Proposed for: Liberty Mutual

Liberty Mutual

225 Borthwick Ave.

Portsmouth, NH 03801

Driver for Corrective Action

Attention Needed Action Needed Action Required

Shoreline Stabilization – Two wet detention ponds with side slope erosion. Easter Pond 252 linear Feet/Western Pond 335 Linear feet

Summary of Issues

The following scope details a proposed option to stabilize the noted side slopes of two wet detention ponds at Portsmouth, Liberty Mutual. This proposed stabilization technique will incorporate engineered fabrics, vegetation, as well as a sub-water level stone toe footer. We recommend this scope, as it coincides with the existing aesthetic and provides a more dynamic approach to stabilizing the soils. The migrated and sloughed soil will be excavated and removed from the toe of the slope and stock-piled for re-use and/or disposal. The toe of each slope will be excavated in order to install a 12”x12” stone toe footer beneath the water line. The trench will be lined with geo-textile fabric to provide separation from the basin’s soil, and prevent side slope soil migration, due to uniform pressure from the stone. TRM 250 (or equivalent) will be installed, extending from the stone to footer to the existing landscape features (replacing the existing turf buffer). A choir log will be installed at the normal water level to be staked into the ground using 2’ engineers’ stakes, which will then have native wetland plants installed on the uphill side of the choir log. Native wetland plants will be installed through the TRM to provide a vegetative buffer during the growing season, though the TRM 250 will provide stability during the winter and cold months.

The following scope includes both ponds shoreline as highlighted in the aerial diagram below (587LF)

Scope of Work

AQUALIS will provide the Services and Deliverable(s) as follows:

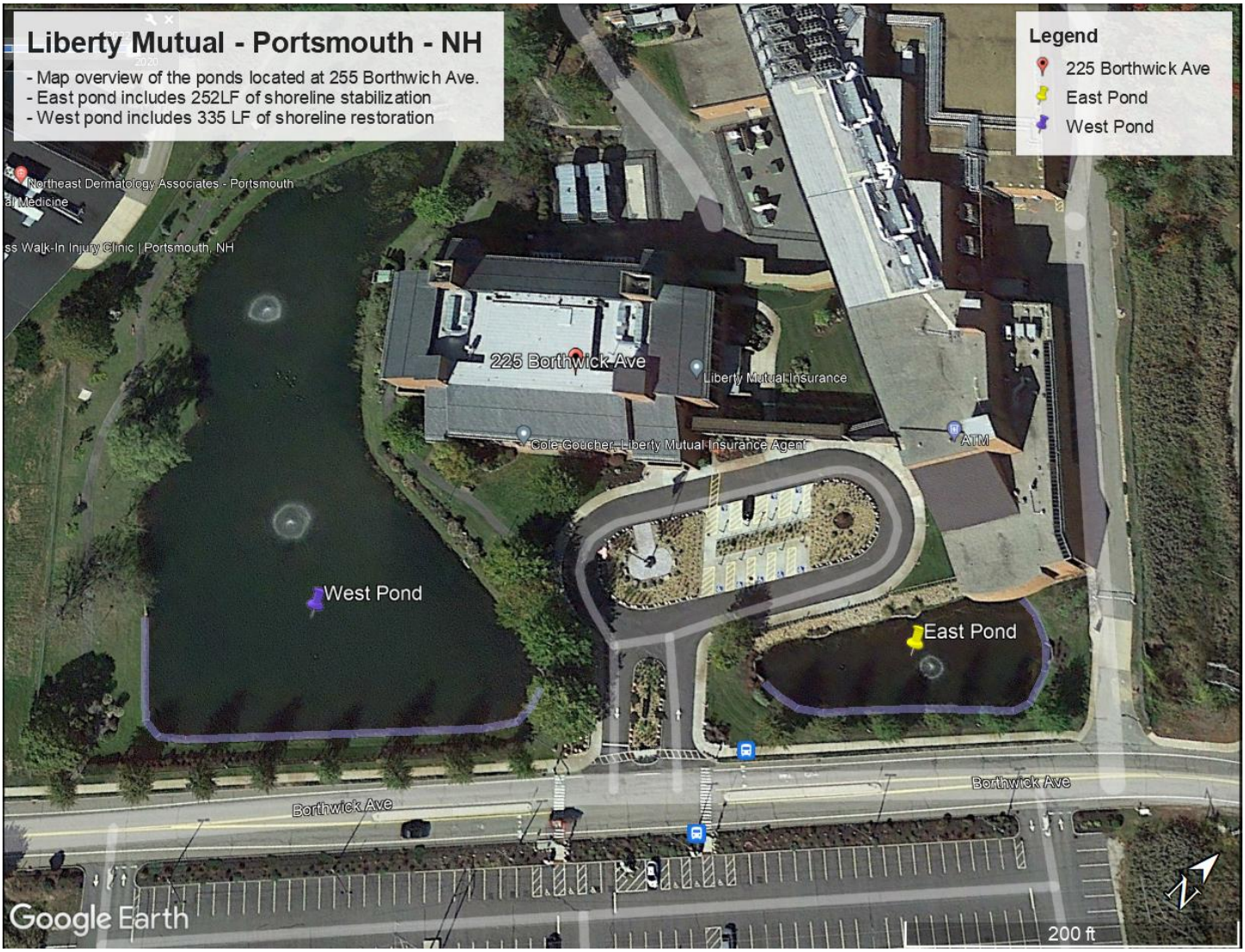
- Mobilize all equipment and labor to the site
- Deploy temporary traffic barricades as necessary for crew and customer safety
- Establish pump around to dewater pond as needed to install buffer
- De-water pond as needed using high flow de-watering pumps and boosters
- Excavate and “strip” non-compactable soil, to be stockpiled for reuse or disposal depending on composition
- Excavate and grade 12”x12 toe stone trench
    - Installation of geo-textile fabric according
    - Installation of 4-6 rip rap mixed with surge stone
- Finish grade of pond slope and embankment, to be confirmed using a rotary laser level and temporary benchmark
- Installation of TRM 250
    - Trench leading edge of TRM
    - Secure TRM 250 using 10” U staples
    - TRM to extend from the top of berm to the toe of slope and tie into stone footer
- Installation of choir log
    - Secured choir log with 2’ engineers stakes driven deep into the ground
- Installation of Native Wetland Plants
    - Installation of 6 native wetland plugs per SY

    - A variation of 4 species will be used to prevent monoculture and vector vulnerability
    - Perforations in the TRM 250 for the installation of the plants will be stapled, and zip tied to prevent soil migration
- Repair landscaping as needed and replace disturbed mulch
- Remove temporary traffic barricades; perform general site cleanup
- Demobilize

*Includes both ponds

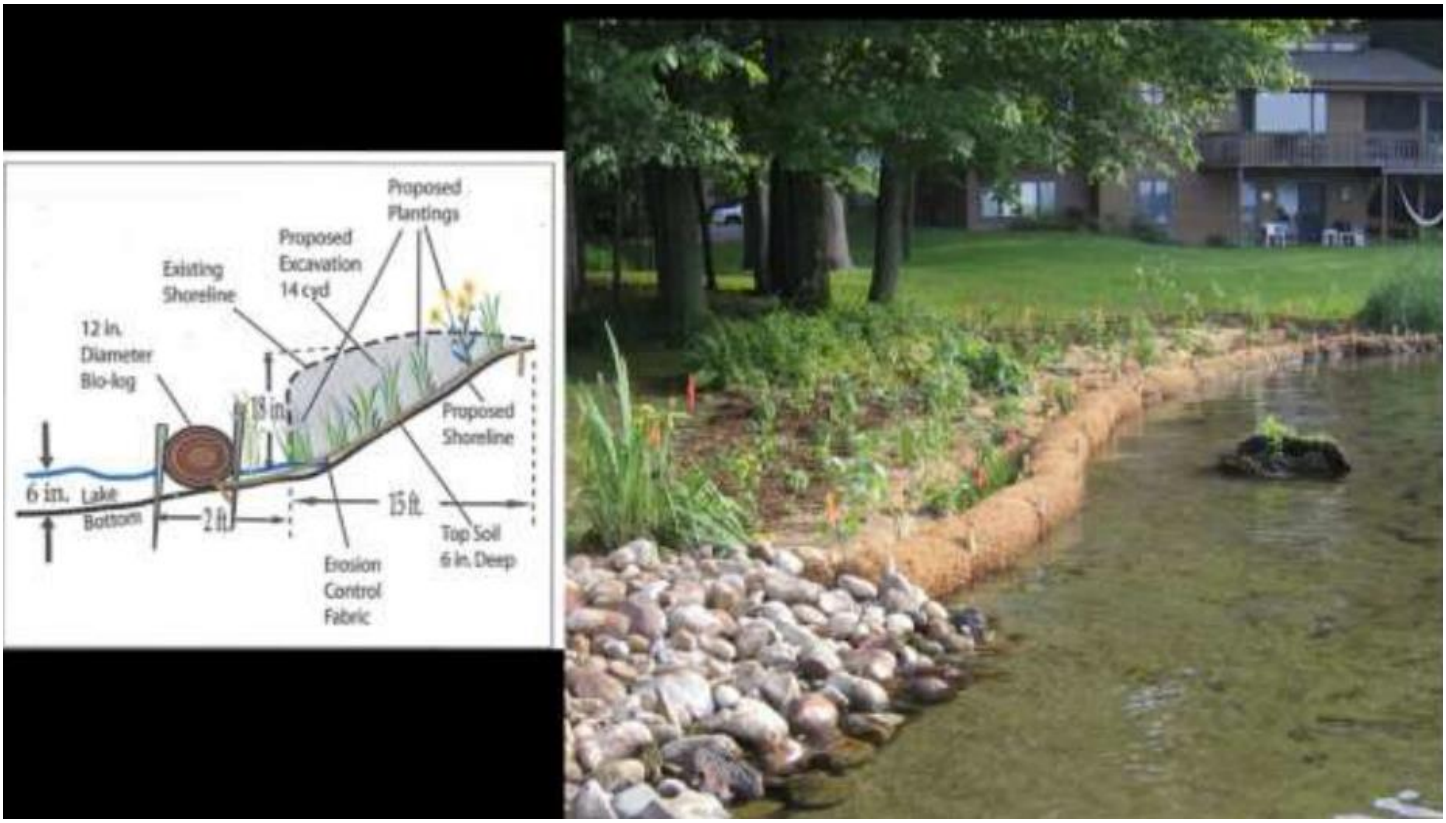
*This cost does not include vactor truck work

