APPENDIX N

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HG Ministries Youth Camp

Preliminary Storm Report

January 15th, 2026

66845 Nehalem Hwy N
Veronia, OR 97064

Applicant/Contact:

Rain River Stormwater Solutions/Benjamin Cruz
[redacted]

Property Owner:

[redacted]
66845 Nehalem Hwy N
Veronia, OR 97064
Tax Account Number(s) : 25064 & 25077
Map ID: 6N4W34-00-00600

Site Data Information:

Address: 66845 Nehalem Hwy N Veronia, OR 97064
Tax Account Number(s) : 25064 & 25077
Map ID: 6N4W34-00-00600

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Project Overview

The "HG Ministries Youth Camp" project proposal for a new campground with associated infrastructure including numerous structures and associated drive and parking area. The property is located at 66845 Nehalem Hwy N, Vernonia, OR 97064 known as parcel #6N4W34-00-00600 within Columbia County, Oregon. The approximate property area is a 67-acre that is intersected by N. Nehalem Hwy with proposed site development activities occurring on the undeveloped 48-acre portion of property on the east side of Nehalem Hwy N. and the currently developed 19-acre portion on the west side of Nehalem Hwy N. and existing infrastructure to remain as is.

The topography of the site slopes from the east, north and south to a low-lying area that slopes west with natural drainage patterns flowing overland from east, north and south to a low-lying channel stream (Gus Creek) that flows west to a culvert crossing under the Nehalem Hwy N. that conveys stream flows directly into the Nehalem River. Vegetation for the east portion of property consists of mostly heavily vegetation with clearing at the location of project area. Environmental areas onsite consist of a stream and the associated riparian habitat area, mapped Flood Plain, and wetland areas as per Columbia County GIS Maps

> Note: LIDAR contours used for the proposed site plan indicate the GIS line work for these features appear to be significantly different and have been revised to represent a more appropriate representation.

This project proposes infrastructure related to site development resulting in new impervious surface runoff with storm facilities designed in accordance with requirements per the Columbia County Stormwater & Erosion Control Ordinance No. 2001-10 to address all applicable requirements with three proposed stormwater facilities (to as attenuation facilities and the third for treatment (bioswale) and runoff attenuation. Refer to stormwater basin maps, plan and storm details for construction specifications, and supporting calculations.

The method proposed to demonstrate compliance with all applicable stormwater requirements has been designed with modeling software to demonstrate compliance with the Santa Barbara Urban Hydrograph method. Refer to further description of how the proposed project intends to meet the stormwater requirements, along with Stormwater Plan and Details, attached herein. Below is a summary of the proposal.

Project Area Totals

Total amount of land-disturbing activities:	569,597 sq. ft.
Native vegetation converted to Lawn:	287,536 sq. ft.
Native vegetation converted to field:	152,589 sq. ft.
Driveway, parking & traffic areas:	66,454 sq. ft.
Roof Area Lodge:	22,521 sq. ft.
Cabins, Gazebos, walkways:	40,497 sq. ft.

v: Runoff Quality Treatment

Discussion of the methods to *be used* to *treat runoff from paved surfaces on the site*

- Biofiltration Swale in stormwater facility near entrance is proposed to provide treatment for all surface runoffs associated mainly with the nearby parking area. Other traffic areas (main entrance road east of the parking will be shed to the north and receive filter strip treatment either across new lawn, field and natural vegetation or combinations of these surfaces. The parking area at the lodge

will be collected and conveyed to a diffuser tee for flow spread distribution and release from a rock weep feature. Non pollution generating areas (roofs and walkways will mostly flow overland through natural vegetation. Refer to Appendix C for calculations prepared to demonstrate compliance with treatment requirements.

v. Flow Control

Discussion of the methods to *be used to control the flow of* storm water runoff *from the developed site. If infiltration is proposed, the discussion should include an analysis of the capability of on-site soils for infiltration of runoff, including the potential impacts on slope stability and on-site sewage systems.*

- Detention stormwater facilities are proposed to control the flow of runoff from the developed site. Onsite infiltration is not proposed to be utilized with the design of facilities at this time. Location of the facilities is not in the proximity of slopes on site that would impact slope stability for areas downslope of proposed septic drain fields.

vi. Calculations of the Pre-development & Post-development runoff from the site

- Refer to Appendix C for calculations prepared for the analysis of the pre-developed and post-development runoff.

Compare 2-yr Event Runoff

POC ID	Peak Runoff (cfs)	Peak Runoff Volume (ac-ft)
E	0.81	0.988
P	0.52	0.417
P*	0.33	0.366

*unconnected composite CN analysis

Note: Unconnected model runoff rate is

40.7% of
pre-model (59.3% reduction)
Note: Unconnected model runoff volume is

Compare 10-yr Event Runoff

POC ID	Peak Runoff (cfs)	Peak Runoff Volume (ac-ft)
E	2.55	2.388
P	1.58	1.638
P*	1.47	1.443

*unconnected composite CN analysis

Compare 100-yr Event Runoff

POC ID	Peak Runoff (cfs)	Peak Runoff Volume (ac-ft)
E	6.28	4.975
P	4.59	4.282
P*	3.96	3.996

*unconnected composite CN analysis

vii. Preliminary Sizing Calculations for the Proposed Stormwater Facilities

Refer to Appendix C for calculations prepared to size storm facilities in compliance to requirements per the Columbia County Stormwater & Erosion Control Ordinance No. 2001-10.

viii. Stormwater Facilities Maintenance

Discussion of who will maintain the storm water

- Stormwater facilities associated with the project will be privately owned by property owners who will be responsible for maintenance to ensure facilities function as designed.

vx. Additional Permits

- Wetland Assessment Permit to DSI related to mapped on site Wetlands has been completed
- Floodplain Permit pending review of applicability for mapped Floodplain areas onsite.

APPENDIX A – Nehalem Campround

MISCELLANEOUS SUPPORT DATA

A-1 Location Maps

A-2 RCN TABLE

A-3 24-hr Rainfall Depths

A-4 USGS StreamStats for Gus Creek

A-5 Soils Map

Vicinity Map

APPENDIX B
Runoff Curve Numbers

The runoff curve numbers shown below are for selected agricultural, suburban and urban land use for a Type 1A rainfall distribution, 24-hour storm duration. The curve numbers are for *wet* antecedent conditions.

The curve numbers originate from SCS Publications, TR55, "Urban Hydrology for Small Watersheds," June 1986.

		Curve Numbers by Hydrologic Group			
Land Use Description		A	B	C	D
Cultivated land:	Winter condition	89	94	97	98
Mountain open areas:	Low-growing brush and grasslands	68	83	89	93
Meadow or pasture:	Continuous forage for grazing <50% groundcover or heavily grazed with no mulch	68	79	86	89
Wood or forest land:	Undisturbed or older second growth	45	66	76	83
Orchard:	With crop cover	75	87	92	94
Open spaces, lawns, parks, golf courses, cemeteries, and landscaping					
Good condition:	Grass cover on 75% or more of area	59	78	88	91
Fair condition:	Grass cover on 50% to 75% of area	69	84	91	93
Poor condition:	Grass cover <50%	84	91	94	96
Gravel roads and parking lots		89	94	96	97
Dirt roads and parking lots		86	92	95	96
Impervious surfaces, pavement, roofs, etc.		99	99	99	99
Open water bodies:	Lakes, wetlands, ponds, etc.	100	100	100	100
Single Family Residential (See note 1)					
Dwelling Unit/Gross Acre	% Impervious (See note 2)	Separate curve number shall be selected for pervious and impervious portion of the site or basin.			
1.0 DU/GA	15				
1.5 DU/GA	20				
2.0 DU/GA	25				
2.5 DU/GA	30				
3.0 DU/GA	34				
3.5 DU/GA	38				
4.0 DU/GA	42				
4.5 DU/GA	46				
5.0 DU/GA	48				
5.5 DU/GA	50				

6.0 DU/GA	52	
6.5 DU/GA	54	
7.0 DU/GA	56	
Planned unit developments, condominiums, apartments, commercial business, and industrial areas.	% of impervious must be computed.	Separate curve number shall be selected for pervious and impervious portion of the site or basin.

Notes:

Assumes roof and driveway runoff is directed into street/storm system.

The remaining pervious areas (lawn) are considered to be in good condition for these curve numbers.

The design storms for Columbia County are based on Isopluvial maps in the NOAA (National Oceanic and Atmospheric Administration) Atlas 2, Volume X, Figure 30. These maps are also available on the Internet at http://www.wrcc.dri.edu.

The design storms for various parts of Columbia County, that are to be used in conjunction with this ordinance, are shown in the table below.

	Inches of Rainfall Resulting from Various 24-Hour Storms						
	Water Quality	2-year	5-year	10-	25-	50-	100-
St. Helens	0.67	2.0	2.5	3.0	3.4	3.6	4.0
Vernonia	0.67	2.0	2.5	3.0	3.5	4.0	4.5
Mist	0.67	2.0	2.5	3.0	3.7	4.2	4.6
Scappoose	0.80	2.4	2.8	3.3	3.8	4.1	4.7
Rainier	0.80	2.4	2.9	3.4	3.9	4.4	4.8
Clatskanie	0.93	2.8	3.4	3.9	4.5	5.0	5.4
US 30 & Clatsop Co. Line	1.17	3.5	4.2	5.0	5.7	6.2	7.0
Above 1000 feet	1.0	3.0	3.5	4.0	4.5	5.0	5.5

Notes:
The Water Quality Storm equals one-third the 2-year storm.
For sites below 1000 feet, the rainfall corresponding to the nearest point in the above chart shall be used for the design storm.

H5

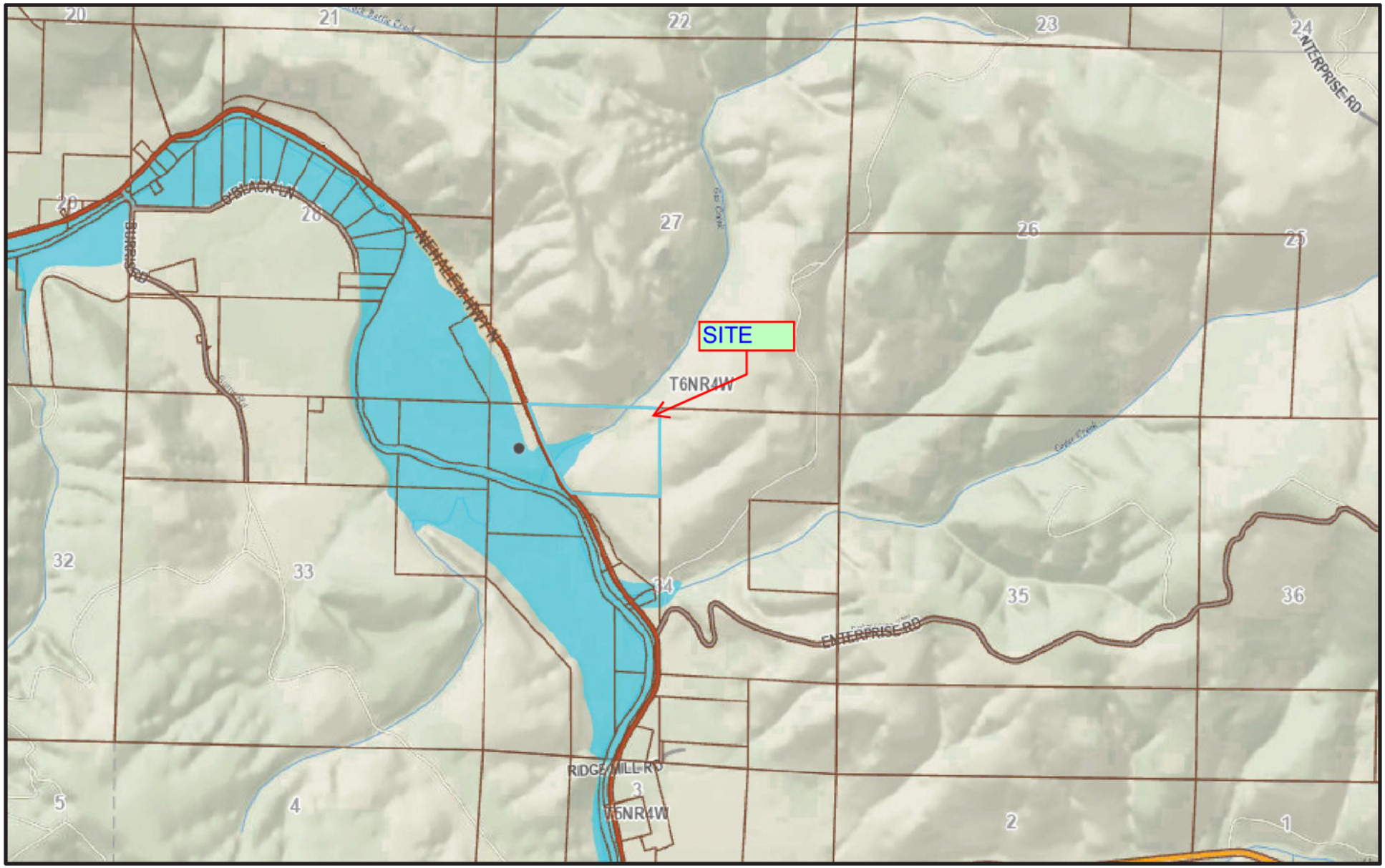
USGS StreamStats Results

Gus Creek to Nehalem River

Strom Event	Peak Rate (cfs)
2-yr	102
5-yr	150
10-yr	183
25-yr	224
50-yr	255
100-yr	285
5000-yr	356

Drainage Area (ac)	Mean Basin Elev. (ft)	Mean Basin Slope (deg)	Mean Basin Slope (ft/ft)
1158.4	1200	13.1	0.233

Flood Plain Map



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Taxlots

Sections

Township & Range

Local Roads

Collector & Arterial Roads

State Highways

FEMA Floodplain Hazard Zones

1% Annual Chance Flood Hazard

1:24,000

0 0.2 0.4 0.8 mi

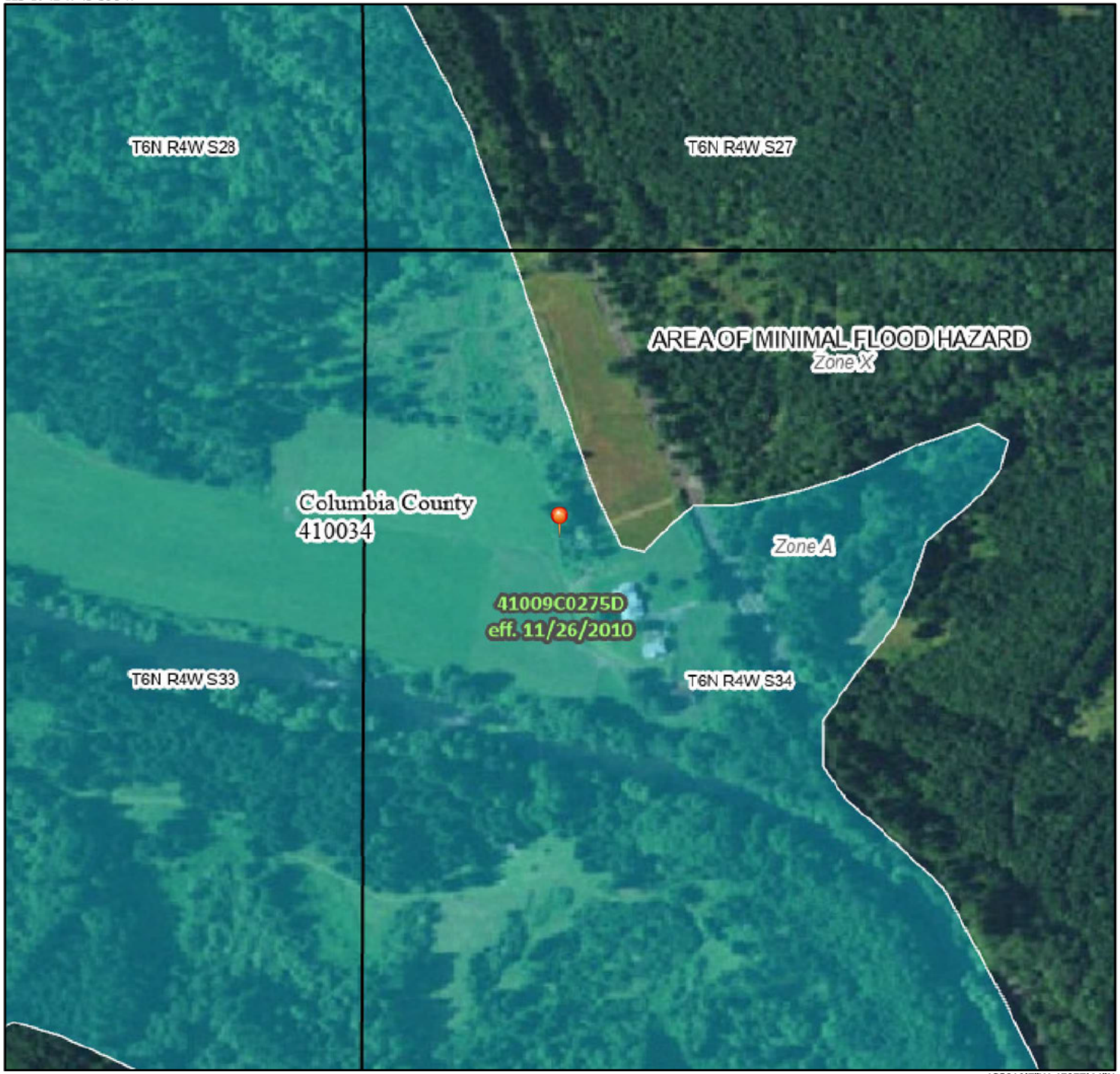
0 0.33 0.65 1.3 km

National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Columbia County, OR

National Flood Hazard Layer FIRMette

FEMA



Basemap Imagery Source: USGS National Map 2023

Legend

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

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

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

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

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

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

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

N

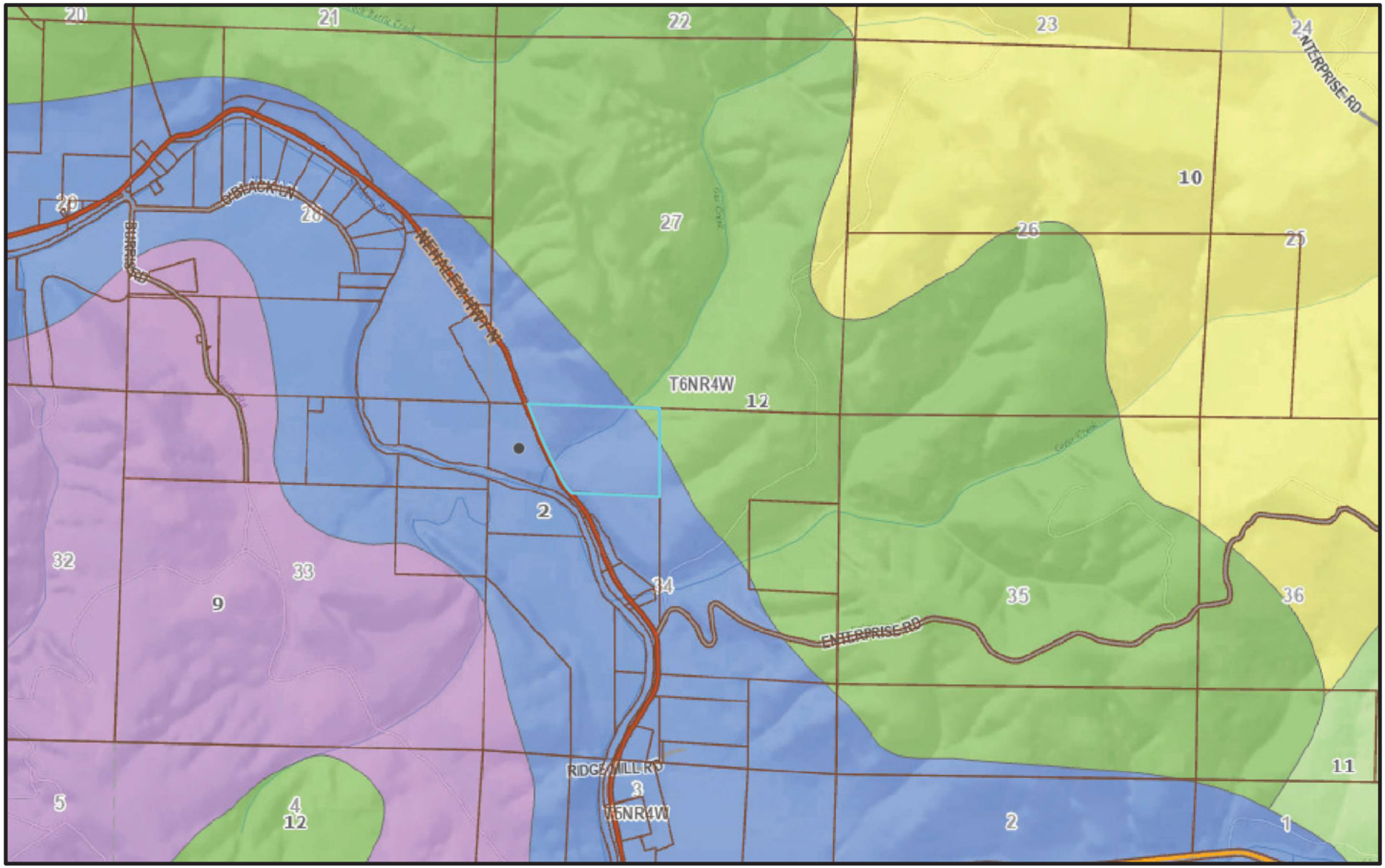
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/11/2025 at 11:19 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Soil Map



