

CITY OF PORTSMOUTH

NOVEMBER 2020

**New Hampshire Department of Environmental Services
Wetland Permit Application**

**Little Bay Subaqueous Water
Transmission Main**

Durham and Newington, NH

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

WETLAND PERMIT APPLICATION

**Little Bay Subaqueous Water Transmission Main
Durham and Newington, NH**

NOVEMBER 2020

PREPARED FOR:

CITY OF PORTSMOUTH
680 PEVERLY HILL ROAD
PORTSMOUTH, NH 03801

PREPARED BY:

WRIGHT-PIERCE
230 Commerce Way, Suite 302
Portsmouth, NH 03801
Phone: 603.430.3728 | Fax:
603.430.4083

November 10, 2020
W-P Project No. 14202B

Stefanie Giallongo
Wetlands Bureau, Land Resources Management
Water Division, NHDES
29 Hazen Drive; PO Box 95
Concord, NH 03302-0095

Subject: NHDES Wetlands Permit Application
Little Bay Subaqueous Water Main Replacement
City of Portsmouth, NH

Dear Ms. Giallongo,

On behalf of the City of Portsmouth, please find enclosed a Wetlands Permit Application and attachments for the proposed replacement of the subaqueous water main crossing of the Little Bay.

This project involves work in both the Town of Durham and the Town of Newington. The attached permit application addresses the proposed impacts in both municipalities. Copies of the application have been filed with the Town Clerk of each Town.

It has been a pleasure to coordinate with you on this project to date. Please feel free to contact me if you have any questions or need any additional information during your review.

Sincerely,
WRIGHT-PIERCE



Britt Eckstrom, PE
Project Engineer
Britt.eckstrom@wright-pierce.com

Enclosures

cc: *Brian Goetz, Al Pratt, Zach Cronin – City of Portsmouth, NH DPW*

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Application and Fee



**STANDARD DREDGE AND FILL
WETLANDS PERMIT APPLICATION**
Water Division/Land Resources Management
Wetlands Bureau
[Check the Status of your Application](#)



RSA/Rule: RSA 482-A/Env-Wt 100-900

APPLICANT'S NAME: City of Portsmouth

TOWN NAME: Durham, Newington

Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

A person may request a waiver of the requirements in Rules Env-Wt 100-900 to accommodate situations where strict adherence to the requirements would not be in the best interest of the public or the environment but is still in compliance with RSA 482-A. A person may also request a waiver of the standards for existing dwellings over water pursuant to RSA 482-A:26, III(b). For more information, please consult the [Waiver Request Form](#).

SECTION 1 - REQUIRED PLANNING FOR ALL PROJECTS (Env-Wt 306.05; RSA 482-A:3, I(d)(2))	
Please use the Wetland Permit Planning Tool (WPPT) , the Natural Heritage Bureau (NHB) DataCheck Tool , the Aquatic Restoration Mapper , or other sources to assist in identifying key features such as: priority resource areas (PRAs) , protected species or habitats , coastal areas, designated rivers, or designated prime wetlands.	
Has the required planning been completed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Does the property contain a PRA? If yes, provide the following information:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> • Does the project qualify for an Impact Classification Adjustment (e.g. NH Fish and Game Department (NHF&G) and NHB agreement for a classification downgrade) or a Project-Type Exception (e.g. Maintenance or Statutory Permit-by-Notification (SPN) project)? See Env-Wt 407.02 and Env-Wt 407.04. 	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> • Protected species or habitat? <ul style="list-style-type: none"> ○ If yes, species or habitat name(s): Atlantic Sturgeon, Common Tern, Shortnose Sturgeon, Sparsley vegetated intertidal system, subtidal system ○ NHB Project ID #: 20-2107 	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
• Bog?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
• Floodplain wetland contiguous to a tier 3 or higher watercourse?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
• Designated prime wetland or duly-established 100-foot buffer?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
• Sand dune, tidal wetland, tidal water, or undeveloped tidal buffer zone?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Is the property within a Designated River corridor? If yes, provide the following information:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> • Name of Local River Management Advisory Committee (LAC): 	

irm@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

<ul style="list-style-type: none"> A copy of the application was sent to the LAC on Month: <input type="text"/> Day: <input type="text"/> Year: <input type="text"/> 	
For dredging projects, is the subject property contaminated? <ul style="list-style-type: none"> If yes, list contaminant: <input type="text"/> 	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is there potential to impact impaired waters, class A waters, or outstanding resource waters?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
For stream crossing projects, provide watershed size (see WPPT or Stream Stats): <input type="text"/> N/A	
SECTION 2 - PROJECT DESCRIPTION (Env-Wt 311.04(i)) Provide a brief description of the project and the purpose of the project, outlining the scope of work to be performed and whether impacts are temporary or permanent. DO NOT reply "See attached"; please use the space provided below.	
<p>The City of Portsmouth owns and maintains a 6 mile cross-country drinking water transmission main that brings treated drinking water from the Madbury Water Treatment Plant to the Newington Booster Pump Station. The pipeline supplies over 60% of the water drinking water serving the City's regional water system. The transmission main has a subaqueous crossing of Little Bay between Durham and Newington (Fox Point) that consists of two, parallel cast iron water mains, approximately 3,200 ft long. The mains have experience significant corrosion. Replacement of this crossing is critical to ensure the reliability of this critical drinking water transmission main. The proposed replacement involves installing a 24" HDPE water main on the ocean floor within the existing pipeline corridor with connection to the existing main at either shore. The project will require temporary impacts to tidal wetlands and the tidal buffer zone and permanent impacts to subtidal wetlands.</p>	
SECTION 3 - PROJECT LOCATION Separate wetland permit applications must be submitted for each municipality within which wetland impacts occur.	
ADDRESS: <input type="text"/> 180 Piscataqua Road, Durham/ Fox Point, Newington	
TOWN/CITY: <input type="text"/> Durham, Newington	
TAX MAP/BLOCK/LOT/UNIT: <input type="text"/> Durham: 12-5-2 / Newington: 1-1	
US GEOLOGICAL SURVEY (USGS) TOPO MAP WATERBODY NAME: <input type="text"/> Little Bay <input type="checkbox"/> N/A	
(Optional) LATITUDE/LONGITUDE in decimal degrees (to five decimal places): <input type="text"/> 43.12393° North	

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-70.86338° West

SECTION 4 - APPLICANT (DESIRED PERMIT HOLDER) INFORMATION (Env-Wt 311.04(a))

If the applicant is a trust or a company, then complete with the trust or company information.

NAME: City of Portsmouth

MAILING ADDRESS: 680 Peverly Hill Road

TOWN/CITY: Portsmouth

STATE: NH

ZIP CODE: 03801

EMAIL ADDRESS: bfgoetz@cityofportsmouth.com

FAX: [REDACTED]

PHONE: 6036107304

ELECTRONIC COMMUNICATION: By initialing here: *B G* I hereby authorize NHDES to communicate all matters relative to this application electronically.**SECTION 5 - AUTHORIZED AGENT INFORMATION (Env-Wt 311.04(c))** N/A

LAST NAME, FIRST NAME, M.I.: Eckstrom, Britt

COMPANY NAME: Wright-Pierce

MAILING ADDRESS: 230 Commerce Way, Suite 302

TOWN/CITY: Portsmouth

STATE: NH

ZIP CODE: 03801

EMAIL ADDRESS: britt.eckstrom@wright-pierce.com

FAX: [REDACTED]

PHONE: 6035707126

ELECTRONIC COMMUNICATION: By initialing here *BE*, I hereby authorize NHDES to communicate all matters relative to this application electronically.**SECTION 6 - PROPERTY OWNER INFORMATION (IF DIFFERENT THAN APPLICANT) (Env-Wt 311.04(b))**

If the owner is a trust or a company, then complete with the trust or company information.

 Same as applicant

NAME: [REDACTED]

MAILING ADDRESS: [REDACTED]

TOWN/CITY: [REDACTED]

STATE: [REDACTED]

ZIP CODE: [REDACTED]

EMAIL ADDRESS: [REDACTED]

FAX: [REDACTED]

PHONE: [REDACTED]

ELECTRONIC COMMUNICATION: By initialing here *B G* I hereby authorize NHDES to communicate all matters relative to this application electronically.

SECTION 7 - RESOURCE-SPECIFIC CRITERIA ESTABLISHED IN Env-Wt 400, Env-Wt 500, Env-Wt 600, Env-Wt 700, OR Env-Wt 900 HAVE BEEN MET (Env-Wt 313.01(a)(3))

Describe how the resource-specific criteria have been met for each chapter listed above (please attach information about stream crossings, coastal resources, prime wetlands, or non-tidal wetlands and surface waters):

The proposed project area includes crossing a private property in the Town Durham, crossing land owned by the Town of Newington, and a crossing of Little Bay. The City of Portsmouth has an easement for use and maintenance of the existing water main. The project area proposes temporary impacts to tidal wetlands including saltmarsh (E2EM1), mudflats (E2US3), subtidal areas (E1UBL), and the 100-foot TBZ. Permanent impacts are proposed to subtidal areas (E1UBL). A small portion of the project area lies with the protected shoreline. There are no freshwater resources within the project area. The following Rare, Threatened and Endangered (RTE) species have been observed near the project vicinity: Atlantic Sturgeon, Common Tern, Shortnose Sturgeon. Please refer to project narrative for further discussion of coastal resources and the proposed mitigation for the planned temporary and permanent impacts to jurisdictional wetlands.

SECTION 8 - AVOIDANCE AND MINIMIZATION

Impacts within wetland jurisdiction must be avoided to the maximum extent practicable (Env-Wt 313.03(a)).* Any project with unavoidable jurisdictional impacts must then be minimized as described in the [Wetlands Best Management Practice Techniques For Avoidance and Minimization](#) and the [Wetlands Permitting: Avoidance, Minimization and Mitigation Fact Sheet](#). For minor or major projects, a functional assessment of all wetlands on the project site is required (Env-Wt 311.03(b)(10)).*

Please refer to the application checklist to ensure you have attached all documents related to avoidance and minimization, as well as functional assessment (where applicable). Use the [Avoidance and Minimization Checklist](#), the [Avoidance and Minimization Narrative](#), or your own avoidance and minimization narrative.

*See Env-Wt 311.03(b)(6) and Env-Wt 311.03(b)(10) for shoreline structure exemptions.

SECTION 9 - MITIGATION REQUIREMENT (Env-Wt 311.02)

If unavoidable jurisdictional impacts require mitigation, a mitigation [pre-application meeting](#) must occur at least 30 days but not more than 90 days prior to submitting this Standard Dredge and Fill Permit Application.

Mitigation Pre-Application Meeting Date: Month: 6 Day: 16 Year: 2020

N/A - Mitigation is not required

SECTION 10 - THE PROJECT MEETS COMPENSATORY MITIGATION REQUIREMENTS (Env-Wt 313.01(a)(1)c)

Confirm that you have submitted a compensatory mitigation proposal that meets the requirements of Env-Wt 800 for all permanent unavoidable impacts that will remain after avoidance and minimization techniques have been exercised to the maximum extent practicable: I confirm submittal.

N/A – Compensatory mitigation is not required

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SECTION 11 - IMPACT AREA (Env-Wt 311.04(g))

For each jurisdictional area that will be/has been impacted, provide square feet (SF) and, if applicable, linear feet (LF) of impact, and note whether the impact is after-the-fact (ATF; i.e., work was started or completed without a permit).

For intermittent and ephemeral streams, the linear footage of impact is measured along the thread of the channel. *Please note, installation of a stream crossing in an ephemeral stream may be undertaken without a permit per Rule Env-Wt 309.02(d), however other dredge or fill impacts should be included below.*

For perennial streams/ivers, the linear footage of impact is calculated by summing the lengths of disturbances to the channel and banks.

Permanent impacts are impacts that will remain after the project is complete (e.g., changes in grade or surface materials).

Temporary impacts are impacts not intended to remain (and will be restored to pre-construction conditions) after the project is completed.

JURISDICTIONAL AREA		PERMANENT			TEMPORARY		
		SF	LF	ATF	SF	LF	ATF
Wetlands	Forested Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Scrub-shrub Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Emergent Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Wet Meadow			<input type="checkbox"/>			<input type="checkbox"/>
	Vernal Pool			<input type="checkbox"/>			<input type="checkbox"/>
	Designated Prime Wetland			<input type="checkbox"/>			<input type="checkbox"/>
	Duly-established 100-foot Prime Wetland Buffer			<input type="checkbox"/>			<input type="checkbox"/>
Surface Water	Intermittent / Ephemeral Stream			<input type="checkbox"/>			<input type="checkbox"/>
	Perennial Stream or River			<input type="checkbox"/>			<input type="checkbox"/>
	Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - River			<input type="checkbox"/>			<input type="checkbox"/>
Banks	Bank - Intermittent Stream			<input type="checkbox"/>			<input type="checkbox"/>
	Bank - Perennial Stream / River			<input type="checkbox"/>			<input type="checkbox"/>
	Bank / Shoreline - Lake / Pond			<input type="checkbox"/>			<input type="checkbox"/>
Tidal	Tidal Waters	5,400		<input type="checkbox"/>	45,650		<input type="checkbox"/>
	Tidal Marsh			<input type="checkbox"/>	2,220		<input type="checkbox"/>
	Sand Dune			<input type="checkbox"/>			<input type="checkbox"/>
	Undeveloped Tidal Buffer Zone (TBZ)			<input type="checkbox"/>	26,100		<input type="checkbox"/>
	Previously-developed TBZ			<input type="checkbox"/>			<input type="checkbox"/>
	Docking - Tidal Water			<input type="checkbox"/>			<input type="checkbox"/>
TOTAL		5,400			73,970		

SECTION 12 - APPLICATION FEE (RSA 482-A:3, I)

<input type="checkbox"/> MINIMUM IMPACT FEE: Flat fee of \$400.	
<input type="checkbox"/> NON-ENFORCEMENT RELATED, PUBLICLY-FUNDED AND SUPERVISED RESTORATION PROJECTS, REGARDLESS OF IMPACT CLASSIFICATION: Flat fee of \$400 (refer to RSA 482-A:3, 1(c) for restrictions).	
<input checked="" type="checkbox"/> MINOR OR MAJOR IMPACT FEE: Calculate using the table below:	
Permanent and temporary (non-docking): 79,370 SF	× \$0.40 = \$ 31,748
Seasonal docking structure: SF	× \$2.00 = \$
Permanent docking structure: SF	× \$4.00 = \$
Projects proposing shoreline structures (including docks) add \$400 = \$	
Total = \$	
The application fee for minor or major impact is the above calculated total or \$400, whichever is greater = \$ 31,748	

irm@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)
 Indicate the project classification.

Minimum Impact Project
 Minor Project
 Major Project

SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)

Initial each box below to certify:

Initials: [Redacted] B G PE	To the best of the signer's knowledge and belief, all required notifications have been provided.
--------------------------------------	--

Initials: [Redacted] B G PE	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.
--------------------------------------	--

Initials: [Redacted] B G PE	The signer understands that: <ul style="list-style-type: none"> The submission of false, incomplete, or misleading information constitutes grounds for NHDES to: <ol style="list-style-type: none"> Deny the application. Revoke any approval that is granted based on the information. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1. The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.
--------------------------------------	---

Initials: [Redacted] B G PE	If the applicant is not the owner of the property, each property owner signature shall constitute certification by the signer that he or she is aware of the application being filed and does not object to the filing.
--------------------------------------	---

SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)

SIGNATURE (OWNER): <i>Brian Goetz</i>	PRINT NAME LEGIBLY: Brian Goetz	DATE: 11/10/2020
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER): [Redacted]	PRINT NAME LEGIBLY: [Redacted]	DATE: [Redacted]
SIGNATURE (AGENT, IF APPLICABLE): <i>Britt Eckstrom</i>	PRINT NAME LEGIBLY: Britt Eckstrom	DATE: 11/9/2020

SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))

As required by RSA 482-A:3, I(a)(1), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

TOWN/CITY CLERK SIGNATURE: <i>[Signature]</i>	PRINT NAME LEGIBLY: Lorne Pitt
TOWN/CITY: <i>Durham</i>	DATE: <i>11/12/2020</i>

SECTION 13 - PROJECT CLASSIFICATION (Env-Wt 306.05)
 Indicate the project classification.

Minimum Impact Project
 Minor Project
 Major Project

SECTION 14 - REQUIRED CERTIFICATIONS (Env-Wt 311.11)

Initial each box below to certify:

Initials: B G PE	To the best of the signer's knowledge and belief, all required notifications have been provided.
------------------------	--

Initials: B G PE	The information submitted on or with the application is true, complete, and not misleading to the best of the signer's knowledge and belief.
------------------------	--

Initials: B G PE	The signer understands that: <ul style="list-style-type: none"> The submission of false, incomplete, or misleading information constitutes grounds for NHDES to: <ol style="list-style-type: none"> Deny the application. Revoke any approval that is granted based on the information. If the signer is a certified wetland scientist, licensed surveyor, or professional engineer licensed to practice in New Hampshire, refer the matter to the joint board of licensure and certification established by RSA 310-A:1. The signer is subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. The signature shall constitute authorization for the municipal conservation commission and the Department to inspect the site of the proposed project, except for minimum impact forestry SPN projects and minimum impact trail projects, where the signature shall authorize only the Department to inspect the site pursuant to RSA 482-A:6, II.
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SECTION 15 - REQUIRED SIGNATURES (Env-Wt 311.04(d); Env-Wt 311.11)

SIGNATURE (OWNER): <i>Brian Goetz</i>	PRINT NAME LEGIBLY: Brian Goetz	DATE: 11/10/2020
SIGNATURE (APPLICANT, IF DIFFERENT FROM OWNER):	PRINT NAME LEGIBLY:	DATE:
SIGNATURE (AGENT, IF APPLICABLE): <i>Britt Eckstrom</i>	PRINT NAME LEGIBLY: Britt Eckstrom	DATE: 11/9/2020

SECTION 16 - TOWN / CITY CLERK SIGNATURE (Env-Wt 311.04(f))

As required by RSA 482-A:3, I(a)(1), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

TOWN/CITY CLERK SIGNATURE: <i>Laura C. Coleman</i>	PRINT NAME LEGIBLY: LAURA C. COLEMAN
TOWN/CITY: NEWINGTON	DATE: Nov. 12, 2020

DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3, I(a)(1)

1. IMMEDIATELY sign the original application form and four copies in the signature space provided above.
2. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
3. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board.
4. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

Submit the original permit application form bearing the signature of the Town/City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery at the address at the bottom of this page. Make check or money order payable to "Treasurer – State of NH".

VENDOR 2753 TREASURER STATE OF NH City of Portsmouth, NH 11/09/20 CHECK NO. 196265

ACCOUNT	PURCH. ORDER	INVOICE NUMBER	AMOUNT	DESCRIPTION
3012093000100001 073097	21000443	1155	31,748.00	NHDES WETLAND PERMIT
			****31,748.00*	

THE FACE OF THIS CHECK IS PRINTED BLUE - THE BACK CONTAINS A SIMULATED WATERMARK



**CITY OF PORTSMOUTH
NEW HAMPSHIRE
ACCOUNTS PAYABLE**

CITIZENS BANK
NEW HAMPSHIRE

54-153
114

CHECK DATE 11/09/20
CHECK NO. 196265

AMOUNT \$ ****31,748.00*

PAY THE SUM OF ***31748* DOLLARS AND *NO* CENTS**

TO THE ORDER OF
TREASURER STATE OF NH
NHDES WETLANDS BUREAU, MS WILBER
29 HAZEN DR PO BOX 95
CONCORD NH 03302-0095

Janet Blong
AUTHORIZED SIGNATURE

Void after 180 Days

⑈ 196265 ⑈ ⑈ 01401531 ⑈ 3303010600 ⑈

2

US Army Corps of Engineers



**US Army Corps
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New England District

Appendix B

New Hampshire General Permits (GPs) Required Information and Corps Secondary Impacts Checklist

In order for the Corps of Engineers to properly evaluate your application, applicants must submit the following information along with the New Hampshire DES Wetlands Bureau application or permit notification forms. Some projects may require more information. For a more comprehensive checklist, go to <https://www.nae.usace.army.mil/Missions/Regulatory/> “Useful Documents, Forms and Publications” and then “Corps Application Form and Guidance.” Check with the Corps at (978) 318-8832 for project-specific requirements. For your convenience, this Appendix B is also attached to the State of New Hampshire DES Wetlands Bureau application and Permit by Notification forms.

All Projects:

- New Hampshire Department of Environmental Services (DES) Wetlands Permit Application.
- Request for Project Review Form by the New Hampshire Division of Historical Resources (DHR).
<https://www.nh.gov/nhdhr/review/rpr.htm>.
- Photographs of wetland/waterway to be impacted.
- Purpose of the project.
- Legible, reproducible plans no larger than 11”x17” with bar scale. Provide locus map and plan views of the entire property.
- Typical cross-section views of all wetland and waterway fill areas and wetland replication areas.
- In navigable waters, show mean low water (MLW) and mean high water (MHW) elevations. Show the high tide line (HTL) elevations when fill is involved. In other waters, show ordinary high water (OHW) elevation.
- On each plan, show the following for the project:
 - Vertical datum and the NAVD 1988 equivalent with the vertical units as U.S. feet. In coastal waters this may be mean higher high water (MHHW), mean high water (MHW), mean low water (MLW), mean lower low water (MLLW) or other tidal datum with the vertical units as U.S. feet. MLLW and MHHW are preferred. Provide the correction factor detailing how the vertical datum (e.g., MLLW) was derived using the latest National Tidal Datum Epoch for that area, typically 1983-2001.
 - Horizontal state plane coordinates in U.S. survey feet based on the Traverse Mercator Grid system for the State of New Hampshire (Zone 2800) NAD 83.
 - Project limits with existing and proposed conditions.
 - Limits of any Federal Navigation Project in the vicinity of the project area and horizontal State Plane Coordinates in U.S. survey feet for the limits of the proposed work closest to the Federal Navigation Project;
 - Volume, type, and source of fill material to be discharged into waters and wetlands, including the area(s) (in square feet or acres) of fill in wetlands, below the OHW in inland waters and below the HTL in coastal waters.
 - Delineation of all waterways and wetlands on the project site,;
- Use Federal delineation methods and include Corps wetland delineation data sheets (GC 2).
- For activities involving discharges of dredged or fill material into waters of the U.S., include a statement describing how impacts to waters of the U.S. are to be avoided and minimized, and either a statement describing how impacts to waters of the U.S. are to be compensated for (or a conceptual or detailed mitigation plan) or a statement explaining why compensatory mitigation should not be required for the proposed impacts. Please contact the Corps for guidance.



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**New Hampshire General Permits (GPs)
Appendix B - Corps Secondary Impacts Checklist
(for inland wetland/waterway fill projects in New Hampshire)**

1. Attach any explanations to this checklist. Lack of information could delay a Corps permit determination.
2. All references to “work” include all work associated with the project construction and operation. Work includes filling, clearing, flooding, draining, excavation, dozing, stumping, etc.
3. See GC 5, regarding single and complete projects.
4. Contact the Corps at (978) 318-8832 with any questions.

1. Impaired Waters	Yes	No
1.1 Will any work occur within 1 mile upstream in the watershed of an impaired water? See http://des.nh.gov/organization/divisions/water/wmb/section401/impaired_waters.htm to determine if there is an impaired water in the vicinity of your work area.*	X	
2. Wetlands	Yes	No
2.1 Are there are streams, brooks, rivers, ponds, or lakes within 200 feet of any proposed work?		X
2.2 Are there proposed impacts to SAS, special wetlands. Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) DataCheck Tool for information about resources located on the property at https://www2.des.state.nh.us/nhb_datacheck/ . The book Natural Community Systems of New Hampshire also contains specific information about the natural communities found in NH.	X	
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?		N/A
2.4 Would the project remove part or all of a riparian buffer? (Riparian buffers are lands adjacent to streams where vegetation is strongly influenced by the presence of water. They are often thin lines of vegetation containing native grasses, flowers, shrubs and/or trees that line the stream banks. They are also called vegetated buffer zones.)		X
2.5 The overall project site is more than 40 acres?		X
2.6 What is the area of the previously filled wetlands?	0	
2.7 What is the area of the proposed fill in wetlands?	0	
2.8 What is the % of previously and proposed fill in wetlands to the overall project site?	0	
3. Wildlife	Yes	No
3.1 Has the NHB & USFWS determined that there are known occurrences of rare species, exemplary natural communities, Federal and State threatened and endangered species and habitat, in the vicinity of the proposed project? (All projects require an NHB ID number & a USFWS IPAC determination.) NHB DataCheck Tool: https://www2.des.state.nh.us/nhb_datacheck/ USFWS IPAC website: https://ecos.fws.gov/ipac/location/index	X	

3.2 Would work occur in any area identified as either “Highest Ranked Habitat in N.H.” or “Highest Ranked Habitat in Ecological Region”? (These areas are colored magenta and green, respectively, on NH Fish and Game’s map, “2010 Highest Ranked Wildlife Habitat by Ecological Condition.”) Map information can be found at: <ul style="list-style-type: none"> • PDF: https://wildlife.state.nh.us/wildlife/wap-high-rank.html. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html. 	X	
3.3 Would the project impact more than 20 acres of an undeveloped land block (upland, wetland/waterway) on the entire project site and/or on an adjoining property(s)?		X
3.4 Does the project propose more than a 10-lot residential subdivision, or a commercial or industrial development?		X
3.5 Are stream crossings designed in accordance with the GC 21?		N/A
4. Flooding/Floodplain Values	Yes	No
4.1 Is the proposed project within the 100-year floodplain of an adjacent river or stream?	X	
4.2 If 4.1 is yes, will compensatory flood storage be provided if the project results in a loss of flood storage?		X
5. Historic/Archaeological Resources		
For a minimum, minor or major impact project - a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) with your DES file number shall be sent to the NH Division of Historical Resources as required on Page 11 GC 8(d) of the GP document**	X	

*Although this checklist utilizes state information, its submittal to the Corps is a Federal requirement.

** If your project is not within Federal jurisdiction, coordination with NH DHR is not required under Federal law.

Appendix B – Corps Secondary Impacts Checklist

Impaired Waters Section 1.1

The project area lies in the Lower Little Bay water quality assessment unit (AUID: NHESTA600030904-06-18). It is listed as Severe for Aquatic Life, and Swimming and Poor for Fish Consumption and Shellfishing. The constituents of concerns are mercury, fecal coliform, dioxins, and PCBa. The proposed project will not result in the addition of any of these constituents to the project area.

Wetlands Section 2.2

The New Hampshire Natural Heritage Datacheck tool identified five records of Rare, Threatened or Endangered (RTE) species near the project area: three vertebrate species (Atlantic Sturgeon, Common Tern and Shortnose Sturgeon) and two natural communities (sparsely vegetated intertidal system and subtidal system). The proposed project is not anticipated to impact any area typical of Common Tern habitat. Time of year restriction to complete the work are proposed to minimize impacts to the Atlantic Sturgeon and Shortnose Sturgeon. Refer to Section 4 for a description of the proposed methods of mitigating impacts to RTE species.

Temporary impacts are proposed with salt marsh wetlands and mud flats, which are both considered Special Aquatic Sites (SAS). A shellfish bed is located adjacent to the project area near the Durham shore. Refer to Section 4 for a description of the proposed methods to restore SAS.

The US Fish and Wildlife Service Information for Planning and Consultation (IPaC) resource identifies the potential for the northern long-eared bat and small whorled pogonia. The IPaC does not list any critical supporting habitat for these species identified. Refer to IPaC report included in Section 6.

Wildlife Section 3.1

The proposed project area is located in a highest rank habitat in the NH Fish and Game Department - Wildlife Action Plan.

Flooding Section 4.1

The proposed project area is within the effective 100-year FEMA floodplain. There will not be any loss of flood storage as a result of this project since all impacted areas will be restored to their preconstruction grades. See FEMA flood map included with in the section.

Historical/Archaeological Resources

A Request for Project Review was sent to NH Division of Historical Resources (NHDHR). NHDHR determined there would be No Adverse Effect to Historic Properties as a result of the proposed project. Refer to NHDHR RPR correspondence in this section.