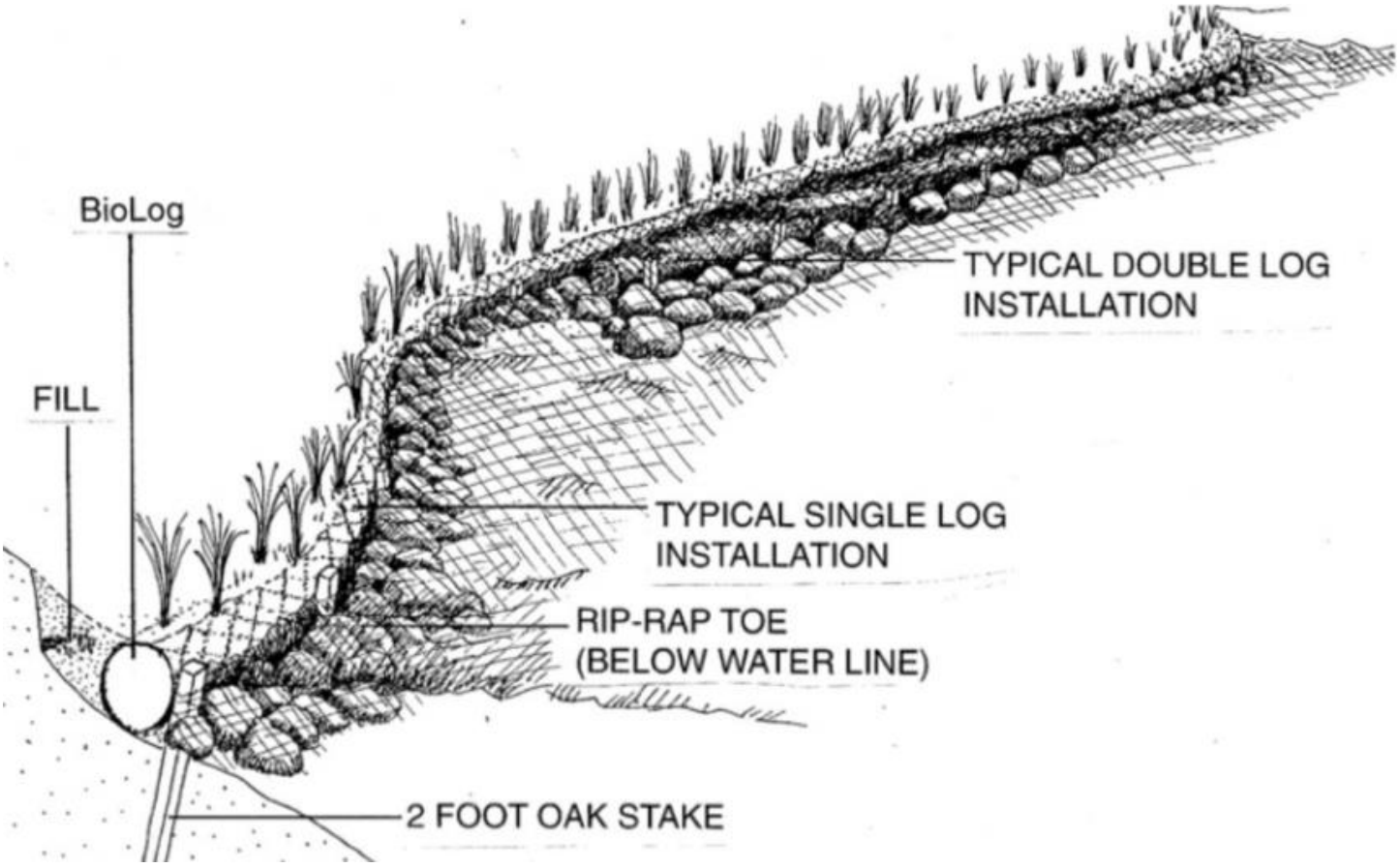
*This cost does not include any camera investigations

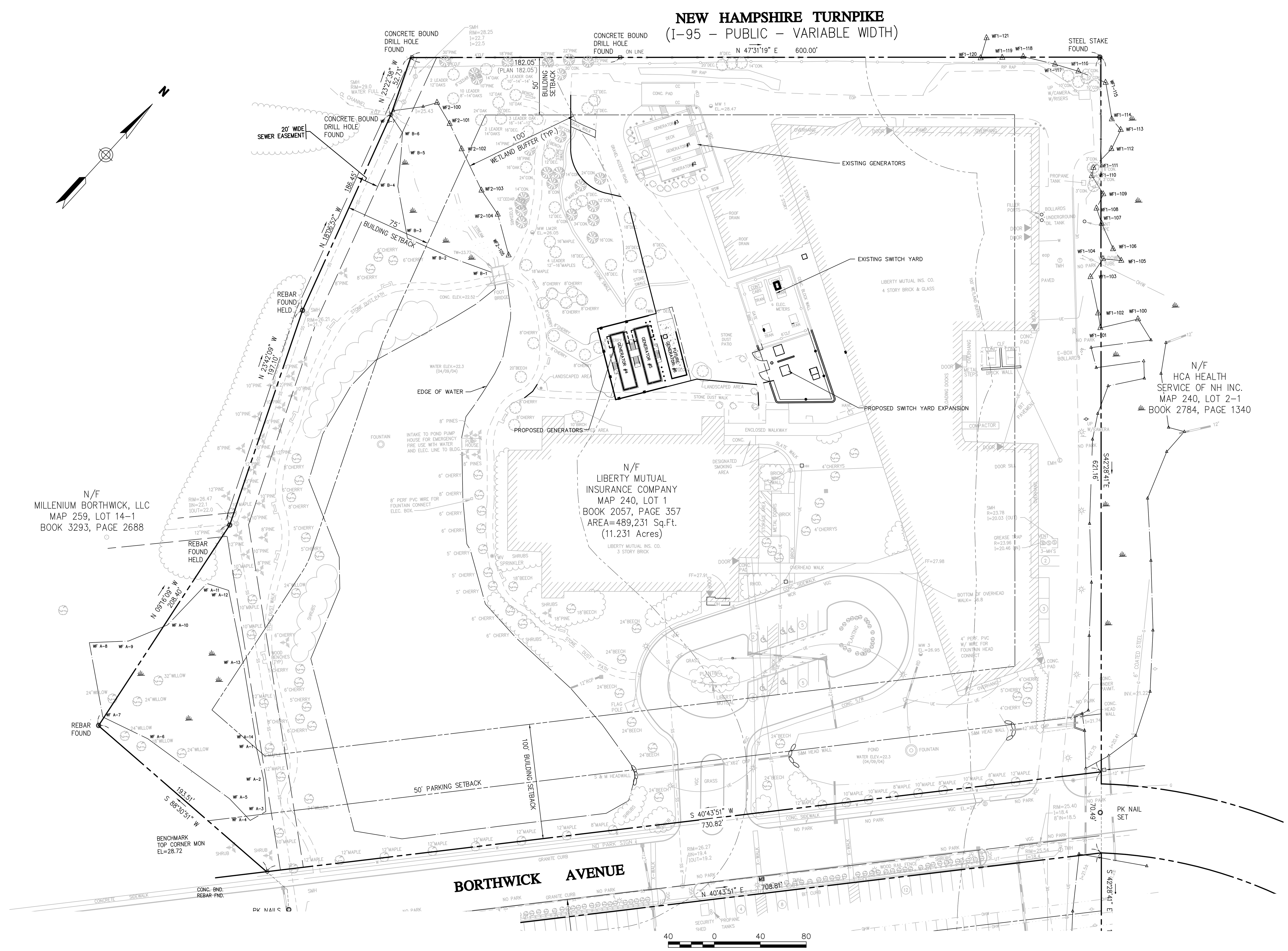

Liberty Mutual - Portsmouth - NH
- Map overview of the ponds located at 255 Borthwich Ave.
- East pond includes 252LF of shoreline stabilization
- West pond includes 335 LF of shoreline restoration
Legend
225 Borthwick Ave
East Pond
West Pond
Northeast Dermatology Associates - Portsmouth
Medicine
ss Walk-In Injury Clinic | Portsmouth, NH
225 Borthwick Ave
Liberty Mutual Insurance
Cole Goucher - Liberty Mutual Insurance Agent
ATM
West Pond
East Pond
Borthwick Ave
Borthwick Ave
Google Earth
200 ft

Living Shoreline Example (De-watered)

Newly Constructed Coir Log shoreline (Coir Log will be visible for apx. 1 growing season)







RDK ENGINEERS

Andover, MA - Boston, MA - Amherst, MA

Durham, NC - Charlotte, NC

RDK Engineers
200 Brickstone Square
Andover, MA 01810-1488

T.978-475-0298
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W. www.rdkengineers.com

VHB
Vanasse Hangen Brustlin, Inc.

Transportation
Land Development
Environmental Services

Six Bedford Farms Drive, Suite 607
Bedford, New Hampshire 03110
603.644.0888 • FAX 603.644.2385

HALEY & ALDRICH

REVISIONS

	DATE	DESCRIPTION
	05-11-12	CONSTRUCTION DOCUMENTS

SEAL

PROJECT

NUMBER
RDK: 20110575, VHB: 52180.00

DATE
05-11-12

Liberty Mutual.

225 Borthwick Avenue
Portsmouth, New Hampshire

DRAWING

DRAWN BY
D. FENSTERMACHER

CHECKED BY
M. LEO

SCALE
1"=40'

OVERALL
SITE PLAN

C-2

RDK

SCOPE OF WORK

* Reconstruction of existing parking areas as shown on Civil Engineers plans, pulverizing, repaving, recurbing and restriping a total area of 372,853 s.f. +/−. This work is to be phased.
* The demolition and replacement of drainage appurtenances in the Northerly parking facility including catch basins, frames and grates, collector piping and perforated piping.
* Demolition of light poles and bases and underground electric in the Northerly parking area, at the main entrance parking area and turn around and upgrade of the existing lighting with the addition of the placement bollard lights.
* Removal of existing entrance (located in the center of the island between Borthwick Avenue and the Northerly parking area).
* Replacement of guardrail in various locations along the perimeter of the Southerly parking area.
* Existing gravel parking area adjacent to the Northerly parking area is to be paved. Northeast corner of Northerly parking area is to be re−graded prior to the repaving to raise the elevation.
* Alternate Bid is to be included for the existing island between Borthwick Avenue and the Northerly parking area to provide upgraded landscaping.

NOTE:
SEE SHEET 2 OF 10 FOR STANDARD NOTES AND ZONE REQUIREMENTS.

MAP 259/LOT 14
N/F HIGH LINER FOODS, INC.
PO BOX 839
PORTSMOUTH, NH 03802−0839
RCRD 2434−112

MAP 259/LOT 14−1
N/F MILLENIUM BORTHWICK, LLC
PO BOX 949
NORTH CHELMSFORD, MA 01863
RCRD 3293−2688

HIGHLINER AVE.