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1:24,000

0 0.2 0.4 0.8 mi

0 0.33 0.65 1.3 km

- Taxlots
- Sections
- Township & Range
- Local Roads
- Collector & Arterial Roads
- State Highways

General Soils

- 2 Eilersten - Trehaurne - McNulty
- 9 Meyger - Glohm
- 10 Scaponia - Braun - Anunde
- 11 Bacona - Alstony
- 12 Vernonia - Scappoose - Braun

National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

Columbia County, OR

APPENDIX B – Nehalem Campground

BASIN AREA DATA AND BASIN MAPS

B-1 Existing and Post-development Condition Subbasin Areas

B-2 Existing Condition Basin Map

B-3 Post-development Basin Map

Existing Subbasin Area Summaries

Subbasin ID	Woods HSG B (CN66)	Woods HSG C (CN76)	Woods HSG D (CN83)	Total Area (sf)
1EE		3,708	10,698	14,406
1E	33,679	117,669	380,684	532,032
2E	78,962	291,057	11,823	381,842
3E	107,711	213,901		321,612
(sf)	220,352	626,335	403,205	1,249,892
(ac)	5.059	14.379	9.256	**28.694**

Post-Development Subbasin Area Summaries

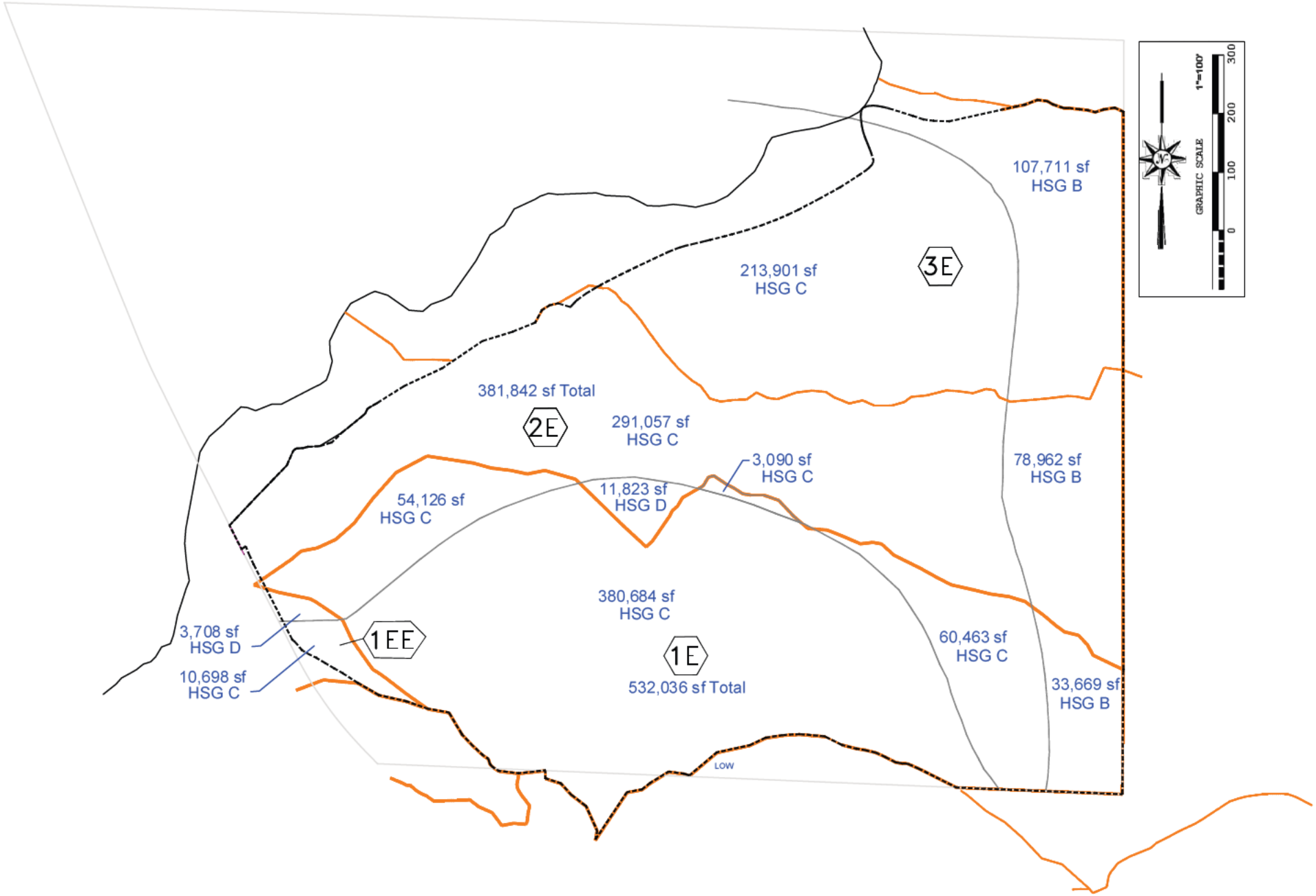
Subbasin ID	Impervious CN 98	Woods HSG B (CN66)	Woods HSG C (CN76)	Woods HSG D (CN83)	Lawn HSG B (CN78)
N1	41,114	54,074			14,646
N2	14,374				
N3	3,308				
P1					
P2	2,497				
S1	55,053	72,687	168,861	375,187	65,724
W4					
W5	13,126				
(sf)	129,472	126,761	168,861	375,187	80,370
(ac)	2.972	2.910	3.877	8.613	1.845

Post-Development Subbasin Area Summaries (Cont'd)

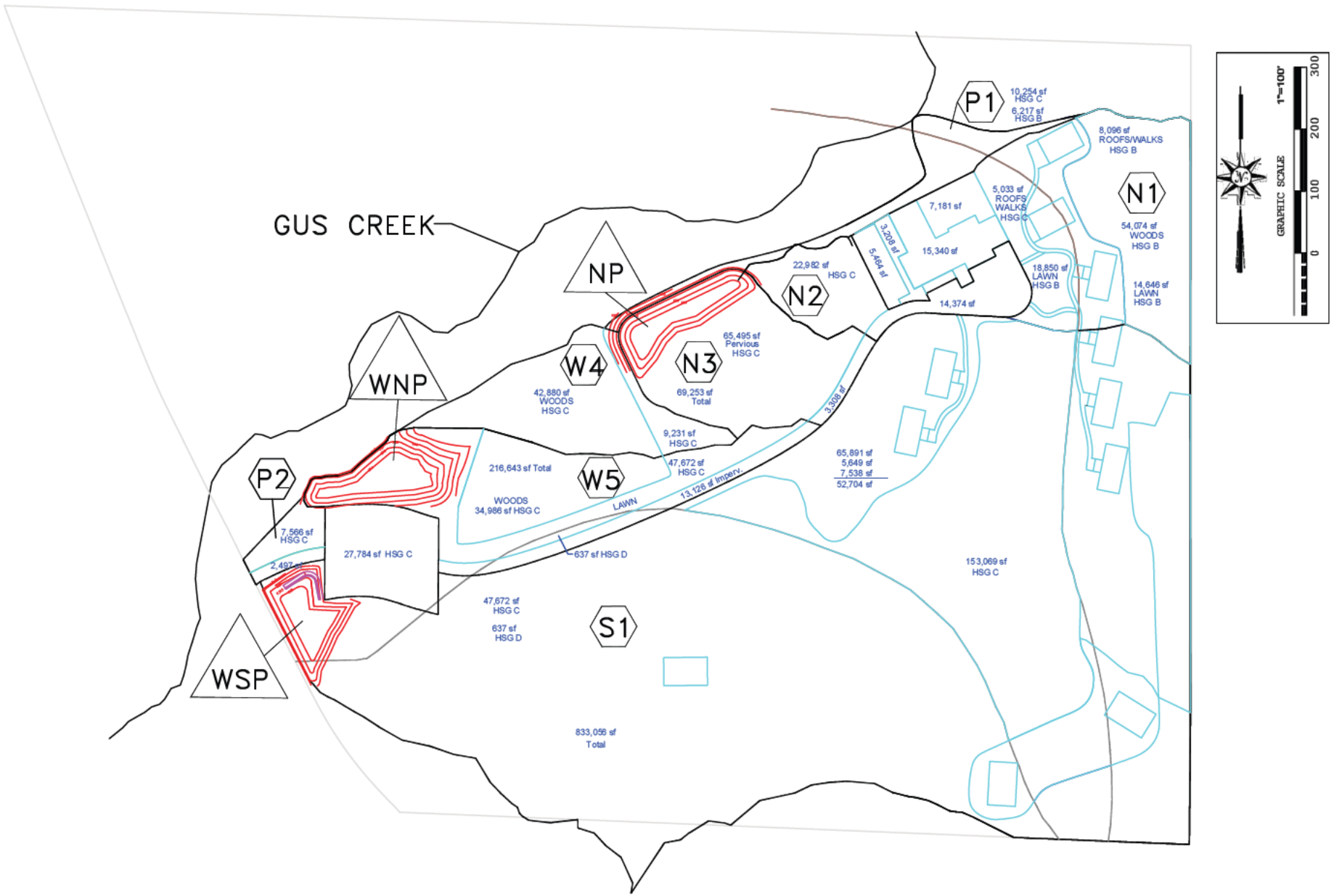
Subbasin ID	Lawn HSG C (CN88)	Lawn HSG D (CN95)	HSG B (CN80) New Field	HSG C (CN86) New Field	Field HSG C (CN 91)	Total Area (sf)
N1	22,058					131,892
N2	22,982					37,356
N3	65,945					69,253
P1			6,217	10,254		16,471
P2				7,566		10,063
S1	95,544					833,056
W4				42,880	9,231	52,111
W5		637		34,986	47,672	96,421
(sf)	206,529	637	6,217	95,686	56,903	1,246,623
(ac)	4.741	0.015	0.143	2.197	1.306	**28.619**

Note: Two areas in S1 (89.895 sf and 5,649 sf)listed as lawn (HSG C) were mistakenly modeled at CN 88 instead of CN 88

For the 100-yr event the cfs difference is 4.59 increase to 4.7 for the comparison node and about 0.150 ac ft runoff volume (Direct runoff scenario)



EXISTING BASIN MAP



POST-DEVELOPMENT BASIN MAP

APPENDIX C – Nehalem Campground

HYDROLOGY/HYDRAULICS CALCULATIONS

Discuss Design Approach – include unconnected runoff condition

C-1 Compare Pre/Post Runoff Data

- **Determine Unconnected Composite CN Values**
- **HCAD Report for Direct (connected) Method**
- **HCAD Report for Unconnected Method**

C-2 Bioswale and Filter Strip Design

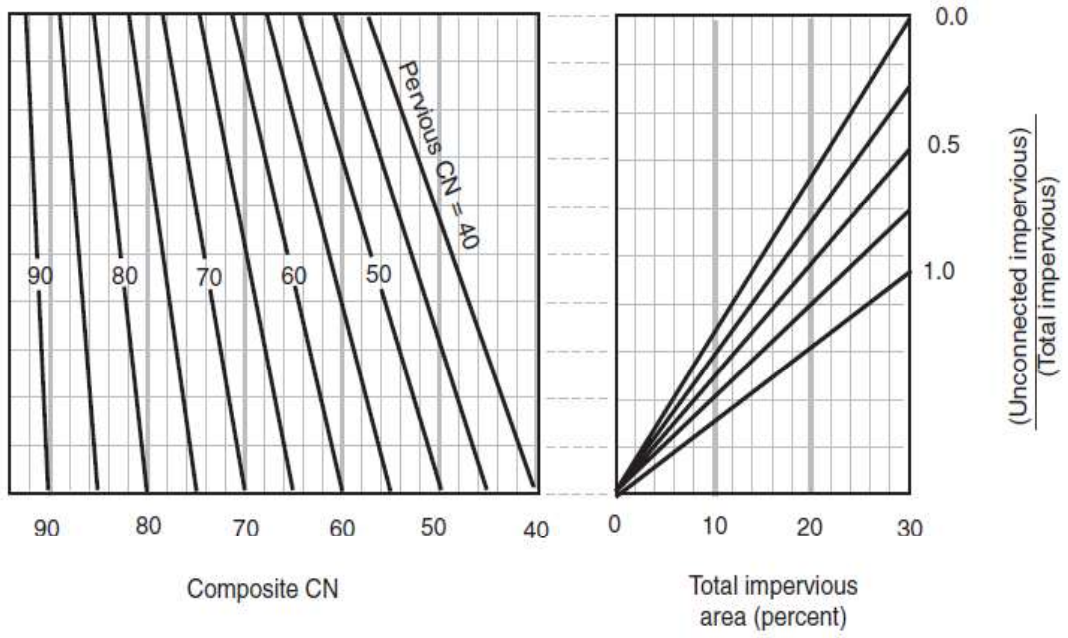
C-3 HCAD for Pond Routing – same as in C-1 reports

Stormwater Analysis Approach

The outline for the post-development analysis was determined as follows:

1. The south property line and east property lines established the boundary for determining the area for runoff analysis. The northerly side was based on the limit of proposed disturbance.
2. The pre-development condition assumed woods (worst case for comparison of pre/post runoff).
3. A large portion of the proposed site work will result in impervious areas being released onto new pervious or undisturbed pervious areas prior to reaching conveyance systems. This is termed "unconnected runoff" and provision was made by SCS modeling methodology to account for this situation.

Figure 2-4 Composite CN with unconnected impervious areas and total impervious area less than 30%



The following formula was developed by SCS and presented as the chart above.

Composite CN (unconnected w/<30% impervious)

$$CN_c = CN_p + (P_{imp}/100)(98-CN_p)(1-0.5R)$$

4. We are providing both the typical direct runoff analysis and the "unconnected" runoff analysis. There is a significant difference.
5. We are also aware the runoff from east of the site property line will also flow onto and across the site (mainly in the south portion). This is not included in the modeling and is not a significant

Consideration as the flow from the wooded area is low. The concern would be if this added inflow collected at the southwest pond would be a design problem. From evaluating other projects with offsite run on, this would need to be accounted for in culvert or pipe conveyance sizing. However, the pond routing is not impacted. The added runoff rate may cause the pond to rize to a greater peak level, but the overflow riser still functions to control flow and the added offsite flow is not an issue. One approach in analysis to model this offsite flow as bypass and then connect the outflow from the pond (site modeling) with the bypass flow. These results will be the same as modeling the offsite flow as passing through the pond facility.

Summarize Comparison of Direct Runoff and Unconnected Runoff_2-yr Event

Subcat ID	Direct (cfs)	Direct Runoff Volume (ac-ft)	Subcat ID	Unconneted* (cfs)	Unconnected Runoff Volume (ac-ft)	Reduction (cfs)	Reduction (ac-ft)
S1	0.86	0.905	US-1	0.77	0.839	0.09	0.066
N1	0.34	0.194	UN-1	0.22	0.140	0.12	0.054
N2	0.25	0.091	UN-2	0.21	0.075	0.04	0.016
N3	0.32	0.132	UN-3	0.31	0.129	0.01	0.003
W5	0.36	0.203	UN-5	0.34	0.192	0.26	0.139
						0.52	0.278

Compare 2-yr Event Runoff

POC ID	Peak Runoff (cfs)	Peak Runoff Volume (ac-ft)	Time at Peak (hr)
E	0.81	0.988	11.02
P	0.52	0.417	22.53
P*	0.33	0.366	24.00

*unconnected composite CN analysis

Note: Unconnected model runoff rate is
40.7% (59.3% reduction)
Note: Unconnected model runoff volume is
37% (63% reduction)

Summarize Comparison of Direct Runoff and Unconnected Runoff_10-yr Event

Subcat ID	Direct (cfs)	Direct Runoff Volume (ac-ft)	Subcat ID	Unconneted* (cfs)	Unconnected Runoff Volume (ac-ft)	Reduction (cfs)	Reduction (ac-ft)
S1	2.29	1.951	US-1	2.15	1.855	0.14	0.096
N1	0.7	0.364	UN-1	0.47	0.284	0.23	0.08
N2	0.45	0.155	UN-2	0.40	0.138	0.05	0.017
N3	0.65	0.245	UN-3	0.64	0.242	0.01	0.003
W5	0.7	0.365	UN-5	0.67	0.352	0.43	0.196
						0.86	0.392

Compare 10-yr Event Runoff

POC ID	Peak Runoff (cfs)	Peak Runoff Volume (ac-ft)	Time at Peak (hr)
E	2.55	2.388	8.96
P	1.58	1.638	12.24
P*	1.47	1.443	12.73

*unconnected composite CN analysis

Summarize Comparison of Direct Runoff and Unconnected Runoff_100-yr Event

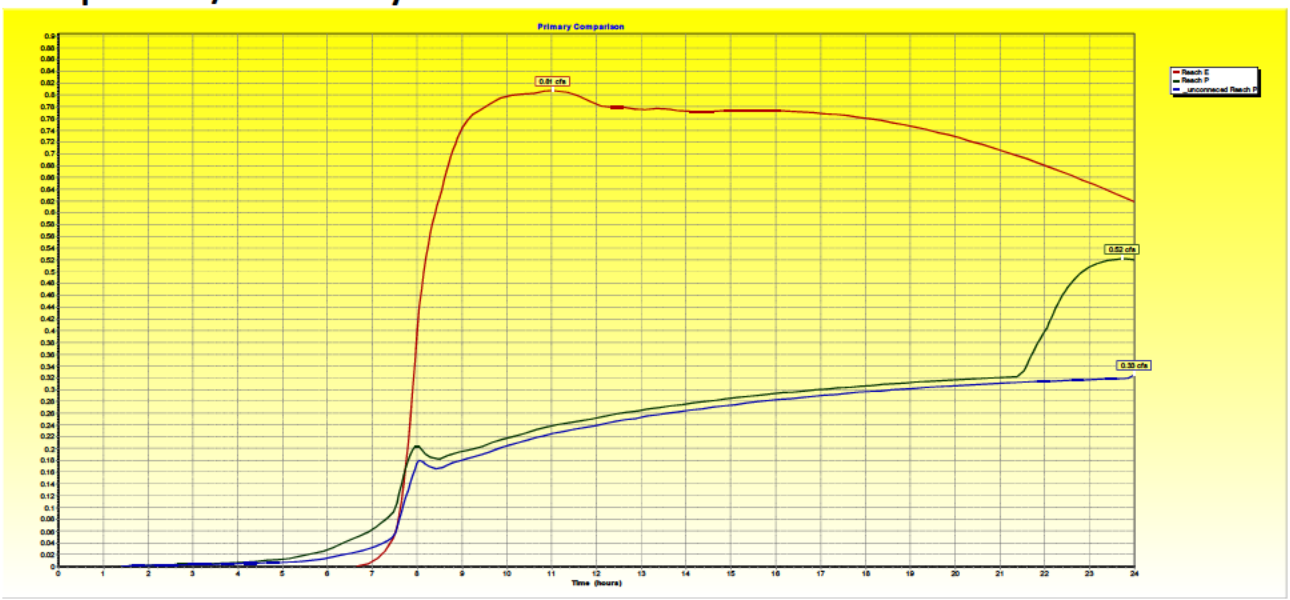
Subcat ID	Direct (cfs)	Direct Runoff Volume (ac-ft)	Subcat ID	Unconneted* (cfs)	Unconnected Runoff Volume (ac-ft)	Reduction (cfs)	Reduction (ac-ft)
S1	5.07	3.803	US-1	4.86	3.660	0.21	0.143
N1	1.38	0.660	UN-1	1.07	0.550	0.31	0.11
N2	0.75	0.257	UN-2	0.71	0.238	0.04	0.019
N3	1.17	0.428	UN-3	1.16	0.424	0.01	0.004
W5	1.23	0.620	UN-5	1.21	0.607	0.57	0.276
						1.14	0.552

Compare 100-yr Event Runoff

POC ID	Peak Runoff (cfs)	Peak Runoff Volume (ac-ft)	Time at Peak (hr)
E	6.28	4.975	8.67
P	4.59	4.282	11.09
P*	3.96	3.996	11.97