National Flood Hazard Layer FIRMMette



70°52'7"W 43°7'37"N



70°51'30"W 43°7'11"N

Legend

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

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

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

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

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

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

MAP PANELS	Digital Data Available
	No Digital Data Available
	Unmapped

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

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

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/21/2020 at 4:49 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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

Please mail the completed form and required material to:

New Hampshire Division of Historical Resources
State Historic Preservation Office
Attention: Review & Compliance
19 Pillsbury Street, Concord, NH 03301-3570

RECEIVED
SEP 10 2019

DHR Use Only	
R&C #	11091
Log In Date	9/10/19
Response Date	9/26/19
Sent Date	9/27/19

Request for Project Review by the New Hampshire Division of Historical Resources

- This is a new submittal
 This is additional information relating to DHR Review & Compliance (R&C) #:

GENERAL PROJECT INFORMATION

Project Title Water Main Crossing

Project Location Piscataqua River

City/Town Newington, Durham Tax Map 1 (N), 12 (D) Lot # 1-1 (N), 5-2 (D), 8-2 (D)

NH State Plane - Feet Geographic Coordinates: Easting 1198714 Northing 228227 ✓
(See RPR Instructions and R&C FAQs for guidance.)

Lead Federal Agency and Contact (if applicable) Army Corps of Engineers
(Agency providing funds, licenses, or permits)
Permit Type and Permit or Job Reference # Wetlands

State Agency and Contact (if applicable) NHDES Wetlands Bureau
Permit Type and Permit or Job Reference #

APPLICANT INFORMATION

Applicant Name City of Portsmouth (Brian Goetz)

Mailing Address 680 Peverly Hill Road Phone Number 603-427-1530

City Portsmouth State NH Zip 03801 Email bfgoetz@cityofportsmouth.com

CONTACT PERSON TO RECEIVE RESPONSE

Name/Company Britt Eckstrom (Wright-Pierce)

Mailing Address 230 Commerce Way Suite 302 Phone Number 603-570-7126

City Portsmouth State NH Zip 03801 Email Britt.Eckstrom@wright-pierce.com

This form is updated periodically. Please download the current form at www.nh.gov/nhdhr/review. Please refer to the Request for Project Review Instructions for direction on completing this form. Submit one copy of this project review form for each project for which review is requested. Include a self-addressed stamped envelope to expedite review response. Project submissions will not be accepted via facsimile or e-mail. This form is required. Review request form must be complete for review to begin. Incomplete forms will be sent back to the applicant without comment. Please be aware that this form may only initiate consultation. For some projects, additional information will be needed to complete the Section 106 review. All items and supporting documentation submitted with a review request, including photographs and publications, will be retained by the DHR as part of its review records. Items to be kept confidential should be clearly identified. For questions regarding the DHR review process and the DHR's role in it, please visit our website at: www.nh.gov/nhdhr/review or contact the R&C Specialist at marika.labash@dncr.nh.gov or 603.271.3558.

PROJECTS CANNOT BE PROCESSED WITHOUT THIS INFORMATION

11091

Project Boundaries and Description

- Attach the Project Mapping using EMMIT or relevant portion of a 7.5' USGS Map. (See RPR Instructions and R&C FAQs for guidance.)
- Attach a detailed narrative description of the proposed project.
- Attach a site plan. The site plan should include the project boundaries and areas of proposed excavation.
- Attach photos of the project area (overview of project location and area adjacent to project location, and specific areas of proposed impacts and disturbances.) (Informative photo captions are requested.)
- A DHR records search must be conducted to identify properties within or adjacent to the project area. Provide records search results via EMMIT or in Table 1. (Blank table forms are available on the DHR website.)
EMMIT or in-house records search conducted on 07/24/2019.

Architecture

Are there any buildings, structures (bridges, walls, culverts, etc.) objects, districts or landscapes within the project area? Yes No

If no, skip to Archaeology section. If yes, submit all of the following information:

Approximate age(s): 130

- Photographs of *each* resource or streetscape located within the project area, with captions, along with a mapped photo key. (Digital photographs are accepted. All photographs must be clear, crisp and focused.)
- If the project involves rehabilitation, demolition, additions, or alterations to existing buildings or structures, provide additional photographs showing detailed project work locations. (i.e. Detail photo of windows if window replacement is proposed.)

Archaeology

Does the proposed undertaking involve ground-disturbing activity? Yes No

If yes, submit all of the following information:

- Description of current and previous land use and disturbances.
- Available information concerning known or suspected archaeological resources within the project area (such as cellar holes, wells, foundations, dams, etc.)

Please note that for many projects an architectural and/or archaeological survey or other additional information may be needed to complete the Section 106 process.

DHR Comment/Finding Recommendation *This Space for Division of Historical Resources Use Only*

- Insufficient information to initiate review. Additional information is needed in order to complete review.
- No Potential to cause Effects No Historic Properties Affected No Adverse Effect Adverse Effect

Comments:

If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation.

Authorized Signature: Nestor Melt, DSHPO

Date: 9/26/19



3

Project Plans

CITY OF PORTSMOUTH

CONTRACT DRAWINGS FOR

LITTLE BAY

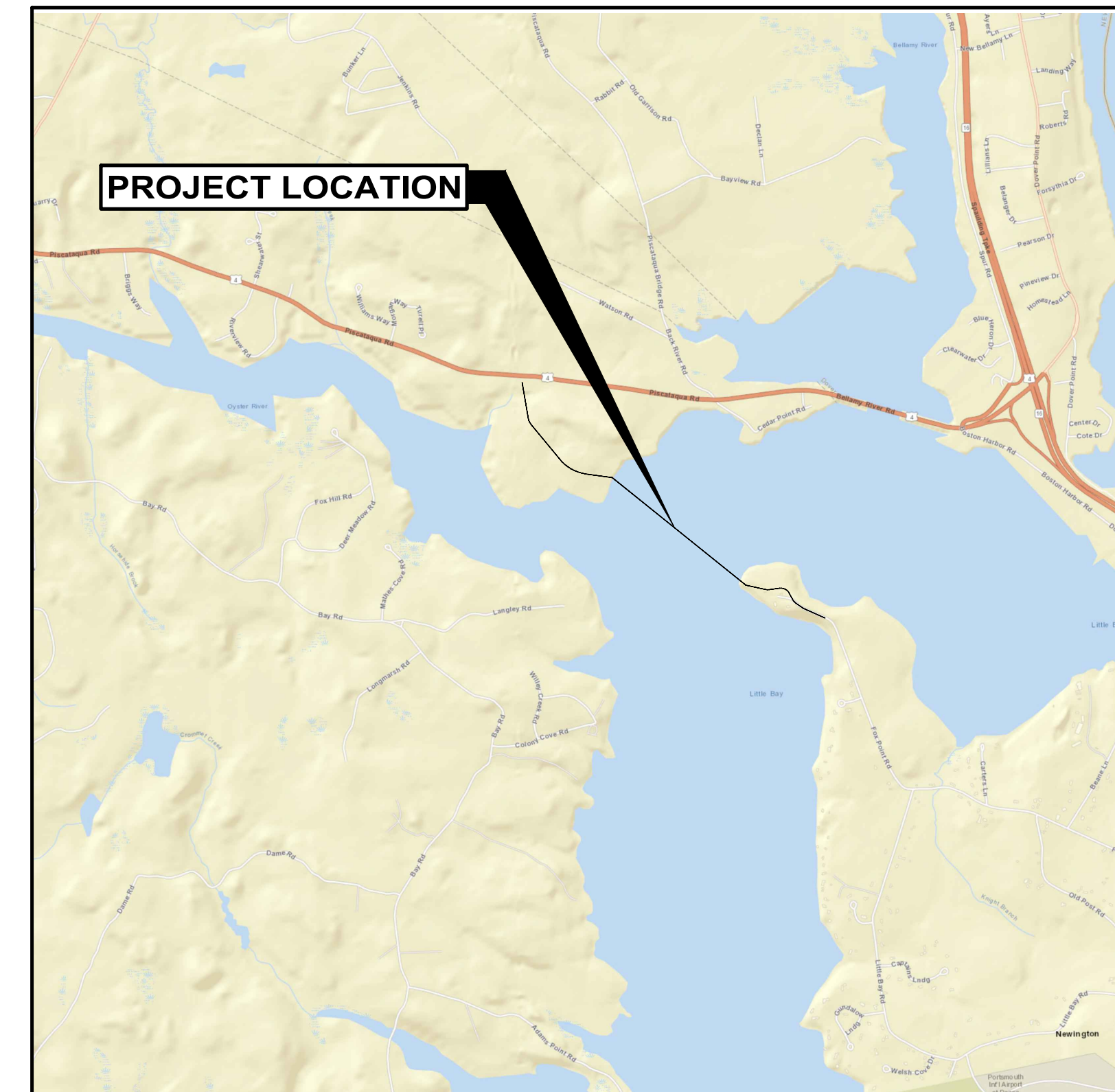
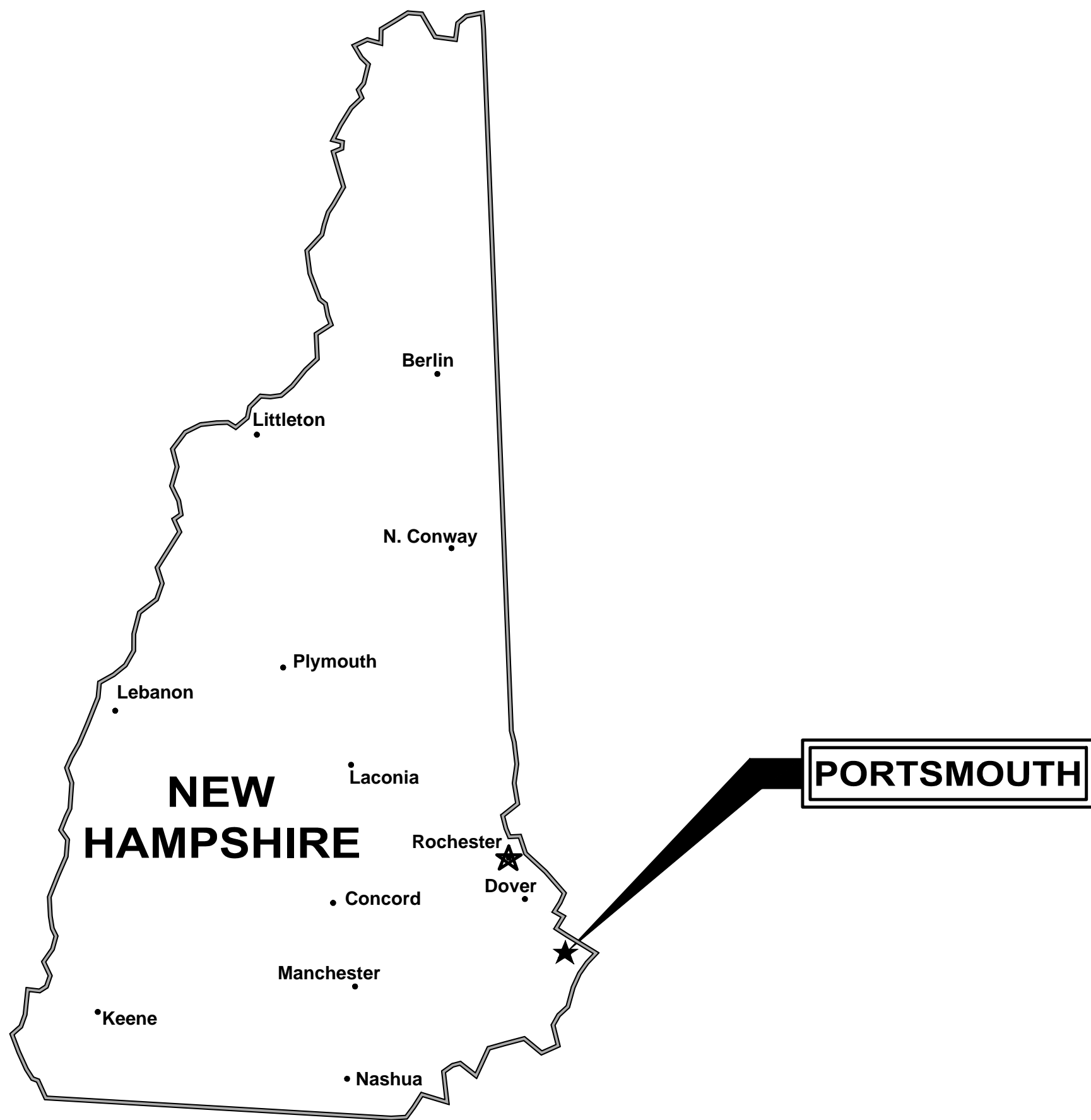
SUBAQUEOUS WATER MAIN REPLACEMENT

DURHAM & NEWINGTON, NH

NOVEMBER 2020

DRAWING INDEX

GENERAL	
.....	COVER SHEET
CIVIL	
C-1	SHEET INDEX
C-2	GENERAL NOTES, ABBREVIATIONS AND LEGEND
C-3	EXISTING CONDITIONS-DURHAM
C-4	EXISTING CONDITIONS-NEWINGTON
C-5	CONSTRUCTION STAGING PLAN - NEWINGTON
C-6	CONSTRUCTION STAGING PLAN - DURHAM
C-7	PLAN & PROFILE I - STA 100+00 TO 106+00
C-8	PLAN & PROFILE II - STA 106+00 TO 112+00
C-9	PLAN & PROFILE III - STA 112+00 TO 118+00
C-10	PLAN & PROFILE IV - STA 118+00 TO 124+00
C-11	PLAN & PROFILE V - STA 124+00 TO 130+00
C-12	PLAN & PROFILE VI - STA 130+00 TO 133+00
C-13	EROSION CONTROL NOTES & DETAILS - DURHAM
C-14	EROSION CONTROL NOTES & DETAILS - NEWINGTON
C-15	DETAILS I



LOCATION PLAN

PRELIMINARY DESIGN



Offices Throughout New England
888.621.8156 | www.wright-pierce.com

FOR REVIEW _____

FOR BIDDING _____

WP PROJECT No. 14202A



SHEET INDEX
SCALE: 1"=150'

<p>WRIGHT-PIERCE Engineering a Better Environment 888.621.8156 www.wright-pierce.com</p>					
<p>CITY OF PORTSMOUTH SUBAQUEOUS WATER TRANSMISSION MAIN PISCATAQUA RIVER, DURHAM-NEWINGTON NEW HAMPSHIRE</p>					
<p>PROJECT EXTENTS</p>					
<p>DRAWING C-1</p>					
<p>DESIGNED BY: W.EDG CAG CORP.: W.EDG CAG: W.EDG CHECKED BY: DATE: APPROVED BY: DATE: PROJECT NO.: 14202A</p>	<p>NO. SUBMISSIONS/REVISIONS PRELIMINARY DESIGN - NOT FOR CONSTRUCTION</p> <table border="1"> <tr> <td>APPD.</td> <td>DATE</td> </tr> <tr> <td></td> <td>07/20</td> </tr> </table>	APPD.	DATE		07/20
APPD.	DATE				
	07/20				

GENERAL NOTES

- 1. THE CONTRACTOR IS REFERRED TO SECTION 01050 OF THE SPECIFICATIONS REGARDING COORDINATION WITH OTHERS, INCLUDING RESPONSIBILITIES AND RELATED COSTS.
2. BELOW GRADE UTILITY INFORMATION IS BASED ON INFORMATION PROVIDED BY EACH UTILITY. LOCATION OF PUBLIC UTILITIES SHOWN IS ONLY APPROXIMATE AND MAY NOT BE COMPLETE. PRIVATE UNDERGROUND UTILITIES SUCH AS, BUT NOT LIMITED TO, SEWER LINES, WATER LINES AND BURIED ELECTRICAL SERVICE ENTRANCES ARE NOT SHOWN. THE CONTRACTOR SHALL ASCERTAIN THE LOCATION AND SIZE OF EXISTING UTILITIES IN THE FIELD WITH THE RESPECTIVE UTILITY COMPANY REPRESENTATIVE PRIOR TO COMMENCING WORK. REFER TO SPECIFICATION SECTION 01050. ADDITIONAL TEST PITS, BEYOND THOSE SHOWN, MAY BE REQUIRED. UTILITY CONTACTS ARE AS FOLLOWS:
ELECTRIC: WATER/SEWER/STORM DRAIN: GAS:
EVERSOURCE CITY OF PORTSMOUTH UNITIL CORPORATION
780 N COMMERCIAL ST PUBLIC WORKS DEPARTMENT 325 WEST ROAD
MANCHESTER, NH 03101 680 PEVERLY ROAD PORTSMOUTH, NH 03801
(800) 662-7764 PORTSMOUTH, NH 03801 TEL. (603) 294-5157 (MAIN)
TEL. (603) 427-1530 CONTACT: BRIAN GOETZ TEL. (603) 325-0252 (CELL)
CONTACT: PHIL JOHNSON
TELEPHONE: DIG SAFE: CABLE TELEVISION:
FAIRPOINT COMMUNICATIONS METROCAST CABLEVISION
6 OLD PRESCOTT HILL ROAD 21 JARVIS BLVD.
BELMONT, NH 03322 ROCHESTER, NH 03868
TEL. (603) 433-2090 (MAIN) TEL. (603) 330-7141
TEL. (603) 540-1616 (CELL) CONTACT: MIKE GRAVEL
CONTACT: JENNIFER FOLEY
ADJUSTMENT OF WATER, SEWER, AND DRAINAGE, COVERS OR SIMILAR STRUCTURES TO MATCH THE NEW PAVEMENT GRADE AND THE RELOCATION OF UTILITY POLES WILL BE PERFORMED BY THE APPROPRIATE UTILITY OR ITS AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL COOPERATE WITH THE UTILITY IN EVERY WAY TO EXPEDITE SUCH ADJUSTMENTS. CONTRACTOR IS RESPONSIBLE TO IMPLEMENT AND SCHEDULE ALL CONTRACTORS INFRASTRUCTURE WORK.
3. THE LOCATION AND LIMITS OF ALL ON SITE WORK AND STORAGE AREAS SHALL BE REVIEWED/COORDINATED WITH, AND ACCEPTABLE TO THE OWNER AND ENGINEER.
4. ALL STRUCTURES AND PIPELINES LOCATED ADJACENT TO THE TRENCH EXCAVATION SHALL BE PROTECTED AND FIRMLY SUPPORTED BY THE CONTRACTOR UNTIL THE TRENCH IS BACKFILLED. DAMAGE TO ANY SUCH STRUCTURES CAUSED BY, OR RESULTING FROM, THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. ALL UTILITIES REQUIRING REPAIR, RELOCATION OR ADJUSTMENT AS A RESULT OF THE PROJECT SHALL BE COORDINATED THROUGH THE RESPECTIVE UTILITY.
5. IN THOSE INSTANCES WHERE POWER OR TELEPHONE POLE SUPPORT IS REQUIRED, THE CONTRACTOR SHALL PROVIDE A MINIMUM 48-HOUR NOTIFICATION TO EVERSOURCE OR FAIRPOINT, RESPECTIVELY. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR TEMPORARY BRACING OF UTILITIES.
6. DO NOT SCALE DRAWINGS UNLESS OTHERWISE NOTED. WRITTEN DIMENSIONS AND STATIONING SHALL PREVAIL.
7. CONTRACTOR SHALL INSTALL AND MAINTAIN TRAFFIC CONTROL DEVICES AS NECESSARY AND IN A MANNER CONSISTENT WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D.), N.H.D.O.T. STANDARDS, OR AS REQUIRED BY OWNER.
8. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TRAFFIC FLOW AT ALL TIMES. THE CONTRACTOR IS REQUIRED TO SUBMIT A TRAFFIC CONTROL PLAN TO THE OWNER PRIOR TO COMMENCING CONSTRUCTION. THE ROCHESTER POLICE DEPARTMENT (335-1338) AND FIRE DEPARTMENT (332-4140) ARE TO BE NOTIFIED AT LEAST 24 HOURS IN ADVANCE OF ANY STREET CLOSING OR DETOUR. REFER TO SPEC. SECTION 01570.
9. THE OWNER SHALL BE RESPONSIBLE FOR OBTAINING NECESSARY RIGHTS OF WAY AND PERMANENT EASEMENTS. THE CONTRACTOR SHALL VERIFY THAT THE NECESSARY EASEMENTS HAVE BEEN SECURED BY THE OWNER. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE APPLICABLE PROVISIONS OF EACH EASEMENT AS THEY APPLY TO THE WORK PRIOR TO BIDDING AND ABIDE BY THOSE PROVISIONS DURING CONSTRUCTION. COPIES OF ANY SUCH RIGHTS-OF-WAY AND EASEMENTS ARE AVAILABLE FOR REVIEW FROM THE CITY OF ROCHESTER.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PREVENTION OF EROSION. ALL DISTURBED EARTH SURFACES ARE TO BE STABILIZED IN THE SHORTEST PRACTICAL TIME AND TEMPORARY EROSION CONTROL DEVICES SHALL BE EMPLOYED UNTIL SUCH TIME AS ADEQUATE SOIL STABILIZATION HAS BEEN ACHIEVED. TEMPORARY STORAGE OF EXCAVATED MATERIAL IS TO BE IN A MANNER THAT WILL MINIMIZE EROSION. MATERIALS AND METHODS USED FOR TEMPORARY EROSION CONTROL SHALL BE AS SPECIFIED BY THE "NEW HAMPSHIRE STORM/WATER MANUAL" PREPARED BY THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES. REFER TO SPECIFICATION SECTION 02270.
11. COMPACTION TESTS SHALL BE PERFORMED IN ACCORDANCE WITH SPECIFICATION SECTION 02200. ANY SETTLEMENT OCCURRING WITHIN ONE YEAR OF SUBSTANTIAL COMPLETION OF THE PROJECT WILL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.
12. OPEN TRENCHES IN THE ROADWAY MUST BE BACKFILLED AT THE END OF THE WORKDAY, UNLESS PERMISSION IS GIVEN IN WRITING BY THE OWNER.
13. CONTRACTOR SHALL CONTROL DUST TO A TOLERABLE LIMIT AS OUTLINED IN SPECIFICATION SECTION 01562. CONTRACTOR SHALL NOT TRACK OR SPILL EARTH AND DEBRIS ON PUBLIC STREETS OUTSIDE THE PROJECT AREA. STREETS OPENED TO THE PUBLIC SHALL BE KEPT SWEEPED AND FREE OF DEBRIS EACH DAY AT THE BEGINNING AND END OF WORK DAY. CROSS STREETS THAT BOUND THE PROJECT AREA WILL BE SWEEPED AT LEAST ONCE EACH WEEK OR AS DIRECTED BY THE ENGINEER.
14. ALL AREAS (EXCEPT GRAVEL DRIVEWAYS) THAT ARE EXCAVATED, FILLED OR OTHERWISE DISTURBED BY THE CONTRACTOR AND ARE NOT TO BE PAVED OR FILLED WITH RIPRAP, SHALL BE LOAMED, GRADED, LIMED, FERTILIZED, SEEDED AND MULCHED.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESETING ALL EXISTING PROPERTY MONUMENTATION THAT IS DISTURBED BY HIS OPERATIONS AT NO EXPENSE TO THE OWNER. THIS WORK IS TO BE DONE BY A LAND SURVEYOR REGISTERED IN THE STATE OF NEW HAMPSHIRE.
16. THE CONTRACTOR SHALL NOT HAVE ANY RIGHT OF PROPERTY IN ANY MATERIALS TAKEN FROM ANY EXCAVATION. SUITABLE EXCAVATED MATERIAL MAY BE INCORPORATED IN THE PROJECT. THE OWNER AND THE ROCHESTER DEPARTMENT OF PUBLIC WORKS SHALL HAVE FIRST REFUSAL TO ALL EXCESS SOIL MATERIAL. EXCESS MATERIALS ACCEPTED BY THE OWNER SHALL BE DELIVERED BY THE CONTRACTOR TO THE ROCHESTER PUBLIC WORKS FACILITY ON 45 OLD DOVER ROAD. THE CONTRACTOR SHALL DISPOSE OF ALL UNSUITABLE AND EXCESS MATERIAL NOT ACCEPTED FOR REUSE BY THE OWNER IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE CONTRACT DOCUMENTS AND ALL STATE, FEDERAL AND LOCAL REGULATIONS. SUITABLE MATERIAL WITH EXCESSIVE MOISTURE SHALL BE STOCKPILED AND MANAGED TO ALLOW DRYING BEFORE FUTURE USE ON PROJECT.
17. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
18. CONTRACTOR SHALL RETURN ALL CASTINGS TO THE CITY OF ROCHESTER. CASTINGS SHALL BE TRANSPORTED TO THE CITY OF ROCHESTER PUBLIC WORKS DEPARTMENT OR SEPARATE STOCKPILE LOCATION. COORDINATE WITH THE CITY.
19. THE ENGINEER WILL PROVIDE CONTRACTOR WITH HORIZONTAL CONTROL POINTS TO ASSIST CONTRACTOR IN LAYING OUT THE CONSTRUCTION BASELINE. THE CONTRACTOR SHALL ESTABLISH HORIZONTAL AND VERTICAL ROADWAY LAYOUT CONTROL POINTS BEYOND THE LIMITS OF ROADWAY WORK AND PROTECT THESE POINTS FOR THE DURATION OF THE PROJECT. LAYOUT OF ALL CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
20. THE CONTRACTOR IS TO TAKE SPECIAL CARE NOT TO DAMAGE TREES WITHIN THE CONSTRUCTION AREA UNLESS THEY ARE NOTED TO BE REMOVED.
21. LIMITS OF WORK IN EXISTING DRIVES AS SHOWN ON THE PLANS ARE APPROXIMATE. ACTUAL LIMITS OF WORK ARE TO BE DETERMINED IN THE FIELD BASED ON THESE DRAWINGS AND AS APPROVED BY THE ENGINEER.
22. PAVEMENT IS TO BE SAWCUT AT ALL SIDE ROADS, PAVED DRIVES, PAVED SIDEWALKS, AS WELL AS THE BEGINNING AND END OF THE PROJECT.
23. SAWCUT LINES FOR PAVED DRIVEWAY MATCHES ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY SAWCUT LOCATION FOR DRIVEWAY MATCHES WITH THE ENGINEER.
24. EXISTING SIGNS IMPACTED BY THIS PROJECT SHALL BE RESET AT NO ADDITIONAL COST TO THE OWNER. PLACEMENT SHALL CONFORM TO THE REQUIREMENTS OF THE MUTCD.
25. ALL DUCTILE IRON WATER MAIN, VALVES AND FITTINGS SHALL BE WRAPPED WITH POLYETHYLENE ENCASEMENT PROTECTION WRAP (POLY WRAP). REFER TO SPEC. SECTION 02616.

PIPELINE GENERAL NOTES

- 1. PROVIDE 2 INCH RIGID INSULATION WHERE DIRECTED BY OWNER OR ENGINEER. TYPICAL INSULATION INSTALLATION IS OVER SEWER AND WATER MAINS WHEN COVER IS LESS THAN 5'-0".
2. MINIMUM DEPTH OF COVER FOR WATER MAIN SHALL BE 5'-0"
3. PIPE RESTRAINT FOR WATER MAINS: ALL BENDS, TEES, REDUCERS, HYDRANTS, AND PLUGS SHALL BE RESTRAINED BY USING CONCRETE THRUST BLOCKS AND "GRIP RINGS" OR OTHER METHOD AS SHOWN ON THE DRAWINGS.
4. A MINIMUM SEPARATION OF 6 INCHES BETWEEN THE WATER MAIN AND STORM DRAINAGE PIPES SHALL BE MAINTAINED. 2 INCH RIGID INSULATION SHALL BE PROVIDED WHEN THE SEPARATION IS LESS THAN 18 INCHES.

