CLOVER LEAF DEVELOPMENT
PHASE 2

986 PORTLAND ROAD
SACO, MAINE

SITE LOCATION APPLICATION

PREPARED FOR:

CLOVER LEAF DEVELOPMENT, LLC
P.O. BOX 6799
SCARBOROUGH, ME 04070

PREPARED BY:

TERRADYN CONSULTANTS LLC
41 CAMPUS DRIVE, SUITE 301
NEW GLOUCESTER, ME 04260

OCTOBER 2024

Section 1 – Development Description

Narrative

On behalf of Cloverleaf Development, LLC, we are pleased to submit this Site Location of Development Act Application for the second phase of the Clover Leaf Development. The previously permitted first phase included a 120 unit apartment complex that is located at 986 Portland Road in Saco, Maine.

The newly proposed second phase of development includes the following:

1. 138 multifamily units to be located in nine buildings
2. A 1 MW AC solar array that will be accessory to the project. It is hoped that the array will be able to fully offset the power usage for both phases of development.
3. Formal creation of a 1.1 acre commercial outparcel along Portland Road. The plan for the creation of this lot was discussed in the first phase and included within the assumed watershed of the now-existing gravel wetland that handles runoff from the area.
4. One single family home that will be accessed via a new private way that will extend off the hammerhead of Apple Tree Lane.

Existing Conditions

The development parcel is located on the westerly side of Portland Road in Saco, Maine. The property is approximately 65.8 acres. The site is bounded to the west by Portland Road (Route 1), to the south by the Aquaboggin Water Park and five single family house lots, to the north by a fairly new residential development and a large tract of undeveloped land and to the east by an undeveloped parcel that is located between the applicant's property and the Maine Turnpike.

The site contains the first phase of development that was recently constructed. The first phase is limited to approximately 10 acres of the property that are closest to Route 1. It includes 120 apartment units that are located within ten twelve-unit buildings, a multipurpose building, storage building, hard-scaped courtyards, landscaped areas and a dog park. The development features a significant amount of proposed landscaping.

The complex is served by public water, sewer and underground power. The majority of the existing development drains to a gravel wetland that is located off the end of the access driveway. A small portion of one parking area flows to a level spreader/forested buffer.

The remainer of the property is undeveloped. Phase 1 is separated from the remainder of the developable portion of the property by a scrub-shrub wetland area that is approximately 250' wide. The rear of the property contains four or five large upland areas that are surrounded by wetlands. There are no streams or vernal pools on the property. The rear of the property is benefitted by 50' of frontage on the Apple Tree Lane turnaround.

The property is located within the Scarborough River Watershed.

Proposed Development

The access road will be extended 1,550' to serve the second phase of multifamily housing. This development exhausts all remaining, usable net residential area. This phase will include 138 units in nine buildings. The units are broken out as follows: five of the buildings will contain 12, three will contain 24 and the final building will feature 6. There are 24 two & three car garages located throughout the project site. There will be centrally located pickleball courts along with an associated support building.

Public water and underground electricity will be extended from the end of the first phase. A new gravity sewer system will be installed in the access road in the area adjacent to the new buildings. That gravity system will flow to a new private pump station that will outlet to the closest gravity manhole in phase 1.

A 1 MW AC solar array will be constructed in the upland area to the west of the apartment complex. It's hoped that arrays will offset the power needs for both the existing & proposed phase of apartments (258 total).

A commercial outparcel will be created adjacent to Portland Road. The area was set aside in phase 1 for the lot to be broken out during the second phase. The driveway to the proposed lot will connect to the existing access road. The phase 1 stormwater pond was sized to handle full development of the outparcel.

The Apple Tree Lane right of way connects to the back portion of the property. The applicant proposes to create one single-family residential lot that will be accessed from this location. The end of the new private way will connect to the nearest parking lot in the development via a gated, emergency access driveway. The gate will be outfitted with a Knox box for fire and rescue access.

A variety of stormwater BMP's will be used to provide the necessary water quality treatment and water quantity control for the development. The design features a gravel wetland, a filter basin, roof drain filter strips, a series of level spreader/buffer combinations, a buffer adjacent to a residential lot and roadside buffers.

Wetlands

Mark Hampton of Hampton Associates, Inc. performed the project wetland delineation. Approximately 32,023 SF of wetlands are proposed to be permanently altered. This figure includes 18,966 SF that were permitted for the filling of a borrow pit in phase 1 and 13,057 SF that are associated with the proposed second phase. We have prepared a NRPA Tier 2 Wetland Alteration Permit along with this application. There are two areas of proposed alteration:

- Area 1 is located just west of phase 1 and is related with the extension of the access road across a scrub shrub wetland to access the buildable area of the lot. Most of the wetland impacts (12,121 SF) associated with the second phase are associated with this crossing. This impact area is generally 240' long and 50' wide.

- Area 2 is associated with the access road to the solar array. A 16' driveway will cross a scrub shrub/foreste wetland and result in an impact of approximately 936 SF.

The associated wetland report can be seen in Section 11 - Soils.

High Intensity Soil Survey

Mark Hampton of Hampton Associates, Inc. completed a Class B High Intensity Soil Survey for the project area. The report can be seen in Section 11 - Soils.

Site Topography

Topography for the entire site was compiled from a variety of sources. The developed area of the first phase and connections to Portland Road & Apple Tree Lane were surveyed by Owen Haskell, Inc. The remainder of the property was obtained from the LIDAR topography that was made available by the Maine Office of GIS. The topographic information can be seen on the attached construction plans. A copy of the U.S.G.S. Quadrangle Map is attached to this section.

Construction Plan

The project will be constructed in one phase. The site work is estimated to take between 8-13 months to complete and would generally correspond to the following table:

	Start	Finish
1. Estimated construction time: 12 months	April 1, 2025	May 1, 2026
2 Erosion control measures placed	April 1, 2025	April 15, 2026
3. Site clearing, grubbing, excavation, filling and construction stormwater facilities	April 1, 2025	April 15, 2026
4. Excavation & construction of roads, parking lots and underground utilities.	April 1, 2025	April 15, 2026
5. Mulch spread for winter erosion control. (if necessary)	November 15, of construction year	May 1 the next year
6. Start progressive final seeding on prepared areas.	Within 24 hours of loam placement	September 15 of construction year
7. Bi-weekly monitoring of vegetative growth.	April 15, 2025	May 1, 2026
8. Re-seed, if necessary, and continue monitoring of growth until established.	April 15, 2025	April 15, 2026
9. Progressive removal of erosion control devices, based on field inspection.	April 15, 2025	April 15, 2026

Dates are subject to change at the discretion of the engineer depending on construction progress.

Drawings

A full set of construction plans have been attached with this submittal, including:

- Site Plans
- Grading & Erosion Control Plans
- Utility Plans
- Plan & Profile Sheets
- Detail Sheets
- Existing Conditions Plans, etc.

Section 2 – Title, right or interest

A copy of the property deed is attached.

NANCY E HAMMOND, REGISTER OF DEEDS
Bk 19071 PG 215
Instr # 2022029966
07/15/2022 01:25:22 PM
Pages 5 YORK CO

DLN: 1002240202008

QUITCLAIM DEED WITH COVENANT

PAMELA CONSIGLIO, of Lady Lake, County of Lake, State of Florida, whose mailing address is 1316 Debra Drive, Lady Lake, Florida 32159 and **SHERRY W. MITCHELL**, of Lady Lake, County of Lake, State of Florida, whose mailing address is 930 Oleander Street, Lady Lake, Florida 32159, for consideration paid, grant, with quitclaim covenant, to **CLOVER LEAF DEVELOPMENT LLC**, a Maine limited liability company with a mailing address of PO Box 6799, Scarborough, Maine 04070, the land located at or near 986 Portland Road in Saco, County of York, State of Maine, together with all rights and easements appurtenant thereto, such land being more particularly described as follows (hereinafter referred to as "Surveyor's Description"):

Maine R.E. Transfer Tax Paid

A certain lot or parcel of land with the buildings thereon, situated on the northwesterly side of Portland Road (US Route 1) in the City of Saco, County of Cumberland and State of Maine bounded and described as follows:

Beginning at a point on the northwesterly sideline of Portland Road (US Route 1) at the northeasterly corner of land now or formerly of Aqua Management, LLC as described in deed book 17607, page 402 and deed book 18450, page 71;

Thence, the following courses and distances along land of said Aqua Management, LLC:

N 55°35'19" W a distance of 998.00 feet to a capped iron rod;

N 55°35'19" W a distance of 214.67 feet;

S 33°20'05" W a distance of 473.10 feet;

S 40°46'17" W a distance of 228.42 feet;

N 56°11'14" W a distance of 1,187.24 feet;

S 35°14'35" W a distance of 401.27 feet to land now or formerly of Jennifer T. & Lucas Mahoney as described in deed book 17782, page 855;

Thence, N 53°01'25" W along land of said Mahoney and the end of a private right of way, as shown on "Final Plan, Apple Tree Lane Subdivision" recorded in York County Registry of Deeds plan book 381, page 44, a distance of 150.02 feet to land now or formerly of Jason A. Camire as described in deed book 18120, page 865;

Thence, N 35°14'35" E along land of said Camire 206.51 feet to a crimped iron pipe;

Thence, N 54°06'44" W continuing along land of said Camire 235.63 feet to an iron pipe and land now or formerly of Therese M. and Paul D. Hersey as described in deed book 18402, page 583;

Thence, N 53°29'04" W along land of said Hersey and land now or formerly of Marilyn Ives as described in deed book 14318, page 329 a distance of 286.42 feet to and iron pipe and other land now or formerly of Marilyn Ives as described in deed book 8075, page 334;

Thence, N 54°01'13" W along land of said Ives 402.98 feet to a granite monument;

Thence, N 35°00'44" E along land of said Ives 195.53 feet to an iron rod and land now or formerly of James H. and Edna M. Leary as described in deed book 11917, page 161;

Thence, the following courses and distances along land of said Leary:

N 36°20'28" E a distance of 730.38 feet;

S 53°57'48" E a distance of 918.75 feet to a granite monument;

N 35°45'01" E a distance of 421.76 feet to a granite monument;

S 53°15'01" E a distance of 2,044.03 feet to a drill hole and land now or formerly of Cottages at Pine Meadows Condominium as shown on "Cottages at Pine Meadows, Overall Site Layout and Materials Plan" recorded in York County Registry of Deeds plan book 960, page 1;

Thence, S 53°45'50" E along land of said Cottage at the Pine Meadows Condominium 165.36 feet to a drill hole at land now or formerly of William A. Jipsom, Jr. as described in deed book 18086, page 906 and land now or formerly of Phineas Merrill heirs, being the grave yard lot excepted in deed book 292, page 508;

Thence, the following courses and distances along land of said Phineas Merrill heirs:

S 35°21'59" W a distance of 28.00 feet;

S 54°38'01" E a distance of 331.82 feet to the northwesterly sideline of said Portland Road (US Route 1);

Thence, S 34°27'03" W along the northwesterly sideline of said Portland Road (US Route 1) 326.02 feet to the point of beginning, containing 65.84 acres more or less.

The above-described parcel of land is shown on "Boundary and Topographic Survey at 986 Portland Road, Saco, Maine made for Clover Leaf Development LLC," dated Feb. 23, 2021 and revised 3/4/21 by Owen Haskell, Inc. OHI Job #2020-392 S-Y.

Also releasing Grantor's right, title and interest in and to the premises described as follows (hereinafter referred to as "Historical Description"):

Certain lots or parcels of land with the buildings thereon, situated on the northwesterly side of Portland Road (US Route 1) in the City of Saco, County of Cumberland and State of Maine bounded and described as follows:

Parcel One:

A certain lot or parcel of land, with the buildings thereon, situated and located on the Northwesterly side of the Portland Road, in Saco, Maine, and being the Mills Homestead, so- called, and containing ninety (90) acres, more or less, and being the same premises devised to Edgar E. Mills by his father, Eugene Mills, late of Saco, Maine, and the same premises devised to this Grantor by his late father, Edgar E. Mills, the Wills of the said Eugene Mills and Edgar E. Mills having been duly proved and allowed by the Probate Court for the County of York.

Excepting from the above above-described premises, the land described in Deed from Pamela Consiglio and Sherry Mitchell to Aqua Management LLC dated September 25, 2020 and recorded in York County Registry of Deeds in Book 18450, Page 71.

Parcel Two:

A certain lot or parcel of land together with any improvements thereon situated northeasterly of the Flag Pond Road but not adjacent thereto, and at the end of Apple Tree Lane as the same is shown on plan recorded in the York County Registry of Deeds in Plan Book 381, Page 44 in Saco, York County, Marne and being more particularly bounded and described as follows:

Beginning at the granite monument which marks the end of Apple Tree Lane, a corner of Lot No. 4 as shown on said plan where it abuts and land labeled on said plan N/F Michael S. Kimball and Peter J Kimball in Book 13763, Page 88;

Thence N 35° 29' 35" W along said Lot No. 4 and land now or formerly of Witham a distance of 392.99 feet to an iron rod and other land of Witham;

Thence S 37° 23' 58" E along said Witham land a distance of 150 feet to a point;

Thence S 35° 29' 35" W through remaining land of Aqua Management LLC a distance of 393 feet, more or less, to a point on the northerly sideline of Lot No. 3 as shown on said plan;

Thence N 52° 59' 44" W along Lot No. 3 and Apple Tree Lane a distance of 150 feet to the monument which marks the point and place of beginning.

For source of title, see Deed of Distribution from Harold Mitchell, personal representative to Grantors dated August 3, 2015, and recorded in the York County Registry of Deeds in Book 17077, Page 835, Warranty Deed from Aqua Management LLC dated November 12, 2020, recorded in said Registry in Book 18450, Page 73, and Boundary Line Establishment with Aqua Management LLC dated March 16, 2021, and recorded in said Registry in Book 18610, Page 857.

IN WITNESS WHEREOF, the undersigned have executed this instrument as of this 13th day of July, 2022.

Witness:

_____ _____
Sherry W. Mitchell

Melissa M. Braley _____ Pamela Consiglio
Pamela Consiglio

STATE OF VERMONT
GRAND ISLE, ss.

July _____, 2022

Then personally appeared before me the above-named Sherry W. Mitchell and acknowledged the foregoing instrument to be her free act and deed.

_____
Notary Public
My Commission Expires:
Print name:

STATE OF MAINE
PENOBSCOT, ss.

July 13th, 2022

Then personally appeared before me the above-named Pamela Consiglio and acknowledged the foregoing instrument to be her free act and deed.

Melissa M. Braley
Notary Public
My Commission Expires:
Print name:

MELISSA M BRALEY
NOTARY PUBLIC
State of Maine
My Commission Expires
June 13, 2028

SEAL

IN WITNESS WHEREOF, the undersigned have executed this instrument as of this 13th day of July, 2022.

Witness:

Sherry W. Mitchell

Pamela Consiglio

STATE OF VERMONT
GRAND ISLE, ss.

July 12, 2022

Then personally appeared before me the above-named Sherry W. Mitchell and acknowledged the foregoing instrument to be her free act and deed.

Danielle James Choiniere
Notary Public Ft James
My Commission Expires: 1.31.2023
Print name: Danielle James Choiniere
Credential # 157.0002819

SEAL

STATE OF MAINE
PENOBSCOT, ss.

July _____, 2022

Then personally appeared before me the above-named Pamela Consiglio and acknowledged the foregoing instrument to be her free act and deed.

Notary Public
My Commission Expires:
Print name:

Section 3 – Financial Capacity

Clover Leaf Development, LLC. is proposing to develop the second phase of the Clover Leaf Development.

The applicant owns the development parcel described as lot 3-1 on the City of Saco Tax Map #63. The second phase will be constructed in one phase. Our engineers estimate indicates that the total project infrastructure will cost approximately 2 million dollars to build out.

The applicants provided financial capacity in the amount of 32 million dollars. This figure includes building construction. We've provided a letter from Bar Harbor Bank & Trust that states that the members of Clover Leaf Development, LLC have the current financial capacity to fund the project.

TERRADYN CONSULTANTS, LLC
P.O. Box 339
New Gloucester, ME 04260
(207) 926-5111

JOB NO. 21-04.1
SHEET NO. 1 OF 1
CALCULATED BY JDA DATE 10/28/2024

BUDGETARY COST ESTIMATE - SITE WORK
CLOVERLEAF PHASE 2 - SACO, MAINE

ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	AMOUNT
	EARTHWORK				
1	GRUB OPEN AREA	AC	$2,000.00	12	$24,000.00
2	EXCAVATE AND FILL TO SUBGRADE	CY	$7.00	12000	$84,000.00
	ROADWAY AND SIDEWALKS				
3	HOT BITUMINOUS SURFACE PAVEMENT	TON	$75.00	740	$55,500.00
4	HOT BITUMINOUS BINDER PAVEMENT	TON	$90.00	987	$88,830.00
5	BASE GRAVEL MDOT TYPE A	CY	$27.00	740	$19,980.00
6	SUBBASE GRAVEL MDOT TYPE D	CY	$18.00	4441	$79,938.00
7	SLIPFORM CURB (ROAD & PARKING)	LF	$12.00	3950	$47,400.00
8	5' WIDE SIDEWALK & HARDSCAPE	SY	$30.00	1323	$39,690.00
9	STRIPING	LS	$3,000.00	1	$3,000.00
	PARKING LOT				
10	HOT BITUMINOUS SURFACE PAVEMENT	TON	$75.00	611	$45,825.00
11	HOT BITUMINOUS BINDER PAVEMENT	TON	$90.00	856	$77,040.00
12	BASE GRAVEL MDOT TYPE A	CY	$27.00	734	$19,818.00
13	SUBBASE GRAVEL MDOT TYPE D	CY	$18.00	2934	$52,812.00
14	5' WIDE SIDEWALK & HARDSCAPE	SY	$30.00	652	$19,560.00
15	DUMPSTER	EA	$8,000.00	12	$96,000.00
	SITE IMPROVEMENTS				
16	SIGNS	EA	$200.00	28	$5,600.00
	DRAINAGE				
17	12" DIAMETER STORM DRAIN	LF	$30.00	1291	$38,730.00
18	15" DIAMETER STORM DRAIN	LF	$30.00	709	$21,270.00
19	18" DIAMETER STORM DRAIN	LF	$40.00	203	$8,120.00
20	36" DIAMETER STORM DRAIN	LF	$75.00	98	$7,350.00
21	4' DIAMETER DRAINAGE MANHOLE	EA	$4,000.00	8	$32,000.00
22	4' DIAMETER CATCH BASIN	EA	$3,000.00	28	$84,000.00
23	FIELD INLET	EA	$3,000.00	0	$0.00
24	FILTER BASIN	LS	$50,000.00	1	$50,000.00
25	GRAVEL WETLAND	LS	$120,000.00	1	$120,000.00
	UTILITIES				
26	1" WATER SERVICE	EA	$800.00	1	$800
27	6" FIRE & 2" DOMESTIC	LF	$58.00	2490	$144,420
28	2" GATE VALVE	EA	$1,000.00	10	$10,000
29	6" GATE VALVE	EA	$1,300.00	11	$14,300
30	2" BLOW OFF	EA	$900.00	2	$1,800
31	6" SANITARY SEWER	LF	$25.00	1076	$26,900
32	SANITARY SEWER MANHOLE	VF	$450.00	9	$4,050
33	SEWER FORCE MAIN	LF	$30.00	900	$27,000
34	PUMP STATION	EA	$300,000.00	1	$300,000
35	TRANSFORMER PAD	EA	$1,000.00	10	$10,000
36	LIGHT POLE BASES	EA	$600.00	39	$23,400
37	ELECTRIC VAULT	EA	$10,000.00	5	$50,000
38	SITE ELECTRICAL	LF	$10.00	3669	$36,690

	AMENITIES				
39	WALKING TRAIL	SY	$15.00	434	$6,510.00
40	WALKING BRIDGE	EA	$5,000.00	2	$10,000.00
41	TENNIS COURT	EA	$50,000.00	1	$50,000
	EROSION & SEDIMENT CONTROL				
42	STABILIZED CONSTRUCTION ENTRANCE	EA	$2,000.00	2	$4,000.00
43	RIPRAP	CY	$40.00	39	$1,560.00
44	SILT FENCE	LF	$5.00	6423	$32,115.00
45	LOAM & SEED	CY	$8.00	2500	$20,000.00
46	STREET TREES	EA	$225.00	328	$73,800.00
	MAINTENANCE & INSPECTION				
47	STORMWATER INSPECTION & MAINTENANCE	LS	$10,000.00	1	$10,000.00

SITE WORK TOTAL= $1,967,808.00

NOTES

1. THE OPINION OF PROBABLE CONSTRUCTION COST IS BASED UPON THE PERMITTING PLANS FOR PHASE TWO OF CLOVERLEAF DATED OCTOBER 28, 2024, PREPARED BY TERRADYN CONSULTANTS, LLC. THIS ESTIMATE IS IN NO WAY, IMPLIED OR EXPRESSED OTHERWISE, A WARRANTEE THAT THE PROJECT CAN BE CONSTRUCTED FOR THE ABOVE COSTS. THIS ESTIMATE IS INTENDED TO BE USED AS A SITE WORK ALLOWANCE FOR PERFORMANCE GUARANTEE PURPOSES ONLY. IT DOES NOT INCLUDE COST ASSOCIATED WITH THE BUILDING CONSTRUCTION, ENGINEERING DESIGN FEES, LAND ACQUISITION, LEGAL FEES, PERMITING FEES, TESTING SERVICES OR CONSTRUCTION PHASE SERVICES.

2. THE ONSITE PAVEMENT AND GRANULAR MATERIAL QUANTITIES FOR CLOVERLEAF ARE BASED UPON THE FOLLOWING SECTION:

MATERIAL DESCRIPTION	PAVEMENT BUILDUP (IN)		
	ROAD	PARKING LOT	DRIVEWAY
BITUMINOUS CONCRETE SURFACE COURSE (INCHES)	2	1.25	N/A
BITUMINOUS CONCRETE BINDER COURSE (INCHES)	2.5	1.75	N/A
AGGREGATE BASE GRAVEL (INCHES)	3	3	N/A
AGGREGATE SUBBASE GRAVEL (INCHES)	21	12	N/A

October 24, 2024

City of Saco
Planning Department
300 Main Street
Saco, ME 04072

RE: Cloverleaf Development, LLC | Cloverleaf Apartments Phase II
986 Portland Road, Saco, Maine

I am pleased to provide this financial capacity letter in support of Cloverleaf Development LLC, developer of the above referenced apartment project. Bar Harbor Bank & Trust currently provides financing for Phase I of Cloverleaf Apartments and is looking forward to entertaining approximately $32 million in financing for Phase II as soon as the applicant is prepared to proceed with construction.

I have known and worked with the principals of Cloverleaf for more than 10 years have been involved with the financing of numerous projects.

Based on my experience with the principal owners as it relates to projects of similar size and scope, I believe that Cloverleaf Development, LLC has the financial capacity and technical expertise to successfully complete this project.

Sincerely,

Joe Delano
Senior Vice President

Section 4 - Technical Ability

Terradyn Consultants, LLC has been retained to obtain the Maine Department of Environmental Protection (MDEP) Site Location of Development Act Permit on behalf of Clover Leaf Development, LLC for the Clover Leaf Development.

The technical phase of the project includes the preparation of detailed site plans, project details, site grading, stormwater management, erosion and sediment control and utility layout. The permitting phase of this project consists of the preparation of all state and local application permits required for the City of Saco Site & Subdivision Approval, including the MDEP Site Location of Development Act Permit and a Tier 2 Wetland Alteration Permit.

Terradyn Consultants, LLC was established in 2005 and currently has nearly thirty employees that include professional engineers, professional land surveyors, cad technicians and administrative staff. Terradyn Consultants, LLC provides land planning, land surveying, stormwater management design and environmental permitting technical assistance to developers, contractors and municipalities in the areas of commercial, residential and industrial developments. The principal owners have previously been involved in the successful design and permitting of many projects of similar size and scope.

Owen Haskell, Inc. prepared the boundary and partial topographic survey for the property. Owen Haskell provides high-quality, client-oriented since 1964. Owen Haskell, Inc. has become one of New England's largest full-service surveying companies with more than 100 years of combined experience in land and engineering surveys.

Mark Hampton Associates, Inc. prepared the Class B High Intensity Soil Survey and delineated the onsite wetlands. Mark Hampton, CSS #216, LSE #263 is a recognized expert in his field.

VHB, Inc is working to obtain the necessary Traffic Movement Permit through the MDOT.

The landscaping plan was prepared by Barry Hosmer, ASLA. Barry has been a practicing landscape architect for several decades.

Section 5 - Noise

The anticipated noise generated by the project will be minor in nature since the project residential. Short-term noise effects may occur during construction because of the use of normal construction equipment on the site. This noise is limited and would be expected to reduce to the minor residential levels once the construction phase is complete. Construction activities will be limited to the hours of 7 am – 7 pm or during daylight hours.

Section 6 - Visual Quality and Scenic Character

The visual quality and scenic character will be maintained/established by the installation of a significant amount of landscaping, the use of architectural light fixtures and the construction of architecturally interesting buildings. Furthermore, only the private way and single family lot are within 500' of any neighboring residential structure. All other portions of the second phase of development are more than 500' from any existing structure.

The landscaping plan was prepared by Barry Hosmer, ASLA. The plan features a large number of trees and a host of bushes and flowers. .

Architectural light fixtures will be installed throughout the internal roadway system and pedestrian areas.

High Rock Designs, LLC designed the buildings to be aesthetically pleasing and have made sure that the building facades are broken up with different architectural features. Only high quality building materials will be used.

The combination of the preservation of buffering, and the proposed landscaping, lighting and architectural design will create a development that is visually attractive both for people passing by the property and for those living in one of the units.

Section 7 - Wildlife and Fisheries

The Maine Department of Inland Fisheries and Wildlife was contacted to determine whether there were any significant wildlife/fisheries habitats associated for the proposed Clover Leaf Development Cove project.

They reviewed the project and concluded that the area is potentially home to northern long eared bats (as is the rest of the State). We propose to prohibit tree clearing from June 1 – July 31 per Army Corp of Engineers typical recommendation. There were no known fisheries resources on site. See attached correspondence.

TERRADYN
CONSULTANTS, LLC

Pineland
Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland
565 Congress Street, Suite 201
Portland, ME 04101

February 8, 2021 2104

John Perry, Environmental Review Coordinator
Maine Department of Inland Fisheries & Wildlife
284 State Street, 41 State House Station
Augusta, ME 04333-0041

REQUEST FOR PROJECT REVIEW
Clover Leaf Development
989 Portland Road, Saco, ME

Dear John:

Terradyn Consultants, LLC has been retained by Clover Leaf Development, LLC, to prepare civil-site plans and permit applications for a proposed 120-unit apartment complex to be located at 989 Portland Road (Route 1) in Saco, Maine. Attached is an excerpt of the USGS topographic map for the project site.

The development will cover approximately 10 acres of the 67-acre property. The forested site is located immediately north of the Aquaboggan Waterpark. The property is shown as Lot 3-1 on the City of Saco Tax Map 63. The property is located within the MU-3 zone but will soon be reclassified to the Portland Road District.

The development will consist of the creation of ten 12-unit apartment buildings to be accessed off Route 1 by approximately 1000 feet of proposed new road. Each building will 3,500 SF (50x\'x70') and three stories tall. The applicant also proposes to create an out-parcel along the Portland Road frontage. The out-parcel will be approximately 1.2 acres. The site is served by City water & sewer. Main lines are located within the Portland Road right of way along the site frontage. A boundary and topographic survey is being prepared by Owen Haskell, Professional Land Surveyors. Site wetlands were delineated by Mark Hampton, C.S.S. of Mark Hampton & Associates.

We anticipate that the apartment complex and outparcel will drain to the rear of the development, where a gravel wetland will be constructed. Roof drain filter strips will be installed along the edge of each building in an effort to both encourage infiltration opportunities of stormwater runoff and to reduce the size of the stormwater pond. The project will result in approximately 3.5 acres of new impervious area. This means that the project will require a Maine DEP Site Location of Development Permit. There is wetland area located near the midpoint of the development area. This wetland is proposed to be filled. This activity will require a Tier 2 wetland alteration permit.

We are requesting that the Department review available information to determine if the project will have an impact on historic structures or archaeological resources. The information will be provided to the Maine DEP as part of the Site Location of Development application process.

Please notify me if you have any questions or require additional information to complete your review.

Sincerely,

TERRADYN CONSULTANTS, LLC

Timothy J. Michaud

Tim Michaud
Project Engineer

Enc. - USGS Topographic Map

JANET T. MILLS
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

JUDITH CAMUSO
COMMISSIONER

March 1, 2021

Tim Michaud
Terradyn
565 Congress Street, Suite 201
Portland, ME 04101

RE: Information Request – Clover Leaf Development at 989 Portland Road Project, Saco

Dear Tim:

Per your request received on February 11, 2021, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and inland fisheries habitat concerns within the vicinity of the *Clover Leaf Development at 989 Portland Road* project in Saco. For purposes of this review we are assuming tree clearing will be part of your project.

Our Department has not mapped any Essential Habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

Bat Species – Of the eight species of bats that occur in Maine, the three *Myotis* species are protected under Maine's Endangered Species Act (MESA) and are afforded special protection under 12 M.R.S §12801 - §12810. The three *Myotis* species include little brown bat (State Endangered), northern long-eared bat (State Endangered), and eastern small-footed bat (State Threatened). The five remaining bat species are listed as Special Concern: big brown bat, red bat, hoary bat, silver-haired bat, and tri-colored bat. While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during migration and/or the breeding season. However, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.

Significant Wildlife Habitat

Significant Vernal Pools - At this time MDIFW Significant Wildlife Habitat (SWH) maps indicate no known presence of SWHs subject to protection under the Natural Resources Protection Act (NRPA) within the project area, which include Waterfowl and Wading Bird Habitats, Seabird Nesting Islands, Shorebird Areas, and Significant Vernal Pools. However, a comprehensive statewide inventory for Significant Vernal Pools has not been completed. Therefore, we recommend that surveys for vernal pools be conducted within the project boundary by qualified wetland scientists prior to final project design to determine whether there are Significant Vernal Pools present in the area. These surveys should extend up to 250 feet beyond the anticipated project footprint because of potential performance standard requirements for off-site Significant Vernal Pools, assuming such pools are located on land owned or controlled by the applicant. Once surveys are completed, survey forms should be submitted to our Agency for review well before the submission of any necessary permits. Our Department will need to review and verify any vernal pool data prior to final determination of significance.

Fisheries Habitat

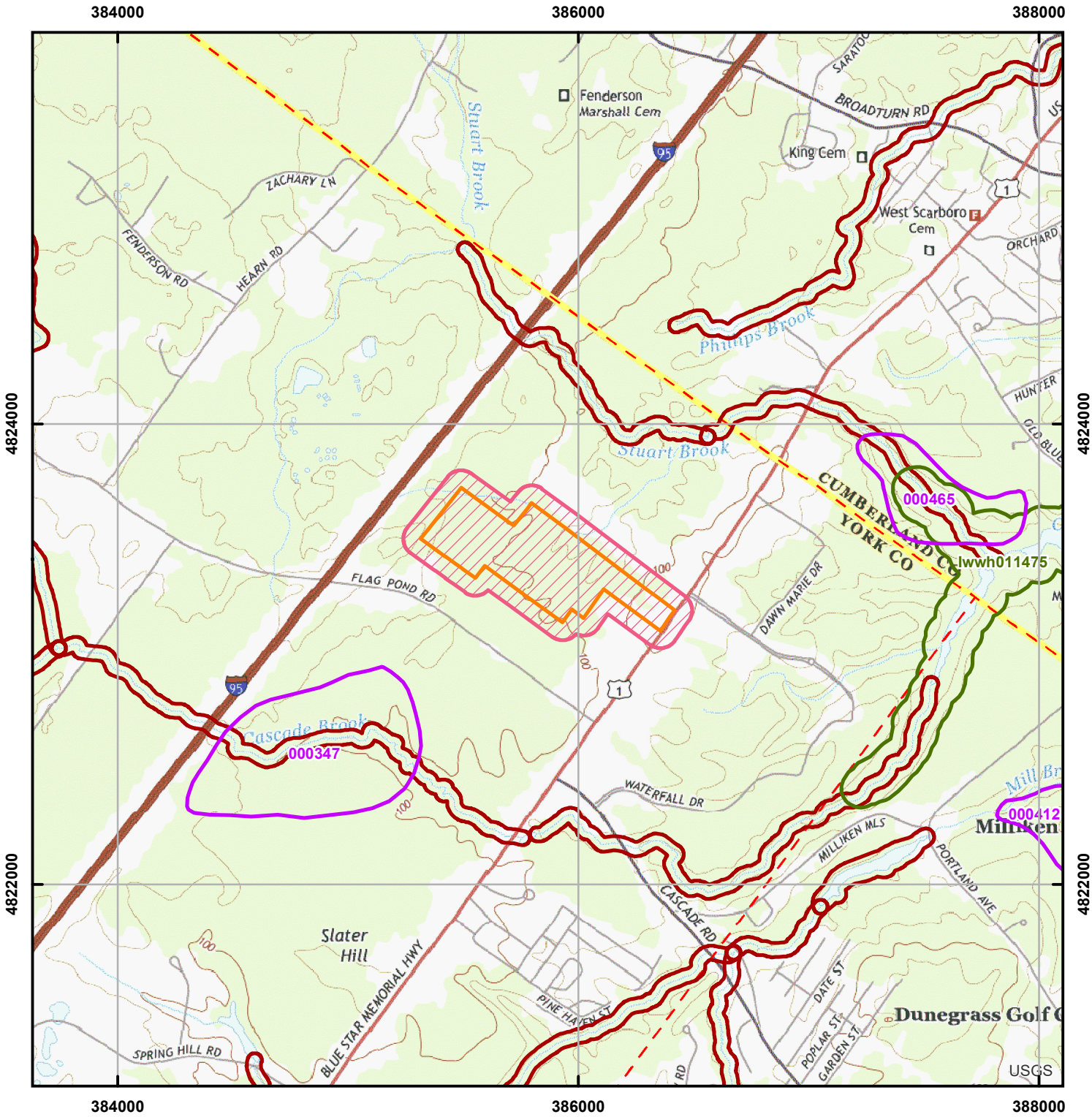
We recommend that 100-foot undisturbed vegetated buffers be maintained along streams. Buffers should be measured from the edge of stream or associated fringe and floodplain wetlands. Maintaining and enhancing buffers along streams that support coldwater fisheries is critical to the protection of water temperatures, water quality, natural inputs of coarse woody debris, and various forms of aquatic life necessary to support conditions required by many fish species. Stream crossings should be avoided, but if a stream crossing is necessary, or an existing crossing needs to be modified, it should be designed to provide full fish passage. Small streams, including intermittent streams, can provide crucial rearing habitat, cold water for thermal refugia, and abundant food for juvenile salmonids on a seasonal basis and undersized crossings may inhibit these functions. Generally, MDIFW recommends that all new, modified, and replacement stream crossings be sized to span at least 1.2 times the bankfull width of the stream. In addition, we generally recommend that stream crossings be open bottomed (i.e. natural bottom), although embedded structures which are backfilled with representative streambed material have been shown to be effective in not only providing habitat connectivity for fish but also for other aquatic organisms. Construction Best Management Practices should be closely followed to avoid erosion, sedimentation, alteration of stream flow, and other impacts as eroding soils from construction activities can travel significant distances as well as transport other pollutants resulting in direct impacts to fish and fisheries habitat. In addition, we recommend that any necessary instream work occur between July 15 and October 1.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program, Maine Department of Marine Resources, and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

Becca Settele
Wildlife Biologist



Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: Clover Leaf Development at 989 Portland Road, Saco (Version 1)

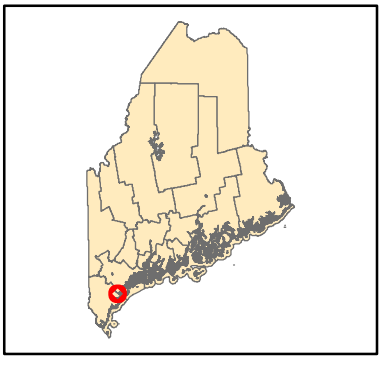
Maine Department of Inland Fisheries and Wildlife

0 0.125 0.25 0.5 0.75 1 Miles

Projection: UTM, NAD83, Zone 19N

Date: 2/12/2021

- ProjectPoints
- ProjectLines
- ProjectPolys
- ProjectSearchAreas
- Maine Cliff and Talus Areas
- Deer Winter Area
- LUPC p-fw
- Cooperative DWAs
- Seabird Nesting Islands
- Shorebird Areas
- Inland Waterfowl and Wading Bird
- 2008 lwwh - Shoreland Zoning
- Tidal Waterfowl and Wading Bird
- Significant Vernal Pools
- Environmental Review Polygons
- Roseate Tern
- Piping Plover and Least Tern
- Aquatic ETSc - 2.5 mi review
- Rare Mussels - 5 mi review
- Maine Heritage Fish Waters
- Arctic Charr Habitat
- Redfin Pickerel and Swamp Darter Habitats - buffer100ft
- Special Concern occupied habitats - 100ft buffer
- Wild Lake Trout Habitats



IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

York County, Maine

Local office

Maine Ecological Services Field Office

(207) 469-7300
(207) 902-1588

MAILING ADDRESS

P. O. Box A
East Orland, ME 04431

PHYSICAL ADDRESS

306 Hatchery Road

East Orland, ME 04431

http://www.fws.gov/mainefieldoffice/index.html

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Northern Long-eared Bat Myotis septentrionalis Threatened
Wherever found
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/9045

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
American Oystercatcher Haematopus palliatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black-billed Cuckoo Coccyzus erythropthalmus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink Dolichonyx oryzivorus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Buff-breasted Sandpiper Calidris subruficollis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9488	Breeds elsewhere
Canada Warbler Cardellina canadensis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10

Dunlin Calidris alpina arcticola This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Hudsonian Godwit Limosa haemastica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Least Tern Sterna antillarum This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Apr 20 to Sep 10
Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-eared Owl asio otus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds elsewhere
Nelson's Sparrow Ammodramus nelsoni This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Sep 5
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Red-throated Loon Gavia stellata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Ruddy Turnstone Arenaria interpres morinella This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Seaside Sparrow Ammodramus maritimus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 20

Semipalmated Sandpiper Calidris pusilla This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Snowy Owl Bubo scandiacus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Whimbrel Numenius phaeopus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9483	Breeds elsewhere
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

- PEM1C
- PEM1Bd
- PEM1Cd
- PEM1Ed
- PEM1Eh

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1/4E
- PSS1Eh
- PFO4/1E
- PSS1E
- PSS1C

FRESHWATER POND

- PUBHh
- PUBHx

RIVERINE

- R2UBH
- R4SBAx
- R4SBCx
- R4SBA

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Section 8 - Historic Sites

The Maine Historic Preservation Commission (MHPC) was contacted regarding the presence of any areas of historic, architectural or archaeological significance on the property or in the immediate vicinity.

Upon review, they concluded that there will be no historic properties affected by the proposed undertaking. Copies of all correspondence are attached.

TERRADYN
CONSULTANTS, LLC

Pineland
Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland
565 Congress Street, Suite 201
Portland, ME 04101

February 8, 2021 2104

Kirk F. Mohney, Director
Maine Historic Preservation Commission
55 Capitol Street, 65 State House Station
Augusta, ME 04333-0065

REQUEST FOR PROJECT REVIEW
Clover Leaf Development
989 Portland Road, Saco, ME

Dear Kirk:

Terradyn Consultants, LLC has been retained by Clover Leaf Development, LLC, to prepare civil-site plans and permit applications for a proposed 120-unit apartment complex to be located at 989 Portland Road (Route 1) in Saco, Maine. Attached is an excerpt of the USGS topographic map for the project site.

The development will cover approximately 10 acres of the 67-acre property. The forested site is located immediately north of the Aquaboggan Waterpark. The property is shown as Lot 3-1 on the City of Saco Tax Map 63. The property is located within the MU-3 zone but will soon be reclassified to the Portland Road District.

The development will consist of the creation of ten 12-unit apartment buildings to be accessed off Route 1 by approximately 1000 feet of proposed new road. Each building will 3,500 SF (50x\'x70') and three stories tall. The applicant also proposes to create an out-parcel along the Portland Road frontage. The out-parcel will be approximately 1.2 acres. The site is served by City water & sewer. Main lines are located within the Portland Road right of way along the site frontage. A boundary and topographic survey is being prepared by Owen Haskell, Professional Land Surveyors. Site wetlands were delineated by Mark Hampton, C.S.S. of Mark Hampton & Associates.

We anticipate that the apartment complex and outparcel will drain to the rear of the development, where a gravel wetland will be constructed. Roof drain filter strips will be installed along the edge of each building in an effort to both encourage infiltration opportunities of stormwater runoff and to reduce the size of the stormwater pond. The project will result in approximately 3.5 acres of new impervious area. This means that the project will require a Maine DEP Site Location of Development Permit. There is wetland area located near the midpoint of the development area. This wetland is proposed to be filled. This activity will require a Tier 2 wetland alteration permit.

We are requesting that the Commission review available information to determine if the project will have an impact on historic structures or archaeological resources. The information will be provided to the Maine DEP as part of the Site Location of Development application process.

Please notify me if you have any questions or require additional information to complete your review.

Sincerely,

TERRADYN CONSULTANTS, LLC

Timothy J. Michaud

Tim Michaud
Project Engineer

Enc. - USGS Topographic Map

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JANET T. MILLS
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

February 17, 2021

Mr. Tim Michaud
Terradyn Consultants LLC
565 Congress Street
Suite 201
Portland, ME 04101

Project: MHPC #0251-21 Clover Leaf Development, LLC; 989 Portland Road
120 Unit Apartment Complex

Town: Saco, ME

Dear Mr. Michaud:

In response to your recent request, I have reviewed the information received February 10, 2021 to initiate consultation on the above referenced project in accordance with the requirements of Maine Department of Environmental Protection.

In order to continue our review, please provide a preliminary site plan and photographs of any buildings, 50 years or older, located on or adjacent to the proposed project. Please key the photographs to a location map. In addition, please confirm if any buildings located on the proposed project parcel will be demolished as part of this project.

We look forward to continuing consultation with you. If you have any questions regarding above-ground properties, please contact Megan M. Rideout of this office at megan.m.rideout@maine.gov.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
State Historic Preservation Officer

SURVEY MAP NO. _____

SURVEY MAP NAME _____

MHPC USE ONLY

INVENTORY NO.

MAINE HISTORIC PRESERVATION COMMISSION
Historic Building/Structure Survey Form

1. PROPERTY NAME (HISTORIC): _____

2. PROPERTY NAME (OTHER): _____

3. STREET ADDRESS: 133 Flag Pond Road

4. TOWN: Saco

5. COUNTY: York

6. DATE RECORDED: _____

7. SURVEYOR: _____

8. OWNER NAME: Marilyn Ives

ADDRESS: _____

9. PRIMARY USE (PRESENT):

- ✓ SINGLE FAMILY
- ___ MULTI-FAMILY
- ___ INDUSTRY
- ___ TRANSPORTATION
- ___ RECREATION/CULTURE
- ___ AGRICULTURE
- ___ GOVERNMENTAL
- ___ RELIGIOUS
- ___ DEFENSE
- ___ UNKNOWN
- ___ COMMERCIAL/TRADE
- ___ EDUCATION
- ___ HOTEL
- ___ SUMMER COTTAGE/CAMP
- ___ FUNERARY
- ___ HEALTH CARE
- ___ LANDSCAPE
- ___ SOCIAL
- ___ OTHER _____

10. CONDITION: ✓ GOOD ___ FAIR ___ POOR ___ DESTROYED, DATE __/__/__

ARCHITECTURAL DATA

11. PRIMARY STYLISTIC CATEGORY:

- ___ COLONIAL
- ___ FEDERAL
- ___ GREEK REVIVAL
- ___ GOTHIC REVIVAL
- ___ ITALIANATE
- ___ SECOND EMPIRE
- ___ STICK STYLE
- ___ QUEEN ANNE
- ___ SHINGLE STYLE
- ___ R. ROMANESQUE
- ___ ROMANESQUE
- ___ HIGH VIC. GOTHIC
- ___ NEO-CLASSICAL REV.
- ___ RENAISSANCE REV.
- ___ 19TH/20TH C. REVIVAL
- ___ ARTS & CRAFTS
- ___ BUNGALOW
- ___ FOUR SQUARE
- ___ ART DECO
- ___ INTERNATIONAL
- ___ RANCH
- ___ VERNACULAR
- OTHER Cape Cod

12. OTHER STYLISTIC CATEGORY:

- ___ COLONIAL
- ___ FEDERAL
- ___ GREEK REVIVAL
- ___ GOTHIC REVIVAL
- ___ ITALIANATE
- ___ SECOND EMPIRE
- ___ STICK STYLE
- ___ QUEEN ANNE
- ___ SHINGLE STYLE
- ___ R. ROMANESQUE
- ___ ROMANESQUE
- ___ HIGH VIC. GOTHIC
- ___ NEO-CLASSICAL REV.
- ___ RENAISSANCE REV.
- ___ 19TH/20TH C. REVIVAL
- ___ ARTS & CRAFTS
- ___ BUNGALOW
- ___ FOUR SQUARE
- ___ ART DECO
- ___ INTERNATIONAL
- ___ RANCH
- ___ VERNACULAR
- OTHER _____

13. HEIGHT:

- ___ 1 STORY
- ___ 5 STORY
- ✓ 1 1/2 STORY
- ___ OVER 5 (___)
- ___ 2 STORY
- ___ 2 1/2 STORY
- ___ 3 STORY
- ___ 4 STORY

14. PRIMARY FACADE WIDTH (MAIN BLOCK; USE GROUND FLOOR):

___ 1 BAY ___ 2 BAY ___ 3 BAY ___ 4 BAY ___ 5 BAY ___ MORE THAN 5 (___)

15. APPENDAGES:

- ___ SIDE ELL
- ___ DORMERS
- ✓ REAR ELL
- ___ PORCH
- ___ FRONT
- ___ TOWER
- ___ ADDED STORIES
- ___ CUPOLA
- ___ SHED
- ___ BAY WINDOW

PHOTOGRAPH:

16. PORCH:
___ ATTACHED ___ ENGAGED ✓ ONE STORY ___ MORE THAN ONE STORY
___ FULL WIDTH ___ WRAPAROUND ___ SLEEPING PORCH ___ SECONDARY PORCH

17. PLAN:
___ HALL AND PARLOR ___ 1/2 CAPE ___ CENTRAL HALL ___ SIDE HALL
___ BACK HALL ___ IRREGULAR OTHER _____

18. PRIMARY STRUCTURAL SYSTEM:
___ TIMBER FRAME ___ BRACED FRAME ___ BRICK ___ STONE ___ BALLOON FRAME
___ CONCRETE ___ STEEL ___ LOG ___ PLANK WALL ___ PLATFORM FRAME
___ FRAME CONSTRUCTION - TYPE UNKNOWN OTHER _____

19. CHIMNEY PLACEMENT:
___ I NTERIOR ___ INTERIOR FRONT/REAR ___ CENTER ___ INTERIOR END ___ EXTERIOR
OTHER _____

20. ROOF CONFIGURATION:
✓ GABLE SIDE ✓ GABLE FRONT ✓ HIP ___ MANSARD ___ FLAT
___ GAMBREL ___ PARAPET GABLE ___ SHED ___ CROSS ___ GABLE
___ COMPOUND OTHER _____

21. ROOF MATERIAL: WOOD ___ METAL ___ TILE ___ SLATE ___ ASPHALT ✓ ASBESTOS ___

22. EXTERIOR WALL MATERIALS:
___ CLAPBOARD ___ BRICK ___ FLUSH SHEATHING ___ WOOD SHINGLE ___ STONE
___ LOG ___ PRESSED METAL ___ CONCRETE ___ STUCCO ___ ASPHALT
___ GRANITE ___ ASBESTOS ___ TERRA COTTA ___ BOARD AND BATTEN ✓ ALUMINUM/VINYL
OTHER _____

23. FOUNDATION MATERIAL:
___ FIELDSTONE ___ BRICK ___ WOOD ___ CONCRETE ___ GRANITE ___ ORNAMENTAL CONC. BLOCK
OTHER _____

24. OUTBUILDINGS/FEATURES:
___ CARRIAGE HOUSE ___ FENCE OR WALL ___ CEMETERY ___ BARN (CONNECTED)
___ BARN (DETACHED) ___ FORMAL GARDEN ___ LANDSCAPE/PLANT MAT. ___ ARCHAEOLOGICAL SITE
___ GARAGE OTHER _____

HISTORICAL DATA

25. DOCUMENTED DATE OF CONSTRUCTION: _____ 26. ESTIMATED DATE OF CONSTRUCTION: 1865

27. DATE MAJOR ADDITIONS/ALTERATIONS: _____

28. ARCHITECT: _____ 29. CONTRACTOR: _____

30. ORIGINAL OWNER: _____

31. SUBSEQUENT SIGNIFICANT OWNER: _____ DATES: _____

32. CULTURAL/ETHNIC AFFILIATION:
___ ENGLISH ___ FRENCH ACADIAN ___ NATIVE AMERICAN ___ SCOTTISH ___ FRENCH CANADIAN
___ EAST EUROPEAN ___ IRISH OTHER _____

33. HISTORIC CONTEXT(S):
___ COMMERCE ___ INDUSTRY ___ TRANSPORTATION ___ AGRICULTURE ___ MILITARY
___ RELIGION ___ CIVIC AFFAIRS ___ RECREATION ___ HABITATION ___ EDUCATION
___ ART, LIT, SCIENCE ___ SOCIAL

34. COMMENTS/SOURCES: _____

35. HISTORICAL DRAWINGS EXIST: ___ YES ___ NO LOCATION: _____

ENVIRONMENTAL DATA

36. SITE INTEGRITY: ___ ORIGINAL ___ MOVED DATE MOVED _____
37. SETTING: ___ RURAL/UNDISTURBED ___ RURAL/BUILT UP ___ SMALL TOWN ___ URBAN ___ SUBURBAN
38. QUADRANGLE MAP USED: _____ QUADRANGLE #: _____
39. UTM NORTHING: _____ 40. UTM EASTING: _____
41. FACADE DIRECTION (CIRCLE ONE): N S E W NE NW SE SW

MHPC USE ONLY

DATE ENTERED IN INVENTORY: _____ PHOTO FILE #: _____
NR STATUS: L ___ HD ___ E ___ NE ___ ND ___ REVIEWER _____
DATA SOURCE: ___ HPF ___ CLG ___ R&C ___ STAFF ___ STATE SURVEY OTHER _____ LEVEL OF SURVEY: __R __I

ASSOCIATED INVENTORY NUMBERS: _____

SURVEY MAP NO. _____

SURVEY MAP NAME _____

MHPC USE ONLY

INVENTORY NO.

