend excavation of organics below the pavement areas.

The soils at the bottom of the excavation should be prepared in accordance with MnDOT Specification 2112, Subgrade Preparation. Before placement of the sand subbase, the final subgrade should have proper stability within three vertical feet of grading grade (grade which contacts the bottom of the aggregate base). This will generally be achieved in fill areas with proper compaction of embankment materials and in cut areas through proper subgrade preparation. The stability of the pavement subgrade should be evaluated prior to placement of the sand subbase using the test roll procedure (MnDOT 2111), except a fully loaded tandem axle dump truck or a full water truck should be utilized for the test roll. If unstable soils are found under the test roll, these soils should be improved by means of scarification, moisture conditioning, and re-compaction, or by subcutting and replacement.

4.10 Pavement Area

Once the site has been prepared as recommended, we anticipate the prepared subgrade soils will consist mostly of lean clays and clayey sands. Based on the MnDOT Flexible Pavement Guide from 2020, the R-values of the subgrade soils would range between 10 and 20. Due to the abundance of lean clays encountered in the borings, we used a design R-value of 10 for the pavements.

Pavement design parameters were provided on the Request for Proposal by AE2S, prepared by Aaron Volmer, dated May 24, 2024: average daily traffic is less than 500 vehicles per day and is mostly truck traffic. Utilizing the provided parameters, the estimated Equivalent Single Axle Loads (ESAL's) for roadway design to be approximately 102,000. Our design is based on a standard thirty-five (35) year design life of the urban pavement section and a 10-ton road design.

Based on MnDOT's FlexPave excel design utilizing granular equivalent charts, we recommend the granular equivalent be a minimum of 19.10. Our recommended pavement section is indicated below in Table 7.

Table 7: Recommended Flexible Pavement Section

Section	Thickness (inches)	Granular Equivalent
Bituminous Course, MnDOT 2360 SPWEB440F	2	4.5
Bituminous Course, MnDOT 2360 SPNWB440F	2	4.5
Aggregate Base, MnDOT 3138 (Class 5)	12	12
Geotextile Fabric, MnDOT 3733.1, Type 9	Yes	-
Subgrade Preparation, MnDOT 2112	Yes	-
TOTAL	-	21

Aggregate base placement for pavement support should meet the gradation and quality requirements for Class 5 per MnDOT specification 3138. Aggregate base material should be compacted to 100 percent of its standard Proctor maximum dry density.

Within several years after the initial paving, some thermal shrinkage cracks will develop. We recommend routine maintenance be performed to improve pavement performance and increase pavement life. Pavement should be sealed with a liquid bitumen sealer to retard water intrusion into the base course and subgrade. Localized failures may also develop where trucks or buses turn on the pavement. When these occur, they should be cut out and repaired with a full depth patch.

The pavement sections above provide options to meet the ESAL requirements. Other pavement design options would be acceptable as well as long as they meet the minimum requirements for bituminous thickness, aggregate base thickness, and can meet the ESAL requirements.

Drainage of the non-frost susceptible subgrade soils is important to ensure the area does not have a “bathtub” effect of holding water, which can lead to excess frost heaving and deteriorating subgrade conditions.

Alternatively, a concrete section could be designed for these roadways. The concrete section in Table 8 is based on the recommended concrete, aggregate base, and select granular thicknesses from MnDOT regarding concrete pavement design.

Table 8: Concrete – Rigid Pavement Section

Section	Thickness (inches)
Concrete, MnDOT 2301	6
Aggregate Base, MnDOT 3138 (Class 5)	4
Sand Subbase, MnDOT 3149.2.B.2	12
Geotextile Fabric (on soft clays or silts)	Yes
Subgrade Preparation, MnDOT 2112	Subgrade Preparation, MnDOT 2112

Aggregate base placement for pavement support should meet the gradation and quality requirements for Class 5 per MnDOT specification 3138. Aggregate base material should be compacted to 100 percent of its standard Proctor maximum dry density.

We recommend concrete pavement design be in accordance with MnDOT 2301.

The pavement sections above provide options to meet the ESAL requirements. Other pavement design options would be acceptable as well as they meet the minimum requirements for concrete thickness, aggregate base thickness, and can meet the ESAL requirements.

Concrete panels require saw cutting of joints at lengths based on the thickness of the concrete slab. The 6-inch concrete slabs recommended in Table 7 above would require panel sizes of 6 feet by 8 feet. A 7-inch concrete panel would require panel sizes of 12 feet by 14 feet. The owner may want to consider the cost/benefit of adding an additional inch of concrete to these recommendations above to reduce the number of joints and sealing/maintenance.

Drainage of the sand subbase is recommended. Drainage of the sand subbase may be accomplished by daylighting to adjacent ditches or the use of drain tile. Drain tile wrapped in a sock should be placed at the base of the sand subbase and tied into catch basins.

4.11 Optional Frost-Free Pavement Design

Optionally, the use of a non-frost susceptible sand cushion will help reduce the effects of frost heave. In our opinion, placement of 18 inches of select granular fill below the Class 5 Aggregate Base should generally provide for a non-frost susceptible subgrade. This is also the minimum recommended MnDOT

pavement section. It should be noted that any sand cushion placed below the pavement section will provide positive benefits for reduced potential frost heave. The owner and/or design team should evaluate the costs and benefit of this option to determine if it should be incorporated into the pavement design.

Drainage of the sand cushion is recommended. Drainage of the sand cushion may be accomplished by daylighting to adjacent ditches or the use of drain tile. Drain tile wrapped in a sock should be placed at the base of the sand cushion and tied into catch basins. We recommend the sand cushion contain a select granular sand with less than 12% passing the #200 sieve. Alternately, a 3 inch minus rock fill could be placed instead of a select granular sand and drain tile.

For transitioning the thickness of the sand subbase along the profile of the roadway, we recommend the thickness have a longitudinal taper of no steeper than 10H:1V. A taper of 4H:1V can be used perpendicular to the centerline for cross street/driveway connections. The placement of the sand subbase should extend slightly beyond the outer edge of the curbs to maintain subgrade uniformity for frost movement.

4.12 Utilities

Invert elevations for the storm utilities are anticipated to be within 5 feet of existing grades, and invert elevations for the watermain and sanitary sewer are anticipated to be between 8 and 12 feet below grade. Based on the borings, the subgrade soils for the utilities will consist chiefly of lean clays and clayey sands.

Underground utilities are expected to be installed by backhoes completing the excavations and placing fills. Soil compactors should be used to compact the backfilled material in even lifts to the specified densities.

The borings encountered clayey soils, which are considered somewhat corrosive to metallic pipes. Where such soils exist along the alignment, we recommend mitigation measures to help reduce corrosion potential. A common option would be to utilize a granular bedding around the pipe. Another option would be for polyethylene encasement for the metal pipes in highly corrosive soils. Trench backfill above this point may consist of the non-organic excavated soils once moisture conditioned as recommended.

4.13 Dewatering

Wet and saturated soils were encountered in the borings at shallow excavations. Groundwater could enter the excavations. Dewatering can likely be accomplished with sumps and pumps placed at low points in the utility trenches.

4.14 Construction Considerations

Good surface drainage should be maintained throughout the work so that the site is not vulnerable to ponding during or after a rainfall. If water enters the excavations, it should be promptly removed prior to further construction activities. Under no circumstances should fill or concrete be placed into standing water.

Soil corrections at this site for foundations and pavement subgrades may not be continuous. We recommend tapering the fills back to native soils at a ten to one (10H:1V) slope.

It is important to review the fill limits and total depth of fill when placing structures upon compacted materials and when filling the excavation. The location of the footings should allow for at least a one to one (1:1) slope from the bottom of the footing to the outside limits of the engineered fill.

It is important to check this at the time of construction that during filling, unsuitable soils do not encroach within the one to one (1:1) slope limits and extend downward and outward from future footings.

4.15 Construction Safety

All excavations should comply with the requirements of OSHA 29 CFR, Part 1926, Subpart P "Excavations and Trenches". This document states that excavation safety is the responsibility of the contractor. Reference to this OSHA requirement should be included in the job specifications.

The responsibility to provide safe working conditions on this site, for earthwork, building construction, or any associated operations is solely that of the contractor. This responsibility is not borne in any manner by WSB.

4.16 Cold Weather Construction

It is our understanding that construction is unlikely to occur during the winter months. However, if the construction does continue into the winter months we recommend the following guidelines.

Roadbeds should not be constructed during periods when the material freezes while being placed and compacted, nor should material be placed on soil that is frozen to a depth greater than 4 inches. When the soils are frozen to a depth exceeding 4 inches, at a time when weather conditions are such that construction could be continued without the material freezing as it is being placed and compacted, the contractor may be permitted to excavate the frozen soil and proceed with the construction for so long as the weather will permit. The frozen soils should be pulverized or replaced with other suitable soils. Only unfrozen material should be used.

Placement of fill and/or foundation concrete should not be permitted on frozen soil, and the bearing soils under footings or under the floor slab should not be allowed to freeze after concrete is placed, because excessive post-construction settlement could occur as the frozen soils thaw.

4.17 Field Observation and Testing

The soil conditions illustrated on the Logs of Test Borings in **Appendix A** are indicative of the conditions only at the boring locations. For this reason, we recommend that excavations at this site be observed by a soil engineer or technician prior to fill or backfill placement or construction of foundation elements to determine if the soils are capable of supporting the fill backfill and/or foundation loads. These observations are recommended to judge if the unsuitable materials have been removed from within the planned construction area and an appropriate degree of lateral oversize has been provided.

WSB also recommends a representative number of field density tests be taken in engineered fill and backfill placed to aid in judging its suitability. Fill placement and compaction should be monitored and evaluated to determine that the resulting fill and backfill conforms to specified density, strength, or compressibility requirements. We recommend at least one compaction test for every 2,000 square feet of building area at vertical intervals not exceeding two (2) feet, and one compaction test for every 150 feet of utility trench at a vertical interval of two (2) feet. Prior to use, proposed fill and backfill material should be submitted to the WSB laboratory for testing to verify compliance with recommendations and project specifications.

Dynamic Cone Penetrometer (DCP) tests can be completed on the aggregate base in lieu of density testing. We recommend following MnDOT Specification 2211.3.D.2.c.

WSB would be pleased to provide the advised field observation, monitoring, and testing services during construction.

4.18 Plan Review and Remarks

The observations, recommendations and conclusions described in this report are based primarily on information provided to WSB, obtained from our subsurface exploration, our experience, several assumptions, and the scopes of service developed for this project and are for the sole use of our client. We recommend that WSB be retained to perform a review of final design drawing and specifications to evaluate that the geotechnical engineering report has not been misinterpreted. Should there be changes in the design or location of the structures related to this project or if there are uncertainties in the report

we should be notified. We would be pleased to review project changes and modify the recommendations in this report or provide clarification in writing.

The entire report should be kept together; for example, boring logs should not be removed and placed in the specifications separately.

The boring logs and related information included in this report are indicators of the subsurface conditions only at the specific locations indicated on the Soil Boring Exhibit and times noted on the Logs of Test Boring sheets in **Appendix A**. The subsurface conditions, including groundwater levels, at other locations on the site may differ significantly from conditions that existed at the time of sampling and at the boring locations.

The test borings were completed by WSB solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.

WSB has not performed observations, investigations, explorations, studies or testing that are not specifically listed in the scope of service. WSB should not be liable for failing to discover any condition whose discovery required the performance of services not authorized by the Agreement.

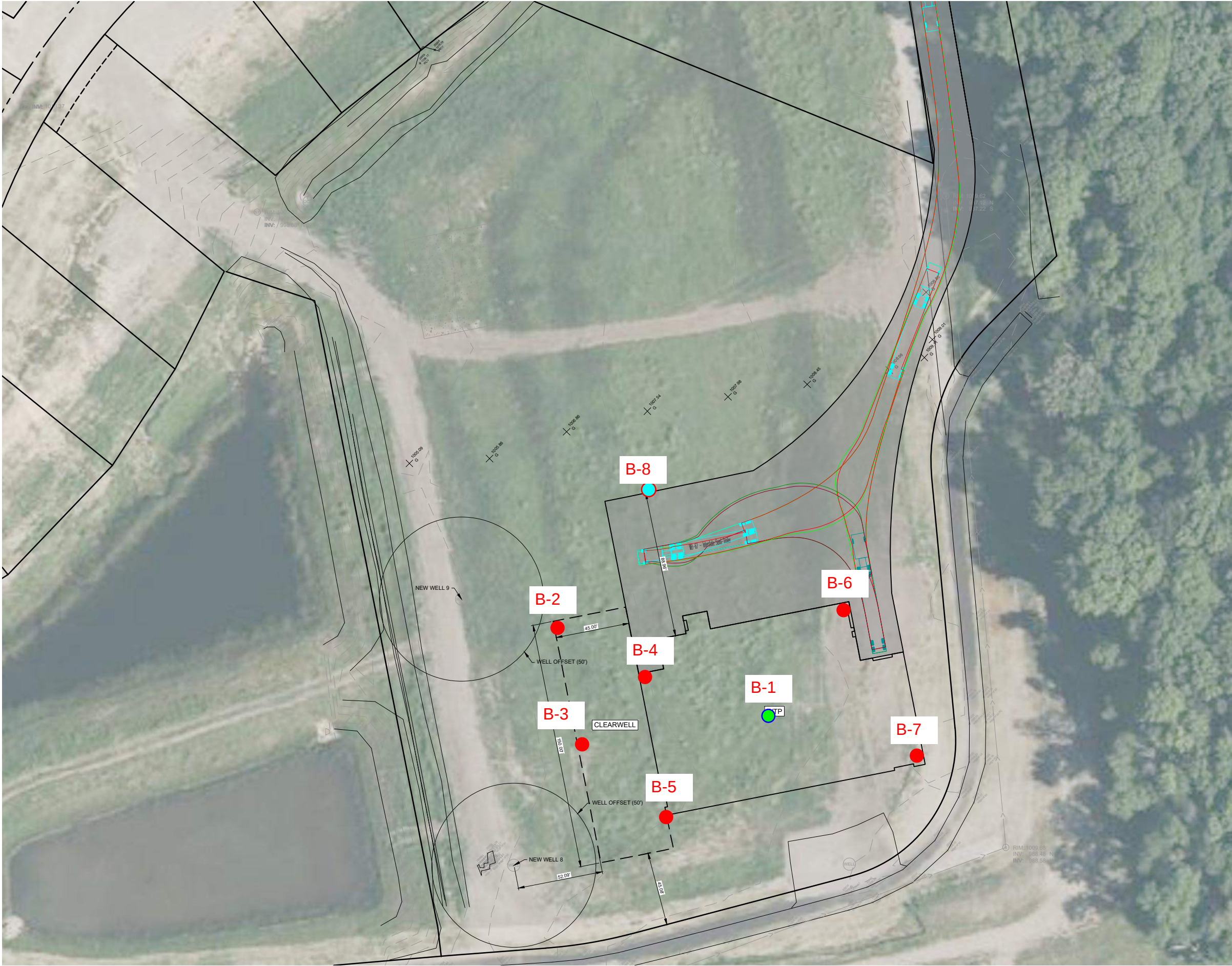
5. STANDARD OF CARE

The recommendations and opinions contained in this report are based on our professional judgment. The soil testing and geotechnical engineering services performed for this project have been performed with the level of skill and diligence ordinarily exercised by reputable members of the same profession under similar circumstances, at the same time and in the same or a similar locale. No warranty, either expressed or implied, is made.

APPENDIX A

Soil Borings Exhibit
Logs of Test Borings
Symbols and Terminology on Test Boring Log
Notice to Report Users Boring Log Information
Unified Soil Classification Sheet (USCS)

File: C:\Users\gpc\OneDrive\Documents\2023\05\2023-05-2023-06\Minnetrista Woodland Cove WTP\Project Files\01 Civil\Plan Sheet\CS SITE.dwg
Printed By: Graham Prior Date: Monday, October 7, 2024





Certification of Individual Project Design Disciplines Are Included On Their Individual Drawings, Respectively

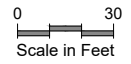


STATUS: **PRELIMINARY - NOT FOR CONSTRUCTION**

SYMBOL: DATE: APPR:



NORTH



Scale in Feet

 =15 foot boring
 =45 foot boring
 =100 foot boring or to refusal

PROJECT TITLE: **WOODLAND COVE WTP**
Advanced Engineering and Environmental Services, LLC www.ae2s.com

SHEET TITLE: **SITE PLAN**

CLIENT:	CITY OF MINNETRISTA MINNETRISTA, MN	PREPARED BY: GP
		CHECKED BY: DL
		APPROVED BY: DL

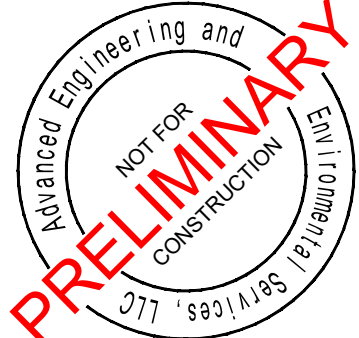
PROJECT NO: P05355-2023-002	SHEET DESIGNATOR:	SHEET NO:
DATE: OCTOBER 2024	SW	C100
ALT. PROJECT NO: XXX-XXXX		

Plotted By: Graham Prior Date: Thursday, October 10, 2024
File: C:\Users\gprior\OneDrive\Documents\2023\05355-2023-002\Minnetrista Woodland Cove WTP\Project Files\DWG\Sheet\CS SITE.dwg





Certification of Individual Project Design Disciplines Are Included On Their Individual Drawings, Respectively

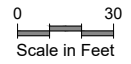


STATUS: **PRELIMINARY - NOT FOR CONSTRUCTION**

SYMBOL: DATE: APPR:



NORTH



Scale in Feet

 = 15 foot boring
 = 45 foot boring
 = 100 foot boring or to refusal

WOODLAND COVE WTP
Advanced Engineering and Environmental Services, LLC www.ae2s.com

SHEET TITLE: **SITE PLAN**

CLIENT: **CITY OF MINNETRISTA**
MINNETRISTA, MN

PROJECT NO: P05355-2023-002
DATE: OCTOBER 2024
ALT. PROJECT NO: XXX-XXXX

SHEET DESIGNATOR: **SW**

SHEET NO: **C100**

PREPARED BY: GP
CHECKED BY: DL
APPROVED BY: DL

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1007.421 ft

BORING NUMBER B-1
PAGE 1 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE TYPE No.	N	MC %	%Fines	N-Value Plot
1	1006	4" TOPSOIL: Lean Clay, dark brown, wet	Fill	Topsoil			AU 1				
2	1005	CLAYEY SAND, grayish brown, wet									
3	1004	CLAYEY SAND, fine to medium grained, brown with reddish brown and grayish brown, moist, medium dense	SC	Glacial Till			SB 2	11	16		
4	1003						HSA				
5	1002	SANDY LEAN CLAY, brown with reddish brown and grayish brown, moist, firm	CL				TW 3	TW		54	
6	1001	- [Organic Content = 1%] [LL = 31, PI = 14]					HSA				
7	1000	[Dry Density = 109.1 pcf]					SB 4	12	20		
8	999	- [Pocket Penetrometer = 1.21 tsf]					HSA				
9	998						SB 5	11			
10	997	- [Pocket Penetrometer = 1.98 tsf]					HSA				
11	996						SB 6	10	19		
12	995	- [Pocket Penetrometer = 1.98 tsf]					HSA				
13	994	- [Organic Content = 2%] [LL = 31, PI = 15]					SB 7	TW		54	
14	993	[Dry Density = 99.7 pcf]					HSA				
15	992						TW 7	TW		53	
16	991	SANDY LEAN CLAY, grayish brown, wet, firm	CL				HSA				
17	990	- [Organic Content = 2%] [LL = 31, PI = 16]					SB 8	9			
18	989	[Dry Density = 105.7 pcf]					HSA				
19	988	[Pocket Penetrometer = 1.96 tsf]					SB 9	15	18		
20	987	SANDY LEAN CLAY, dark grayish brown, moist, firm	CL				HSA				
21	986	- [Pocket Penetrometer = 2.64 tsf]									
22	985										
23	984	SANDY LEAN CLAY, gray, wet, soft to firm	CL								
24	983										
25	982	- [Pocket Penetrometer = 1.21 tsf]					SB 10	7			
26	981	- [Organic Content = 2%] [LL = 30, PI = 15]					HSA				
27	980	[Dry Density = 113.2 pcf]					TW 11'	TW		54	
28	979	[Pocket Penetrometer = 1.45 tsf]					HSA				
29	978						SB 11	10			
30	977	- [Pocket Penetrometer = 1.21 tsf]									
31	976										
32	975										
33	974										
34	973										
35	972	- [Pocket Penetrometer = 1.45 tsf]					SB 12	8	16		
36	971	- [Organic Content = 2%] [LL = 24, PI = 10]					HSA				
37	970	[Dry Density = 111.6 pcf]					TW 13'	TW			
38	969	[Pocket Penetrometer = 2.40 tsf]					HSA				
39	968						SB 13	10		53	
40	967	- [Pocket Penetrometer = 1.45 tsf]									
41	966										
42	965										
43	964										
44	963										
45	962										

WATER LEVEL MEASUREMENTS

START: 1/05/2025

END: 1/06/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief: D. Bailey	Logged By: A. Wacek
1/05/2025	10:00 am	86	89.5	55	66.0	941.421	3.25" HSA 0' - 89'	Notes:	
1/06/2025	10:00 am			5.5	None				

GEO-TECHNICAL N-PLT - WSB.GDT - 3/10/25 10:00 - M:026658-000\GEO-TECH-CMT\GEO-TECH-MISC\ELLANEOUS\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1007.421 ft

BORING NUMBER B-1
PAGE 2 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	9.5	19
46	961	SANDY LEAN CLAY, gray, wet, soft to firm (continued) - [Pocket Penetrometer = .50 tsf]					SB	14	7	18				
47	960						HSA							
48	959						HSA							
49	958	- [Pocket Penetrometer = 1.45 tsf]					SB	15	11	17				
50	957						HSA							
51	956						SB	16	12					
52	955	- [Pocket Penetrometer = 1.21 tsf]					HSA			17				
53	954						SB	17	7					
54	953						HSA							
55	952	- [Pocket Penetrometer = 1.21 tsf]					SB	17	7	17				
56	951						HSA							
57	950						SB	17	7					
58	949	- [Pocket Penetrometer = 1.21 tsf]					HSA			17				
59	948						SB	17	7					
60	947						HSA							
61	946	- [Organic Content = 2%] [LL = 22, PI = 9] [Dry Density = 115.8 pcf] [Pocket Penetrometer = 1.96 tsf]					TW	18	TW	53				
62	945						HSA							
63	944						SB	19	10					
64	943	- [Pocket Penetrometer = .74 tsf]					HSA			17				
65	942						SB	20	11					
66	941						HSA							
67	940	- [Pocket Penetrometer = 1.45 tsf]					TW	21	TW	19				
68	939						HSA							
69	938						SB	22	10					
70	937	- [Pocket Penetrometer = .98 tsf]					HSA			19				
71	936						SB	22	10					
72	935						HSA							
73	934	- [Pocket Penetrometer = 1.45 tsf]					SB	23	50/0					
74	933						HSA							
75	932						SB	23	50/0					
76	931	- [Pocket Penetrometer = 1.45 tsf]					HSA			19				
77	930						SB	22	10					
78	929						HSA							
79	928	- [Pocket Penetrometer = .98 tsf]					SB	22	10	19				
80	927						HSA							
81	926						SB	22	10					
82	925	- [Pocket Penetrometer = .98 tsf]					HSA			19				
83	924						SB	22	10					
84	923						HSA							
85	922	- [Pocket Penetrometer = .98 tsf]					SB	22	10	19				
86	921						HSA							
87	920						SB	22	10					
88	919	- [Pocket Penetrometer = .98 tsf]					HSA			19				
89	918						SB	22	10					
89	918						SB	23	50/0					

End of Boring 89.5 ft.

WATER LEVEL MEASUREMENTS

START: 1/05/2025

END: 1/06/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:	Logged By:
1/05/2025	10:00 am	86	89.5	55	66.0	941.421		D. Bailey	A. Wacek
1/06/2025	10:00 am			5.5	None				

Notes:

GEO-TECHNICAL N-PLT - WSB GDT - 3/10/25 10:00 - M:026658-000\GEO-TECH\CMIT\GEO-TECH\SCHEM\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1006.186 ft

BORING NUMBER B-2
PAGE 1 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	9	18
1	1005	5" TOPSOIL: Lean Clay, dark brown, wet	Fill	Topsoil Fill			AU	1						
2	1004	SANDY LEAN CLAY WITH LITTLE GRAVEL, brown with reddish brown, moist												
3	1003	CLAYEY SAND WITH LITTLE GRAVEL, brown, moist	Fill				SB	2	13	13				
4	1002	SANDY LEAN CLAY, brown, wet [LL = 26, PI = 9] [Dry Density = 110.5 pcf]	CL	Glacial Till			HSA							
5	1001						TW	3	TW	18	51			
6	1000						HSA							
7	999	SANDY LEAN CLAY, grayish brown, wet, firm [Pocket Penetrometer = 2.40 tsf]	CL											
8	998						SB	4	9	18				
9	997	SANDY LEAN CLAY, grayish brown with brown, wet, firm [Pocket Penetrometer = 2.87 tsf]	CL				HSA							
10	996						SB	5	14	16				
11	995						HSA							
12	994	- [LL = 24, PI = 9] [Dry Density = 113.1 pcf] CLAYEY SAND, fine to medium grained, grayish brown with brown, wet, medium dense [LL = 21, PI = 4] [Dry Density = 111.6 pcf] [Pocket Penetrometer = 1.96 tsf]	SC											
13	993						TW	6	TW	16	50			
14	992						HSA			16	40			
15	991	SANDY LEAN CLAY, gray, wet, firm [Pocket Penetrometer = 2.87 tsf] - [Pocket Penetrometer = 2.87 tsf]	CL				SB	7	13	14				
16	990						HSA							
17	989													
18	988						SB	8	10					
19	987						HSA							
20	986						SB	9	11	16				
21	985													
22	984						HSA							
23	983													
24	982													

WATER LEVEL MEASUREMENTS

START: 2/05/2025

END: 2/05/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:	Logged By:
2/05/2025	9:00 am	46	44.5		None		3.25" HSA 0' - 44.5'	D. Bailey	A. Wacek
								Notes:	

GEO-TECHNICAL N-VALUE PLOT - WSB.GDT - 3/10/25 10:00 - M:\026658-000\GEO-TECH\GEO-TECH\WELL\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1006.186 ft

BORING NUMBER B-2
PAGE 2 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	9	18
25	981	SANDY LEAN CLAY, gray, wet, firm [Pocket Penetrometer = 2.87 tsf] (continued) - [LL = 23, PI = 9] [Dry Density = 115.9 pcf]					TW	10	TW	16	53			
26	980													
27	979													
28	978						HSA							
29	977													
30	976	- [Pocket Penetrometer = 1.96 tsf]					SB	11	14	18				
31	975													
32	974													
33	973						HSA							
34	972													
35	971	- [Pocket Penetrometer = 1.96 tsf]					SB	12	10	15				
36	970													
37	969													
38	968						HSA							
39	967													
40	966	- [Pocket Penetrometer = 1.45 tsf]					SB	13	11	15				
41	965													
42	964													
43	963						HSA							
44	962													
45	961	- [Pocket Penetrometer = 1.96 tsf]					SB	14	10	14				
46	960													

End of Boring 46.0 ft.

WATER LEVEL MEASUREMENTS

START: 2/05/2025

END: 2/05/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief: D. Bailey	Logged By: A. Wacek
2/05/2025	9:00 am	46	44.5		None			Notes:	

GEO-TECHNICAL N-VALUE PLOT - WSB.GDT - 3/10/25 10:00 - M:\026658-000\GEO-TECH\GEO-TECH\WELL\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1006.467 ft

BORING NUMBER B-3
PAGE 1 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE TYPE No.	N	MC %	%Fines	N-Value Plot
1	1005	5" TOPSOIL: Lean Clay, dark brown, moist	Fill	Topsoil			AU 1				
2	1004	CLAYEY SAND, brown, moist	Fill	Fill			SB 2	16	7		
3	1003						HSA				
4	1002						SB 3	6	25		
5	1001	SANDY LEAN CLAY WITH SILT, brown, wet, soft [Pocket Penetrometer = 1.96 tsf]	CL	Glacial Till			HSA				
6	1000						TW 4	TW	20	70	
7	999	SANDY LEAN CLAY, brown, wet, soft [LL = 43, PI = 21]	CL				HSA				
8	998	[Dry Density = 104.7 pcf] - [Lens of Sand and Silt at 8.25 feet]					SB 5	7	28		
9	997						HSA				
10	996	- [Pocket Penetrometer = 1.96 tsf]					TW 6	TW	18	54	
11	995						HSA				
12	994	- [Lens of Silty Clay at 13 feet]					SB 7	10	22		
13	993	SANDY LEAN CLAY, brown with grayish brown, wet, firm [LL = 29, PI = 12]	CL				HSA				
14	992	[Dry Density = 110.6 pcf] [Pocket Penetrometer = 1.45 tsf]					SB 8	8	18		
15	991						HSA				
16	990						SB 9	11	18		
17	989	SANDY LEAN CLAY, grayish brown, wet, soft [Pocket Penetrometer = 3.12 tsf]	CL				HSA				
18	988						SB 10	10	22		
19	987	SANDY LEAN CLAY, dark grayish brown, wet, firm [Pocket Penetrometer = 3.12 tsf]	CL				HSA				
20	986						SB 11	11	18		
21	985						HSA				
22	984						HSA				
23	983						HSA				
24	982						HSA				

WATER LEVEL MEASUREMENTS

START: 2/06/2025

END: 2/06/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief: D. Bailey	Logged By: A. Wacek
2/06/2025	9:30 am	46	44.5	35	None		3.25" HSA 0' - 44.5'	Notes:	
2/07/2025	9:30 am				19.0	987.467			

GEO-TECHNICAL N-VALUE PLOT - WSB.GDT - 3/10/25 10:00 - M:\026658-000\GEO-TECH-CMT\GEO-TECH-MISC\ELLANEOUS\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1006.467 ft

BORING NUMBER B-3
PAGE 2 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	10	20
25	981	CLAYEY SAND, fine to medium grained, grayish brown, moist [LL = 29, PI = 13] [Dry Density = 121.2 pcf]	SC				TW	10	TW	12	47			
26	980	SANDY LEAN CLAY, gray, wet, firm [LL = 29, PI = 13] [Dry Density = 121.2 pcf]	CL				HSA							
27	979													
28	978						HSA							
29	977													
30	976						SB	11	14					
31	975													
32	974						HSA							
33	973													
34	972													
35	971						SB	12	14					
36	970													
37	969						HSA							
38	968													
39	967													
40	966						SB	13	13	17				
41	965													
42	964						HSA							
43	963													
44	962													
45	961	SB	14	12	18									
46	960	- [Pocket Penetrometer = 1.96 tsf] End of Boring 46.0 ft.												

GEO-TECHNICAL N-VALUE PLOT - WSB.GDT - 3/10/25 10:00 - M:\026658-000\GEO-TECH-CMT\GEO-TECH-MISC\ELLANEOUS\WOODLAND COVE - BORING LOG.GPJ

WATER LEVEL MEASUREMENTS							START: 2/06/2025		END: 2/06/2025	
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:		Logged By:
								D. Bailey		A. Wacek
2/06/2025	9:30 am	46	44.5	35	None			Notes:		
2/07/2025	9:30 am				19.0	987.467				

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1006.858 ft

BORING NUMBER B-4
PAGE 1 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	7	14
1	1006	5" TOPSOIL: Lean Clay, dark brown, wet LEAN CLAY, slightly organic, dark brown, wet	Fill	Topsoil Fill			AU	1						
2	1005	SANDY LEAN CLAY, brown with light gray and reddish brown, wet, firm [Pocket Penetrometer = 2.64 tsf]	CL	Glacial Till			SB	2	10	21				
3	1004						HSA							
4	1003	SANDY LEAN CLAY, grayish brown with reddish brown, wet, soft [Pocket Penetrometer = 2.64 tsf] - [LL = 25, PI = 8] [Dry Density = 109.2 pcf]	CL				SB	3	7	19				
5	1002						HSA							
6	1001	SANDY LEAN CLAY, grayish brown with reddish brown, wet, firm [Pocket Penetrometer = 2.18 tsf]	CL				TW	4	TW	17	51			
7	1000						HSA							
8	999	SANDY LEAN CLAY, grayish brown with reddish brown, wet, firm [Pocket Penetrometer = 2.18 tsf]	CL				SB	5	9	16				
9	998						HSA							
10	997	- [LL = 29, PI = 12] [Dry Density = 106.3 pcf] - [Pocket Penetrometer = 2.87 tsf]	CL				TW	6	TW	19	56			
11	996						HSA							
12	995	- [Pocket Penetrometer = 2.87 tsf]	CL				SB	7	9	18				
13	994						HSA							
14	993	- [Pocket Penetrometer = 2.87 tsf]	CL				SB	8	9					
15	992						HSA							
16	991	SANDY LEAN CLAY, gray, moist, soft [Pocket Penetrometer = 3.86 tsf]	CL				SB	9	8	17				
17	990						HSA							
18	989						HSA							
19	988													
20	987													
21	986													
22	985													
23	984													
24	983													

WATER LEVEL MEASUREMENTS

START: 1/27/2025

END: 1/27/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:	Logged By:
1/27/2025	9:00 am	46	44.5	19	None		3.25" HSA 0' - 44.5'	D. Bailey	A. Wacek
1/28/2025	10:00 am				18.0	988.858			

Notes:

GEO-TECHNICAL N-VALUE PLOT - WSB.GDT - 3/10/25 10:00 - M:\026658-000\GEO-TECH-CMT\GEO-TECH-MISC\ELLANEOUS\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1006.858 ft

BORING NUMBER B-4
PAGE 2 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	7	14
25	982	SANDY LEAN CLAY, gray, wet, firm [Pocket Penetrometer = 1.96 tsf] - [LL = 27, PI = 10] [Dry Density = 110.0 pcf]	CL				SB	10	9	17				
26	981													
27	980						HSA							
28	979													
29	978													
30	977	SANDY LEAN CLAY, gray, wet, soft [Pocket Penetrometer = 2.40 tsf]	CL				TW	11	TW	18	57			
31	976													
32	975						HSA							
33	974													
34	973													
35	972	SANDY LEAN CLAY, gray, wet, firm [Pocket Penetrometer = 1.96 tsf]	CL				SB	12	8					
36	971													
37	970						HSA							
38	969													
39	968													
40	967	SANDY LEAN CLAY, gray, wet, firm [Pocket Penetrometer = 1.96 tsf] - [Pocket Penetrometer = 1.96 tsf]	CL				SB	13	10	18				
41	966													
42	965						HSA							
43	964													
44	963													
45	962	End of Boring 46.0 ft.					SB	14	10					
46	961													

GEO-TECHNICAL N-VALUE PLOT - WSB.GDT - 3/10/25 10:00 - M:\026658-000\GEO-TECH\CMIT\GEO-TECH\MISC\WOODLAND COVE - BORING LOG.GPJ

WATER LEVEL MEASUREMENTS							START: 1/27/2025		END: 1/27/2025	
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:		Logged By:
								D. Bailey		A. Wacek
1/27/2025	9:00 am	46	44.5	19	None			Notes:		
1/28/2025	10:00 am				18.0	988.858				

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1007.108 ft

BORING NUMBER B-5
PAGE 1 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE TYPE No.	N	MC %	%Fines	N-Value Plot		
1	1006	5" TOPSOIL: Sandy Lean Clay, dark brown, wet SANDY LEAN CLAY, dark brown, moist	Fill	Topsoil Fill			AU 1				0	14	28
2	1005												
3	1004	CLAYEY SAND, fine to coarse grained, brown with light gray and reddish brown, wet, medium dense [Pocket Penetrometer = 1.45 tsf]	SC	Glacial Till			SB 2**	24	15	44			24
4	1003						HSA						
5	1002	SANDY LEAN CLAY, brown with light gray and reddish brown, wet, hard [Pocket Penetrometer = 2.40 tsf]	CL				SB 3**	22	21				22
6	1001						HSA						
7	1000	SANDY LEAN CLAY, light grayish brown with reddish brown, wet, firm [Pocket Penetrometer = 1.45 tsf]	CL				SB 4	13	18				13
8	999						HSA						
9	998						SB 5	13					13
10	997	- [Pocket Penetrometer = 1.71 tsf]					HSA						
11	996						TW 6	TW					
12	995						HSA						
13	994						SB 7	16	17				16
14	993	SANDY LEAN CLAY, brown with grayish brown, wet, hard [Pocket Penetrometer = 2.40 tsf]	CL				HSA						
15	992						SB 8	11	18	53			11
16	991	CLAYEY SAND WITH LITTLE GRAVEL, fine to medium grained, brown with reddish brown, wet, medium dense [Pocket Penetrometer = 2.87 tsf]	SC				HSA						
17	990						SB 9	14	18				14
18	989						HSA						
19	988	SANDY LEAN CLAY WITH LITTLE GRAVEL, brown with grayish brown, wet, firm [Pocket Penetrometer = 2.18 tsf]	CL										
20	987												
21	986												
22	985												
23	984												
24	983												

WATER LEVEL MEASUREMENTS

START: 2/06/2025

END: 2/06/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:	Logged By:
2/06/2025	10:00 am	46	44.5	19	None		3.25" HSA 0' - 44.5'	J. Sharp	A. Wacek
2/07/2025	10:00 am				19.0	988.108		Notes: ** Frozen Soil	

GEO-TECHNICAL N-VALUE - WSB.GDT - 3/10/25 10:00 - M:\026658-000\GEO-TECH\GEO-TECH\WELL\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1007.108 ft

BORING NUMBER B-5
PAGE 2 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	14	28
25	982	SANDY LEAN CLAY WITH LITTLE GRAVEL, brown with grayish brown, wet, firm [Pocket Penetrometer = 2.18 tsf] <i>(continued)</i> - [LL = 30, PI = 14] [Dry Density = 110.9 pcf]								17	55			
26	981						TW	10	TW					
27	980													
28	979						HSA							
29	978	SANDY LEAN CLAY WITH LITTLE GRAVEL, gray, wet, firm [Pocket Penetrometer = 1.96 tsf] - [Pocket Penetrometer = 1.45 tsf] - [LL = 29, PI = 14] [Dry Density = 112.7 pcf]	CL							19				
30	977						SB	11	13					
31	976													
32	975													
33	974						HSA							
34	973													
35	972						SB	12	12					
36	971													
37	970													
38	969													
39	968													
40	967													
41	966													
42	965													
43	964	SANDY LEAN CLAY, gray, wet, soft [Pocket Penetrometer = 1.45 tsf]	CL							16	56			
44	963													
45	962													
46	961													
End of Boring 46.0 ft.														

WATER LEVEL MEASUREMENTS

START: 2/06/2025

END: 2/06/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief: J. Sharp	Logged By: A. Wacek
2/06/2025	10:00 am	46	44.5	19	None			Notes: ** Frozen Soil	
2/07/2025	10:00 am				19.0	988.108			

GEO-TECHNICAL N-VALUE PLOT - WSB.GDT - 3/10/25 10:00 - M:\026658-000\GEO-TECH-CMT\GEO-TECH-MISC\ELLANEOUS\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1008.152 ft

BORING NUMBER B-6
PAGE 1 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	8.5	17
1	1007	5" TOPSOIL: Lean Clay, dark brown, saturated	Fill	Topsoil			AU	1						
2	1006	SANDY LEAN CLAY, brown with dark brown, moist	Fill											
3	1005						SB	2	10	19				
4	1004						HSA							
5	1003	SANDY LEAN CLAY, brown with reddish brown, moist, soft	CL	Glacial Till			SB	3	7	18				
6	1002						HSA							
7	1001													
8	1000	- [LL = 26, PI = 10] [Dry Density = 106.5 pcf] [Pocket Penetrometer = 2.40 tsf]	CL				TW	4	TW	21	61			
9	999						HSA							
10	998						SB	5	9	22				
11	997	SANDY LEAN CLAY, brown, wet, firm [Pocket Penetrometer = 2.18 tsf]	CL				HSA							
12	996													
13	995						TW	6	TW					
14	994	CLAYEY SAND, fine to medium grained, grayish brown, wet [LL = 25, PI = 9] [Dry Density = 113.9]	SC				HSA			16	46			
15	993						SB	7	9	28				
16	992						HSA							
17	991	CLAYEY SAND, fine to medium grained, gray, wet, loose to medium dense [Pocket Penetrometer = 3.12 tsf] - [Pocket Penetrometer = 1.96 tsf]	SC				SB	8	10					
18	990						HSA							
19	989													
20	988	- [Pocket Penetrometer = 2.18 tsf]					SB	9	13					
21	987						HSA							
22	986													
23	985						HSA							
24	984													

WATER LEVEL MEASUREMENTS

START: 1/28/2025

END: 1/28/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:	Logged By:
1/28/2025	10:00 am	46	44.5	18	None		3.25" HSA 0' - 44.5'	D. Bailey	A. Wacek
								Notes: Boring was backfilled immediately	

GEO-TECHNICAL N-VALUE PLOT - WSB.GDT - 3/10/25 10:01 - M:\026658-000\GEO-TECH-CMT\GEO-TECH-MISC\CELLANE\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1008.152 ft

BORING NUMBER B-6
PAGE 2 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	8,5	17
25	983	CLAYEY SAND, fine to medium grained, gray, wet, loose to medium dense [Pocket Penetrometer = 3.12 tsf] (continued) - [Pocket Penetrometer = 3.12 tsf] - [LL = 24, PI = 8] [Dry Density = 115.1 pcf]					SB	10	10	16	44			
26	982						HSA							
27	981													
28	980													
29	979													
30	978						TW	11	TW	16				
31	977													
32	976						HSA							
33	975													
34	974													
35	973	- [Pocket Penetrometer = 1.71 tsf]					SB	12	11	14				
36	972													
37	971						HSA							
38	970													
39	969													
40	968						SB	13	11					
41	967													
42	966						HSA							
43	965													
44	964													
45	963						SB	14	11	17				
46	962	End of Boring 46.0 ft.												

GEO-TECHNICAL N-VALUE PLOT - WSB.GDT - 3/10/25 10:01 - M:\026658-000\GEO-TECH\CMIT\GEO-TECH\MISC\WOODLAND COVE - BORING LOG.GPJ

WATER LEVEL MEASUREMENTS							START: 1/28/2025		END: 1/28/2025	
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:		Logged By:
1/28/2025	10:00 am	46	44.5	18	None			D. Bailey		A. Wacek
								Notes: Boring was backfilled immediately		

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1008.97 ft

BORING NUMBER B-7
PAGE 1 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE TYPE No.	N	MC %	%Fines	N-Value Plot
1	1008	4" TOPSOIL: Lean Clay, dark brown, wet SLIGHTLY ORGANIC LEAN CLAY, dark brown and gray, wet [Organic Content = 3%]	Fill	Topsoil Buried Organics			AU 1				
2	1007						SB 2	7	27		
3	1006						HSA				
4	1005	CLAYEY SAND WITH GRAVEL, brown with grayish brown and reddish brown, moist [LL = 23, PI = 8] [Dry Density = 118.6 pcf]	Fill	Fill			TW 3	TW	13	43	
5	1004						HSA				
6	1003						SB 4	12	27		
7	1002	SANDY LEAN CLAY, brown, moist, firm	CL	Glacial Till			HSA				
8	1001						SB 5	12	16		
9	1000	SANDY LEAN CLAY, grayish brown with reddish brown, moist to wet, firm [Pocket Penetrometer = 2.87 tsf]	CL				HSA				
10	999						SB 6	11			
11	998						HSA				
12	997						SB 7	6	18		
13	996	- [Pocket Penetrometer = 3.37 tsf]					HSA				
14	995	SANDY LEAN CLAY, brown, moist, soft [Pocket Penetrometer = 2.87 tsf]	CL				SB 8	TW	17	52	
15	994						HSA				
16	993						TW 9	TW			
17	992	SANDY LEAN CLAY, grayish brown, moist [LL = 30, PI = 13] [Dry Density = 111.7 pcf]	CL				HSA				
18	991						SB 9	9			
19	990						HSA				
20	989	SAND, fine to medium grained, brown, waterbearing, loose	SP				HSA				
21	988										
22	987										
23	986		ML								
24	985										

WATER LEVEL MEASUREMENTS

START: 1/21/2025

END: 1/21/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief: D. Bailey	Logged By: A. Wacek
1/21/2025	10:00 am	46	44.5	19.5	None		3.25" HSA 0' - 44.5'	Notes:	

GEO-TECHNICAL N-PLAT - WSB.GDT - 3/10/25 10:01 - M:\026658-000\GEO-TECH-CMT\GEO-TECH-MISC\ELLANEOUS\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1008.97 ft

BORING NUMBER B-7
PAGE 2 OF 2

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	10	20
25	984	SILT WITH SAND AND CLAY, light brown, moist, loose [Pocket Penetrometer = 2.4 tsf] (continued)					SB	10	9	18	71			
26	983													
27	982						HSA							
28	981													
29	980	SANDY LEAN CLAY, grayish brown, moist, firm [Pocket Penetrometer = 2.87 tsf]	CL				SB	11	9	19				
30	979													
31	978						HSA							
32	977													
33	976	- [Pocket Penetrometer = 3.86 tsf]					SB	12	14	17				
34	975													
35	974						HSA							
36	973													
37	972	SANDY LEAN CLAY, gray, moist, firm [Pocket Penetrometer = 3.86 tsf]	CL				SB	13	14	16				
38	971													
39	970						HSA							
40	969													
41	968	SANDY LEAN CLAY, gray, wet, hard [Pocket Penetrometer = 2.18 tsf]	CL				SB	14	16					
42	967													
43	966						HSA							
44	965													
45	964	End of Boring 46.0 ft.					SB	14	16					
46	963													

GEO-TECHNICAL N-VALUE PLOT - WSB.GDT - 3/10/25 10:01 - M:\026658-000\GEO-TECH\GEO-TECH\WELL\WOODLAND COVE - BORING LOG.GPJ

WATER LEVEL MEASUREMENTS							START: 1/21/2025		END: 1/21/2025	
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:		Logged By:
								D. Bailey		A. Wacek
1/21/2025	10:00 am	46	44.5	19.5	None				Notes:	

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 1007.145 ft

BORING NUMBER B-8

PAGE 1 OF 1

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE		N	MC %	%Fines	N-Value Plot		
							TYPE	No.				0	8	16
1	1006	4" TOPSOIL: Lean Clay, dark brown, wet SANDY LEAN CLAY, dark brown, moist	Fill	Topsoil Fill			AU	1						
2	1005	SANDY LEAN CLAY, brown with reddish brown, moist	Fill				SB	2	12	20				
3	1004						HSA							
4	1003	SANDY LEAN CLAY, light grayish brown with reddish brown, wet, soft - [Pocket Penetrometer = 1.71 tsf]	CL	Glacial Till			SB	3	8	20				
5	1002						HSA							
6	1001	SANDY LEAN CLAY, grayish brown with reddish brown, wet, firm [LL = 27, PI = 10] [Dry Density = 108.3 pcf]	CL				TW	4	TW	19	55			
7	1000						HSA							
8	999	- [LL = 34, PI = 15] [Dry Density = 101.5 pcf]					SB	5	9	23				
9	998						HSA							
10	997	SANDY LEAN CLAY, gray, wet, firm - [Pocket Penetrometer = 2.4 tsf]	CL				TW	6	TW	21	59			
11	996						HSA							
12	995	- [Pocket Penetrometer = 2.18 tsf]					SB	7	9	17				
13	994						HSA							
14	993	- [LL = 31, PI = 14] [Dry Density = 110.7 pcf]					SB	8	10	16				
15	992						HSA							
16	991						TW	9	TW	18	59			
17	990													
18	989													
19	988													
20	987													
21	986	End of Boring 21.0 ft.												

WATER LEVEL MEASUREMENTS

START: 1/21/2025

END: 1/21/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:	Logged By:
1/21/2025	9:00 am	21	19.5	18	None		3.25" HSA 0' - 19.5'	D. Bailey	A. Wacek
1/22/2025	9:00 am				17.0	990.145		Notes:	

GEO-TECHNICAL N-PLAT - WSB.GDT - 3/10/25 10:01 - M:\026658-000\GEO-TECH\CMIT\GEO-TECH\MISC\CELLANE\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 999.155 ft

BORING NUMBER B-9
PAGE 1 OF 1

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE TYPE No.	N	MC %	%Fines	N-Value Plot
1	998	6" TOPSOIL: Lean Clay, dark brown, moist		Topsoil			AU 1				
2	997	SANDY LEAN CLAY, dark brown, moist	Fill	Fill							
3	996						SB 2	11	21		
4	995	SANDY LEAN CLAY, light brown with light gray and reddish brown, wet, firm [Pocket Penetrometer = 1.45 tsf]	CL	Glacial Till			HSA				
5	994						SB 3	13	19		
6	993						HSA				
7	992										
8	991	CLAYEY SAND, fine to medium grained, light brown with light gray and reddish brown, wet [LL = 24, PI = 8] [Dry Density = 110.9 pcf]	SC				TW 4	TW	19	45	
9	990						HSA				
10	989	SANDY LEAN CLAY, grayish brown, wet [LL = 31, PI = 13] [Dry Density = 109.4]	CL				TW 5	TW	19	53	
11	988						HSA				
12	987										
13	986	SANDY LEAN CLAY, gray, wet, firm [Pocket Penetrometer = 2.87 tsf]	CL				SB 6	12			
14	985						HSA		18		
15	984						TW 7	TW			
16	983						HSA				
17	982										
18	981	- [LL = 28, PI = 13] [Dry Density = 110.0 pcf] [Pocket Penetrometer = 1.96 tsf]					SB 8	11	17	55	
19	980						HSA				
20	979										
21	978	- [Pocket Penetrometer = 2.87 tsf]					SB 9	11	16		
End of Boring 21.0 ft.											

WATER LEVEL MEASUREMENTS

START: 2/05/2025

END: 2/05/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief: N. Olson	Logged By: A. Wacek
2/05/2025	2:00 pm	21	19.5		None		3.25" HSA 0' - 19.5'	Notes:	

GEO-TECHNICAL N-VALUE PLOT - WSB GDT - 3/10/25 10:01 - M:\026658-000\GEO-TECH-CMT\GEO-TECH-MISC\CELLANE\WOODLAND COVE - BORING LOG.GPJ

LOG OF TEST BORING



PROJECT NAME: Woodland Cove
CLIENT/WSB #: 026658-000

PROJECT LOCATION: Minnetrista, MN
SURFACE ELEVATION: 998.955 ft

BORING NUMBER B-10
PAGE 1 OF 1

DEPTH (ft)	ELEV. (ft)	DESCRIPTION OF MATERIAL	USCS	GEOLOGIC ORIGIN	WL	Drilling Operation	SAMPLE TYPE No.	N	MC %	%Fines	N-Value Plot		
1	998	5" TOPSOIL: Lean Clay, dark brown, wet ORGANIC LEAN CLAY, dark brown, wet [Organic Content = 6%]	Fill	Topsoil Fill			AU 1				0	8	16
2	997						SB 2	8	31				
3	996						HSA						
4	995	SANDY LEAN CLAY, brown with light grayish brown, wet, soft [LL = 38, PI = 17] [Dry Density = 103.7 pcf]	CL	Glacial Till			TW 3	TW		53			
5	994						HSA						
6	993						SB 4	7	20				
7	992						HSA						
8	991	- [Pocket Penetrometer = 1.96 tsf]					TW 5	TW		53			
9	990	SANDY LEAN CLAY, grayish brown, wet, firm [LL = 29, PI = 10] [Dry Density = 106.1 pcf]	CL				HSA						
10	989						SB 6	12	18				
11	988						HSA						
12	987						SB 7	11					
13	986	- [Pocket Penetrometer = 2.87 tsf]					HSA						
14	985	SANDY LEAN CLAY, gray, wet, firm	CL				SB 8	11	16				
15	984	- [Pocket Penetrometer = 3.62 tsf]					HSA						
16	983						SB 9	11					
17	982						HSA						
18	981	- [Pocket Penetrometer = 3.12 tsf]											
19	980												
20	979	- [Pocket Penetrometer = 3.12 tsf]											
21	978	End of Boring 21.0 ft.											

WATER LEVEL MEASUREMENTS

START: 1/21/2025

END: 1/21/2025

DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	WATER DEPTH	WATER ELEVATION	METHOD	Crew Chief:	Logged By:
1/21/2025	2:00 pm	21	19.5	19	7.5	991.455	3.25" HSA 0' - 19.5'	D. Bailey	A. Wacek
1/22/2025	2:00 pm				4.0	994.955			

Notes:

GEO-TECHNICAL N-VALUE PLOT - WSB GDT - 3/10/25 10:01 - M:\026658-000\GEO-TECH\GEO-TECH\SCHEMATIC\WOODLAND COVE - BORING LOG.GPJ

SYMBOLS AND TERMINOLOGY ON TEST BORING LOG

SYMBOLS			
Drilling and Sampling		Laboratory Testing	
<u>Symbol</u>	<u>Description</u>	<u>Symbol</u>	<u>Description</u>
HSA	3 1/4" LD. Hollow Stem Auger	MC	Moisture content, % (ASTM D2216)
FA	Flight Auger	DD	Dry Density, pcf
HA	Hand Auger	LL	Liquid Limit (ASTM D4318)
RC	Size A, B, or N rotary casing	PL	Plastic Limit (ASTM D4318)
CS	Continuous split barrel sampling		
DM	Drilling Mud		- Inserts in last column
JW	Jetting Water		
SB	2" O.D. split barrel sampling	Qu	Unconfined compressive strength, psf (ASTM D2166)
_L	2 1/2" or 3 1/2" OD split barrel liner sampler	Pq	Penetrometer Reading, tsf (ASTM D1558)
_T	2" or 3" thin walled tube sample	Ts	Torvane Reading, ts
W	Wash sample	G	Specific Gravity (ASTM D854)
B	Bag sample	SL	Shrinkage limits (ASTM D427)
P	Test Pit sample	OC	Organic Content (ASTM D2974)
_Q	BQ, NQ, or PQ wire line system	SP	Swell Pressure, tsf (ASTM D4546)
_X	AX, BX, or NX double tube barrel	PS	Percent swell under pressure (ASTM D4546)
N	Standard penetration test, blow per foot	FS	Free swell, % (ASTM D4546)
CR	Core recovery, percent	SS	Shrink swell, % (ASTM D4546)
WL	Water level	pH	
n/a	no measurement recorded	SC	Sulfate content, parts/million or mg/l
		CC	Chloride content, parts/million or mg/l
		C	One dimensional consolidation (ASTM D2435)
		Qc	Triaxial compression (ASTM D2850 and D4767)
		DS	Direct Shear (ASTM D3080)
		K	Coefficient of permeability, cm/sec (ASTM D2434)
		P	Pinhole Test (ASTM D4647)
		DH	Double hydrometer (ASTM D4221)
		MA	Particle size analysis (ASTM D422)
		R	Laboratory electrical resistivity, ohm-cm (ASTM G57)
		VS	Field vane shear (ASTM D2573)
		RQD	Rock quality designation, percent
		IR	Infiltration Test (ASTM D3385)

TERMINOLOGY							
Particle Sizes				Soil Layering and Moisture			
<u>Type</u>	<u>Size Range</u>	<u>Term</u>	<u>Visual Observation</u>				
Boulders	> 12"	Lenses	Small pockets of different soils				
Cobbles	3" - 12"	Lamination	< 1/4" thick stratum				
Coarse gravel	3/4" - 3"	Layer	1/4" - 12" thick stratum				
Fine gravel	#4 sieve - 3/4"	Stratified	Altering lenses of varying materials or colors				
Coarse sand	#4 sieve - #10 sieve	Varved	Altering laminations of clay, silt, fine sand, or colors				
Medium sand	#10 sieve - #40 sieve	Dry	Powdery, no noticeable water				
Fine sand	#40 sieve - #200 sieve	Moist	Damp, below saturation				
Silt	100% passing #200 sieve, and > 0.002mm	Wet	MC above plastic limit				
Clay	100% passing #200 sieve, and < 0.002mm	Waterbearing	Pervious soil below water table				
		Saturated	Cohesive soil with MC above liquid limit				
Gravel Content				Standard Penetration Resistance (N-value)			
Coarse-Grained Soils		Fine-Grained Soils		Cohesionless Soils		Cohesive Soils	
<u>% Gravel</u>	<u>Description</u>	<u>% Gravel</u>	<u>Description</u>	<u>N-Value</u>	<u>Relative Density</u>	<u>N-Value</u>	<u>Consistency</u>
2 - 15	A little gravel	2 - 5	Trace of gravel	0 - 4	Very loose	0 - 4	Very soft
16 - 30	With gravel	5 - 15	a little gravel	5 - 10	Loose	5 - 8	Soft
31 - 49	Gravelly	16 - 30	with gravel	11 - 30	Medium dense	9 - 15	Firm
		31 - 49	Gravelly	31 - 50	Dense	16 - 30	Hard
				>50	Very dense	>30	Very hard

NOTICE TO REPORT USERS BORING LOG INFORMATION

Subsurface Profiles

The subsurface stratification lines on the graphic representation of the test borings show an approximate boundary between soil types or rock. The transition between materials is approximate and is usually far more gradual than shown. Estimating excavation depths, soil volumes, and other computations relying on the subsurface strata may not be possible to any degree of accuracy.

Water Level

WSB & Associates, Inc. took groundwater level readings in the exploratory borings, reviewed the data obtained, and discussed its interpretation of the data in the text of this report. The groundwater level may fluctuate due to seasonal variations caused by precipitation, snowmelt, rainfalls, construction or remediation activities, and/or other factors not evident at the time of measurement.

The actual determination of the subsurface water level is an interpretive process. Subsurface water level may not be accurately depicted by the levels indicated on the boring logs. Normally, a subsurface exploration obtains general information regarding subsurface features for design purposes. An accurate determination of subsurface water levels is not possible with a typical scope of work. The use of the subsurface water level information provided for estimating purposes or other site review can present a moderate to high risk of error.

The following information is obtained in the field and noted under "Water Level Measurements" at the bottom of the log.

Sample Depth:	The lowest depth of soil sampling at the time a water level measurement is taken.
Casing Depth:	The depth to the bottom of the casing or hollow stem auger at the time of water level measurement.
Cave-in Depth:	The depth at which a measuring tape stops in the bore hole.
Water Level:	The point in the bore hole at which free-standing water is encountered by a measure device from the surface.

Obstruction Depths

Obstructions and/or obstruction depths may be noted on the boring logs. Obstruction indicates the sampling equipment encountered resistance to penetration. It must be realized that continuation of drilling, the use of other drilling equipment or further exploration may provide information other than that depicted on the logs. The correlation of obstruction depths on the log with construction features such as rock excavation, foundation depths, or buried debris cannot normally be determined with any degree of accuracy. For example, penetration of weathered rock by soil sampling equipment may not correlate with removal by certain types of construction equipment. Using this information for estimating purposes often results in a high degree of misinterpretation.

Accurately identifying the obstruction or estimating depths where hard rock is present over the site requires a scope of service beyond the normal geotechnical exploration program. The risk of using the information noted on the boring logs for estimating purposes must be understood.

UNIFIED SOIL CLASSIFICATION SYSTEM

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART		
COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size.)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	
	GW	Well-graded gravels, gravel-sand mixtures, little or no fines
	GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	
	GM	Silty gravels, gravel-sand-silt mixtures
	GC	Clayey gravels, gravel-sand-clay mixtures
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	
	SW	Well-graded sands, gravelly sands, little or no fines
	SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
	SM	Silty sands, sand-silt mixtures
	SC	Clayey sands, sand-clay mixtures
FINE GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%	ML	Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts with slight plasticity
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	OL	Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
	CH	Inorganic clays of high plasticity, fat clays
	OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS	PT	Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA

$$GW \quad C_u = \frac{D_{60}}{D_{10}} \text{ greater than } 4; C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} \text{ between } 1 \text{ and } 3$$

GP Not meeting all gradation requirements for GW

GM Atterberg limits below "A" line or P.I. less than 4
 GC Atterberg limits above "A" line with P.I. greater than 7
 Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols

$$SW \quad C_u = \frac{D_{60}}{D_{10}} \text{ greater than } 4; C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} \text{ between } 1 \text{ and } 3$$

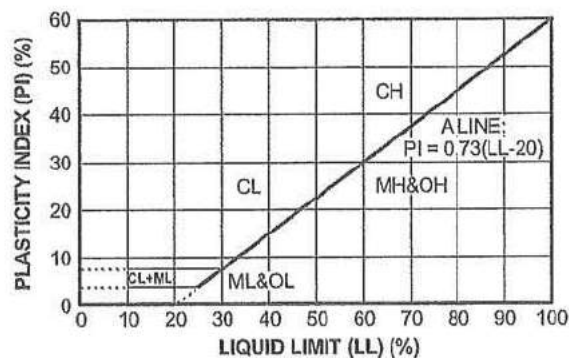
SP Not meeting all gradation requirements for GW

SM Atterberg limits below "A" line or P.I. less than 4
 SC Atterberg limits above "A" line with P.I. greater than 7
 Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols.

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

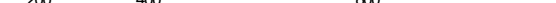
Less than 5 percent GW, GP, SW, SP
 More than 12 percent GM, GC, SM, SC
 5 to 12 percent Borderline cases requiring dual symbols

PLASTICITY CHART



[illegible]

Map Scale: 1 cm = 100 m printed on manuscript (20 dots/cm)



0 200 400 800 1200 Meters

0 500 1000 2000 3000 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84



Web Soil Survey
National Cooperative Soil Survey

8/27/2024
Page 1 of 6

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

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

Soil Rating Lines

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

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Carver County, Minnesota

Survey Area Data: Version 20, Sep 10, 2023

Soil Survey Area: Hennepin County, Minnesota

Survey Area Data: Version 19, Sep 10, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jun 29, 2023—Sep 13, 2023

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CO	Cordova clay loam, 0 to 2 percent slopes	C/D	2.8	0.3%
GL	Glencoe clay loam, 0 to 1 percent slopes	C/D	0.0	0.0%
HM	Hamel loam, 0 to 2 percent slopes	C/D	3.1	0.3%
KB	Kilkenny-Lester loams, 2 to 6 percent slopes	C/D	33.5	3.5%
KB2	Lester-Kilkenny loams, 2 to 6 percent slopes, eroded	B	7.5	0.8%
KC	Lester-Kilkenny loams, 6 to 12 percent slopes	B	2.2	0.2%
KC2	Lester-Kilkenny complex, 6 to 10 percent slopes, moderately eroded	C	10.9	1.2%
KD	Lester-Kilkenny loams, 12 to 18 percent slopes	B	12.4	1.3%
KD2	Lester-Kilkenny complex, 10 to 16 percent slopes, moderately eroded	C	2.9	0.3%
KE2	Lester-Kilkenny complex, 16 to 22 percent slopes	C	4.4	0.5%
KF	Lester-Kilkenny complex, 22 to 40 percent slopes	C	2.7	0.3%
LS	Le Sueur loam, 1 to 3 percent slopes	C/D	8.3	0.9%
MK	Muskego and Houghton soils, 0 to 1 percent slopes	C/D	30.9	3.3%
MP	Klossner and Muskego soils, ponded, 0 to 1 percent slopes	C/D	10.9	1.2%
TB	Terril loam, 2 to 6 percent slopes	B	5.1	0.5%
W	Water		36.7	3.9%
Subtotals for Soil Survey Area			174.2	18.4%
Totals for Area of Interest			945.0	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
L2C	Malardi-Hawick complex, 6 to 12 percent slopes	A	3.9	0.4%
L2E	Malardi-Hawick complex, 18 to 35 percent slopes	A	10.0	1.1%
L9A	Minnetonka silty clay loam, 0 to 2 percent slopes	C/D	27.8	2.9%
L16A	Muskego, Blue Earth, and Houghton soils, ponded, 0 to 1 percent slopes	B/D	22.1	2.3%
L22C2	Lester loam, 6 to 10 percent slopes, moderately eroded	C	78.7	8.3%
L22D2	Lester loam, 10 to 16 percent slopes, moderately eroded	C	3.2	0.3%
L22E	Lester loam, 10 to 22 percent slopes	C	2.9	0.3%
L22F	Lester loam, morainic, 25 to 35 percent slopes	B	13.5	1.4%
L23A	Cordova loam, 0 to 2 percent slopes	C/D	115.4	12.2%
L24A	Glencoe clay loam, 0 to 1 percent slopes	C/D	9.5	1.0%
L25A	Le Sueur loam, 1 to 3 percent slopes	C/D	101.4	10.7%
L35A	Lerdal loam, 1 to 3 percent slopes	C/D	2.1	0.2%
L36A	Hamel, overwash-Hamel complex, 0 to 3 percent slopes	C/D	48.2	5.1%
L37B	Angus loam, 2 to 6 percent slopes	C	124.5	13.2%
L40B	Angus-Kilkenny complex, 2 to 6 percent slopes	C/D	62.4	6.6%
L41C2	Lester-Kilkenny complex, 6 to 10 percent slopes, moderately eroded	C	59.1	6.3%
L41D2	Lester-Kilkenny complex, 10 to 16 percent slopes, moderately eroded	C	10.7	1.1%
L41E	Lester-Kilkenny complex, 16 to 22 percent slopes	C	7.4	0.8%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
L44A	Nessel loam, 1 to 3 percent slopes	C	1.2	0.1%
L45A	Dundas-Cordova complex, 0 to 3 percent slopes	C/D	9.2	1.0%
L49A	Klossner soils, depressional, 0 to 1 percent slopes	B/D	5.6	0.6%
L60B	Angus-Moon complex, 2 to 5 percent slopes	B	6.2	0.7%
L61C2	Lester-Metea complex, 6 to 12 percent slopes, eroded	B	11.5	1.2%
L64A	Tadkee-Tadkee, depressional, complex, 0 to 2 percent slopes	B/D	2.2	0.2%
L70C2	Lester-Malardi complex, 6 to 12 percent slopes, eroded	B	4.6	0.5%
L70D2	Lester-Malardi complex, 12 to 18 percent slopes, eroded	B	14.3	1.5%
W	Water		13.1	1.4%
Subtotals for Soil Survey Area			770.8	81.6%
Totals for Area of Interest			945.0	100.0%

Description

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

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

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

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

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

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

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

Rating Options

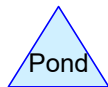
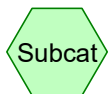
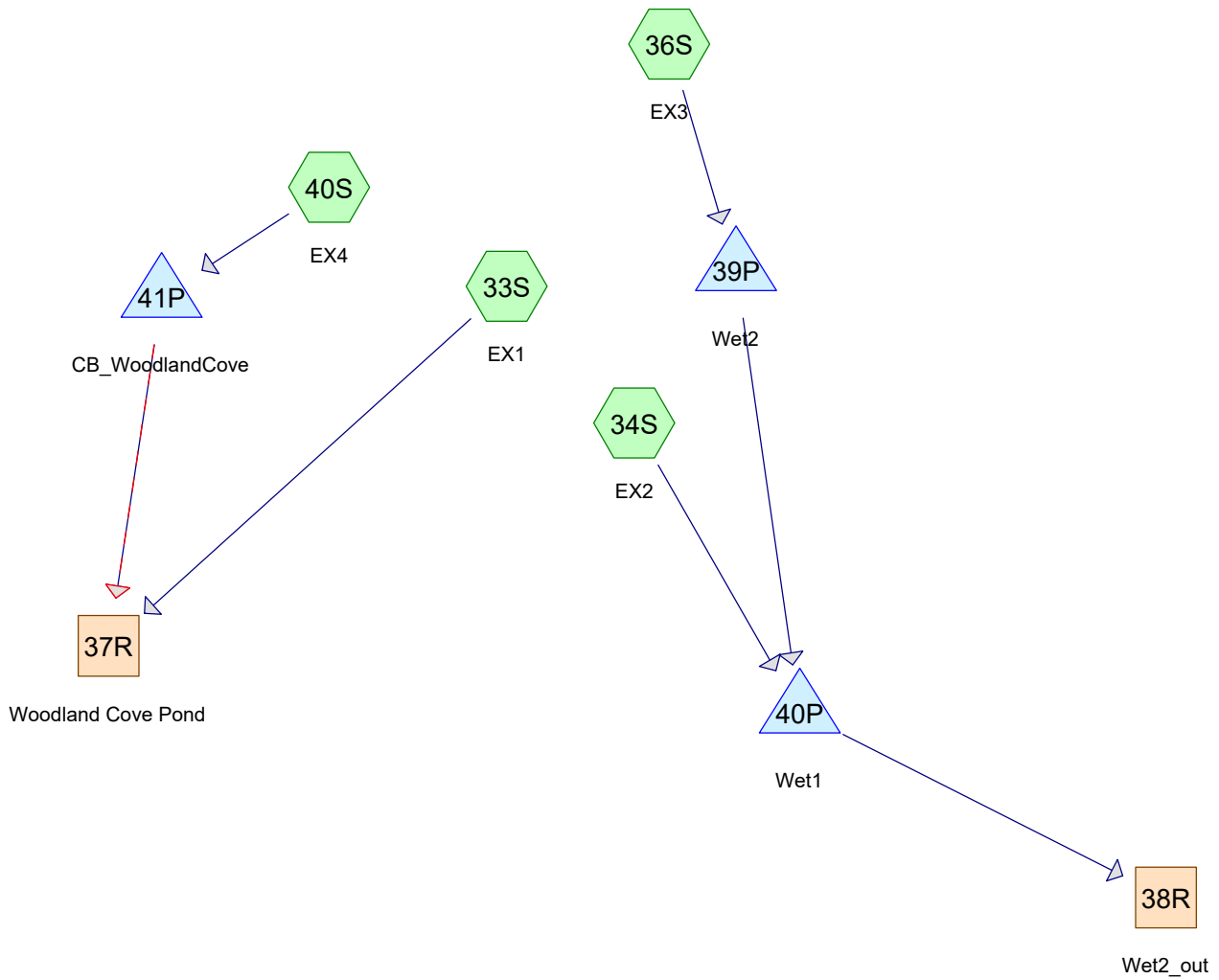
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Appendix C: HydroCAD Summaries (Pre- and Post-Development)

Existing



MinnetristaWTP_20250930

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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	MSE 24-hr	3	Default	24.00	1	2.85	2
2	10-Year	MSE 24-hr	3	Default	24.00	1	4.21	2
3	100-Year	MSE 24-hr	3	Default	24.00	1	7.24	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.842	74	>75% Grass cover, Good, HSG C (33S, 34S, 36S, 40S)
4.183	80	>75% Grass cover, Good, HSG D (33S, 34S, 40S)
11.230	70	Woods, Good, HSG C (34S, 36S)
8.559	77	Woods, Good, HSG D (34S, 36S)
0.789	98	impervious (33S, 34S, 36S)
0.112	98	impervious - old (40S)
1.900	98	wetland (34S, 36S)
29.615	76	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
14.072	HSG C	33S, 34S, 36S, 40S
12.742	HSG D	33S, 34S, 36S, 40S
2.801	Other	33S, 34S, 36S, 40S
29.615		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	2.842	4.183	0.000	7.025	>75% Grass cover, Good	33S, 34S, 36S, 40S
0.000	0.000	11.230	8.559	0.000	19.789	Woods, Good	34S, 36S
0.000	0.000	0.000	0.000	0.789	0.789	impervious	33S, 34S, 36S
0.000	0.000	0.000	0.000	0.112	0.112	impervious - old	40S
0.000	0.000	0.000	0.000	1.900	1.900	wetland	34S, 36S
0.000	0.000	14.072	12.742	2.801	29.615	TOTAL AREA	

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	39P	991.00	990.00	52.0	0.0192	0.024	0.0	24.0	0.0
2	41P	998.45	998.06	85.0	0.0046	0.013	0.0	12.0	0.0

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Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points x 2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment33S: EX1Runoff Area=4.540 ac 4.54% Impervious Runoff Depth>1.09"
Flow Length=360' Tc=18.6 min CN=78/98 Runoff=5.56 cfs 0.414 af**Subcatchment34S: EX2**Runoff Area=17.824 ac 12.34% Impervious Runoff Depth>1.08"
Flow Length=600' Tc=24.7 min CN=75/98 Runoff=17.76 cfs 1.602 af**Subcatchment36S: EX3**Runoff Area=6.744 ac 4.21% Impervious Runoff Depth>0.71"
Flow Length=720' Tc=22.6 min CN=70/98 Runoff=4.38 cfs 0.402 af**Subcatchment40S: EX4**Runoff Area=0.507 ac 22.09% Impervious Runoff Depth>1.29"
Flow Length=100' Slope=0.0200 '/' Tc=15.1 min CN=76/98 Runoff=0.78 cfs 0.055 af**Reach 37R: Woodland Cove Pond**Inflow=6.31 cfs 0.468 af
Outflow=6.31 cfs 0.468 af**Reach 38R: Wet2_out**Avg. Flow Depth=0.67' Max Vel=2.80 fps Inflow=17.06 cfs 1.994 af
n=0.035 L=150.0' S=0.0110 '/' Capacity=5,231.48 cfs Outflow=17.05 cfs 1.993 af**Pond 39P: Wet2**Peak Elev=991.81' Storage=4,779 cf Inflow=4.38 cfs 0.402 af
Primary=3.12 cfs 0.394 af Secondary=0.00 cfs 0.000 af Outflow=3.12 cfs 0.394 af**Pond 40P: Wet1**Peak Elev=988.67' Storage=0.206 af Inflow=20.10 cfs 1.996 af
Outflow=17.06 cfs 1.994 af**Pond 41P: CB_WoodlandCove**Peak Elev=1,002.80' Storage=12 cf Inflow=0.78 cfs 0.055 af
Primary=0.78 cfs 0.055 af Secondary=0.00 cfs 0.000 af Outflow=0.78 cfs 0.055 af**Total Runoff Area = 29.615 ac Runoff Volume = 2.472 af Average Runoff Depth = 1.00"**
90.54% Pervious = 26.814 ac 9.46% Impervious = 2.801 ac

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Summary for Subcatchment 33S: EX1

Runoff = 5.56 cfs @ 12.29 hrs, Volume= 0.414 af, Depth> 1.09"
Routed to Reach 37R : Woodland Cove Pond

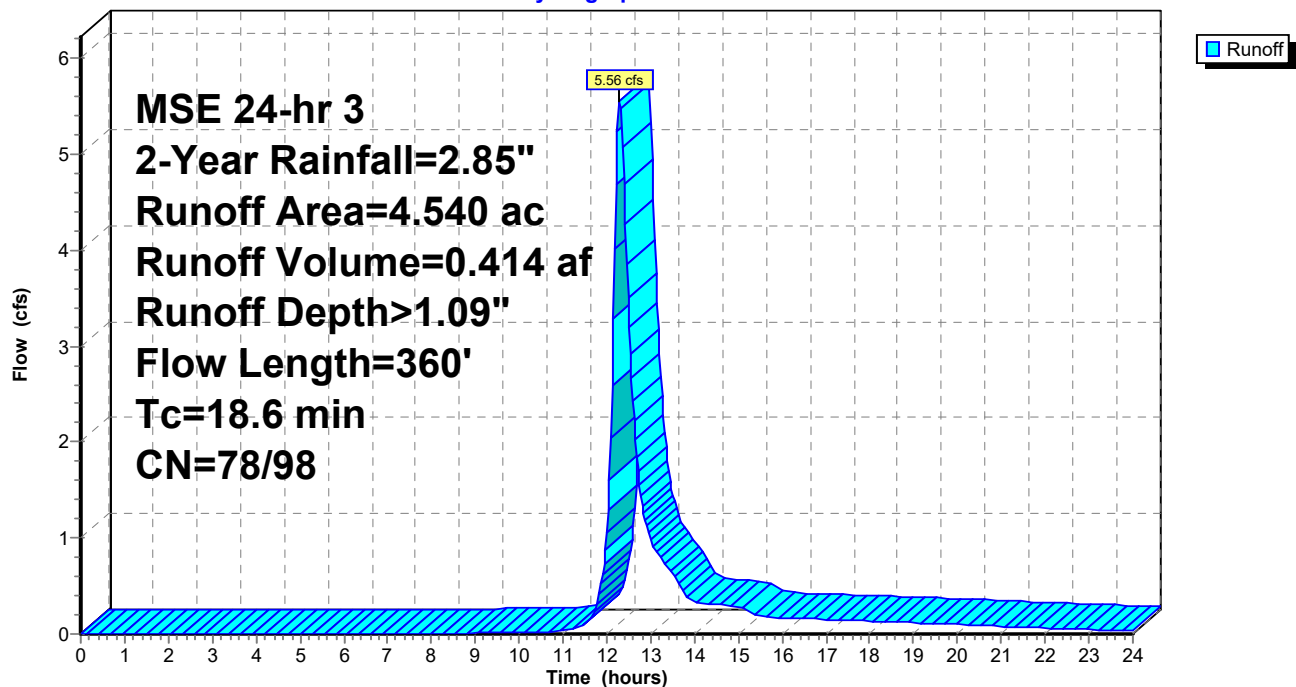
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
1.679	74	>75% Grass cover, Good, HSG C
2.255	80	>75% Grass cover, Good, HSG D
* 0.206	98	impervious
0.014	74	>75% Grass cover, Good, HSG C
0.386	80	>75% Grass cover, Good, HSG D
4.540	79	Weighted Average
4.334	78	95.46% Pervious Area
0.206	98	4.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 2.85"
4.9	260	0.0160	0.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
18.6	360	Total			

Subcatchment 33S: EX1

Hydrograph



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Summary for Subcatchment 34S: EX2

Runoff = 17.76 cfs @ 12.37 hrs, Volume= 1.602 af, Depth> 1.08"
 Routed to Pond 40P : Wet1

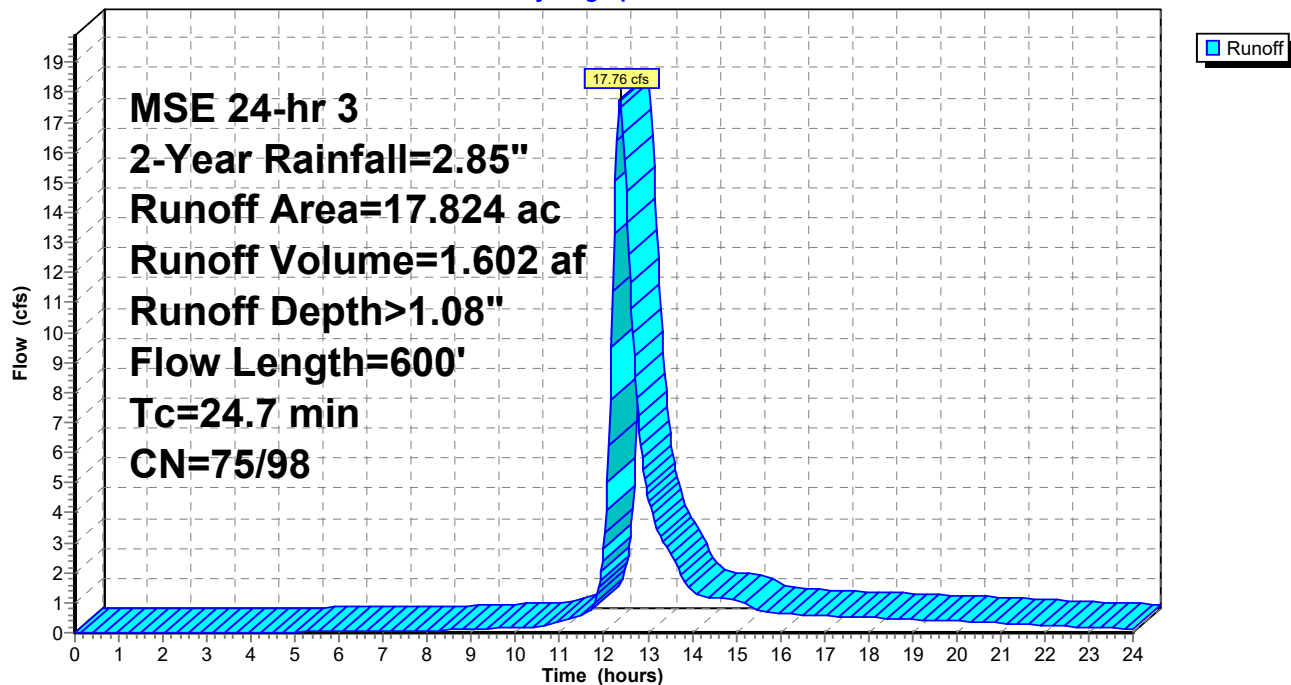
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.039	74	>75% Grass cover, Good, HSG C
0.621	80	>75% Grass cover, Good, HSG D
* 0.440	98	impervious
* 0.000	74	imp_tempC
* 0.000	80	imp_tempD
* 1.759	98	wetland
4.786	70	Woods, Good, HSG C
8.227	77	Woods, Good, HSG D
0.317	77	Woods, Good, HSG D
0.873	74	>75% Grass cover, Good, HSG C
0.762	80	>75% Grass cover, Good, HSG D
17.824	78	Weighted Average
15.625	75	87.66% Pervious Area
2.199	98	12.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
8.9	500	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.7	600	Total			