SURVEY NOTES

- 1. EXISTING CONDITION INFORMATION AND WETLAND INFORMATION IS BASED ON A GROUND SURVEY CONDUCTED BY DOUCET SURVEY, INC., OF NEWMARKET, NEW HAMPSHIRE. SURVEY CONDUCTED DURING NOVEMBER 2018, AUGUST & SEPTEMBER 2019, AND DECEMBER 2019 USING A TRIMBLE S7 TOTAL STATION AND A TRIMBLE R10 SURVEY GRADE GPS WITH A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.
2. JURISDICTIONAL RESOURCES INCLUDING HIGHEST OBSERVABLE TIDE LINE WERE DELINEATED ON MAY 29, 2019 BY MARC JACOBS, CERTIFIED WETLAND SCIENTIST NUMBER 090, ACCORDING TO THE STANDARDS OF THE US ARMY CORPS OF ENGINEERS - WETLANDS DELINEATION MANUAL: THE 2012 REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION; AND THE CODE OF ADMINISTRATIVE RULES, NH DEPARTMENT OF ENVIRONMENTAL SERVICES - WETLANDS BUREAU - ENV WT 100-900. SOILS WERE EVALUATED UTILIZING THE FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, APRIL 2019 AND THE FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8, 2016. THE INDICATOR STATUS OF VEGETATION AS HYDROPHYTIC WAS DETERMINED ACCORDING TO THE U.S. ARMY CORPS OF ENGINEERS - NORTHCENTRAL AND NORTHEAST 2016 REGIONAL WETLAND PLANT LIST. COPIES OF SITE PLANS WHICH HAVE BEEN REVIEWED BY THE WETLAND SCIENTIST ARE INDIVIDUALLY STAMPED, SIGNED AND DATED. THIS NOTE HAS BEEN CUSTOMIZED FOR THIS PROJECT.
3. HORIZONTAL DATUM BASED ON NEW HAMPSHIRE STATE PLANE (2800) NAD83(2011) DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK.
4. VERTICAL DATUM IS BASED ON APPROXIMATE MLLW (MEAN LOWER LOW WATER) PER CONVERSION FROM NAVD88 TO MLLW, ELEVATION CHANGE -2.27' PROVIDED BY OCEANS SURVEY, INC. AND VERIFIED USING THE NOAA ONLINE VERTICAL DATUM TRANSFORMATION (VDATUM) WEBSITE. NAVD88(GEIOD12A) ELEVATIONS DERIVED FROM REDUNDANT GPS OBSERVATIONS UTILIZING THE KEYNET GPS VRS NETWORK (+/- 2).
5. THE LOCATION OF THE WATER LINE EASEMENT SHOWN IS BASED ON THE LISTED REFERENCE PLAN AND IS ALIGNED USING THE NGS COORDINATE AND TRANSFORMATION TOOL (NCA1) TO CONVERT FROM NAD27 TO NAD83(2011).

LEGEND

LEGEND table with columns: EXISTING, PROPOSED, and CIVIL ABBREVIATIONS. Includes symbols for property/row line, setback line, easement line, edge of pavement, curb, edge of gravel, edge of concrete, contour, building, stone wall, tree line, chain link fence, stockade fence, barb wire fence, retaining wall, guardrail, sewer, sewer force main, gas, water, storm drain, underdrain, culvert, underground electric, overhead electric, iron pipe/rebar, drill hole, monument, survey control point, spot elevation, sewer manhole, drainage manhole, catch basin, electric manhole, telephone manhole, gate valve, curb stop, yard hydrant, hydrant, utility pole, utility pole w/ guy, utility pole w/ light, light pole, bollard, flagpole, deciduous tree, shrub, edge of water, stream, edge of wetlands, floodplain, wetlands, drainage flow, pavement markings, sign, mailbox, temporary bench mark, test boring, test probe, limit of work, silt fence, riprap, matchline, rock outcrop.

PROPOSED WETLAND IMPACT AREAS

Color-coded legend for proposed wetland impact areas: TEMP. TIDAL BUFFER ZONE (orange), TEMP. TIDAL MARSH (green), TEMP. TIDAL WATERS (blue), PERM. TIDAL WATER (dark blue).

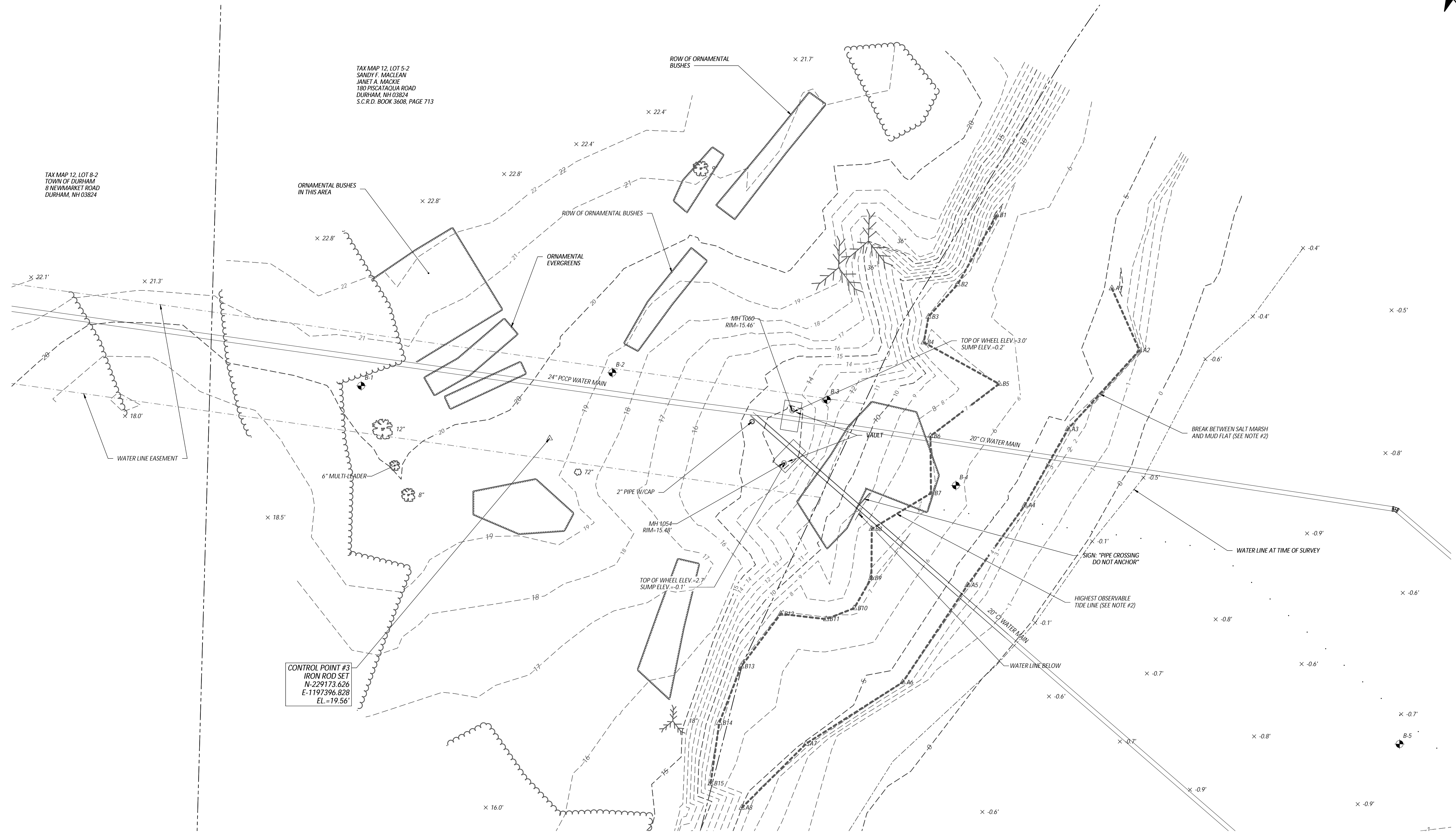
CIVIL ABBREVIATIONS

Table of Civil Abbreviations with columns: SYMBOL, DESCRIPTION, and ABBREVIATION. Includes symbols for diameter, number, approved building, catch basin, center, cubic feet per second, cast iron, centerline, corrugated metal pipe, cleanout, concrete, corner, cubic yard, demolition, drain manhole, ductile iron, drain, drawing, elevation, electric manhole, force main, feet, gas, hydrant, inch, influent, invert, pounds, maximum, manhole, minimum, monitoring well, north, national geodetic vertical datum, not available/applicable, not to scale, outside diameter, perforated clay, pounds per square foot, pounds per square inch, primary sludge, point of tangency, polyvinyl chloride, reinforced concrete pipe, roof drain, required, slope, sewer, storm drain, square feet, sanitary sewer manhole, square, station, transformer, temporary bench mark, thickness, top of structure, typical, underdrain, underground, underground electric, vitrified clay, with, potable water.

Project information block including: CITY OF PORTSMOUTH, SUBAQUEOUS WATER TRANSMISSION MAIN, PISCATAQUA RIVER, DURHAM-NEWINGTON, NEW HAMPSHIRE. Includes drawing title 'DRAWING C-2', project number '888.621.8156', website 'www.wright-pierce.com', and Wright-Pierce logo 'Engineering a Better Environment'.

NOTES

1. FIELD SURVEY PERFORMED BY DOUCET SURVEY, INC., DURING MAY & JUNE 2019 USING A TRIMBLE S7 TOTAL STATION AND A TRIMBLE R10 SURVEY GRADE GPS WITH A TRIMBLE TSC3 DATA COLLECTOR AND A SOKKIA B21 AUTO LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.
2. JURISDICTIONAL RESOURCES INCLUDING HIGHEST OBSERVABLE TIDE LINE WERE DELINEATED ON MAY 29, 2019 BY MARC JACOBS, CERTIFIED WETLAND SCIENTIST NUMBER 090, ACCORDING TO THE STANDARDS OF THE US ARMY CORPS OF ENGINEERS - WETLANDS DELINEATION MANUAL; THE 2012 REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL: NORTHCENTRAL AND NORTHEAST REGION; AND THE CODE OF ADMINISTRATIVE RULES, NH DEPARTMENT OF ENVIRONMENTAL SERVICES - WETLANDS BUREAU - ENV WT 100-900. SOILS WERE EVALUATED UTILIZING THE FIELD INDICATORS FOR IDENTIFYING HYDRIC SOILS IN NEW ENGLAND, VERSION 4, APRIL 2019 AND THE FIELD INDICATORS OF HYDRIC SOILS IN THE UNITED STATES, VERSION 8, 2016. THE INDICATOR STATUS OF VEGETATION AS HYDROPHYTIC WAS DETERMINED ACCORDING TO THE U.S. ARMY CORPS OF ENGINEERS - NORTHCENTRAL AND NORTHEAST 2016 REGIONAL WETLAND PLANT LIST. COPIES OF SITE PLANS WHICH HAVE BEEN REVIEWED BY THE WETLAND SCIENTIST ARE INDIVIDUALLY STAMPED, SIGNED AND DATED. THIS NOTE HAS BEEN CUSTOMIZED FOR THIS PROJECT.



TAX MAP 12, LOT 5-2
SANDY F. MACLEAN
JANET A. MACKIE
180 PISCATAQUA ROAD
DURHAM, NH 03824
S.C.R.D. BOOK 3608, PAGE 713

TAX MAP 12, LOT 8-2
TOWN OF DURHAM
9 NEWMARKET ROAD
DURHAM, NH 03824

CONTROL POINT #3
IRON ROD SET
N=229173.626
E=1197396.828
EL.=19.56'

EXISTING CONDITIONS-DURHAM
SCALE: 1"=20'



NO	DESCRIPTION	DATE
1	PRELIMINARY DESIGN - NOT FOR CONSTRUCTION	07/20

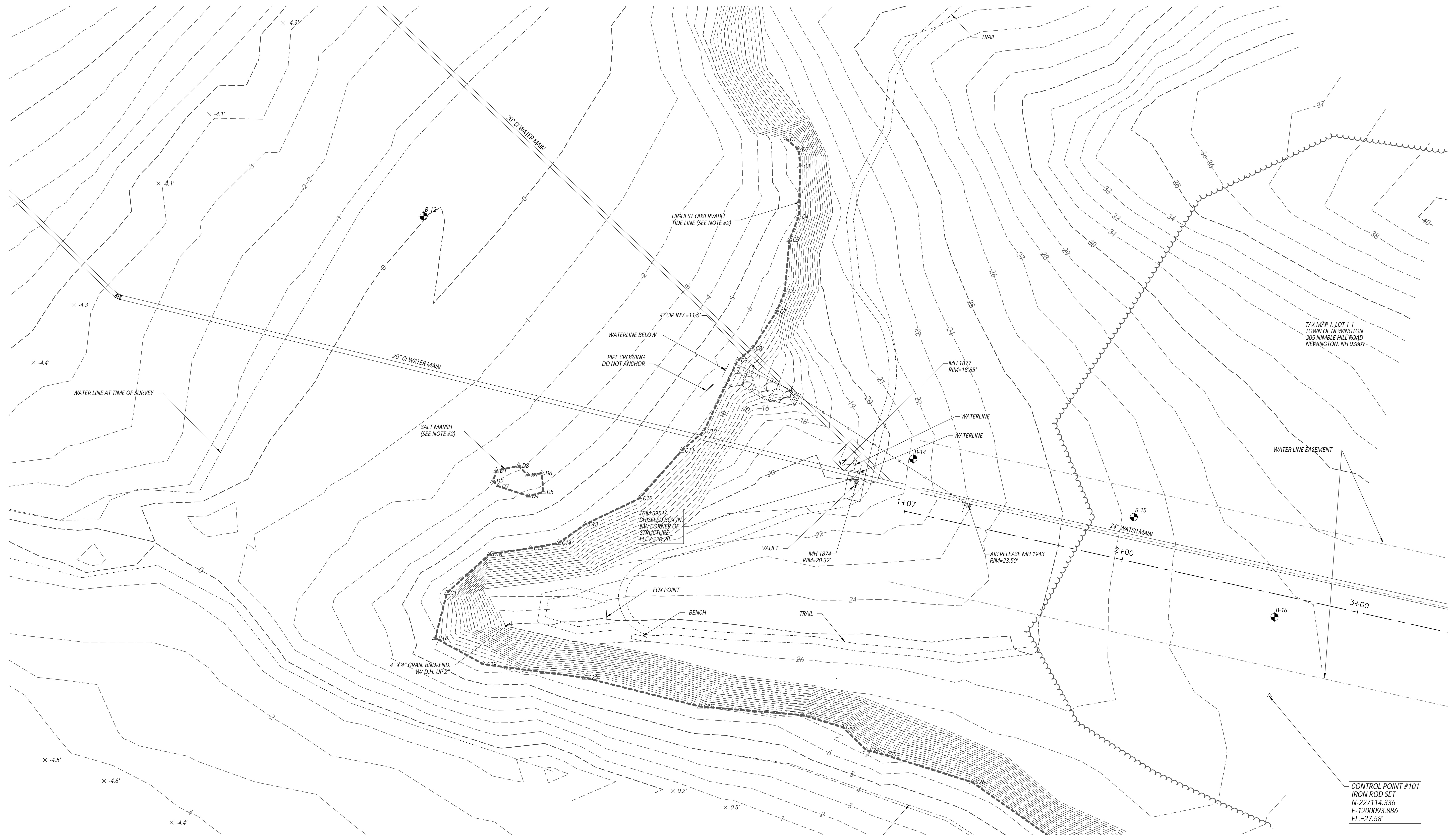
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 C&D CORP.: W.EDG
 C.D.: W.EDG
 CHECKED BY:
 DATE:
 APPROVED BY:
 DATE: 11/20/20
 PROJECT NO.: 14202A

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CITY OF PORTSMOUTH
 SUBAQUEOUS WATER TRANSMISSION MAIN
 PISCATAQUA RIVER, DURHAM-NEWINGTON
 NEW HAMPSHIRE
 EXISTING CONDITIONS
 DURHAM SITE

NOTES

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EXISTING CONDITIONS-NEWINGTON
SCALE: 1"=20'



NO	DESCRIPTION	DATE
1	PRELIMINARY DESIGN - NOT FOR CONSTRUCTION	07/20

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CAD CORP: W. EDG	W. EDG
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DATE:	
APPROVED BY:	
DATE:	11/20/20
PROJECT NO:	14202A

TAX MAP 1, LOT 1-1
TOWN OF NEWINGTON
205 NIMBLE HILL ROAD
NEWINGTON, NH 03807

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CITY OF PORTSMOUTH
SUBAQUEOUS WATER TRANSMISSION MAIN
PISCATAQUA RIVER, DURHAM-NEWINGTON
NEW HAMPSHIRE
EXISTING CONDITIONS
NEWINGTON SITE



CONSTRUCTION STAGING PLAN-NEWINGTON SITE

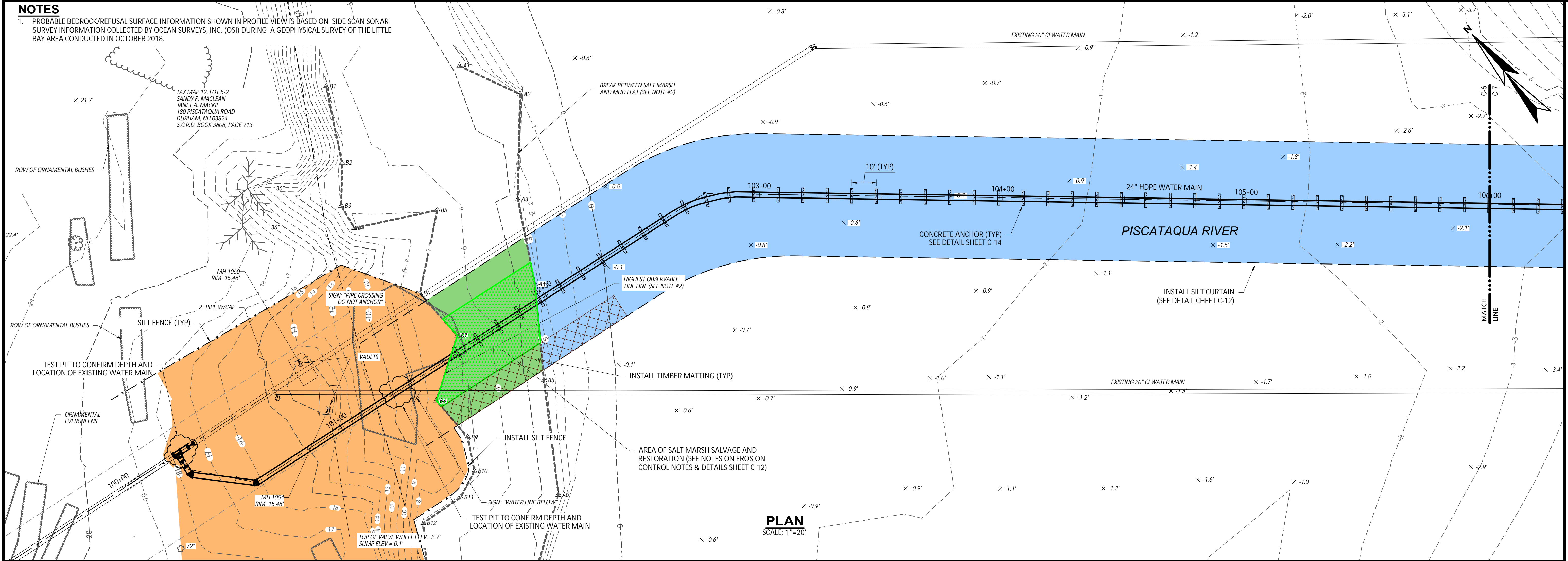
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SUBAQUEOUS WATER TRANSMISSION MAIN PISCATAQUA RIVER, DURHAM-NEWINGTON NEW HAMPSHIRE		CITY OF PORTSMOUTH	
CONSTRUCTION STAGING PLAN - NEWINGTON		DRAWING	
C-5		888.621.8156 www.wright-pierce.com	
Engineering a Better Environment		WRIGHT-PIERCE	
DESIGNED BY: W.P.E.D.G.		NO.	
CHECKED BY: W.P.E.D.G.		SUBMISSIONS/REVISIONS	
DATE: 11/10/2020		PRELIMINARY DESIGN - NOT FOR CONSTRUCTION	
APPROVED BY:		APP'D DATE:	
PROJECT NO: 14202A		07/20	

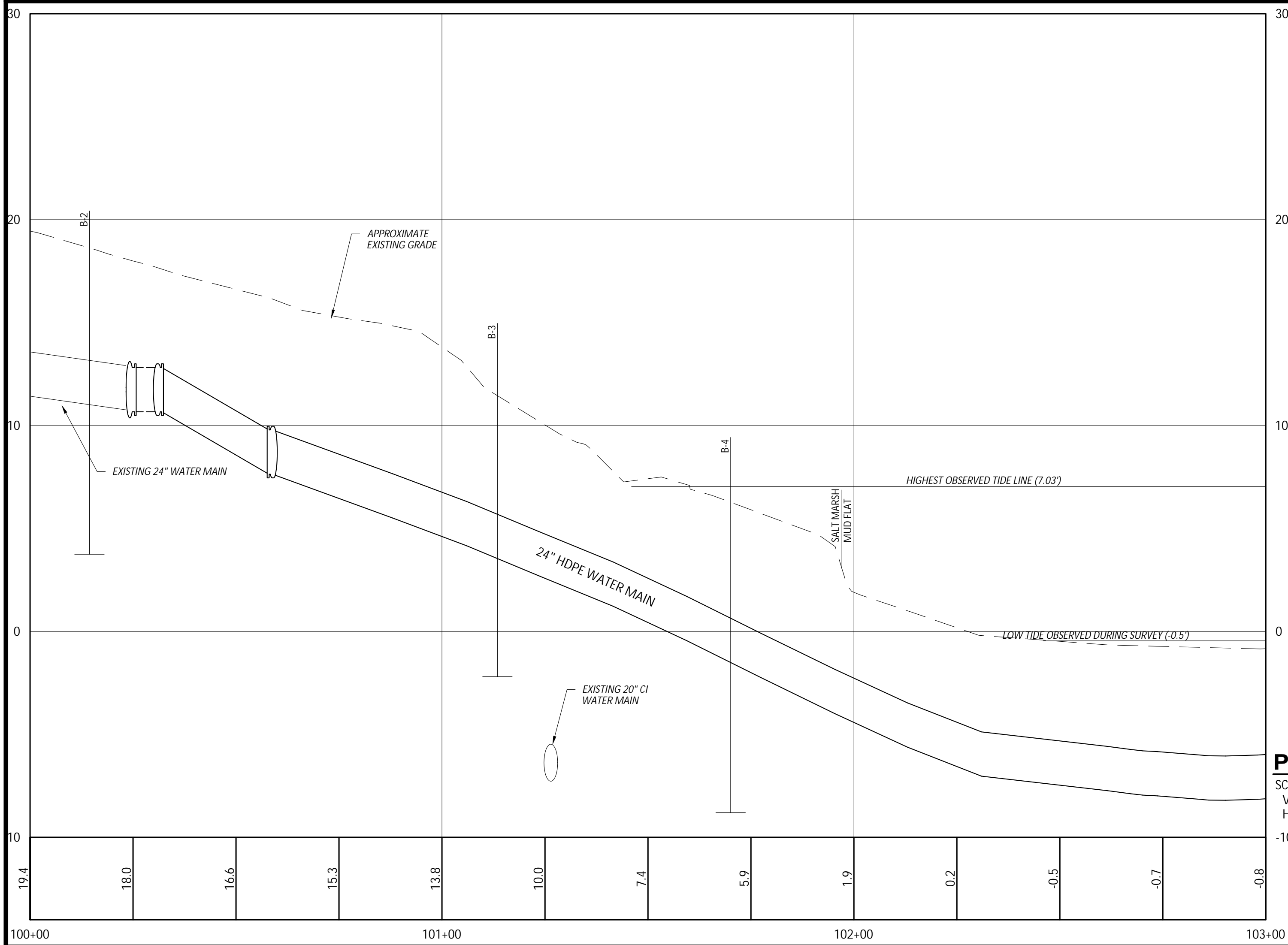
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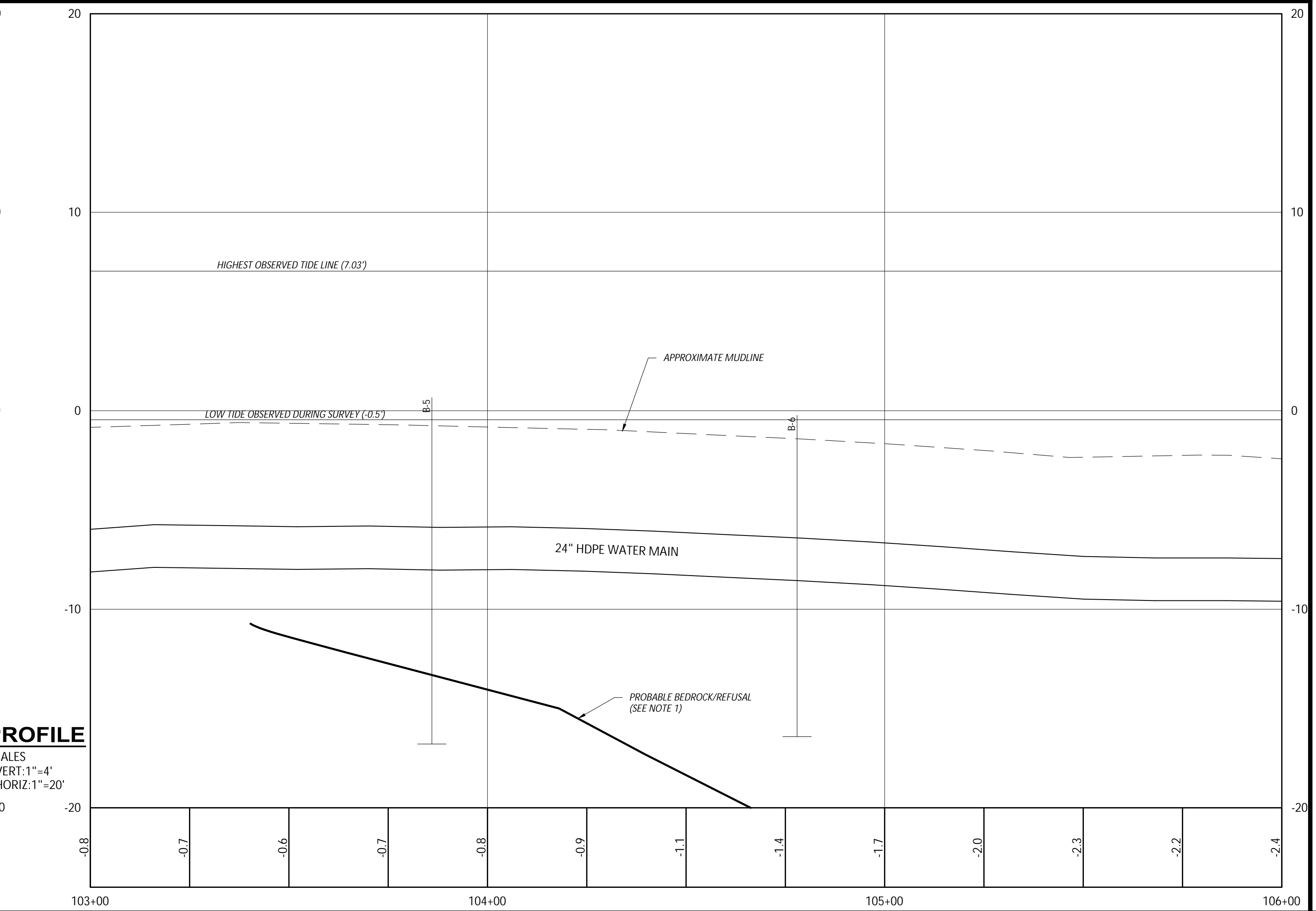
1. PROBABLE BEDROCK/REFUSAL SURFACE INFORMATION SHOWN IN PROFILE VIEW IS BASED ON SIDE SCAN SONAR SURVEY INFORMATION COLLECTED BY OCEAN SURVEYS, INC. (OSI) DURING A GEOPHYSICAL SURVEY OF THE LITTLE BAY AREA CONDUCTED IN OCTOBER 2018.