*unconnected composite CN analysis

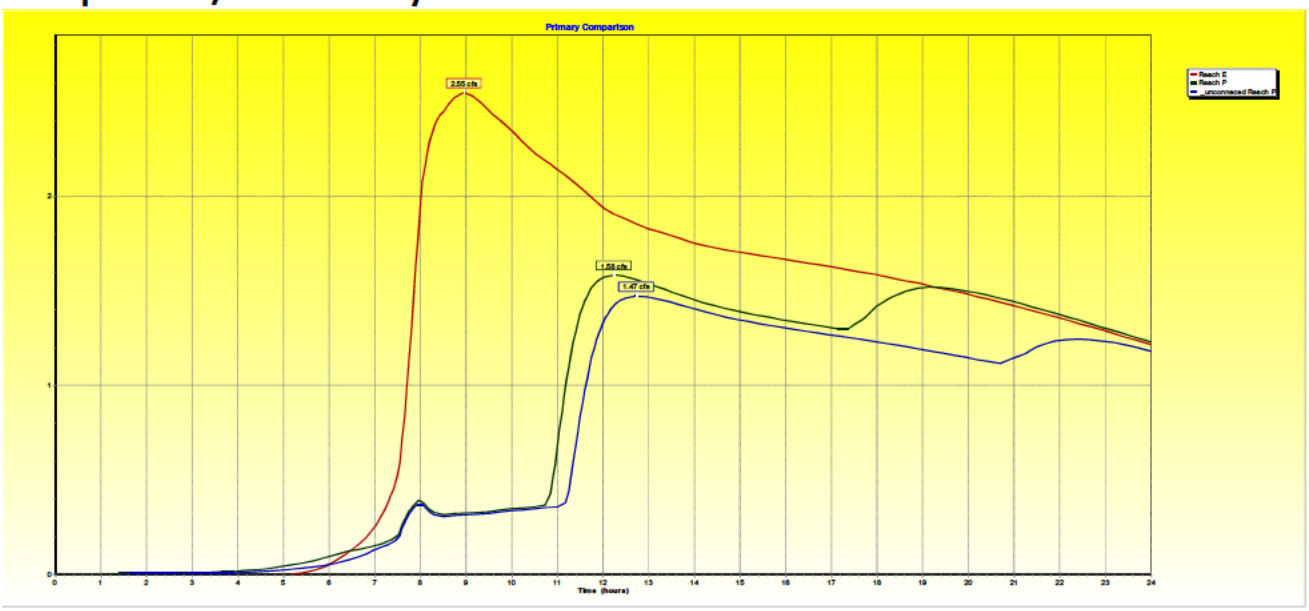
Compare Pre/Post for 2-yr event



Pre (E) red = 0.81 cfs at peak
Post (P) green = 0.52 cfs at peak
Post (P*) blue = 0.33 cfs at peak

*unconnected composite CN analysis

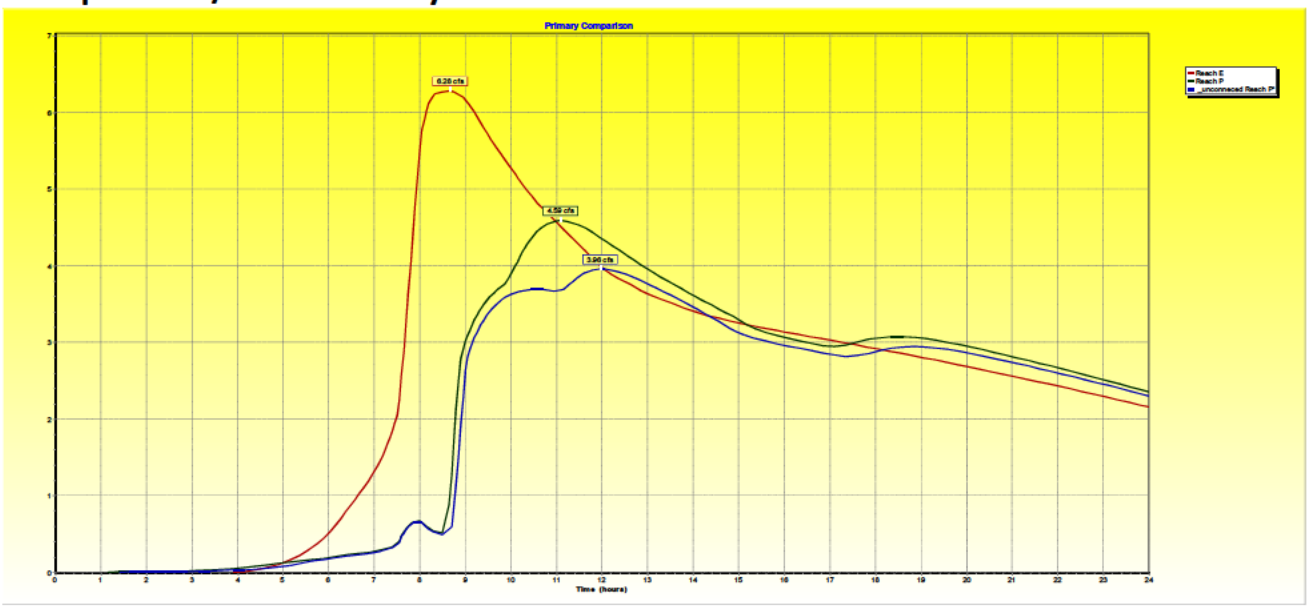
Compare Pre/Post for 10-yr event



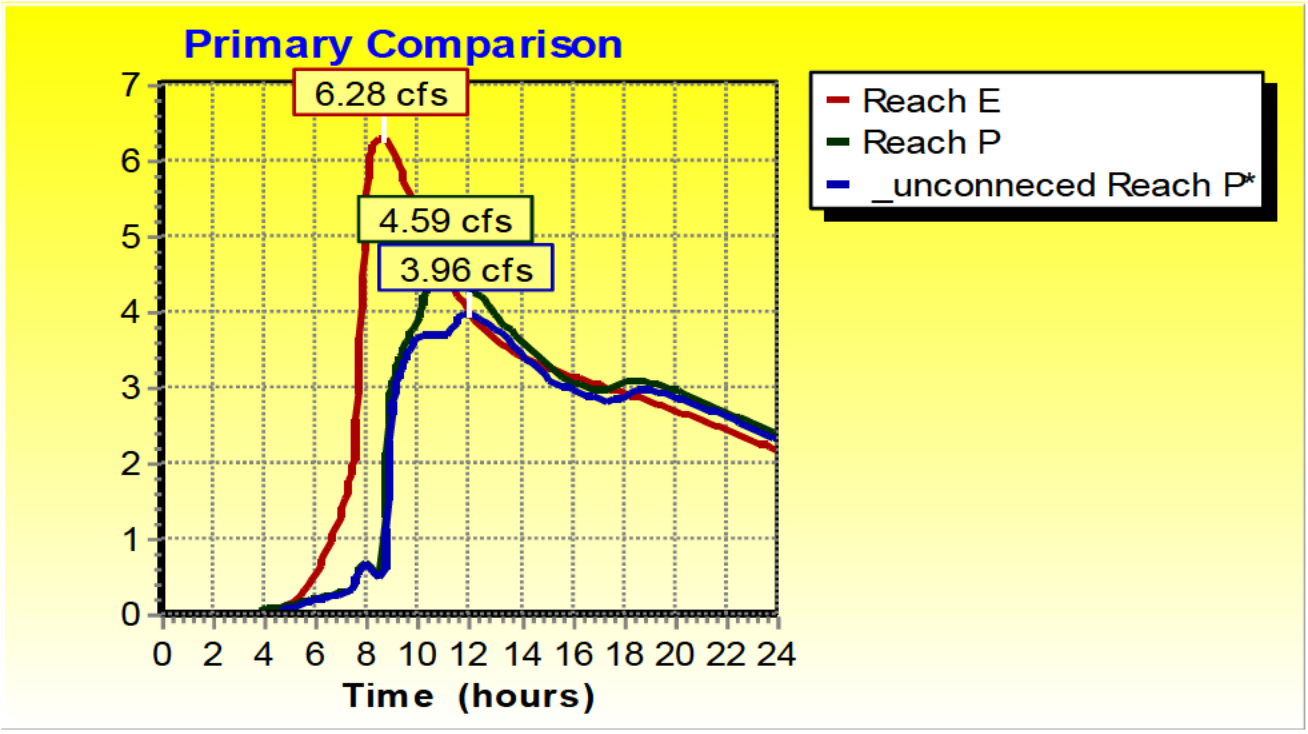
Pre (E) red =2.55 cfs at peak
Post (P) green = 1.58 cfs at peak
Post (P*) blue = 1.47 cfs at peak

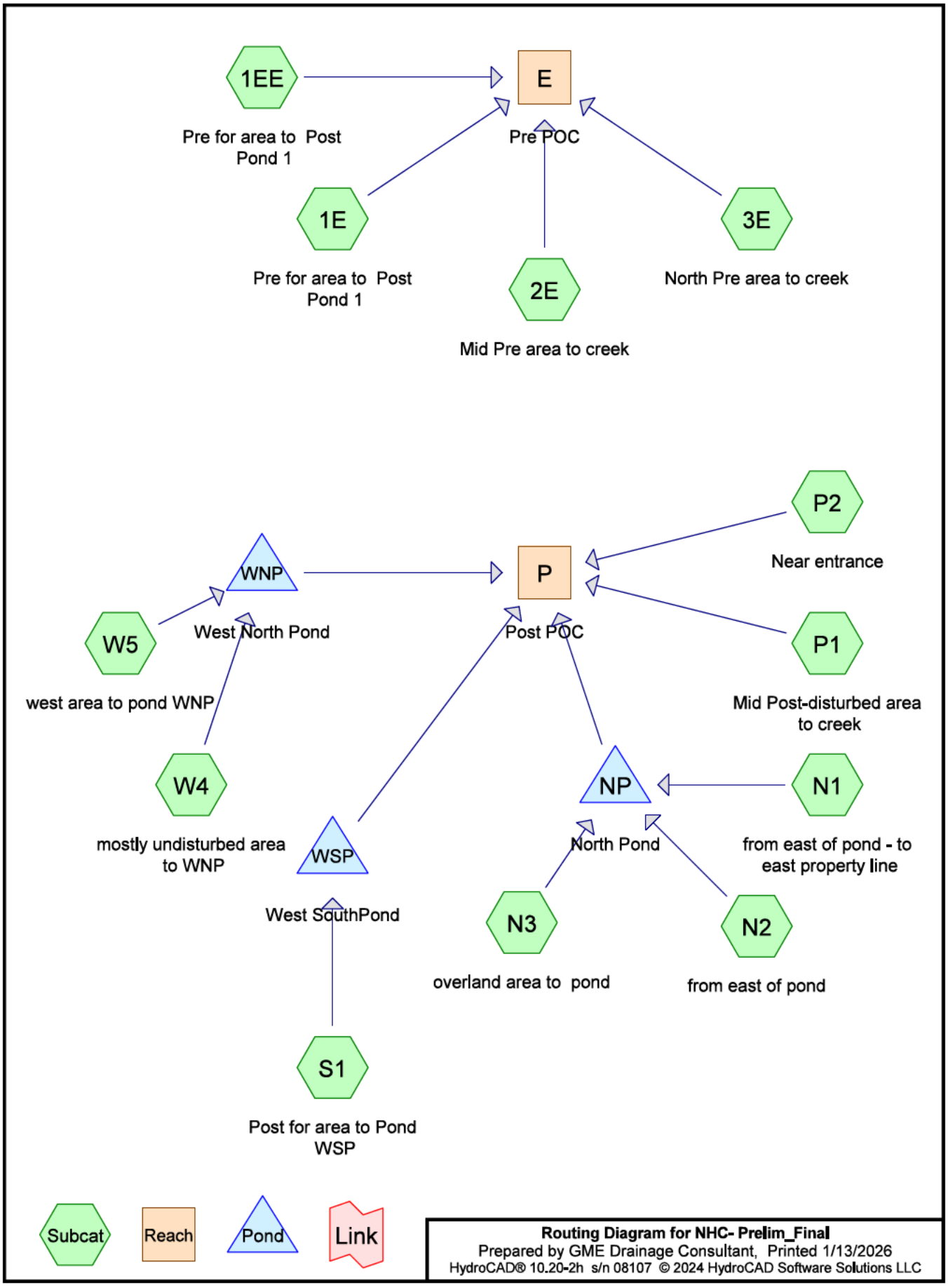
*unconnected composite CN analysis

Compare Pre/Post for 100-yr event



repeat at different scales


Primary Comparison
6.28 cfs
4.59 cfs
3.96 cfs
Reach E
Reach P
_unconneced Reach P*
7
6
5
4
3
2
1
0
0 2 4 6 8 10 12 14 16 18 20 22 24
Time (hours)



Routing Diagram for NHC- Prelim_Final
Prepared by GME Drainage Consultant, Printed 1/13/2026

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type IA 24-hr		Default	24.00	1	2.00	2
2	10-yr	Type IA 24-hr		Default	24.00	1	3.00	2
3	100-yr	Type IA 24-hr		Default	24.00	1	4.50	2

Summary for Subcatchment 1E: Pre for area to Post Pond 1

Runoff = 0.52 cfs @ 9.22 hrs, Volume= 0.555 af, Depth> 0.54"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	33,679	66.00	Wooded
*	117,669	76.00	Wooded
*	380,684	83.00	Wooded
	532,032	80.38	Weighted Average
	532,032	80.38	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 1EE: Pre for area to Post Pond 1

Runoff = 0.02 cfs @ 8.34 hrs, Volume= 0.016 af, Depth> 0.60"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	10,698	83.00	Wooded (HSG D)
*	3,708	76.00	Wooded (HHSG C)
	14,406	81.20	Weighted Average
	14,406	81.20	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.8	255	0.1880	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"

Summary for Subcatchment 2E: Mid Pre area to creek

Runoff = 0.20 cfs @ 17.16 hrs, Volume= 0.241 af, Depth> 0.33"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	78,962	66.00	Wooded (HSG B)
*	291,057	76.00	Wooded (HSG C)
*	11,823	83.00	Wooded (HSG D)
	381,842	74.15	Weighted Average
	381,842	74.15	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 3E: North Pre area to creek

Runoff = 0.15 cfs @ 17.81 hrs, Volume= 0.177 af, Depth> 0.29"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	107,711	66.00	Wooded (HSG B)
*	213,901	76.00	Wooded (HSG C)
	321,612	72.65	Weighted Average
	321,612	72.65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment N1: from east of pond - to east property line

Runoff = 0.34 cfs @ 8.05 hrs, Volume= 0.194 af, Depth> 0.77"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	5,033	98.00	Impervious
*	8,096	98.00	Impervious
*	27,985	98.00	Impervious
*	14,646	78.00	pervious (HSG B)
*	18,850	88.00	pervious (HSG C)
*	3,208	88.00	pervious (HSG C)
*	54,074	66.00	woods (HSG B)
	131,892	80.99	Weighted Average
	90,778	73.28	68.83% Pervious Area
	41,114	98.00	31.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	127	0.1730	0.15		**Sheet Flow, woode** Woods: Light underbrush n= 0.400 P2= 2.00"
12.3	173	0.1560	0.23		**Sheet Flow, lawn** Grass: Dense n= 0.240 P2= 2.00"
26.2	300	Total			

Summary for Subcatchment N2: from east of pond

Runoff = 0.25 cfs @ 7.99 hrs, Volume= 0.091 af, Depth> 1.27"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	14,374	98.00	Impervious
*	22,982	88.00	overland and natural into pond
	37,356	91.85	Weighted Average
	22,982	88.00	61.52% Pervious Area
	14,374	98.00	38.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	124	0.1450	0.21		**Sheet Flow, lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment N3: overland area to pond

Runoff = 0.32 cfs @ 8.02 hrs, Volume= 0.132 af, Depth> 1.00"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	52,077	88.00	Pervious
*	13,868	88.00	Pervious
*	3,308	98.00	Impervious
	69,253	88.48	Weighted Average
	65,945	88.00	95.22% Pervious Area
	3,308	98.00	4.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	182	0.1100	0.21		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment P1: Mid Post-disturbed area to creek

Runoff = 0.06 cfs @ 7.99 hrs, Volume= 0.023 af, Depth> 0.73"
Routed to Reach P : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	10,254	86.00	Cleared (HSG C)
*	6,217	80.00	Cleared (HSG B)
	16,471	83.74	Weighted Average
	16,471	83.74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	34	0.0800	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment P2: Near entrance

Runoff = 0.05 cfs @ 8.00 hrs, Volume= 0.021 af, Depth> 1.07"
Routed to Reach P : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	7,566	86.00	Cleared (HSG C)
*	2,496	98.00	Impervious
	10,062	88.98	Weighted Average
	7,566	86.00	75.19% Pervious Area
	2,496	98.00	24.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0800	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment S1: Post for area to Pond WSP

Runoff = 0.86 cfs @ 9.07 hrs, Volume= 0.904 af, Depth> 0.57"
Routed to Pond WSP : West SouthPond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	22,044	66.00	Wooded (HSG B)
*	45,524	66.00	Wooded (HSG B)
*	5,119	66.00	Wooded (HSG B)
*	168,861	76.00	Wooded (HSG C)
*	375,187	83.00	Wooded (HSG D)
*	27,785	98.00	parking
*	27,268	98.00	cabins, walks, pads, etc
*	39,090	78.00	lawn (HSG B)
*	722	78.00	lawn (HSG B)
*	89,895	78.00	lawn (HSG C)
*	5,649	78.00	lawn (HSG C)
*	13,290	78.00	lawn (HSG D)
*	12,622	78.00	lawn (HSG D)
	833,056	80.12	Weighted Average
	778,003	78.86	93.39% Pervious Area
	55,053	98.00	6.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment W4: mostly undisturbed area to WNP

Runoff = 0.15 cfs @ 8.15 hrs, Volume= 0.088 af, Depth> 0.88"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	42,880	86.00	Woods (HSG C)
*	9,231	91.00	Cleared (HSG C)
	52,111	86.89	Weighted Average
	52,111	86.89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	166	0.0960	0.19		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"
19.5	134	0.0820	0.11		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
2.6	43	0.0120	0.27		**Shallow Concentrated Flow, woode** Forest w/Heavy Litter Kv= 2.5 fps
36.6	343	Total			

Summary for Subcatchment W5: west area to pond WNP

Runoff = 0.36 cfs @ 8.13 hrs, Volume= 0.203 af, Depth> 1.10"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	34,986	86.00	Woods (HSG C)
*	47,672	91.00	Pervious (HSG C)
*	13,126	98.00	Impervious
*	637	95.00	Lawn (HSG D)
	96,421	90.17	Weighted Average
	83,295	88.93	86.39% Pervious Area
	13,126	98.00	13.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	300	0.0700	0.13		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
1.2	80	0.0500	1.12		**Shallow Concentrated Flow, woode** Woodland Kv= 5.0 fps
40.8	380	Total			

Summary for Reach E: Pre POC

Inflow Area = 28.694 ac, 0.00% Impervious, Inflow Depth > 0.41" for 2-yr event
Inflow = 0.81 cfs @ 11.02 hrs, Volume= 0.988 af
Outflow = 0.81 cfs @ 11.02 hrs, Volume= 0.988 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach P: Post POC

Inflow Area = 28.619 ac, 10.39% Impervious, Inflow Depth > 0.17" for 2-yr event
Inflow = 0.52 cfs @ 23.74 hrs, Volume= 0.417 af
Outflow = 0.52 cfs @ 23.74 hrs, Volume= 0.417 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond NP: North Pond

Inflow Area = 5.475 ac, 24.65% Impervious, Inflow Depth > 0.91" for 2-yr event
Inflow = 0.91 cfs @ 8.02 hrs, Volume= 0.417 af
Outflow = 0.01 cfs @ 24.00 hrs, Volume= 0.012 af, Atten= 99%, Lag= 959.0 min
Primary = 0.01 cfs @ 24.00 hrs, Volume= 0.012 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 608.30' @ 24.00 hrs Surf.Area= 10,036 sf Storage= 17,607 cf

Plug-Flow detention time= 731.4 min calculated for 0.012 af (3% of inflow)
Center-of-Mass det. time= 163.8 min (938.8 - 775.0)

Volume	Invert	Avail.Storage	Storage Description
#1	606.00'	37,953 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
606.00	5,353	0	0
608.00	9,366	14,719	14,719
610.00	13,868	23,234	37,953

Device	Routing	Invert	Outlet Devices
#1	Primary	606.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 606.00' / 604.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	606.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	609.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 24.00 hrs HW=608.30' (Free Discharge)
└**1=Culvert** (Passes 0.01 cfs of 5.07 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 7.30 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond WNP: West North Pond

Inflow Area = 3.410 ac, 8.84% Impervious, Inflow Depth > 1.02" for 2-yr event
Inflow = 0.51 cfs @ 8.13 hrs, Volume= 0.291 af
Outflow = 0.01 cfs @ 24.00 hrs, Volume= 0.009 af, Atten= 98%, Lag= 952.0 min
Primary = 0.01 cfs @ 24.00 hrs, Volume= 0.009 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 585.46' @ 24.00 hrs Surf.Area= 10,355 sf Storage= 12,279 cf

Plug-Flow detention time= 662.9 min calculated for 0.009 af (3% of inflow)
Center-of-Mass det. time= 167.7 min (975.2 - 807.5)

Volume	Invert	Avail.Storage	Storage Description
#1	584.00'	44,491 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
584.00	6,420	0	0
586.00	11,796	18,216	18,216
588.00	14,479	26,275	44,491