Subcatchment 34S: EX2

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Summary for Subcatchment 36S: EX3

Runoff = 4.38 cfs @ 12.36 hrs, Volume= 0.402 af, Depth> 0.71"
 Routed to Pond 39P : Wet2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.001	74	>75% Grass cover, Good, HSG C
* 0.143	98	impervious
* 0.141	98	wetland
6.444	70	Woods, Good, HSG C
0.015	77	Woods, Good, HSG D
6.744	71	Weighted Average
6.460	70	95.79% Pervious Area
0.284	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
7.6	500	0.0480	1.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	120	0.0500	6.94	69.40	Channel Flow, Area= 10.0 sf Perim= 16.0' r= 0.63' n= 0.035
22.6	720	Total			

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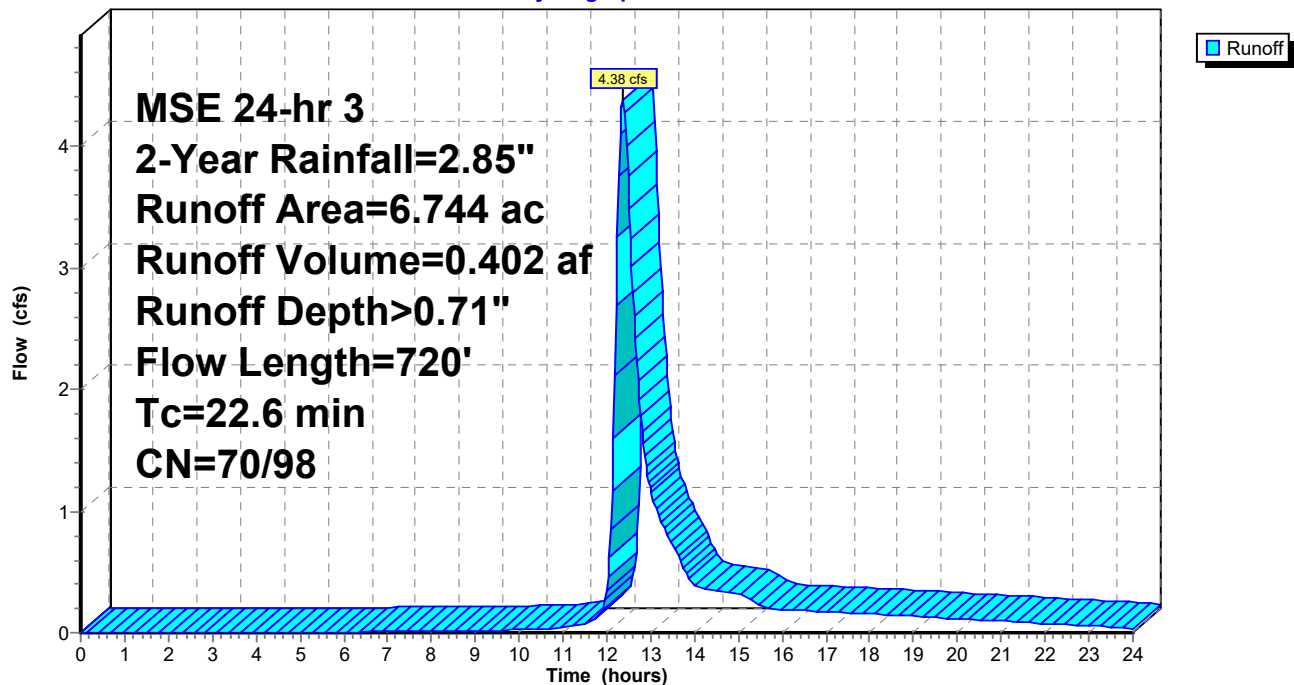
MSE 24-hr 3 2-Year Rainfall=2.85"

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Subcatchment 36S: EX3

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Summary for Subcatchment 40S: EX4

Runoff = 0.78 cfs @ 12.24 hrs, Volume= 0.055 af, Depth> 1.29"
Routed to Pond 41P : CB_WoodlandCove

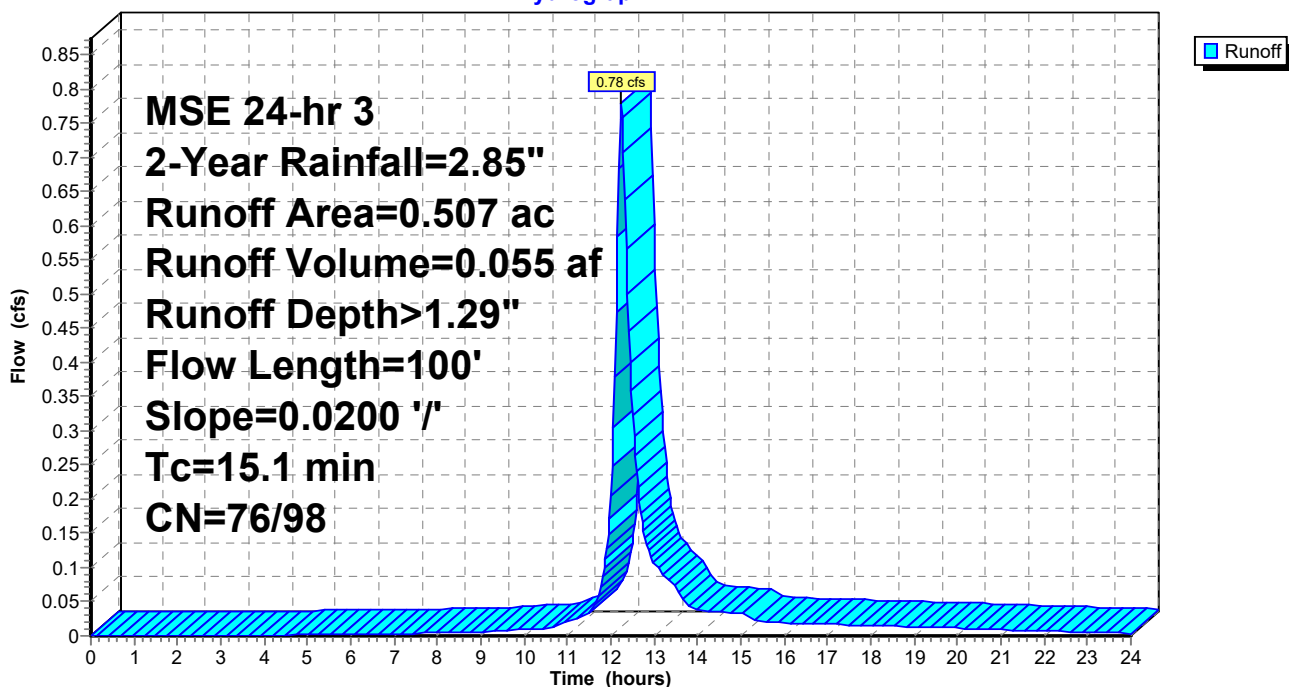
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.159	80	>75% Grass cover, Good, HSG D
* 0.000	98	impervious - new
0.236	74	>75% Grass cover, Good, HSG C
* 0.112	98	impervious - old
0.507	81	Weighted Average
0.395	76	77.91% Pervious Area
0.112	98	22.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 40S: EX4

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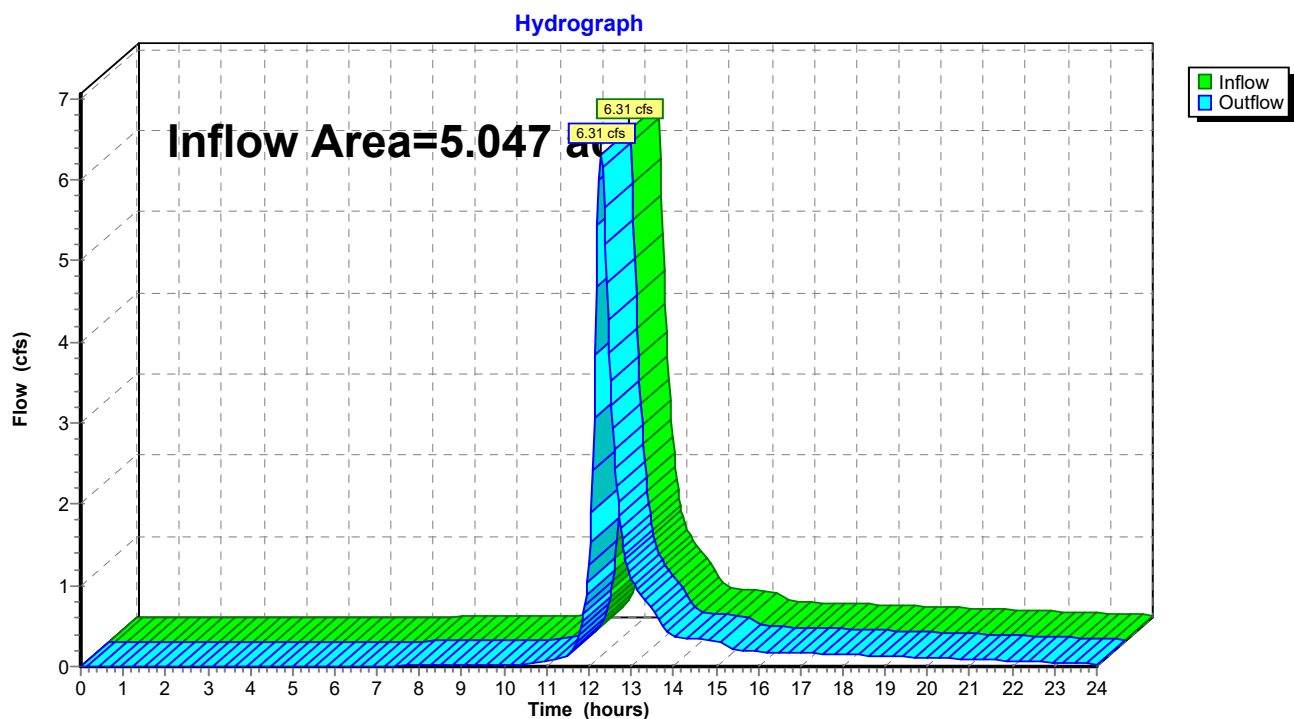
Summary for Reach 37R: Woodland Cove Pond

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.047 ac, 6.30% Impervious, Inflow Depth > 1.11" for 2-Year event
Inflow = 6.31 cfs @ 12.28 hrs, Volume= 0.468 af
Outflow = 6.31 cfs @ 12.28 hrs, Volume= 0.468 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Reach 37R: Woodland Cove Pond



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Summary for Reach 38R: Wet2_out

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 0.97" for 2-Year event
Inflow = 17.06 cfs @ 12.53 hrs, Volume= 1.994 af
Outflow = 17.05 cfs @ 12.54 hrs, Volume= 1.993 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Max. Velocity= 2.80 fps, Min. Travel Time= 0.9 min

Avg. Velocity= 1.05 fps, Avg. Travel Time= 2.4 min

Peak Storage= 912 cf @ 12.54 hrs

Average Depth at Peak Storage= 0.67' , Surface Width= 12.05'

Bank-Full Depth= 9.00' Flow Area= 418.5 sf, Capacity= 5,231.48 cfs

6.00' x 9.00' deep channel, n= 0.035

Side Slope Z-value= 4.5 ' ' Top Width= 87.00'

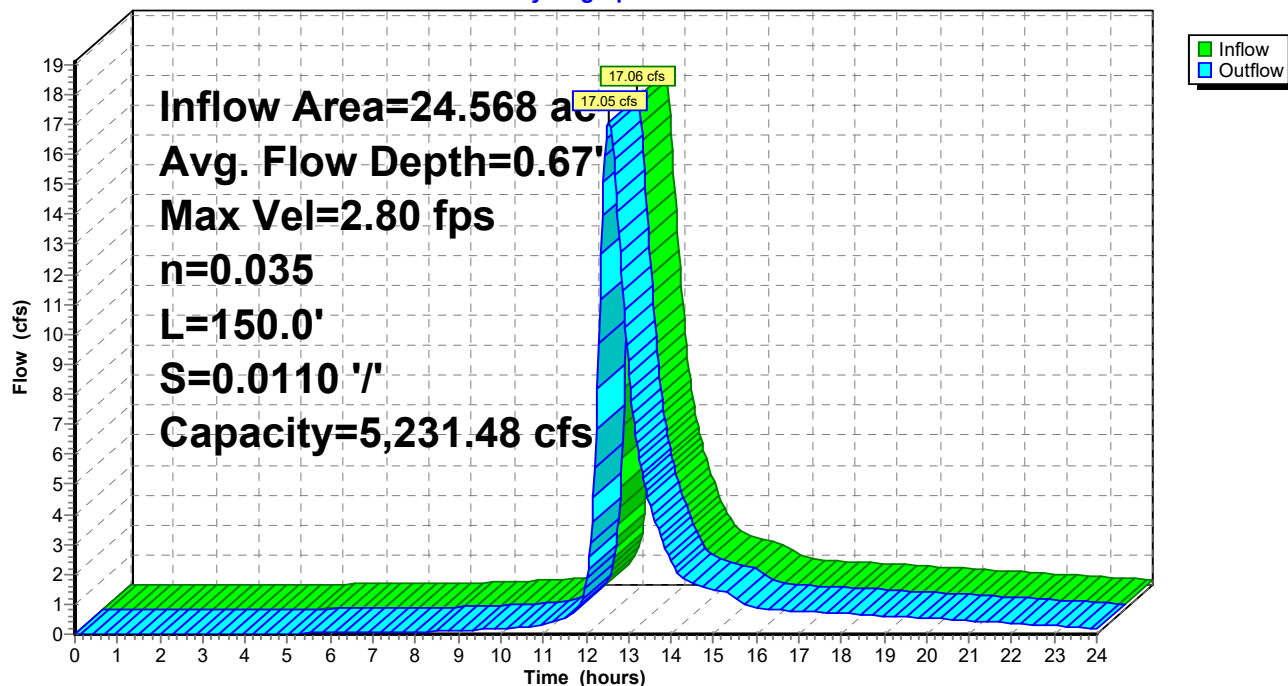
Length= 150.0' Slope= 0.0110 ' '

Inlet Invert= 988.00', Outlet Invert= 986.35'



Reach 38R: Wet2_out

Hydrograph



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Stage-Area-Storage for Reach 38R: Wet2_out

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
988.00	0.0	0	993.10	147.7	22,148
988.10	0.6	97	993.20	152.9	22,933
988.20	1.4	208	993.30	158.2	23,731
988.30	2.2	332	993.40	163.6	24,543
988.40	3.1	469	993.50	169.1	25,369
988.50	4.1	620	993.60	174.7	26,209
988.60	5.2	784	993.70	180.4	27,062
988.70	6.4	962	993.80	186.2	27,928
988.80	7.7	1,153	993.90	192.1	28,808
988.90	9.0	1,357	994.00	198.0	29,701
989.00	10.5	1,576	994.10	204.1	30,608
989.10	12.1	1,808	994.20	210.2	31,528
989.20	13.7	2,053	994.30	216.4	32,461
989.30	15.4	2,312	994.40	222.7	33,409
989.40	17.2	2,584	994.50	229.1	34,370
989.50	19.1	2,870	994.60	235.6	35,344
989.60	21.1	3,169	994.70	242.2	36,332
989.70	23.2	3,481	994.80	248.9	37,333
989.80	25.4	3,807	994.90	255.7	38,348
989.90	27.6	4,147	995.00	262.5	39,376
990.00	30.0	4,501	995.10	269.4	40,417
990.10	32.5	4,868	995.20	276.5	41,472
990.20	35.0	5,248	995.30	283.6	42,541
990.30	37.6	5,642	995.40	290.8	43,624
990.40	40.3	6,049	995.50	298.1	44,720
990.50	43.1	6,470	995.60	305.5	45,829
990.60	46.0	6,904	995.70	313.0	46,952
990.70	49.0	7,351	995.80	320.6	48,088
990.80	52.1	7,813	995.90	328.3	49,238
990.90	55.3	8,288	996.00	336.0	50,401
991.00	58.5	8,776	996.10	343.8	51,577
991.10	61.9	9,278	996.20	351.8	52,768
991.20	65.3	9,793	996.30	359.8	53,972
991.30	68.8	10,322	996.40	367.9	55,189
991.40	72.4	10,864	996.50	376.1	56,420
991.50	76.1	11,419	996.60	384.4	57,664
991.60	79.9	11,988	996.70	392.8	58,922
991.70	83.8	12,571	996.80	401.3	60,193
991.80	87.8	13,168	996.90	409.8	61,477
991.90	91.9	13,778	997.00	418.5	62,775
992.00	96.0	14,401			
992.10	100.3	15,038			
992.20	104.6	15,688			
992.30	109.0	16,352			
992.40	113.5	17,029			
992.50	118.1	17,719			
992.60	122.8	18,424			
992.70	127.6	19,142			
992.80	132.5	19,873			
992.90	137.5	20,618			
993.00	142.5	21,376			

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Summary for Pond 39P: Wet2

Inflow Area = 6.744 ac, 4.21% Impervious, Inflow Depth > 0.71" for 2-Year event
 Inflow = 4.38 cfs @ 12.36 hrs, Volume= 0.402 af
 Outflow = 3.12 cfs @ 12.56 hrs, Volume= 0.394 af, Atten= 29%, Lag= 11.5 min
 Primary = 3.12 cfs @ 12.56 hrs, Volume= 0.394 af
 Routed to Pond 40P : Wet1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 991.00' Surf.Area= 2,915 sf Storage= 1,508 cf

Peak Elev= 991.81' @ 12.56 hrs Surf.Area= 5,188 sf Storage= 4,779 cf (3,272 cf above start)

Plug-Flow detention time= 86.1 min calculated for 0.359 af (90% of inflow)

Center-of-Mass det. time= 25.6 min (871.2 - 845.6)

Volume	Invert	Avail.Storage	Storage Description
#1	990.00'	221,260 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
990.00	100	0	0
992.00	5,730	5,830	5,830
994.00	20,000	25,730	31,560
996.00	47,200	67,200	98,760
998.00	75,300	122,500	221,260

Device	Routing	Invert	Outlet Devices
#1	Primary	991.00'	24.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 991.00' / 990.00' S= 0.0192 ' S Cc= 0.900 n= 0.024, Flow Area= 3.14 sf
#2	Secondary	997.00'	25.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=3.12 cfs @ 12.56 hrs HW=991.81' TW=988.67' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 3.12 cfs @ 3.88 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=991.00' (Free Discharge)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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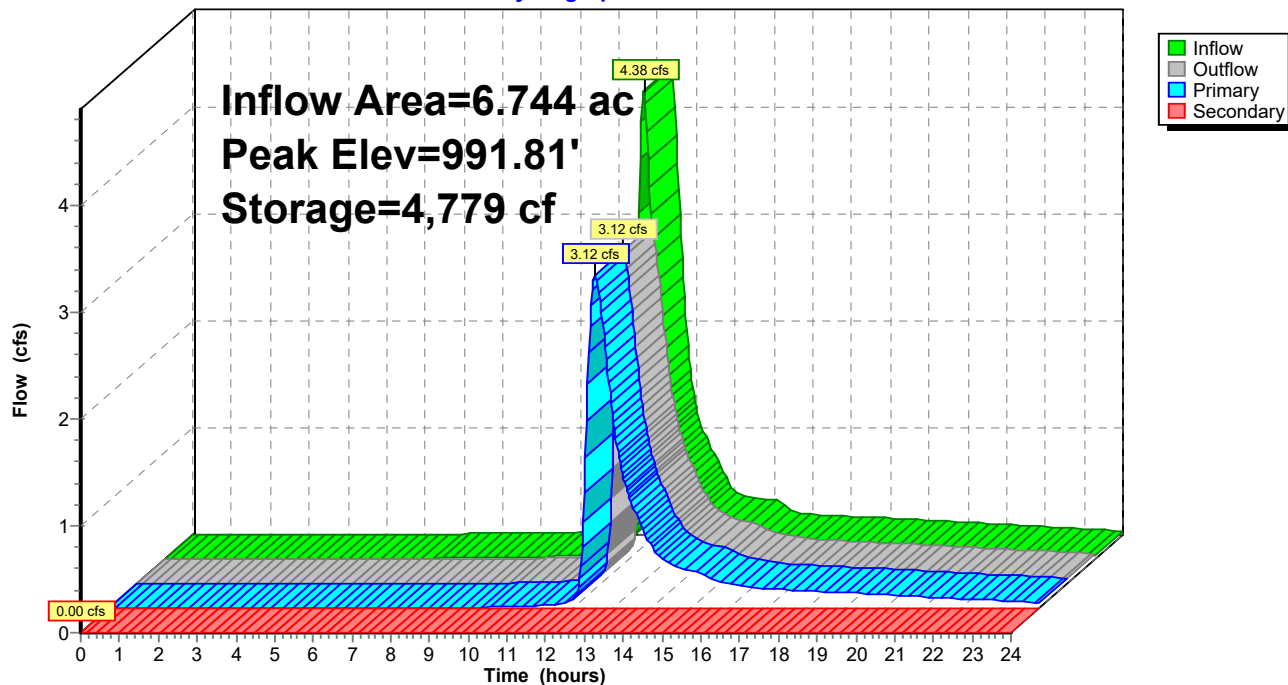
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Pond 39P: Wet2

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Stage-Area-Storage for Pond 39P: Wet2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
990.00	100	0	995.10	34,960	61,788
990.10	382	24	995.20	36,320	65,352
990.20	663	76	995.30	37,680	69,052
990.30	944	157	995.40	39,040	72,888
990.40	1,226	265	995.50	40,400	76,860
990.50	1,508	402	995.60	41,760	80,968
990.60	1,789	567	995.70	43,120	85,212
990.70	2,071	760	995.80	44,480	89,592
990.80	2,352	981	995.90	45,840	94,108
990.90	2,633	1,230	996.00	47,200	98,760
991.00	2,915	1,508	996.10	48,605	103,550
991.10	3,197	1,813	996.20	50,010	108,481
991.20	3,478	2,147	996.30	51,415	113,552
991.30	3,759	2,509	996.40	52,820	118,764
991.40	4,041	2,899	996.50	54,225	124,116
991.50	4,323	3,317	996.60	55,630	129,609
991.60	4,604	3,763	996.70	57,035	135,242
991.70	4,886	4,238	996.80	58,440	141,016
991.80	5,167	4,740	996.90	59,845	146,930
991.90	5,448	5,271	997.00	61,250	152,985
992.00	5,730	5,830	997.10	62,655	159,180
992.10	6,444	6,439	997.20	64,060	165,516
992.20	7,157	7,119	997.30	65,465	171,992
992.30	7,870	7,870	997.40	66,870	178,609
992.40	8,584	8,693	997.50	68,275	185,366
992.50	9,298	9,587	997.60	69,680	192,264
992.60	10,011	10,552	997.70	71,085	199,302
992.70	10,725	11,589	997.80	72,490	206,481
992.80	11,438	12,697	997.90	73,895	213,800
992.90	12,151	13,877	998.00	75,300	221,260
993.00	12,865	15,128			
993.10	13,579	16,450			
993.20	14,292	17,843			
993.30	15,005	19,308			
993.40	15,719	20,844			
993.50	16,433	22,452			
993.60	17,146	24,131			
993.70	17,860	25,881			
993.80	18,573	27,703			
993.90	19,286	29,596			
994.00	20,000	31,560			
994.10	21,360	33,628			
994.20	22,720	35,832			
994.30	24,080	38,172			
994.40	25,440	40,648			
994.50	26,800	43,260			
994.60	28,160	46,008			
994.70	29,520	48,892			
994.80	30,880	51,912			
994.90	32,240	55,068			
995.00	33,600	58,360			

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Summary for Pond 40P: Wet1

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 0.97" for 2-Year event
 Inflow = 20.10 cfs @ 12.39 hrs, Volume= 1.996 af
 Outflow = 17.06 cfs @ 12.53 hrs, Volume= 1.994 af, Atten= 15%, Lag= 8.2 min
 Primary = 17.06 cfs @ 12.53 hrs, Volume= 1.994 af
 Routed to Reach 38R : Wet2_out

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 988.67' @ 12.53 hrs Surf.Area= 0.591 ac Storage= 0.206 af

Plug-Flow detention time= 8.3 min calculated for 1.994 af (100% of inflow)
 Center-of-Mass det. time= 7.7 min (841.3 - 833.6)

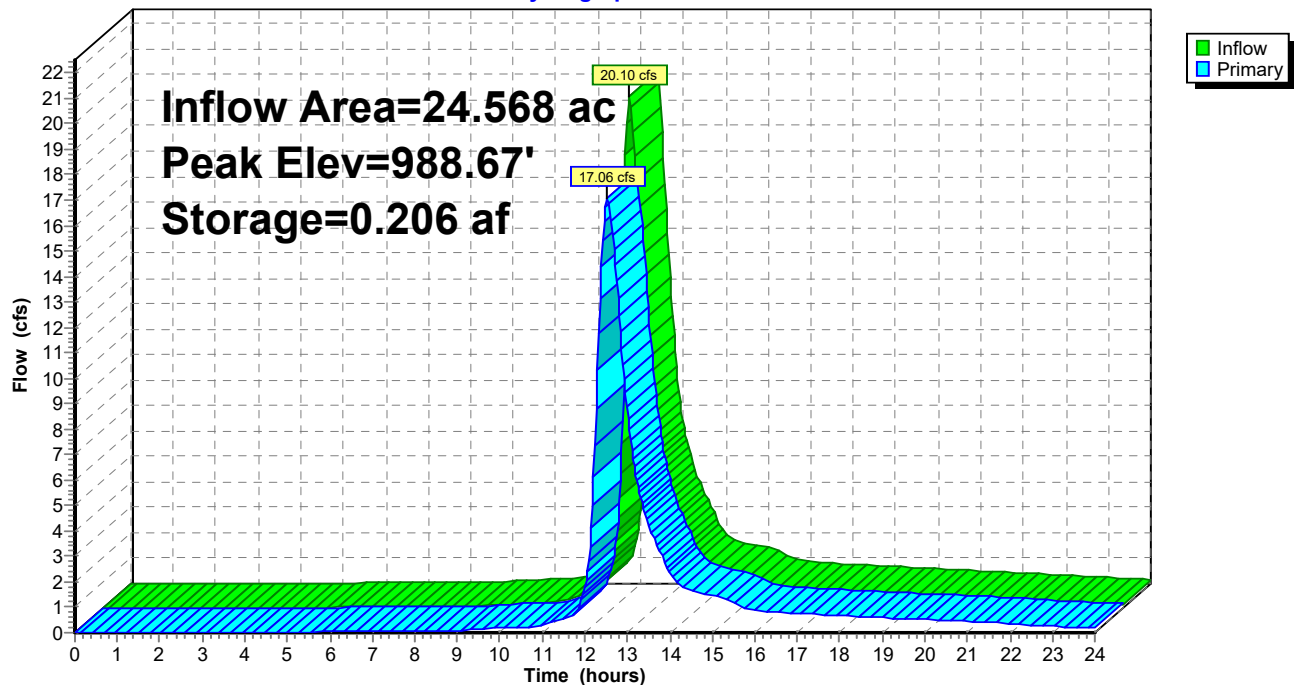
Volume	Invert	Avail.Storage	Storage Description
#1	988.00'	23.952 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
988.00	0.020	0.000	0.000
989.50	1.290	0.983	0.983
990.00	3.430	1.180	2.162
992.00	5.580	9.010	11.172
994.00	7.200	12.780	23.952

Device	Routing	Invert	Outlet Devices
#1	Primary	988.00'	Channel/Reach using Reach 38R: Wet2_out

Primary OutFlow Max=17.04 cfs @ 12.53 hrs HW=988.67' TW=988.67' (Dynamic Tailwater)
 ↑1=Channel/Reach (Channel Controls 17.04 cfs @ 2.80 fps)

Pond 40P: Wet1

Hydrograph



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Stage-Area-Storage for Pond 40P: Wet1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
988.00	0.020	0.000	993.10	6.471	17.801
988.10	0.105	0.006	993.20	6.552	18.452
988.20	0.189	0.021	993.30	6.633	19.111
988.30	0.274	0.044	993.40	6.714	19.778
988.40	0.359	0.076	993.50	6.795	20.454
988.50	0.443	0.116	993.60	6.876	21.137
988.60	0.528	0.164	993.70	6.957	21.829
988.70	0.613	0.221	993.80	7.038	22.529
988.80	0.697	0.287	993.90	7.119	23.237
988.90	0.782	0.361	994.00	7.200	23.952
989.00	0.867	0.443	994.10	7.200	23.952
989.10	0.951	0.534	994.20	7.200	23.952
989.20	1.036	0.634	994.30	7.200	23.952
989.30	1.121	0.741	994.40	7.200	23.952
989.40	1.205	0.858	994.50	7.200	23.952
989.50	1.290	0.983	994.60	7.200	23.952
989.60	1.718	1.133	994.70	7.200	23.952
989.70	2.146	1.326	994.80	7.200	23.952
989.80	2.574	1.562	994.90	7.200	23.952
989.90	3.002	1.841	995.00	7.200	23.952
990.00	3.430	2.162	995.10	7.200	23.952
990.10	3.538	2.511	995.20	7.200	23.952
990.20	3.645	2.870	995.30	7.200	23.952
990.30	3.752	3.240	995.40	7.200	23.952
990.40	3.860	3.620	995.50	7.200	23.952
990.50	3.967	4.012	995.60	7.200	23.952
990.60	4.075	4.414	995.70	7.200	23.952
990.70	4.183	4.827	995.80	7.200	23.952
990.80	4.290	5.250	995.90	7.200	23.952
990.90	4.397	5.685	996.00	7.200	23.952
991.00	4.505	6.130	996.10	7.200	23.952
991.10	4.613	6.586	996.20	7.200	23.952
991.20	4.720	7.053	996.30	7.200	23.952
991.30	4.827	7.530	996.40	7.200	23.952
991.40	4.935	8.018	996.50	7.200	23.952
991.50	5.042	8.517	996.60	7.200	23.952
991.60	5.150	9.027	996.70	7.200	23.952
991.70	5.258	9.547	996.80	7.200	23.952
991.80	5.365	10.078	996.90	7.200	23.952
991.90	5.472	10.620	997.00	7.200	23.952
992.00	5.580	11.172			
992.10	5.661	11.735			
992.20	5.742	12.305			
992.30	5.823	12.883			
992.40	5.904	13.469			
992.50	5.985	14.064			
992.60	6.066	14.666			
992.70	6.147	15.277			
992.80	6.228	15.896			
992.90	6.309	16.523			
993.00	6.390	17.157			

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Summary for Pond 41P: CB_WoodlandCove

Inflow Area = 0.507 ac, 22.09% Impervious, Inflow Depth > 1.29" for 2-Year event
 Inflow = 0.78 cfs @ 12.24 hrs, Volume= 0.055 af
 Outflow = 0.78 cfs @ 12.24 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.2 min
 Primary = 0.78 cfs @ 12.24 hrs, Volume= 0.055 af
 Routed to Reach 37R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 37R : Woodland Cove Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,002.80' @ 12.24 hrs Surf.Area= 132 sf Storage= 12 cf

Plug-Flow detention time= 0.5 min calculated for 0.054 af (100% of inflow)

Center-of-Mass det. time= 0.4 min (803.4 - 803.0)

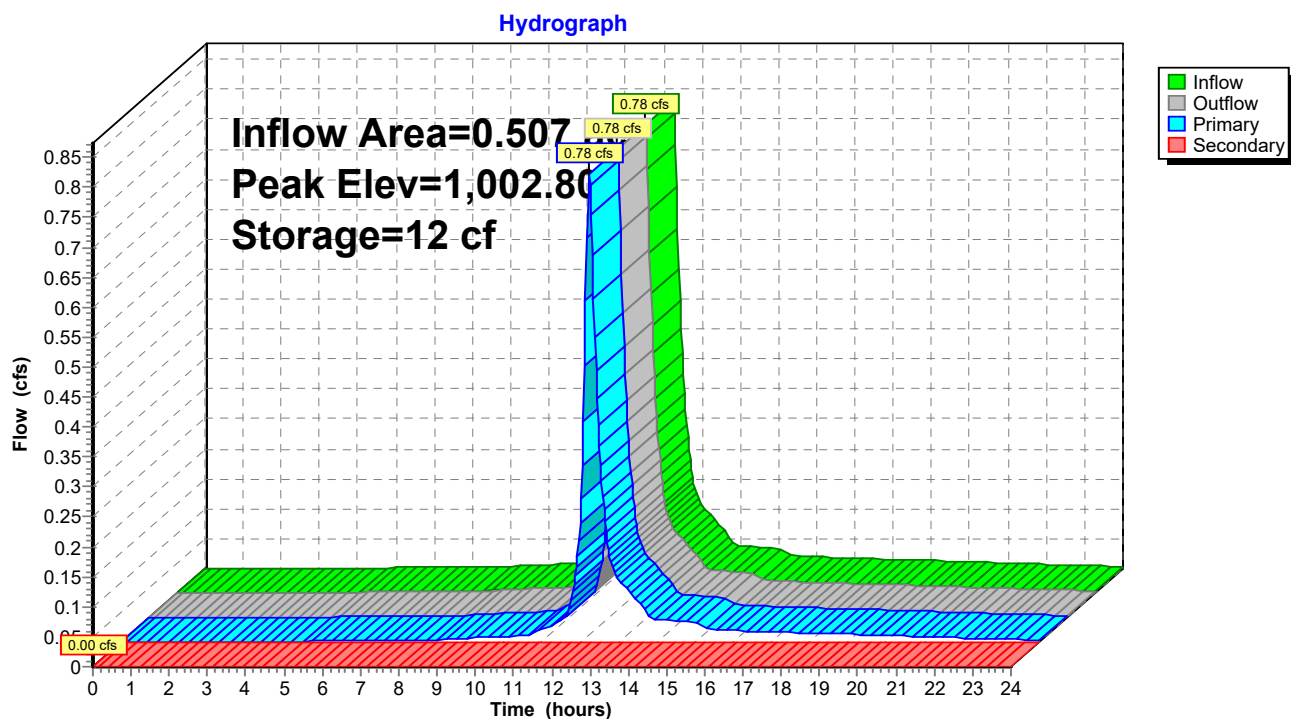
Volume	Invert	Avail.Storage	Storage Description
#1	1,002.70'	15,590 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,002.70	100	0	0
1,004.00	500	390	390
1,005.00	4,250	2,375	2,765
1,008.00	4,300	12,825	15,590

Device	Routing	Invert	Outlet Devices
#1	Primary	998.45'	12.0" Round Culvert L= 85.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.45' / 998.06' S= 0.0046 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,002.70'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	1,005.80'	20.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.78 cfs @ 12.24 hrs HW=1,002.80' TW=0.00' (Dynamic Tailwater)↑ **1=Culvert** (Passes 0.78 cfs of 6.20 cfs potential flow)↑ **2=Orifice/Grate** (Weir Controls 0.78 cfs @ 1.06 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=1,002.70' TW=0.00' (Dynamic Tailwater)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 41P: CB_WoodlandCove



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Stage-Area-Storage for Pond 41P: CB_WoodlandCove

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,002.70	100	0	1,007.80	4,297	14,730
1,002.80	131	12	1,007.90	4,298	15,160
1,002.90	162	26	1,008.00	4,300	15,590
1,003.00	192	44			
1,003.10	223	65			
1,003.20	254	88			
1,003.30	285	115			
1,003.40	315	145			
1,003.50	346	178			
1,003.60	377	215			
1,003.70	408	254			
1,003.80	438	296			
1,003.90	469	342			
1,004.00	500	390			
1,004.10	875	459			
1,004.20	1,250	565			
1,004.30	1,625	709			
1,004.40	2,000	890			
1,004.50	2,375	1,109			
1,004.60	2,750	1,365			
1,004.70	3,125	1,659			
1,004.80	3,500	1,990			
1,004.90	3,875	2,359			
1,005.00	4,250	2,765			
1,005.10	4,252	3,190			
1,005.20	4,253	3,615			
1,005.30	4,255	4,041			
1,005.40	4,257	4,466			
1,005.50	4,258	4,892			
1,005.60	4,260	5,318			
1,005.70	4,262	5,744			
1,005.80	4,263	6,170			
1,005.90	4,265	6,597			
1,006.00	4,267	7,023			
1,006.10	4,268	7,450			
1,006.20	4,270	7,877			
1,006.30	4,272	8,304			
1,006.40	4,273	8,731			
1,006.50	4,275	9,159			
1,006.60	4,277	9,586			
1,006.70	4,278	10,014			
1,006.80	4,280	10,442			
1,006.90	4,282	10,870			
1,007.00	4,283	11,298			
1,007.10	4,285	11,727			
1,007.20	4,287	12,155			
1,007.30	4,288	12,584			
1,007.40	4,290	13,013			
1,007.50	4,292	13,442			
1,007.60	4,293	13,871			
1,007.70	4,295	14,301			

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Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment33S: EX1

Runoff Area=4.540 ac 4.54% Impervious Runoff Depth>2.14"
Flow Length=360' Tc=18.6 min CN=78/98 Runoff=11.18 cfs 0.810 af

Subcatchment34S: EX2

Runoff Area=17.824 ac 12.34% Impervious Runoff Depth>2.09"
Flow Length=600' Tc=24.7 min CN=75/98 Runoff=35.85 cfs 3.100 af

Subcatchment36S: EX3

Runoff Area=6.744 ac 4.21% Impervious Runoff Depth>1.57"
Flow Length=720' Tc=22.6 min CN=70/98 Runoff=10.69 cfs 0.885 af

Subcatchment40S: EX4

Runoff Area=0.507 ac 22.09% Impervious Runoff Depth>2.36"
Flow Length=100' Slope=0.0200 '/' Tc=15.1 min CN=76/98 Runoff=1.46 cfs 0.100 af

Reach 37R: Woodland Cove Pond

Inflow=12.57 cfs 0.909 af
Outflow=12.57 cfs 0.909 af

Reach 38R: Wet2_out

Avg. Flow Depth=1.00' Max Vel=3.47 fps Inflow=36.26 cfs 3.972 af
n=0.035 L=150.0' S=0.0110 '/' Capacity=5,231.48 cfs Outflow=36.25 cfs 3.970 af

Pond 39P: Wet2

Peak Elev=992.36' Storage=8,384 cf Inflow=10.69 cfs 0.885 af
Primary=7.84 cfs 0.875 af Secondary=0.00 cfs 0.000 af Outflow=7.84 cfs 0.875 af

Pond 40P: Wet1

Peak Elev=989.00' Storage=0.440 af Inflow=42.55 cfs 3.975 af
Outflow=36.26 cfs 3.972 af

Pond 41P: CB_WoodlandCove

Peak Elev=1,002.86' Storage=20 cf Inflow=1.46 cfs 0.100 af
Primary=1.46 cfs 0.100 af Secondary=0.00 cfs 0.000 af Outflow=1.46 cfs 0.100 af

Total Runoff Area = 29.615 ac Runoff Volume = 4.894 af Average Runoff Depth = 1.98"
90.54% Pervious = 26.814 ac 9.46% Impervious = 2.801 ac

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Summary for Subcatchment 33S: EX1

Runoff = 11.18 cfs @ 12.28 hrs, Volume= 0.810 af, Depth> 2.14"
Routed to Reach 37R : Woodland Cove Pond

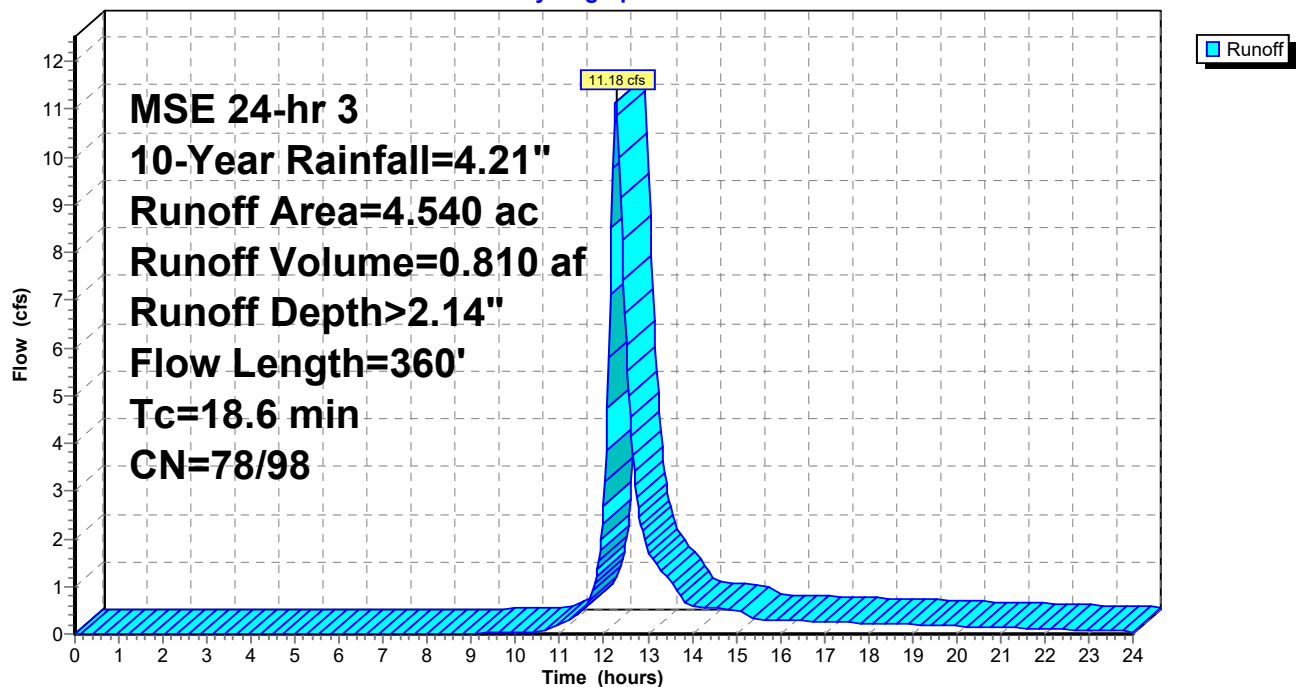
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
1.679	74	>75% Grass cover, Good, HSG C
2.255	80	>75% Grass cover, Good, HSG D
* 0.206	98	impervious
0.014	74	>75% Grass cover, Good, HSG C
0.386	80	>75% Grass cover, Good, HSG D
4.540	79	Weighted Average
4.334	78	95.46% Pervious Area
0.206	98	4.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 2.85"
4.9	260	0.0160	0.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
18.6	360	Total			

Subcatchment 33S: EX1

Hydrograph



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Summary for Subcatchment 34S: EX2

Runoff = 35.85 cfs @ 12.36 hrs, Volume= 3.100 af, Depth> 2.09"
 Routed to Pond 40P : Wet1

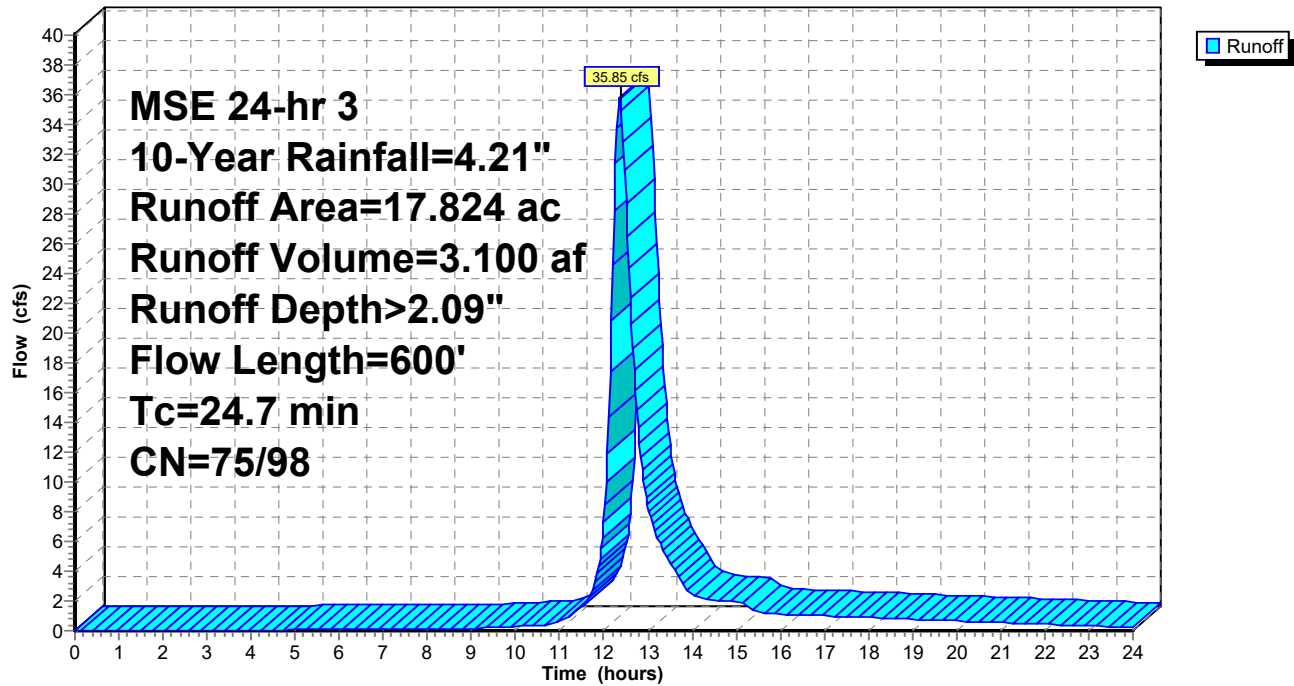
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.039	74	>75% Grass cover, Good, HSG C
0.621	80	>75% Grass cover, Good, HSG D
* 0.440	98	impervious
* 0.000	74	imp_tempC
* 0.000	80	imp_tempD
* 1.759	98	wetland
4.786	70	Woods, Good, HSG C
8.227	77	Woods, Good, HSG D
0.317	77	Woods, Good, HSG D
0.873	74	>75% Grass cover, Good, HSG C
0.762	80	>75% Grass cover, Good, HSG D
17.824	78	Weighted Average
15.625	75	87.66% Pervious Area
2.199	98	12.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
8.9	500	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.7	600	Total			

Subcatchment 34S: EX2

Hydrograph



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MSE 24-hr 3 10-Year Rainfall=4.21"

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Summary for Subcatchment 36S: EX3

Runoff = 10.69 cfs @ 12.34 hrs, Volume= 0.885 af, Depth> 1.57"
 Routed to Pond 39P : Wet2

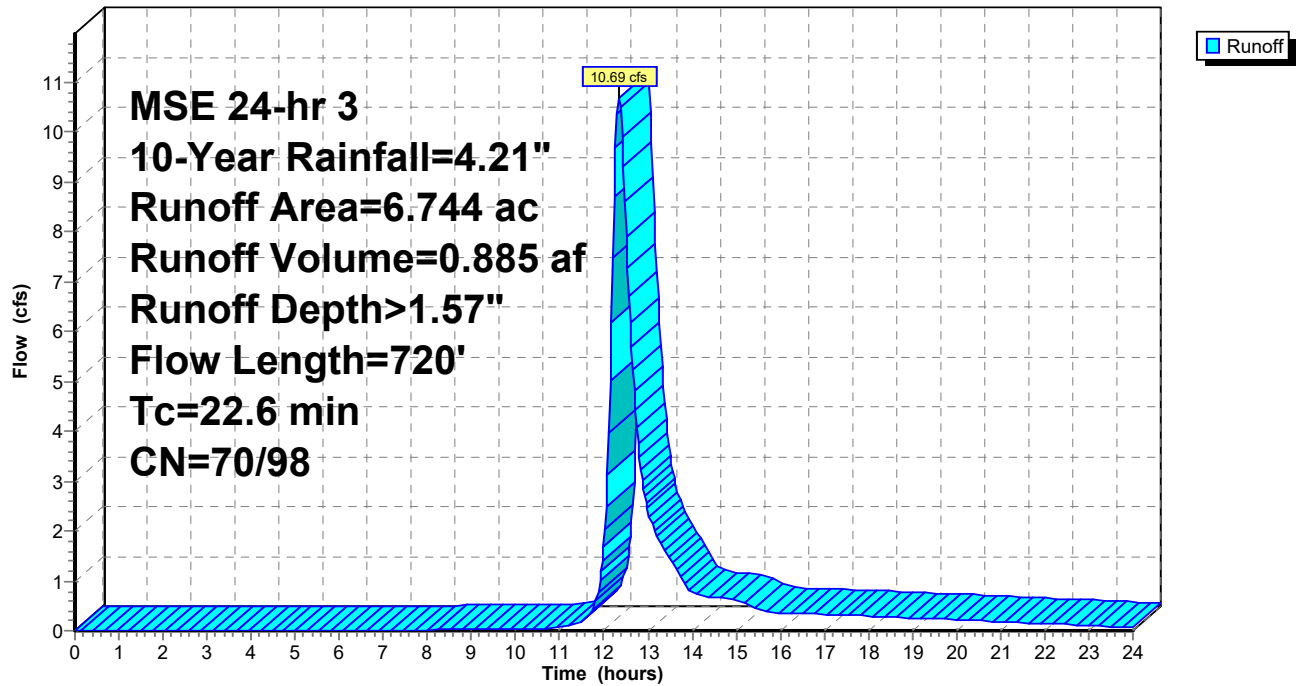
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.001	74	>75% Grass cover, Good, HSG C
* 0.143	98	impervious
* 0.141	98	wetland
6.444	70	Woods, Good, HSG C
0.015	77	Woods, Good, HSG D
6.744	71	Weighted Average
6.460	70	95.79% Pervious Area
0.284	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
7.6	500	0.0480	1.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	120	0.0500	6.94	69.40	Channel Flow, Area= 10.0 sf Perim= 16.0' r= 0.63' n= 0.035
22.6	720	Total			

Subcatchment 36S: EX3

Hydrograph



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MSE 24-hr 3 10-Year Rainfall=4.21"

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Summary for Subcatchment 40S: EX4

Runoff = 1.46 cfs @ 12.24 hrs, Volume= 0.100 af, Depth> 2.36"
Routed to Pond 41P : CB_WoodlandCove

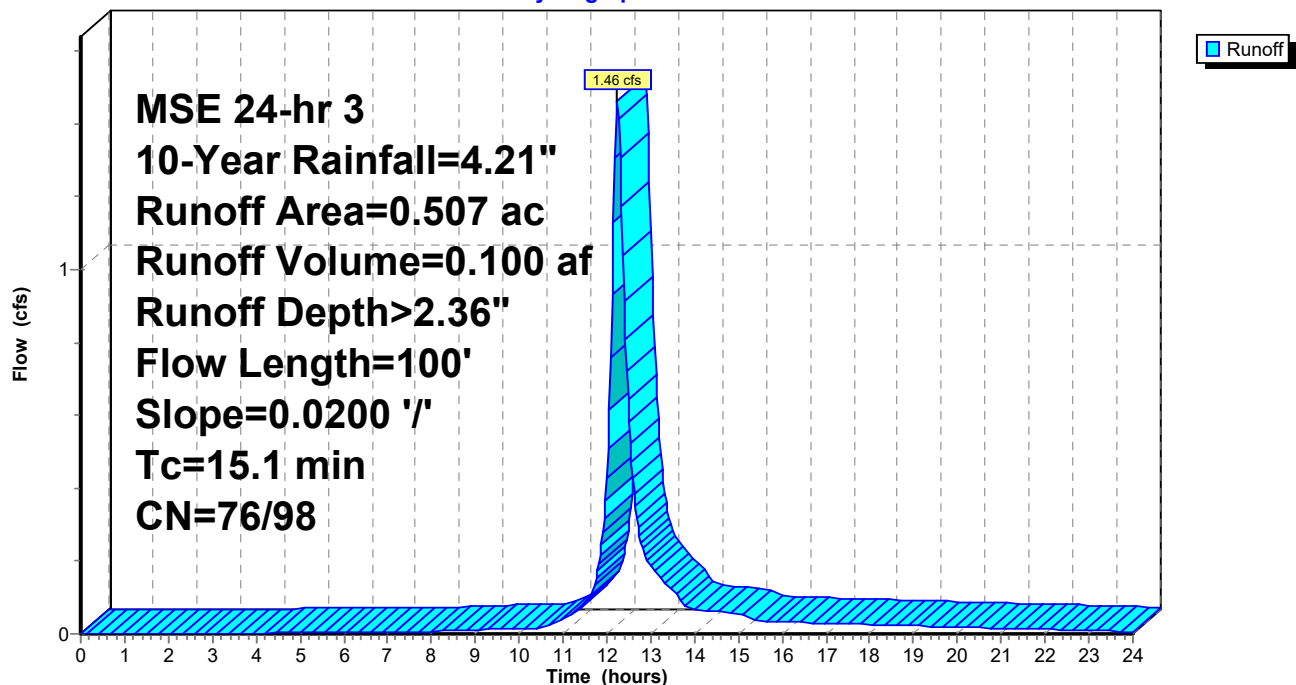
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.159	80	>75% Grass cover, Good, HSG D
* 0.000	98	impervious - new
0.236	74	>75% Grass cover, Good, HSG C
* 0.112	98	impervious - old
0.507	81	Weighted Average
0.395	76	77.91% Pervious Area
0.112	98	22.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 40S: EX4

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Summary for Reach 37R: Woodland Cove Pond

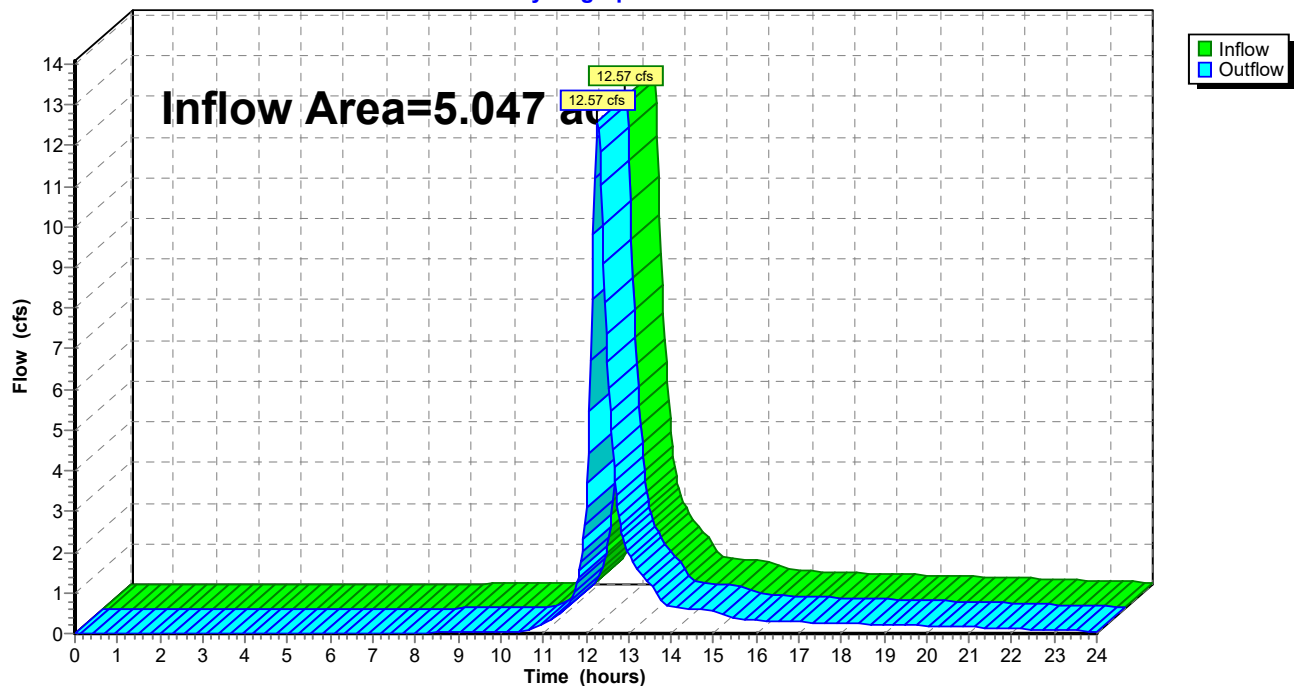
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.047 ac, 6.30% Impervious, Inflow Depth > 2.16" for 10-Year event
Inflow = 12.57 cfs @ 12.28 hrs, Volume= 0.909 af
Outflow = 12.57 cfs @ 12.28 hrs, Volume= 0.909 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Reach 37R: Woodland Cove Pond

Hydrograph



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Summary for Reach 38R: Wet2_out

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 1.94" for 10-Year event
Inflow = 36.26 cfs @ 12.52 hrs, Volume= 3.972 af
Outflow = 36.25 cfs @ 12.52 hrs, Volume= 3.970 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Max. Velocity= 3.47 fps, Min. Travel Time= 0.7 min

Avg. Velocity= 1.19 fps, Avg. Travel Time= 2.1 min

Peak Storage= 1,567 cf @ 12.52 hrs

Average Depth at Peak Storage= 1.00' , Surface Width= 14.97'

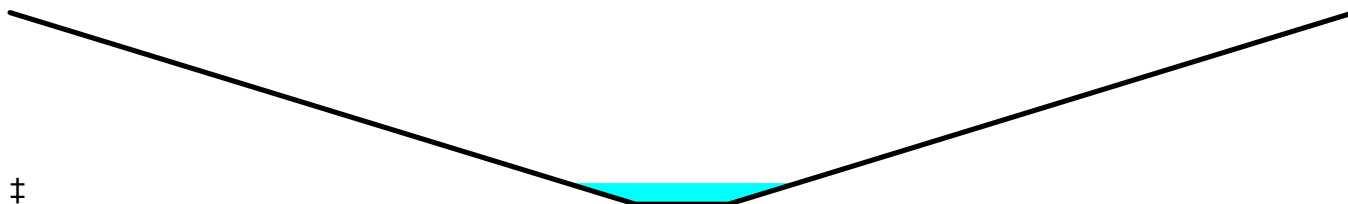
Bank-Full Depth= 9.00' Flow Area= 418.5 sf, Capacity= 5,231.48 cfs

6.00' x 9.00' deep channel, n= 0.035

Side Slope Z-value= 4.5 ' ' Top Width= 87.00'

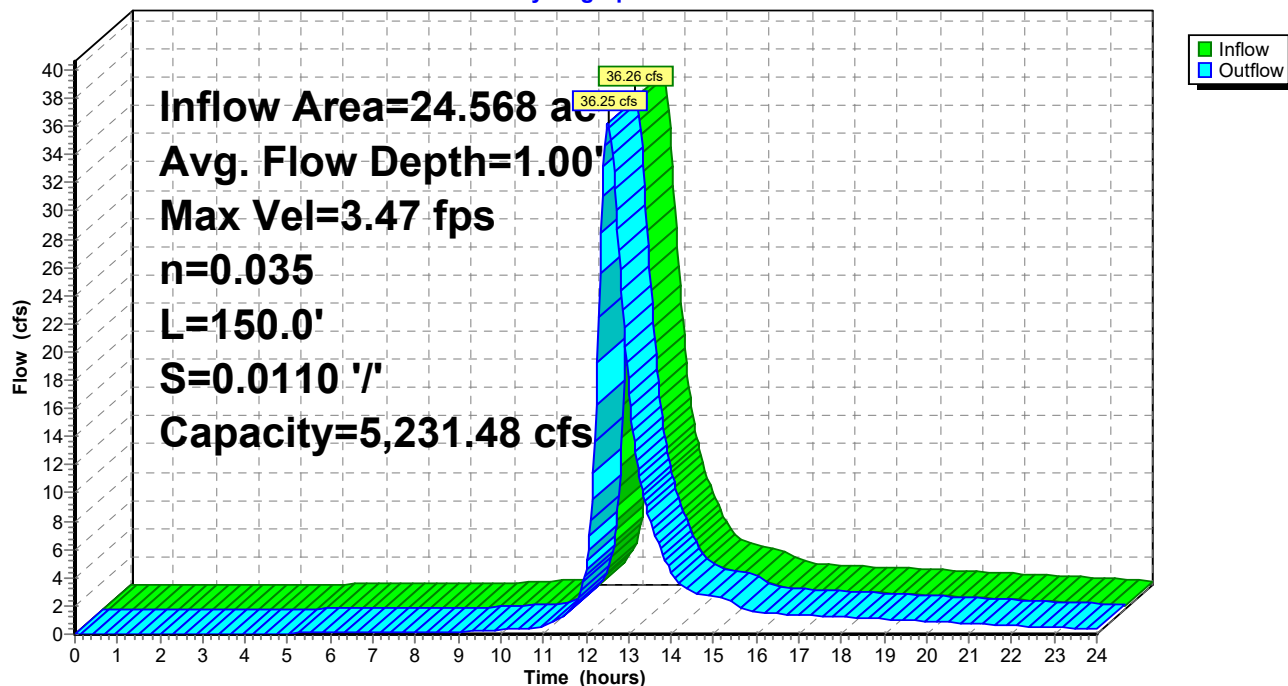
Length= 150.0' Slope= 0.0110 ' '

Inlet Invert= 988.00', Outlet Invert= 986.35'



Reach 38R: Wet2_out

Hydrograph



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MSE 24-hr 3 10-Year Rainfall=4.21"

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Stage-Area-Storage for Reach 38R: Wet2_out

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
988.00	0.0	0	993.10	147.7	22,148
988.10	0.6	97	993.20	152.9	22,933
988.20	1.4	208	993.30	158.2	23,731
988.30	2.2	332	993.40	163.6	24,543
988.40	3.1	469	993.50	169.1	25,369
988.50	4.1	620	993.60	174.7	26,209
988.60	5.2	784	993.70	180.4	27,062
988.70	6.4	962	993.80	186.2	27,928
988.80	7.7	1,153	993.90	192.1	28,808
988.90	9.0	1,357	994.00	198.0	29,701
989.00	10.5	1,576	994.10	204.1	30,608
989.10	12.1	1,808	994.20	210.2	31,528
989.20	13.7	2,053	994.30	216.4	32,461
989.30	15.4	2,312	994.40	222.7	33,409
989.40	17.2	2,584	994.50	229.1	34,370
989.50	19.1	2,870	994.60	235.6	35,344
989.60	21.1	3,169	994.70	242.2	36,332
989.70	23.2	3,481	994.80	248.9	37,333
989.80	25.4	3,807	994.90	255.7	38,348
989.90	27.6	4,147	995.00	262.5	39,376
990.00	30.0	4,501	995.10	269.4	40,417
990.10	32.5	4,868	995.20	276.5	41,472
990.20	35.0	5,248	995.30	283.6	42,541
990.30	37.6	5,642	995.40	290.8	43,624
990.40	40.3	6,049	995.50	298.1	44,720
990.50	43.1	6,470	995.60	305.5	45,829
990.60	46.0	6,904	995.70	313.0	46,952
990.70	49.0	7,351	995.80	320.6	48,088
990.80	52.1	7,813	995.90	328.3	49,238
990.90	55.3	8,288	996.00	336.0	50,401
991.00	58.5	8,776	996.10	343.8	51,577
991.10	61.9	9,278	996.20	351.8	52,768
991.20	65.3	9,793	996.30	359.8	53,972
991.30	68.8	10,322	996.40	367.9	55,189
991.40	72.4	10,864	996.50	376.1	56,420
991.50	76.1	11,419	996.60	384.4	57,664
991.60	79.9	11,988	996.70	392.8	58,922
991.70	83.8	12,571	996.80	401.3	60,193
991.80	87.8	13,168	996.90	409.8	61,477
991.90	91.9	13,778	997.00	418.5	62,775
992.00	96.0	14,401			
992.10	100.3	15,038			
992.20	104.6	15,688			
992.30	109.0	16,352			
992.40	113.5	17,029			
992.50	118.1	17,719			
992.60	122.8	18,424			
992.70	127.6	19,142			
992.80	132.5	19,873			
992.90	137.5	20,618			
993.00	142.5	21,376			

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Summary for Pond 39P: Wet2

Inflow Area = 6.744 ac, 4.21% Impervious, Inflow Depth > 1.57" for 10-Year event
 Inflow = 10.69 cfs @ 12.34 hrs, Volume= 0.885 af
 Outflow = 7.84 cfs @ 12.51 hrs, Volume= 0.875 af, Atten= 27%, Lag= 10.3 min
 Primary = 7.84 cfs @ 12.51 hrs, Volume= 0.875 af
 Routed to Pond 40P : Wet1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 991.00' Surf.Area= 2,915 sf Storage= 1,508 cf

Peak Elev= 992.36' @ 12.51 hrs Surf.Area= 8,324 sf Storage= 8,384 cf (6,877 cf above start)

Plug-Flow detention time= 50.7 min calculated for 0.839 af (95% of inflow)

Center-of-Mass det. time= 19.3 min (850.3 - 831.0)

Volume	Invert	Avail.Storage	Storage Description
#1	990.00'	221,260 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
990.00	100	0	0
992.00	5,730	5,830	5,830
994.00	20,000	25,730	31,560
996.00	47,200	67,200	98,760
998.00	75,300	122,500	221,260

Device	Routing	Invert	Outlet Devices
#1	Primary	991.00'	24.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 991.00' / 990.00' S= 0.0192 '/' Cc= 0.900 n= 0.024, Flow Area= 3.14 sf
#2	Secondary	997.00'	25.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=7.84 cfs @ 12.51 hrs HW=992.36' TW=989.00' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 7.84 cfs @ 4.85 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=991.00' (Free Discharge)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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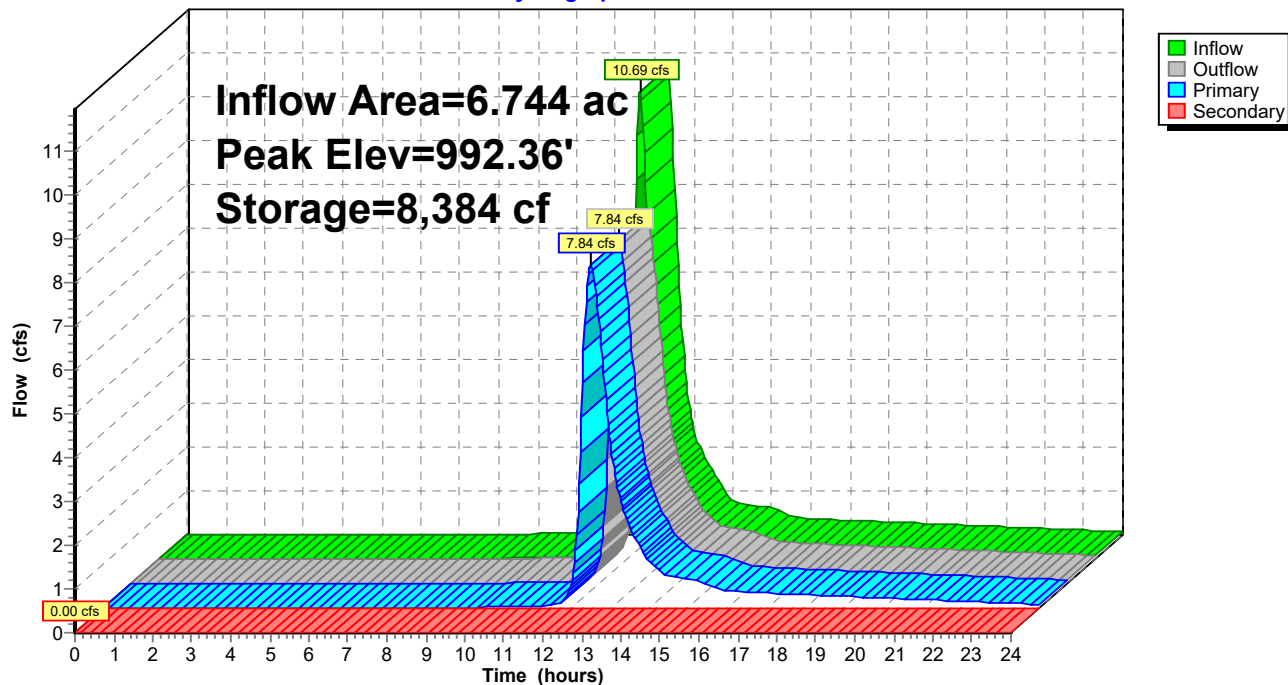
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Pond 39P: Wet2

Hydrograph



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Stage-Area-Storage for Pond 39P: Wet2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
990.00	100	0	995.10	34,960	61,788
990.10	382	24	995.20	36,320	65,352
990.20	663	76	995.30	37,680	69,052
990.30	944	157	995.40	39,040	72,888
990.40	1,226	265	995.50	40,400	76,860
990.50	1,508	402	995.60	41,760	80,968
990.60	1,789	567	995.70	43,120	85,212
990.70	2,071	760	995.80	44,480	89,592
990.80	2,352	981	995.90	45,840	94,108
990.90	2,633	1,230	996.00	47,200	98,760
991.00	2,915	1,508	996.10	48,605	103,550
991.10	3,197	1,813	996.20	50,010	108,481
991.20	3,478	2,147	996.30	51,415	113,552
991.30	3,759	2,509	996.40	52,820	118,764
991.40	4,041	2,899	996.50	54,225	124,116
991.50	4,323	3,317	996.60	55,630	129,609
991.60	4,604	3,763	996.70	57,035	135,242
991.70	4,886	4,238	996.80	58,440	141,016
991.80	5,167	4,740	996.90	59,845	146,930
991.90	5,448	5,271	997.00	61,250	152,985
992.00	5,730	5,830	997.10	62,655	159,180
992.10	6,444	6,439	997.20	64,060	165,516
992.20	7,157	7,119	997.30	65,465	171,992
992.30	7,870	7,870	997.40	66,870	178,609
992.40	8,584	8,693	997.50	68,275	185,366
992.50	9,298	9,587	997.60	69,680	192,264
992.60	10,011	10,552	997.70	71,085	199,302
992.70	10,725	11,589	997.80	72,490	206,481
992.80	11,438	12,697	997.90	73,895	213,800
992.90	12,151	13,877	998.00	75,300	221,260
993.00	12,865	15,128			
993.10	13,579	16,450			
993.20	14,292	17,843			
993.30	15,005	19,308			
993.40	15,719	20,844			
993.50	16,433	22,452			
993.60	17,146	24,131			
993.70	17,860	25,881			
993.80	18,573	27,703			
993.90	19,286	29,596			
994.00	20,000	31,560			
994.10	21,360	33,628			
994.20	22,720	35,832			
994.30	24,080	38,172			
994.40	25,440	40,648			
994.50	26,800	43,260			
994.60	28,160	46,008			
994.70	29,520	48,892			
994.80	30,880	51,912			
994.90	32,240	55,068			
995.00	33,600	58,360			

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Summary for Pond 40P: Wet1

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 1.94" for 10-Year event
 Inflow = 42.55 cfs @ 12.38 hrs, Volume= 3.975 af
 Outflow = 36.26 cfs @ 12.52 hrs, Volume= 3.972 af, Atten= 15%, Lag= 8.0 min
 Primary = 36.26 cfs @ 12.52 hrs, Volume= 3.972 af
 Routed to Reach 38R : Wet2_out

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 989.00' @ 12.52 hrs Surf.Area= 0.864 ac Storage= 0.440 af

Plug-Flow detention time= 8.5 min calculated for 3.967 af (100% of inflow)
 Center-of-Mass det. time= 8.0 min (830.9 - 823.0)

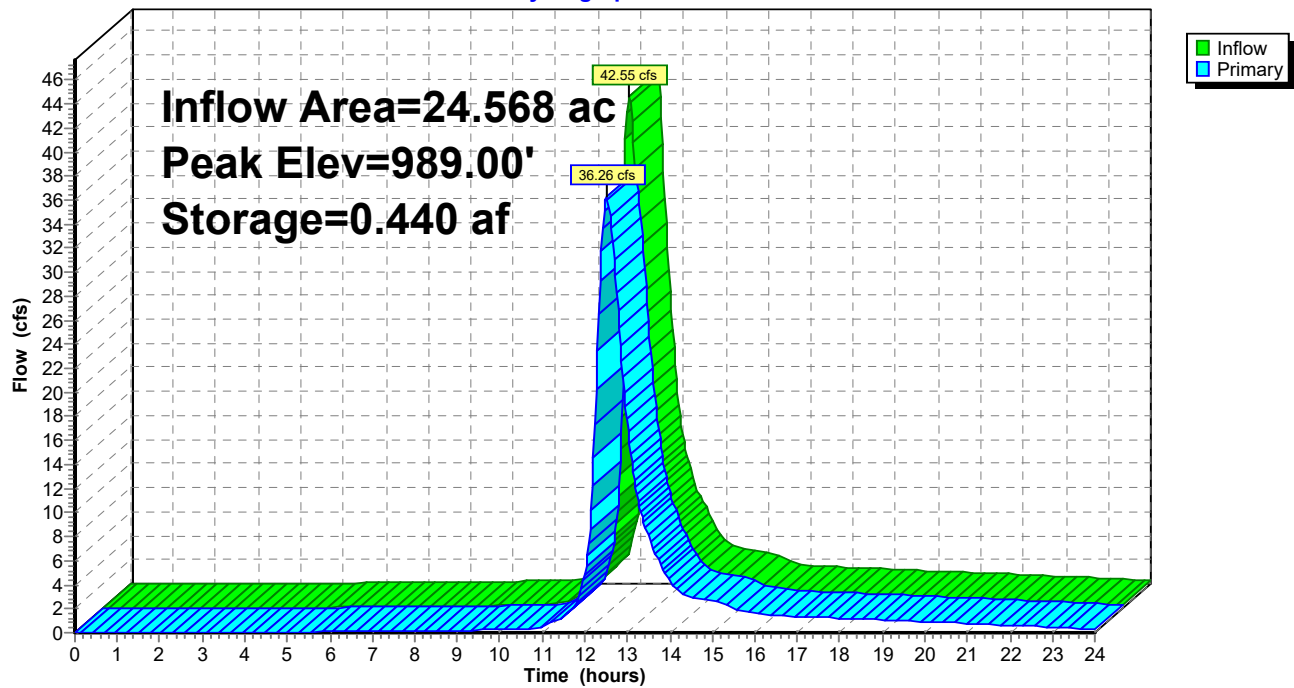
Volume	Invert	Avail.Storage	Storage Description
#1	988.00'	23.952 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
988.00	0.020	0.000	0.000
989.50	1.290	0.983	0.983
990.00	3.430	1.180	2.162
992.00	5.580	9.010	11.172
994.00	7.200	12.780	23.952

Device	Routing	Invert	Outlet Devices
#1	Primary	988.00'	Channel/Reach using Reach 38R: Wet2_out

Primary OutFlow Max=36.23 cfs @ 12.52 hrs HW=989.00' TW=989.00' (Dynamic Tailwater)
 ↑1=Channel/Reach (Channel Controls 36.23 cfs @ 3.47 fps)

Pond 40P: Wet1

Hydrograph



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Stage-Area-Storage for Pond 40P: Wet1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
988.00	0.020	0.000	993.10	6.471	17.801
988.10	0.105	0.006	993.20	6.552	18.452
988.20	0.189	0.021	993.30	6.633	19.111
988.30	0.274	0.044	993.40	6.714	19.778
988.40	0.359	0.076	993.50	6.795	20.454
988.50	0.443	0.116	993.60	6.876	21.137
988.60	0.528	0.164	993.70	6.957	21.829
988.70	0.613	0.221	993.80	7.038	22.529
988.80	0.697	0.287	993.90	7.119	23.237
988.90	0.782	0.361	994.00	7.200	23.952
989.00	0.867	0.443	994.10	7.200	23.952
989.10	0.951	0.534	994.20	7.200	23.952
989.20	1.036	0.634	994.30	7.200	23.952
989.30	1.121	0.741	994.40	7.200	23.952
989.40	1.205	0.858	994.50	7.200	23.952
989.50	1.290	0.983	994.60	7.200	23.952
989.60	1.718	1.133	994.70	7.200	23.952
989.70	2.146	1.326	994.80	7.200	23.952
989.80	2.574	1.562	994.90	7.200	23.952
989.90	3.002	1.841	995.00	7.200	23.952
990.00	3.430	2.162	995.10	7.200	23.952
990.10	3.538	2.511	995.20	7.200	23.952
990.20	3.645	2.870	995.30	7.200	23.952
990.30	3.752	3.240	995.40	7.200	23.952
990.40	3.860	3.620	995.50	7.200	23.952
990.50	3.967	4.012	995.60	7.200	23.952
990.60	4.075	4.414	995.70	7.200	23.952
990.70	4.183	4.827	995.80	7.200	23.952
990.80	4.290	5.250	995.90	7.200	23.952
990.90	4.397	5.685	996.00	7.200	23.952
991.00	4.505	6.130	996.10	7.200	23.952
991.10	4.613	6.586	996.20	7.200	23.952
991.20	4.720	7.053	996.30	7.200	23.952
991.30	4.827	7.530	996.40	7.200	23.952
991.40	4.935	8.018	996.50	7.200	23.952
991.50	5.042	8.517	996.60	7.200	23.952
991.60	5.150	9.027	996.70	7.200	23.952
991.70	5.258	9.547	996.80	7.200	23.952
991.80	5.365	10.078	996.90	7.200	23.952
991.90	5.472	10.620	997.00	7.200	23.952
992.00	5.580	11.172			
992.10	5.661	11.735			
992.20	5.742	12.305			
992.30	5.823	12.883			
992.40	5.904	13.469			
992.50	5.985	14.064			
992.60	6.066	14.666			
992.70	6.147	15.277			
992.80	6.228	15.896			
992.90	6.309	16.523			
993.00	6.390	17.157			

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Summary for Pond 41P: CB_WoodlandCove

Inflow Area = 0.507 ac, 22.09% Impervious, Inflow Depth > 2.36" for 10-Year event
 Inflow = 1.46 cfs @ 12.24 hrs, Volume= 0.100 af
 Outflow = 1.46 cfs @ 12.24 hrs, Volume= 0.100 af, Atten= 0%, Lag= 0.2 min
 Primary = 1.46 cfs @ 12.24 hrs, Volume= 0.100 af
 Routed to Reach 37R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 37R : Woodland Cove Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 1,002.86' @ 12.24 hrs Surf.Area= 149 sf Storage= 20 cf

Plug-Flow detention time= 0.4 min calculated for 0.099 af (100% of inflow)
 Center-of-Mass det. time= 0.4 min (796.7 - 796.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,002.70'	15,590 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,002.70	100	0	0
1,004.00	500	390	390
1,005.00	4,250	2,375	2,765
1,008.00	4,300	12,825	15,590

Device	Routing	Invert	Outlet Devices
#1	Primary	998.45'	12.0" Round Culvert L= 85.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.45' / 998.06' S= 0.0046 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,002.70'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	1,005.80'	20.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

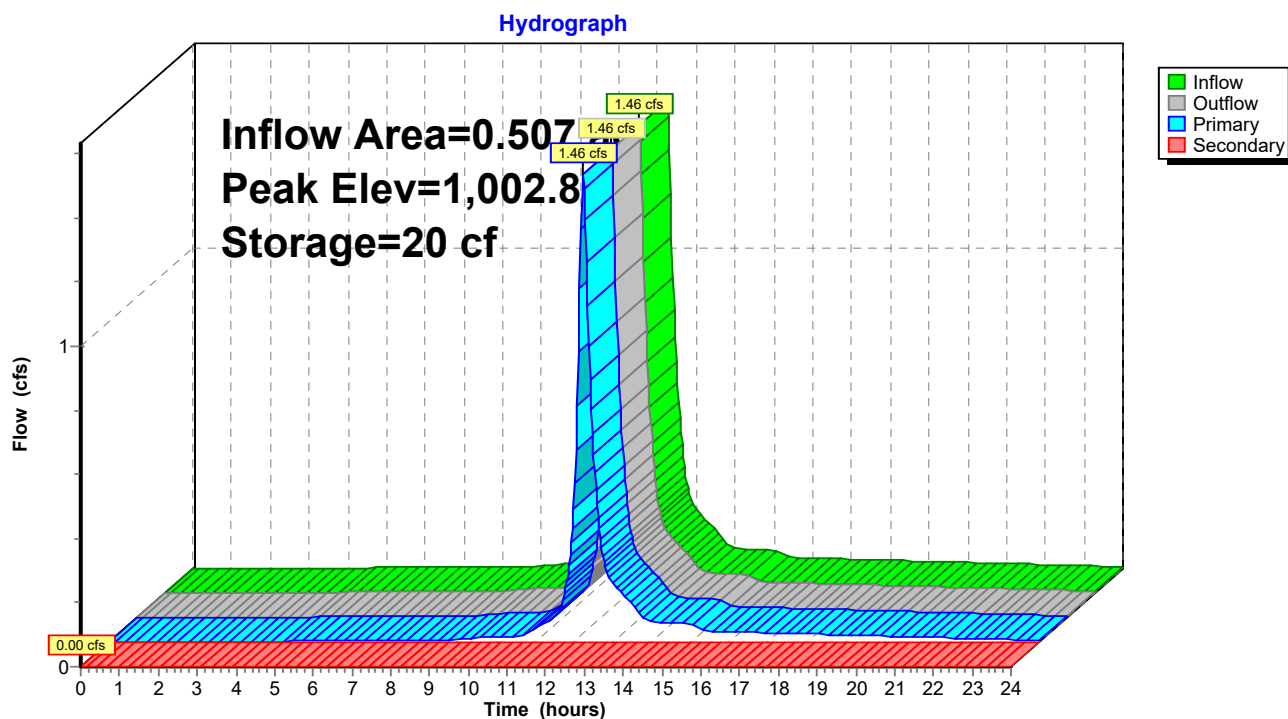
Primary OutFlow Max=1.46 cfs @ 12.24 hrs HW=1,002.86' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.46 cfs of 6.25 cfs potential flow)
 ↑ **2=Orifice/Grate** (Weir Controls 1.46 cfs @ 1.30 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,002.70' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 41P: CB_WoodlandCove