PLAN
SCALE: 1"=20'



PROFILE
SCALES
VERT: 1"=4'
HORIZ: 1"=20'



J:\ENGINEERING\PORTSMOUTH\14202 SUBAQUEOUS WATER TRANSMISSION MAIN DRAWINGS\CIVIL\14202-C5-786\DWG | P&P | 11/10/2020 6:27:27 PM | BRITT_ECKSTROM

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CAD CORP: W. EDG	W. EDG
CHECKED BY: W. EDG	W. EDG
DATE: 11/10/2020	11/10/2020
APPROVED BY: W. EDG	W. EDG
DATE: 11/10/2020	11/10/2020
PROJECT NO: 14202A	

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CITY OF PORTSMOUTH
SUBAQUEOUS WATER TRANSMISSION MAIN
PISCATAQUA RIVER, DURHAM-NEWINGTON
NEW HAMPSHIRE

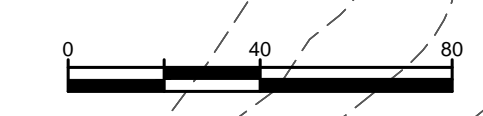
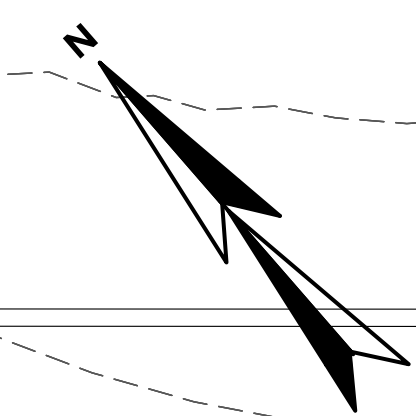
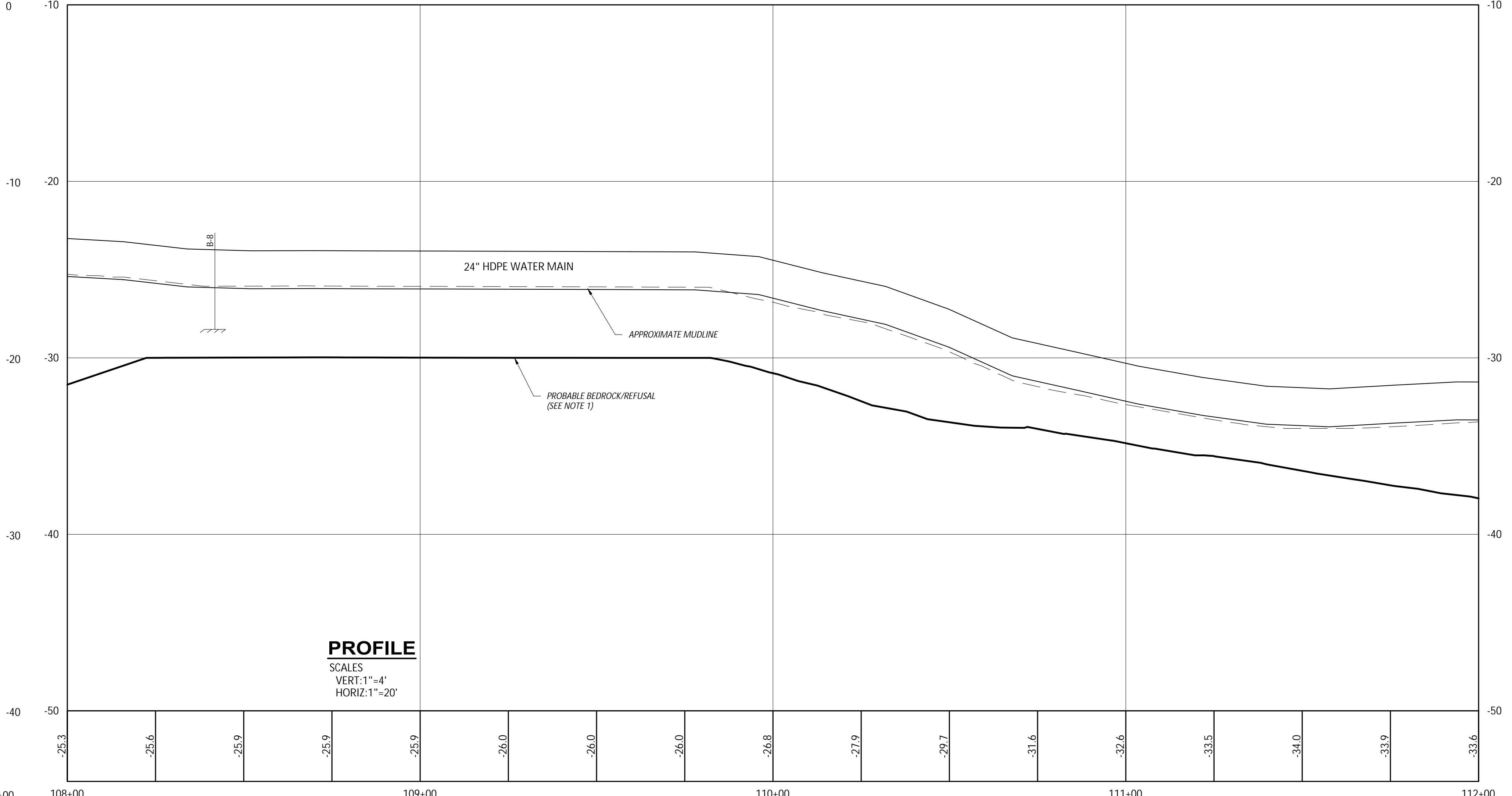
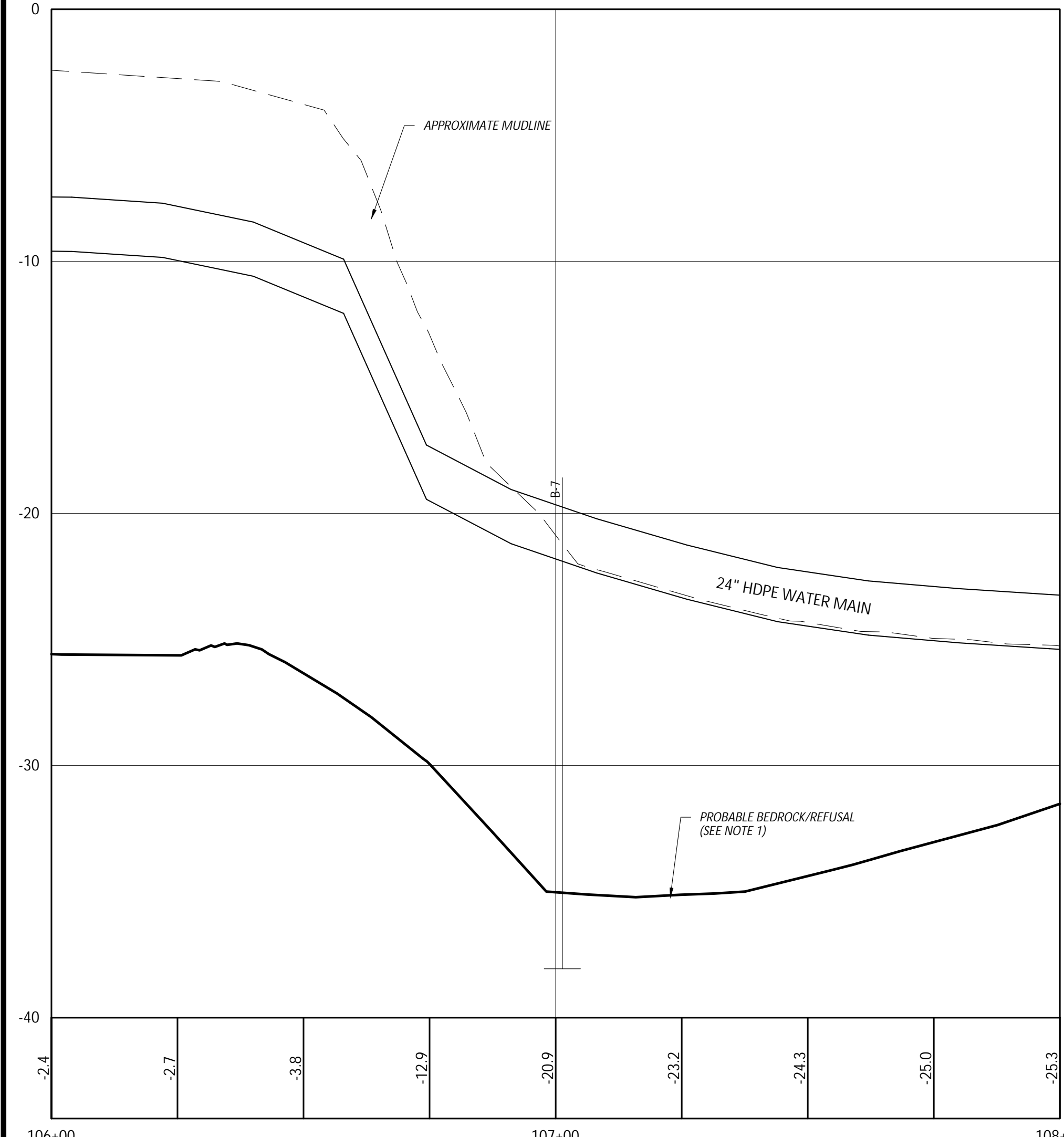
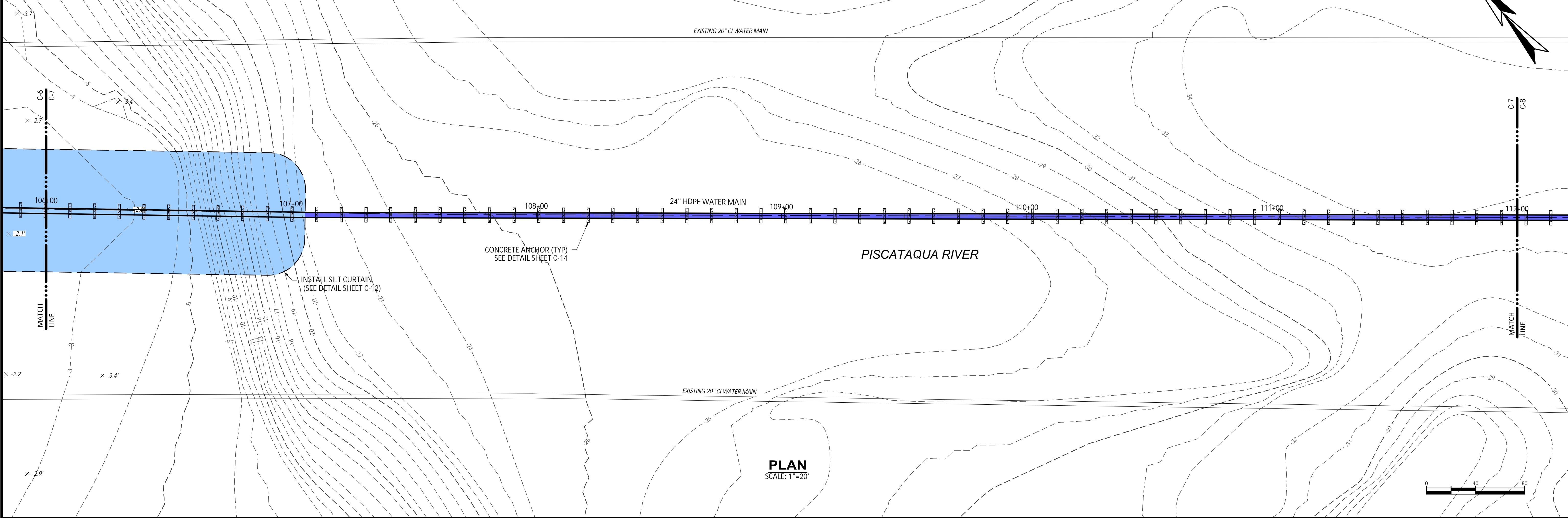
WATER MAIN REPLACEMENT PLAN & PROFILE I
STA. 100+00 TO STA. 106+00

DRAWING
C-7

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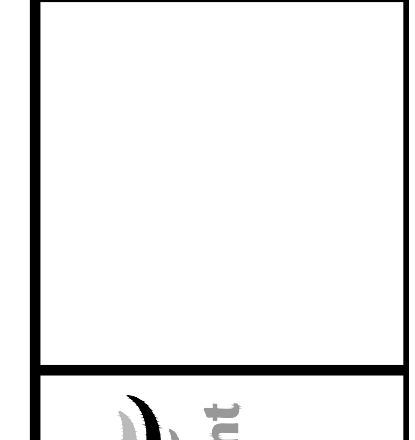
NOTES

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NO	DATE	DESCRIPTION
1	07/20	PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

DESIGNED BY: W.EDG
 CAD CORP: W.EDG
 CHECKED BY: W.EDG
 DATE: 11/10/2020
 APPROVED BY: W.EDG
 DATE: 11/10/2020
 PROJECT NO: 14202A



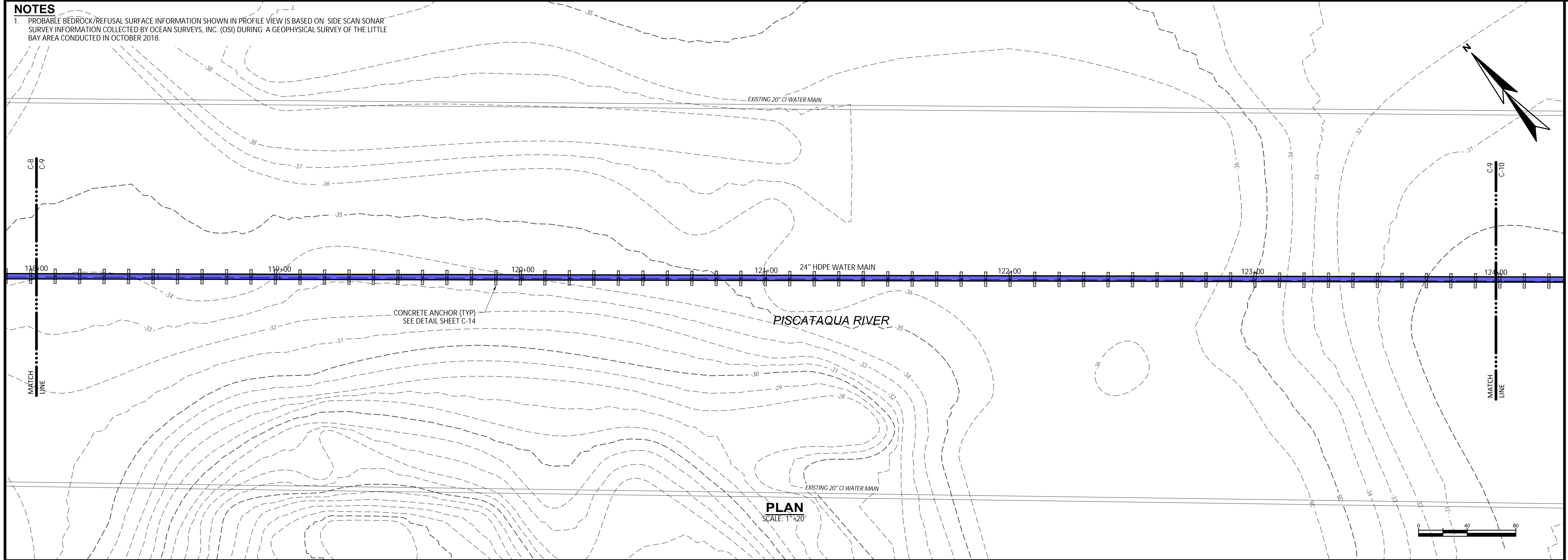
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 SUBAQUEOUS WATER TRANSMISSION MAIN
 PISCATAQUA RIVER, DURHAM-NEWINGTON
 NEW HAMPSHIRE
 WATER MAIN REPLACEMENT PLAN & PROFILE II
 STA. 106+00 TO STA. 112+00

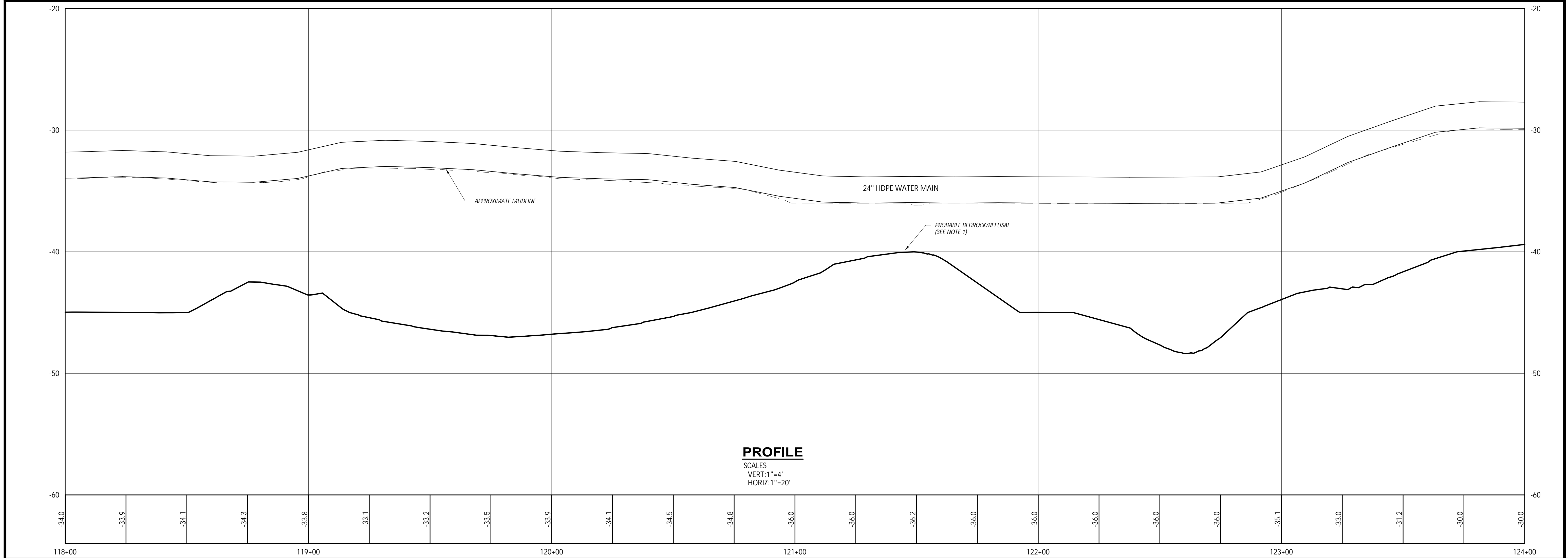
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NOTES

1. PROBABLE BEDROCK/REFUSAL SURFACE INFORMATION SHOWN IN PROFILE VIEW IS BASED ON 'SIDE SCAN SONAR' SURVEY INFORMATION COLLECTED BY OCEAN SURVEYS, INC. (OSI) DURING A GEOPHYSICAL SURVEY OF THE LITTLE BAY AREA CONDUCTED IN OCTOBER 2018.



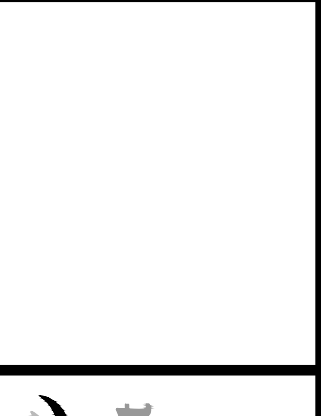
PLAN
SCALE: 1"=20'



PROFILE
SCALES
VERT: 1"=4'
HORIZ: 1"=20'

NO	DESCRIPTION	DATE
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 DATE: 07/20
 PROJECT NO: 14202A



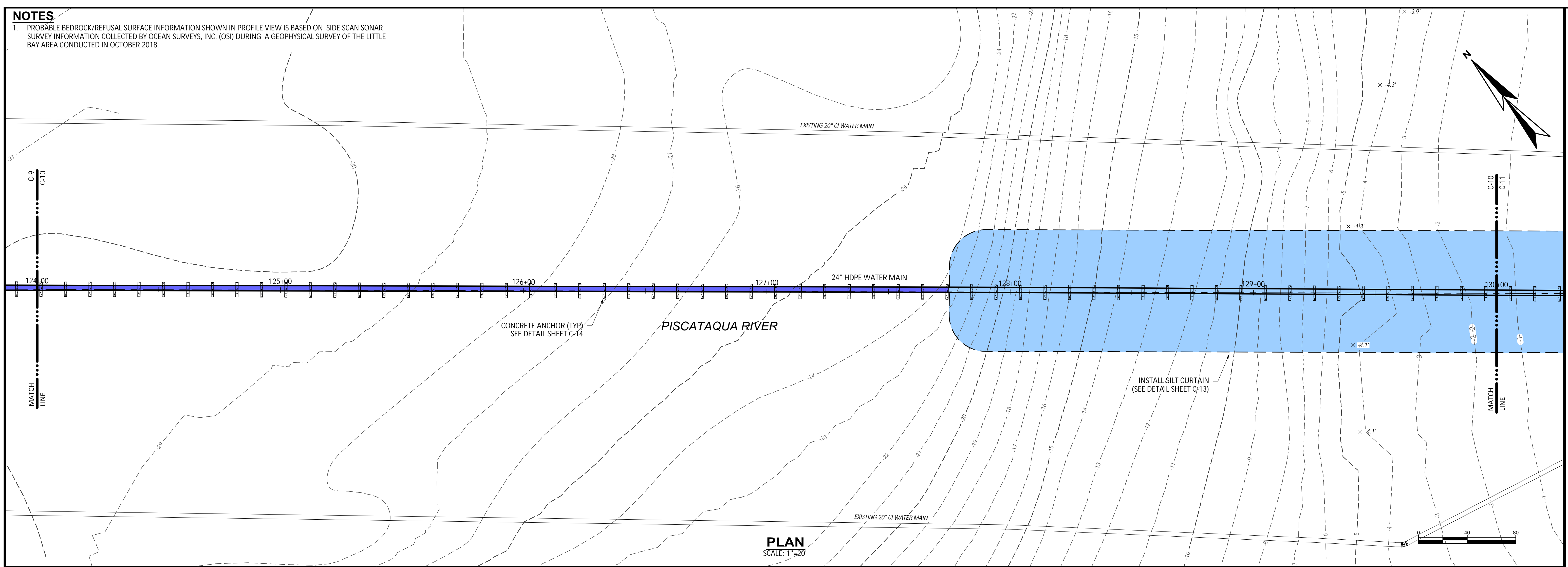
CITY OF PORTSMOUTH
 SUBAQUEOUS WATER TRANSMISSION MAIN
 PISCATAQUA RIVER, DURHAM-NEWINGTON
 NEW HAMPSHIRE

WATER MAIN REPLACEMENT PLAN & PROFILE IV
 STA. 118+00 TO STA. 124+00

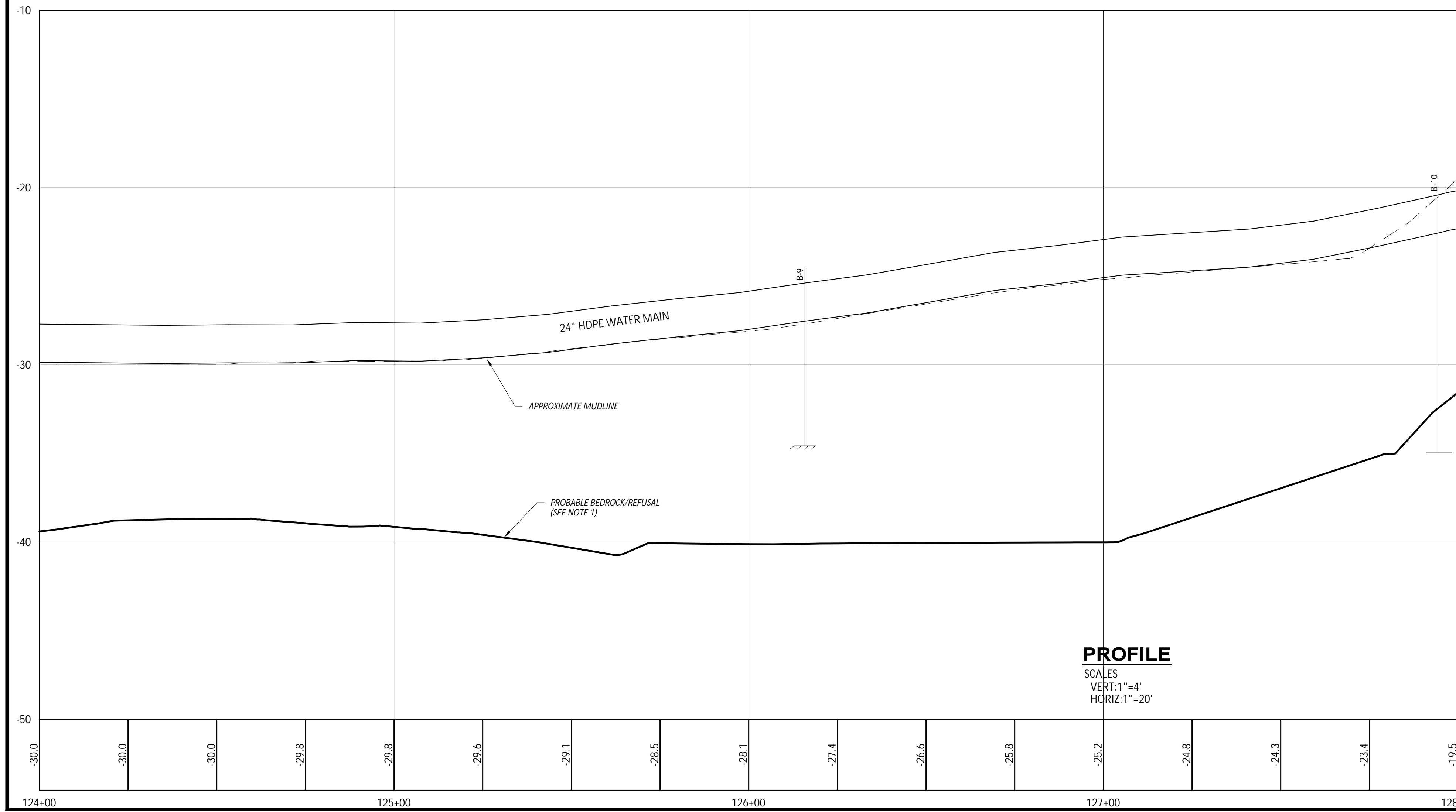
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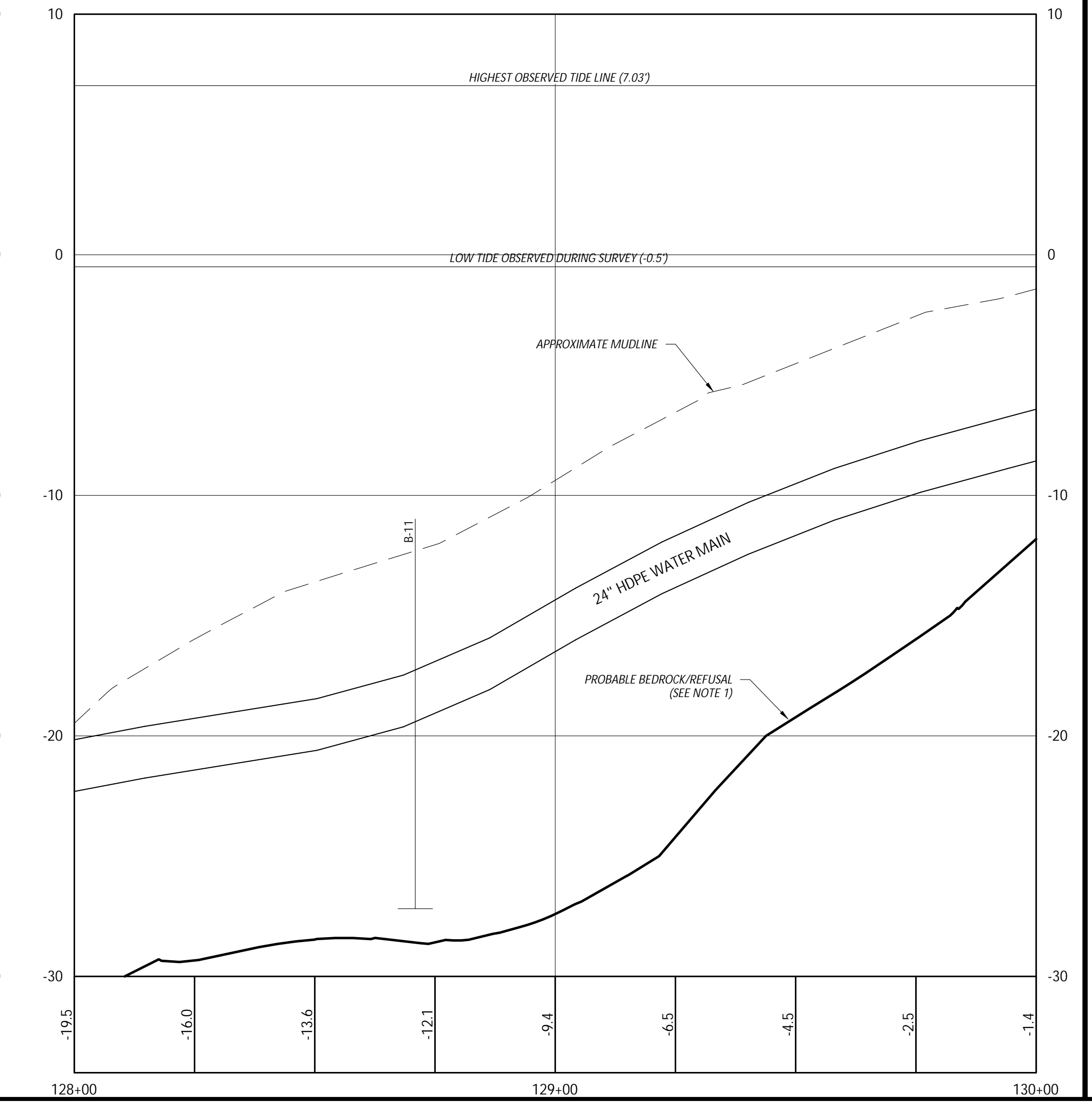
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PLAN
SCALE: 1"=20'