Device	Routing	Invert	Outlet Devices
#1	Primary	584.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 584.00' / 582.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	584.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 24.00 hrs HW=585.46' (Free Discharge)
↑—**1=Culvert** (Passes 0.01 cfs of 3.71 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 5.83 fps)
—**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond WSP: West SouthPond

Inflow Area = 19.124 ac, 6.61% Impervious, Inflow Depth > 0.57" for 2-yr event
Inflow = 0.86 cfs @ 9.07 hrs, Volume= 0.904 af
Outflow = 0.49 cfs @ 23.76 hrs, Volume= 0.352 af, Atten= 44%, Lag= 881.6 min
Primary = 0.49 cfs @ 23.76 hrs, Volume= 0.352 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 581.07' @ 23.76 hrs Surf.Area= 10,798 sf Storage= 24,056 cf

Plug-Flow detention time= 442.0 min calculated for 0.351 af (39% of inflow)
Center-of-Mass det. time= 139.0 min (1,031.9 - 892.9)

Volume	Invert	Avail.Storage	Storage Description
#1	578.00'	34,969 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.00	5,055	0	0
580.00	8,609	13,664	13,664
582.00	12,696	21,305	34,969

Device	Routing	Invert	Outlet Devices
#1	Primary	578.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.00' / 578.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	578.00'	**2.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	581.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.48 cfs @ 23.76 hrs HW=581.07' (Free Discharge)
└─**1=Culvert** (Passes 0.48 cfs of 5.70 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.29 cfs @ 8.44 fps)
  └─**3=Orifice/Grate** (Weir Controls 0.19 cfs @ 0.87 fps)

Summary for Subcatchment 1E: Pre for area to Post Pond 1

Runoff = 1.46 cfs @ 8.80 hrs, Volume= 1.234 af, Depth> 1.21"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	33,679	66.00	Wooded
*	117,669	76.00	Wooded
*	380,684	83.00	Wooded
	532,032	80.38	Weighted Average
	532,032	80.38	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 1EE: Pre for area to Post Pond 1

Runoff = 0.06 cfs @ 8.19 hrs, Volume= 0.036 af, Depth> 1.30"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	10,698	83.00	Wooded (HSG D)
*	3,708	76.00	Wooded (HHSG C)
	14,406	81.20	Weighted Average
	14,406	81.20	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.8	255	0.1880	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"

Summary for Subcatchment 2E: Mid Pre area to creek

Runoff = 0.61 cfs @ 9.14 hrs, Volume= 0.631 af, Depth> 0.86"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	78,962	66.00	Wooded (HSG B)
*	291,057	76.00	Wooded (HSG C)
*	11,823	83.00	Wooded (HSG D)
	381,842	74.15	Weighted Average
	381,842	74.15	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 3E: North Pre area to creek

Runoff = 0.45 cfs @ 9.27 hrs, Volume= 0.487 af, Depth> 0.79"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	107,711	66.00	Wooded (HSG B)
*	213,901	76.00	Wooded (HSG C)
	321,612	72.65	Weighted Average
	321,612	72.65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment N1: from east of pond - to east property line

Runoff = 0.70 cfs @ 8.06 hrs, Volume= 0.364 af, Depth> 1.44"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	5,033	98.00	Impervious
*	8,096	98.00	Impervious
*	27,985	98.00	Impervious
*	14,646	78.00	pervious (HSG B)
*	18,850	88.00	pervious (HSG C)
*	3,208	88.00	pervious (HSG C)
*	54,074	66.00	woods (HSG B)
	131,892	80.99	Weighted Average
	90,778	73.28	68.83% Pervious Area
	41,114	98.00	31.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	127	0.1730	0.15		**Sheet Flow, woode** Woods: Light underbrush n= 0.400 P2= 2.00"
12.3	173	0.1560	0.23		**Sheet Flow, lawn** Grass: Dense n= 0.240 P2= 2.00"
26.2	300	Total			

Summary for Subcatchment N2: from east of pond

Runoff = 0.45 cfs @ 7.98 hrs, Volume= 0.155 af, Depth> 2.18"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	14,374	98.00	Impervious
*	22,982	88.00	overland and natural into pond
	37,356	91.85	Weighted Average
	22,982	88.00	61.52% Pervious Area
	14,374	98.00	38.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	124	0.1450	0.21		**Sheet Flow, lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment N3: overland area to pond

Runoff = 0.65 cfs @ 8.01 hrs, Volume= 0.245 af, Depth> 1.85"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	52,077	88.00	Pervious
*	13,868	88.00	Pervious
*	3,308	98.00	Impervious
	69,253	88.48	Weighted Average
	65,945	88.00	95.22% Pervious Area
	3,308	98.00	4.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	182	0.1100	0.21		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment P1: Mid Post-disturbed area to creek

Runoff = 0.13 cfs @ 7.98 hrs, Volume= 0.047 af, Depth> 1.49"
Routed to Reach P : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	10,254	86.00	Cleared (HSG C)
*	6,217	80.00	Cleared (HSG B)
	16,471	83.74	Weighted Average
	16,471	83.74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	34	0.0800	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment P2: Near entrance

Runoff = 0.10 cfs @ 7.99 hrs, Volume= 0.037 af, Depth> 1.93"
Routed to Reach P : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	7,566	86.00	Cleared (HSG C)
*	2,496	98.00	Impervious
	10,062	88.98	Weighted Average
	7,566	86.00	75.19% Pervious Area
	2,496	98.00	24.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0800	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment S1: Post for area to Pond WSP

Runoff = 2.29 cfs @ 8.77 hrs, Volume= 1.951 af, Depth> 1.22"
Routed to Pond WSP : West SouthPond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	22,044	66.00	Wooded (HSG B)
*	45,524	66.00	Wooded (HSG B)
*	5,119	66.00	Wooded (HSG B)
*	168,861	76.00	Wooded (HSG C)
*	375,187	83.00	Wooded (HSG D)
*	27,785	98.00	parking
*	27,268	98.00	cabins, walks, pads, etc
*	39,090	78.00	lawn (HSG B)
*	722	78.00	lawn (HSG B)
*	89,895	78.00	lawn (HSG C)
*	5,649	78.00	lawn (HSG C)
*	13,290	78.00	lawn (HSG D)
*	12,622	78.00	lawn (HSG D)
	833,056	80.12	Weighted Average
	778,003	78.86	93.39% Pervious Area
	55,053	98.00	6.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment W4: mostly undisturbed area to WNP

Runoff = 0.32 cfs @ 8.09 hrs, Volume= 0.169 af, Depth> 1.70"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	42,880	86.00	Woods (HSG C)
*	9,231	91.00	Cleared (HSG C)
	52,111	86.89	Weighted Average
	52,111	86.89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	166	0.0960	0.19		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"
19.5	134	0.0820	0.11		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
2.6	43	0.0120	0.27		**Shallow Concentrated Flow, woode** Forest w/Heavy Litter Kv= 2.5 fps
36.6	343	Total			

Summary for Subcatchment W5: west area to pond WNP

Runoff = 0.70 cfs @ 8.09 hrs, Volume= 0.365 af, Depth> 1.98"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	34,986	86.00	Woods (HSG C)
*	47,672	91.00	Pervious (HSG C)
*	13,126	98.00	Impervious
*	637	95.00	Lawn (HSG D)
	96,421	90.17	Weighted Average
	83,295	88.93	86.39% Pervious Area
	13,126	98.00	13.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	300	0.0700	0.13		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
1.2	80	0.0500	1.12		**Shallow Concentrated Flow, woode** Woodland Kv= 5.0 fps
40.8	380	Total			

Summary for Reach E: Pre POC

Inflow Area = 28.694 ac, 0.00% Impervious, Inflow Depth > 1.00" for 10-yr event
Inflow = 2.55 cfs @ 8.96 hrs, Volume= 2.388 af
Outflow = 2.55 cfs @ 8.96 hrs, Volume= 2.388 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach P: Post POC

Inflow Area = 28.619 ac, 10.39% Impervious, Inflow Depth > 0.69" for 10-yr event
Inflow = 1.58 cfs @ 12.24 hrs, Volume= 1.638 af
Outflow = 1.58 cfs @ 12.24 hrs, Volume= 1.638 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond NP: North Pond

Inflow Area = 5.475 ac, 24.65% Impervious, Inflow Depth > 1.68" for 10-yr event
Inflow = 1.78 cfs @ 8.01 hrs, Volume= 0.765 af
Outflow = 0.33 cfs @ 20.07 hrs, Volume= 0.163 af, Atten= 81%, Lag= 723.2 min
Primary = 0.33 cfs @ 20.07 hrs, Volume= 0.163 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 609.10' @ 20.07 hrs Surf.Area= 11,838 sf Storage= 26,360 cf

Plug-Flow detention time= 839.2 min calculated for 0.163 af (21% of inflow)
Center-of-Mass det. time= 466.8 min (1,224.7 - 757.9)

Volume	Invert	Avail.Storage	Storage Description
#1	606.00'	37,953 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
606.00	5,353	0	0
608.00	9,366	14,719	14,719
610.00	13,868	23,234	37,953

Device	Routing	Invert	Outlet Devices
#1	Primary	606.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 606.00' / 604.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	606.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	609.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.33 cfs @ 20.07 hrs HW=609.10' (Free Discharge)
└─**1=Culvert** (Passes 0.01 cfs of 6.10 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.47 fps)
└─**3=Orifice/Grate** (Weir Controls 0.32 cfs @ 1.02 fps)

Summary for Pond WNP: West North Pond

Inflow Area = 3.410 ac, 8.84% Impervious, Inflow Depth > 1.88" for 10-yr event
Inflow = 1.02 cfs @ 8.09 hrs, Volume= 0.534 af
Outflow = 0.01 cfs @ 24.00 hrs, Volume= 0.012 af, Atten= 99%, Lag= 954.5 min
Primary = 0.01 cfs @ 24.00 hrs, Volume= 0.012 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 586.37' @ 24.00 hrs Surf.Area= 12,296 sf Storage= 22,709 cf

Plug-Flow detention time= 697.6 min calculated for 0.012 af (2% of inflow)
Center-of-Mass det. time= 178.5 min (955.2 - 776.8)

Volume	Invert	Avail.Storage	Storage Description
#1	584.00'	44,491 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
584.00	6,420	0	0
586.00	11,796	18,216	18,216
588.00	14,479	26,275	44,491

Device	Routing	Invert	Outlet Devices
#1	Primary	584.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 584.00' / 582.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	584.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 24.00 hrs HW=586.37' (Free Discharge)
└**1=Culvert** (Passes 0.01 cfs of 5.18 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 7.42 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond WSP: West SouthPond

Inflow Area = 19.124 ac, 6.61% Impervious, Inflow Depth > 1.22" for 10-yr event
Inflow = 2.29 cfs @ 8.77 hrs, Volume= 1.951 af
Outflow = 1.51 cfs @ 12.23 hrs, Volume= 1.378 af, Atten= 34%, Lag= 207.6 min
Primary = 1.51 cfs @ 12.23 hrs, Volume= 1.378 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 581.24' @ 12.23 hrs Surf.Area= 11,145 sf Storage= 25,924 cf

Plug-Flow detention time= 296.3 min calculated for 1.378 af (71% of inflow)
Center-of-Mass det. time= 139.2 min (995.6 - 856.4)

Volume	Invert	Avail.Storage	Storage Description
#1	578.00'	34,969 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.00	5,055	0	0
580.00	8,609	13,664	13,664
582.00	12,696	21,305	34,969

Device	Routing	Invert	Outlet Devices
#1	Primary	578.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.00' / 578.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	578.00'	**2.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	581.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.51 cfs @ 12.23 hrs HW=581.24' (Free Discharge)
└─**1=Culvert** (Passes 1.51 cfs of 5.93 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.30 cfs @ 8.67 fps)
  └─**3=Orifice/Grate** (Weir Controls 1.22 cfs @ 1.61 fps)

Summary for Subcatchment 1E: Pre for area to Post Pond 1

Runoff = 3.27 cfs @ 8.38 hrs, Volume= 2.432 af, Depth> 2.39"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	33,679	66.00	Wooded
*	117,669	76.00	Wooded
*	380,684	83.00	Wooded
	532,032	80.38	Weighted Average
	532,032	80.38	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 1EE: Pre for area to Post Pond 1

Runoff = 0.13 cfs @ 8.13 hrs, Volume= 0.069 af, Depth> 2.51"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	10,698	83.00	Wooded (HSG D)
*	3,708	76.00	Wooded (HHSG C)
	14,406	81.20	Weighted Average
	14,406	81.20	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.8	255	0.1880	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"

Summary for Subcatchment 2E: Mid Pre area to creek

Runoff = 1.66 cfs @ 8.77 hrs, Volume= 1.380 af, Depth> 1.89"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	78,962	66.00	Wooded (HSG B)
*	291,057	76.00	Wooded (HSG C)
*	11,823	83.00	Wooded (HSG D)
	381,842	74.15	Weighted Average
	381,842	74.15	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 3E: North Pre area to creek

Runoff = 1.28 cfs @ 8.82 hrs, Volume= 1.094 af, Depth> 1.78"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	107,711	66.00	Wooded (HSG B)
*	213,901	76.00	Wooded (HSG C)
	321,612	72.65	Weighted Average
	321,612	72.65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment N1: from east of pond - to east property line

Runoff = 1.38 cfs @ 8.05 hrs, Volume= 0.660 af, Depth> 2.62"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	5,033	98.00	Impervious
*	8,096	98.00	Impervious
*	27,985	98.00	Impervious
*	14,646	78.00	pervious (HSG B)
*	18,850	88.00	pervious (HSG C)
*	3,208	88.00	pervious (HSG C)
*	54,074	66.00	woods (HSG B)
	131,892	80.99	Weighted Average
	90,778	73.28	68.83% Pervious Area
	41,114	98.00	31.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	127	0.1730	0.15		**Sheet Flow, woode** Woods: Light underbrush n= 0.400 P2= 2.00"
12.3	173	0.1560	0.23		**Sheet Flow, lawn** Grass: Dense n= 0.240 P2= 2.00"
26.2	300	Total			

Summary for Subcatchment N2: from east of pond

Runoff = 0.75 cfs @ 7.98 hrs, Volume= 0.257 af, Depth> 3.59"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	14,374	98.00	Impervious
*	22,982	88.00	overland and natural into pond
	37,356	91.85	Weighted Average
	22,982	88.00	61.52% Pervious Area
	14,374	98.00	38.48% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	124	0.1450	0.21		**Sheet Flow, lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment N3: overland area to pond

Runoff = 1.17 cfs @ 8.00 hrs, Volume= 0.428 af, Depth> 3.23"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	52,077	88.00	Pervious
*	13,868	88.00	Pervious
*	3,308	98.00	Impervious
	69,253	88.48	Weighted Average
	65,945	88.00	95.22% Pervious Area
	3,308	98.00	4.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	182	0.1100	0.21		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment P1: Mid Post-disturbed area to creek

Runoff = 0.26 cfs @ 7.95 hrs, Volume= 0.088 af, Depth> 2.79"
Routed to Reach P : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	10,254	86.00	Cleared (HSG C)
*	6,217	80.00	Cleared (HSG B)
	16,471	83.74	Weighted Average
	16,471	83.74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	34	0.0800	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment P2: Near entrance

Runoff = 0.18 cfs @ 7.99 hrs, Volume= 0.064 af, Depth> 3.30"
Routed to Reach P : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	7,566	86.00	Cleared (HSG C)
*	2,496	98.00	Impervious
	10,062	88.98	Weighted Average
	7,566	86.00	75.19% Pervious Area
	2,496	98.00	24.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0800	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment S1: Post for area to Pond WSP

Runoff = 5.07 cfs @ 8.38 hrs, Volume= 3.803 af, Depth> 2.39"
Routed to Pond WSP : West SouthPond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	22,044	66.00	Wooded (HSG B)
*	45,524	66.00	Wooded (HSG B)
*	5,119	66.00	Wooded (HSG B)
*	168,861	76.00	Wooded (HSG C)
*	375,187	83.00	Wooded (HSG D)
*	27,785	98.00	parking
*	27,268	98.00	cabins, walks, pads, etc
*	39,090	78.00	lawn (HSG B)
*	722	78.00	lawn (HSG B)
*	89,895	78.00	lawn (HSG C)
*	5,649	78.00	lawn (HSG C)
*	13,290	78.00	lawn (HSG D)
*	12,622	78.00	lawn (HSG D)
	833,056	80.12	Weighted Average
	778,003	78.86	93.39% Pervious Area
	55,053	98.00	6.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment W4: mostly undisturbed area to WNP

Runoff = 0.62 cfs @ 8.07 hrs, Volume= 0.303 af, Depth> 3.04"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	42,880	86.00	Woods (HSG C)
*	9,231	91.00	Cleared (HSG C)
	52,111	86.89	Weighted Average
	52,111	86.89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	166	0.0960	0.19		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"
19.5	134	0.0820	0.11		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
2.6	43	0.0120	0.27		**Shallow Concentrated Flow, woode** Forest w/Heavy Litter Kv= 2.5 fps
36.6	343	Total			

Summary for Subcatchment W5: west area to pond WNP

Runoff = 1.23 cfs @ 8.07 hrs, Volume= 0.620 af, Depth> 3.36"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	34,986	86.00	Woods (HSG C)
*	47,672	91.00	Pervious (HSG C)
*	13,126	98.00	Impervious
*	637	95.00	Lawn (HSG D)
	96,421	90.17	Weighted Average
	83,295	88.93	86.39% Pervious Area
	13,126	98.00	13.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	300	0.0700	0.13		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
1.2	80	0.0500	1.12		**Shallow Concentrated Flow, woode** Woodland Kv= 5.0 fps
40.8	380	Total			

Summary for Reach E: Pre POC

Inflow Area = 28.694 ac, 0.00% Impervious, Inflow Depth > 2.08" for 100-yr event
Inflow = 6.28 cfs @ 8.67 hrs, Volume= 4.975 af
Outflow = 6.28 cfs @ 8.67 hrs, Volume= 4.975 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach P: Post POC

Inflow Area = 28.619 ac, 10.39% Impervious, Inflow Depth > 1.80" for 100-yr event
Inflow = 4.59 cfs @ 11.09 hrs, Volume= 4.282 af
Outflow = 4.59 cfs @ 11.09 hrs, Volume= 4.282 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond NP: North Pond

Inflow Area = 5.475 ac, 24.65% Impervious, Inflow Depth > 2.95" for 100-yr event
Inflow = 3.28 cfs @ 8.01 hrs, Volume= 1.345 af
Outflow = 0.85 cfs @ 11.52 hrs, Volume= 0.733 af, Atten= 74%, Lag= 210.4 min
Primary = 0.85 cfs @ 11.52 hrs, Volume= 0.733 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 609.19' @ 11.52 hrs Surf.Area= 12,038 sf Storage= 27,424 cf

Plug-Flow detention time= 495.8 min calculated for 0.733 af (55% of inflow)
Center-of-Mass det. time= 245.8 min (985.6 - 739.8)

Volume	Invert	Avail.Storage	Storage Description
#1	606.00'	37,953 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
606.00	5,353	0	0
608.00	9,366	14,719	14,719
610.00	13,868	23,234	37,953

Device	Routing	Invert	Outlet Devices
#1	Primary	606.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 606.00' / 604.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	606.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	609.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.84 cfs @ 11.52 hrs HW=609.19' (Free Discharge)
└─**1=Culvert** (Passes 0.01 cfs of 6.20 cfs potential flow)
└─**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.60 fps)
└─**3=Orifice/Grate** (Weir Controls 0.83 cfs @ 1.41 fps)

Summary for Pond WNP: West North Pond

Inflow Area = 3.410 ac, 8.84% Impervious, Inflow Depth > 3.25" for 100-yr event
Inflow = 1.85 cfs @ 8.07 hrs, Volume= 0.923 af
Outflow = 0.38 cfs @ 19.91 hrs, Volume= 0.191 af, Atten= 80%, Lag= 710.1 min
Primary = 0.38 cfs @ 19.91 hrs, Volume= 0.191 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 587.11' @ 19.91 hrs Surf.Area= 13,282 sf Storage= 32,101 cf

Plug-Flow detention time= 824.5 min calculated for 0.190 af (21% of inflow)
Center-of-Mass det. time= 472.7 min (1,223.2 - 750.5)

Volume	Invert	Avail.Storage	Storage Description
#1	584.00'	44,491 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
584.00	6,420	0	0
586.00	11,796	18,216	18,216
588.00	14,479	26,275	44,491

Device	Routing	Invert	Outlet Devices
#1	Primary	584.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 584.00' / 582.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	584.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.37 cfs @ 19.91 hrs HW=587.11' (Free Discharge)
└**1=Culvert** (Passes 0.37 cfs of 6.11 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.49 fps)
└**3=Orifice/Grate** (Weir Controls 0.36 cfs @ 1.07 fps)