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Stage-Area-Storage for Pond 41P: CB_WoodlandCove

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,002.70	100	0	1,007.80	4,297	14,730
1,002.80	131	12	1,007.90	4,298	15,160
1,002.90	162	26	1,008.00	4,300	15,590
1,003.00	192	44			
1,003.10	223	65			
1,003.20	254	88			
1,003.30	285	115			
1,003.40	315	145			
1,003.50	346	178			
1,003.60	377	215			
1,003.70	408	254			
1,003.80	438	296			
1,003.90	469	342			
1,004.00	500	390			
1,004.10	875	459			
1,004.20	1,250	565			
1,004.30	1,625	709			
1,004.40	2,000	890			
1,004.50	2,375	1,109			
1,004.60	2,750	1,365			
1,004.70	3,125	1,659			
1,004.80	3,500	1,990			
1,004.90	3,875	2,359			
1,005.00	4,250	2,765			
1,005.10	4,252	3,190			
1,005.20	4,253	3,615			
1,005.30	4,255	4,041			
1,005.40	4,257	4,466			
1,005.50	4,258	4,892			
1,005.60	4,260	5,318			
1,005.70	4,262	5,744			
1,005.80	4,263	6,170			
1,005.90	4,265	6,597			
1,006.00	4,267	7,023			
1,006.10	4,268	7,450			
1,006.20	4,270	7,877			
1,006.30	4,272	8,304			
1,006.40	4,273	8,731			
1,006.50	4,275	9,159			
1,006.60	4,277	9,586			
1,006.70	4,278	10,014			
1,006.80	4,280	10,442			
1,006.90	4,282	10,870			
1,007.00	4,283	11,298			
1,007.10	4,285	11,727			
1,007.20	4,287	12,155			
1,007.30	4,288	12,584			
1,007.40	4,290	13,013			
1,007.50	4,292	13,442			
1,007.60	4,293	13,871			
1,007.70	4,295	14,301			

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Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment33S: EX1

Runoff Area=4.540 ac 4.54% Impervious Runoff Depth>4.79"
Flow Length=360' Tc=18.6 min CN=78/98 Runoff=24.94 cfs 1.813 af

Subcatchment34S: EX2

Runoff Area=17.824 ac 12.34% Impervious Runoff Depth>4.68"
Flow Length=600' Tc=24.7 min CN=75/98 Runoff=81.32 cfs 6.951 af

Subcatchment36S: EX3

Runoff Area=6.744 ac 4.21% Impervious Runoff Depth>3.95"
Flow Length=720' Tc=22.6 min CN=70/98 Runoff=27.82 cfs 2.218 af

Subcatchment40S: EX4

Runoff Area=0.507 ac 22.09% Impervious Runoff Depth>5.03"
Flow Length=100' Slope=0.0200 '/' Tc=15.1 min CN=76/98 Runoff=3.13 cfs 0.212 af

Reach 37R: Woodland Cove Pond

Inflow=27.94 cfs 2.026 af
Outflow=27.94 cfs 2.026 af

Reach 38R: Wet2_out

Avg. Flow Depth=1.50' Max Vel=4.35 fps Inflow=83.43 cfs 9.149 af
n=0.035 L=150.0' S=0.0110 '/' Capacity=5,231.48 cfs Outflow=83.39 cfs 9.147 af

Pond 39P: Wet2

Peak Elev=993.43' Storage=21,367 cf Inflow=27.82 cfs 2.218 af
Primary=16.94 cfs 2.204 af Secondary=0.00 cfs 0.000 af Outflow=16.94 cfs 2.204 af

Pond 40P: Wet1

Peak Elev=989.50' Storage=0.986 af Inflow=96.35 cfs 9.155 af
Outflow=83.43 cfs 9.149 af

Pond 41P: CB_WoodlandCove

Peak Elev=1,002.96' Storage=37 cf Inflow=3.13 cfs 0.212 af
Primary=3.13 cfs 0.212 af Secondary=0.00 cfs 0.000 af Outflow=3.13 cfs 0.212 af

Total Runoff Area = 29.615 ac Runoff Volume = 11.195 af Average Runoff Depth = 4.54"
90.54% Pervious = 26.814 ac 9.46% Impervious = 2.801 ac

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Summary for Subcatchment 33S: EX1

Runoff = 24.94 cfs @ 12.28 hrs, Volume= 1.813 af, Depth> 4.79"
Routed to Reach 37R : Woodland Cove Pond

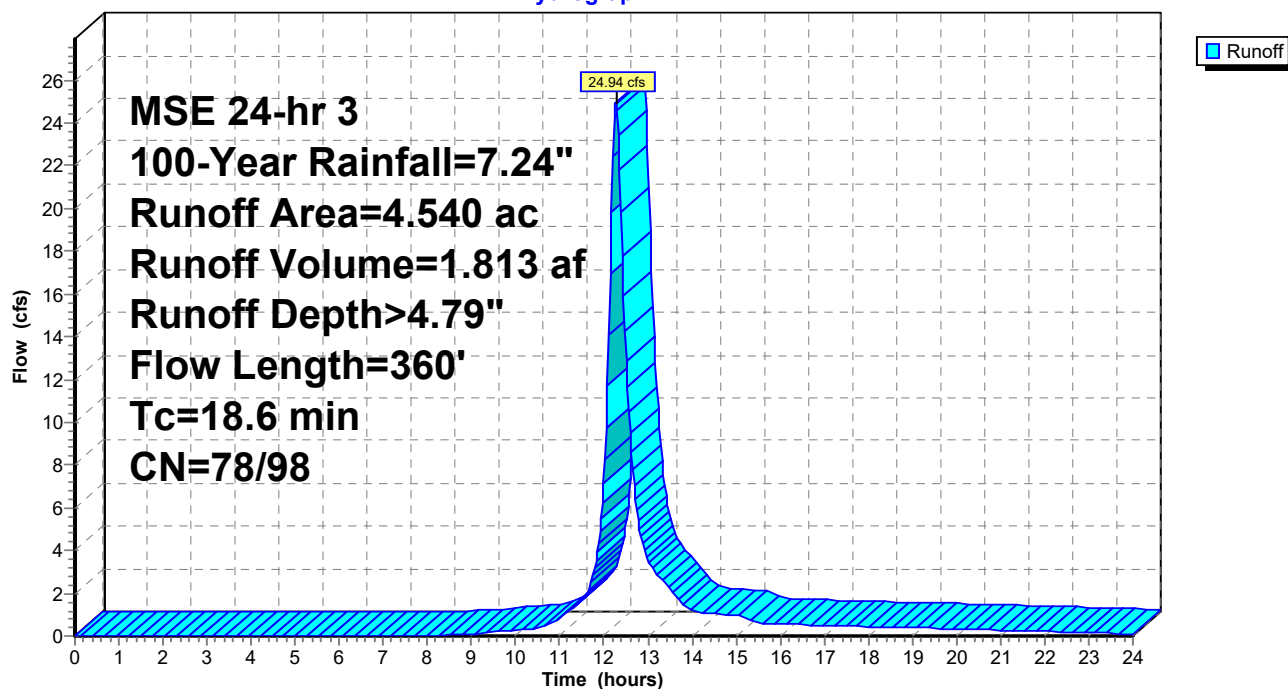
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
1.679	74	>75% Grass cover, Good, HSG C
2.255	80	>75% Grass cover, Good, HSG D
* 0.206	98	impervious
0.014	74	>75% Grass cover, Good, HSG C
0.386	80	>75% Grass cover, Good, HSG D
4.540	79	Weighted Average
4.334	78	95.46% Pervious Area
0.206	98	4.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.7	100	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 2.85"
4.9	260	0.0160	0.89		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
18.6	360	Total			

Subcatchment 33S: EX1

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Summary for Subcatchment 34S: EX2

Runoff = 81.32 cfs @ 12.35 hrs, Volume= 6.951 af, Depth> 4.68"
 Routed to Pond 40P : Wet1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.039	74	>75% Grass cover, Good, HSG C
0.621	80	>75% Grass cover, Good, HSG D
* 0.440	98	impervious
* 0.000	74	imp_tempC
* 0.000	80	imp_tempD
* 1.759	98	wetland
4.786	70	Woods, Good, HSG C
8.227	77	Woods, Good, HSG D
0.317	77	Woods, Good, HSG D
0.873	74	>75% Grass cover, Good, HSG C
0.762	80	>75% Grass cover, Good, HSG D
17.824	78	Weighted Average
15.625	75	87.66% Pervious Area
2.199	98	12.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
8.9	500	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.7	600	Total			

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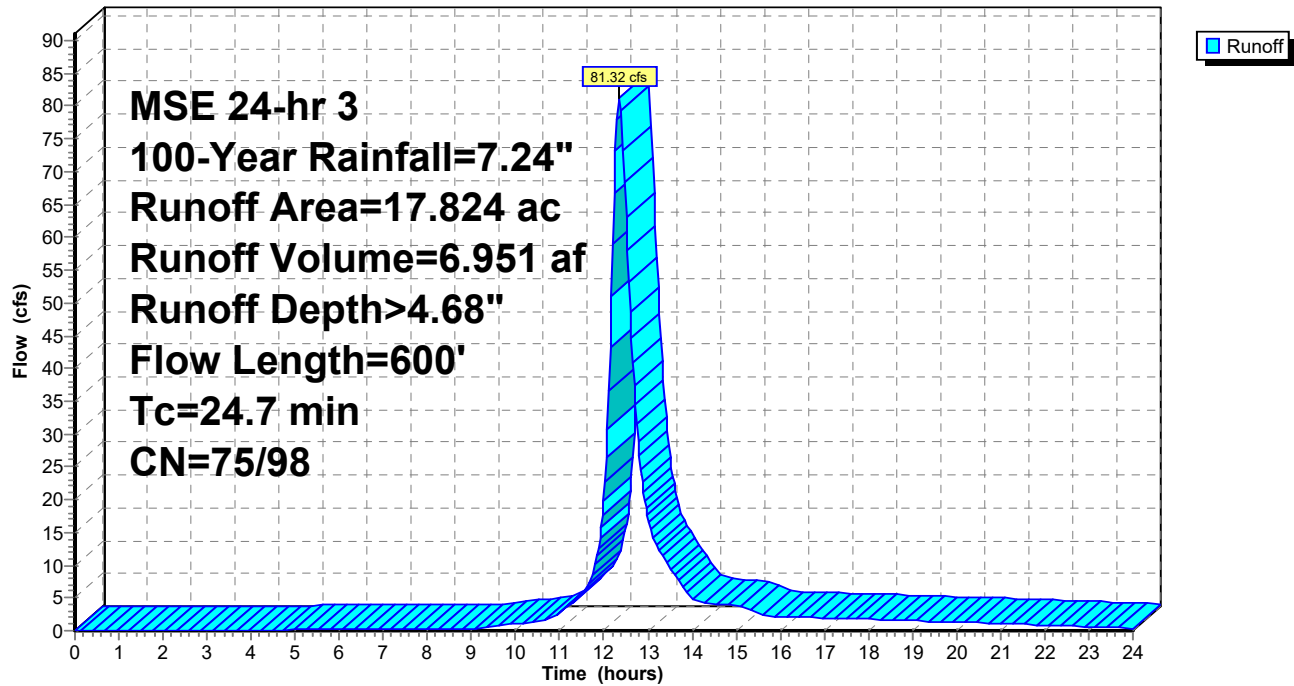
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Subcatchment 34S: EX2

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Summary for Subcatchment 36S: EX3

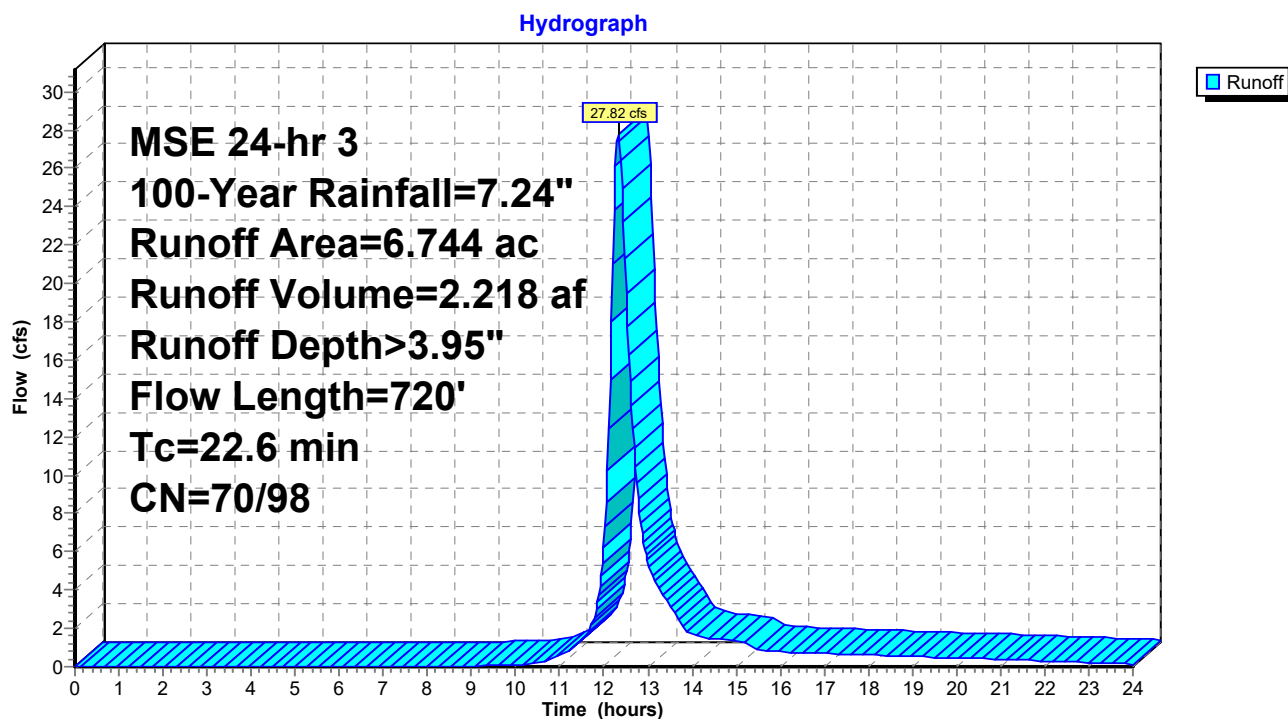
Runoff = 27.82 cfs @ 12.33 hrs, Volume= 2.218 af, Depth> 3.95"
 Routed to Pond 39P : Wet2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.001	74	>75% Grass cover, Good, HSG C
* 0.143	98	impervious
* 0.141	98	wetland
6.444	70	Woods, Good, HSG C
0.015	77	Woods, Good, HSG D
6.744	71	Weighted Average
6.460	70	95.79% Pervious Area
0.284	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
7.6	500	0.0480	1.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	120	0.0500	6.94	69.40	Channel Flow, Area= 10.0 sf Perim= 16.0' r= 0.63' n= 0.035
22.6	720	Total			

Subcatchment 36S: EX3



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Summary for Subcatchment 40S: EX4

Runoff = 3.13 cfs @ 12.23 hrs, Volume= 0.212 af, Depth> 5.03"
Routed to Pond 41P : CB_WoodlandCove

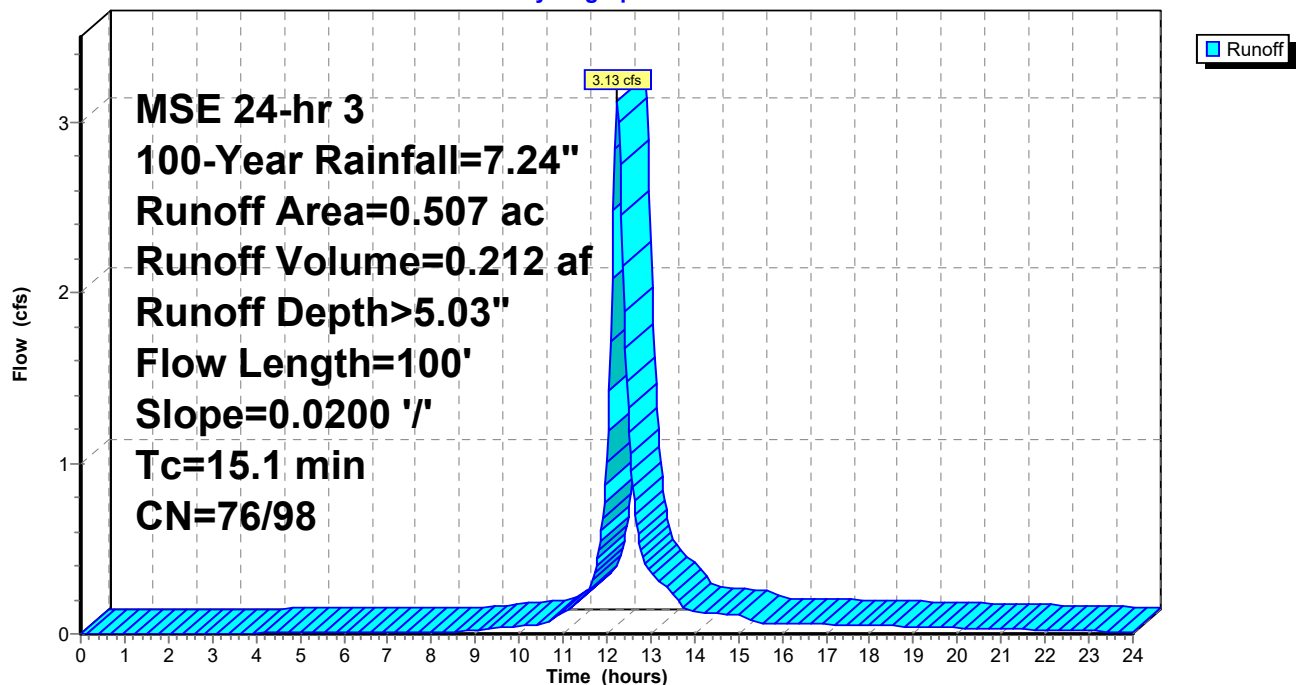
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.159	80	>75% Grass cover, Good, HSG D
* 0.000	98	impervious - new
0.236	74	>75% Grass cover, Good, HSG C
* 0.112	98	impervious - old
0.507	81	Weighted Average
0.395	76	77.91% Pervious Area
0.112	98	22.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 40S: EX4

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Summary for Reach 37R: Woodland Cove Pond

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.047 ac, 6.30% Impervious, Inflow Depth > 4.82" for 100-Year event

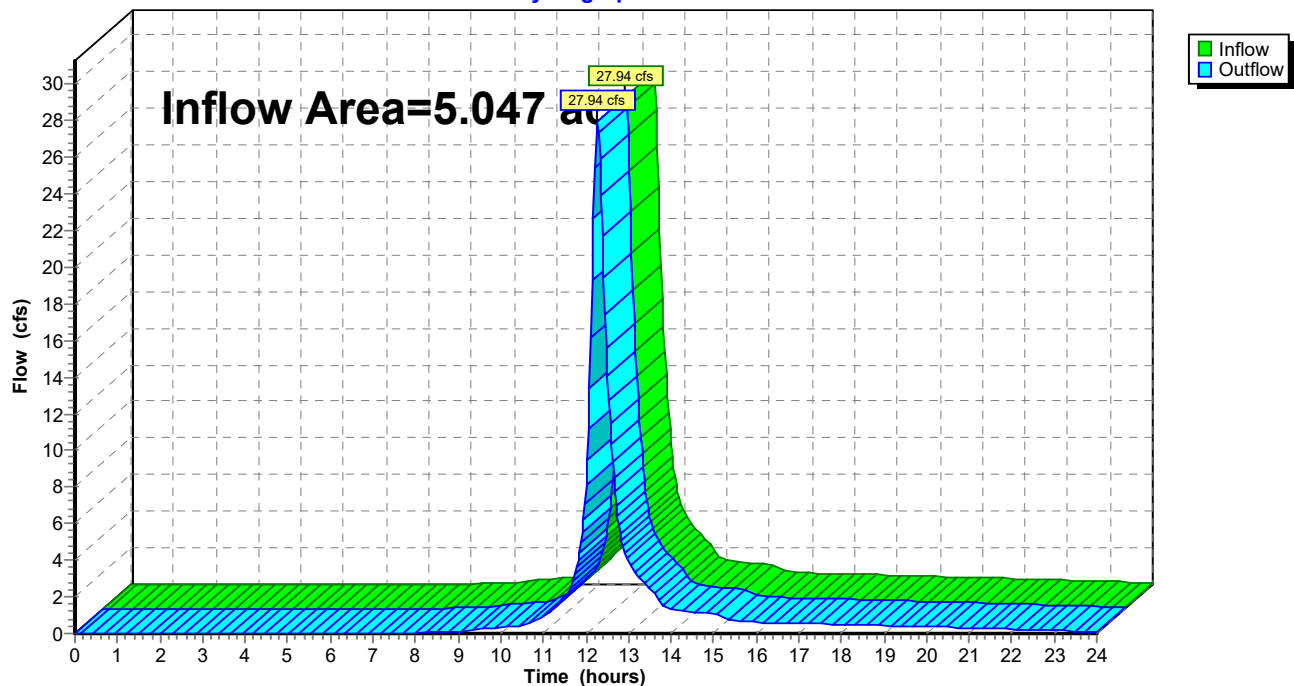
Inflow = 27.94 cfs @ 12.27 hrs, Volume= 2.026 af

Outflow = 27.94 cfs @ 12.27 hrs, Volume= 2.026 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Reach 37R: Woodland Cove Pond

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Summary for Reach 38R: Wet2_out

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 4.47" for 100-Year event
Inflow = 83.43 cfs @ 12.49 hrs, Volume= 9.149 af
Outflow = 83.39 cfs @ 12.50 hrs, Volume= 9.147 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Max. Velocity= 4.35 fps, Min. Travel Time= 0.6 min

Avg. Velocity= 1.44 fps, Avg. Travel Time= 1.7 min

Peak Storage= 2,874 cf @ 12.50 hrs

Average Depth at Peak Storage= 1.50' , Surface Width= 19.51'

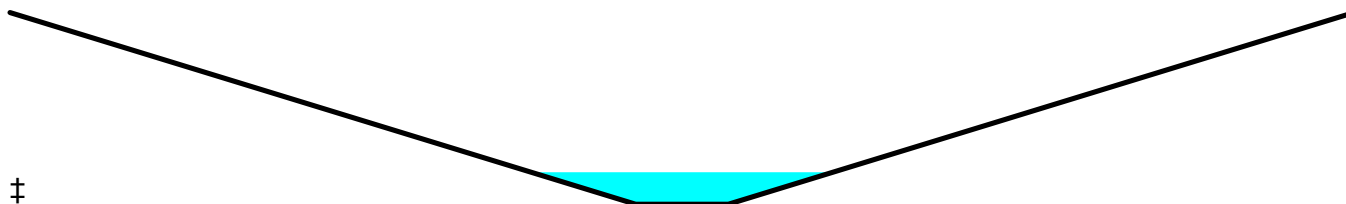
Bank-Full Depth= 9.00' Flow Area= 418.5 sf, Capacity= 5,231.48 cfs

6.00' x 9.00' deep channel, n= 0.035

Side Slope Z-value= 4.5 ' / ' Top Width= 87.00'

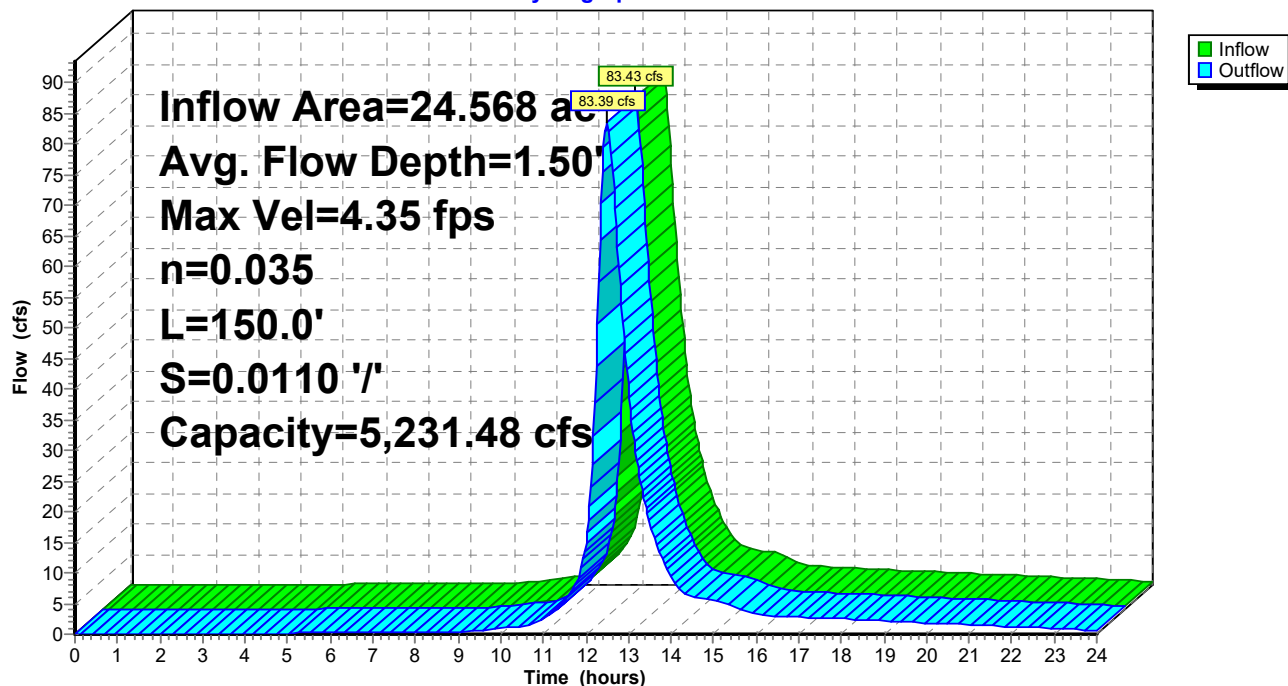
Length= 150.0' Slope= 0.0110 ' / '

Inlet Invert= 988.00', Outlet Invert= 986.35'



Reach 38R: Wet2_out

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Stage-Area-Storage for Reach 38R: Wet2_out

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
988.00	0.0	0	993.10	147.7	22,148
988.10	0.6	97	993.20	152.9	22,933
988.20	1.4	208	993.30	158.2	23,731
988.30	2.2	332	993.40	163.6	24,543
988.40	3.1	469	993.50	169.1	25,369
988.50	4.1	620	993.60	174.7	26,209
988.60	5.2	784	993.70	180.4	27,062
988.70	6.4	962	993.80	186.2	27,928
988.80	7.7	1,153	993.90	192.1	28,808
988.90	9.0	1,357	994.00	198.0	29,701
989.00	10.5	1,576	994.10	204.1	30,608
989.10	12.1	1,808	994.20	210.2	31,528
989.20	13.7	2,053	994.30	216.4	32,461
989.30	15.4	2,312	994.40	222.7	33,409
989.40	17.2	2,584	994.50	229.1	34,370
989.50	19.1	2,870	994.60	235.6	35,344
989.60	21.1	3,169	994.70	242.2	36,332
989.70	23.2	3,481	994.80	248.9	37,333
989.80	25.4	3,807	994.90	255.7	38,348
989.90	27.6	4,147	995.00	262.5	39,376
990.00	30.0	4,501	995.10	269.4	40,417
990.10	32.5	4,868	995.20	276.5	41,472
990.20	35.0	5,248	995.30	283.6	42,541
990.30	37.6	5,642	995.40	290.8	43,624
990.40	40.3	6,049	995.50	298.1	44,720
990.50	43.1	6,470	995.60	305.5	45,829
990.60	46.0	6,904	995.70	313.0	46,952
990.70	49.0	7,351	995.80	320.6	48,088
990.80	52.1	7,813	995.90	328.3	49,238
990.90	55.3	8,288	996.00	336.0	50,401
991.00	58.5	8,776	996.10	343.8	51,577
991.10	61.9	9,278	996.20	351.8	52,768
991.20	65.3	9,793	996.30	359.8	53,972
991.30	68.8	10,322	996.40	367.9	55,189
991.40	72.4	10,864	996.50	376.1	56,420
991.50	76.1	11,419	996.60	384.4	57,664
991.60	79.9	11,988	996.70	392.8	58,922
991.70	83.8	12,571	996.80	401.3	60,193
991.80	87.8	13,168	996.90	409.8	61,477
991.90	91.9	13,778	997.00	418.5	62,775
992.00	96.0	14,401			
992.10	100.3	15,038			
992.20	104.6	15,688			
992.30	109.0	16,352			
992.40	113.5	17,029			
992.50	118.1	17,719			
992.60	122.8	18,424			
992.70	127.6	19,142			
992.80	132.5	19,873			
992.90	137.5	20,618			
993.00	142.5	21,376			

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Summary for Pond 39P: Wet2

Inflow Area = 6.744 ac, 4.21% Impervious, Inflow Depth > 3.95" for 100-Year event
 Inflow = 27.82 cfs @ 12.33 hrs, Volume= 2.218 af
 Outflow = 16.94 cfs @ 12.56 hrs, Volume= 2.204 af, Atten= 39%, Lag= 13.5 min
 Primary = 16.94 cfs @ 12.56 hrs, Volume= 2.204 af
 Routed to Pond 40P : Wet1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 991.00' Surf.Area= 2,915 sf Storage= 1,508 cf

Peak Elev= 993.43' @ 12.56 hrs Surf.Area= 15,954 sf Storage= 21,367 cf (19,859 cf above start)

Plug-Flow detention time= 33.2 min calculated for 2.169 af (98% of inflow)

Center-of-Mass det. time= 17.5 min (831.9 - 814.4)

Volume	Invert	Avail.Storage	Storage Description
#1	990.00'	221,260 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
990.00	100	0	0
992.00	5,730	5,830	5,830
994.00	20,000	25,730	31,560
996.00	47,200	67,200	98,760
998.00	75,300	122,500	221,260

Device	Routing	Invert	Outlet Devices
#1	Primary	991.00'	24.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 991.00' / 990.00' S= 0.0192 ' / Cc= 0.900 n= 0.024, Flow Area= 3.14 sf
#2	Secondary	997.00'	25.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=16.93 cfs @ 12.56 hrs HW=993.43' TW=989.48' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 16.93 cfs @ 5.63 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=991.00' (Free Discharge)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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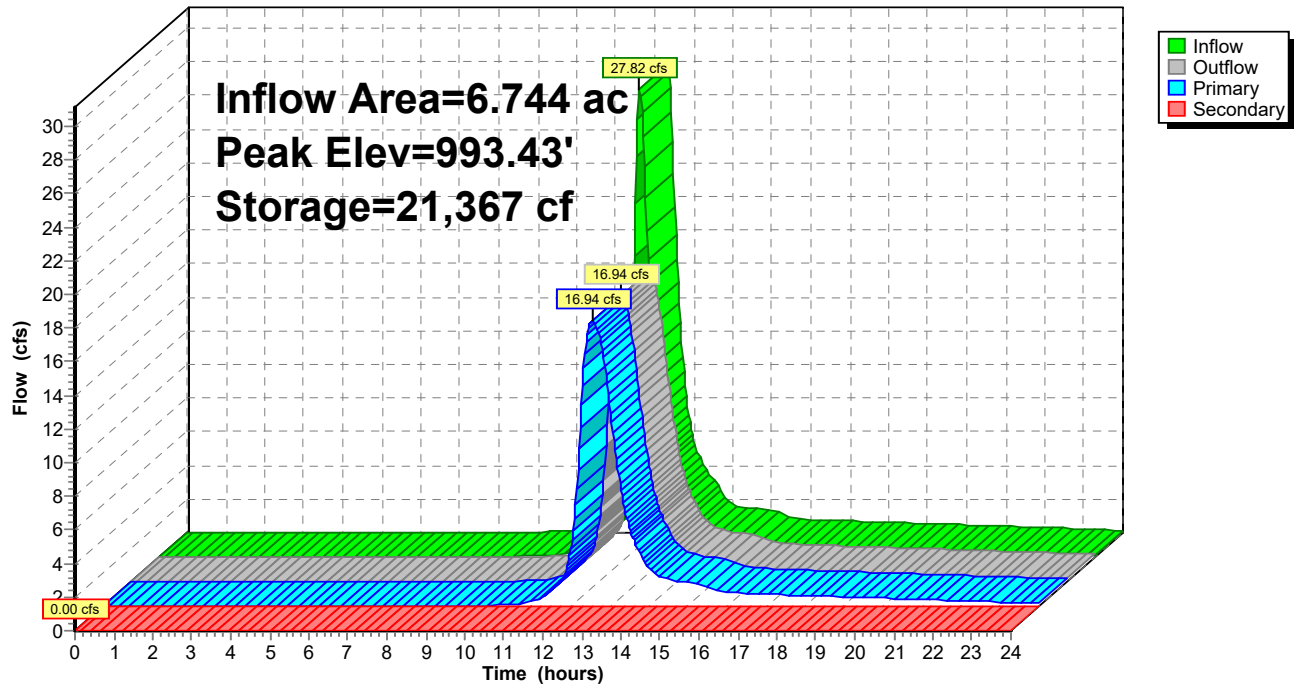
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Pond 39P: Wet2

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Stage-Area-Storage for Pond 39P: Wet2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
990.00	100	0	995.10	34,960	61,788
990.10	382	24	995.20	36,320	65,352
990.20	663	76	995.30	37,680	69,052
990.30	944	157	995.40	39,040	72,888
990.40	1,226	265	995.50	40,400	76,860
990.50	1,508	402	995.60	41,760	80,968
990.60	1,789	567	995.70	43,120	85,212
990.70	2,071	760	995.80	44,480	89,592
990.80	2,352	981	995.90	45,840	94,108
990.90	2,633	1,230	996.00	47,200	98,760
991.00	2,915	1,508	996.10	48,605	103,550
991.10	3,197	1,813	996.20	50,010	108,481
991.20	3,478	2,147	996.30	51,415	113,552
991.30	3,759	2,509	996.40	52,820	118,764
991.40	4,041	2,899	996.50	54,225	124,116
991.50	4,323	3,317	996.60	55,630	129,609
991.60	4,604	3,763	996.70	57,035	135,242
991.70	4,886	4,238	996.80	58,440	141,016
991.80	5,167	4,740	996.90	59,845	146,930
991.90	5,448	5,271	997.00	61,250	152,985
992.00	5,730	5,830	997.10	62,655	159,180
992.10	6,444	6,439	997.20	64,060	165,516
992.20	7,157	7,119	997.30	65,465	171,992
992.30	7,870	7,870	997.40	66,870	178,609
992.40	8,584	8,693	997.50	68,275	185,366
992.50	9,298	9,587	997.60	69,680	192,264
992.60	10,011	10,552	997.70	71,085	199,302
992.70	10,725	11,589	997.80	72,490	206,481
992.80	11,438	12,697	997.90	73,895	213,800
992.90	12,151	13,877	998.00	75,300	221,260
993.00	12,865	15,128			
993.10	13,579	16,450			
993.20	14,292	17,843			
993.30	15,005	19,308			
993.40	15,719	20,844			
993.50	16,433	22,452			
993.60	17,146	24,131			
993.70	17,860	25,881			
993.80	18,573	27,703			
993.90	19,286	29,596			
994.00	20,000	31,560			
994.10	21,360	33,628			
994.20	22,720	35,832			
994.30	24,080	38,172			
994.40	25,440	40,648			
994.50	26,800	43,260			
994.60	28,160	46,008			
994.70	29,520	48,892			
994.80	30,880	51,912			
994.90	32,240	55,068			
995.00	33,600	58,360			

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Summary for Pond 40P: Wet1

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 4.47" for 100-Year event
 Inflow = 96.35 cfs @ 12.37 hrs, Volume= 9.155 af
 Outflow = 83.43 cfs @ 12.49 hrs, Volume= 9.149 af, Atten= 13%, Lag= 7.5 min
 Primary = 83.43 cfs @ 12.49 hrs, Volume= 9.149 af
 Routed to Reach 38R : Wet2_out

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 989.50' @ 12.49 hrs Surf.Area= 1.301 ac Storage= 0.986 af

Plug-Flow detention time= 8.5 min calculated for 9.149 af (100% of inflow)
 Center-of-Mass det. time= 8.1 min (818.1 - 810.0)

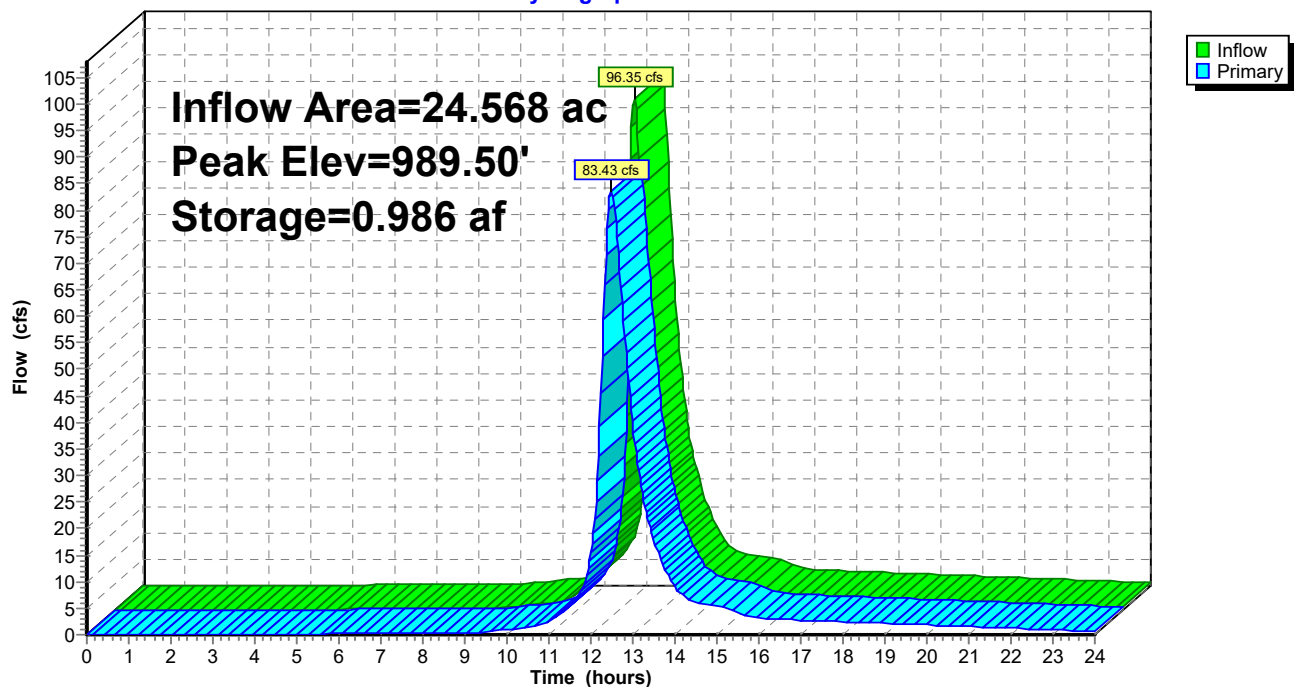
Volume	Invert	Avail.Storage	Storage Description
#1	988.00'	23.952 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
988.00	0.020	0.000	0.000
989.50	1.290	0.983	0.983
990.00	3.430	1.180	2.162
992.00	5.580	9.010	11.172
994.00	7.200	12.780	23.952

Device	Routing	Invert	Outlet Devices
#1	Primary	988.00'	Channel/Reach using Reach 38R: Wet2_out

Primary OutFlow Max=83.30 cfs @ 12.49 hrs HW=989.50' TW=989.50' (Dynamic Tailwater)
 ↑1=**Channel/Reach** (Channel Controls 83.30 cfs @ 4.35 fps)

Pond 40P: Wet1

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Stage-Area-Storage for Pond 40P: Wet1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
988.00	0.020	0.000	993.10	6.471	17.801
988.10	0.105	0.006	993.20	6.552	18.452
988.20	0.189	0.021	993.30	6.633	19.111
988.30	0.274	0.044	993.40	6.714	19.778
988.40	0.359	0.076	993.50	6.795	20.454
988.50	0.443	0.116	993.60	6.876	21.137
988.60	0.528	0.164	993.70	6.957	21.829
988.70	0.613	0.221	993.80	7.038	22.529
988.80	0.697	0.287	993.90	7.119	23.237
988.90	0.782	0.361	994.00	7.200	23.952
989.00	0.867	0.443	994.10	7.200	23.952
989.10	0.951	0.534	994.20	7.200	23.952
989.20	1.036	0.634	994.30	7.200	23.952
989.30	1.121	0.741	994.40	7.200	23.952
989.40	1.205	0.858	994.50	7.200	23.952
989.50	1.290	0.983	994.60	7.200	23.952
989.60	1.718	1.133	994.70	7.200	23.952
989.70	2.146	1.326	994.80	7.200	23.952
989.80	2.574	1.562	994.90	7.200	23.952
989.90	3.002	1.841	995.00	7.200	23.952
990.00	3.430	2.162	995.10	7.200	23.952
990.10	3.538	2.511	995.20	7.200	23.952
990.20	3.645	2.870	995.30	7.200	23.952
990.30	3.752	3.240	995.40	7.200	23.952
990.40	3.860	3.620	995.50	7.200	23.952
990.50	3.967	4.012	995.60	7.200	23.952
990.60	4.075	4.414	995.70	7.200	23.952
990.70	4.183	4.827	995.80	7.200	23.952
990.80	4.290	5.250	995.90	7.200	23.952
990.90	4.397	5.685	996.00	7.200	23.952
991.00	4.505	6.130	996.10	7.200	23.952
991.10	4.613	6.586	996.20	7.200	23.952
991.20	4.720	7.053	996.30	7.200	23.952
991.30	4.827	7.530	996.40	7.200	23.952
991.40	4.935	8.018	996.50	7.200	23.952
991.50	5.042	8.517	996.60	7.200	23.952
991.60	5.150	9.027	996.70	7.200	23.952
991.70	5.258	9.547	996.80	7.200	23.952
991.80	5.365	10.078	996.90	7.200	23.952
991.90	5.472	10.620	997.00	7.200	23.952
992.00	5.580	11.172			
992.10	5.661	11.735			
992.20	5.742	12.305			
992.30	5.823	12.883			
992.40	5.904	13.469			
992.50	5.985	14.064			
992.60	6.066	14.666			
992.70	6.147	15.277			
992.80	6.228	15.896			
992.90	6.309	16.523			
993.00	6.390	17.157			

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Summary for Pond 41P: CB_WoodlandCove

Inflow Area = 0.507 ac, 22.09% Impervious, Inflow Depth > 5.03" for 100-Year event
 Inflow = 3.13 cfs @ 12.23 hrs, Volume= 0.212 af
 Outflow = 3.13 cfs @ 12.24 hrs, Volume= 0.212 af, Atten= 0%, Lag= 0.2 min
 Primary = 3.13 cfs @ 12.24 hrs, Volume= 0.212 af
 Routed to Reach 37R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 37R : Woodland Cove Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 1,002.96' @ 12.24 hrs Surf.Area= 181 sf Storage= 37 cf

Plug-Flow detention time= 0.3 min calculated for 0.212 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (786.8 - 786.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,002.70'	15,590 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,002.70	100	0	0
1,004.00	500	390	390
1,005.00	4,250	2,375	2,765
1,008.00	4,300	12,825	15,590

Device	Routing	Invert	Outlet Devices
#1	Primary	998.45'	12.0" Round Culvert L= 85.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.45' / 998.06' S= 0.0046 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,002.70'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#3	Secondary	1,005.80'	20.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=3.12 cfs @ 12.24 hrs HW=1,002.96' TW=0.00' (Dynamic Tailwater)

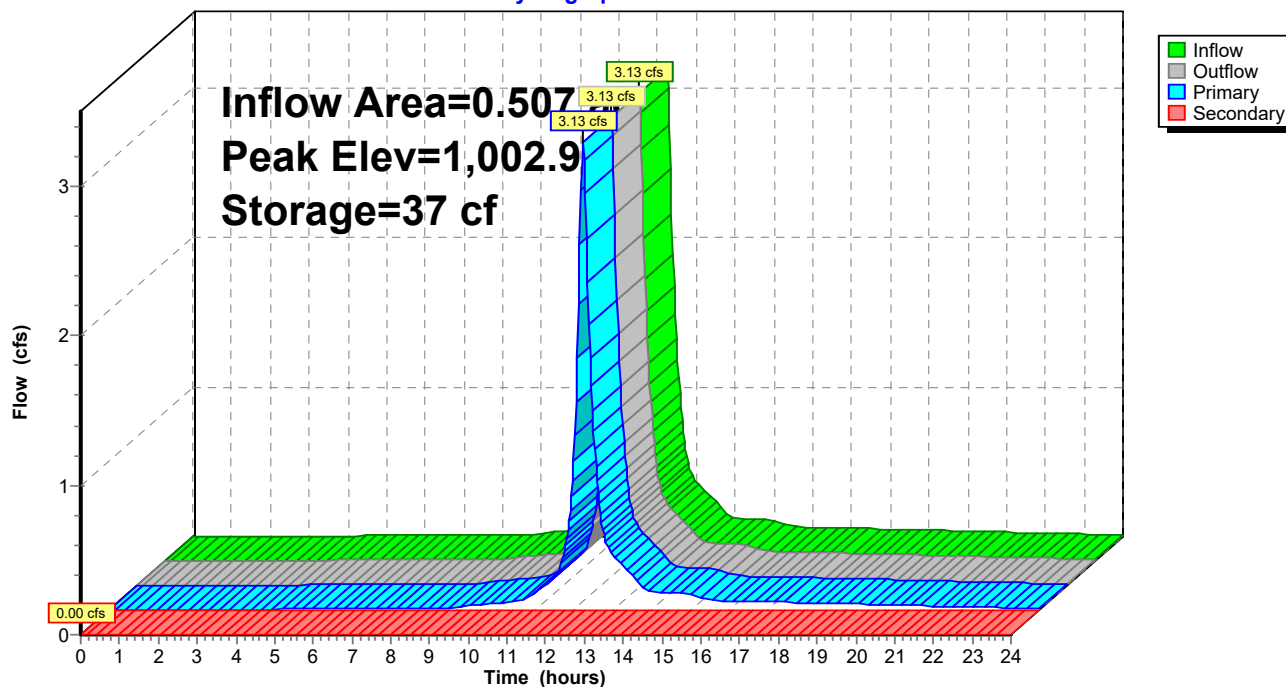
↑ **1=Culvert** (Passes 3.12 cfs of 6.33 cfs potential flow)
 ↑ **2=Orifice/Grate** (Weir Controls 3.12 cfs @ 1.68 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,002.70' TW=0.00' (Dynamic Tailwater)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 41P: CB_WoodlandCove

Hydrograph



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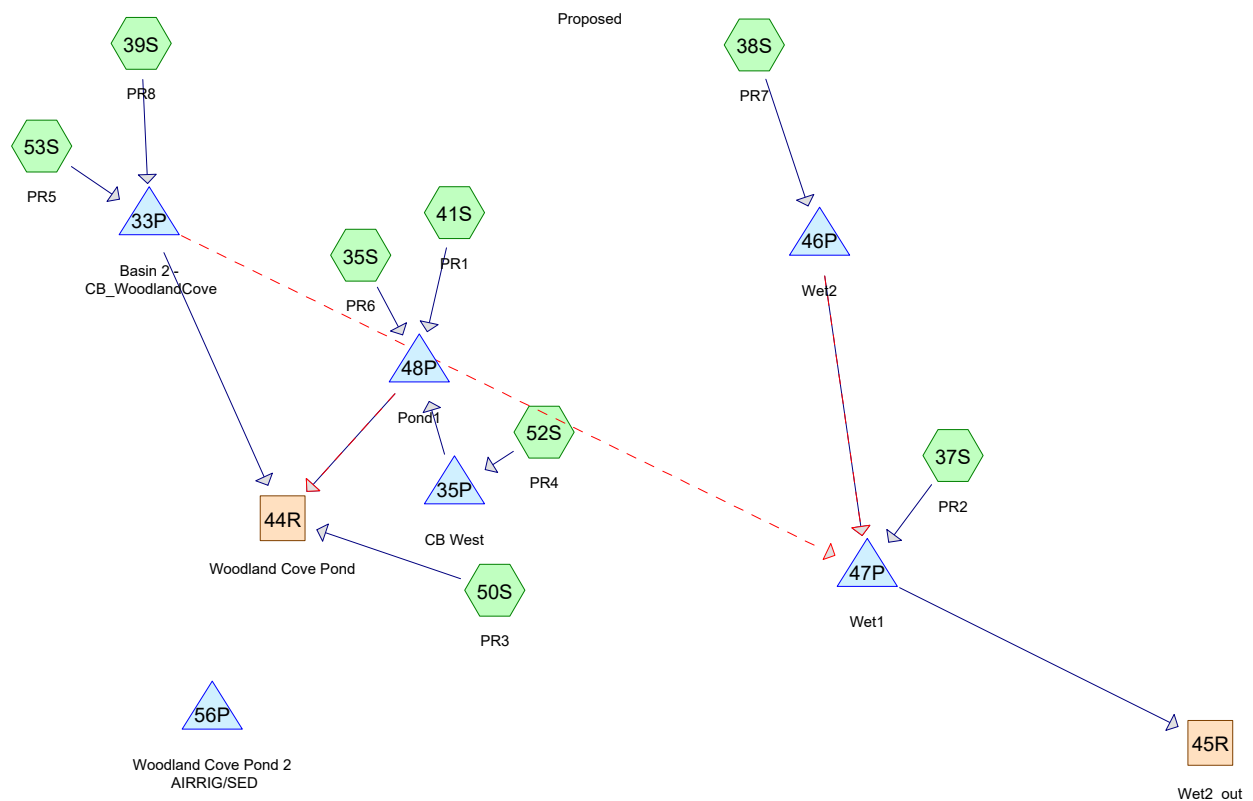
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Stage-Area-Storage for Pond 41P: CB_WoodlandCove

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,002.70	100	0	1,007.80	4,297	14,730
1,002.80	131	12	1,007.90	4,298	15,160
1,002.90	162	26	1,008.00	4,300	15,590
1,003.00	192	44			
1,003.10	223	65			
1,003.20	254	88			
1,003.30	285	115			
1,003.40	315	145			
1,003.50	346	178			
1,003.60	377	215			
1,003.70	408	254			
1,003.80	438	296			
1,003.90	469	342			
1,004.00	500	390			
1,004.10	875	459			
1,004.20	1,250	565			
1,004.30	1,625	709			
1,004.40	2,000	890			
1,004.50	2,375	1,109			
1,004.60	2,750	1,365			
1,004.70	3,125	1,659			
1,004.80	3,500	1,990			
1,004.90	3,875	2,359			
1,005.00	4,250	2,765			
1,005.10	4,252	3,190			
1,005.20	4,253	3,615			
1,005.30	4,255	4,041			
1,005.40	4,257	4,466			
1,005.50	4,258	4,892			
1,005.60	4,260	5,318			
1,005.70	4,262	5,744			
1,005.80	4,263	6,170			
1,005.90	4,265	6,597			
1,006.00	4,267	7,023			
1,006.10	4,268	7,450			
1,006.20	4,270	7,877			
1,006.30	4,272	8,304			
1,006.40	4,273	8,731			
1,006.50	4,275	9,159			
1,006.60	4,277	9,586			
1,006.70	4,278	10,014			
1,006.80	4,280	10,442			
1,006.90	4,282	10,870			
1,007.00	4,283	11,298			
1,007.10	4,285	11,727			
1,007.20	4,287	12,155			
1,007.30	4,288	12,584			
1,007.40	4,290	13,013			
1,007.50	4,292	13,442			
1,007.60	4,293	13,871			
1,007.70	4,295	14,301			



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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Inch Rnf	MSE 24-hr	3	Default	24.00	1	1.00	4
2	2-Year	MSE 24-hr	3	Default	24.00	1	2.85	2
3	10-Year	MSE 24-hr	3	Default	24.00	1	4.21	2
4	100-Year	MSE 24-hr	3	Default	24.00	1	7.24	2
5	NURP	MSE 24-hr	3	Default	24.00	1	2.50	2

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.734	74	>75% Grass cover, Good, HSG C (35S, 37S, 38S, 39S, 41S, 50S, 53S)
3.334	80	>75% Grass cover, Good, HSG D (35S, 37S, 39S, 41S, 50S, 52S, 53S)
11.230	70	Woods, Good, HSG C (37S, 38S)
8.559	77	Woods, Good, HSG D (37S, 38S)
0.849	98	impervious - new (35S, 41S, 50S, 52S, 53S)
0.837	98	impervious - old (35S, 37S, 38S, 39S, 50S, 53S)
0.172	98	pond (41S)
1.900	98	wetland (37S, 38S)
29.615	77	TOTAL AREA

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Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
13.964	HSG C	35S, 37S, 38S, 39S, 41S, 50S, 53S
11.893	HSG D	35S, 37S, 38S, 39S, 41S, 50S, 52S, 53S
3.758	Other	35S, 37S, 38S, 39S, 41S, 50S, 52S, 53S
29.615		TOTAL AREA

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Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	2.734	3.334	0.000	6.068	>75% Grass cover, Good	35S, 37S, 38S, 39S, 41S, 50S, 52S, 53S
0.000	0.000	11.230	8.559	0.000	19.789	Woods, Good	37S, 38S
0.000	0.000	0.000	0.000	0.849	0.849	impervious - new	35S, 41S, 50S, 52S, 53S
0.000	0.000	0.000	0.000	0.837	0.837	impervious - old	35S, 37S, 38S, 39S, 50S, 53S
0.000	0.000	0.000	0.000	0.172	0.172	pond	41S
0.000	0.000	0.000	0.000	1.900	1.900	wetland	37S, 38S
0.000	0.000	13.964	11.893	3.758	29.615	TOTAL AREA	

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)
1	33P	998.45	998.06	85.0	0.0046	0.013	0.0	12.0	0.0
2	33P	998.62	998.55	13.5	0.0052	0.013	0.0	12.0	0.0
3	46P	991.00	990.00	52.0	0.0192	0.024	0.0	24.0	0.0
4	48P	999.50	999.10	149.5	0.0027	0.013	0.0	18.0	0.0
5	48P	1,000.00	1,000.00	81.5	0.0000	0.013	0.0	15.0	0.0
6	56P	994.00	998.00	80.0	-0.0500	0.013	0.0	12.0	0.0

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MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

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Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment35S: PR6 Runoff Area=0.483 ac 47.83% Impervious Runoff Depth>0.79"
Tc=6.0 min AMC Adjusted CN=98/98 Runoff=0.65 cfs 0.032 af

Subcatchment37S: PR2 Runoff Area=17.824 ac 12.34% Impervious Runoff Depth>0.79"
Flow Length=600' Tc=24.7 min AMC Adjusted CN=98/98 Runoff=13.58 cfs 1.173 af

Subcatchment38S: PR7 Runoff Area=6.744 ac 4.21% Impervious Runoff Depth>0.79"
Flow Length=720' Tc=22.6 min AMC Adjusted CN=98/98 Runoff=5.42 cfs 0.444 af

Subcatchment39S: PR8 Runoff Area=0.507 ac 22.09% Impervious Runoff Depth>0.79"
Flow Length=100' Slope=0.0200 '/' Tc=15.1 min AMC Adjusted CN=98/98 Runoff=0.49 cfs 0.033 af

Subcatchment41S: PR1 Runoff Area=1.286 ac 55.75% Impervious Runoff Depth>0.79"
Tc=6.0 min AMC Adjusted CN=98/98 Runoff=1.74 cfs 0.085 af

Subcatchment50S: PR3 Runoff Area=1.325 ac 8.15% Impervious Runoff Depth>0.79"
Flow Length=200' Tc=15.9 min AMC Adjusted CN=98/98 Runoff=1.26 cfs 0.087 af

Subcatchment52S: PR4 Runoff Area=0.178 ac 24.72% Impervious Runoff Depth>0.79"
Flow Length=50' Slope=0.0100 '/' Tc=11.5 min AMC Adjusted CN=98/98 Runoff=0.19 cfs 0.012 af

Subcatchment53S: PR5 Runoff Area=1.268 ac 4.97% Impervious Runoff Depth>0.79"
Flow Length=200' Tc=16.2 min AMC Adjusted CN=98/98 Runoff=1.20 cfs 0.084 af

Reach 44R: Woodland Cove Pond Inflow=2.92 cfs 0.194 af
Outflow=2.92 cfs 0.194 af

Reach 45R: Wet2_out Avg. Flow Depth=0.62' Max Vel=2.69 fps Inflow=14.79 cfs 1.610 af
n=0.035 L=150.0' S=0.0110 '/' Capacity=5,231.48 cfs Outflow=14.78 cfs 1.609 af

Pond 33P: Basin 2 - CB_WoodlandCove Peak Elev=1,004.07' Storage=616 cf Inflow=1.69 cfs 0.117 af
Primary=1.67 cfs 0.106 af Secondary=0.00 cfs 0.000 af Outflow=1.67 cfs 0.106 af

Pond 35P: CB West Peak Elev=1,007.54' Storage=2 cf Inflow=0.19 cfs 0.012 af
Outflow=0.19 cfs 0.012 af

Pond 46P: Wet2 Peak Elev=991.94' Storage=5,492 cf Inflow=5.42 cfs 0.444 af
Primary=4.12 cfs 0.438 af Secondary=0.00 cfs 0.000 af Outflow=4.12 cfs 0.438 af

Pond 47P: Wet1 Peak Elev=988.63' Storage=0.178 af Inflow=17.24 cfs 1.611 af
Outflow=14.79 cfs 1.610 af

Pond 48P: Pond1 Peak Elev=1,002.75' Storage=16,412 cf Inflow=2.55 cfs 0.128 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond 56P: Woodland Cove Pond 2 Peak Elev=997.35' Storage=260,413 cf Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

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Total Runoff Area = 29.615 ac Runoff Volume = 1.950 af Average Runoff Depth = 0.79"
87.31% Pervious = 25.857 ac 12.69% Impervious = 3.758 ac

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MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

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Summary for Subcatchment 35S: PR6

Runoff = 0.65 cfs @ 12.13 hrs, Volume= 0.032 af, Depth> 0.79"
Routed to Pond 48P : Pond1

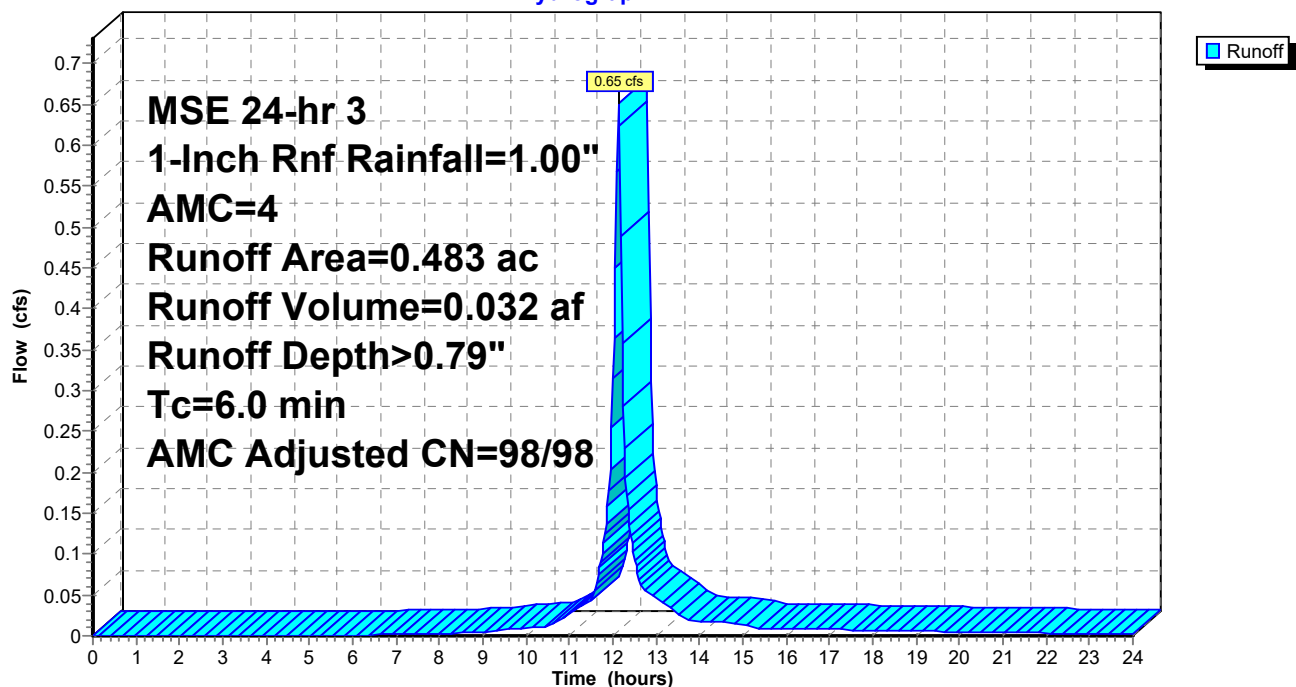
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

Area (ac)	CN	Adj	Description
0.230	74		>75% Grass cover, Good, HSG C
0.022	80		>75% Grass cover, Good, HSG D
* 0.197	98		impervious - new
* 0.034	98		impervious - old
0.000	70		Woods, Good, HSG C
0.000	77		Woods, Good, HSG D
* 0.000	98		pond
0.483	86	98	Weighted Average, AMC Adjusted
0.252	75	98	52.17% Pervious Area, AMC Adjusted
0.231	98	98	47.83% Impervious Area, AMC Adjusted

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

Subcatchment 35S: PR6

Hydrograph



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MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

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Summary for Subcatchment 37S: PR2

Runoff = 13.58 cfs @ 12.34 hrs, Volume= 1.173 af, Depth> 0.79"
 Routed to Pond 47P : Wet1

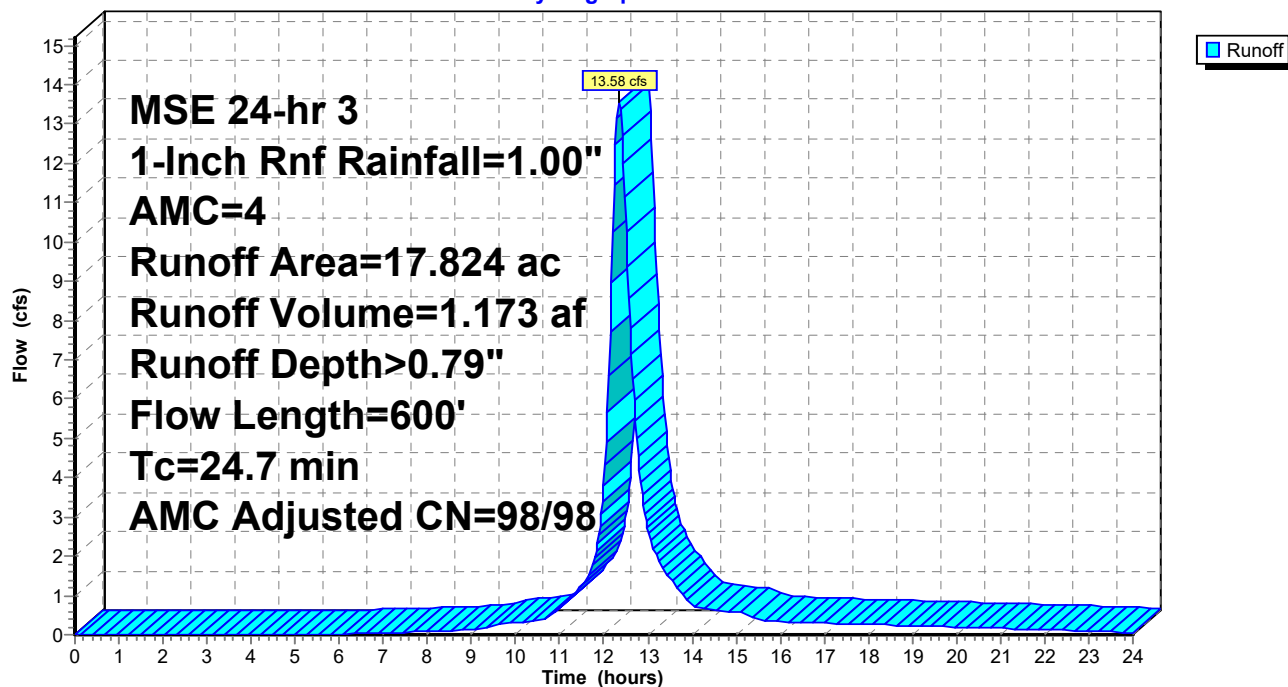
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

Area (ac)	CN	Adj	Description
0.039	74		>75% Grass cover, Good, HSG C
0.621	80		>75% Grass cover, Good, HSG D
* 0.440	98		impervious - old
* 0.000	74		imp_tempC
* 0.000	80		imp_tempD
* 1.759	98		wetland
4.786	70		Woods, Good, HSG C
8.227	77		Woods, Good, HSG D
0.317	77		Woods, Good, HSG D
0.873	74		>75% Grass cover, Good, HSG C
0.762	80		>75% Grass cover, Good, HSG D
17.824	78	98	Weighted Average, AMC Adjusted
15.625	75	98	87.66% Pervious Area, AMC Adjusted
2.199	98	98	12.34% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
8.9	500	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.7	600	Total			

Subcatchment 37S: PR2

Hydrograph



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MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

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Summary for Subcatchment 38S: PR7

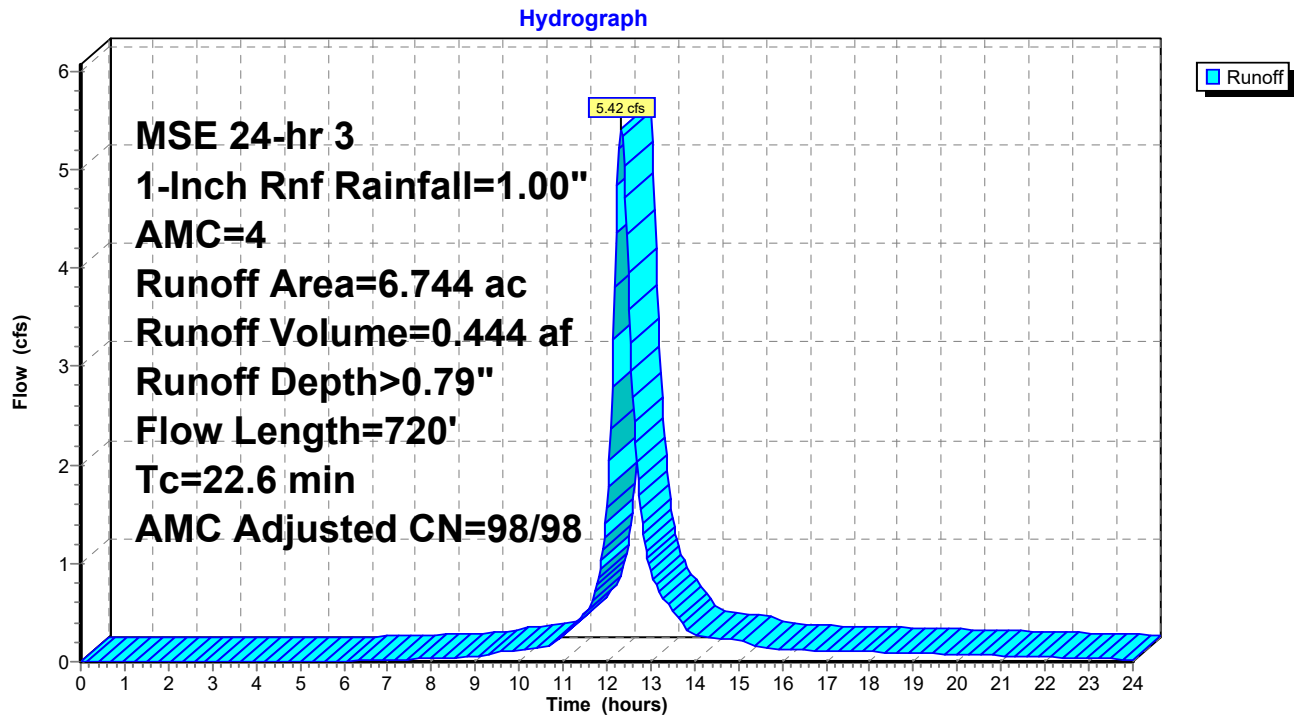
Runoff = 5.42 cfs @ 12.32 hrs, Volume= 0.444 af, Depth> 0.79"
 Routed to Pond 46P : Wet2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

Area (ac)	CN	Adj	Description
0.001	74		>75% Grass cover, Good, HSG C
* 0.143	98		impervious - old
* 0.141	98		wetland
6.444	70		Woods, Good, HSG C
0.015	77		Woods, Good, HSG D
6.744	71	98	Weighted Average, AMC Adjusted
6.460	70	98	95.79% Pervious Area, AMC Adjusted
0.284	98	98	4.21% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
7.6	500	0.0480	1.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	120	0.0500	6.94	69.40	Channel Flow, Area= 10.0 sf Perim= 16.0' r= 0.63' n= 0.035
22.6	720	Total			

Subcatchment 38S: PR7



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Summary for Subcatchment 39S: PR8

Runoff = 0.49 cfs @ 12.23 hrs, Volume= 0.033 af, Depth> 0.79"
Routed to Pond 33P : Basin 2 - CB_WoodlandCove

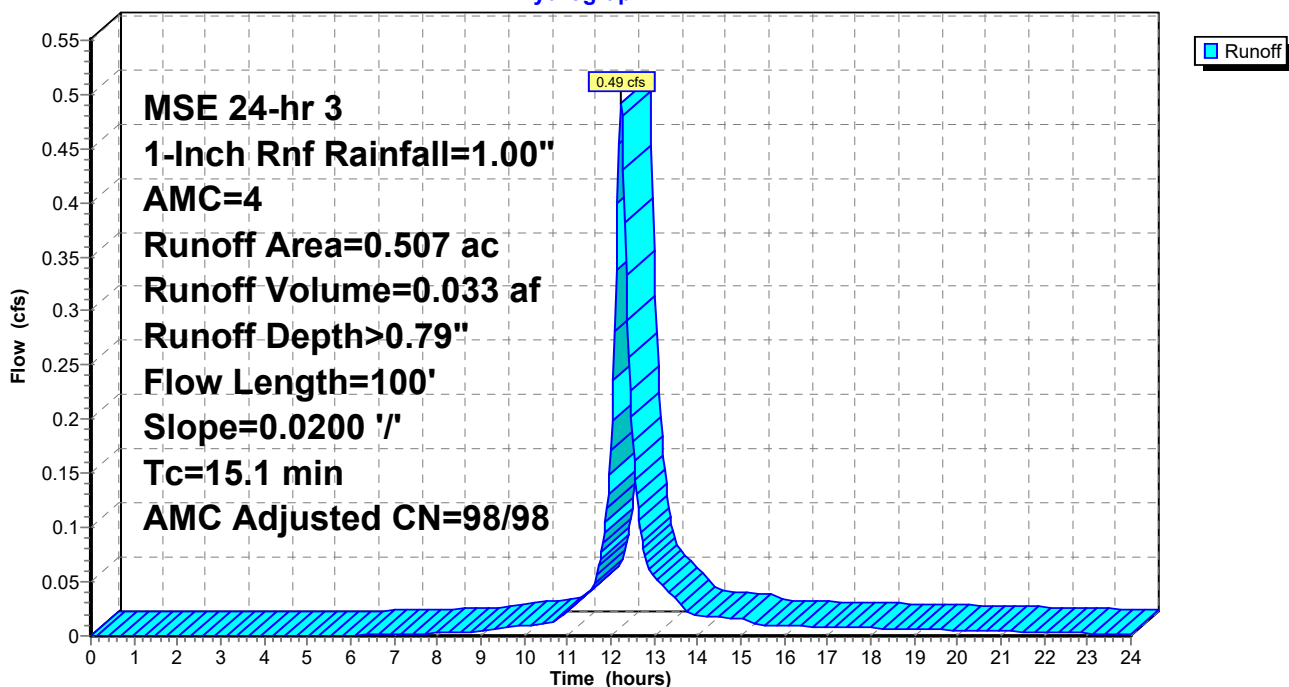
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

Area (ac)	CN	Adj	Description
0.159	80		>75% Grass cover, Good, HSG D
* 0.000	98		impervious - new
0.236	74		>75% Grass cover, Good, HSG C
* 0.112	98		impervious - old
0.507	81	98	Weighted Average, AMC Adjusted
0.395	76	98	77.91% Pervious Area, AMC Adjusted
0.112	98	98	22.09% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 39S: PR8

Hydrograph



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MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

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Summary for Subcatchment 41S: PR1

Runoff = 1.74 cfs @ 12.13 hrs, Volume= 0.085 af, Depth> 0.79"
Routed to Pond 48P : Pond1

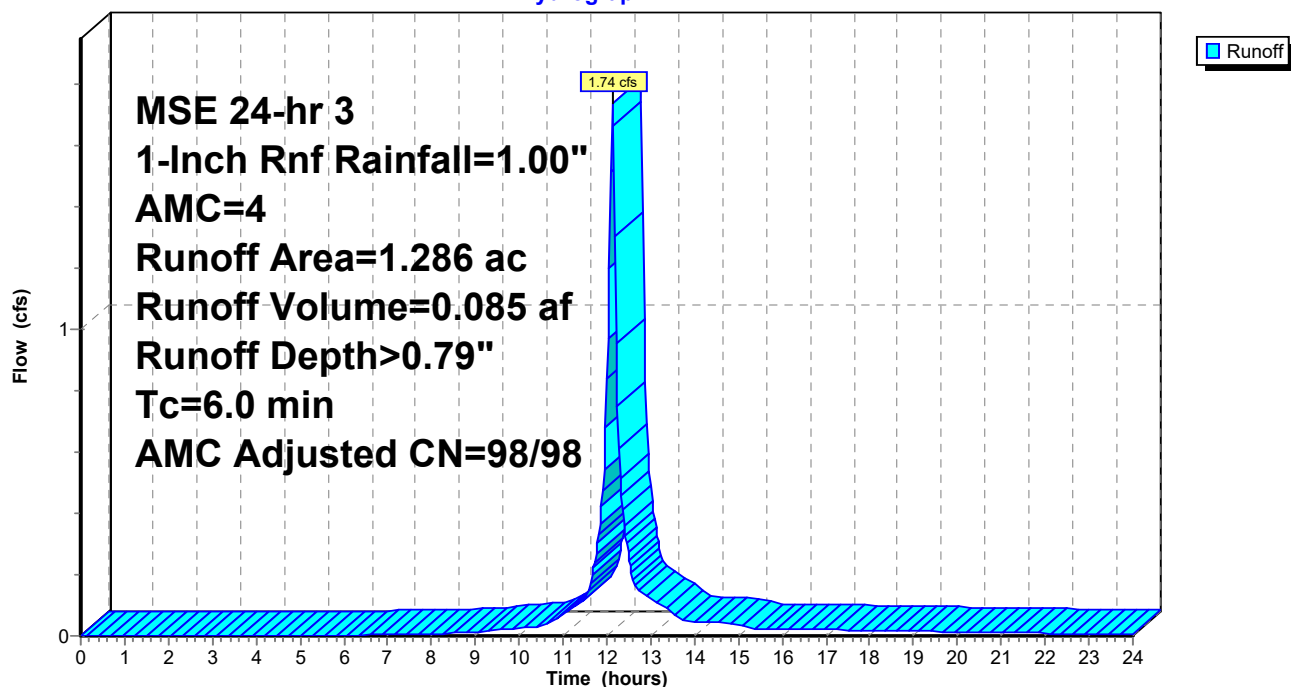
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

Area (ac)	CN	Adj	Description
0.043	74		>75% Grass cover, Good, HSG C
0.477	80		>75% Grass cover, Good, HSG D
* 0.545	98		impervious - new
* 0.172	98		pond
0.049	80		>75% Grass cover, Good, HSG D
1.286	90	98	Weighted Average, AMC Adjusted
0.569	80	98	44.25% Pervious Area, AMC Adjusted
0.717	98	98	55.75% Impervious Area, AMC Adjusted

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

Subcatchment 41S: PR1

Hydrograph



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MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

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Summary for Subcatchment 50S: PR3

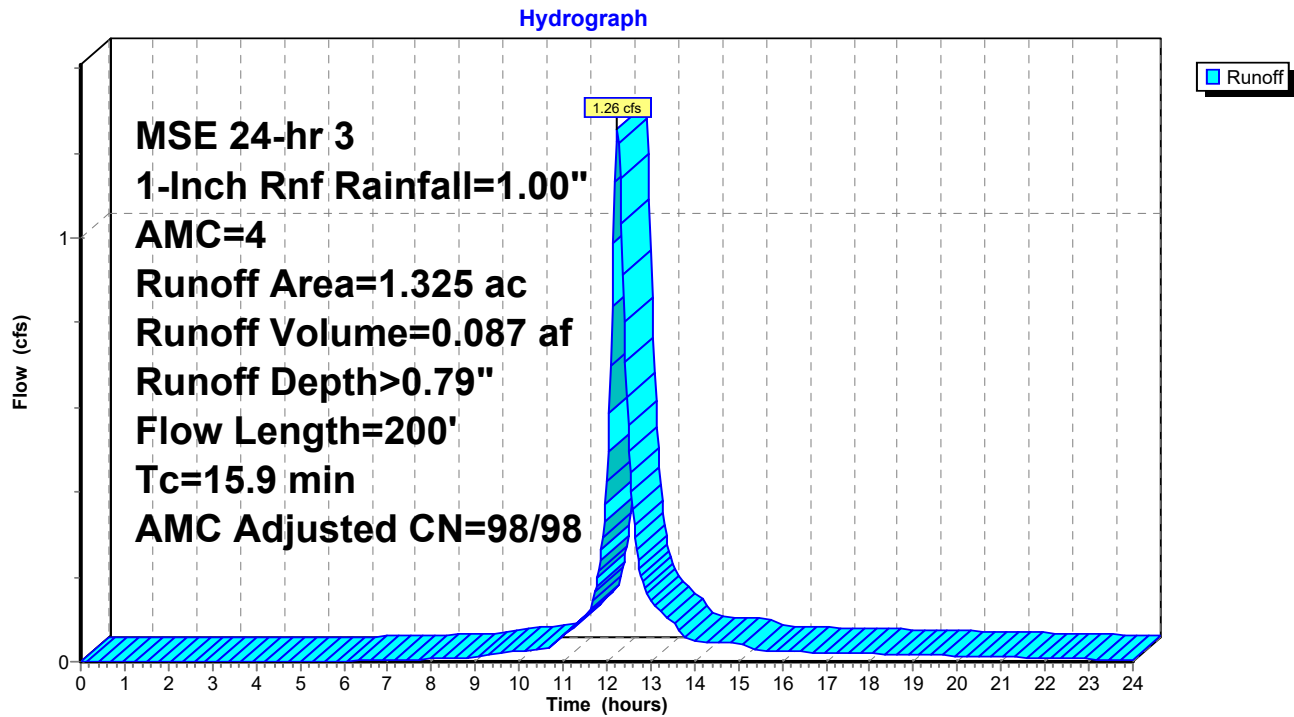
Runoff = 1.26 cfs @ 12.24 hrs, Volume= 0.087 af, Depth> 0.79"
 Routed to Reach 44R : Woodland Cove Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