PROFILE
SCALES
VERT: 1"=4'
HORIZ: 1"=20'



NO	DATE	DESCRIPTION
1	07/20	PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

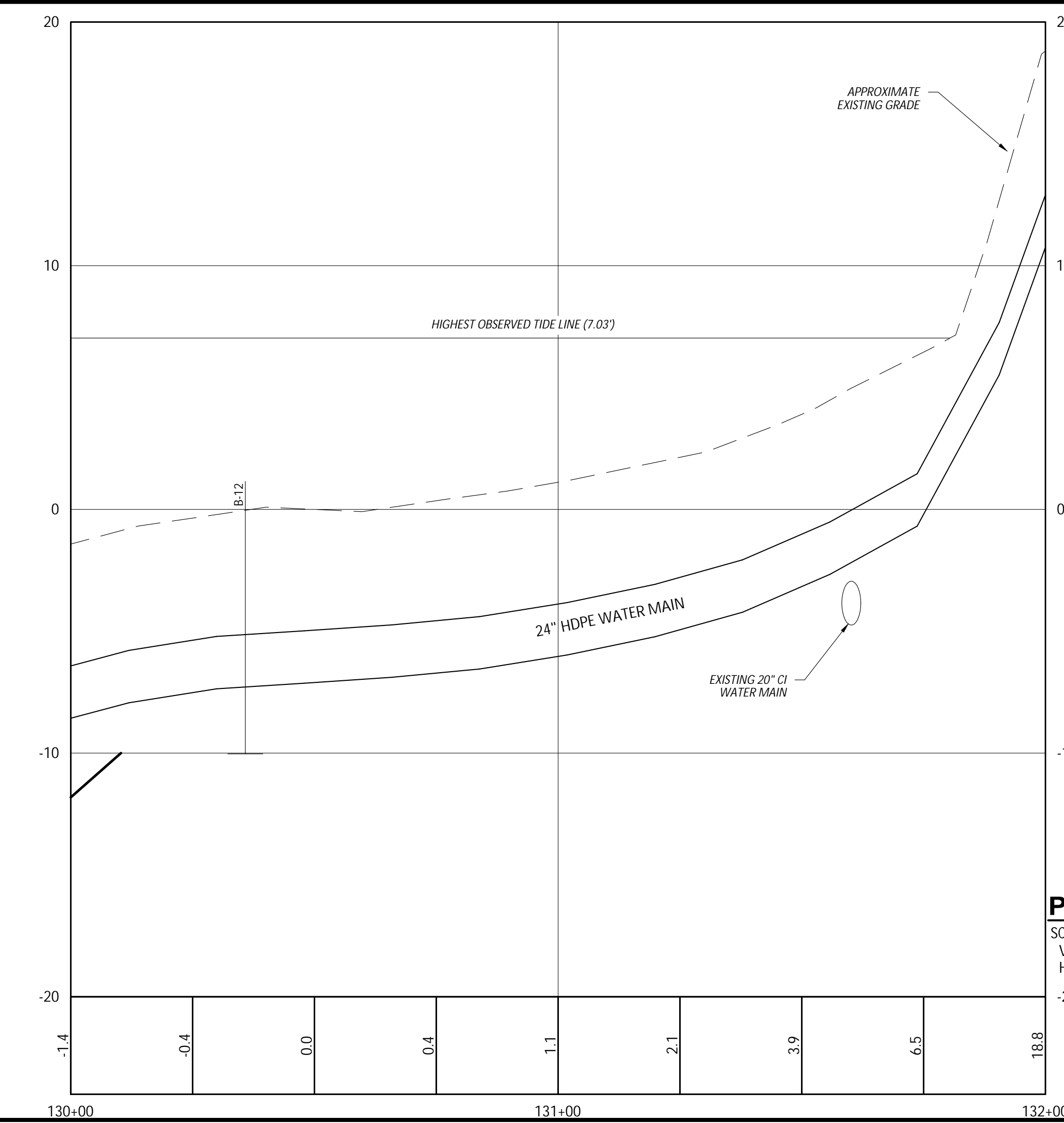
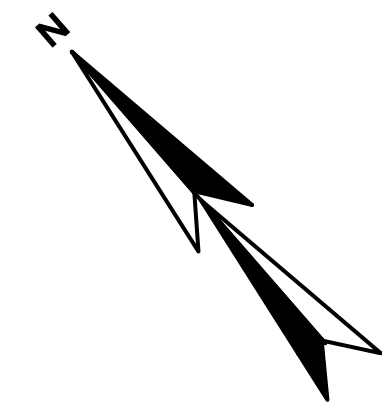
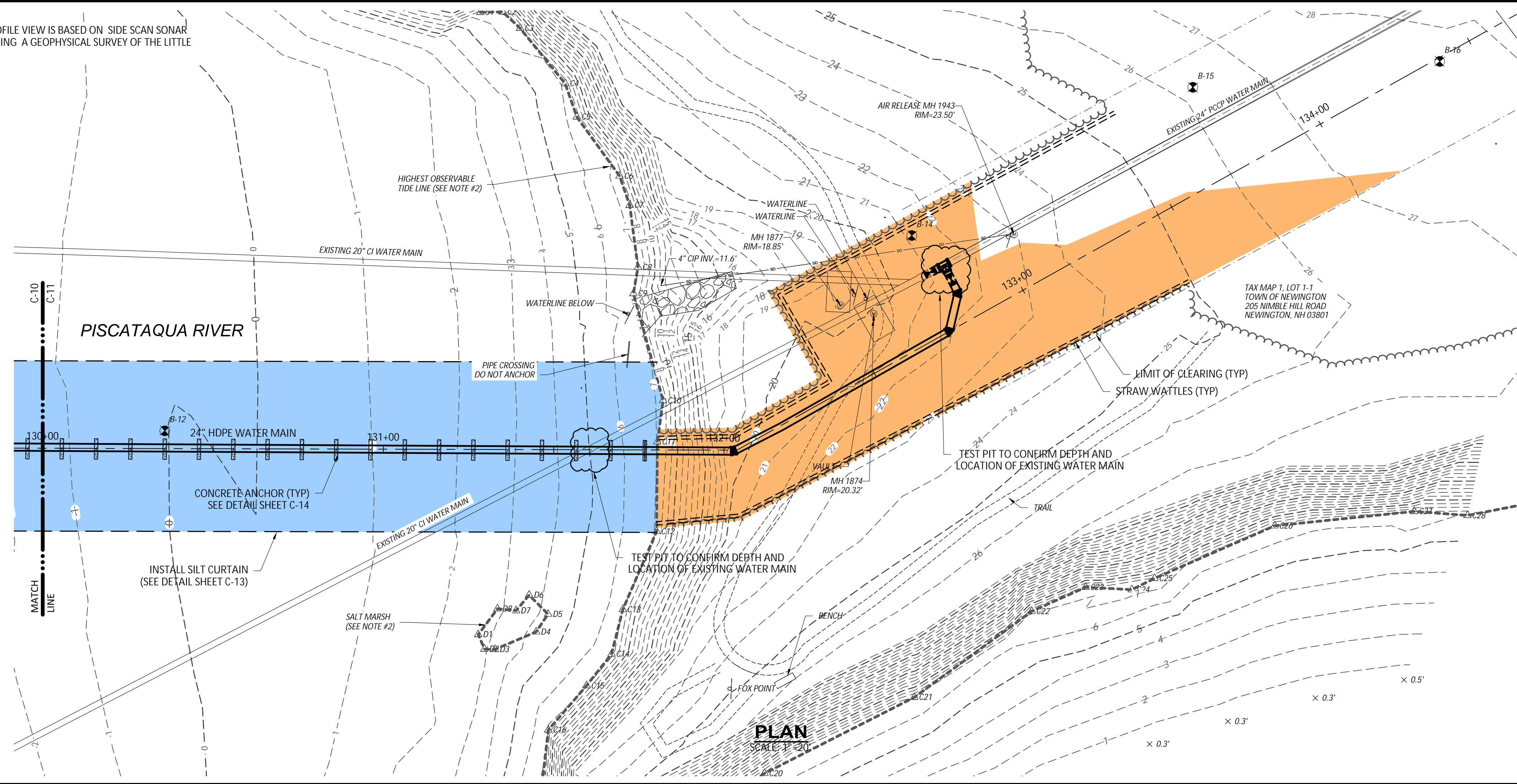
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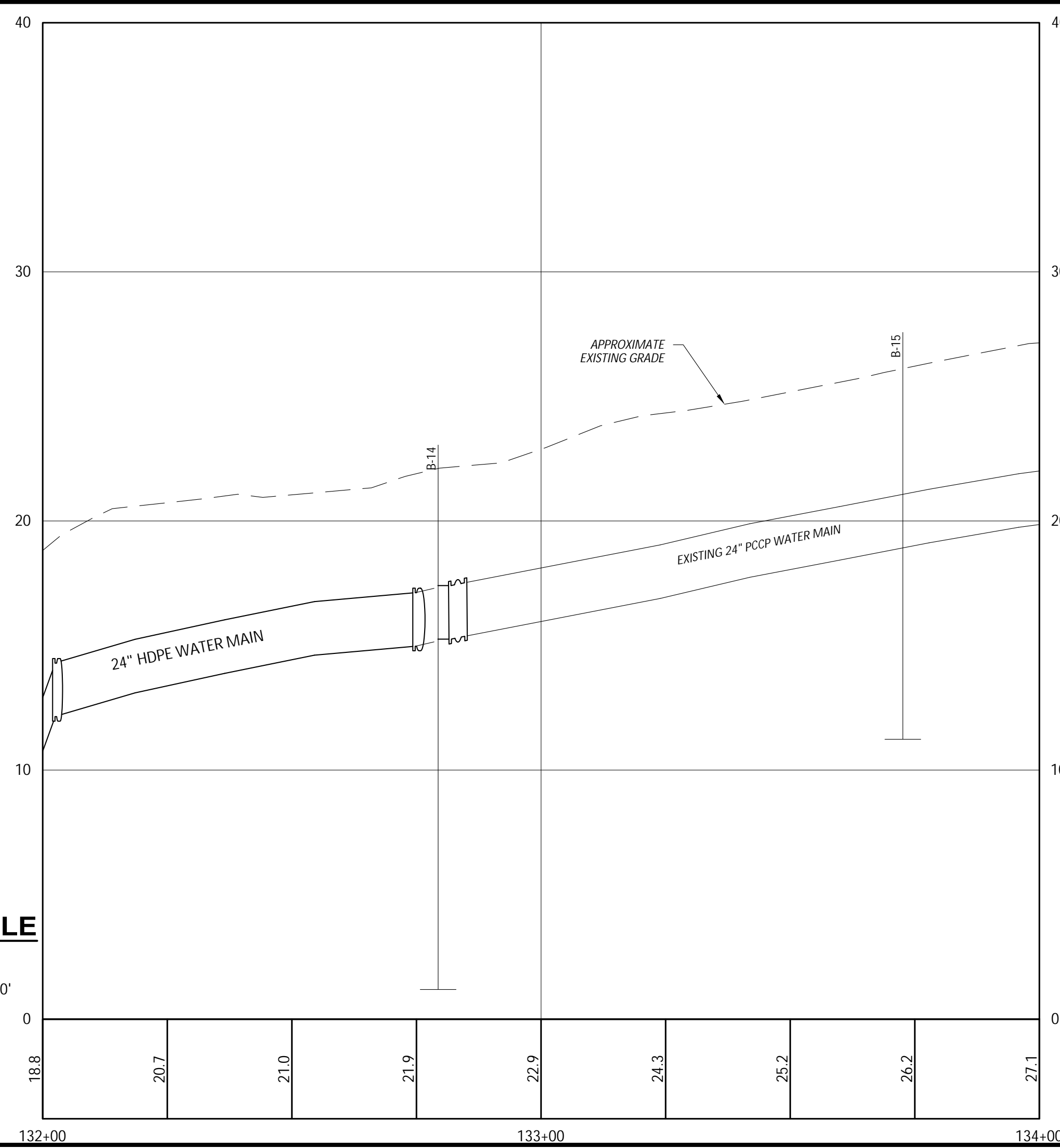
CITY OF PORTSMOUTH
 SUBAQUEOUS WATER TRANSMISSION MAIN
 PISCATAQUA RIVER, DURHAM-NEWINGTON
 NEW HAMPSHIRE
 WATER MAIN REPLACEMENT PLAN & PROFILE V
 STA. 124+00 TO STA. 130+00

NOTES

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PROFILE
 SCALES
 VERT: 1"=4'
 HORIZ: 1"=20'



NO	DESCRIPTION	DATE
1	PRELIMINARY DESIGN - NOT FOR CONSTRUCTION	07/20

DESIGNED BY: W. EDG	W. EDG
CAD CORP: W. EDG	W. EDG
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APPROVED BY:	
DATE:	1/14/2024
PROJECT NO:	14202A

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CITY OF PORTSMOUTH
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 NEW HAMPSHIRE
 WATER MAIN REPLACEMENT PLAN & PROFILE V1
 STA. 130+00 TO STA 133+00

DRAWING
 C-12

EROSION AND SEDIMENTATION CONTROL NOTES

THIS PLAN HAS BEEN DEVELOPED AS A STRATEGY TO CONTROL SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION. THIS PLAN IS BASED ON THE NEW HAMPSHIRE STORMWATER MANUAL BY THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES, TERRAIN ALTERATION BUREAU, DATED DECEMBER 2008

THE PROPOSED LOCATIONS OF SILTATION AND EROSION CONTROL STRUCTURES REQUIRED ARE SHOWN ON THE DRAWINGS. PROVIDE SILT FENCE, STONE CHECK DAMS AND OTHER EROSION CONTROL MEASURES AS REQUIRED TO ADEQUATELY PREVENT SEDIMENT TRANSPORT AS NOTED IN THE BMP.

- ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL AND THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES, ENV-Wq 1500: ALTERATION OF TERRAIN AND THE NHDES BEST MANAGEMENT PRACTICES MANUAL FOR THE UTILITY MAINTENANCE IN AND ADJACENT TO WETLANDS AND WATERBODIES.
- THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE MAINTAINED IN AN UNTREATED OR UNVEGETATED CONDITION FOR THE MINIMUM TIME REQUIRED. IN GENERAL AREAS TO BE VEGETATED SHALL BE PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL.
- SEDIMENT BARRIERS (SILT FENCE, STONE CHECK DAMS, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF UPGRADIENT DRAINAGE AREAS.
- INSTALL SILT FENCE AT TOE OF SLOPES TO FILTER SILT FROM RUNOFF. SEE SILT FENCE DETAIL FOR PROPER INSTALLATION. SILT FENCE WILL REMAIN IN PLACE PER NOTE #5.
- ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITS MUST BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE PERMANENTLY STABILIZED.
- NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2 TO 1) UNLESS STABILIZED WITH RIPRAP OR OTHER STRUCTURAL MEANS.
- IF FINAL SEEDING AND SODDING IS NOT EXPECTED PRIOR TO THE ANTICIPATED DATE OF THE FIRST KILLING FROST, USE TEMPORARY ANNUAL REYGRASS SEEDING AND MULCHING ON ROUGH GRADED SUBSOIL TO PROTECT THE SITE AND DELAY PERMANENT LOAMING, FINE GRADING, AND SEEDING OR SODDING UNTIL SPRING.
- WHEN FEASIBLE, TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINISH GRADED SHALL BE COMPLETED 30 DAYS PRIOR TO THE FIRST KILLING FROST.
- DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED ONTO OPEN AREAS. POST SEEDING SEDIMENT, IF ANY, WILL BE DISPOSED OF IN AN ACCEPTABLE MANNER.
- REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND REVEGETATED.
- ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.
- STABILIZATION SCHEDULE BEFORE WINTER:
 - SEPTEMBER 15** ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED. ALL SLOPES MUST BE STABILIZED, SEEDED AND MULCHED. SLOPES 3:1 OR GREATER TO BE STABILIZED WITH EROSION CONTROL MATTING AND SEEDED. ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANNUAL GRASS MUST BE SEEDED AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND MULCHED.
 - OCTOBER 1** ALL GRASS-LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR EROSION CONTROL BLANKET.
 - NOVEMBER 15** ALL STONE-LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED. SLOPES THAT ARE COVERED WITH RIPRAP MUST BE CONSTRUCTED BY THAT DATE.
 - DECEMBER 1** ALL DISTURBED AREAS WHERE THE GROWTH OF VEGETATION FAILS TO BE AT LEAST THREE INCHES TALL OR AT LEAST 75% OF THE DISTURBED SOIL IS COVERED BY VEGETATION, MUST BE PROTECTED FOR OVER-WINTER.

EROSION CONTROL - WINTER CONSTRUCTION

- WINTER CONSTRUCTION PERIOD DEFINED: NOVEMBER 1 THROUGH APRIL 15
- WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.
- EXPOSED AREA SHOULD BE LIMITED SUCH THAT THE AREA CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.
- CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.
- AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW AT A RATE OF 100 LB. PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE. IN ALL CASES, MULCH SHALL BE APPLIED SUCH THAT SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH.
- BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE-FREEZING TEMPERATURES, THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED AND IS SMOOTH, THEN THE AREA MUST BE STABILIZED WITH MULCH. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT EXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OF HAY OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.
- THE APPLICATION OF MULCH TO FINE GRADED AREAS WILL BE STABILIZED AS FOLLOWS:
 - A) BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 15TH ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING, ASPHALT EMULSION, CHEMICAL TACK OR WOOD CELLULOSE FIBER.
 - B) MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GRATER THAN 8%.
 - C) MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15%. AFTER OCTOBER 1ST, THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.

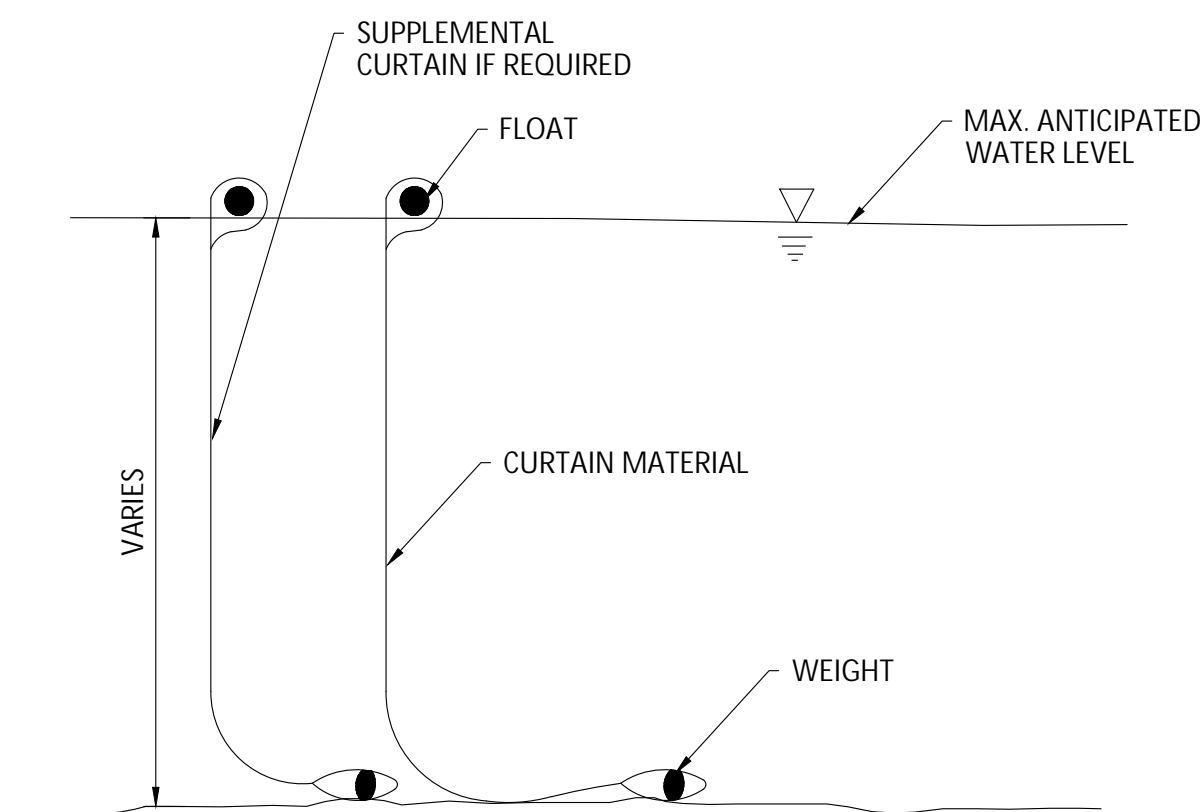
- AFTER NOVEMBER 1ST THE CONTRACTOR SHALL APPLY MULCH AND ANCHORING ON ALL BARE EARTH AT THE END OF EACH WORKING DAY.
- DURING WINTER CONSTRUCTION PERIODS ALL SNOW SHALL BE REMOVED FROM AREAS OF MULCHING PRIOR TO PLACEMENT.

EROSION CONTROL - WETLAND NOTES

- WETLANDS AND SURFACE WATERS (EXCEPTING THOSE WHICH ARE TO BE FILLED IN ACCORDANCE WITH STATE AND FEDERAL REGULATIONS) WILL BE PROTECTED WITH SILT FENCE. INSTALLED AT THE EDGE OF THE WETLAND OR THE BOUNDARY OF WETLAND DISTURBANCE.
- IF THE WORK INCLUDES CROSSING OF WETLANDS AND/OR STREAMS, THE CONTRACTOR SHALL TAKE SPECIAL PRECAUTIONS WORKING IN THESE AREAS. CONTRACTOR IS TO PLAN EARTH DISTURBANCE AND GRADING ACTIVITIES TO MINIMIZE THE AREA OF SOIL EXPOSED AT ONE TIME, AS WELL AS THE LENGTH OF TIME BETWEEN INITIAL SOIL EXPOSURE AND FINAL GRADING.
- ANY WETLAND CROSSING WORK SHALL BE COMPLETED BETWEEN THE PERIOD OF MAY 1 AND SEPTEMBER 30
- ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO COMMENCING CONSTRUCTION WITHIN OR ADJACENT TO WETLAND AREAS.
- WETLAND VEGETATIVE LAYERS SHALL BE REMOVED AND SALVAGED FOR RESTORATION OF THE DISTURBED AREAS.
- SOIL EXCAVATED FROM WETLANDS SHALL BE TEMPORARILY STOCKPILED IN UPLAND AREAS SEPARATED FROM OTHER MATERIALS AND SOILS. ALL STOCKPILED WETLAND SOILS SHALL BE PUT BACK IN THE SAME TRENCH THEY WERE EXCAVATED FROM. STORAGE AREAS FOR WETLAND MATERIALS SHALL BE PROPERLY PROTECTED AGAINST EROSION.
- DISPERSE CLEAN STORMWATER AWAY FROM ALL WETLANDS TO UNDISTURBED, VEGETATED, FLAT OR MODERATE-SLOPED, SURFACES WHEREVER POSSIBLE, RATHER THAN CONCENTRATED INTO CHANNELS.
- ANY SIGN OF RILL OR GULLY EROSION SHALL BE IMMEDIATELY INVESTIGATED AND REPAIRED AS NEEDED BASED ON THE DISCRETION OF THE ENGINEER AND OR OWNER.
- ONLY DISTURB, CLEAR OR GRADE AREAS NECESSARY FOR CONSTRUCTION. FLAG OR OTHERWISE DELINEATE IDENTIFIED WETLAND AREAS NOT TO BE DISTURBED. EXCLUDE VEHICLES AND CONSTRUCTION EQUIPMENT FROM THESE AREAS TO PRESERVE NATURAL VEGETATION. CONTRACTOR TO AVOID GRADING IN WETLANDS CROSSING AREAS.
- FALL AND WINTER EROSION CONTROL MEASURES MUST BE UPGRADED AND REFINED TO PROTECT THE DISTURBED WETLAND AREAS FROM SPRING RUNOFF AND SNOWMELT
- SEEDING OF THE DISTURBED AREAS WITHIN WETLAND AREAS SHALL UTILIZE MIXTURES APPROPRIATE FOR WETLAND AREAS AS OUTLINED IN SECTION 02270 OF THE SPECIFICATIONS.
- TRENCH DEWATERING RUNOFF MUST BE DIRECTED AWAY FROM WETLANDS AREAS USING THE APPLICABLE EROSION CONTROL PRACTICES. DEWATERING WILL NOT BE PERMITTED FOR TRENCH EXCAVATION IN WETLANDS.

SALT MARSH SALVAGE AND RESTORATION NOTES

- ALL CONSTRUCTION AND RESTORATION SHALL BE DONE UNDER THE SUPERVISION OF THE ENGINEER AND AN ENVIRONMENTAL MONITOR.
- INSTALL EROSION CONTROLS ALONG THE EDGE OF WORK TO PREVENT DISTURBED SOIL FROM MIGRATING INTO THE SALT MARSH DURING THE WORK PERIOD.
- EXCAVATION WITHIN THE SALT MARSH SHALL BE LIMITED TO ONLY THE AREA NECESSARY FOR INSTALLATION OF THE NEW PIPE LINE.
- MATTING AND EXCAVATION WITHIN THE SALT MARSH SHALL BE LIMITED TO THE SHORTEST AMOUNT OF TIME PRACTICABLE.
- IN THE EXCAVATION AREAS, ALL SUITABLE SALT MARSH PEAT WILL BE SALVAGED AND STOCKPILED FOR REPLACEMENT DURING RESTORATION. SUITABLE PEAT WILL BE DEFINED IN THE FIELD BY THE ENVIRONMENTAL MONITOR, BUT WILL BE PROTECTED FROM SUN, WIND, DEHYDRATION AND FREEZING IN A SUITABLE UPLAND AREA AND MAINTAINED FOR THE DURATION OF THE PROJECT. THE PEAT BLOCKS SHALL BE KEPT MOIST WITH FRESH WATER.
- OUTSIDE THE EXCAVATION AREAS, TIMBER MATS SHALL BE USED TO PROTECT THE MARSH FROM EQUIPMENT AND FOOT TRAFFIC.
- THE SALVAGED PEAT BLOCKS SHALL BE PROTECTED FROM THE SUN, WIND, DEHYDRATION, AND FREEZING IN A SUITABLE UPLAND AREA AND MAINTAINED FOR THE DURATION OF THE PROJECT. THE PEAT BLOCKS SHALL BE KEPT MOIST WITH FRESH WATER.
- CONSTRUCTION IN THE SALVAGE AREA SHALL BE COMPLETED SUCH THAT THE SALVAGED BLOCKS ARE REPLACED NO LATER THAN NOVEMBER 1. IF THE CONSTRUCTION EXTENDS BEYOND NOVEMBER 1, THE PEAT BLOCKS WILL BE MAINTAINED THROUGH THE WINTER AND REPLACED IN APRIL OF THE FOLLOWING YEAR.
- UPON COMPLETION OF THE WATER MAIN INSTALLATION AND BACKFILLING, THE UNDERLYING SUBSTRATES WILL BE RESTORED TO APPROPRIATE SUBGRADES TO SUPPORT THE PEAT BLOCKS. FINAL ELEVATION OF THE TOP OF PEAT SHALL BE EQUAL TO OR UP TO 2 INCHES HIGHER THAN THE PRE-CONSTRUCTION CONDITION.
- THE PEAT BLOCKS SHALL BE REPLACED TO MATCH THE ORIGINAL SALT MARSH LIMITS. PEAT BLOCKS SHALL BE ANCHORED WITH 3/8 INCH REBAR STAKES DRIVEN INTO THE SUBSTRATES AND/OR ADJACENT PEAT. ANY OPENING BETWEEN THE PEAT BLOCKS WILL BE FILLED WITH SAND TO COVER EXPOSED ROOTS AND MAINTAIN GRADES. ADDITIONAL SALT MARSH CORDGRASS (SPARTINA ALTERNIFLORA) SEEDLINE SHALL BE PLANTED IN THE GAP BETWEEN THE PEAT BLOCKS IF IT EXCEEDS 4 INCHES.
- IF THE SALVAGED PEAT BLOCKS DO NOT FULLY COVER THE DISTURBED MARSH AREA, CORDGRASS SEEDLINGS SHALL BE PLANTED AT 1 SQ. FT INTERVALS IN THE AREAS THAT WERE PREVIOUSLY MARSH AREAS.
- IN THE REPLANTING AREAS, THE SUBSTRATES SHALL BE RESTORED WITH SAND, CONTAINED WITHIN SANDBAGS OR OTHERWISE PROTECTED, TO STABILIZE THE SEDIMENTS. SURFACE ELEVATIONS SHALL MATCH PRE-CONSTRUCTION CONDITIONS OR AS DIRECTED BY THE ENVIRONMENTAL MONITOR. THE SEAWARD FACE OF THE RESTORED MARSH WILL BE PROTECTED FROM ICE AND WAVE ACTION WITH COIR LOGS AND/OR BOULDERS, AS COORDINATED WITH THE ENVIRONMENTAL MONITOR.