Summary for Pond WSP: West SouthPond

Inflow Area = 19.124 ac, 6.61% Impervious, Inflow Depth > 2.39" for 100-yr event
Inflow = 5.07 cfs @ 8.38 hrs, Volume= 3.803 af
Outflow = 3.72 cfs @ 10.51 hrs, Volume= 3.206 af, Atten= 27%, Lag= 127.7 min
Primary = 3.72 cfs @ 10.51 hrs, Volume= 3.206 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 581.81' @ 10.51 hrs Surf.Area= 12,302 sf Storage= 32,558 cf

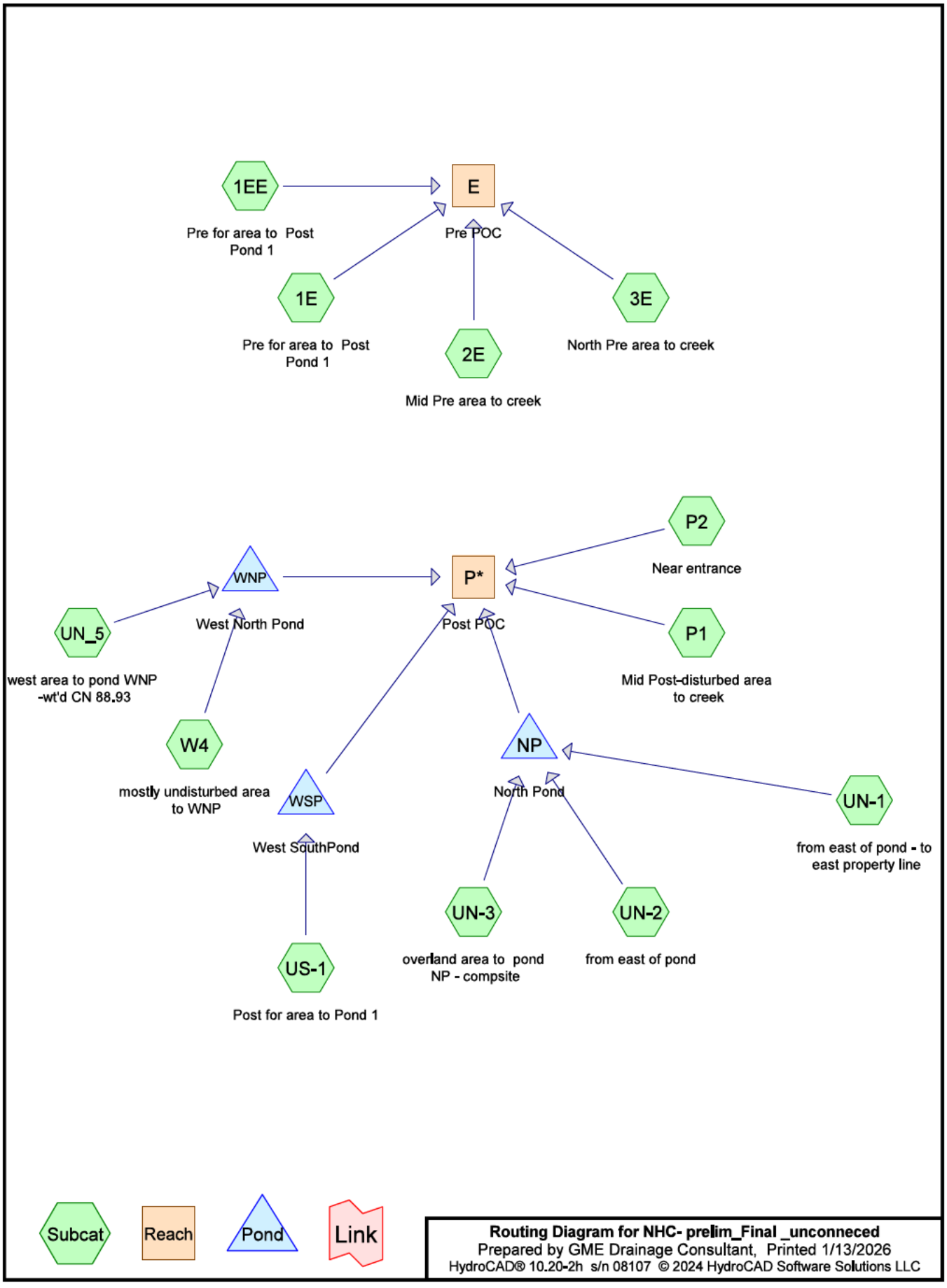
Plug-Flow detention time= 172.9 min calculated for 3.206 af (84% of inflow)
Center-of-Mass det. time= 82.3 min (906.0 - 823.7)

Volume	Invert	Avail.Storage	Storage Description
#1	578.00'	34,969 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.00	5,055	0	0
580.00	8,609	13,664	13,664
582.00	12,696	21,305	34,969

Device	Routing	Invert	Outlet Devices
#1	Primary	578.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.00' / 578.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	578.00'	**2.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	581.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.72 cfs @ 10.51 hrs HW=581.81' (Free Discharge)
└**1=Culvert** (Passes 3.72 cfs of 6.63 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.32 cfs @ 9.39 fps)
  └**3=Orifice/Grate** (Orifice Controls 3.40 cfs @ 4.33 fps)



Routing Diagram for NHC- prelim_Final _unconneced
Prepared by GME Drainage Consultant, Printed 1/13/2026
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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type IA 24-hr		Default	24.00	1	2.00	2
2	10-yr	Type IA 24-hr		Default	24.00	1	3.00	2
3	100-yr	Type IA 24-hr		Default	24.00	1	4.50	2

Summary for Subcatchment 1E: Pre for area to Post Pond 1

Runoff = 0.52 cfs @ 9.22 hrs, Volume= 0.555 af, Depth> 0.54"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	33,679	66.00	Wooded
*	117,669	76.00	Wooded
*	380,684	83.00	Wooded
	532,032	80.38	Weighted Average
	532,032	80.38	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 1EE: Pre for area to Post Pond 1

Runoff = 0.02 cfs @ 8.34 hrs, Volume= 0.016 af, Depth> 0.60"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	10,698	83.00	Wooded (HSG D)
*	3,708	76.00	Wooded (HHSG C)
	14,406	81.20	Weighted Average
	14,406	81.20	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.8	255	0.1880	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"

Summary for Subcatchment 2E: Mid Pre area to creek

Runoff = 0.20 cfs @ 17.16 hrs, Volume= 0.241 af, Depth> 0.33"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	78,962	66.00	Wooded (HSG B)
*	291,057	76.00	Wooded (HSG C)
*	11,823	83.00	Wooded (HSG D)
	381,842	74.15	Weighted Average
	381,842	74.15	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 3E: North Pre area to creek

Runoff = 0.15 cfs @ 17.81 hrs, Volume= 0.177 af, Depth> 0.29"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	107,711	66.00	Wooded (HSG B)
*	213,901	76.00	Wooded (HSG C)
	321,612	72.65	Weighted Average
	321,612	72.65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment P1: Mid Post-disturbed area to creek

Runoff = 0.06 cfs @ 7.99 hrs, Volume= 0.023 af, Depth> 0.73"
Routed to Reach P* : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	10,254	86.00	Cleared (HSG C)
*	6,217	80.00	Cleared (HSG B)
	16,471	83.74	Weighted Average
	16,471	83.74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	34	0.0800	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment P2: Near entrance

Runoff = 0.05 cfs @ 8.00 hrs, Volume= 0.021 af, Depth> 1.07"
Routed to Reach P* : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	7,566	86.00	Cleared (HSG C)
*	2,496	98.00	Impervious
	10,062	88.98	Weighted Average
	7,566	86.00	75.19% Pervious Area
	2,496	98.00	24.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0800	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment UN-1: from east of pond - to east property line

Runoff = 0.22 cfs @ 8.03 hrs, Volume= 0.140 af, Depth> 0.55"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	5,033	72.90	Impervious
*	8,096	72.90	Impervious
*	27,985	98.00	Impervious
*	14,646	72.90	pervious (HSG B)
*	18,850	72.90	pervious (HSG C)
*	3,208	88.00	pervious (HSG C)
*	54,074	66.00	woods (HSG B)
	131,892	75.76	Weighted Average
	103,907	69.78	78.78% Pervious Area
	27,985	98.00	21.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	127	0.1730	0.15		**Sheet Flow, woode** Woods: Light underbrush n= 0.400 P2= 2.00"
12.3	173	0.1560	0.23		**Sheet Flow, lawn** Grass: Dense n= 0.240 P2= 2.00"
26.2	300	Total			

Summary for Subcatchment UN-2: from east of pond

Runoff = 0.21 cfs @ 8.00 hrs, Volume= 0.075 af, Depth> 1.06"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	14,374	89.50	Impervious
*	22,982	89.50	overland and natural into pond
	37,356	89.50	Weighted Average
	37,356	89.50	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	124	0.1450	0.21		**Sheet Flow, lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment UN-3: overland area to pond NP - compsite

Runoff = 0.31 cfs @ 8.02 hrs, Volume= 0.129 af, Depth> 0.97"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	62,736	88.24	Pervious
*	6,517	88.24	Impervious
	69,253	88.24	Weighted Average
	69,253	88.24	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	182	0.1100	0.21		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment UN_5: west area to pond WNP -wt'd CN 88.93

Runoff = 0.34 cfs @ 8.14 hrs, Volume= 0.192 af, Depth> 1.04"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	34,986	89.55	Woods (HSG C)
*	47,672	89.55	Pervious (HSG C)
*	637	89.55	Lawn (HSG D)
*	13,126	89.55	Impevious
	96,421	89.55	Weighted Average
	96,421	89.55	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	300	0.0700	0.13		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
1.2	80	0.0500	1.12		**Shallow Concentrated Flow, woode** Woodland Kv= 5.0 fps
40.8	380	Total			

Summary for Subcatchment US-1: Post for area to Pond 1

Runoff = 0.77 cfs @ 9.18 hrs, Volume= 0.839 af, Depth> 0.54"
Routed to Pond WSP : West SouthPond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	22,044	79.14	Wooded (HSG B)
*	45,524	79.14	Wooded (HSG B)
*	5,119	79.14	Wooded (HSG B)
*	168,861	79.14	Wooded (HSG C)
*	375,187	79.14	Wooded (HSG D)
*	27,785	98.00	parking
*	27,268	79.14	cabins, walks, pads, etc
*	39,090	79.14	lawn (HSG B)
*	722	79.14	lawn (HSG B)
*	89,895	79.14	lawn (HSG C)
*	13,290	79.14	lawn (HSG D)
	814,785	79.78	Weighted Average
	787,000	79.14	96.59% Pervious Area
	27,785	98.00	3.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment W4: mostly undisturbed area to WNP

Runoff = 0.15 cfs @ 8.15 hrs, Volume= 0.088 af, Depth> 0.88"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 2-yr Rainfall=2.00"

	Area (sf)	CN	Description
*	42,880	86.00	Woods (HSG C)
*	9,231	91.00	Cleared (HSG C)
	52,111	86.89	Weighted Average
	52,111	86.89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	166	0.0960	0.19		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"
19.5	134	0.0820	0.11		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
2.6	43	0.0120	0.27		**Shallow Concentrated Flow, woode** Forest w/Heavy Litter Kv= 2.5 fps
36.6	343	Total			

Summary for Reach E: Pre POC

Inflow Area = 28.694 ac, 0.00% Impervious, Inflow Depth > 0.41" for 2-yr event
Inflow = 0.81 cfs @ 11.02 hrs, Volume= 0.988 af
Outflow = 0.81 cfs @ 11.02 hrs, Volume= 0.988 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach P*: Post POC

Inflow Area = 28.199 ac, 4.74% Impervious, Inflow Depth > 0.16" for 2-yr event
Inflow = 0.33 cfs @ 24.00 hrs, Volume= 0.366 af
Outflow = 0.33 cfs @ 24.00 hrs, Volume= 0.366 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond NP: North Pond

Inflow Area = 5.475 ac, 11.73% Impervious, Inflow Depth > 0.75" for 2-yr event
Inflow = 0.74 cfs @ 8.01 hrs, Volume= 0.344 af
Outflow = 0.01 cfs @ 24.00 hrs, Volume= 0.011 af, Atten= 99%, Lag= 959.2 min
Primary = 0.01 cfs @ 24.00 hrs, Volume= 0.011 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 607.98' @ 24.00 hrs Surf.Area= 9,317 sf Storage= 14,490 cf

Plug-Flow detention time= 695.9 min calculated for 0.011 af (3% of inflow)
Center-of-Mass det. time= 154.9 min (956.0 - 801.1)

Volume	Invert	Avail.Storage	Storage Description
#1	606.00'	37,953 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
606.00	5,353	0	0
608.00	9,366	14,719	14,719
610.00	13,868	23,234	37,953

Device	Routing	Invert	Outlet Devices
#1	Primary	606.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 606.00' / 604.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	606.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	609.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 24.00 hrs HW=607.98' (Free Discharge)
└**1=Culvert** (Passes 0.01 cfs of 4.59 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 6.77 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond WNP: West North Pond

Inflow Area = 3.410 ac, 0.00% Impervious, Inflow Depth > 0.98" for 2-yr event
Inflow = 0.49 cfs @ 8.15 hrs, Volume= 0.280 af
Outflow = 0.01 cfs @ 24.00 hrs, Volume= 0.009 af, Atten= 98%, Lag= 951.2 min
Primary = 0.01 cfs @ 24.00 hrs, Volume= 0.009 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 585.42' @ 24.00 hrs Surf.Area= 10,231 sf Storage= 11,802 cf

Plug-Flow detention time= 615.0 min calculated for 0.009 af (3% of inflow)
Center-of-Mass det. time= 170.7 min (991.4 - 820.7)

Volume	Invert	Avail.Storage	Storage Description
#1	584.00'	44,491 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
584.00	6,420	0	0
586.00	11,796	18,216	18,216
588.00	14,479	26,275	44,491

Device	Routing	Invert	Outlet Devices
#1	Primary	584.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 584.00' / 582.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	584.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 24.00 hrs HW=585.42' (Free Discharge)
└─**1=Culvert** (Passes 0.01 cfs of 3.62 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 5.73 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond WSP: West SouthPond

Inflow Area = 18.705 ac, 3.41% Impervious, Inflow Depth > 0.54" for 2-yr event
Inflow = 0.77 cfs @ 9.18 hrs, Volume= 0.839 af
Outflow = 0.29 cfs @ 24.00 hrs, Volume= 0.303 af, Atten= 62%, Lag= 889.0 min
Primary = 0.29 cfs @ 24.00 hrs, Volume= 0.303 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 581.00' @ 24.00 hrs Surf.Area= 10,659 sf Storage= 23,328 cf

Plug-Flow detention time= 415.4 min calculated for 0.302 af (36% of inflow)
Center-of-Mass det. time= 106.2 min (1,015.2 - 909.0)

Volume	Invert	Avail.Storage	Storage Description
#1	578.00'	34,969 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.00	5,055	0	0
580.00	8,609	13,664	13,664
582.00	12,696	21,305	34,969

Device	Routing	Invert	Outlet Devices
#1	Primary	578.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.00' / 578.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

#2	Device 1	578.00'	**2.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	581.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.29 cfs @ 24.00 hrs HW=581.00' (Free Discharge)
└─**1=Culvert** (Passes 0.29 cfs of 5.60 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.28 cfs @ 8.34 fps)
  └─**3=Orifice/Grate** (Weir Controls 0.00 cfs @ 0.18 fps)

Summary for Subcatchment 1E: Pre for area to Post Pond 1

Runoff = 1.46 cfs @ 8.80 hrs, Volume= 1.234 af, Depth> 1.21"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	33,679	66.00	Wooded
*	117,669	76.00	Wooded
*	380,684	83.00	Wooded
	532,032	80.38	Weighted Average
	532,032	80.38	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 1EE: Pre for area to Post Pond 1

Runoff = 0.06 cfs @ 8.19 hrs, Volume= 0.036 af, Depth> 1.30"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	10,698	83.00	Wooded (HSG D)
*	3,708	76.00	Wooded (HHSG C)
	14,406	81.20	Weighted Average
	14,406	81.20	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.8	255	0.1880	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"

Summary for Subcatchment 2E: Mid Pre area to creek

Runoff = 0.61 cfs @ 9.14 hrs, Volume= 0.631 af, Depth> 0.86"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	78,962	66.00	Wooded (HSG B)
*	291,057	76.00	Wooded (HSG C)
*	11,823	83.00	Wooded (HSG D)
	381,842	74.15	Weighted Average
	381,842	74.15	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 3E: North Pre area to creek

Runoff = 0.45 cfs @ 9.27 hrs, Volume= 0.487 af, Depth> 0.79"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	107,711	66.00	Wooded (HSG B)
*	213,901	76.00	Wooded (HSG C)
	321,612	72.65	Weighted Average
	321,612	72.65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment P1: Mid Post-disturbed area to creek

Runoff = 0.13 cfs @ 7.98 hrs, Volume= 0.047 af, Depth> 1.49"
Routed to Reach P* : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	10,254	86.00	Cleared (HSG C)
*	6,217	80.00	Cleared (HSG B)
	16,471	83.74	Weighted Average
	16,471	83.74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	34	0.0800	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment P2: Near entrance

Runoff = 0.10 cfs @ 7.99 hrs, Volume= 0.037 af, Depth> 1.93"
Routed to Reach P* : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	7,566	86.00	Cleared (HSG C)
*	2,496	98.00	Impervious
	10,062	88.98	Weighted Average
	7,566	86.00	75.19% Pervious Area
	2,496	98.00	24.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0800	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment UN-1: from east of pond - to east property line

Runoff = 0.47 cfs @ 8.07 hrs, Volume= 0.284 af, Depth> 1.13"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	5,033	72.90	Impervious
*	8,096	72.90	Impervious
*	27,985	98.00	Impervious
*	14,646	72.90	pervious (HSG B)
*	18,850	72.90	pervious (HSG C)
*	3,208	88.00	pervious (HSG C)
*	54,074	66.00	woods (HSG B)
	131,892	75.76	Weighted Average
	103,907	69.78	78.78% Pervious Area
	27,985	98.00	21.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	127	0.1730	0.15		**Sheet Flow, woode** Woods: Light underbrush n= 0.400 P2= 2.00"
12.3	173	0.1560	0.23		**Sheet Flow, lawn** Grass: Dense n= 0.240 P2= 2.00"
26.2	300	Total			

Summary for Subcatchment UN-2: from east of pond

Runoff = 0.40 cfs @ 7.99 hrs, Volume= 0.138 af, Depth> 1.93"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	14,374	89.50	Impervious
*	22,982	89.50	overland and natural into pond
	37,356	89.50	Weighted Average
	37,356	89.50	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	124	0.1450	0.21		**Sheet Flow, lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment UN-3: overland area to pond NP - compsite

Runoff = 0.64 cfs @ 8.01 hrs, Volume= 0.242 af, Depth> 1.82"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	62,736	88.24	Pervious
*	6,517	88.24	Impervious
	69,253	88.24	Weighted Average
	69,253	88.24	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	182	0.1100	0.21		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment UN_5: west area to pond WNP -wt'd CN 88.93

Runoff = 0.67 cfs @ 8.10 hrs, Volume= 0.352 af, Depth> 1.91"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	34,986	89.55	Woods (HSG C)
*	47,672	89.55	Pervious (HSG C)
*	637	89.55	Lawn (HSG D)
*	13,126	89.55	Impevious
	96,421	89.55	Weighted Average
	96,421	89.55	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	300	0.0700	0.13		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
1.2	80	0.0500	1.12		**Shallow Concentrated Flow, woode** Woodland Kv= 5.0 fps
40.8	380	Total			

Summary for Subcatchment US-1: Post for area to Pond 1

Runoff = 2.15 cfs @ 8.81 hrs, Volume= 1.855 af, Depth> 1.19"
Routed to Pond WSP : West SouthPond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	22,044	79.14	Wooded (HSG B)
*	45,524	79.14	Wooded (HSG B)
*	5,119	79.14	Wooded (HSG B)
*	168,861	79.14	Wooded (HSG C)
*	375,187	79.14	Wooded (HSG D)
*	27,785	98.00	parking
*	27,268	79.14	cabins, walks, pads, etc
*	39,090	79.14	lawn (HSG B)
*	722	79.14	lawn (HSG B)
*	89,895	79.14	lawn (HSG C)
*	13,290	79.14	lawn (HSG D)
	814,785	79.78	Weighted Average
	787,000	79.14	96.59% Pervious Area
	27,785	98.00	3.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment W4: mostly undisturbed area to WNP

Runoff = 0.32 cfs @ 8.09 hrs, Volume= 0.169 af, Depth> 1.70"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 10-yr Rainfall=3.00"

	Area (sf)	CN	Description
*	42,880	86.00	Woods (HSG C)
*	9,231	91.00	Cleared (HSG C)
	52,111	86.89	Weighted Average
	52,111	86.89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	166	0.0960	0.19		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"
19.5	134	0.0820	0.11		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
2.6	43	0.0120	0.27		**Shallow Concentrated Flow, woode** Forest w/Heavy Litter Kv= 2.5 fps
36.6	343	Total			