Area (ac)	CN	Adj	Description
0.597	74		>75% Grass cover, Good, HSG C
0.610	80		>75% Grass cover, Good, HSG D
* 0.057	98		impervious - old
* 0.032	98		impervious - new
0.010	80		>75% Grass cover, Good, HSG D
* 0.019	98		impervious - new
1.325	79	98	Weighted Average, AMC Adjusted
1.217	77	98	91.85% Pervious Area, AMC Adjusted
0.108	98	98	8.15% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"
0.8	100	0.0900	2.10		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
15.9	200	Total			

Subcatchment 50S: PR3



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MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

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Summary for Subcatchment 52S: PR4

Runoff = 0.19 cfs @ 12.19 hrs, Volume= 0.012 af, Depth> 0.79"
Routed to Pond 35P : CB West

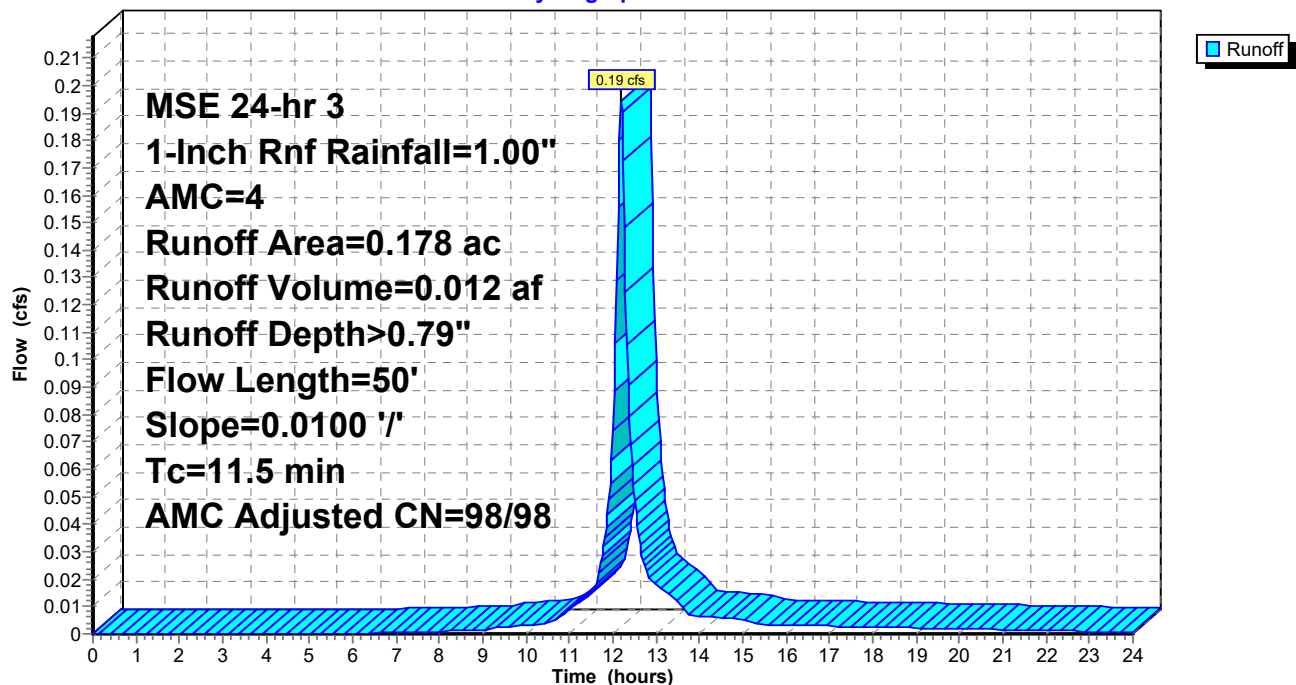
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

Area (ac)	CN	Adj	Description
0.098	80		>75% Grass cover, Good, HSG D
* 0.037	98		impervious - new
0.036	80		>75% Grass cover, Good, HSG D
* 0.007	98		impervious - new
0.178	84	98	Weighted Average, AMC Adjusted
0.134	80	98	75.28% Pervious Area, AMC Adjusted
0.044	98	98	24.72% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 52S: PR4

Hydrograph



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MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

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Summary for Subcatchment 53S: PR5

Runoff = 1.20 cfs @ 12.24 hrs, Volume= 0.084 af, Depth> 0.79"
Routed to Pond 33P : Basin 2 - CB_WoodlandCove

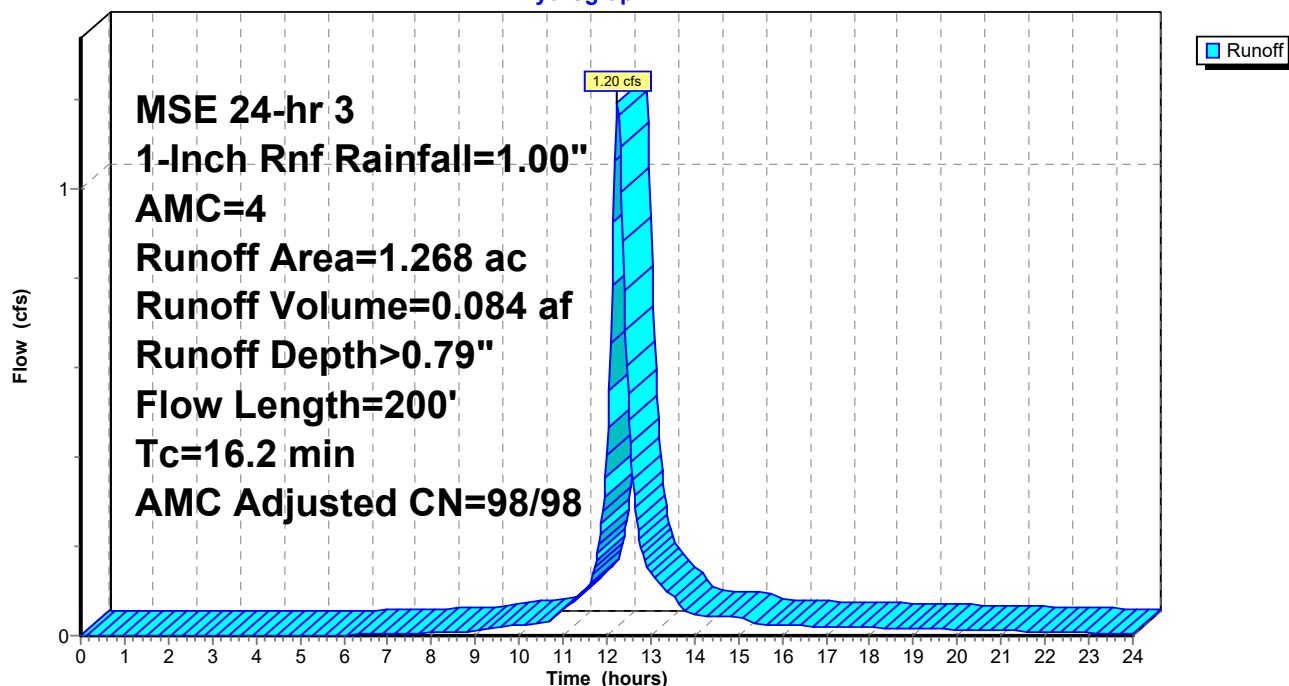
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

Area (ac)	CN	Adj	Description
0.490	80		>75% Grass cover, Good, HSG D
* 0.012	98		impervious - new
0.715	74		>75% Grass cover, Good, HSG C
* 0.051	98		impervious - old
1.268	78	98	Weighted Average, AMC Adjusted
1.205	76	98	95.03% Pervious Area, AMC Adjusted
0.063	98	98	4.97% Impervious Area, AMC Adjusted

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"
1.1	100	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
16.2	200	Total			

Subcatchment 53S: PR5

Hydrograph



Summary for Reach 44R: Woodland Cove Pond

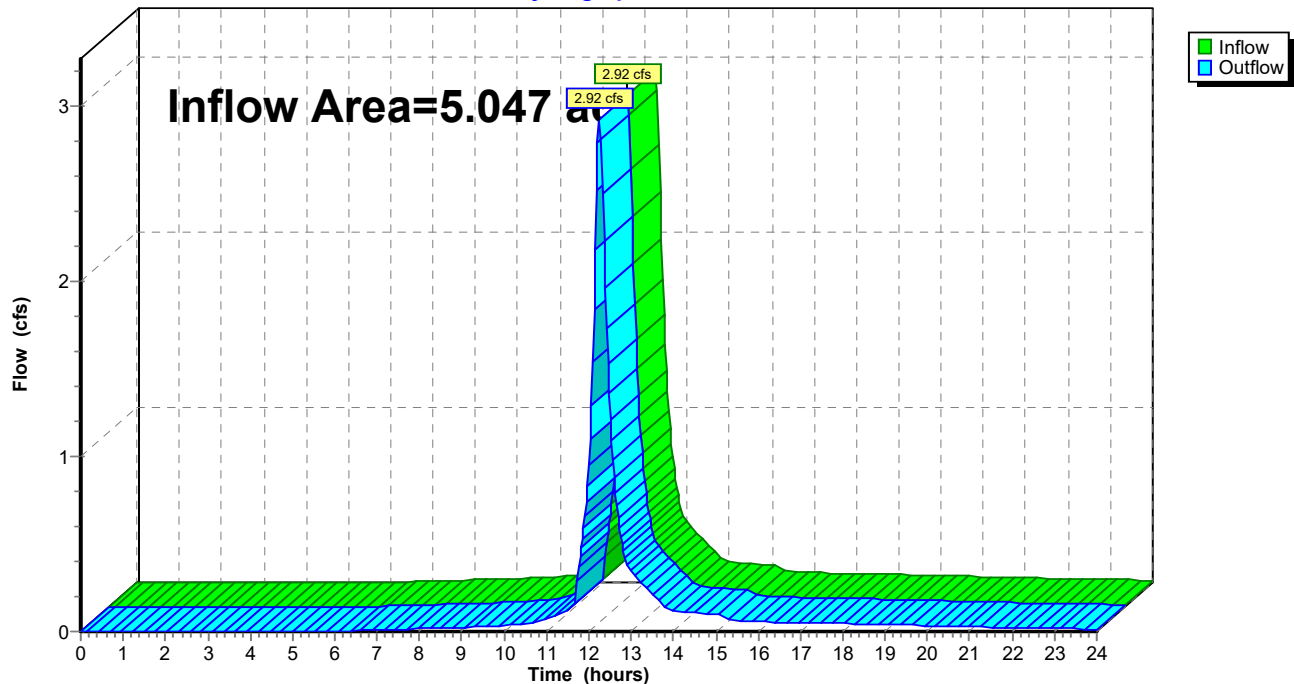
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.047 ac, 25.26% Impervious, Inflow Depth > 0.46" for 1-Inch Rnf event
 Inflow = 2.92 cfs @ 12.25 hrs, Volume= 0.194 af
 Outflow = 2.92 cfs @ 12.25 hrs, Volume= 0.194 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Reach 44R: Woodland Cove Pond

Hydrograph



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MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

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Summary for Reach 45R: Wet2_out

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 0.79" for 1-Inch Rnf event
Inflow = 14.79 cfs @ 12.50 hrs, Volume= 1.610 af
Outflow = 14.78 cfs @ 12.51 hrs, Volume= 1.609 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Max. Velocity= 2.69 fps, Min. Travel Time= 0.9 min

Avg. Velocity= 1.03 fps, Avg. Travel Time= 2.4 min

Peak Storage= 826 cf @ 12.51 hrs

Average Depth at Peak Storage= 0.62' , Surface Width= 11.62'

Bank-Full Depth= 9.00' Flow Area= 418.5 sf, Capacity= 5,231.48 cfs

6.00' x 9.00' deep channel, n= 0.035

Side Slope Z-value= 4.5 '/' Top Width= 87.00'

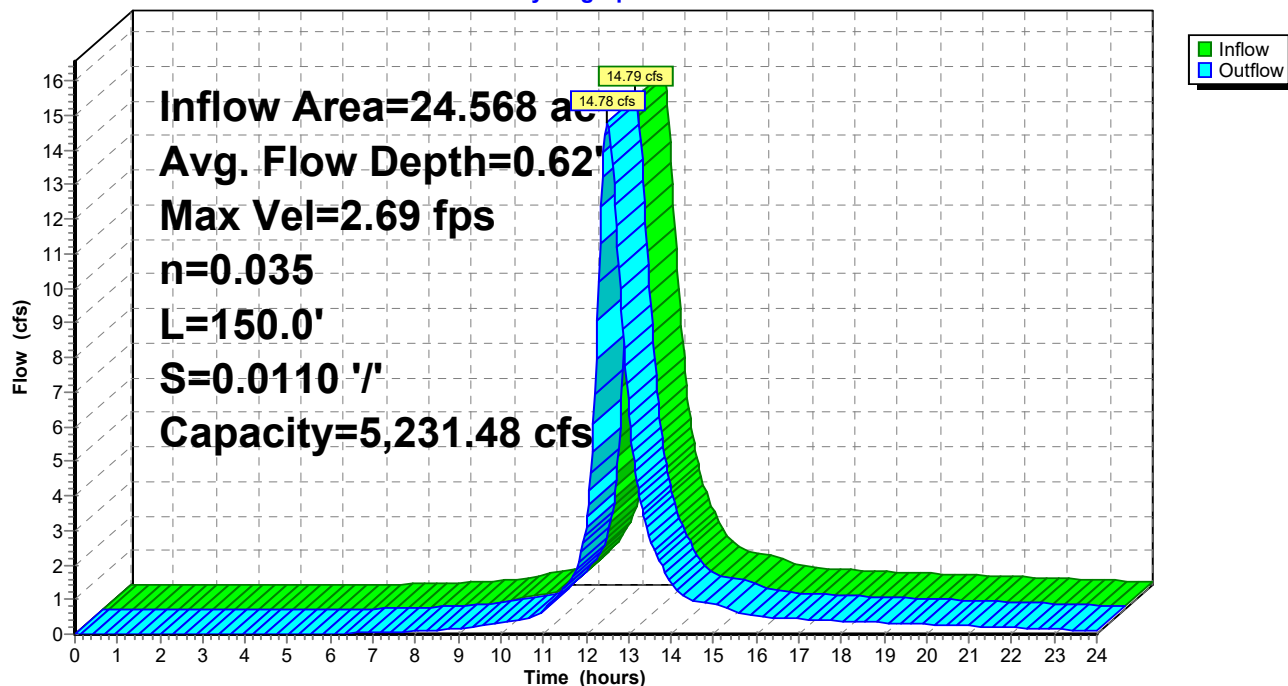
Length= 150.0' Slope= 0.0110 '/'

Inlet Invert= 988.00', Outlet Invert= 986.35'



Reach 45R: Wet2_out

Hydrograph



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MSE 24-hr 3 1-Inch Rnf Rainfall=1.00", AMC=4

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Stage-Area-Storage for Reach 45R: Wet2_out

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
988.00	0.0	0	993.10	147.7	22,148
988.10	0.6	97	993.20	152.9	22,933
988.20	1.4	208	993.30	158.2	23,731
988.30	2.2	332	993.40	163.6	24,543
988.40	3.1	469	993.50	169.1	25,369
988.50	4.1	620	993.60	174.7	26,209
988.60	5.2	784	993.70	180.4	27,062
988.70	6.4	962	993.80	186.2	27,928
988.80	7.7	1,153	993.90	192.1	28,808
988.90	9.0	1,357	994.00	198.0	29,701
989.00	10.5	1,576	994.10	204.1	30,608
989.10	12.1	1,808	994.20	210.2	31,528
989.20	13.7	2,053	994.30	216.4	32,461
989.30	15.4	2,312	994.40	222.7	33,409
989.40	17.2	2,584	994.50	229.1	34,370
989.50	19.1	2,870	994.60	235.6	35,344
989.60	21.1	3,169	994.70	242.2	36,332
989.70	23.2	3,481	994.80	248.9	37,333
989.80	25.4	3,807	994.90	255.7	38,348
989.90	27.6	4,147	995.00	262.5	39,376
990.00	30.0	4,501	995.10	269.4	40,417
990.10	32.5	4,868	995.20	276.5	41,472
990.20	35.0	5,248	995.30	283.6	42,541
990.30	37.6	5,642	995.40	290.8	43,624
990.40	40.3	6,049	995.50	298.1	44,720
990.50	43.1	6,470	995.60	305.5	45,829
990.60	46.0	6,904	995.70	313.0	46,952
990.70	49.0	7,351	995.80	320.6	48,088
990.80	52.1	7,813	995.90	328.3	49,238
990.90	55.3	8,288	996.00	336.0	50,401
991.00	58.5	8,776	996.10	343.8	51,577
991.10	61.9	9,278	996.20	351.8	52,768
991.20	65.3	9,793	996.30	359.8	53,972
991.30	68.8	10,322	996.40	367.9	55,189
991.40	72.4	10,864	996.50	376.1	56,420
991.50	76.1	11,419	996.60	384.4	57,664
991.60	79.9	11,988	996.70	392.8	58,922
991.70	83.8	12,571	996.80	401.3	60,193
991.80	87.8	13,168	996.90	409.8	61,477
991.90	91.9	13,778	997.00	418.5	62,775
992.00	96.0	14,401			
992.10	100.3	15,038			
992.20	104.6	15,688			
992.30	109.0	16,352			
992.40	113.5	17,029			
992.50	118.1	17,719			
992.60	122.8	18,424			
992.70	127.6	19,142			
992.80	132.5	19,873			
992.90	137.5	20,618			
993.00	142.5	21,376			

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Summary for Pond 33P: Basin 2 - CB_WoodlandCove

Inflow Area = 1.775 ac, 9.86% Impervious, Inflow Depth > 0.79" for 1-Inch Rnf event
 Inflow = 1.69 cfs @ 12.24 hrs, Volume= 0.117 af
 Outflow = 1.67 cfs @ 12.26 hrs, Volume= 0.106 af, Atten= 1%, Lag= 1.1 min
 Primary = 1.67 cfs @ 12.26 hrs, Volume= 0.106 af
 Routed to Reach 44R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 47P : Wet1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 1,004.07' @ 12.26 hrs Surf.Area= 974 sf Storage= 616 cf

Plug-Flow detention time= 55.2 min calculated for 0.106 af (91% of inflow)
 Center-of-Mass det. time= 16.9 min (801.0 - 784.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,003.00'	12,577 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,003.00	303	0	0
1,004.00	800	552	552
1,005.00	3,200	2,000	2,552
1,007.00	3,400	6,600	9,152
1,008.00	3,450	3,425	12,577

Device	Routing	Invert	Outlet Devices
#1	Primary	998.45'	12.0" Round Culvert L= 85.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.45' / 998.06' S= 0.0046 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	998.62'	12.0" Round Culvert L= 13.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.62' / 998.55' S= 0.0052 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	1,003.90'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	1,005.90'	20.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#5	Device 2	1,003.00'	0.01 cfs Filtration at all elevations Phase-In= 0.01'

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Primary OutFlow Max=1.66 cfs @ 12.26 hrs HW=1,004.07' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 1.66 cfs of 7.17 cfs potential flow)

2=Culvert (Passes 1.66 cfs of 10.52 cfs potential flow)

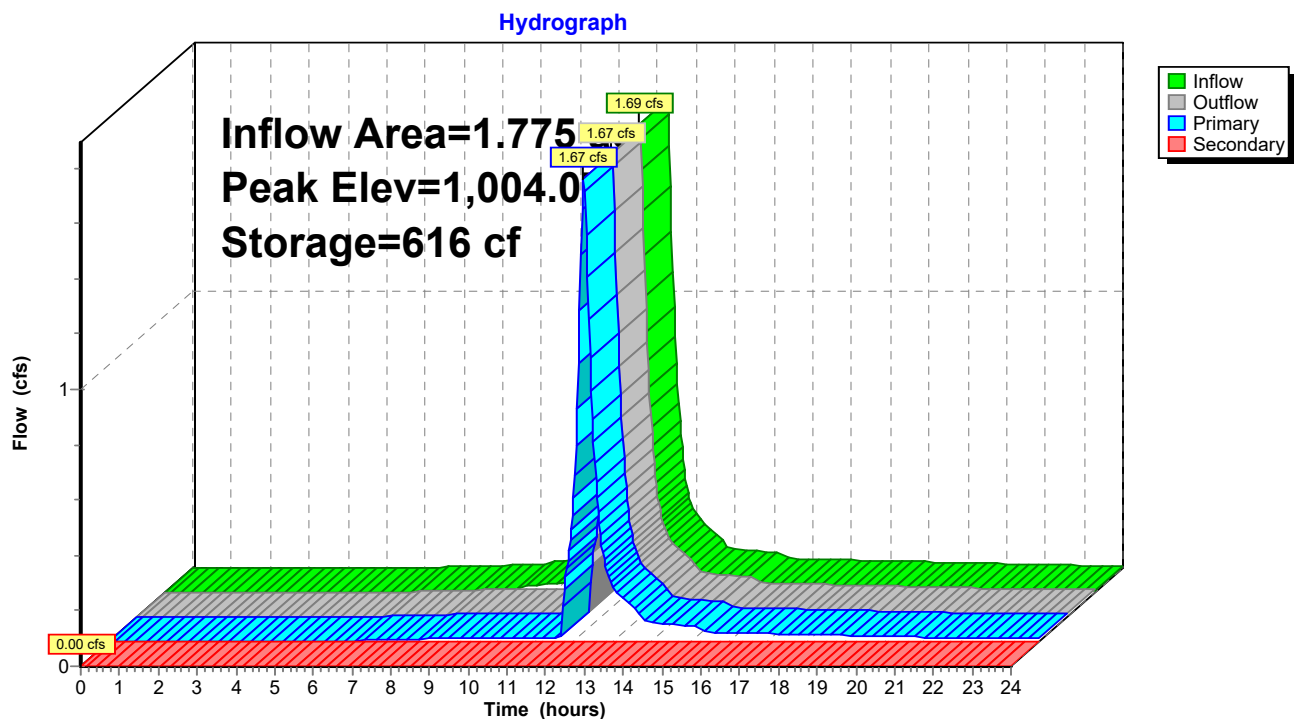
3=Orifice/Grate (Weir Controls 1.65 cfs @ 1.36 fps)

5=Filtration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,003.00' TW=988.00' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir(Controls 0.00 cfs)

Pond 33P: Basin 2 - CB_WoodlandCove



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Stage-Area-Storage for Pond 33P: Basin 2 - CB_WoodlandCove

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,003.00	303	0	1,005.55	3,255	4,327
1,003.05	328	16	1,005.60	3,260	4,490
1,003.10	353	33	1,005.65	3,265	4,653
1,003.15	378	51	1,005.70	3,270	4,816
1,003.20	402	71	1,005.75	3,275	4,980
1,003.25	427	91	1,005.80	3,280	5,143
1,003.30	452	113	1,005.85	3,285	5,308
1,003.35	477	136	1,005.90	3,290	5,472
1,003.40	502	161	1,005.95	3,295	5,637
1,003.45	527	187	1,006.00	3,300	5,802
1,003.50	552	214	1,006.05	3,305	5,967
1,003.55	576	242	1,006.10	3,310	6,132
1,003.60	601	271	1,006.15	3,315	6,298
1,003.65	626	302	1,006.20	3,320	6,464
1,003.70	651	334	1,006.25	3,325	6,630
1,003.75	676	367	1,006.30	3,330	6,796
1,003.80	701	401	1,006.35	3,335	6,963
1,003.85	725	437	1,006.40	3,340	7,129
1,003.90	750	474	1,006.45	3,345	7,297
1,003.95	775	512	1,006.50	3,350	7,464
1,004.00	800	552	1,006.55	3,355	7,632
1,004.05	920	594	1,006.60	3,360	7,800
1,004.10	1,040	644	1,006.65	3,365	7,968
1,004.15	1,160	698	1,006.70	3,370	8,136
1,004.20	1,280	760	1,006.75	3,375	8,305
1,004.25	1,400	827	1,006.80	3,380	8,473
1,004.30	1,520	899	1,006.85	3,385	8,643
1,004.35	1,640	979	1,006.90	3,390	8,812
1,004.40	1,760	1,063	1,006.95	3,395	8,982
1,004.45	1,880	1,155	1,007.00	3,400	9,152
1,004.50	2,000	1,252	1,007.05	3,402	9,322
1,004.55	2,120	1,354	1,007.10	3,405	9,492
1,004.60	2,240	1,464	1,007.15	3,407	9,662
1,004.65	2,360	1,578	1,007.20	3,410	9,833
1,004.70	2,480	1,700	1,007.25	3,413	10,003
1,004.75	2,600	1,827	1,007.30	3,415	10,174
1,004.80	2,720	1,959	1,007.35	3,418	10,345
1,004.85	2,840	2,099	1,007.40	3,420	10,515
1,004.90	2,960	2,243	1,007.45	3,423	10,687
1,004.95	3,080	2,395	1,007.50	3,425	10,858
1,005.00	3,200	2,552	1,007.55	3,427	11,029
1,005.05	3,205	2,712	1,007.60	3,430	11,201
1,005.10	3,210	2,872	1,007.65	3,432	11,372
1,005.15	3,215	3,033	1,007.70	3,435	11,544
1,005.20	3,220	3,194	1,007.75	3,438	11,716
1,005.25	3,225	3,355	1,007.80	3,440	11,887
1,005.30	3,230	3,516	1,007.85	3,443	12,060
1,005.35	3,235	3,678	1,007.90	3,445	12,232
1,005.40	3,240	3,839	1,007.95	3,448	12,404
1,005.45	3,245	4,002	1,008.00	3,450	12,577
1,005.50	3,250	4,164			

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Summary for Pond 35P: CB West

Inflow Area = 0.178 ac, 24.72% Impervious, Inflow Depth > 0.79" for 1-Inch Rnf event
 Inflow = 0.19 cfs @ 12.19 hrs, Volume= 0.012 af
 Outflow = 0.19 cfs @ 12.19 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.2 min
 Primary = 0.19 cfs @ 12.19 hrs, Volume= 0.012 af
 Routed to Pond 48P : Pond1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,007.54' @ 12.19 hrs Surf.Area= 67 sf Storage= 2 cf

Plug-Flow detention time= 0.4 min calculated for 0.012 af (100% of inflow)

Center-of-Mass det. time= 0.4 min (780.6 - 780.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,007.50'	850 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

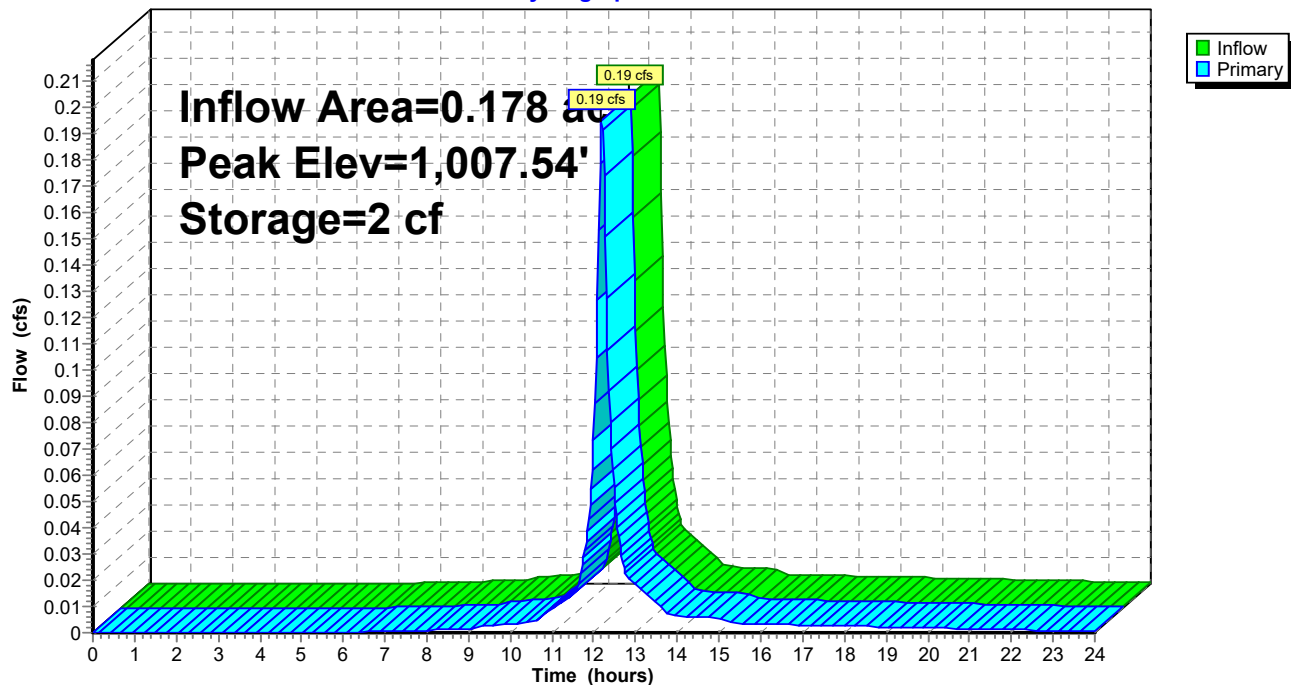
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,007.50	50	0	0
1,008.00	250	75	75
1,009.00	1,300	775	850

Device	Routing	Invert	Outlet Devices
#1	Primary	1,007.50'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.19 cfs @ 12.19 hrs HW=1,007.54' TW=1,002.41' (Dynamic Tailwater)↑ **1=Orifice/Grate** (Weir Controls 0.19 cfs @ 0.66 fps)

Pond 35P: CB West

Hydrograph



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Stage-Area-Storage for Pond 35P: CB West

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,007.50	50	0	1,008.52	796	347
1,007.52	58	1	1,008.54	817	363
1,007.54	66	2	1,008.56	838	380
1,007.56	74	4	1,008.58	859	397
1,007.58	82	5	1,008.60	880	414
1,007.60	90	7	1,008.62	901	432
1,007.62	98	9	1,008.64	922	450
1,007.64	106	11	1,008.66	943	469
1,007.66	114	13	1,008.68	964	488
1,007.68	122	15	1,008.70	985	507
1,007.70	130	18	1,008.72	1,006	527
1,007.72	138	21	1,008.74	1,027	547
1,007.74	146	24	1,008.76	1,048	568
1,007.76	154	27	1,008.78	1,069	589
1,007.78	162	30	1,008.80	1,090	611
1,007.80	170	33	1,008.82	1,111	633
1,007.82	178	36	1,008.84	1,132	655
1,007.84	186	40	1,008.86	1,153	678
1,007.86	194	44	1,008.88	1,174	702
1,007.88	202	48	1,008.90	1,195	725
1,007.90	210	52	1,008.92	1,216	749
1,007.92	218	56	1,008.94	1,237	774
1,007.94	226	61	1,008.96	1,258	799
1,007.96	234	65	1,008.98	1,279	824
1,007.98	242	70	1,009.00	1,300	850
1,008.00	250	75			
1,008.02	271	80			
1,008.04	292	86			
1,008.06	313	92			
1,008.08	334	98			
1,008.10	355	105			
1,008.12	376	113			
1,008.14	397	120			
1,008.16	418	128			
1,008.18	439	137			
1,008.20	460	146			
1,008.22	481	155			
1,008.24	502	165			
1,008.26	523	175			
1,008.28	544	186			
1,008.30	565	197			
1,008.32	586	209			
1,008.34	607	221			
1,008.36	628	233			
1,008.38	649	246			
1,008.40	670	259			
1,008.42	691	273			
1,008.44	712	287			
1,008.46	733	301			
1,008.48	754	316			
1,008.50	775	331			

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Summary for Pond 46P: Wet2

Inflow Area = 6.744 ac, 4.21% Impervious, Inflow Depth > 0.79" for 1-Inch Rnf event
 Inflow = 5.42 cfs @ 12.32 hrs, Volume= 0.444 af
 Outflow = 4.12 cfs @ 12.47 hrs, Volume= 0.438 af, Atten= 24%, Lag= 8.9 min
 Primary = 4.12 cfs @ 12.47 hrs, Volume= 0.438 af
 Routed to Pond 47P : Wet1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 47P : Wet1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 991.00' Surf.Area= 2,915 sf Storage= 1,508 cf

Peak Elev= 991.94' @ 12.47 hrs Surf.Area= 5,562 sf Storage= 5,492 cf (3,985 cf above start)

Plug-Flow detention time= 78.6 min calculated for 0.403 af (91% of inflow)

Center-of-Mass det. time= 25.8 min (815.9 - 790.1)

Volume	Invert	Avail.Storage	Storage Description
#1	990.00'	221,260 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

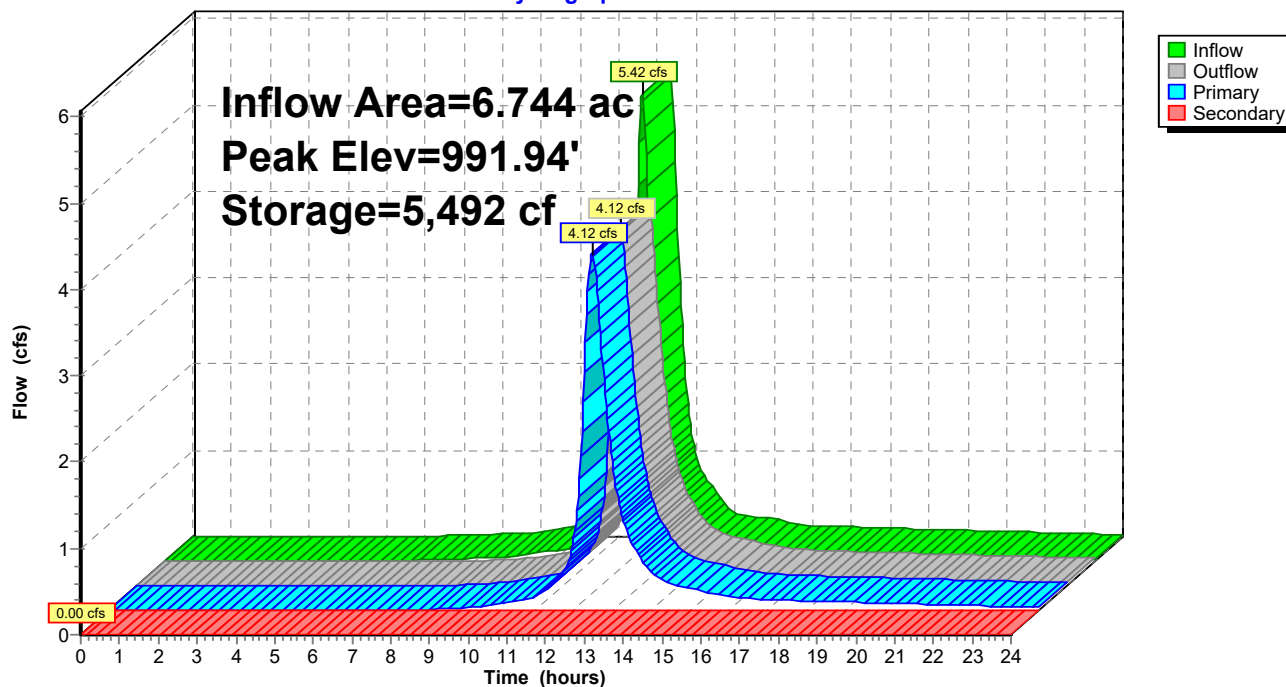
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
990.00	100	0	0
992.00	5,730	5,830	5,830
994.00	20,000	25,730	31,560
996.00	47,200	67,200	98,760
998.00	75,300	122,500	221,260

Device	Routing	Invert	Outlet Devices
#1	Primary	991.00'	24.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 991.00' / 990.00' S= 0.0192 '/' Cc= 0.900 n= 0.024, Flow Area= 3.14 sf
#2	Secondary	997.00'	25.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=4.12 cfs @ 12.47 hrs HW=991.94' TW=988.62' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 4.12 cfs @ 4.16 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=991.00' TW=988.00' (Dynamic Tailwater)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 46P: Wet2

Hydrograph



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Stage-Area-Storage for Pond 46P: Wet2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
990.00	100	0	995.10	34,960	61,788
990.10	382	24	995.20	36,320	65,352
990.20	663	76	995.30	37,680	69,052
990.30	944	157	995.40	39,040	72,888
990.40	1,226	265	995.50	40,400	76,860
990.50	1,508	402	995.60	41,760	80,968
990.60	1,789	567	995.70	43,120	85,212
990.70	2,071	760	995.80	44,480	89,592
990.80	2,352	981	995.90	45,840	94,108
990.90	2,633	1,230	996.00	47,200	98,760
991.00	2,915	1,508	996.10	48,605	103,550
991.10	3,197	1,813	996.20	50,010	108,481
991.20	3,478	2,147	996.30	51,415	113,552
991.30	3,759	2,509	996.40	52,820	118,764
991.40	4,041	2,899	996.50	54,225	124,116
991.50	4,323	3,317	996.60	55,630	129,609
991.60	4,604	3,763	996.70	57,035	135,242
991.70	4,886	4,238	996.80	58,440	141,016
991.80	5,167	4,740	996.90	59,845	146,930
991.90	5,448	5,271	997.00	61,250	152,985
992.00	5,730	5,830	997.10	62,655	159,180
992.10	6,444	6,439	997.20	64,060	165,516
992.20	7,157	7,119	997.30	65,465	171,992
992.30	7,870	7,870	997.40	66,870	178,609
992.40	8,584	8,693	997.50	68,275	185,366
992.50	9,298	9,587	997.60	69,680	192,264
992.60	10,011	10,552	997.70	71,085	199,302
992.70	10,725	11,589	997.80	72,490	206,481
992.80	11,438	12,697	997.90	73,895	213,800
992.90	12,151	13,877	998.00	75,300	221,260
993.00	12,865	15,128			
993.10	13,579	16,450			
993.20	14,292	17,843			
993.30	15,005	19,308			
993.40	15,719	20,844			
993.50	16,433	22,452			
993.60	17,146	24,131			
993.70	17,860	25,881			
993.80	18,573	27,703			
993.90	19,286	29,596			
994.00	20,000	31,560			
994.10	21,360	33,628			
994.20	22,720	35,832			
994.30	24,080	38,172			
994.40	25,440	40,648			
994.50	26,800	43,260			
994.60	28,160	46,008			
994.70	29,520	48,892			
994.80	30,880	51,912			
994.90	32,240	55,068			
995.00	33,600	58,360			

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Summary for Pond 47P: Wet1

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 0.79" for 1-Inch Rnf event
 Inflow = 17.24 cfs @ 12.37 hrs, Volume= 1.611 af
 Outflow = 14.79 cfs @ 12.50 hrs, Volume= 1.610 af, Atten= 14%, Lag= 7.7 min
 Primary = 14.79 cfs @ 12.50 hrs, Volume= 1.610 af
 Routed to Reach 45R : Wet2_out

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 988.63' @ 12.50 hrs Surf.Area= 0.549 ac Storage= 0.178 af

Plug-Flow detention time= 8.3 min calculated for 1.610 af (100% of inflow)
 Center-of-Mass det. time= 7.8 min (806.3 - 798.4)

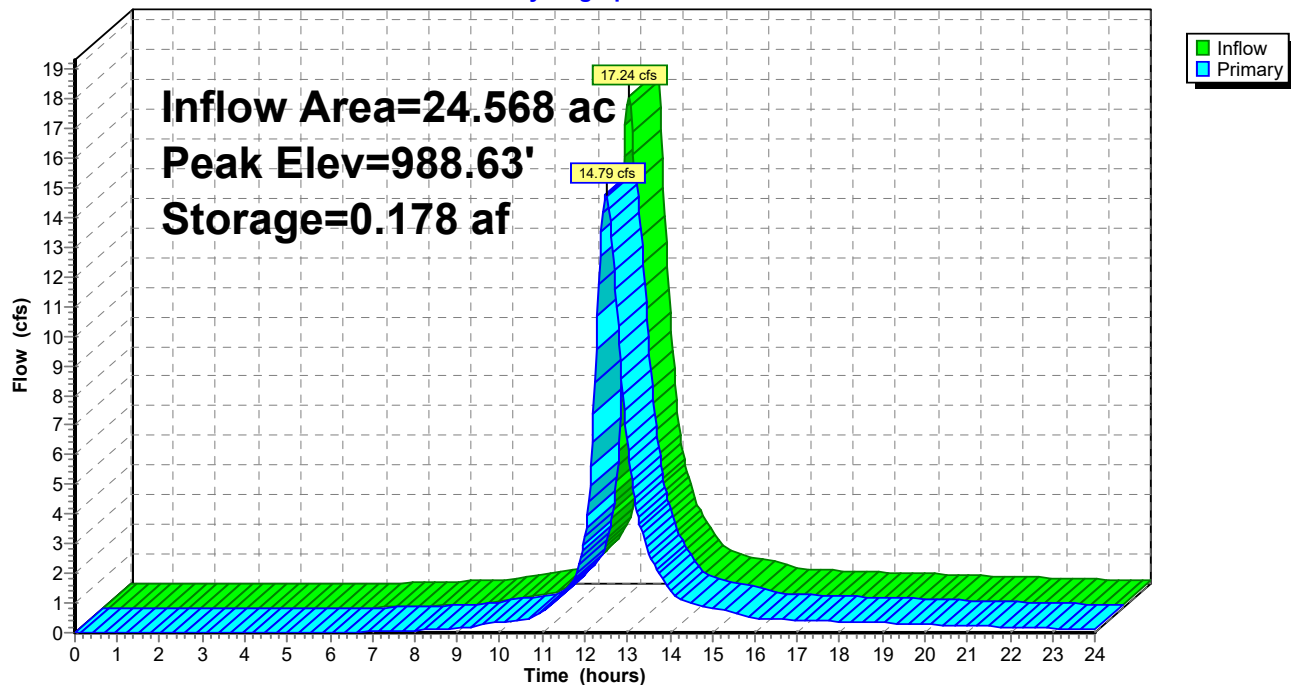
Volume	Invert	Avail.Storage	Storage Description
#1	988.00'	23.952 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
988.00	0.020	0.000	0.000
989.50	1.290	0.983	0.983
990.00	3.430	1.180	2.162
992.00	5.580	9.010	11.172
994.00	7.200	12.780	23.952

Device	Routing	Invert	Outlet Devices
#1	Primary	988.00'	Channel/Reach using Reach 45R: Wet2_out

Primary OutFlow Max=14.77 cfs @ 12.50 hrs HW=988.62' TW=988.62' (Dynamic Tailwater)
 ↑1=**Channel/Reach** (Channel Controls 14.77 cfs @ 2.68 fps)

Pond 47P: Wet1

Hydrograph



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Stage-Area-Storage for Pond 47P: Wet1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
988.00	0.020	0.000	993.10	6.471	17.801
988.10	0.105	0.006	993.20	6.552	18.452
988.20	0.189	0.021	993.30	6.633	19.111
988.30	0.274	0.044	993.40	6.714	19.778
988.40	0.359	0.076	993.50	6.795	20.454
988.50	0.443	0.116	993.60	6.876	21.137
988.60	0.528	0.164	993.70	6.957	21.829
988.70	0.613	0.221	993.80	7.038	22.529
988.80	0.697	0.287	993.90	7.119	23.237
988.90	0.782	0.361	994.00	7.200	23.952
989.00	0.867	0.443	994.10	7.200	23.952
989.10	0.951	0.534	994.20	7.200	23.952
989.20	1.036	0.634	994.30	7.200	23.952
989.30	1.121	0.741	994.40	7.200	23.952
989.40	1.205	0.858	994.50	7.200	23.952
989.50	1.290	0.983	994.60	7.200	23.952
989.60	1.718	1.133	994.70	7.200	23.952
989.70	2.146	1.326	994.80	7.200	23.952
989.80	2.574	1.562	994.90	7.200	23.952
989.90	3.002	1.841	995.00	7.200	23.952
990.00	3.430	2.162	995.10	7.200	23.952
990.10	3.538	2.511	995.20	7.200	23.952
990.20	3.645	2.870	995.30	7.200	23.952
990.30	3.752	3.240	995.40	7.200	23.952
990.40	3.860	3.620	995.50	7.200	23.952
990.50	3.967	4.012	995.60	7.200	23.952
990.60	4.075	4.414	995.70	7.200	23.952
990.70	4.183	4.827	995.80	7.200	23.952
990.80	4.290	5.250	995.90	7.200	23.952
990.90	4.397	5.685	996.00	7.200	23.952
991.00	4.505	6.130	996.10	7.200	23.952
991.10	4.613	6.586	996.20	7.200	23.952
991.20	4.720	7.053	996.30	7.200	23.952
991.30	4.827	7.530	996.40	7.200	23.952
991.40	4.935	8.018	996.50	7.200	23.952
991.50	5.042	8.517	996.60	7.200	23.952
991.60	5.150	9.027	996.70	7.200	23.952
991.70	5.258	9.547	996.80	7.200	23.952
991.80	5.365	10.078	996.90	7.200	23.952
991.90	5.472	10.620	997.00	7.200	23.952
992.00	5.580	11.172			
992.10	5.661	11.735			
992.20	5.742	12.305			
992.30	5.823	12.883			
992.40	5.904	13.469			
992.50	5.985	14.064			
992.60	6.066	14.666			
992.70	6.147	15.277			
992.80	6.228	15.896			
992.90	6.309	16.523			
993.00	6.390	17.157			

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Summary for Pond 48P: Pond1

Inflow Area = 1.947 ac, 50.95% Impervious, Inflow Depth > 0.79" for 1-Inch Rnf event
 Inflow = 2.55 cfs @ 12.13 hrs, Volume= 0.128 af
 Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 44R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 44R : Woodland Cove Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 1,002.00' Surf.Area= 4,596 sf Storage= 10,824 cf

Peak Elev= 1,002.75' @ 24.00 hrs Surf.Area= 8,252 sf Storage= 16,412 cf (5,588 cf above start)

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	998.00'	92,791 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 1.2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
998.00	810	0	0
1,000.00	2,190	3,000	3,000
1,002.00	3,830	6,020	9,020
1,002.10	6,000	492	9,512
1,003.00	7,220	5,949	15,460
1,004.00	8,360	7,790	23,250
1,005.00	9,930	9,145	32,395
1,007.00	11,000	20,930	53,325
1,008.00	12,000	11,500	64,825
1,009.00	13,000	12,500	77,325

Device	Routing	Invert	Outlet Devices
#1	Primary	999.50'	18.0" Round Culvert L= 149.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 999.50' / 999.10' S= 0.0027 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,004.50'	48.0" Horiz. grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,003.00'	Custom Weir/Orifice, Cv= 3.00 (C= 3.75) Head (feet) 0.00 0.50 0.51 4.00 Width (feet) 4.00 4.00 4.00 4.00
#4	Device 3	1,000.00'	15.0" Round lowflow L= 81.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 1,000.00' / 1,000.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Device 1	1,002.00'	0.04 cfs Filtration X 0.00 when above 1,002.00' Phase-In= 0.01'
#6	Secondary	1,008.00'	10.0' long + 4.0 '/' SideZ x 3.0' breadth EOF Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50

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Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,002.00' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 0.00 cfs of 8.46 cfs potential flow)

2=grate (Controls 0.00 cfs)

3=Custom Weir/Orifice (Controls 0.00 cfs)

4=lowflow (Controls 0.00 cfs)

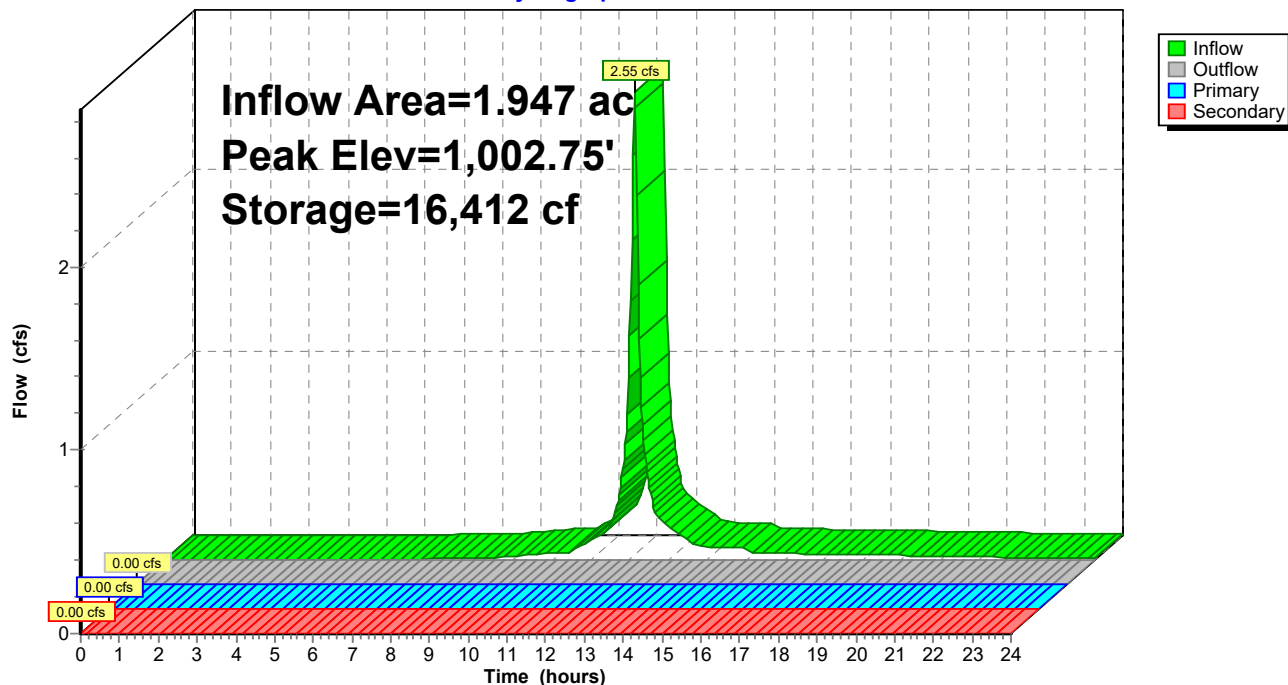
5=Filtration (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,002.00' TW=0.00' (Dynamic Tailwater)

6=EOF (Controls 0.00 cfs)

Pond 48P: Pond1

Hydrograph



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Stage-Area-Storage for Pond 48P: Pond1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
998.00	972	0	1,008.20	14,640	80,695
998.20	1,138	211	1,008.40	14,880	83,647
998.40	1,303	455	1,008.60	15,120	86,647
998.60	1,469	732	1,008.80	15,360	89,695
998.80	1,634	1,043	1,009.00	15,600	92,791
999.00	1,800	1,386			
999.20	1,966	1,763			
999.40	2,131	2,172			
999.60	2,297	2,615			
999.80	2,462	3,091			
1,000.00	2,628	3,600			
1,000.20	2,825	4,145			
1,000.40	3,022	4,730			
1,000.60	3,218	5,354			
1,000.80	3,415	6,017			
1,001.00	3,612	6,720			
1,001.20	3,809	7,462			
1,001.40	4,006	8,244			
1,001.60	4,202	9,064			
1,001.80	4,399	9,924			
1,002.00	4,596	10,824			
1,002.20	7,363	12,142			
1,002.40	7,688	13,647			
1,002.60	8,013	15,217			
1,002.80	8,339	16,852			
1,003.00	8,664	18,553			
1,003.20	8,938	20,313			
1,003.40	9,211	22,128			
1,003.60	9,485	23,997			
1,003.80	9,758	25,922			
1,004.00	10,032	27,901			
1,004.20	10,409	29,945			
1,004.40	10,786	32,064			
1,004.60	11,162	34,259			
1,004.80	11,539	36,529			
1,005.00	11,916	38,875			
1,005.20	12,044	41,271			
1,005.40	12,173	43,692			
1,005.60	12,301	46,140			
1,005.80	12,430	48,613			
1,006.00	12,558	51,112			
1,006.20	12,686	53,636			
1,006.40	12,815	56,186			
1,006.60	12,943	58,762			
1,006.80	13,072	61,363			
1,007.00	13,200	63,991			
1,007.20	13,440	66,655			
1,007.40	13,680	69,367			
1,007.60	13,920	72,127			
1,007.80	14,160	74,935			
1,008.00	14,400	77,791			

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Summary for Pond 56P: Woodland Cove Pond 2 AIRRIG/SED

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

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 997.35' Surf.Area= 68,822 sf Storage= 260,413 cf

Peak Elev= 997.35' @ 0.00 hrs Surf.Area= 68,822 sf Storage= 260,413 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no inflow)

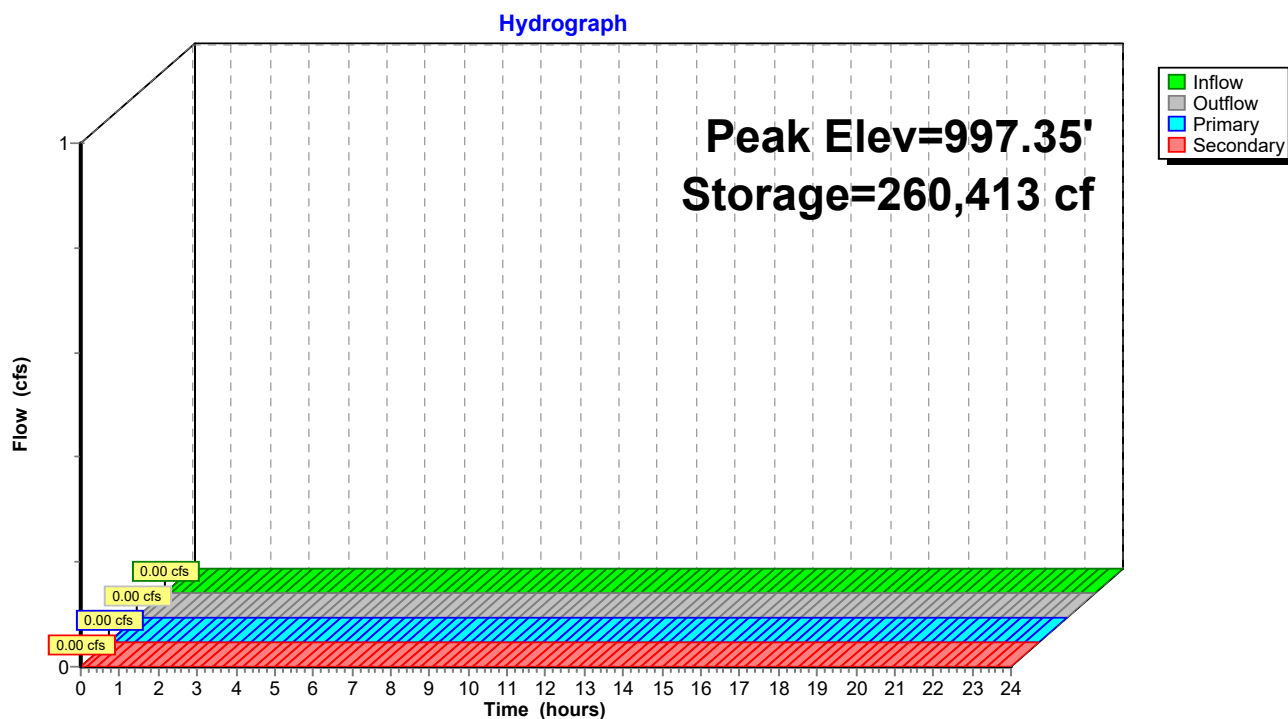
Volume	Invert	Avail.Storage	Storage Description
#1	998.00'	977,118 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
988.00	1,246	0	0
990.00	4,714	5,960	5,960
992.00	15,160	19,874	25,834
994.00	35,780	50,940	76,774
996.00	60,540	96,320	173,094
997.35	68,822	87,319	260,413
998.00	77,800	47,652	308,065
998.01	90,500	841	308,907
1,000.00	125,240	214,661	523,568
1,002.00	160,640	285,880	809,448
1,003.00	174,700	167,670	977,118

Device	Routing	Invert	Outlet Devices
#1	Primary	998.00'	12.0" Round Culvert L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 994.00' / 998.00' S= -0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	998.00'	0.500 cfs Constant Flow/Skimmer Phase-In= 0.01'

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=997.35' (Free Discharge)↑ **1=Culvert** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=997.35' (Free Discharge)↑ **2=Constant Flow/Skimmer** (Constant Controls 0.00 cfs)

Pond 56P: Woodland Cove Pond 2 AIRRIG/SED



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Stage-Area-Storage for Pond 56P: Woodland Cove Pond 2 AIRRIG/SED

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
988.00	1,246	0	998.20	93,817	326,417
988.20	1,593	284	998.40	97,308	345,530
988.40	1,940	637	998.60	100,800	365,340
988.60	2,286	1,060	998.80	104,291	385,850
988.80	2,633	1,552	999.00	107,783	407,057
989.00	2,980	2,113	999.20	111,274	428,963
989.20	3,327	2,744	999.40	114,766	451,567
989.40	3,674	3,444	999.60	118,257	474,869
989.60	4,020	4,213	999.80	121,749	498,869
989.80	4,367	5,052	1,000.00	125,240	523,568
990.00	4,714	5,960	1,000.20	128,780	548,970
990.20	5,759	7,007	1,000.40	132,320	575,080
990.40	6,803	8,263	1,000.60	135,860	601,898
990.60	7,848	9,729	1,000.80	139,400	629,424
990.80	8,892	11,403	1,001.00	142,940	657,658
991.00	9,937	13,286	1,001.20	146,480	686,600
991.20	10,982	15,377	1,001.40	150,020	716,250
991.40	12,026	17,678	1,001.60	153,560	746,608
991.60	13,071	20,188	1,001.80	157,100	777,674
991.80	14,115	22,906	1,002.00	160,640	809,448
992.00	15,160	25,834	1,002.20	163,452	841,858
992.20	17,222	29,072	1,002.40	166,264	874,829
992.40	19,284	32,723	1,002.60	169,076	908,363
992.60	21,346	36,786	1,002.80	171,888	942,459
992.80	23,408	41,261	1,003.00	174,700	977,118
993.00	25,470	46,149			
993.20	27,532	51,449			
993.40	29,594	57,162			
993.60	31,656	63,287			
993.80	33,718	69,824			
994.00	35,780	76,774			
994.20	38,256	84,178			
994.40	40,732	92,076			
994.60	43,208	100,470			
994.80	45,684	109,360			
995.00	48,160	118,744			
995.20	50,636	128,624			
995.40	53,112	138,998			
995.60	55,588	149,868			
995.80	58,064	161,234			
996.00	60,540	173,094			
996.20	61,767	185,325			
996.40	62,994	197,801			
996.60	64,221	210,522			
996.80	65,448	223,489			
997.00	66,675	236,701			
997.20	67,902	250,159			
997.40	69,513	263,872			
997.60	72,275	278,050			
997.80	75,038	292,782			
998.00	77,800	308,065			

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Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment35S: PR6	Runoff Area=0.483 ac 47.83% Impervious Runoff Depth>1.70" Tc=6.0 min CN=75/98 Runoff=1.35 cfs 0.069 af
Subcatchment37S: PR2	Runoff Area=17.824 ac 12.34% Impervious Runoff Depth>1.08" Flow Length=600' Tc=24.7 min CN=75/98 Runoff=17.76 cfs 1.602 af
Subcatchment38S: PR7	Runoff Area=6.744 ac 4.21% Impervious Runoff Depth>0.71" Flow Length=720' Tc=22.6 min CN=70/98 Runoff=4.38 cfs 0.402 af
Subcatchment39S: PR8	Runoff Area=0.507 ac 22.09% Impervious Runoff Depth>1.29" Flow Length=100' Slope=0.0200 '/' Tc=15.1 min CN=76/98 Runoff=0.78 cfs 0.055 af
Subcatchment41S: PR1	Runoff Area=1.286 ac 55.75% Impervious Runoff Depth>1.96" Tc=6.0 min CN=80/98 Runoff=4.16 cfs 0.210 af
Subcatchment50S: PR3	Runoff Area=1.325 ac 8.15% Impervious Runoff Depth>1.10" Flow Length=200' Tc=15.9 min CN=77/98 Runoff=1.74 cfs 0.122 af
Subcatchment52S: PR4	Runoff Area=0.178 ac 24.72% Impervious Runoff Depth>1.50" Flow Length=50' Slope=0.0100 '/' Tc=11.5 min CN=80/98 Runoff=0.37 cfs 0.022 af
Subcatchment53S: PR5	Runoff Area=1.268 ac 4.97% Impervious Runoff Depth>1.00" Flow Length=200' Tc=16.2 min CN=76/98 Runoff=1.50 cfs 0.106 af
Reach 44R: Woodland Cove Pond	Inflow=3.98 cfs 0.392 af Outflow=3.98 cfs 0.392 af
Reach 45R: Wet2_out	Avg. Flow Depth=0.67' Max Vel=2.80 fps Inflow=17.06 cfs 1.994 af n=0.035 L=150.0' S=0.0110 '/' Capacity=5,231.48 cfs Outflow=17.05 cfs 1.993 af
Pond 33P: Basin 2 - CB_WoodlandCove	Peak Elev=1,004.11' Storage=655 cf Inflow=2.27 cfs 0.160 af Primary=2.25 cfs 0.149 af Secondary=0.00 cfs 0.000 af Outflow=2.25 cfs 0.149 af
Pond 35P: CB West	Peak Elev=1,007.56' Storage=4 cf Inflow=0.37 cfs 0.022 af Outflow=0.37 cfs 0.022 af
Pond 46P: Wet2	Peak Elev=991.81' Storage=4,779 cf Inflow=4.38 cfs 0.402 af Primary=3.12 cfs 0.394 af Secondary=0.00 cfs 0.000 af Outflow=3.12 cfs 0.394 af
Pond 47P: Wet1	Peak Elev=988.67' Storage=0.206 af Inflow=20.10 cfs 1.996 af Outflow=17.06 cfs 1.994 af
Pond 48P: Pond1	Peak Elev=1,003.11' Storage=19,503 cf Inflow=5.80 cfs 0.301 af Primary=0.54 cfs 0.121 af Secondary=0.00 cfs 0.000 af Outflow=0.54 cfs 0.121 af
Pond 56P: Woodland Cove Pond 2	Peak Elev=997.35' Storage=260,413 cf Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

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Total Runoff Area = 29.615 ac Runoff Volume = 2.586 af Average Runoff Depth = 1.05"
87.31% Pervious = 25.857 ac 12.69% Impervious = 3.758 ac

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MSE 24-hr 3 2-Year Rainfall=2.85"

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Summary for Subcatchment 35S: PR6

Runoff = 1.35 cfs @ 12.13 hrs, Volume= 0.069 af, Depth> 1.70"
Routed to Pond 48P : Pond1

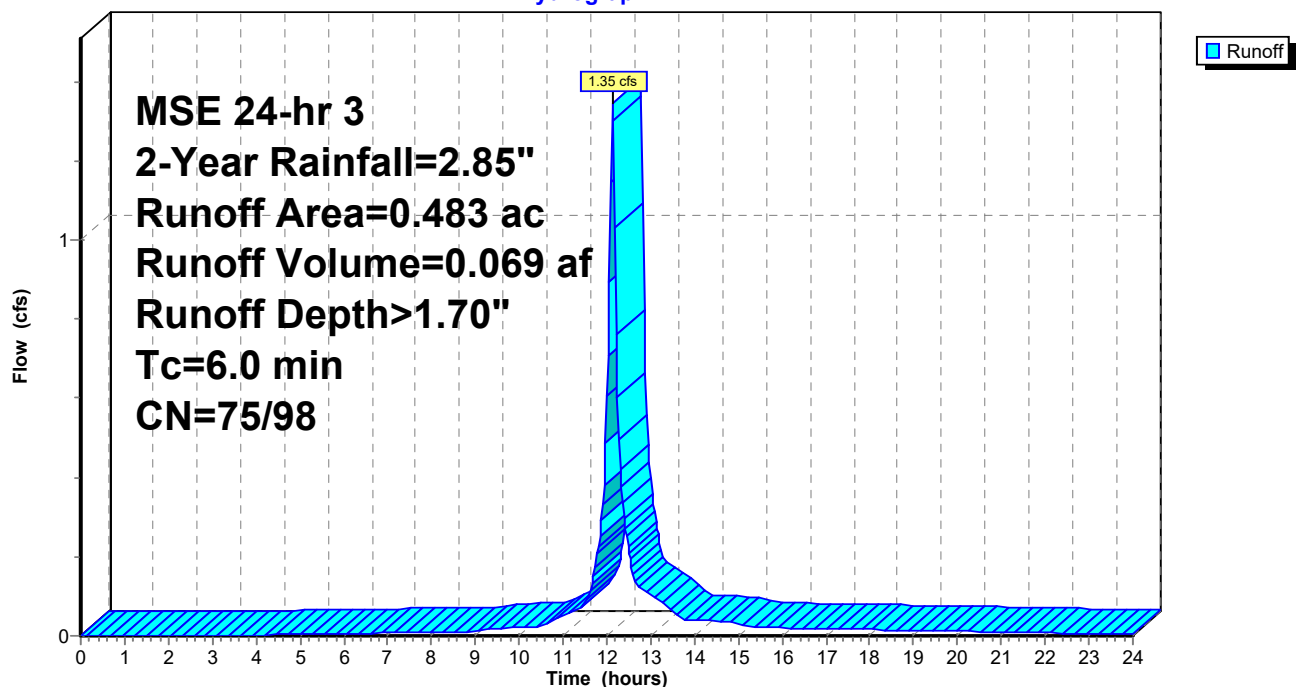
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.230	74	>75% Grass cover, Good, HSG C
0.022	80	>75% Grass cover, Good, HSG D
* 0.197	98	impervious - new
* 0.034	98	impervious - old
0.000	70	Woods, Good, HSG C
0.000	77	Woods, Good, HSG D
* 0.000	98	pond
0.483	86	Weighted Average
0.252	75	52.17% Pervious Area
0.231	98	47.83% Impervious Area

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

Subcatchment 35S: PR6

Hydrograph



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MSE 24-hr 3 2-Year Rainfall=2.85"

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Summary for Subcatchment 37S: PR2

Runoff = 17.76 cfs @ 12.37 hrs, Volume= 1.602 af, Depth> 1.08"
 Routed to Pond 47P : Wet1

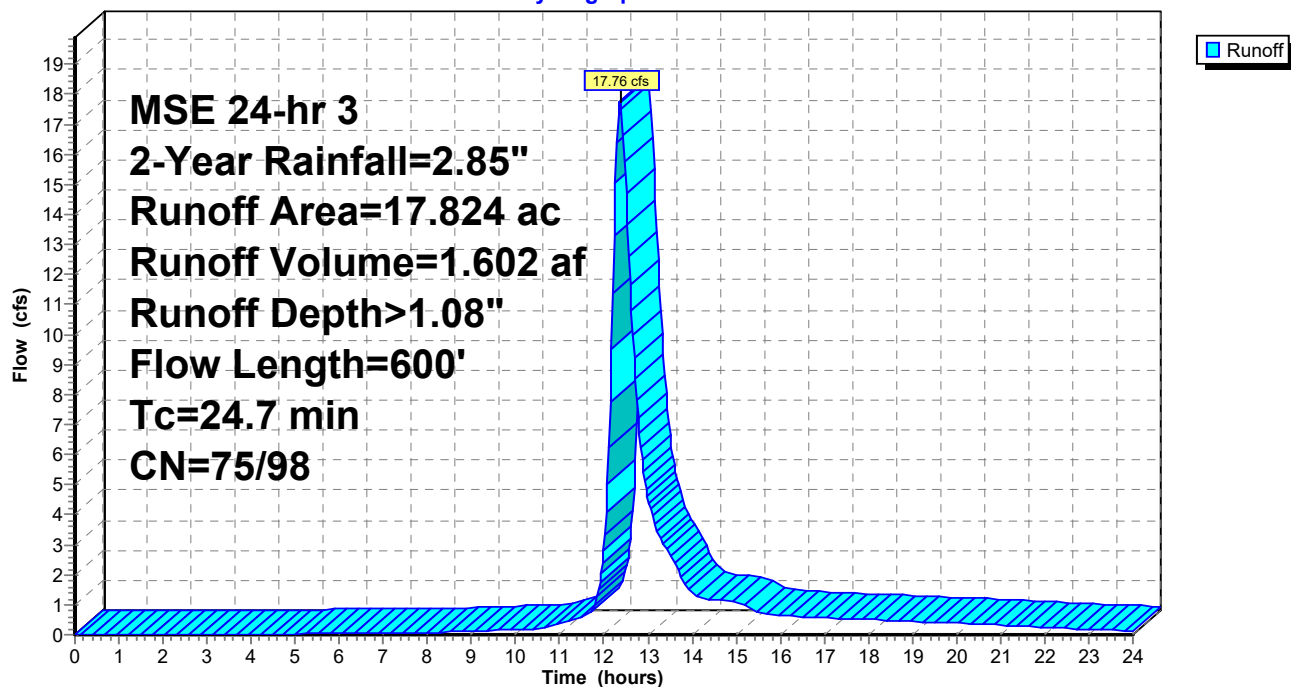
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.039	74	>75% Grass cover, Good, HSG C
0.621	80	>75% Grass cover, Good, HSG D
* 0.440	98	impervious - old
* 0.000	74	imp_tempC
* 0.000	80	imp_tempD
* 1.759	98	wetland
4.786	70	Woods, Good, HSG C
8.227	77	Woods, Good, HSG D
0.317	77	Woods, Good, HSG D
0.873	74	>75% Grass cover, Good, HSG C
0.762	80	>75% Grass cover, Good, HSG D
17.824	78	Weighted Average
15.625	75	87.66% Pervious Area
2.199	98	12.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
8.9	500	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.7	600	Total			

Subcatchment 37S: PR2

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MSE 24-hr 3 2-Year Rainfall=2.85"

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Summary for Subcatchment 38S: PR7

Runoff = 4.38 cfs @ 12.36 hrs, Volume= 0.402 af, Depth> 0.71"
 Routed to Pond 46P : Wet2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.001	74	>75% Grass cover, Good, HSG C
* 0.143	98	impervious - old
* 0.141	98	wetland
6.444	70	Woods, Good, HSG C
0.015	77	Woods, Good, HSG D
6.744	71	Weighted Average
6.460	70	95.79% Pervious Area
0.284	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
7.6	500	0.0480	1.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	120	0.0500	6.94	69.40	Channel Flow, Area= 10.0 sf Perim= 16.0' r= 0.63' n= 0.035
22.6	720	Total			

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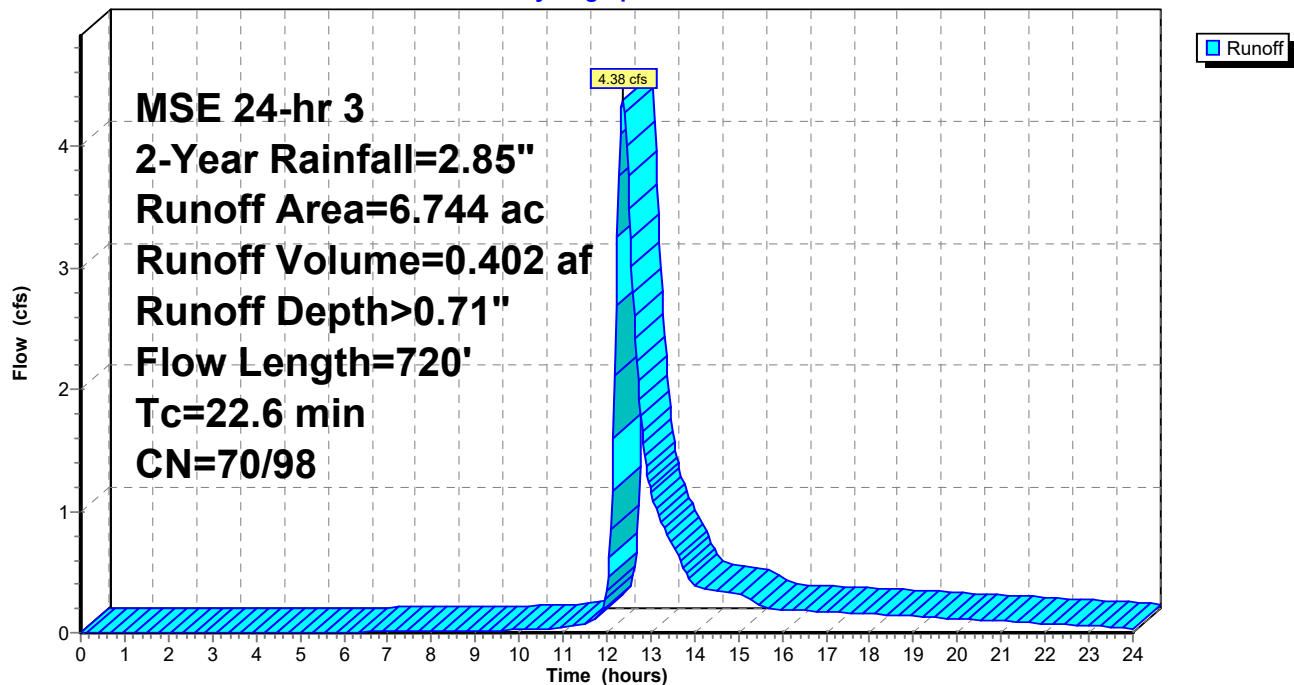
MSE 24-hr 3 2-Year Rainfall=2.85"

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Subcatchment 38S: PR7

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MSE 24-hr 3 2-Year Rainfall=2.85"

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Summary for Subcatchment 39S: PR8

Runoff = 0.78 cfs @ 12.24 hrs, Volume= 0.055 af, Depth> 1.29"
Routed to Pond 33P : Basin 2 - CB_WoodlandCove

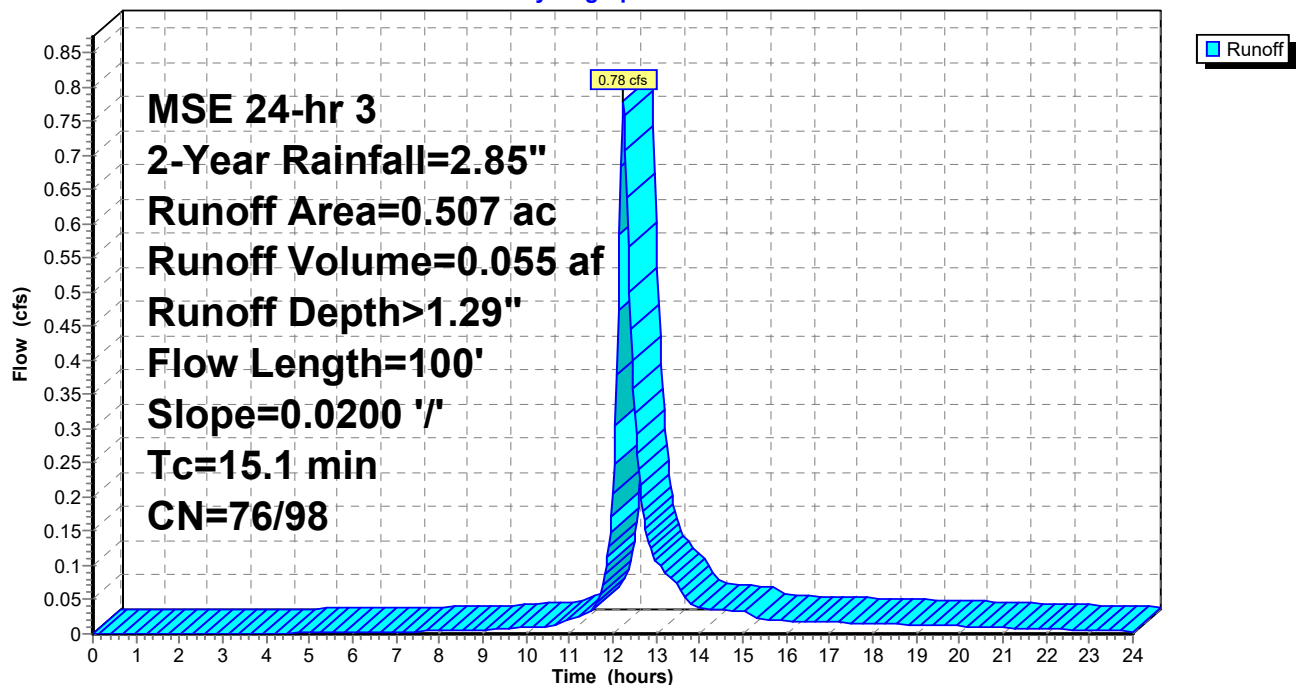
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.159	80	>75% Grass cover, Good, HSG D
* 0.000	98	impervious - new
0.236	74	>75% Grass cover, Good, HSG C
* 0.112	98	impervious - old
0.507	81	Weighted Average
0.395	76	77.91% Pervious Area
0.112	98	22.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 39S: PR8

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MSE 24-hr 3 2-Year Rainfall=2.85"

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Summary for Subcatchment 41S: PR1

Runoff = 4.16 cfs @ 12.13 hrs, Volume= 0.210 af, Depth> 1.96"
Routed to Pond 48P : Pond1

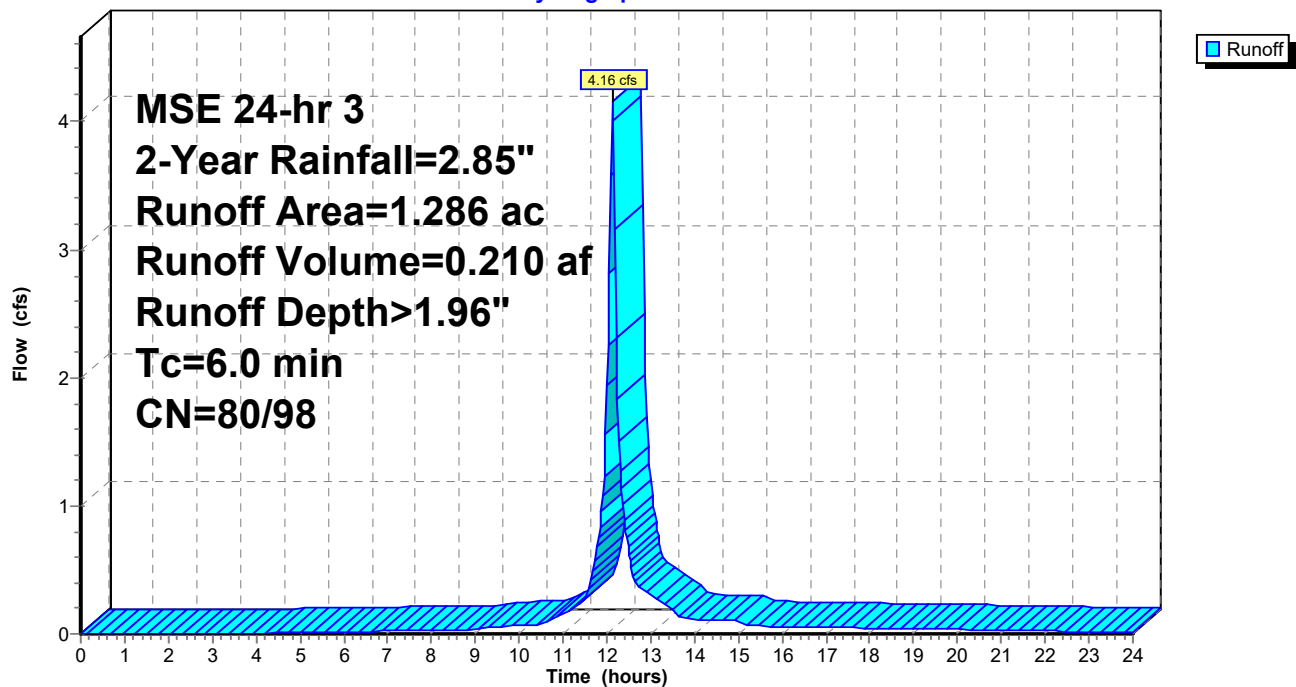
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.043	74	>75% Grass cover, Good, HSG C
0.477	80	>75% Grass cover, Good, HSG D
* 0.545	98	impervious - new
* 0.172	98	pond
0.049	80	>75% Grass cover, Good, HSG D
1.286	90	Weighted Average
0.569	80	44.25% Pervious Area
0.717	98	55.75% Impervious Area

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

Subcatchment 41S: PR1

Hydrograph



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MSE 24-hr 3 2-Year Rainfall=2.85"

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Summary for Subcatchment 50S: PR3

Runoff = 1.74 cfs @ 12.25 hrs, Volume= 0.122 af, Depth> 1.10"
 Routed to Reach 44R : Woodland Cove Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.597	74	>75% Grass cover, Good, HSG C
0.610	80	>75% Grass cover, Good, HSG D
* 0.057	98	impervious - old
* 0.032	98	impervious - new
0.010	80	>75% Grass cover, Good, HSG D
* 0.019	98	impervious - new
1.325	79	Weighted Average
1.217	77	91.85% Pervious Area
0.108	98	8.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"
0.8	100	0.0900	2.10		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
15.9	200	Total			