BORTHWICK AVENUE

S40°44'00"W 23.53'

S41°40'00"E 58.05'

MAP 259/LOT 15
N/F NORTHEAST FEDERAL CREDIT UNION
PO BOX 1240
PORTSMOUTH, NH 03802−1240
RCRD 2270−345

MAP 259/LOT 27
N/F CITY OF PORTSMOUTH
DEPT. OF PUBLIC WORKS
PO BOX 628
PORTSMOUTH, NH 03802−0628

FOUND 5"x5" CONCRETE BOUND (2" HIGH, TOP BROKEN OFF) 11/28/2005

TBM
TOP CORNER OF MONUMENT
ELEV.=28.72

N22°42'00"W 191.10'

20' WIDE SEWER EASEMENT

100' WETLAND BUFFER

N09°18'00"W 208.40'

S08°31'00"W 199.43'

20' SEWER EASEMENT

3' STONE DUST PATH

3' STONE DUST PATH

FOUNTAIN

POND
WATER ELEV.=22.3
(04/09/04

EXISTING 3 STORY BRICK BUILDING

MAP 240/LOT 1
N/F LIBERTY MUTUAL INSURANCE
175 BERKLEY STREET
BOSTON, MA 02116
RCRD 2057−357

LIMIT OF PROPOSED WORK AREA (TYP.)

100' BUILDING SETBACK

50' PARKING SETBACK

EXISTING 4 STORY BRICK & GLASS BUILDING

PAVEMENT RECONSTRUCTION AREA 18,313 S.F. ±

619.65' S42°24'00"E

MAP 240/LOT 2−1
N/F HCA HEALTH SERVICES OF NH, INC.
PO BOX 1504
NASHVILLE, TN 37202
RCRD 2784−1340

CONCRETE SLAB

POND
WATER ELEV.=22.3
04/09/04

FOUNTAIN

PAVEMENT RECONSTRUCTION AREA 1,363 S.F. ±

LIMIT OF PROPOSED WORK AREA (TYP.)

729.00' N40°44'00"E

LIMIT OF PROPOSED WORK AREA (TYP.)

EXISTING LANDSCAPE ISLAND TO BE UPDATED.

BORTHWICK AVENUE

REMOVE EXISTING ENTRANCE

EXISTING LANDSCAPE ISLAND TO BE UPDATED.

N40°44'00"E 711.07'

62.7 (PLAN 56.78)

S40°44'00"W 789.39'

EDGE OF WET

FOUND 5"x5" GRANITE BOUND WITH DRILL HOLE (9" HIGH) 11/28/2005

N46°41'00"W 90.44'

PUBLIC SERVICE COMPANY OF NH 300' EASEMENT

EDGE OF WET

LIMIT OF PROPOSED WORK AREA (TYP.)

EDGE OF WET

STEEL GUARDRAIL

STEEL GUARDRAIL

STEEL GUARDRAIL

REPAIR EXISTING GUARDRAIL

R=384.00' L=356.99

LIMIT OF PROPOSED WORK AREA (TYP.)

PAVEMENT RECONSTRUCTION AREA 101,450 S.F. ±

445.80'

85' WIDE PUBLIC SERVICE COMPANY OF NH EASEMENT & STATE OF NH EASEMENTRCRD 1935−330

100' WETLAND BUFFER (TYP.)

N25°27'00"W 462.37'

RAILROAD SPUR EASEMENT TO NATIONAL SEA FACTS RCRD 2250/621

298.99' N54°16'00"E

EDGE OF WET

STEEL GUARDRAIL

REPLACE EXISTING GUARDRAIL

EDGE OF WET

EDGE OF WET

STEEL GUARDRAIL

S35°44'00"E 8.00'

138.00' N54°16'00"E

FOUND 1/4" PINCHED IRON PIPE (5" HIGH) 12/01/2005

FOUND 5"x5" GRANITE BOUND WITH DRILL HOLE (9" HIGH) 12/01/2005

BOSTON & MAINE RAILROAD

R=8566.42 L=766.80

100.00' N54°16'00"E

N35°44'00"W 16.50'

N24°56'10"W 16.39'

70.00' S54°16'00"W

PUBLIC SERVICE COMPANY OF NH 300' EASEMENT

100' BUILDING SETBACK

EXISTING GRAVEL PARKING AREA TO BE PAVED

GRAVEL PARKING

EDGE OF WET

PAVEMENT RECONSTRUCTION AREA 248,561 S.F. ±

REPLACE ALL DRAINAGE IN THIS LOT

100' WETLAND BUFFER (TYP.)

EDGE OF WET

85' WIDE PUBLIC SERVICE COMPANY OF NH EASEMENT & STATE OF NH EASEMENT RCRD 1935−330

EXISTING PAVED AREA TO BE REGRADED

681.12' S42°24'00"E

MAP 240/LOT 2−2−1
N/F CITY OF PORTSMOUTH
DEPT. OF PUBLIC WORKS
PO BOX 628
PORTSMOUTH, NH 03802−0628
RCRD 2648−901

LIMIT OF PROPOSED WORK AREA (TYP.)

EDGE OF WET

MAP 240/LOT 3
N/F LIBERTY MUTUAL INSURANCE
175 BERKLEY STREET
BOSTON, MA 02116

75' BUILDING SETBACK

60 0 30 60 120 240
(IN FEET)

Jan 11, 2007 - 1:56pm
P:\05783\dwg\05783 OA-ST.dwg

MAP 240, LOT 3 & MAP 259, LOT 15
PROPERTY OF
LIBERTY MUTUAL INSURANCE COMPANY
BORTHWICK AVENUE
COUNTY OF ROCKINGHAM
NEW HAMPSHIRE

OVERALL VIEW SITE PLAN

REV. 4	06/05/06	NO REVISIONS THIS SHEET
REV. 3	05/18/06	REVISIONS PER REVIEW
REV. 2	03/17/06	REVISIONS PER CLIENT REVIEW
REV. 1	02/23/06	REVISIONS PER CLIENT REVIEW
DRAWN BY: LAS		CHECKED BY: FRS

AMES MSC
ARCHITECTS & ENGINEERS
JOHN HART MANSION
403 THE HILL
P.O. Box 427
PORTSMOUTH, NH 03802-0427
PHONE: 603-431-2222
FAX: 603-431-0910
www.amesmsc.com

DATE: DECEMBER 27, 2005

SHEET 1 OF 10

PROJECT NO. 05783

SCALE: 1" = 60'

Wetland and Waterbody Delineation Report

Liberty Mutual Wetland Delineation Project

225 Borthwick Avenue Portsmouth, New Hampshire

September 30, 2022

Prepared By:

TRC
670 N. Commercial Street
Suite 203
Manchester, NH 03101

TABLE OF CONTENTS

TABLES

APPENDICES

1.0 Introduction

This report presents the results of a wetland and waterbody delineation conducted on September 19, 2022, by TRC Companies, Inc. (TRC) at 225 Borthwick Avenue in the City of Portsmouth, Rockingham County, New Hampshire (Site). The survey area included approximately 11.23 acres on Parcel ID 240-1.

This report documents wetlands, streams, and other aquatic resources (ponds, lakes, impoundments, etc.) at the Site regardless of assumed jurisdictional status and addresses the implementation of local and state regulated buffer areas. To the extent practicable, the delineated resources were investigated to determine drainage patterns and a physical nexus to Waters of the United States (WOTUS).

Appendix A provides a Site location map (Figure 1) and a map of the resources delineated by TRC (Figure 2). Appendix B includes representative photographs of the Site, Appendix C includes wetland determination data forms, and Appendix D contains the Natural Resources Conservation Service (NRCS) Soil Report.

2.0 Project Site Characteristics

Prior to conducting field investigations on September 19, 2022, the following data sources were reviewed to aid in identifying wetlands and streams:

- US Geological Survey (USGS) topographic mapping;
- US Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping;
- Natural Resources Conservation Service (NRCS) medium-intensity soil survey mapping;
- GRANIT, the New Hampshire statewide Geographic Information Systems (GIS) clearinghouse; and
- Recent and historical aerial photography.

2.1 General Description

The Site is generally flat with a few shallow slopes surrounding the ponds and wetlands. The Site is bounded by commercial and open space properties. Interstate I-95 (Blue Star Turnpike) borders the Site to the northwest and additional office complexes and parking lots abut the Site in all other directions.

2.2 Hydrology

The Site generally drains offsite via culverts and underwater routes towards the southeast. The boundary of the Site is depicted in the Locus map in Figure 1, outlined in black. The Site is located in the Salmon Falls/Piscataqua Rivers Watershed (01060003).

Flood hazard areas identified on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) are identified as Special Flood Hazard Areas (SFHAs). SFHAs are defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. There are no SFHAs or other FEMA flood zones in the Project parcel.

2.3 Federal and State Mapped Wetlands and Streams

The USFWS is the principal federal agency tasked with providing information to the public on the status and trends of wetlands on a national scale. The USFWS NWI is a publicly available resource that provides detailed information on the abundance, characteristics, and distribution of nationwide wetlands (where

mapped). NWI mapping data is offered to promote the understanding, conservation, and restoration of wetlands. The online New Hampshire Department of Environmental Services (NHDES) Wetlands Permitting Planning Tool was accessed to determine the extent of federal and state-mapped aquatic resources.

According to TRC's review of NWI and NHDES mapping, there are two NWI-mapped wetlands connected by one riverine feature within the Site. The two wetland features were confirmed during TRC's delineation, and the riverine feature appeared to be culverted under the existing roadway. There is one NWI-mapped wetland located to the northeast of the site, although TRC confirmed that this feature did not extend into the Site.

2.4 Mapped Soils

The NRCS's Web Soil Survey identifies three soil map units within the Site. Map units can represent a type of soil, a combination of soils, or miscellaneous land cover types (e.g., water, rock outcrop, developed impervious surface). Map units are usually named for the predominant soil series or land types within the map unit. A summary of soil characteristics for soils mapped at the Site are included in Table 1, below. The following sections provide details about hydric ratings, drainage class, prime farmland, and hydrologic soil groups (HSGs). Details about soil map unit descriptions are provided in the NRCS Soil Report included as Appendix D.

Table 1. Mapped Soils

Symbol	Soil Name	Hydric Rating (%)	Drainage Class	Hydrologic Soil Group	Farmland Classification
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	8	Well drained	B	Not prime farmland
699	Urban land	0	N/A	N/A	Not prime farmland
299	Udorthents, smoothed	0	Excessively drained	N/A	Not prime farmland

2.4.1 Hydric Rating

The *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) (1987 Manual) defines a hydric soil as "…a soil that in its undrained condition, is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation."

Due to limitations imposed by the small scale of the soil survey mapping, it is not uncommon to identify wetlands within areas not mapped as hydric soil while areas mapped as hydric often do not support wetlands. This concept is emphasized by the NRCS:

> *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.*

Hydric Soil Rating (HSR) indicates the percentage of a map unit that meets the criteria for hydric soils.

Map unit 140B has an HSR of 8 percent, and map units 299 and 600 have HSRs of 0 percent. For map unit 140B, the hydric components within the map unit are Freetown and Walpole, very stony. For map units 299 and 699, there are no hydric components.