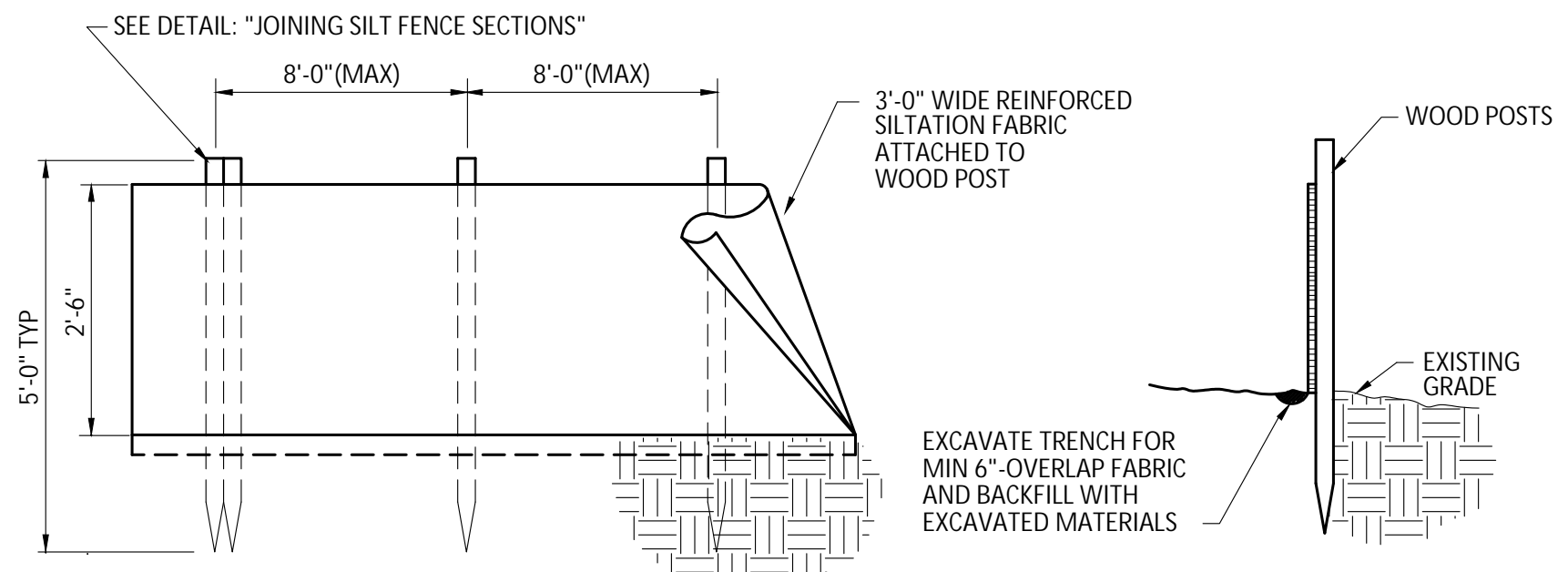


NOTES:

- TURBIDITY CURTAIN SHALL BE APPROXIMATELY RATED FOR RIVERINE AND TIDAL ENVIRONMENTS.
- CURTAIN SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

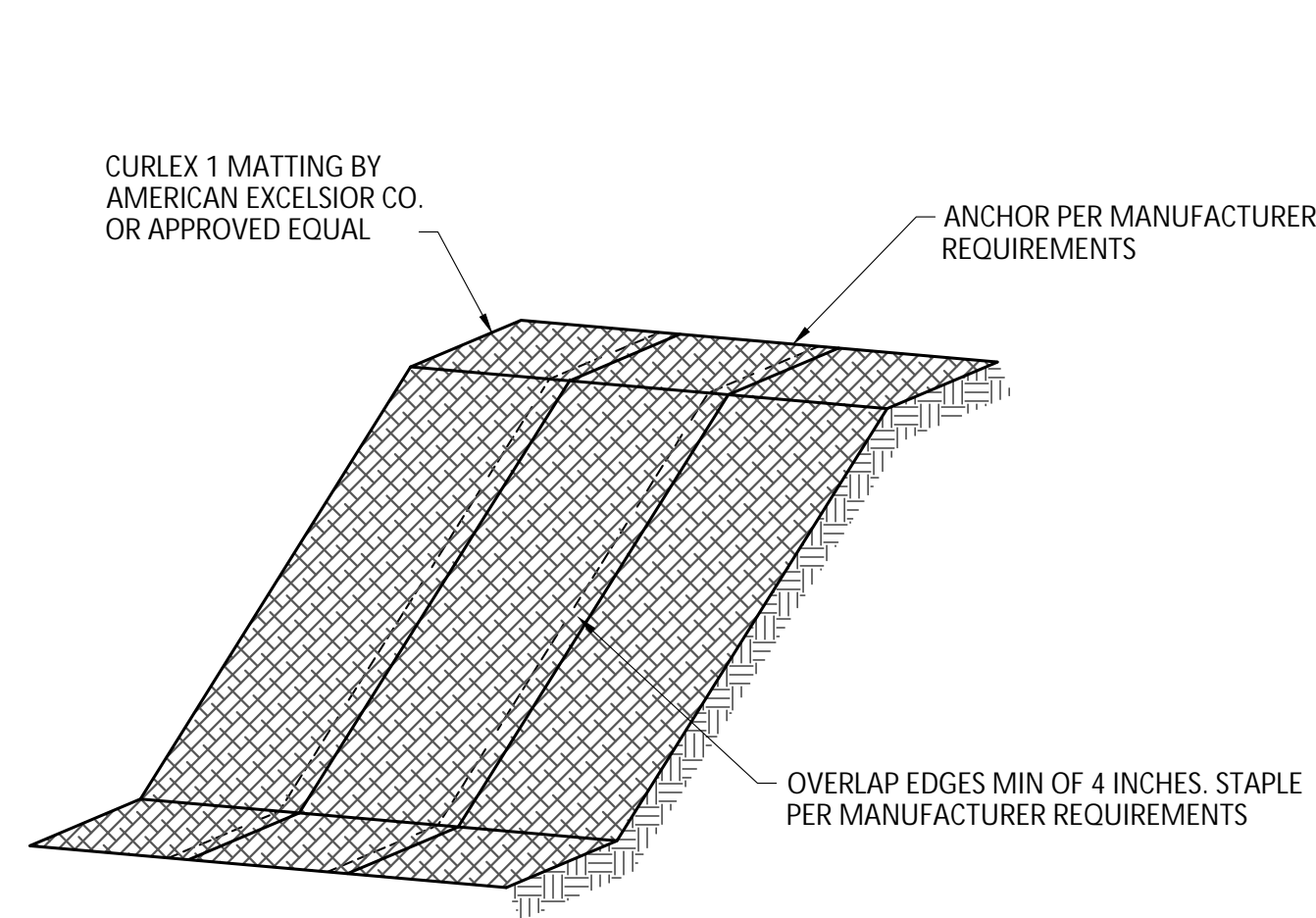
FLOATING SEDIMENT TURBIDITY CURTAIN

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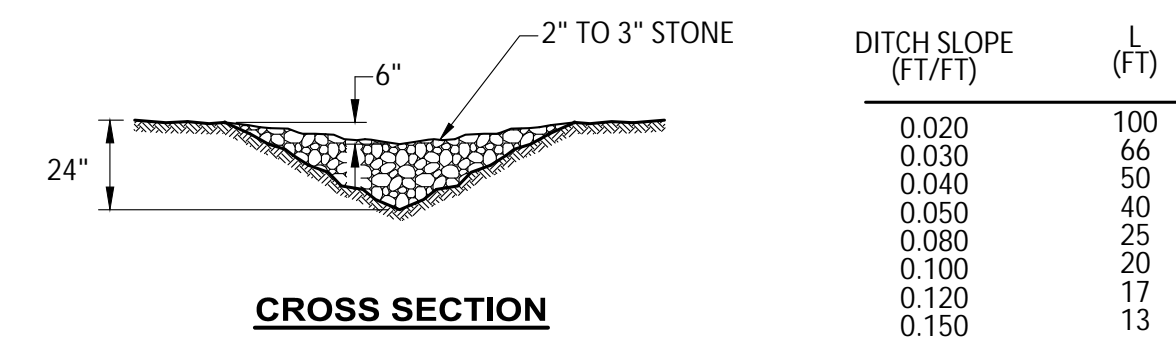
SILT FENCE INSTALLATION DETAIL

NTS

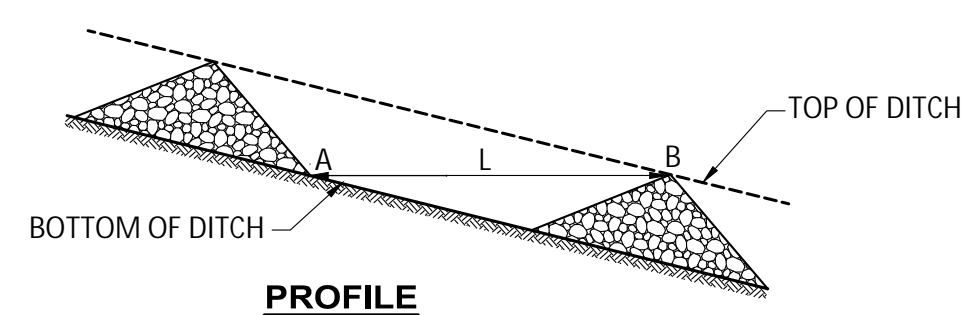


EROSION CONTROL MATTING - SLOPES

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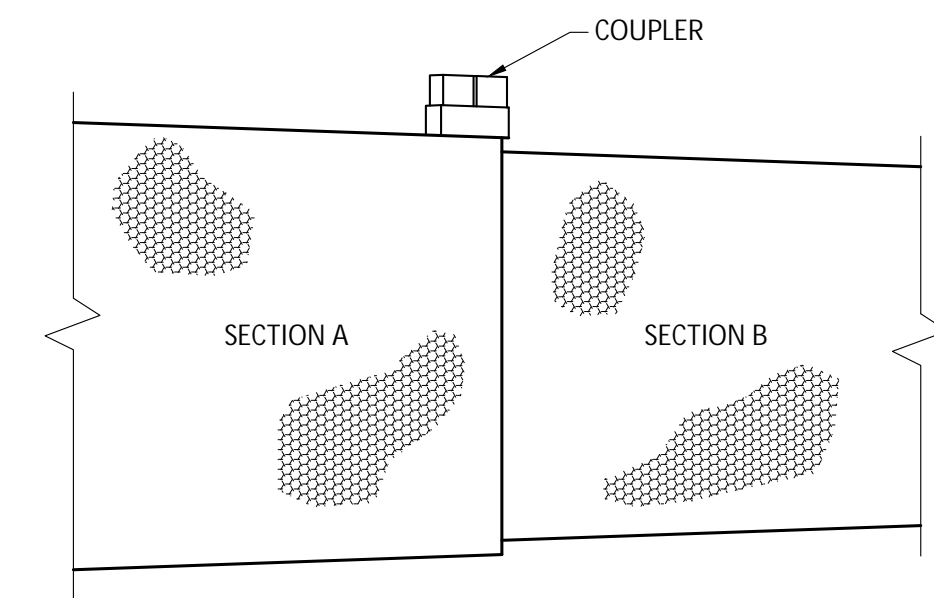
CROSS SECTION



PROFILE

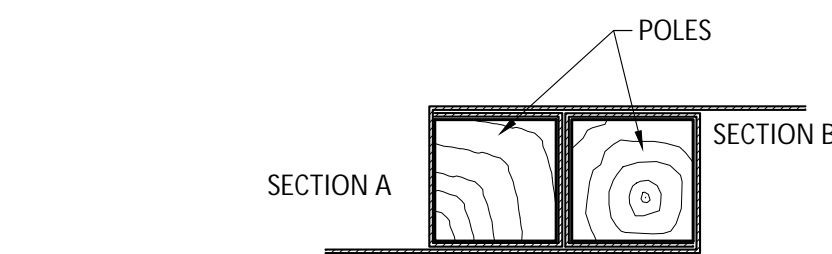
STONE CHECK DAM DETAIL

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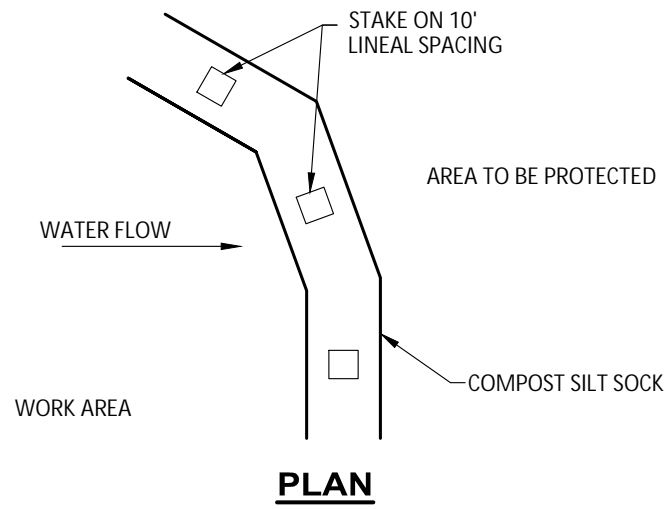
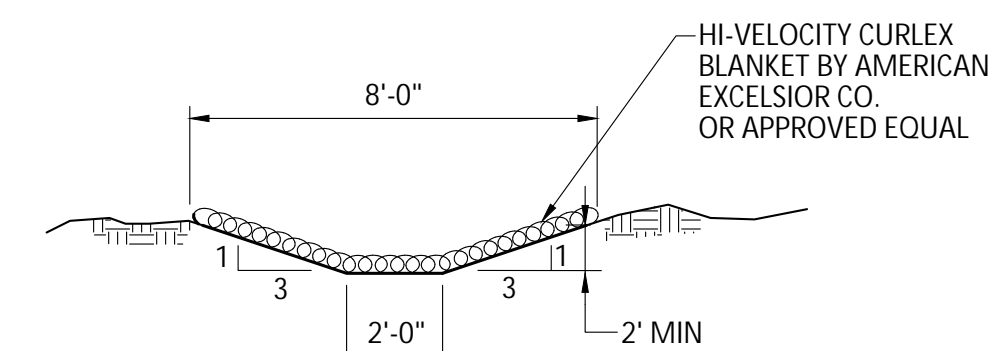
JOINING SILT FENCE SECTIONS

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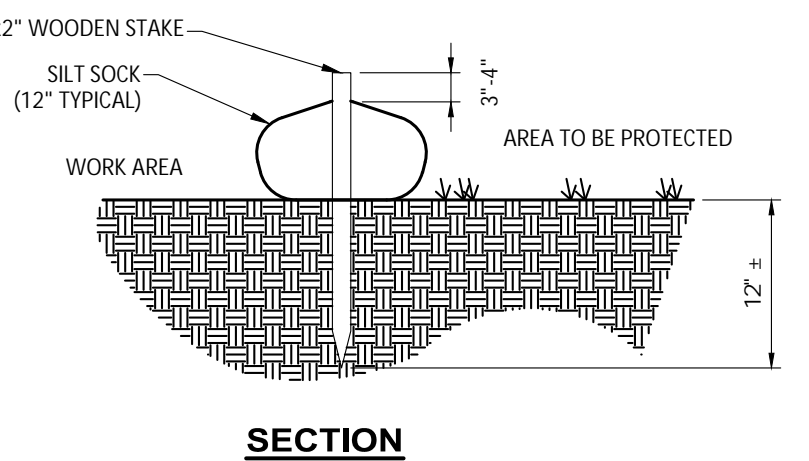


EROSION CONTROL MATTING - DITCHES

NTS



PLAN



SECTION

NOTES:

- ALL MATERIAL TO MEET SPECIFICATIONS
- SILT SOCK COMPOST/SOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS
- SILT SOCK DEPICTED IS FOR MINIMUM SLOPES. GREATER SLOPES MAY REQUIRE LARGER SOCKS PER THE ENGINEER
- COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

COMPOST SILT SOCK

NTS

NO	DATE	DESCRIPTION
1	07/20	PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

DESIGNED BY: B. LECK	APPROVED BY: DATE: 11/20/20
CAD CORP: W. LEDG	PROJECT NO: 14202A
CD: W. LEDG	
CHECKED BY: DATE:	

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CITY OF PORTSMOUTH
SUBAQUEOUS WATER TRANSMISSION MAIN
PISCATAQUA RIVER, DURHAM-NEWINGTON
NEW HAMPSHIRE
EROSION CONTROL NOTES & DETAILS - DURHAM SITE

EROSION AND SEDIMENTATION CONTROL NOTES

THIS PLAN HAS BEEN DEVELOPED AS A STRATEGY TO CONTROL SOIL EROSION AND SEDIMENTATION DURING AND AFTER CONSTRUCTION. THIS PLAN IS BASED ON THE NEW HAMPSHIRE STORMWATER MANUAL BY THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES, TERRAIN ALTERATION BUREAU, DATED DECEMBER 2008

THE PROPOSED LOCATIONS OF SILTATION AND EROSION CONTROL STRUCTURES REQUIRED ARE SHOWN ON THE DRAWINGS. PROVIDE SILT FENCE, STONE CHECK DAMS AND OTHER EROSION CONTROL MEASURES AS REQUIRED TO ADEQUATELY PREVENT SEDIMENT TRANSPORT AS NOTED IN THE BMP.

- ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE DONE IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANAGEMENT MANUAL AND THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES, ENV-Wq 1500: ALTERATION OF TERRAIN AND THE NHDES BEST MANAGEMENT PRACTICES MANUAL FOR THE UTILITY MAINTENANCE IN AND ADJACENT TO WETLANDS AND WATERBODIES.
- THOSE AREAS UNDERGOING ACTUAL CONSTRUCTION WILL BE MAINTAINED IN AN UNTREATED OR UNVEGETATED CONDITION FOR THE MINIMUM TIME REQUIRED. IN GENERAL AREAS TO BE VEGETATED SHALL BE PERMANENTLY STABILIZED WITHIN 15 DAYS OF FINAL GRADING AND TEMPORARILY STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE OF THE SOIL.
- SEDIMENT BARRIERS (SILT FENCE, STONE CHECK DAMS, ETC.) SHOULD BE INSTALLED PRIOR TO ANY SOIL DISTURBANCE OF UPGRADIENT DRAINAGE AREAS.
- INSTALL SILT FENCE AT TOE OF SLOPES TO FILTER SILT FROM RUNOFF. SEE SILT FENCE DETAIL FOR PROPER INSTALLATION. SILT FENCE WILL REMAIN IN PLACE PER NOTE #5.
- ALL EROSION CONTROL STRUCTURES WILL BE INSPECTED, REPLACED AND/OR REPAIRED EVERY 7 DAYS AND IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL OR SNOW MELT OR WHEN NO LONGER SERVICEABLE DUE TO SEDIMENT ACCUMULATION OR DECOMPOSITION. SEDIMENT DEPOSITS MUST BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF THE HEIGHT OF THE BARRIER. SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL AREAS UPSLOPE ARE PERMANENTLY STABILIZED.
- NO SLOPES, EITHER PERMANENT OR TEMPORARY, SHALL BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2 TO 1) UNLESS STABILIZED WITH RIPRAP OR OTHER STRUCTURAL MEANS.
- IF FINAL SEEDING AND SODDING IS NOT EXPECTED PRIOR TO THE ANTICIPATED DATE OF THE FIRST KILLING FROST, USE TEMPORARY ANNUAL REYGRASS SEEDING AND MULCHING ON ROUGH GRADED SUBSOIL TO PROTECT THE SITE AND DELAY PERMANENT LOAMING, FINE GRADING, AND SEEDING OR SODDING UNTIL SPRING.
- WHEN FEASIBLE, TEMPORARY SEEDING OF DISTURBED AREAS THAT HAVE NOT BEEN FINISH GRADED SHALL BE COMPLETED 30 DAYS PRIOR TO THE FIRST KILLING FROST.
- DURING THE CONSTRUCTION PHASE, INTERCEPTED SEDIMENT WILL BE RETURNED TO THE SITE AND REGRADED ONTO OPEN AREAS. POST SEEDING SEDIMENT, IF ANY, WILL BE DISPOSED OF IN AN ACCEPTABLE MANNER.
- REVEGETATION MEASURES WILL COMMENCE UPON COMPLETION OF CONSTRUCTION EXCEPT AS NOTED ABOVE. ALL DISTURBED AREAS NOT OTHERWISE STABILIZED WILL BE GRADED, SMOOTHED, AND REVEGETATED.
- ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE THE SITE IS STABILIZED.
- STABILIZATION SCHEDULE BEFORE WINTER:
 - SEPTEMBER 15** ALL DISTURBED AREAS MUST BE SEEDED AND MULCHED. ALL SLOPES MUST BE STABILIZED, SEEDED AND MULCHED. SLOPES 3:1 OR GREATER TO BE STABILIZED WITH EROSION CONTROL MATTING AND SEEDED. ALL DISTURBED AREAS TO BE PROTECTED WITH AN ANNUAL GRASS MUST BE SEEDED AT A SEEDING RATE OF 3 POUNDS PER 1,000 SQUARE FEET AND MULCHED.
 - OCTOBER 1** ALL GRASS-LINED DITCHES AND CHANNELS MUST BE STABILIZED WITH MULCH OR EROSION CONTROL BLANKET.
 - NOVEMBER 15** ALL STONE-LINED DITCHES AND CHANNELS MUST BE CONSTRUCTED AND STABILIZED. SLOPES THAT ARE COVERED WITH RIPRAP MUST BE CONSTRUCTED BY THAT DATE.
 - DECEMBER 1** ALL DISTURBED AREAS WHERE THE GROWTH OF VEGETATION FAILS TO BE AT LEAST THREE INCHES TALL OR AT LEAST 75% OF THE DISTURBED SOIL IS COVERED BY VEGETATION, MUST BE PROTECTED FOR OVER-WINTER.