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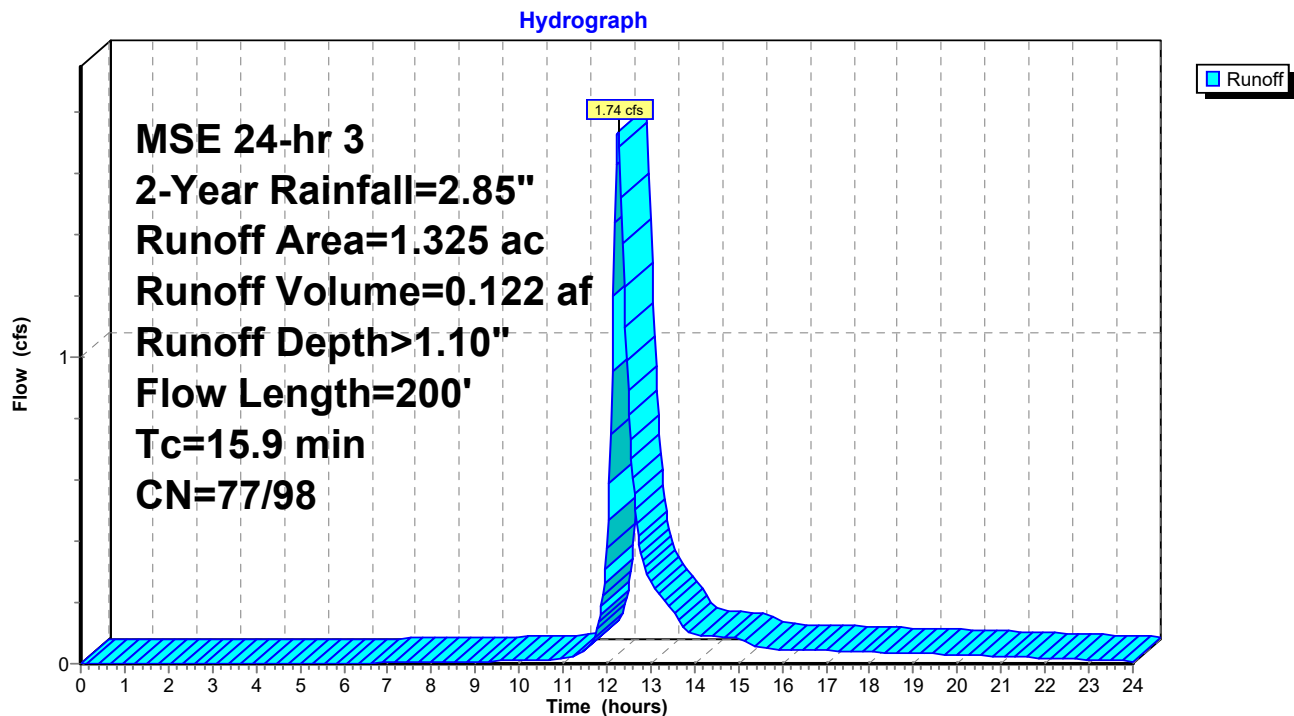
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MSE 24-hr 3 2-Year Rainfall=2.85"

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Subcatchment 50S: PR3



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MSE 24-hr 3 2-Year Rainfall=2.85"

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Summary for Subcatchment 52S: PR4

Runoff = 0.37 cfs @ 12.19 hrs, Volume= 0.022 af, Depth> 1.50"
Routed to Pond 35P : CB West

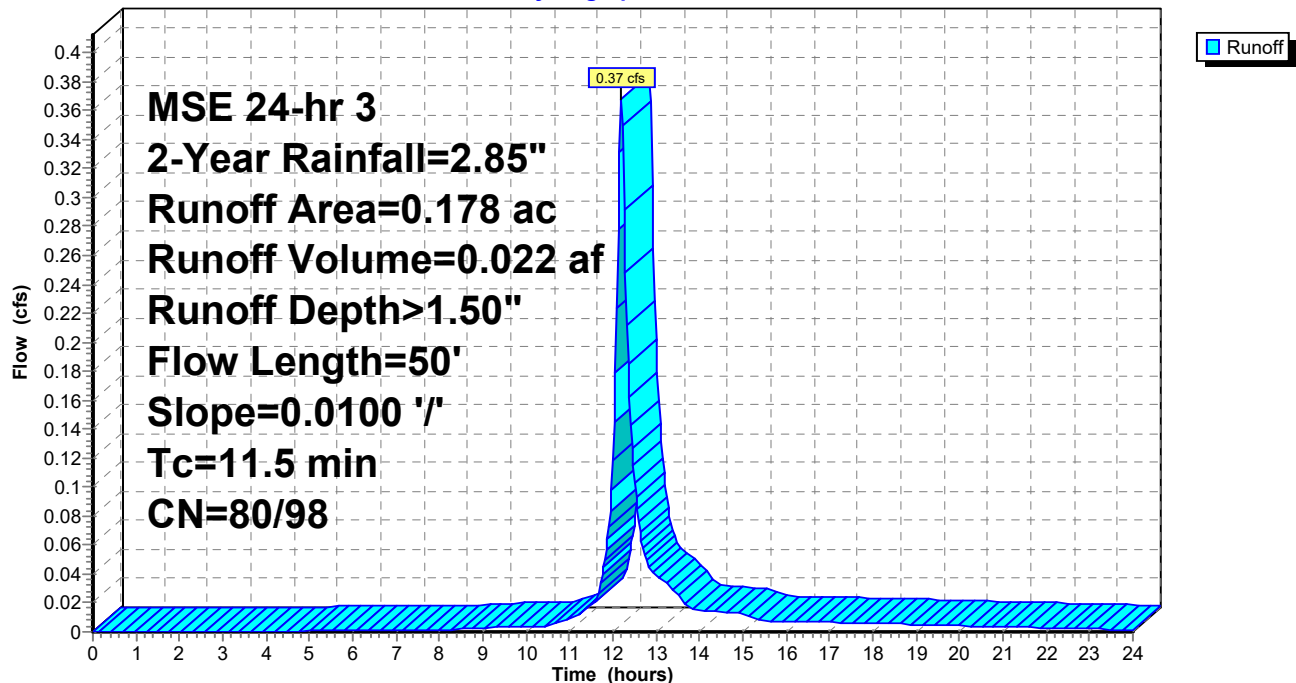
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.098	80	>75% Grass cover, Good, HSG D
* 0.037	98	impervious - new
0.036	80	>75% Grass cover, Good, HSG D
* 0.007	98	impervious - new
0.178	84	Weighted Average
0.134	80	75.28% Pervious Area
0.044	98	24.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 52S: PR4

Hydrograph



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MSE 24-hr 3 2-Year Rainfall=2.85"

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Summary for Subcatchment 53S: PR5

Runoff = 1.50 cfs @ 12.26 hrs, Volume= 0.106 af, Depth> 1.00"
Routed to Pond 33P : Basin 2 - CB_WoodlandCove

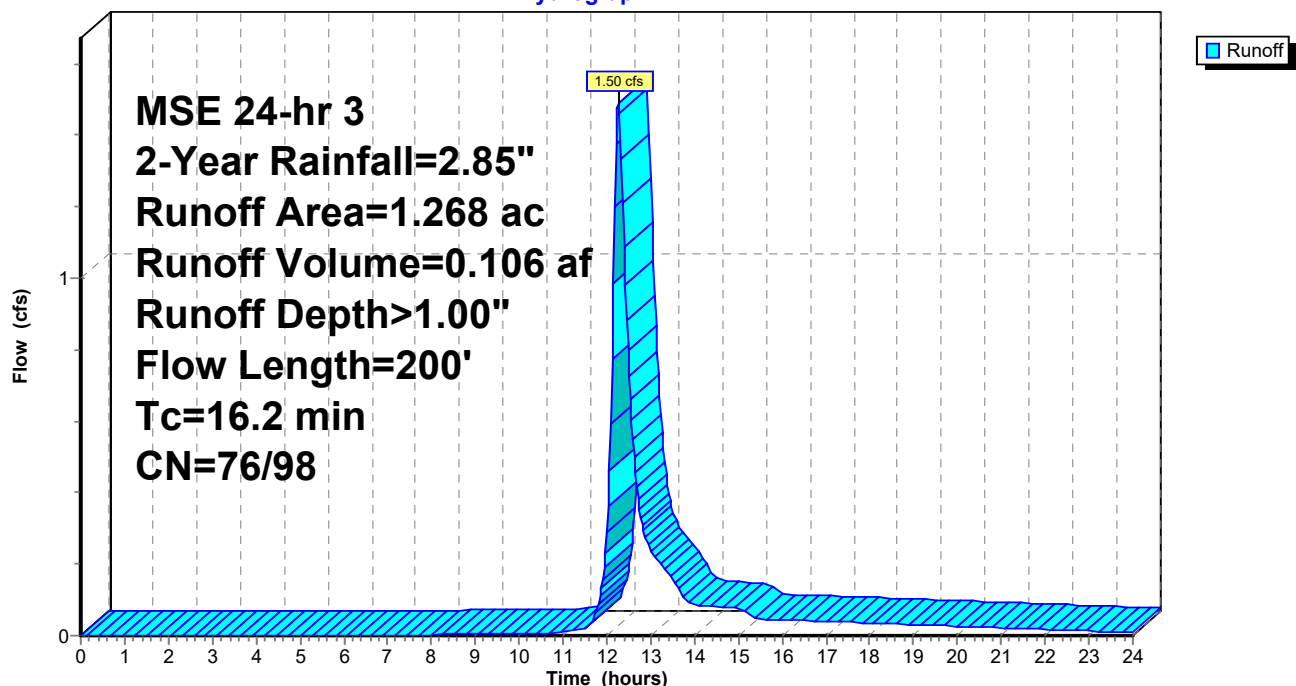
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 2-Year Rainfall=2.85"

Area (ac)	CN	Description
0.490	80	>75% Grass cover, Good, HSG D
* 0.012	98	impervious - new
0.715	74	>75% Grass cover, Good, HSG C
* 0.051	98	impervious - old
1.268	78	Weighted Average
1.205	76	95.03% Pervious Area
0.063	98	4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"
1.1	100	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
16.2	200	Total			

Subcatchment 53S: PR5

Hydrograph

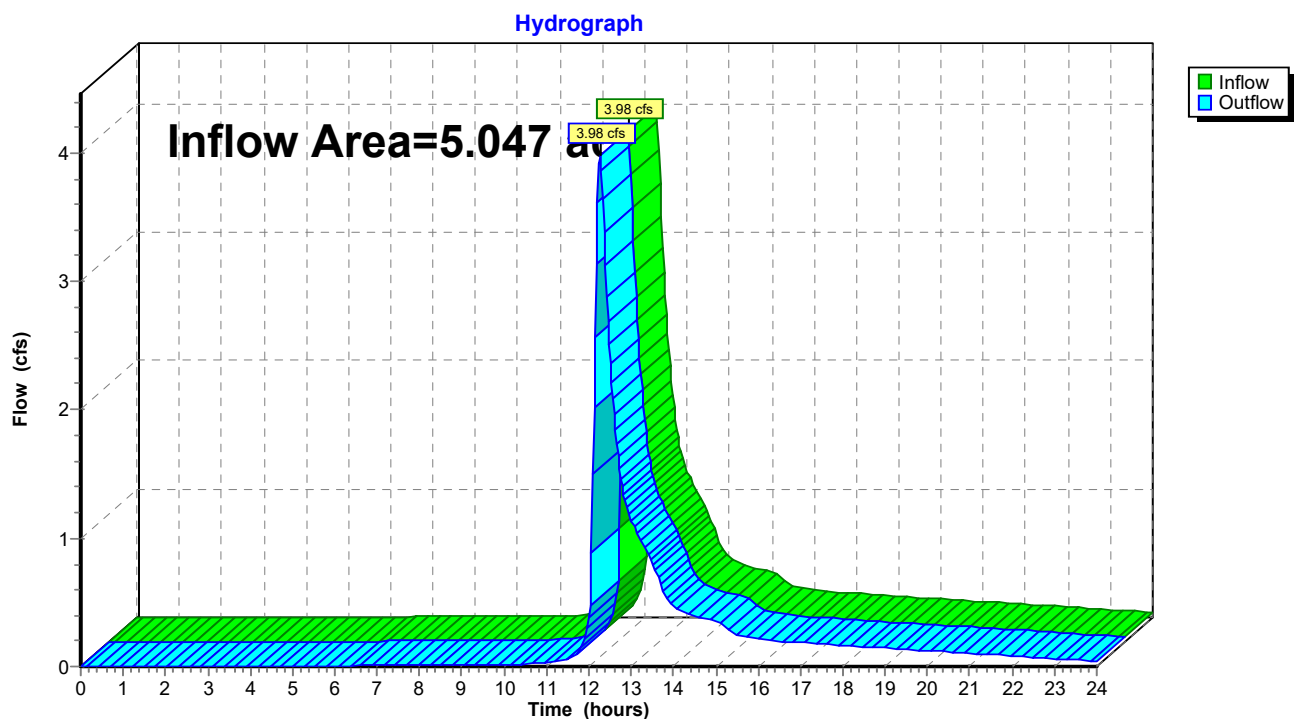


Summary for Reach 44R: Woodland Cove Pond

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.047 ac, 25.26% Impervious, Inflow Depth > 0.93" for 2-Year event
Inflow = 3.98 cfs @ 12.27 hrs, Volume= 0.392 af
Outflow = 3.98 cfs @ 12.27 hrs, Volume= 0.392 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Reach 44R: Woodland Cove Pond

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Summary for Reach 45R: Wet2_out

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 0.97" for 2-Year event
Inflow = 17.06 cfs @ 12.53 hrs, Volume= 1.994 af
Outflow = 17.05 cfs @ 12.54 hrs, Volume= 1.993 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Max. Velocity= 2.80 fps, Min. Travel Time= 0.9 min

Avg. Velocity= 1.05 fps, Avg. Travel Time= 2.4 min

Peak Storage= 912 cf @ 12.54 hrs

Average Depth at Peak Storage= 0.67' , Surface Width= 12.05'

Bank-Full Depth= 9.00' Flow Area= 418.5 sf, Capacity= 5,231.48 cfs

6.00' x 9.00' deep channel, n= 0.035

Side Slope Z-value= 4.5 ' ' Top Width= 87.00'

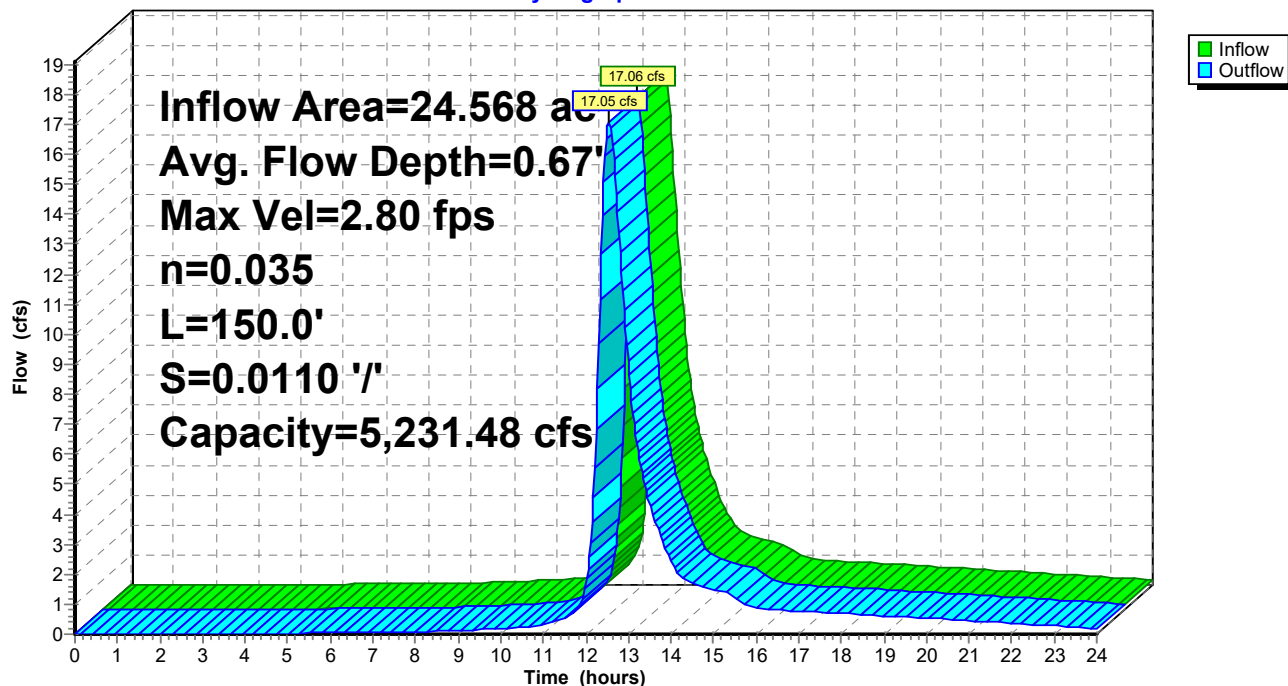
Length= 150.0' Slope= 0.0110 ' '

Inlet Invert= 988.00', Outlet Invert= 986.35'



Reach 45R: Wet2_out

Hydrograph



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Stage-Area-Storage for Reach 45R: Wet2_out

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
988.00	0.0	0	993.10	147.7	22,148
988.10	0.6	97	993.20	152.9	22,933
988.20	1.4	208	993.30	158.2	23,731
988.30	2.2	332	993.40	163.6	24,543
988.40	3.1	469	993.50	169.1	25,369
988.50	4.1	620	993.60	174.7	26,209
988.60	5.2	784	993.70	180.4	27,062
988.70	6.4	962	993.80	186.2	27,928
988.80	7.7	1,153	993.90	192.1	28,808
988.90	9.0	1,357	994.00	198.0	29,701
989.00	10.5	1,576	994.10	204.1	30,608
989.10	12.1	1,808	994.20	210.2	31,528
989.20	13.7	2,053	994.30	216.4	32,461
989.30	15.4	2,312	994.40	222.7	33,409
989.40	17.2	2,584	994.50	229.1	34,370
989.50	19.1	2,870	994.60	235.6	35,344
989.60	21.1	3,169	994.70	242.2	36,332
989.70	23.2	3,481	994.80	248.9	37,333
989.80	25.4	3,807	994.90	255.7	38,348
989.90	27.6	4,147	995.00	262.5	39,376
990.00	30.0	4,501	995.10	269.4	40,417
990.10	32.5	4,868	995.20	276.5	41,472
990.20	35.0	5,248	995.30	283.6	42,541
990.30	37.6	5,642	995.40	290.8	43,624
990.40	40.3	6,049	995.50	298.1	44,720
990.50	43.1	6,470	995.60	305.5	45,829
990.60	46.0	6,904	995.70	313.0	46,952
990.70	49.0	7,351	995.80	320.6	48,088
990.80	52.1	7,813	995.90	328.3	49,238
990.90	55.3	8,288	996.00	336.0	50,401
991.00	58.5	8,776	996.10	343.8	51,577
991.10	61.9	9,278	996.20	351.8	52,768
991.20	65.3	9,793	996.30	359.8	53,972
991.30	68.8	10,322	996.40	367.9	55,189
991.40	72.4	10,864	996.50	376.1	56,420
991.50	76.1	11,419	996.60	384.4	57,664
991.60	79.9	11,988	996.70	392.8	58,922
991.70	83.8	12,571	996.80	401.3	60,193
991.80	87.8	13,168	996.90	409.8	61,477
991.90	91.9	13,778	997.00	418.5	62,775
992.00	96.0	14,401			
992.10	100.3	15,038			
992.20	104.6	15,688			
992.30	109.0	16,352			
992.40	113.5	17,029			
992.50	118.1	17,719			
992.60	122.8	18,424			
992.70	127.6	19,142			
992.80	132.5	19,873			
992.90	137.5	20,618			
993.00	142.5	21,376			

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Summary for Pond 33P: Basin 2 - CB_WoodlandCove

Inflow Area = 1.775 ac, 9.86% Impervious, Inflow Depth > 1.08" for 2-Year event
 Inflow = 2.27 cfs @ 12.25 hrs, Volume= 0.160 af
 Outflow = 2.25 cfs @ 12.27 hrs, Volume= 0.149 af, Atten= 1%, Lag= 1.2 min
 Primary = 2.25 cfs @ 12.27 hrs, Volume= 0.149 af
 Routed to Reach 44R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 47P : Wet1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 1,004.11' @ 12.27 hrs Surf.Area= 1,066 sf Storage= 655 cf

Plug-Flow detention time= 43.5 min calculated for 0.149 af (93% of inflow)
 Center-of-Mass det. time= 10.9 min (830.2 - 819.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,003.00'	12,577 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,003.00	303	0	0
1,004.00	800	552	552
1,005.00	3,200	2,000	2,552
1,007.00	3,400	6,600	9,152
1,008.00	3,450	3,425	12,577

Device	Routing	Invert	Outlet Devices
#1	Primary	998.45'	12.0" Round Culvert L= 85.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.45' / 998.06' S= 0.0046 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	998.62'	12.0" Round Culvert L= 13.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.62' / 998.55' S= 0.0052 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	1,003.90'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	1,005.90'	20.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#5	Device 2	1,003.00'	0.01 cfs Filtration at all elevations Phase-In= 0.01'

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Primary OutFlow Max=2.24 cfs @ 12.27 hrs HW=1,004.11' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 2.24 cfs of 7.20 cfs potential flow)

2=Culvert (Passes 2.24 cfs of 10.56 cfs potential flow)

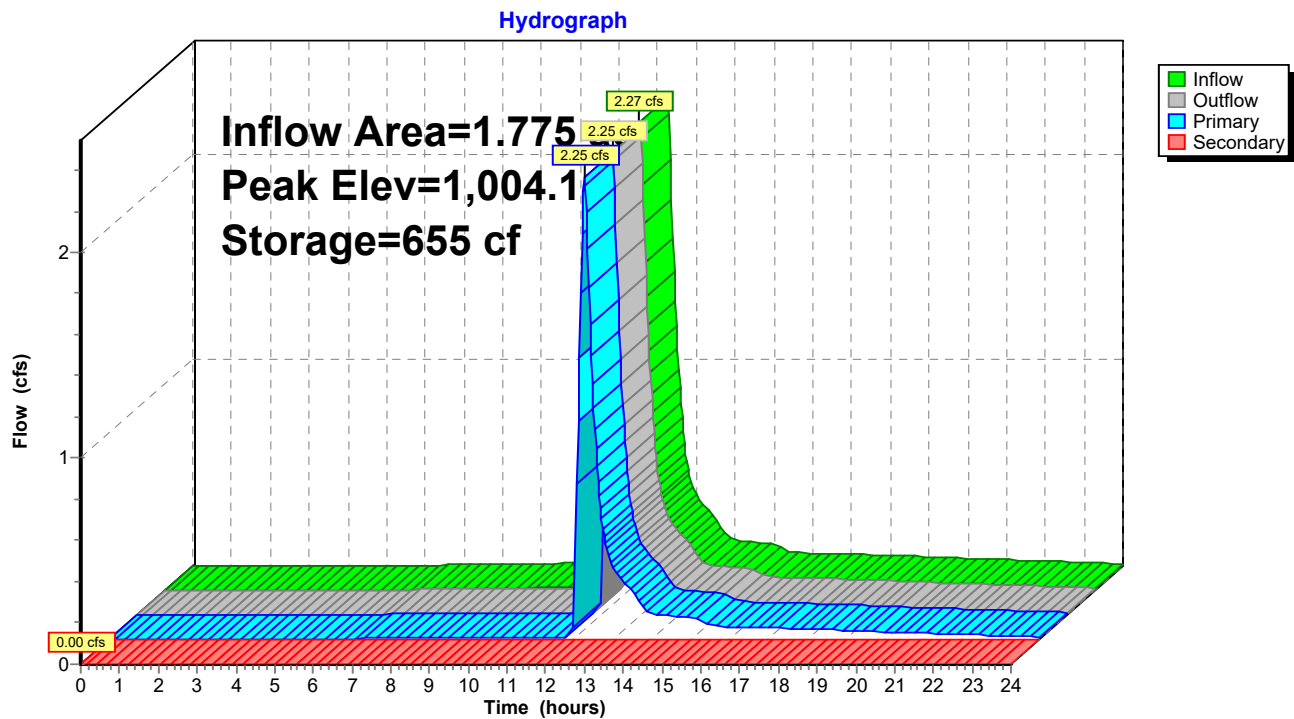
3=Orifice/Grate (Weir Controls 2.23 cfs @ 1.50 fps)

5=Filtration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,003.00' TW=988.00' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 33P: Basin 2 - CB_WoodlandCove



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Stage-Area-Storage for Pond 33P: Basin 2 - CB_WoodlandCove

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,003.00	303	0	1,005.55	3,255	4,327
1,003.05	328	16	1,005.60	3,260	4,490
1,003.10	353	33	1,005.65	3,265	4,653
1,003.15	378	51	1,005.70	3,270	4,816
1,003.20	402	71	1,005.75	3,275	4,980
1,003.25	427	91	1,005.80	3,280	5,143
1,003.30	452	113	1,005.85	3,285	5,308
1,003.35	477	136	1,005.90	3,290	5,472
1,003.40	502	161	1,005.95	3,295	5,637
1,003.45	527	187	1,006.00	3,300	5,802
1,003.50	552	214	1,006.05	3,305	5,967
1,003.55	576	242	1,006.10	3,310	6,132
1,003.60	601	271	1,006.15	3,315	6,298
1,003.65	626	302	1,006.20	3,320	6,464
1,003.70	651	334	1,006.25	3,325	6,630
1,003.75	676	367	1,006.30	3,330	6,796
1,003.80	701	401	1,006.35	3,335	6,963
1,003.85	725	437	1,006.40	3,340	7,129
1,003.90	750	474	1,006.45	3,345	7,297
1,003.95	775	512	1,006.50	3,350	7,464
1,004.00	800	552	1,006.55	3,355	7,632
1,004.05	920	594	1,006.60	3,360	7,800
1,004.10	1,040	644	1,006.65	3,365	7,968
1,004.15	1,160	698	1,006.70	3,370	8,136
1,004.20	1,280	760	1,006.75	3,375	8,305
1,004.25	1,400	827	1,006.80	3,380	8,473
1,004.30	1,520	899	1,006.85	3,385	8,643
1,004.35	1,640	979	1,006.90	3,390	8,812
1,004.40	1,760	1,063	1,006.95	3,395	8,982
1,004.45	1,880	1,155	1,007.00	3,400	9,152
1,004.50	2,000	1,252	1,007.05	3,402	9,322
1,004.55	2,120	1,354	1,007.10	3,405	9,492
1,004.60	2,240	1,464	1,007.15	3,407	9,662
1,004.65	2,360	1,578	1,007.20	3,410	9,833
1,004.70	2,480	1,700	1,007.25	3,413	10,003
1,004.75	2,600	1,827	1,007.30	3,415	10,174
1,004.80	2,720	1,959	1,007.35	3,418	10,345
1,004.85	2,840	2,099	1,007.40	3,420	10,515
1,004.90	2,960	2,243	1,007.45	3,423	10,687
1,004.95	3,080	2,395	1,007.50	3,425	10,858
1,005.00	3,200	2,552	1,007.55	3,427	11,029
1,005.05	3,205	2,712	1,007.60	3,430	11,201
1,005.10	3,210	2,872	1,007.65	3,432	11,372
1,005.15	3,215	3,033	1,007.70	3,435	11,544
1,005.20	3,220	3,194	1,007.75	3,438	11,716
1,005.25	3,225	3,355	1,007.80	3,440	11,887
1,005.30	3,230	3,516	1,007.85	3,443	12,060
1,005.35	3,235	3,678	1,007.90	3,445	12,232
1,005.40	3,240	3,839	1,007.95	3,448	12,404
1,005.45	3,245	4,002	1,008.00	3,450	12,577
1,005.50	3,250	4,164			

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Summary for Pond 35P: CB West

Inflow Area = 0.178 ac, 24.72% Impervious, Inflow Depth > 1.50" for 2-Year event
 Inflow = 0.37 cfs @ 12.19 hrs, Volume= 0.022 af
 Outflow = 0.37 cfs @ 12.20 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.2 min
 Primary = 0.37 cfs @ 12.20 hrs, Volume= 0.022 af
 Routed to Pond 48P : Pond1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,007.56' @ 12.20 hrs Surf.Area= 75 sf Storage= 4 cf

Plug-Flow detention time= 0.3 min calculated for 0.022 af (100% of inflow)

Center-of-Mass det. time= 0.3 min (795.7 - 795.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,007.50'	850 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

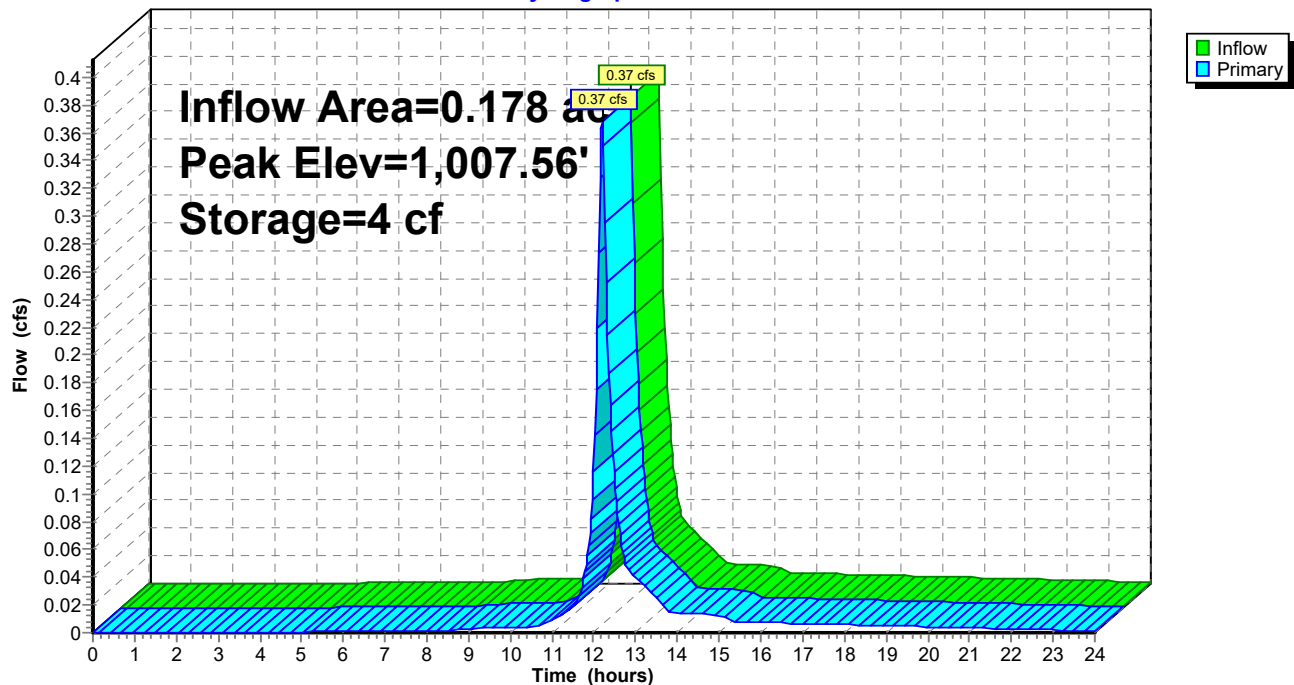
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,007.50	50	0	0
1,008.00	250	75	75
1,009.00	1,300	775	850

Device	Routing	Invert	Outlet Devices
#1	Primary	1,007.50'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.36 cfs @ 12.20 hrs HW=1,007.56' TW=1,002.87' (Dynamic Tailwater)↑ **1=Orifice/Grate** (Weir Controls 0.36 cfs @ 0.82 fps)

Pond 35P: CB West

Hydrograph



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Stage-Area-Storage for Pond 35P: CB West

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,007.50	50	0	1,008.52	796	347
1,007.52	58	1	1,008.54	817	363
1,007.54	66	2	1,008.56	838	380
1,007.56	74	4	1,008.58	859	397
1,007.58	82	5	1,008.60	880	414
1,007.60	90	7	1,008.62	901	432
1,007.62	98	9	1,008.64	922	450
1,007.64	106	11	1,008.66	943	469
1,007.66	114	13	1,008.68	964	488
1,007.68	122	15	1,008.70	985	507
1,007.70	130	18	1,008.72	1,006	527
1,007.72	138	21	1,008.74	1,027	547
1,007.74	146	24	1,008.76	1,048	568
1,007.76	154	27	1,008.78	1,069	589
1,007.78	162	30	1,008.80	1,090	611
1,007.80	170	33	1,008.82	1,111	633
1,007.82	178	36	1,008.84	1,132	655
1,007.84	186	40	1,008.86	1,153	678
1,007.86	194	44	1,008.88	1,174	702
1,007.88	202	48	1,008.90	1,195	725
1,007.90	210	52	1,008.92	1,216	749
1,007.92	218	56	1,008.94	1,237	774
1,007.94	226	61	1,008.96	1,258	799
1,007.96	234	65	1,008.98	1,279	824
1,007.98	242	70	1,009.00	1,300	850
1,008.00	250	75			
1,008.02	271	80			
1,008.04	292	86			
1,008.06	313	92			
1,008.08	334	98			
1,008.10	355	105			
1,008.12	376	113			
1,008.14	397	120			
1,008.16	418	128			
1,008.18	439	137			
1,008.20	460	146			
1,008.22	481	155			
1,008.24	502	165			
1,008.26	523	175			
1,008.28	544	186			
1,008.30	565	197			
1,008.32	586	209			
1,008.34	607	221			
1,008.36	628	233			
1,008.38	649	246			
1,008.40	670	259			
1,008.42	691	273			
1,008.44	712	287			
1,008.46	733	301			
1,008.48	754	316			
1,008.50	775	331			

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Summary for Pond 46P: Wet2

Inflow Area = 6.744 ac, 4.21% Impervious, Inflow Depth > 0.71" for 2-Year event
 Inflow = 4.38 cfs @ 12.36 hrs, Volume= 0.402 af
 Outflow = 3.12 cfs @ 12.56 hrs, Volume= 0.394 af, Atten= 29%, Lag= 11.5 min
 Primary = 3.12 cfs @ 12.56 hrs, Volume= 0.394 af
 Routed to Pond 47P : Wet1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 47P : Wet1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 991.00' Surf.Area= 2,915 sf Storage= 1,508 cf

Peak Elev= 991.81' @ 12.56 hrs Surf.Area= 5,188 sf Storage= 4,779 cf (3,272 cf above start)

Plug-Flow detention time= 86.1 min calculated for 0.359 af (90% of inflow)

Center-of-Mass det. time= 25.6 min (871.2 - 845.6)

Volume	Invert	Avail.Storage	Storage Description
#1	990.00'	221,260 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
990.00	100	0	0
992.00	5,730	5,830	5,830
994.00	20,000	25,730	31,560
996.00	47,200	67,200	98,760
998.00	75,300	122,500	221,260

Device	Routing	Invert	Outlet Devices
#1	Primary	991.00'	24.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 991.00' / 990.00' S= 0.0192 '/' Cc= 0.900 n= 0.024, Flow Area= 3.14 sf
#2	Secondary	997.00'	25.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=3.12 cfs @ 12.56 hrs HW=991.81' TW=988.67' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 3.12 cfs @ 3.88 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=991.00' TW=988.00' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

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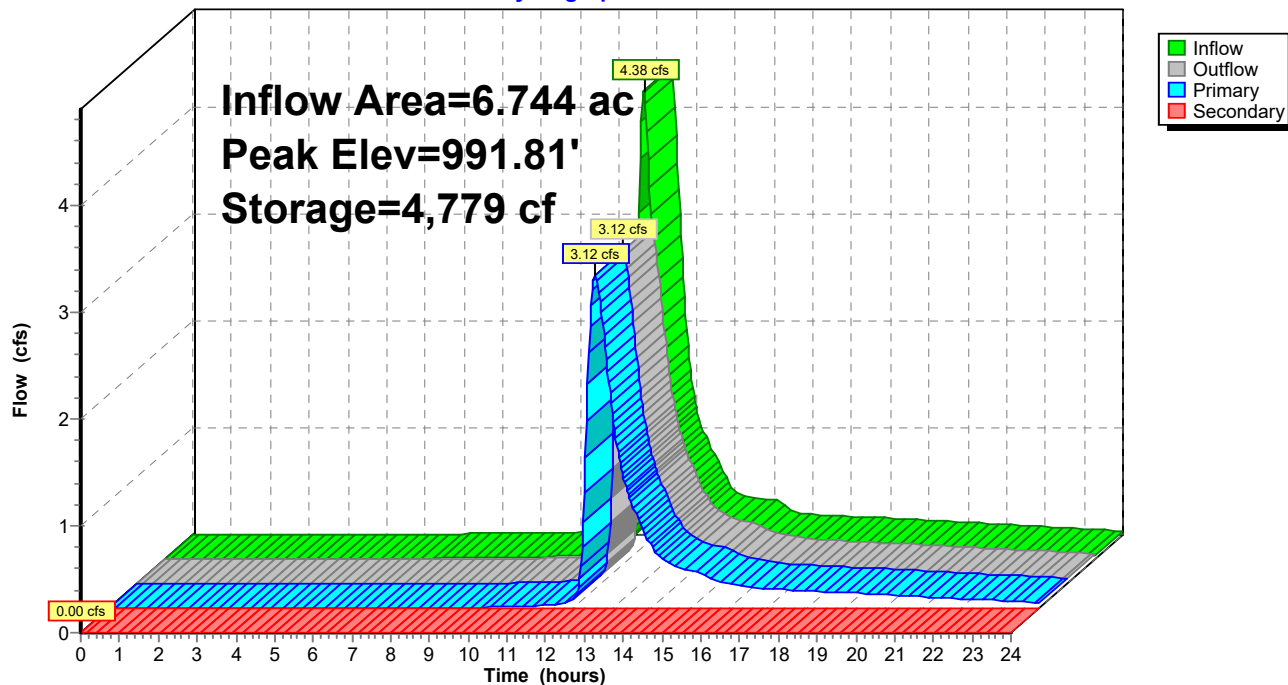
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Pond 46P: Wet2

Hydrograph



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Stage-Area-Storage for Pond 46P: Wet2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
990.00	100	0	995.10	34,960	61,788
990.10	382	24	995.20	36,320	65,352
990.20	663	76	995.30	37,680	69,052
990.30	944	157	995.40	39,040	72,888
990.40	1,226	265	995.50	40,400	76,860
990.50	1,508	402	995.60	41,760	80,968
990.60	1,789	567	995.70	43,120	85,212
990.70	2,071	760	995.80	44,480	89,592
990.80	2,352	981	995.90	45,840	94,108
990.90	2,633	1,230	996.00	47,200	98,760
991.00	2,915	1,508	996.10	48,605	103,550
991.10	3,197	1,813	996.20	50,010	108,481
991.20	3,478	2,147	996.30	51,415	113,552
991.30	3,759	2,509	996.40	52,820	118,764
991.40	4,041	2,899	996.50	54,225	124,116
991.50	4,323	3,317	996.60	55,630	129,609
991.60	4,604	3,763	996.70	57,035	135,242
991.70	4,886	4,238	996.80	58,440	141,016
991.80	5,167	4,740	996.90	59,845	146,930
991.90	5,448	5,271	997.00	61,250	152,985
992.00	5,730	5,830	997.10	62,655	159,180
992.10	6,444	6,439	997.20	64,060	165,516
992.20	7,157	7,119	997.30	65,465	171,992
992.30	7,870	7,870	997.40	66,870	178,609
992.40	8,584	8,693	997.50	68,275	185,366
992.50	9,298	9,587	997.60	69,680	192,264
992.60	10,011	10,552	997.70	71,085	199,302
992.70	10,725	11,589	997.80	72,490	206,481
992.80	11,438	12,697	997.90	73,895	213,800
992.90	12,151	13,877	998.00	75,300	221,260
993.00	12,865	15,128			
993.10	13,579	16,450			
993.20	14,292	17,843			
993.30	15,005	19,308			
993.40	15,719	20,844			
993.50	16,433	22,452			
993.60	17,146	24,131			
993.70	17,860	25,881			
993.80	18,573	27,703			
993.90	19,286	29,596			
994.00	20,000	31,560			
994.10	21,360	33,628			
994.20	22,720	35,832			
994.30	24,080	38,172			
994.40	25,440	40,648			
994.50	26,800	43,260			
994.60	28,160	46,008			
994.70	29,520	48,892			
994.80	30,880	51,912			
994.90	32,240	55,068			
995.00	33,600	58,360			

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MSE 24-hr 3 2-Year Rainfall=2.85"

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Summary for Pond 47P: Wet1

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 0.97" for 2-Year event
 Inflow = 20.10 cfs @ 12.39 hrs, Volume= 1.996 af
 Outflow = 17.06 cfs @ 12.53 hrs, Volume= 1.994 af, Atten= 15%, Lag= 8.2 min
 Primary = 17.06 cfs @ 12.53 hrs, Volume= 1.994 af
 Routed to Reach 45R : Wet2_out

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 988.67' @ 12.53 hrs Surf.Area= 0.591 ac Storage= 0.206 af

Plug-Flow detention time= 8.3 min calculated for 1.994 af (100% of inflow)
 Center-of-Mass det. time= 7.7 min (841.3 - 833.6)

Volume	Invert	Avail.Storage	Storage Description
#1	988.00'	23.952 af	Custom Stage Data (Prismatic) Listed below (Recalc)

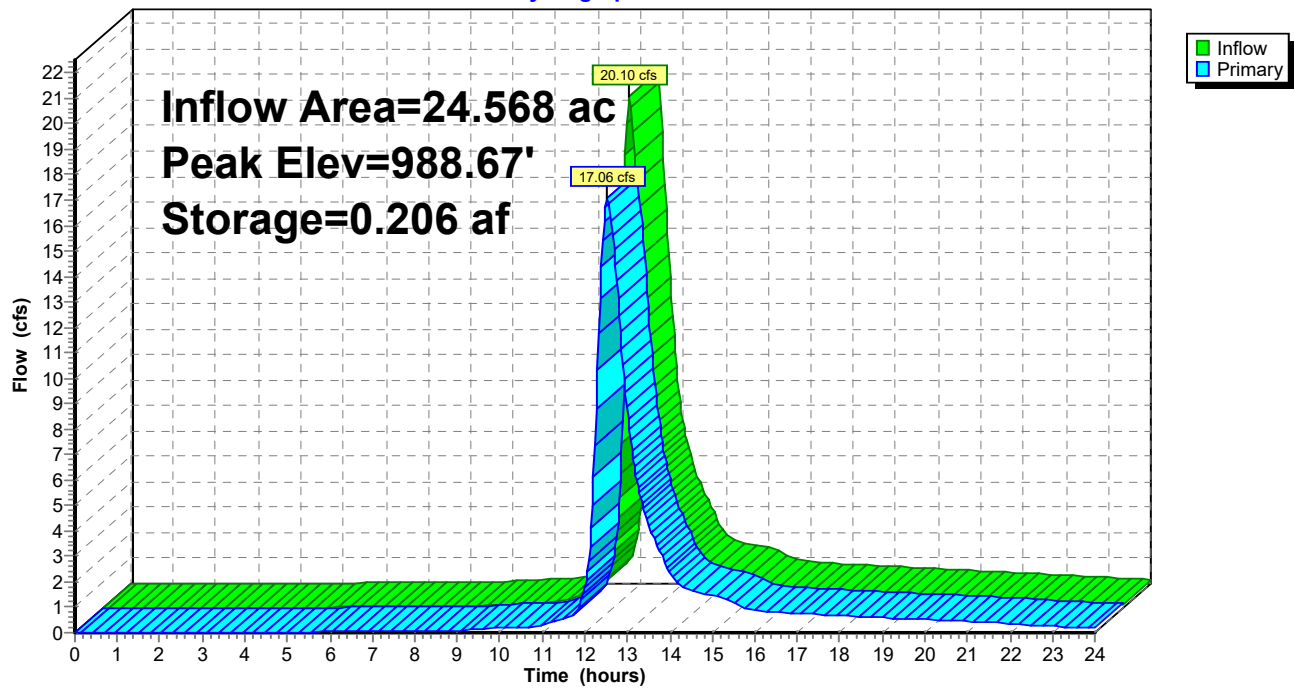
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
988.00	0.020	0.000	0.000
989.50	1.290	0.983	0.983
990.00	3.430	1.180	2.162
992.00	5.580	9.010	11.172
994.00	7.200	12.780	23.952

Device	Routing	Invert	Outlet Devices
#1	Primary	988.00'	Channel/Reach using Reach 45R: Wet2_out

Primary OutFlow Max=17.04 cfs @ 12.53 hrs HW=988.67' TW=988.67' (Dynamic Tailwater)
 ↑1=Channel/Reach (Channel Controls 17.04 cfs @ 2.80 fps)

Pond 47P: Wet1

Hydrograph



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Stage-Area-Storage for Pond 47P: Wet1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
988.00	0.020	0.000	993.10	6.471	17.801
988.10	0.105	0.006	993.20	6.552	18.452
988.20	0.189	0.021	993.30	6.633	19.111
988.30	0.274	0.044	993.40	6.714	19.778
988.40	0.359	0.076	993.50	6.795	20.454
988.50	0.443	0.116	993.60	6.876	21.137
988.60	0.528	0.164	993.70	6.957	21.829
988.70	0.613	0.221	993.80	7.038	22.529
988.80	0.697	0.287	993.90	7.119	23.237
988.90	0.782	0.361	994.00	7.200	23.952
989.00	0.867	0.443	994.10	7.200	23.952
989.10	0.951	0.534	994.20	7.200	23.952
989.20	1.036	0.634	994.30	7.200	23.952
989.30	1.121	0.741	994.40	7.200	23.952
989.40	1.205	0.858	994.50	7.200	23.952
989.50	1.290	0.983	994.60	7.200	23.952
989.60	1.718	1.133	994.70	7.200	23.952
989.70	2.146	1.326	994.80	7.200	23.952
989.80	2.574	1.562	994.90	7.200	23.952
989.90	3.002	1.841	995.00	7.200	23.952
990.00	3.430	2.162	995.10	7.200	23.952
990.10	3.538	2.511	995.20	7.200	23.952
990.20	3.645	2.870	995.30	7.200	23.952
990.30	3.752	3.240	995.40	7.200	23.952
990.40	3.860	3.620	995.50	7.200	23.952
990.50	3.967	4.012	995.60	7.200	23.952
990.60	4.075	4.414	995.70	7.200	23.952
990.70	4.183	4.827	995.80	7.200	23.952
990.80	4.290	5.250	995.90	7.200	23.952
990.90	4.397	5.685	996.00	7.200	23.952
991.00	4.505	6.130	996.10	7.200	23.952
991.10	4.613	6.586	996.20	7.200	23.952
991.20	4.720	7.053	996.30	7.200	23.952
991.30	4.827	7.530	996.40	7.200	23.952
991.40	4.935	8.018	996.50	7.200	23.952
991.50	5.042	8.517	996.60	7.200	23.952
991.60	5.150	9.027	996.70	7.200	23.952
991.70	5.258	9.547	996.80	7.200	23.952
991.80	5.365	10.078	996.90	7.200	23.952
991.90	5.472	10.620	997.00	7.200	23.952
992.00	5.580	11.172			
992.10	5.661	11.735			
992.20	5.742	12.305			
992.30	5.823	12.883			
992.40	5.904	13.469			
992.50	5.985	14.064			
992.60	6.066	14.666			
992.70	6.147	15.277			
992.80	6.228	15.896			
992.90	6.309	16.523			
993.00	6.390	17.157			

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MSE 24-hr 3 2-Year Rainfall=2.85"

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Summary for Pond 48P: Pond1

Inflow Area = 1.947 ac, 50.95% Impervious, Inflow Depth > 1.86" for 2-Year event
 Inflow = 5.80 cfs @ 12.13 hrs, Volume= 0.301 af
 Outflow = 0.54 cfs @ 12.76 hrs, Volume= 0.121 af, Atten= 91%, Lag= 37.4 min
 Primary = 0.54 cfs @ 12.76 hrs, Volume= 0.121 af
 Routed to Reach 44R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 44R : Woodland Cove Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 1,002.00' Surf.Area= 4,596 sf Storage= 10,824 cf

Peak Elev= 1,003.11' @ 12.76 hrs Surf.Area= 8,813 sf Storage= 19,503 cf (8,679 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 150.9 min (924.0 - 773.0)

Volume	Invert	Avail.Storage	Storage Description
#1	998.00'	92,791 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 1.2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
998.00	810	0	0
1,000.00	2,190	3,000	3,000
1,002.00	3,830	6,020	9,020
1,002.10	6,000	492	9,512
1,003.00	7,220	5,949	15,460
1,004.00	8,360	7,790	23,250
1,005.00	9,930	9,145	32,395
1,007.00	11,000	20,930	53,325
1,008.00	12,000	11,500	64,825
1,009.00	13,000	12,500	77,325

Device	Routing	Invert	Outlet Devices
#1	Primary	999.50'	18.0" Round Culvert L= 149.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 999.50' / 999.10' S= 0.0027 ' S= 0.0027 ' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,004.50'	48.0" Horiz. grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,003.00'	Custom Weir/Orifice, Cv= 3.00 (C= 3.75) Head (feet) 0.00 0.50 0.51 4.00 Width (feet) 4.00 4.00 4.00 4.00
#4	Device 3	1,000.00'	15.0" Round lowflow L= 81.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 1,000.00' / 1,000.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Device 1	1,002.00'	0.04 cfs Filtration X 0.00 when above 1,002.00' Phase-In= 0.01'
#6	Secondary	1,008.00'	10.0' long + 4.0 ' SideZ x 3.0' breadth EOF Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50

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Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.54 cfs @ 12.76 hrs HW=1,003.11' TW=0.00' (Dynamic Tailwater)

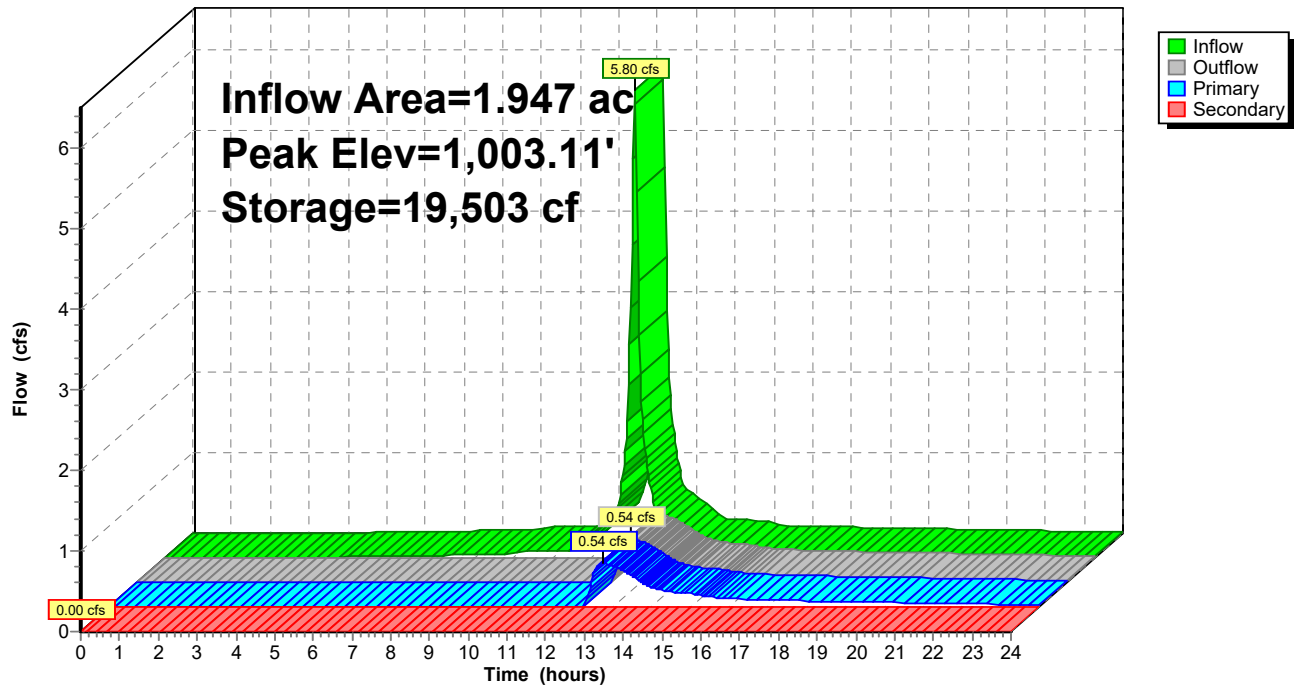
- 1=Culvert (Passes 0.54 cfs of 11.32 cfs potential flow)
- 2=grate (Controls 0.00 cfs)
- 3=Custom Weir/Orifice (Weir Controls 0.54 cfs @ 1.24 fps)
- 4=lowflow (Passes 0.54 cfs of 1.76 cfs potential flow)
- 5=Filtration (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,002.00' TW=0.00' (Dynamic Tailwater)

- 6=EOF (Controls 0.00 cfs)

Pond 48P: Pond1

Hydrograph



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Stage-Area-Storage for Pond 48P: Pond1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
998.00	972	0	1,008.20	14,640	80,695
998.20	1,138	211	1,008.40	14,880	83,647
998.40	1,303	455	1,008.60	15,120	86,647
998.60	1,469	732	1,008.80	15,360	89,695
998.80	1,634	1,043	1,009.00	15,600	92,791
999.00	1,800	1,386			
999.20	1,966	1,763			
999.40	2,131	2,172			
999.60	2,297	2,615			
999.80	2,462	3,091			
1,000.00	2,628	3,600			
1,000.20	2,825	4,145			
1,000.40	3,022	4,730			
1,000.60	3,218	5,354			
1,000.80	3,415	6,017			
1,001.00	3,612	6,720			
1,001.20	3,809	7,462			
1,001.40	4,006	8,244			
1,001.60	4,202	9,064			
1,001.80	4,399	9,924			
1,002.00	4,596	10,824			
1,002.20	7,363	12,142			
1,002.40	7,688	13,647			
1,002.60	8,013	15,217			
1,002.80	8,339	16,852			
1,003.00	8,664	18,553			
1,003.20	8,938	20,313			
1,003.40	9,211	22,128			
1,003.60	9,485	23,997			
1,003.80	9,758	25,922			
1,004.00	10,032	27,901			
1,004.20	10,409	29,945			
1,004.40	10,786	32,064			
1,004.60	11,162	34,259			
1,004.80	11,539	36,529			
1,005.00	11,916	38,875			
1,005.20	12,044	41,271			
1,005.40	12,173	43,692			
1,005.60	12,301	46,140			
1,005.80	12,430	48,613			
1,006.00	12,558	51,112			
1,006.20	12,686	53,636			
1,006.40	12,815	56,186			
1,006.60	12,943	58,762			
1,006.80	13,072	61,363			
1,007.00	13,200	63,991			
1,007.20	13,440	66,655			
1,007.40	13,680	69,367			
1,007.60	13,920	72,127			
1,007.80	14,160	74,935			
1,008.00	14,400	77,791			

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Summary for Pond 56P: Woodland Cove Pond 2 AIRRIG/SED

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

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 997.35' Surf.Area= 68,822 sf Storage= 260,413 cf

Peak Elev= 997.35' @ 0.00 hrs Surf.Area= 68,822 sf Storage= 260,413 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no inflow)

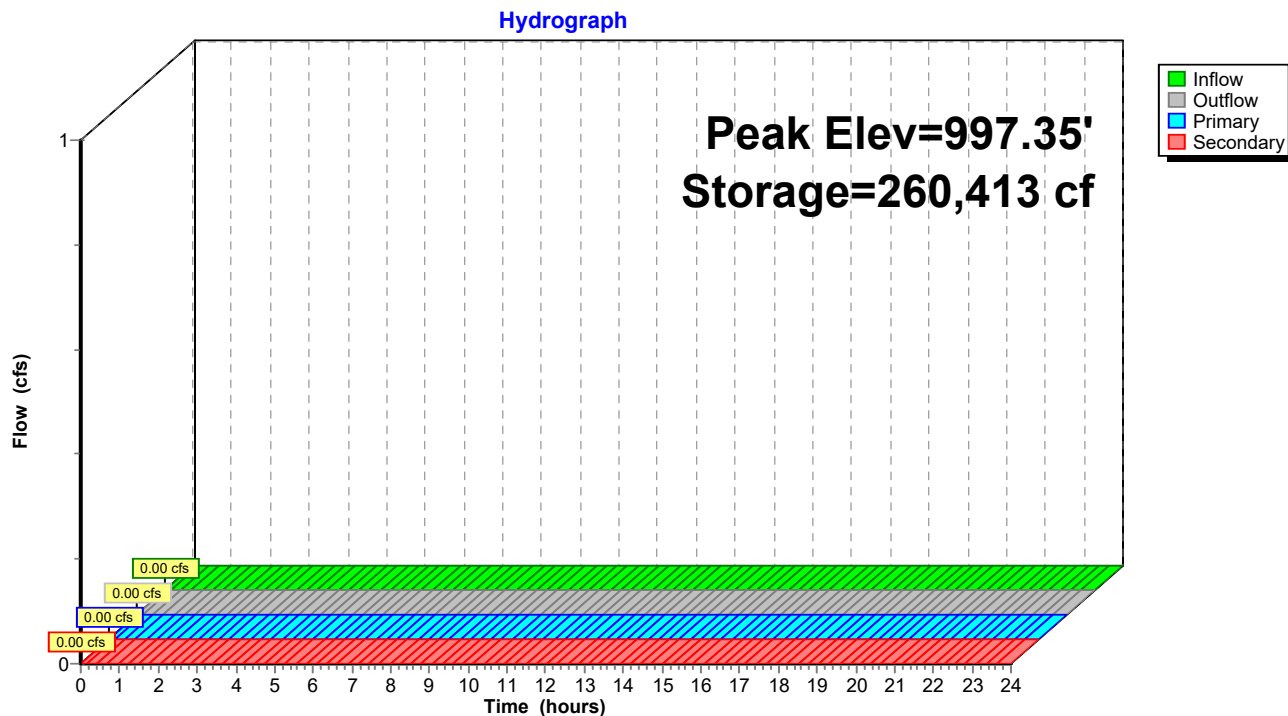
Volume	Invert	Avail.Storage	Storage Description
#1	998.00'	977,118 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
988.00	1,246	0	0
990.00	4,714	5,960	5,960
992.00	15,160	19,874	25,834
994.00	35,780	50,940	76,774
996.00	60,540	96,320	173,094
997.35	68,822	87,319	260,413
998.00	77,800	47,652	308,065
998.01	90,500	841	308,907
1,000.00	125,240	214,661	523,568
1,002.00	160,640	285,880	809,448
1,003.00	174,700	167,670	977,118

Device	Routing	Invert	Outlet Devices
#1	Primary	998.00'	12.0" Round Culvert L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 994.00' / 998.00' S= -0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	998.00'	0.500 cfs Constant Flow/Skimmer Phase-In= 0.01'

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=997.35' (Free Discharge)↑ **1=Culvert** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=997.35' (Free Discharge)↑ **2=Constant Flow/Skimmer** (Constant Controls 0.00 cfs)

Pond 56P: Woodland Cove Pond 2 AIRRIG/SED



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Stage-Area-Storage for Pond 56P: Woodland Cove Pond 2 AIRRIG/SED

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
988.00	1,246	0	998.20	93,817	326,417
988.20	1,593	284	998.40	97,308	345,530
988.40	1,940	637	998.60	100,800	365,340
988.60	2,286	1,060	998.80	104,291	385,850
988.80	2,633	1,552	999.00	107,783	407,057
989.00	2,980	2,113	999.20	111,274	428,963
989.20	3,327	2,744	999.40	114,766	451,567
989.40	3,674	3,444	999.60	118,257	474,869
989.60	4,020	4,213	999.80	121,749	498,869
989.80	4,367	5,052	1,000.00	125,240	523,568
990.00	4,714	5,960	1,000.20	128,780	548,970
990.20	5,759	7,007	1,000.40	132,320	575,080
990.40	6,803	8,263	1,000.60	135,860	601,898
990.60	7,848	9,729	1,000.80	139,400	629,424
990.80	8,892	11,403	1,001.00	142,940	657,658
991.00	9,937	13,286	1,001.20	146,480	686,600
991.20	10,982	15,377	1,001.40	150,020	716,250
991.40	12,026	17,678	1,001.60	153,560	746,608
991.60	13,071	20,188	1,001.80	157,100	777,674
991.80	14,115	22,906	1,002.00	160,640	809,448
992.00	15,160	25,834	1,002.20	163,452	841,858
992.20	17,222	29,072	1,002.40	166,264	874,829
992.40	19,284	32,723	1,002.60	169,076	908,363
992.60	21,346	36,786	1,002.80	171,888	942,459
992.80	23,408	41,261	1,003.00	174,700	977,118
993.00	25,470	46,149			
993.20	27,532	51,449			
993.40	29,594	57,162			
993.60	31,656	63,287			
993.80	33,718	69,824			
994.00	35,780	76,774			
994.20	38,256	84,178			
994.40	40,732	92,076			
994.60	43,208	100,470			
994.80	45,684	109,360			
995.00	48,160	118,744			
995.20	50,636	128,624			
995.40	53,112	138,998			
995.60	55,588	149,868			
995.80	58,064	161,234			
996.00	60,540	173,094			
996.20	61,767	185,325			
996.40	62,994	197,801			
996.60	64,221	210,522			
996.80	65,448	223,489			
997.00	66,675	236,701			
997.20	67,902	250,159			
997.40	69,513	263,872			
997.60	72,275	278,050			
997.80	75,038	292,782			
998.00	77,800	308,065			

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Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment35S: PR6 Runoff Area=0.483 ac 47.83% Impervious Runoff Depth>2.85"
Tc=6.0 min CN=75/98 Runoff=2.27 cfs 0.115 af

Subcatchment37S: PR2 Runoff Area=17.824 ac 12.34% Impervious Runoff Depth>2.09"
Flow Length=600' Tc=24.7 min CN=75/98 Runoff=35.85 cfs 3.100 af

Subcatchment38S: PR7 Runoff Area=6.744 ac 4.21% Impervious Runoff Depth>1.57"
Flow Length=720' Tc=22.6 min CN=70/98 Runoff=10.69 cfs 0.885 af

Subcatchment39S: PR8 Runoff Area=0.507 ac 22.09% Impervious Runoff Depth>2.36"
Flow Length=100' Slope=0.0200 '/' Tc=15.1 min CN=76/98 Runoff=1.46 cfs 0.100 af

Subcatchment41S: PR1 Runoff Area=1.286 ac 55.75% Impervious Runoff Depth>3.20"
Tc=6.0 min CN=80/98 Runoff=6.74 cfs 0.342 af

Subcatchment50S: PR3 Runoff Area=1.325 ac 8.15% Impervious Runoff Depth>2.14"
Flow Length=200' Tc=15.9 min CN=77/98 Runoff=3.48 cfs 0.236 af

Subcatchment52S: PR4 Runoff Area=0.178 ac 24.72% Impervious Runoff Depth>2.65"
Flow Length=50' Slope=0.0100 '/' Tc=11.5 min CN=80/98 Runoff=0.65 cfs 0.039 af

Subcatchment53S: PR5 Runoff Area=1.268 ac 4.97% Impervious Runoff Depth>2.00"
Flow Length=200' Tc=16.2 min CN=76/98 Runoff=3.11 cfs 0.212 af

Reach 44R: Woodland Cove Pond Inflow=11.27 cfs 0.852 af
Outflow=11.27 cfs 0.852 af

Reach 45R: Wet2_out Avg. Flow Depth=1.00' Max Vel=3.47 fps Inflow=36.26 cfs 3.972 af
n=0.035 L=150.0' S=0.0110 '/' Capacity=5,231.48 cfs Outflow=36.25 cfs 3.970 af

Pond 33P: Basin 2 - CB_WoodlandCove Peak Elev=1,004.24' Storage=808 cf Inflow=4.57 cfs 0.311 af
Primary=4.52 cfs 0.300 af Secondary=0.00 cfs 0.000 af Outflow=4.52 cfs 0.300 af

Pond 35P: CB West Peak Elev=1,007.59' Storage=6 cf Inflow=0.65 cfs 0.039 af
Outflow=0.65 cfs 0.039 af

Pond 46P: Wet2 Peak Elev=992.36' Storage=8,384 cf Inflow=10.69 cfs 0.885 af
Primary=7.84 cfs 0.875 af Secondary=0.00 cfs 0.000 af Outflow=7.84 cfs 0.875 af

Pond 47P: Wet1 Peak Elev=989.00' Storage=0.440 af Inflow=42.55 cfs 3.975 af
Outflow=36.26 cfs 3.972 af

Pond 48P: Pond1 Peak Elev=1,003.39' Storage=21,992 cf Inflow=9.54 cfs 0.497 af
Primary=3.31 cfs 0.316 af Secondary=0.00 cfs 0.000 af Outflow=3.31 cfs 0.316 af

Pond 56P: Woodland Cove Pond 2 Peak Elev=997.35' Storage=260,413 cf Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

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Total Runoff Area = 29.615 ac Runoff Volume = 5.029 af Average Runoff Depth = 2.04"
87.31% Pervious = 25.857 ac 12.69% Impervious = 3.758 ac

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Summary for Subcatchment 35S: PR6

Runoff = 2.27 cfs @ 12.13 hrs, Volume= 0.115 af, Depth> 2.85"
Routed to Pond 48P : Pond1

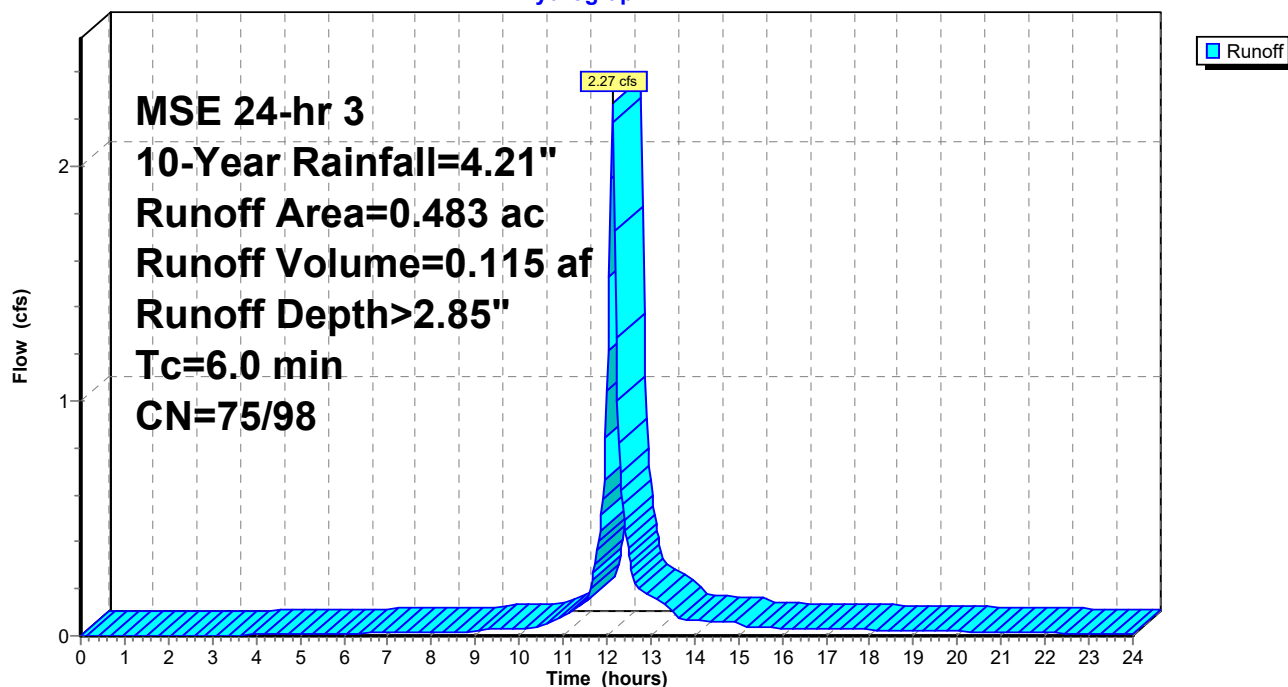
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.230	74	>75% Grass cover, Good, HSG C
0.022	80	>75% Grass cover, Good, HSG D
* 0.197	98	impervious - new
* 0.034	98	impervious - old
0.000	70	Woods, Good, HSG C
0.000	77	Woods, Good, HSG D
* 0.000	98	pond
0.483	86	Weighted Average
0.252	75	52.17% Pervious Area
0.231	98	47.83% Impervious Area

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

Subcatchment 35S: PR6

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Summary for Subcatchment 37S: PR2

Runoff = 35.85 cfs @ 12.36 hrs, Volume= 3.100 af, Depth> 2.09"
 Routed to Pond 47P : Wet1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.039	74	>75% Grass cover, Good, HSG C
0.621	80	>75% Grass cover, Good, HSG D
* 0.440	98	impervious - old
* 0.000	74	imp_tempC
* 0.000	80	imp_tempD
* 1.759	98	wetland
4.786	70	Woods, Good, HSG C
8.227	77	Woods, Good, HSG D
0.317	77	Woods, Good, HSG D
0.873	74	>75% Grass cover, Good, HSG C
0.762	80	>75% Grass cover, Good, HSG D
17.824	78	Weighted Average
15.625	75	87.66% Pervious Area
2.199	98	12.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
8.9	500	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.7	600	Total			

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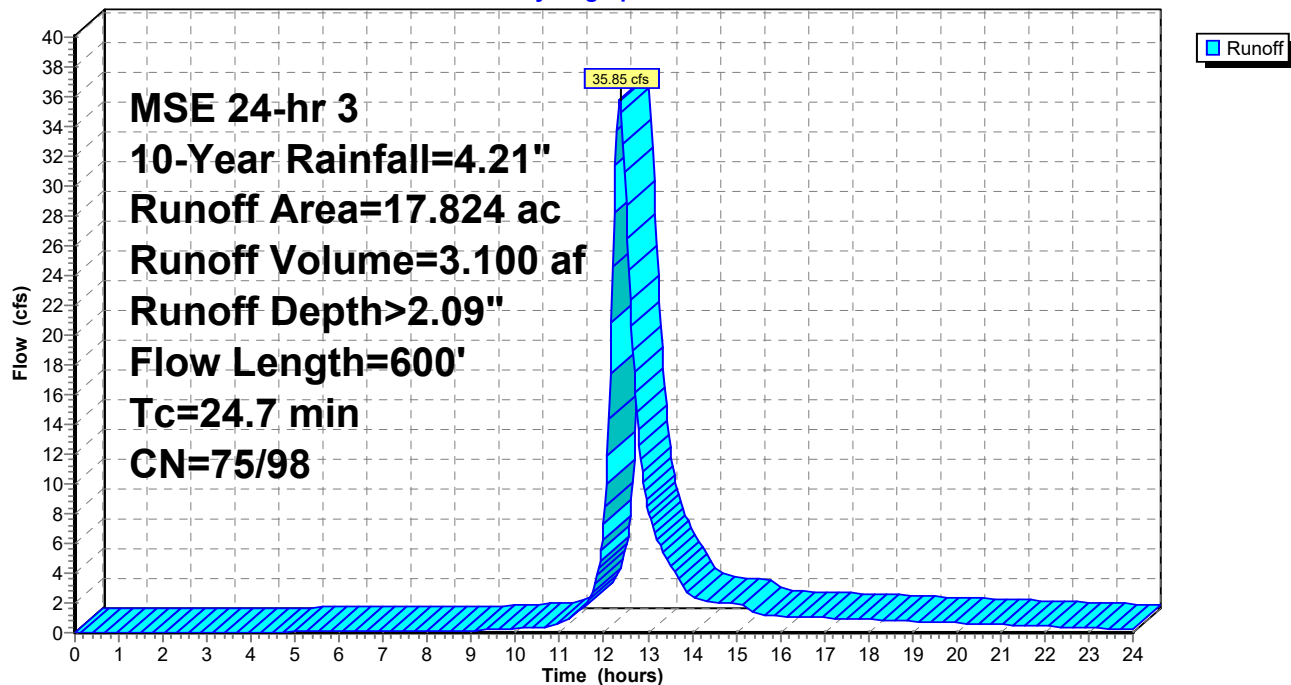
MSE 24-hr 3 10-Year Rainfall=4.21"

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Subcatchment 37S: PR2

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Summary for Subcatchment 38S: PR7

Runoff = 10.69 cfs @ 12.34 hrs, Volume= 0.885 af, Depth> 1.57"
 Routed to Pond 46P : Wet2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.001	74	>75% Grass cover, Good, HSG C
* 0.143	98	impervious - old
* 0.141	98	wetland
6.444	70	Woods, Good, HSG C
0.015	77	Woods, Good, HSG D
6.744	71	Weighted Average
6.460	70	95.79% Pervious Area
0.284	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
7.6	500	0.0480	1.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	120	0.0500	6.94	69.40	Channel Flow, Area= 10.0 sf Perim= 16.0' r= 0.63' n= 0.035
22.6	720	Total			

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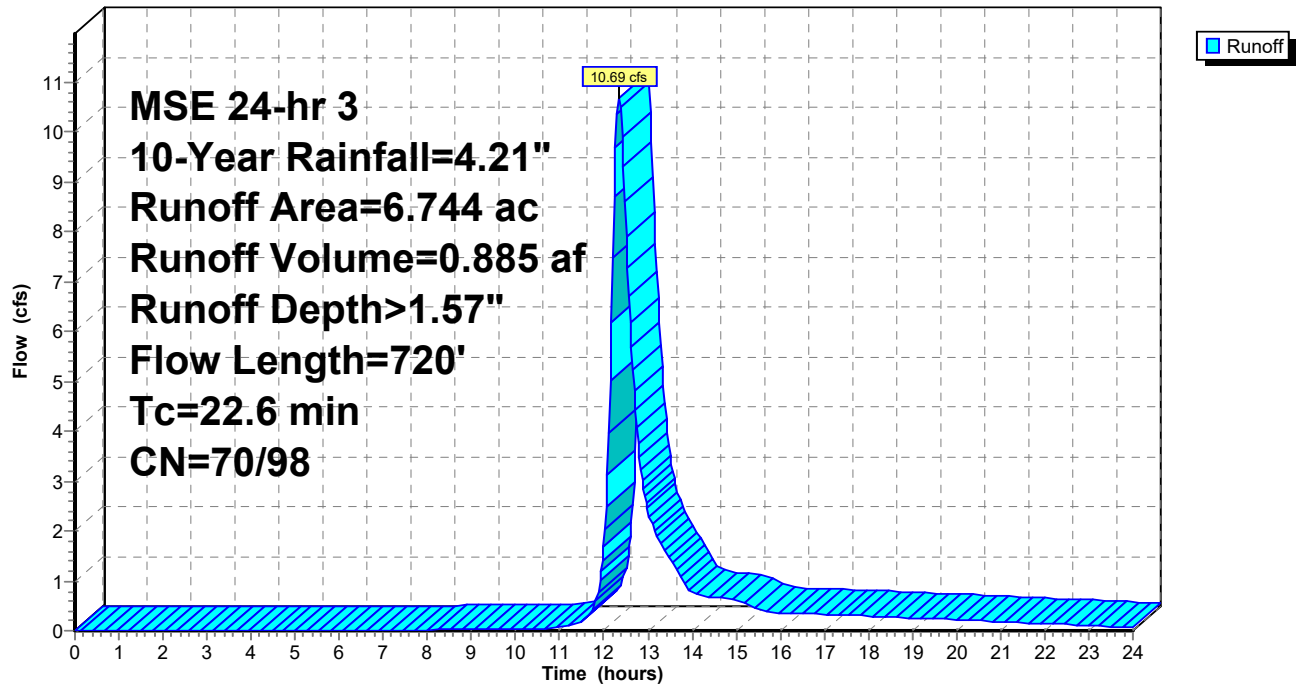
MSE 24-hr 3 10-Year Rainfall=4.21"

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Subcatchment 38S: PR7

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MSE 24-hr 3 10-Year Rainfall=4.21"

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Summary for Subcatchment 39S: PR8

Runoff = 1.46 cfs @ 12.24 hrs, Volume= 0.100 af, Depth> 2.36"
Routed to Pond 33P : Basin 2 - CB_WoodlandCove

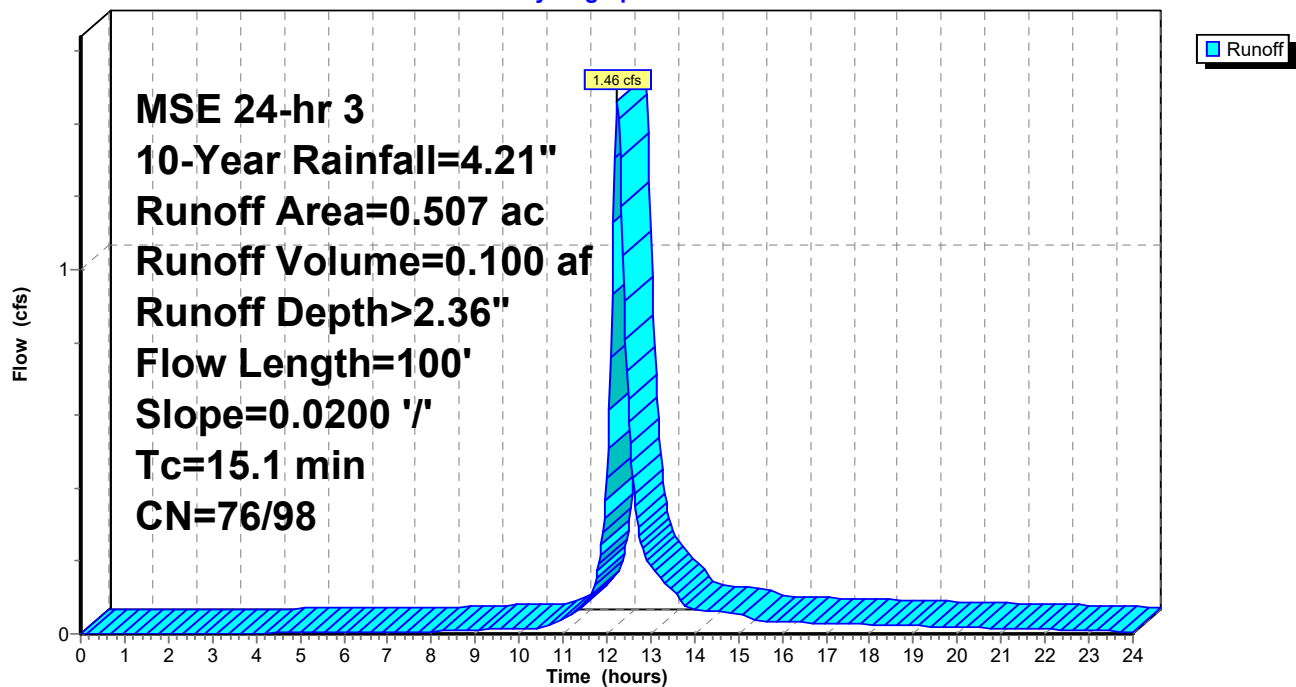
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.159	80	>75% Grass cover, Good, HSG D
* 0.000	98	impervious - new
0.236	74	>75% Grass cover, Good, HSG C
* 0.112	98	impervious - old
0.507	81	Weighted Average
0.395	76	77.91% Pervious Area
0.112	98	22.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 39S: PR8

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MSE 24-hr 3 10-Year Rainfall=4.21"

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Summary for Subcatchment 41S: PR1

Runoff = 6.74 cfs @ 12.13 hrs, Volume= 0.342 af, Depth> 3.20"
Routed to Pond 48P : Pond1