2.4.2 Natural Drainage Class

Natural drainage class refers to the frequency and duration of wet periods under conditions similar to those under which the soil developed. Anthropogenic alteration of the water regime, either through drainage or irrigation, is not a consideration unless the alterations have significantly changed the morphology of the soil.

Map unit 140B is rated as well drained, map unit 299 is rated as excessively drained, and map unit 699 does not have a drainage class because it is a land type.

2.4.3 Prime Farmland

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses (the land could be cropland, pastureland, rangeland, forestland, or other land, but not urban built-up land or water). Land used for a specific high-value food or fiber crop is classified as “unique farmland.” Generally, additional “farmlands of statewide importance” include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. In some local areas, there is concern for certain additional farmlands, even though these lands are not identified as having national or statewide importance. These farmlands are identified as being of “local importance” through ordinances adopted by local government. The NRCS State Conservationist reviews and certifies lists of farmlands of state and local importance. These lists, along with state and locally established Land Evaluation and Site Assessment (LESA) systems where applicable, are used by federal agencies to review and evaluate activities that may impact farmland. As defined in 7 CFR Part 657, important farmland encompasses prime and unique farmland, as well as farmland of statewide and local importance.

According to the NRCS, all three map units are classified as “not prime farmland.”

2.4.4 Hydrologic Soil Groups

Soils are assigned to a HSG 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 have 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 have 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 have 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 have a very slow infiltration rate (high runoff potential) when thoroughly wet. Soils 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 in Group D are assigned to dual classes.

Map unit 140B is in HSG B, and map units 299 and 699 do not have assigned HSGs.

2.5 Rare, Threatened, and Endangered Species

TRC's wetland and waterbody delineations did not include field surveys for rare plants or rare, threatened, or endangered (RTE) species. During permitting, TRC recommends consultation with the New Hampshire Natural Heritage Bureau (NHNHB) to understand if there are known occurrences of rare, threatened, or endangered species within one mile of the proposed Project. Consultation with NHNHB will result in a report from NHNHB documenting any known occurrences of RTE species and further discussion to determine if proposed work will affect these species.

3.0 Wetland and Stream Delineation Methodology

In addition to the desktop review described above, TRC biologists performed field investigations at the Site to identify wetlands, waterbodies, and other surface waters on September 19, 2022.

The Portsmouth Conservation Commission (the Commission) administers local wetland protection regulations in addition to the United States Army Corps of Engineers (USACE). The Commission has jurisdiction over the following resource areas according to the Portsmouth Zoning Ordinance:

- Any inland wetland, other than a vernal pool, that is 10,000 square feet or more in area;
- Any vernal pool regardless of area;
- Any non-tidal perennial river or stream; and
- The tidal wetlands of Sagamore Creek, Little Harbour, North Mill Pond, South Mill Pond, and part of the Piscataqua River.

3.1 Non-wetland Aquatic Resource Methodology

Streams and other non-wetland aquatic features within the Site were identified by the presence of an ordinary high water mark (OHWM), which is the line established by the fluctuations of water (33 CFR 328.3). The OHWM line is indicated by physical characteristics, which can include: a clear, natural line impressed

on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other characteristics of the surrounding areas.

3.1.1 Streams

Streams were identified using the State of New Hampshire Code of Administrative Rules Chapter Env-Wt. 101.109, which defines a "Watercourse" as:

"… any surface water that:

(a) Develops and maintains a defined scoured channel, with evidence of sediment transport, that:
(1) Is greater than 75 feet in length; or
(2) Is of any length and connected to another jurisdictional area at either end; and
(b) Is not a drainage swale." (Env-Wt. 101.109)

Streams were further defined based on the flow characteristics as ephemeral, intermittent, or perennial using the following New Hampshire regulatory definitions:

*"**Ephemeral stream**" means a watercourse that is located above the water table year-round and is not fed by groundwater, such that runoff from rainfall and snowmelt is the primary source of stream flow and so the stream has flowing water only during, and for a short duration after, precipitation or spring thaw events. (Env-Wt. 101.39)*

*"**Intermittent stream**" means a watercourse that is fed by groundwater but is not in the groundwater table throughout the year, with runoff from rainfall and snowmelt as a supplemental source of water for flow, such that it typically does not have flowing water during dry portions of the year. (Env-Wt. 101.52)*

*"**Perennial stream**" means a watercourse that is in the groundwater table for most of the year and so has groundwater as its primary source of water for stream flow, with runoff from rainfall and snowmelt as a supplemental source of water, so that it contains flowing water year-round during a typical year. (Env-Wt. 101-70)*

When a watercourse was encountered that met any of the above definitions, blue survey flagging was labeled with an alpha-numeric code and hung at points along the stream. For streams wider than six (6) feet, flags were hung along the bank of the stream. For streams narrower than six (6) feet, flags were hung along the centerline of the stream and the width of the stream was noted for the purpose of developing GIS shapefiles.

3.1.2 Vernal Pools

During wetland delineations TRC concurrently conducted surveys for potential vernal pools. To conduct these surveys TRC scientists utilized vernal pool survey protocols and field data forms based on the document "Identification and Documentation of Vernal Pools in New Hampshire", published by the New Hampshire Fish and Game Department (New Hampshire F&G) Nongame and Endangered Wildlife Program. Confirmation of vernal pool presence would have to occur during the vernal pool breeding season in the spring when vernal pool indicator species are active.

3.2 Wetland Delineation Methodologies

Wetlands are regulated by the USACE under Section 404 of the Clean Water Act (CWA). Further, wetlands in New Hampshire are regulated under the Fill and Dredge in Wetlands Law (Wetlands Law, RSA 482-A) which is administered by the NHDES Wetlands Bureau.

The CWA and NH Wetlands Law *(Env-Wt. 101.113)* define wetlands as:

> *areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances (do) support, a prevalence of vegetation typically adapted for life in saturated soil conditions.*

In accordance with the New Hampshire Code of Administrative Rules for the Delineation and Classification of Wetlands (Env-Wt. 301), wetland delineations were conducted according to the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, v2* ("Regional Supplement") (USACE 2012). The Regional Supplement follows criteria established in the USACE Wetlands Delineation Manual (Environmental Laboratory 1987), but is region specific, giving the wetland delineator a better tool to apply to regional vegetation communities, indicators of hydrology, and indicators of hydric soils when conducting a wetland boundary determination.

The USACE manual provides a repeatable methodology to identify potential wetland areas using a three (3) factor approach (i.e. hydrophytic vegetation, indicators of hydrology, and the presence of hydric soils). When a location having the requisite three (3) factors that constitute a wetland was encountered, the boundaries were flagged in the field using glo-pink survey flagging emblazoned with the words "Wetland Delineation" and sequentially labeled with a unique alpha-numeric code. This code designates the wetland Resource ID which is used on Wetland Determination Forms, resource mapping, and summary tables to identify each delineated resource.

3.2.1 Hydrophytic Vegetation Methodologies

Hydrophytic vegetation is defined in the 1987 Manual as:

> …the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present.

Plants are categorized according to their occurrence in wetlands. Scientific names and wetland indicator statuses for vegetation are those listed in *The National Wetland Plant List: 2016 Wetland Ratings* (NWPL) (Lichvar et al. 2016). The indicator statuses specific to the "Northcentral and Northeast Region" as defined by the USACE apply to the Site. For upland species that are not listed on the NWPL, the Integrated Taxonomic Information System was referenced for currently accepted scientific names. The official short definitions for wetland indicator statuses are as follows:

- Obligate Wetland (OBL): Almost always occur in wetlands;
- Facultative Wetland (FACW): Usually occur in wetlands, but may occur in non-wetlands;
- Facultative (FAC): Occur in wetlands and non-wetlands (50/50 mix);
- Facultative Upland (FACU): Usually occur in non-wetlands, but may occur in wetlands; and
- Upland (UPL): Almost never occur in wetlands.

Plants that are not found in a region, but are found in an adjacent region, take on the indicator status of that adjacent region for dominance calculations. Plants that are included on the NWPL, but not within the Site region or an adjacent region, are not included in dominance calculations. Plants that are not found in wetlands in any region are considered "UPL" for dominance calculations.

Vegetation community sampling was accomplished using the methodologies outlined in the 2012 Supplement. The "50/20 rule" was applied to determine whether a species was dominant in its stratum. In using the 50/20 rule, the plants that comprise each stratum are ranked from highest to lowest in percent cover. The species that cumulatively equal or exceed 50 percent of the total percent cover for each stratum are dominant species, and any additional species that individually provides 20 percent or more percent cover is also considered dominant species of its respective strata.

A hydrophytic vegetation community is present when: 1) all of the dominant species are FACW and/or OBL (Rapid Test for Hydrophytic Vegetation); 2) greater than 50 percent of the dominant species' (as determined by the 50/20 rule) indicator statuses are FAC, FACW, or OBL (Dominance Test); and/or 3) when the calculated Prevalence Index is equal to or less than 3.0. When applying the Prevalence Index, all plants are assigned a numeric value based on indicator status (OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5) and their abundance (absolute percent cover) is used to calculate the prevalence index.

Cover types are also assigned to each wetland and waterbody in accordance with the system presented in *The Classification of Wetlands and Deepwater Habitats of the United States, Second Edition* (Federal Geographic Data Committee 2013).

3.2.2 Hydric Soil Methodologies

Hydric soil indicators described in *Field Indicators for Identifying Hydric Soils in New England, Version 4* (New England Hydric Soils Technical Committee 2017) and in *Field Indicators of Hydric Soils in the United States, Version 8.2* (NRCS 2018) were used to determine the presence of characteristic soil morphologies resulting from prolonged saturation and/or inundation. Soil color was described using standard color notations provided on Munsell® soil color charts. Soil texture was determined using the methods described by Thien (1979). Soil test pits were dug using a spade shovel to a depth of approximately 20 inches or more (if needed).

Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin (MLRA Handbook) (USDA NRCS 2006) was referenced to determine the hydric soil indicators that apply to the Site. Per the MLRA Handbook, the Site is within Major Land Resource Area (MLRA) 144A (New England and Eastern New York Upland, Southern Part) of Land Resource Region (LRR) R (Northeastern Forage and Forest Region). Hydric soil indicators that do not apply to this MLRA were not considered on the wetland determination data forms.

3.2.3 Wetland Hydrology Methodologies

Per the 1987 Manual:

> *The term "wetland hydrology" encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and*

reducing conditions, respectively. Such characteristics are usually present in areas that are inundated or have soils that are saturated to the surface for sufficient duration to develop hydric soils and support vegetation typically adapted for life in periodically anaerobic soil conditions. Hydrology is often the least exact of the parameters, and indicators of wetland hydrology are sometimes difficult to find in the field. However, it is essential to establish that a wetland area is periodically inundated or has saturated soils during the growing season. (Environmental Laboratory 1987)

Wetland hydrology indicators are grouped into 18 primary and 11 secondary indicators presented in the Supplement. The USACE considers wetland hydrology to be present when at least one primary indicator or two secondary indicators are identified.