EROSION CONTROL - WINTER CONSTRUCTION

- WINTER CONSTRUCTION PERIOD DEFINED: NOVEMBER 1 THROUGH APRIL 15
- WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE SITE IS WITHOUT STABILIZATION AT ANY ONE TIME.
- EXPOSED AREA SHOULD BE LIMITED SUCH THAT THE AREA CAN BE MULCHED IN ONE DAY PRIOR TO ANY SNOW EVENT.
- CONTINUATION OF EARTHWORK OPERATIONS ON ADDITIONAL AREAS SHALL NOT BEGIN UNTIL THE EXPOSED SOIL SURFACE ON THE AREA BEING WORKED HAS BEEN STABILIZED SUCH THAT NO LARGER AREA OF THE SITE IS WITHOUT EROSION CONTROL PROTECTION AS LISTED IN ITEM 2 ABOVE.
- AN AREA SHALL BE CONSIDERED TO HAVE BEEN STABILIZED WHEN EXPOSED SURFACES HAVE BEEN EITHER MULCHED WITH STRAW AT A RATE OF 100 LB. PER 1,000 SQUARE FEET (WITH OR WITHOUT SEEDING) OR DORMANT SEEDED, MULCHED AND ADEQUATELY ANCHORED BY AN APPROVED ANCHORING TECHNIQUE. IN ALL CASES, MULCH SHALL BE APPLIED SUCH THAT SOIL SURFACE IS NOT VISIBLE THROUGH THE MULCH.
- BETWEEN THE DATES OF OCTOBER 15 AND APRIL 1ST, LOAM OR SEED WILL NOT BE REQUIRED. DURING PERIODS OF ABOVE-FREEZING TEMPERATURES, THE SLOPES SHALL BE FINE GRADED AND EITHER PROTECTED WITH MULCH OR TEMPORARILY SEEDED AND MULCHED UNTIL SUCH TIME AS THE FINAL TREATMENT CAN BE APPLIED. IF THE DATE IS AFTER NOVEMBER 1ST AND IF THE EXPOSED AREA HAS BEEN LOAMED, FINAL GRADED AND IS SMOOTH, THEN THE AREA MUST BE STABILIZED WITH MULCH. IF CONSTRUCTION CONTINUES DURING FREEZING WEATHER, ALL EXPOSED AREAS SHALL BE GRADED BEFORE FREEZING AND THE SURFACE TEMPORARILY PROTECTED FROM EROSION BY THE APPLICATION OF MULCH. SLOPES SHALL NOT BE LEFT EXPOSED OVER THE WINTER OR ANY OTHER EXTENDED TIME OF WORK SUSPENSION UNLESS TREATED IN THE ABOVE MANNER. UNTIL SUCH TIME AS WEATHER CONDITIONS ALLOW DITCHES TO BE FINISHED WITH THE PERMANENT SURFACE TREATMENT, EROSION SHALL BE CONTROLLED BY THE INSTALLATION OF BALES OF HAY OR STONE CHECK DAMS IN ACCORDANCE WITH THE STANDARD DETAILS.
- THE APPLICATION OF MULCH TO FINE GRADED AREAS WILL BE STABILIZED AS FOLLOWS:
 - A) BETWEEN THE DATES OF NOVEMBER 1ST AND APRIL 15TH ALL MULCH SHALL BE ANCHORED BY EITHER PEG LINE, MULCH NETTING, ASPHALT EMULSION, CHEMICAL TACK OR WOOD CELLULOSE FIBER.
 - B) MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL DRAINAGE WAYS WITH A SLOPE GREATER THAN 3% FOR SLOPES EXPOSED TO DIRECT WINDS AND FOR ALL OTHER SLOPES GRATER THAN 8%.
 - C) MULCH NETTING SHALL BE USED TO ANCHOR MULCH IN ALL AREAS WITH SLOPES GREATER THAN 15%. AFTER OCTOBER 1ST, THE SAME APPLIES FOR ALL SLOPES GREATER THAN 8%.
- AFTER NOVEMBER 1ST THE CONTRACTOR SHALL APPLY MULCH AND ANCHORING ON ALL BARE EARTH AT THE END OF EACH WORKING DAY.
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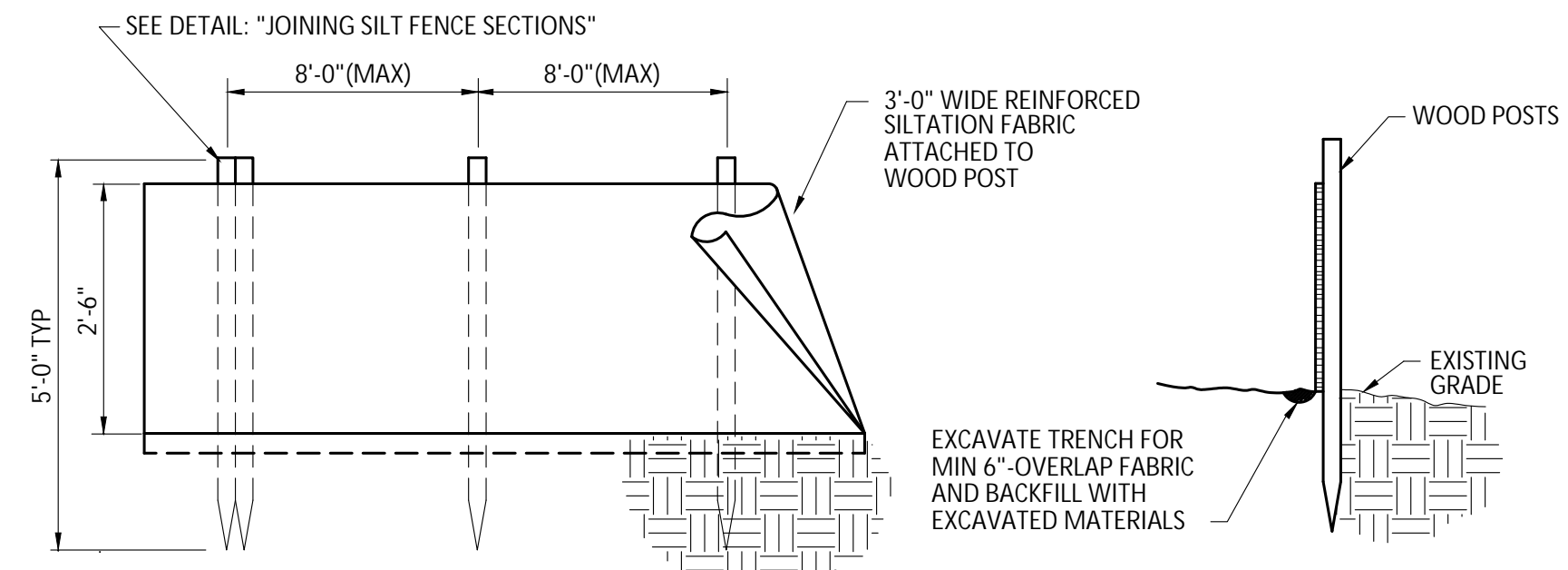
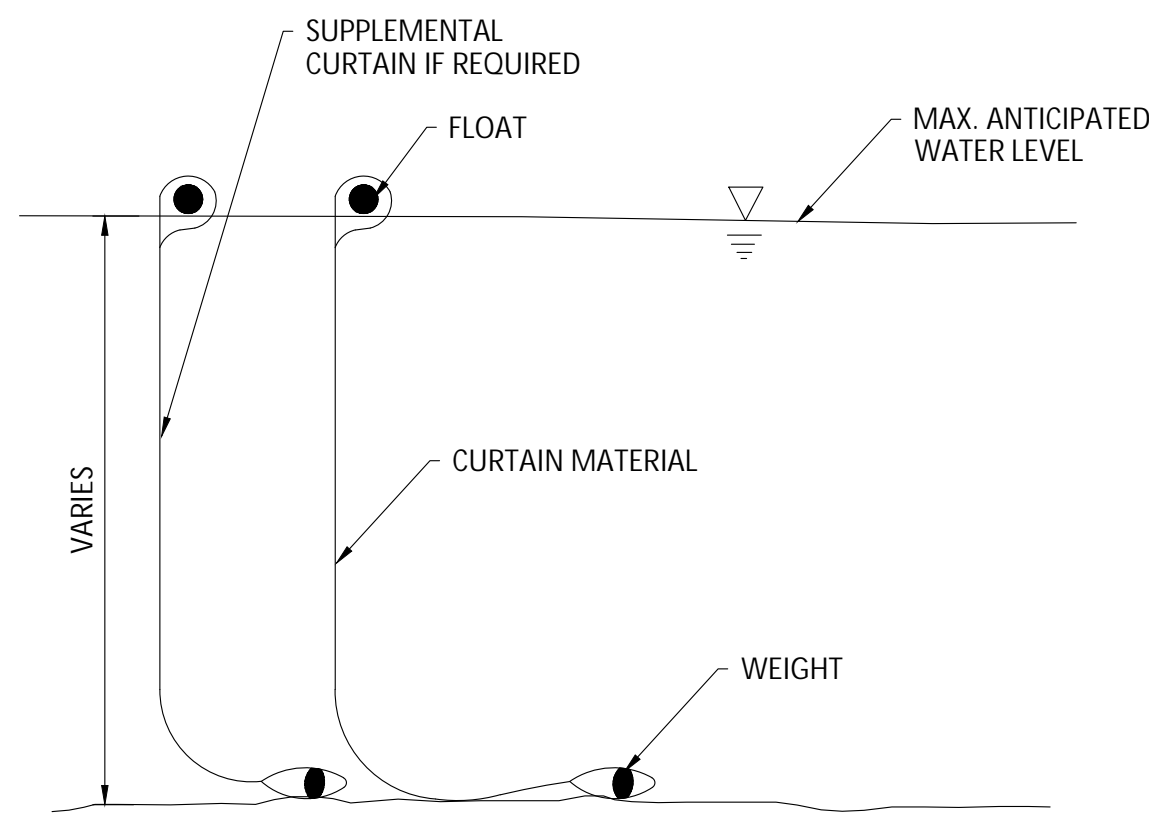
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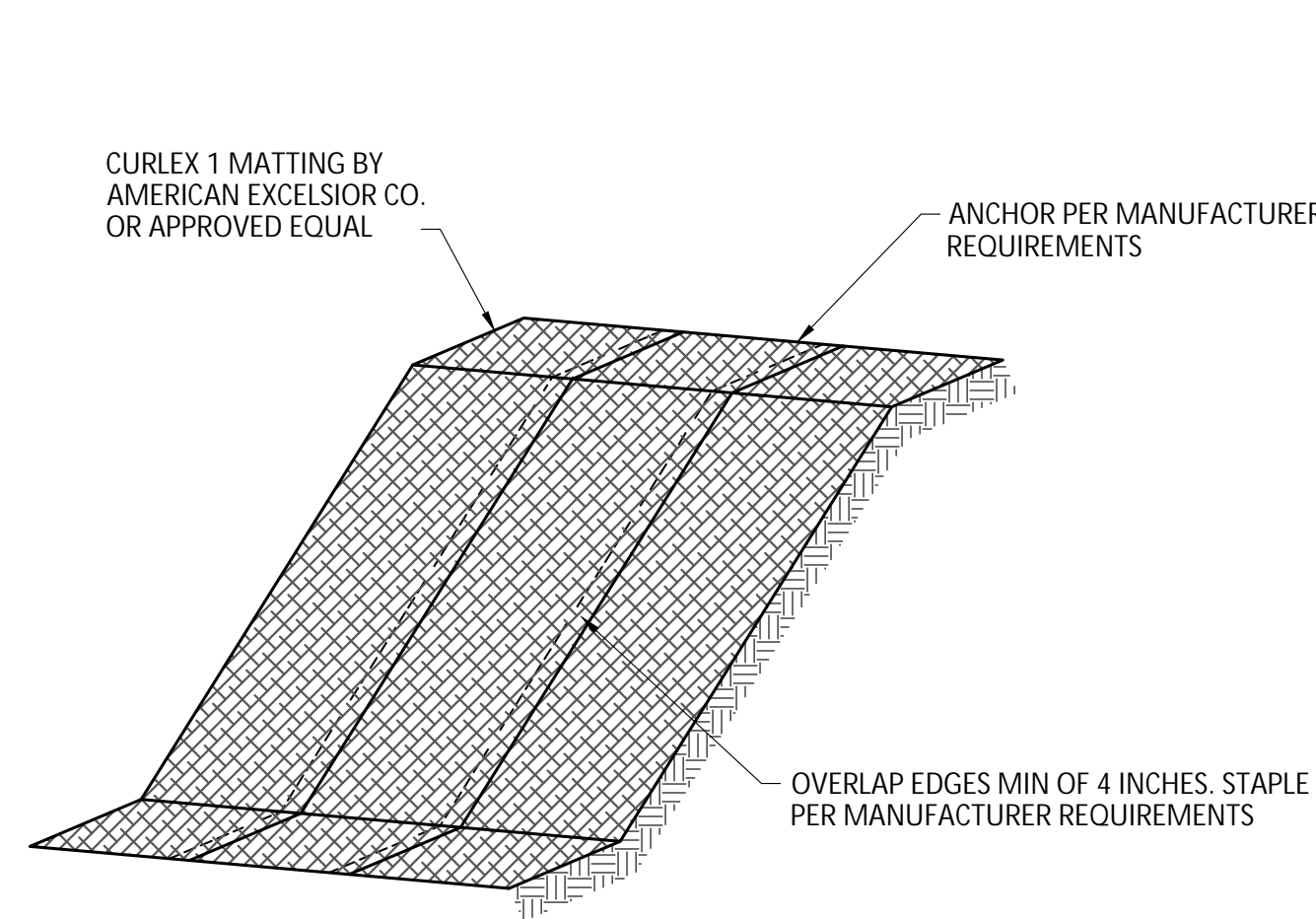
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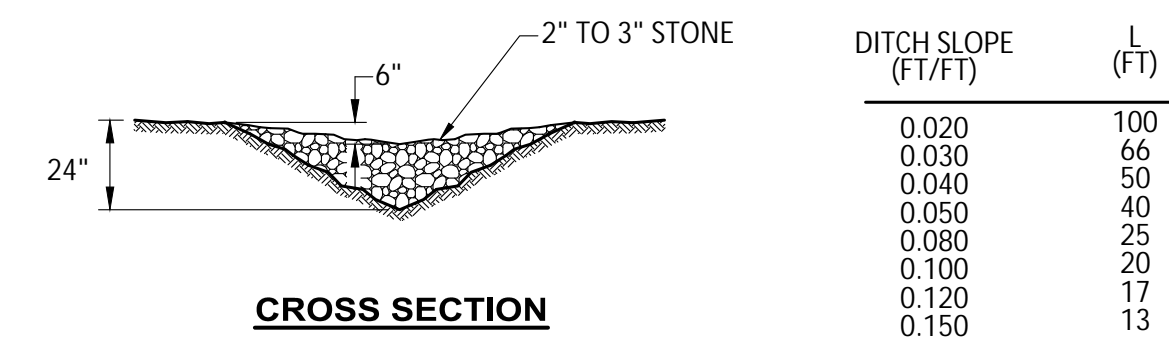
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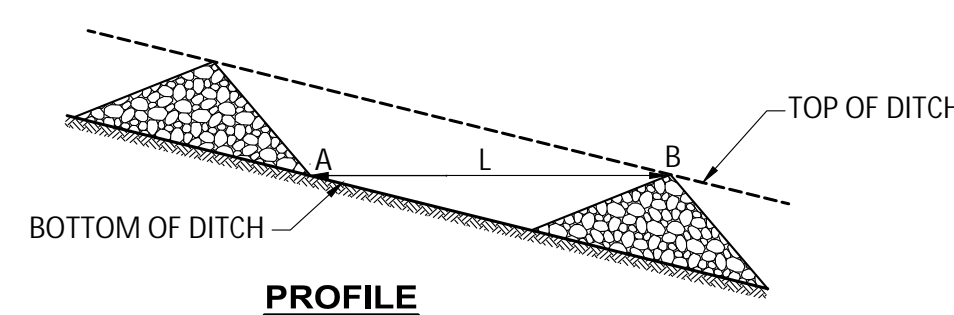


EROSION CONTROL MATTING - SLOPES

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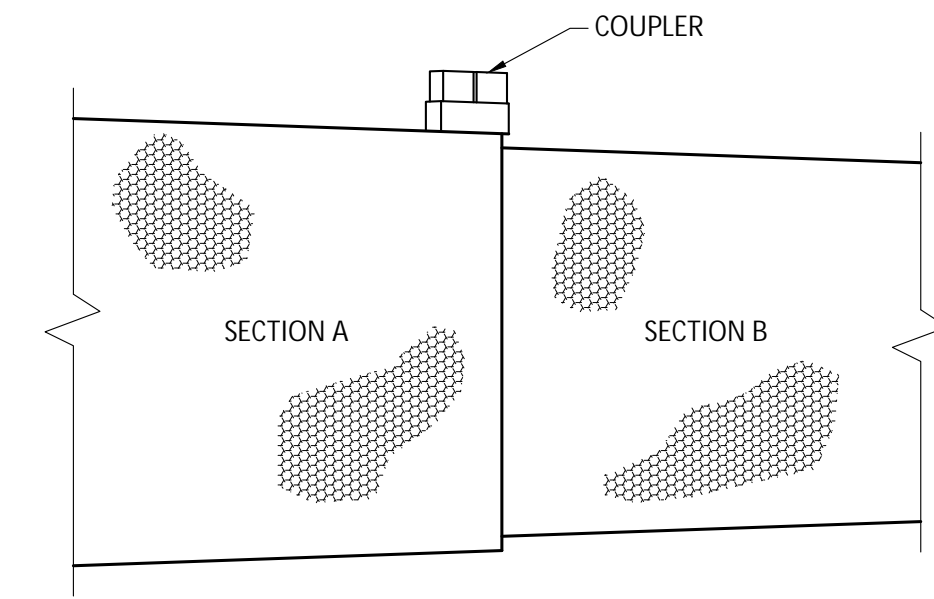
CROSS SECTION



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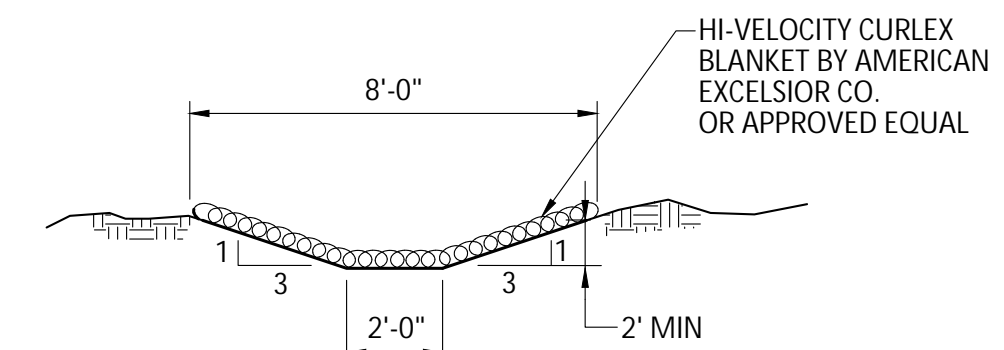
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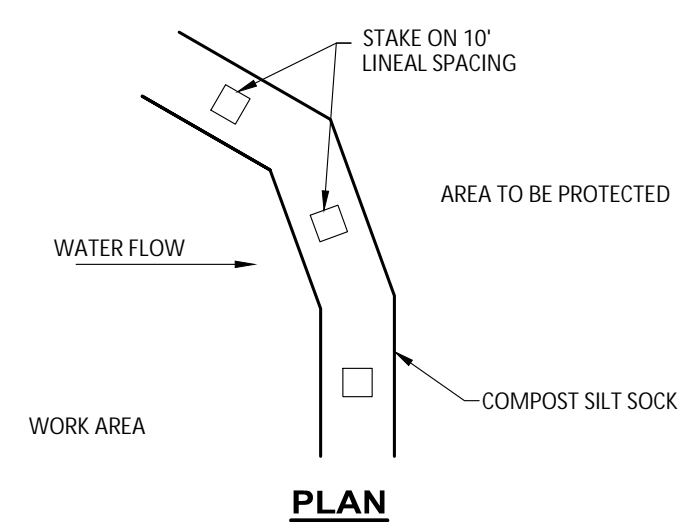
JOINING SILT FENCE SECTIONS

NTS

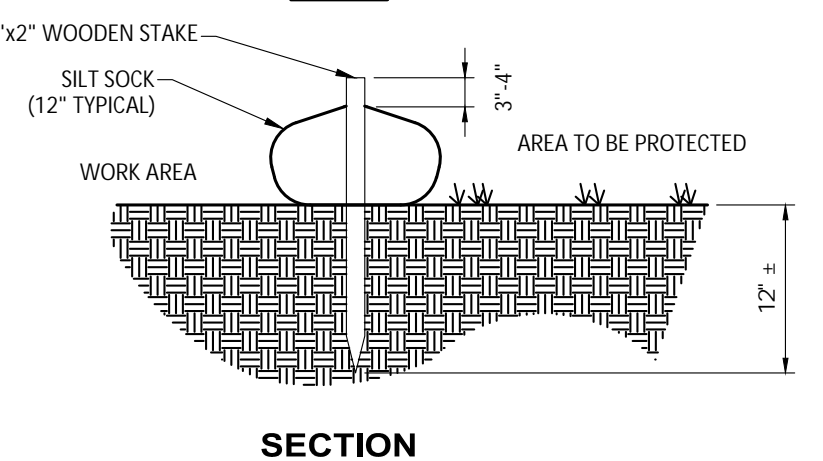


EROSION CONTROL MATTING - DITCHES

NTS



PLAN



SECTION

NOTES:

- ALL MATERIAL TO MEET SPECIFICATIONS
- SILT SOCK COMPOST/SOIL/ROCK/SEED FILL TO MEET APPLICATION REQUIREMENTS
- SILT SOCK DEPICTED IS FOR MINIMUM SLOPES. GREATER SLOPES MAY REQUIRE LARGER SOCKS PER THE ENGINEER
- COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

COMPOST SILT SOCK

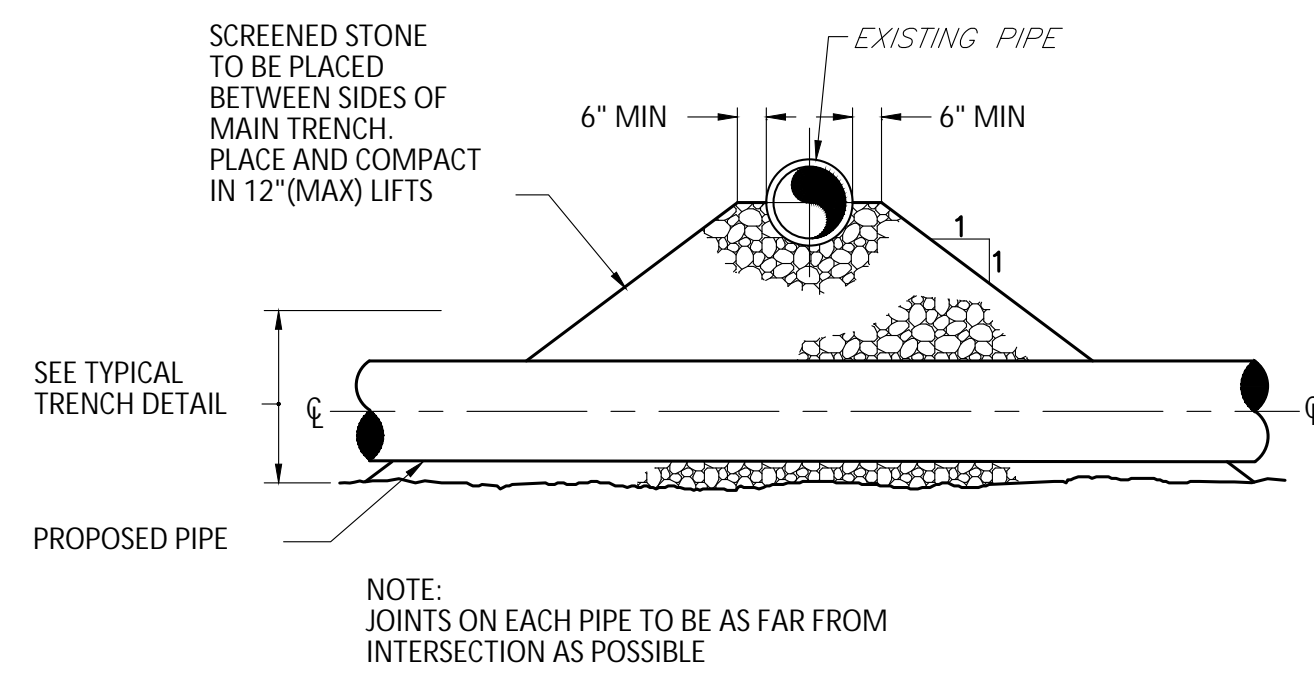
NTS

NO	DATE	DESCRIPTION
	07/20	PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

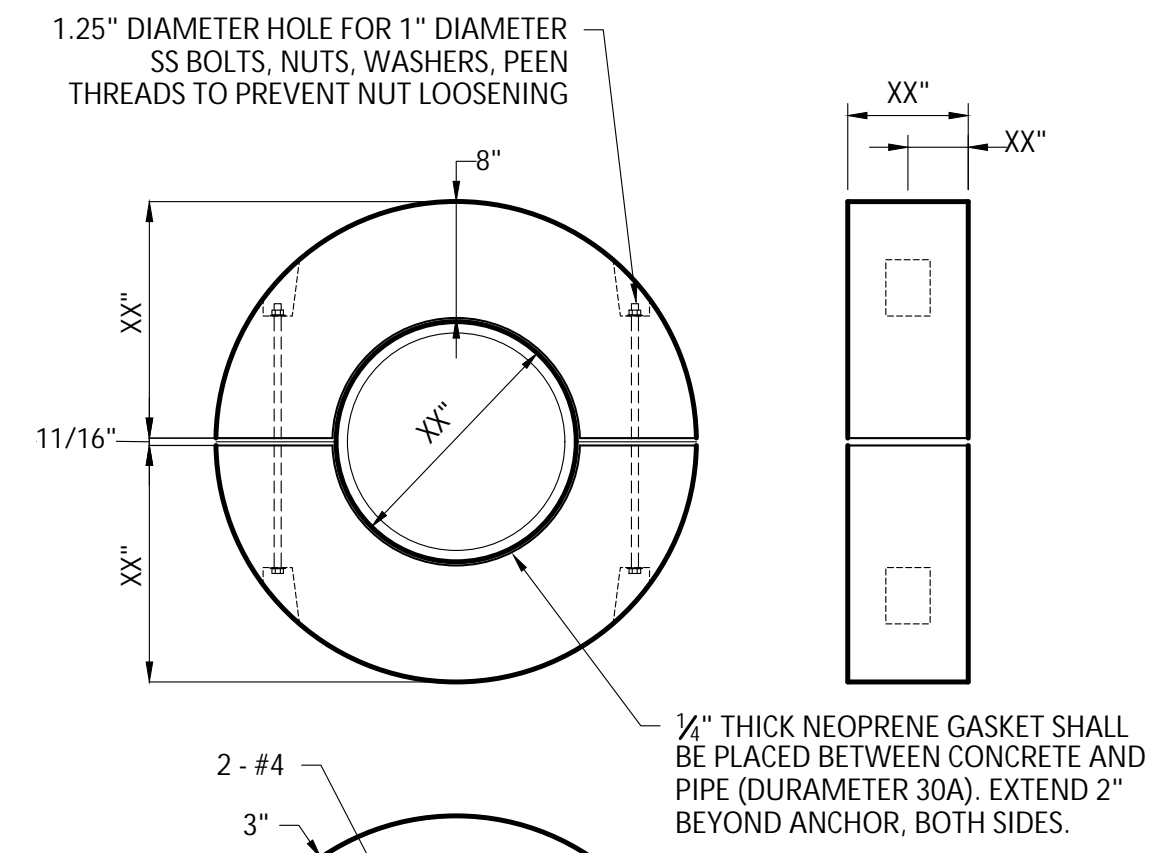
DESIGNED BY: B. LECK	APPROVED BY: [Signature]
CAD CORP.: W. EDG	DATE: 11/20/20
CD: W. EDG	PROJECT NO.: 14202A
CHECKED BY: [Signature]	
DATE: [Signature]	

WRIGHT-PIERCE
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888.621.8156 | www.wright-pierce.com

CITY OF PORTSMOUTH
SUBAQUEOUS WATER TRANSMISSION MAIN
PISCATAQUA RIVER, DURHAM-NEWINGTON
NEW HAMPSHIRE
EROSION CONTROL NOTES & DETAILS - NEWINGTON SITE
DRAWING
C-14

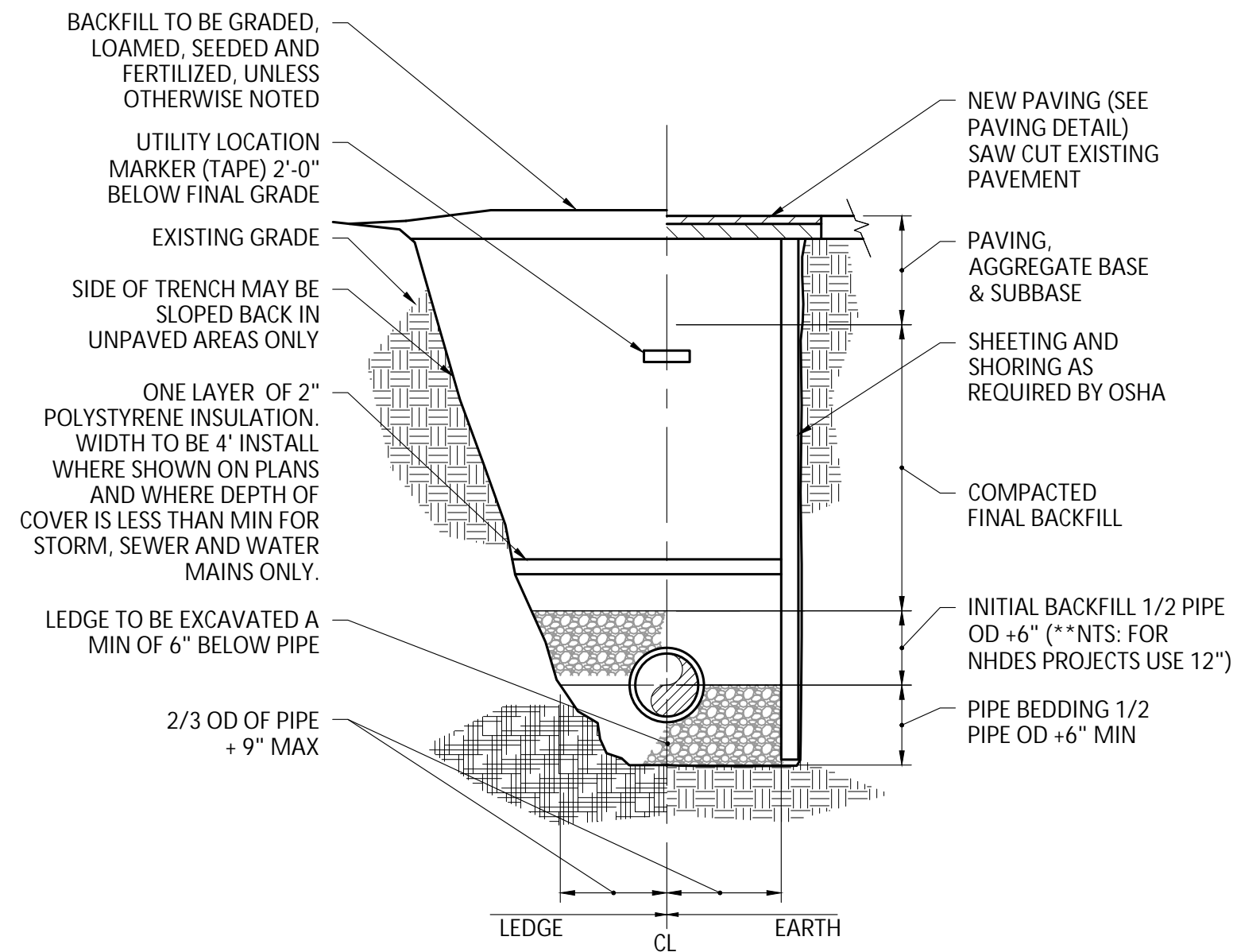


PIPE CROSSING DETAIL
NTS



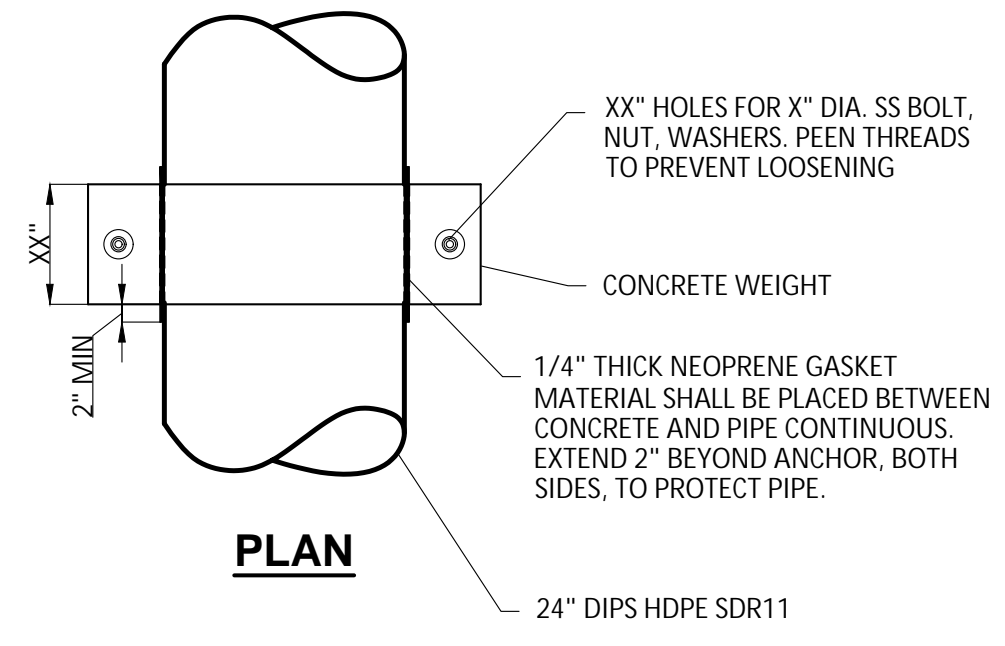
1. CONCRETE SHALL HAVE A MINIMUM 28 DAY STRENGTH OF 4500 PSI.
2. REINFORCING STEEL SHALL BE ASTM A615 GRADE 60 DEFORMED BARS.
3. ANCHOR BOLTS, NUTS, WASHERS, BARS, PLATES SHALL BE STAINLESS STEEL TYPE 316.
4. CONCRETE ANCHORS SHALL BE SECURELY FASTENED TO THE PIPE TO PREVENT MOVEMENT.
5. CONCRETE ANCHORS TO BE SPACED AT 10'-0" O.C. BASED ON 24" SDR 11 PIPE WITH XX-INCHES O.D. AND PIPE WEIGHT 34.44 LBS PER LINEAR FOOT.
6. CONTRACTOR SHALL VERIFY THE ABOVE CONCRETE ANCHOR DIMENSIONS WITH PIPE.
7. PROVIDE LIFTING INSERT ON EACH ANCHOR SECTION.