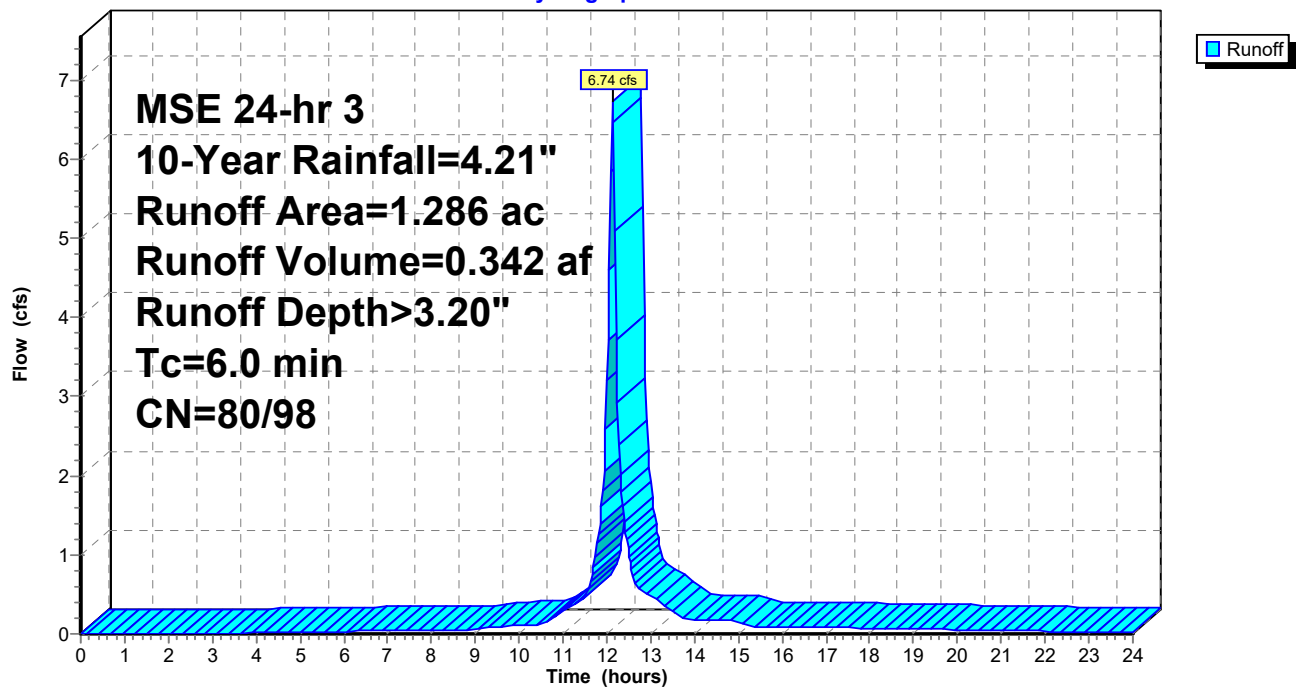
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.043	74	>75% Grass cover, Good, HSG C
0.477	80	>75% Grass cover, Good, HSG D
* 0.545	98	impervious - new
* 0.172	98	pond
0.049	80	>75% Grass cover, Good, HSG D
1.286	90	Weighted Average
0.569	80	44.25% Pervious Area
0.717	98	55.75% Impervious Area

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

Subcatchment 41S: PR1

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MSE 24-hr 3 10-Year Rainfall=4.21"

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Summary for Subcatchment 50S: PR3

Runoff = 3.48 cfs @ 12.25 hrs, Volume= 0.236 af, Depth> 2.14"
 Routed to Reach 44R : Woodland Cove Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.597	74	>75% Grass cover, Good, HSG C
0.610	80	>75% Grass cover, Good, HSG D
* 0.057	98	impervious - old
* 0.032	98	impervious - new
0.010	80	>75% Grass cover, Good, HSG D
* 0.019	98	impervious - new
1.325	79	Weighted Average
1.217	77	91.85% Pervious Area
0.108	98	8.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"
0.8	100	0.0900	2.10		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
15.9	200	Total			

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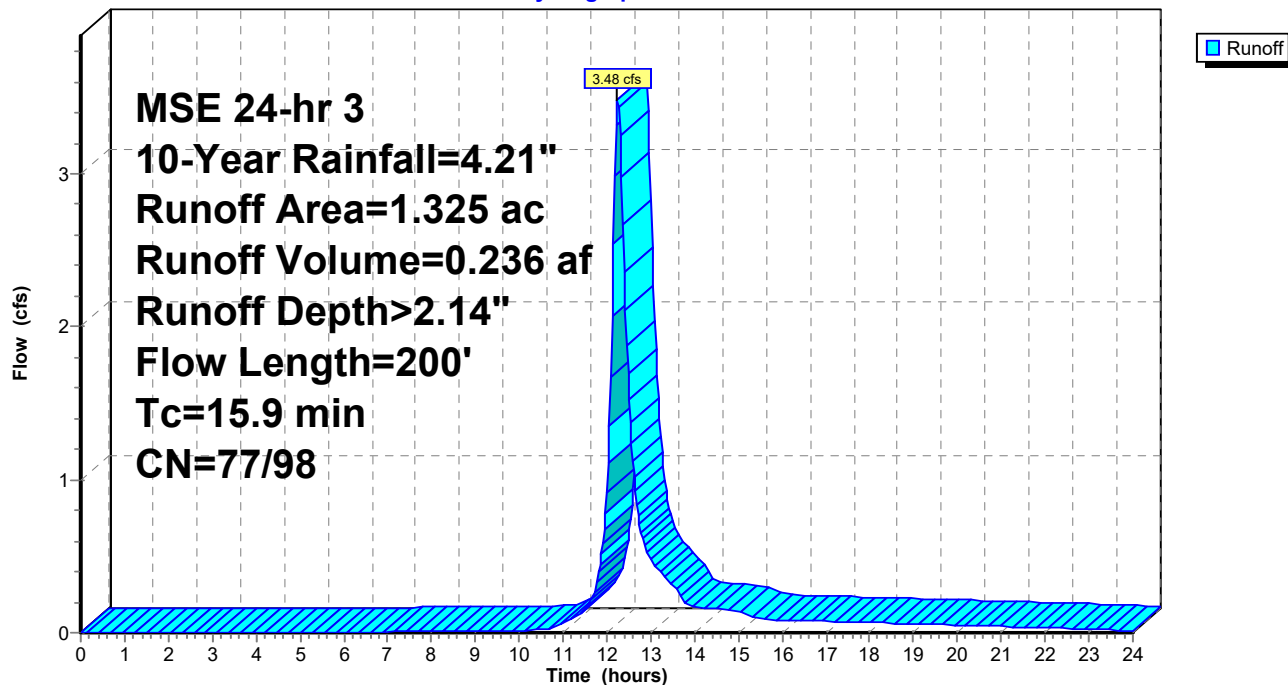
MSE 24-hr 3 10-Year Rainfall=4.21"

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Subcatchment 50S: PR3

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Summary for Subcatchment 52S: PR4

Runoff = 0.65 cfs @ 12.19 hrs, Volume= 0.039 af, Depth> 2.65"
Routed to Pond 35P : CB West

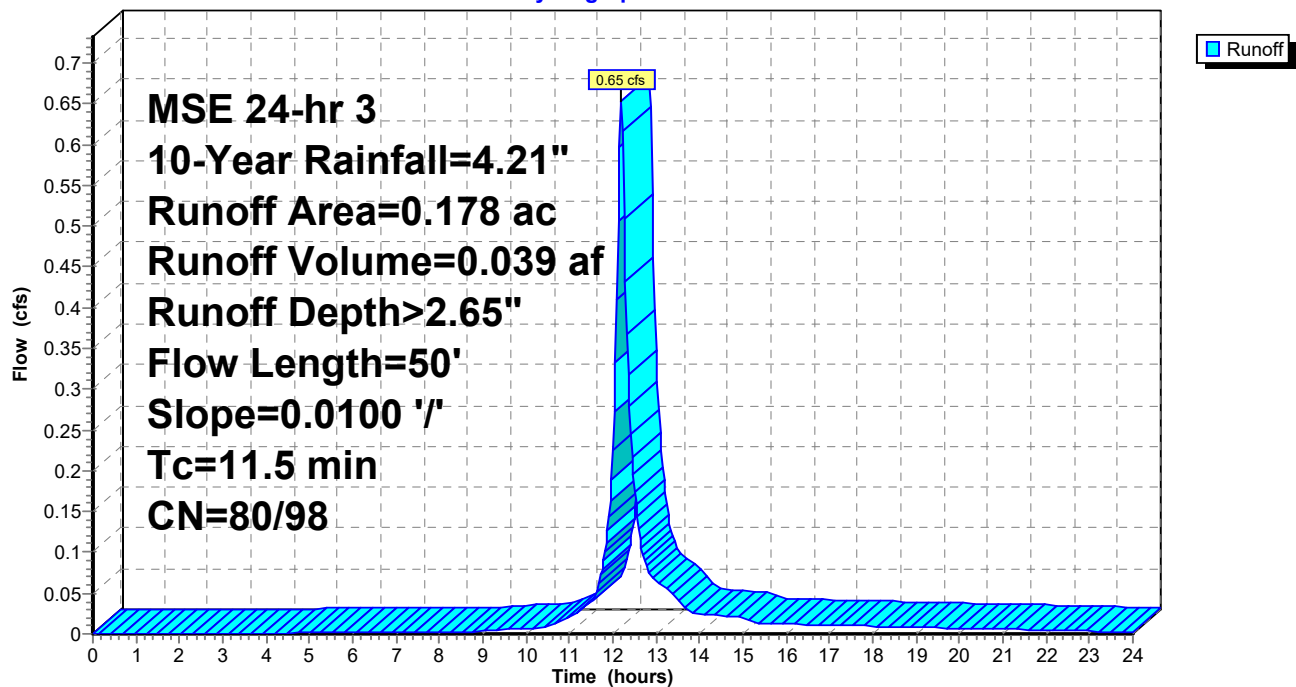
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.098	80	>75% Grass cover, Good, HSG D
* 0.037	98	impervious - new
0.036	80	>75% Grass cover, Good, HSG D
* 0.007	98	impervious - new
0.178	84	Weighted Average
0.134	80	75.28% Pervious Area
0.044	98	24.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 52S: PR4

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MSE 24-hr 3 10-Year Rainfall=4.21"

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Summary for Subcatchment 53S: PR5

Runoff = 3.11 cfs @ 12.25 hrs, Volume= 0.212 af, Depth> 2.00"
Routed to Pond 33P : Basin 2 - CB_WoodlandCove

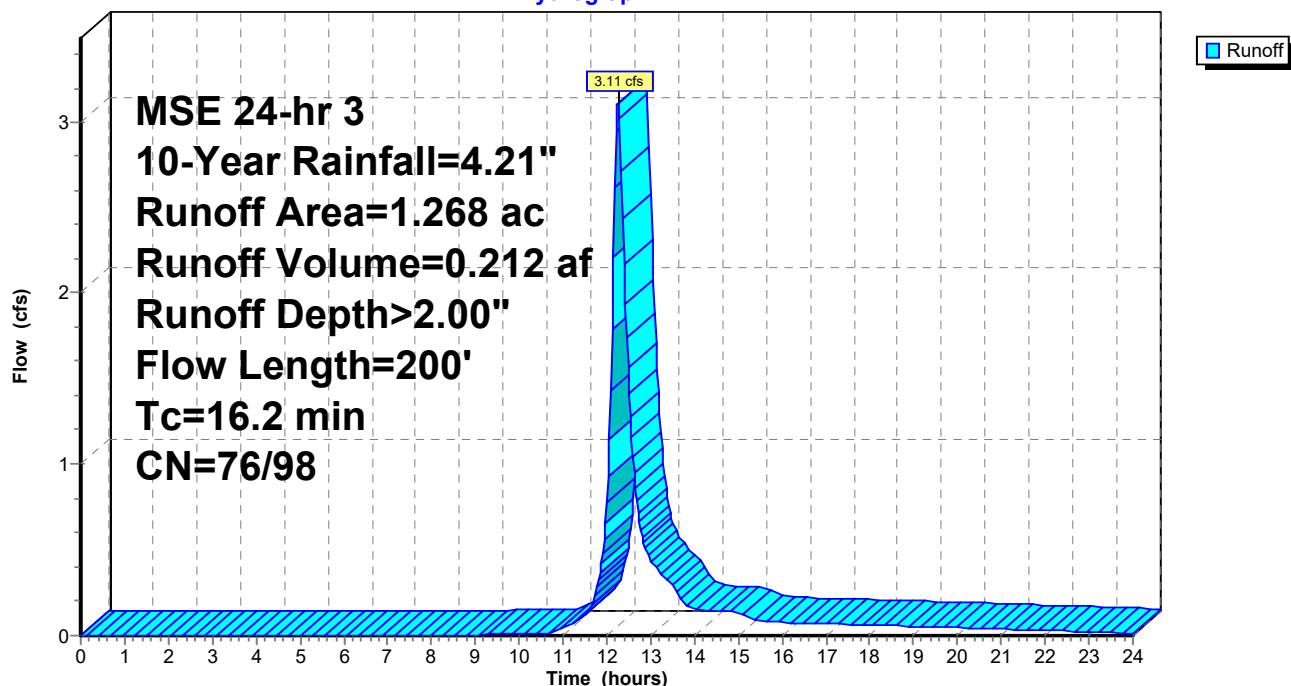
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 10-Year Rainfall=4.21"

Area (ac)	CN	Description
0.490	80	>75% Grass cover, Good, HSG D
* 0.012	98	impervious - new
0.715	74	>75% Grass cover, Good, HSG C
* 0.051	98	impervious - old
1.268	78	Weighted Average
1.205	76	95.03% Pervious Area
0.063	98	4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"
1.1	100	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
16.2	200	Total			

Subcatchment 53S: PR5

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Summary for Reach 44R: Woodland Cove Pond

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.047 ac, 25.26% Impervious, Inflow Depth > 2.03" for 10-Year event

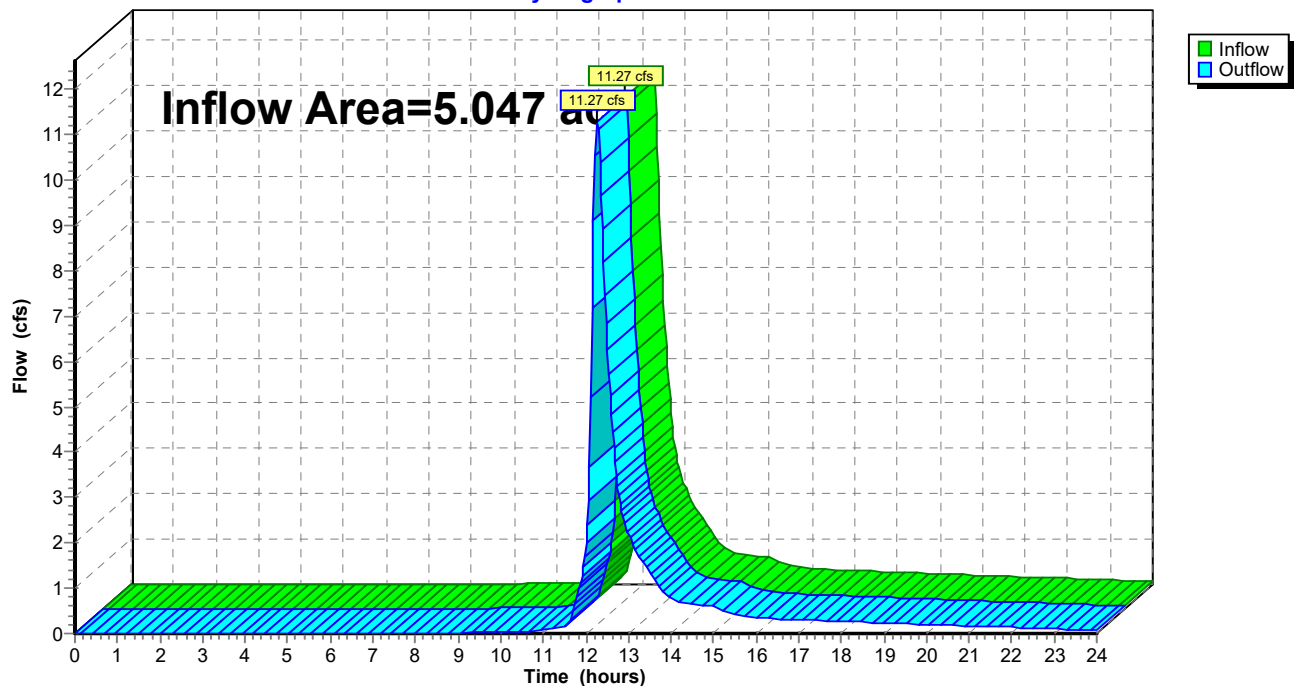
Inflow = 11.27 cfs @ 12.26 hrs, Volume= 0.852 af

Outflow = 11.27 cfs @ 12.26 hrs, Volume= 0.852 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Reach 44R: Woodland Cove Pond

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Summary for Reach 45R: Wet2_out

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 1.94" for 10-Year event
Inflow = 36.26 cfs @ 12.52 hrs, Volume= 3.972 af
Outflow = 36.25 cfs @ 12.52 hrs, Volume= 3.970 af, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Max. Velocity= 3.47 fps, Min. Travel Time= 0.7 min

Avg. Velocity= 1.19 fps, Avg. Travel Time= 2.1 min

Peak Storage= 1,567 cf @ 12.52 hrs

Average Depth at Peak Storage= 1.00' , Surface Width= 14.97'

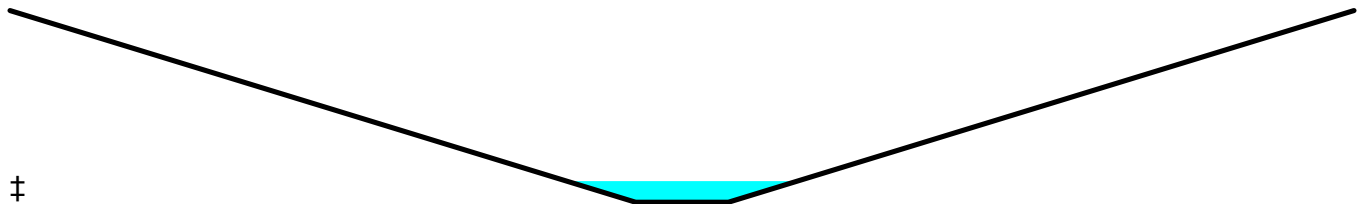
Bank-Full Depth= 9.00' Flow Area= 418.5 sf, Capacity= 5,231.48 cfs

6.00' x 9.00' deep channel, n= 0.035

Side Slope Z-value= 4.5 ' ' Top Width= 87.00'

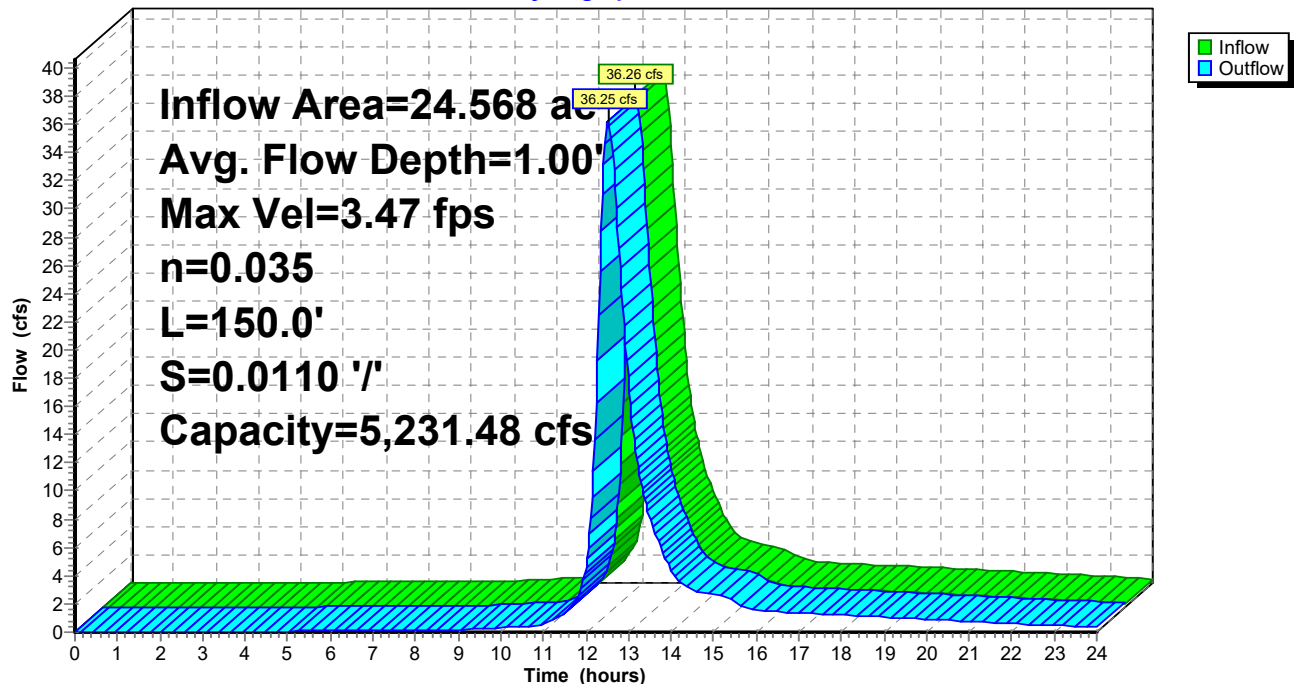
Length= 150.0' Slope= 0.0110 ' '

Inlet Invert= 988.00', Outlet Invert= 986.35'



Reach 45R: Wet2_out

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Stage-Area-Storage for Reach 45R: Wet2_out

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
988.00	0.0	0	993.10	147.7	22,148
988.10	0.6	97	993.20	152.9	22,933
988.20	1.4	208	993.30	158.2	23,731
988.30	2.2	332	993.40	163.6	24,543
988.40	3.1	469	993.50	169.1	25,369
988.50	4.1	620	993.60	174.7	26,209
988.60	5.2	784	993.70	180.4	27,062
988.70	6.4	962	993.80	186.2	27,928
988.80	7.7	1,153	993.90	192.1	28,808
988.90	9.0	1,357	994.00	198.0	29,701
989.00	10.5	1,576	994.10	204.1	30,608
989.10	12.1	1,808	994.20	210.2	31,528
989.20	13.7	2,053	994.30	216.4	32,461
989.30	15.4	2,312	994.40	222.7	33,409
989.40	17.2	2,584	994.50	229.1	34,370
989.50	19.1	2,870	994.60	235.6	35,344
989.60	21.1	3,169	994.70	242.2	36,332
989.70	23.2	3,481	994.80	248.9	37,333
989.80	25.4	3,807	994.90	255.7	38,348
989.90	27.6	4,147	995.00	262.5	39,376
990.00	30.0	4,501	995.10	269.4	40,417
990.10	32.5	4,868	995.20	276.5	41,472
990.20	35.0	5,248	995.30	283.6	42,541
990.30	37.6	5,642	995.40	290.8	43,624
990.40	40.3	6,049	995.50	298.1	44,720
990.50	43.1	6,470	995.60	305.5	45,829
990.60	46.0	6,904	995.70	313.0	46,952
990.70	49.0	7,351	995.80	320.6	48,088
990.80	52.1	7,813	995.90	328.3	49,238
990.90	55.3	8,288	996.00	336.0	50,401
991.00	58.5	8,776	996.10	343.8	51,577
991.10	61.9	9,278	996.20	351.8	52,768
991.20	65.3	9,793	996.30	359.8	53,972
991.30	68.8	10,322	996.40	367.9	55,189
991.40	72.4	10,864	996.50	376.1	56,420
991.50	76.1	11,419	996.60	384.4	57,664
991.60	79.9	11,988	996.70	392.8	58,922
991.70	83.8	12,571	996.80	401.3	60,193
991.80	87.8	13,168	996.90	409.8	61,477
991.90	91.9	13,778	997.00	418.5	62,775
992.00	96.0	14,401			
992.10	100.3	15,038			
992.20	104.6	15,688			
992.30	109.0	16,352			
992.40	113.5	17,029			
992.50	118.1	17,719			
992.60	122.8	18,424			
992.70	127.6	19,142			
992.80	132.5	19,873			
992.90	137.5	20,618			
993.00	142.5	21,376			

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Summary for Pond 33P: Basin 2 - CB_WoodlandCove

Inflow Area = 1.775 ac, 9.86% Impervious, Inflow Depth > 2.10" for 10-Year event
 Inflow = 4.57 cfs @ 12.25 hrs, Volume= 0.311 af
 Outflow = 4.52 cfs @ 12.27 hrs, Volume= 0.300 af, Atten= 1%, Lag= 1.2 min
 Primary = 4.52 cfs @ 12.27 hrs, Volume= 0.300 af
 Routed to Reach 44R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 47P : Wet1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 1,004.24' @ 12.27 hrs Surf.Area= 1,367 sf Storage= 808 cf

Plug-Flow detention time= 25.7 min calculated for 0.300 af (96% of inflow)
 Center-of-Mass det. time= 7.1 min (816.2 - 809.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,003.00'	12,577 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,003.00	303	0	0
1,004.00	800	552	552
1,005.00	3,200	2,000	2,552
1,007.00	3,400	6,600	9,152
1,008.00	3,450	3,425	12,577

Device	Routing	Invert	Outlet Devices
#1	Primary	998.45'	12.0" Round Culvert L= 85.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.45' / 998.06' S= 0.0046 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	998.62'	12.0" Round Culvert L= 13.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.62' / 998.55' S= 0.0052 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	1,003.90'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	1,005.90'	20.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#5	Device 2	1,003.00'	0.01 cfs Filtration at all elevations Phase-In= 0.01'

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Primary OutFlow Max=4.51 cfs @ 12.27 hrs HW=1,004.24' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 4.51 cfs of 7.29 cfs potential flow)

2=Culvert (Passes 4.51 cfs of 10.69 cfs potential flow)

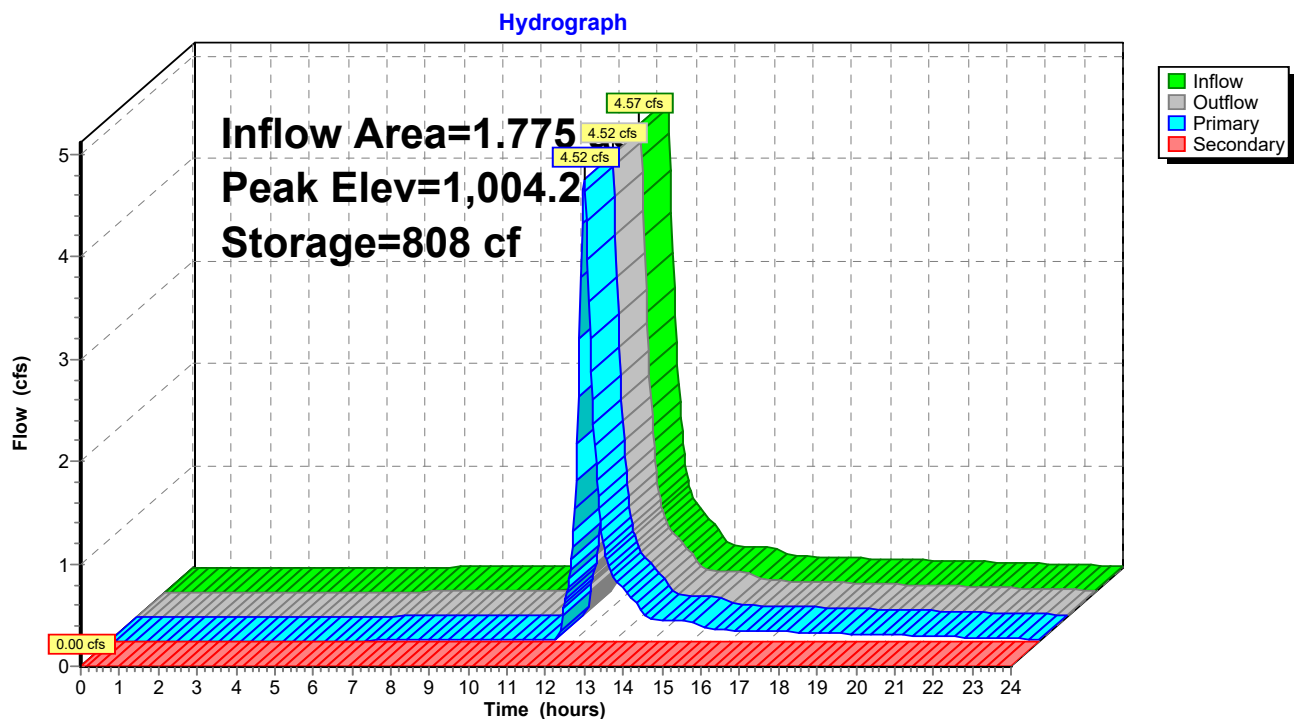
3=Orifice/Grate (Weir Controls 4.50 cfs @ 1.90 fps)

5=Filtration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,003.00' TW=988.00' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 33P: Basin 2 - CB_WoodlandCove



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Stage-Area-Storage for Pond 33P: Basin 2 - CB_WoodlandCove

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,003.00	303	0	1,005.55	3,255	4,327
1,003.05	328	16	1,005.60	3,260	4,490
1,003.10	353	33	1,005.65	3,265	4,653
1,003.15	378	51	1,005.70	3,270	4,816
1,003.20	402	71	1,005.75	3,275	4,980
1,003.25	427	91	1,005.80	3,280	5,143
1,003.30	452	113	1,005.85	3,285	5,308
1,003.35	477	136	1,005.90	3,290	5,472
1,003.40	502	161	1,005.95	3,295	5,637
1,003.45	527	187	1,006.00	3,300	5,802
1,003.50	552	214	1,006.05	3,305	5,967
1,003.55	576	242	1,006.10	3,310	6,132
1,003.60	601	271	1,006.15	3,315	6,298
1,003.65	626	302	1,006.20	3,320	6,464
1,003.70	651	334	1,006.25	3,325	6,630
1,003.75	676	367	1,006.30	3,330	6,796
1,003.80	701	401	1,006.35	3,335	6,963
1,003.85	725	437	1,006.40	3,340	7,129
1,003.90	750	474	1,006.45	3,345	7,297
1,003.95	775	512	1,006.50	3,350	7,464
1,004.00	800	552	1,006.55	3,355	7,632
1,004.05	920	594	1,006.60	3,360	7,800
1,004.10	1,040	644	1,006.65	3,365	7,968
1,004.15	1,160	698	1,006.70	3,370	8,136
1,004.20	1,280	760	1,006.75	3,375	8,305
1,004.25	1,400	827	1,006.80	3,380	8,473
1,004.30	1,520	899	1,006.85	3,385	8,643
1,004.35	1,640	979	1,006.90	3,390	8,812
1,004.40	1,760	1,063	1,006.95	3,395	8,982
1,004.45	1,880	1,155	1,007.00	3,400	9,152
1,004.50	2,000	1,252	1,007.05	3,402	9,322
1,004.55	2,120	1,354	1,007.10	3,405	9,492
1,004.60	2,240	1,464	1,007.15	3,407	9,662
1,004.65	2,360	1,578	1,007.20	3,410	9,833
1,004.70	2,480	1,700	1,007.25	3,413	10,003
1,004.75	2,600	1,827	1,007.30	3,415	10,174
1,004.80	2,720	1,959	1,007.35	3,418	10,345
1,004.85	2,840	2,099	1,007.40	3,420	10,515
1,004.90	2,960	2,243	1,007.45	3,423	10,687
1,004.95	3,080	2,395	1,007.50	3,425	10,858
1,005.00	3,200	2,552	1,007.55	3,427	11,029
1,005.05	3,205	2,712	1,007.60	3,430	11,201
1,005.10	3,210	2,872	1,007.65	3,432	11,372
1,005.15	3,215	3,033	1,007.70	3,435	11,544
1,005.20	3,220	3,194	1,007.75	3,438	11,716
1,005.25	3,225	3,355	1,007.80	3,440	11,887
1,005.30	3,230	3,516	1,007.85	3,443	12,060
1,005.35	3,235	3,678	1,007.90	3,445	12,232
1,005.40	3,240	3,839	1,007.95	3,448	12,404
1,005.45	3,245	4,002	1,008.00	3,450	12,577
1,005.50	3,250	4,164			

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Summary for Pond 35P: CB West

Inflow Area = 0.178 ac, 24.72% Impervious, Inflow Depth > 2.65" for 10-Year event
 Inflow = 0.65 cfs @ 12.19 hrs, Volume= 0.039 af
 Outflow = 0.65 cfs @ 12.19 hrs, Volume= 0.039 af, Atten= 0%, Lag= 0.2 min
 Primary = 0.65 cfs @ 12.19 hrs, Volume= 0.039 af
 Routed to Pond 48P : Pond1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 1,007.59' @ 12.19 hrs Surf.Area= 87 sf Storage= 6 cf

Plug-Flow detention time= 0.3 min calculated for 0.039 af (100% of inflow)
 Center-of-Mass det. time= 0.3 min (788.6 - 788.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,007.50'	850 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

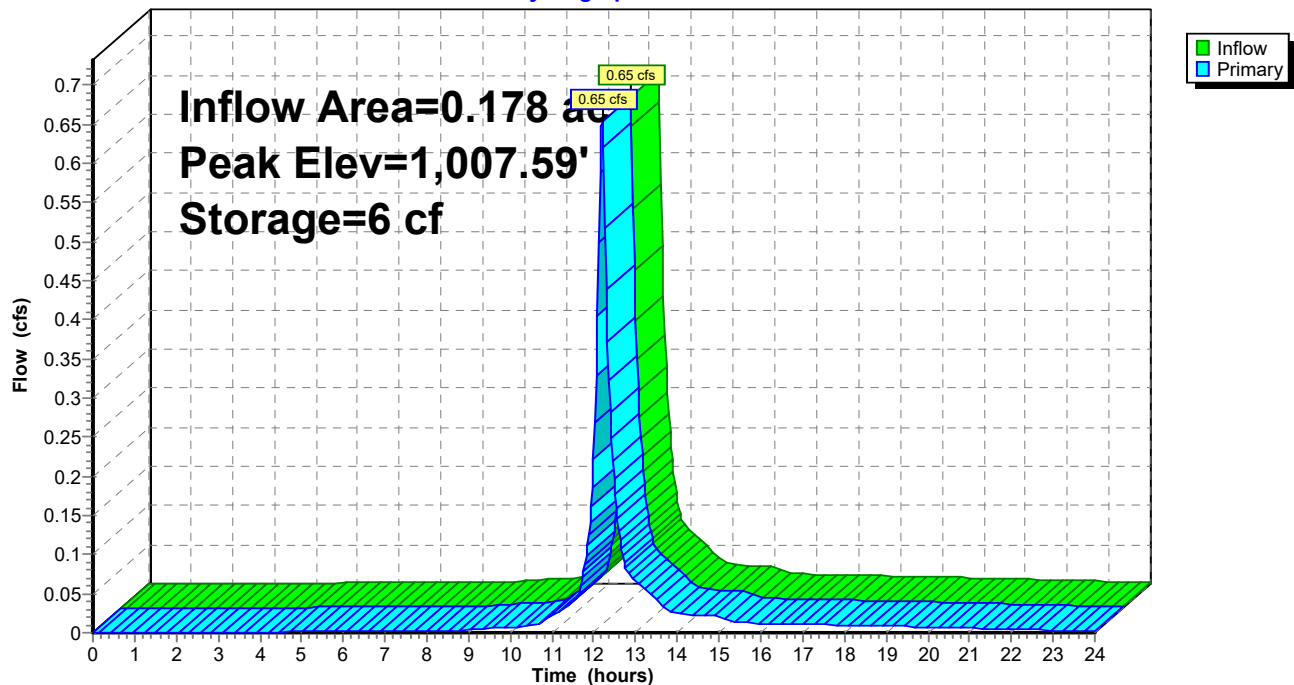
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,007.50	50	0	0
1,008.00	250	75	75
1,009.00	1,300	775	850

Device	Routing	Invert	Outlet Devices
#1	Primary	1,007.50'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.65 cfs @ 12.19 hrs HW=1,007.59' TW=1,003.33' (Dynamic Tailwater)
 ↑ **1=Orifice/Grate** (Weir Controls 0.65 cfs @ 0.99 fps)

Pond 35P: CB West

Hydrograph



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Stage-Area-Storage for Pond 35P: CB West

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,007.50	50	0	1,008.52	796	347
1,007.52	58	1	1,008.54	817	363
1,007.54	66	2	1,008.56	838	380
1,007.56	74	4	1,008.58	859	397
1,007.58	82	5	1,008.60	880	414
1,007.60	90	7	1,008.62	901	432
1,007.62	98	9	1,008.64	922	450
1,007.64	106	11	1,008.66	943	469
1,007.66	114	13	1,008.68	964	488
1,007.68	122	15	1,008.70	985	507
1,007.70	130	18	1,008.72	1,006	527
1,007.72	138	21	1,008.74	1,027	547
1,007.74	146	24	1,008.76	1,048	568
1,007.76	154	27	1,008.78	1,069	589
1,007.78	162	30	1,008.80	1,090	611
1,007.80	170	33	1,008.82	1,111	633
1,007.82	178	36	1,008.84	1,132	655
1,007.84	186	40	1,008.86	1,153	678
1,007.86	194	44	1,008.88	1,174	702
1,007.88	202	48	1,008.90	1,195	725
1,007.90	210	52	1,008.92	1,216	749
1,007.92	218	56	1,008.94	1,237	774
1,007.94	226	61	1,008.96	1,258	799
1,007.96	234	65	1,008.98	1,279	824
1,007.98	242	70	1,009.00	1,300	850
1,008.00	250	75			
1,008.02	271	80			
1,008.04	292	86			
1,008.06	313	92			
1,008.08	334	98			
1,008.10	355	105			
1,008.12	376	113			
1,008.14	397	120			
1,008.16	418	128			
1,008.18	439	137			
1,008.20	460	146			
1,008.22	481	155			
1,008.24	502	165			
1,008.26	523	175			
1,008.28	544	186			
1,008.30	565	197			
1,008.32	586	209			
1,008.34	607	221			
1,008.36	628	233			
1,008.38	649	246			
1,008.40	670	259			
1,008.42	691	273			
1,008.44	712	287			
1,008.46	733	301			
1,008.48	754	316			
1,008.50	775	331			

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Summary for Pond 46P: Wet2

Inflow Area = 6.744 ac, 4.21% Impervious, Inflow Depth > 1.57" for 10-Year event
 Inflow = 10.69 cfs @ 12.34 hrs, Volume= 0.885 af
 Outflow = 7.84 cfs @ 12.51 hrs, Volume= 0.875 af, Atten= 27%, Lag= 10.3 min
 Primary = 7.84 cfs @ 12.51 hrs, Volume= 0.875 af
 Routed to Pond 47P : Wet1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 47P : Wet1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 991.00' Surf.Area= 2,915 sf Storage= 1,508 cf

Peak Elev= 992.36' @ 12.51 hrs Surf.Area= 8,324 sf Storage= 8,384 cf (6,877 cf above start)

Plug-Flow detention time= 50.7 min calculated for 0.839 af (95% of inflow)

Center-of-Mass det. time= 19.3 min (850.3 - 831.0)

Volume	Invert	Avail.Storage	Storage Description
#1	990.00'	221,260 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

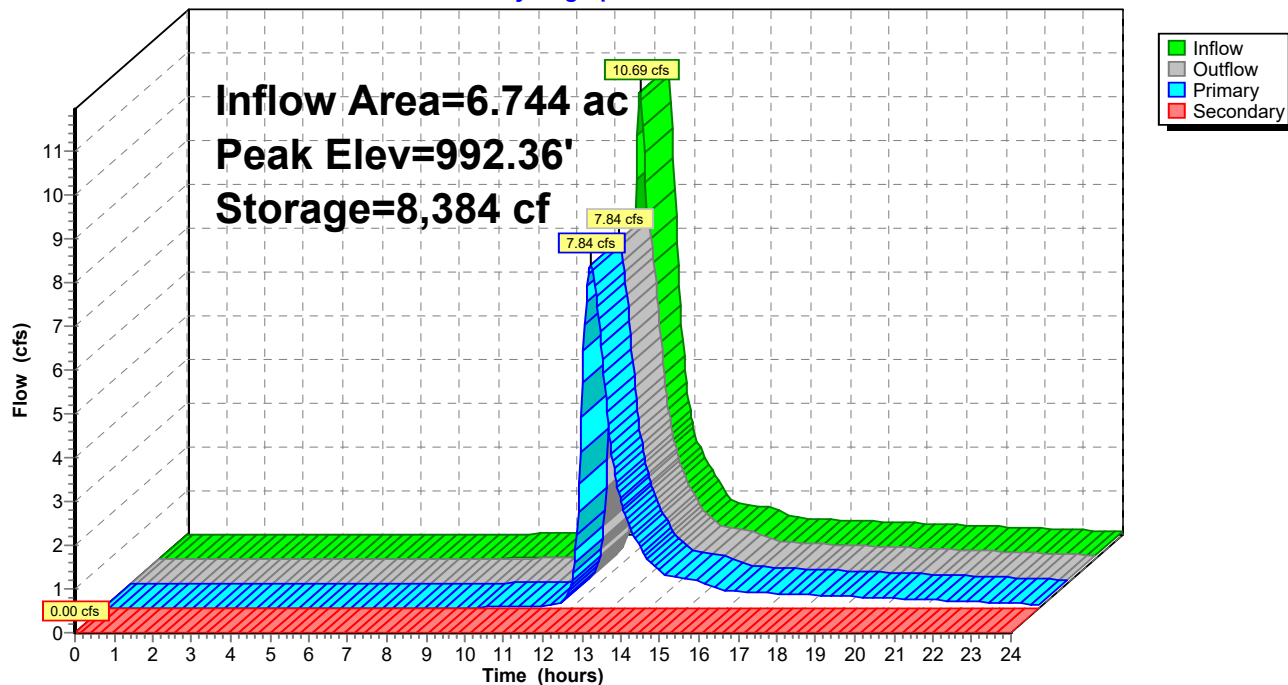
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
990.00	100	0	0
992.00	5,730	5,830	5,830
994.00	20,000	25,730	31,560
996.00	47,200	67,200	98,760
998.00	75,300	122,500	221,260

Device	Routing	Invert	Outlet Devices
#1	Primary	991.00'	24.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 991.00' / 990.00' S= 0.0192 '/' Cc= 0.900 n= 0.024, Flow Area= 3.14 sf
#2	Secondary	997.00'	25.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=7.84 cfs @ 12.51 hrs HW=992.36' TW=989.00' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 7.84 cfs @ 4.85 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=991.00' TW=988.00' (Dynamic Tailwater)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 46P: Wet2

Hydrograph



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Stage-Area-Storage for Pond 46P: Wet2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
990.00	100	0	995.10	34,960	61,788
990.10	382	24	995.20	36,320	65,352
990.20	663	76	995.30	37,680	69,052
990.30	944	157	995.40	39,040	72,888
990.40	1,226	265	995.50	40,400	76,860
990.50	1,508	402	995.60	41,760	80,968
990.60	1,789	567	995.70	43,120	85,212
990.70	2,071	760	995.80	44,480	89,592
990.80	2,352	981	995.90	45,840	94,108
990.90	2,633	1,230	996.00	47,200	98,760
991.00	2,915	1,508	996.10	48,605	103,550
991.10	3,197	1,813	996.20	50,010	108,481
991.20	3,478	2,147	996.30	51,415	113,552
991.30	3,759	2,509	996.40	52,820	118,764
991.40	4,041	2,899	996.50	54,225	124,116
991.50	4,323	3,317	996.60	55,630	129,609
991.60	4,604	3,763	996.70	57,035	135,242
991.70	4,886	4,238	996.80	58,440	141,016
991.80	5,167	4,740	996.90	59,845	146,930
991.90	5,448	5,271	997.00	61,250	152,985
992.00	5,730	5,830	997.10	62,655	159,180
992.10	6,444	6,439	997.20	64,060	165,516
992.20	7,157	7,119	997.30	65,465	171,992
992.30	7,870	7,870	997.40	66,870	178,609
992.40	8,584	8,693	997.50	68,275	185,366
992.50	9,298	9,587	997.60	69,680	192,264
992.60	10,011	10,552	997.70	71,085	199,302
992.70	10,725	11,589	997.80	72,490	206,481
992.80	11,438	12,697	997.90	73,895	213,800
992.90	12,151	13,877	998.00	75,300	221,260
993.00	12,865	15,128			
993.10	13,579	16,450			
993.20	14,292	17,843			
993.30	15,005	19,308			
993.40	15,719	20,844			
993.50	16,433	22,452			
993.60	17,146	24,131			
993.70	17,860	25,881			
993.80	18,573	27,703			
993.90	19,286	29,596			
994.00	20,000	31,560			
994.10	21,360	33,628			
994.20	22,720	35,832			
994.30	24,080	38,172			
994.40	25,440	40,648			
994.50	26,800	43,260			
994.60	28,160	46,008			
994.70	29,520	48,892			
994.80	30,880	51,912			
994.90	32,240	55,068			
995.00	33,600	58,360			

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Summary for Pond 47P: Wet1

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 1.94" for 10-Year event
 Inflow = 42.55 cfs @ 12.38 hrs, Volume= 3.975 af
 Outflow = 36.26 cfs @ 12.52 hrs, Volume= 3.972 af, Atten= 15%, Lag= 8.0 min
 Primary = 36.26 cfs @ 12.52 hrs, Volume= 3.972 af
 Routed to Reach 45R : Wet2_out

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 989.00' @ 12.52 hrs Surf.Area= 0.864 ac Storage= 0.440 af

Plug-Flow detention time= 8.5 min calculated for 3.967 af (100% of inflow)
 Center-of-Mass det. time= 8.0 min (830.9 - 823.0)

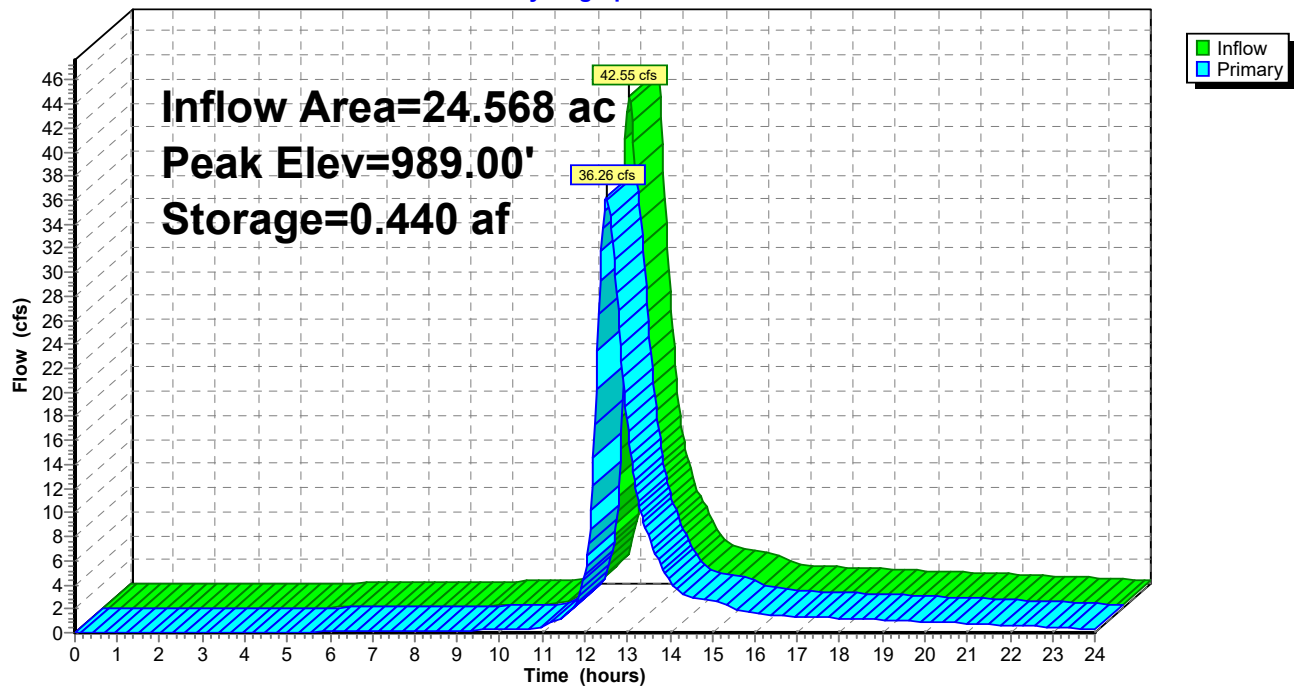
Volume	Invert	Avail.Storage	Storage Description
#1	988.00'	23.952 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
988.00	0.020	0.000	0.000
989.50	1.290	0.983	0.983
990.00	3.430	1.180	2.162
992.00	5.580	9.010	11.172
994.00	7.200	12.780	23.952

Device	Routing	Invert	Outlet Devices
#1	Primary	988.00'	Channel/Reach using Reach 45R: Wet2_out

Primary OutFlow Max=36.23 cfs @ 12.52 hrs HW=989.00' TW=989.00' (Dynamic Tailwater)
 ↑1=Channel/Reach (Channel Controls 36.23 cfs @ 3.47 fps)

Pond 47P: Wet1

Hydrograph



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Stage-Area-Storage for Pond 47P: Wet1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
988.00	0.020	0.000	993.10	6.471	17.801
988.10	0.105	0.006	993.20	6.552	18.452
988.20	0.189	0.021	993.30	6.633	19.111
988.30	0.274	0.044	993.40	6.714	19.778
988.40	0.359	0.076	993.50	6.795	20.454
988.50	0.443	0.116	993.60	6.876	21.137
988.60	0.528	0.164	993.70	6.957	21.829
988.70	0.613	0.221	993.80	7.038	22.529
988.80	0.697	0.287	993.90	7.119	23.237
988.90	0.782	0.361	994.00	7.200	23.952
989.00	0.867	0.443	994.10	7.200	23.952
989.10	0.951	0.534	994.20	7.200	23.952
989.20	1.036	0.634	994.30	7.200	23.952
989.30	1.121	0.741	994.40	7.200	23.952
989.40	1.205	0.858	994.50	7.200	23.952
989.50	1.290	0.983	994.60	7.200	23.952
989.60	1.718	1.133	994.70	7.200	23.952
989.70	2.146	1.326	994.80	7.200	23.952
989.80	2.574	1.562	994.90	7.200	23.952
989.90	3.002	1.841	995.00	7.200	23.952
990.00	3.430	2.162	995.10	7.200	23.952
990.10	3.538	2.511	995.20	7.200	23.952
990.20	3.645	2.870	995.30	7.200	23.952
990.30	3.752	3.240	995.40	7.200	23.952
990.40	3.860	3.620	995.50	7.200	23.952
990.50	3.967	4.012	995.60	7.200	23.952
990.60	4.075	4.414	995.70	7.200	23.952
990.70	4.183	4.827	995.80	7.200	23.952
990.80	4.290	5.250	995.90	7.200	23.952
990.90	4.397	5.685	996.00	7.200	23.952
991.00	4.505	6.130	996.10	7.200	23.952
991.10	4.613	6.586	996.20	7.200	23.952
991.20	4.720	7.053	996.30	7.200	23.952
991.30	4.827	7.530	996.40	7.200	23.952
991.40	4.935	8.018	996.50	7.200	23.952
991.50	5.042	8.517	996.60	7.200	23.952
991.60	5.150	9.027	996.70	7.200	23.952
991.70	5.258	9.547	996.80	7.200	23.952
991.80	5.365	10.078	996.90	7.200	23.952
991.90	5.472	10.620	997.00	7.200	23.952
992.00	5.580	11.172			
992.10	5.661	11.735			
992.20	5.742	12.305			
992.30	5.823	12.883			
992.40	5.904	13.469			
992.50	5.985	14.064			
992.60	6.066	14.666			
992.70	6.147	15.277			
992.80	6.228	15.896			
992.90	6.309	16.523			
993.00	6.390	17.157			

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Summary for Pond 48P: Pond1

Inflow Area = 1.947 ac, 50.95% Impervious, Inflow Depth > 3.06" for 10-Year event
 Inflow = 9.54 cfs @ 12.13 hrs, Volume= 0.497 af
 Outflow = 3.31 cfs @ 12.29 hrs, Volume= 0.316 af, Atten= 65%, Lag= 9.8 min
 Primary = 3.31 cfs @ 12.29 hrs, Volume= 0.316 af
 Routed to Reach 44R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 44R : Woodland Cove Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Starting Elev= 1,002.00' Surf.Area= 4,596 sf Storage= 10,824 cf
 Peak Elev= 1,003.39' @ 12.29 hrs Surf.Area= 9,191 sf Storage= 21,992 cf (11,168 cf above start)

Plug-Flow detention time= 556.2 min calculated for 0.067 af (14% of inflow)
 Center-of-Mass det. time= 84.0 min (852.0 - 768.0)

Volume	Invert	Avail.Storage	Storage Description
#1	998.00'	92,791 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 1.2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
998.00	810	0	0
1,000.00	2,190	3,000	3,000
1,002.00	3,830	6,020	9,020
1,002.10	6,000	492	9,512
1,003.00	7,220	5,949	15,460
1,004.00	8,360	7,790	23,250
1,005.00	9,930	9,145	32,395
1,007.00	11,000	20,930	53,325
1,008.00	12,000	11,500	64,825
1,009.00	13,000	12,500	77,325

Device	Routing	Invert	Outlet Devices
#1	Primary	999.50'	18.0" Round Culvert L= 149.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 999.50' / 999.10' S= 0.0027 ' S= 0.0027 ' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,004.50'	48.0" Horiz. grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,003.00'	Custom Weir/Orifice, Cv= 3.00 (C= 3.75) Head (feet) 0.00 0.50 0.51 4.00 Width (feet) 4.00 4.00 4.00 4.00
#4	Device 3	1,000.00'	15.0" Round lowflow L= 81.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 1,000.00' / 1,000.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Device 1	1,002.00'	0.04 cfs Filtration X 0.00 when above 1,002.00' Phase-In= 0.01'
#6	Secondary	1,008.00'	10.0' long + 4.0 ' SideZ x 3.0' breadth EOF Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50

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Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=3.31 cfs @ 12.29 hrs HW=1,003.38' TW=0.00' (Dynamic Tailwater)

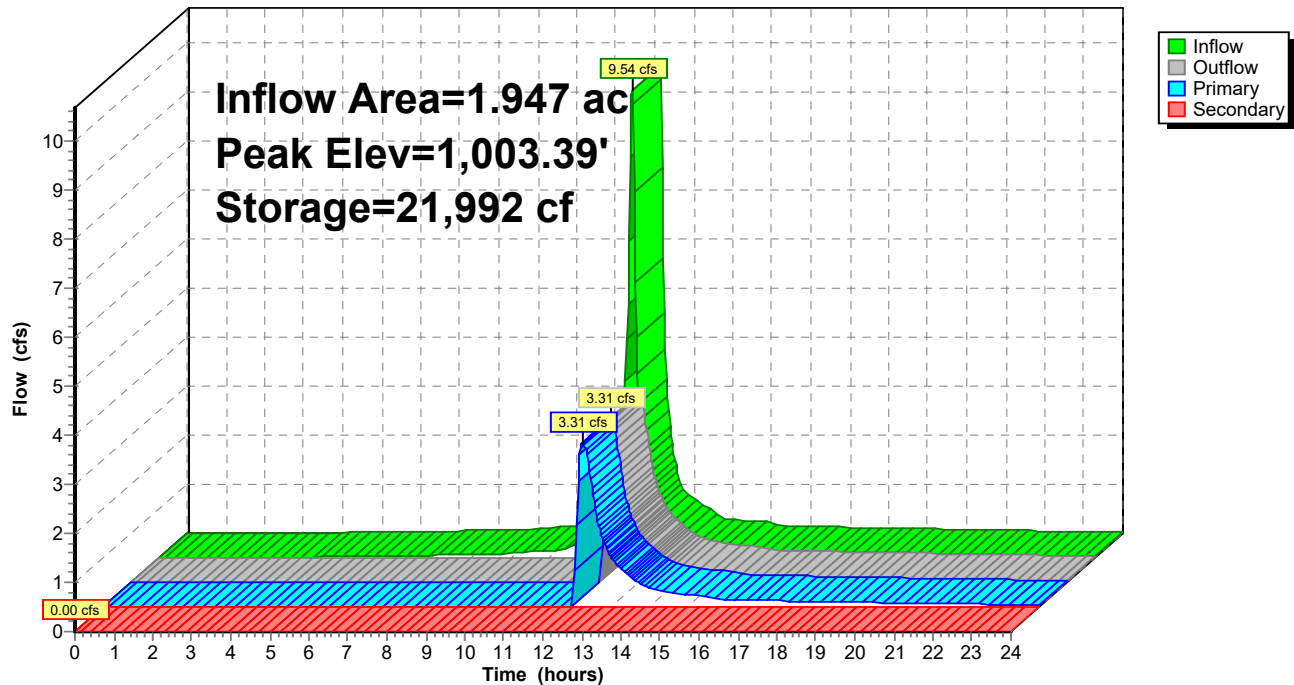
- 1=Culvert (Passes 3.31 cfs of 11.93 cfs potential flow)
- 2=grate (Controls 0.00 cfs)
- 3=Custom Weir/Orifice (Passes 3.31 cfs of 3.58 cfs potential flow)
- 4=lowflow (Outlet Controls 3.31 cfs @ 2.70 fps)
- 5=Filtration (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,002.00' TW=0.00' (Dynamic Tailwater)

- 6=EOF (Controls 0.00 cfs)

Pond 48P: Pond1

Hydrograph



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Stage-Area-Storage for Pond 48P: Pond1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
998.00	972	0	1,008.20	14,640	80,695
998.20	1,138	211	1,008.40	14,880	83,647
998.40	1,303	455	1,008.60	15,120	86,647
998.60	1,469	732	1,008.80	15,360	89,695
998.80	1,634	1,043	1,009.00	15,600	92,791
999.00	1,800	1,386			
999.20	1,966	1,763			
999.40	2,131	2,172			
999.60	2,297	2,615			
999.80	2,462	3,091			
1,000.00	2,628	3,600			
1,000.20	2,825	4,145			
1,000.40	3,022	4,730			
1,000.60	3,218	5,354			
1,000.80	3,415	6,017			
1,001.00	3,612	6,720			
1,001.20	3,809	7,462			
1,001.40	4,006	8,244			
1,001.60	4,202	9,064			
1,001.80	4,399	9,924			
1,002.00	4,596	10,824			
1,002.20	7,363	12,142			
1,002.40	7,688	13,647			
1,002.60	8,013	15,217			
1,002.80	8,339	16,852			
1,003.00	8,664	18,553			
1,003.20	8,938	20,313			
1,003.40	9,211	22,128			
1,003.60	9,485	23,997			
1,003.80	9,758	25,922			
1,004.00	10,032	27,901			
1,004.20	10,409	29,945			
1,004.40	10,786	32,064			
1,004.60	11,162	34,259			
1,004.80	11,539	36,529			
1,005.00	11,916	38,875			
1,005.20	12,044	41,271			
1,005.40	12,173	43,692			
1,005.60	12,301	46,140			
1,005.80	12,430	48,613			
1,006.00	12,558	51,112			
1,006.20	12,686	53,636			
1,006.40	12,815	56,186			
1,006.60	12,943	58,762			
1,006.80	13,072	61,363			
1,007.00	13,200	63,991			
1,007.20	13,440	66,655			
1,007.40	13,680	69,367			
1,007.60	13,920	72,127			
1,007.80	14,160	74,935			
1,008.00	14,400	77,791			

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Summary for Pond 56P: Woodland Cove Pond 2 AIRRIG/SED

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

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 997.35' Surf.Area= 68,822 sf Storage= 260,413 cf

Peak Elev= 997.35' @ 0.00 hrs Surf.Area= 68,822 sf Storage= 260,413 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no inflow)

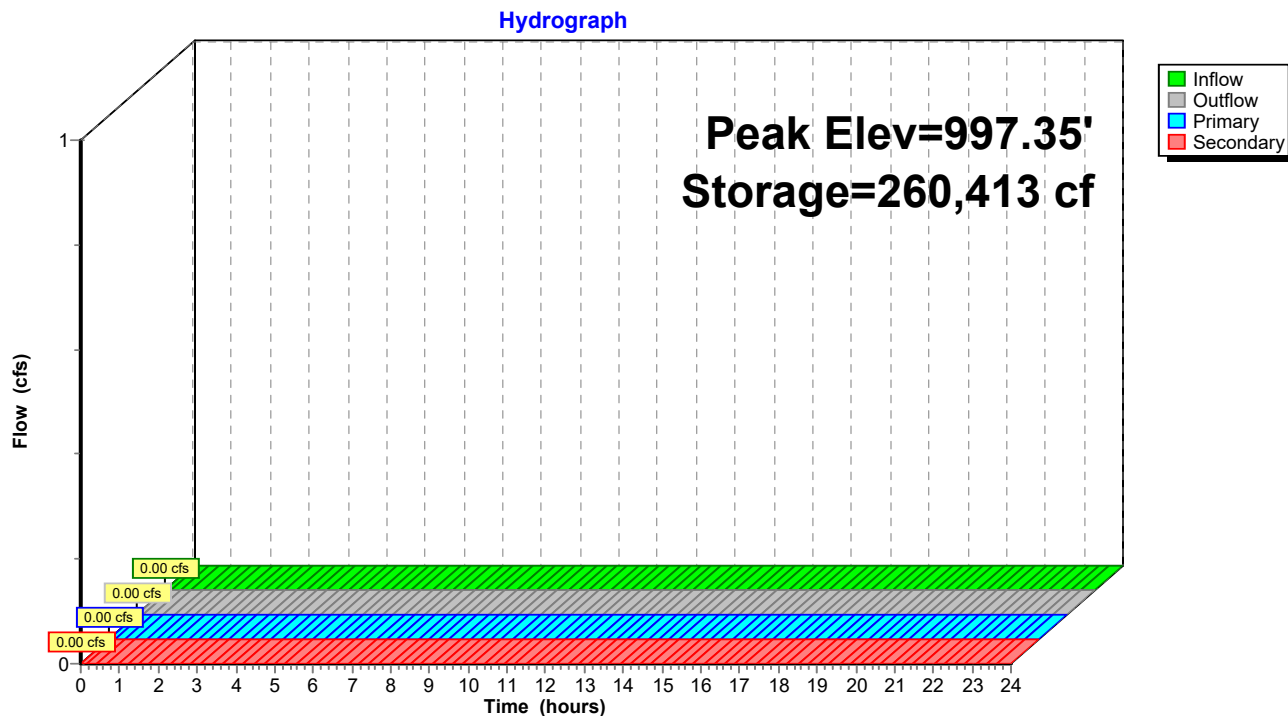
Volume	Invert	Avail.Storage	Storage Description
#1	998.00'	977,118 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
988.00	1,246	0	0
990.00	4,714	5,960	5,960
992.00	15,160	19,874	25,834
994.00	35,780	50,940	76,774
996.00	60,540	96,320	173,094
997.35	68,822	87,319	260,413
998.00	77,800	47,652	308,065
998.01	90,500	841	308,907
1,000.00	125,240	214,661	523,568
1,002.00	160,640	285,880	809,448
1,003.00	174,700	167,670	977,118

Device	Routing	Invert	Outlet Devices
#1	Primary	998.00'	12.0" Round Culvert L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 994.00' / 998.00' S= -0.0500 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	998.00'	0.500 cfs Constant Flow/Skimmer Phase-In= 0.01'

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=997.35' (Free Discharge)↑ **1=Culvert** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=997.35' (Free Discharge)↑ **2=Constant Flow/Skimmer** (Constant Controls 0.00 cfs)

Pond 56P: Woodland Cove Pond 2 AIRRIG/SED



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Stage-Area-Storage for Pond 56P: Woodland Cove Pond 2 AIRRIG/SED

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
988.00	1,246	0	998.20	93,817	326,417
988.20	1,593	284	998.40	97,308	345,530
988.40	1,940	637	998.60	100,800	365,340
988.60	2,286	1,060	998.80	104,291	385,850
988.80	2,633	1,552	999.00	107,783	407,057
989.00	2,980	2,113	999.20	111,274	428,963
989.20	3,327	2,744	999.40	114,766	451,567
989.40	3,674	3,444	999.60	118,257	474,869
989.60	4,020	4,213	999.80	121,749	498,869
989.80	4,367	5,052	1,000.00	125,240	523,568
990.00	4,714	5,960	1,000.20	128,780	548,970
990.20	5,759	7,007	1,000.40	132,320	575,080
990.40	6,803	8,263	1,000.60	135,860	601,898
990.60	7,848	9,729	1,000.80	139,400	629,424
990.80	8,892	11,403	1,001.00	142,940	657,658
991.00	9,937	13,286	1,001.20	146,480	686,600
991.20	10,982	15,377	1,001.40	150,020	716,250
991.40	12,026	17,678	1,001.60	153,560	746,608
991.60	13,071	20,188	1,001.80	157,100	777,674
991.80	14,115	22,906	1,002.00	160,640	809,448
992.00	15,160	25,834	1,002.20	163,452	841,858
992.20	17,222	29,072	1,002.40	166,264	874,829
992.40	19,284	32,723	1,002.60	169,076	908,363
992.60	21,346	36,786	1,002.80	171,888	942,459
992.80	23,408	41,261	1,003.00	174,700	977,118
993.00	25,470	46,149			
993.20	27,532	51,449			
993.40	29,594	57,162			
993.60	31,656	63,287			
993.80	33,718	69,824			
994.00	35,780	76,774			
994.20	38,256	84,178			
994.40	40,732	92,076			
994.60	43,208	100,470			
994.80	45,684	109,360			
995.00	48,160	118,744			
995.20	50,636	128,624			
995.40	53,112	138,998			
995.60	55,588	149,868			
995.80	58,064	161,234			
996.00	60,540	173,094			
996.20	61,767	185,325			
996.40	62,994	197,801			
996.60	64,221	210,522			
996.80	65,448	223,489			
997.00	66,675	236,701			
997.20	67,902	250,159			
997.40	69,513	263,872			
997.60	72,275	278,050			
997.80	75,038	292,782			
998.00	77,800	308,065			

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Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment35S: PR6 Runoff Area=0.483 ac 47.83% Impervious Runoff Depth>5.62"
Tc=6.0 min CN=75/98 Runoff=4.46 cfs 0.226 af

Subcatchment37S: PR2 Runoff Area=17.824 ac 12.34% Impervious Runoff Depth>4.68"
Flow Length=600' Tc=24.7 min CN=75/98 Runoff=81.32 cfs 6.951 af

Subcatchment38S: PR7 Runoff Area=6.744 ac 4.21% Impervious Runoff Depth>3.95"
Flow Length=720' Tc=22.6 min CN=70/98 Runoff=27.82 cfs 2.218 af

Subcatchment39S: PR8 Runoff Area=0.507 ac 22.09% Impervious Runoff Depth>5.03"
Flow Length=100' Slope=0.0200 '/' Tc=15.1 min CN=76/98 Runoff=3.13 cfs 0.212 af

Subcatchment41S: PR1 Runoff Area=1.286 ac 55.75% Impervious Runoff Depth>6.08"
Tc=6.0 min CN=80/98 Runoff=12.64 cfs 0.651 af

Subcatchment50S: PR3 Runoff Area=1.325 ac 8.15% Impervious Runoff Depth>4.77"
Flow Length=200' Tc=15.9 min CN=77/98 Runoff=7.77 cfs 0.527 af

Subcatchment52S: PR4 Runoff Area=0.178 ac 24.72% Impervious Runoff Depth>5.43"
Flow Length=50' Slope=0.0100 '/' Tc=11.5 min CN=80/98 Runoff=1.32 cfs 0.081 af

Subcatchment53S: PR5 Runoff Area=1.268 ac 4.97% Impervious Runoff Depth>4.59"
Flow Length=200' Tc=16.2 min CN=76/98 Runoff=7.16 cfs 0.485 af

Reach 44R: Woodland Cove Pond Inflow=21.16 cfs 1.990 af
Outflow=21.16 cfs 1.990 af

Reach 45R: Wet2_out Avg. Flow Depth=1.50' Max Vel=4.35 fps Inflow=83.43 cfs 9.149 af
n=0.035 L=150.0' S=0.0110 '/' Capacity=5,231.48 cfs Outflow=83.39 cfs 9.147 af

Pond 33P: Basin 2 - CB_WoodlandCove Peak Elev=1,004.91' Storage=2,277 cf Inflow=10.28 cfs 0.698 af
Primary=7.75 cfs 0.687 af Secondary=0.00 cfs 0.000 af Outflow=7.75 cfs 0.687 af

Pond 35P: CB West Peak Elev=1,007.65' Storage=12 cf Inflow=1.32 cfs 0.081 af
Outflow=1.32 cfs 0.081 af

Pond 46P: Wet2 Peak Elev=993.43' Storage=21,367 cf Inflow=27.82 cfs 2.218 af
Primary=16.94 cfs 2.204 af Secondary=0.00 cfs 0.000 af Outflow=16.94 cfs 2.204 af

Pond 47P: Wet1 Peak Elev=989.50' Storage=0.986 af Inflow=96.35 cfs 9.155 af
Outflow=83.43 cfs 9.149 af

Pond 48P: Pond1 Peak Elev=1,004.19' Storage=29,876 cf Inflow=18.18 cfs 0.958 af
Primary=5.83 cfs 0.776 af Secondary=0.00 cfs 0.000 af Outflow=5.83 cfs 0.776 af

Pond 56P: Woodland Cove Pond 2 Peak Elev=997.35' Storage=260,413 cf Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

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Total Runoff Area = 29.615 ac Runoff Volume = 11.352 af Average Runoff Depth = 4.60"
87.31% Pervious = 25.857 ac 12.69% Impervious = 3.758 ac

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MSE 24-hr 3 100-Year Rainfall=7.24"

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Summary for Subcatchment 35S: PR6

Runoff = 4.46 cfs @ 12.13 hrs, Volume= 0.226 af, Depth> 5.62"
Routed to Pond 48P : Pond1

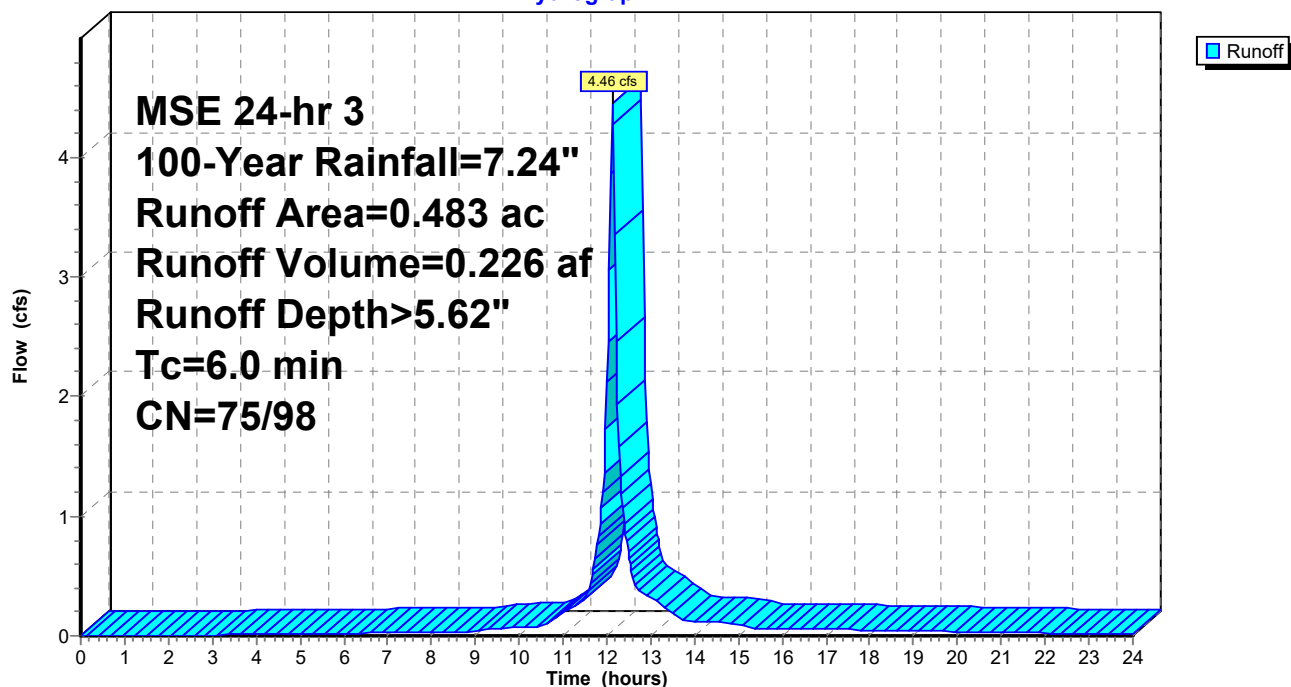
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.230	74	>75% Grass cover, Good, HSG C
0.022	80	>75% Grass cover, Good, HSG D
* 0.197	98	impervious - new
* 0.034	98	impervious - old
0.000	70	Woods, Good, HSG C
0.000	77	Woods, Good, HSG D
* 0.000	98	pond
0.483	86	Weighted Average
0.252	75	52.17% Pervious Area
0.231	98	47.83% Impervious Area

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

Subcatchment 35S: PR6

Hydrograph



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MSE 24-hr 3 100-Year Rainfall=7.24"

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Summary for Subcatchment 37S: PR2

Runoff = 81.32 cfs @ 12.35 hrs, Volume= 6.951 af, Depth> 4.68"
 Routed to Pond 47P : Wet1

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.039	74	>75% Grass cover, Good, HSG C
0.621	80	>75% Grass cover, Good, HSG D
* 0.440	98	impervious - old
* 0.000	74	imp_tempC
* 0.000	80	imp_tempD
* 1.759	98	wetland
4.786	70	Woods, Good, HSG C
8.227	77	Woods, Good, HSG D
0.317	77	Woods, Good, HSG D
0.873	74	>75% Grass cover, Good, HSG C
0.762	80	>75% Grass cover, Good, HSG D
17.824	78	Weighted Average
15.625	75	87.66% Pervious Area
2.199	98	12.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
8.9	500	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.7	600	Total			

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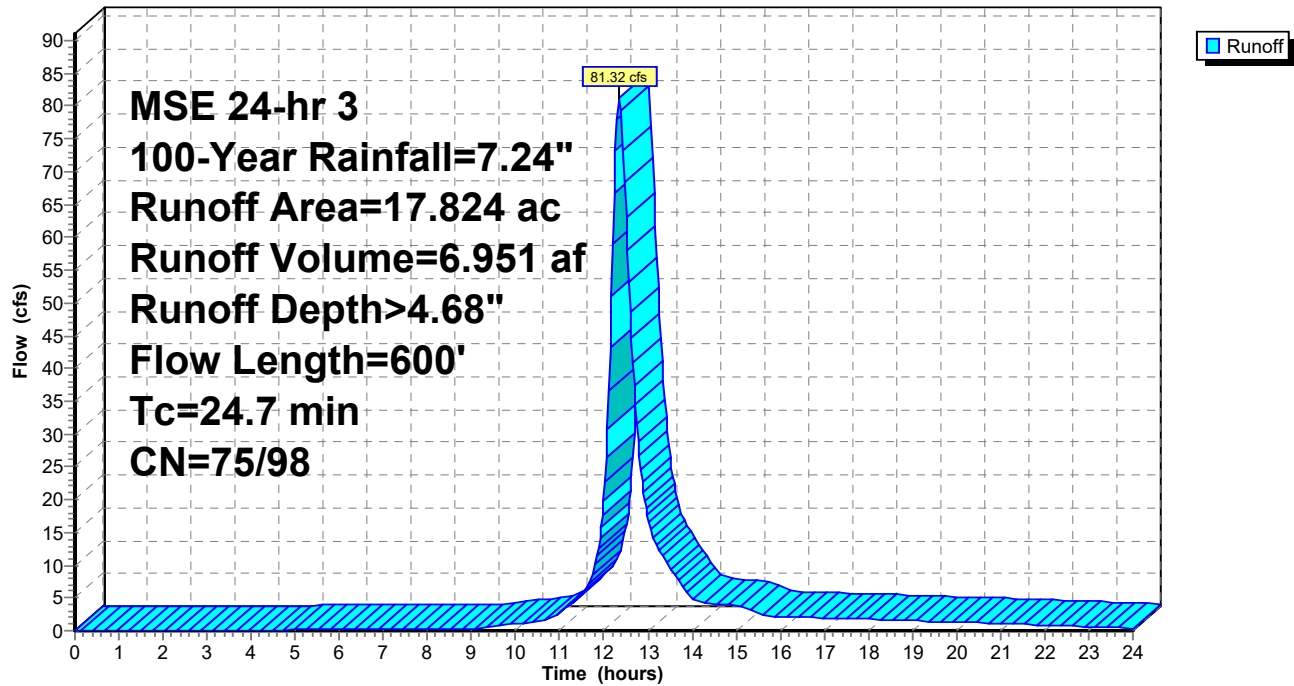
MSE 24-hr 3 100-Year Rainfall=7.24"

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Subcatchment 37S: PR2

Hydrograph



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MSE 24-hr 3 100-Year Rainfall=7.24"

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Summary for Subcatchment 38S: PR7

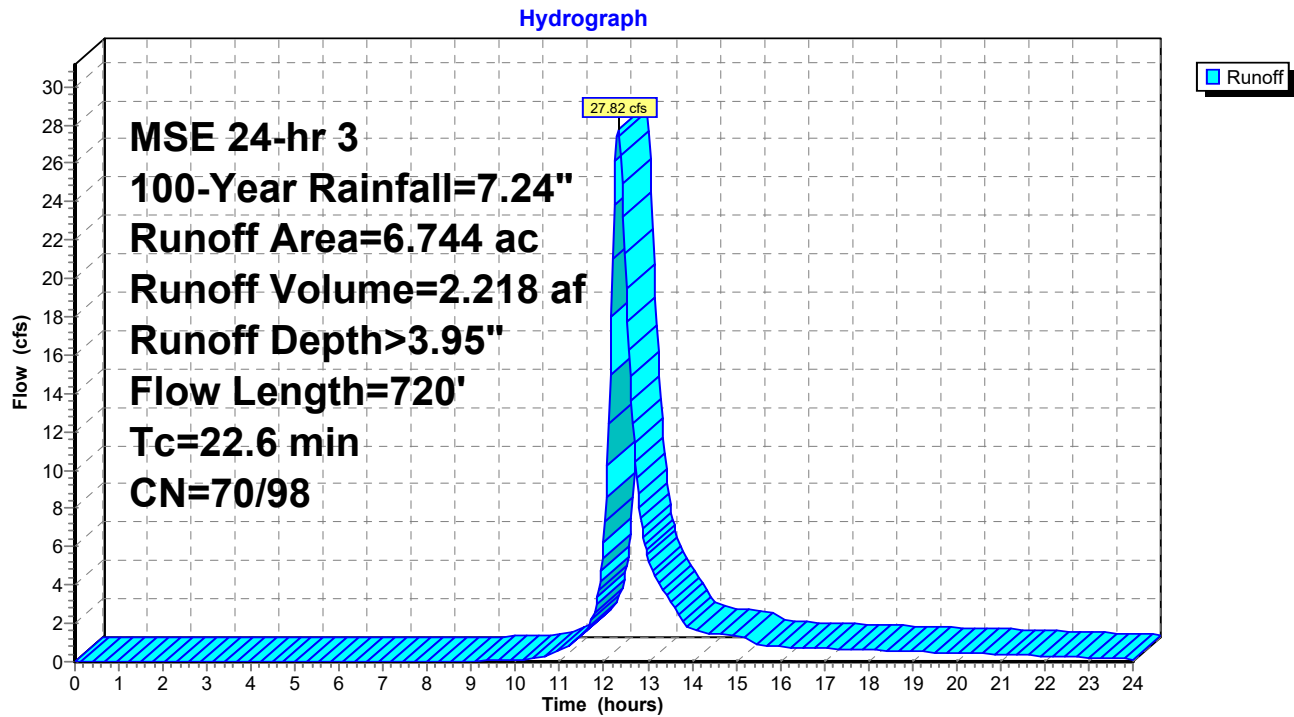
Runoff = 27.82 cfs @ 12.33 hrs, Volume= 2.218 af, Depth> 3.95"
 Routed to Pond 46P : Wet2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.001	74	>75% Grass cover, Good, HSG C
* 0.143	98	impervious - old
* 0.141	98	wetland
6.444	70	Woods, Good, HSG C
0.015	77	Woods, Good, HSG D
6.744	71	Weighted Average
6.460	70	95.79% Pervious Area
0.284	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
7.6	500	0.0480	1.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	120	0.0500	6.94	69.40	Channel Flow, Area= 10.0 sf Perim= 16.0' r= 0.63' n= 0.035
22.6	720	Total			

Subcatchment 38S: PR7



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MSE 24-hr 3 100-Year Rainfall=7.24"

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Summary for Subcatchment 39S: PR8

Runoff = 3.13 cfs @ 12.23 hrs, Volume= 0.212 af, Depth> 5.03"
Routed to Pond 33P : Basin 2 - CB_WoodlandCove