3.2.4 Prime Wetlands

Under NH Wetlands Law a municipality may designate high-value wetlands as "Prime Wetlands". Prime Wetlands provide functions and values such as protection of a Town's surface and groundwater quality, control of flooding during significant rain events, protection of significant wildlife habitats, or recreational opportunities for the greater public good. To designate wetlands as Prime, a rigorous evaluation process is used to rank a Town's wetland resources. Only wetlands providing a high level of functions and values are considered. Once wetlands are chosen, the Town must hold a public hearing where residents vote on the designations. If approved by residents, the Town provides the NHDES Wetlands Program a copy of the wetlands study and mapping of designated Prime Wetlands at which point the maps are registered with NHDES. Under Env-Wt. 700, any work within 100 feet of designated Prime Wetlands (in certain municipalities depending on when Prime Wetlands were designated) requires a higher level of scrutiny during permit review to ensure that an activity will not result in the significant loss of any wetlands values.

TRC reviewed online information provided by the NHDES and the City of Portsmouth and determined that there are no Prime Wetlands located within the Site. There is one Prime Wetland located on the parcel adjacent to the Site, identified as Prime Wetland 015. The State of New Hampshire also regulates a 100-foot upland buffer next to this Prime Wetland, a small portion of which is within the Site. None of TRC's delineated wetlands appear to be proximal to the mapped Prime Wetland area or overlap with the Prime Wetland 100-foot upland buffer.

3.2.5 Priority Resource Areas

The NHDES groups certain high-value wetland resources into Priority Resource Areas (PRA). PRA are protected under New Hampshire wetland law RSA 482-A and have one or more of the following characteristics:

(a) Has documented occurrences of protected species or habitat;

(b) Is a bog;

(c) Is a floodplain wetland contiguous to a Tier 3 or higher watercourse;

(d) Is a designated prime wetland;

(e) Is a duly-established 100-foot buffer of designated prime wetlands;

(f) Is a sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone; or

(g) Is any combination of (a) through (f), above.

At the time of this writing, the Survey Area does not contain wetlands that meet any of the PRA characteristics. At the time of the survey, the Project area is not known to contain protected species or habitat. However, to fully determine the applicability of characteristic (a), TRC recommends that Aqualis conduct a review with the New Hampshire Natural Heritage Bureau (NHNHB) regarding occurrences of protected species.

4.0 Results

TRC investigated the Site depicted on the Resource Maps provided in Figure 2. Two wetlands, two ponds, and two perennial streams were delineated within the Site. Delineated areas are described in the following sections and summarized at the end of this section in Tables 2 and 3. Refer to the photographs in Appendix B and the wetland determination data forms in Appendix C for further details about each delineated area.

4.1 Delineated Wetlands

W-HSW-1 is a palustrine emergent (PEM) wetland. This wetland is located along the southern edge of the Site and does not have any aboveground hydrologic connections to other wetlands or waterbodies on site. The dominant vegetation included purple loosestrife (*Lythrum salicaria*). Indicators of wetland hydrology included saturation (A3), oxidized rhizospheres on living roots (C3), presence of reduced iron (C4), and dry-season water table (C2). Soils were composed of silt loam, and they met Hydric Soil Indicator A12, Thick Dark Surface as described in *Field Indicators of Hydric Soils in the United States*, Version 8.2 (Field Indicators) (USDA NRCS 2018).

W-HSW-2 is also a palustrine emergent (PEM) wetland. This wetland is located in the northwestern corner of the Site and is associated with S-HSW-1 and S-HSW-2. The dominant vegetation included broad-leaf cat-tail (*Typha latifolia*) and mild water-pepper (*Persicaria hydropiper*). Indicators of wetland hydrology included saturation (A3), oxidized rhizospheres on living roots (C3), presence of reduced iron (C4), and FAC-neutral test (D5). Soils were composed of clay loam and silty clay loam, and they met Hydric Soil Indicator F2, Loamy Gleyed Matrix as described in *Field Indicators of Hydric Soils in the United States*, Version 8.2 (Field Indicators) (USDA NRCS 2018).

4.2 Delineated Streams

S-HSW-1 and **S-HSW-2** are perennial streams that begin at culverts in the northwestern corner of the site and converge with each other before feeding into WB-HSW-1 via concrete dam. These streams had a moderate flow stage and were flowing towards the southeast during the field delineation. Average depth of the streams was four inches, and the substrate was comprised of silt/clay. The channel gradient was less than two percent, and banks were approximately two feet high with moderate erosion potential.

4.3 Delineated Waterbodies

WB-HSW-1 and WB-HSW-2 appear to be artificial ponds that are connected to each other via a culverted stream. The substrate was silty and there was significant algae growth in the ponds. TRC biologists noted the presence of ramshorn snails, bladder snails, and a deceased painted turtle.

There were no Potential Vernal Pools identified on-site on September 19, 2022.

Table 2. Delineated Wetlands and Waterbodies

Wetland Field Designation	Field Designated NWI Classification [1]	Assumed Jurisdictional Status	Assumed Buffer/ Setback Requirements
W-HSW-1	PEM	USACE/NHDES/Local	100-ft buffer zone
W-HSW-2	PEM	USACE/NHDES/Local	100-ft buffer zone
WB-HSW-1	N/A – Pond	USACE/NHDES/Local	100-ft buffer zone
WB-HSW-2	N/A - Pond	USACE/NHDES/Local	100-ft buffer zone

[1] *The Classification of Wetlands and Deepwater Habitats of the United States, Second Edition* (Federal Geographic Data Committee 2013). Categories include: Palustrine Forested (PFO) and Palustrine Unconsolidated Bottom (PUB).

Table 3. Delineated Streams

Stream Field Designation	Flow Regime	Flow Stage	Flow Velocity	Bank Width	Water Depth	Dominant Substrate
S-HSW-1	Perennial	Moderate	Slow	4.5 ft	4 in	Silt/clay
S-HSW-2	Perennial	Moderate	Slow	4.5 ft	4 in	Silt/clay

5.0 References

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

Environmental Protection Agency (EPA). 2019. *Electronic Code of Federal Regulations*. Title 40, Chapter 1, Subchapter H, Part 230, Subpart A, Section 230.3. https://www.ecfr.gov/cgi-bin/text-idx?SID=c2ac4e35564a7e132276a5092222dded&mc=true&node=se40.27.230_13&rgn=div8. Accessed October 2021.

Federal Geographic Data Committee. 2013. *Classification of wetlands and deepwater habitats of the United States*. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.

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New England Hydric Soils Technical Committee. 2017. *Version 4, Field Indicators for Identifying Hydric Soils in New England*. New England Interstate Water Pollution Control Commission, Lowell, MA.

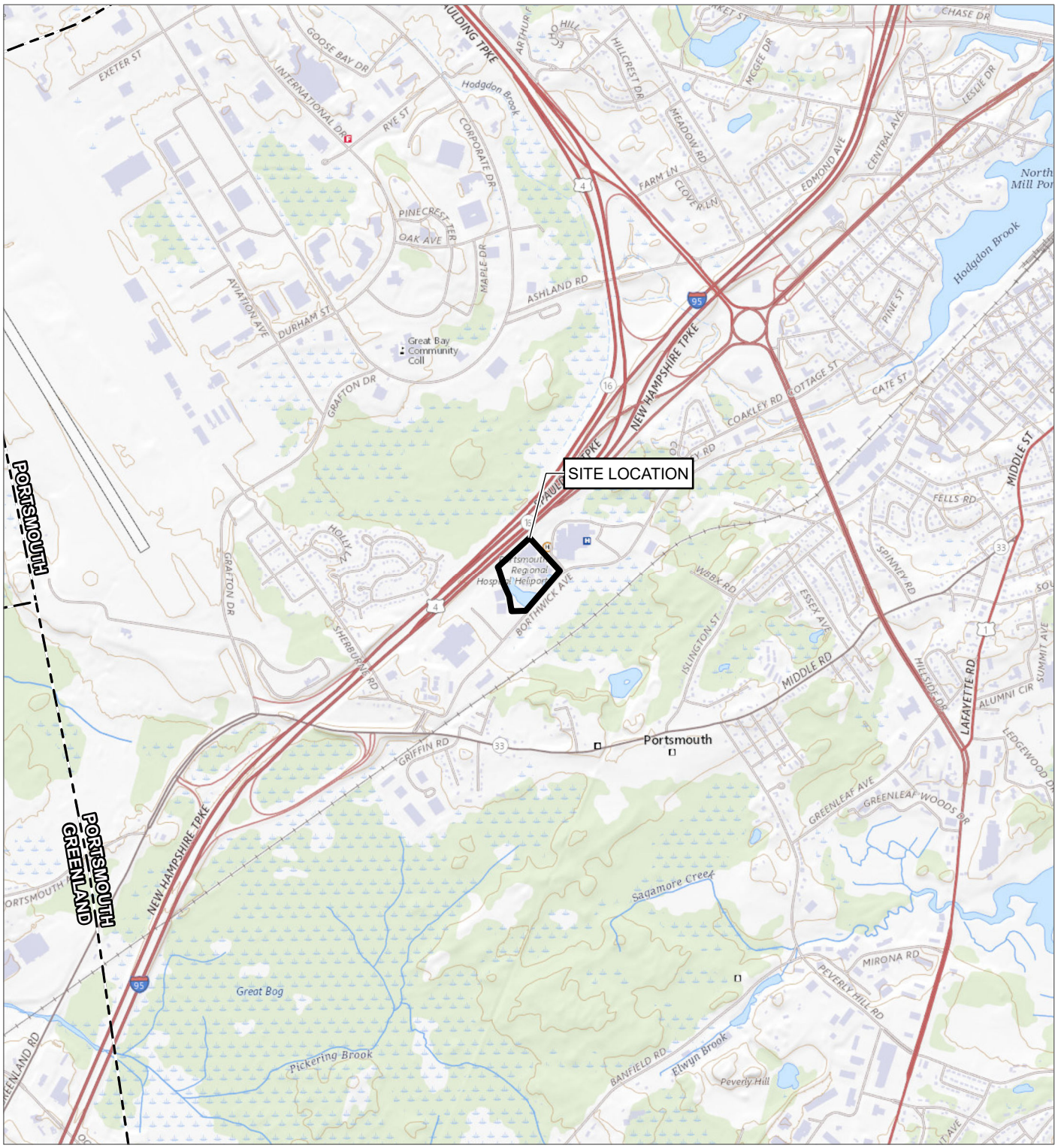
U.S. Army Corps of Engineers (USACE). 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)*. U.S. Army Engineer Research and Development Center, Vicksburg, MS, 162 pp.

USDA NRCS. Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/. Accessed September 2022.