Summary for Reach E: Pre POC

Inflow Area = 28.694 ac, 0.00% Impervious, Inflow Depth > 1.00" for 10-yr event
Inflow = 2.55 cfs @ 8.96 hrs, Volume= 2.388 af
Outflow = 2.55 cfs @ 8.96 hrs, Volume= 2.388 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach P*: Post POC

Inflow Area = 28.199 ac, 4.74% Impervious, Inflow Depth > 0.61" for 10-yr event
Inflow = 1.47 cfs @ 12.73 hrs, Volume= 1.443 af
Outflow = 1.47 cfs @ 12.73 hrs, Volume= 1.443 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond NP: North Pond

Inflow Area = 5.475 ac, 11.73% Impervious, Inflow Depth > 1.46" for 10-yr event
Inflow = 1.50 cfs @ 8.02 hrs, Volume= 0.664 af
Outflow = 0.25 cfs @ 23.52 hrs, Volume= 0.064 af, Atten= 83%, Lag= 930.0 min
Primary = 0.25 cfs @ 23.52 hrs, Volume= 0.064 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 609.08' @ 23.52 hrs Surf.Area= 11,800 sf Storage= 26,163 cf

Plug-Flow detention time= 930.4 min calculated for 0.064 af (10% of inflow)
Center-of-Mass det. time= 485.9 min (1,265.6 - 779.8)

Volume	Invert	Avail.Storage	Storage Description
#1	606.00'	37,953 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
606.00	5,353	0	0
608.00	9,366	14,719	14,719
610.00	13,868	23,234	37,953

Device	Routing	Invert	Outlet Devices
#1	Primary	606.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 606.00' / 604.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	606.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	609.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.25 cfs @ 23.52 hrs HW=609.08' (Free Discharge)
└**1=Culvert** (Passes 0.01 cfs of 6.08 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.45 fps)
└**3=Orifice/Grate** (Weir Controls 0.24 cfs @ 0.93 fps)

Summary for Pond WNP: West North Pond

Inflow Area = 3.410 ac, 0.00% Impervious, Inflow Depth > 1.84" for 10-yr event
Inflow = 1.00 cfs @ 8.10 hrs, Volume= 0.522 af
Outflow = 0.01 cfs @ 24.00 hrs, Volume= 0.012 af, Atten= 99%, Lag= 954.1 min
Primary = 0.01 cfs @ 24.00 hrs, Volume= 0.012 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 586.33' @ 24.00 hrs Surf.Area= 12,239 sf Storage= 22,186 cf

Plug-Flow detention time= 661.5 min calculated for 0.012 af (2% of inflow)
Center-of-Mass det. time= 181.8 min (967.1 - 785.3)

Volume	Invert	Avail.Storage	Storage Description
#1	584.00'	44,491 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
584.00	6,420	0	0
586.00	11,796	18,216	18,216
588.00	14,479	26,275	44,491

Device	Routing	Invert	Outlet Devices
#1	Primary	584.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 584.00' / 582.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	584.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 24.00 hrs HW=586.33' (Free Discharge)
└─**1=Culvert** (Passes 0.01 cfs of 5.12 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 7.35 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Summary for Pond WSP: West SouthPond

Inflow Area = 18.705 ac, 3.41% Impervious, Inflow Depth > 1.19" for 10-yr event
Inflow = 2.15 cfs @ 8.81 hrs, Volume= 1.855 af
Outflow = 1.40 cfs @ 12.75 hrs, Volume= 1.283 af, Atten= 35%, Lag= 236.8 min
Primary = 1.40 cfs @ 12.75 hrs, Volume= 1.283 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 581.23' @ 12.75 hrs Surf.Area= 11,115 sf Storage= 25,757 cf

Plug-Flow detention time= 307.3 min calculated for 1.283 af (69% of inflow)
Center-of-Mass det. time= 145.2 min (1,010.7 - 865.6)

Volume	Invert	Avail.Storage	Storage Description
#1	578.00'	34,969 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.00	5,055	0	0
580.00	8,609	13,664	13,664
582.00	12,696	21,305	34,969

Device	Routing	Invert	Outlet Devices
#1	Primary	578.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.00' / 578.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

#2	Device 1	578.00'	**2.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	581.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.40 cfs @ 12.75 hrs HW=581.23' (Free Discharge)
└**1=Culvert** (Passes 1.40 cfs of 5.91 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.29 cfs @ 8.65 fps)
  └**3=Orifice/Grate** (Weir Controls 1.11 cfs @ 1.56 fps)

Summary for Subcatchment 1E: Pre for area to Post Pond 1

Runoff = 3.27 cfs @ 8.38 hrs, Volume= 2.432 af, Depth> 2.39"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	33,679	66.00	Wooded
*	117,669	76.00	Wooded
*	380,684	83.00	Wooded
	532,032	80.38	Weighted Average
	532,032	80.38	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 1EE: Pre for area to Post Pond 1

Runoff = 0.13 cfs @ 8.13 hrs, Volume= 0.069 af, Depth> 2.51"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	10,698	83.00	Wooded (HSG D)
*	3,708	76.00	Wooded (HHSG C)
	14,406	81.20	Weighted Average
	14,406	81.20	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
40.8	255	0.1880	0.10		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"

Summary for Subcatchment 2E: Mid Pre area to creek

Runoff = 1.66 cfs @ 8.77 hrs, Volume= 1.380 af, Depth> 1.89"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	78,962	66.00	Wooded (HSG B)
*	291,057	76.00	Wooded (HSG C)
*	11,823	83.00	Wooded (HSG D)
	381,842	74.15	Weighted Average
	381,842	74.15	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment 3E: North Pre area to creek

Runoff = 1.28 cfs @ 8.82 hrs, Volume= 1.094 af, Depth> 1.78"
Routed to Reach E : Pre POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	107,711	66.00	Wooded (HSG B)
*	213,901	76.00	Wooded (HSG C)
	321,612	72.65	Weighted Average
	321,612	72.65	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment P1: Mid Post-disturbed area to creek

Runoff = 0.26 cfs @ 7.95 hrs, Volume= 0.088 af, Depth> 2.79"
Routed to Reach P* : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	10,254	86.00	Cleared (HSG C)
*	6,217	80.00	Cleared (HSG B)
	16,471	83.74	Weighted Average
	16,471	83.74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.4	34	0.0800	0.13		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment P2: Near entrance

Runoff = 0.18 cfs @ 7.99 hrs, Volume= 0.064 af, Depth> 3.30"
Routed to Reach P* : Post POC

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	7,566	86.00	Cleared (HSG C)
*	2,496	98.00	Impervious
	10,062	88.98	Weighted Average
	7,566	86.00	75.19% Pervious Area
	2,496	98.00	24.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.4	100	0.0800	0.16		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment UN-1: from east of pond - to east property line

Runoff = 1.07 cfs @ 8.06 hrs, Volume= 0.550 af, Depth> 2.18"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	5,033	72.90	Impervious
*	8,096	72.90	Impervious
*	27,985	98.00	Impervious
*	14,646	72.90	pervious (HSG B)
*	18,850	72.90	pervious (HSG C)
*	3,208	88.00	pervious (HSG C)
*	54,074	66.00	woods (HSG B)
	131,892	75.76	Weighted Average
	103,907	69.78	78.78% Pervious Area
	27,985	98.00	21.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	127	0.1730	0.15		**Sheet Flow, woode** Woods: Light underbrush n= 0.400 P2= 2.00"
12.3	173	0.1560	0.23		**Sheet Flow, lawn** Grass: Dense n= 0.240 P2= 2.00"
26.2	300	Total			

Summary for Subcatchment UN-2: from east of pond

Runoff = 0.71 cfs @ 7.98 hrs, Volume= 0.238 af, Depth> 3.33"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	14,374	89.50	Impervious
*	22,982	89.50	overland and natural into pond
	37,356	89.50	Weighted Average
	37,356	89.50	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	124	0.1450	0.21		**Sheet Flow, lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment UN-3: overland area to pond NP - compsite

Runoff = 1.16 cfs @ 8.00 hrs, Volume= 0.424 af, Depth> 3.20"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	62,736	88.24	Pervious
*	6,517	88.24	Impervious
	69,253	88.24	Weighted Average
	69,253	88.24	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	182	0.1100	0.21		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Summary for Subcatchment UN_5: west area to pond WNP -wt'd CN 88.93

Runoff = 1.21 cfs @ 8.07 hrs, Volume= 0.607 af, Depth> 3.29"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	34,986	89.55	Woods (HSG C)
*	47,672	89.55	Pervious (HSG C)
*	637	89.55	Lawn (HSG D)
*	13,126	89.55	Impevious
	96,421	89.55	Weighted Average
	96,421	89.55	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	300	0.0700	0.13		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
1.2	80	0.0500	1.12		**Shallow Concentrated Flow, woode** Woodland Kv= 5.0 fps
40.8	380	Total			

Summary for Subcatchment US-1: Post for area to Pond 1

Runoff = 4.86 cfs @ 8.39 hrs, Volume= 3.660 af, Depth> 2.35"
Routed to Pond WSP : West SouthPond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	22,044	79.14	Wooded (HSG B)
*	45,524	79.14	Wooded (HSG B)
*	5,119	79.14	Wooded (HSG B)
*	168,861	79.14	Wooded (HSG C)
*	375,187	79.14	Wooded (HSG D)
*	27,785	98.00	parking
*	27,268	79.14	cabins, walks, pads, etc
*	39,090	79.14	lawn (HSG B)
*	722	79.14	lawn (HSG B)
*	89,895	79.14	lawn (HSG C)
*	13,290	79.14	lawn (HSG D)
	814,785	79.78	Weighted Average
	787,000	79.14	96.59% Pervious Area
	27,785	98.00	3.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Summary for Subcatchment W4: mostly undisturbed area to WNP

Runoff = 0.62 cfs @ 8.07 hrs, Volume= 0.303 af, Depth> 3.04"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	42,880	86.00	Woods (HSG C)
*	9,231	91.00	Cleared (HSG C)
	52,111	86.89	Weighted Average
	52,111	86.89	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.5	166	0.0960	0.19		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"
19.5	134	0.0820	0.11		**Sheet Flow, wooded** Woods: Light underbrush n= 0.400 P2= 2.00"
2.6	43	0.0120	0.27		**Shallow Concentrated Flow, woode** Forest w/Heavy Litter Kv= 2.5 fps
36.6	343	Total			

Summary for Reach E: Pre POC

Inflow Area = 28.694 ac, 0.00% Impervious, Inflow Depth > 2.08" for 100-yr event
Inflow = 6.28 cfs @ 8.67 hrs, Volume= 4.975 af
Outflow = 6.28 cfs @ 8.67 hrs, Volume= 4.975 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Reach P*: Post POC

Inflow Area = 28.199 ac, 4.74% Impervious, Inflow Depth > 1.70" for 100-yr event
Inflow = 3.96 cfs @ 11.97 hrs, Volume= 3.996 af
Outflow = 3.96 cfs @ 11.97 hrs, Volume= 3.996 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs

Summary for Pond NP: North Pond

Inflow Area = 5.475 ac, 11.73% Impervious, Inflow Depth > 2.66" for 100-yr event
Inflow = 2.92 cfs @ 8.01 hrs, Volume= 1.213 af
Outflow = 0.69 cfs @ 13.44 hrs, Volume= 0.602 af, Atten= 76%, Lag= 325.8 min
Primary = 0.69 cfs @ 13.44 hrs, Volume= 0.602 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 609.16' @ 13.44 hrs Surf.Area= 11,985 sf Storage= 27,139 cf

Plug-Flow detention time= 544.9 min calculated for 0.601 af (50% of inflow)
Center-of-Mass det. time= 276.9 min (1,034.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	606.00'	37,953 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
606.00	5,353	0	0
608.00	9,366	14,719	14,719
610.00	13,868	23,234	37,953

Device	Routing	Invert	Outlet Devices
#1	Primary	606.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 606.00' / 604.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	606.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	609.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 13.44 hrs HW=609.16' (Free Discharge)
└**1=Culvert** (Passes 0.01 cfs of 6.17 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.56 fps)
└**3=Orifice/Grate** (Weir Controls 0.68 cfs @ 1.32 fps)

Summary for Pond WNP: West North Pond

Inflow Area = 3.410 ac, 0.00% Impervious, Inflow Depth > 3.20" for 100-yr event
Inflow = 1.83 cfs @ 8.07 hrs, Volume= 0.910 af
Outflow = 0.37 cfs @ 20.26 hrs, Volume= 0.178 af, Atten= 80%, Lag= 731.2 min
Primary = 0.37 cfs @ 20.26 hrs, Volume= 0.178 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 587.11' @ 20.26 hrs Surf.Area= 13,279 sf Storage= 32,080 cf

Plug-Flow detention time= 829.0 min calculated for 0.178 af (20% of inflow)
Center-of-Mass det. time= 477.2 min (1,233.3 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	584.00'	44,491 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
584.00	6,420	0	0
586.00	11,796	18,216	18,216
588.00	14,479	26,275	44,491

Device	Routing	Invert	Outlet Devices
#1	Primary	584.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 584.00' / 582.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	584.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.36 cfs @ 20.26 hrs HW=587.11' (Free Discharge)
└─**1=Culvert** (Passes 0.36 cfs of 6.10 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.49 fps)
  └─**3=Orifice/Grate** (Weir Controls 0.35 cfs @ 1.06 fps)

Summary for Pond WSP: West SouthPond

Inflow Area = 18.705 ac, 3.41% Impervious, Inflow Depth > 2.35" for 100-yr event
Inflow = 4.86 cfs @ 8.39 hrs, Volume= 3.660 af
Outflow = 3.57 cfs @ 10.56 hrs, Volume= 3.065 af, Atten= 27%, Lag= 130.6 min
Primary = 3.57 cfs @ 10.56 hrs, Volume= 3.065 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 581.74' @ 10.56 hrs Surf.Area= 12,162 sf Storage= 31,720 cf

Plug-Flow detention time= 175.9 min calculated for 3.059 af (84% of inflow)
Center-of-Mass det. time= 83.2 min (912.5 - 829.3)

Volume	Invert	Avail.Storage	Storage Description
#1	578.00'	34,969 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.00	5,055	0	0
580.00	8,609	13,664	13,664
582.00	12,696	21,305	34,969

Device	Routing	Invert	Outlet Devices
#1	Primary	578.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.00' / 578.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf

#2	Device 1	578.00'	**2.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	581.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.57 cfs @ 10.56 hrs HW=581.74' (Free Discharge)
└─**1=Culvert** (Passes 3.57 cfs of 6.55 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.32 cfs @ 9.31 fps)
  └─**3=Orifice/Grate** (Orifice Controls 3.25 cfs @ 4.14 fps)

Typical Filter Strip Calculations

y = 1 inch maximum

100 LF along drive - how long a flow path re uired to provie W treatment for each ft

Substituting for AR:

$Q = (1.49Ty^{1.67} s^{0.5})/n$

Where:

- Ty = Arectangle, ft2
- y ≈ Rrectangle, design depth of flow, ft. (1 inch maximum)
- Q = peak Water Quality design flow rate based (ft^3/sec) 0.007
- n = Manning's roughness coefficient 0.35
- s = Longitudinal slope of filter strip parallel to direction of flow 0.0714 ft/ft
- T = Width of filter strip perpendicular to the direction of flow, ft. 100
- A = Filter strip inlet cross-sectional flow area (rectangular), ft^2
- R = hydraulic radius, ft.

Rearranging for y:

$y = [KQn/1.49Ts^{0.5}]^{0.6}$ y must not exceed 1 inch

				find y
Qn	T*s^.5	apply 1.49	divide	raise to 0.6
0.00245	26.721	39.81	6.15E-05	0.0030

Calculate the design flow velocity V, ft./sec., through the filter strip:

V = KQ/Ty V must not exceed 0.5 ft./sec

Q	Ty	Find V
0.007	0.297	0.0235299

Calculate required length, ft., of the filter strip at the minimum hydraulic residence time, t, of 9 minutes:

L = tV = 540V

540V

Find L = 12.71

This length was input into ydroCAD to check treatment time

Source for WQ rate and checks travel time at 9.2 min. Provides 18.4 average time.

Summary for Subcatchment D2: Imprvious to Filterstrip

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

Runoff = 0.007 cfs @ 7.91 hrs, Volume= 0.002 af, Depth> 0.56"
Routed to Reach F3 : Filterstrip along drive

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr WQ Rainfall=0.67"

	Area (sf)	CN	Description
*	2,000	99.00	Drive
	2,000	99.00	100.00% Impervious Area

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

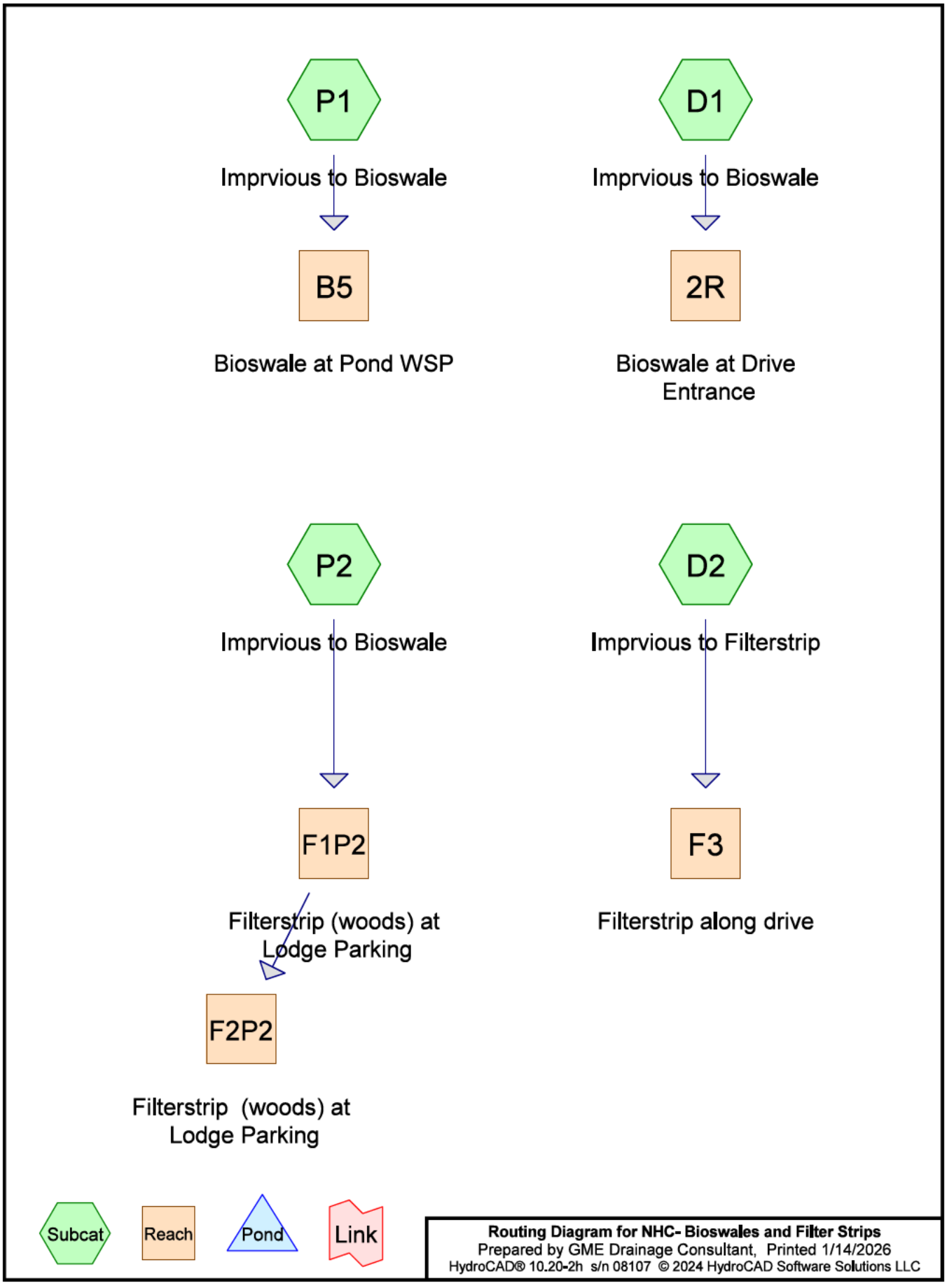
Summary for Reach F3: Filterstrip along drive

Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth > 0.56" for WQ event
Inflow = 0.007 cfs @ 7.91 hrs, Volume= 0.002 af
Outflow = 0.006 cfs @ 8.15 hrs, Volume= 0.002 af, Atten= 3%, Lag= 14.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.02 fps, Min. Travel Time= 9.2 min
Avg. Velocity = 0.01 fps, Avg. Travel Time= 18.4 min

Peak Storage= 4 cf @ 8.00 hrs
Average Depth at Peak Storage= 0.00' , Surface Width= 100.00'
Bank-Full Depth= 0.08' Flow Area= 8.0 sf, Capacity= 1.686 cfs

100.00' x 0.08' deep channel, n= 0.350
Length= 12.7' Slope= 0.0717 '/'
Inlet Invert= 610.00', Outlet Invert= 609.09'