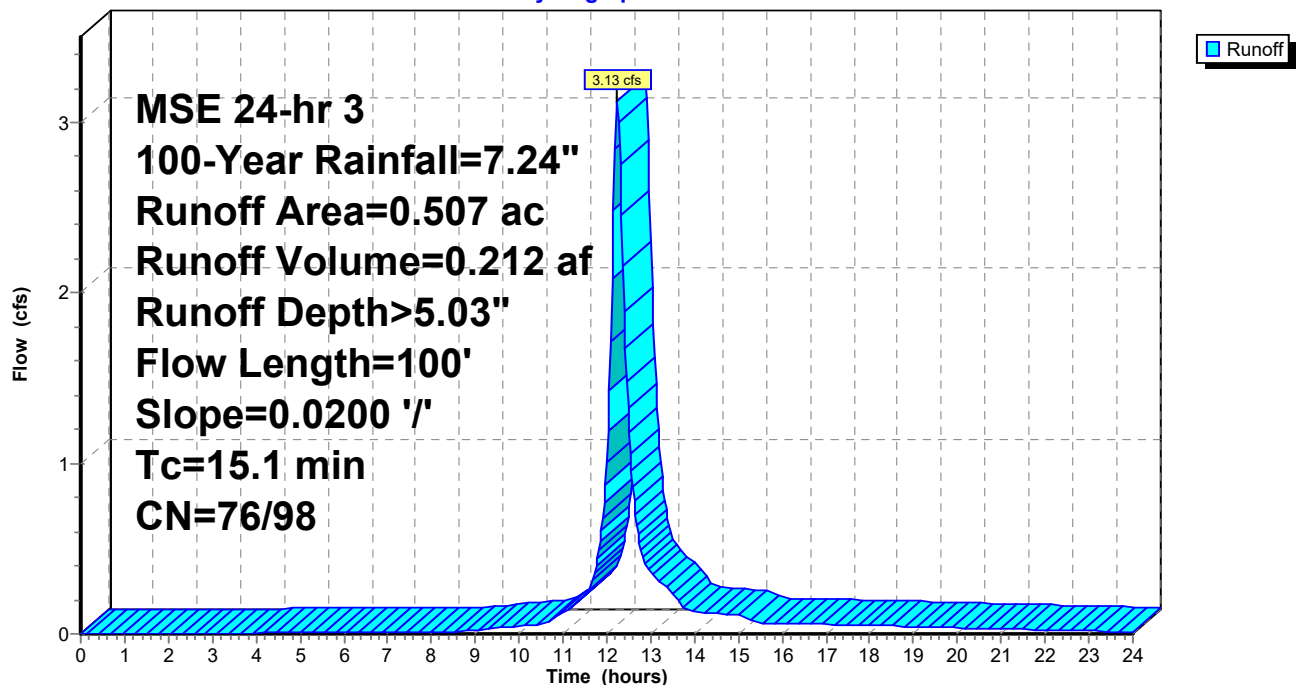
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.159	80	>75% Grass cover, Good, HSG D
* 0.000	98	impervious - new
0.236	74	>75% Grass cover, Good, HSG C
* 0.112	98	impervious - old
0.507	81	Weighted Average
0.395	76	77.91% Pervious Area
0.112	98	22.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 39S: PR8

Hydrograph



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MSE 24-hr 3 100-Year Rainfall=7.24"

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Summary for Subcatchment 41S: PR1

Runoff = 12.64 cfs @ 12.13 hrs, Volume= 0.651 af, Depth> 6.08"
Routed to Pond 48P : Pond1

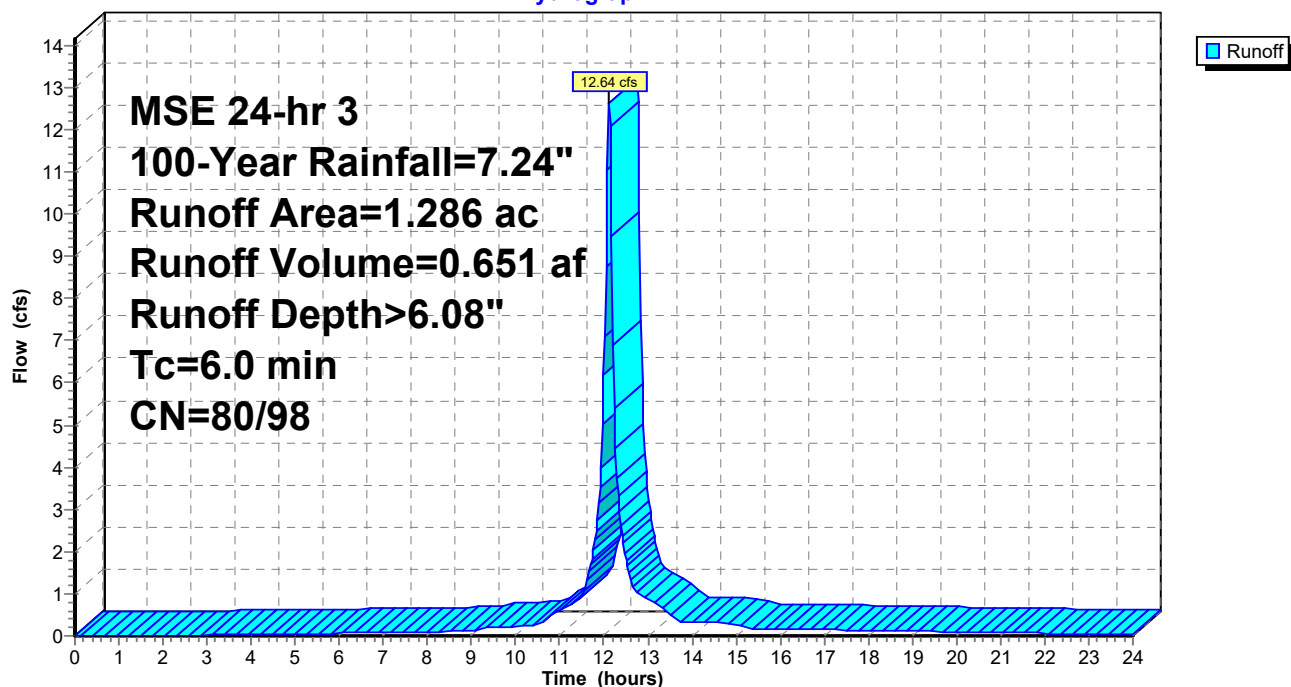
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.043	74	>75% Grass cover, Good, HSG C
0.477	80	>75% Grass cover, Good, HSG D
* 0.545	98	impervious - new
* 0.172	98	pond
0.049	80	>75% Grass cover, Good, HSG D
1.286	90	Weighted Average
0.569	80	44.25% Pervious Area
0.717	98	55.75% Impervious Area

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

Subcatchment 41S: PR1

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Summary for Subcatchment 50S: PR3

Runoff = 7.77 cfs @ 12.24 hrs, Volume= 0.527 af, Depth> 4.77"
 Routed to Reach 44R : Woodland Cove Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.597	74	>75% Grass cover, Good, HSG C
0.610	80	>75% Grass cover, Good, HSG D
* 0.057	98	impervious - old
* 0.032	98	impervious - new
0.010	80	>75% Grass cover, Good, HSG D
* 0.019	98	impervious - new
1.325	79	Weighted Average
1.217	77	91.85% Pervious Area
0.108	98	8.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"
0.8	100	0.0900	2.10		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
15.9	200	Total			

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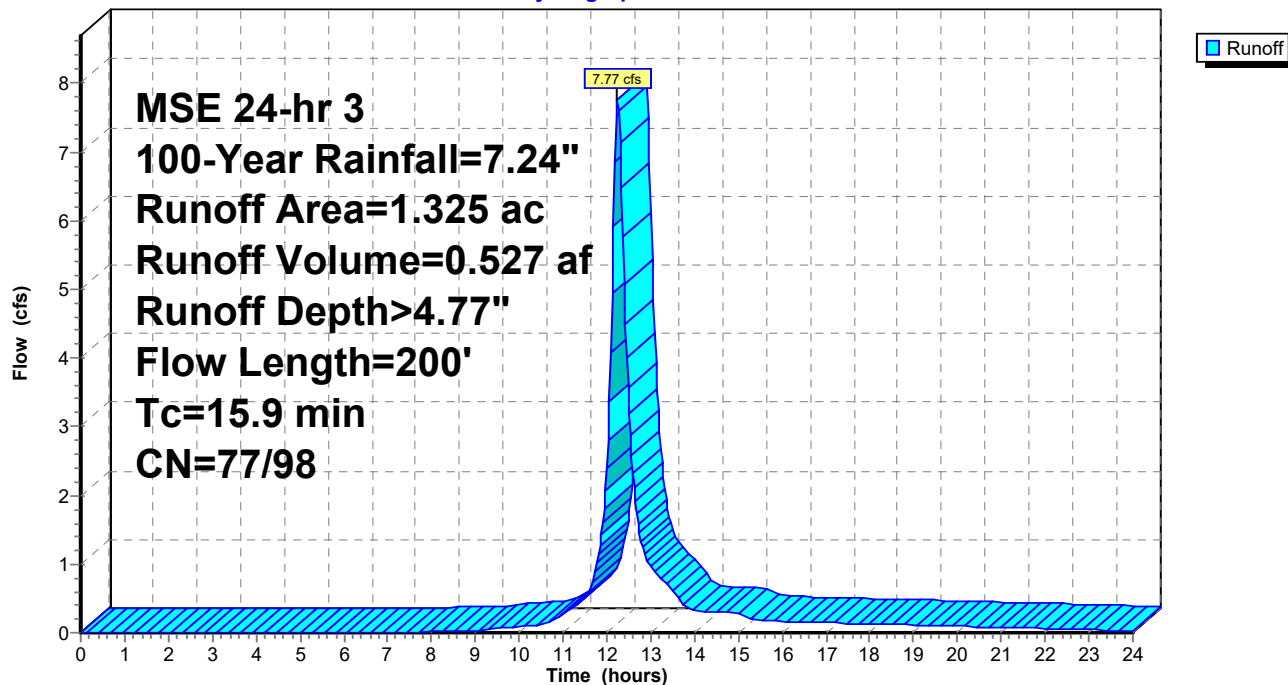
MSE 24-hr 3 100-Year Rainfall=7.24"

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Subcatchment 50S: PR3

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Summary for Subcatchment 52S: PR4

Runoff = 1.32 cfs @ 12.19 hrs, Volume= 0.081 af, Depth> 5.43"
Routed to Pond 35P : CB West

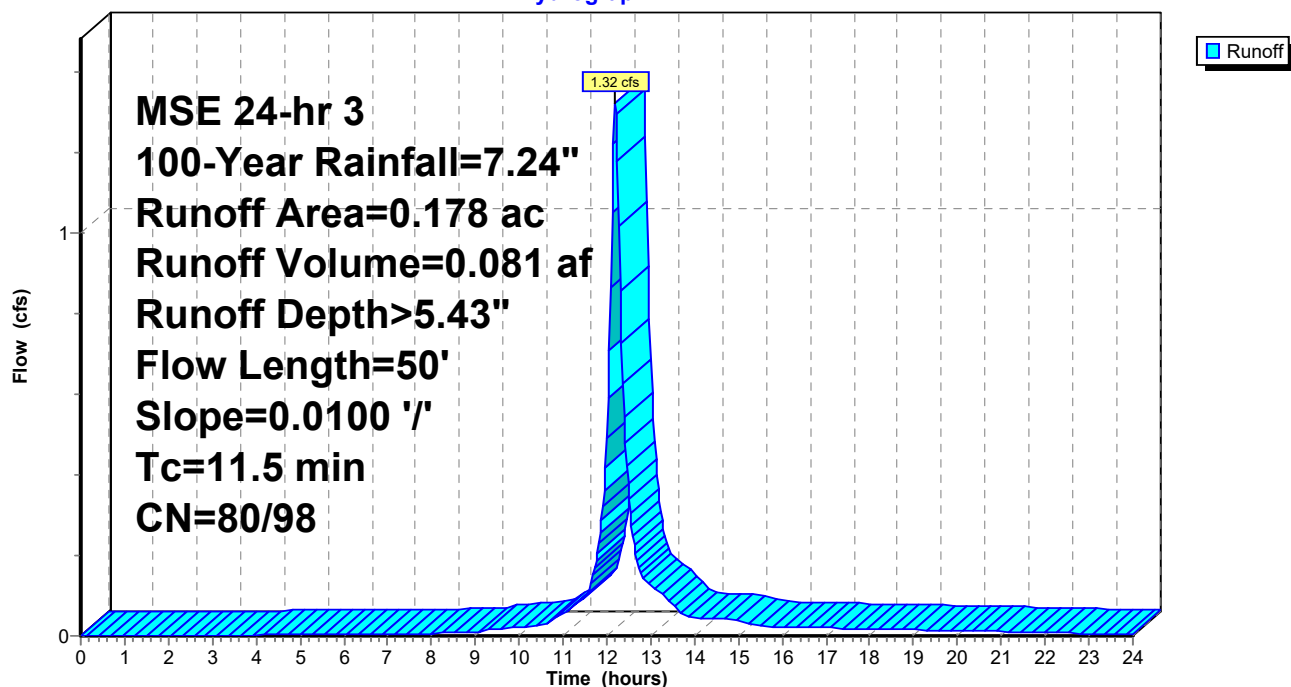
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.098	80	>75% Grass cover, Good, HSG D
* 0.037	98	impervious - new
0.036	80	>75% Grass cover, Good, HSG D
* 0.007	98	impervious - new
0.178	84	Weighted Average
0.134	80	75.28% Pervious Area
0.044	98	24.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 52S: PR4

Hydrograph



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MSE 24-hr 3 100-Year Rainfall=7.24"

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Summary for Subcatchment 53S: PR5

Runoff = 7.16 cfs @ 12.25 hrs, Volume= 0.485 af, Depth> 4.59"
Routed to Pond 33P : Basin 2 - CB_WoodlandCove

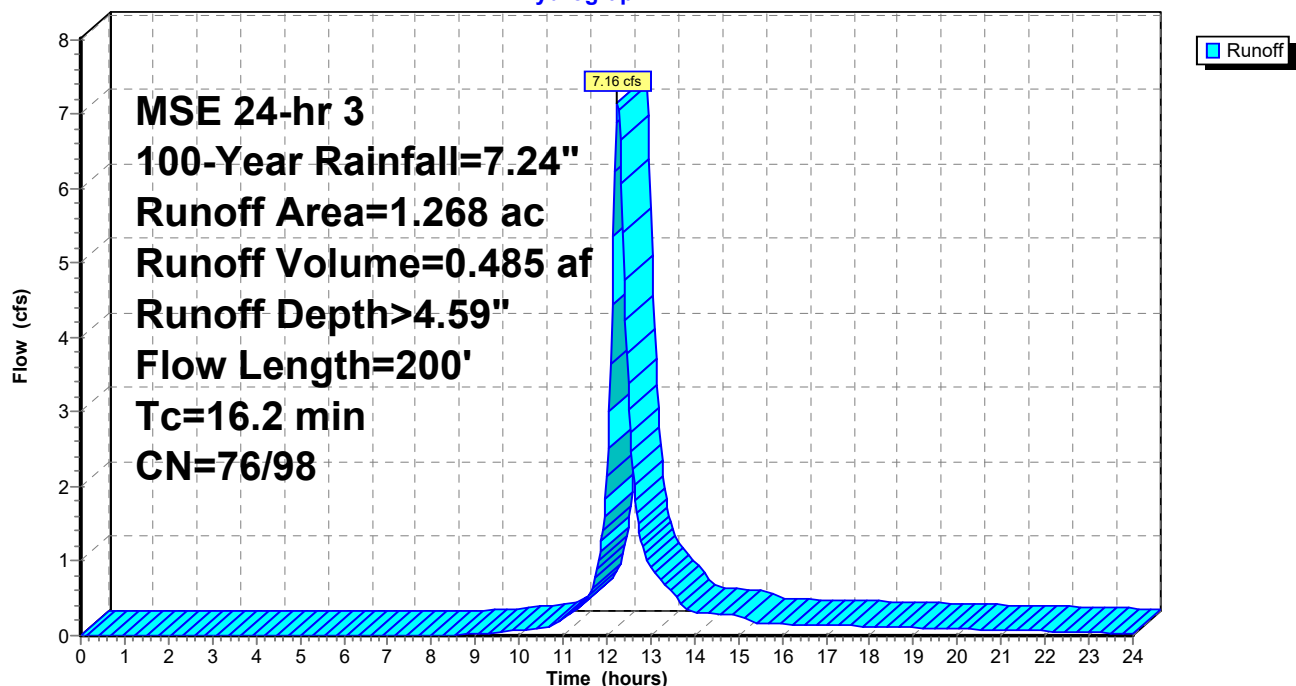
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 100-Year Rainfall=7.24"

Area (ac)	CN	Description
0.490	80	>75% Grass cover, Good, HSG D
* 0.012	98	impervious - new
0.715	74	>75% Grass cover, Good, HSG C
* 0.051	98	impervious - old
1.268	78	Weighted Average
1.205	76	95.03% Pervious Area
0.063	98	4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"
1.1	100	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
16.2	200	Total			

Subcatchment 53S: PR5

Hydrograph



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MSE 24-hr 3 100-Year Rainfall=7.24"

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Summary for Reach 44R: Woodland Cove Pond

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.047 ac, 25.26% Impervious, Inflow Depth > 4.73" for 100-Year event

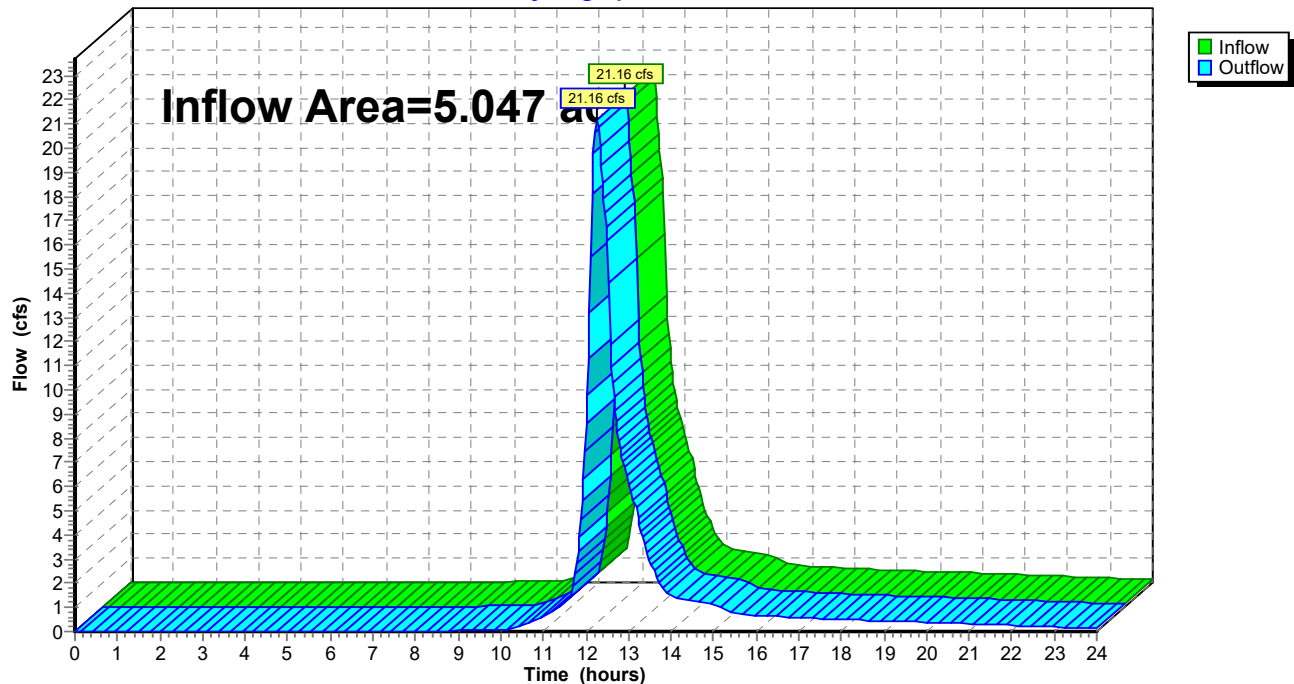
Inflow = 21.16 cfs @ 12.25 hrs, Volume= 1.990 af

Outflow = 21.16 cfs @ 12.25 hrs, Volume= 1.990 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Reach 44R: Woodland Cove Pond

Hydrograph



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MSE 24-hr 3 100-Year Rainfall=7.24"

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Summary for Reach 45R: Wet2_out

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 4.47" for 100-Year event
Inflow = 83.43 cfs @ 12.49 hrs, Volume= 9.149 af
Outflow = 83.39 cfs @ 12.50 hrs, Volume= 9.147 af, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Max. Velocity= 4.35 fps, Min. Travel Time= 0.6 min

Avg. Velocity = 1.44 fps, Avg. Travel Time= 1.7 min

Peak Storage= 2,874 cf @ 12.50 hrs

Average Depth at Peak Storage= 1.50' , Surface Width= 19.51'

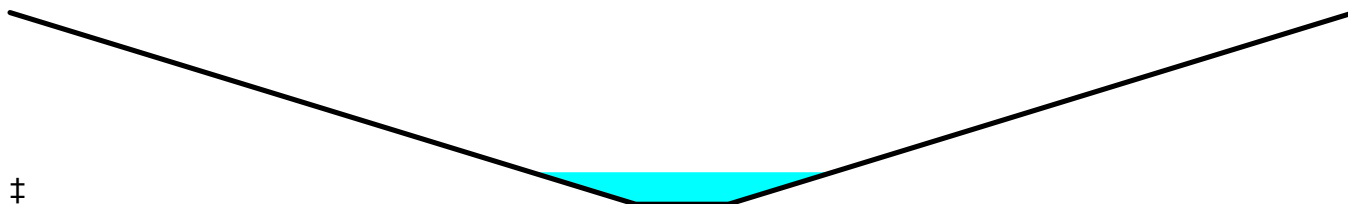
Bank-Full Depth= 9.00' Flow Area= 418.5 sf, Capacity= 5,231.48 cfs

6.00' x 9.00' deep channel, n= 0.035

Side Slope Z-value= 4.5 ' ' Top Width= 87.00'

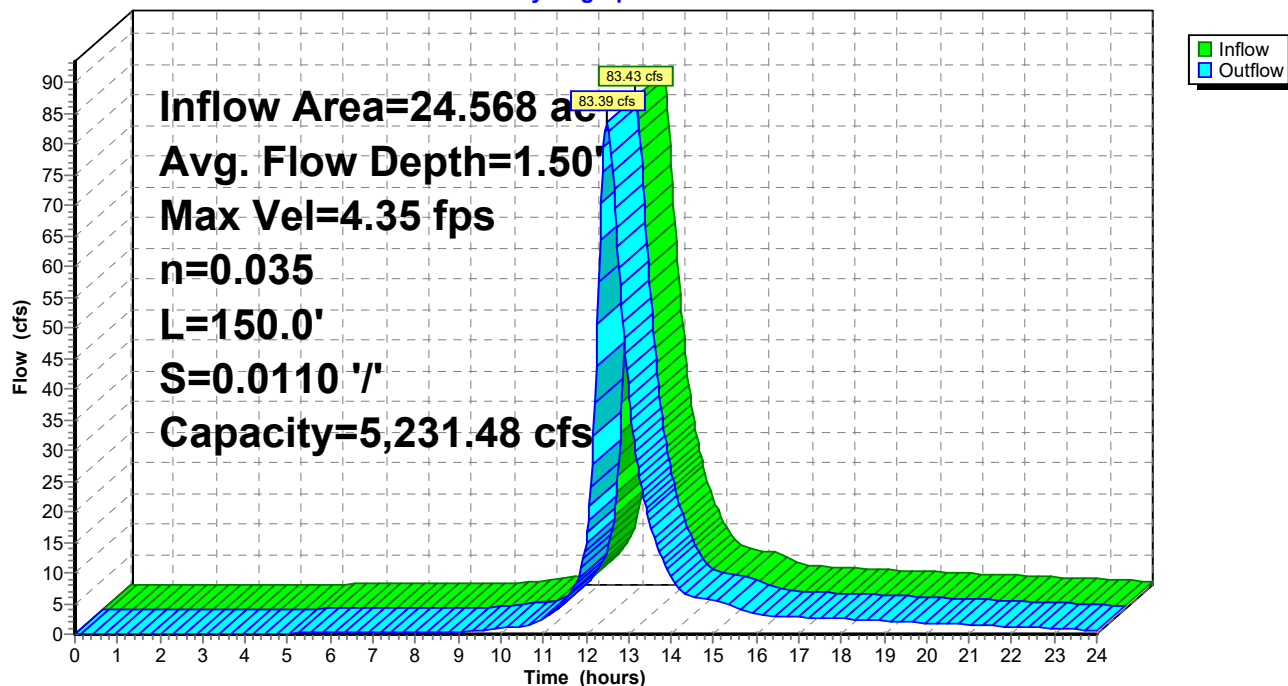
Length= 150.0' Slope= 0.0110 ' '

Inlet Invert= 988.00', Outlet Invert= 986.35'



Reach 45R: Wet2_out

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Stage-Area-Storage for Reach 45R: Wet2_out

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
988.00	0.0	0	993.10	147.7	22,148
988.10	0.6	97	993.20	152.9	22,933
988.20	1.4	208	993.30	158.2	23,731
988.30	2.2	332	993.40	163.6	24,543
988.40	3.1	469	993.50	169.1	25,369
988.50	4.1	620	993.60	174.7	26,209
988.60	5.2	784	993.70	180.4	27,062
988.70	6.4	962	993.80	186.2	27,928
988.80	7.7	1,153	993.90	192.1	28,808
988.90	9.0	1,357	994.00	198.0	29,701
989.00	10.5	1,576	994.10	204.1	30,608
989.10	12.1	1,808	994.20	210.2	31,528
989.20	13.7	2,053	994.30	216.4	32,461
989.30	15.4	2,312	994.40	222.7	33,409
989.40	17.2	2,584	994.50	229.1	34,370
989.50	19.1	2,870	994.60	235.6	35,344
989.60	21.1	3,169	994.70	242.2	36,332
989.70	23.2	3,481	994.80	248.9	37,333
989.80	25.4	3,807	994.90	255.7	38,348
989.90	27.6	4,147	995.00	262.5	39,376
990.00	30.0	4,501	995.10	269.4	40,417
990.10	32.5	4,868	995.20	276.5	41,472
990.20	35.0	5,248	995.30	283.6	42,541
990.30	37.6	5,642	995.40	290.8	43,624
990.40	40.3	6,049	995.50	298.1	44,720
990.50	43.1	6,470	995.60	305.5	45,829
990.60	46.0	6,904	995.70	313.0	46,952
990.70	49.0	7,351	995.80	320.6	48,088
990.80	52.1	7,813	995.90	328.3	49,238
990.90	55.3	8,288	996.00	336.0	50,401
991.00	58.5	8,776	996.10	343.8	51,577
991.10	61.9	9,278	996.20	351.8	52,768
991.20	65.3	9,793	996.30	359.8	53,972
991.30	68.8	10,322	996.40	367.9	55,189
991.40	72.4	10,864	996.50	376.1	56,420
991.50	76.1	11,419	996.60	384.4	57,664
991.60	79.9	11,988	996.70	392.8	58,922
991.70	83.8	12,571	996.80	401.3	60,193
991.80	87.8	13,168	996.90	409.8	61,477
991.90	91.9	13,778	997.00	418.5	62,775
992.00	96.0	14,401			
992.10	100.3	15,038			
992.20	104.6	15,688			
992.30	109.0	16,352			
992.40	113.5	17,029			
992.50	118.1	17,719			
992.60	122.8	18,424			
992.70	127.6	19,142			
992.80	132.5	19,873			
992.90	137.5	20,618			
993.00	142.5	21,376			

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Summary for Pond 33P: Basin 2 - CB_WoodlandCove

Inflow Area = 1.775 ac, 9.86% Impervious, Inflow Depth > 4.72" for 100-Year event
 Inflow = 10.28 cfs @ 12.24 hrs, Volume= 0.698 af
 Outflow = 7.75 cfs @ 12.35 hrs, Volume= 0.687 af, Atten= 25%, Lag= 6.8 min
 Primary = 7.75 cfs @ 12.35 hrs, Volume= 0.687 af
 Routed to Reach 44R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 47P : Wet1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 1,004.91' @ 12.35 hrs Surf.Area= 2,987 sf Storage= 2,277 cf

Plug-Flow detention time= 15.0 min calculated for 0.686 af (98% of inflow)
 Center-of-Mass det. time= 5.9 min (801.9 - 796.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,003.00'	12,577 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,003.00	303	0	0
1,004.00	800	552	552
1,005.00	3,200	2,000	2,552
1,007.00	3,400	6,600	9,152
1,008.00	3,450	3,425	12,577

Device	Routing	Invert	Outlet Devices
#1	Primary	998.45'	12.0" Round Culvert L= 85.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.45' / 998.06' S= 0.0046 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	998.62'	12.0" Round Culvert L= 13.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.62' / 998.55' S= 0.0052 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	1,003.90'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	1,005.90'	20.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#5	Device 2	1,003.00'	0.01 cfs Filtration at all elevations Phase-In= 0.01'

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Primary OutFlow Max=7.75 cfs @ 12.35 hrs HW=1,004.91' TW=0.00' (Dynamic Tailwater)

1=Culvert (Barrel Controls 7.75 cfs @ 9.87 fps)

2=Culvert (Passes 7.75 cfs of 11.37 cfs potential flow)

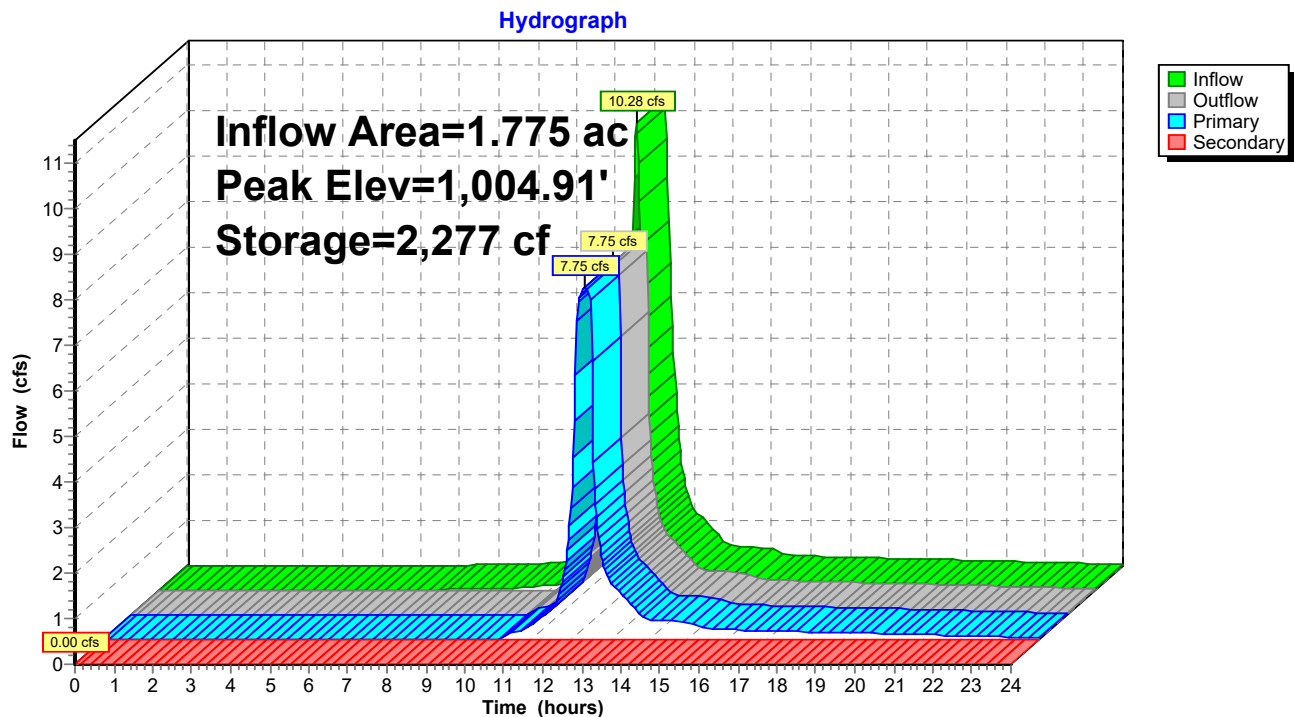
3=Orifice/Grate (Passes < 19.23 cfs potential flow)

5=Filtration (Passes < 0.01 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,003.00' TW=988.00' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 33P: Basin 2 - CB_WoodlandCove



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Stage-Area-Storage for Pond 33P: Basin 2 - CB_WoodlandCove

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,003.00	303	0	1,005.55	3,255	4,327
1,003.05	328	16	1,005.60	3,260	4,490
1,003.10	353	33	1,005.65	3,265	4,653
1,003.15	378	51	1,005.70	3,270	4,816
1,003.20	402	71	1,005.75	3,275	4,980
1,003.25	427	91	1,005.80	3,280	5,143
1,003.30	452	113	1,005.85	3,285	5,308
1,003.35	477	136	1,005.90	3,290	5,472
1,003.40	502	161	1,005.95	3,295	5,637
1,003.45	527	187	1,006.00	3,300	5,802
1,003.50	552	214	1,006.05	3,305	5,967
1,003.55	576	242	1,006.10	3,310	6,132
1,003.60	601	271	1,006.15	3,315	6,298
1,003.65	626	302	1,006.20	3,320	6,464
1,003.70	651	334	1,006.25	3,325	6,630
1,003.75	676	367	1,006.30	3,330	6,796
1,003.80	701	401	1,006.35	3,335	6,963
1,003.85	725	437	1,006.40	3,340	7,129
1,003.90	750	474	1,006.45	3,345	7,297
1,003.95	775	512	1,006.50	3,350	7,464
1,004.00	800	552	1,006.55	3,355	7,632
1,004.05	920	594	1,006.60	3,360	7,800
1,004.10	1,040	644	1,006.65	3,365	7,968
1,004.15	1,160	698	1,006.70	3,370	8,136
1,004.20	1,280	760	1,006.75	3,375	8,305
1,004.25	1,400	827	1,006.80	3,380	8,473
1,004.30	1,520	899	1,006.85	3,385	8,643
1,004.35	1,640	979	1,006.90	3,390	8,812
1,004.40	1,760	1,063	1,006.95	3,395	8,982
1,004.45	1,880	1,155	1,007.00	3,400	9,152
1,004.50	2,000	1,252	1,007.05	3,402	9,322
1,004.55	2,120	1,354	1,007.10	3,405	9,492
1,004.60	2,240	1,464	1,007.15	3,407	9,662
1,004.65	2,360	1,578	1,007.20	3,410	9,833
1,004.70	2,480	1,700	1,007.25	3,413	10,003
1,004.75	2,600	1,827	1,007.30	3,415	10,174
1,004.80	2,720	1,959	1,007.35	3,418	10,345
1,004.85	2,840	2,099	1,007.40	3,420	10,515
1,004.90	2,960	2,243	1,007.45	3,423	10,687
1,004.95	3,080	2,395	1,007.50	3,425	10,858
1,005.00	3,200	2,552	1,007.55	3,427	11,029
1,005.05	3,205	2,712	1,007.60	3,430	11,201
1,005.10	3,210	2,872	1,007.65	3,432	11,372
1,005.15	3,215	3,033	1,007.70	3,435	11,544
1,005.20	3,220	3,194	1,007.75	3,438	11,716
1,005.25	3,225	3,355	1,007.80	3,440	11,887
1,005.30	3,230	3,516	1,007.85	3,443	12,060
1,005.35	3,235	3,678	1,007.90	3,445	12,232
1,005.40	3,240	3,839	1,007.95	3,448	12,404
1,005.45	3,245	4,002	1,008.00	3,450	12,577
1,005.50	3,250	4,164			

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Summary for Pond 35P: CB West

Inflow Area = 0.178 ac, 24.72% Impervious, Inflow Depth > 5.43" for 100-Year event
 Inflow = 1.32 cfs @ 12.19 hrs, Volume= 0.081 af
 Outflow = 1.32 cfs @ 12.19 hrs, Volume= 0.081 af, Atten= 0%, Lag= 0.1 min
 Primary = 1.32 cfs @ 12.19 hrs, Volume= 0.081 af
 Routed to Pond 48P : Pond1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 1,007.65' @ 12.19 hrs Surf.Area= 109 sf Storage= 12 cf

Plug-Flow detention time= 0.2 min calculated for 0.080 af (100% of inflow)
 Center-of-Mass det. time= 0.2 min (778.5 - 778.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,007.50'	850 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

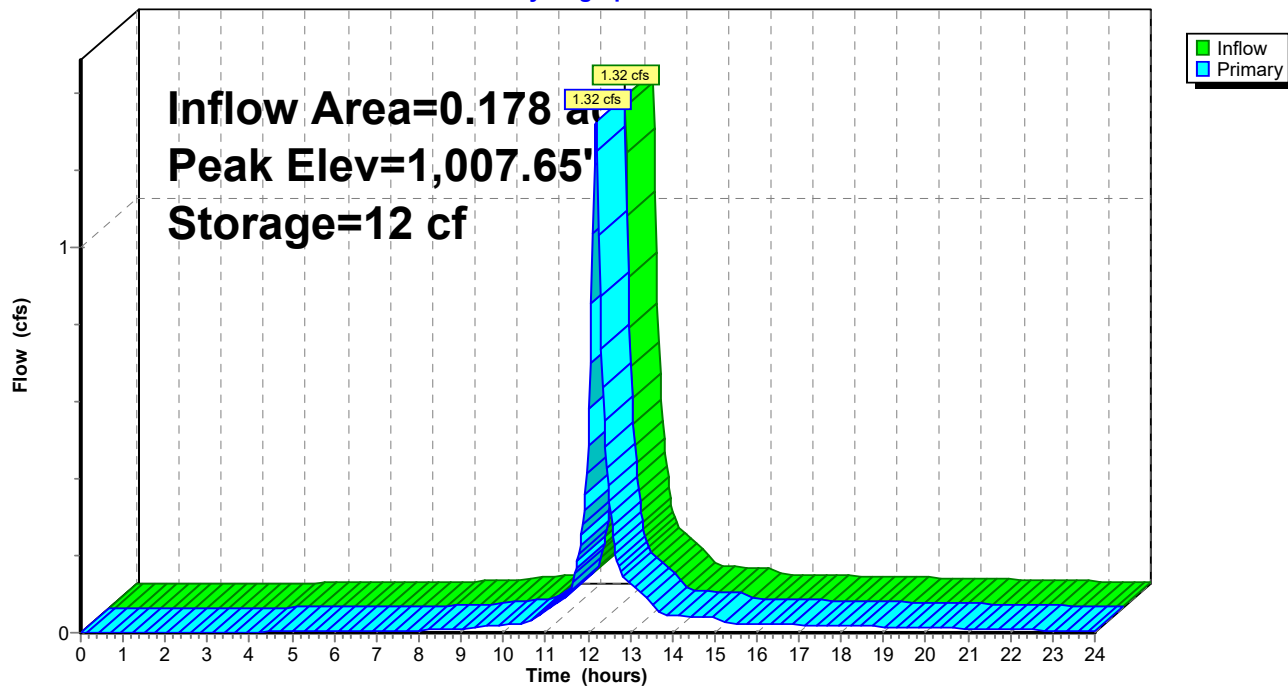
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,007.50	50	0	0
1,008.00	250	75	75
1,009.00	1,300	775	850

Device	Routing	Invert	Outlet Devices
#1	Primary	1,007.50'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.31 cfs @ 12.19 hrs HW=1,007.65' TW=1,004.08' (Dynamic Tailwater)
 ↑ **1=Orifice/Grate** (Weir Controls 1.31 cfs @ 1.26 fps)

Pond 35P: CB West

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Stage-Area-Storage for Pond 35P: CB West

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,007.50	50	0	1,008.52	796	347
1,007.52	58	1	1,008.54	817	363
1,007.54	66	2	1,008.56	838	380
1,007.56	74	4	1,008.58	859	397
1,007.58	82	5	1,008.60	880	414
1,007.60	90	7	1,008.62	901	432
1,007.62	98	9	1,008.64	922	450
1,007.64	106	11	1,008.66	943	469
1,007.66	114	13	1,008.68	964	488
1,007.68	122	15	1,008.70	985	507
1,007.70	130	18	1,008.72	1,006	527
1,007.72	138	21	1,008.74	1,027	547
1,007.74	146	24	1,008.76	1,048	568
1,007.76	154	27	1,008.78	1,069	589
1,007.78	162	30	1,008.80	1,090	611
1,007.80	170	33	1,008.82	1,111	633
1,007.82	178	36	1,008.84	1,132	655
1,007.84	186	40	1,008.86	1,153	678
1,007.86	194	44	1,008.88	1,174	702
1,007.88	202	48	1,008.90	1,195	725
1,007.90	210	52	1,008.92	1,216	749
1,007.92	218	56	1,008.94	1,237	774
1,007.94	226	61	1,008.96	1,258	799
1,007.96	234	65	1,008.98	1,279	824
1,007.98	242	70	1,009.00	1,300	850
1,008.00	250	75			
1,008.02	271	80			
1,008.04	292	86			
1,008.06	313	92			
1,008.08	334	98			
1,008.10	355	105			
1,008.12	376	113			
1,008.14	397	120			
1,008.16	418	128			
1,008.18	439	137			
1,008.20	460	146			
1,008.22	481	155			
1,008.24	502	165			
1,008.26	523	175			
1,008.28	544	186			
1,008.30	565	197			
1,008.32	586	209			
1,008.34	607	221			
1,008.36	628	233			
1,008.38	649	246			
1,008.40	670	259			
1,008.42	691	273			
1,008.44	712	287			
1,008.46	733	301			
1,008.48	754	316			
1,008.50	775	331			

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Summary for Pond 46P: Wet2

Inflow Area = 6.744 ac, 4.21% Impervious, Inflow Depth > 3.95" for 100-Year event
 Inflow = 27.82 cfs @ 12.33 hrs, Volume= 2.218 af
 Outflow = 16.94 cfs @ 12.56 hrs, Volume= 2.204 af, Atten= 39%, Lag= 13.5 min
 Primary = 16.94 cfs @ 12.56 hrs, Volume= 2.204 af
 Routed to Pond 47P : Wet1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 47P : Wet1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 991.00' Surf.Area= 2,915 sf Storage= 1,508 cf

Peak Elev= 993.43' @ 12.56 hrs Surf.Area= 15,954 sf Storage= 21,367 cf (19,859 cf above start)

Plug-Flow detention time= 33.2 min calculated for 2.169 af (98% of inflow)

Center-of-Mass det. time= 17.5 min (831.9 - 814.4)

Volume	Invert	Avail.Storage	Storage Description
#1	990.00'	221,260 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
990.00	100	0	0
992.00	5,730	5,830	5,830
994.00	20,000	25,730	31,560
996.00	47,200	67,200	98,760
998.00	75,300	122,500	221,260

Device	Routing	Invert	Outlet Devices
#1	Primary	991.00'	24.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 991.00' / 990.00' S= 0.0192 '/' Cc= 0.900 n= 0.024, Flow Area= 3.14 sf
#2	Secondary	997.00'	25.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=16.93 cfs @ 12.56 hrs HW=993.43' TW=989.48' (Dynamic Tailwater)↑**1=Culvert** (Barrel Controls 16.93 cfs @ 5.63 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=991.00' TW=988.00' (Dynamic Tailwater)↑**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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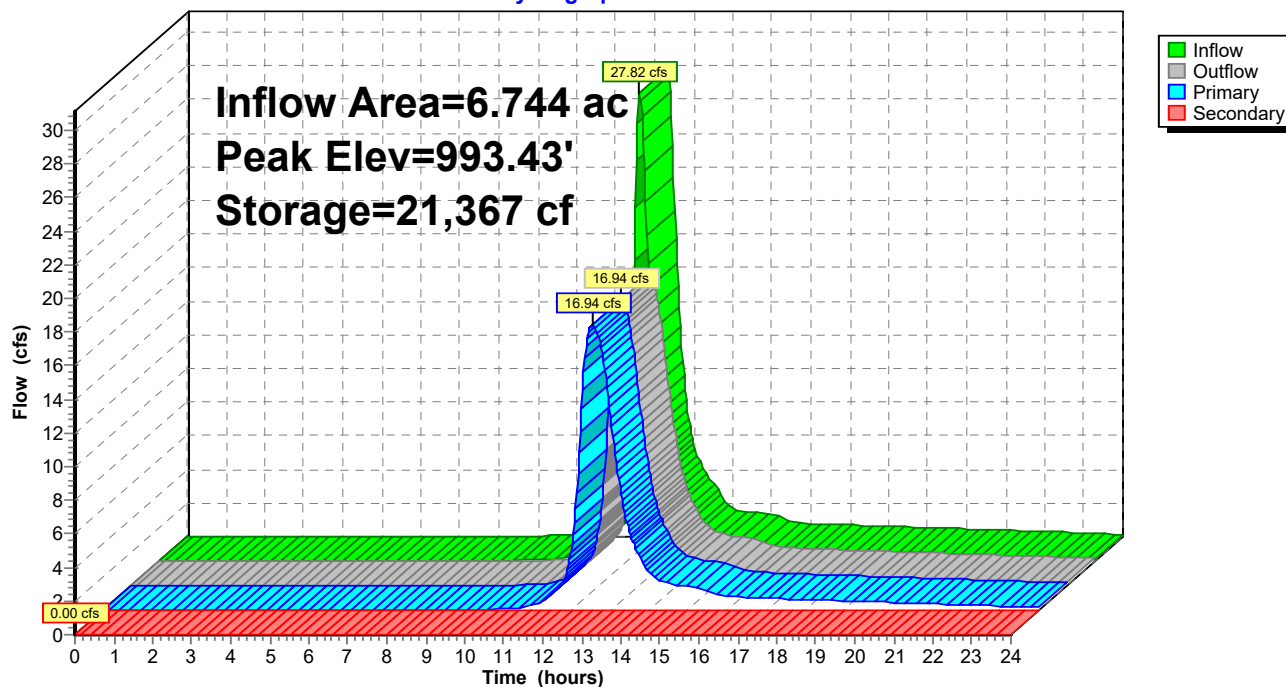
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Pond 46P: Wet2

Hydrograph



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Stage-Area-Storage for Pond 46P: Wet2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
990.00	100	0	995.10	34,960	61,788
990.10	382	24	995.20	36,320	65,352
990.20	663	76	995.30	37,680	69,052
990.30	944	157	995.40	39,040	72,888
990.40	1,226	265	995.50	40,400	76,860
990.50	1,508	402	995.60	41,760	80,968
990.60	1,789	567	995.70	43,120	85,212
990.70	2,071	760	995.80	44,480	89,592
990.80	2,352	981	995.90	45,840	94,108
990.90	2,633	1,230	996.00	47,200	98,760
991.00	2,915	1,508	996.10	48,605	103,550
991.10	3,197	1,813	996.20	50,010	108,481
991.20	3,478	2,147	996.30	51,415	113,552
991.30	3,759	2,509	996.40	52,820	118,764
991.40	4,041	2,899	996.50	54,225	124,116
991.50	4,323	3,317	996.60	55,630	129,609
991.60	4,604	3,763	996.70	57,035	135,242
991.70	4,886	4,238	996.80	58,440	141,016
991.80	5,167	4,740	996.90	59,845	146,930
991.90	5,448	5,271	997.00	61,250	152,985
992.00	5,730	5,830	997.10	62,655	159,180
992.10	6,444	6,439	997.20	64,060	165,516
992.20	7,157	7,119	997.30	65,465	171,992
992.30	7,870	7,870	997.40	66,870	178,609
992.40	8,584	8,693	997.50	68,275	185,366
992.50	9,298	9,587	997.60	69,680	192,264
992.60	10,011	10,552	997.70	71,085	199,302
992.70	10,725	11,589	997.80	72,490	206,481
992.80	11,438	12,697	997.90	73,895	213,800
992.90	12,151	13,877	998.00	75,300	221,260
993.00	12,865	15,128			
993.10	13,579	16,450			
993.20	14,292	17,843			
993.30	15,005	19,308			
993.40	15,719	20,844			
993.50	16,433	22,452			
993.60	17,146	24,131			
993.70	17,860	25,881			
993.80	18,573	27,703			
993.90	19,286	29,596			
994.00	20,000	31,560			
994.10	21,360	33,628			
994.20	22,720	35,832			
994.30	24,080	38,172			
994.40	25,440	40,648			
994.50	26,800	43,260			
994.60	28,160	46,008			
994.70	29,520	48,892			
994.80	30,880	51,912			
994.90	32,240	55,068			
995.00	33,600	58,360			

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Summary for Pond 47P: Wet1

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 4.47" for 100-Year event
 Inflow = 96.35 cfs @ 12.37 hrs, Volume= 9.155 af
 Outflow = 83.43 cfs @ 12.49 hrs, Volume= 9.149 af, Atten= 13%, Lag= 7.5 min
 Primary = 83.43 cfs @ 12.49 hrs, Volume= 9.149 af
 Routed to Reach 45R : Wet2_out

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 989.50' @ 12.49 hrs Surf.Area= 1.301 ac Storage= 0.986 af

Plug-Flow detention time= 8.5 min calculated for 9.149 af (100% of inflow)
 Center-of-Mass det. time= 8.1 min (818.1 - 810.0)

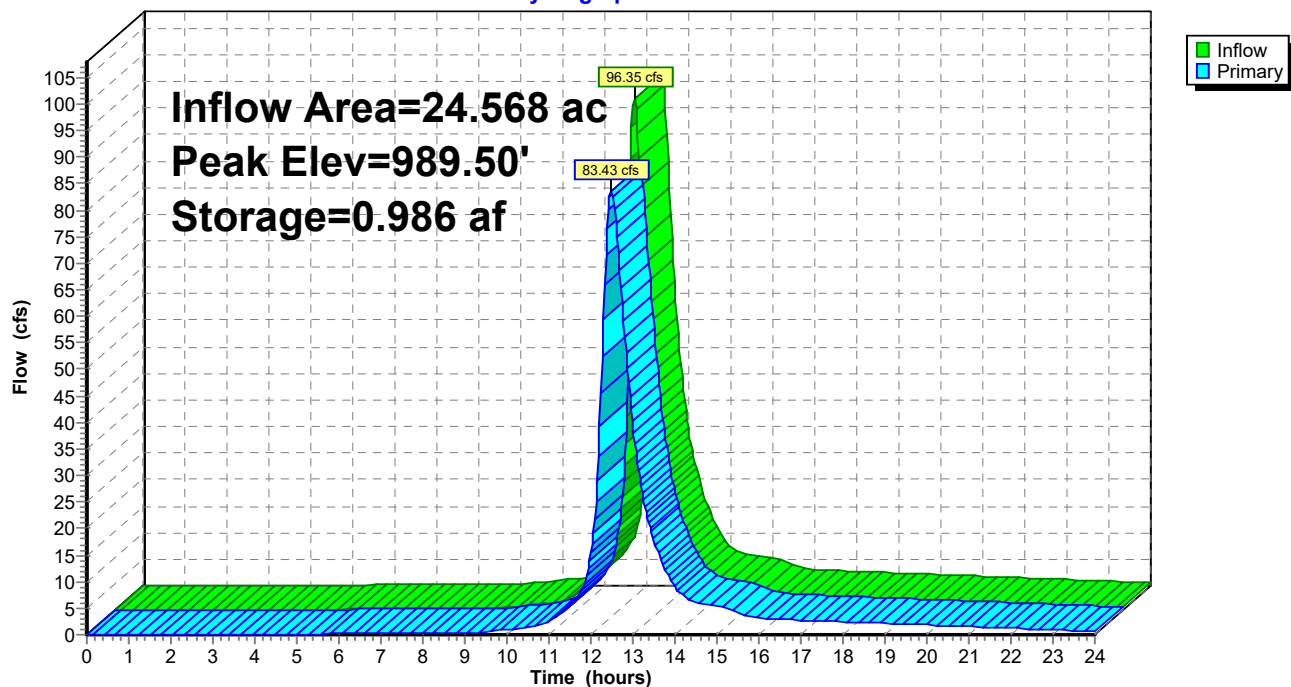
Volume	Invert	Avail.Storage	Storage Description
#1	988.00'	23.952 af	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
988.00	0.020	0.000	0.000
989.50	1.290	0.983	0.983
990.00	3.430	1.180	2.162
992.00	5.580	9.010	11.172
994.00	7.200	12.780	23.952

Device	Routing	Invert	Outlet Devices
#1	Primary	988.00'	Channel/Reach using Reach 45R: Wet2_out

Primary OutFlow Max=83.30 cfs @ 12.49 hrs HW=989.50' TW=989.50' (Dynamic Tailwater)
 ↑1=Channel/Reach (Channel Controls 83.30 cfs @ 4.35 fps)

Pond 47P: Wet1

Hydrograph



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Stage-Area-Storage for Pond 47P: Wet1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
988.00	0.020	0.000	993.10	6.471	17.801
988.10	0.105	0.006	993.20	6.552	18.452
988.20	0.189	0.021	993.30	6.633	19.111
988.30	0.274	0.044	993.40	6.714	19.778
988.40	0.359	0.076	993.50	6.795	20.454
988.50	0.443	0.116	993.60	6.876	21.137
988.60	0.528	0.164	993.70	6.957	21.829
988.70	0.613	0.221	993.80	7.038	22.529
988.80	0.697	0.287	993.90	7.119	23.237
988.90	0.782	0.361	994.00	7.200	23.952
989.00	0.867	0.443	994.10	7.200	23.952
989.10	0.951	0.534	994.20	7.200	23.952
989.20	1.036	0.634	994.30	7.200	23.952
989.30	1.121	0.741	994.40	7.200	23.952
989.40	1.205	0.858	994.50	7.200	23.952
989.50	1.290	0.983	994.60	7.200	23.952
989.60	1.718	1.133	994.70	7.200	23.952
989.70	2.146	1.326	994.80	7.200	23.952
989.80	2.574	1.562	994.90	7.200	23.952
989.90	3.002	1.841	995.00	7.200	23.952
990.00	3.430	2.162	995.10	7.200	23.952
990.10	3.538	2.511	995.20	7.200	23.952
990.20	3.645	2.870	995.30	7.200	23.952
990.30	3.752	3.240	995.40	7.200	23.952
990.40	3.860	3.620	995.50	7.200	23.952
990.50	3.967	4.012	995.60	7.200	23.952
990.60	4.075	4.414	995.70	7.200	23.952
990.70	4.183	4.827	995.80	7.200	23.952
990.80	4.290	5.250	995.90	7.200	23.952
990.90	4.397	5.685	996.00	7.200	23.952
991.00	4.505	6.130	996.10	7.200	23.952
991.10	4.613	6.586	996.20	7.200	23.952
991.20	4.720	7.053	996.30	7.200	23.952
991.30	4.827	7.530	996.40	7.200	23.952
991.40	4.935	8.018	996.50	7.200	23.952
991.50	5.042	8.517	996.60	7.200	23.952
991.60	5.150	9.027	996.70	7.200	23.952
991.70	5.258	9.547	996.80	7.200	23.952
991.80	5.365	10.078	996.90	7.200	23.952
991.90	5.472	10.620	997.00	7.200	23.952
992.00	5.580	11.172			
992.10	5.661	11.735			
992.20	5.742	12.305			
992.30	5.823	12.883			
992.40	5.904	13.469			
992.50	5.985	14.064			
992.60	6.066	14.666			
992.70	6.147	15.277			
992.80	6.228	15.896			
992.90	6.309	16.523			
993.00	6.390	17.157			

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Summary for Pond 48P: Pond1

Inflow Area = 1.947 ac, 50.95% Impervious, Inflow Depth > 5.90" for 100-Year event
 Inflow = 18.18 cfs @ 12.13 hrs, Volume= 0.958 af
 Outflow = 5.83 cfs @ 12.31 hrs, Volume= 0.776 af, Atten= 68%, Lag= 10.6 min
 Primary = 5.83 cfs @ 12.31 hrs, Volume= 0.776 af
 Routed to Reach 44R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 44R : Woodland Cove Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 1,002.00' Surf.Area= 4,596 sf Storage= 10,824 cf

Peak Elev= 1,004.19' @ 12.31 hrs Surf.Area= 10,396 sf Storage= 29,876 cf (19,052 cf above start)

Plug-Flow detention time= 192.9 min calculated for 0.527 af (55% of inflow)

Center-of-Mass det. time= 64.5 min (825.3 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1	998.00'	92,791 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 1.2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
998.00	810	0	0
1,000.00	2,190	3,000	3,000
1,002.00	3,830	6,020	9,020
1,002.10	6,000	492	9,512
1,003.00	7,220	5,949	15,460
1,004.00	8,360	7,790	23,250
1,005.00	9,930	9,145	32,395
1,007.00	11,000	20,930	53,325
1,008.00	12,000	11,500	64,825
1,009.00	13,000	12,500	77,325

Device	Routing	Invert	Outlet Devices
#1	Primary	999.50'	18.0" Round Culvert L= 149.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 999.50' / 999.10' S= 0.0027 ' S= 0.0027 ' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,004.50'	48.0" Horiz. grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,003.00'	Custom Weir/Orifice, Cv= 3.00 (C= 3.75) Head (feet) 0.00 0.50 0.51 4.00 Width (feet) 4.00 4.00 4.00 4.00
#4	Device 3	1,000.00'	15.0" Round lowflow L= 81.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 1,000.00' / 1,000.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Device 1	1,002.00'	0.04 cfs Filtration X 0.00 when above 1,002.00' Phase-In= 0.01'
#6	Secondary	1,008.00'	10.0' long + 4.0 ' SideZ x 3.0' breadth EOF Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50

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Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=5.83 cfs @ 12.31 hrs HW=1,004.19' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 5.83 cfs of 13.55 cfs potential flow)

2=grate (Controls 0.00 cfs)

3=Custom Weir/Orifice (Passes 5.83 cfs of 19.53 cfs potential flow)

4=lowflow (Outlet Controls 5.83 cfs @ 4.75 fps)

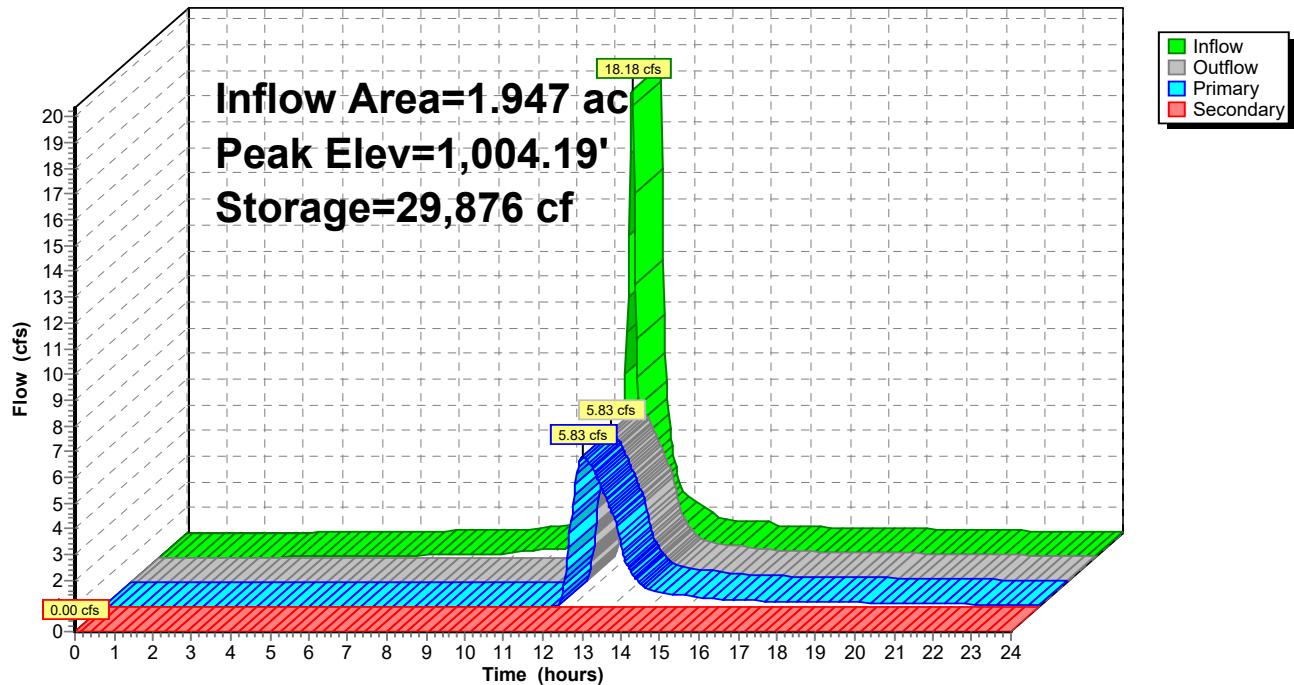
5=Filtration (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,002.00' TW=0.00' (Dynamic Tailwater)

6=EOF (Controls 0.00 cfs)

Pond 48P: Pond1

Hydrograph



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Stage-Area-Storage for Pond 48P: Pond1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
998.00	972	0	1,008.20	14,640	80,695
998.20	1,138	211	1,008.40	14,880	83,647
998.40	1,303	455	1,008.60	15,120	86,647
998.60	1,469	732	1,008.80	15,360	89,695
998.80	1,634	1,043	1,009.00	15,600	92,791
999.00	1,800	1,386			
999.20	1,966	1,763			
999.40	2,131	2,172			
999.60	2,297	2,615			
999.80	2,462	3,091			
1,000.00	2,628	3,600			
1,000.20	2,825	4,145			
1,000.40	3,022	4,730			
1,000.60	3,218	5,354			
1,000.80	3,415	6,017			
1,001.00	3,612	6,720			
1,001.20	3,809	7,462			
1,001.40	4,006	8,244			
1,001.60	4,202	9,064			
1,001.80	4,399	9,924			
1,002.00	4,596	10,824			
1,002.20	7,363	12,142			
1,002.40	7,688	13,647			
1,002.60	8,013	15,217			
1,002.80	8,339	16,852			
1,003.00	8,664	18,553			
1,003.20	8,938	20,313			
1,003.40	9,211	22,128			
1,003.60	9,485	23,997			
1,003.80	9,758	25,922			
1,004.00	10,032	27,901			
1,004.20	10,409	29,945			
1,004.40	10,786	32,064			
1,004.60	11,162	34,259			
1,004.80	11,539	36,529			
1,005.00	11,916	38,875			
1,005.20	12,044	41,271			
1,005.40	12,173	43,692			
1,005.60	12,301	46,140			
1,005.80	12,430	48,613			
1,006.00	12,558	51,112			
1,006.20	12,686	53,636			
1,006.40	12,815	56,186			
1,006.60	12,943	58,762			
1,006.80	13,072	61,363			
1,007.00	13,200	63,991			
1,007.20	13,440	66,655			
1,007.40	13,680	69,367			
1,007.60	13,920	72,127			
1,007.80	14,160	74,935			
1,008.00	14,400	77,791			

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Summary for Pond 56P: Woodland Cove Pond 2 AIRRIG/SED

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

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 997.35' Surf.Area= 68,822 sf Storage= 260,413 cf

Peak Elev= 997.35' @ 0.00 hrs Surf.Area= 68,822 sf Storage= 260,413 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no inflow)

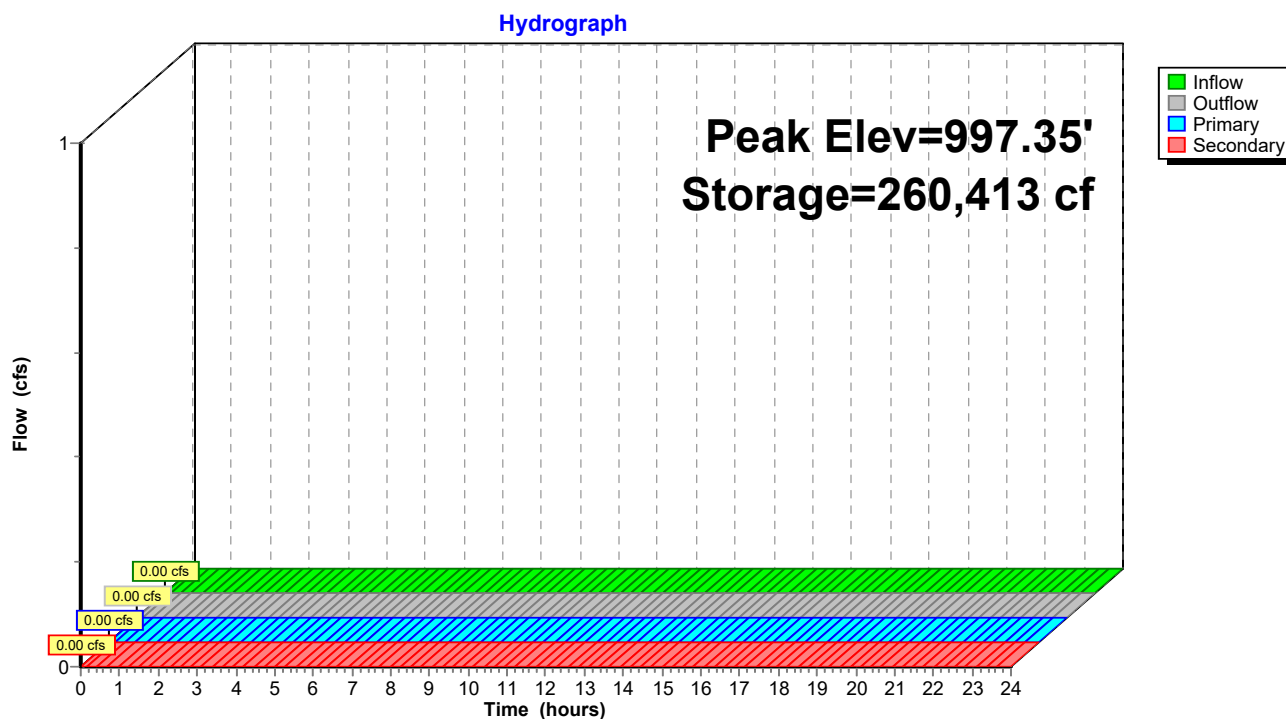
Volume	Invert	Avail.Storage	Storage Description
#1	998.00'	977,118 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
988.00	1,246	0	0
990.00	4,714	5,960	5,960
992.00	15,160	19,874	25,834
994.00	35,780	50,940	76,774
996.00	60,540	96,320	173,094
997.35	68,822	87,319	260,413
998.00	77,800	47,652	308,065
998.01	90,500	841	308,907
1,000.00	125,240	214,661	523,568
1,002.00	160,640	285,880	809,448
1,003.00	174,700	167,670	977,118

Device	Routing	Invert	Outlet Devices
#1	Primary	998.00'	12.0" Round Culvert L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 994.00' / 998.00' S= -0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	998.00'	0.500 cfs Constant Flow/Skimmer Phase-In= 0.01'

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=997.35' (Free Discharge)↑ **1=Culvert** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=997.35' (Free Discharge)↑ **2=Constant Flow/Skimmer** (Constant Controls 0.00 cfs)

Pond 56P: Woodland Cove Pond 2 AIRRIG/SED



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Stage-Area-Storage for Pond 56P: Woodland Cove Pond 2 AIRRIG/SED

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
988.00	1,246	0	998.20	93,817	326,417
988.20	1,593	284	998.40	97,308	345,530
988.40	1,940	637	998.60	100,800	365,340
988.60	2,286	1,060	998.80	104,291	385,850
988.80	2,633	1,552	999.00	107,783	407,057
989.00	2,980	2,113	999.20	111,274	428,963
989.20	3,327	2,744	999.40	114,766	451,567
989.40	3,674	3,444	999.60	118,257	474,869
989.60	4,020	4,213	999.80	121,749	498,869
989.80	4,367	5,052	1,000.00	125,240	523,568
990.00	4,714	5,960	1,000.20	128,780	548,970
990.20	5,759	7,007	1,000.40	132,320	575,080
990.40	6,803	8,263	1,000.60	135,860	601,898
990.60	7,848	9,729	1,000.80	139,400	629,424
990.80	8,892	11,403	1,001.00	142,940	657,658
991.00	9,937	13,286	1,001.20	146,480	686,600
991.20	10,982	15,377	1,001.40	150,020	716,250
991.40	12,026	17,678	1,001.60	153,560	746,608
991.60	13,071	20,188	1,001.80	157,100	777,674
991.80	14,115	22,906	1,002.00	160,640	809,448
992.00	15,160	25,834	1,002.20	163,452	841,858
992.20	17,222	29,072	1,002.40	166,264	874,829
992.40	19,284	32,723	1,002.60	169,076	908,363
992.60	21,346	36,786	1,002.80	171,888	942,459
992.80	23,408	41,261	1,003.00	174,700	977,118
993.00	25,470	46,149			
993.20	27,532	51,449			
993.40	29,594	57,162			
993.60	31,656	63,287			
993.80	33,718	69,824			
994.00	35,780	76,774			
994.20	38,256	84,178			
994.40	40,732	92,076			
994.60	43,208	100,470			
994.80	45,684	109,360			
995.00	48,160	118,744			
995.20	50,636	128,624			
995.40	53,112	138,998			
995.60	55,588	149,868			
995.80	58,064	161,234			
996.00	60,540	173,094			
996.20	61,767	185,325			
996.40	62,994	197,801			
996.60	64,221	210,522			
996.80	65,448	223,489			
997.00	66,675	236,701			
997.20	67,902	250,159			
997.40	69,513	263,872			
997.60	72,275	278,050			
997.80	75,038	292,782			
998.00	77,800	308,065			

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Time span=0.00-24.00 hrs, dt=0.03 hrs, 801 points x 2
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment35S: PR6	Runoff Area=0.483 ac 47.83% Impervious Runoff Depth>1.43" Tc=6.0 min CN=75/98 Runoff=1.12 cfs 0.057 af
Subcatchment37S: PR2	Runoff Area=17.824 ac 12.34% Impervious Runoff Depth>0.85" Flow Length=600' Tc=24.7 min CN=75/98 Runoff=13.61 cfs 1.261 af
Subcatchment38S: PR7	Runoff Area=6.744 ac 4.21% Impervious Runoff Depth>0.53" Flow Length=720' Tc=22.6 min CN=70/98 Runoff=3.05 cfs 0.298 af
Subcatchment39S: PR8	Runoff Area=0.507 ac 22.09% Impervious Runoff Depth>1.04" Flow Length=100' Slope=0.0200 '/' Tc=15.1 min CN=76/98 Runoff=0.62 cfs 0.044 af
Subcatchment41S: PR1	Runoff Area=1.286 ac 55.75% Impervious Runoff Depth>1.66" Tc=6.0 min CN=80/98 Runoff=3.52 cfs 0.178 af
Subcatchment50S: PR3	Runoff Area=1.325 ac 8.15% Impervious Runoff Depth>0.86" Flow Length=200' Tc=15.9 min CN=77/98 Runoff=1.34 cfs 0.095 af
Subcatchment52S: PR4	Runoff Area=0.178 ac 24.72% Impervious Runoff Depth>1.23" Flow Length=50' Slope=0.0100 '/' Tc=11.5 min CN=80/98 Runoff=0.30 cfs 0.018 af
Subcatchment53S: PR5	Runoff Area=1.268 ac 4.97% Impervious Runoff Depth>0.77" Flow Length=200' Tc=16.2 min CN=76/98 Runoff=1.13 cfs 0.082 af
Reach 44R: Woodland Cove Pond	Inflow=3.05 cfs 0.284 af Outflow=3.05 cfs 0.284 af
Reach 45R: Wet2_out	Avg. Flow Depth=0.58' Max Vel=2.58 fps Inflow=12.80 cfs 1.550 af n=0.035 L=150.0' S=0.0110 '/' Capacity=5,231.48 cfs Outflow=12.79 cfs 1.550 af
Pond 33P: Basin 2 - CB_WoodlandCove	Peak Elev=1,004.08' Storage=620 cf Inflow=1.74 cfs 0.126 af Primary=1.72 cfs 0.115 af Secondary=0.00 cfs 0.000 af Outflow=1.72 cfs 0.115 af
Pond 35P: CB West	Peak Elev=1,007.56' Storage=3 cf Inflow=0.30 cfs 0.018 af Outflow=0.30 cfs 0.018 af
Pond 46P: Wet2	Peak Elev=991.65' Storage=4,015 cf Inflow=3.05 cfs 0.298 af Primary=2.09 cfs 0.291 af Secondary=0.00 cfs 0.000 af Outflow=2.09 cfs 0.291 af
Pond 47P: Wet1	Peak Elev=988.58' Storage=0.153 af Inflow=15.06 cfs 1.552 af Outflow=12.80 cfs 1.550 af
Pond 48P: Pond1	Peak Elev=1,003.06' Storage=19,105 cf Inflow=4.88 cfs 0.253 af Primary=0.24 cfs 0.074 af Secondary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.074 af
Pond 56P: Woodland Cove Pond 2	Peak Elev=997.35' Storage=260,413 cf Inflow=0.00 cfs 0.000 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

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Total Runoff Area = 29.615 ac Runoff Volume = 2.033 af Average Runoff Depth = 0.82"
87.31% Pervious = 25.857 ac 12.69% Impervious = 3.758 ac

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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 35S: PR6

Runoff = 1.12 cfs @ 12.13 hrs, Volume= 0.057 af, Depth> 1.43"
Routed to Pond 48P : Pond1

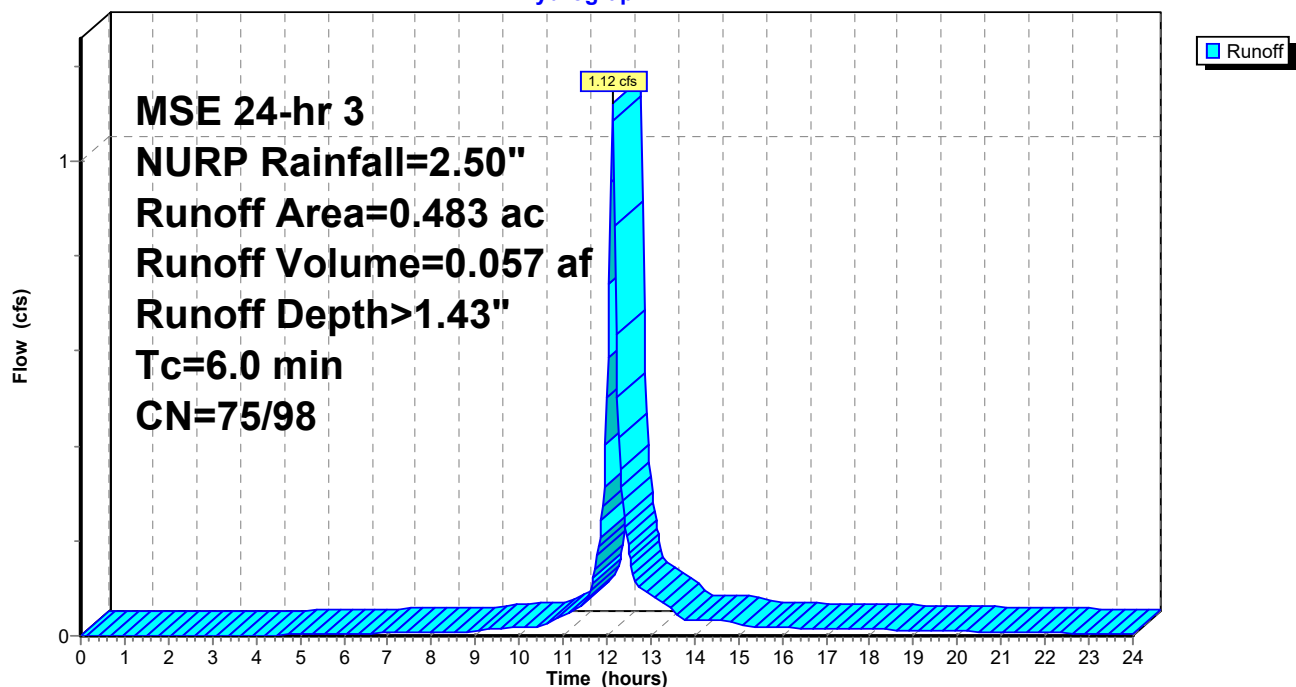
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.230	74	>75% Grass cover, Good, HSG C
0.022	80	>75% Grass cover, Good, HSG D
* 0.197	98	impervious - new
* 0.034	98	impervious - old
0.000	70	Woods, Good, HSG C
0.000	77	Woods, Good, HSG D
* 0.000	98	pond
0.483	86	Weighted Average
0.252	75	52.17% Pervious Area
0.231	98	47.83% Impervious Area

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

Subcatchment 35S: PR6

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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 37S: PR2

Runoff = 13.61 cfs @ 12.38 hrs, Volume= 1.261 af, Depth> 0.85"
 Routed to Pond 47P : Wet1

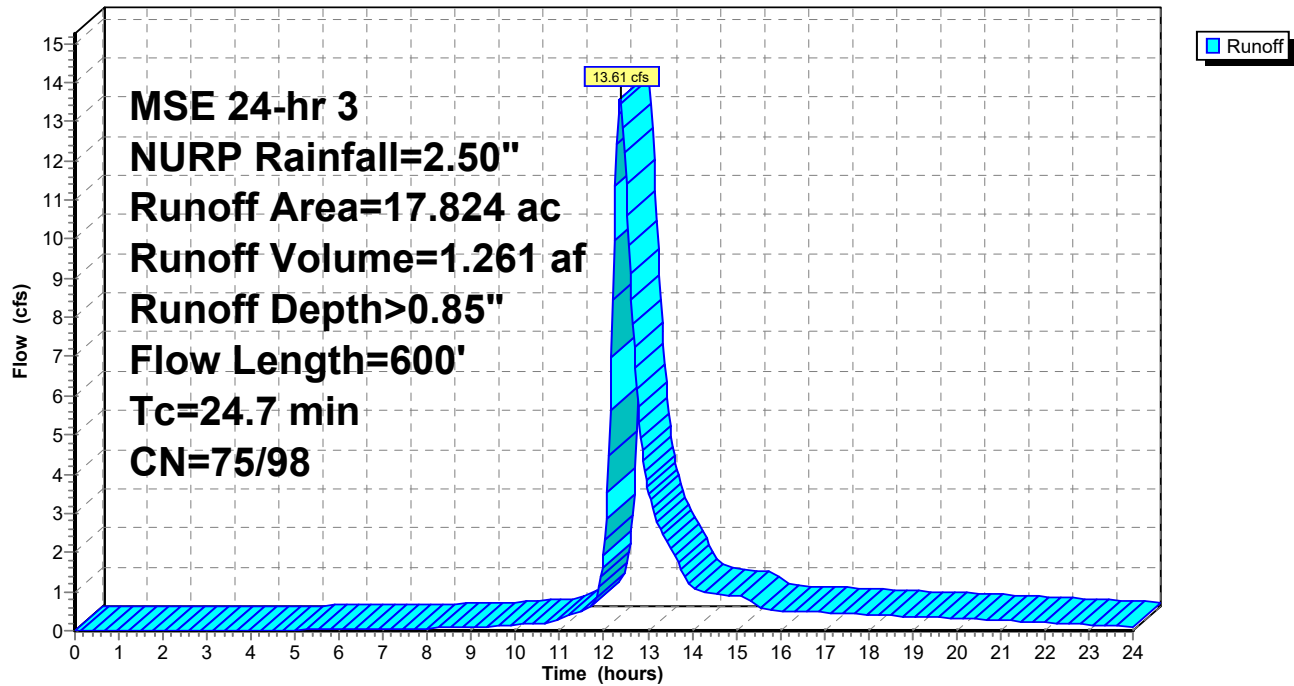
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.039	74	>75% Grass cover, Good, HSG C
0.621	80	>75% Grass cover, Good, HSG D
* 0.440	98	impervious - old
* 0.000	74	imp_tempC
* 0.000	80	imp_tempD
* 1.759	98	wetland
4.786	70	Woods, Good, HSG C
8.227	77	Woods, Good, HSG D
0.317	77	Woods, Good, HSG D
0.873	74	>75% Grass cover, Good, HSG C
0.762	80	>75% Grass cover, Good, HSG D
17.824	78	Weighted Average
15.625	75	87.66% Pervious Area
2.199	98	12.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.8	100	0.0500	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
8.9	500	0.0350	0.94		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
24.7	600	Total			

Subcatchment 37S: PR2

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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 38S: PR7

Runoff = 3.05 cfs @ 12.38 hrs, Volume= 0.298 af, Depth> 0.53"
 Routed to Pond 46P : Wet2

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.001	74	>75% Grass cover, Good, HSG C
* 0.143	98	impervious - old
* 0.141	98	wetland
6.444	70	Woods, Good, HSG C
0.015	77	Woods, Good, HSG D
6.744	71	Weighted Average
6.460	70	95.79% Pervious Area
0.284	98	4.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	100	0.0600	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 2.85"
7.6	500	0.0480	1.10		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
0.3	120	0.0500	6.94	69.40	Channel Flow, Area= 10.0 sf Perim= 16.0' r= 0.63' n= 0.035
22.6	720	Total			