MAINE HISTORIC PRESERVATION COMMISSION
Historic Building/Structure Survey Form

1. PROPERTY NAME (HISTORIC): _____

2. PROPERTY NAME (OTHER): _____

3. STREET ADDRESS: 269 Flag Pond Road

4. TOWN: Saco

5. COUNTY: York

6. DATE RECORDED: _____

7. SURVEYOR: _____

8. OWNER NAME: James H. & Edna M. Leary

ADDRESS: _____

9. PRIMARY USE (PRESENT):

___ SINGLE FAMILY
___ MULTI-FAMILY
___ INDUSTRY
___ TRANSPORTATION
___ RECREATION/CULTURE
___ AGRICULTURE
___ GOVERNMENTAL
___ RELIGIOUS
___ DEFENSE
___ UNKNOWN
___ COMMERCIAL/TRADE
___ EDUCATION
___ HOTEL
___ SUMMER COTTAGE/CAMP
___ FUNERARY
___ HEALTH CARE
___ LANDSCAPE
___ SOCIAL
___ OTHER _____

10. CONDITION: ___ GOOD ___ FAIR ___ POOR ___ DESTROYED, DATE __/__/__

ARCHITECTURAL DATA

11. PRIMARY STYLISTIC CATEGORY:

✓ COLONIAL
___ FEDERAL
___ GREEK REVIVAL
___ GOTHIC REVIVAL
___ ITALIANATE
___ SECOND EMPIRE
___ STICK STYLE
___ QUEEN ANNE
___ SHINGLE STYLE
___ R. ROMANESQUE
___ ROMANESQUE
___ HIGH VIC. GOTHIC
___ NEO-CLASSICAL REV.
___ RENAISSANCE REV.
___ 19TH/20TH C. REVIVAL
___ ARTS & CRAFTS
___ BUNGALOW
___ FOUR SQUARE
___ ART DECO
___ INTERNATIONAL
___ RANCH
___ VERNACULAR
OTHER _____

12. OTHER STYLISTIC CATEGORY:

___ COLONIAL
___ FEDERAL
___ GREEK REVIVAL
___ GOTHIC REVIVAL
___ ITALIANATE
___ SECOND EMPIRE
___ STICK STYLE
___ QUEEN ANNE
___ SHINGLE STYLE
___ R. ROMANESQUE
___ ROMANESQUE
___ HIGH VIC. GOTHIC
___ NEO-CLASSICAL REV.
___ RENAISSANCE REV.
___ 19TH/20TH C. REVIVAL
___ ARTS & CRAFTS
___ BUNGALOW
___ FOUR SQUARE
___ ART DECO
___ INTERNATIONAL
___ RANCH
___ VERNACULAR
OTHER _____

13. HEIGHT:

___ 1 STORY
___ 5 STORY
___ 1½ STORY
___ OVER 5 (___)
✓ 2 STORY
___ 2½ STORY
___ 3 STORY
___ 4 STORY

14. PRIMARY FACADE WIDTH (MAIN BLOCK; USE GROUND FLOOR):

___ 1 BAY
___ 2 BAY
___ 3 BAY
___ 4 BAY
___ 5 BAY
___ MORE THAN 5 (___)

15. APPENDAGES:

___ SIDE ELL
___ DORMERS
✓ REAR ELL
___ PORCH
___ FRONT
___ TOWER
___ ADDED STORIES
___ CUPOLA
___ SHED
___ BAY WINDOW

PHOTOGRAPH:

16. PORCH:
✓ ATTACHED ___ ENGAGED ___ ONE STORY ___ MORE THAN ONE STORY
___ FULL WIDTH ___ WRAPAROUND ___ SLEEPING PORCH ___ SECONDARY PORCH

17. PLAN:
___ HALL AND PARLOR ___ 1/2 CAPE ___ CENTRAL HALL ___ SIDE HALL
___ BACK HALL ___ IRREGULAR ___ OTHER _____

18. PRIMARY STRUCTURAL SYSTEM:
___ TIMBER FRAME ___ BRACED FRAME ___ BRICK ___ STONE ___ BALLOON FRAME
___ CONCRETE ___ STEEL ___ LOG ___ PLANK WALL ___ PLATFORM FRAME
___ FRAME CONSTRUCTION - TYPE UNKNOWN ___ OTHER _____

19. CHIMNEY PLACEMENT:
✓ I NTERIOR ___ INTERIOR FRONT/REAR ___ CENTER ___ INTERIOR END ___ EXTERIOR
___ OTHER _____

20. ROOF CONFIGURATION:
✓ GABLE SIDE ___ GABLE FRONT ✓ HIP ___ MANSARD ___ FLAT
___ GAMBREL ___ PARAPET GABLE ___ SHED ___ CROSS ___ GABLE
___ COMPOUND ___ OTHER _____

21. ROOF MATERIAL: WOOD ___ METAL ___ TILE ___ SLATE ___ ASPHALT ___ ASBESTOS ___

22. EXTERIOR WALL MATERIALS:
✓ CLAPBOARD ___ BRICK ___ FLUSH SHEATHING ___ WOOD SHINGLE ___ STONE
___ LOG ___ PRESSED METAL ___ CONCRETE ___ STUCCO ___ ASPHALT
___ GRANITE ___ ASBESTOS ___ TERRA COTTA ___ BOARD AND BATTEN ___ ALUMINUM/VINYL
___ OTHER _____

23. FOUNDATION MATERIAL:
___ FIELDSTONE ✓ BRICK ___ WOOD ___ CONCRETE ___ GRANITE ___ ORNAMENTAL CONC. BLOCK
___ OTHER _____

24. OUTBUILDINGS/FEATURES:
___ CARRIAGE HOUSE ___ FENCE OR WALL ___ CEMETERY ___ BARN (CONNECTED)
___ BARN (DETACHED) ___ FORMAL GARDEN ___ LANDSCAPE/PLANT MAT. ___ ARCHAEOLOGICAL SITE
___ GARAGE ___ OTHER _____

HISTORICAL DATA

25. DOCUMENTED DATE OF CONSTRUCTION: _____ 26. ESTIMATED DATE OF CONSTRUCTION: 1800

27. DATE MAJOR ADDITIONS/ALTERATIONS: _____

28. ARCHITECT: _____ 29. CONTRACTOR: _____

30. ORIGINAL OWNER: _____

31. SUBSEQUENT SIGNIFICANT OWNER: _____ DATES: _____

32. CULTURAL/ETHNIC AFFILIATION:
___ ENGLISH ___ FRENCH ACADIAN ___ NATIVE AMERICAN ___ SCOTTISH ___ FRENCH CANADIAN
___ EAST EUROPEAN ___ IRISH ___ OTHER _____

33. HISTORIC CONTEXT(S):
___ COMMERCE ___ INDUSTRY ___ TRANSPORTATION ___ AGRICULTURE ___ MILITARY
___ RELIGION ___ CIVIC AFFAIRS ___ RECREATION ___ HABITATION ___ EDUCATION
___ ART, LIT, SCIENCE ___ SOCIAL

34. COMMENTS/SOURCES: _____

35. HISTORICAL DRAWINGS EXIST: ___ YES ___ NO LOCATION: _____

ENVIRONMENTAL DATA

36. SITE INTEGRITY: ___ ORIGINAL ___ MOVED DATE MOVED _____
37. SETTING: ___ RURAL/UNDISTURBED ___ RURAL/BUILT UP ___ SMALL TOWN ___ URBAN ___ SUBURBAN
38. QUADRANGLE MAP USED: _____ QUADRANGLE #: _____
39. UTM NORTHING: _____ 40. UTM EASTING: _____
41. FACADE DIRECTION (CIRCLE ONE): N S E W NE NW SE SW

MHPC USE ONLY

DATE ENTERED IN INVENTORY: _____ PHOTO FILE #: _____
NR STATUS: L ___ HD ___ E ___ NE ___ ND ___ REVIEWER _____
DATA SOURCE: ___ HPF ___ CLG ___ R&C ___ STAFF ___ STATE SURVEY OTHER _____ LEVEL OF SURVEY: __R __I

ASSOCIATED INVENTORY NUMBERS: _____

SURVEY MAP NO. _____

SURVEY MAP NAME _____

MHPC USE ONLY

INVENTORY NO.

MAINE HISTORIC PRESERVATION COMMISSION
Historic Building/Structure Survey Form

1. PROPERTY NAME (HISTORIC): _____

2. PROPERTY NAME (OTHER): Building 1

3. STREET ADDRESS: 986 Portland Rd

4. TOWN: Saco

5. COUNTY: York

6. DATE RECORDED: _____

7. SURVEYOR: _____

8. OWNER NAME: Sherry Mitchell & Pamela Consiglio

ADDRESS: 115 US RT 2 South, Alburgh, VT 05440

9. PRIMARY USE (PRESENT):

✓ SINGLE FAMILY	___ AGRICULTURE	___ COMMERCIAL/TRADE	___ FUNERARY
✓ MULTI-FAMILY	___ GOVERNMENTAL	___ EDUCATION	___ HEALTH CARE
___ INDUSTRY	___ RELIGIOUS	___ HOTEL	___ LANDSCAPE
___ TRANSPORTATION	___ DEFENSE	___ SUMMER COTTAGE/CAMP	___ SOCIAL
___ RECREATION/CULTURE	___ UNKNOWN		
___ OTHER _____			

10. CONDITION: ___ GOOD ___ FAIR ✓ POOR ___ DESTROYED, DATE __/__/__

ARCHITECTURAL DATA

11. PRIMARY STYLISTIC CATEGORY:

___ COLONIAL	___ STICK STYLE	___ NEO-CLASSICAL REV.	___ FOUR SQUARE
___ FEDERAL	___ QUEEN ANNE	___ RENAISSANCE REV.	___ ART DECO
___ GREEK REVIVAL	___ SHINGLE STYLE	___ 19*TH*/20*TH* C. REVIVAL	___ INTERNATIONAL
___ GOTHIC REVIVAL	___ R. ROMANESQUE	___ ARTS & CRAFTS	___ RANCH
___ ITALIANATE	___ ROMANESQUE	___ BUNGALOW	___ VERNACULAR
___ SECOND EMPIRE	___ HIGH VIC. GOTHIC	OTHER _____	

12. OTHER STYLISTIC CATEGORY:

___ COLONIAL	___ STICK STYLE	___ NEO-CLASSICAL REV.	___ FOUR SQUARE
___ FEDERAL	___ QUEEN ANNE	___ RENAISSANCE REV.	___ ART DECO
___ GREEK REVIVAL	___ SHINGLE STYLE	___ 19*TH*/20*TH* C. REVIVAL	___ INTERNATIONAL
___ GOTHIC REVIVAL	___ R. ROMANESQUE	___ ARTS & CRAFTS	___ RANCH
___ ITALIANATE	___ ROMANESQUE	___ BUNGALOW	___ VERNACULAR
___ SECOND EMPIRE	___ HIGH VIC. GOTHIC	OTHER _____	

13. HEIGHT:

___ 1 STORY	___ 1½ STORY	✓ 2 STORY	___ 2½ STORY	___ 3 STORY	___ 4 STORY
___ 5 STORY	___ OVER 5 (___)				

14. PRIMARY FACADE WIDTH (MAIN BLOCK; USE GROUND FLOOR):

___ 1 BAY	___ 2 BAY	___ 3 BAY	___ 4 BAY	___ 5 BAY	___ MORE THAN 5 (___)

15. APPENDAGES:

___ SIDE ELL	✓ REAR ELL	___ FRONT	___ ADDED STORIES	___ SHED
___ DORMERS	___ PORCH	___ TOWER	___ CUPOLA	___ BAY WINDOW

PHOTOGRAPH:

16. PORCH:
___ ATTACHED ___ ENGAGED ___ ONE STORY ___ MORE THAN ONE STORY
___ FULL WIDTH ___ WRAPAROUND ___ SLEEPING PORCH ___ SECONDARY PORCH

17. PLAN:
___ HALL AND PARLOR ___ 1/2 CAPE ___ CENTRAL HALL ___ SIDE HALL
___ BACK HALL ___ IRREGULAR OTHER _____

18. PRIMARY STRUCTURAL SYSTEM:
___ TIMBER FRAME ___ BRACED FRAME ___ BRICK ___ STONE ___ BALLOON FRAME
___ CONCRETE ___ STEEL ___ LOG ___ PLANK WALL ___ PLATFORM FRAME
___ FRAME CONSTRUCTION - TYPE UNKNOWN OTHER _____

19. CHIMNEY PLACEMENT:
___ I NTERIOR ✓ INTERIOR FRONT/REAR ___ CENTER ___ INTERIOR END ✓ EXTERIOR
OTHER _____

20. ROOF CONFIGURATION:
✓ GABLE SIDE ___ GABLE FRONT ___ HIP ___ MANSARD ___ FLAT
___ GAMBREL ___ PARAPET GABLE ___ SHED ___ CROSS ___ GABLE
___ COMPOUND OTHER _____

21. ROOF MATERIAL: WOOD ___ METAL ___ TILE ___ SLATE ___ ASPHALT ✓ ASBESTOS ___

22. EXTERIOR WALL MATERIALS:
✓ CLAPBOARD ___ BRICK ___ FLUSH SHEATHING ___ WOOD SHINGLE ___ STONE
___ LOG ___ PRESSED METAL ___ CONCRETE ___ STUCCO ___ ASPHALT
___ GRANITE ___ ASBESTOS ___ TERRA COTTA ___ BOARD AND BATTEN ___ ALUMINUM/VINYL
OTHER _____

23. FOUNDATION MATERIAL:
___ FIELDSTONE ✓ BRICK ___ WOOD ___ CONCRETE ___ GRANITE ___ ORNAMENTAL CONC. BLOCK
OTHER _____

24. OUTBUILDINGS/FEATURES:
___ CARRIAGE HOUSE ___ FENCE OR WALL ___ CEMETERY ___ BARN (CONNECTED)
___ BARN (DETACHED) ___ FORMAL GARDEN ___ LANDSCAPE/PLANT MAT. ___ ARCHAEOLOGICAL SITE
___ GARAGE OTHER _____

HISTORICAL DATA

25. DOCUMENTED DATE OF CONSTRUCTION: _____ 26. ESTIMATED DATE OF CONSTRUCTION: 1900

27. DATE MAJOR ADDITIONS/ALTERATIONS: _____

28. ARCHITECT: _____ 29. CONTRACTOR: _____

30. ORIGINAL OWNER: _____

31. SUBSEQUENT SIGNIFICANT OWNER: _____ DATES: _____

32. CULTURAL/ETHNIC AFFILIATION:
___ ENGLISH ___ FRENCH ACADIAN ___ NATIVE AMERICAN ___ SCOTTISH ___ FRENCH CANADIAN
___ EAST EUROPEAN ___ IRISH OTHER _____

33. HISTORIC CONTEXT(S):
___ COMMERCE ___ INDUSTRY ___ TRANSPORTATION ___ AGRICULTURE ___ MILITARY
___ RELIGION ___ CIVIC AFFAIRS ___ RECREATION ___ HABITATION ___ EDUCATION
___ ART, LIT, SCIENCE ___ SOCIAL

34. COMMENTS/SOURCES: _____

35. HISTORICAL DRAWINGS EXIST: ___ YES ___ NO LOCATION: _____

ENVIRONMENTAL DATA

36. SITE INTEGRITY: ___ ORIGINAL ___ MOVED DATE MOVED _____
37. SETTING: ___ RURAL/UNDISTURBED ___ RURAL/BUILT UP ___ SMALL TOWN ___ URBAN ___ SUBURBAN
38. QUADRANGLE MAP USED: _____ QUADRANGLE #: _____
39. UTM NORTHING: _____ 40. UTM EASTING: _____
41. FACADE DIRECTION (CIRCLE ONE): N S E W NE NW SE SW

==========

MHPC USE ONLY

DATE ENTERED IN INVENTORY: _____ PHOTO FILE #: _____
NR STATUS: L ___ HD ___ E ___ NE ___ ND ___ REVIEWER _____
DATA SOURCE: ___ HPF ___ CLG ___ R&C ___ STAFF ___ STATE SURVEY OTHER _____ LEVEL OF SURVEY: __R __I

ASSOCIATED INVENTORY NUMBERS: _____

FORM G:\KIRK\ARCH-SVY.FRM\HBSSFHD3.FRM

SURVEY MAP NO. _____

SURVEY MAP NAME _____

MHPC USE ONLY

INVENTORY NO.

MAINE HISTORIC PRESERVATION COMMISSION
Historic Building/Structure Survey Form

1. PROPERTY NAME (HISTORIC): _____

2. PROPERTY NAME (OTHER): Building 2

3. STREET ADDRESS: 986 Portland Rd

4. TOWN: Saco

5. COUNTY: York

6. DATE RECORDED: _____

7. SURVEYOR: _____

8. OWNER NAME: Sherry Mitchell & Pamela Consiglio

ADDRESS: 115 US RT 2 South, Alburgh, VT 05440

9. PRIMARY USE (PRESENT):

✓ SINGLE FAMILY	___ AGRICULTURE	___ COMMERCIAL/TRADE	___ FUNERARY
✓ MULTI-FAMILY	___ GOVERNMENTAL	___ EDUCATION	___ HEALTH CARE
___ INDUSTRY	___ RELIGIOUS	___ HOTEL	___ LANDSCAPE
___ TRANSPORTATION	___ DEFENSE	___ SUMMER COTTAGE/CAMP	___ SOCIAL
___ RECREATION/CULTURE	___ UNKNOWN		
___ OTHER _____			

10. CONDITION: ___ GOOD ___ FAIR ✓ POOR ___ DESTROYED, DATE __/__/__

ARCHITECTURAL DATA

11. PRIMARY STYLISTIC CATEGORY:

___ COLONIAL	___ STICK STYLE	___ NEO-CLASSICAL REV.	___ FOUR SQUARE
___ FEDERAL	___ QUEEN ANNE	___ RENAISSANCE REV.	___ ART DECO
___ GREEK REVIVAL	___ SHINGLE STYLE	___ 19*TH*/20*TH* C. REVIVAL	___ INTERNATIONAL
___ GOTHIC REVIVAL	___ R. ROMANESQUE	___ ARTS & CRAFTS	___ RANCH
___ ITALIANATE	___ ROMANESQUE	___ BUNGALOW	___ VERNACULAR
___ SECOND EMPIRE	___ HIGH VIC. GOTHIC	OTHER _____	

12. OTHER STYLISTIC CATEGORY:

___ COLONIAL	___ STICK STYLE	___ NEO-CLASSICAL REV.	___ FOUR SQUARE
___ FEDERAL	___ QUEEN ANNE	___ RENAISSANCE REV.	___ ART DECO
___ GREEK REVIVAL	___ SHINGLE STYLE	___ 19*TH*/20*TH* C. REVIVAL	___ INTERNATIONAL
___ GOTHIC REVIVAL	___ R. ROMANESQUE	___ ARTS & CRAFTS	___ RANCH
___ ITALIANATE	___ ROMANESQUE	___ BUNGALOW	___ VERNACULAR
___ SECOND EMPIRE	___ HIGH VIC. GOTHIC	OTHER _____	

13. HEIGHT:

✓ 1 STORY	___ 1½ STORY	___ 2 STORY	___ 2½ STORY	___ 3 STORY	___ 4 STORY
___ 5 STORY	___ OVER 5 (___)				

14. PRIMARY FACADE WIDTH (MAIN BLOCK; USE GROUND FLOOR):

___ 1 BAY	___ 2 BAY	___ 3 BAY	___ 4 BAY	___ 5 BAY	___ MORE THAN 5 (___)

15. APPENDAGES:

___ SIDE ELL	___ REAR ELL	___ FRONT	___ ADDED STORIES	___ SHED
___ DORMERS	___ PORCH	___ TOWER	___ CUPOLA	___ BAY WINDOW

PHOTOGRAPH:

16. PORCH:
___ ATTACHED ___ ENGAGED ___ ONE STORY ___ MORE THAN ONE STORY
___ FULL WIDTH ___ WRAPAROUND ___ SLEEPING PORCH ___ SECONDARY PORCH

17. PLAN:
___ HALL AND PARLOR ___ 1/2 CAPE ___ CENTRAL HALL ___ SIDE HALL
___ BACK HALL ___ IRREGULAR OTHER _____

18. PRIMARY STRUCTURAL SYSTEM:
___ TIMBER FRAME ___ BRACED FRAME ___ BRICK ___ STONE ___ BALLOON FRAME
___ CONCRETE ___ STEEL ___ LOG ___ PLANK WALL ___ PLATFORM FRAME
___ FRAME CONSTRUCTION - TYPE UNKNOWN OTHER _____

19. CHIMNEY PLACEMENT:
___ I NTERIOR ___ INTERIOR FRONT/REAR ___ CENTER ___ INTERIOR END ___ EXTERIOR
OTHER _____

20. ROOF CONFIGURATION:
___ GABLE SIDE ___ GABLE FRONT ___ HIP ___ MANSARD ___ FLAT
___ GAMBREL ___ PARAPET GABLE ___ SHED ___ CROSS ___ GABLE
___ COMPOUND OTHER _____

21. ROOF MATERIAL: WOOD ___ METAL ✓ TILE ___ SLATE ___ ASPHALT ___ ASBESTOS ___

22. EXTERIOR WALL MATERIALS:
✓ CLAPBOARD ___ BRICK ___ FLUSH SHEATHING ___ WOOD SHINGLE ___ STONE
___ LOG ___ PRESSED METAL ___ CONCRETE ___ STUCCO ___ ASPHALT
___ GRANITE ___ ASBESTOS ___ TERRA COTTA ___ BOARD AND BATTEN ___ ALUMINUM/VINYL
OTHER _____

23. FOUNDATION MATERIAL:
___ FIELDSTONE ___ BRICK ___ WOOD ___ CONCRETE ___ GRANITE ___ ORNAMENTAL CONC. BLOCK
OTHER _____

24. OUTBUILDINGS/FEATURES:
___ CARRIAGE HOUSE ___ FENCE OR WALL ___ CEMETERY ___ BARN (CONNECTED)
___ BARN (DETACHED) ___ FORMAL GARDEN ___ LANDSCAPE/PLANT MAT. ___ ARCHAEOLOGICAL SITE
___ GARAGE OTHER _____

HISTORICAL DATA

25. DOCUMENTED DATE OF CONSTRUCTION: _____ 26. ESTIMATED DATE OF CONSTRUCTION: 1971

27. DATE MAJOR ADDITIONS/ALTERATIONS: _____

28. ARCHITECT: _____ 29. CONTRACTOR: _____

30. ORIGINAL OWNER: _____

31. SUBSEQUENT SIGNIFICANT OWNER: _____ DATES: _____

32. CULTURAL/ETHNIC AFFILIATION:
___ ENGLISH ___ FRENCH ACADIAN ___ NATIVE AMERICAN ___ SCOTTISH ___ FRENCH CANADIAN
___ EAST EUROPEAN ___ IRISH OTHER _____

33. HISTORIC CONTEXT(S):
___ COMMERCE ___ INDUSTRY ___ TRANSPORTATION ___ AGRICULTURE ___ MILITARY
___ RELIGION ___ CIVIC AFFAIRS ___ RECREATION ___ HABITATION ___ EDUCATION
___ ART, LIT, SCIENCE ___ SOCIAL

34. COMMENTS/SOURCES: _____

35. HISTORICAL DRAWINGS EXIST: ___ YES ___ NO LOCATION: _____

ENVIRONMENTAL DATA

36. SITE INTEGRITY: ___ ORIGINAL ___ MOVED DATE MOVED _____
37. SETTING: ___ RURAL/UNDISTURBED ___ RURAL/BUILT UP ___ SMALL TOWN ___ URBAN ___ SUBURBAN
38. QUADRANGLE MAP USED: _____ QUADRANGLE #: _____
39. UTM NORTHING: _____ 40. UTM EASTING: _____
41. FACADE DIRECTION (CIRCLE ONE): N S E W NE NW SE SW

==========

MHPC USE ONLY

DATE ENTERED IN INVENTORY: _____ PHOTO FILE #: _____
NR STATUS: L ___ HD ___ E ___ NE ___ ND ___ REVIEWER _____
DATA SOURCE: ___ HPF ___ CLG ___ R&C ___ STAFF ___ STATE SURVEY OTHER _____ LEVEL OF SURVEY: __R __I

ASSOCIATED INVENTORY NUMBERS: _____

FORM G:\KIRK\ARCH-SVY.FRM\HBSSFHD3.FRM

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JANET T. MILLS
GOVERNOR

KIRK F. MOHNEY
DIRECTOR

June 10, 2021

Mr. Tim Michaud
Terradyn Consultants LLC
565 Congress Street
Suite 201
Portland, ME 04101

Project: MHPC #0251-21 Clover Leaf Development, LLC; 989 Portland Road
120 Unit Apartment Complex

Town: Saco, ME

Dear Mr. Michaud:

In response to your recent request, I have reviewed the information received May 24, 2021 to continue consultation on the above referenced project in accordance with the requirements of the Maine Department of Environmental Protection.

Based on the information submitted, I have concluded that there will be no historic properties (archaeological or architectural) affected by the proposed undertaking, as defined by Section 106 of the National Historic Preservation Act.

Please contact Megan Rideout at (207) 287-2992 or megan.m.rideout@maine.gov if we can be of further assistance in this matter.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
State Historic Preservation Officer

PHONE: (207) 287-2132 FAX: (207) 287-2335

Section 9 - Unusual Natural Areas

The Department of Agriculture, Conservation & Forestry was contacted regarding the presence of rare vascular plants, natural communities, registered critical areas, or other natural features of special concern on the property or in the immediate vicinity. The Department determine that there are no known rare botanical features documented specifically within the project area.

TERRADYN
CONSULTANTS, LLC

Pineland
Cumberland Hall
41 Campus Drive, Suite 101
New Gloucester, ME 04260

Portland
565 Congress Street, Suite 201
Portland, ME 04101

February 8, 2021 2104

Lisa St. Hilaire, Information Manager
Maine Natural Areas Program
Department of Agriculture, Conservation and Forestry
93 State House Station
Augusta, ME 04333

REQUEST FOR PROJECT REVIEW
Clover Leaf Development
989 Portland Road, Saco, ME

Dear Lisa:

Terradyn Consultants, LLC has been retained by Clover Leaf Development, LLC, to prepare civil-site plans and permit applications for a proposed 120-unit apartment complex to be located at 989 Portland Road (Route 1) in Saco, Maine. Attached is an excerpt of the USGS topographic map for the project site.

The development will cover approximately 10 acres of the 67-acre property. The forested site is located immediately north of the Aquaboggan Waterpark. The property is shown as Lot 3-1 on the City of Saco Tax Map 63. The property is located within the MU-3 zone but will soon be reclassified to the Portland Road District.

The development will consist of the creation of ten 12-unit apartment buildings to be accessed off Route 1 by approximately 1000 feet of proposed new road. Each building will 3,500 SF (50x\'x70') and three stories tall. The applicant also proposes to create an out-parcel along the Portland Road frontage. The out-parcel will be approximately 1.2 acres. The site is served by City water & sewer. Main lines are located within the Portland Road right of way along the site frontage. A boundary and topographic survey is being prepared by Owen Haskell, Professional Land Surveyors. Site wetlands were delineated by Mark Hampton, C.S.S. of Mark Hampton & Associates.

We anticipate that the apartment complex and outparcel will drain to the rear of the development, where a gravel wetland will be constructed. Roof drain filter strips will be installed along the edge of each building in an effort to both encourage infiltration opportunities of stormwater runoff and to reduce the size of the stormwater pond. The project will result in approximately 3.5 acres of new impervious area. This means that the project will require a Maine DEP Site Location of Development Permit. There is wetland area located near the midpoint of the development area. This wetland is proposed to be filled. This activity will require a Tier 2 wetland alteration permit.

We are requesting that the Program review available information to determine if the project will have an impact on historic structures or archaeological resources. The information will be provided to the Maine DEP as part of the Site Location of Development application process.

Please notify me if you have any questions or require additional information to complete your review.

Sincerely,

TERRADYN CONSULTANTS, LLC

Timothy J. Michaud

Tim Michaud
Project Engineer

Enc. - USGS Topographic Map

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
177 STATE HOUSE STATION
AUGUSTA, MAINE 04333

JANET T. MILLS
GOVERNOR

AMANDA E. BEAL
COMMISSIONER

February 25, 2021

Timothy Michaud
Terradyn Consultants
565 Congress Street, Suite 201
Portland, ME 04101

Via email: tim@terradynconsultants.com

Re: Rare and exemplary botanical features in proximity to: #21-04, Clover Leaf Apartment Complex, 989 Portland Road, Saco, Maine

Dear Mr. Michaud:

I have searched the Maine Natural Areas Program's Biological and Conservation Data System files in response to your request received February 10, 2021 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Saco, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. MNAP recommends that you have the site surveyed by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

In particular, MNAP recommends that you survey the project area for Hollow Joe-pye Weed (*Eutrochium fistulosum*). There is a population located within about half a mile of the site along Cascade Brook, and it appears that suitable habitat may be present at the project site. Hollow Joe-pye Weed is a species of moist areas in uplands and wetlands, and MNAP recommends survey along the tributary to Stuart Brook and low wet areas on the site. Hollow Joe-pye Weed is most easily identified mid-July through mid-September.

Feature	State Status	State Rank	Global Rank	Notes
Hollow Joe-pye Weed *Eutrochium fistulosum*	SC	S2	G5?	Cascade Brook

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM
BLOSSOM LANE, DEERING BUILDING

DEPARTMENT OF Agriculture Conservation & Forestry

PHONE: (207) 287-804490
WWW.MAINE.GOV/DACF/MNAP

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Maine Natural Areas Program (MNAP) is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. MNAP welcomes coordination with individuals or organizations proposing environmental alteration or conducting environmental assessments. If, however, data provided by MNAP are to be published in any form, the Program should be informed at the outset and credited as the source.

The Maine Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $150.00 for two hours of our services.

Thank you for using MNAP in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Lisa St. Hilaire

Lisa St. Hilaire | Information Manager | Maine Natural Areas Program
207-287-8044 | lisa.st.hilaire@maine.gov

Maine Natural Areas Program

Eutrochium fistulosum (Barratt) E.E. Lamont

Hollow Joe-pye Weed

- State Rank: S2
- Global Rank: G5?
- State Status: Special Concern

Habitat: Roadsides, moist ditches. [Open wetland, not coastal nor rivershore (non-forested, wetland); Old field / roadside (non-forested, wetland or upland)]

Range: Southern Maine to Iowa, south to Florida and Texas.

Aids to Identification: This Joe-pye weed is characterized by the hollow central cavity of the stem. The stem is also covered with a whitish bloom, and is usually purplish. The whorled leaves grow in groups of 4 to 7, with more rounded teeth than other similar species. There are 4-7 bright pink-purple flowers in each capitulum (flowerhead). The similar species *E. purpureum* has sharper, more coarse teeth on the leaves.

Ecological characteristics: Known in Maine to occur in moist roadside ditches and stream shores.

Phenology: Flowers July - September.

Family: Asteraceae

Synonyms: *Eupatoriadelphus fistulosus* (Barratt) King & H.E. Robins; *Eupatorium fistulosum* Barratt; *Eupatorium laevigatum* Torr. *in* Eat.

Known Distribution in Maine: This rare plant has been documented from a total of 15 town(s) in the following county(ies): Cumberland, York.

Reason(s) for rarity: At northern limit of range.

Conservation considerations: This plant occurs in small wetlands or moist pockets along roadsides in extreme southern Maine. Some road maintenance is obviously compatible with the species, but populations could be vulnerable to road-widening or extensive

shoulder work.

Rare and Exemplary Botanical Features within 4 miles of
Project: #21-04, Clover Leaf Apartment Complex, 989 Portland Road, Saco, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Atlantic White Cedar						
	SC	S2	G4	2017-07-26	3	Forested wetland
Atlantic White Cedar Bog						
	<null>	S1	G3G4	2017-07-26	3	Forested wetland
Beach Plum						
	E	S1	G4	1903-07-31	17	Rocky coastal (non-forested, upland)
	E	S1	G4	1932-09	12	Rocky coastal (non-forested, upland)
	E	S1	G4	1933-06-21	9	Rocky coastal (non-forested, upland)
	E	S1	G4	1933-05-19	10	Rocky coastal (non-forested, upland)
	E	S1	G4	1999-05-25	18	Rocky coastal (non-forested, upland)
Beach wormwood						
	SC	S1S2	G5T5	2010-11-09	5	<null>
Butterfly Weed						
	PE	SX	G5	1986	1	Dry barrens (partly forested, upland)
Button Sedge						
	SC	S2	G5	2017-07-26	5	<null>
Clothed Sedge						
	E	S1	G5	2006-06-07	7	Dry barrens (partly forested, upland)
	E	S1	G5	2006-06-16	8	Dry barrens (partly forested, upland)
Creeping Spike-moss						
	E	S2	G5	1920-07-30	6	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	E	S2	G5	1924-08-21	8	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)

Rare and Exemplary Botanical Features within 4 miles of
Project: #21-04, Clover Leaf Apartment Complex, 989 Portland Road, Saco, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
	E	S2	G5	1989-08-14	2	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
Dioecious Sedge						
	SC	S3	G4G5	1936-07-14	7	Non-tidal rivershore (non-forested, seasonally wet),Open wetland, not coastal nor rivershore (non-forested, wetland)
Dwarf Glasswort						
	SC	S1	G5	1981-09-16	2	Tidal wetland (non-forested, wetland)
	SC	S1	G5	2006-06-21	4	Tidal wetland (non-forested, wetland)
Hollow Joe-pye Weed						
	SC	S2	G5?	1989-08-14	2	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	SC	S2	G5?	2013-09-01	23	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	SC	S2	G5?	1989-08-14	4	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	SC	S2	G5?	1989-08-21	1	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
	SC	S2	G5?	1989-08-22	3	Open wetland, not coastal nor rivershore (non-forested, wetland),Old field/roadside (non-forested, wetland or upland)
Horned Pondweed						
	SC	S2	G5	1907-08-18	10	Tidal wetland (non-forested, wetland)
	SC	S2	G5	1972-06-13	3	Tidal wetland (non-forested, wetland)
Long's Bulrush						
	T	S2	G3	2017-07-26	10	Open wetland, not coastal nor rivershore (non-forested, wetland)
Long-spined Sandbur						
	PE	SH	G5	1984	1	Rocky coastal (non-forested, upland)
Parker's Pipewort						
	SC	S3	G3	1924-08-20	8	Tidal wetland (non-forested, wetland)

Rare and Exemplary Botanical Features within 4 miles of
Project: #21-04, Clover Leaf Apartment Complex, 989 Portland Road, Saco, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Pitch Pine Bog						
	<null>	S2	G3G5	2017-07-26	4	Forested wetland,Coastal non-tidal wetland (non-forested, wetland)
	<null>	S2	G3G5	2006-06-21	3	Forested wetland,Coastal non-tidal wetland (non-forested, wetland)
Raised Level Bog Ecosystem						
	<null>	S4	GNR	2017-07-26	3	Forested wetland,Open wetland, not coastal nor rivershore (non-forested, wetland)
Salt-hay Saltmarsh						
	<null>	S3	G5	2010-07-16	14	Tidal wetland (non-forested, wetland)
	<null>	S3	G5	2010-10-14	12	Tidal wetland (non-forested, wetland)
Saltmarsh False-foxglove						
	SC	S3	G5	1982	12	Tidal wetland (non-forested, wetland)
	SC	S3	G5	2008-07-02	1	Tidal wetland (non-forested, wetland)
Smooth Winterberry Holly						
	SC	S3	G5	1979	13	Forested wetland
	SC	S3	G5	2018-09-15	24	Forested wetland
Tidal Marsh Estuary Ecosystem						
	<null>	S3	GNR	2010-07-16	6	Tidal wetland (non-forested, wetland)
	<null>	S3	GNR	2010-10-14	4	Tidal wetland (non-forested, wetland)
Water-plantain Spearwort						
	PE	SH	G4	1862-08	3	Open water (non-forested, wetland)
Wild Ginger						
	T	S1S2	G5	1986	4	Hardwood to mixed forest (forest, upland)

STATE RARITY RANKS

S1 Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.

S2 Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

S3 Rare in Maine (20-100 occurrences).

S4 Apparently secure in Maine.

S5 Demonstrably secure in Maine.

SU Under consideration for assigning rarity status; more information needed on threats or distribution.

SNR Not yet ranked.

SNA Rank not applicable.

S#? Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

Note: **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

GLOBAL RARITY RANKS

G1 Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.

G2 Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.

G3 Globally rare (20-100 occurrences).

G4 Apparently secure globally.

G5 Demonstrably secure globally.

GNR Not yet ranked.

Note: **Global Ranks** are determined by NatureServe.

STATE LEGAL STATUS

Note: State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered** and **Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

E ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.

T THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

NON-LEGAL STATUS

SC SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.

PE Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size**: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition**: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

Note: **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!
http://www.maine.gov/dacf/mnap

Section 10 - Buffers

The development features a significant amount of buffering and more than 40 acres of the property will remain undisturbed.

The City of Saco Subdivision ordinance requires that a 20 wide green space be maintained along all external property lines. The second phase of the apartment complex is located hundreds of feet from the nearest residential structure. The rear corner of the parking lot for Building 6 is just over 20' from the undeveloped portion of the Aquaboggin property. Beside that location, the parking lots for Buildings 5 & 6 will maintain more than the required 20' wide screen of existing trees. Sheet C-1.0 Subdivision Plan includes a note that states that the perimeter setback of the apartment complex lot will be maintained as a green space buffer.

The solar field was designed to conform to the commercial solar requirements of the zoning ordinance. As such, a 100' no disturbance buffer has been left between the extents of the field and the nearest residential property line.

The development plan features a significant amount of landscaping. Our entrance driveway is adjacent to the Aquaboggin Water Park on the southern edge of the property. That driveway will be lined with street trees on both sides. The street trees will provide a new visual screen between the Aquaboggin site and the apartments.

In the first phase of development, a 25'-50' buffer of existing landscaping was preserved on the north side of the development area.

See the plans for buffer and limits of proposed disturbance.

Section 11 - Soils

Mark Hampton, CSS of Mark Hampton Associates, Inc completed a Class "B" High Intensity Soils Survey for the project area. A copy of the report and related soil map has been included with this submission. Mark also performed the wetland delineation for this property. That report is also attached.

MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

6434

July 24, 2024

Mr. Kerry Anderson
Clover Leaf Development LLC
P. O. Box 6799
Scarborough, ME 04070

Re: Wetland Delineation 67+ acre parcel 986 Portland Road Saco, ME

Dear Kerry,

At your request, I have completed a delineation of wetlands on a 67+ acre parcel located at 986 Portland Road Saco, ME. The parcel is noted on the City of Saco tax maps as map 63 lot 3-1. The wetland delineation was completed on January 2020 and March 2021. At the time of the delineation, the weather was dry, and the ground was free of snow. The wetland delineation was completed in accordance with the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Northcentral and Northeast Regions dated January 2012. These manuals require the presence of three parameters for a wetland to be present, wetland hydrology, hydrophytic vegetation, and hydric soils.

This report includes a review of background information, methodology, and a summary of findings.

This wetland delineation was conducted to provide detailed information regarding the natural resources present on this property and to assist in determining whether any wetlands were impacted due to recent site activities. This information is intended to be used for planning purposes and any potential permitting process. Wetlands are regulated federally by the U.S. Army Corps of Engineers, by the State of Maine under the Natural Resources Protection Act, and municipally by town zoning ordinances. Any proposed wetland impacts proposed by development plans will likely require permits from the Maine DEP and US Army Corps of Engineers and local planning board review. It is strongly encouraged to consult with these agencies early in the design process if any impacts are anticipated.

BACKGROUND INFORMATION

The parcel is in a commercially and residentially developed portion of Portland Road. The lot abuts commercial, and residential developments. The area is zoned Portland Road. The parcel is an almost entirely wooded and slopes gently from south to north. The site is depicted in the

Maine DOT topographic map (Figure 1). The front 10 acres of the parcel has recently been developed with apartment buildings, as is proposed for part of the remainder of the parcel.

The USFWS National Wetland Inventory map (Figure 2) shows wetlands adjacent to the parcel.

The Beginning with Habitat Map (Figure 3) from the Maine Department of Inland Fisheries and Wildlife shows that there are no Essential or Significant Wildlife Habitats mapped on the parcel, nor are there any Rare Plants and Natural Communities.

The NRCS soil survey (Figure 4) obtained for York County shows that the predominate soils throughout the parcel are well drained glacial till over ledge, moderately well drained and somewhat poorly to poorly drained marine lacustrine soils. Work onsite confirmed the soils as mapped. The soils are listed in the table below.

Map unit symbol	Map unit name	Rating
AdB	Adams Loamy Sand 0 to 8 percent slopes	Well Drained
BuB	Buxton Silt loam 0-8 percent slopes	Moderately Well Drained
LnB	Lyman Loam 0-8 percent slopes	Well Drained
Sc	Scantic Silt Loam 0-3 percent slopes	Poorly Drained

The Maine Flood Hazard Map (Figure 5) does not show any flood hazard areas on the parcel, in layers Effective, Pending, and Preliminary.

METHODOLOGY

Flagging of the wetland boundaries was completed in January 2020 and March 2021. Data collection at the boundaries was completed the same day. The wetlands found were flagged with yellow flagging, labeled in an alphanumeric sequence (i.e. A1-A31). The wetland flags were located by Trimble GPS equipment capable of sub meter accuracy, post processed, and sent to Northam Survey.

The wetland delineation was completed in accordance with the 1987 U.S. Army Corps of

Engineers Wetland Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual for the Northcentral and Northeast Regions dated January 2012. These manuals require the presence of three parameters for a wetland to be present, wetland hydrology, hydrophytic vegetation, and hydric soils.

The wetland flags were placed along the wetland and upland boundaries based on observations made of the vegetation, soils, and hydrologic conditions. Data on these conditions were collected from sample plots of both upland and wetland sections and recorded on data sheets that comply with the Northcentral and Northeast regional supplement for (See Appendix A). Photographs were taken to further support the data collected (See Appendix B).

There are a few areas made up of aquatic, emergent, or peatland wetlands found that may be considered a Wetland of Special Significance by the Maine Department of Environmental Protection (NRPA Chapter 310).

Although the wetland delineation was completed outside of the indicator breeding season, a vernal pool assessment of the site was completed in the spring of 2024. There were no areas on the parcel which were identified as habitat sufficient for amphibians to breed within.

SUMMARY OF FINDINGS

Using the methods described above, the wetlands found on the parcel are freshwater forested wetlands and wet meadow wetlands. There are two wetland areas, Wetlands A and B.

Wetland A is a wet meadow wetland which drains north toward a tributary of Stuart Brook.

Wetland B is a forested wetland located west of Wetland A and is a wetland which drains across the site to the north toward Stuart Brook.

The soils in both wetlands have a dark gray silty loam surface with many depletions present. The soils found on the site are characteristic of the soils mapped by US Department of Agriculture, Natural Resources Conservation Service as Lyman-Tunbridge sandy loam well drained and Buxton moderately well drained soils in the upland areas and Scantic silt loam poorly drained soils in the wetlands areas.

REFERENCES

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual, Technical Report Y-87-1, U.S. Army Engineers Waterways Experiment Station, Vicksburg, MS.

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Figure 1. Maine DOT Topographic Map Site location with 2 foot contours City of Saco	N

Figure 2. National Wetland Inventory Map City of Saco	N

Figure 3. Beginning with Habitat Map Maine Department of Inland Fisheries and Wildlife Topographic basemap of the site with Wildlife Habitat & Plants and Natural Communities Layers	**N**

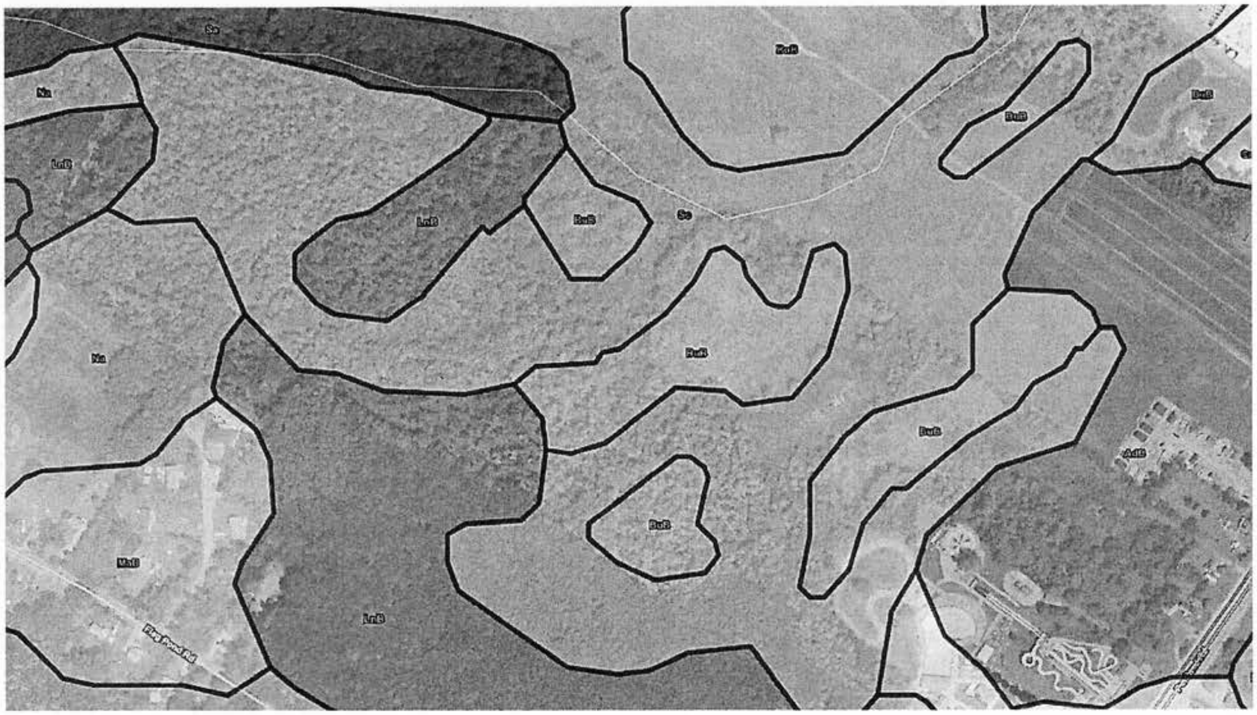


Figure 4. Web Soil Survey with Drainage Class

Natural Resource Conservation Service

York County

Soil Rating Polygons

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

N

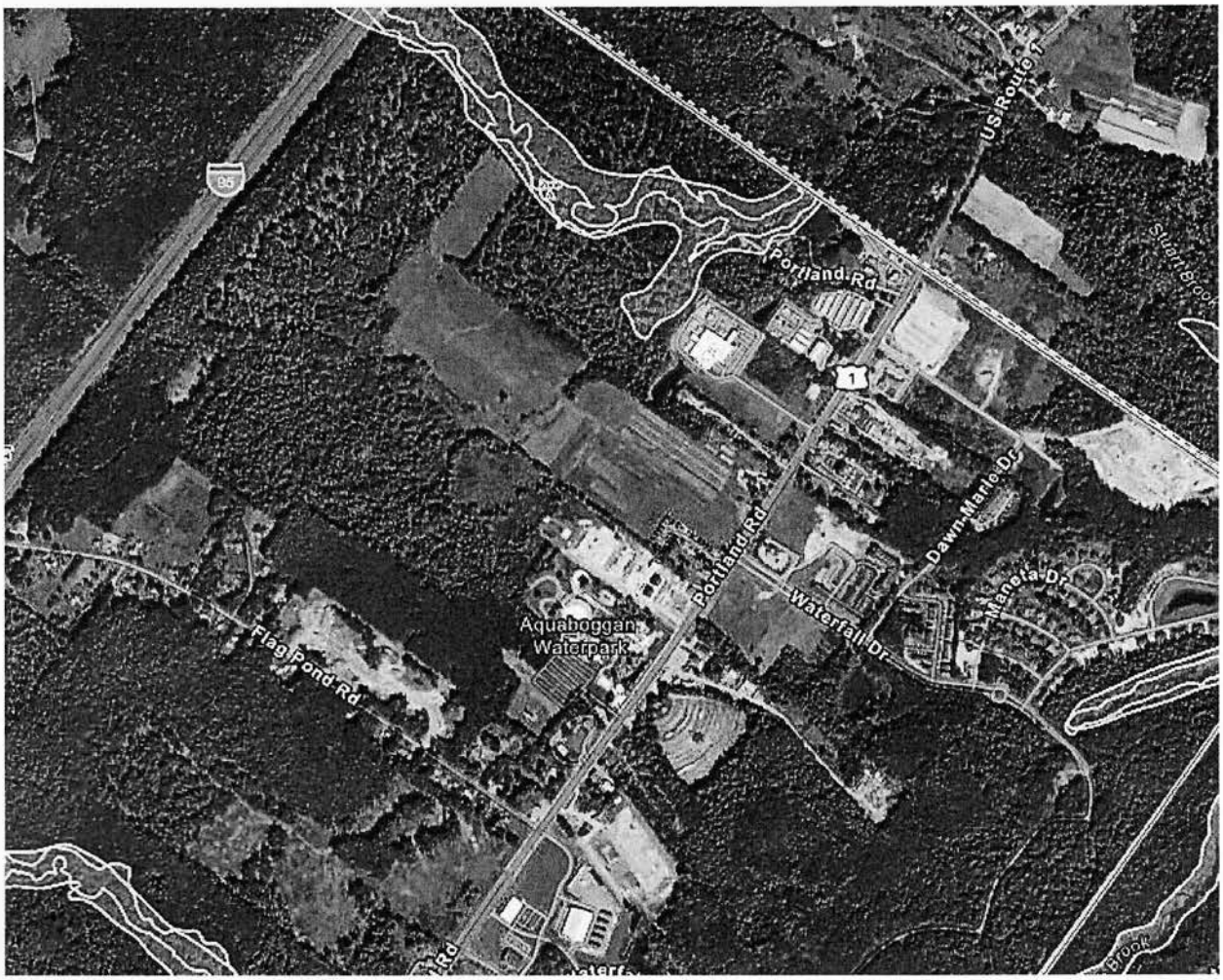


Figure 5. Maine Flood Hazard Map Maine Department of Agriculture, Conservation, and Forestry National Flood Hazard Layers – Effective	**N**

APPENDIX A:
DATA SHEETS

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Clover Leaf Development City/County: Saco York Sampling Date: July 2024

Applicant/Owner: Clover Leaf Development LLC State: ME Sampling Point: A-1

Investigator(s): M Hampton Section, Township, Range: Old Orchard Beach Quad

Landform (hillslope, terrace, etc.): hillside Local relief (concave, convex, none): none Slope (%): 0-8

Subregion (LRR or MLRA): New Eng/E NY Upland Lat: 43-33-19 N Long: 70-24-51W Datum: NAD 83

Soil Map Unit Name: Lyman-Tunbridge Sandy Loam NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes _____	No ✔	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✔	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: A-1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus rubra	10	No	FACU
2. Populus tremuloides	30	Yes	FACU
3. Pinus strobus	15	No	FACU
4.			
5.			
6.			
	55	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: 15)			
1. Plnus strobu	15	No	FACU
2. Populus tremuloides	20	Yes	FACU
3.			
4.			
5.			
6.			
	35	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5)			
1. Pteridium aquilinum	25	Yes	FACU
2. Vaccinium angustifolium	30	Yes	FACU
3. Maianthemum canadense	10	No	FACU
4. Trientalis borealis	10	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	75	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: A-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	5 YR 5/2						sl	
6-18	2.5 YR 5/2						sl	
18+							rock	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: bedrock

Depth (inches): 18

Hydric Soil Present? Yes ☐ No ☑

Remarks:

WETLAND DETERMINATION DATA FORM

Project/Site: Clover Leaf Development City/County: Saco York Sampling Date: July 2024

Applicant/Owner: Clover Leaf Development LLC State: ME Sampling Point: B-1

Investigator(s): M Hampton Section, Township, Range: Old Orchard Beach Quad

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): New Eng/E NY Upland Lat: 43-33-19 N Long: 70-24-51W Datum: NAD 83

Soil Map Unit Name: Scantic Silt Loam NWI classification: PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ✔ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ✔	No _____	Depth (inches): +6
Water Table Present?	Yes ✔	No _____	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): _____

Wetland Hydrology Present? Yes ✔ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: B-1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	15	No	FAC
2. Alnus rugosa	30	Yes	FACW
3.			
4.			
5.			
6.			
	45	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: 15)			
1. Acer rubrum	20	No	FACU
2. Alnus rugosa	25	Yes	FACU
3.			
4.			
5.			
6.			
	45	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5)			
1. Typha latifolia	15	No	OBL
2. Osmunda cinnamomea	30	Yes	FACW
3. Impatiens capensis	10	No	FACW
4. Juncus effusus	5	No	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	60	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes [x] No [ ]

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: B-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 4/2		5 Y 5/2		D	M	sl	
6-18	5 Y 5/2		2.5 Y 5/2		C	M	sl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ✔ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✔ Depleted Matrix (F3)
- ✔ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ✔ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: hardpan

Depth (inches): 8

Hydric Soil Present? Yes ☑ No ☐

Remarks:

WETLAND DETERMINATION DATA FORM – [illegible] Region

Project/Site: Clover Leaf Development City/County: Saco York Sampling Date: July 2024

Applicant/Owner: Clover Leaf Development LLC State: ME Sampling Point: C-1

Investigator(s): M Hampton Section, Township, Range: Old Orchard Beach Quad

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR or MLRA): New Eng/E NY Upland Lat: 43-33-19 N Long: 70-24-51W Datum: NAD 83

Soil Map Unit Name: Scantic Silt Loam NWI classification: PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔ No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔ No _____	
Wetland Hydrology Present?	Yes ✔ No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✔ Surface Water (A1)
- ___ High Water Table (A2)
- ✔ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ✔ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ✔ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✔	Depth (inches): _____
Water Table Present?	Yes ✔	No _____	Depth (inches): 6
Saturation Present? (includes capillary fringe)	Yes ✔	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✔ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: C-1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	30	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	30 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: 15)			
1. Acer rubrum	5	No	FAC
2.			
3.			
4.			
5.			
6.			
	5 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 15)			
1. Alnus rugosa	30	Yes	FACW
2.			
3.			
4.			
5.			
6.			
	30 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5)			
1. Impatiens capensis	15	No	FACW
2. Osmunda cinnamomea	30	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	45 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 5)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- [x] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes [x] No [ ]

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: C-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 4/2		5 Y 5/2		D	M	sl	
6-18	5 Y 5/2		2.5 Y 5/2		C	M	sl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Coast Prairie Redox (A16) **(MLRA 150A)**
- ___ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- ___ Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ✓ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ___ Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- ___ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: hardpan

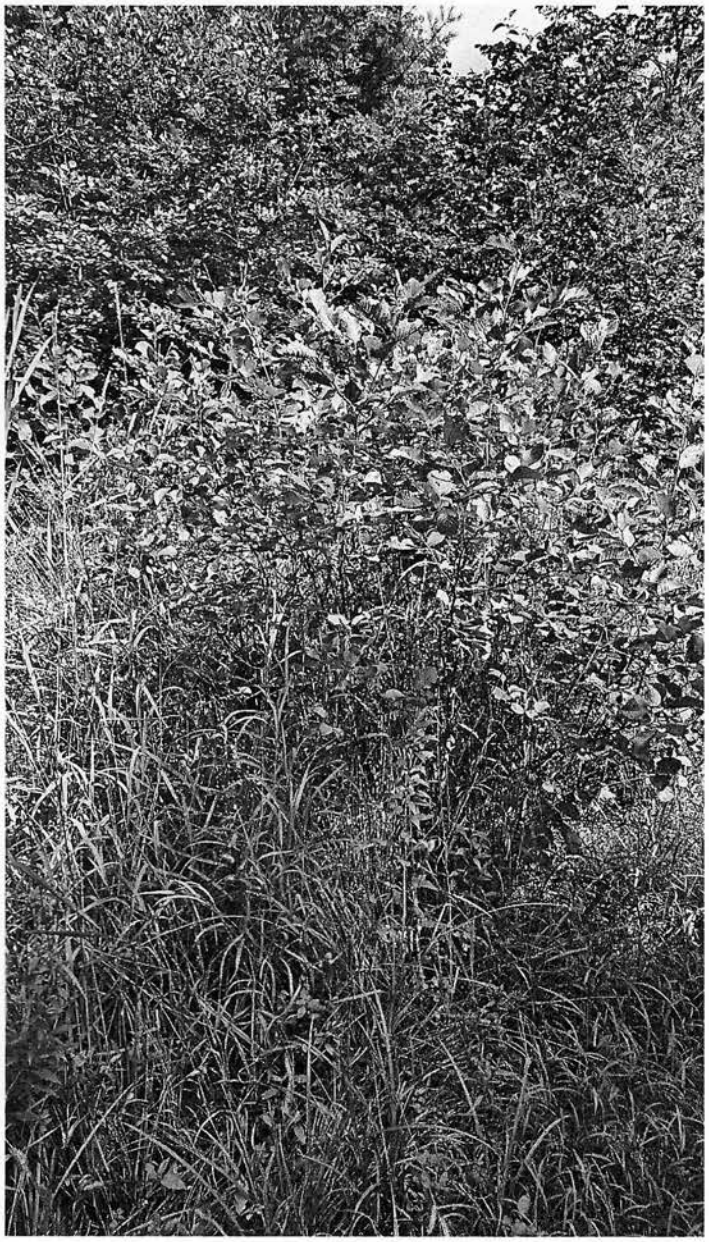
Depth (inches): 8

Hydric Soil Present? Yes ☑ No ☐

Remarks:

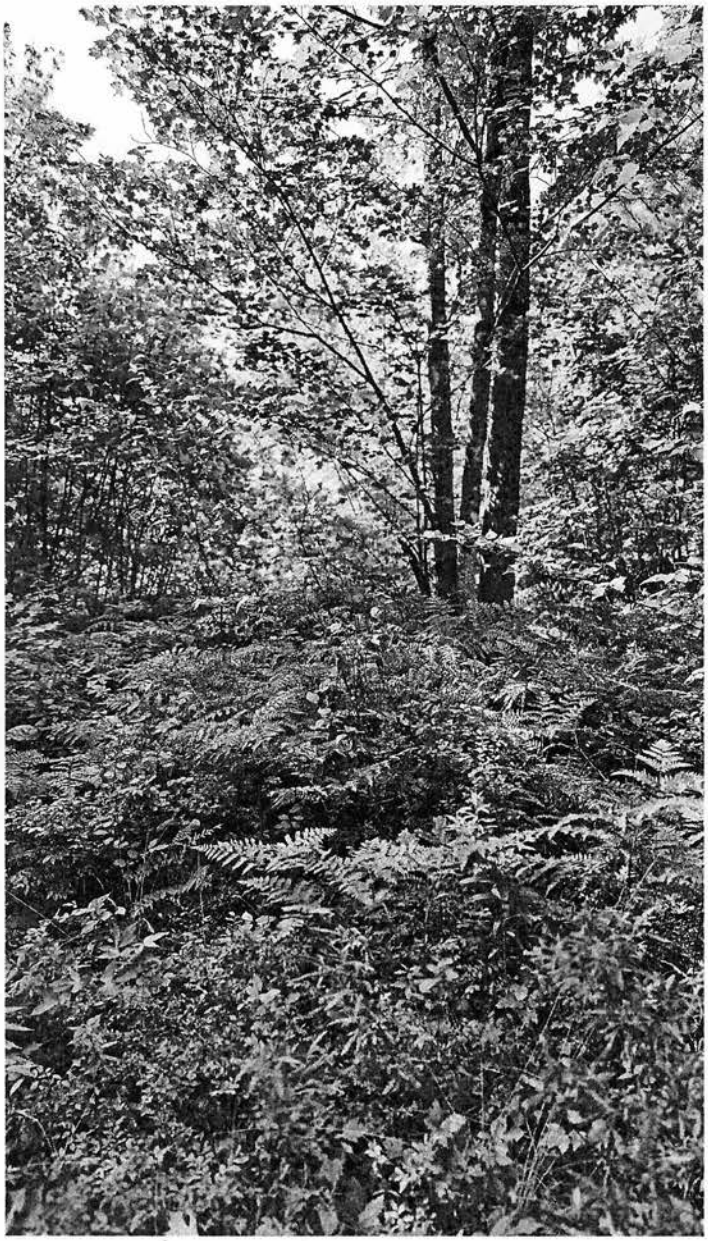
APPENDIX B:
PHOTOGRAPHS

Wetland A



Wetland B

Wetland B



Upland

MARK HAMPTON ASSOCIATES, INC.

SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

6434

Cloverleaf Development Phase 2
986 Portland Road
Saco, ME
Cloverleaf Development, LLC

Soil Narrative Report

DATE:	Soil Profiles observed on May 20, 2024
BASE MAP:	Base plan provided by Terradyn Consultants LLC scale 1 inch equals 100 feet and one foot contours.
GROUND CONTROL:	Soil survey boundaries located by Mark Hampton Associates, Inc. for Class B Soil Survey

Class B-High Intensity Soil Survey (Minimum Standards)

Mapping units of 1 acre or less.
Scale of 1"= 200 feet or larger.
Up to 25% inclusions in mapping units of which no more than 15% may be dissimilar soils.
Ground Control – test pits located by means of compass by chaining, pacing or taping from known control points
Base Map –2 foot contour intervals

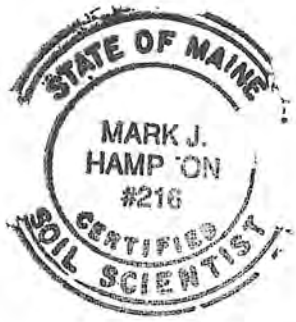
Provided:

Mapping units of 1 acre or less
Base map scale of 1"= 40 feet.
Up to 25 percent inclusions in mapping units of which no more than 15 percent is dissimilar soils.
Baseline information and test pits located by gps equipment with accuracy to less than 3 feet.
Ground topographic survey with one foot contours and ground control provided.

The accompanying soil profile descriptions, soil map, and this soil narrative report were done in accordance with the standards adopted by the Maine Association of Professional Soil Scientists, and the Maine Board of Certification of Geologists and Soil Scientists.

C.S.S. #216, L.S.E. #263 June 2, 2024

Mark J. Hampton Date



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SOIL EVALUATION • WETLAND DELINEATIONS • SOIL SURVEYS • WETLAND PERMITTING

6434

Cloverleaf Development Phase 2
986 Portland Road
Saco, ME
Cloverleaf Development LLC

Buxton
(Aquic Dystric Eutrochrepts)

SETTING

PARENT MATERIAL:	Derived from glaciomarine or glaciolaucustrine sediments
LANDFORM:	Coastal lowlands and river valleys
POSITION IN LANDSCAPE:	Intermediate positions on landform
SLOPE GRADIENT RANGES:	(A) 03%, (B) 3-8%, (C)8-15%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Moderately well drained with a perched watertable from 1.5 to 3.0 feet below the surface at some time from November to May or during periods of heavy precipitation.

TYPICAL PROFILE:

Surface Layer:	Dark Brown, fine sandy loam 0-7"
Subsurface Layer:	Olive brown, silt loam, 8-15"
Subsoil Layer:	Olive gray silty clay loam, 15-32"
Substratum:	Gray silty clay loam +32"

HYDROLOGIC GROUP:	Group C
SURFACE RUNOFF:	Moderate to moderately slow
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 60 inches
HAZARD TO FLOODING:	None

INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Scantic, Lamoine

USE AND MANAGEMENT

Development: The limiting factor for building site development is wetness due to the presence of a high watertable for a portion of the year. Proper foundation drainage or site modification is recommended.

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Cloverleaf Development Phase 2
986 Portland Road
Saco, ME
Cloverleaf Development LLC

LYMAN-TUNBRIDGE COMPLEX

SETTING

PARENT MATERIAL:	Loamy glacial till
LANDFORM:	Glaciated uplands
POSITION IN LANDSCAPE:	Uppermost locations, sideslopes, shoulders and crests
SLOPE GRADIENT RANGES:	(A) 0-3%, (C) 8-15%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Excessively well drained Lyman (10-20 inches to bedrock) and Tunbridge (20-40 inches to bedrock) These soils occur in a nonrepeating pattern with exposed bedrock outcrops and cannot be separated.

TYPICAL PROFILE:

Surface Layer:	Reddish brown fine sandy loam, 0-4 inches
Subsurface Layer:	Red brown fine sandy loam 4-12"
Subsoil Layer:	Dark red fine sandy loam 12-18"
Substratum:	Brown fine sandy loam 18-36"

HYDROLOGIC GROUP:	Group C/D
PERMEABILITY:	Slow to rapid, depending on slope and bedrock outcrops.
DEPTH TO BEDROCK:	Shallow (Lyman 10-20 inches) to moderately deep (Tunbridge 20-40 inches).
HAZARD TO FLOODING:	None

INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Scantic, Buxton

STATE OF MAINE
MARK J. HAMPTON
#216
CERTIFIED SOIL SCIENTIST

USE AND MANAGEMENT

Development: The limiting factor for building site development is depth to bedrock which ranges from 0 to 40 inches within this complex. Tunbridge and Lyman (deeper than 11 inches) soils may be suitable for subsurface wastewater disposal.

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6434

Cloverleaf Development Phase 2
986 Portland Road
Saco, ME
Cloverleaf Development LLC

Scantic
(Aquic Haplorthod)

SETTING

PARENT MATERIAL:	Derived from glaciomarine or glaciolaucustrine sediments
LANDFORM:	Coastal lowlands and river valleys
POSITION IN LANDSCAPE:	Lower positions on landform
SLOPE GRADIENT RANGES:	(A) 0-3%

COMPOSITION AND SOIL CHARACTERISTICS

DRAINAGE CLASS: Poorly drained with a perched watertable from 0.0 to 1.0 feet below the surface at some time from October to May or during periods of heavy precipitation.

TYPICAL PROFILE:

Surface Layer:	Dark grayish brown, silt loam 0-9"
Subsurface Layer:	Olive gray silt loam, 9-16"
Substratum:	Gray silty clay loam, 16"+

HYDROLOGIC GROUP:	Group D
SURFACE RUNOFF:	Moderate to moderately slow
PERMEABILITY:	Slow to very slow
DEPTH TO BEDROCK:	Greater than 65 inches
HAZARD TO FLOODING:	None

INCLUSIONS
(Within Mapping Unit)

CONTRASTING: Buxton, Lamoine

USE AND MANAGEMENT

Development: The limiting factor for building site development is wetness due to the presence of a high watertable for a portion of the year. Proper foundation drainage or site modification is recommended.

6434

PAGE ____ OF ____

FORM F (SS1) Rev. 7/21

SOIL PROFILE / CLASSIFICATION INFORMATION

SOIL SCIENTIST DESCRIPTION OF SOIL CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
986 Portland Road	Cloverleaf Development LLC	Saco

Exploration Symbol # SS-1 ☐ Test Pit ☒ Boring ☐ Probe

0 " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Black	F. Sandy Loam	Grand	Very Friable	
Bg1	Gray	Silt Loam	Weak Sub Ang Blocky	Friable	Common and Distinct
Bg2	Olive Brown	Silty Clay Loam	Fine Grandu	Firm	
Cg	Olive Gray	Silty Clay Loam	Platy	Very Firm	

Soil Details

Soil Series/Phase Name: Scantic

Limiting Factor: 6 " Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☐ MWD ☐ SPD ☒ PD ☐ VPD

Slope: 2 Percent

Hydric Soil: ☐ No ☒ Yes

Hydrologic Soil Group:

Exploration Symbol # SS-2 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Weak Angular	Very Friable	
Bhs	Brown	F. Sandy Loam	Sub Ang Blocky	Friable	
Bs	Olive Brown	Silty Clay Loam	Thin Platy	Firm	Common and Distinct
Cd	Olive Gray	Silty Clay Loam	Medium Platy	Very Firm	

Soil Details

Soil Series/Phase Name: Buxton

Limiting Factor: 16 " Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD

Slope: 4 Percent

Hydric Soil: ☐ No ☒ Yes

Hydrologic Soil Group:

Exploration Symbol # SS-3 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Fine Grandul	Friable	
Bhs	Brown	F. Sandy Loam	Weak Sub Ang Blocky	Friable	
Bs	Olive Brown	Silty Clay Loam	Thin Platy	Firm	Common and Distinct
Cd	Olive	Silty Clay Loam	Medium Platy	Very Firm	

Soil Details

Soil Series/Phase Name: Buxton

Limiting Factor: 16 " Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD

Slope: 10 Percent

Hydric Soil: ☒ No ☐ Yes

Hydrologic Soil Group:

Exploration Symbol # SS-4 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Grand	Friable	
Bhs	Brown	F. Sandy Loam	Fine Grandul	Friable	
Bs	Olive Brown	Silty Clay Loam	Fine Grandul	Firm	Common and Distinct
Cd	Olive	Silty Clay Loam	Platy	Very Firm	

Soil Details

Soil Series/Phase Name: Buxton

Limiting Factor: 15 " Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD

Slope: 8 Percent

Hydric Soil: ☒ No ☐ Yes

Hydrologic Soil Group:

SOIL SCIENTIST INFORMATION AND SIGNATURE

Signature

Mark J. Hampton

Name Printed

05/20/2024

Date

216

SS License No.

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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SOIL PROFILE / CLASSIFICATION INFORMATION

SOIL SCIENTIST DESCRIPTION OF SOIL CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
986 Portland Road	Cloverleaf Development LLC	Saco

Exploration Symbol # SS-5 ☐ Test Pit ☒ Boring ☐ Probe

0 " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Grand	Very Friable	
Bhs	Brown	F. Sandy Loam	Weak Sub Ang Blocky	Friable	
Bs	Olive Brown	Silty Clay Loam	Fine Grandu	Firm	Common and Distinct
Cd	Olive Gray	Silty Clay Loam	Platy	Very Firm	

Soil Details

Soil Series/Phase Name:	Limiting Factor		Drainage Class	Slope	Hydric Soil	Hydrologic
Buxton	15 " Depth	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock	☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD	12 Percent	☒ No ☐ Yes	Soil Group

Exploration Symbol # SS-6 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Weak Angular	Very Friable	
Bhs	Brown	F. Sandy Loam	Sub Ang Blocky	Friable	
Bs	Olive Brown	Silty Clay Loam	Thin Platy	Firm	Common and Distinct
Cd	Olive Gray	Silty Clay Loam	Medium Platy	Very Firm	

Soil Details

Soil Series/Phase Name:	Limiting Factor		Drainage Class	Slope	Hydric Soil	Hydrologic
Buxton	16 " Depth	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock	☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD	10 Percent	☒ No ☐ Yes	Soil Group

Exploration Symbol # SS-7 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Black	Silt Loam	Fine Grandul	Friable	
Bg1	Gray	Silt Loam	Weak Sub Ang Blocky	Friable	Common and Distinct
Bg2	Olive Brown	Silty Clay Loam	Thin Platy	Firm	
Cg	Olive	Silty Clay Loam	Medium Platy	Very Firm	

Soil Details

Soil Series/Phase Name:	Limiting Factor		Drainage Class	Slope	Hydric Soil	Hydrologic
Scantic	6 " Depth	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock	☐ ED ☐ SED ☐ WD ☐ MWD ☐ SPD ☒ PD ☐ VPD	2 Percent	☐ No ☒ Yes	Soil Group

Exploration Symbol # SS-8 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Grand	Friable	
Bhs	Brown	F. Sandy Loam	Fine Grandul	Friable	
Bs	Olive Brown	Silty Clay Loam	Fine Grandul	Firm	Common and Distinct
Cd	Olive	Silty Clay Loam	Platy	Very Firm	

Soil Details

Soil Series/Phase Name:	Limiting Factor		Drainage Class	Slope	Hydric Soil	Hydrologic
Buxton	16 " Depth	☒ Groundwater ☒ Restrictive Layer ☐ Bedrock	☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD	2 Percent	☒ No ☐ Yes	Soil Group

SOIL SCIENTIST INFORMATION AND SIGNATURE

Signature

Mark J. Hampton

Name Printed

05/20/2024

Date

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SOIL PROFILE / CLASSIFICATION INFORMATION

SOIL SCIENTIST DESCRIPTION OF SOIL CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
986 Portland Road	Cloverleaf Development LLC	Saco

Exploration Symbol # SS-9 ☐ Test Pit ☒ Boring ☐ Probe

0 " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Grand	Very Friable	
Bhs	Brown	F. Sandy Loam	Weak Sub Ang Blocky	Friable	None Noted
R		LEDGE			

Soil Details

Soil Series/Phase Name: Lyman-Tunbridge

Limiting Factor: 15 " Depth ☐ Groundwater ☐ Restrictive Layer ☒ Bedrock

Drainage Class: ☐ ED ☐ SED ☒ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD

Slope: 10 Percent

Hydric Soil: ☒ No ☐ Yes

Hydrologic Soil Group:

Exploration Symbol # SS-10 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Black	Silt Loam	Weak Angular	Very Friable	
Bg1	Gray	Silt Loam	Sub Ang Blocky	Friable	Common and Distinct
Bg2	Olive Brown	Silty Clay Loam	Thin Platy	Firm	
Cg	Olive Gray	Silty Clay Loam	Medium Platy	Very Firm	

Soil Details

Soil Series/Phase Name: Scantic

Limiting Factor: 6 " Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☒ PD ☐ VPD

Slope: 2 Percent

Hydric Soil: ☐ No ☒ Yes

Hydrologic Soil Group:

Exploration Symbol # SS-11 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Fine Grandul	Friable	
Bh2	Brown	F. Sandy Loam	Weak Sub Ang Blocky	Friable	
Bs	Olive Brown	Silty Clay Loam	Thin Platy	Firm	Common and Distinct
Cd	Olive	Silty Clay Loam	Medium Platy	Very Firm	

Soil Details

Soil Series/Phase Name: Buxton

Limiting Factor: 16 " Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD

Slope: 12 Percent

Hydric Soil: ☒ No ☐ Yes

Hydrologic Soil Group:

Exploration Symbol # SS-12 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Grand	Friable	
Bhs	Brown	F. Sandy Loam	Fine Grandul	Friable	None Noted
R		LEDGE			

Soil Details

Soil Series/Phase Name: Lyman-Tunbridge

Limiting Factor: 16 " Depth ☐ Groundwater ☐ Restrictive Layer ☒ Bedrock

Drainage Class: ☐ ED ☐ SED ☒ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD

Slope: 2 Percent

Hydric Soil: ☒ No ☐ Yes

Hydrologic Soil Group:

SOIL SCIENTIST INFORMATION AND SIGNATURE

Signature

Mark J. Hampton

Name Printed

05/20/2024

Date

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SOIL PROFILE / CLASSIFICATION INFORMATION

SOIL SCIENTIST DESCRIPTION OF SOIL CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
986 Portland Road	Cloverleaf Development LLC	Saco

Exploration Symbol # SS-13 ☐ Test Pit ☒ Boring ☐ Probe

0 " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Black	Silt Loam	Grand	Very Friable	
Bg1	Gray	Silt Loam	Weak Sub Ang Blocky	Friable	Common and Distinct
Bg2	Olive Brown	Silty Clay Loam	Thin Platy	Firm	
Cg	Olive Gray	Silty Clay Loam	Medium Platy	Very Firm	

Soil Details

Soil Series/Phase Name: Scantic

Limiting Factor: 6 " Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☐ MWD ☐ SPD ☒ PD ☐ VPD

Slope: 2 Percent

Hydric Soil: ☐ No ☒ Yes

Hydrologic Soil Group:

Exploration Symbol # SS-14 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Weak Angular	Very Friable	
Bhs	Brown	F. Sandy Loam	Sub Ang Blocky	Friable	None Noted
R		LEDGE			

Soil Details

Soil Series/Phase Name: Lyman-Tunbridge

Limiting Factor: 18 " Depth ☐ Groundwater ☐ Restrictive Layer ☒ Bedrock

Drainage Class: ☐ ED ☐ SED ☒ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD

Slope: 3 Percent

Hydric Soil: ☒ No ☐ Yes

Hydrologic Soil Group:

Exploration Symbol # SS-15 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Fine Grandul	Friable	
Bh2	Brown	F. Sandy Loam	Weak Sub Ang Blocky	Friable	
Bs	Olive Brown	Silty Clay Loam	Thin Platy	Firm	Common and Distinct
Cd	Olive	Silty Clay Loam	Medium Platy	Very Firm	

Soil Details

Soil Series/Phase Name: Buxton

Limiting Factor: 16 " Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD

Slope: 6 Percent

Hydric Soil: ☒ No ☐ Yes

Hydrologic Soil Group:

Exploration Symbol # SS-16 ☐ Test Pit ☒ Boring ☐ Probe

_____ " Organic horizon thickness Ground surface elev. _____

_____ " Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Black	Silt Loam	Grand	Friable	
Bg1	Gray	Silt Loam	Fine Grandul	Friable	Common and Distinct
Bg2	Olive Brown	Silty Clay Loam	Thin Platy	Firm	
Cg	Olive Gray	Silty Clay Loam	Medium Platy	Very Firm	

Soil Details

Soil Series/Phase Name: Scantic

Limiting Factor: 6 " Depth ☒ Groundwater ☐ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☐ MWD ☐ SPD ☒ PD ☐ VPD

Slope: 2 Percent

Hydric Soil: ☐ No ☒ Yes

Hydrologic Soil Group:

SOIL SCIENTIST INFORMATION AND SIGNATURE

Signature

Mark J. Hampton

Name Printed

05/20/2024

Date

216

SS License No.

MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

affix professional seal

PAGE ____ OF ____

4434

FORM F (SS1) Rev. 7/21

SOIL PROFILE / CLASSIFICATION INFORMATION

SOIL SCIENTIST DESCRIPTION OF SOIL CONDITIONS AT PROJECT SITES

Project Name:	Applicant Name:	Project Location (municipality):
986 Portland Road	Cloverleaf Development LLC	Saco

Exploration Symbol # SS-17 ☐ Test Pit ☒ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox
Ap	Dark Brown	F. Sandy Loam	Grand	Very Friable	
Bhs	Brown	F. Sandy Loam	Weak Sub Ang Blocky	Friable	
Bs	Olive Brown	Silty Clay Loam	Thin Platy	Firm	Common and Distinct
Cd	Olive	Silty Clay Loam	Medium Platy	Very Firm	

Soil Details

Soil Series/Phase Name: Buxton

Limiting Factor: 15" Depth ☒ Groundwater ☒ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☒ MWD ☐ SPD ☐ PD ☐ VPD

Slope: 6 Percent

Hydric Soil: ☒ No ☐ Yes

Hydrologic Soil Group

Exploration Symbol # _____ ☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth: ☒ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox

Soil Details

Soil Series/Phase Name:

Limiting Factor: " Depth ☐ Groundwater ☐ Restrictive Layer ☒ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD

Slope: Percent

Hydric Soil: ☐ No ☐ Yes

Hydrologic Soil Group

Exploration Symbol # _____ ☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth: ☐ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox

Soil Details

Soil Series/Phase Name:

Limiting Factor: " Depth ☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD

Slope: Percent

Hydric Soil: ☐ No ☐ Yes

Hydrologic Soil Group

Exploration Symbol # _____ ☐ Test Pit ☐ Boring ☐ Probe

_____" Organic horizon thickness Ground surface elev. _____

_____" Depth: ☐ of exploration, or ☐ to refusal

Depth below mineral soil horizon (inches)

Horizon	Color	Texture	Structure	Consistence	Redox

Soil Details

Soil Series/Phase Name:

Limiting Factor: " Depth ☐ Groundwater ☐ Restrictive Layer ☐ Bedrock

Drainage Class: ☐ ED ☐ SED ☐ WD ☐ MWD ☐ SPD ☐ PD ☐ VPD

Slope: Percent

Hydric Soil: ☐ No ☐ Yes

Hydrologic Soil Group

SOIL SCIENTIST INFORMATION AND SIGNATURE

Signature

Mark J. Hampton

Name Printed

05/20/2024

Date

216

SS License No.

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

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Legend for Soil Maps

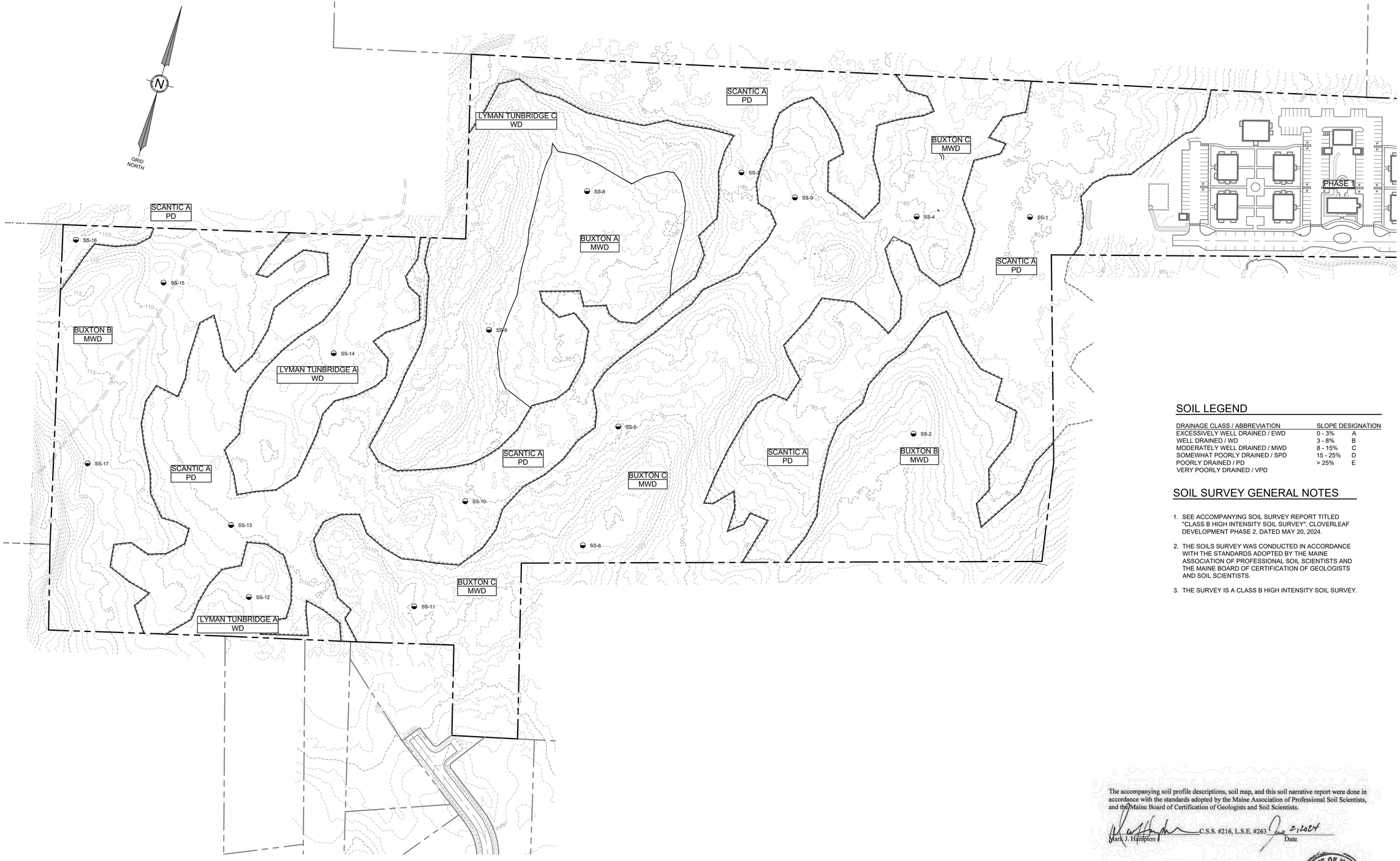
1. Drainage Class

Excessively Well Drained	EWD
Well Drained	WD
Moderately Well Drained	MWD
Somewhat Poorly Drained	SPD
Poorly Drained	PD
Very Poorly Drained	VPD

2. Slope Designation

0-3%	A
3-8%	B
8-15%	C
15-25%	D
>25%	E

3. Note: High Intensity Soil Survey has been prepared by Mark Hampton Associates, Inc. in accordance with the standards adopted by the Maine Association of Professional Soil Scientists, and the Maine Board of Certification of Geologists and Soil Scientists.



SOIL LEGEND

DRAINAGE CLASS / ABBREVIATION	SLOPE DESIGNATION	
EXCESSIVELY WELL DRAINED / EWD	0 - 3%	A
WELL DRAINED / WD	3 - 8%	B
MODERATELY WELL DRAINED / MWD	8 - 15%	C
SOMEWHAT POORLY DRAINED / SPD	15 - 25%	D
POORLY DRAINED / PD	> 25%	E
VERY POORLY DRAINED / VPD		

SOIL SURVEY GENERAL NOTES

1. SEE ACCOMPANYING SOIL SURVEY REPORT TITLED "CLASS B HIGH INTENSITY SOIL SURVEY", CLOVERLEAF DEVELOPMENT PHASE 2, DATED MAY 20, 2024.
2. THE SOILS SURVEY WAS CONDUCTED IN ACCORDANCE WITH THE STANDARDS ADOPTED BY THE MAINE ASSOCIATION OF PROFESSIONAL SOIL SCIENTISTS AND THE MAINE BOARD OF CERTIFICATION OF GEOLOGISTS AND SOIL SCIENTISTS.
3. THE SURVEY IS A CLASS B HIGH INTENSITY SOIL SURVEY.

The accompanying soil profile descriptions, soil map, and this soil narrative report were done in accordance with the standards adopted by the Maine Association of Professional Soil Scientists, and the Maine Board of Certification of Geologists and Soil Scientists.

Mark J. Hampton C.S.S. #216, L.S.E. #263 Date: June 3, 2024

STATE OF MAINE MARK J. HAMPTON #216 CERTIFIED SOIL SCIENTIST

DATE: 10-29-2024

NO.	DATE	REVISIONS
3	10-29-2024	SUBMITTED FOR PRELIMINARY REVIEW
2	08-13-2024	MDOT TMP SUBMISSION
1	04-30-2024	SKETCH PLAN SUBMISSION

ADDRESS: 41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260
PHONE: (207) 926-5111
WEB SITE: www.terradynconsultants.com
TERRADYN CONSULTANTS, LLC
Civil Engineering | Land Surveying | Geomatics
Stormwater Design | Land Planning | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: CLOVERLEAF DEVELOPMENT, PHASE 2
968 PORTLAND ROAD, SACO, MAINE

SHEET TITLE: CLASS B HIGH INTENSITY SOIL SURVEY

CLIENT: CLOVERLEAF DEVELOPMENT, LLC
P.O. BOX 6799
SCARBOROUGH, MAINE 04070

DATE:	01-30-2024
SCALE:	1" = 100'
JOB NO:	21-04.1
SHEET:	C-0.1

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STORMWATER MANAGEMENT PLAN

Clover Leaf Development – Phase 2
Saco, Maine

The following Stormwater Management Plan has been prepared for the Clover Leaf Multifamily Development to evaluate stormwater runoff and erosion control for the proposed second phase of development that includes 138 additional apartment units, an accessory solar array and a private way to access one single family residential lot. The property is located at 986 Portland Road in Saco, Maine.

Site Calculations

Total Property Area	65.8 Ac (+/-)
Total Project Impervious Area	9.85 Ac
Total Developed Area	16.87 Ac

Existing Conditions

The development parcel is located on the west side of Route 1 at 986 Portland Road, just north of the Aquaboggin Water Park. The first phase of development was recently constructed in the 10+/- acres closest to Portland Road. The remainder of the property is undeveloped.

Approximately 4 acres of the 65.8 acre property drain into the Route 1 drainage system. The remainder of the site drains to a central forested wetland system which flows north to Stuart Brook. Stuart Brook ultimately runs to the Scarborough River via Cascade Brook. Copies of the U.S.G.S. Quadrangle Map and an Aerial Map are attached to this submittal. The proposed development area is limited to approximately 10 acres that are located between Portland Road and the eastern edge of the onsite wetland system. The wetland area drains to the northern property line and leaves in two separate locations. These locations are modeled as Study Points #1 & #3 in this report. Study Point #2 represents the Portland Road drainage system.

Flooding

The development area is not located within an area of flood hazard according to the Federal Insurance Rate Map 230155 0045 D. See attached map.

Modeling Assumptions

The onsite stormwater facilities were sized utilizing the USDA Soil Conservation Service (SCS) TR-20 Runoff Simulation Model, as contained in the HydroCAD computer software program (Version 9.0). Runoff curve numbers were determined for each direct watershed by measuring the area of

each hydrologic soil group within each type of land cover. Weighted curve numbers were then calculated using curve numbers for various cover types and hydrologic soil groups, assuming "good" conditions as defined in U.S Soil Conservation Service (SCS) publications. Times of concentration and travel times were determined from site topographic maps in accordance with SCS procedures. A maximum length of 150 feet was used for sheet flow.

All of the watersheds' peak runoff rates were analyzed for the 2, 10, and 25-year frequency, 24-hour duration storm events. A Type III rainfall distribution was applied to these storms. The rainfall amounts for York County are as follows:

Storm Frequency Precipitation (in./24 hr)	
2-year	3.3
10-year	4.9
25-year	6.2
50-year	7.3

Onsite Soils

The soils were delineated by Mark Hampton of Mark Hampton Associates. His Class B High Intensity Soil Survey is attached to this submission. Offsite soils were determined from the NRCS Web Soil Mapper. See attached NRCS Soils Map.

Water Quantity (Flooding Standard)

The following table summarizes the results of stormwater calculations for the design storm events for the project areas. Calculations and computer modeling sheets are provided with this report.

Table 1 - Stormwater Runoff Summary Table
Pre-Development vs. Post-Development

Study Point #	2Yr/24Hr (cfs)		10Yr/24Hr (cfs)		25Yr/24Hr (cfs)		50Yr/24Hr (cfs)	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
1	22.1	21.2	47.0	46.9	69.1	69.0	88.5	87.7
2	0.0	0.0	0.2	0.1	0.9	0.4	2.1	0.8
3	18.4	16.9	52.1	48.1	85.8	79.7	117.3	109.2

As the above result table shows, the post-development flow rates for the 2, 10, 25 and 50-year/24 hour design storm events do not exceed the pre-development conditions.

Basic Standards

A site-specific Erosion & Sedimentation Control Plan has been developed for the project. Means and methods to control erosion and sedimentation during and after construction are detailed in the erosion control plan narrative and construction details, which are included directly on the project drawings for ease of reference during construction.

Requirements for inspection and maintenance of the stormwater management system are provided in the stormwater management system inspection and maintenance plan are attached.

Housekeeping requirements are included in the Erosion & Sediment Control Narrative located on the project drawings. Draft buffer deed restrictions are attached.

General Standards

The General Standard requires that a project's stormwater management system includes measures that will provide pollutant removal from runoff and mitigate for the increased frequency of channels erosive flows due to runoff from smaller storms and potential temperature impacts.

Best Management Practices (BMPs) will be implemented to reduce the impacts of site development on downstream water quality. The property is located in the Scarborough River Watershed via Stuart Brook and Cascade Brook. BMP sizing calculations are shown below.

Water Quality (BMP Standard)

The water quality requirements will be met with the construction of a gravel wetland, filter basin, level spreader/forested buffers & various roadside buffers.

New Impervious Area: The project will result in the creation of approximately 429,219 SF of new impervious area. This figure includes:

- 173,523 SF of impervious area that was previously permitted in Phase 1
- 202,669 SF of landscaped area that is included in Phase 2
- 8,984 SF of impervious area that is exempt since its over wetland areas.
- 34,380 SF of impervious that is part of the assumed commercial development to be located on the outparcel that's adjacent to Route 1.
- After subtracting the exemptions, the total impervious area used in the treatment calculations is 420,235 SF

The proposed BMPs will result in the treatment of approximately 404,258 Sf of new impervious area resulting in a treatment percentage of 96.2%. (404,258/420,235)x100%

Percentage of Treatment of the Impervious Area =96.2% (95% req'd)

Project Developed Area: The project will result in the creation of approximately 734,967 SF of developed area. This figure includes:

- 307,870 SF of developed area that was previously permitted in Phase 1
- 446,889 SF of developed area that is included in Phase 2.
- 14,332 SF of developed area that is exempt since its over wetland areas.
- 34,380 SF of impervious area and 11,460 SF of lawn area from the assumed future development to be located along Portland Road.
- After subtracting the exemptions, the total developed area used in the treatment calculations is 720,635 SF

The proposed BMPs will result in the treatment of approximately 601,734 SF of the developed area resulting in a treatment percentage of 83.5% (601,734/720,635) x 100%.

Percentage of Treatment of the Developed Area = 83.5% (80% required)

Housekeeping and Maintenance & Inspection guidelines are attached to this report.

BMP Sizing

Roof Dripline Filter Bed
We propose to provide treatment for the roof runoff for each of the proposed apartment buildings. The bed is required to provide volume for 1" of runoff from the contributing area and store it within a reservoir bed. The bed sizing is as follows:

Building 1 (rear half)
Area of Watershed: = 2,160 SF
Treatment Volume Required: Area x runoff depth: 2.160 SF x 1/12 FT = 180 CF
Bed Sizing:
Porosity = 40% Bed Length = 120' Bed Width = 3' Bed Depth = 2.0
Available Volume= 120' x 3' x 2' x 0.40 = 288 CF.

Buildings 2, 3, 7, 8 & 9 (rear half of each)
Area of Watershed: = 1,528 SF
Treatment Volume Required: Area x runoff depth: 1,528 SF x 1/12 FT = 127 CF
Bed Sizing:
Porosity = 40% Bed Length = 62.5' Bed Width = 3' Bed Depth = 2.0
Available Volume= 62.5' x 3' x 2' x 0.40 = 187.5 CF.

The design is adequate since the available volume exceeds the required volume. The filter strips meet the standard sizing criteria and will have a corresponding treatment factor of 0.4.

Filter Basin

STAGE (FT)	AREA (SF)	STORAGE (CF)
96.2	2140	0
97	2576	1886
97.6	2903	3530
98	3120	4734
98.5	3393	6363
99	3665	8127

WATERSHED IMPERVIOUS AREA=	34736	SF
WATERSHED LANDSCAPED AREA=	8969	SF
REQUIRED WATER QUALITY VOLUME=	3194	CF
PROVIDED WATER QUALITY VOLUME=	3530	CF
REQUIRED MINIMUM SURFACE AREA=	1916	SF
PROVIDED MINIMUM SURFACE AREA=	2140	SF

The required water quality volume was calculated by multiplying the impervious area by 1.0" and the landscaped area by 0.4". The minimum surface area is 5% of the impervious area + 2% of the landscaped area.

Gravel Wetland

Forebay

STAGE (FT)	AREA (SF)	STORAGE (CF)
83	640	0
84	1120	880
84.5	1360	1500

Cell #1

STAGE (FT)	AREA (SF)	STORAGE (CF)
83	2800	0
84	3467	3133
84.5	3800	4950

Cell #2

STAGE (FT)	AREA (SF)	STORAGE (CF)
83	2800	0
84	3467	3133
84.5	3800	4950

Total Pond

STAGE (FT)	AREA (SF)	STORAGE (CF)
83	6240	0
84	8053	7147
84.5	8960	11400
84.51	9500	11400
87	12662	38220

WATERSHED IMPERVIOUS AREA=	117899	SF
WATERSHED LANDSCAPED AREA=	35423	SF
REQUIRED WATER QUALITY VOLUME=	11006	CF
PROVIDED WATER QUALITY VOLUME=	11400	CF

The required water quality volume was calculated by multiplying the impervious area by 1.0" and the landscaped area by 0.4".

Level Spreader #2 (near Building 1)

The buffer contains soils that are consistent with Soil Group C. *Table 5.5 – Berm and Flow Path Length per Acre of Impervious Area* of the BMP manual shows that standard sizing for a 75' flow path at 8% max slope requires that the berm length for a forested buffer must be 125' per acre of

impervious area and 35' per acre of lawn. Evaluation of the watershed shows that it contains the following:

Impervious area = 0.27 Ac (11,828 SF)
Lawn area = 0.17 Ac (7,435 SF)

Standard sizing: 125(0.27) + 35(0.17) = 33.8' + 6.0' = 39.8'
Proposed Length: 40'

Level Spreader #3 (Gravel Wetland #2 Outlet)

This level spreader is not for water quality credit. Its purpose is to ensure that the pond outlet waters flow into the neighboring wetlands in a non-erosive manner. We used the SCS methodology of a maximum flow rate of 0.25 cfs/foot for the 10 year/24 hour storm. According to the HydroCad, the 10 year flow rate of the pond outlet is 5.93 cfs.

Standard sizing: 5.93 cfs/0.25 cfs/foot=23.72'
Proposed Length: 25'

Level Spreader #4 (Start of Emergency Access)

This level spreader is not for water quality credit. Its purpose is to ensure that the pond outlet waters flow into the neighboring wetlands in a non-erosive manner. This level spreader handles runoff from a small offsite watershed. We use a minimum size of 20'.

Level Spreader #5

The buffer contains soils that are consistent with Soil Group C. *Table 5.5 – Berm and Flow Path Length per Acre of Impervious Area* of the BMP manual shows that standard sizing for a75 flow path at 8% max slope requires that the berm length for a forested buffer must be 125' per acre of impervious area and 35' per acre of lawn. Evaluation of the watershed shows that it contains the following:

Impervious area = 0.203 Ac (8,842 SF)
Lawn area = 0.354 Ac (15,423 SF)

Standard sizing: 125(0.203) + 35(0.354) = 25.4' + 12.4' = 37.8'
Proposed Length: 40'

Level Spreader #6

The buffer contains soils that are consistent with Soil Group C. *Table 5.5 – Berm and Flow Path Length per Acre of Impervious Area* of the BMP manual shows that standard sizing for a75 flow path at 8% max slope requires that the berm length for a forested buffer must be 125' per acre of impervious area and 35' per acre of lawn. Evaluation of the watershed shows that it contains the following:

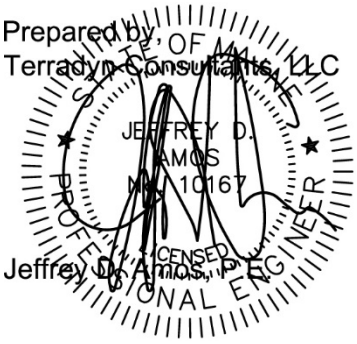
Impervious area = 0.291 Ac (12,696 SF)
Lawn area = 0.028 Ac (1,226 SF)

Standard sizing: 125(0.291) + 35(0.028) = 36.4' + 1.0 = 37.4'
Proposed Length: 40'

Summary

Based on the results of this evaluation, the proposed stormwater design is not expected to cause flooding, erosion or other significant adverse effects downstream of the site.

Prepared by,
Terradyn Consultants, LLC



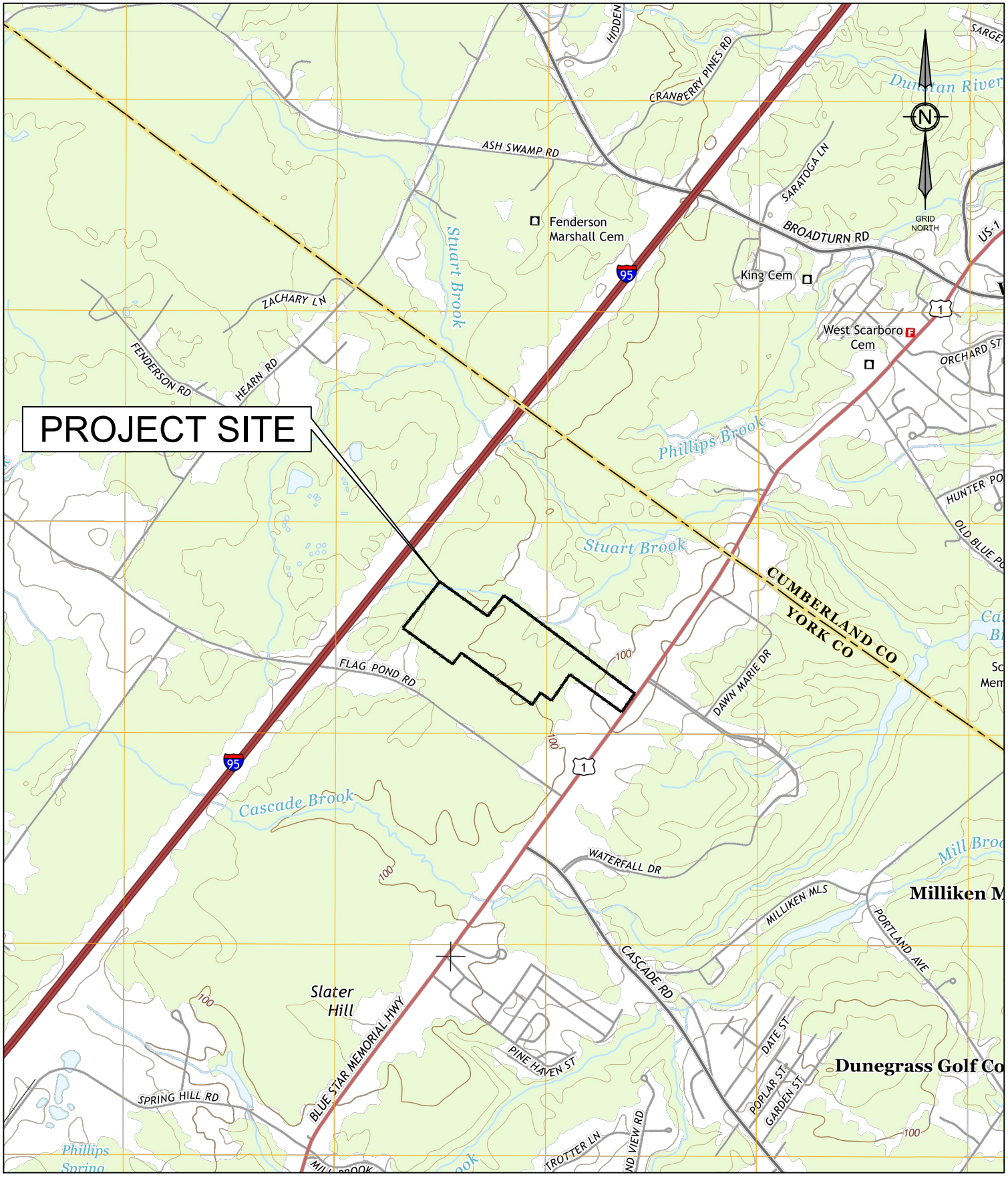
Jeffrey D. Amos, P.E.