P1
Imprvious to Bioswale
B5
Bioswale at Pond WSP
D1
Imprvious to Bioswale
2R
Bioswale at Drive Entrance
P2
Imprvious to Bioswale
F1P2
Filterstrip (woods) at Lodge Parking
F2P2
Filterstrip (woods) at Lodge Parking
D2
Imprvious to Filterstrip
F3
Filterstrip along drive
Subcat
Reach
Pond
Link
Routing Diagram for NHC- Bioswales and Filter Strips
Prepared by GME Drainage Consultant, Printed 1/14/2026
HydroCAD® 10.20-2h s/n 08107 © 2024 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQ	Type IA 24-hr		Default	24.00	1	0.67	2

Summary for Subcatchment D1: Imprvious to Bioswale

Runoff = 0.008 cfs @ 7.91 hrs, Volume= 0.003 af, Depth> 0.56"
Routed to Reach 2R : Bioswale at Drive Entrance

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr WQ Rainfall=0.67"

	Area (sf)	CN	Description
*	2,497	99.00	Parking
	2,497	99.00	100.00% Impervious Area

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

Summary for Subcatchment D2: Imprvious to Filterstrip

Runoff = 0.007 cfs @ 7.91 hrs, Volume= 0.002 af, Depth> 0.56"
Routed to Reach F3 : Filterstrip along drive

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr WQ Rainfall=0.67"

	Area (sf)	CN	Description
*	2,000	99.00	Drive
	2,000	99.00	100.00% Impervious Area

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

Summary for Subcatchment P1: Imprvious to Bioswale

Runoff = 0.093 cfs @ 7.91 hrs, Volume= 0.030 af, Depth> 0.56"
Routed to Reach B5 : Bioswale at Pond WSP

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr WQ Rainfall=0.67"

	Area (sf)	CN	Description
*	27,784	99.00	Parking
	27,784	99.00	100.00% Impervious Area

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

Summary for Subcatchment P2: Imprvious to Bioswale

Runoff = 0.018 cfs @ 7.91 hrs, Volume= 0.006 af, Depth> 0.56"
Routed to Reach F1P2 : Filterstrip (woods) at Lodge Parking

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr WQ Rainfall=0.67"

	Area (sf)	CN	Description
*	5,464	99.00	Parking
	5,464	99.00	100.00% Impervious Area

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

Summary for Reach 2R: Bioswale at Drive Entrance

Inflow Area = 0.057 ac,100.00% Impervious, Inflow Depth > 0.56" for WQ event
Inflow = 0.008 cfs @ 7.91 hrs, Volume= 0.003 af
Outflow = 0.008 cfs @ 8.28 hrs, Volume= 0.003 af, Atten= 8%, Lag= 22.1 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.11 fps, Min. Travel Time= 14.6 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 29.1 min

Peak Storage= 7 cf @ 8.04 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 2.25'
Bank-Full Depth= 0.35' Flow Area= 1.2 sf, Capacity= 0.552 cfs

2.00' x 0.35' deep channel, n= 0.250
Side Slope Z-value= 4.0 '/' Top Width= 4.80'
Length= 100.0' Slope= 0.0400 '/'
Inlet Invert= 583.00', Outlet Invert= 579.00'

‡

Summary for Reach B5: Bioswale at Pond WSP

Inflow Area = 0.638 ac,100.00% Impervious, Inflow Depth > 0.56" for WQ event
Inflow = 0.093 cfs @ 7.91 hrs, Volume= 0.030 af
Outflow = 0.089 cfs @ 8.18 hrs, Volume= 0.029 af, Atten= 4%, Lag= 15.9 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.16 fps, Min. Travel Time= 10.2 min
Avg. Velocity = 0.08 fps, Avg. Travel Time= 20.7 min

Peak Storage= 54 cf @ 8.01 hrs
Average Depth at Peak Storage= 0.10' , Surface Width= 5.80'
Bank-Full Depth= 0.35' Flow Area= 2.2 sf, Capacity= 0.772 cfs

5.00' x 0.35' deep channel, n= 0.250
Side Slope Z-value= 4.0 '/' Top Width= 7.80'
Length= 100.0' Slope= 0.0180 '/'
Inlet Invert= 581.26', Outlet Invert= 579.46'

‡

Summary for Reach F1P2: Filterstrip (woods) at Lodge Parking

Inflow Area = 0.125 ac,100.00% Impervious, Inflow Depth > 0.56" for WQ event
Inflow = 0.018 cfs @ 7.91 hrs, Volume= 0.006 af
Outflow = 0.018 cfs @ 8.10 hrs, Volume= 0.006 af, Atten= 2%, Lag= 11.3 min
Routed to Reach F2P2 : Filterstrip (woods) at Lodge Parking

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.03 fps, Min. Travel Time= 7.2 min
Avg. Velocity = 0.02 fps, Avg. Travel Time= 15.4 min

Peak Storage= 8 cf @ 7.98 hrs
Average Depth at Peak Storage= 0.03' , Surface Width= 20.00'
Bank-Full Depth= 0.08' Flow Area= 1.6 sf, Capacity= 0.104 cfs

20.00' x 0.08' deep channel, n= 0.800
Length= 14.0' Slope= 0.0357 '/'
Inlet Invert= 616.50', Outlet Invert= 616.00'

‡

Summary for Reach F2P2: Filterstrip (woods) at Lodge Parking

Inflow Area = 0.125 ac,100.00% Impervious, Inflow Depth > 0.56" for WQ event
Inflow = 0.018 cfs @ 8.10 hrs, Volume= 0.006 af
Outflow = 0.018 cfs @ 8.14 hrs, Volume= 0.006 af, Atten= 0%, Lag= 2.7 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.06 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.03 fps, Avg. Travel Time= 3.9 min

Peak Storage= 2 cf @ 8.12 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 20.00'
Bank-Full Depth= 0.08' Flow Area= 1.6 sf, Capacity= 0.300 cfs

20.00' x 0.08' deep channel, n= 0.800
Length= 6.7' Slope= 0.2985 '/'
Inlet Invert= 616.00', Outlet Invert= 614.00'

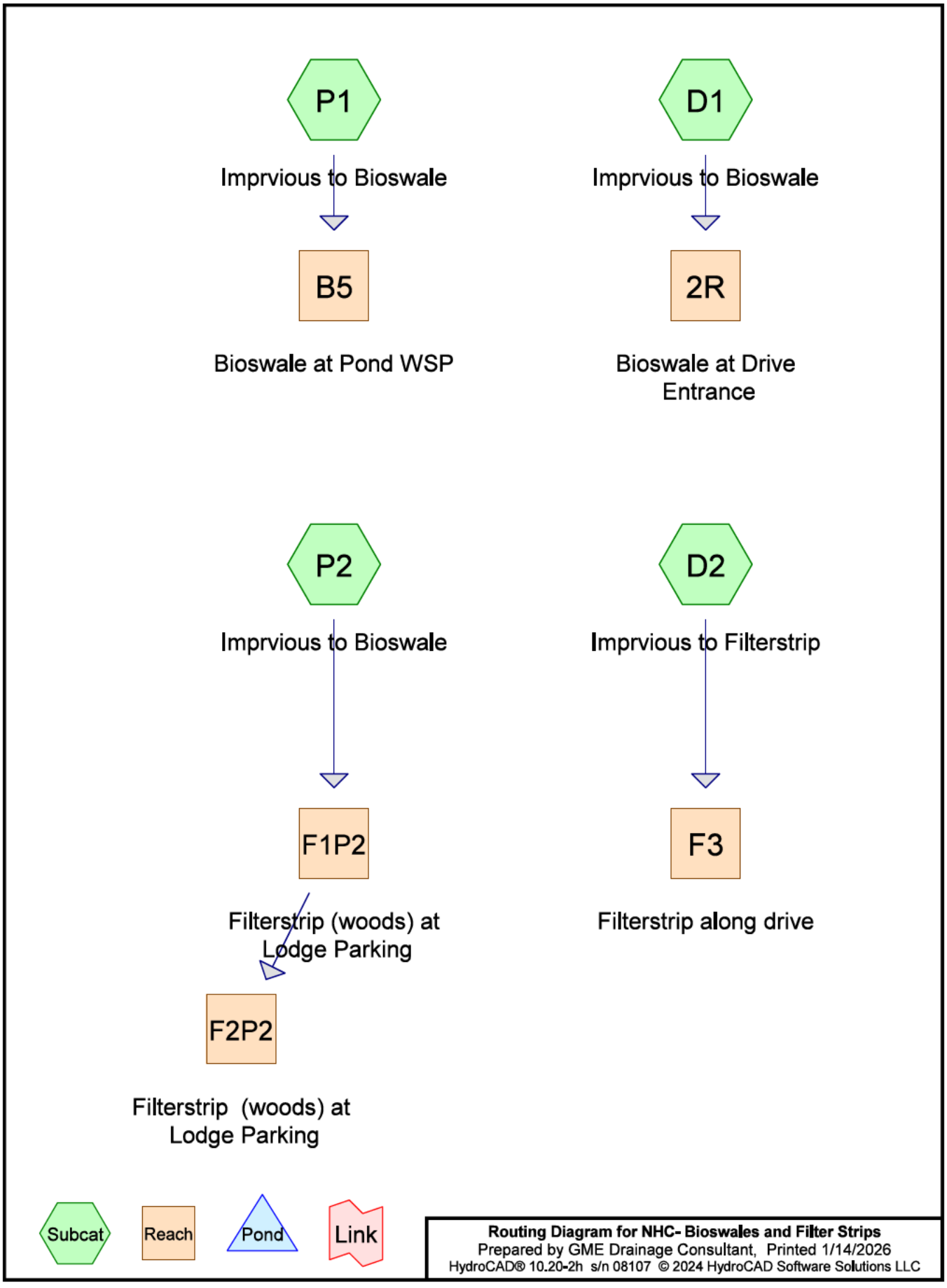
Summary for Reach F3: Filterstrip along drive

Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth > 0.56" for WQ event
Inflow = 0.007 cfs @ 7.91 hrs, Volume= 0.002 af
Outflow = 0.006 cfs @ 8.15 hrs, Volume= 0.002 af, Atten= 3%, Lag= 14.3 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.02 fps, Min. Travel Time= 9.2 min
Avg. Velocity = 0.01 fps, Avg. Travel Time= 18.4 min

Peak Storage= 4 cf @ 8.00 hrs
Average Depth at Peak Storage= 0.00' , Surface Width= 100.00'
Bank-Full Depth= 0.08' Flow Area= 8.0 sf, Capacity= 1.686 cfs

100.00' x 0.08' deep channel, n= 0.350
Length= 12.7' Slope= 0.0717 '/'
Inlet Invert= 610.00', Outlet Invert= 609.09'


P1
Imprvious to Bioswale
B5
Bioswale at Pond WSP
D1
Imprvious to Bioswale
2R
Bioswale at Drive Entrance
P2
Imprvious to Bioswale
F1P2
Filterstrip (woods) at Lodge Parking
F2P2
Filterstrip (woods) at Lodge Parking
D2
Imprvious to Filterstrip
F3
Filterstrip along drive
Subcat
Reach
Pond
Link
Routing Diagram for NHC- Bioswales and Filter Strips
Prepared by GME Drainage Consultant, Printed 1/14/2026
HydroCAD® 10.20-2h s/n 08107 © 2024 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-yr	Type IA 24-hr		Default	24.00	1	4.50	2

Summary for Subcatchment D1: Imprvious to Bioswale

Runoff = 0.061 cfs @ 7.89 hrs, Volume= 0.021 af, Depth> 4.37"
Routed to Reach 2R : Bioswale at Drive Entrance

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	2,497	99.00	Parking
	2,497	99.00	100.00% Impervious Area

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

Summary for Subcatchment D2: Imprvious to Filterstrip

Runoff = 0.049 cfs @ 7.89 hrs, Volume= 0.017 af, Depth> 4.37"
Routed to Reach F3 : Filterstrip along drive

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	2,000	99.00	Drive
	2,000	99.00	100.00% Impervious Area

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

Summary for Subcatchment P1: Imprvious to Bioswale

Runoff = 0.683 cfs @ 7.89 hrs, Volume= 0.232 af, Depth> 4.37"
Routed to Reach B5 : Bioswale at Pond WSP

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	27,784	99.00	Parking
	27,784	99.00	100.00% Impervious Area

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

Summary for Subcatchment P2: Imprvious to Bioswale

Runoff = 0.134 cfs @ 7.89 hrs, Volume= 0.046 af, Depth> 4.37"
Routed to Reach F1P2 : Filterstrip (woods) at Lodge Parking

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	5,464	99.00	Parking
	5,464	99.00	100.00% Impervious Area

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

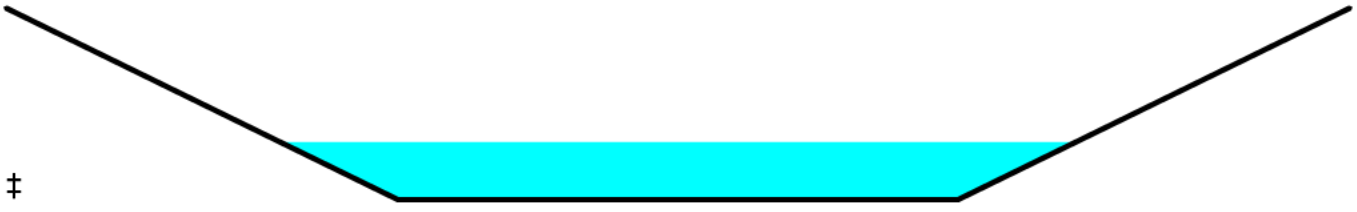
Summary for Reach 2R: Bioswale at Drive Entrance

Inflow Area = 0.057 ac,100.00% Impervious, Inflow Depth > 4.37" for 100-yr event
Inflow = 0.061 cfs @ 7.89 hrs, Volume= 0.021 af
Outflow = 0.060 cfs @ 8.09 hrs, Volume= 0.021 af, Atten= 2%, Lag= 11.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.24 fps, Min. Travel Time= 7.0 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 13.6 min

Peak Storage= 25 cf @ 7.98 hrs
Average Depth at Peak Storage= 0.11' , Surface Width= 2.84'
Bank-Full Depth= 0.35' Flow Area= 1.2 sf, Capacity= 0.552 cfs

2.00' x 0.35' deep channel, n= 0.250
Side Slope Z-value= 4.0 '/' Top Width= 4.80'
Length= 100.0' Slope= 0.0400 '/'
Inlet Invert= 583.00', Outlet Invert= 579.00'



‡

Summary for Reach B5: Bioswale at Pond WSP

Inflow Area = 0.638 ac,100.00% Impervious, Inflow Depth > 4.37" for 100-yr event
Inflow = 0.683 cfs @ 7.89 hrs, Volume= 0.232 af
Outflow = 0.676 cfs @ 8.04 hrs, Volume= 0.231 af, Atten= 1%, Lag= 8.5 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.33 fps, Min. Travel Time= 5.0 min
Avg. Velocity = 0.17 fps, Avg. Travel Time= 9.7 min

Peak Storage= 205 cf @ 7.96 hrs
Average Depth at Peak Storage= 0.33' , Surface Width= 7.60'
Bank-Full Depth= 0.35' Flow Area= 2.2 sf, Capacity= 0.772 cfs

5.00' x 0.35' deep channel, n= 0.250
Side Slope Z-value= 4.0 '/' Top Width= 7.80'
Length= 100.0' Slope= 0.0180 '/'
Inlet Invert= 581.26', Outlet Invert= 579.46'

‡

Summary for Reach F1P2: Filterstrip (woods) at Lodge Parking

Inflow Area = 0.125 ac,100.00% Impervious, Inflow Depth > 4.37" for 100-yr event
Inflow = 0.134 cfs @ 7.89 hrs, Volume= 0.046 af
Outflow = 0.134 cfs @ 7.99 hrs, Volume= 0.046 af, Atten= 0%, Lag= 5.5 min
Routed to Reach F2P2 : Filterstrip (woods) at Lodge Parking

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.07 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.03 fps, Avg. Travel Time= 6.9 min

Peak Storage= 26 cf @ 7.93 hrs
Average Depth at Peak Storage= 0.09' , Surface Width= 20.00'
Bank-Full Depth= 0.08' Flow Area= 1.6 sf, Capacity= 0.104 cfs

20.00' x 0.08' deep channel, n= 0.800
Length= 14.0' Slope= 0.0357 '/'
Inlet Invert= 616.50', Outlet Invert= 616.00'

‡

Summary for Reach F2P2: Filterstrip (woods) at Lodge Parking

Inflow Area = 0.125 ac,100.00% Impervious, Inflow Depth > 4.36" for 100-yr event
Inflow = 0.134 cfs @ 7.99 hrs, Volume= 0.046 af
Outflow = 0.134 cfs @ 8.01 hrs, Volume= 0.045 af, Atten= 0%, Lag= 1.4 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.14 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 1.7 min

Peak Storage= 7 cf @ 7.99 hrs
Average Depth at Peak Storage= 0.05' , Surface Width= 20.00'
Bank-Full Depth= 0.08' Flow Area= 1.6 sf, Capacity= 0.300 cfs

20.00' x 0.08' deep channel, n= 0.800
Length= 6.7' Slope= 0.2985 '/'
Inlet Invert= 616.00', Outlet Invert= 614.00'

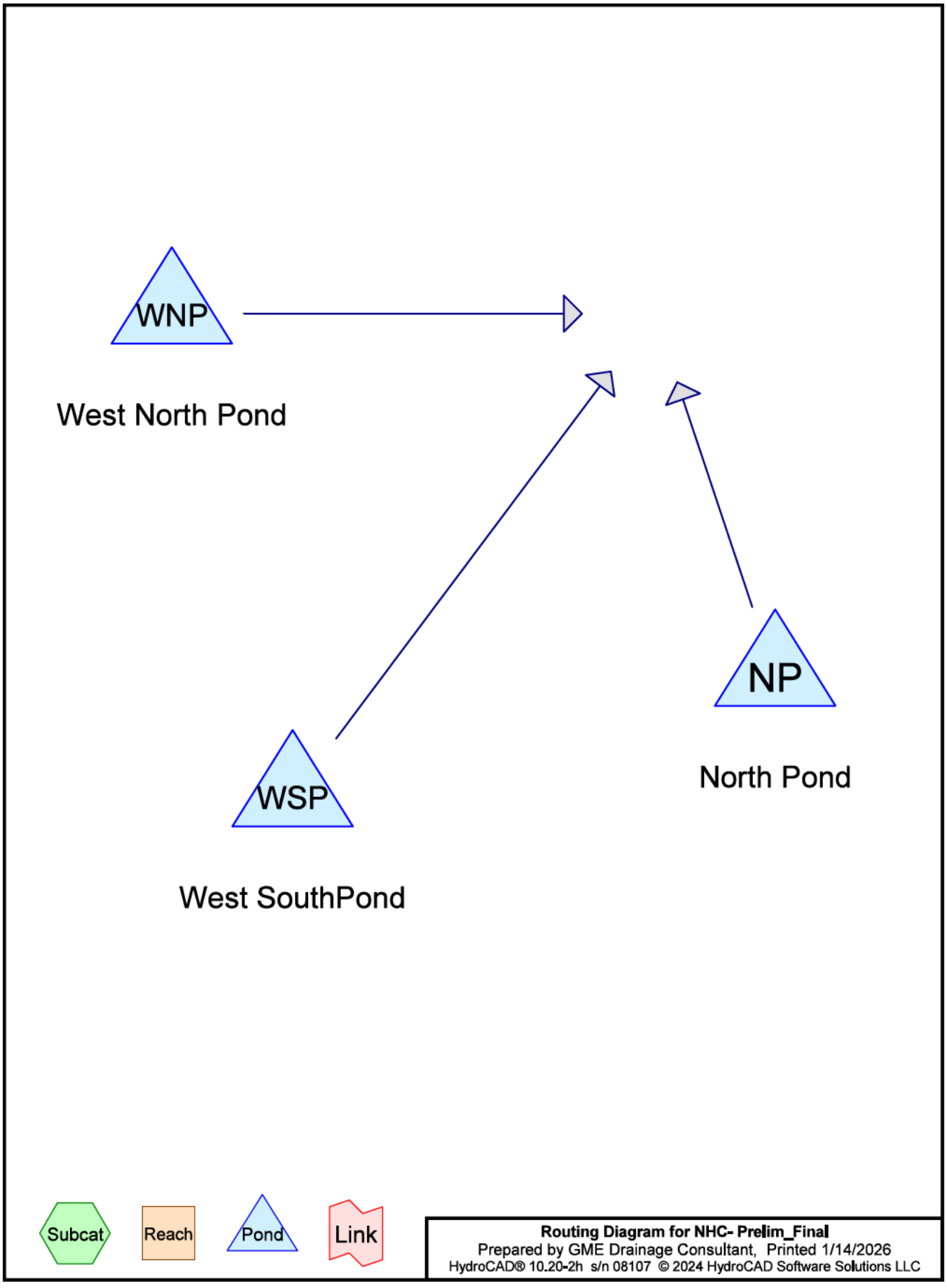
Summary for Reach F3: Filterstrip along drive