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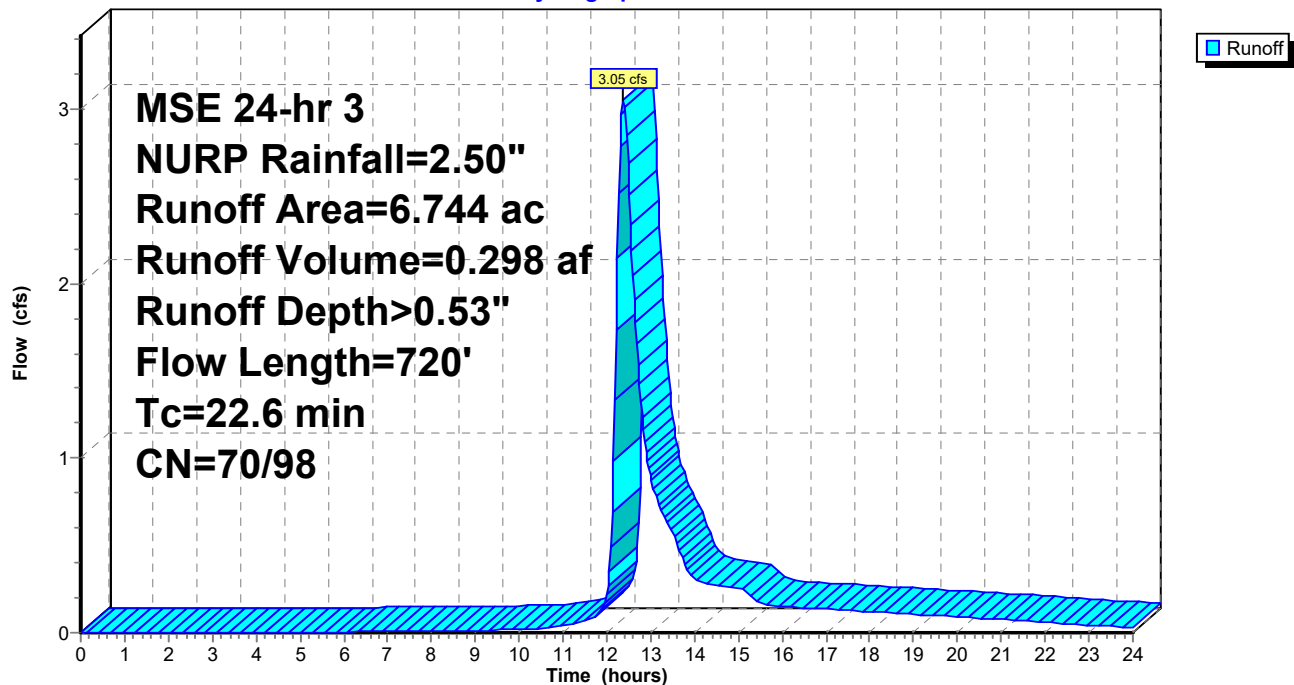
MSE 24-hr 3 NURP Rainfall=2.50"

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Subcatchment 38S: PR7

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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 39S: PR8

Runoff = 0.62 cfs @ 12.24 hrs, Volume= 0.044 af, Depth> 1.04"
Routed to Pond 33P : Basin 2 - CB_WoodlandCove

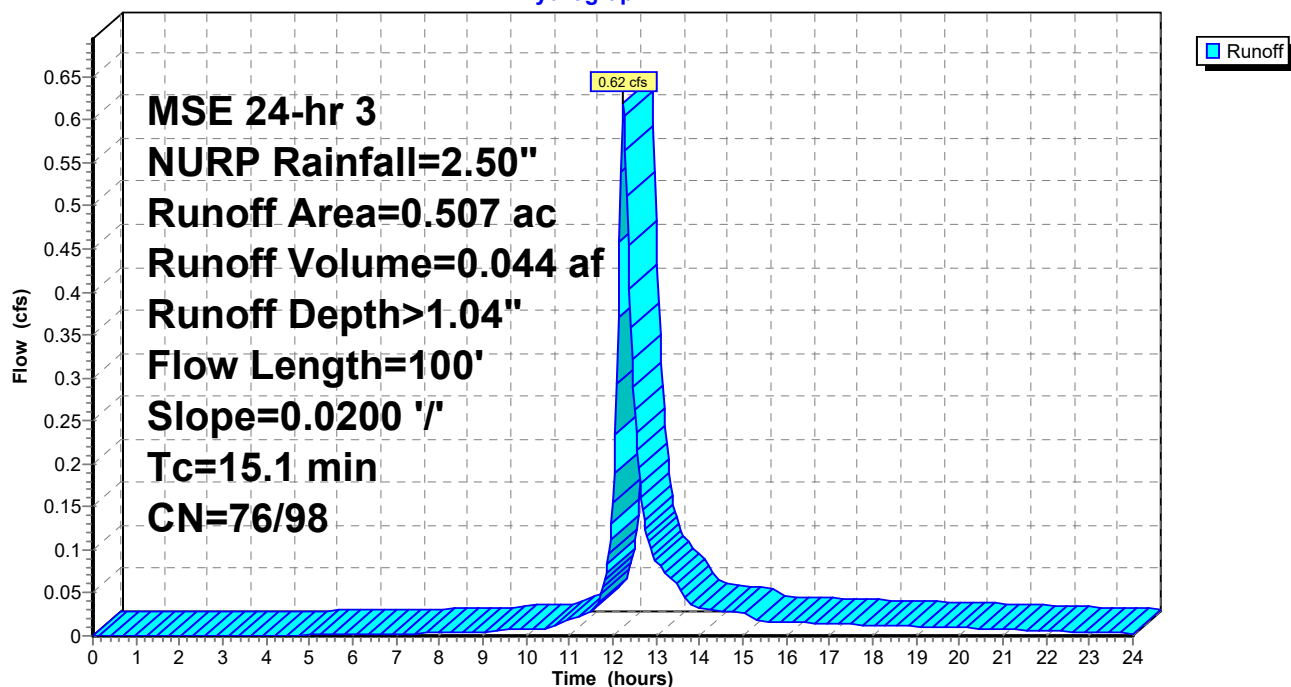
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.159	80	>75% Grass cover, Good, HSG D
* 0.000	98	impervious - new
0.236	74	>75% Grass cover, Good, HSG C
* 0.112	98	impervious - old
0.507	81	Weighted Average
0.395	76	77.91% Pervious Area
0.112	98	22.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 39S: PR8

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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 41S: PR1

Runoff = 3.52 cfs @ 12.13 hrs, Volume= 0.178 af, Depth> 1.66"
Routed to Pond 48P : Pond1

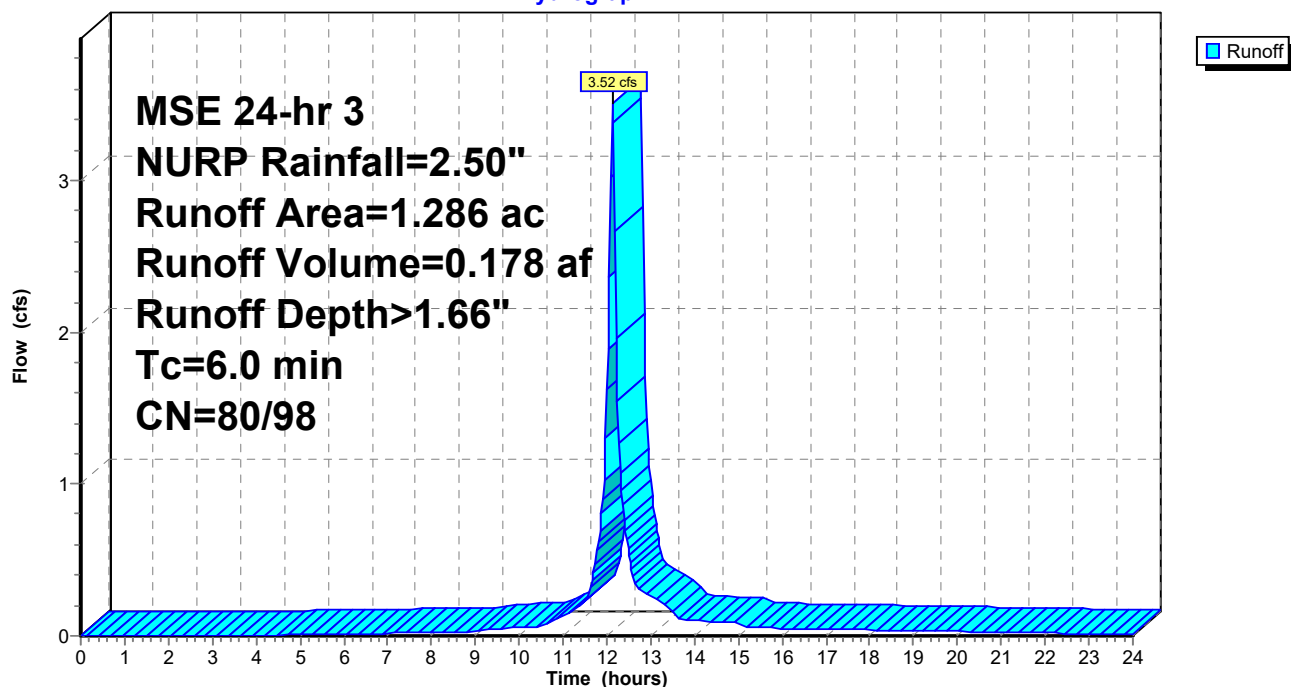
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.043	74	>75% Grass cover, Good, HSG C
0.477	80	>75% Grass cover, Good, HSG D
* 0.545	98	impervious - new
* 0.172	98	pond
0.049	80	>75% Grass cover, Good, HSG D
1.286	90	Weighted Average
0.569	80	44.25% Pervious Area
0.717	98	55.75% Impervious Area

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

Subcatchment 41S: PR1

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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 50S: PR3

Runoff = 1.34 cfs @ 12.26 hrs, Volume= 0.095 af, Depth> 0.86"
 Routed to Reach 44R : Woodland Cove Pond

Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
 MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.597	74	>75% Grass cover, Good, HSG C
0.610	80	>75% Grass cover, Good, HSG D
* 0.057	98	impervious - old
* 0.032	98	impervious - new
0.010	80	>75% Grass cover, Good, HSG D
* 0.019	98	impervious - new
1.325	79	Weighted Average
1.217	77	91.85% Pervious Area
0.108	98	8.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"
0.8	100	0.0900	2.10		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
15.9	200	Total			

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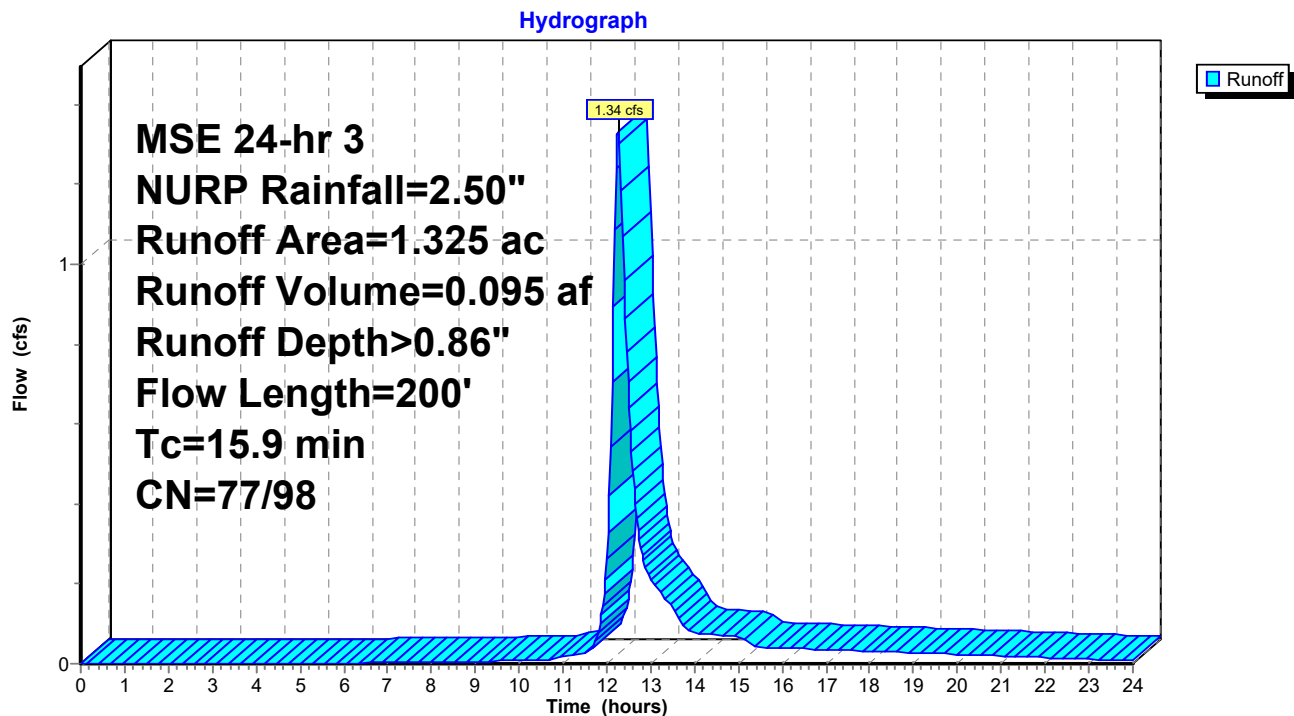
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MSE 24-hr 3 NURP Rainfall=2.50"

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Subcatchment 50S: PR3



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 52S: PR4

Runoff = 0.30 cfs @ 12.20 hrs, Volume= 0.018 af, Depth> 1.23"
Routed to Pond 35P : CB West

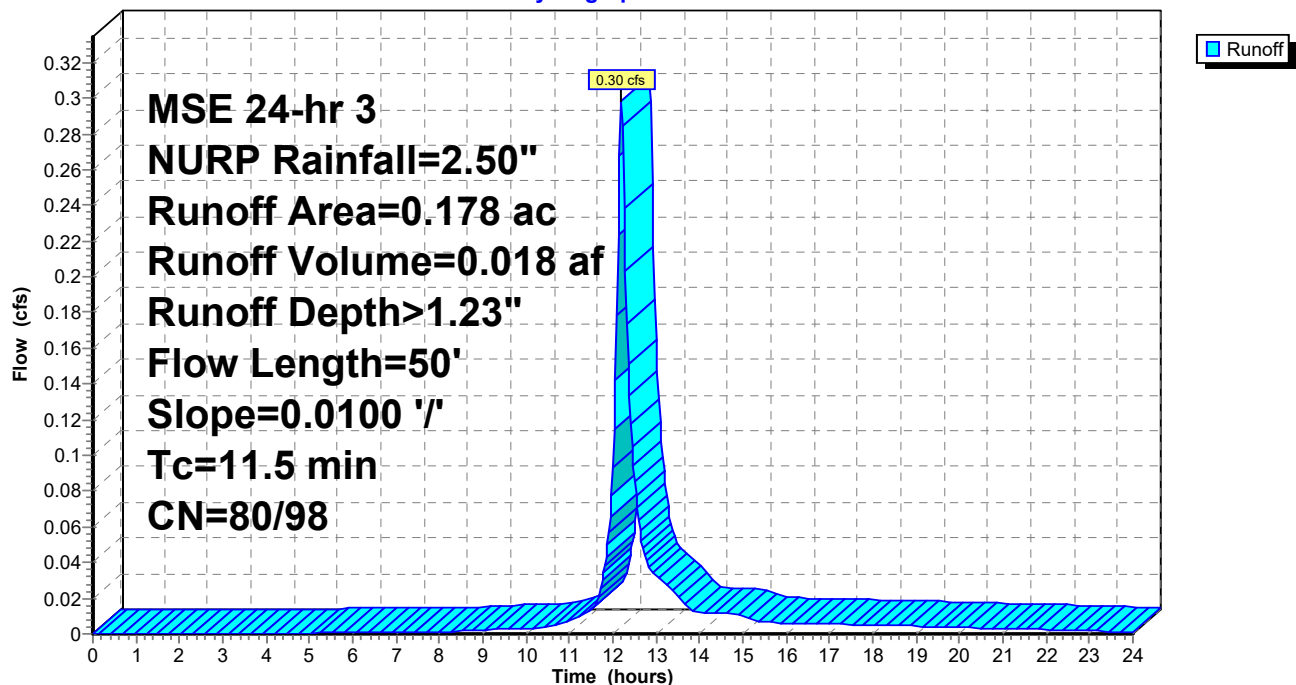
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.098	80	>75% Grass cover, Good, HSG D
* 0.037	98	impervious - new
0.036	80	>75% Grass cover, Good, HSG D
* 0.007	98	impervious - new
0.178	84	Weighted Average
0.134	80	75.28% Pervious Area
0.044	98	24.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5	50	0.0100	0.07		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"

Subcatchment 52S: PR4

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Summary for Subcatchment 53S: PR5

Runoff = 1.13 cfs @ 12.27 hrs, Volume= 0.082 af, Depth> 0.77"
Routed to Pond 33P : Basin 2 - CB_WoodlandCove

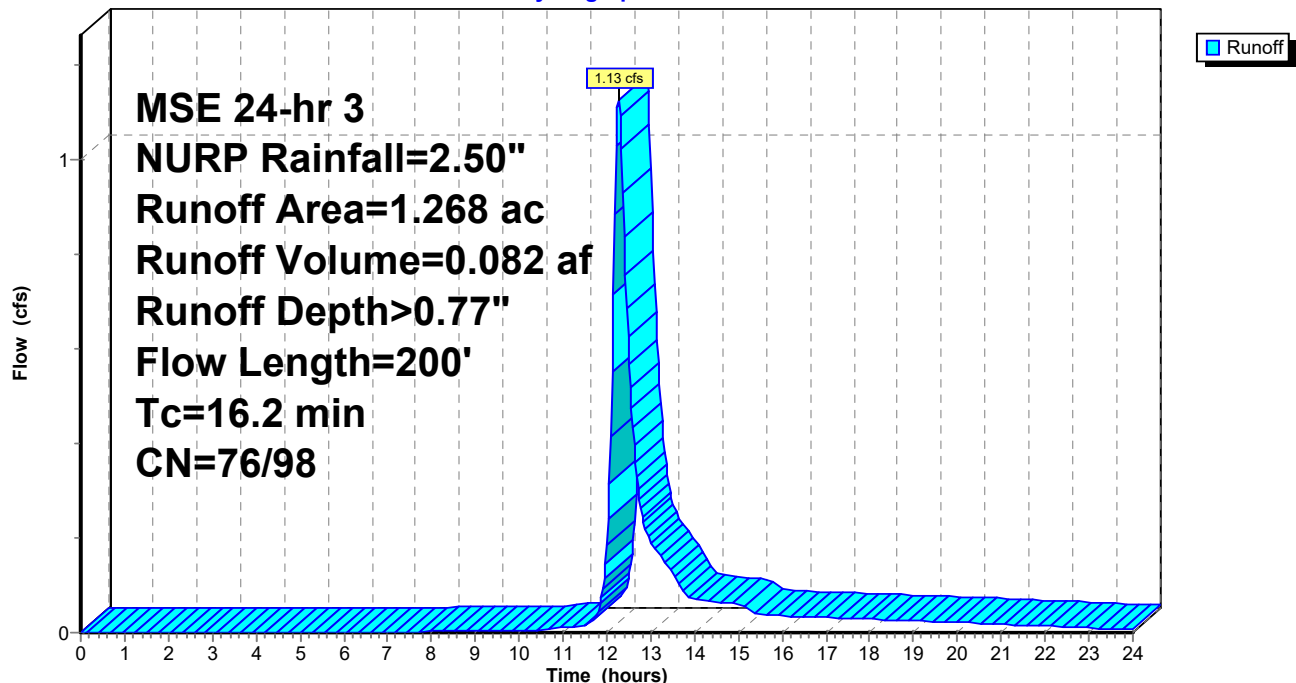
Runoff by SCS TR-20 method, UH=SCS, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.03 hrs
MSE 24-hr 3 NURP Rainfall=2.50"

Area (ac)	CN	Description
0.490	80	>75% Grass cover, Good, HSG D
* 0.012	98	impervious - new
0.715	74	>75% Grass cover, Good, HSG C
* 0.051	98	impervious - old
1.268	78	Weighted Average
1.205	76	95.03% Pervious Area
0.063	98	4.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.1	100	0.0200	0.11		Sheet Flow, Grass: Dense n= 0.240 P2= 2.85"
1.1	100	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
16.2	200	Total			

Subcatchment 53S: PR5

Hydrograph

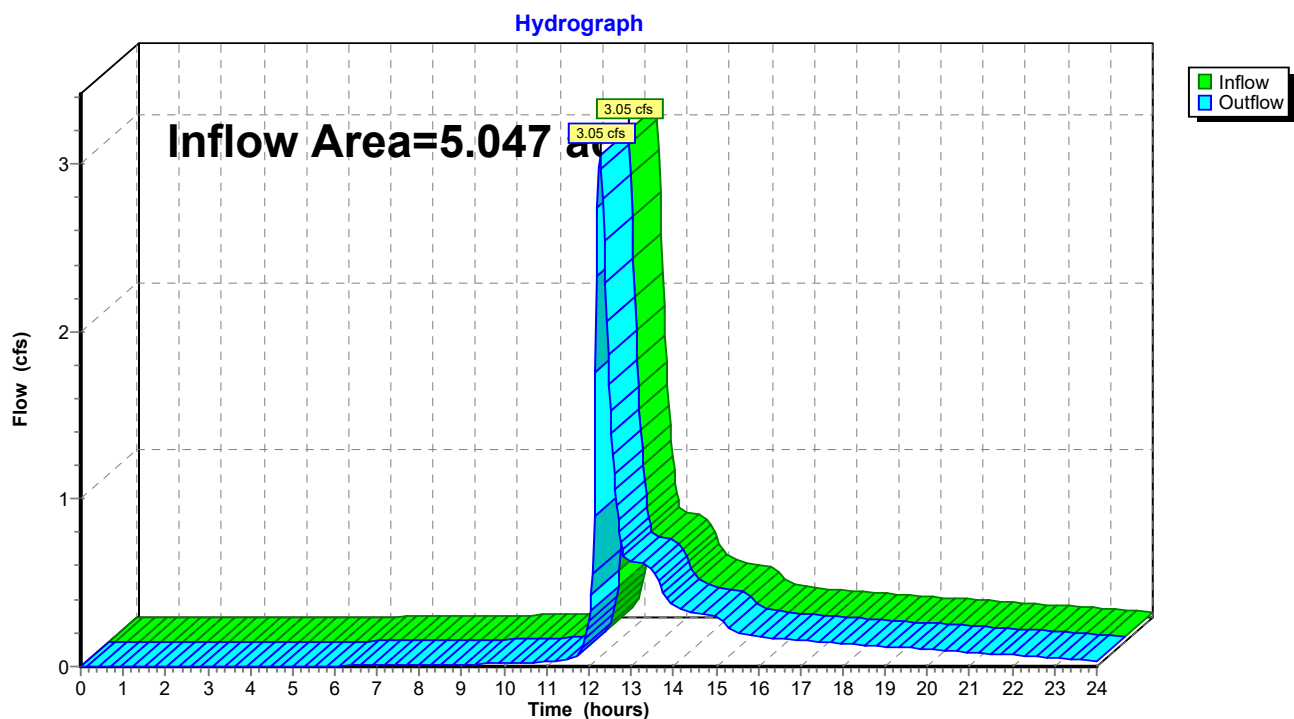


Summary for Reach 44R: Woodland Cove Pond

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 5.047 ac, 25.26% Impervious, Inflow Depth > 0.67" for NURP event
Inflow = 3.05 cfs @ 12.27 hrs, Volume= 0.284 af
Outflow = 3.05 cfs @ 12.27 hrs, Volume= 0.284 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Reach 44R: Woodland Cove Pond

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Summary for Reach 45R: Wet2_out

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 0.76" for NURP event
Inflow = 12.80 cfs @ 12.54 hrs, Volume= 1.550 af
Outflow = 12.79 cfs @ 12.55 hrs, Volume= 1.550 af, Atten= 0%, Lag= 0.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Max. Velocity= 2.58 fps, Min. Travel Time= 1.0 min

Avg. Velocity= 1.01 fps, Avg. Travel Time= 2.5 min

Peak Storage= 744 cf @ 12.55 hrs

Average Depth at Peak Storage= 0.58' , Surface Width= 11.19'

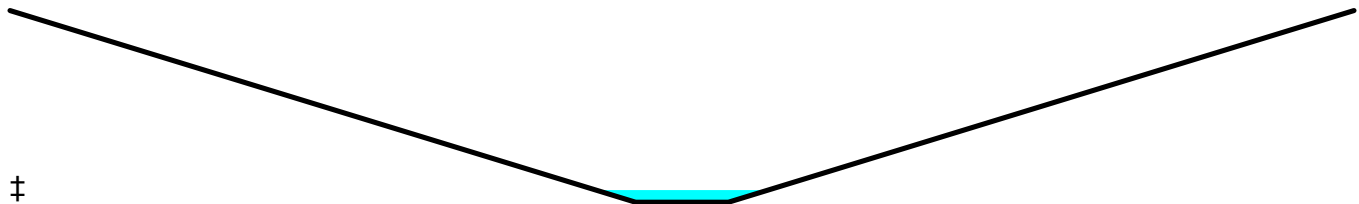
Bank-Full Depth= 9.00' Flow Area= 418.5 sf, Capacity= 5,231.48 cfs

6.00' x 9.00' deep channel, n= 0.035

Side Slope Z-value= 4.5 ' ' Top Width= 87.00'

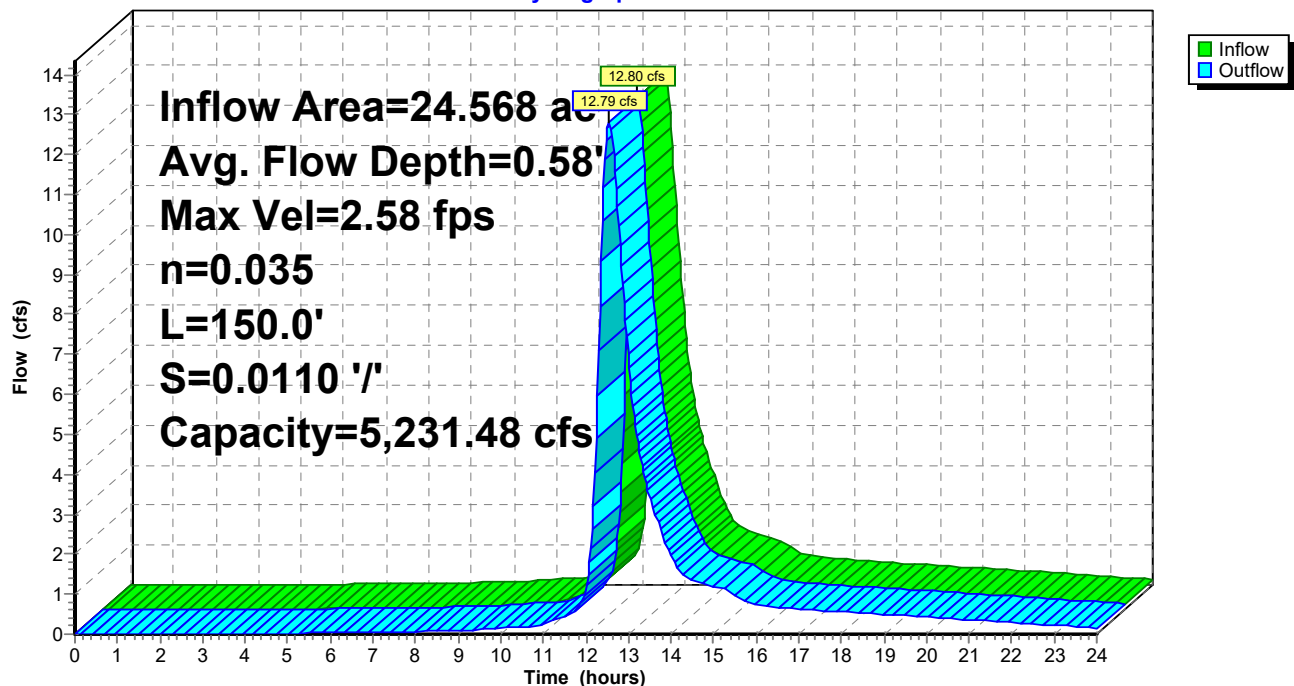
Length= 150.0' Slope= 0.0110 ' '

Inlet Invert= 988.00', Outlet Invert= 986.35'



Reach 45R: Wet2_out

Hydrograph



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MSE 24-hr 3 NURP Rainfall=2.50"

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Stage-Area-Storage for Reach 45R: Wet2_out

Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)	Elevation (feet)	End-Area (sq-ft)	Storage (cubic-feet)
988.00	0.0	0	993.10	147.7	22,148
988.10	0.6	97	993.20	152.9	22,933
988.20	1.4	208	993.30	158.2	23,731
988.30	2.2	332	993.40	163.6	24,543
988.40	3.1	469	993.50	169.1	25,369
988.50	4.1	620	993.60	174.7	26,209
988.60	5.2	784	993.70	180.4	27,062
988.70	6.4	962	993.80	186.2	27,928
988.80	7.7	1,153	993.90	192.1	28,808
988.90	9.0	1,357	994.00	198.0	29,701
989.00	10.5	1,576	994.10	204.1	30,608
989.10	12.1	1,808	994.20	210.2	31,528
989.20	13.7	2,053	994.30	216.4	32,461
989.30	15.4	2,312	994.40	222.7	33,409
989.40	17.2	2,584	994.50	229.1	34,370
989.50	19.1	2,870	994.60	235.6	35,344
989.60	21.1	3,169	994.70	242.2	36,332
989.70	23.2	3,481	994.80	248.9	37,333
989.80	25.4	3,807	994.90	255.7	38,348
989.90	27.6	4,147	995.00	262.5	39,376
990.00	30.0	4,501	995.10	269.4	40,417
990.10	32.5	4,868	995.20	276.5	41,472
990.20	35.0	5,248	995.30	283.6	42,541
990.30	37.6	5,642	995.40	290.8	43,624
990.40	40.3	6,049	995.50	298.1	44,720
990.50	43.1	6,470	995.60	305.5	45,829
990.60	46.0	6,904	995.70	313.0	46,952
990.70	49.0	7,351	995.80	320.6	48,088
990.80	52.1	7,813	995.90	328.3	49,238
990.90	55.3	8,288	996.00	336.0	50,401
991.00	58.5	8,776	996.10	343.8	51,577
991.10	61.9	9,278	996.20	351.8	52,768
991.20	65.3	9,793	996.30	359.8	53,972
991.30	68.8	10,322	996.40	367.9	55,189
991.40	72.4	10,864	996.50	376.1	56,420
991.50	76.1	11,419	996.60	384.4	57,664
991.60	79.9	11,988	996.70	392.8	58,922
991.70	83.8	12,571	996.80	401.3	60,193
991.80	87.8	13,168	996.90	409.8	61,477
991.90	91.9	13,778	997.00	418.5	62,775
992.00	96.0	14,401			
992.10	100.3	15,038			
992.20	104.6	15,688			
992.30	109.0	16,352			
992.40	113.5	17,029			
992.50	118.1	17,719			
992.60	122.8	18,424			
992.70	127.6	19,142			
992.80	132.5	19,873			
992.90	137.5	20,618			
993.00	142.5	21,376			

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Summary for Pond 33P: Basin 2 - CB_WoodlandCove

Inflow Area = 1.775 ac, 9.86% Impervious, Inflow Depth > 0.85" for NURP event
 Inflow = 1.74 cfs @ 12.26 hrs, Volume= 0.126 af
 Outflow = 1.72 cfs @ 12.28 hrs, Volume= 0.115 af, Atten= 1%, Lag= 1.2 min
 Primary = 1.72 cfs @ 12.28 hrs, Volume= 0.115 af
 Routed to Reach 44R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 47P : Wet1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 1,004.08' @ 12.28 hrs Surf.Area= 983 sf Storage= 620 cf

Plug-Flow detention time= 52.7 min calculated for 0.115 af (91% of inflow)
 Center-of-Mass det. time= 13.3 min (836.1 - 822.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,003.00'	12,577 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,003.00	303	0	0
1,004.00	800	552	552
1,005.00	3,200	2,000	2,552
1,007.00	3,400	6,600	9,152
1,008.00	3,450	3,425	12,577

Device	Routing	Invert	Outlet Devices
#1	Primary	998.45'	12.0" Round Culvert L= 85.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.45' / 998.06' S= 0.0046 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	998.62'	12.0" Round Culvert L= 13.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 998.62' / 998.55' S= 0.0052 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#3	Device 2	1,003.90'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#4	Secondary	1,005.90'	20.0' long + 10.0 '/' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#5	Device 2	1,003.00'	0.01 cfs Filtration at all elevations Phase-In= 0.01'

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Primary OutFlow Max=1.72 cfs @ 12.28 hrs HW=1,004.08' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 1.72 cfs of 7.18 cfs potential flow)

2=Culvert (Passes 1.72 cfs of 10.52 cfs potential flow)

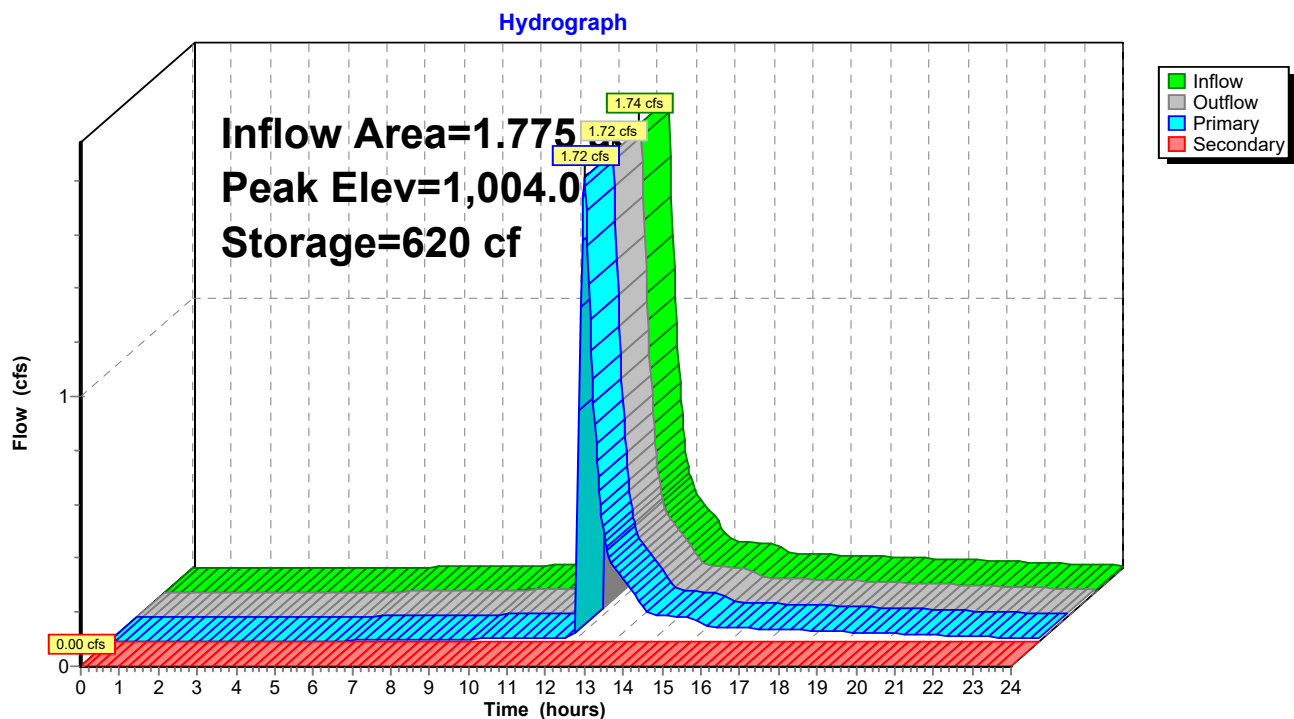
3=Orifice/Grate (Weir Controls 1.71 cfs @ 1.37 fps)

5=Filtration (Exfiltration Controls 0.01 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,003.00' TW=988.00' (Dynamic Tailwater)

4=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 33P: Basin 2 - CB_WoodlandCove



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Stage-Area-Storage for Pond 33P: Basin 2 - CB_WoodlandCove

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,003.00	303	0	1,005.55	3,255	4,327
1,003.05	328	16	1,005.60	3,260	4,490
1,003.10	353	33	1,005.65	3,265	4,653
1,003.15	378	51	1,005.70	3,270	4,816
1,003.20	402	71	1,005.75	3,275	4,980
1,003.25	427	91	1,005.80	3,280	5,143
1,003.30	452	113	1,005.85	3,285	5,308
1,003.35	477	136	1,005.90	3,290	5,472
1,003.40	502	161	1,005.95	3,295	5,637
1,003.45	527	187	1,006.00	3,300	5,802
1,003.50	552	214	1,006.05	3,305	5,967
1,003.55	576	242	1,006.10	3,310	6,132
1,003.60	601	271	1,006.15	3,315	6,298
1,003.65	626	302	1,006.20	3,320	6,464
1,003.70	651	334	1,006.25	3,325	6,630
1,003.75	676	367	1,006.30	3,330	6,796
1,003.80	701	401	1,006.35	3,335	6,963
1,003.85	725	437	1,006.40	3,340	7,129
1,003.90	750	474	1,006.45	3,345	7,297
1,003.95	775	512	1,006.50	3,350	7,464
1,004.00	800	552	1,006.55	3,355	7,632
1,004.05	920	594	1,006.60	3,360	7,800
1,004.10	1,040	644	1,006.65	3,365	7,968
1,004.15	1,160	698	1,006.70	3,370	8,136
1,004.20	1,280	760	1,006.75	3,375	8,305
1,004.25	1,400	827	1,006.80	3,380	8,473
1,004.30	1,520	899	1,006.85	3,385	8,643
1,004.35	1,640	979	1,006.90	3,390	8,812
1,004.40	1,760	1,063	1,006.95	3,395	8,982
1,004.45	1,880	1,155	1,007.00	3,400	9,152
1,004.50	2,000	1,252	1,007.05	3,402	9,322
1,004.55	2,120	1,354	1,007.10	3,405	9,492
1,004.60	2,240	1,464	1,007.15	3,407	9,662
1,004.65	2,360	1,578	1,007.20	3,410	9,833
1,004.70	2,480	1,700	1,007.25	3,413	10,003
1,004.75	2,600	1,827	1,007.30	3,415	10,174
1,004.80	2,720	1,959	1,007.35	3,418	10,345
1,004.85	2,840	2,099	1,007.40	3,420	10,515
1,004.90	2,960	2,243	1,007.45	3,423	10,687
1,004.95	3,080	2,395	1,007.50	3,425	10,858
1,005.00	3,200	2,552	1,007.55	3,427	11,029
1,005.05	3,205	2,712	1,007.60	3,430	11,201
1,005.10	3,210	2,872	1,007.65	3,432	11,372
1,005.15	3,215	3,033	1,007.70	3,435	11,544
1,005.20	3,220	3,194	1,007.75	3,438	11,716
1,005.25	3,225	3,355	1,007.80	3,440	11,887
1,005.30	3,230	3,516	1,007.85	3,443	12,060
1,005.35	3,235	3,678	1,007.90	3,445	12,232
1,005.40	3,240	3,839	1,007.95	3,448	12,404
1,005.45	3,245	4,002	1,008.00	3,450	12,577
1,005.50	3,250	4,164			

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Summary for Pond 35P: CB West

Inflow Area = 0.178 ac, 24.72% Impervious, Inflow Depth > 1.23" for NURP event
 Inflow = 0.30 cfs @ 12.20 hrs, Volume= 0.018 af
 Outflow = 0.30 cfs @ 12.20 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.2 min
 Primary = 0.30 cfs @ 12.20 hrs, Volume= 0.018 af
 Routed to Pond 48P : Pond1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Peak Elev= 1,007.56' @ 12.20 hrs Surf.Area= 72 sf Storage= 3 cf

Plug-Flow detention time= 0.4 min calculated for 0.018 af (100% of inflow)

Center-of-Mass det. time= 0.3 min (798.1 - 797.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,007.50'	850 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

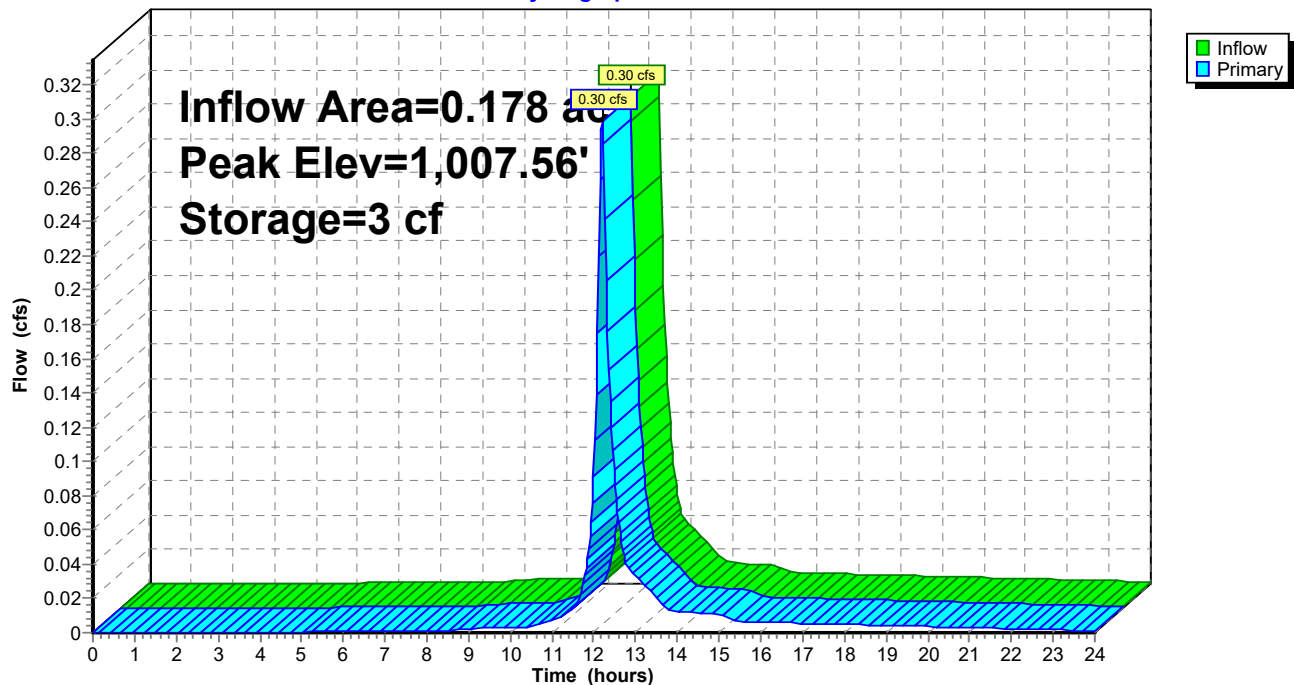
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
1,007.50	50	0	0
1,008.00	250	75	75
1,009.00	1,300	775	850

Device	Routing	Invert	Outlet Devices
#1	Primary	1,007.50'	27.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.30 cfs @ 12.20 hrs HW=1,007.55' TW=1,002.74' (Dynamic Tailwater)↑ **1=Orifice/Grate** (Weir Controls 0.30 cfs @ 0.76 fps)

Pond 35P: CB West

Hydrograph



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Stage-Area-Storage for Pond 35P: CB West

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,007.50	50	0	1,008.52	796	347
1,007.52	58	1	1,008.54	817	363
1,007.54	66	2	1,008.56	838	380
1,007.56	74	4	1,008.58	859	397
1,007.58	82	5	1,008.60	880	414
1,007.60	90	7	1,008.62	901	432
1,007.62	98	9	1,008.64	922	450
1,007.64	106	11	1,008.66	943	469
1,007.66	114	13	1,008.68	964	488
1,007.68	122	15	1,008.70	985	507
1,007.70	130	18	1,008.72	1,006	527
1,007.72	138	21	1,008.74	1,027	547
1,007.74	146	24	1,008.76	1,048	568
1,007.76	154	27	1,008.78	1,069	589
1,007.78	162	30	1,008.80	1,090	611
1,007.80	170	33	1,008.82	1,111	633
1,007.82	178	36	1,008.84	1,132	655
1,007.84	186	40	1,008.86	1,153	678
1,007.86	194	44	1,008.88	1,174	702
1,007.88	202	48	1,008.90	1,195	725
1,007.90	210	52	1,008.92	1,216	749
1,007.92	218	56	1,008.94	1,237	774
1,007.94	226	61	1,008.96	1,258	799
1,007.96	234	65	1,008.98	1,279	824
1,007.98	242	70	1,009.00	1,300	850
1,008.00	250	75			
1,008.02	271	80			
1,008.04	292	86			
1,008.06	313	92			
1,008.08	334	98			
1,008.10	355	105			
1,008.12	376	113			
1,008.14	397	120			
1,008.16	418	128			
1,008.18	439	137			
1,008.20	460	146			
1,008.22	481	155			
1,008.24	502	165			
1,008.26	523	175			
1,008.28	544	186			
1,008.30	565	197			
1,008.32	586	209			
1,008.34	607	221			
1,008.36	628	233			
1,008.38	649	246			
1,008.40	670	259			
1,008.42	691	273			
1,008.44	712	287			
1,008.46	733	301			
1,008.48	754	316			
1,008.50	775	331			

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Summary for Pond 46P: Wet2

Inflow Area = 6.744 ac, 4.21% Impervious, Inflow Depth > 0.53" for NURP event
 Inflow = 3.05 cfs @ 12.38 hrs, Volume= 0.298 af
 Outflow = 2.09 cfs @ 12.59 hrs, Volume= 0.291 af, Atten= 31%, Lag= 12.9 min
 Primary = 2.09 cfs @ 12.59 hrs, Volume= 0.291 af
 Routed to Pond 47P : Wet1
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Pond 47P : Wet1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 991.00' Surf.Area= 2,915 sf Storage= 1,508 cf

Peak Elev= 991.65' @ 12.59 hrs Surf.Area= 4,756 sf Storage= 4,015 cf (2,508 cf above start)

Plug-Flow detention time= 106.5 min calculated for 0.256 af (86% of inflow)

Center-of-Mass det. time= 29.0 min (880.3 - 851.3)

Volume	Invert	Avail.Storage	Storage Description
#1	990.00'	221,260 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
990.00	100	0	0
992.00	5,730	5,830	5,830
994.00	20,000	25,730	31,560
996.00	47,200	67,200	98,760
998.00	75,300	122,500	221,260

Device	Routing	Invert	Outlet Devices
#1	Primary	991.00'	24.0" Round Culvert L= 52.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 991.00' / 990.00' S= 0.0192 '/' Cc= 0.900 n= 0.024, Flow Area= 3.14 sf
#2	Secondary	997.00'	25.0' long + 10.0 ' SideZ x 3.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=2.09 cfs @ 12.59 hrs HW=991.65' TW=988.57' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 2.09 cfs @ 3.50 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=991.00' TW=988.00' (Dynamic Tailwater)↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

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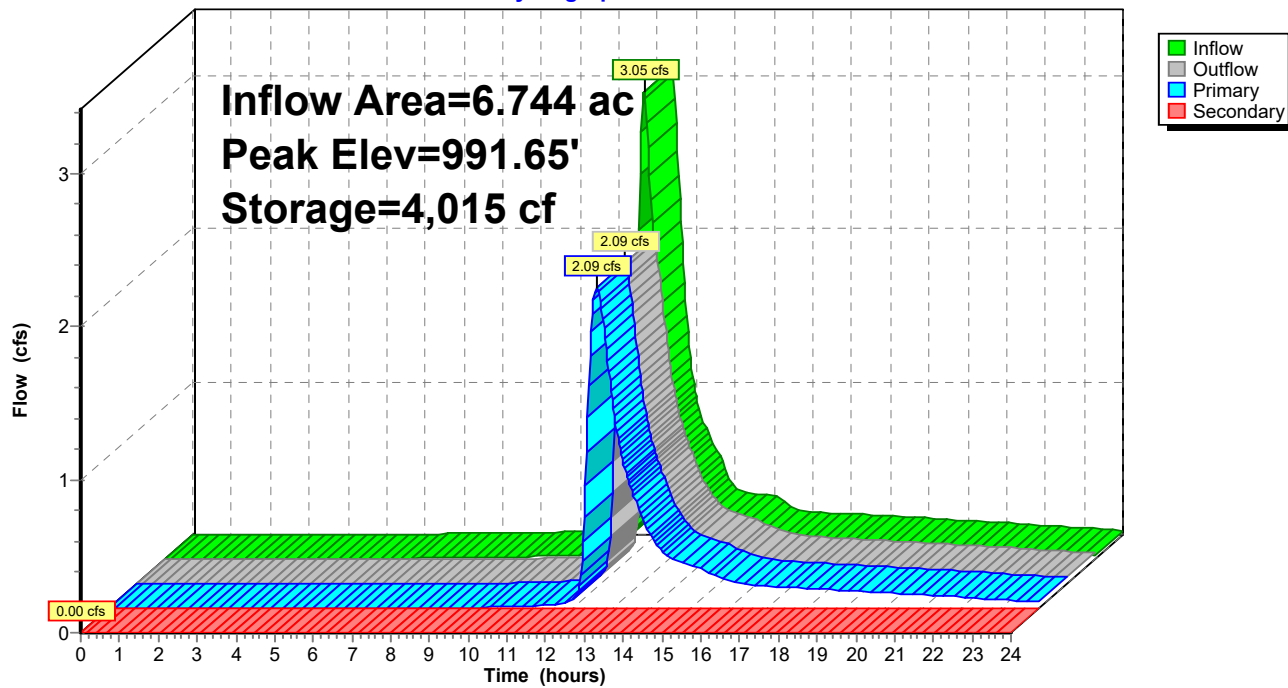
MSE 24-hr 3 NURP Rainfall=2.50"

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Pond 46P: Wet2

Hydrograph



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Stage-Area-Storage for Pond 46P: Wet2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
990.00	100	0	995.10	34,960	61,788
990.10	382	24	995.20	36,320	65,352
990.20	663	76	995.30	37,680	69,052
990.30	944	157	995.40	39,040	72,888
990.40	1,226	265	995.50	40,400	76,860
990.50	1,508	402	995.60	41,760	80,968
990.60	1,789	567	995.70	43,120	85,212
990.70	2,071	760	995.80	44,480	89,592
990.80	2,352	981	995.90	45,840	94,108
990.90	2,633	1,230	996.00	47,200	98,760
991.00	2,915	1,508	996.10	48,605	103,550
991.10	3,197	1,813	996.20	50,010	108,481
991.20	3,478	2,147	996.30	51,415	113,552
991.30	3,759	2,509	996.40	52,820	118,764
991.40	4,041	2,899	996.50	54,225	124,116
991.50	4,323	3,317	996.60	55,630	129,609
991.60	4,604	3,763	996.70	57,035	135,242
991.70	4,886	4,238	996.80	58,440	141,016
991.80	5,167	4,740	996.90	59,845	146,930
991.90	5,448	5,271	997.00	61,250	152,985
992.00	5,730	5,830	997.10	62,655	159,180
992.10	6,444	6,439	997.20	64,060	165,516
992.20	7,157	7,119	997.30	65,465	171,992
992.30	7,870	7,870	997.40	66,870	178,609
992.40	8,584	8,693	997.50	68,275	185,366
992.50	9,298	9,587	997.60	69,680	192,264
992.60	10,011	10,552	997.70	71,085	199,302
992.70	10,725	11,589	997.80	72,490	206,481
992.80	11,438	12,697	997.90	73,895	213,800
992.90	12,151	13,877	998.00	75,300	221,260
993.00	12,865	15,128			
993.10	13,579	16,450			
993.20	14,292	17,843			
993.30	15,005	19,308			
993.40	15,719	20,844			
993.50	16,433	22,452			
993.60	17,146	24,131			
993.70	17,860	25,881			
993.80	18,573	27,703			
993.90	19,286	29,596			
994.00	20,000	31,560			
994.10	21,360	33,628			
994.20	22,720	35,832			
994.30	24,080	38,172			
994.40	25,440	40,648			
994.50	26,800	43,260			
994.60	28,160	46,008			
994.70	29,520	48,892			
994.80	30,880	51,912			
994.90	32,240	55,068			
995.00	33,600	58,360			

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Summary for Pond 47P: Wet1

Inflow Area = 24.568 ac, 10.11% Impervious, Inflow Depth > 0.76" for NURP event
 Inflow = 15.06 cfs @ 12.40 hrs, Volume= 1.552 af
 Outflow = 12.80 cfs @ 12.54 hrs, Volume= 1.550 af, Atten= 15%, Lag= 8.3 min
 Primary = 12.80 cfs @ 12.54 hrs, Volume= 1.550 af
 Routed to Reach 45R : Wet2_out

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2
 Peak Elev= 988.58' @ 12.54 hrs Surf.Area= 0.510 ac Storage= 0.153 af

Plug-Flow detention time= 8.2 min calculated for 1.550 af (100% of inflow)
 Center-of-Mass det. time= 7.6 min (844.9 - 837.3)

Volume	Invert	Avail.Storage	Storage Description
#1	988.00'	23.952 af	Custom Stage Data (Prismatic) Listed below (Recalc)

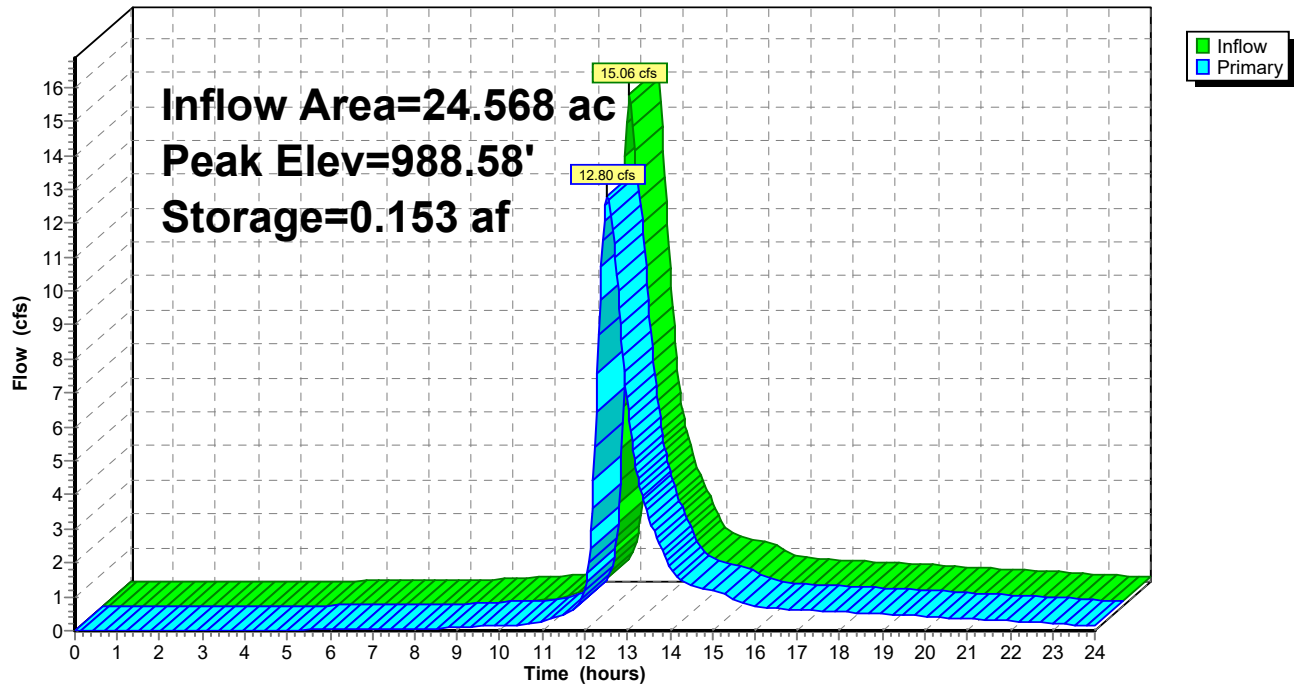
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
988.00	0.020	0.000	0.000
989.50	1.290	0.983	0.983
990.00	3.430	1.180	2.162
992.00	5.580	9.010	11.172
994.00	7.200	12.780	23.952

Device	Routing	Invert	Outlet Devices
#1	Primary	988.00'	Channel/Reach using Reach 45R: Wet2_out

Primary OutFlow Max=12.79 cfs @ 12.54 hrs HW=988.58' TW=988.58' (Dynamic Tailwater)
 ↑1=Channel/Reach (Channel Controls 12.79 cfs @ 2.57 fps)

Pond 47P: Wet1

Hydrograph



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Stage-Area-Storage for Pond 47P: Wet1

Elevation (feet)	Surface (acres)	Storage (acre-feet)	Elevation (feet)	Surface (acres)	Storage (acre-feet)
988.00	0.020	0.000	993.10	6.471	17.801
988.10	0.105	0.006	993.20	6.552	18.452
988.20	0.189	0.021	993.30	6.633	19.111
988.30	0.274	0.044	993.40	6.714	19.778
988.40	0.359	0.076	993.50	6.795	20.454
988.50	0.443	0.116	993.60	6.876	21.137
988.60	0.528	0.164	993.70	6.957	21.829
988.70	0.613	0.221	993.80	7.038	22.529
988.80	0.697	0.287	993.90	7.119	23.237
988.90	0.782	0.361	994.00	7.200	23.952
989.00	0.867	0.443	994.10	7.200	23.952
989.10	0.951	0.534	994.20	7.200	23.952
989.20	1.036	0.634	994.30	7.200	23.952
989.30	1.121	0.741	994.40	7.200	23.952
989.40	1.205	0.858	994.50	7.200	23.952
989.50	1.290	0.983	994.60	7.200	23.952
989.60	1.718	1.133	994.70	7.200	23.952
989.70	2.146	1.326	994.80	7.200	23.952
989.80	2.574	1.562	994.90	7.200	23.952
989.90	3.002	1.841	995.00	7.200	23.952
990.00	3.430	2.162	995.10	7.200	23.952
990.10	3.538	2.511	995.20	7.200	23.952
990.20	3.645	2.870	995.30	7.200	23.952
990.30	3.752	3.240	995.40	7.200	23.952
990.40	3.860	3.620	995.50	7.200	23.952
990.50	3.967	4.012	995.60	7.200	23.952
990.60	4.075	4.414	995.70	7.200	23.952
990.70	4.183	4.827	995.80	7.200	23.952
990.80	4.290	5.250	995.90	7.200	23.952
990.90	4.397	5.685	996.00	7.200	23.952
991.00	4.505	6.130	996.10	7.200	23.952
991.10	4.613	6.586	996.20	7.200	23.952
991.20	4.720	7.053	996.30	7.200	23.952
991.30	4.827	7.530	996.40	7.200	23.952
991.40	4.935	8.018	996.50	7.200	23.952
991.50	5.042	8.517	996.60	7.200	23.952
991.60	5.150	9.027	996.70	7.200	23.952
991.70	5.258	9.547	996.80	7.200	23.952
991.80	5.365	10.078	996.90	7.200	23.952
991.90	5.472	10.620	997.00	7.200	23.952
992.00	5.580	11.172			
992.10	5.661	11.735			
992.20	5.742	12.305			
992.30	5.823	12.883			
992.40	5.904	13.469			
992.50	5.985	14.064			
992.60	6.066	14.666			
992.70	6.147	15.277			
992.80	6.228	15.896			
992.90	6.309	16.523			
993.00	6.390	17.157			

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Summary for Pond 48P: Pond1

Inflow Area = 1.947 ac, 50.95% Impervious, Inflow Depth > 1.56" for NURP event
 Inflow = 4.88 cfs @ 12.13 hrs, Volume= 0.253 af
 Outflow = 0.24 cfs @ 13.50 hrs, Volume= 0.074 af, Atten= 95%, Lag= 82.1 min
 Primary = 0.24 cfs @ 13.50 hrs, Volume= 0.074 af
 Routed to Reach 44R : Woodland Cove Pond
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Reach 44R : Woodland Cove Pond

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 1,002.00' Surf.Area= 4,596 sf Storage= 10,824 cf

Peak Elev= 1,003.06' @ 13.50 hrs Surf.Area= 8,751 sf Storage= 19,105 cf (8,281 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 210.5 min (985.2 - 774.7)

Volume	Invert	Avail.Storage	Storage Description
#1	998.00'	92,791 cf	Custom Stage Data (Prismatic) Listed below (Recalc) x 1.2

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
998.00	810	0	0
1,000.00	2,190	3,000	3,000
1,002.00	3,830	6,020	9,020
1,002.10	6,000	492	9,512
1,003.00	7,220	5,949	15,460
1,004.00	8,360	7,790	23,250
1,005.00	9,930	9,145	32,395
1,007.00	11,000	20,930	53,325
1,008.00	12,000	11,500	64,825
1,009.00	13,000	12,500	77,325

Device	Routing	Invert	Outlet Devices
#1	Primary	999.50'	18.0" Round Culvert L= 149.5' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 999.50' / 999.10' S= 0.0027 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,004.50'	48.0" Horiz. grate C= 0.600 Limited to weir flow at low heads
#3	Device 1	1,003.00'	Custom Weir/Orifice, Cv= 3.00 (C= 3.75) Head (feet) 0.00 0.50 0.51 4.00 Width (feet) 4.00 4.00 4.00 4.00
#4	Device 3	1,000.00'	15.0" Round lowflow L= 81.5' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 1,000.00' / 1,000.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#5	Device 1	1,002.00'	0.04 cfs Filtration X 0.00 when above 1,002.00' Phase-In= 0.01'
#6	Secondary	1,008.00'	10.0' long + 4.0 ' SideZ x 3.0' breadth EOF Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50

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Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68
2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.24 cfs @ 13.50 hrs HW=1,003.06' TW=0.00' (Dynamic Tailwater)

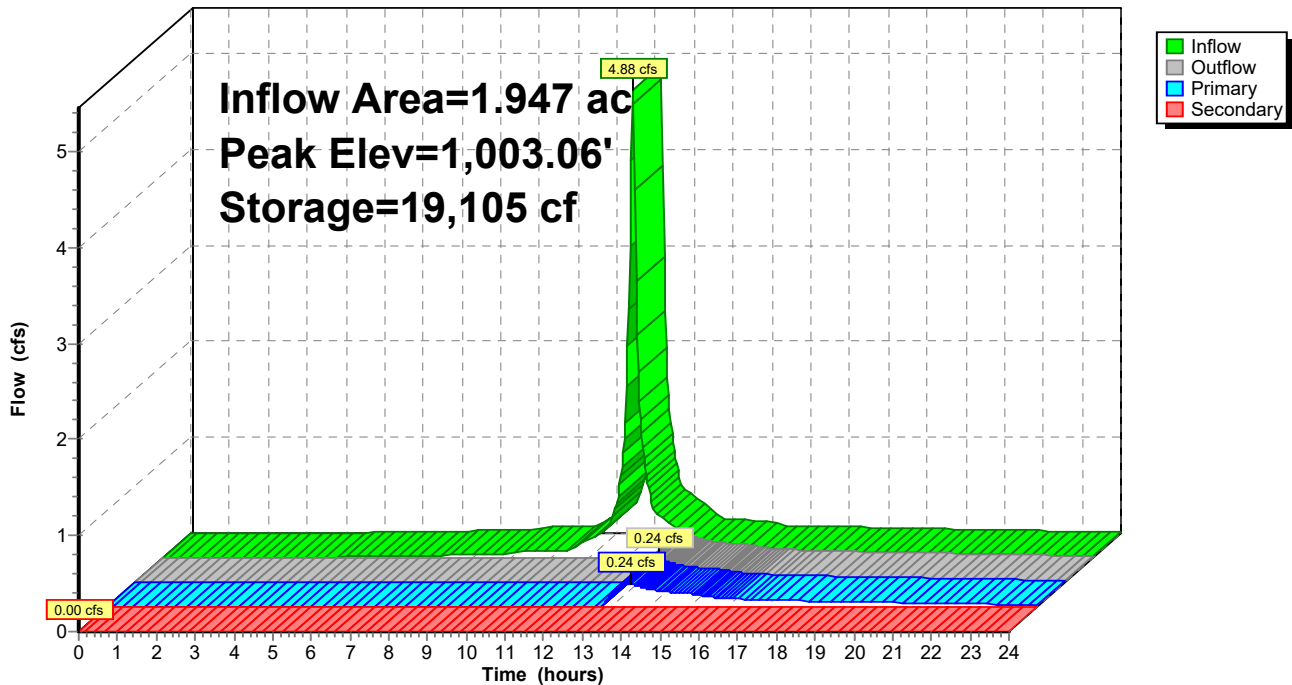
- 1=Culvert (Passes 0.24 cfs of 11.22 cfs potential flow)
- 2=grate (Controls 0.00 cfs)
- 3=Custom Weir/Orifice (Weir Controls 0.24 cfs @ 0.94 fps)
- 4=lowflow (Passes 0.24 cfs of 1.35 cfs potential flow)
- 5=Filtration (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,002.00' TW=0.00' (Dynamic Tailwater)

- 6=EOF (Controls 0.00 cfs)

Pond 48P: Pond1

Hydrograph



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Stage-Area-Storage for Pond 48P: Pond1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
998.00	972	0	1,008.20	14,640	80,695
998.20	1,138	211	1,008.40	14,880	83,647
998.40	1,303	455	1,008.60	15,120	86,647
998.60	1,469	732	1,008.80	15,360	89,695
998.80	1,634	1,043	1,009.00	15,600	92,791
999.00	1,800	1,386			
999.20	1,966	1,763			
999.40	2,131	2,172			
999.60	2,297	2,615			
999.80	2,462	3,091			
1,000.00	2,628	3,600			
1,000.20	2,825	4,145			
1,000.40	3,022	4,730			
1,000.60	3,218	5,354			
1,000.80	3,415	6,017			
1,001.00	3,612	6,720			
1,001.20	3,809	7,462			
1,001.40	4,006	8,244			
1,001.60	4,202	9,064			
1,001.80	4,399	9,924			
1,002.00	4,596	10,824			
1,002.20	7,363	12,142			
1,002.40	7,688	13,647			
1,002.60	8,013	15,217			
1,002.80	8,339	16,852			
1,003.00	8,664	18,553			
1,003.20	8,938	20,313			
1,003.40	9,211	22,128			
1,003.60	9,485	23,997			
1,003.80	9,758	25,922			
1,004.00	10,032	27,901			
1,004.20	10,409	29,945			
1,004.40	10,786	32,064			
1,004.60	11,162	34,259			
1,004.80	11,539	36,529			
1,005.00	11,916	38,875			
1,005.20	12,044	41,271			
1,005.40	12,173	43,692			
1,005.60	12,301	46,140			
1,005.80	12,430	48,613			
1,006.00	12,558	51,112			
1,006.20	12,686	53,636			
1,006.40	12,815	56,186			
1,006.60	12,943	58,762			
1,006.80	13,072	61,363			
1,007.00	13,200	63,991			
1,007.20	13,440	66,655			
1,007.40	13,680	69,367			
1,007.60	13,920	72,127			
1,007.80	14,160	74,935			
1,008.00	14,400	77,791			

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Summary for Pond 56P: Woodland Cove Pond 2 AIRRIG/SED

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

Routing by Dyn-Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.03 hrs / 2

Starting Elev= 997.35' Surf.Area= 68,822 sf Storage= 260,413 cf

Peak Elev= 997.35' @ 0.00 hrs Surf.Area= 68,822 sf Storage= 260,413 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= (not calculated: no inflow)

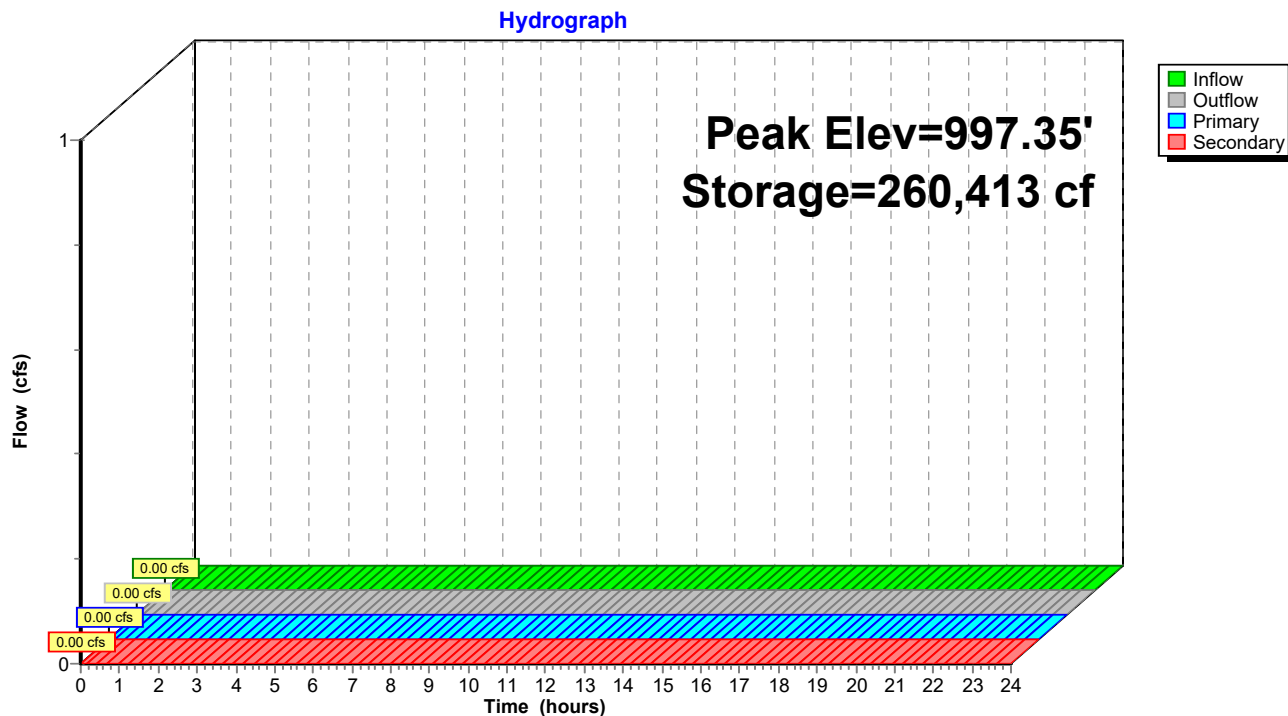
Volume	Invert	Avail.Storage	Storage Description
#1	998.00'	977,118 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
988.00	1,246	0	0
990.00	4,714	5,960	5,960
992.00	15,160	19,874	25,834
994.00	35,780	50,940	76,774
996.00	60,540	96,320	173,094
997.35	68,822	87,319	260,413
998.00	77,800	47,652	308,065
998.01	90,500	841	308,907
1,000.00	125,240	214,661	523,568
1,002.00	160,640	285,880	809,448
1,003.00	174,700	167,670	977,118

Device	Routing	Invert	Outlet Devices
#1	Primary	998.00'	12.0" Round Culvert L= 80.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 994.00' / 998.00' S= -0.0500 ' / Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	998.00'	0.500 cfs Constant Flow/Skimmer Phase-In= 0.01'

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=997.35' (Free Discharge)↑ **1=Culvert** (Controls 0.00 cfs)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=997.35' (Free Discharge)↑ **2=Constant Flow/Skimmer** (Constant Controls 0.00 cfs)

Pond 56P: Woodland Cove Pond 2 AIRRIG/SED



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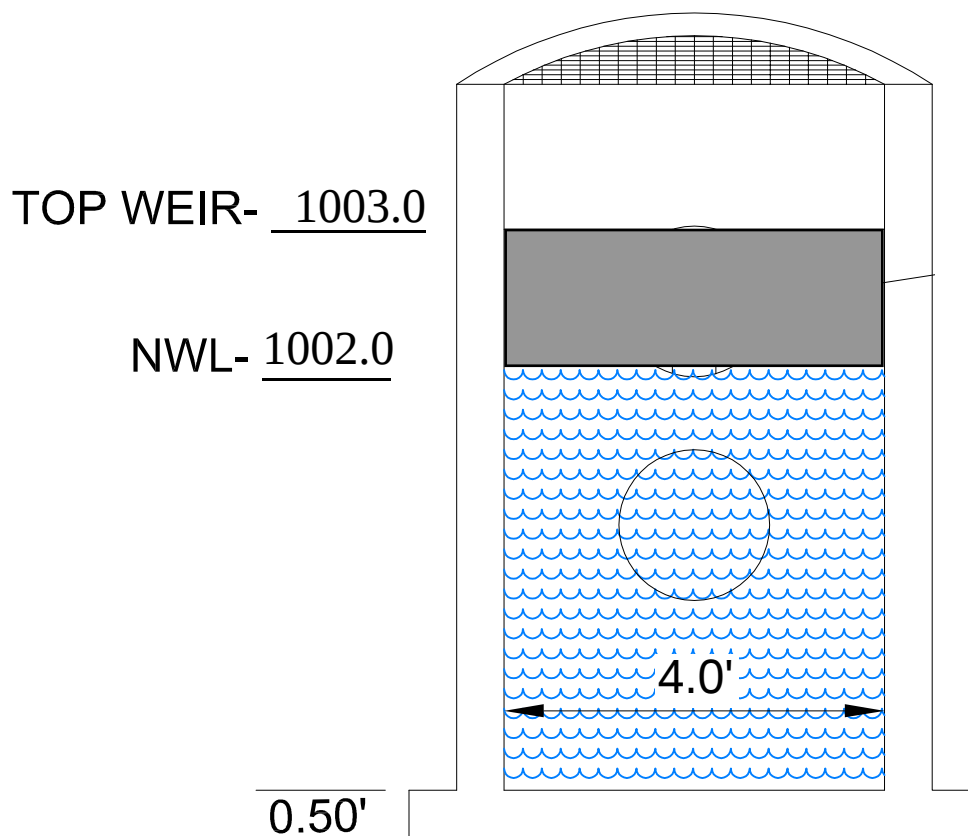
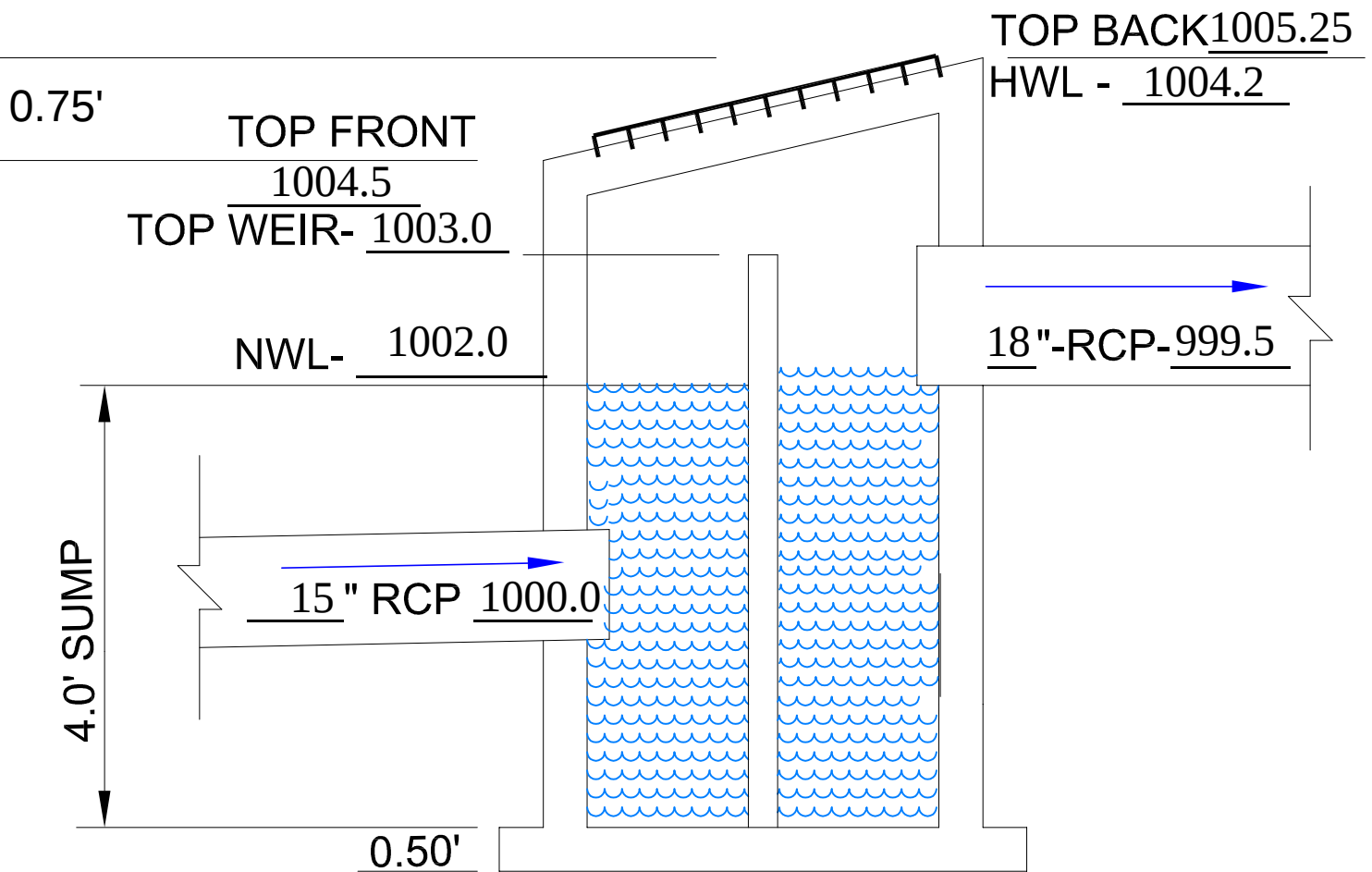
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Stage-Area-Storage for Pond 56P: Woodland Cove Pond 2 AIRRIG/SED

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
988.00	1,246	0	998.20	93,817	326,417
988.20	1,593	284	998.40	97,308	345,530
988.40	1,940	637	998.60	100,800	365,340
988.60	2,286	1,060	998.80	104,291	385,850
988.80	2,633	1,552	999.00	107,783	407,057
989.00	2,980	2,113	999.20	111,274	428,963
989.20	3,327	2,744	999.40	114,766	451,567
989.40	3,674	3,444	999.60	118,257	474,869
989.60	4,020	4,213	999.80	121,749	498,869
989.80	4,367	5,052	1,000.00	125,240	523,568
990.00	4,714	5,960	1,000.20	128,780	548,970
990.20	5,759	7,007	1,000.40	132,320	575,080
990.40	6,803	8,263	1,000.60	135,860	601,898
990.60	7,848	9,729	1,000.80	139,400	629,424
990.80	8,892	11,403	1,001.00	142,940	657,658
991.00	9,937	13,286	1,001.20	146,480	686,600
991.20	10,982	15,377	1,001.40	150,020	716,250
991.40	12,026	17,678	1,001.60	153,560	746,608
991.60	13,071	20,188	1,001.80	157,100	777,674
991.80	14,115	22,906	1,002.00	160,640	809,448
992.00	15,160	25,834	1,002.20	163,452	841,858
992.20	17,222	29,072	1,002.40	166,264	874,829
992.40	19,284	32,723	1,002.60	169,076	908,363
992.60	21,346	36,786	1,002.80	171,888	942,459
992.80	23,408	41,261	1,003.00	174,700	977,118
993.00	25,470	46,149			
993.20	27,532	51,449			
993.40	29,594	57,162			
993.60	31,656	63,287			
993.80	33,718	69,824			
994.00	35,780	76,774			
994.20	38,256	84,178			
994.40	40,732	92,076			
994.60	43,208	100,470			
994.80	45,684	109,360			
995.00	48,160	118,744			
995.20	50,636	128,624			
995.40	53,112	138,998			
995.60	55,588	149,868			
995.80	58,064	161,234			
996.00	60,540	173,094			
996.20	61,767	185,325			
996.40	62,994	197,801			
996.60	64,221	210,522			
996.80	65,448	223,489			
997.00	66,675	236,701			
997.20	67,902	250,159			
997.40	69,513	263,872			
997.60	72,275	278,050			
997.80	75,038	292,782			
998.00	77,800	308,065			

Appendix D: Outlet Control Structure Details

OUTLET STRUCTURE - POND 1



Appendix E: Storm Sewer Analysis – Rational Method

Appendix F: Woodland Cove 4th Addition SWMP