USDA NRCS. 2018. *Field Indicators of Hydric Soils in the United States, Version 8.2* L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

USDA NRCS. 2006. *Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin*. USDA Handbook 296.

Appendix A: Figures



SITE BOUNDARY

MUNICIPAL BOUNDARY

USGS 7.5 MINUTE QUADRANGLE MAP BOUNDARY

BASE MAP: USGS NATIONAL MAP
DATA SOURCES: USGS, ESRI, TRC

N

0 1,000 2,000

FEET

1:24,000 1" = 2,000'

PROJECT:

LIBERTY PORTSMOUTH
WETLAND DELINEATION PROJECT
PORTSMOUTH, NEW HAMPSHIRE

TITLE:

SITE LOCATION MAP

DRAWN BY:	R. BARBER	PROJ. NO.:	504308.0000.0000
CHECKED BY:	J. FREDENBURG		
APPROVED BY:	O. SHAW		**FIGURE 1**
DATE:	SEPTEMBER 2022		

TRC

6 ASHLEY DRIVE
1ST FLOOR
SCARBOROUGH, ME 04074

FILE: Portsmouth

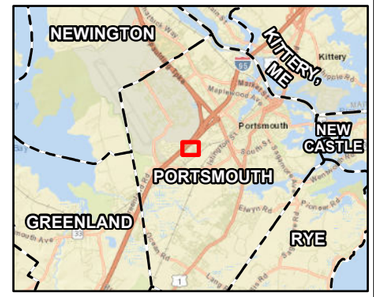
Coordinate System: NAD 1983 StatePlane New Hampshire FIPS 2800 Feet: Map Rotation: 0
-- Saved By: RBARBER on 9/22/2022, 08:27:32 AM -- File Path: \\EMPLOYEES\gislarc\gispro\1-PROJECTS\Aquals\504308_Portsmouth\2-APRX\Portsmouth.aprx -- Layout Name: Portsmouth_Fig1_SLM

PEM PLOT
UPL PLOT
STREAM PLOT
CULVERT

DELINEATED STREAM LINE

BANK/EDGE
CENTERLINE
DELINEATED WETLAND BOUNDARY LINE
DELINEATED SURFACE WATER
DELINEATED WETLAND
SITE BOUNDARY

BASE MAP: GOOGLE IMAGERY SERVICE
DATA SOURCES: USGS, ESRI, TRC



N

1:1,800
1" = 150'

0 150 300
FEET

PROJECT:
LIBERTY MUTUAL
WETLAND DELINEATION PROJECT
PORTSMOUTH, NEW HAMPSHIRE

TITLE:
DELINEATED RESOURCE

DRAWN BY:	R. BARBER	PROJ. NO.:	504308.0000.0000
CHECKED BY:	J. FREDENBURG		
APPROVED BY:	O. SHAW		**FIGURE 2**
DATE:	SEPTEMBER 2022		

TRC
6 ASHLEY DRIVE
1ST FLOOR
SCARBOROUGH, ME 04074

FILE: Portsmouth.aprx

Coordinate System: NAD 1983 StatePlane New Hampshire FIPS 2800 Feet; Map Rotation: 0
Saved By: J.FREDENBURG on 9/30/2022 10:47:29 AM File Path: T:\1_PROJECTS\Aquatic\504308_Portsmouth\2_APRX\Portsmouth.aprx Layout Name: Portsmouth_Fig2_Site Plan

Appendix B: Photographs

LIBERTY MUTUAL WETLAND DELINEATION PROJECT

225 BORTHWICK AVE, PORTSMOUTH, NEW HAMPSHIRE

Photograph: 1 **Date**: 9/19/2022 **Direction**: North **Description**: Overview of W-HSW-1.	
Photograph: 2 **Date**: 9/19/2022 **Direction**: South **Description**: Overview of W-HSW-1.	

LIBERTY MUTUAL WETLAND DELINEATION PROJECT

225 BORTHWICK AVE, PORTSMOUTH, NEW HAMPSHIRE

Photograph: 3 **Date**: 9/19/2022 **Direction**: North **Description**: Overview of W-HSW-2.	
Photograph: 4 **Date**: 9/19/2022 **Direction**: South **Description**: Overview of W-HSW-2.	

LIBERTY MUTUAL WETLAND DELINEATION PROJECT

225 BORTHWICK AVE, PORTSMOUTH, NEW HAMPSHIRE

Photograph: 5 **Date**: 9/19/2022 **Direction**: South **Description**: View of S-HSW-1 where it ends at the dam between the stream and WB-HSW-1.	
Photograph: 6 **Date**: 9/19/2022 **Direction**: North **Description**: View upstream of S-HSW-1.	

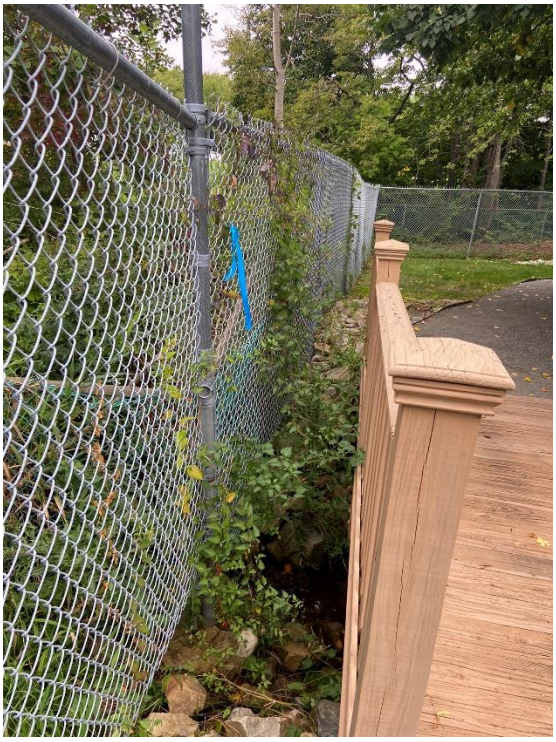
LIBERTY MUTUAL WETLAND DELINEATION PROJECT

225 BORTHWICK AVE, PORTSMOUTH, NEW HAMPSHIRE

Photograph: 7 **Date**: 9/19/2022 **Direction**: South **Description**: View downstream of S-HSW-1.	
Photograph: 8 **Date**: 9/19/2022 **Direction**: East **Description**: View of termination of S-HSW-1 at WB-HSW-1.	

LIBERTY MUTUAL WETLAND DELINEATION PROJECT

225 BORTHWICK AVE, PORTSMOUTH, NEW HAMPSHIRE

Photograph: 9 **Date**: 9/19/2022 **Direction**: East **Description**: View of termination of S-HSW-1 at northwestern Site boundary.	
Photograph: 10 **Date**: 9/19/2022 **Direction**: South **Description**: Downstream view of S-HSW-2	

LIBERTY MUTUAL WETLAND DELINEATION PROJECT

225 BORTHWICK AVE, PORTSMOUTH, NEW HAMPSHIRE

Photograph: 11 **Date**: 9/19/2022 **Direction**: Southeast **Description**: Overview of WB-HSW-1.	
Photograph: 12 **Date**: 9/19/2022 **Direction**: Down **Description**: Photo of typical bank conditions along WB-HSW-1.	

LIBERTY MUTUAL WETLAND DELINEATION PROJECT

225 BORTHWICK AVE, PORTSMOUTH, NEW HAMPSHIRE

Photograph: 13 **Date**: 9/19/2022 **Direction**: East **Description**: Dam connecting S-HSW-1 and WB-HSW-1.	
Photograph: 14 **Date**: 9/19/2022 **Direction**: Northeast **Description**: Overview of WB-HSW-2.	

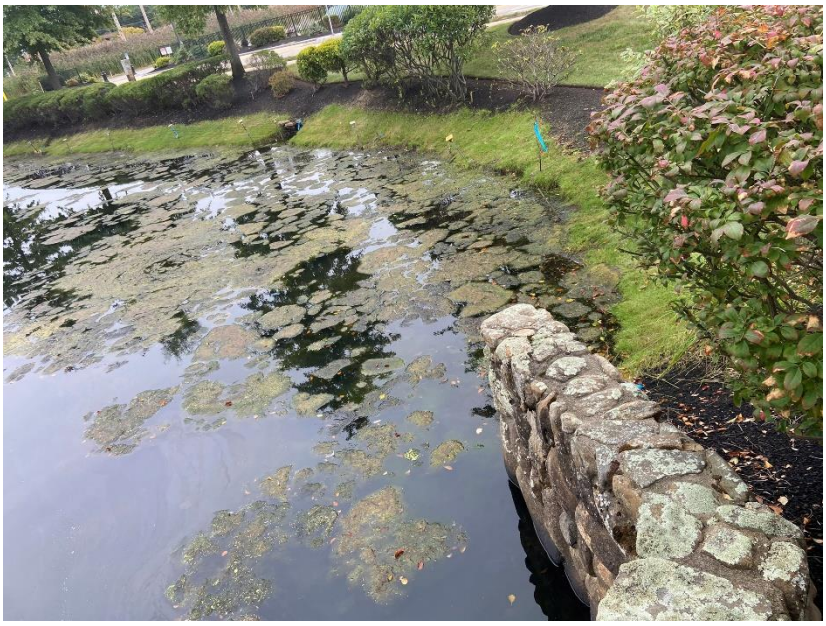
LIBERTY MUTUAL WETLAND DELINEATION PROJECT

225 BORTHWICK AVE, PORTSMOUTH, NEW HAMPSHIRE

Photograph: 15 **Date**: 9/19/2022 **Direction**: Northwest **Description**: View of bank along northwestern edge of WB-HSW-2, and culvert connecting WB-HSW-1 and WB-HSW-2.	
Photograph: 16 **Date**: 9/19/2022 **Direction**: North **Description**: View of bank along north edge of WB-HSW-2.	

LIBERTY MUTUAL WETLAND DELINEATION PROJECT

225 BORTHWICK AVE, PORTSMOUTH, NEW HAMPSHIRE

Photograph: 17 **Date**: 9/19/2022 **Direction**: East **Description**: View of southeastern bank of WB-HSW-2.	
Photograph: 18 **Date**: 9/19/2022 **Direction**: Northeast **Description**: View of Liberty Mutual building abutting WB-HSW-2. The culverted bridge on the northeastern edge of the waterbody is also pictured.	