Inflow Area = 0.046 ac,100.00% Impervious, Inflow Depth > 4.37" for 100-yr event
Inflow = 0.049 cfs @ 7.89 hrs, Volume= 0.017 af
Outflow = 0.049 cfs @ 8.01 hrs, Volume= 0.017 af, Atten= 1%, Lag= 6.8 min

Routing by Stor-Ind+Trans method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.05 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.02 fps, Avg. Travel Time= 8.7 min

Peak Storage= 12 cf @ 7.94 hrs
Average Depth at Peak Storage= 0.01' , Surface Width= 100.00'
Bank-Full Depth= 0.08' Flow Area= 8.0 sf, Capacity= 1.686 cfs

100.00' x 0.08' deep channel, n= 0.350
Length= 12.7' Slope= 0.0717 '/'
Inlet Invert= 610.00', Outlet Invert= 609.09'



Routing Diagram for NHC- Prelim_Final
Prepared by GME Drainage Consultant, Printed 1/14/2026

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-yr	Type IA 24-hr		Default	24.00	1	4.50	2

Summary for Pond NP: North Pond

Inflow Area = 5.475 ac, 24.65% Impervious, Inflow Depth > 2.95" for 100-yr event
Inflow = 3.28 cfs @ 8.01 hrs, Volume= 1.345 af
Outflow = 0.85 cfs @ 11.52 hrs, Volume= 0.733 af, Atten= 74%, Lag= 210.4 min
Primary = 0.85 cfs @ 11.52 hrs, Volume= 0.733 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 609.19' @ 11.52 hrs Surf.Area= 12,038 sf Storage= 27,424 cf

Plug-Flow detention time= 495.8 min calculated for 0.733 af (55% of inflow)
Center-of-Mass det. time= 245.8 min (985.6 - 739.8)

Volume	Invert	Avail.Storage	Storage Description
#1	606.00'	37,953 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
606.00	5,353	0	0
608.00	9,366	14,719	14,719
610.00	13,868	23,234	37,953

Device	Routing	Invert	Outlet Devices
#1	Primary	606.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 606.00' / 604.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	606.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	609.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.84 cfs @ 11.52 hrs HW=609.19' (Free Discharge)
- **1=Culvert** (Passes 0.01 cfs of 6.20 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.60 fps)
- **3=Orifice/Grate** (Weir Controls 0.83 cfs @ 1.41 fps)

Summary for Pond WNP: West North Pond

Inflow Area = 3.410 ac, 8.84% Impervious, Inflow Depth > 3.25" for 100-yr event
Inflow = 1.85 cfs @ 8.07 hrs, Volume= 0.923 af
Outflow = 0.38 cfs @ 19.91 hrs, Volume= 0.191 af, Atten= 80%, Lag= 710.1 min
Primary = 0.38 cfs @ 19.91 hrs, Volume= 0.191 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 587.11' @ 19.91 hrs Surf.Area= 13,282 sf Storage= 32,101 cf

Plug-Flow detention time= 824.5 min calculated for 0.190 af (21% of inflow)
Center-of-Mass det. time= 472.7 min (1,223.2 - 750.5)

Volume	Invert	Avail.Storage	Storage Description
#1	584.00'	44,491 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
584.00	6,420	0	0
586.00	11,796	18,216	18,216
588.00	14,479	26,275	44,491

Device	Routing	Invert	Outlet Devices
#1	Primary	584.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 584.00' / 582.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	584.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.37 cfs @ 19.91 hrs HW=587.11' (Free Discharge)
↑—**1=Culvert** (Passes 0.37 cfs of 6.11 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.49 fps)
—**3=Orifice/Grate** (Weir Controls 0.36 cfs @ 1.07 fps)

Summary for Pond WSP: West SouthPond

Inflow Area = 19.124 ac, 6.61% Impervious, Inflow Depth > 2.39" for 100-yr event
Inflow = 5.07 cfs @ 8.38 hrs, Volume= 3.803 af
Outflow = 3.72 cfs @ 10.51 hrs, Volume= 3.206 af, Atten= 27%, Lag= 127.7 min
Primary = 3.72 cfs @ 10.51 hrs, Volume= 3.206 af
Routed to Reach P : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 581.81' @ 10.51 hrs Surf.Area= 12,302 sf Storage= 32,558 cf

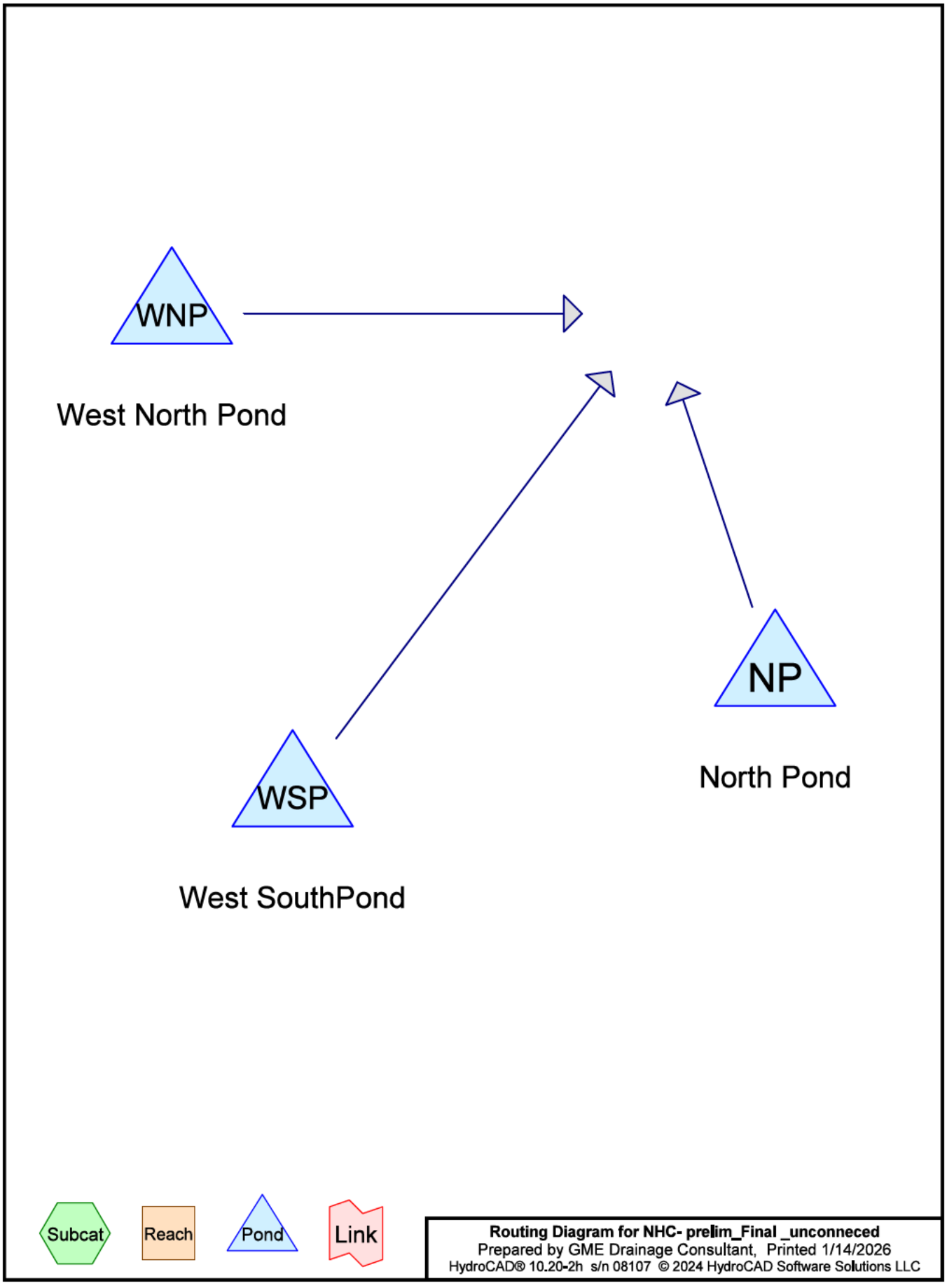
Plug-Flow detention time= 172.9 min calculated for 3.206 af (84% of inflow)
Center-of-Mass det. time= 82.3 min (906.0 - 823.7)

Volume	Invert	Avail.Storage	Storage Description
#1	578.00'	34,969 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.00	5,055	0	0
580.00	8,609	13,664	13,664
582.00	12,696	21,305	34,969

Device	Routing	Invert	Outlet Devices
#1	Primary	578.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.00' / 578.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	578.00'	**2.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	581.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.72 cfs @ 10.51 hrs HW=581.81' (Free Discharge)
└─**1=Culvert** (Passes 3.72 cfs of 6.63 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.32 cfs @ 9.39 fps)
  └─**3=Orifice/Grate** (Orifice Controls 3.40 cfs @ 4.33 fps)



Routing Diagram for NHC- prelim_Final _unconneced
Prepared by GME Drainage Consultant, Printed 1/14/2026

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-yr	Type IA 24-hr		Default	24.00	1	4.50	2

Summary for Pond NP: North Pond

Inflow Area = 5.475 ac, 11.73% Impervious, Inflow Depth > 2.66" for 100-yr event
Inflow = 2.92 cfs @ 8.01 hrs, Volume= 1.213 af
Outflow = 0.69 cfs @ 13.44 hrs, Volume= 0.602 af, Atten= 76%, Lag= 325.8 min
Primary = 0.69 cfs @ 13.44 hrs, Volume= 0.602 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 609.16' @ 13.44 hrs Surf.Area= 11,985 sf Storage= 27,139 cf

Plug-Flow detention time= 544.9 min calculated for 0.601 af (50% of inflow)
Center-of-Mass det. time= 276.9 min (1,034.7 - 757.8)

Volume	Invert	Avail.Storage	Storage Description
#1	606.00'	37,953 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
606.00	5,353	0	0
608.00	9,366	14,719	14,719
610.00	13,868	23,234	37,953

Device	Routing	Invert	Outlet Devices
#1	Primary	606.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 606.00' / 604.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	606.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	609.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 13.44 hrs HW=609.16' (Free Discharge)
- **1=Culvert** (Passes 0.01 cfs of 6.17 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.56 fps)
- **3=Orifice/Grate** (Weir Controls 0.68 cfs @ 1.32 fps)

Summary for Pond WNP: West North Pond

Inflow Area = 3.410 ac, 0.00% Impervious, Inflow Depth > 3.20" for 100-yr event
Inflow = 1.83 cfs @ 8.07 hrs, Volume= 0.910 af
Outflow = 0.37 cfs @ 20.26 hrs, Volume= 0.178 af, Atten= 80%, Lag= 731.2 min
Primary = 0.37 cfs @ 20.26 hrs, Volume= 0.178 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 587.11' @ 20.26 hrs Surf.Area= 13,279 sf Storage= 32,080 cf

Plug-Flow detention time= 829.0 min calculated for 0.178 af (20% of inflow)
Center-of-Mass det. time= 477.2 min (1,233.3 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	584.00'	44,491 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
584.00	6,420	0	0
586.00	11,796	18,216	18,216
588.00	14,479	26,275	44,491

Device	Routing	Invert	Outlet Devices
#1	Primary	584.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 584.00' / 582.00' S= 0.0606 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	584.00'	**0.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	587.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.36 cfs @ 20.26 hrs HW=587.11' (Free Discharge)
↑—**1=Culvert** (Passes 0.36 cfs of 6.10 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 8.49 fps)
—**3=Orifice/Grate** (Weir Controls 0.35 cfs @ 1.06 fps)

Summary for Pond WSP: West SouthPond

Inflow Area = 18.705 ac, 3.41% Impervious, Inflow Depth > 2.35" for 100-yr event
Inflow = 4.86 cfs @ 8.39 hrs, Volume= 3.660 af
Outflow = 3.57 cfs @ 10.56 hrs, Volume= 3.065 af, Atten= 27%, Lag= 130.6 min
Primary = 3.57 cfs @ 10.56 hrs, Volume= 3.065 af
Routed to Reach P* : Post POC

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 581.74' @ 10.56 hrs Surf.Area= 12,162 sf Storage= 31,720 cf

Plug-Flow detention time= 175.9 min calculated for 3.059 af (84% of inflow)
Center-of-Mass det. time= 83.2 min (912.5 - 829.3)

Volume	Invert	Avail.Storage	Storage Description
#1	578.00'	34,969 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
578.00	5,055	0	0
580.00	8,609	13,664	13,664
582.00	12,696	21,305	34,969

Device	Routing	Invert	Outlet Devices
#1	Primary	578.00'	**12.0" Round Culvert** L= 33.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 578.00' / 578.00' S= 0.0000 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	578.00'	**2.5" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	581.00'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.57 cfs @ 10.56 hrs HW=581.74' (Free Discharge)
└─**1=Culvert** (Passes 3.57 cfs of 6.55 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.32 cfs @ 9.31 fps)
  └─**3=Orifice/Grate** (Orifice Controls 3.25 cfs @ 4.14 fps)

Determine Unconnected CN for part of N1

Composite CN (unconnected w/<30% impervious)

$CN_c = CN_p + (P_{imp}/100)(98-CN_p)(1-0.5R)$

CN_p	$P_{imp}/100$	$98-CN_p$	(1- 0.5R)	CN_c
72.74	0.013	25.26	0.5	72.90

Where

CN_c= composite runoff curve number

CN_p= pervious runoff curve number

P_{imp}= percent impervious

Where

R= ratio of unconnected impervious area to total impervious area

Summary for Subcatchment N1P: from east of pond - to east property line find Wt'd perv = 72.74

Runoff = 0.57 cfs @ 8.07 hrs, Volume= 0.309 af, Depth> 1.85"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	14,646	78.00	pervious (HSG B)
*	18,850	88.00	pervious (HSG C)
*	54,074	66.00	pervious woods (HSG B)
	87,570	72.74	Weighted Average
	87,570	72.74	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	127	0.1730	0.15		**Sheet Flow, woode** Woods: Light underbrush n= 0.400 P2= 2.00"
12.3	173	0.1560	0.23		**Sheet Flow, lawn** Grass: Dense n= 0.240 P2= 2.00"
26.2	300	Total			

Summary for Subcatchment UN-1: from east of pond - to east property line

Runoff = 1.07 cfs @ 8.06 hrs, Volume= 0.550 af, Depth> 2.18"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	5,033	72.90	Impervious
*	8,096	72.90	Impervious
*	27,985	98.00	Impervious
*	14,646	72.90	pervious (HSG B)
*	18,850	72.90	pervious (HSG C)
*	3,208	88.00	pervious (HSG C)
*	54,074	66.00	woods (HSG B)
	131,892	75.76	Weighted Average
	103,907	69.78	78.78% Pervious Area
	27,985	98.00	21.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.9	127	0.1730	0.15		**Sheet Flow, woode**
					Woods: Light underbrush n= 0.400 P2= 2.00"
12.3	173	0.1560	0.23		**Sheet Flow, lawn**
					Grass: Dense n= 0.240 P2= 2.00"
26.2	300	Total			

Determine Composite CN for subcat N2

Composite CN (unconnected w/<30% impervious)

$CN_c = CN_p + (P_{imp}/100)(98-CN_p)(1-0.5R)$

14,374 sf Imperv.
22,982 sf perv.
Total 37,356 sf

Let R=1

CN_p	$P_{imp}/100$	$98-CN_p$	(1- 0.5R)	CN_c
88	0.3000	10	0.5	89.50

Where

CN_c= composite runoff curve number

CN_p= pervious runoff curve number

Note: all the impervious area is unconnected condition

		14,374/ 37,356	Limit is 30%
P_{imp}=	percent impervious	0.385	0.300 = 11,207 unconnected

So model all except 14,374 - 11,207 at composite CN and 3,167 sf at CN 98
Since it is all unconnected and flows over pervious for full length, use full impervious at CN 89.5

Where

R= ratio of unconnected impervious area to total impervious area

All is unconnected, so use R=1

Summary for Subcatchment UN-2: from east of pond

Runoff = 0.71 cfs @ 7.98 hrs, Volume= 0.238 af, Depth> 3.33"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	14,374	89.50	Impervious
*	22,982	89.50	overland and natural into pond
	37,356	89.50	Weighted Average
	37,356	89.50	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.7	124	0.1450	0.21		**Sheet Flow, lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Determine Composite CN for Subcat N-3

Composite CN (unconnected w/<30% impervious)

$CN_c = CN_p + (P_{imp}/100)(98-CN_p)(1-0.5R)$

CN_p	$P_{imp}/100$	$98-CN_p$	$(1-0.5R)$	CN_c
88	0.0480	10	0.5	88.24

Where

CN_c= composite runoff curve number

CN_p= pervious runoff curve number

P_{imp}= percent impervious 4.800%

65,945 pervious

3,308 impervious

Total = 69,253 sf

Where

R= ratio of unconnected impervious area to total impervious area

Summary for Subcatchment UN-3: overland area to pond NP - compsite

Runoff = 1.16 cfs @ 8.00 hrs, Volume= 0.424 af, Depth> 3.20"
Routed to Pond NP : North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	62,736	88.24	Pervious
*	6,517	88.24	Impervious
	69,253	88.24	Weighted Average
	69,253	88.24	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	182	0.1100	0.21		**Sheet Flow, cleared - lawn or field** Grass: Dense n= 0.240 P2= 2.00"

Determine Composite CN for Subcat S1

Composite CN (unconnected w/<30% impervious)

$CN_c = CN_p + (P_{imp}/100)(98-CN_p)(1-0.5R)$

CN_p	$P_{imp}/100$	$98-CN_p$	$(1- 0.5R)$	CN_c
78.76	0.0390	19.24	0.5	79.14

Where

CN_c= composite runoff curve number

CN_p= pervious runoff curve number (determined by modeling pervious CNs to determine wt'd value)

P_{imp}= percent impervious 3.386%

778,003 sf perv

unconnected portion (cabins, walks, gazebos) = 27,268 sf

total = 805,271

Where

R= ratio of unconnected impervious area to total impervious area

unconnected is 100%, direct is modeled at CN 98

Summary for Subcatchment US-1: Post for area to Pond 1

Runoff = 4.86 cfs @ 8.39 hrs, Volume= 3.660 af, Depth> 2.35"
Routed to Pond WSP : West SouthPond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	22,044	79.14	Wooded (HSG B)
*	45,524	79.14	Wooded (HSG B)
*	5,119	79.14	Wooded (HSG B)
*	168,861	79.14	Wooded (HSG C)
*	375,187	79.14	Wooded (HSG D)
*	27,785	98.00	parking
*	27,268	79.14	cabins, walks, pads, etc
*	39,090	79.14	lawn (HSG B)
*	722	79.14	lawn (HSG B)
*	89,895	79.14	lawn (HSG C)
*	13,290	79.14	lawn (HSG D)
	814,785	79.78	Weighted Average
	787,000	79.14	96.59% Pervious Area
	27,785	98.00	3.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
65.4	300	0.0800	0.08		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 2.00"
13.9	1,200	0.0833	1.44		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
79.3	1,500	Total			

Determine Unconnected CN for Subbasin W5

Composite CN (unconnected w/<30% impervious)

$CN_c = CN_p + (P_{imp}/100)(98-CN_p)(1-0.5R)$

CN_p	$P_{imp}/100$	$98-CN_p$	$(1- 0.5R)$	CN_c
88.93	0.136	9.07	0.5	89.55

Where

CN_c= composite runoff curve number

CN_p= pervious runoff curve number

P_{imp}= percent impervious

Where

R= ratio of unconnected impervious area to total impervious area

Summary for Subcatchment W5P: west area to pond WNP -wt'd CN 88.93

Runoff = 1.02 cfs @ 8.08 hrs, Volume= 0.515 af, Depth> 3.23"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	34,986	86.00	Woods (HSG C)
*	47,672	91.00	Pervious (HSG C)
*	637	95.00	Lawn (HSG D)
	83,295	88.93	Weighted Average
	83,295	88.93	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	300	0.0700	0.13		**Sheet Flow, wooded**
					Woods: Light underbrush n= 0.400 P2= 2.00"
1.2	80	0.0500	1.12		**Shallow Concentrated Flow, woode**
					Woodland Kv= 5.0 fps
40.8	380	Total			

Summary for Subcatchment UN_5: west area to pond WNP -wt'd CN 88.93

Runoff = 1.21 cfs @ 8.07 hrs, Volume= 0.607 af, Depth> 3.29"
Routed to Pond WNP : West North Pond

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type IA 24-hr 100-yr Rainfall=4.50"

	Area (sf)	CN	Description
*	34,986	89.55	Woods (HSG C)
*	47,672	89.55	Pervious (HSG C)
*	637	89.55	Lawn (HSG D)
*	13,126	89.55	Impevious
	96,421	89.55	Weighted Average
	96,421	89.55	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
39.6	300	0.0700	0.13		**Sheet Flow, wooded**
					Woods: Light underbrush n= 0.400 P2= 2.00"
1.2	80	0.0500	1.12		**Shallow Concentrated Flow, woode**
					Woodland Kv= 5.0 fps
40.8	380	Total			