Attached:

Site Figures:

- USGS Quadrangle Map
- Aerial Photo
- Medium Intensity Soil Map
- FEMA Floodmap

Pre Development Hydrocad Calculations
Post Development Hydrocad Calculations
Pond Spillway Check – 25 Year
Pond Spillway Check – 100 Year
Pipe Sizing Calculations
Maintenance & Inspection of Stormwater Facilities
Housekeeping Plan
Draft Buffer Deeds
Pre Development Watershed Maps
Post Development Watershed Maps
Stormwater Treatment Map



U.S.G.S. QUADRANGLE MAP	TERRADYN CONSULTANTS, LLC	PROJECT NO. 21-04	SHEET 1
PROJECT: CLOVER LEAF DEVELOPMENT 986 PORTLAND ROAD, SACO ME	PINELAND 41 CAMPUS DRIVE, SUITE 101 NEW GLOUCESTER, ME 04260	DATE 2/9/2021	OF 1
PREPARED FOR: CLOVER LEAF DEVELOPMENT, LLC	PORTLAND 565 CONGRESS STREET, SUITE 201 PORTLAND, ME 04101	SCALE 1"=2,000'	
	207.926.5111 • info@terradynconsultants.com • www.terradynconsultants.com		

AERIAL MAP

PROJECT:
CLOVER LEAF DEVELOPMENT
986 PORTLAND ROAD, SACO, ME

PREPARED FOR:
CLOVER LEAF DEVELOPMENT, LLC

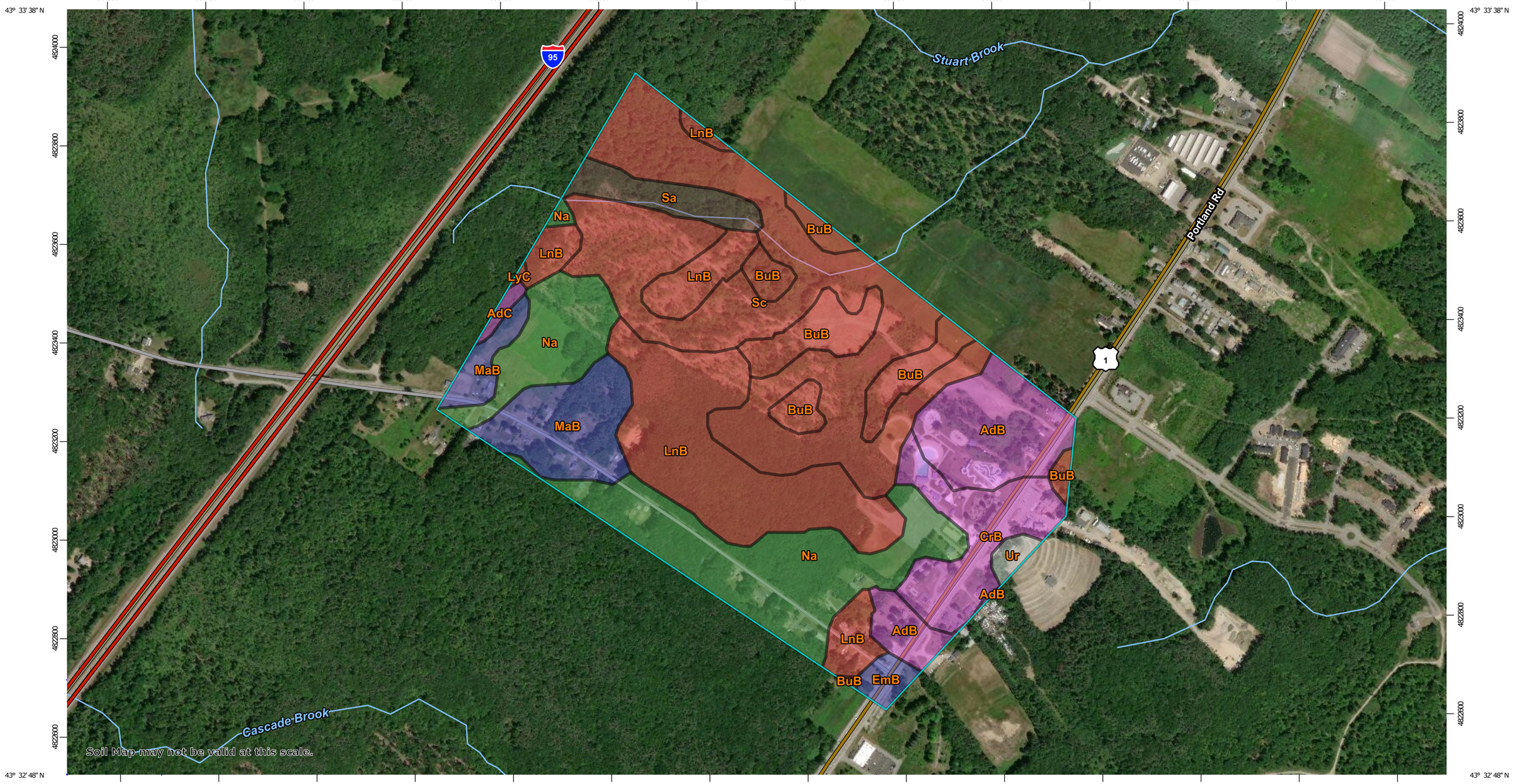
TERRADYN CONSULTANTS, LLC

PINELAND
41 CAMPUS DRIVE, SUITE 101
NEW GLOUCESTER, ME 04260

PORTLAND
565 CONGRESS STREET, SUITE 201
PORTLAND, ME 04101

207.926.5111 • info@terradynconsultants.com • www.terradynconsultants.com

PROJECT NO.	SHEET
2104	2
DATE	OF
2/9/2021	4
SCALE	
1"=500'	



Map Scale: 1:7,560 if printed on B landscape (17" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

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

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

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

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

Soil Survey Area: York County, Maine
Survey Area Data: Version 19, May 29, 2020

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

Date(s) aerial images were photographed: Dec 31, 2009—Sep 9, 2017

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

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AdB	Adams loamy sand, 0 to 8 percent slopes	A	18.7	8.7%
AdC	Adams loamy sand, 8 to 15 percent slopes	A	0.8	0.4%
BuB	Buxton silt loam, 3 to 8 percent slopes	D	16.7	7.8%
CrB	Croghan loamy fine sand, 0 to 8 percent slopes, wooded	A	14.1	6.5%
EmB	Elmwood fine sandy loam, 0 to 8 percent slopes	B	2.2	1.0%
LnB	Lyman loam, 3 to 8 percent slopes, rocky	D	40.6	18.8%
LyC	Lyman-Rock outcrop complex, 8 to 15 percent slopes	D	0.2	0.1%
MaB	Madawaska fine sandy loam, 0 to 8 percent slopes	B	16.3	7.6%
Na	Naumburg sand	A/D	39.6	18.4%
Sa	Saco mucky silt loam	B/D	6.2	2.9%
Sc	Scantic silt loam, 0 to 3 percent slopes	D	58.6	27.2%
Ur	Urban land		1.4	0.6%
Totals for Area of Interest			**215.4**	**100.0%**

Description

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

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

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

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

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

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

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

Rating Options

Aggregation Method: Dominant Condition

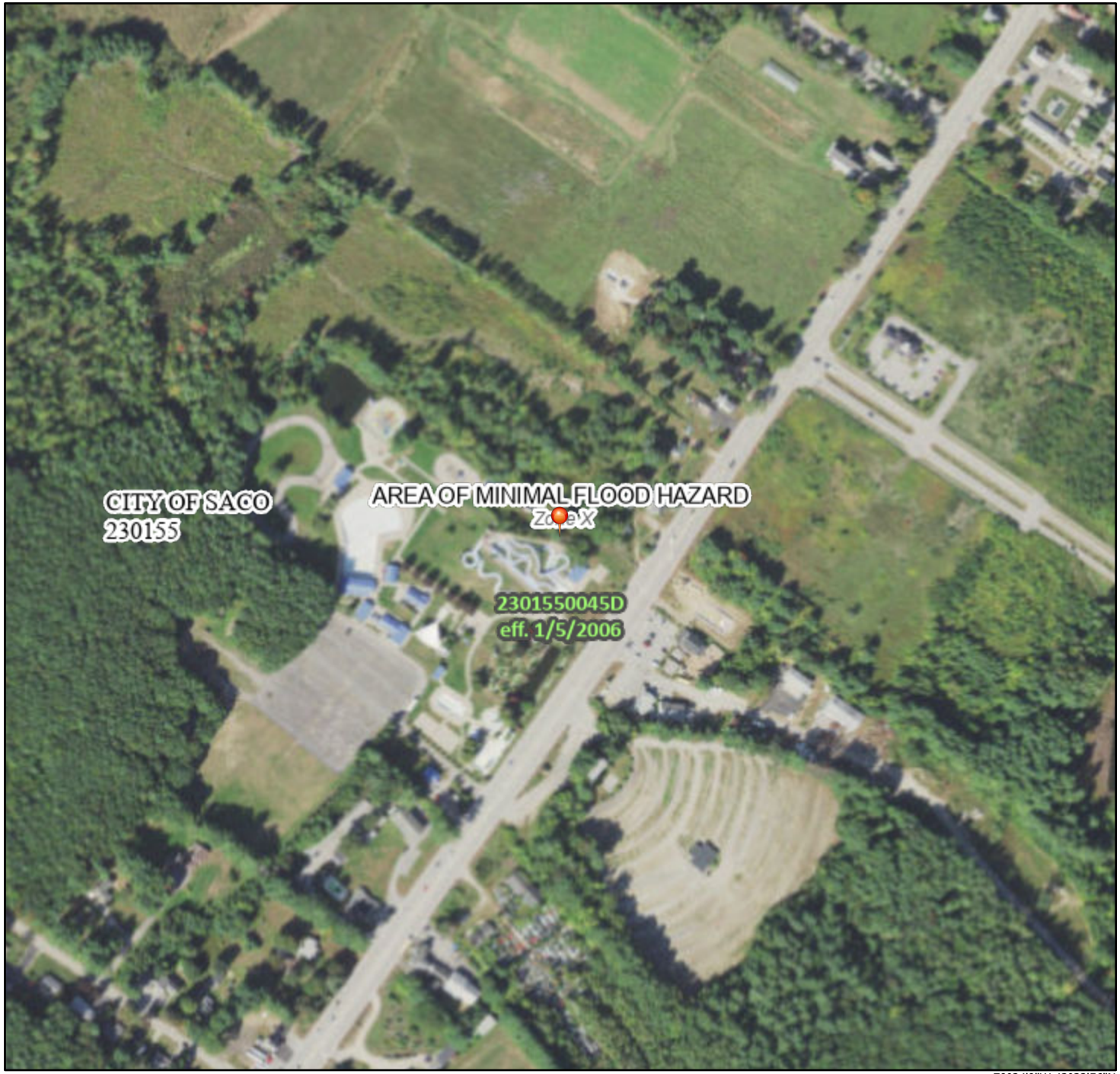
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

National Flood Hazard Layer FIRMette

FEMA

70°24'46"W 43°33'22"N



70°24'9"W 43°32'56"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

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

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

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

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

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 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

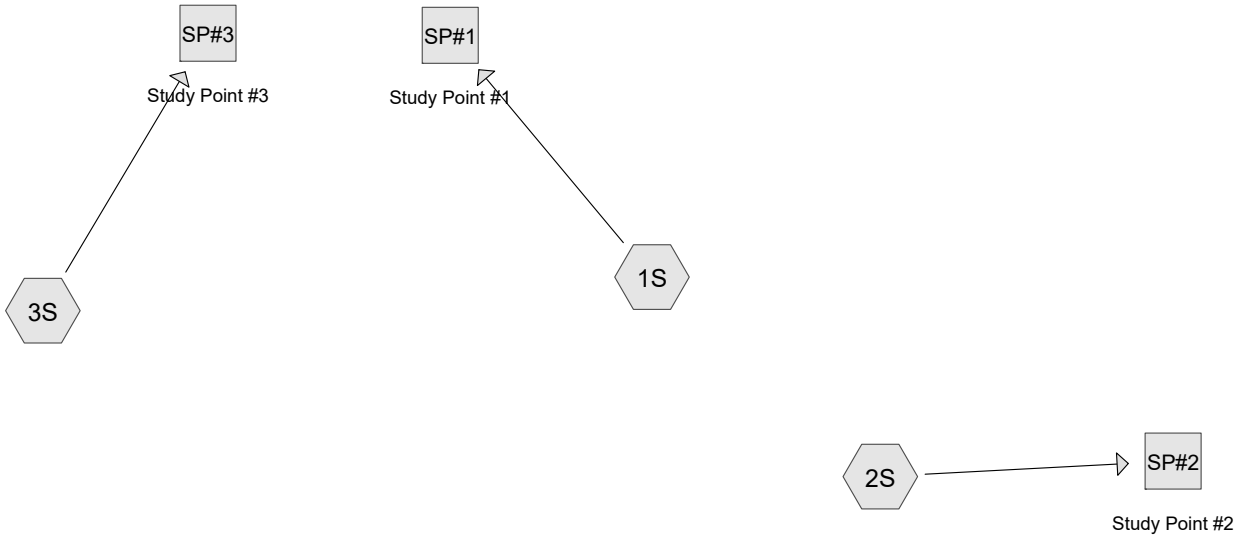
N

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 6/15/2021 at 7:13 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.



Subcat Reach Pond Link

Routing Diagram for 2104.1 Pre
Prepared by Terradyn Consultants, LLC, Printed 9/27/2024

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

Subcatchment 1S: Runoff Area=70.140 ac 1.33% Impervious Runoff Depth>1.00"
Flow Length=2,230' Tc=124.9 min CN=75 Runoff=22.06 cfs 5.855 af

Subcatchment 2S: Runoff Area=4.650 ac 8.60% Impervious Runoff Depth>0.00"
Flow Length=150' Slope=0.0100 '/' Tc=25.6 min CN=40 Runoff=0.00 cfs 0.001 af

Subcatchment 3S: Runoff Area=179.120 ac 5.70% Impervious Runoff Depth>0.46"
Flow Length=5,280' Tc=193.5 min CN=64 Runoff=18.40 cfs 6.880 af

Reach SP#1: Study Point #1 Inflow=22.06 cfs 5.855 af
Outflow=22.06 cfs 5.855 af

Reach SP#2: Study Point #2 Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af

Reach SP#3: Study Point #3 Inflow=18.40 cfs 6.880 af
Outflow=18.40 cfs 6.880 af

Total Runoff Area = 253.910 ac Runoff Volume = 12.735 af Average Runoff Depth = 0.60"
95.45% Pervious = 242.365 ac 4.55% Impervious = 11.545 ac

Summary for Subcatchment 1S:

Runoff = 22.06 cfs @ 13.75 hrs, Volume= 5.855 af, Depth> 1.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (ac)	CN	Description
	0.860	92	Paved roads w/open ditches, 50% imp, HSG C
*	0.500	98	Impervious Area
	1.000	80	>75% Grass cover, Good, HSG D
	12.740	70	Woods, Good, HSG C
	49.750	77	Woods, Good, HSG D
	1.250	39	Pasture/grassland/range, Good, HSG A
	4.040	74	Pasture/grassland/range, Good, HSG C
	70.140	75	Weighted Average
	69.210		98.67% Pervious Area
	0.930		1.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
7.9	410	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.8	970	0.0370	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.0	700	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
124.9	2,230	Total			

Summary for Subcatchment 2S:

[73] Warning: Peak may fall outside time span

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

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (ac)	CN	Description
	0.300	92	Paved roads w/open ditches, 50% imp, HSG C
*	0.250	98	Impervious Area
	0.500	39	>75% Grass cover, Good, HSG A
	0.500	39	Pasture/grassland/range, Good, HSG A
	3.100	30	Woods, Good, HSG A
	4.650	40	Weighted Average
	4.250		91.40% Pervious Area
	0.400		8.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	150	0.0100	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"

Summary for Subcatchment 3S:

Runoff = 18.40 cfs @ 15.05 hrs, Volume= 6.880 af, Depth> 0.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (ac)	CN	Description
*	12.380	77	On-Property Wetlands
*	26.460	70	On-Property Upplands HSG C
	7.940	83	Paved roads w/open ditches, 50% imp, HSG A
	6.340	89	Paved roads w/open ditches, 50% imp, HSG B
	1.590	93	Paved roads w/open ditches, 50% imp, HSG D
	1.120	54	1/2 acre lots, 25% imp, HSG A
	8.000	70	1/2 acre lots, 25% imp, HSG B
	6.500	39	Pasture/grassland/range, Good, HSG A
	37.080	30	Woods, Good, HSG A
	13.050	55	Woods, Good, HSG B
	58.660	77	Woods, Good, HSG D
	179.120	64	Weighted Average
	168.905		94.30% Pervious Area
	10.215		5.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
82.4	150	0.0060	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
54.8	1,560	0.0090	0.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
32.3	750	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	150	0.0100	12.38	155.61	**Pipe Channel,** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.012
17.0	720	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	1,950	0.0130	4.79	68.23	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=1.50' Z= 3.0 '/' Top.W=14.00' n= 0.035
193.5	5,280	Total			

Summary for Reach SP#1: Study Point #1

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

Inflow Area = 70.140 ac, 1.33% Impervious, Inflow Depth > 1.00" for 2-YEAR event
Inflow = 22.06 cfs @ 13.75 hrs, Volume= 5.855 af
Outflow = 22.06 cfs @ 13.75 hrs, Volume= 5.855 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP#2: Study Point #2

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

Inflow Area = 4.650 ac, 8.60% Impervious, Inflow Depth > 0.00" for 2-YEAR event
Inflow = 0.00 cfs @ 20.00 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 20.00 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP#3: Study Point #3

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

Inflow Area = 179.120 ac, 5.70% Impervious, Inflow Depth > 0.46" for 2-YEAR event
Inflow = 18.40 cfs @ 15.05 hrs, Volume= 6.880 af
Outflow = 18.40 cfs @ 15.05 hrs, Volume= 6.880 af, Atten= 0%, Lag= 0.0 min

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

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

Subcatchment 1S: Runoff Area=70.140 ac 1.33% Impervious Runoff Depth>2.09"
Flow Length=2,230' Tc=124.9 min CN=75 Runoff=46.97 cfs 12.200 af

Subcatchment 2S: Runoff Area=4.650 ac 8.60% Impervious Runoff Depth>0.17"
Flow Length=150' Slope=0.0100 '/' Tc=25.6 min CN=40 Runoff=0.16 cfs 0.064 af

Subcatchment 3S: Runoff Area=179.120 ac 5.70% Impervious Runoff Depth>1.22"
Flow Length=5,280' Tc=193.5 min CN=64 Runoff=52.11 cfs 18.195 af

Reach SP#1: Study Point #1 Inflow=46.97 cfs 12.200 af
Outflow=46.97 cfs 12.200 af

Reach SP#2: Study Point #2 Inflow=0.16 cfs 0.064 af
Outflow=0.16 cfs 0.064 af

Reach SP#3: Study Point #3 Inflow=52.11 cfs 18.195 af
Outflow=52.11 cfs 18.195 af

Total Runoff Area = 253.910 ac Runoff Volume = 30.459 af Average Runoff Depth = 1.44"
95.45% Pervious = 242.365 ac 4.55% Impervious = 11.545 ac

Summary for Subcatchment 1S:

Runoff = 46.97 cfs @ 13.73 hrs, Volume= 12.200 af, Depth> 2.09"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=4.90"

	Area (ac)	CN	Description
	0.860	92	Paved roads w/open ditches, 50% imp, HSG C
*	0.500	98	Impervious Area
	1.000	80	>75% Grass cover, Good, HSG D
	12.740	70	Woods, Good, HSG C
	49.750	77	Woods, Good, HSG D
	1.250	39	Pasture/grassland/range, Good, HSG A
	4.040	74	Pasture/grassland/range, Good, HSG C
	70.140	75	Weighted Average
	69.210		98.67% Pervious Area
	0.930		1.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
7.9	410	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.8	970	0.0370	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
33.0	700	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
124.9	2,230	Total			

Summary for Subcatchment 2S:

Runoff = 0.16 cfs @ 12.87 hrs, Volume= 0.064 af, Depth> 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=4.90"

	Area (ac)	CN	Description
	0.300	92	Paved roads w/open ditches, 50% imp, HSG C
*	0.250	98	Impervious Area
	0.500	39	>75% Grass cover, Good, HSG A
	0.500	39	Pasture/grassland/range, Good, HSG A
	3.100	30	Woods, Good, HSG A
	4.650	40	Weighted Average
	4.250		91.40% Pervious Area
	0.400		8.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	150	0.0100	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"

Summary for Subcatchment 3S:

Runoff = 52.11 cfs @ 14.83 hrs, Volume= 18.195 af, Depth> 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-YEAR Rainfall=4.90"

	Area (ac)	CN	Description
*	12.380	77	On-Property Wetlands
*	26.460	70	On-Property Upplands HSG C
	7.940	83	Paved roads w/open ditches, 50% imp, HSG A
	6.340	89	Paved roads w/open ditches, 50% imp, HSG B
	1.590	93	Paved roads w/open ditches, 50% imp, HSG D
	1.120	54	1/2 acre lots, 25% imp, HSG A
	8.000	70	1/2 acre lots, 25% imp, HSG B
	6.500	39	Pasture/grassland/range, Good, HSG A
	37.080	30	Woods, Good, HSG A
	13.050	55	Woods, Good, HSG B
	58.660	77	Woods, Good, HSG D
	179.120	64	Weighted Average
	168.905		94.30% Pervious Area
	10.215		5.70% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
82.4	150	0.0060	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
54.8	1,560	0.0090	0.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
32.3	750	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	150	0.0100	12.38	155.61	**Pipe Channel,** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.012
17.0	720	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	1,950	0.0130	4.79	68.23	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=1.50' Z= 3.0 '/' Top.W=14.00' n= 0.035
193.5	5,280	Total			

Summary for Reach SP#1: Study Point #1

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

Inflow Area = 70.140 ac, 1.33% Impervious, Inflow Depth > 2.09" for 10-YEAR event
Inflow = 46.97 cfs @ 13.73 hrs, Volume= 12.200 af
Outflow = 46.97 cfs @ 13.73 hrs, Volume= 12.200 af, Atten= 0%, Lag= 0.0 min

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

Summary for Reach SP#2: Study Point #2

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

Inflow Area = 4.650 ac, 8.60% Impervious, Inflow Depth > 0.17" for 10-YEAR event
Inflow = 0.16 cfs @ 12.87 hrs, Volume= 0.064 af
Outflow = 0.16 cfs @ 12.87 hrs, Volume= 0.064 af, Atten= 0%, Lag= 0.0 min

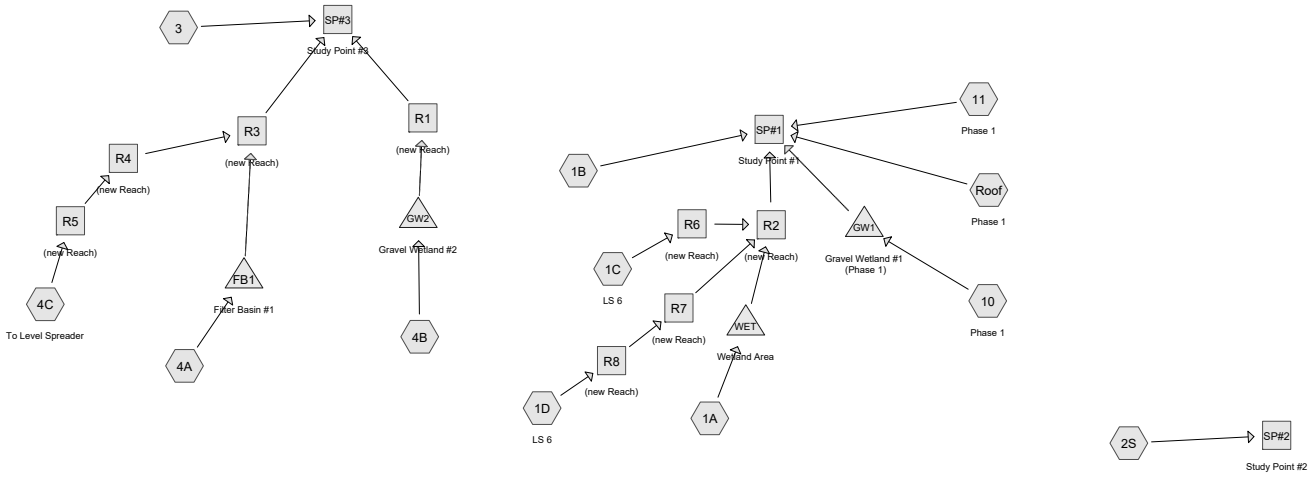
Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach SP#3: Study Point #3

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

Inflow Area = 179.120 ac, 5.70% Impervious, Inflow Depth > 1.22" for 10-YEAR event
Inflow = 52.11 cfs @ 14.83 hrs, Volume= 18.195 af
Outflow = 52.11 cfs @ 14.83 hrs, Volume= 18.195 af, Atten= 0%, Lag= 0.0 min

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



Subcat Reach Pond Link

Routing Diagram for 2104.1 Post
Prepared by Terradyn Consultants, LLC, Printed 10/27/2024

2104.1 Post

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1A	0.00	0.00	50.0	0.0050	0.035	36.0	0.0	12.0
2	3	0.00	0.00	150.0	0.0100	0.012	48.0	0.0	0.0
3	4B	0.00	0.00	800.0	0.0200	0.012	18.0	0.0	0.0
4	10	0.00	0.00	800.0	0.0200	0.012	18.0	0.0	0.0
5	FB1	94.20	93.39	160.0	0.0051	0.012	6.0	0.0	0.0
6	GW1	80.67	80.50	25.0	0.0068	0.012	15.0	0.0	0.0
7	GW1	78.25	78.25	100.0	0.0000	0.012	6.0	0.0	0.0
8	GW2	82.67	82.50	25.0	0.0068	0.012	15.0	0.0	0.0
9	GW2	80.25	80.25	100.0	0.0000	0.012	6.0	0.0	0.0
10	WET	79.50	79.30	60.0	0.0033	0.035	48.0	0.0	12.0

Time span=2.00-36.00 hrs, dt=0.05 hrs, 681 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Runoff Area=65.123 ac 1.33% Impervious Runoff Depth=1.16"
Flow Length=1,580' Tc=92.3 min CN=75 Runoff=25.13 cfs 6.307 af

Subcatchment 1B: Runoff Area=4.000 ac 7.25% Impervious Runoff Depth=1.28"
Flow Length=380' Tc=46.1 min CN=77 Runoff=2.68 cfs 0.428 af

Subcatchment 1C: LS 6 Runoff Area=22,621 sf 67.13% Impervious Runoff Depth=2.26"
Tc=6.0 min CN=90 Runoff=1.33 cfs 0.098 af

Subcatchment 1D: LS 6 Runoff Area=22,621 sf 67.13% Impervious Runoff Depth=2.26"
Tc=6.0 min CN=90 Runoff=1.33 cfs 0.098 af

Subcatchment 2S: Runoff Area=1.767 ac 8.60% Impervious Runoff Depth=0.01"
Flow Length=150' Slope=0.0100 '/' Tc=25.6 min CN=40 Runoff=0.00 cfs 0.001 af

Subcatchment 3: Runoff Area=169.363 ac 6.44% Impervious Runoff Depth=0.56"
Flow Length=5,280' Tc=193.5 min CN=63 Runoff=15.90 cfs 7.971 af

Subcatchment 4A: Runoff Area=50,131 sf 69.29% Impervious Runoff Depth=2.35"
Tc=6.0 min CN=91 Runoff=3.05 cfs 0.226 af

Subcatchment 4B: Runoff Area=163,322 sf 72.19% Impervious Runoff Depth=2.35"
Flow Length=920' Tc=14.4 min CN=91 Runoff=7.79 cfs 0.735 af

Subcatchment 4C: To Level Spreader Runoff Area=33,136 sf 26.68% Impervious Runoff Depth=1.41"
Tc=6.0 min CN=79 Runoff=1.22 cfs 0.090 af

Subcatchment 10: Phase 1 Runoff Area=227,876 sf 54.25% Impervious Runoff Depth=1.28"
Flow Length=920' Tc=14.4 min CN=77 Runoff=5.86 cfs 0.560 af

Subcatchment 11: Phase 1 Runoff Area=39,446 sf 35.93% Impervious Runoff Depth=1.62"
Flow Length=480' Tc=50.9 min CN=82 Runoff=0.74 cfs 0.122 af

Subcatchment Roof: Phase 1 Runoff Area=35,726 sf 100.00% Impervious Runoff Depth>3.07"
Tc=5.0 min CN=98 Runoff=2.65 cfs 0.209 af

Reach R1: (new Reach) Avg. Flow Depth=0.19' Max Vel=0.14 fps Inflow=3.72 cfs 0.504 af
n=0.400 L=160.0' S=0.0125 '/' Capacity=86.45 cfs Outflow=2.60 cfs 0.498 af

Reach R2: (new Reach) Avg. Flow Depth=0.52' Max Vel=0.36 fps Inflow=20.56 cfs 6.298 af
n=0.150 L=380.0' S=0.0034 '/' Capacity=295.04 cfs Outflow=19.89 cfs 6.293 af

Reach R3: (new Reach) Avg. Flow Depth=0.06' Max Vel=0.28 fps Inflow=1.66 cfs 0.289 af
n=0.100 L=820.0' S=0.0159 '/' Capacity=30.57 cfs Outflow=0.85 cfs 0.276 af

Reach R4: (new Reach) Avg. Flow Depth=0.14' Max Vel=0.49 fps Inflow=1.10 cfs 0.090 af
n=0.100 L=390.0' S=0.0179 '/' Capacity=7.75 cfs Outflow=0.76 cfs 0.090 af

Reach R5: (new Reach) Avg. Flow Depth=0.11' Max Vel=0.25 fps Inflow=1.22 cfs 0.090 af
n=0.400 L=54.0' S=0.0926 '/' Capacity=14.93 cfs Outflow=1.10 cfs 0.090 af

Reach R6: (new Reach) Avg. Flow Depth=0.15' Max Vel=0.17 fps Inflow=1.33 cfs 0.098 af
n=0.400 L=75.0' S=0.0267 '/' Capacity=8.01 cfs Outflow=1.05 cfs 0.098 af

Reach R7: (new Reach) Avg. Flow Depth=0.05' Max Vel=0.19 fps Inflow=1.03 cfs 0.098 af
n=0.150 L=690.0' S=0.0188 '/' Capacity=17.95 cfs Outflow=0.41 cfs 0.097 af

Reach R8: (new Reach) Avg. Flow Depth=0.13' Max Vel=0.19 fps Inflow=1.33 cfs 0.098 af
n=0.400 L=100.0' S=0.0400 '/' Capacity=9.81 cfs Outflow=1.03 cfs 0.098 af

Reach SP#1: Study Point #1 Inflow=21.24 cfs 7.336 af
Outflow=21.24 cfs 7.336 af

Reach SP#2: Study Point #2 Inflow=0.00 cfs 0.001 af
Outflow=0.00 cfs 0.001 af

Reach SP#3: Study Point #3 Inflow=16.93 cfs 8.745 af
Outflow=16.93 cfs 8.745 af

Pond FB1: Filter Basin #1 Peak Elev=97.72' Storage=3,888 cf Inflow=3.05 cfs 0.226 af
Primary=0.05 cfs 0.119 af Secondary=1.40 cfs 0.081 af Outflow=1.45 cfs 0.199 af

Pond GW1: Gravel Wetland #1 (Phase 1) Peak Elev=82.61' Storage=14,559 cf Inflow=5.86 cfs 0.560 af
Primary=0.55 cfs 0.284 af Secondary=0.00 cfs 0.000 af Outflow=0.55 cfs 0.284 af

Pond GW2: Gravel Wetland #2 Peak Elev=84.83' Storage=14,568 cf Inflow=7.79 cfs 0.735 af
Primary=3.72 cfs 0.504 af Secondary=0.00 cfs 0.000 af Outflow=3.72 cfs 0.504 af

Pond WET: Wetland Area Peak Elev=81.57' Storage=51,624 cf Inflow=25.13 cfs 6.307 af
48.0" Round Culvert w/ 12.0" inside fill x 3.00 n=0.035 L=60.0' S=0.0033 '/' Outflow=20.06 cfs 6.103 af

Total Runoff Area = 253.910 ac Runoff Volume = 16.844 af Average Runoff Depth = 0.80"
91.88% Pervious = 233.302 ac 8.12% Impervious = 20.608 ac

Summary for Subcatchment 1A:

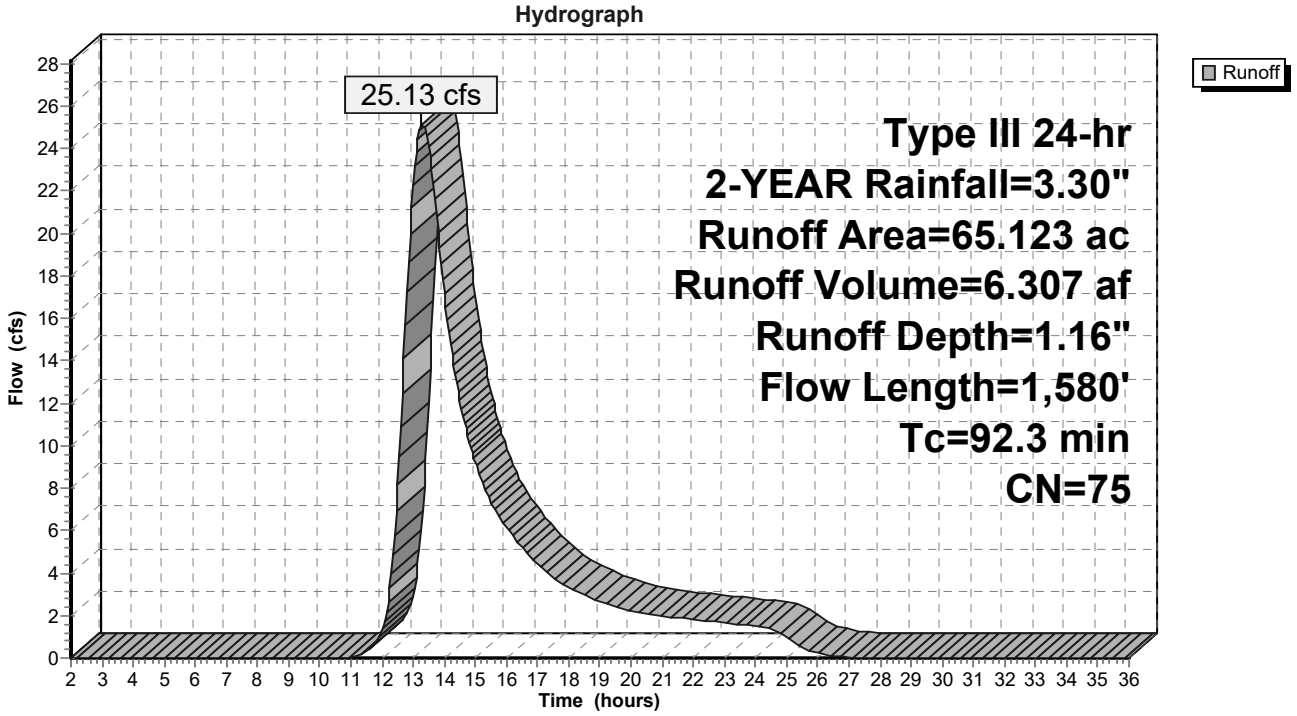
Runoff = 25.13 cfs @ 13.27 hrs, Volume= 6.307 af, Depth= 1.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (ac)	CN	Description
	1.070	92	Paved roads w/open ditches, 50% imp, HSG C
*	0.105	98	Roof Area (to RDFS)
*	0.223	98	Impervious Area
	0.934	80	>75% Grass cover, Good, HSG D
	12.791	70	Woods, Good, HSG C
	48.230	77	Woods, Good, HSG D
	1.000	39	Pasture/grassland/range, Good, HSG A
	0.770	74	Pasture/grassland/range, Good, HSG C
	65.123	75	Weighted Average
	64.260		98.67% Pervious Area
	0.863		1.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
67.2	150	0.0100	0.04		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
7.9	410	0.0300	0.87		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
16.8	970	0.0370	0.96		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.4	50	0.0050	2.10	10.51	**Pipe Channel,** 36.0" Round w/ 12.0" inside fill Area= 5.0 sf Perim= 8.6' r= 0.58' n= 0.035
92.3	1,580	Total			

Subcatchment 1A:



Summary for Subcatchment 1B:

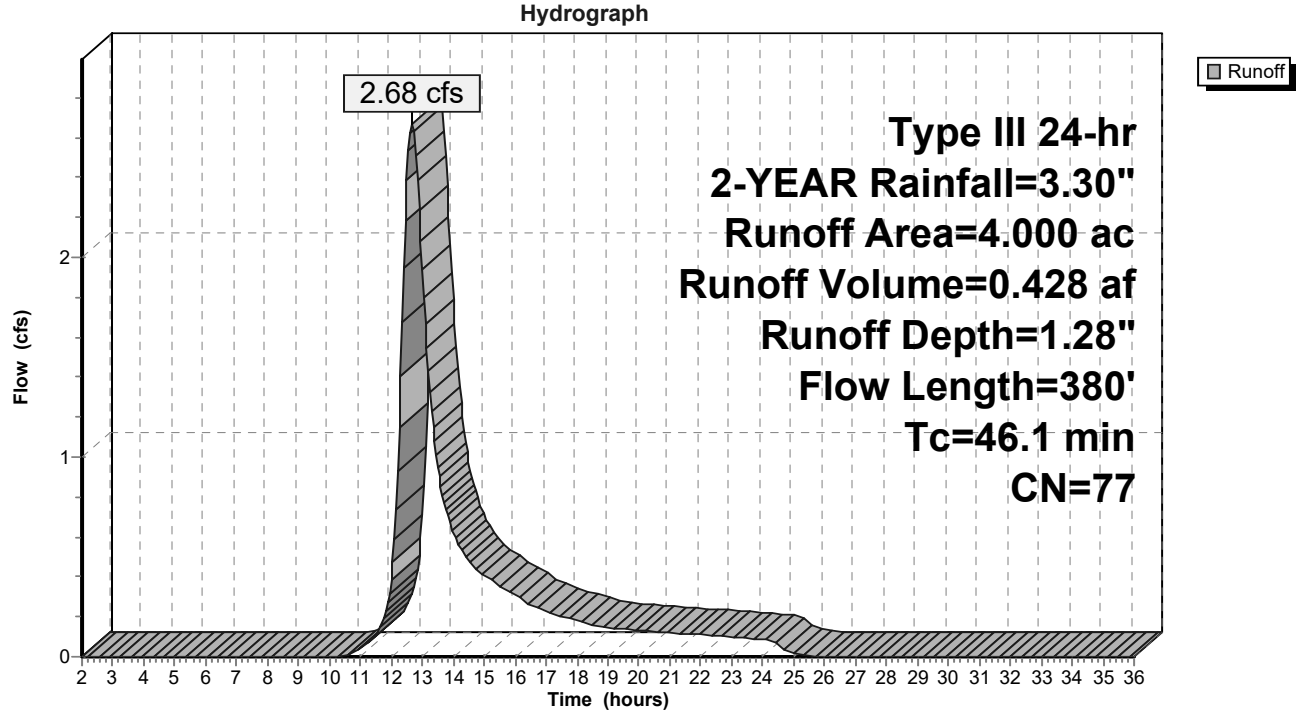
Runoff = 2.68 cfs @ 12.66 hrs, Volume= 0.428 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (ac)	CN	Description
*	0.290	98	Impervious Area
	0.100	80	>75% Grass cover, Good, HSG D
*	0.570	70	Onsite Uplands, HSG C
	2.320	77	Woods, Good, HSG D
*	0.720	74	Untreated Grass from PH 1
	4.000	77	Weighted Average
	3.710		92.75% Pervious Area
	0.290		7.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
35.3	150	0.0500	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
10.8	230	0.0050	0.35		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
46.1	380	Total			

Subcatchment 1B:



Summary for Subcatchment 1C: LS 6

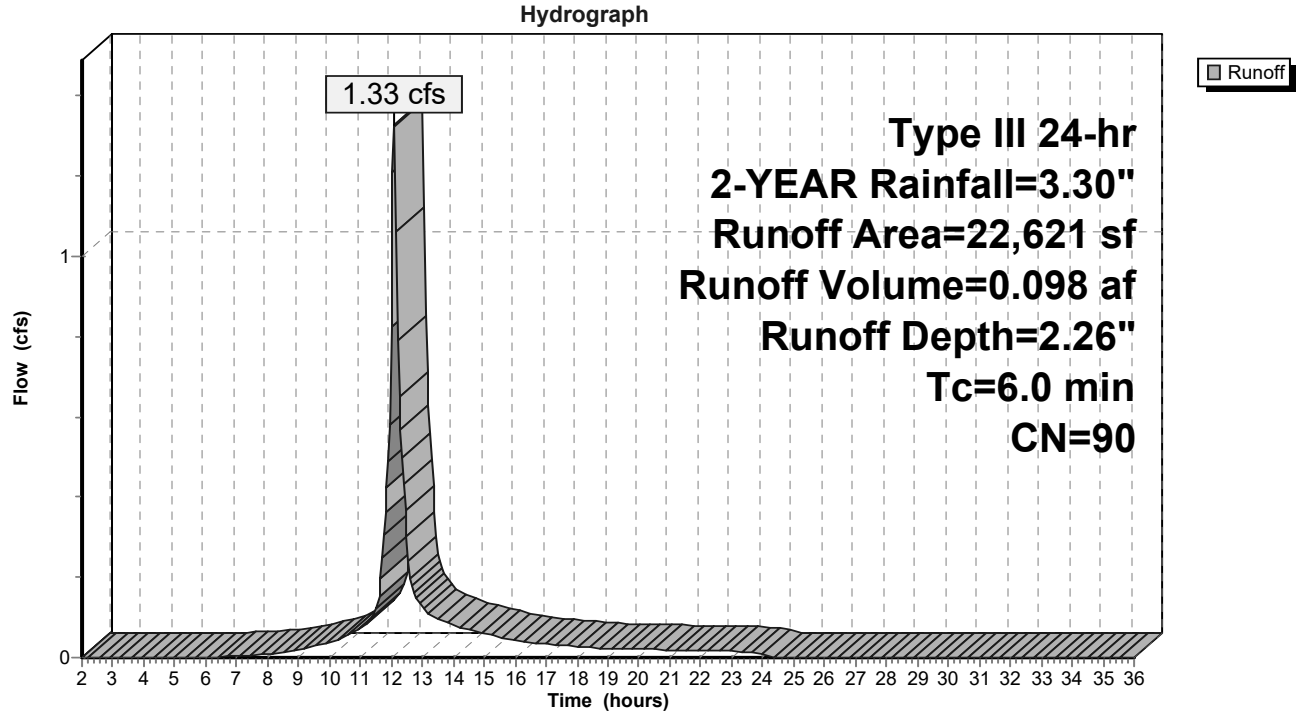
Runoff = 1.33 cfs @ 12.09 hrs, Volume= 0.098 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	11,828	98	Impervious
*	3,358	98	Roof
	7,435	74	>75% Grass cover, Good, HSG C
	22,621	90	Weighted Average
	7,435		32.87% Pervious Area
	15,186		67.13% Impervious Area

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

Subcatchment 1C: LS 6



Summary for Subcatchment 1D: LS 6

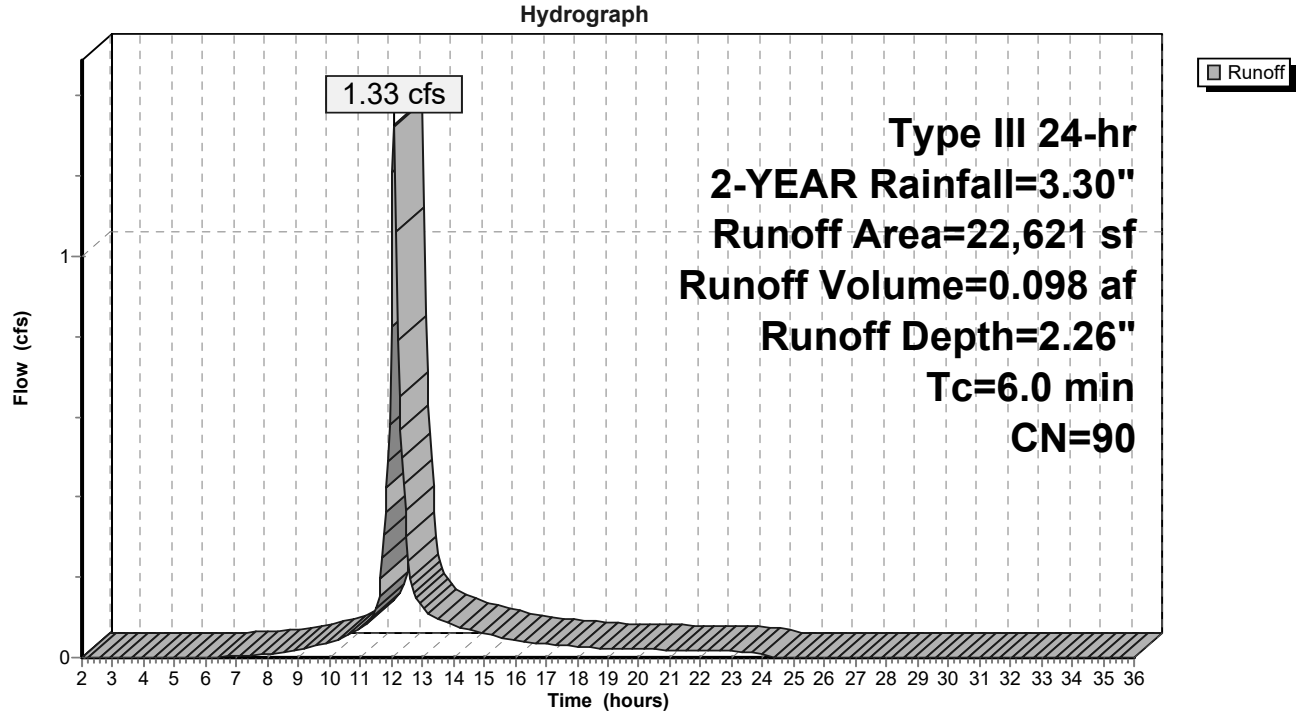
Runoff = 1.33 cfs @ 12.09 hrs, Volume= 0.098 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	11,828	98	Impervious
*	3,358	98	Roof
	7,435	74	>75% Grass cover, Good, HSG C
	22,621	90	Weighted Average
	7,435		32.87% Pervious Area
	15,186		67.13% Impervious Area

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

Subcatchment 1D: LS 6



Summary for Subcatchment 2S:

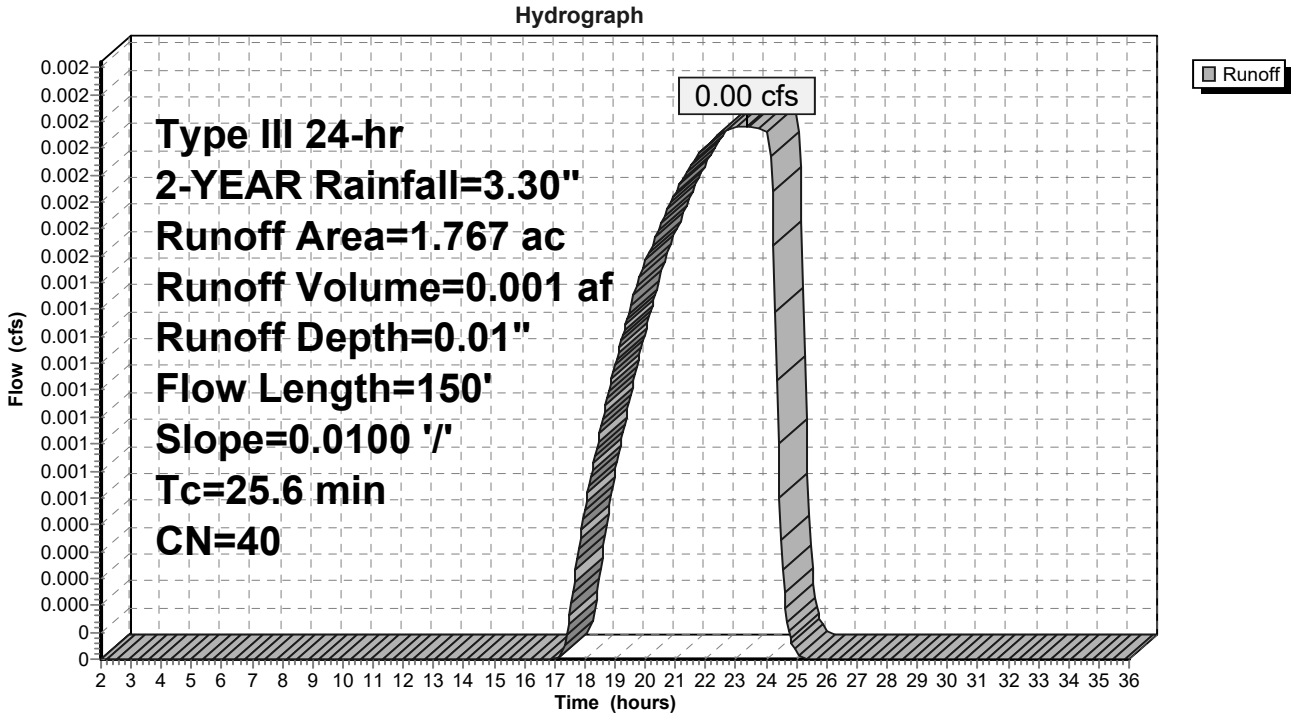
Runoff = 0.00 cfs @ 23.34 hrs, Volume= 0.001 af, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (ac)	CN	Description
	0.114	92	Paved roads w/open ditches, 50% imp, HSG C
*	0.095	98	Impervious Area
	0.190	39	>75% Grass cover, Good, HSG A
	0.190	39	Pasture/grassland/range, Good, HSG A
	1.178	30	Woods, Good, HSG A
	1.767	40	Weighted Average
	1.615		91.40% Pervious Area
	0.152		8.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.6	150	0.0100	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"

Subcatchment 2S:



Summary for Subcatchment 3:

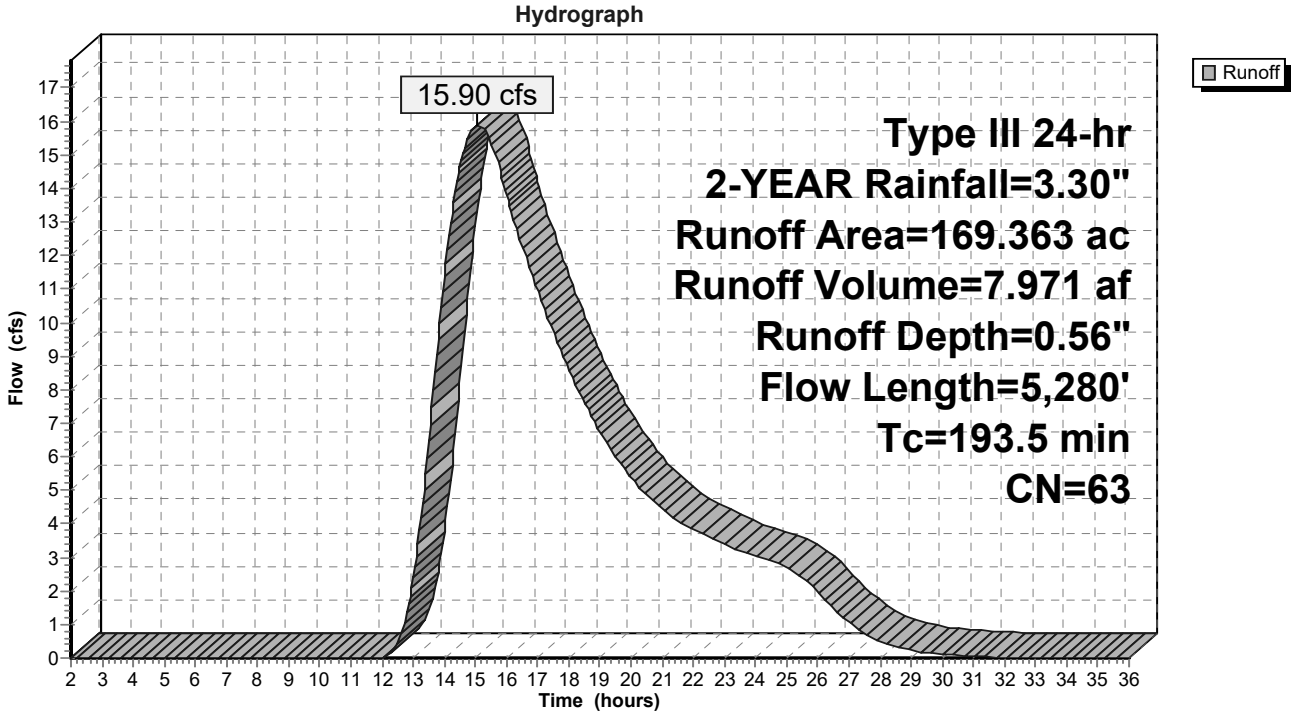
Runoff = 15.90 cfs @ 15.06 hrs, Volume= 7.971 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (ac)	CN	Description
*	12.380	77	On-Property Wetlands
*	9.473	70	On-Property Upplands HSG C
*	4.150	71	Solar Array
*	0.530	98	Solar Access
*	0.070	98	Proposed Roofs
*	0.780	74	Proposed Untreated Grass
*	0.100	98	Proposed Untreated Impervious
*	1.000	77	Proposed Single Family Lot
	7.940	83	Paved roads w/open ditches, 50% imp, HSG A
	6.340	89	Paved roads w/open ditches, 50% imp, HSG B
	1.590	93	Paved roads w/open ditches, 50% imp, HSG D
	1.120	54	1/2 acre lots, 25% imp, HSG A
	8.000	70	1/2 acre lots, 25% imp, HSG B
	6.500	39	Pasture/grassland/range, Good, HSG A
	37.080	30	Woods, Good, HSG A
	13.050	55	Woods, Good, HSG B
	0.600	70	Woods, Good, HSG C
	58.660	77	Woods, Good, HSG D
	169.363	63	Weighted Average
	158.448		93.56% Pervious Area
	10.915		6.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
82.4	150	0.0060	0.03		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
54.8	1,560	0.0090	0.47		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
32.3	750	0.0060	0.39		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
0.2	150	0.0100	12.38	155.61	**Pipe Channel,** 48.0" Round Area= 12.6 sf Perim= 12.6' r= 1.00' n= 0.012
17.0	720	0.0200	0.71		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.8	1,950	0.0130	4.79	68.23	**Trap/Vee/Rect Channel Flow,** Bot.W=5.00' D=1.50' Z= 3.0 '/' Top.W=14.00' n= 0.035
193.5	5,280	Total			

Subcatchment 3:



Summary for Subcatchment 4A:

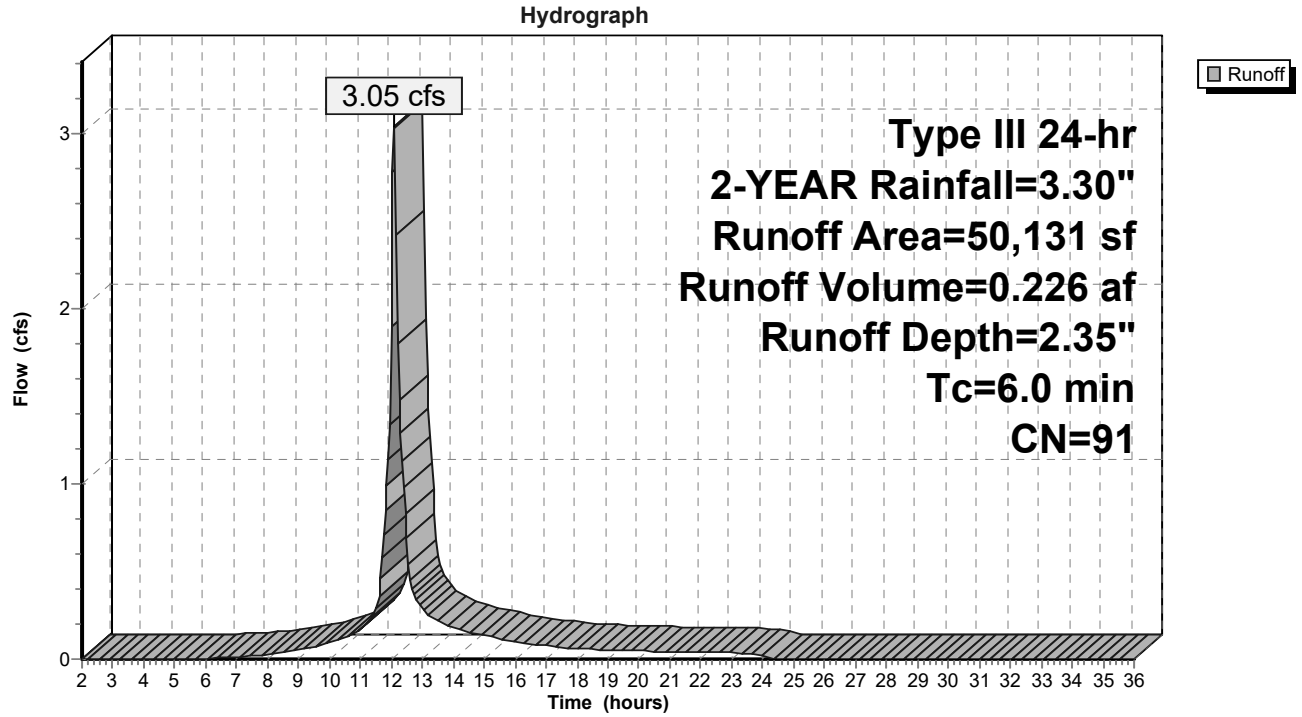
Runoff = 3.05 cfs @ 12.09 hrs, Volume= 0.226 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	28,020	98	Impervious
*	6,716	98	Roof
	10,195	74	>75% Grass cover, Good, HSG C
*	5,200	74	Stormwater Pond
	50,131	91	Weighted Average
	15,395		30.71% Pervious Area
	34,736		69.29% Impervious Area