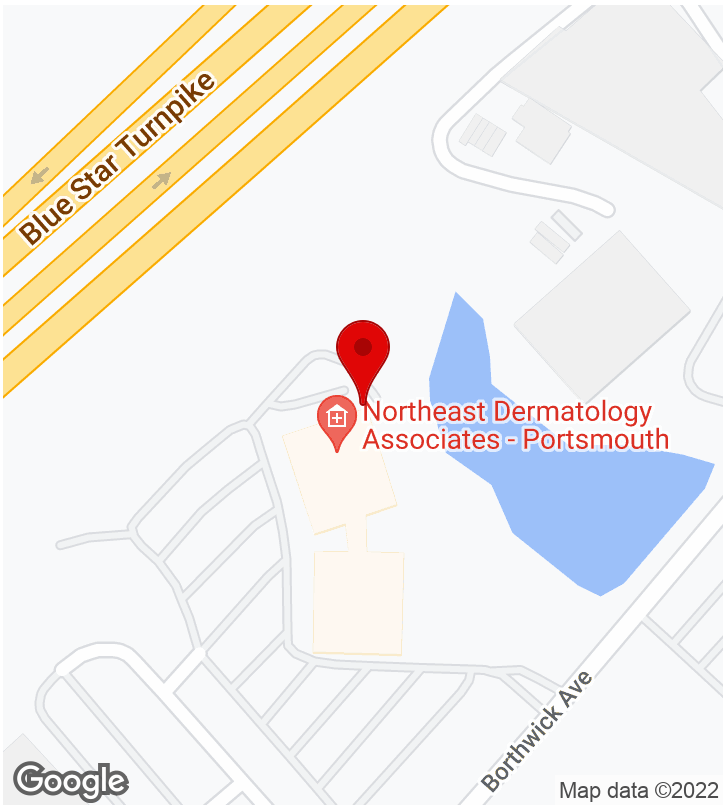
Appendix C: Wetland Determination Data Forms

New Hampshire SWIMR Waterbody Inventory

Generic stream and waterbody inventory app. SWIMR

S-HSW-01, Liberty Portsmouth

9/23/2022, 6:25:01 PM UTC



CREATED

9/19/2022, 3:07:54 PM UTC
by Heather Storlazzi-Ward

UPDATED

9/23/2022, 6:25:01 PM UTC
by Olivia Shaw

STATUS

Field Collected

LOCATION

43.063041, -70.793939

Select Project	
Client	Liberty
Project Name	Liberty Portsmouth
Project Number	504308.0000.0000
Date and Time	2022-09-19 11:07:54
Lead Evaluator	Heather Storlazzi-Ward
Evaluator's Initials	HSW
Additional Evaluators	
Evaluated By	Heather Storlazzi-Ward
Stream / Waterbody Number	1
Stream/Waterbody Delineation ID	S-HSW-01
Stream Delineation ID Override	
Stream Name	
Stream Location	
Latitude/Longitude	43.0630408, -70.7939394
Presumed Regulatory Authority	
Address	155 Borthwick Avenue Portsmouth New Hampshire 03801 United States

STREAM / WATERBODY CHARACTERISTICS

Stream / Waterbody Class	Perennial

Observed Hydrology

Flow Stage	Moderate
Flow Direction	SE
Average Depth (in.)	4
Perceptible Flow	Yes
Channel Substrate	Silt/Clay
Channel Gradient	< 2% (< 1 deg) Gentle

Width Measurement (feet)

Is floodplain present?	Yes
Across Existing Water (ft)	2
Ordinary High Water Mark (ft)	3
Bankfull Width (ft)	4.5
OHWM Indicators	Matted, Bent, or Absent Vegetation, Bed and Banks

Probed Stream Depth (in.)	0 to 6 inches
Observed Use	Drainage
Water Quality	Slightly Turbid
Water Quality Comments	

Left Bank

Left Bank Height (feet)	2
Left Bank Slope	> 35% (> 20 deg) Very Steep
Left Bank Erosion Potential	Moderate

Right Bank

Right Bank Height (feet)	2
Right Bank Slope	> 35% (> 20 deg) Very Steep
Right Bank Erosion Potential	Moderate
Bank Substrate	Silt/Clay
Aquatic Habitat	Overhanging Vegetation, Undercut Banks
Estimated Canopy Closure	0 to 10%
Observed Fauna	
Presence of Rare, Threatened, or Endangered Species	Unknown
Species and Evidence	
Notes	

Photos Upstream

Photos Downstream

Photos Across Stream

Photos

Sketch of Stream

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Liberty Portsmouth **City/County:** Portsmouth, Rockingham County **Sampling Date:** 2022-Sept-19
Applicant/Owner: Liberty **State:** New Hampshire **Sampling Point:** W-HSW-01_PEM-1
Investigator(s): Heather Storlazzi-Ward, Olivia Shaw **Section, Township, Range:** NA
Landform (hillslope, terrace, etc.): Depression **Local relief (concave, convex, none):** Concave **Slope (%):** 0 to 1
Subregion (LRR or MLRA): LRR R **Lat:** 43.0623348 **Long:** -70.7931076 **Datum:** WGS84
Soil Map Unit Name: 299 - Udorthents, smoothed **NWI classification:** None
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 ____		
Hydric Soil Present?	Yes _✓_ No ____	**Is the Sampled Area within a Wetland?**	**Yes _✓_ No ____**
Wetland Hydrology Present?	Yes _✓_ No ____	**If yes, optional Wetland Site ID:**	W-HSW-01

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is PEM. Area is wetland, all three wetland parameters are present. Circumstances are not normal due to mowing of vegetation.

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)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
_✓_ Oxidized Rhizospheres on 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)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
_✓_ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
_✓_ Microtopographic Relief (D4)
_✓_ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No _✓_	Depth (inches):	
Water Table Present?	Yes _✓_ No ____	Depth (inches):	0
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 -- Use scientific names of plants.

Sampling Point: W-HSW-01_PEM-1

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Lythrum salicaria*	90	Yes	OBL
2. *Verbena hastata*	10	No	FACW
3. *Persicaria hydropiper*	5	No	OBL
4. *Juncus effusus*	5	No	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	110	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply By:	
OBL species	100	x 1 =	100
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals	110	(A)	120 (B)
Prevalence Index = B/A =	1.1		

Hydrophytic Vegetation Indicators:

✓ 1- Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

✓ 3 - Prevalence Index is ≤ 3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Fallow field.

SOIL

Sampling Point: W-HSW-01_PEM-1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 4	10YR 2/1	70	5YR 3/4	20	C	PL	Silt Loam	
0 - 4			10YR 4/2	10	D	M	Silt Loam	
4 - 10	10YR 2/1	83	2.5Y 4/1	15	D	M	Silt Loam	
4 - 10			7.5YR 3/2	2	C	M	Silt Loam	
10 - 21	10YR 2/1	95	2.5Y 3/2	5	D	M	Sapric Silt Loam	

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
_✓_ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ 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: None
Depth (inches):

Hydric Soil Present? Yes _✓_ No ____

Remarks:

new England indicator 8 dark mineral soils.

Soil Photos

Photo of Sample Plot North

Photo of Sample Plot East

Photo of Sample Plot South

Photo of Sample Plot
West

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Liberty Portsmouth **City/County:** Portsmouth, Rockingham County **Sampling Date:** 2022-Sept-19
Applicant/Owner: Liberty **State:** New Hampshire **Sampling Point:** W-HSW-01_UPL-1
Investigator(s): Heather Storlazzi-Ward, Olivia Shaw **Section, Township, Range:** NA
Landform (hillslope, terrace, etc.): Hillslope **Local relief (concave, convex, none):** Convex **Slope (%):** 1 to 3
Subregion (LRR or MLRA): LRR R **Lat:** 43.0623647 **Long:** -70.7938273 **Datum:** WGS84
Soil Map Unit Name: 299 - Udorthents, smoothed **NWI classification:** None
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 ✓		
Hydric Soil Present?	Yes ____ No ✓	**Is the Sampled Area within a Wetland?**	**Yes ____ No ✓**
Wetland Hydrology Present?	Yes ____ No ✓	**If yes, optional Wetland Site ID:**	

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is UPL. Area is upland, not all three wetland parameters are present. Circumstances are not normal due to mowing of vegetation.

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)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on 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)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No ✓	Depth (inches):	
Water Table Present?	Yes ____ No ✓	Depth (inches):	**Wetland Hydrology Present?** Yes ____ No ✓
Saturation Present? (includes capillary fringe)	Yes ____ No ✓	Depth (inches):	

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

Remarks:

VEGETATION -- Use scientific names of plants.

Sampling Point: W-HSW-01_UPL-1

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Poaceae*	95	Yes	NI
2. *Glechoma hederacea*	10	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	105	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= 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:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply By:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals	10	(A)	40 (B)
Prevalence Index = B/A =	4		

Hydrophytic Vegetation Indicators:

_____ 1- Rapid Test for Hydrophytic Vegetation

_____ 2 - Dominance Test is > 50%

_____ 3 - Prevalence Index is ≤ 3.0[1]

_____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

Mowed and maintained lawn.

SOIL

Sampling Point: W-HSW-01_UPL-1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18	10YR 2/2	100					Silt Loam	

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ 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: None
Depth (inches):

Hydric Soil Present? Yes ____ No ✓

Remarks:

No positive indication of hydric soils was observed. The criterion for hydric soil is not met.

Soil Photos

Photo of Sample Plot North

Photo of Sample Plot East

Photo of Sample Plot South

Photo of Sample Plot West

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Liberty Portsmouth **City/County:** Portsmouth, Rockingham County **Sampling Date:** 2022-Sept-19
Applicant/Owner: Liberty **State:** New Hampshire **Sampling Point:** W-HSW-02_PEM-1
Investigator(s): Heather Storlazzi-Ward, Olivia Shaw **Section, Township, Range:** NA
Landform (hillslope, terrace, etc.): Flat **Local relief (concave, convex, none):** Concave **Slope (%):** 0 to 1
Subregion (LRR or MLRA): LRR R **Lat:** 43.0629557 **Long:** -70.7939775 **Datum:** WGS84
Soil Map Unit Name: 299 - Udorthents, smoothed **NWI classification:** None
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 ____		
Hydric Soil Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?**	**Yes ✓ No ____**
Wetland Hydrology Present?	Yes ✓ No ____	**If yes, optional Wetland Site ID:**	W-HSW-02

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is PEM. Area is wetland, all three wetland parameters are present.

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)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
✓ Oxidized Rhizospheres on 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)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No ✓	Depth (inches):	
Water Table Present?	Yes ✓ No ____	Depth (inches):	3
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:

The criterion for wetland hydrology is met.

VEGETATION -- Use scientific names of plants.

Sampling Point: W-HSW-02_PEM-1

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Typha latifolia*	60	Yes	OBL
2. *Persicaria hydropiper*	50	Yes	OBL
3. *Verbena hastata*	5	No	FACW
4. *Carex gynandra*	5	No	OBL
5. *Poaceae*	5	No	NI
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	125	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply By:	
OBL species	115	x 1 =	115
FACW species	5	x 2 =	10
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals	120	(A)	125 (B)
Prevalence Index = B/A =	1		

Hydrophytic Vegetation Indicators:

____ 1- Rapid Test for Hydrophytic Vegetation

_✓_ 2 - Dominance Test is >50%

_✓_ 3 - Prevalence Index is ≤ 3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _✓_ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

A positive indication of hydrophytic vegetation was observed (>50% of dominant species indexed as OBL, FACW, or FAC).