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

Subcatchment 4A:



Summary for Subcatchment 4B:

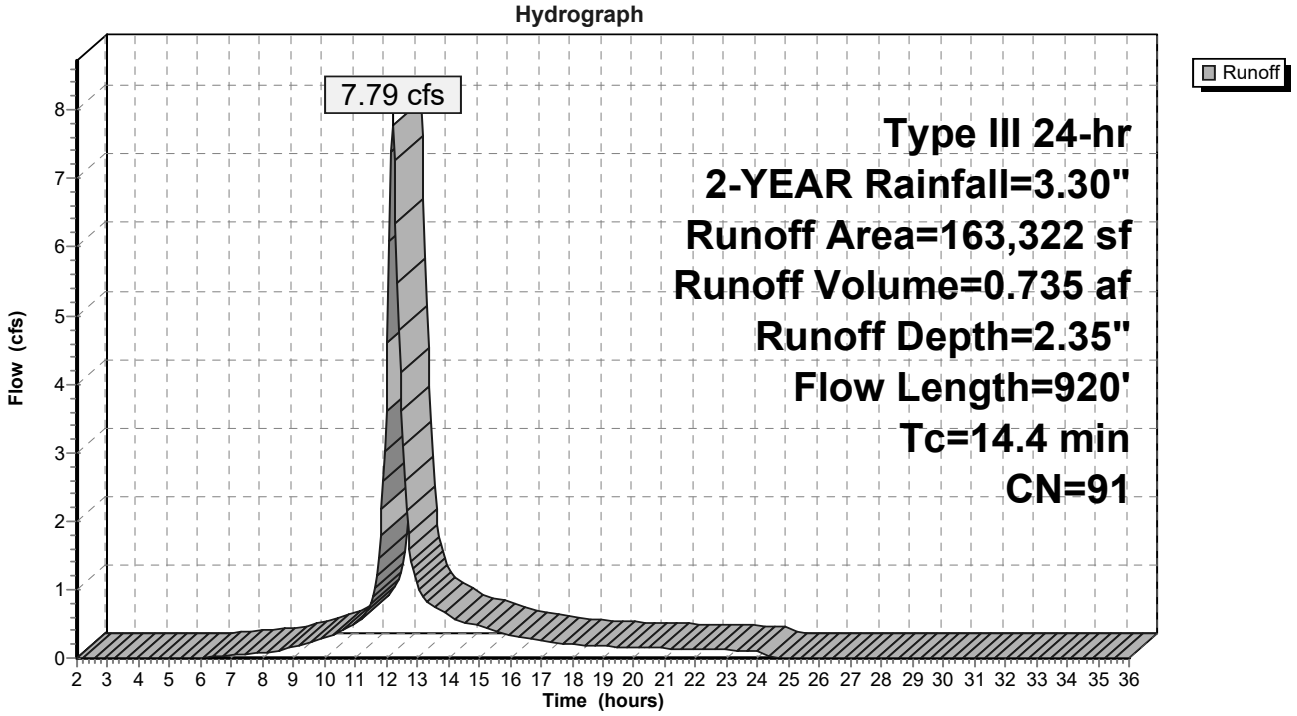
Runoff = 7.79 cfs @ 12.20 hrs, Volume= 0.735 af, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	100,185	98	Impervious
*	17,714	98	Roof
	35,423	74	>75% Grass cover, Good, HSG C
*	10,000	74	Stormwater Pond
	163,322	91	Weighted Average
	45,423		27.81% Pervious Area
	117,899		72.19% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	70	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.7	50	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
1.5	800	0.0200	9.11	16.09	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
14.4	920	Total			

Subcatchment 4B:



Summary for Subcatchment 4C: To Level Spreader

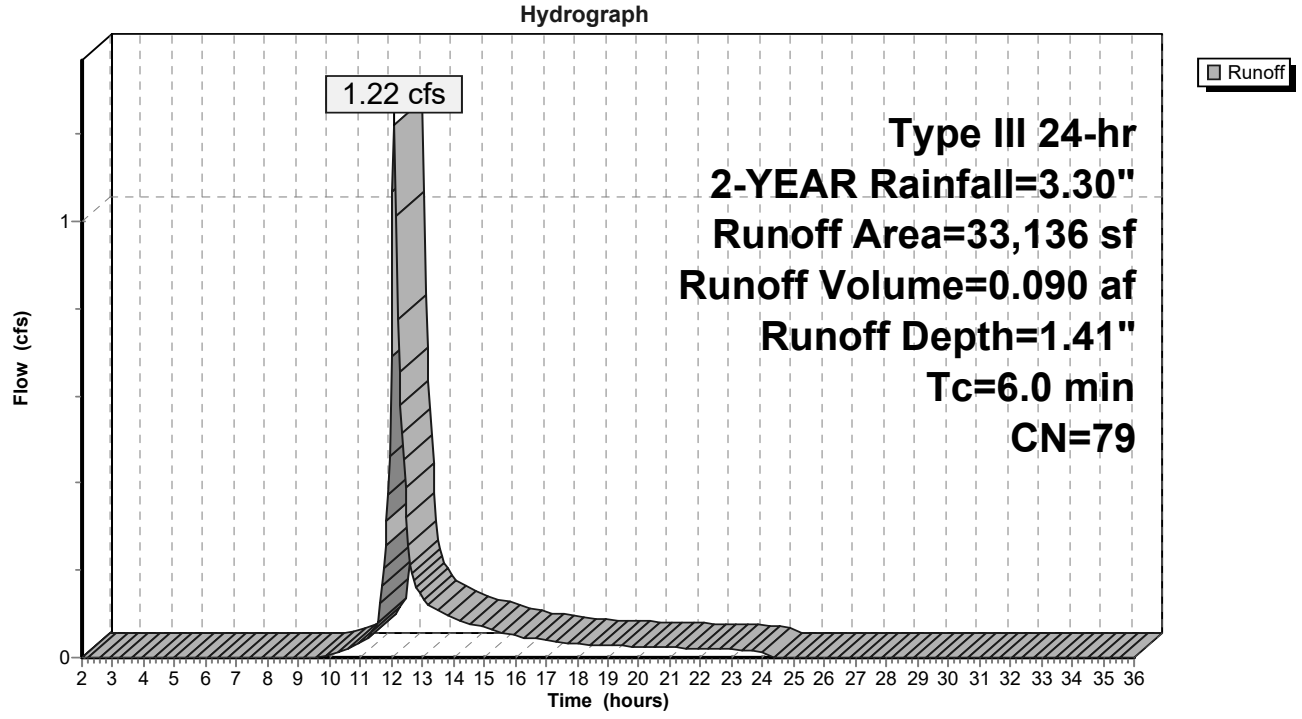
Runoff = 1.22 cfs @ 12.10 hrs, Volume= 0.090 af, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	8,842	98	Impervious
	15,423	74	>75% Grass cover, Good, HSG C
	8,871	70	Woods, Good, HSG C
	33,136	79	Weighted Average
	24,294		73.32% Pervious Area
	8,842		26.68% Impervious Area

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

Subcatchment 4C: To Level Spreader



Summary for Subcatchment 10: Phase 1

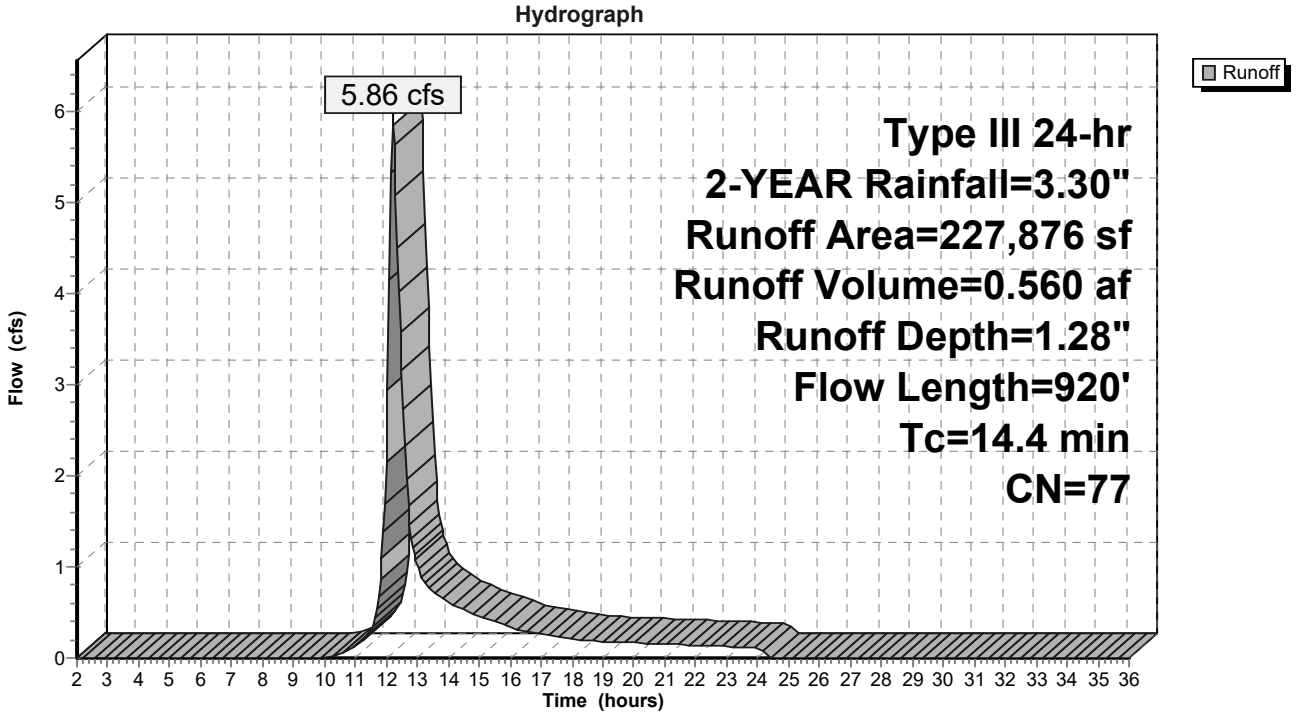
Runoff = 5.86 cfs @ 12.21 hrs, Volume= 0.560 af, Depth= 1.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	89,244	98	Impervious
*	34,380	98	Potential Outparcel Impervious
	50,000	39	>75% Grass cover, Good, HSG A
	22,792	74	>75% Grass cover, Good, HSG C
	11,460	39	>75% Grass cover, Good, HSG A
*	15,000	74	Stormwater Pond
	5,000	70	Woods, Good, HSG C
	227,876	77	Weighted Average
	104,252		45.75% Pervious Area
	123,624		54.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.2	70	0.0140	0.10		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.7	50	0.0200	1.22		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
1.5	800	0.0200	9.11	16.09	**Pipe Channel,** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.012
14.4	920	Total			

Subcatchment 10: Phase 1



Summary for Subcatchment 11: Phase 1

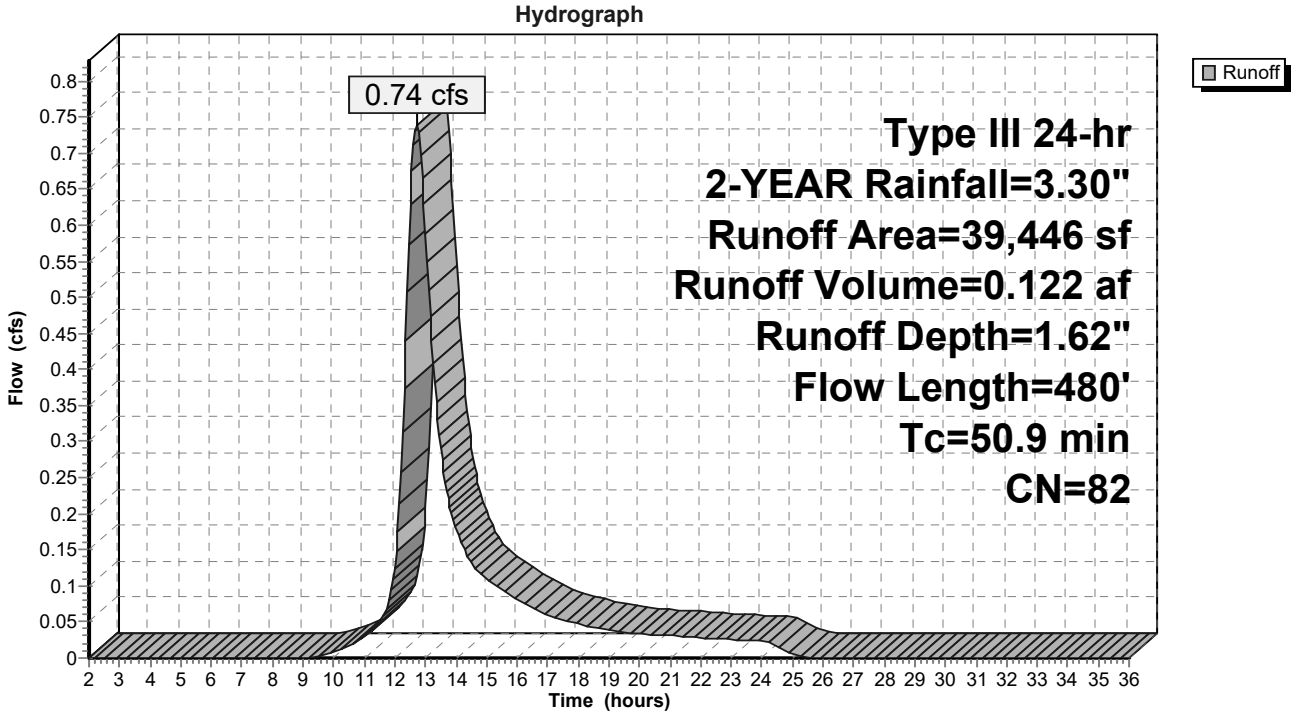
Runoff = 0.74 cfs @ 12.71 hrs, Volume= 0.122 af, Depth= 1.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	14,173	98	Impervious
	18,827	74	>75% Grass cover, Good, HSG C
	6,446	70	Woods, Good, HSG C
	39,446	82	Weighted Average
	25,273		64.07% Pervious Area
	14,173		35.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.6	105	0.0200	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
0.6	45	0.0200	1.19		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
0.4	110	0.0600	4.97		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
0.8	70	0.0100	1.50		**Shallow Concentrated Flow,** Grassed Waterway Kv= 15.0 fps
34.5	150	0.0530	0.07		**Sheet Flow,** Woods: Dense underbrush n= 0.800 P2= 3.30"
50.9	480	Total			

Subcatchment 11: Phase 1



Summary for Subcatchment Roof: Phase 1

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

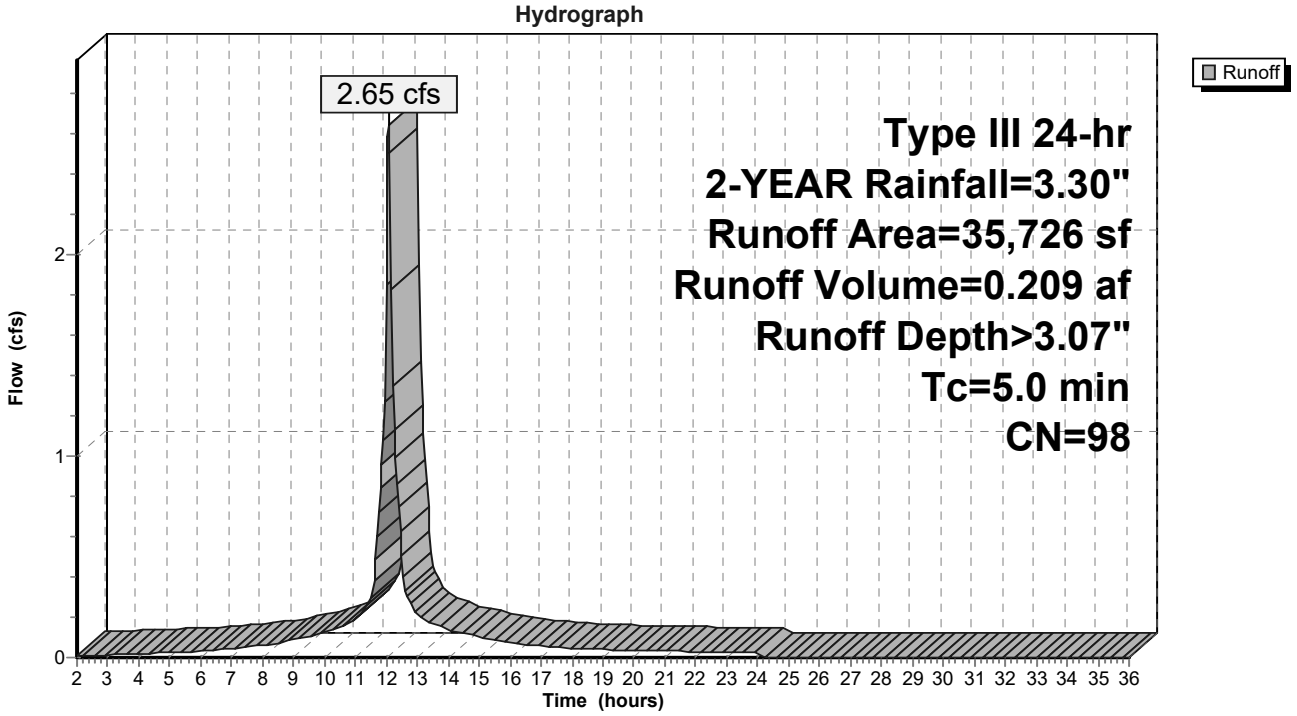
Runoff = 2.65 cfs @ 12.07 hrs, Volume= 0.209 af, Depth> 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-YEAR Rainfall=3.30"

	Area (sf)	CN	Description
*	35,726	98	Impervious
	35,726		100.00% Impervious Area

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

Subcatchment Roof: Phase 1



Summary for Reach R1: (new Reach)

Inflow Area = 3.749 ac, 72.19% Impervious, Inflow Depth > 1.61" for 2-YEAR event
Inflow = 3.72 cfs @ 12.49 hrs, Volume= 0.504 af
Outflow = 2.60 cfs @ 13.08 hrs, Volume= 0.498 af, Atten= 30%, Lag= 35.0 min

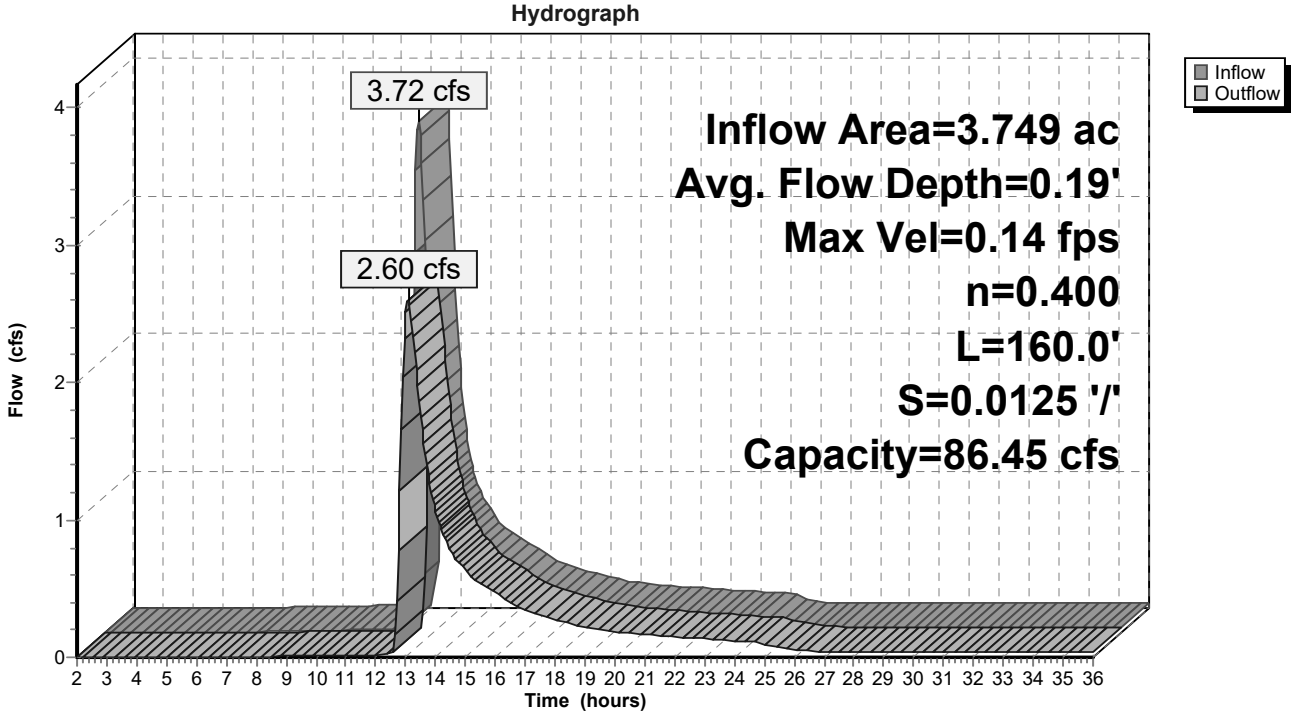
Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.14 fps, Min. Travel Time= 19.7 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 66.6 min

Peak Storage= 3,083 cf @ 12.75 hrs
Average Depth at Peak Storage= 0.19'
Bank-Full Depth= 1.50' Flow Area= 172.5 sf, Capacity= 86.45 cfs

100.00' x 1.50' deep channel, n= 0.400
Side Slope Z-value= 10.0 '/' Top Width= 130.00'
Length= 160.0' Slope= 0.0125 '/'
Inlet Invert= 82.00', Outlet Invert= 80.00'

‡

Reach R1: (new Reach)



Summary for Reach R2: (new Reach)

Inflow Area = 66.162 ac, 2.36% Impervious, Inflow Depth > 1.14" for 2-YEAR event
Inflow = 20.56 cfs @ 13.79 hrs, Volume= 6.298 af
Outflow = 19.89 cfs @ 14.31 hrs, Volume= 6.293 af, Atten= 3%, Lag= 31.1 min

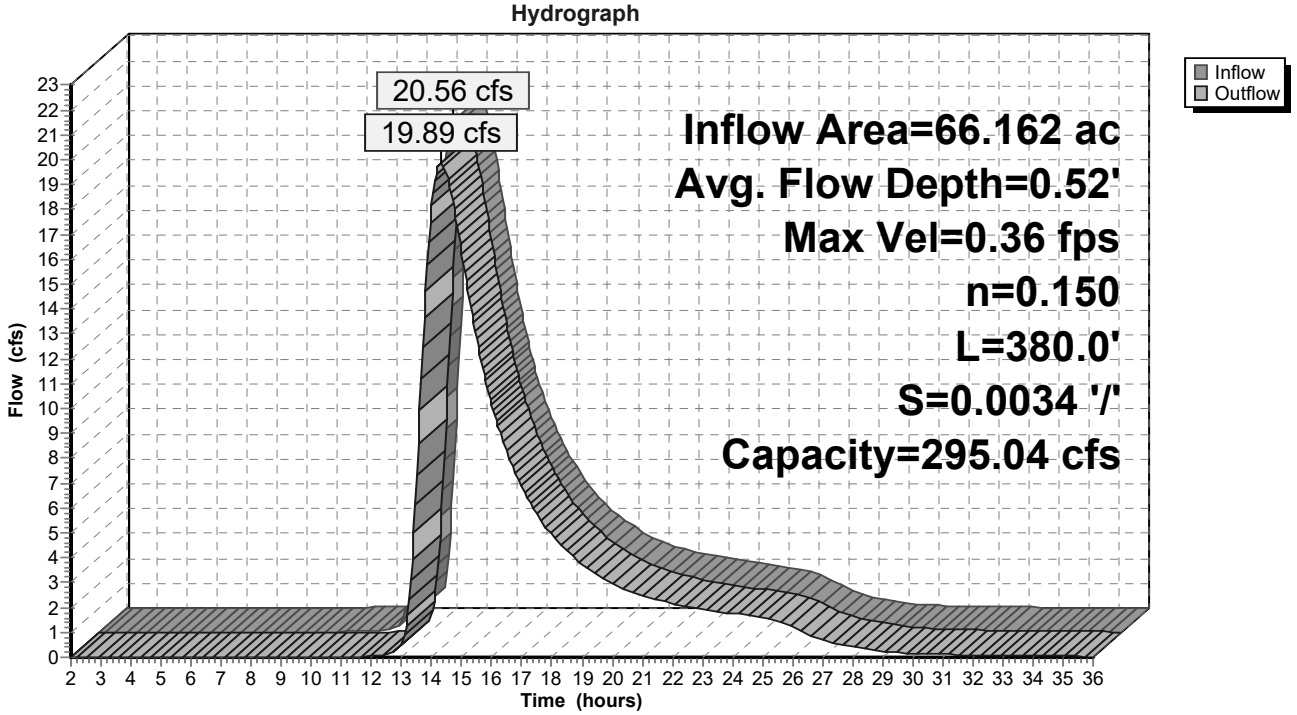
Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.36 fps, Min. Travel Time= 17.4 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 51.9 min

Peak Storage= 20,819 cf @ 14.02 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 2.50' Flow Area= 312.5 sf, Capacity= 295.04 cfs

100.00' x 2.50' deep channel, n= 0.150
Side Slope Z-value= 10.0 '/' Top Width= 150.00'
Length= 380.0' Slope= 0.0034 '/'
Inlet Invert= 79.30', Outlet Invert= 78.00'

‡

Reach R2: (new Reach)



Summary for Reach R3: (new Reach)

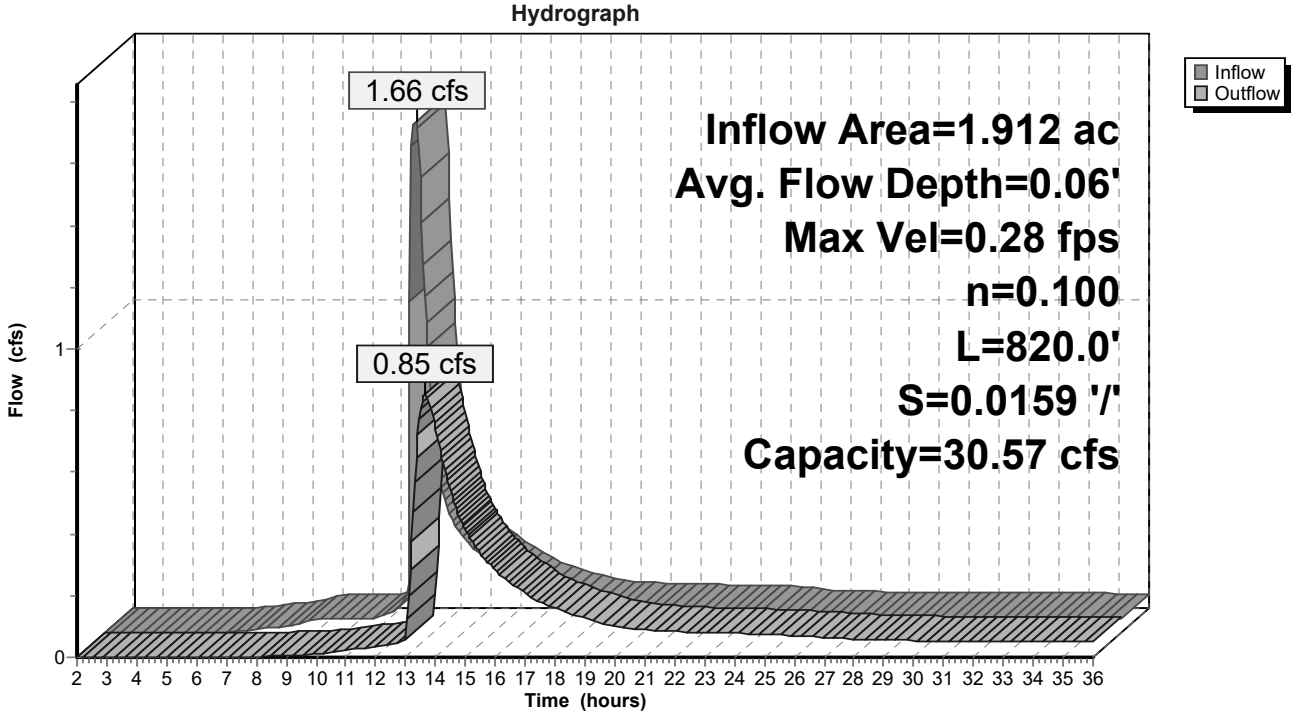
Inflow Area = 1.912 ac, 52.34% Impervious, Inflow Depth > 1.81" for 2-YEAR event
Inflow = 1.66 cfs @ 12.42 hrs, Volume= 0.289 af
Outflow = 0.85 cfs @ 13.66 hrs, Volume= 0.276 af, Atten= 49%, Lag= 74.1 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.28 fps, Min. Travel Time= 48.4 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 122.6 min

Peak Storage= 2,463 cf @ 12.85 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 0.50' Flow Area= 27.5 sf, Capacity= 30.57 cfs

50.00' x 0.50' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 10.0 '/' Top Width= 60.00'
Length= 820.0' Slope= 0.0159 '/'
Inlet Invert= 93.00', Outlet Invert= 80.00'

Reach R3: (new Reach)



Summary for Reach R4: (new Reach)

[62] Hint: Exceeded Reach R5 OUTLET depth by 0.06' @ 12.40 hrs

Inflow Area = 0.761 ac, 26.68% Impervious, Inflow Depth = 1.41" for 2-YEAR event
Inflow = 1.10 cfs @ 12.20 hrs, Volume= 0.090 af
Outflow = 0.76 cfs @ 12.55 hrs, Volume= 0.090 af, Atten= 31%, Lag= 21.0 min

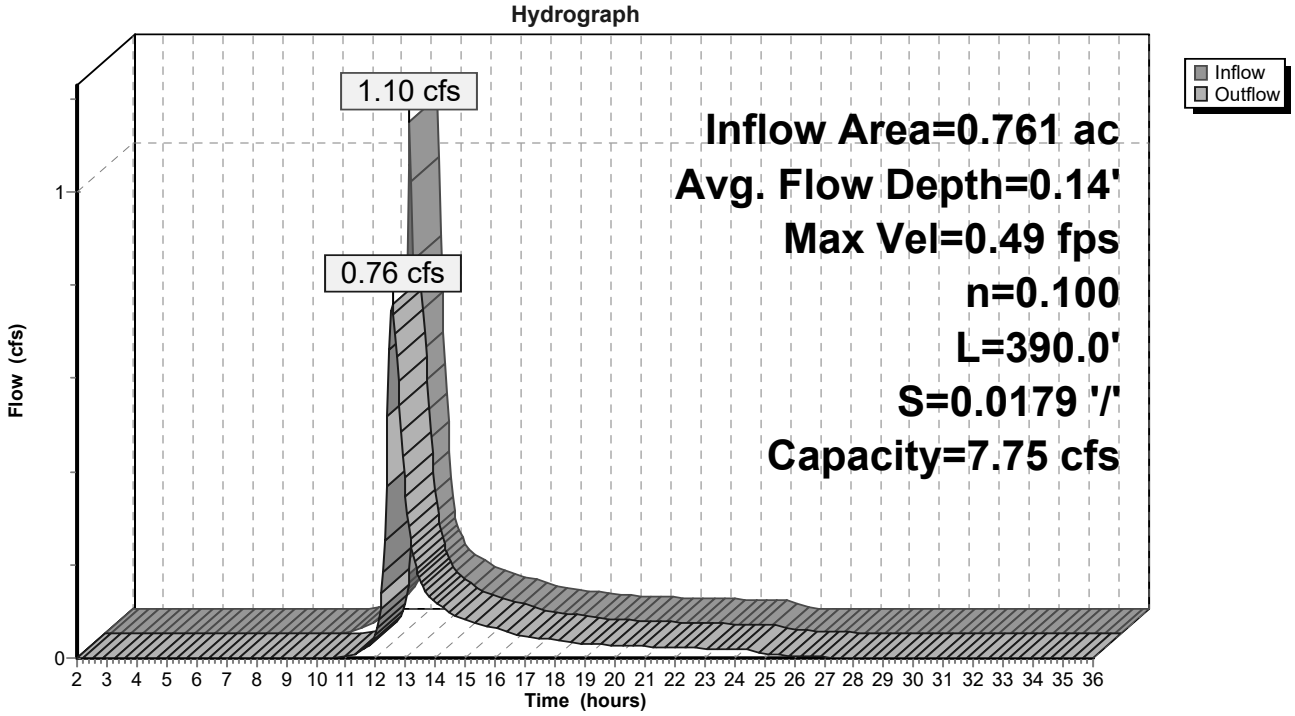
Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.49 fps, Min. Travel Time= 13.3 min
Avg. Velocity = 0.12 fps, Avg. Travel Time= 52.8 min

Peak Storage= 610 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 0.50' Flow Area= 7.5 sf, Capacity= 7.75 cfs

10.00' x 0.50' deep channel, n= 0.100 Earth, dense brush, high stage
Side Slope Z-value= 10.0 '/' Top Width= 20.00'
Length= 390.0' Slope= 0.0179 '/'
Inlet Invert= 103.00', Outlet Invert= 96.00'

‡

Reach R4: (new Reach)



Summary for Reach R5: (new Reach)

Inflow Area = 0.761 ac, 26.68% Impervious, Inflow Depth = 1.41" for 2-YEAR event
Inflow = 1.22 cfs @ 12.10 hrs, Volume= 0.090 af
Outflow = 1.10 cfs @ 12.20 hrs, Volume= 0.090 af, Atten= 10%, Lag= 6.0 min

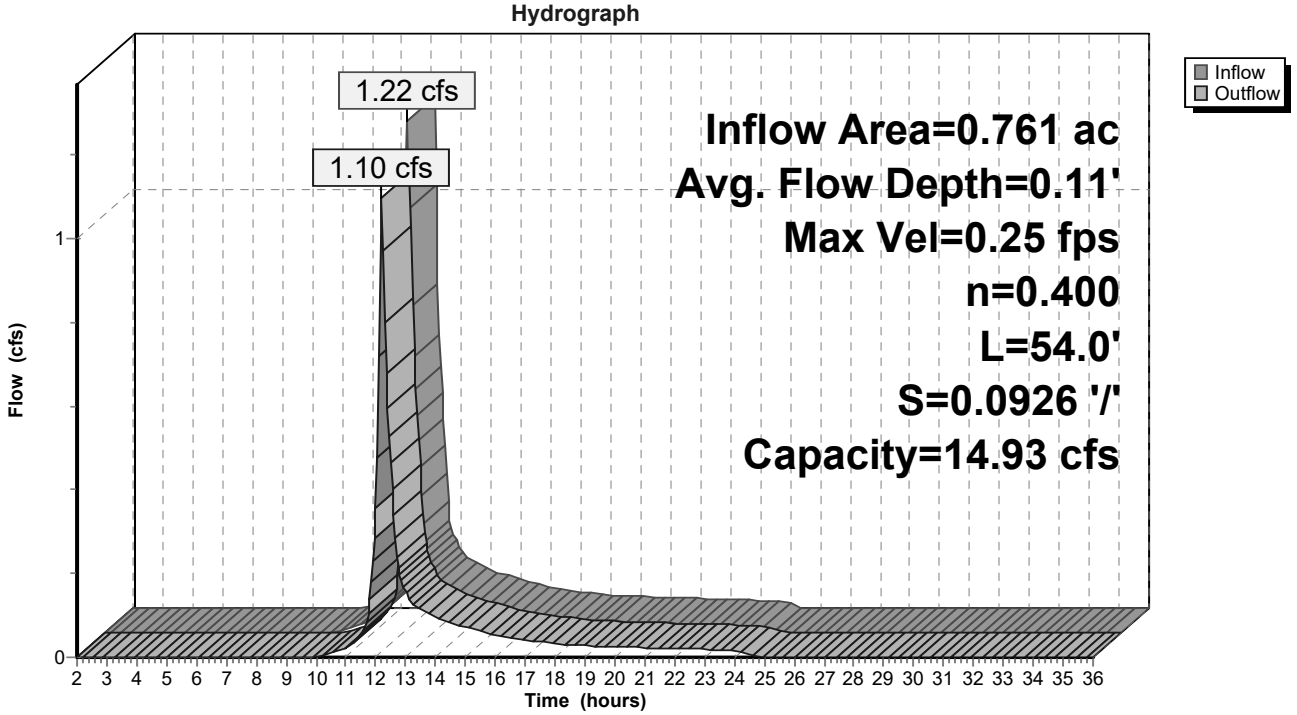
Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.25 fps, Min. Travel Time= 3.6 min
Avg. Velocity = 0.07 fps, Avg. Travel Time= 13.8 min

Peak Storage= 239 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.11'
Bank-Full Depth= 0.50' Flow Area= 22.5 sf, Capacity= 14.93 cfs

40.00' x 0.50' deep channel, n= 0.400
Side Slope Z-value= 10.0 '/' Top Width= 50.00'
Length= 54.0' Slope= 0.0926 '/'
Inlet Invert= 108.00', Outlet Invert= 103.00'

‡

Reach R5: (new Reach)



Summary for Reach R6: (new Reach)

Inflow Area = 0.519 ac, 67.13% Impervious, Inflow Depth = 2.26" for 2-YEAR event
Inflow = 1.33 cfs @ 12.09 hrs, Volume= 0.098 af
Outflow = 1.05 cfs @ 12.28 hrs, Volume= 0.098 af, Atten= 21%, Lag= 11.2 min

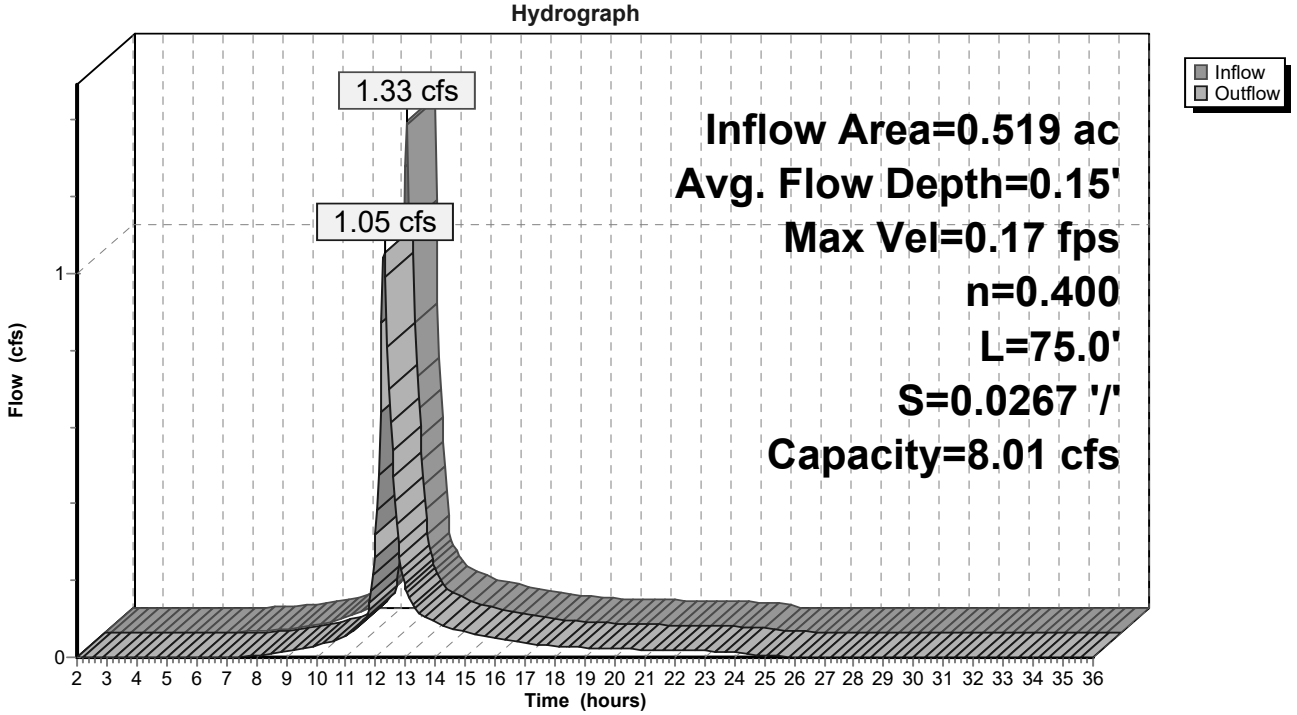
Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.17 fps, Min. Travel Time= 7.4 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 34.5 min

Peak Storage= 479 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.15'
Bank-Full Depth= 0.50' Flow Area= 22.5 sf, Capacity= 8.01 cfs

40.00' x 0.50' deep channel, n= 0.400
Side Slope Z-value= 10.0 '/' Top Width= 50.00'
Length= 75.0' Slope= 0.0267 '/'
Inlet Invert= 83.00', Outlet Invert= 81.00'

‡

Reach R6: (new Reach)



Summary for Reach R7: (new Reach)

[62] Hint: Exceeded Reach R8 OUTLET depth by 0.01' @ 13.20 hrs

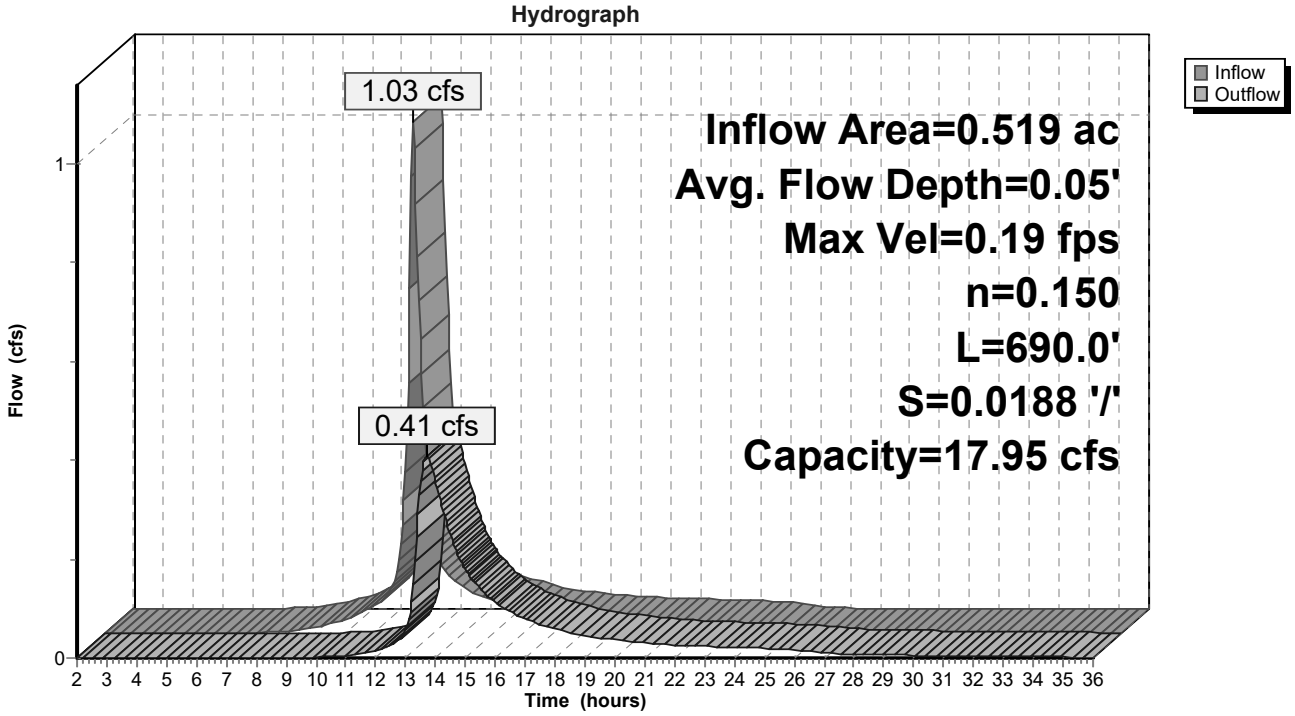
Inflow Area = 0.519 ac, 67.13% Impervious, Inflow Depth = 2.26" for 2-YEAR event
Inflow = 1.03 cfs @ 12.31 hrs, Volume= 0.098 af
Outflow = 0.41 cfs @ 13.70 hrs, Volume= 0.097 af, Atten= 61%, Lag= 83.6 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.19 fps, Min. Travel Time= 60.5 min
Avg. Velocity = 0.06 fps, Avg. Travel Time= 180.9 min

Peak Storage= 1,477 cf @ 12.69 hrs
Average Depth at Peak Storage= 0.05'
Bank-Full Depth= 0.50' Flow Area= 22.5 sf, Capacity= 17.95 cfs

40.00' x 0.50' deep channel, n= 0.150
Side Slope Z-value= 10.0 '/' Top Width= 50.00'
Length= 690.0' Slope= 0.0188 '/'
Inlet Invert= 94.00', Outlet Invert= 81.00'

Reach R7: (new Reach)



Summary for Reach R8: (new Reach)

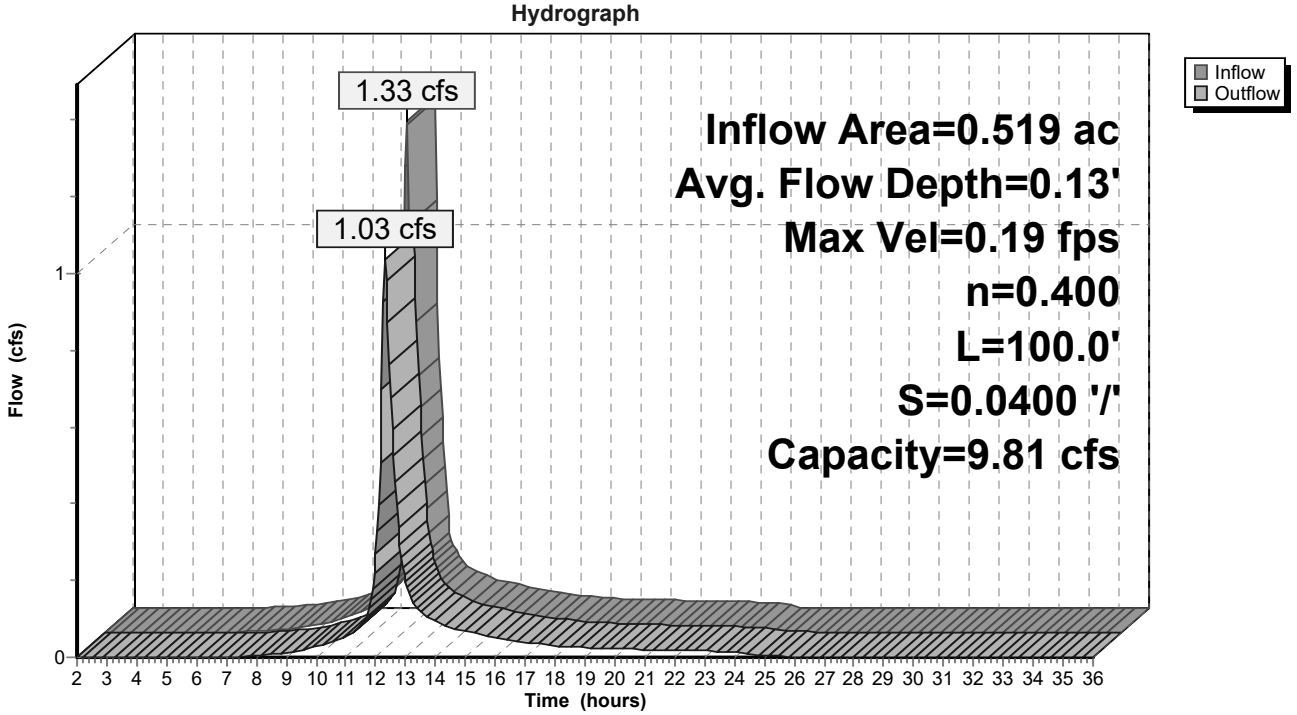
Inflow Area = 0.519 ac, 67.13% Impervious, Inflow Depth = 2.26" for 2-YEAR event
Inflow = 1.33 cfs @ 12.09 hrs, Volume= 0.098 af
Outflow = 1.03 cfs @ 12.31 hrs, Volume= 0.098 af, Atten= 22%, Lag= 13.1 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.19 fps, Min. Travel Time= 8.8 min
Avg. Velocity = 0.04 fps, Avg. Travel Time= 40.5 min

Peak Storage= 549 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.13'
Bank-Full Depth= 0.50' Flow Area= 22.5 sf, Capacity= 9.81 cfs

40.00' x 0.50' deep channel, n= 0.400
Side Slope Z-value= 10.0 '/' Top Width= 50.00'
Length= 100.0' Slope= 0.0400 '/'
Inlet Invert= 98.00', Outlet Invert= 94.00'

Reach R8: (new Reach)



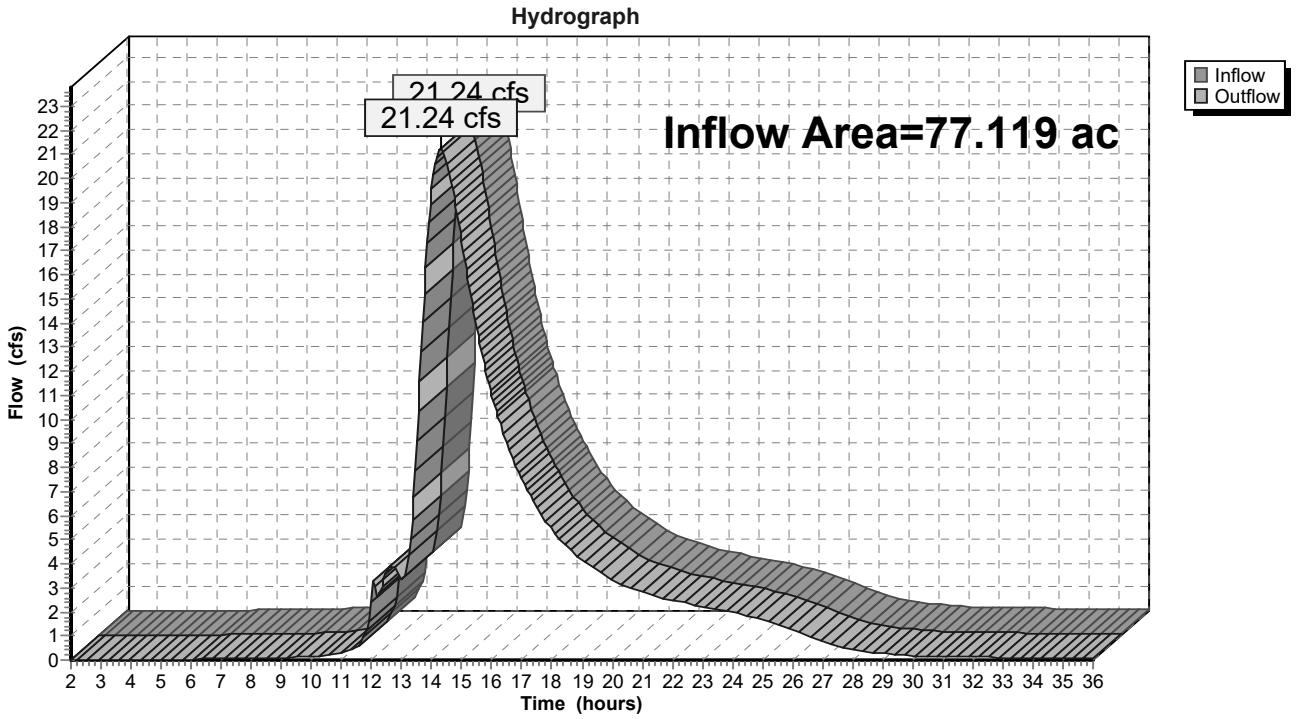
Summary for Reach SP#1: Study Point #1

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

Inflow Area = 77.119 ac, 7.56% Impervious, Inflow Depth > 1.14" for 2-YEAR event
Inflow = 21.24 cfs @ 14.30 hrs, Volume= 7.336 af
Outflow = 21.24 cfs @ 14.30 hrs, Volume= 7.336 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs

Reach SP#1: Study Point #1



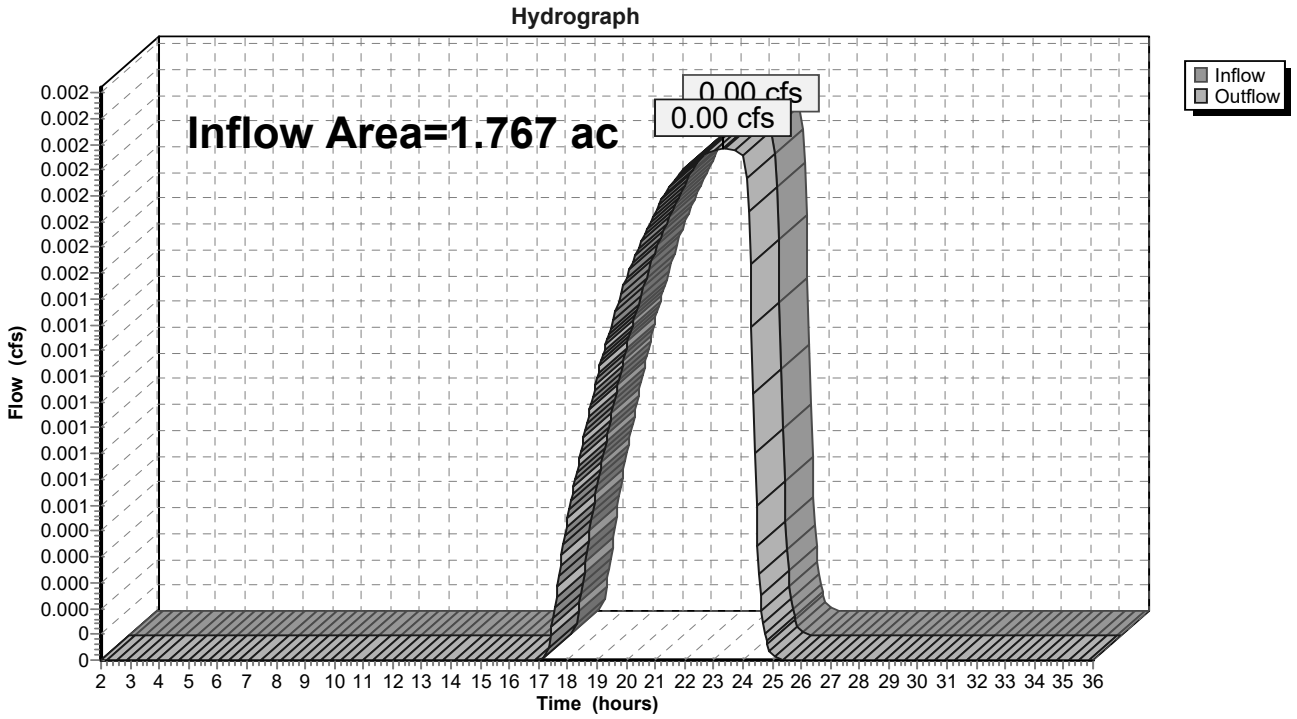
Summary for Reach SP#2: Study Point #2

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

Inflow Area = 1.767 ac, 8.60% Impervious, Inflow Depth = 0.01" for 2-YEAR event
Inflow = 0.00 cfs @ 23.34 hrs, Volume= 0.001 af
Outflow = 0.00 cfs @ 23.34 hrs, Volume= 0.001 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs

Reach SP#2: Study Point #2



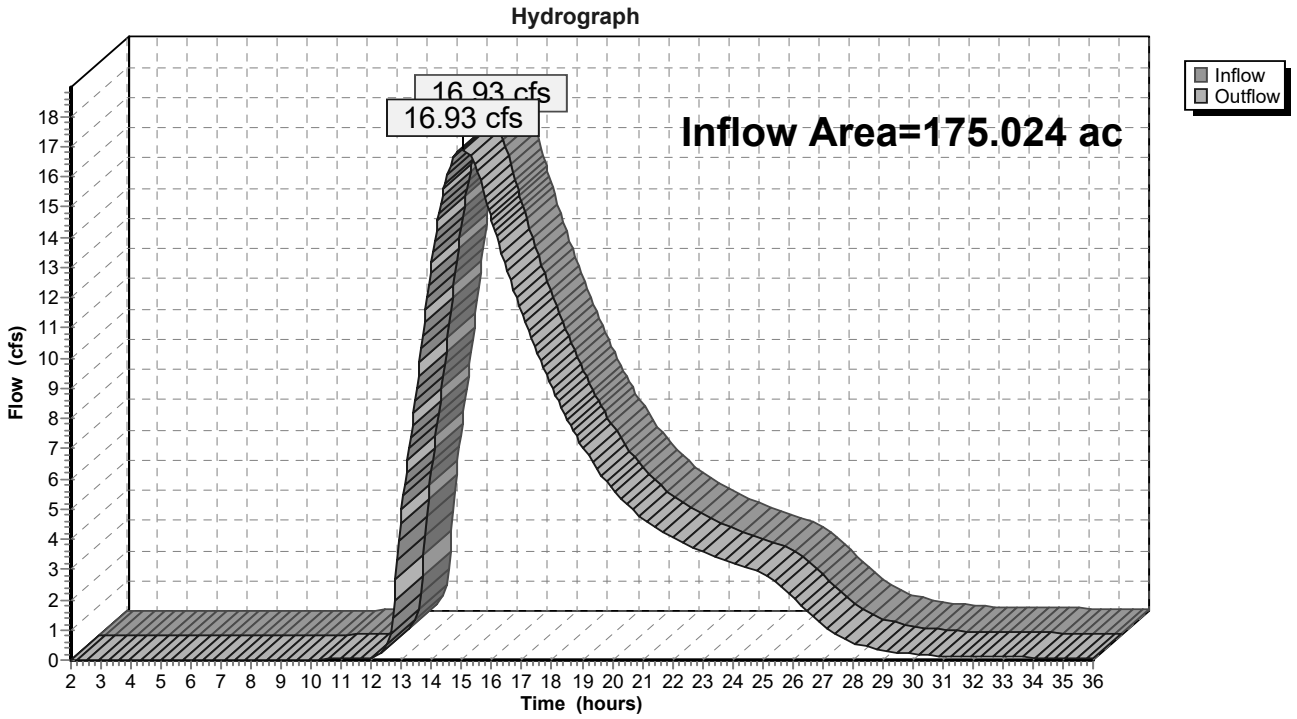
Summary for Reach SP#3: Study Point #3

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

Inflow Area = 175.024 ac, 8.35% Impervious, Inflow Depth > 0.60" for 2-YEAR event
Inflow = 16.93 cfs @ 15.04 hrs, Volume= 8.745 af
Outflow = 16.93 cfs @ 15.04 hrs, Volume= 8.745 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs

Reach SP#3: Study Point #3



Summary for Pond FB1: Filter Basin #1

Inflow Area = 1.151 ac, 69.29% Impervious, Inflow Depth = 2.35" for 2-YEAR event
Inflow = 3.05 cfs @ 12.09 hrs, Volume= 0.226 af
Outflow = 1.45 cfs @ 12.27 hrs, Volume= 0.199 af, Atten= 52%, Lag= 11.1 min
Primary = 0.05 cfs @ 12.27 hrs, Volume= 0.119 af
Secondary = 1.40 cfs @ 12.27 hrs, Volume= 0.081 af

Routing by Stor-Ind method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 97.72' @ 12.27 hrs Surf.Area= 2,969 sf Storage= 3,888 cf

Plug-Flow detention time= 360.2 min calculated for 0.199 af (88% of inflow)
Center-of-Mass det. time= 306.3 min (1,107.6 - 801.3)

Volume	Invert	Avail.Storage	Storage Description
#1	96.20'	8,127 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

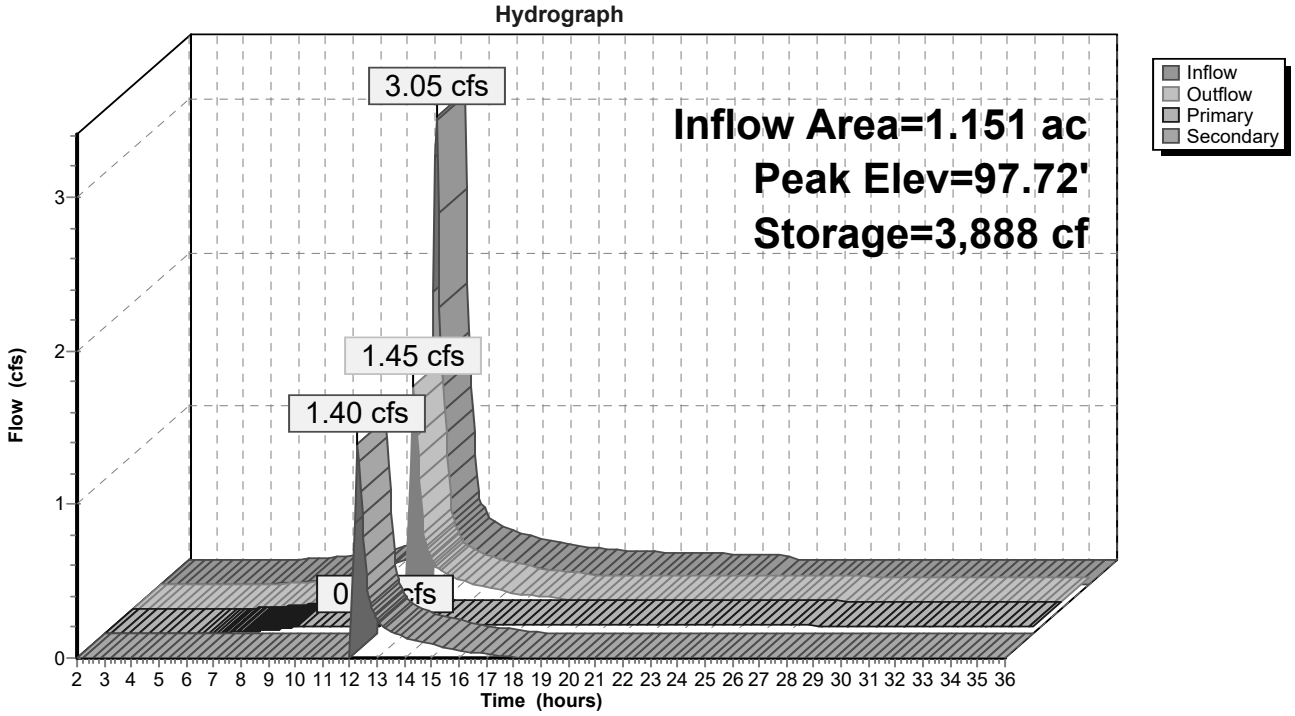
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.20	2,140	0	0
97.00	2,576	1,886	1,886
98.00	3,120	2,848	4,734
99.00	3,665	3,393	8,127

Device	Routing	Invert	Outlet Devices
#1	Primary	93.39'	**1.0" Vert. Orifice/Grate** C= 0.600
#2	Device 1	94.20'	**6.0" Round Culvert** L= 160.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.20' / 93.39' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#3	Device 2	96.20'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 92.67'
#4	Secondary	97.60'	**14.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.05 cfs @ 12.27 hrs HW=97.72' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.05 cfs @ 9.97 fps)
└**2=Culvert** (Passes 0.05 cfs of 0.87 cfs potential flow)
└**3=Exfiltration** (Passes 0.05 cfs of 0.22 cfs potential flow)

Secondary OutFlow Max=1.33 cfs @ 12.27 hrs HW=97.72' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 1.33 cfs @ 0.81 fps)

Pond FB1: Filter Basin #1



Summary for Pond GW1: Gravel Wetland #1 (Phase 1)

Inflow Area = 5.231 ac, 54.25% Impervious, Inflow Depth = 1.28" for 2-YEAR event
Inflow = 5.86 cfs @ 12.21 hrs, Volume= 0.560 af
Outflow = 0.55 cfs @ 14.29 hrs, Volume= 0.284 af, Atten= 91%, Lag= 124.9 min
Primary = 0.55 cfs @ 14.29 hrs, Volume= 0.284 af
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 82.61' @ 14.29 hrs Surf.Area= 11,134 sf Storage= 14,559 cf

Plug-Flow detention time= 395.5 min calculated for 0.284 af (51% of inflow)
Center-of-Mass det. time= 271.9 min (1,130.3 - 858.4)

Volume	Invert	Avail.Storage	Storage Description
#1	81.00'	44,705 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

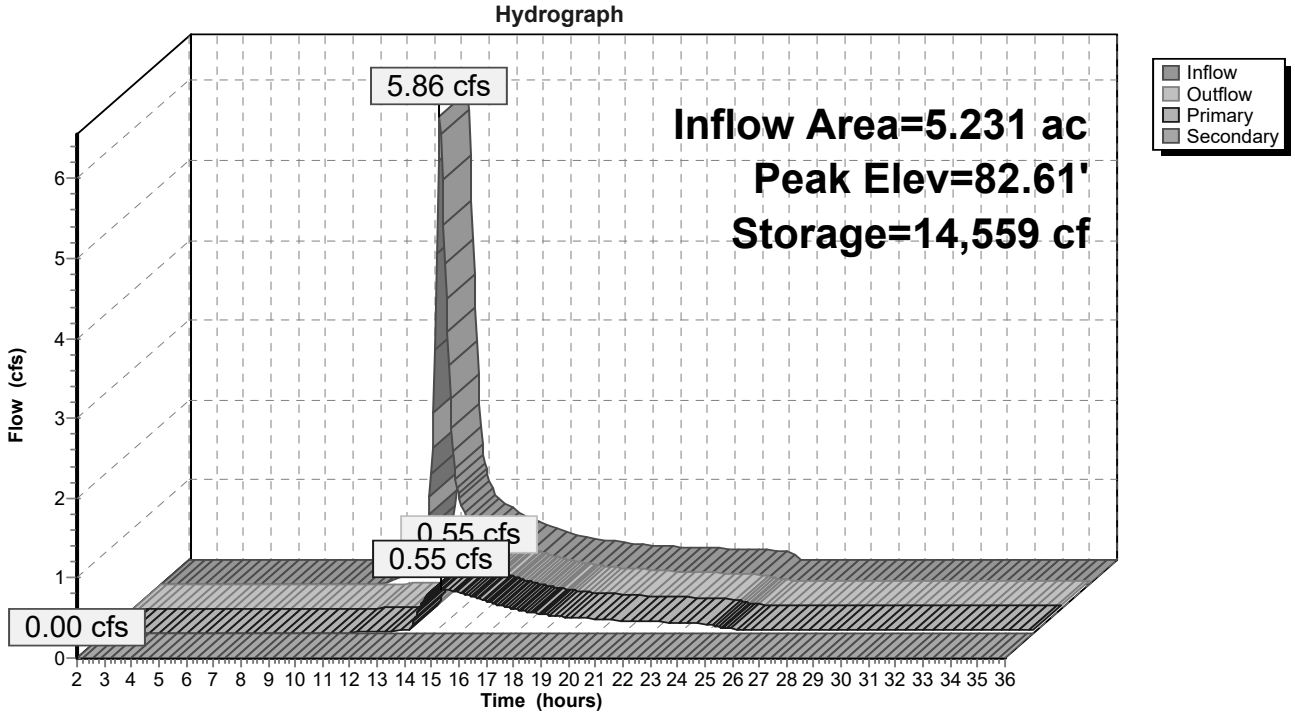
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
81.00	7,030	0	0
82.00	9,377	8,204	8,204
82.51	11,000	5,196	13,400
84.00	12,900	17,805	31,205
85.00	14,100	13,500	44,705

Device	Routing	Invert	Outlet Devices
#1	Primary	80.67'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 80.67' / 80.50' S= 0.0068 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	82.50'	**4.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 1	78.25'	**1.0" Vert. Orifice/Grate** C= 0.600
#4	Device 3	78.25'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 78.25' / 78.25' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#5	Device 4	81.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 80.67'
#6	Secondary	83.65'	**20.0' long x 13.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.60 2.64 2.70 2.66 2.65 2.66 2.65 2.63

Primary OutFlow Max=0.55 cfs @ 14.29 hrs HW=82.61' (Free Discharge)
- **1=Culvert** (Passes 0.55 cfs of 6.48 cfs potential flow)
  - **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.51 cfs @ 1.11 fps)
  - **3=Orifice/Grate** (Orifice Controls 0.04 cfs @ 6.71 fps)
    - **4=Culvert** (Passes 0.04 cfs of 0.75 cfs potential flow)
      - **5=Exfiltration** (Passes 0.04 cfs of 2.76 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=81.00' (Free Discharge)
- **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond GW1: Gravel Wetland #1 (Phase 1)



Summary for Pond GW2: Gravel Wetland #2

Inflow Area = 3.749 ac, 72.19% Impervious, Inflow Depth = 2.35" for 2-YEAR event
Inflow = 7.79 cfs @ 12.20 hrs, Volume= 0.735 af
Outflow = 3.72 cfs @ 12.49 hrs, Volume= 0.504 af, Atten= 52%, Lag= 17.9 min
Primary = 3.72 cfs @ 12.49 hrs, Volume= 0.504 af
Secondary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 84.83' @ 12.49 hrs Surf.Area= 9,898 sf Storage= 14,568 cf

Plug-Flow detention time= 242.1 min calculated for 0.503 af (69% of inflow)
Center-of-Mass det. time= 149.0 min (958.1 - 809.1)

Volume	Invert	Avail.Storage	Storage Description
#1	83.00'	39,034 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

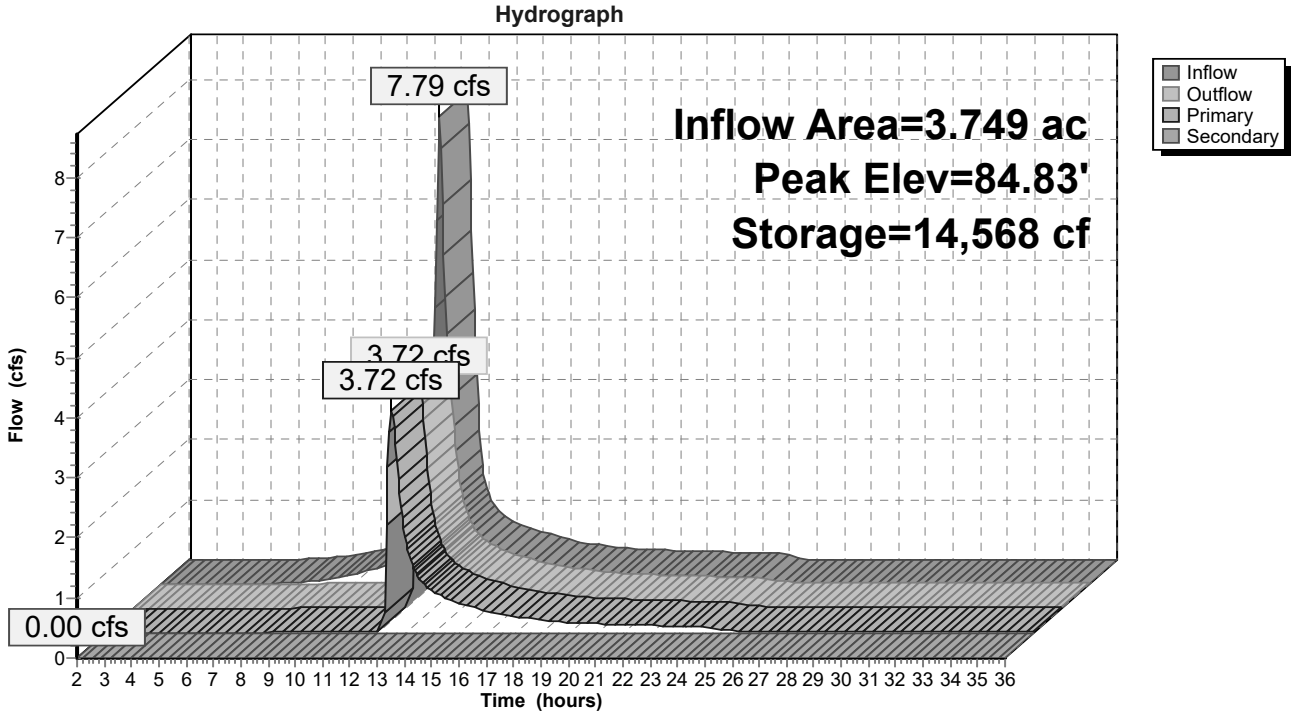
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
83.00	6,240	0	0
84.50	8,960	11,400	11,400
84.51	9,500	92	11,492
87.00	12,622	27,542	39,034

Device	Routing	Invert	Outlet Devices
#1	Primary	82.67'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.67' / 82.50' S= 0.0068 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	84.50'	**6.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 1	80.25'	**1.0" Vert. Orifice/Grate** C= 0.600
#4	Device 3	80.25'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 80.25' / 80.25' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#5	Device 4	83.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 82.67'
#6	Secondary	85.60'	**20.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=3.71 cfs @ 12.49 hrs HW=84.83' (Free Discharge)
- **1=Culvert** (Passes 3.71 cfs of 7.23 cfs potential flow)
  - **2=Sharp-Crested Vee/Trap Weir** (Weir Controls 3.67 cfs @ 1.87 fps)
  - **3=Orifice/Grate** (Orifice Controls 0.04 cfs @ 7.07 fps)
    - **4=Culvert** (Passes 0.04 cfs of 0.79 cfs potential flow)
      - **5=Exfiltration** (Passes 0.04 cfs of 2.69 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 2.00 hrs HW=83.00' (Free Discharge)
- **6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond GW2: Gravel Wetland #2



Summary for Pond WET: Wetland Area

Inflow Area = 65.123 ac, 1.33% Impervious, Inflow Depth = 1.16" for 2-YEAR event
Inflow = 25.13 cfs @ 13.27 hrs, Volume= 6.307 af
Outflow = 20.06 cfs @ 13.80 hrs, Volume= 6.103 af, Atten= 20%, Lag= 31.5 min
Primary = 20.06 cfs @ 13.80 hrs, Volume= 6.103 af

Routing by Stor-Ind method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 81.57' @ 13.80 hrs Surf.Area= 57,780 sf Storage= 51,624 cf

Plug-Flow detention time= 69.3 min calculated for 6.094 af (97% of inflow)
Center-of-Mass det. time= 51.9 min (988.9 - 937.0)

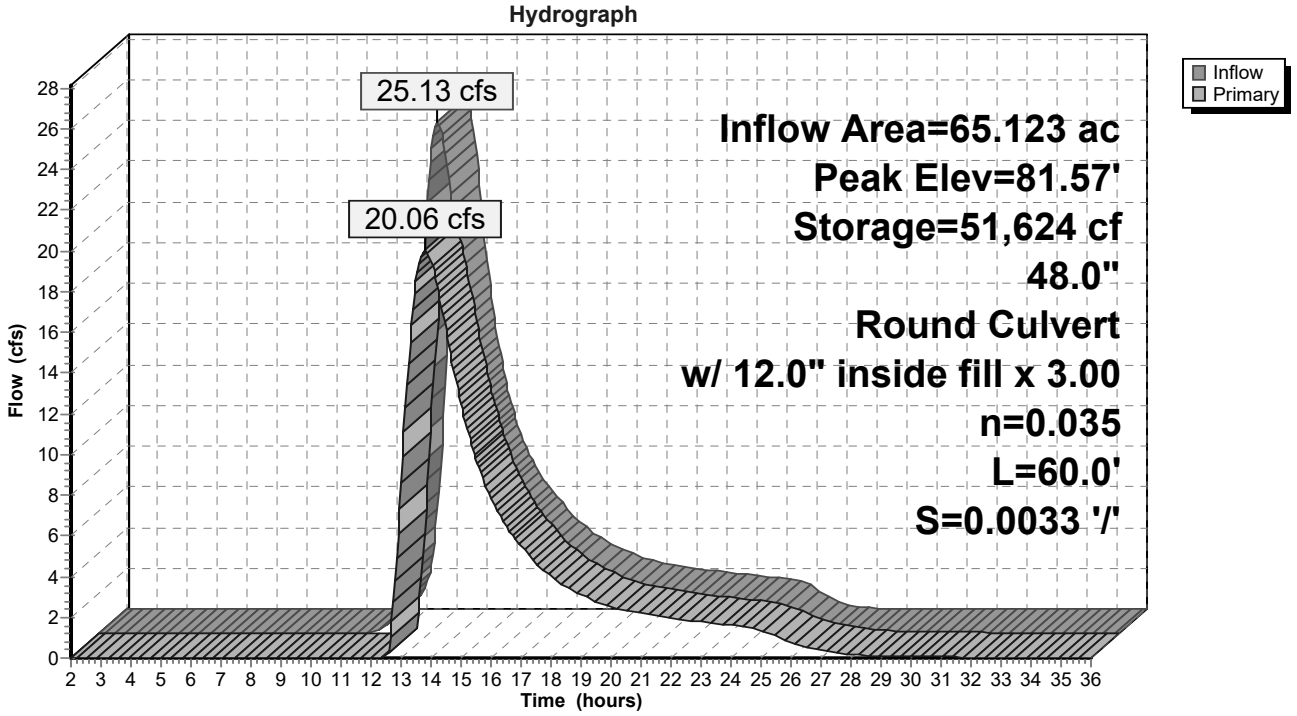
Volume	Invert	Avail.Storage	Storage Description
#1	79.50'	266,375 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

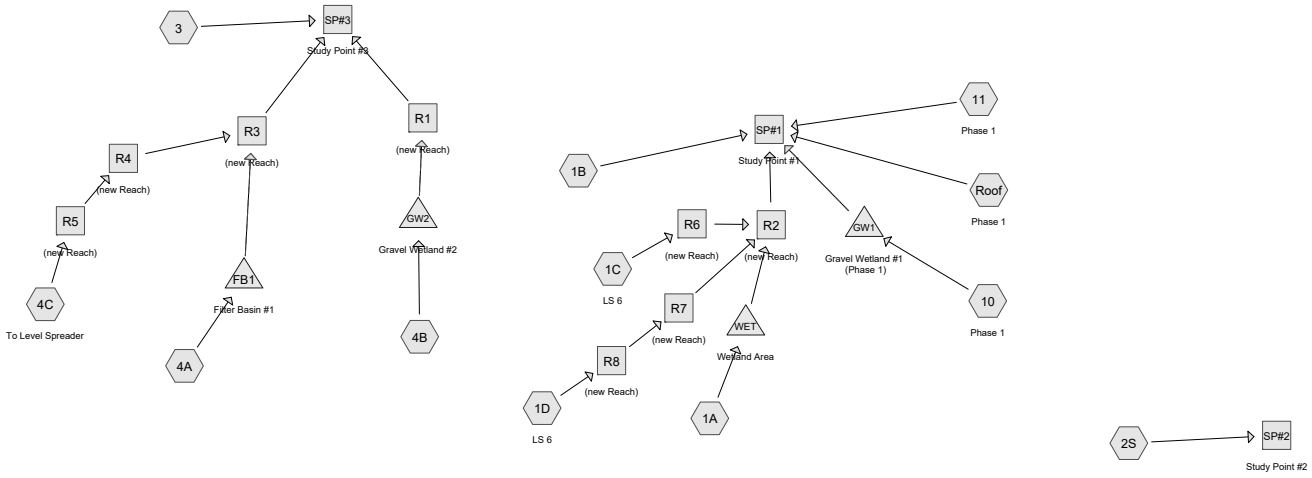
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
79.50	2,000	0	0
80.00	5,500	1,875	1,875
82.00	72,000	77,500	79,375
84.00	115,000	187,000	266,375

Device	Routing	Invert	Outlet Devices
#1	Primary	80.50'	**48.0" Round Culvert X 3.00 w/ 12.0" inside fill** L= 60.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 79.50' / 79.30' S= 0.0033 '/' Cc= 0.900 n= 0.035, Flow Area= 10.11 sf

Primary OutFlow Max=20.05 cfs @ 13.80 hrs HW=81.57' (Free Discharge)
1=Culvert (Barrel Controls 20.05 cfs @ 2.20 fps)

Pond WET: Wetland Area





Subcat Reach Pond Link

Routing Diagram for 2104.1 Post
Prepared by Terradyn Consultants, LLC, Printed 10/27/2024

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1A	0.00	0.00	50.0	0.0050	0.035	36.0	0.0	12.0
2	3	0.00	0.00	150.0	0.0100	0.012	48.0	0.0	0.0
3	4B	0.00	0.00	800.0	0.0200	0.012	18.0	0.0	0.0
4	10	0.00	0.00	800.0	0.0200	0.012	18.0	0.0	0.0
5	FB1	94.20	93.39	160.0	0.0051	0.012	6.0	0.0	0.0
6	GW1	80.67	80.50	25.0	0.0068	0.012	15.0	0.0	0.0
7	GW1	78.25	78.25	100.0	0.0000	0.012	6.0	0.0	0.0
8	GW2	82.67	82.50	25.0	0.0068	0.012	15.0	0.0	0.0
9	GW2	80.25	80.25	100.0	0.0000	0.012	6.0	0.0	0.0
10	WET	79.50	79.30	60.0	0.0033	0.035	48.0	0.0	12.0

Time span=2.00-36.00 hrs, dt=0.05 hrs, 681 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Runoff Area=65.123 ac 1.33% Impervious Runoff Depth=2.37"
Flow Length=1,580' Tc=92.3 min CN=75 Runoff=53.63 cfs 12.853 af

Subcatchment 1B: Runoff Area=4.000 ac 7.25% Impervious Runoff Depth=2.54"
Flow Length=380' Tc=46.1 min CN=77 Runoff=5.43 cfs 0.847 af

Subcatchment 1C: LS 6 Runoff Area=22,621 sf 67.13% Impervious Runoff Depth=3.78"
Tc=6.0 min CN=90 Runoff=2.17 cfs 0.164 af

Subcatchment 1D: LS 6 Runoff Area=22,621 sf 67.13% Impervious Runoff Depth=3.78"
Tc=6.0 min CN=90 Runoff=2.17 cfs 0.164 af

Subcatchment 2S: Runoff Area=1.767 ac 8.60% Impervious Runoff Depth=0.21"
Flow Length=150' Slope=0.0100 '/' Tc=25.6 min CN=40 Runoff=0.06 cfs 0.031 af

Subcatchment 3: Runoff Area=169.363 ac 6.44% Impervious Runoff Depth=1.45"
Flow Length=5,280' Tc=193.5 min CN=63 Runoff=46.56 cfs 20.407 af

Subcatchment 4A: Runoff Area=50,131 sf 69.29% Impervious Runoff Depth=3.89"
Tc=6.0 min CN=91 Runoff=4.91 cfs 0.373 af

Subcatchment 4B: Runoff Area=163,322 sf 72.19% Impervious Runoff Depth=3.89"
Flow Length=920' Tc=14.4 min CN=91 Runoff=12.58 cfs 1.214 af

Subcatchment 4C: To Level Spreader Runoff Area=33,136 sf 26.68% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=79 Runoff=2.37 cfs 0.172 af

Subcatchment 10: Phase 1 Runoff Area=227,876 sf 54.25% Impervious Runoff Depth=2.54"
Flow Length=920' Tc=14.4 min CN=77 Runoff=11.89 cfs 1.107 af

Subcatchment 11: Phase 1 Runoff Area=39,446 sf 35.93% Impervious Runoff Depth=2.99"
Flow Length=480' Tc=50.9 min CN=82 Runoff=1.37 cfs 0.226 af

Subcatchment Roof: Phase 1 Runoff Area=35,726 sf 100.00% Impervious Runoff Depth>4.65"
Tc=5.0 min CN=98 Runoff=3.96 cfs 0.318 af

Reach R1: (new Reach) Avg. Flow Depth=0.36' Max Vel=0.21 fps Inflow=8.16 cfs 0.983 af
n=0.400 L=160.0' S=0.0125 '/' Capacity=86.45 cfs Outflow=7.59 cfs 0.977 af

Reach R2: (new Reach) Avg. Flow Depth=0.83' Max Vel=0.49 fps Inflow=44.78 cfs 12.976 af
n=0.150 L=380.0' S=0.0034 '/' Capacity=295.04 cfs Outflow=44.06 cfs 12.969 af

Reach R3: (new Reach) Avg. Flow Depth=0.12' Max Vel=0.44 fps Inflow=5.02 cfs 0.514 af
n=0.100 L=820.0' S=0.0159 '/' Capacity=30.57 cfs Outflow=2.57 cfs 0.502 af

Reach R4: (new Reach) Avg. Flow Depth=0.22' Max Vel=0.64 fps Inflow=2.23 cfs 0.172 af
n=0.100 L=390.0' S=0.0179 '/' Capacity=7.75 cfs Outflow=1.65 cfs 0.172 af

Reach R5: (new Reach) Avg. Flow Depth=0.16' Max Vel=0.33 fps Inflow=2.37 cfs 0.172 af
n=0.400 L=54.0' S=0.0926 '/' Capacity=14.93 cfs Outflow=2.23 cfs 0.172 af

Reach R6: (new Reach) Avg. Flow Depth=0.21' Max Vel=0.21 fps Inflow=2.17 cfs 0.164 af
n=0.400 L=75.0' S=0.0267 '/' Capacity=8.01 cfs Outflow=1.85 cfs 0.164 af

Reach R7: (new Reach) Avg. Flow Depth=0.08' Max Vel=0.25 fps Inflow=1.75 cfs 0.164 af
n=0.150 L=690.0' S=0.0188 '/' Capacity=17.95 cfs Outflow=0.80 cfs 0.163 af

Reach R8: (new Reach) Avg. Flow Depth=0.18' Max Vel=0.23 fps Inflow=2.17 cfs 0.164 af
n=0.400 L=100.0' S=0.0400 '/' Capacity=9.81 cfs Outflow=1.75 cfs 0.164 af

Reach SP#1: Study Point #1 Inflow=46.91 cfs 15.190 af
Outflow=46.91 cfs 15.190 af

Reach SP#2: Study Point #2 Inflow=0.06 cfs 0.031 af
Outflow=0.06 cfs 0.031 af

Reach SP#3: Study Point #3 Inflow=48.11 cfs 21.886 af
Outflow=48.11 cfs 21.886 af

Pond FB1: Filter Basin #1 Peak Elev=97.86' Storage=4,318 cf Inflow=4.91 cfs 0.373 af
Primary=0.06 cfs 0.126 af Secondary=4.56 cfs 0.216 af Outflow=4.61 cfs 0.342 af

Pond GW1: Gravel Wetland #1 (Phase 1) Peak Elev=83.04' Storage=19,364 cf Inflow=11.89 cfs 1.107 af
Primary=5.18 cfs 0.830 af Secondary=0.00 cfs 0.000 af Outflow=5.18 cfs 0.830 af

Pond GW2: Gravel Wetland #2 Peak Elev=85.20' Storage=18,356 cf Inflow=12.58 cfs 1.214 af
Primary=8.16 cfs 0.983 af Secondary=0.00 cfs 0.000 af Outflow=8.16 cfs 0.983 af

Pond WET: Wetland Area Peak Elev=82.23' Storage=96,248 cf Inflow=53.63 cfs 12.853 af
48.0" Round Culvert w/ 12.0" inside fill x 3.00 n=0.035 L=60.0' S=0.0033 '/' Outflow=43.99 cfs 12.649 af

Total Runoff Area = 253.910 ac Runoff Volume = 37.875 af Average Runoff Depth = 1.79"
91.88% Pervious = 233.302 ac 8.12% Impervious = 20.608 ac

Time span=2.00-36.00 hrs, dt=0.05 hrs, 681 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Runoff Area=65.123 ac 1.33% Impervious Runoff Depth=3.45"
Flow Length=1,580' Tc=92.3 min CN=75 Runoff=78.93 cfs 18.740 af

Subcatchment 1B: Runoff Area=4.000 ac 7.25% Impervious Runoff Depth=3.65"
Flow Length=380' Tc=46.1 min CN=77 Runoff=7.83 cfs 1.218 af

Subcatchment 1C: LS 6 Runoff Area=22,621 sf 67.13% Impervious Runoff Depth=5.04"
Tc=6.0 min CN=90 Runoff=2.85 cfs 0.218 af

Subcatchment 1D: LS 6 Runoff Area=22,621 sf 67.13% Impervious Runoff Depth=5.04"
Tc=6.0 min CN=90 Runoff=2.85 cfs 0.218 af

Subcatchment 2S: Runoff Area=1.767 ac 8.60% Impervious Runoff Depth=0.56"
Flow Length=150' Slope=0.0100 '/' Tc=25.6 min CN=40 Runoff=0.36 cfs 0.083 af

Subcatchment 3: Runoff Area=169.363 ac 6.44% Impervious Runoff Depth=2.32"
Flow Length=5,280' Tc=193.5 min CN=63 Runoff=77.72 cfs 32.705 af

Subcatchment 4A: Runoff Area=50,131 sf 69.29% Impervious Runoff Depth=5.15"
Tc=6.0 min CN=91 Runoff=6.41 cfs 0.494 af

Subcatchment 4B: Runoff Area=163,322 sf 72.19% Impervious Runoff Depth=5.15"
Flow Length=920' Tc=14.4 min CN=91 Runoff=16.44 cfs 1.610 af

Subcatchment 4C: To Level Spreader Runoff Area=33,136 sf 26.68% Impervious Runoff Depth=3.86"
Tc=6.0 min CN=79 Runoff=3.36 cfs 0.245 af

Subcatchment 10: Phase 1 Runoff Area=227,876 sf 54.25% Impervious Runoff Depth=3.65"
Flow Length=920' Tc=14.4 min CN=77 Runoff=17.14 cfs 1.593 af

Subcatchment 11: Phase 1 Runoff Area=39,446 sf 35.93% Impervious Runoff Depth=4.17"
Flow Length=480' Tc=50.9 min CN=82 Runoff=1.90 cfs 0.315 af

Subcatchment Roof: Phase 1 Runoff Area=35,726 sf 100.00% Impervious Runoff Depth>5.94"
Tc=5.0 min CN=98 Runoff=5.02 cfs 0.406 af

Reach R1: (new Reach) Avg. Flow Depth=0.39' Max Vel=0.22 fps Inflow=8.97 cfs 1.378 af
n=0.400 L=160.0' S=0.0125 '/' Capacity=86.45 cfs Outflow=8.73 cfs 1.373 af

Reach R2: (new Reach) Avg. Flow Depth=1.05' Max Vel=0.56 fps Inflow=65.75 cfs 18.971 af
n=0.150 L=380.0' S=0.0034 '/' Capacity=295.04 cfs Outflow=64.98 cfs 18.965 af

Reach R3: (new Reach) Avg. Flow Depth=0.15' Max Vel=0.53 fps Inflow=6.84 cfs 0.708 af
n=0.100 L=820.0' S=0.0159 '/' Capacity=30.57 cfs Outflow=4.14 cfs 0.696 af

Reach R4: (new Reach) Avg. Flow Depth=0.27' Max Vel=0.73 fps Inflow=3.16 cfs 0.245 af
n=0.100 L=390.0' S=0.0179 '/' Capacity=7.75 cfs Outflow=2.46 cfs 0.245 af

Reach R5: (new Reach) Avg. Flow Depth=0.20' Max Vel=0.38 fps Inflow=3.36 cfs 0.245 af
n=0.400 L=54.0' S=0.0926 '/' Capacity=14.93 cfs Outflow=3.16 cfs 0.245 af

Reach R6: (new Reach) Avg. Flow Depth=0.25' Max Vel=0.23 fps Inflow=2.85 cfs 0.218 af
n=0.400 L=75.0' S=0.0267 '/' Capacity=8.01 cfs Outflow=2.43 cfs 0.218 af

Reach R7: (new Reach) Avg. Flow Depth=0.10' Max Vel=0.29 fps Inflow=2.38 cfs 0.218 af
n=0.150 L=690.0' S=0.0188 '/' Capacity=17.95 cfs Outflow=1.15 cfs 0.217 af

Reach R8: (new Reach) Avg. Flow Depth=0.22' Max Vel=0.26 fps Inflow=2.85 cfs 0.218 af
n=0.400 L=100.0' S=0.0400 '/' Capacity=9.81 cfs Outflow=2.38 cfs 0.218 af

Reach SP#1: Study Point #1 Inflow=69.00 cfs 22.219 af
Outflow=69.00 cfs 22.219 af

Reach SP#2: Study Point #2 Inflow=0.36 cfs 0.083 af
Outflow=0.36 cfs 0.083 af

Reach SP#3: Study Point #3 Inflow=79.66 cfs 34.774 af
Outflow=79.66 cfs 34.774 af

Pond FB1: Filter Basin #1 Peak Elev=97.92' Storage=4,474 cf Inflow=6.41 cfs 0.494 af
Primary=0.06 cfs 0.130 af Secondary=6.04 cfs 0.333 af Outflow=6.10 cfs 0.463 af

Pond GW1: Gravel Wetland #1 (Phase 1) Peak Elev=83.46' Storage=24,385 cf Inflow=17.14 cfs 1.593 af
Primary=8.69 cfs 1.316 af Secondary=0.00 cfs 0.000 af Outflow=8.69 cfs 1.316 af

Pond GW2: Gravel Wetland #2 Peak Elev=85.60' Storage=22,582 cf Inflow=16.44 cfs 1.610 af
Primary=8.97 cfs 1.378 af Secondary=0.00 cfs 0.000 af Outflow=8.97 cfs 1.378 af

Pond WET: Wetland Area Peak Elev=82.71' Storage=136,031 cf Inflow=78.93 cfs 18.740 af
48.0" Round Culvert w/ 12.0" inside fill x 3.00 n=0.035 L=60.0' S=0.0033 '/' Outflow=64.80 cfs 18.536 af

Total Runoff Area = 253.910 ac Runoff Volume = 57.845 af Average Runoff Depth = 2.73"
91.88% Pervious = 233.302 ac 8.12% Impervious = 20.608 ac

Time span=2.00-36.00 hrs, dt=0.05 hrs, 681 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1A: Runoff Area=65.123 ac 1.33% Impervious Runoff Depth=4.41"
Flow Length=1,580' Tc=92.3 min CN=75 Runoff=101.10 cfs 23.959 af

Subcatchment 1B: Runoff Area=4.000 ac 7.25% Impervious Runoff Depth=4.64"
Flow Length=380' Tc=46.1 min CN=77 Runoff=9.92 cfs 1.545 af

Subcatchment 1C: LS 6 Runoff Area=22,621 sf 67.13% Impervious Runoff Depth=6.12"
Tc=6.0 min CN=90 Runoff=3.42 cfs 0.265 af

Subcatchment 1D: LS 6 Runoff Area=22,621 sf 67.13% Impervious Runoff Depth=6.12"
Tc=6.0 min CN=90 Runoff=3.42 cfs 0.265 af

Subcatchment 2S: Runoff Area=1.767 ac 8.60% Impervious Runoff Depth=0.96"
Flow Length=150' Slope=0.0100 '/' Tc=25.6 min CN=40 Runoff=0.78 cfs 0.141 af

Subcatchment 3: Runoff Area=169.363 ac 6.44% Impervious Runoff Depth=3.13"
Flow Length=5,280' Tc=193.5 min CN=63 Runoff=106.84 cfs 44.135 af

Subcatchment 4A: Runoff Area=50,131 sf 69.29% Impervious Runoff Depth=6.23"
Tc=6.0 min CN=91 Runoff=7.67 cfs 0.598 af

Subcatchment 4B: Runoff Area=163,322 sf 72.19% Impervious Runoff Depth=6.23"
Flow Length=920' Tc=14.4 min CN=91 Runoff=19.68 cfs 1.948 af

Subcatchment 4C: To Level Spreader Runoff Area=33,136 sf 26.68% Impervious Runoff Depth=4.86"
Tc=6.0 min CN=79 Runoff=4.20 cfs 0.308 af

Subcatchment 10: Phase 1 Runoff Area=227,876 sf 54.25% Impervious Runoff Depth=4.64"
Flow Length=920' Tc=14.4 min CN=77 Runoff=21.68 cfs 2.021 af

Subcatchment 11: Phase 1 Runoff Area=39,446 sf 35.93% Impervious Runoff Depth=5.20"
Flow Length=480' Tc=50.9 min CN=82 Runoff=2.36 cfs 0.392 af

Subcatchment Roof: Phase 1 Runoff Area=35,726 sf 100.00% Impervious Runoff Depth>7.03"
Tc=5.0 min CN=98 Runoff=5.91 cfs 0.480 af

Reach R1: (new Reach) Avg. Flow Depth=0.46' Max Vel=0.24 fps Inflow=13.26 cfs 1.716 af
n=0.400 L=160.0' S=0.0125 '/' Capacity=86.45 cfs Outflow=11.63 cfs 1.710 af

Reach R2: (new Reach) Avg. Flow Depth=1.21' Max Vel=0.61 fps Inflow=83.48 cfs 24.283 af
n=0.150 L=380.0' S=0.0034 '/' Capacity=295.04 cfs Outflow=82.70 cfs 24.276 af

Reach R3: (new Reach) Avg. Flow Depth=0.18' Max Vel=0.58 fps Inflow=8.42 cfs 0.875 af
n=0.100 L=820.0' S=0.0159 '/' Capacity=30.57 cfs Outflow=5.44 cfs 0.863 af

Reach R4: (new Reach) Avg. Flow Depth=0.31' Max Vel=0.78 fps Inflow=3.95 cfs 0.308 af
n=0.100 L=390.0' S=0.0179 '/' Capacity=7.75 cfs Outflow=3.14 cfs 0.308 af

Reach R5: (new Reach) Avg. Flow Depth=0.23' Max Vel=0.41 fps Inflow=4.20 cfs 0.308 af
n=0.400 L=54.0' S=0.0926 '/' Capacity=14.93 cfs Outflow=3.95 cfs 0.308 af

Reach R6: (new Reach) Avg. Flow Depth=0.28' Max Vel=0.25 fps Inflow=3.42 cfs 0.265 af
n=0.400 L=75.0' S=0.0267 '/' Capacity=8.01 cfs Outflow=2.95 cfs 0.265 af

Reach R7: (new Reach) Avg. Flow Depth=0.11' Max Vel=0.31 fps Inflow=2.92 cfs 0.265 af
n=0.150 L=690.0' S=0.0188 '/' Capacity=17.95 cfs Outflow=1.46 cfs 0.264 af

Reach R8: (new Reach) Avg. Flow Depth=0.25' Max Vel=0.28 fps Inflow=3.42 cfs 0.265 af
n=0.400 L=100.0' S=0.0400 '/' Capacity=9.81 cfs Outflow=2.92 cfs 0.265 af

Reach SP#1: Study Point #1 Inflow=87.71 cfs 28.438 af
Outflow=87.71 cfs 28.438 af

Reach SP#2: Study Point #2 Inflow=0.78 cfs 0.141 af
Outflow=0.78 cfs 0.141 af

Reach SP#3: Study Point #3 Inflow=109.21 cfs 46.709 af
Outflow=109.21 cfs 46.709 af

Pond FB1: Filter Basin #1 Peak Elev=97.95' Storage=4,594 cf Inflow=7.67 cfs 0.598 af
Primary=0.06 cfs 0.133 af Secondary=7.29 cfs 0.433 af Outflow=7.35 cfs 0.567 af

Pond GW1: Gravel Wetland #1 (Phase 1) Peak Elev=83.83' Storage=29,017 cf Inflow=21.68 cfs 2.021 af
Primary=9.41 cfs 1.667 af Secondary=3.95 cfs 0.077 af Outflow=13.36 cfs 1.743 af

Pond GW2: Gravel Wetland #2 Peak Elev=85.78' Storage=24,570 cf Inflow=19.68 cfs 1.948 af
Primary=9.31 cfs 1.646 af Secondary=3.94 cfs 0.070 af Outflow=13.26 cfs 1.716 af

Pond WET: Wetland Area Peak Elev=83.10' Storage=171,988 cf Inflow=101.10 cfs 23.959 af
48.0" Round Culvert w/ 12.0" inside fill x 3.00 n=0.035 L=60.0' S=0.0033 '/' Outflow=82.42 cfs 23.754 af

Total Runoff Area = 253.910 ac Runoff Volume = 76.057 af Average Runoff Depth = 3.59"
91.88% Pervious = 233.302 ac 8.12% Impervious = 20.608 ac

Summary for Pond FB1: Filter Basin #1

Inflow Area = 1.151 ac, 69.29% Impervious, Inflow Depth = 5.15" for 25-YEAR event
Inflow = 6.41 cfs @ 12.09 hrs, Volume= 0.494 af
Outflow = 6.10 cfs @ 12.11 hrs, Volume= 0.463 af, Atten= 5%, Lag= 1.6 min
Primary = 0.06 cfs @ 12.12 hrs, Volume= 0.130 af
Secondary = 6.04 cfs @ 12.11 hrs, Volume= 0.333 af

Routing by Stor-Ind method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 97.92' @ 12.12 hrs Surf.Area= 3,074 sf Storage= 4,474 cf

Plug-Flow detention time= 176.2 min calculated for 0.463 af (94% of inflow)
Center-of-Mass det. time= 142.1 min (922.1 - 780.0)

Volume	Invert	Avail.Storage	Storage Description
#1	96.20'	8,127 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.20	2,140	0	0
97.00	2,576	1,886	1,886
98.00	3,120	2,848	4,734
99.00	3,665	3,393	8,127

Device	Routing	Invert	Outlet Devices
#1	Primary	93.39'	**1.0" Vert. Orifice/Grate** C= 0.600
#2	Device 1	94.20'	**6.0" Round Culvert** L= 160.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.20' / 93.39' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#3	Device 2	96.20'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 92.67'
#4	Secondary	97.60'	**14.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.06 cfs @ 12.12 hrs HW=97.91' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.06 cfs @ 10.19 fps)
└**2=Culvert** (Passes 0.06 cfs of 0.89 cfs potential flow)
└**3=Exfiltration** (Passes 0.06 cfs of 0.24 cfs potential flow)

Secondary OutFlow Max=5.87 cfs @ 12.11 hrs HW=97.91' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 5.87 cfs @ 1.35 fps)

Summary for Pond GW2: Gravel Wetland #2

Inflow Area = 3.749 ac, 72.19% Impervious, Inflow Depth = 5.15" for 25-YEAR event
Inflow = 16.44 cfs @ 12.19 hrs, Volume= 1.610 af
Outflow = 14.05 cfs @ 12.29 hrs, Volume= 1.091 af, Atten= 15%, Lag= 5.6 min
Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Secondary = 14.05 cfs @ 12.29 hrs, Volume= 1.091 af

Routing by Stor-Ind method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 86.01' @ 12.29 hrs Surf.Area= 11,387 sf Storage= 27,209 cf

Plug-Flow detention time= 176.2 min calculated for 1.091 af (68% of inflow)
Center-of-Mass det. time= 81.4 min (869.2 - 787.8)

Volume	Invert	Avail.Storage	Storage Description
#1	83.00'	39,034 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
83.00	6,240	0	0
84.50	8,960	11,400	11,400
84.51	9,500	92	11,492
87.00	12,622	27,542	39,034

Device	Routing	Invert	Outlet Devices
#1	Primary	82.67'	**15.0" Round Culvert X 0.00** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.67' / 82.50' S= 0.0068 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	84.50'	**6.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 1	80.25'	**1.0" Vert. Orifice/Grate** C= 0.600
#4	Device 3	80.25'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 80.25' / 80.25' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#5	Device 4	83.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 82.67'
#6	Secondary	85.60'	**20.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=83.00' (Free Discharge)
- **1=Culvert** (Controls 0.00 cfs)
  - **2=Sharp-Crested Vee/Trap Weir** (Controls 0.00 cfs)
  - **3=Orifice/Grate** (Passes 0.00 cfs of 0.02 cfs potential flow)
    - **4=Culvert** (Passes 0.00 cfs of 0.31 cfs potential flow)
      - **5=Exfiltration** (Passes 0.00 cfs of 0.35 cfs potential flow)

Secondary OutFlow Max=13.90 cfs @ 12.29 hrs HW=86.01' (Free Discharge)
- **6=Broad-Crested Rectangular Weir** (Weir Controls 13.90 cfs @ 1.69 fps)

Summary for Pond FB1: Filter Basin #1

Inflow Area = 1.151 ac, 69.29% Impervious, Inflow Depth = 7.62" for 100-YEAR event
Inflow = 9.26 cfs @ 12.09 hrs, Volume= 0.730 af
Outflow = 8.92 cfs @ 12.11 hrs, Volume= 0.699 af, Atten= 4%, Lag= 1.4 min
Primary = 0.06 cfs @ 12.11 hrs, Volume= 0.137 af
Secondary = 8.87 cfs @ 12.11 hrs, Volume= 0.563 af