SOIL

Sampling Point: W-HSW-02_PEM-1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/1	95	5YR 3/4	5	C	PL	Silty Clay Loam	
6 - 20	10Y 4/1	60	2.5Y 4/3	40	C	M	Clay Loam	

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
_✓_ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ 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: None
Depth (inches):

Hydric Soil Present? Yes _✓_ No ____

Remarks:

A positive indication of hydric soil was observed.

Soil Photos

Photo of Sample Plot North

Photo of Sample Plot East

Photo of Sample Plot South

Photo of Sample Plot West

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Liberty Portsmouth **City/County:** Portsmouth, Rockingham County **Sampling Date:** 2022-Sept-19
Applicant/Owner: Liberty **State:** New Hampshire **Sampling Point:** W-HSW-02_UPL-1
Investigator(s): Heather Storlazzi-Ward, Olivia Shaw **Section, Township, Range:** NA
Landform (hillslope, terrace, etc.): Hillslope **Local relief (concave, convex, none):** Convex **Slope (%):** 1 to 3
Subregion (LRR or MLRA): LRR R **Lat:** 43.0629711 **Long:** -70.7939499 **Datum:** WGS84
Soil Map Unit Name: 299 - Udorthents, smoothed **NWI classification:** None
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 _✓_		
Hydric Soil Present?	Yes ____ No _✓_	**Is the Sampled Area within a Wetland?**	**Yes ____ No _✓_**
Wetland Hydrology Present?	Yes _✓_ No ____	**If yes, optional Wetland Site ID:**	

Remarks: (Explain alternative procedures here or in a separate report)
Covertype is UPL. Area is upland, not all three wetland parameters are present. Circumstances are not normal due to mowing of vegetation.

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)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Marl Deposits (B15)
___ Hydrogen Sulfide Odor (C1)
_✓_ Oxidized Rhizospheres on 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)
___ Drainage Patterns (B10)
___ Moss Trim Lines (B16)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ Microtopographic Relief (D4)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No _✓_	Depth (inches):	
Water Table Present?	Yes ____ No _✓_	Depth (inches):	**Wetland Hydrology Present?** Yes _✓_ No ____
Saturation Present? (includes capillary fringe)	Yes ____ No _✓_	Depth (inches):	

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

Remarks:

A positive indication of wetland hydrology was observed (at least one primary indicator).

VEGETATION -- Use scientific names of plants.

Sampling Point: W-HSW-02_UPL-1

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Betula populifolia*	5	Yes	FAC
2. *Picea pungens*	5	Yes	FACU
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	0	= Total Cover	
Herb Stratum (Plot size: 5 ft)			
1. *Poaceae*	100	Yes	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 ft)			
1.			
2.			
3.			
4.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	33.3	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply By:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals	10	(A)	35 (B)
Prevalence Index = B/A =	3.5		

Hydrophytic Vegetation Indicators:

_____ 1- Rapid Test for Hydrophytic Vegetation

_____ 2 - Dominance Test is > 50%

_____ 3 - Prevalence Index is ≤ 3.0[1]

_____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

_____ Problematic Hydrophytic Vegetation[1] (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

Residential lawn.

SOIL

Sampling Point: W-HSW-02_UPL-1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 16	10YR 4/2	98	10YR 4/4	2	C	PL	Sandy Loam	
16 - 20	2.5Y 3/1	65	10YR 4/6	25	C	M	Clay Loam	
16 - 20			2.5Y 4/1	10	D	M	Clay Loam	

[1]Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. [2]Location: PL = Pore Lining, M = Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Dark Surface (S7) **(LRR R, MLRA 149B)**
___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
___ Loamy Mucky Mineral (F1) **(LRR K, L)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
___ Coast Prairie Redox (A16) **(LRR K, L, R)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
___ Dark Surface (S7) **(LRR K, L)**
___ Polyvalue Below Surface (S8) **(LRR K, L)**
___ Thin Dark Surface (S9) **(LRR K, L)**
___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
___ Red Parent Material (F21)
___ 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: None
Depth (inches):

Hydric Soil Present? Yes ____ No ✓

Remarks:

Soil Photos

Photo of Sample Plot North

Photo of Sample Plot East

Photo of Sample Plot South

Photo of Sample Plot
West

Appendix D: NRCS Soil Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Rockingham County, New Hampshire

September 23, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

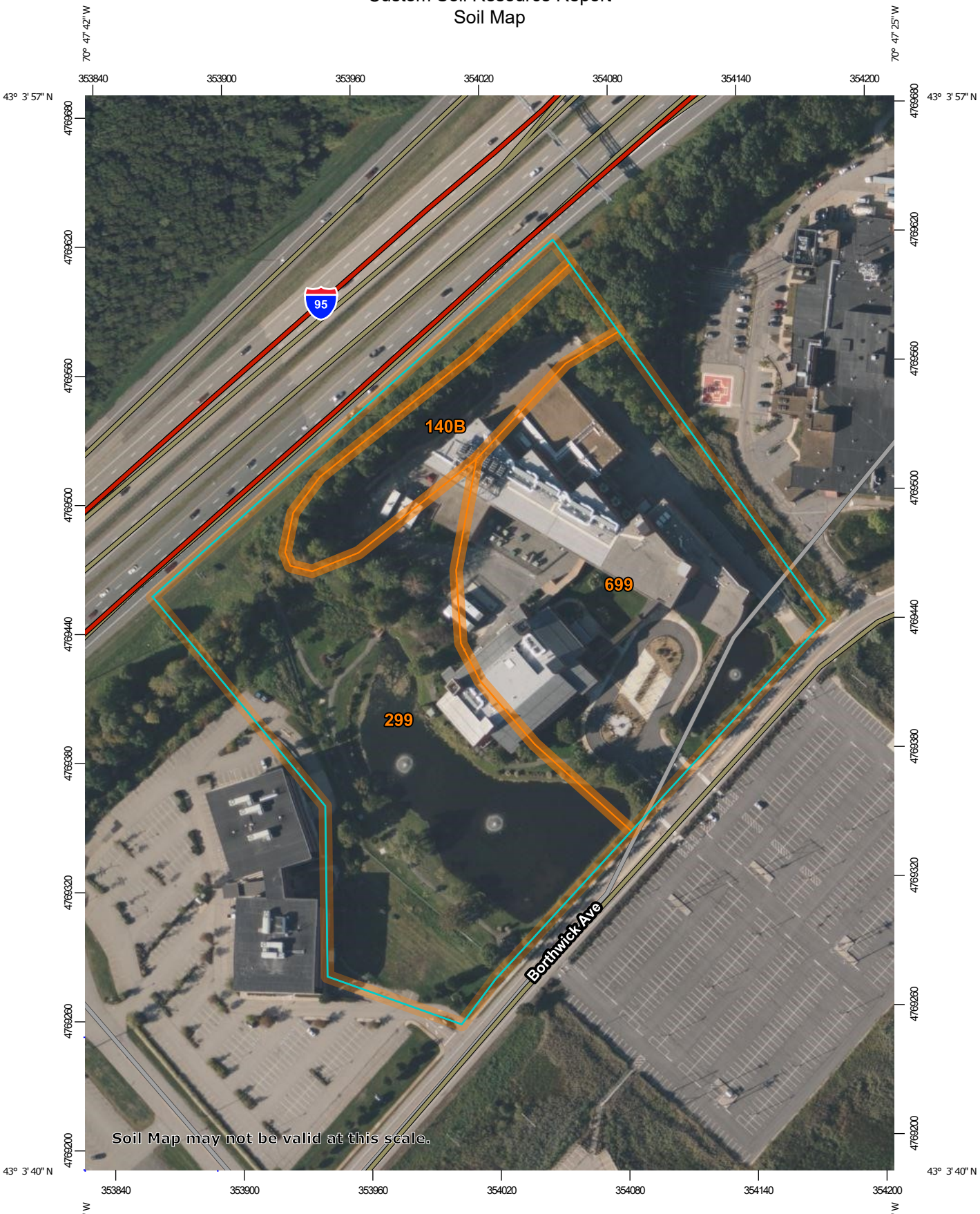
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,430 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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: Rockingham County, New Hampshire
Survey Area Data: Version 24, Aug 31, 2021

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

Date(s) aerial images were photographed: Jun 19, 2020—Sep 20, 2020

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
140B	Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky	1.6	11.3%
299	Udorthents, smoothed	7.1	48.9%
699	Urban land	5.8	39.8%
Totals for Area of Interest		**14.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Rockingham County, New Hampshire

140B—Chatfield-Hollis-Canton complex, 0 to 8 percent slopes, rocky

Map Unit Setting

National map unit symbol: 2w82m
Elevation: 380 to 1,070 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Chatfield, very stony, and similar soils: 35 percent
Hollis, very stony, and similar soils: 25 percent
Canton, very stony, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Chatfield, Very Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 2 inches: fine sandy loam
Bw - 2 to 30 inches: gravelly fine sandy loam
2R - 30 to 40 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 20 to 41 inches to lithic bedrock
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

Description of Hollis, Very Stony

Setting

Landform: Ridges, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex
Across-slope shape: Linear, convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 7 inches: gravelly fine sandy loam
Bw - 7 to 16 inches: gravelly fine sandy loam
2R - 16 to 26 inches: bedrock

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 8 to 23 inches to lithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: D
Ecological site: F144AY033MA - Shallow Dry Till Uplands
Hydric soil rating: No

Description of Canton, Very Stony

Setting

Landform: Moraines, hills, ridges
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Nose slope, side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy over sandy melt-out till derived from gneiss, granite, and/or schist

Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material
A - 2 to 5 inches: fine sandy loam
Bw1 - 5 to 16 inches: fine sandy loam
Bw2 - 16 to 22 inches: gravelly fine sandy loam
2C - 22 to 67 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 8 percent
Surface area covered with cobbles, stones or boulders: 1.6 percent
Depth to restrictive feature: 19 to 39 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Newfields, very stony

Percent of map unit: 5 percent
Landform: Ground moraines, hills, moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: No

Freetown

Percent of map unit: 5 percent
Landform: Marshes, depressions, bogs, kettles, swamps
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Walpole, very stony

Percent of map unit: 3 percent
Landform: Deltas, depressions, outwash plains, depressions, outwash terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Rock outcrop

Percent of map unit: 2 percent
Landform: Ridges, hills
Hydric soil rating: Unranked

299—Udorthents, smoothed

Map Unit Setting

National map unit symbol: 9cmt
Elevation: 0 to 840 feet
Mean annual precipitation: 44 to 49 inches
Mean annual air temperature: 48 degrees F
Frost-free period: 155 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents

Properties and qualities

Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

699—Urban land

Map Unit Composition

Urban land: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Not named

Percent of map unit: 15 percent
Hydric soil rating: No

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