Routing by Stor-Ind method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 98.00' @ 12.11 hrs Surf.Area= 3,120 sf Storage= 4,736 cf

Plug-Flow detention time= 128.5 min calculated for 0.699 af (96% of inflow)
Center-of-Mass det. time= 103.6 min (873.8 - 770.3)

Volume	Invert	Avail.Storage	Storage Description
#1	96.20'	8,127 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
96.20	2,140	0	0
97.00	2,576	1,886	1,886
98.00	3,120	2,848	4,734
99.00	3,665	3,393	8,127

Device	Routing	Invert	Outlet Devices
#1	Primary	93.39'	**1.0" Vert. Orifice/Grate** C= 0.600
#2	Device 1	94.20'	**6.0" Round Culvert** L= 160.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 94.20' / 93.39' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#3	Device 2	96.20'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 92.67'
#4	Secondary	97.60'	**14.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.06 cfs @ 12.11 hrs HW=97.99' (Free Discharge)
└**1=Orifice/Grate** (Orifice Controls 0.06 cfs @ 10.29 fps)
└**2=Culvert** (Passes 0.06 cfs of 0.90 cfs potential flow)
└**3=Exfiltration** (Passes 0.06 cfs of 0.25 cfs potential flow)

Secondary OutFlow Max=8.66 cfs @ 12.11 hrs HW=97.99' (Free Discharge)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 8.66 cfs @ 1.57 fps)

Summary for Pond GW2: Gravel Wetland #2

Inflow Area = 3.749 ac, 72.19% Impervious, Inflow Depth = 7.62" for 100-YEAR event
Inflow = 23.78 cfs @ 12.19 hrs, Volume= 2.380 af
Outflow = 18.72 cfs @ 12.31 hrs, Volume= 2.148 af, Atten= 21%, Lag= 7.4 min
Primary = 9.56 cfs @ 12.32 hrs, Volume= 1.950 af
Secondary = 9.16 cfs @ 12.31 hrs, Volume= 0.198 af

Routing by Stor-Ind method, Time Span= 2.00-36.00 hrs, dt= 0.05 hrs
Peak Elev= 85.91' @ 12.32 hrs Surf.Area= 11,261 sf Storage= 26,069 cf

Plug-Flow detention time= 113.3 min calculated for 2.144 af (90% of inflow)
Center-of-Mass det. time= 66.6 min (844.7 - 778.1)

Volume	Invert	Avail.Storage	Storage Description
#1	83.00'	39,034 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

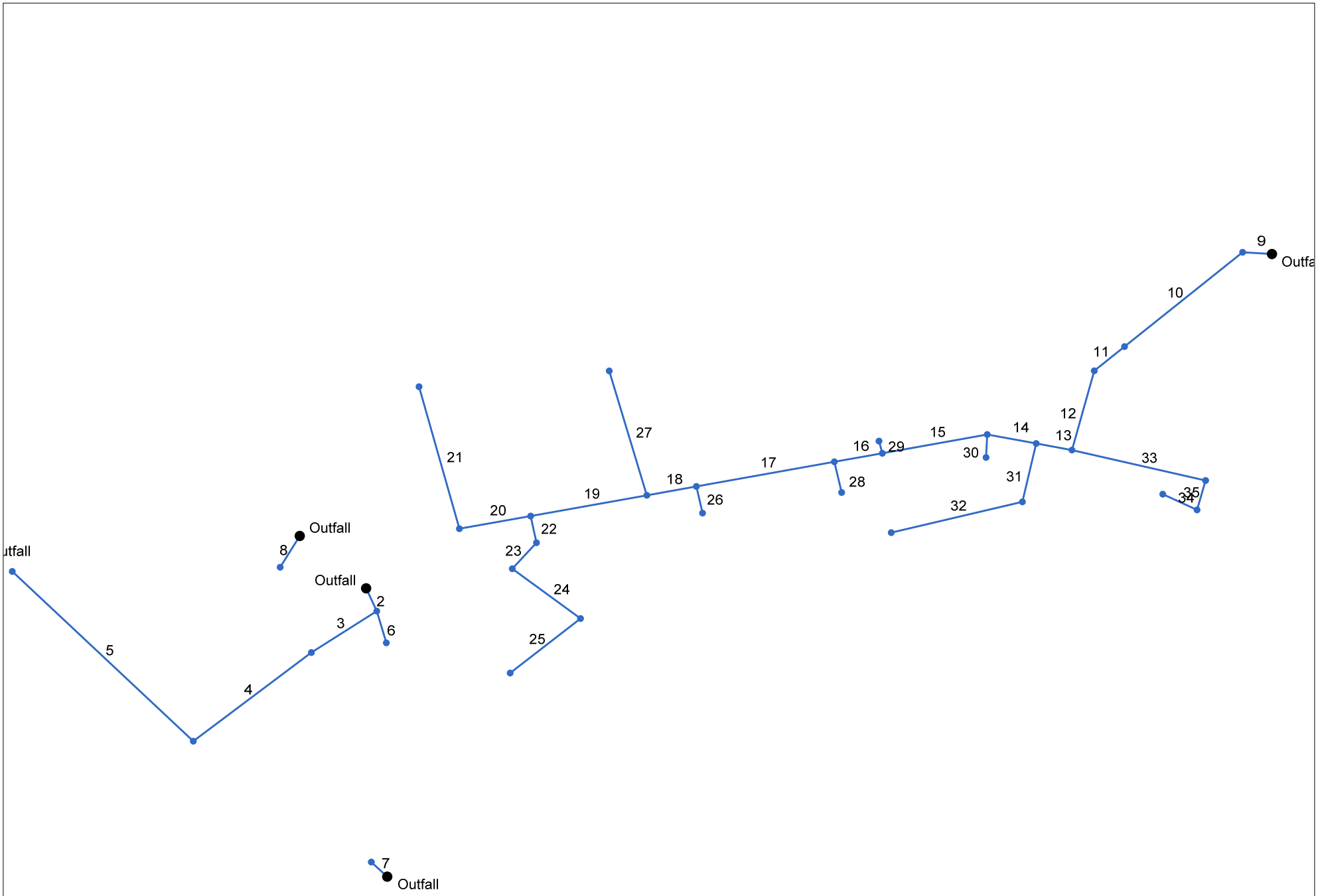
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
83.00	6,240	0	0
84.50	8,960	11,400	11,400
84.51	9,500	92	11,492
87.00	12,622	27,542	39,034

Device	Routing	Invert	Outlet Devices
#1	Primary	82.67'	**15.0" Round Culvert** L= 25.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.67' / 82.50' S= 0.0068 '/' Cc= 0.900 n= 0.012, Flow Area= 1.23 sf
#2	Device 1	84.50'	**6.0' long Sharp-Crested Vee/Trap Weir** Cv= 2.62 (C= 3.28)
#3	Device 1	80.25'	**1.0" Vert. Orifice/Grate** C= 0.600
#4	Device 3	80.25'	**6.0" Round Culvert** L= 100.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 80.25' / 80.25' S= 0.0000 '/' Cc= 0.900 n= 0.012, Flow Area= 0.20 sf
#5	Device 4	83.00'	**2.400 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 82.67'
#6	Secondary	85.60'	**20.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=9.55 cfs @ 12.32 hrs HW=85.91' (Free Discharge)
- **1=Culvert** (Inlet Controls 9.55 cfs @ 7.78 fps)
  - **2=Sharp-Crested Vee/Trap Weir** (Passes < 32.84 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 0.05 cfs potential flow)
    - **4=Culvert** (Passes < 0.96 cfs potential flow)
      - **5=Exfiltration** (Passes < 4.12 cfs potential flow)

Secondary OutFlow Max=8.89 cfs @ 12.31 hrs HW=85.91' (Free Discharge)
- **6=Broad-Crested Rectangular Weir** (Weir Controls 8.89 cfs @ 1.44 fps)

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: Pipe network.stm	Number of lines: 35	Date: 10/1/2024

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
35	SD-7	0.37	12	Cir	31.735	84.23	84.43	0.630	85.50*	85.50*	0.00	85.50	34	Grate
34	SD-6	0.70	15	Cir	29.000	83.78	83.98	0.690	85.49*	85.49*	0.01	85.50	33	Grate
33	SD-5	0.98	15	Cir	112.976	83.45	84.03	0.513	85.45*	85.47*	0.01	85.49	12	Grate
32	SD-11	0.27	12	Cir	111.300	85.08	86.50	1.276	85.40	86.71	n/a	86.71 j	31	Grate
31	SD-10	0.58	12	Cir	56.982	84.79	85.08	0.509	85.11	85.40	n/a	85.40	13	Grate
30	SD-12	0.27	12	Cir	21.910	85.49	85.69	0.913	86.03	85.90	0.08	85.90	14	Grate
29	SD-13	0.88	12	Cir	12.001	86.56	86.76	1.667	87.09	87.15	n/a	87.15 j	15	Grate
28	SD-15	0.37	12	Cir	30.000	86.94	87.14	0.667	87.66	87.39	0.09	87.39	16	Grate
27	SD-24	0.34	12	Cir	123.049	89.57	90.19	0.504	90.43	90.43	n/a	90.43	18	Grate
26	SD-17	0.03	12	Cir	26.000	89.73	89.93	0.769	89.80	90.00	0.03	90.00	17	Grate
25	SD-23	0.77	12	Cir	77.709	92.37	93.53	1.493	92.64	93.90	0.14	93.90	24	Grate
24	SD-22	1.57	15	Cir	73.428	91.78	92.12	0.463	92.27	92.62	n/a	92.62	23	Grate
23	SD-21	1.53	15	Cir	31.807	91.58	91.78	0.629	92.10	92.27	n/a	92.27 j	22	Manhole
22	SD-20	1.71	15	Cir	26.000	91.38	91.58	0.769	92.01	92.10	n/a	92.10 j	19	Grate
21	SD-26	0.77	12	Cir	140.049	93.10	93.80	0.500	93.46	94.17	0.14	94.17	20	Grate
20	SD-25	0.69	12	Cir	59.342	92.20	92.85	1.095	92.48	93.20	0.13	93.20	19	Manhole
19	SD-19	2.51	15	Cir	97.092	89.32	91.38	2.122	90.43	92.01	n/a	92.01 j	18	Manhole
18	SD-18	2.96	15	Cir	41.511	89.11	89.32	0.506	89.80	90.01	0.42	90.43	17	Grate
17	SD-16	2.72	15	Cir	115.000	86.94	89.11	1.887	87.66	89.77	n/a	89.77 j	16	Manhole
16	SD-14	3.17	15	Cir	40.153	86.31	86.94	1.569	87.09	87.66	n/a	87.66 j	15	Grate
15	SD-34	3.72	15	Cir	87.575	85.24	86.31	1.222	86.03	87.09	n/a	87.09 j	14	Manhole
14	SD-9	3.85	15	Cir	40.883	84.54	85.24	1.712	85.11	86.03	0.34	86.03	13	Manhole
13	SD-8	4.60	18	Cir	30.000	83.95	84.29	1.133	85.45	85.11	n/a	85.11	12	Grate
12	SD-4	5.69	18	Cir	78.116	83.56	83.95	0.499	84.49	84.88	0.57	85.45	11	Grate

Project File: Pipe network.stm | Number of lines: 35 | Run Date: 10/1/2024

NOTES: Return period = 10 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
11	SD-3	5.64	18	Cir	33.903	83.36	83.56	0.590	84.51	84.48	n/a	84.48	10	Manhole
10	SD-2	5.93	18	Cir	132.153	82.70	83.36	0.499	83.66	84.32	0.19	84.51	9	Grate
9	SD-1	6.16	18	Cir	24.114	82.50	82.70	0.829	83.47	83.66	n/a	83.66 j	End	Grate
8	SD-27	0.67	12	Cir	33.978	96.20	96.47	0.795	96.55	96.81	n/a	96.81 j	End	Grate
7	SD-32	0.84	12	Cir	19.106	98.00	98.81	4.240	98.39	99.19	n/a	99.19 j	End	Grate
6	SD-28	0.54	12	Cir	31.341	96.40	96.60	0.638	96.93	96.90	n/a	96.90	2	Grate
5	SD-33	1.21	12	Cir	220.049	98.79	99.88	0.495	99.26	100.35	0.17	100.52	4	Grate
4	SD-31	1.08	12	Cir	128.416	97.77	98.79	0.794	98.22	99.23	n/a	99.23 j	3	Manhole
3	SD-30	1.32	15	Cir	66.570	96.40	97.77	2.058	96.93	98.22	n/a	98.22 j	2	Grate
2	SD-29	1.80	15	Cir	23.554	96.20	96.40	0.849	96.74	96.93	n/a	96.93 j	End	Grate
1	SD-41	0.03	15	Cir	60.223	101.30	101.60	0.498	101.38	101.67	0.02	101.69	End	None

Project File: Pipe network.stm | Number of lines: 35 | Run Date: 10/1/2024

NOTES: Return period = 10 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
35	12	0.37	84.23	85.50	1.00	0.79	0.47	0.00	85.50	0.009	31.735	84.43	85.50	1.00	0.79	0.47	0.00	85.50	0.009	0.009	0.003	1.00	0.00
34	15	0.70	83.78	85.49	1.25	1.23	0.57	0.01	85.49	0.010	29.000	83.98	85.49	1.25	1.23	0.57	0.01	85.49	0.010	0.010	0.003	1.50	0.01
33	15	0.98	83.45	85.45	1.25	1.23	0.80	0.01	85.46	0.020	112.976	84.03	85.47	1.25	1.23	0.80	0.01	85.48	0.019	0.019	0.022	1.50	0.01
32	12	0.27	85.08	85.40	0.32	0.12	1.27	0.08	85.47	0.000	111.300	86.50	86.71 j	0.21**	0.12	2.20	0.08	86.79	0.000	0.000	n/a	1.00	0.08
31	12	0.58	84.79	85.11	0.32	0.21	2.63	0.11	85.23	0.000	56.982	85.08	85.40	0.32**	0.21	2.72	0.11	85.51	0.000	0.000	n/a	1.37	n/a
30	12	0.27	85.49	86.03	0.54	0.12	0.62	0.08	86.11	0.000	21.910	85.69	85.90	0.21**	0.12	2.20	0.08	85.98	0.000	0.000	n/a	1.00	0.08
29	12	0.88	86.56	87.09	0.53	0.29	2.08	0.15	87.23	0.000	12.001	86.76	87.15 j	0.39**	0.29	3.07	0.15	87.30	0.000	0.000	n/a	1.00	0.15
28	12	0.37	86.94	87.66	0.72	0.15	0.62	0.09	87.75	0.000	30.000	87.14	87.39	0.25**	0.15	2.40	0.09	87.48	0.000	0.000	n/a	1.00	0.09
27	12	0.34	89.57	90.43	0.86	0.14	0.47	0.08	90.52	0.000	123.049	90.19	90.43	0.24**	0.14	2.33	0.08	90.51	0.000	0.000	n/a	1.00	n/a
26	12	0.03	89.73	89.80	0.07*	0.02	1.38	0.03	89.83	0.000	26.000	89.93	90.00	0.07**	0.03	1.27	0.03	90.03	0.000	0.000	n/a	1.00	0.03
25	12	0.77	92.37	92.64	0.27*	0.17	4.43	0.14	92.78	0.000	77.709	93.53	93.90	0.37**	0.26	2.96	0.14	94.03	0.000	0.000	n/a	1.00	0.14
24	15	1.57	91.78	92.27	0.49*	0.45	3.48	0.19	92.46	0.000	73.428	92.12	92.62	0.50**	0.45	3.46	0.19	92.80	0.000	0.000	n/a	1.50	n/a
23	15	1.53	91.58	92.10	0.52	0.45	3.18	0.18	92.28	0.000	31.807	91.78	92.27 j	0.49**	0.45	3.44	0.18	92.45	0.000	0.000	n/a	1.00	n/a
22	15	1.71	91.38	92.01	0.63	0.48	2.74	0.20	92.21	0.000	26.000	91.58	92.10 j	0.52**	0.48	3.55	0.20	92.30	0.000	0.000	n/a	1.19	n/a
21	12	0.77	93.10	93.46	0.36*	0.26	2.99	0.14	93.60	0.000	140.049	93.80	94.17	0.37**	0.26	2.96	0.14	94.30	0.000	0.000	n/a	1.00	0.14
20	12	0.69	92.20	92.48	0.28*	0.18	3.83	0.13	92.61	0.000	59.342	92.85	93.20	0.35**	0.24	2.86	0.13	93.32	0.000	0.000	n/a	1.00	0.13
19	15	2.51	89.32	90.43	1.11	0.62	2.18	0.25	90.68	0.000	97.092	91.38	92.01 j	0.63**	0.62	4.02	0.25	92.26	0.000	0.000	n/a	1.00	0.25
18	15	2.96	89.11	89.80	0.69*	0.70	4.23	0.28	90.08	0.506	41.511	89.32	90.01	0.69**	0.70	4.23	0.28	90.29	0.506	0.506	0.210	1.50	0.42
17	15	2.72	86.94	87.66	0.72	0.66	3.74	0.27	87.92	0.000	115.000	89.11	89.77 j	0.66**	0.66	4.13	0.27	90.04	0.000	0.000	n/a	1.00	n/a
16	15	3.17	86.31	87.09	0.78	0.73	3.95	0.30	87.38	0.000	40.153	86.94	87.66 j	0.72**	0.73	4.36	0.30	87.95	0.000	0.000	n/a	1.50	n/a
15	15	3.72	85.24	86.03	0.79	0.80	4.53	0.33	86.37	0.000	87.575	86.31	87.09 j	0.78**	0.80	4.63	0.33	87.42	0.000	0.000	n/a	1.00	0.33
14	15	3.85	84.54	85.11	0.57	0.55	7.01	0.34	85.46	0.000	40.883	85.24	86.03	0.79**	0.82	4.69	0.34	86.37	0.000	0.000	n/a	1.00	0.34

Project File: Pipe network.stm | Number of lines: 35 | Run Date: 10/1/2024

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
13	18	4.60	83.95	85.45	1.50	0.99	2.60	0.33	85.78	0.000	30.000	84.29	85.11	0.82**	0.99	4.63	0.33	85.45	0.000	0.000	n/a	1.50	n/a
12	18	5.69	83.56	84.49	0.93*	1.15	4.93	0.38	84.87	0.499	78.116	83.95	84.88	0.93	1.15	4.94	0.38	85.26	0.501	0.500	0.391	1.50	0.57
11	18	5.64	83.36	84.51	1.15	1.13	3.88	0.39	84.90	0.000	33.903	83.56	84.48	0.92**	1.13	4.99	0.39	84.86	0.000	0.000	n/a	0.60	n/a
10	18	5.93	82.70	83.66	0.96*	1.19	4.98	0.38	84.04	0.499	132.153	83.36	84.32	0.96	1.19	4.98	0.39	84.70	0.500	0.500	0.660	0.50	0.19
9	18	6.16	82.50	83.47	0.97	1.19	5.09	0.42	83.89	0.000	24.114	82.70	83.66 j	0.96**	1.19	5.17	0.42	84.07	0.000	0.000	n/a	1.16	n/a
8	12	0.67	96.20	96.55	0.35	0.24	2.75	0.13	96.68	0.000	33.978	96.47	96.81 j	0.34**	0.24	2.84	0.13	96.94	0.000	0.000	n/a	1.00	0.13
7	12	0.84	98.00	98.39	0.39	0.28	2.97	0.14	98.53	0.000	19.106	98.81	99.19 j	0.38**	0.28	3.03	0.14	99.34	0.000	0.000	n/a	1.00	n/a
6	12	0.54	96.40	96.93	0.53	0.20	1.26	0.11	97.04	0.000	31.341	96.60	96.90	0.30**	0.20	2.66	0.11	97.01	0.000	0.000	n/a	1.00	n/a
5	12	1.21	98.79	99.26	0.47*	0.36	3.36	0.18	99.43	0.495	220.049	99.88	100.35	0.47**	0.36	3.35	0.17	100.52	0.492	0.493	1.085	1.00	0.17
4	12	1.08	97.77	98.22	0.45	0.33	3.11	0.17	98.39	0.000	128.416	98.79	99.23 j	0.44**	0.33	3.27	0.17	99.39	0.000	0.000	n/a	1.00	n/a
3	15	1.32	96.40	96.93	0.53	0.40	2.63	0.17	97.10	0.000	66.570	97.77	98.22 j	0.45**	0.40	3.28	0.17	98.39	0.000	0.000	n/a	0.50	n/a
2	15	1.80	96.20	96.74	0.54	0.50	3.55	0.20	96.94	0.000	23.554	96.40	96.93 j	0.53**	0.50	3.61	0.20	97.14	0.000	0.000	n/a	1.71	n/a
1	15	0.03	101.30	101.38	0.08	0.03	1.02	0.02	101.40	0.352	60.223	101.60	101.67	0.07**	0.03	1.20	0.02	101.69	0.562	0.457	0.275	1.00	0.02

Project File: Pipe network.stm | Number of lines: 35 | Run Date: 10/1/2024

Notes: * depth assumed; ** Critical depth.; j-Line contains hyd. jump ; c = cir e = ellip b = box

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MAINTENANCE PLAN OF STORMWATER MANAGEMENT FACILITIES

CLOVER LEAF DEVELOPMENT
SACO, MAINE

Prepared by:
Jeffrey D. Amos, P.E. 10167

Project Developer: Clover Leaf Development, LLC
986 Portland Road
Saco, Me 04072

Responsible Party: Clover Leaf Development, LLC
986 Portland Road
Saco, Me 04072

List of Stormwater Measures:

Conveyance & Distribution System (Stormwater Channels & Culverts)
Roadways & Parking Surfaces
Level Lip Spreader
Vegetated Buffer

Introduction:

Regular inspection and maintenance of the entire stormwater management system is crucial to the long-term effectiveness of the system. The responsible party must provide regular inspection and maintenance of all permanent erosion control measures and stormwater management structures, establish any contract services required to implement the program, and keep records and a maintenance log book of inspection and maintenance activities. At a minimum, the inspection and maintenance activities outlined herein should be performed at the recommended intervals. All inspection and maintenance documentation shall be maintained for at least 5 years. This project is subject to the Maine Department of Environmental Protection's 5-year Recertification Process.

All measures must be maintained in effective operating condition. A person with knowledge of erosion and sedimentation practices, stormwater management, and the standards and conditions of all local, state and federal permits for the project shall conduct the inspections. The following areas, facilities, and measures must be inspected and identified deficiencies must be corrected.

Inspection & Maintenance Tasks:

Inspections should be performed by a qualified erosion control professional. NOTE: The following instruction are excerpts from the Maine Department of Environmental Protection's *Stormwater Management for Maine, Volume III BMPs Technical Design Manual*, dated January 2006.

1. Inspect **vegetated areas**, particularly slopes and embankments, early in the growing season or after storm events resulting in one inch of rain in 24 hours to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

2. Inspect **ditches, swales and other open stormwater channels** in the spring, in late fall, and after storm events resulting in one inch of rain in 24 hours to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or sideslopes.

3. Inspect **resource and treatment buffers** once a year for evidence of erosion, concentrating flow, and encroachment by development. If flows are concentrating within a buffer, site grading, level spreaders, or ditch turn-outs must be used to ensure a more even distribution of flow into a buffer. Check down slope of all spreaders and turn-outs for erosion. If erosion is present, adjust or modify the spreader's or turnout's lip to ensure a better distribution of flow into a buffer. Clean-out any accumulation of sediment within the spreader bays or turn-out pools.

Recertification requirement:

Within three months of the expiration of each five-year interval from the date of issuance of the permit, the permittee shall certify the following to the Department.

(a) All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.

(b) All aspects of the stormwater control system are operating as approved, have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the system, or portions of the system, as necessary.

(c) The stormwater maintenance plan for the site is being implemented as approved by the Department, and the maintenance log is being maintained.

(d) All proprietary systems have been maintained according to the manufacturer's recommendations. Where required by the Department, the permittee shall execute a 5-year

maintenance contract with a qualified professional for the coming 5-year interval. The maintenance contract must include provisions for routine inspections, cleaning and general maintenance.

(e) The Department may waive some or all of these recertification requirements on a case-by-case basis for permittees subject to the Department's Multi-Sector General Permit ("MSGP") and/or Maine Pollutant Discharge Elimination System ("MEPDES") programs where it is demonstrated that these programs are providing stormwater control that is at least as effective as required pursuant to this Chapter.

Conveyance & Distribution Systems: (Stormwater Channels & Culverts, etc.)

1. Inspection schedule:

a. Inspect ditches, swales and other open stormwater channels in the spring, in late fall, and after heavy rains (one inch of rain in 24 hours) to remove any obstructions to flow, remove accumulated sediments and debris, to control vegetated growth that could obstruct flow, and to repair any erosion of the ditch lining. Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity. Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable. If the ditch has a riprap lining, replace riprap on areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged. The channel must receive adequate routine maintenance to maintain capacity and prevent or correct any erosion of the channel's bottom or side-slopes.

b. Inspect culverts in the spring, in late fall, and after heavy rains to remove any obstructions to flow; remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit; and to repair any erosion damage at the culvert's inlet and outlet.

c. Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains to identify active or potential erosion problems. Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

2. Mowing: Grass should not be trimmed extremely short, as this will reduce the filtering effect of the swale (MPCA, 1989). The cut vegetation should be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale. The mowed height of the grass should be 2-4 inches taller than the maximum flow depth of the design water quality storm. A minimum mow height of 6 inches is generally recommended (Galli, 1993).

3. Erosion: It is important to install erosion and sediment control measures to stabilize this area as soon as possible and to retain any organic matter in the bottom of the trench.

4. Fertilization: Routine fertilization and/or use of pesticides is strongly discouraged. If complete re-seeding is necessary, half the original recommended rate of fertilizer should be applied with a full rate of seed.

5. Sediment Removal: The level of sediment deposition in the channel should be monitored regularly, and removed from grassed channels before permanent damage is done to the grassed vegetation, or if infiltration times are longer than 12 hours. Sediment should be removed from riprap channels when it reduces the capacity of the channel.

Roadways & Parking Surfaces:

Paved surfaces shall be swept or vacuumed at least once annually in the Spring to remove all Winter sand, and periodically during the year on an as-needed basis to minimize transportation of sediment during rainfall events.

Vegetated Swales:

Mowing: Grass should not be trimmed extremely short, as this will reduce the filtering effect of the swale (MPCA, 1989). The cut vegetation should be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale. The mowed height of the grass should be 2-4 inches taller than the maximum flow depth of the design water quality storm. A minimum mow height of 6 inches is generally recommended (Galli, 1993).

Routine Maintenance and Inspection: The area should be inspected for failures following heavy rainfall (one inch of rain in 24 hours) and repaired as necessary for newly formed channels or gullies, reseeding/sodding of bare spots, removal of trash, leaves and/or accumulated sediments, the control of woody or other undesirable vegetation and to check the condition and integrity of the check dams.
Aeration: The buffer strip may require periodic mechanical aeration to restore infiltration capacity. This aeration must be done during a time when the area can be reseeded and mulched prior to any significant rainfall.

Erosion: It is important to install erosion and sediment control measures to stabilize this area as soon as possible and to retain any organic matter in the bottom of the trench.

Fertilization: Routine fertilization and/or use of pesticides is strongly discouraged. If complete re-seeding is necessary, half the original recommended rate of fertilizer should be applied with a full rate of seed.

Sediment Removal: The level of sediment deposition in the channel should be monitored regularly, and removed from grassed channels before permanent damage is done to the grassed vegetation, or if infiltration times are longer than 12 hours. Sediment should be removed from riprap channels when it reduces the capacity of the channel.

Level Lip Spreader:

Long term maintenance of the level spreader is essential to ensure its effectiveness. Spreaders constructed of wood, asphalt, stone or concrete curbing also require inspection and maintenance.

1. **Inspections:** At least once a year and following major storms (one inch of rain in 24 hours), the level spreader pool should be inspected for sand accumulation and debris that may reduce its capacity.
2. **Sediment Removal:** Sediment build-up within the swale should be removed when it has accumulated to approximately 25% of design volume or channel capacity. Dispose of the sediments appropriately.
3. **Debris:** Remove debris such as leaf litter, branches and tree growth from the spreader.
4. **Mowing:** Vegetated spreaders may require mowing.
5. **Snow Storage:** Do not store snow within the area of the level spreader.
6. **Level Spreader Replacement:** The reconstruction of the level spreader may be necessary when sheet flow from the spreader channelize into the buffer.

Vegetated Buffers:

1. **Mowing:** Meadow buffers may be mown no more than twice per year. They may not be maintained as a lawn.

2. **Inspection Frequency:** Buffers should be inspected annually for evidence of erosion or concentrated flows through or around the buffer. All eroded areas should be repaired, seeded and mulched. A shallow stone trench should be installed and maintained as a level spreader to distribute flows evenly in any area showing concentrated flows.
3. **Access and Use:** Buffers should not be traversed by all-terrain vehicles or other vehicles. Activities within buffers should be conducted so as not to damage vegetation, disturb any organic duff layer, and expose soil.

4. **Snow Storage:** Do not store snow within the buffer area.

5. **Model Maintenance Plan:** The following techniques should be followed to maintain the integrity of buffers from initial planning through post-construction (Schueler, 1994):

    a. Planning Stage
        i. Require buffer limits to be present on all clearing/grading and erosion control plans
        ii. Record all buffer boundaries on official maps and site plans.
        iii. Clearly establish acceptable and unacceptable uses for the buffer, and include in deed restrictions and conservation easements.
        iv. Establish clear vegetation targets and management rules for the buffer.
        v. Provide incentives for owners protect buffers through perpetual conservation easements rather than deed restrictions.

    b. Construction Stage
        i. Pre-construction stakeout of buffers to define the Limit of Disturbance (LOD). ii. Set LOD based on drip-line of the forested buffer.
        iii. Conduct pre-construction meeting to familiarize contractors and foremen with LOD and buffer limit.

iv. Mark the LOD with silt fence barrier, signs or other methods to exclude construction equipment.

c. Post-Development Stage

i. Mark buffer boundaries with permanent signs (or fences) describing allowable uses.
ii. Educate property owners/homeowner associations on the purpose, limits and allowable uses of the buffer.
iii. Conduct periodic "buffer walks" to inspect the condition of the buffer network (using volunteers, where possible).
iv. Replant unused meadow buffers with trees and shrubs, if possible.

6. **Tree Removal**: Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:

(i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees" is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot rectangle (1,250 square feet) area, as determined by the rating scheme in Table 11:

Table 11.
Point System for Determining an Evenly Distributed Stand of Trees

Diameter of tree at 4½ feet above ground level	Points
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

(ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

GRAVEL WETLANDS:

1ST YEAR POST-CONSTRUCTION: Inspection frequency should be after every major storm in the first year following construction.

1. Inspect to be certain system drains within 24-48 hours.
2. Watering plants as necessary during the first growing season
3. Re-vegetating poorly established areas as necessary
4. Quarterly inspection of soil and repairing eroded areas, especially on slopes & make timely repairs.

5. Checking inlets, outlets, and overflow spillway for blockage, structural integrity, and evidence of erosion. Risers may need to be cleaned.

POST-CONSTRUCTION: Inspection frequency should be at least every 6 months and after every major storm. Activities are expected to include:

1. Check the basin for a dense root mat establishment of wetland vegetation.
2. Check and clean the risers if there is evidence of standing water, discolored water or accumulated sediments in the cells.
3. Check and clean the forebay for sediments, trash and debris. When sediments have accumulated to a depth of 12 inches, standing water is persistent or wetland vegetation become established, the forebay will need to be excavated and reformed.
4. Verify that the cells drain within 24-48 hours. Sediment will need to be removed when an accumulation of 4 inches is evident over the wetland surface.
5. Check and clean all outlets and overflow spillway if blocked or there is evidence of structural damage or erosion.
6. Remove decaying vegetation, litter and debris.
7. Check for foreign species. Particular care must be used to avoid the unintended introduction of invasive species such as purple loosestrife (Lythrum salicaria) and common reed (Phragmites australis). It is recommended that a qualified wetland biologist be consulted when these are found in the area of the gravel wetland.

CLEANING CRITERIA FOR SEDIMENTATION FOREBAY: Sediment should be removed from the sedimentation chamber (forebay) when it accumulates to a depth of more than 12 inches (30 cm) or 10 percent of the pretreatment volume. The sedimentation forebay should be cleaned of vegetation if persistent standing water and wetland vegetation becomes dominant. The cleaning interval is approximately every 4 years. A dry sedimentation forebay is the optimal condition while in practice this condition is rarely achieved. The sedimentation chamber, forebay, and treatment cell outlet devices should be cleaned when drawdown times exceed 60 to 72 hours. Materials can be removed with heavy construction equipment; however, this equipment should not track on the wetland surface. Revegetation of disturbed areas as necessary. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.

CLEANING CRITERIA FOR GRAVEL WETLAND TREATMENT CELLS: Sediment should be removed from the gravel wetland surface when it accumulates to a depth of several inches (>10 cm) across the wetland surface. Materials should be removed with rakes rather than heavy construction equipment to avoid compaction of the gravel wetland surface. Heavy equipment could be used if the system is designed with dimensions that allow equipment to be located outside the gravel wetland, while a backhoe shovel reaches inside the gravel wetland to remove sediment. Removed sediments should be dewatered (if necessary) and disposed of in an acceptable manner.

Enc.

Sample Maintenance Log Sheet

Sample Maintenance Log Sheet:

Stormwater Management Facilities Inspection & Maintenance Log Clover Leaf Development		
General Information:		
Inspected by:	Date:	Weather:
Reason for Inspection: (Regular Inspection) (Major Rain Event)		

BMP	Conditions Observed	Repairs Needed ?
1. Vegetated Areas		
2. Ditches, Swales, Open Channels		
3. Roadway & Parking Surfaces		
4. Level Lip Spreader		
5. Vegetated Buffers		
6. Gravel Wetland		

Detailed Repair Notes:

BMP Type	Date	Description of Repairs & Sediment Disposal

Inspection & Maintenance Log

Gravel Wetland

Inspection Frequency Key: A=annually; B=biannually; S=after major storms (>1")

Inspection/Maintenance Task	Inspection Frequency	Date Inspected	Maintenance Needed?	Date Repaired	Date Inspected	Maintenance Needed?	Date Repaired
First Year Post Construction Phase							
Inspect that the system drains within 24-48 hours.	S						
Water plants, if necessary. Revegetate as necessary	S						
Identify areas of erosion & repair as necessary	S						
Check all inlets, outlets and subdrains for proper function. Clean risers as needed	S						
Post Construction Phase							
Check basin for dense root mat of wetland vegetation.	B/S						
Check and clean risers if there is evidence of standing or discolored water, or accumulated sediment	B/S						
Check & clean forebay for sediment, trash & debris. Excavate & reform forebay when sediment is >12", persisitant standing water or wetland vegetation becomes established	B/S						
Verify that cells drain within 24-48 hours. Sediment to be removed when >4"	B/S						
Check and clean all outlets and overflow spillway if blocked or there are signs of damage or erosion	B/S						
Remove decaying vegetation, litter & debris	B/S						
Check for foreign species & remove consult wetland biologist when invasive species are found	B/S						

Date	Description of Repair/Comments

HOUSEKEEPING PERFORMANCE STANDARDS

FOR:

CLOVER LEAF DEVELOPMENT

SACO, MAINE

Project Developer: Clover Leaf Development, LLC
986 Portland Road
Saco, Me 04072

Responsible Party: Clover Leaf Development, LLC
986 Portland Road
Saco, Me 04072

Introduction:

The contractor shall be responsible for maintaining proper housekeeping standards throughout the construction phase of the project. After the construction phase has been completed, the owner or operator of the project will be responsible.

Standards:

In accordance with the housekeeping performance standards required by MDEP chapter 500 stormwater regulations, the following standards shall be met:

1. **Spill prevention.** Controls must be used to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.
2. **Groundwater protection.** During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography and other relevant factors accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.
3. **Fugitive sediment and dust.** Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

   Operations during wet months that experience tracking of mud off the site onto public roads should provide for sweeping of road areas at least once a week and prior to significant storm events. Where chronic mud tracking occurs, a stabilized construction entrance should be provided. Operations during dry months, that experience fugitive dust problems, should wet down the access roads once a week or more frequently as needed.
4. **Debris and other materials.** Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

   To prevent these materials from becoming a source of pollutants, construction and post-construction activities related to a project may be required to comply with applicable

provision of rules related to solid, universal, and hazardous waste, including, but not limited to, the Maine solid waste and hazardous waste management rules; Maine hazardous waste management rules; Maine oil conveyance and storage rules; and Maine pesticide requirements.

5. **Trench or foundation de-watering.** Trench de-watering is the removal of water from trenches, foundations, coffer dams, ponds, and other areas within the construction area that retain water after excavation. In most cases the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved by the department.

6. **Authorized Non-stormwater discharges.** Identify and prevent contamination by non-stormwater discharges. Where allowed non-stormwater discharges exist, they must be identified and steps should be taken to ensure the implementation of appropriate pollution prevention measures for the non-stormwater component(s) of the discharge. Authorized non-stormwater discharges are:

(a) Discharges from firefighting activity;

(b) Fire hydrant flushings;

(c) Vehicle washwater if detergents are not used and washing is limited to the exterior of vehicles (engine, undercarriage and transmission washing is prohibited);

(d) Dust control runoff in accordance with permit conditions and Appendix (C)(3);

(e) Routine external building washdown, not including surface paint removal, that does not involve detergents;

(f) Pavement washwater (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material had been removed) if detergents are not used;

(g) Uncontaminated air conditioning or compressor condensate;

(h) Uncontaminated groundwater or spring water;

(i) Foundation or footer drain-water where flows are not contaminated;

(j) Uncontaminated excavation dewatering (see requirements in Appendix C(5));

(k) Potable water sources including waterline flushings; and

(l) Landscape irrigation.

7. **Unauthorized non-stormwater discharges .** The Department's approval under this Chapter does not authorize a discharge that is mixed with a source of non-stormwater, other than those discharges in compliance with Appendix C (6). Specifically, the Department's approval does not authorize discharges of the following:

(a) Wastewater from the washout or cleanout of concrete, stucco, paint, form release oils, curing compounds or other construction materials;

(b) Fuels, oils or other pollutants used in vehicle and equipment operation and maintenance;

(c) Soaps, solvents, or detergents used in vehicle and equipment washing; and

(d) Toxic or hazardous substances from a spill or other release.

Attachment 10

Sample Buffer Restriction Language

Forms H1-3 SUGGESTED TEMPLATES FOR STORMWATER BUFFER DEED RESTRICTIONS. With some minor revisions the H-1 (Forested buffer, no disturbance) template may be used to protect undisturbed stream buffers.

Forested buffer, No disturbance FORM H-1 04/06

DECLARATION OF RESTRICTIONS (Forested Buffer, No Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____day of _____ , 20___, by _____, _____ ,
(Name) (Street Address)

_____, _____County, Maine, _____ , (herein referred to as the
(City or Town) (County) (Zip Code)

"Declarant", pursuant to a permit received from the Maine Department of Environmental Protection under the Site Location of Development Act, to preserve a buffer area on a parcel of land near _____, _____ .
(Road Name) (Known Feature and/or Town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(Town)

described in a deed from _____to _____, dated
(Name) (Name of Declarant)

_____, 20____, and recorded in Book ____ Page ____ at the _____County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer location here)

WHEREAS, pursuant to the Site Location of Development Act, 38 M.R.S.A. §§ 481-490, and Department Rules for stormwater management, Chapter 500, promulgated by the Maine Board of Environmental Protection, Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties

having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. Restrictions on Restricted Buffer Area. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Site Location of Development Act and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor shall the topography of the area be altered or manipulated in any way;

b. No trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

c. No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

d. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence;

e. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;

f. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

_____

(Name)

STATE OF MAINE, _____County, dated _____, 20__.
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

_____
Notary Public

1. Forested buffer, limited disturbance

DECLARATION OF RESTRICTIONS (Forested Buffer, Limited Disturbance)

THIS DECLARATION OF RESTRICTIONS is made this _____day of _____, 20___, by _____ , _____,
(Name) (Street Address)

_____, _____County, Maine, _____, (herein referred to as the
(City or Town) (County) (Zip Code)

"Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Site Location of Development Act to preserve a buffer area on a parcel of land near _____,_____ .
(Road Name) (Known Feature and/or Town)

WHEREAS, the Declarant holds title to certain real property situated in _____, Maine
(Town)

described in a deed from_____ to _____dated
(Name) (Name of Declarant)

_____, 20____, and recorded in Book ____ Page ____ at the _____County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer area location here)

WHEREAS, pursuant to the Site Location of Development Act, 38 M.R.S.A. §§ 481-490, and Department Rules for stormwater management, Chapter 500, promulgated by the Maine Board of Environmental Protection, Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. Restrictions on Restricted Buffer Area. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and

absorb stormwater, and to maintain compliance with the Site Location of Development Act and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material may be placed, stored or dumped on the Restricted Buffer Area, nor may the topography of the area be altered or manipulated in any way;

b. Any removal of trees or other vegetation within the Restricted Buffer Area must be limited to the following:

(i) No purposefully cleared openings may be created and an evenly distributed stand of trees and other vegetation must be maintained. An "evenly distributed stand of trees " is defined as maintaining a minimum rating score of 24 points in any 25 foot by 50 foot square (2500 square feet) area, as determined by the following rating scheme:

Diameter of tree at 4½ feet above ground level	Points
2 - 4 inches	1
4 - 8 inches	2
8 - 12 inches	4
>12 inches	8

Where existing trees and other vegetation result in a rating score less than 24 points, no trees may be cut or sprayed with biocides except for the normal maintenance of dead, windblown or damaged trees and for pruning of tree branches below a height of 12 feet provided two thirds of the tree's canopy is maintained;

(ii) No undergrowth, ground cover vegetation, leaf litter, organic duff layer or mineral soil may be disturbed except that one winding path, that is no wider than six feet and that does not provide a downhill channel for runoff, is allowed through the area;

c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence;

d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area;

e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

(Name)

_____

STATE OF MAINE

_____ County, _____, 20__.
(County) (Date)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

_____

Notary Public

_____

Meadow buffer **FORM H-3**

DECLARATION OF RESTRICTIONS (Non-Wooded Meadow Buffer)

THIS DECLARATION OF RESTRICTIONS is made this _____day of _____, 20___, by _____ (Name), _____ (Street Address) _____ (City or Town), _____ (County) County, Maine, _____ (Zip Code), (herein referred to as the "Declarant"), pursuant to a permit received from the Maine Department of Environmental Protection under the Site Location of Development Act, to preserve a buffer area on a parcel of land near _____ (Road Name), _____ (known feature and/or town) .

WHEREAS, the Declarant holds title to certain real property situated in _____ (Town), Maine described in a deed from_____ (Name) to _____ (Name of Declarant), dated _____, 20____, and recorded in Book ____ Page ____ at the _____County Registry of Deeds, herein referred to as the "property"; and

WHEREAS, Declarant desires to place certain restrictions, under the terms and conditions herein, over a portion of said real property (hereinafter referred to as the "Restricted Buffer") described as follows: (Note: Insert description of restricted buffer location here)

WHEREAS, pursuant to the Site Location of Development Act, 38 M.R.S.A. §§ 481-490 and Department Rules for stormwater management (Chapter 500) promulgated by the Maine Board of Environmental Protection, Declarant has agreed to impose certain restrictions on the Restricted Buffer Area as more particularly set forth herein and has agreed that these restrictions may be enforced by the Maine Department of Environmental Protection or any successor (hereinafter the "MDEP"),

NOW, THEREFORE, the Declarant hereby declares that the Restricted Buffer Area is and shall forever be held, transferred, sold, conveyed, occupied and maintained subject to the conditions and restrictions set forth herein. The Restrictions shall run with the Restricted Buffer Area and shall be binding on all parties having any right, title or interest in and to the Restricted Buffer Area, or any portion thereof, and their heirs, personal representatives, successors, and assigns. Any present or future owner or occupant of the Restricted Buffer Area or any portion thereof, by the acceptance of a deed of conveyance of all or part of the Covenant Area or an instrument conveying any interest therein, whether or not the deed or instrument shall so express, shall be deemed to have accepted the Restricted Buffer Area subject to the Restrictions and shall agree to be bound by, to comply with and to be subject to each and every one of the Restrictions hereinafter set forth.

1. Restrictions on Restricted Buffer Area. Unless the owner of the Restricted Buffer Area, or any successors or assigns, obtains the prior written approval of the MDEP, the Restricted Buffer Area must remain undeveloped in perpetuity. To maintain the ability of the Restricted Buffer Area to filter and absorb stormwater, and to maintain compliance with the Site Location of Development Act and the permit issued thereunder to the Declarant, the use of the Restricted Buffer Area is hereinafter limited as follows.

a. No soil, loam, peat, sand, gravel, concrete, rock or other mineral substance, refuse, trash, vehicle bodies or parts, rubbish, debris, junk waste, pollutants or other fill material will be placed, stored or dumped on the Restricted Buffer Area, nor may the topography or the natural mineral soil of the area be altered or manipulated in any way;

b. A dense cover of grassy vegetation must be maintained over the Restricted Buffer Area, except that shrubs, trees and other woody vegetation may also be planted or allowed to grow in the area. The Restricted Buffer Area may not be maintained as a lawn or used as a pasture. If vegetation in the Restricted Buffer Area is mowed, it may be mown no more than two times per year.

c. No building or other temporary or permanent structure may be constructed, placed or permitted to remain on the Restricted Buffer Area, except for a sign, utility pole or fence;

d. No trucks, cars, dirt bikes, ATVs, bulldozers, backhoes, or other motorized vehicles or mechanical equipment may be permitted on the Restricted Buffer Area, except for vehicles used in mowing;

e. Any level lip spreader directing flow to the Restricted Buffer Area must be regularly inspected and adequately maintained to preserve the function of the level spreader.

Any activity on or use of the Restricted Buffer Area inconsistent with the purpose of these Restrictions is prohibited. Any future alterations or changes in use of the Restricted Buffer Area must receive prior approval in writing from the MDEP. The MDEP may approve such alterations and changes in use if such alterations and uses do not impede the stormwater control and treatment capability of the Restricted Buffer Area or if adequate and appropriate alternative means of stormwater control and treatment are provided.

2. Enforcement. The MDEP may enforce any of the Restrictions set forth in Section 1 above.

3. Binding Effect. The restrictions set forth herein shall be binding on any present or future owner of the Restricted Buffer Area. If the Restricted Buffer Area is at any time owned by more than one owner, each owner shall be bound by the foregoing restrictions to the extent that any of the Restricted Buffer Area is included within such owner's property.

4. Amendment. Any provision contained in this Declaration may be amended or revoked only by the recording of a written instrument or instruments specifying the amendment or the revocation signed by the owner or owners of the Restricted Buffer Area and by the MDEP.

5. Effective Provisions of Declaration. Each provision of this Declaration, and any agreement, promise, covenant and undertaking to comply with each provision of this Declaration, shall be deemed a land use restriction running with the land as a burden and upon the title to the Restricted Buffer Area.

6. Severability. Invalidity or unenforceability of any provision of this Declaration in whole or in part shall not affect the validity or enforceability of any other provision or any valid and enforceable part of a provision of this Declaration.

7. Governing Law. This Declaration shall be governed by and interpreted in accordance with the laws of the State of Maine.

_____
(NAME)

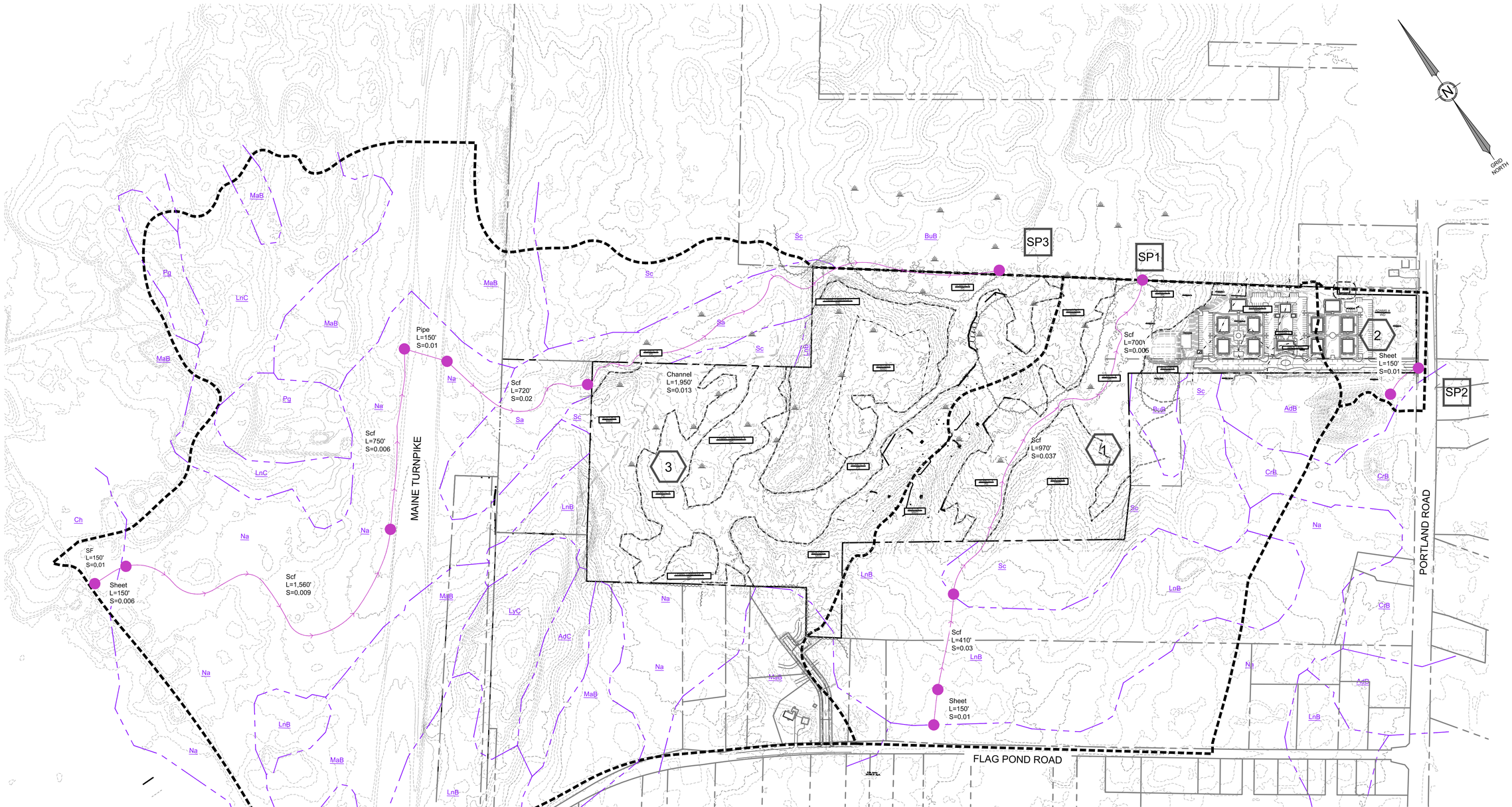
STATE OF MAINE, _____, County, dated _____, 20__ .
(County)

Personally appeared before me the above named _____, who swore to the truth of the foregoing to the best of (his/her) knowledge, information and belief and acknowledged the foregoing instrument to be (his/her) free act and deed.

_____

Notary Public

_____



LEGEND

- WATERSHED BOUNDARY
- TIME OF CONCENTRATION
- REACH
- PRE — WATERSHED LABEL
- 1 — REACH
- CB — CATCH BASIN/POND
- Na — MEDIUM INTENSITY SOIL NAME
- ADAMS — HIGH INTENSITY SOIL NAME
- MEDIUM INTENSITY SOIL BOUNDARY
- HIGH INTENSITY SOIL BOUNDARY
- EXISTING PROPERTY LINE
- PROPOSED PROPERTY LINE
- 124 — MINOR CONTOURS
- 124 — MAJOR CONTOURS
- 124 — PROPOSED CONTOURS
- WETLAND BOUNDARY

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

SOILS NOTES:

1. ONSITE SOILS OBTAINED FROM CLASS B HIGH INTENSITY SOIL SURVEY CONDUCTED BY MARK HAMPTON ASSOCIATES, DATED 6/2/2024. THE REPORT CAN BE FOUND IN SECTION 11 OF THE SITE LOCATION OF DEVELOPMENT PERMIT APPLICATION. THE SOILS ARE SUMMARIZED BELOW:

MAP UNIT NAME	SLOPE DESIGNATION	DRAINAGE CLASS	HSG RATING
ADAMS	A	WD	A
ELMWOOD	A	MWD	C
MAN MADE LAND	N/A	VARIES	C
BUXTON	B	MWD	C
SCANTIC	B	PD	D
LYMAN TUNBRIDGE	A	WD	C

2. OFFSITE SOILS OBTAINED FROM THE YORK COUNTY SOIL SURVEY AS SHOWN ON THE USDA WEB SOIL SURVEY. THE FULL OUTPUT CAN BE FOUND IN SECTION 12. THE SOIL SURVEY IS OF MEDIUM INTENSITY. THE SOILS ARE SUMMARIZED BELOW:

MAP UNIT SYMBOL	MAP UNIT NAME	HSG RATING
AdB, AdC	ADAMS LOAMY SAND	A
BuB	BUXTON SILT LOAM	D
CrB	CROGHAN LOAMY FINE SAND	A
EmB	ELMWOOD FINE SANDY LOAM	B
LnB	LYMAN LOAM	D
LyC	LYMAN-ROCK OUTCROP	D
MaB	MADAWASKA FINE SANDY LOAM	B
Na	NAUMBURG SAND	A/D
Sa	SEBAGO MUCKY PEAT	A/D
Sc	SCANTIC SILT LOAM	D
Ur	URBAN	

STATE OF MAINE
JEFFREY S. AMOS
10161
LICENSED PROFESSIONAL ENGINEER

DATE: 08-13-2024

NO.	DATE	REVISIONS
2	08-13-2024	MDOT TMP SUBMISSION
1	04-30-2024	SKETCH PLAN SUBMISSION

TERRADYN CONSULTANTS, LLC
Civil Engineering | Land Surveying | Geomatics
Stormwater Design | Land Planning | Environmental Permitting
ADDRESS: 41 CAMPUS DRIVE, SUITE 301, NEW GLOUCESTER, ME 04260
PHONE: (207) 926-5111
WEB SITE: www.terradynconsultants.com

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: CLOVERLEAF DEVELOPMENT, PHASE 2
968 PORTLAND ROAD, SACO, MAINE

SHEET TITLE: PRE DEVELOPMENT WATERSHED MAP

CLIENT: CLOVERLEAF DEVELOPMENT, LLC
P.O. BOX 6799
SCARBOROUGH, MAINE 04070

DATE: 01-30-2024
SCALE: 1" = 200'
JOB NO: 21-04.1
SHEET: SW-1.0

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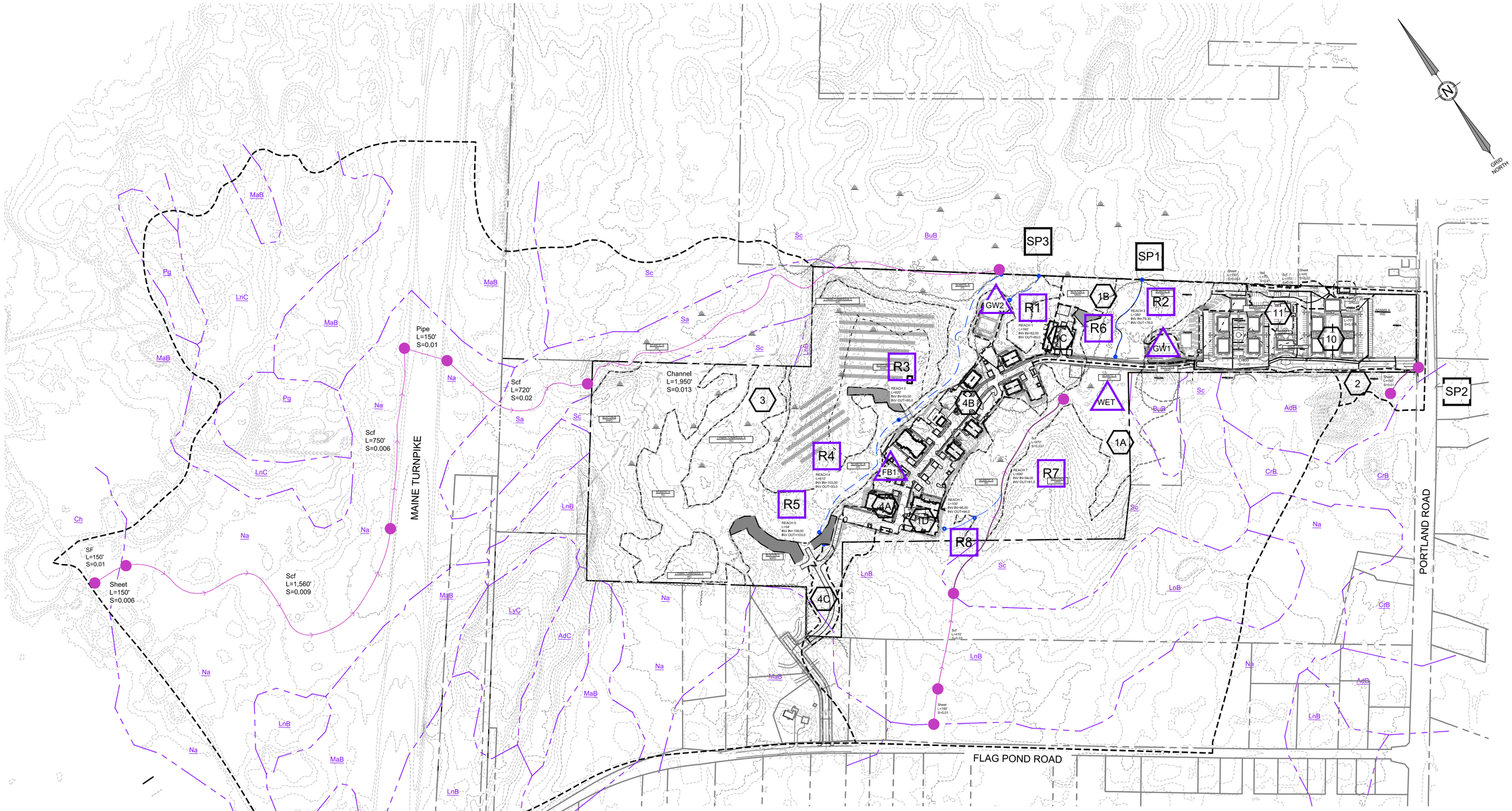

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(IN FEET)
1 inch = 200 ft.

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LnB	LYMAN LOAM	D
LyC	LYMAN-ROCK OUTCROP	D
MaB	MADAWASKA FINE SANDY LOAM	B
Na	NAUMBURG SAND	A/D
Sa	SEBAGO MUCKY PEAT	A/D
Sc	SCANTIC SILT LOAM	D
Ur	URBAN	

STATE OF MAINE
JEFFREY S. AMOS
10161
LICENSED PROFESSIONAL ENGINEER

DATE: 08-13-2024

NO.	DATE	REVISIONS
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ADDRESS: 41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260
PHONE: (207) 926-5111
WEB SITE: www.terradynconsultants.com

TERRADYN CONSULTANTS, LLC
Civil Engineering | Land Surveying | Geomatics
Stormwater Design | Land Planning | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: CLOVERLEAF DEVELOPMENT, PHASE 2
968 PORTLAND ROAD, SACO, MAINE

SHEET TITLE: POST DEVELOPMENT WATERSHED MAP

CLIENT: CLOVERLEAF DEVELOPMENT, LLC
P.O. BOX 6799
SCARBOROUGH, MAINE 04070

DATE: 01-30-2024
SCALE: 1" = 200'
JOB NO: 21-04.1
SHEET: SW-1.1

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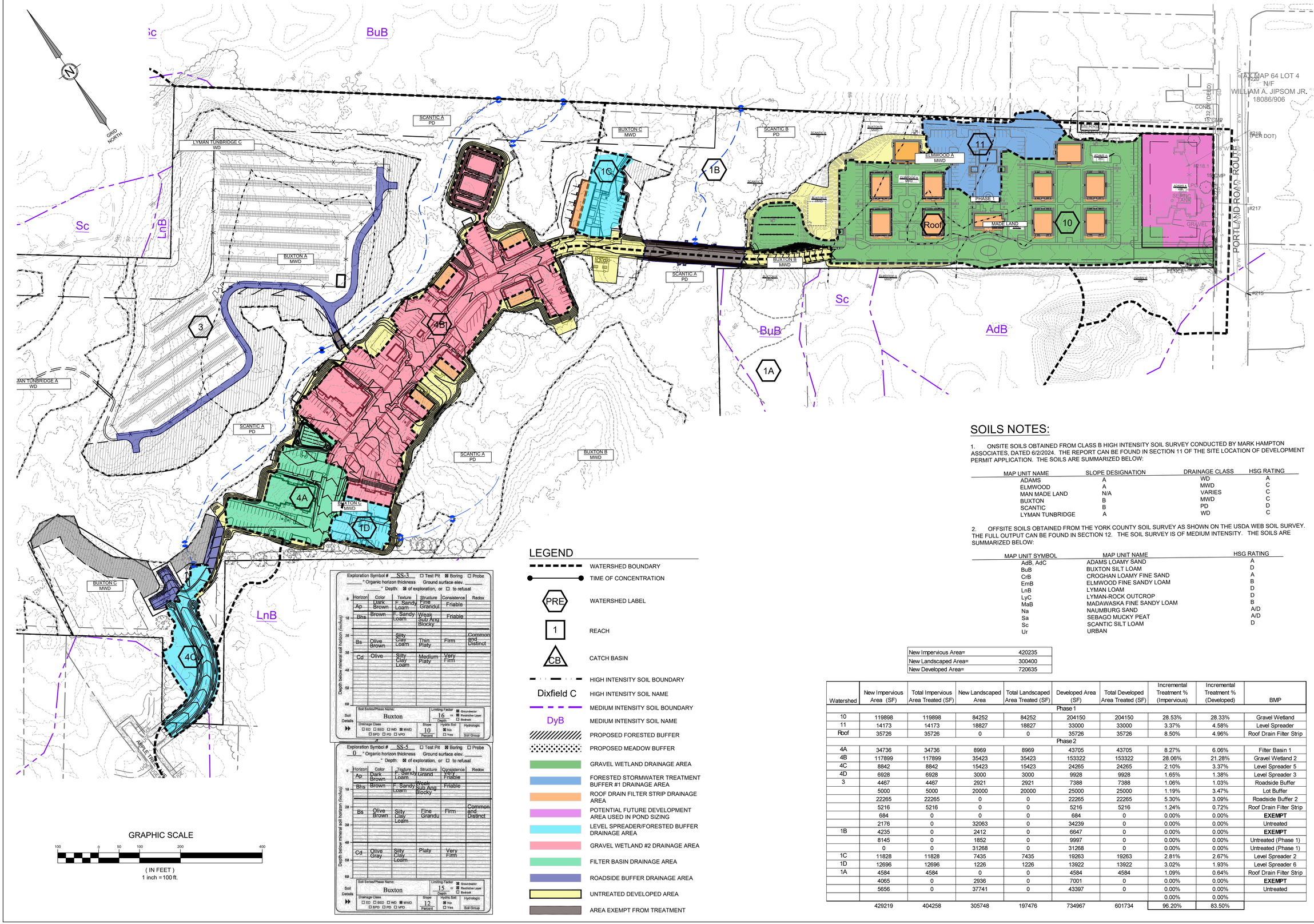

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100 0 50 100 200 400

(IN FEET)
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LEGEND

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- PRE — WATERSHED LABEL
- 1 — REACH
- CB — CATCH BASIN
- HIGH INTENSITY SOIL BOUNDARY
- Dixfield C — HIGH INTENSITY SOIL NAME
- MEDIUM INTENSITY SOIL BOUNDARY
- DyB — MEDIUM INTENSITY SOIL NAME
- PROPOSED FORESTED BUFFER
- PROPOSED MEADOW BUFFER
- GRAVEL WETLAND DRAINAGE AREA
- FORESTED STORMWATER TREATMENT BUFFER #1 DRAINAGE AREA
- ROOF DRAIN FILTER STRIP DRAINAGE AREA
- POTENTIAL FUTURE DEVELOPMENT AREA USED IN POND SIZING
- LEVEL SPREADER/FORESTED BUFFER DRAINAGE AREA
- GRAVEL WETLAND #2 DRAINAGE AREA
- FILTER BASIN DRAINAGE AREA
- ROADSIDE BUFFER DRAINAGE AREA
- UNTREATED DEVELOPED AREA
- AREA EXEMPT FROM TREATMENT

SOILS NOTES:

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Na	NAUMBURG SAND	A/D
Sa	SEBAGO MUCKY PEAT	A/D
Sc	SCANTIC SILT LOAM	D
Ur	URBAN	

New Impervious Area=	420235
New Landscaped Area=	300400
New Developed Area=	720635

Watershed	New Impervious Area (SF)	Total Impervious Area Treated (SF)	New Landscaped Area	Total Landscaped Area Treated (SF)	Developed Area (SF)	Total Developed Area Treated (SF)	Incremental Treatment % (Impervious)	Incremental Treatment % (Developed)	BMP
Phase 1									
10	119898	119898	84252	84252	204150	204150	28.53%	28.33%	Gravel Wetland
11	14173	14173	18827	18827	33000	33000	3.37%	4.58%	Level Spreader
Roof	35726	35726	0	0	35726	35726	8.50%	4.96%	Roof Drain Filter Strip
Phase 2									
4A	34736	34736	8969	8969	43705	43705	8.27%	6.06%	Filter Basin 1
4B	117899	117899	35423	35423	153322	153322	28.06%	21.28%	Gravel Wetland 2
4C	8842	8842	15423	15423	24265	24265	2.10%	3.37%	Level Spreader 5
4D	6928	6928	3000	3000	9928	9928	1.65%	1.38%	Level Spreader 3
3	4467	4467	2921	2921	7388	7388	1.06%	1.03%	Roadside Buffer
	5000	5000	20000	20000	25000	25000	1.19%	3.47%	Lot Buffer
	22265	22265	0	0	22265	22265	5.30%	3.09%	Roadside Buffer 2
	5216	5216	0	0	5216	5216	1.24%	0.72%	Roof Drain Filter Strip
	684	0	0	0	684	0	0.00%	0.00%	**EXEMPT**
	2176	0	32063	0	34239	0	0.00%	0.00%	Untreated
1B	4235	0	2412	0	6647	0	0.00%	0.00%	**EXEMPT**
	8145	0	1852	0	9997	0	0.00%	0.00%	Untreated (Phase 1)
	0	0	31268	0	31268	0	0.00%	0.00%	Untreated (Phase 1)
1C	11828	11828	7435	7435	19263	19263	2.81%	2.67%	Level Spreader 2
1D	12696	12696	1226	1226	13922	13922	3.02%	1.93%	Level Spreader 6
1A	4584	4584	0	0	4584	4584	1.09%	0.64%	Roof Drain Filter Strip
	4065	0	2936	0	7001	0	0.00%	0.00%	**EXEMPT**
	5656	0	37741	0	43397	0	0.00%	0.00%	Untreated
							0.00%	0.00%	
	429219	404258	305748	197476	734967	601734	96.20%	83.50%	

STATE OF MAINE
JEFFREY S. MOSS
10161
LICENSED PROFESSIONAL ENGINEER

DATE: 08-13-2024

NO.	DATE	REVISIONS
1	04-30-2024	SKETCH PLAN SUBMISSION
2	08-13-2024	MDOT TMP SUBMISSION

ADDRESS: 41 CAMPUS DRIVE, SUITE 301 NEW GLOUCESTER, ME 04260
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Civil Engineering | Land Surveying | Geomatics
Stormwater Design | Land Planning | Environmental Permitting

PERMIT DRAWING
NOT FOR CONSTRUCTION

PROJECT: CLOVERLEAF DEVELOPMENT, PHASE 2
986 PORTLAND ROAD, SACO, MAINE

SHEET TITLE: STORMWATER TREATMENT PLAN

CLIENT: CLOVERLEAF DEVELOPMENT, LLC
P.O. BOX 6799
SCARBOROUGH, MAINE 04070

DATE: 01-30-2024
SCALE: 1" = 100'
JOB NO: 21-04.1
SHEET: SW-1.2

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Section 13 - Urban Impaired Stream Submissions

The property is located within the Scarborough (Dunstan) River Watershed. This section is not applicable.

Section 14 - Basic Standards

Temporary and Permanent Erosion and Sedimentation Control

Introduction

This Erosion and Sediment Control Plan has been prepared to provide guidelines for soil erosion and sedimentation control during the construction of the Sunrise Cove Retirement Community for CCHFI, Inc. This plan has been developed using the Maine Department of Environmental Protection's Best Management Practices and the standards.

Pre-Construction Phase

A person who conducts, or causes to be conducted, an activity that involves filling, displacing or exposing soil or other earthen materials shall take measures to prevent unreasonable erosion of soil or sediment beyond the project site or into a protected natural resource as defined in 38 MRSA § 480-B. Erosion control measures must be in place before the activity begins. Measures must remain in place and functional until the site is permanently stabilized. Adequate and timely temporary and permanent stabilization measures must be taken. The site must be maintained to prevent unreasonable erosion and sedimentation. Minimize disturbed areas and protect natural downgradient buffer areas to the extent practicable.

BMP Construction Phase

A. Sediment Barriers. Prior to the beginning of any construction**,** properly install sediment barriers at the edge of any downgradient disturbed area and adjacent to any drainage channels within the proposed disturbed area. Maintain the sediment barriers until the disturbed area is permanently stabilized. At a minimum, silt fences shall be inspected and repaired once a week or immediately following any significant rainfall or snow melt. Sediment trapped behind these barriers shall be excavated and re-graded onto the site when it reaches a depth of 6 inches. All silt fences shall be installed where shown on the plans and according to the engineer's specifications.

B. Construction Entrance: Prior to any clearing or grubbing, a construction entrance shall be constructed at the intersection with the proposed access drive and the existing roadway to avoid tracking of mud, dust and debris from the site.

C. Riprap: Since riprap is used where erosion potential is high, construction must be sequenced so that the riprap is put in place with the minimum delay. Disturbance of areas where riprap is to be placed should be undertaken only when final preparation and placement of the riprap can follow immediately behind the initial disturbance. Where

riprap is used for outlet protection, the riprap should be placed before or in conjunction with the construction of the pipe or channel so that it is in place when the pipe or channel begins to operate. Maintain temporary riprap, such as temporary check dams until the disturbed area is permanently stabilized.

D. Temporary Stabilization. Stabilize with temporary seeding, mulch, or other non-erodible cover any exposed soils that will remain unworked for more than 14 days except, stabilize areas within 100 feet of a wetland or waterbody within 7 days or prior to a predicted storm event, whichever comes first. If hay or straw mulch is used, the application rate must be 2 bales (70-90 pounds) per 1000 SF or 1.5 to 2 tons (90-100 bales) per acre to cover 75 to 90% of the ground surface. Hay mulch must be kept moist or anchored to prevent wind blowing. An erosion control blanket or mat shall be used at the base of grassed waterways, steep slopes (15% or greater) and on any disturbed soil within 100 feet of lakes, streams and wetlands. Grading shall be planned so as to minimize the length of time between initial soil exposure and final grading. On large projects this should be accomplished by phasing the operation and completing the first phase up to final grading and seeding before starting the second phase, and so on.

E. Vegetated Waterway. Upon final grading, the disturbed areas shall be immediately seeded to permanent vegetation and mulched and will not be used as outlets until a dense, vigorous vegetative cover has been obtained. Once soil is exposed for waterway construction, it should be immediately shaped, graded and stabilized. Vegetated waterways need to be stabilized early during the growing season (prior to September 15). If final seeding of waterways is delayed past September 15, emergency provisions such as sod or riprap may be required to stabilize the channel. Waterways should be fully stabilized prior to directing runoff to them.

Permanent Stabilization Defined

Permanent stabilization for the following list of BMPs is defined as:

A. Seeded Areas. For seeded areas, permanent stabilization means a 90% cover of the disturbed area with mature, healthy plants with no evidence of washing or rilling of the topsoil.

B. Sodded Areas. For sodded areas, permanent stabilization means the complete binding of the sod roots into the underlying soil with no Slumping of the sod or die-off.

C. Permanent Mulch. For mulched areas, permanent mulching means total coverage of the exposed area with an approved mulch material. Erosion Control Mix may be used as mulch for permanent stabilization according to the approved application rates and limitations.

D. Riprap. For areas stabilized with riprap, permanent stabilization means that slopes stabilized with riprap have an appropriate backing of a well-graded gravel or approved geotextile to prevent soil movement from behind the riprap. Stone must be sized appropriately. It is recommended that angular stone be used.

E. Agricultural Use. For construction projects on land used for agricultural purposes, (e.g., pipelines across crop land) permanent stabilization may be accomplished by returning the disturbed land to agricultural use.

F. Paved areas. For paved areas, permanent stabilization means the placement of the compacted gravel subbase is completed.

G. Ditches, Channels, and Swales. For open channels, permanent stabilization means the channel is stabilized with mature vegetation at least three inches in height, with well-graded riprap, or with another non-erosive lining capable of withstanding the anticipated flow velocities and flow depths without reliance on check dams to slow flow. There must be no evidence of slumping of the lining, undercutting of the banks, or down-cutting of the channel.

General Construction Phase

The following erosion control measures shall be followed by the contractor throughout construction of this project:

A. All topsoil shall be collected, stockpiled, seeded with rye at 3 pounds/1,000 SF and mulched, and reused as required. Siltation fencing shall be placed down gradient from the stockpiled loam. Loam shall be stockpiled at location designated by the owner and inspecting engineer.

B. The inspecting engineer at his/her discretion, may require additional erosion control measures and/or supplemental vegetative provisions to maintain stability of earthworks and finish graded areas. The contractor shall be responsible for providing and installing any supplemental measures as directed by the inspecting engineer. Failure to comply with the engineer's directions will result in discontinuation of construction activities.

C. Erosion control mesh shall be applied in accordance with the plans over all finish seeded areas as specified on the design plans.

D. All graded or disturbed areas including slopes shall be protected during clearing and construction in accordance with the approved erosion and sediment control plan until they are adequately stabilized.

E. All erosion, and sediment control practices and measures shall be constructed, applied and maintained in accordance with the approved erosion and sediment control plan.

F. Areas to be filled shall be cleared, grubbed and stripped of topsoil to remove trees, vegetation, roots or other objectionable materials.

G. Unless otherwise authorized by the project engineer, any fill used on the site will meet M.D.O.T. Standard 703.08 for common borrow, 703.06(b) for subbase aggregate, and 703.06(a) for base.

H. Areas shall be scarified to a minimum depth of 3 inches prior to placement of topsoil.

I. All fills shall be compacted as required to reduce erosion, slippage, settlement, subsidence or other related problems. Fill intended to support buildings, structures and conduits, etc., shall be compacted in accordance with local requirements or codes.

J. All fills shall be placed and compacted in layers not to exceed 8 inches in thickness.

K. Except for approved landfills or non-structural fills, fill material shall be free of brush, rubbish, rocks, logs, stumps, building debris and other objectionable materials that would interfere with or prevent Construction of satisfactory lifts.

L. Frozen material or soft, mucky or highly compressible materials shall not be incorporated into fill slopes or structural fills.

M. Fill shall not be placed on a frozen foundation.

M. Seeps or springs encountered during construction shall be handled appropriately.

O. All graded areas shall be permanently stabilized immediately following finished grading.

P. Remove any temporary control measures, such as silt fence, within 30 days after permanent stabilization is attained. Remove any accumulated sediments and stabilize.

Permanent Vegetation

Permanent vegetative cover should be established on disturbed areas where permanent, long lived vegetative cover is needed to stabilize the soil, to reduce damages from sediment and runoff, and to enhance the environment.

Seedbed Preparation

A. Grade as feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application and anchoring, and maintenance.

B. Apply limestone and fertilizer according to soil tests such as those offered by the University of Maine Soil Testing Laboratory. Soil sample mailers are available from the local Cooperative Extension Service Office. If soil testing is not feasible on small or variable sites, or where timing is critical, fertilizer may be applied at the rate of 800 pounds per acre or 18.4 pounds per 1,000 square feet using 10-20-20 (N-P2O5-K2O) or equivalent. Apply ground limestone (equivalent to 50% calcium plus magnesium oxide) at a rate of 3 tons per acre (138 lb. Per 1,000 sq. ft).

C. Work lime and fertilizer into the soil as nearly as practical to a depth of 4 inches with a disc, spring tooth harrow or other suitable equipment. The final harrowing operation should be on the general contour. Continue tillage until a reasonably uniform, fine seedbed is prepared. All but clay or silty soils and coarse sands should be rolled to firm the seedbed wherever feasible.

D. Remove from the surface all stones 2 inches or larger in any dimension. Remove all other debris, such as wire, cable, tree roots, concrete, clods, lumps or other unsuitable material.

E. Inspect seedbed just before seeding. If traffic has left the soil compacted; the area must be tilled and firmed as above.

F. Permanent seeding should be made 45 days prior to the first killing frost or as a dormant seeding with mulch after the first killing frost and before snowfall. When crown vetch is seeded in later summer, at least 35% of the seed should be hard seed (unscarified). If seeding cannot be done within the seeding dates, mulch according to the Temporary Mulching BMP and Over-winter Stabilization and Construction to protect the site and delay seeding until the next recommended seeding period.

G. Following seed bed preparation, swale areas, fill areas and back slopes shall be seeded at a rate of 3 lbs./1,000 S.F. with a mixture of 35% creeping red **h.** fescue, 6% red top, 24% Kentucky bluegrass, 10% perennial ryegrass, 20% annual ryegrass and 5% white dutch clover.

I. Areas which have been temporarily or permanently seeded shall be mulched immediately following seeding.

J. Areas which cannot be seeded within the growing season shall be mulched for over-winter protection and the area should be seeded at the beginning of the growing season.

Winter Construction phase

The winter construction period is from November 15 through April 15. If an area is not stabilized with temporary or permanent measures by November 15, then the site must be protected with additional stabilization measures.

A. Permanent stabilization consists of at least 90% vegetation, Pavement/gravel base or riprap.

B. Do not expose slopes or leave slopes exposed over the winter or for any other extended time of work suspension unless fully protected with Mulch.

C. Apply hay mulch at twice the standard rate (150 lbs. Per 1,000 sf). The mulch must be thick enough such that the ground surface will not be visible and must be anchored.

D. Use mulch and mulch netting or an erosion control mulch blanket or mix for all slopes greater than 8 % or other areas exposed to direct wind.

E. Install an erosion control blanket in all drainage ways (bottom and sides) with a slope greater than 3 %.

F. During frozen conditions, sediment barriers shall consist of wood-waste filter berms as frozen soil prevents the proper installation of hay bales and silt fences.

G. Between the dates of October 15th and April 1st, loam or seed will not be required. During periods of above freezing temperatures, finished areas shall be fine graded and either protected with mulch or temporarily seeded and mulched until such time as the final treatment can be applied. If the date is after November 1st and if the exposed area has been loamed, final graded with a uniform surface, then the area may be dormant seeded at a rate of 3 times higher than specified for permanent seed and then mulched. Dormant seeding may be placed prior to the placement of mulch and fabric netting anchored with staples. If dormant seeding is used for the site, all disturbed areas shall receive 4" of loam and seed at an application rate of 5lbs/1000 s.f. All areas seeded during the winter will be inspected in the spring for adequate catch. All areas not sufficiently vegetated (less than 75 % catch) shall be re-vegetated by replacing loam, seed and mulch.

H. Winter excavation and earthwork shall be completed as such that no more than 1 acre of the site is without stabilization at any one time.

I. An area within 100 feet of a protected natural resource must be protected with a double row of sediment barrier.

J. Temporary mulch must be applied within 7 days of soil exposure or prior to any storm event, but after every workday in areas within 100 feet from a protected natural resource.

K. Areas that have been brought to final grade must be permanently mulched that same day.

L. In the event of a snowfall greater than 1 inch (fresh or cumulative), the snow shall be removed from the areas due to be seeded and mulched.

M. Loam shall be free of frozen clumps before it is applied.

N. All vegetated ditch lines that have not been stabilized by November 1, or will be worked during the winter construction period, must be stabilized with an appropriate stone lining backed by an appropriate gravel bed or geotextile unless specifically released from this standard by the department.

O. Maintenance measures shall be applied as needed during the entire construction season. After each rainfall, snow storm or period of thawing and runoff, the site contractor shall perform a visual inspection of all installed erosion control measures and perform repairs as needed to ensure their continuous function. Following the temporary and or final seeding and mulching, the contractor shall in the spring inspect and repair any damages and/ or unestablished spots. Established vegetative cover means a minimum of 85 to 90% of areas vegetated with vigorous growth.

Construction Plan

The project will be constructed in one phase. The site work is estimated to take between 8-13 months to complete and would generally correspond to the following table:

	Start	Finish
1. Estimated construction time: 12 months	April 1, 2025	May 1, 2026
2 Erosion control measures placed	April 1, 2025	April 15, 2026
3. Site clearing, grubbing, excavation, filling and construction stormwater facilities	April 1, 2025	April 15, 2026
4. Excavation & construction of roads, parking lots and underground utilities.	April 1, 2025	April 15, 2026
5. Mulch spread for winter erosion control. (if necessary)	November 15, of construction year	May 1 the next year
6. Start progressive final seeding on prepared areas.	Within 24 hours of loam placement	September 15 of construction year

7. Bi-weekly monitoring of vegetative growth.	April 15, 2025	May 1, 2026
8. Re-seed, if necessary, and continue monitoring of growth until established.	April 15, 2025	April 15, 2026
9. Progressive removal of erosion control devices, based on field inspection.	April 15, 2025	April 15, 2026

Dates are subject to change at the discretion of the engineer depending on construction progress.

Maintenance and Inspection Phase

A. Contractor shall inspect disturbed and impervious areas, and erosion and stormwater control measures, areas used for storage that are exposed to precipitation, and locations where vehicles enter or exit the parcel at least once a week and before and after a storm event, prior to completion of permanent stabilization. A person with knowledge of erosion and stormwater must conduct the inspection. This person must be identified in the inspection log. If best management practices (BMPs) need to be modified or if additional BMPs are necessary, implementation must be completed within 7 calendar days and prior to any storm event (rainfall). All measures must be maintained in effective operating condition until areas are permanently stabilized.

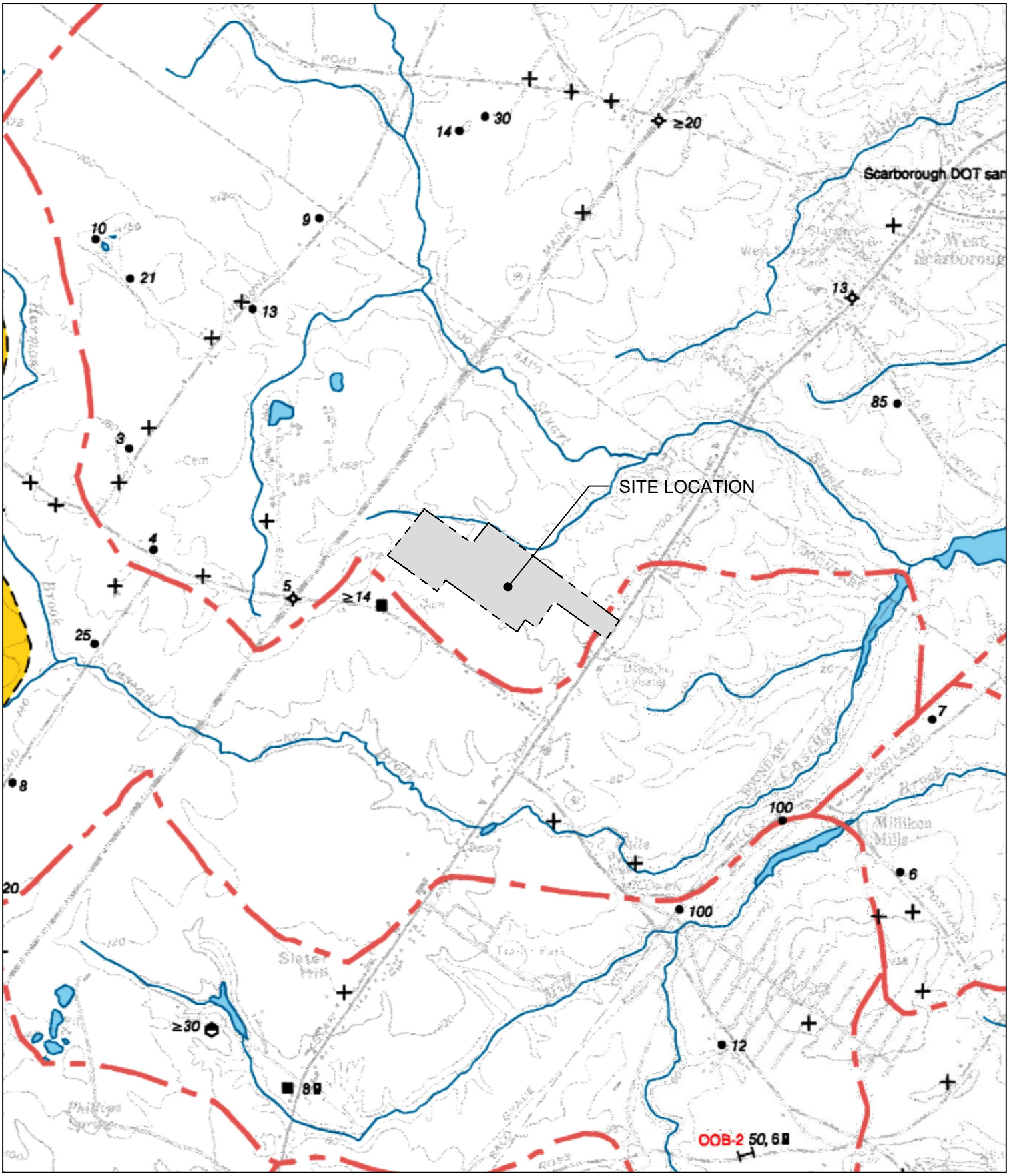
Following the final seedings, reseeding will be carried out, with follow-up inspections, in the event of any failures. All erosion control measures will be removed within 10 days after vegetation is adequately established. The applicant shall be responsible for making arrangements for the inspections.

B. A log (report) must be kept summarizing the scope of the inspection, name(s) and qualifications of the personnel making the inspection, the date(s) of the inspection, and major observations relating to operation of erosion and sedimentation controls and pollution prevention measures. Major observations must include: BMPs that need to be maintained; location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location; and location(s) where additional BMPs are needed that did not exist at the time of inspection. Follow-up to correct deficiencies or enhance controls must also be indicated in the log and dated, including what action was taken and when.

Section 15 - Groundwater

The project will not have any expected impact to the groundwater. The attached figure shows the site is not located on a sand and gravel aquifer. The development will connect to the public water system.

The stormwater system makes use of roof drain filter strips, a gravel wetland and permanent erosion control measures to filter stormwater and maximize potential infiltration.



AERIAL MAP

PROJECT:
CLOVER LEAF DEVELOPMENT
986 PORTLAND ROAD, SACO, ME

PREPARED FOR:
CLOVER LEAF DEVELOPMENT, LLC

TERRADYN CONSULTANTS, LLC

PINELAND
41 CAMPUS DRIVE, SUITE 101
NEW GLOUCESTER, ME 04260

PORTLAND
565 CONGRESS STREET, SUITE 201
PORTLAND, ME 04101

207.926.5111 • info@terradynconsultants.com • www.terradynconsultants.com

PROJECT NO.	SHEET
2104	1
DATE	OF
6/25/2021	1
SCALE	
1"=2,000'	

Section 16 - Water Supply

The Clover Leaf Development Project will feature a connection to the public water system that is located within Portland Road (Route 1). The Maine Water has the capacity to serve the project. Their ability to serve letter is attached. They will also review and approve the water layout & design prior to final approval by the planning board. Their approval letter will be forwarded to the City of Saco Planning Department, once received.

October 24, 2024

Jeff Amos, PE
Terradyn Consultants, LLC
41 Campus Drive
New Gloucester, ME 04260

Re: Ability to Serve Determination – 986 Portland Rd, Saco

Greetings,

The Maine Water Company (MWC) has received your request on the behalf of your client, Cloverleaf Development, LLC, for an Ability to Serve Determination for a proposed development to be located at 986 Portland Rd, Saco, ME.

The request specifies a plan to create Phase 2 of the Cloverleaf Development to include one 6-unit building, five 12-unit buildings, three 24-unit buildings, one community building, a single-family lot, and utility infrastructure improvements. The expected peak domestic service demand is 35 gallons per minute. The expected fire service demand for the project is not provided. Based on the criteria provided by the developer's engineer, the expected increase in water usage is within the water system's available capacity. The static pressure in the area is approximately **40 psi**. The Biddeford Saco Division of MWC does have sufficient capacity from the existing 16-inch HDPE water main in the Portland Road Right-of-Way to serve this project. Additional infrastructure improvements may be required at the expense of the developer to meet the overall needs of this project.

Conditions of Service

- MWC has the understanding that fire service demand is unknown at this time, are not to be included in this request, or accounted for in this Ability to Serve Determination.
- If fire service is required, a hydrant flow test at the nearest available hydrant will need to be conducted and analyzed by the sprinkler designer to ensure that adequate flows can be met during a peak fire demand event.
- The developer is required to pay for the cost of any modification, renewal of impacted service lines, and retirement of unused or discontinued services to MWC standards of best practice.
- Additional plan approval, paperwork, and fees associated with this project will require proper coordination with MWC. MWC requires upfront payment for inspection and paperwork to be fully completed before any construction on waterworks materials.
- Service lines must comply with MWC Cross Connection Control Program.
- Allow up to 30 days for the MWC utility review process once final plans are ready to be completed before any construction on waterworks materials will be approved.

Should a request for service or completion of the project not be executed within one year of the date of this letter, MWC reserves the right to reevaluate its ability to serve this project. All work must be completed in accordance with MWC Terms and Conditions as well as material specifications. All appropriate paperwork must be completed, and deposit paid prior to the start of construction. Please forward all design plan revisions as the project develops to prevent construction delays. Water service will be provided in accordance with Maine Public Utility Commission rules. If you have any additional questions, please do not hesitate to contact our office at 1-800-287-1643 or by email at Patrick.Gere@mainewater.com. We look forward to working with you throughout design and construction.

Sincerely,
The Maine Water Company

Patrick Gere, PE
Project Engineer

The Maine Water Company
93 Industrial Park Road
Saco, ME 04072

T: 1.800.287.1643
www.mainewater.com

Section 17 - Wastewater Disposal

The Clover Leaf Development will connect to the City sewer system. Our sewer design will be reviewed and approved by the water resource recovery department prior to final approval by the planning board. The department did not express concern about the project at the staff review meeting earlier this year. They will provide proof of capacity during their review.

Section 18 - Solid Waste

The Clover Leaf Development will generate solid waste during land clearing, construction of the infrastructure and buildings and after occupation. The specific types, quantities, haulers and disposal sites are described below.

Woodwaste, Stumps & Grubbings

The majority of the waste will be generated by the harvesting of trees and the removal of stumps. Marketable timber will be removed from the project site and sold. Smaller woody debris will be mulched and used as a soil amendment or as an erosion control measure. Stump grindings will be used to make erosion control mix berm whenever possible, which will be used to augment or substitute for silt fence. An estimate of the amount of stumps/grinding waste can be calculated by assuming that 400 CY of material produced per acre of disturbance of mature forest. This approximation yields 5,600 CY over the 14 acres of clearing.

Construction & Demolition Debris

The construction waste generation rate for both residential & commercial construction is approximately 4.4 lb/ft^2. This value is from Estimating 2003 Building-Related Construction and Demolition Materials Amounts, published by the US EPA. The site contains the following:

12 apartment buildings @ 9,056 SF ea x 5	45,280 SF
24 Unit Apt Buildings @ 19,707 SF ea x 3	59,121 SF
6 Unit Building @ 8,745 SF ea x 1	8,745 SF
Community Building	864 SF
2 Car Garage @ 528 SF ea x 17	8,976 SF
3 Car Garage @ 792 SF ea x 6	4,752 SF
4 recycling buildings @ 135 SF ea x 11	1,485 SF
Total	129,223 SF

This equates to approximately 285 tons of expected construction debris.

General construction waste material from roadway, utility and infrastructure construction as well as building construction will be disposed of at appropriately licensed disposal facilities. We anticipate that construction and demolition debris will be transported by Casella Waste and disposed of at the Juniper Ridge Landfill in West Old Town, ME or by

Waste Management of Maine, Inc and disposed of at the Crossroads Landfill in Norridgewock, Maine or the turnkey Landfill in Rochester, NH.

Once the construction phase is completed, any general construction debris will be disposed of at appropriately licensed disposal facilities.

Site demolition will be limited to tree clearing. Two existing homes and their associated septic systems were removed during the first phase.

Household Solid Waste

It is estimated by the US EPA (https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials) that as of 2017, the average person generates 4.51 lbs per day.

The apartment complex contains 114 studio & one bedroom apartments and 24 two & three bedroom apartments. The one-bedroom units would likely average no more than two people per unit. The two & three-bedroom units would likely be closer to the average household. According to the Pew Research Center (https://www.pewresearch.org/fact-tank/2019/10/01/the-number-of-people-in-the-average-u-s-household-is-going-up-for-the-first-time-in-over-160-years), the average person lives in a household consisting of 3.4 people. This brings the development average to (2 x 114 + 3.4 x 24)/138=2.3 people per apartment. Therefore, the assumed amount of household waste is approximately (4.51 lbs/person/day x 2.3 people per apartment x 138 apartments) 1,432 lbs/day (262 tons/year).

All waste from the apartments will be stored on site in dumpsters and recyclable receptacles that will be located in four separate buildings to be located in each main parking area. The waste will be collected by Waste Management of Maine, Inc and disposed of at the Crossroads Landfill in Norridgewock, Maine or the turnkey Landfill in Rochester, NH.

Industrial Solid Wastes – Not applicable

Special & Hazardous Wastes – Not applicable

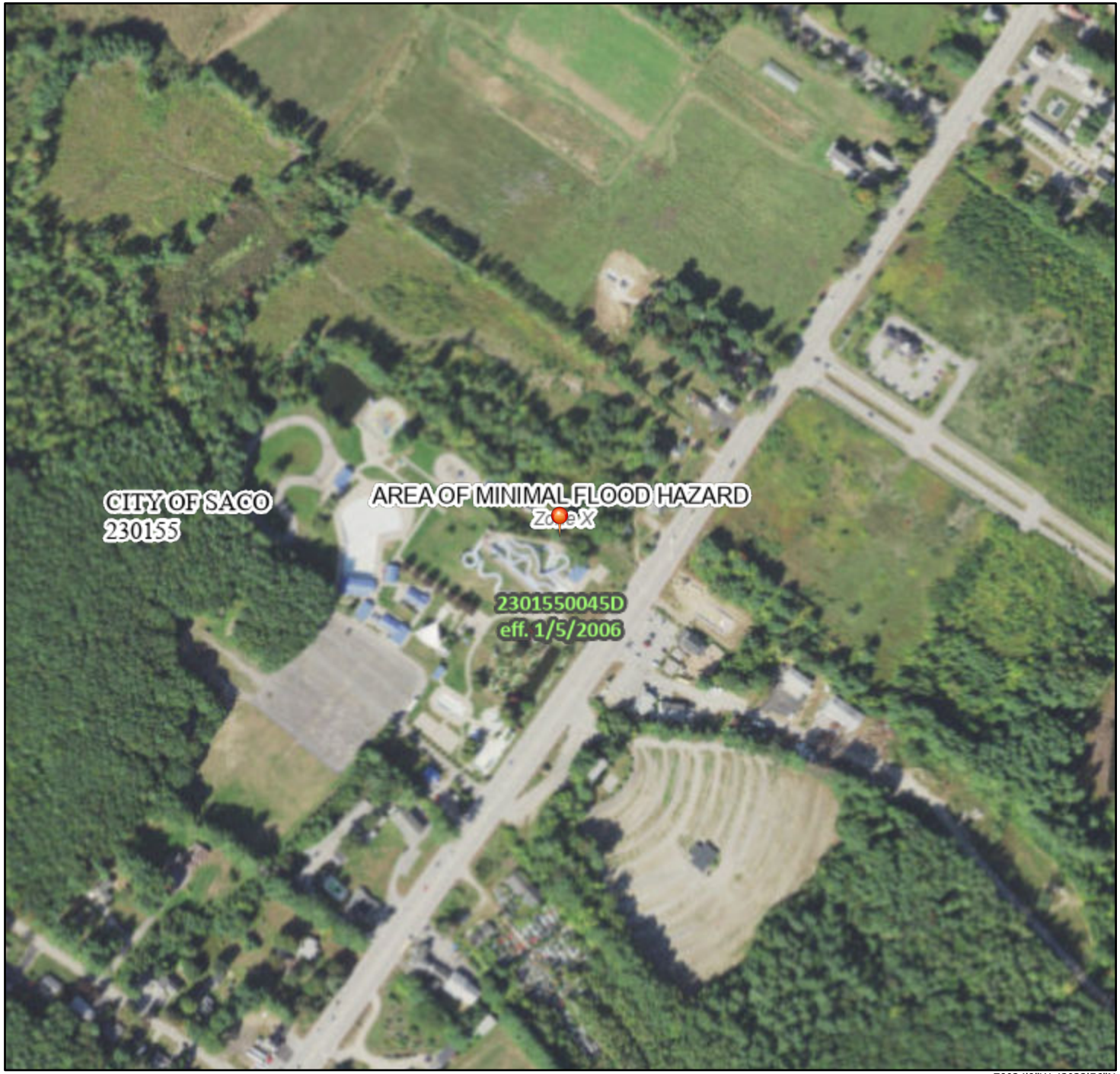
Section 19 - Flooding

The development area is not located within an area of flood hazard according to Federal Insurance Rate Map 230155 0045 D. See attached map.

National Flood Hazard Layer FIRMette

FEMA

70°24'46"W 43°33'22"N



70°24'9"W 43°32'56"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

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

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

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

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

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

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- 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 6/15/2021 at 7:13 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.

Section 20 - Blasting

There are no areas of expected blasting. However, if blasting is unexpectedly determined to be necessary, the contractor shall adhere to the following plan.

A professional (licensed in the State of Maine) blasting contractor will be employed to conduct any blasting work in accordance with applicable State and local laws. At a minimum, the blasting contractor shall conduct his work in accordance with the following criteria:

1. "Manual of Accident Prevention in Construction" issued by Associated General Contractors of America, Inc.
2. "Construction Safety Rules and Regulations" as adopted by the State Board of Construction Safety, Augusta, Maine.
3. Section 107.12 of the "Standard Specifications" Maine Department of Transportation.
4. 30 CMR 815.64.

The blasting contractor will be required to prepare and submit a blasting plan to the owner prior to construction. At a minimum, the plan shall outline his proposal for monitoring of blasts, sequencing of blasts, sketches of proposed drill patterns, and specified field procedures, including the hours of operation, use of blasting mats, safety procedures, security measures in the work zone, and warning sequences. Blasting mats or earth cover shall be used to limit peak air overpressures and to protect against uncontrolled blast rock. Blasting vibrations, frequencies and overpressures shall not exceed the limits established by State or local codes. The maximum Peak Particle Velocity (PPV) shall be based on Fig. B-1 of Appendix B from the U. S. Bureau of Mines RI 8507

The Contractor shall design his charges using the Scaled Distance Equation as follows:

$$W = (D/D_s)^2$$

Where:

W	=	Maximum allowable weight of explosives per delay of 8 milliseconds or greater.
D	=	The shortest distance between the blast area and any inhabitable structure not owned or controlled by the developer.
D_s	=	70 ft./$lb^{1/2}$

The contractor shall prepare and submit a blasting schedule which shall be presented to the owner, the municipality, and the MDEP prior to blasting. This schedule shall, at a minimum, include the following:

- Name, address and phone number of blaster;
- Identification of specific blasting areas;
- Dates and times of blasts;
- Methods to restrict access in the blast area and warning whistle announcements;
- All blasting work shall be the responsibility of the blasting contractor.

The blasting contractor shall maintain accurate and current blasting records which shall be submitted to the owner, the municipality, and the MDEP on a weekly basis during blasting operations. These records shall contain, at a minimum:

- General location of the blast
- Depth and number of drill holes
- Type and quantity of explosives used (including sizing calculations based on the scaled distance equation)
- Time of blast
- Seismographic record of each blast taken within 300' of the blast area

The blasting contractor shall retain an independent firm to provide a seismograph to be set up within a 300 foot radius of blasting activities. The seismograph shall have a Seismic Frequency Range of 2 to 150 Hertz and a sound frequency range of 1-500 Hz. It shall be capable to recording longitudinal, transverse, and vertical peak particle motion and frequency. The following information shall be printed out for each blast:

- Instrument Type
- Instrument Calibration Date
- Date and Time of Blast
- Instrument Location
- Distance to Blast
- Resultant Peak Particle Velocity (in/sec)
- Longitudinal, Vertical and Transverse Peak Particle Velocity (in/sec)
- Frequency (Hz)
- Seismograph Operator
- Airblast (dB)
- Stratum Directly Beneath Geophone

The seismograph shall be used to determine the air blast and peak particle velocity of each shot in the area where the seismograph is set. Peak particle velocities recorded with a 300' radius which exceed the Frequency-Peak Particle Velocity Curve (Figure B from Appendix B of the US Bureau of Mines RI 8507) shall be documented and reported by the blaster to the owner's representative and a copy forwarded to the Department within 7 days of the record becoming available.

During the blasting operation, the blasting contractor shall be responsible for control of access in and around the general blast area. Equipment and traffic shall be stopped far enough away to ensure work area safety and shall not be released until the blast foreman issues the “all clear signal”. Warning signals shall be issued prior to every shot as follows:

- 3 whistles at 5 minutes prior to blast
- 2 whistles at 1 minute prior to blast
- once the shot has been checked for any misfires, one whistle will issue the “all clear”

Blasting shall only occur as needed during the hours of 7:00 A.M. to 5:00 P.M. daily, Monday through Friday. Explosives shall be delivered to the job site on a daily basis. Only that amount necessary for the day’s work shall be brought to the site. Explosives shall be transported and stored in approved magazines when not in use. No overnight storage of explosives on the site shall be permitted.

Section 21 - Air Emissions

No significant adverse air emissions are anticipated. The proposed road and parking areas will be paved. No stacks or expansive gravel areas are proposed. The estimated peak hour vehicle trips are not expected to be a significant source of air emissions. Temporary emissions may occur during the construction of the project due to earth moving activities and construction equipment. These emissions are expected to be limited in nature and of short duration. Provisions for dust control, if needed during construction, have been included in the Erosion and Sediment Control Plan attached to Section 14 of this application. Once the construction phase is complete, no undue air emissions are expected.

Section 22 - Odors

Odor generation is not expected to be significant and would be consistent with any normal residential use. Temporary limited odors may arise during constriction as a result of construction equipment working on the site. This short-term odor potential is also not expected to be significant.

Section 23 - Water Vapor

Due to the proposed residential use of the property, no large scale water vapor emissions are anticipated.

Section 24 - Sunlight

Due to the proposed residential use of the property, no sunlight exposure or deprivation problems are anticipated.

Section 25 - Notices

Public notifications will be sent out as part of the local permitting process. We've attached an abutter list that includes all property owners within 200' of the property. However, City staff informed us that they'll prepare the official abutter list and will mail notices, as needed.

Map #	Lot #	Owner	Co-Owner	Mailing Address	City	State	Zip Code
63	3	AQUA MANAGEMENT, LLC		33 APRIL DR.	LITCHFIELD	NH	03052
76	3	MARILYN IVES		133 FLAG POND RD.	SACO	ME	04072
76	1	TIMOTHY J. & LYNN M. W. LEARY		1 BUTTERNUT LANE	SACO	ME	04072
77	2	EDNA M. LEARY		269 FLAG POND RD.	SACO	ME	04072
76	4-2						
64	14	EDNA M. LEARY		269 FLAG POND RD.	SACO	ME	04072
76	4-1	THERESE M & PAUL D. HERSEY		117 FLAG POND RD.	SACO	ME	04072
76	5-4	JASON A. CAMIRE		5 APPLE TREE LANE	SACO	ME	04072
63	5	GLENN & KAYE S. MARTIN		132 TARA LANE	GOODLETTSVILLE	TN	37072
63	4	WILLIAM A. JIPSON JR.		992 PORTLAND RD.	SACO	ME	04072
63	6	PARK NORTH DEVELOPMENT, LLC		1022 PORTLAND RD.	SACO	ME	04072
63	7-1	TK ENTERPRISES, LLC		987 PORTLAND RD.	SACO	ME	04072
63	7	MKM REALTY TRUST, LLC		198 SACO AVE.	OLD ORCHARD BEACH	ME	04064
76	5-3	JACQUES RURANGWA		4 APPLE TREE LANE	SACO	ME	04072
		CITY OF SACO		300 MAIN ST.	SACO	ME	04072