CONCRETE ANCHOR DETAIL
NTS

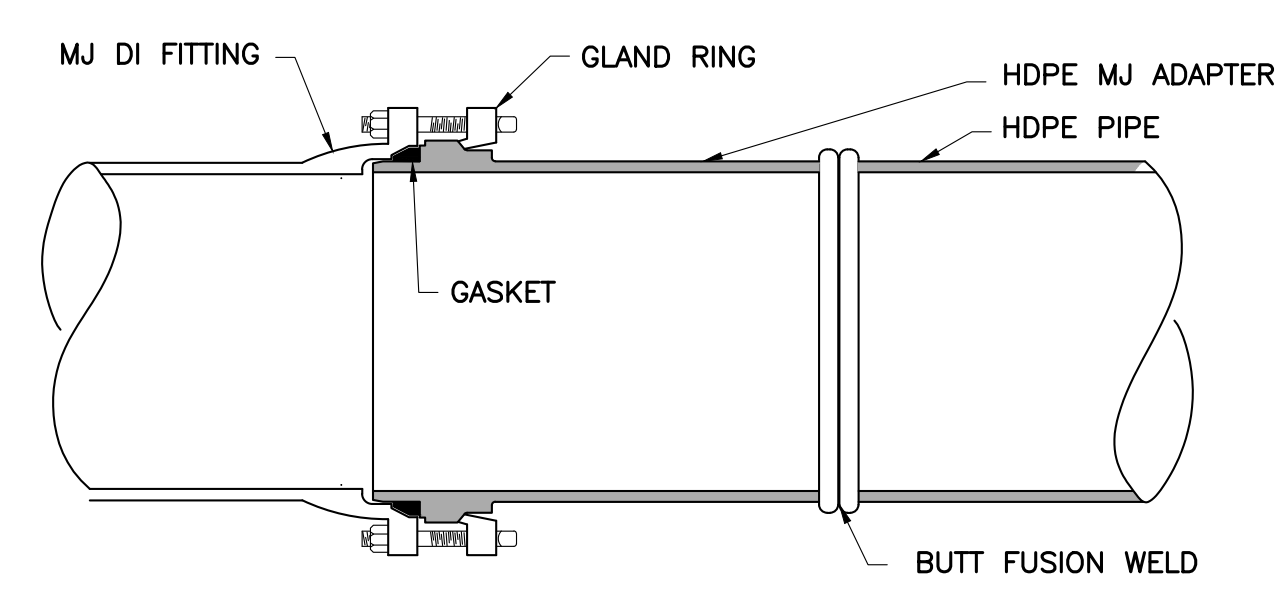


- NOTES:
1. ALL EXCAVATION MUST MEET OSHA STANDARDS.
 2. INSTALL 3 FOOT LONG IMPERVIOUS MATERIAL DAM IN BEDDING/INITIAL BACKFILL MATERIAL EVERY 100' AND WHERE SHOWN ON PLANS TO PREVENT TRENCH GROUNDWATER FROM BEING CHANNLED ALONG BEDDING/INITIAL BACKFILL.
 3. SEE SPECIFICATIONS FOR BEDDING AND BACKFILL REQUIREMENTS.

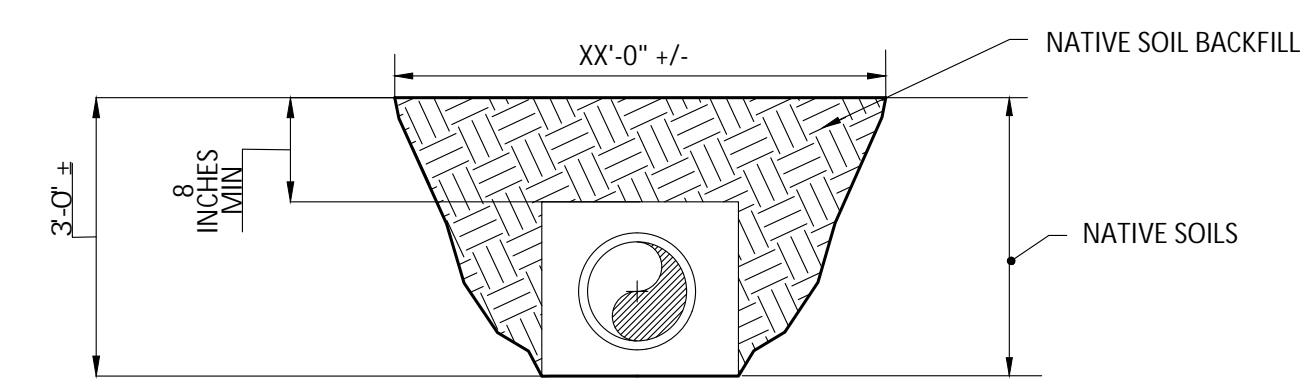
PIPE TRENCH
SCALE: \"/>



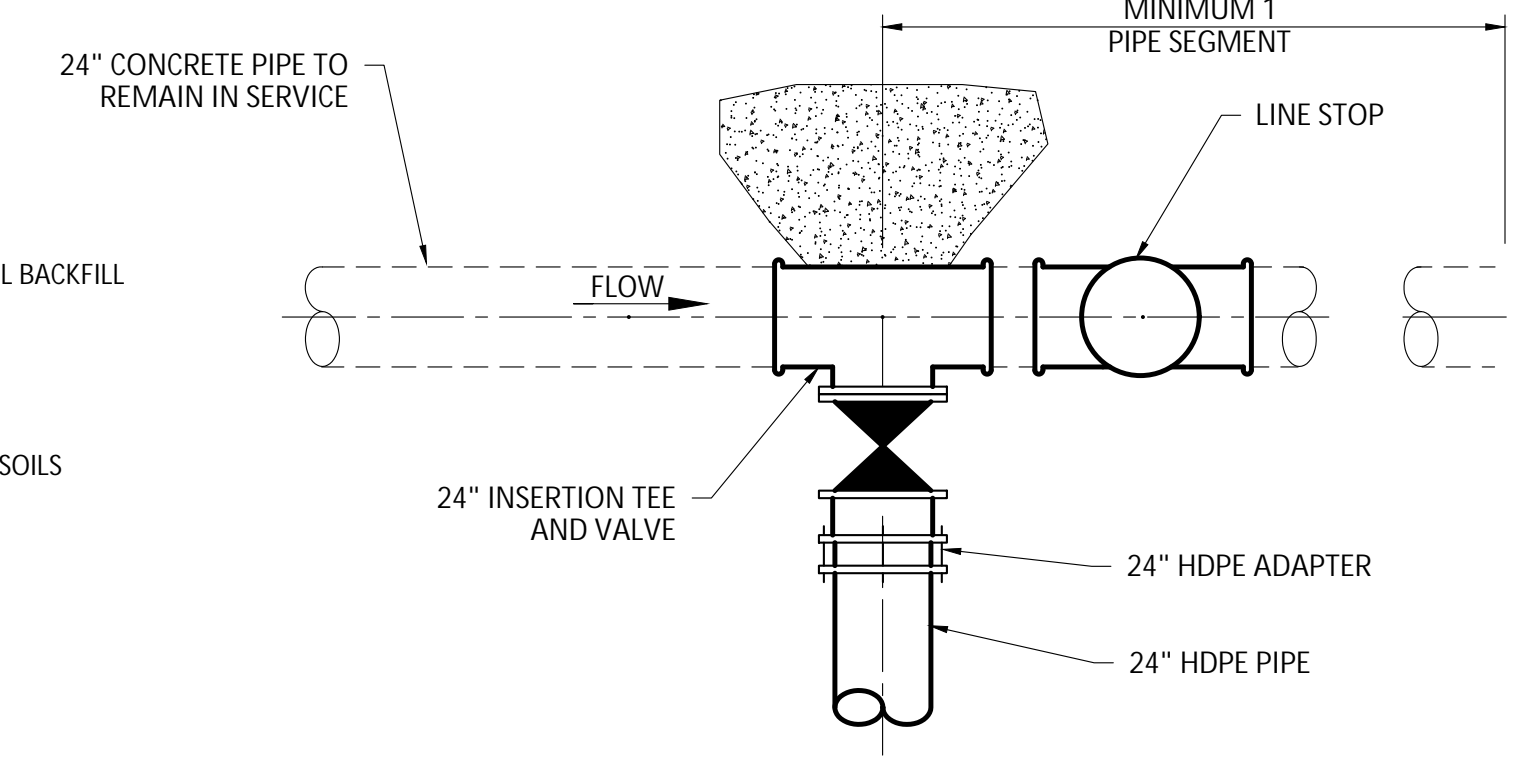
PLAN



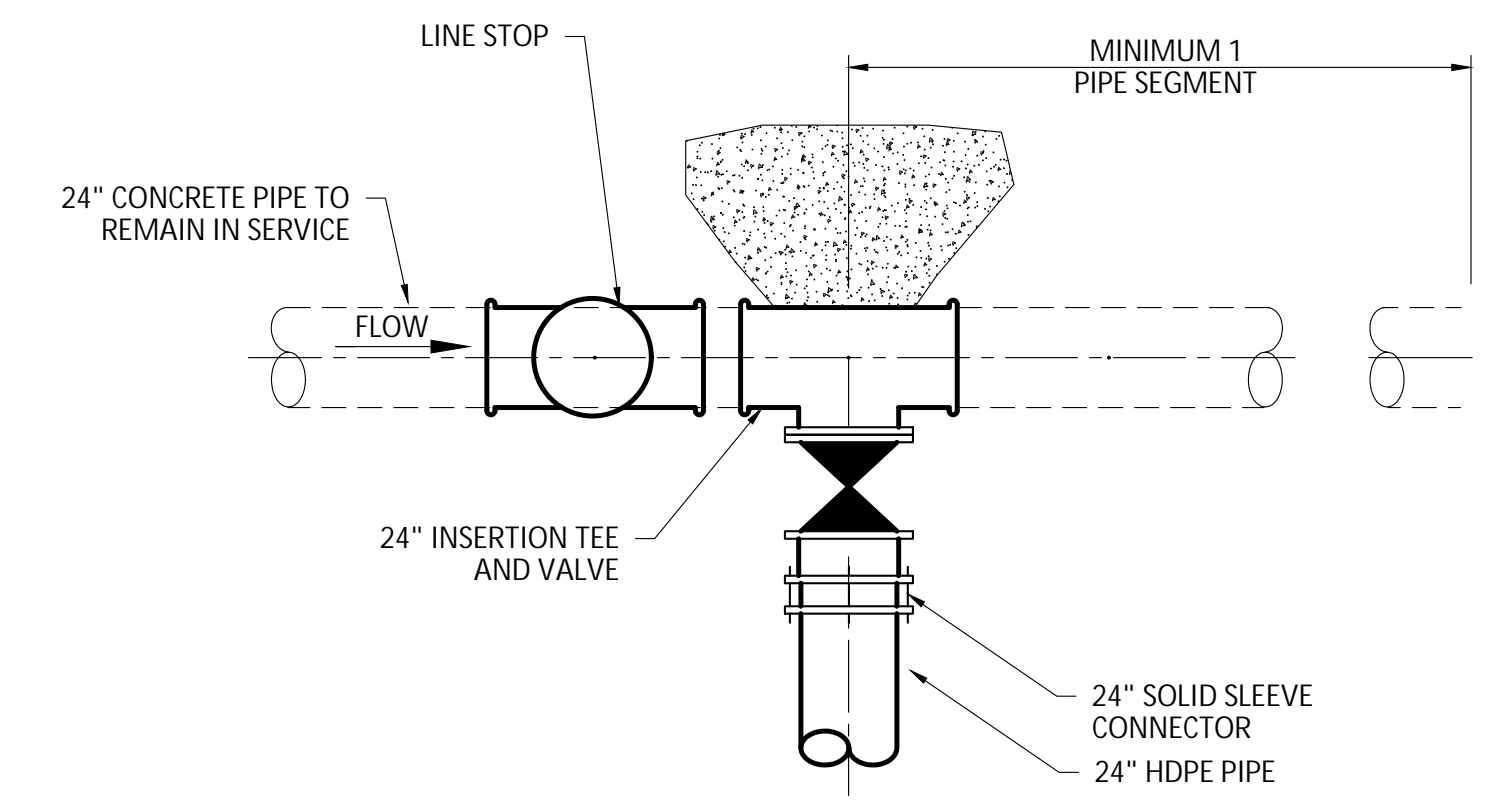
HIGH DENSITY POLYETHYLENE PIPE TO MECHANICAL JOINT CONNECTION DETAIL
SCALE: NTS



MARINE WATER MAIN TRENCH DETAIL
NTS



DURHAM LOCATION



NEWINGTON LOCATION

NEW WATER MAIN TIE IN DETAIL
NTS

NO	DATE	DESCRIPTION
1	07/20	PRELIMINARY DESIGN - NOT FOR CONSTRUCTION

DESIGNED BY: W. EDG	W. EDG
CAD CORP: W. EDG	W. EDG
CHECKED BY: W. EDG	W. EDG
DATE: 07/20	07/20
APPROVED BY: W. EDG	W. EDG
DATE: 07/20	07/20
PROJECT NO: 14202A	

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CITY OF PORTSMOUTH
SUBAQUEOUS WATER TRANSMISSION MAIN
PISCATAQUA RIVER, DURHAM-NEWINGTON
NEW HAMPSHIRE



4

Project Narrative



Project Introduction

The City of Portsmouth (the City) owns and maintains a cross-country drinking water transmission main that brings treated drinking water from the Madbury Water Treatment Plant to Portsmouth. The 24-inch reinforced concrete main carries approximately 60% of the water serving the City's regional water system that includes Portsmouth, Newington, Greenland, New Castle and portions of Madbury, Dover, Durham and Rye. The main crosses the Little Bay, approximately 4,000 ft to the southwest of the Scammell Bridge (US Route 4). At the crossing, the main transitions to two 20-inch cast iron pipes from the Durham shore to Fox Point shore in Newington. The two parallel transmission mains, installed in the 1950s, are approximately 3,200 feet in length across the bay. A dive inspection completed in 2016 observed that portions of the two cast iron pipes have become exposed to salt water and have experienced significant corrosion, with pits greater than 50% of the pipe wall thickness in some instances. This critical water main requires replacement in order for the City to maintain a safe reliable supply of drinking water to the regional water system. Refer to Section 11 for project location map.

Natural Resources

The project area is located in the section of Little Bay referred to as Lower Little Bay. The Oyster River outlets to Little Bay to the southeast of the project area. The boundary between the Town of Durham and the Town of Newington is located approximately halfway between the crossing location. On the Durham side, the existing pipeline crosses a 9-acre, private residential property which will be referred to as the Durham site. On the Newington side, the existing pipeline crosses land owned by the Town of Newington which will be referred to as the Newington site. The City has a 40 ft easement along the length of the water transmission main.

Wetlands and resource areas were delineated at each site by Marc Jacobs, CWS in May 2019. The following summaries his observations at each site.

Durham

Areas upland of the Highest Observable Tide Line (HOTL) consist mainly of infrequently mowed grasses and patches of ornamental shrubs. Uplands immediately adjacent to the HOTL are generally vegetated with a dense growth of non-ornamental shrubs and saplings, including species such as glossy buckthorn (*Frangula alnus*), olive (*Elaeagnus umbellata*), honeysuckle (*Lonicera* sp.), and Japanese barberry (*Berberis thunbergii*). Other shrubs include staghorn sumac (*Rhus typhina*). The sapling layer is dominated by poplar (*Populus tremuloides*). Trees observed adjacent to and north of the project area predominantly involve conifers and the dominant species include white pine (*Pinus strobus*). Trees observed adjacent to and south of the project area predominantly involve deciduous species and the dominant species include red oak (*Quercus rubra*). The slope of the upland areas is gradual to the tidal wetlands, ranging from 5 to 15 percent.

Tidally influenced project areas generally include salt marsh and mudflats. The salt marsh extends east of the HOTL an average of 50-feet before a very distinct change to mud flat. Salt marsh vegetation observed includes glasswort (*Salicornia* sp.), Black grass (*Juncus gerardii*), and salt marsh hay (*Spartina* sp.). Classification of non-upland site condition moving west to east is:

- Estuarine, Intertidal, Emergent, Persistent, Irregularly Flooded (E2EM1P)
- Estuarine, Intertidal, Unconsolidated Shore, Mud, Regularly Exposed (E2US3N)
- Estuarine, Intertidal, Unconsolidated Shore, Mud, Irregularly Exposed (E2US3M)
- Estuarine, Subtidal, Unconsolidated Bottom, Subtidal (E1UBL)

The boundary between the salt marsh and mudflats is experiencing high rates of erosion within and adjacent to the project area. Elevation drops of 3 to 4 feet were observed.

Newington

Fox Point is a 110-acre conservation land. The property has an older residential building, a grange hall, accessory structures, a boat launch, and hiking trails for use by Town of Newington residents.

Upland areas within the project area are densely forested with steep slopes to the water. Exposed bedrock was observed at the HOTL north of the existing water line. The area at the HOTL is experiencing some erosion. Significant erosion was observed on the south side of Fox Point, outside of the proposed project area.

Tidally influenced project areas are comprised of mudflats and small section of gravelly beach at the HOTL. A small area of salt marsh was observed south of the project area. Classification of non-upland site condition moving east to west is:

- Estuarine, Intertidal, Unconsolidated Shore, Mud, Regularly Exposed (E2US3N)
- Estuarine, Subtidal, Unconsolidated Bottom, Subtidal (E1UBL)

Refer to wetland delineation report included at Attachment 2 within the Coastal Function Assessment Report prepared by Marc Jacobs included in Section 8.

Rare, Endangered and Threatened Species

A New Hampshire Natural Heritage Bureau Datacheck report indicates the presence of two Natural Communities: sparsely vegetated intertidal system and subtidal system and three threatened or endangered vertebrate species: Atlantic Sturgeon (*Acipenser oxyrinchus*), Common Tern (*Sterna hirundo*) and Shortnose Sturgeon (*Acipenser brevirostrum*) have been observed near the project area. The NHB report is included in Section 14.

Designated River

The project is located near where the Oyster River discharges to Great Bay. Upper reaches of the Oyster River have been classified as Designated Rivers, however the section near the project areas has not.

Aquaculture

There is an existing aquaculture licensed area located on the Durham side overlapping part of the project area. License No. 2020-18 is owned by Choice Oysters, LLC.

Proposed Project

The proposed project involves installing one 24-inch high density polyethylene main (HDPE) on the ocean floor between the existing cast iron mains crossing Little Bay with connections to the existing reinforced concrete mains on either shore. The proposed installation method involves assembling the new pipeline on land and floating the pipeline into Little Bay. Since the HDPE pipe is buoyant, concrete collars are required to sink and anchor the pipeline along the river bottom. The concrete anchors are designed to be installed while the pipeline is floating and full of air. Upon the evacuation of the air from the pipe, the

pipe sinks to the bottom at the proposed location. At the intertidal zone and with portions of the tidal buffer zone, the proposed pipeline will be buried to protect the pipe from freezing, anchor drag, and tidal currents. Excavation within the tidal buffer zone will also be necessary to connect the new main to the existing mains. Refer to Project Plan included in Section 3. After installation and connection of the new HPDE main, the existing cast iron mains will be evaluated for potential to be rehabilitated to maintain a necessary redundant pipeline crossing.

Proposed Wetland Impacts

The project proposes temporary impacts to jurisdictional areas as follows:

Activity	Tidal Waters (sq ft)	Tidal Marsh (sq ft)	Tidal Buffer Zone (sq ft)
Trench excavation and construction access - Durham	25,450	2,220	18,700
Trench excavation and construction access - Newington	20,200	-	7,400
Total	45,650	2,220	17,800

The project proposes permanent impacts to jurisdictional areas as follows:

Activity	Tidal Waters (sq ft)	Tidal Marsh (sq ft)	Tidal Buffer Zone (sq ft)
Submerged pipe with anchors	5,400	-	-
Total	5,400	-	-

Proposed Construction BMPs

In general, proposed construction will be completed in accordance with the Best Management Practices Manual: Utility Maintenance in and Adjacent to Wetlands and Waterbodies in New Hampshire.

Turbidity curtains will be used to minimize/prevent sediment from spreading from the excavated areas. The Contractor will be required to submit a turbidity curtain design in accordance with the project specifications and approved permit conditions. The Contractor will be required to monitor the turbidity of water outside the project area to confirm the turbidity curtain is performing in accordance with surface water quality standards and permit conditions. Proposed turbidity curtain locations are shown on Project Plans provided in Section 3.

Salt Marsh Restoration Plan

The following steps to restore unavoidable impacts to the salt marsh is proposed:

- a. Timber mats will be placed on the salt marsh not slated for removal to protect it from equipment and foot traffic.
- b. Salt marsh peat will be removed from the areas indicated on the Project Plans in intact sections (minimum 4 square feet) and minimum 6-inch thick and stockpiled during the completion of the work. The peat blocks will be kept moist with fresh water.

- c. Upon removal of the peat blocks, excavation for the water main installation will commence. Excavated soil will be stockpiled for backfilling.
- d. Upon completion of the water main installation, backfilling of the stockpiled soils will be returned to the trench and the subgrade reestablished to match previous grade. If supplemental substrate is needed, sand will be added.
- e. The peat blocks will be replaced and anchored with rebar stakes driven into the substrate and adjacent peat. Any gaps between the peat block and surrounding peat will be filled with sand.
- f. Upon completion of the water main installation, site restoration, and removal of equipment, an inspection of the area will be completed to confirm that there were no other impacts to the salt marsh.
- g. An inspection of the restored salt marsh and surrounding salt marsh will be conducted in the spring to observe that at least 75% survival of the replanted vegetation. If more than 25% of the vegetation hasn't regrown, salt marsh cordgrass seedlings will be planted, and erosion control measures installed to protect the seedlings from wave action.
- h. The area will be monitored for two years to confirm the salt marsh restoration is successful. Site inspections will be completed in the spring and late summer.
- i. Salt marsh restoration will be documented and reported in accordance with approved permit conditions.

The following sections describe how the proposed project will meet standard permit conditions required in Env-Wt 307.

Env-Wt 307.03 Protection of Water Quality

- a. Best management practices (BMPs) will be used to protect water quality during construction.
- b. Soil stockpiles will be managed to minimize risk of erosion and sedimentation to tidal waters.
- c. All water quality measures will be designed to provide maximum protection during storm events during construction and will be removed when construction is complete and vegetated areas are stable.
- d. During construction, erosion and sedimentation controls will be inspected daily and any accumulated sediments will be removed and disposed of to a stable and suitable site.
- e. Upland areas disturbed during construction will be permanently stabilized with 3 days of completion of final grades.
- f. A turbidity curtain will be used to enclose the dredging proposed within tidal waters.
- g. The contractor will be required to inspect equipment daily for leaking fuel, oil and hydraulic fluid prior to initiating work. All leaks shall be contained and repaired to prevent fluids from reaching groundwater, surface water or wetlands.
- h. Equipment will be staged and refueled in accordance with Env-Wt 307.15.

Env-Wt 307.04 Protection of Fisheries and Breeding Areas Required

The proposed project will be conducted to minimize impacts to fish and shellfish. Dredging within tidal waters will be limited to the ACOE General Permit dredge window from November 15 to March 15. Turbidity curtains will be used to enclose the dredge areas to minimize/prevent suspended sediment from migrating from the dredge area.

Env-Wt 307.05 Protection Against Invasive Species

- a. Prior to the installation of timber mats, the mats will be inspected for and cleaned of all vegetative matter by a method and location that prevents the spread of vegetative matter to jurisdictional areas.

- b. Equipment will be inspected prior to use to ensure that it is free of all aquatic and terrestrial invasive plants and all exotic aquatic species of wildlife.
- c. Not applicable.
- d. Not applicable.
- e. To prevent the use of soil or seed stock contain nuisance or invasive species, the Contractor will be required to follow the Invasive Plant BMPs.

During delineation of wetlands and other resource areas, Marc Jacobs observed the presence of glossy buckthorn, autumn olive, honeysuckle, and Japanese barberry on the Durham site. The Contractor will be required to prepare and submit an Invasive Species Control and Management Plan, prepared in accordance with the NHDOT Invasive Plant BMP manual.

Env-Wt 307.06 Protection of Rare, Threatened or Endangered Species or Critical Habitat

- a-c. All proposed activities will be conducted so as to minimize impacts to threatened and endangered species. Impacts to Atlantic and shortnose sturgeon will be minimized by conducting in water work during the dredge window (Nov. 15 to March 15). Turbidity curtains will be used to prevent degradation of water quality.

Common Terns have been observed on Goat Island which is approximately 0.25 miles from the project area. However, terns are not expected to be found within the project area since neither site has the type of habitat that they typically nest in: areas with loose sand, gravel and shell. The upland areas of the Durham site are covered with grass and shrubs and all of the gravelly beach at the Newington site is subject to inundation by the tide.

Env-Wt 307.07 Consistency with Shoreland Water Quality Protection Act

All project activities will be conducted in compliance with the applicable requirements of RSA 483-B and Env-Wq 1400 during and after construction. It is anticipated that a Shoreland Permit by Notification Application will be obtained for temporary impacts outside of the TBZ and within 250 ft of the HOTL for both project sites.

Env-Wt 307.08 Protection of Designated Prime Wetlands and Duly-Established 100-foot Buffers

The Town of Durham does not have any designated prime wetlands. The Town of Newington does have designated wetlands, but none exist within the project area.

Env-Wt 307.09 Shoreline Structures

The proposed project does not involve the construction of any structures over public waters.

Env-Wt 307.10 Dredging Activity Conditions

- a. Since the areas where dredging is proposed will be restored, there will be not be any changes to set-backs specified in RSA 485-A and 483-B.
- b. Not applicable.

- c. Turbidity curtains will be installed prior to construction and maintained during the duration of the project to prevent the migration of sediment from the dredge area. The curtains will remain in place until water has returned to normal clarity.
- d. The proposed dredging is for excavation of a trench for the new water main. All dredge materials will be returned to the trench once the new pipeline is installed. Accordingly, there should be no need to dispose of dredged materials.
- e. Not applicable.
- f. Dredged (excavated) materials from upland areas will be stockpiled within the construction areas designated on the plans. These stockpiles will have sedimentation controls installed around them to prevent sediment from leaving the site. Dredged materials from subtidal areas will be placed adjacent to the trench and within the confines of the turbidity curtains. These materials will be moved back into the trench once the water main has been installed.
- g. Not applicable.
- h. Not applicable.
- i. The proposed project will limit dredging activity to November 15 to March 15 dredge window to minimize impacts to fish migration and larval stages of fish and shellfish.
- j. The proposed dredging area will be located on the intertidal areas on each shore. The proposed work and area enclosed by the turbidity curtains will occupy a relatively small area of Little Bay and is therefore not anticipated to disrupt tidal flushing.
- k. By conducting the proposed dredging during the November 15 to March 15 window, impacts to fish migration and spawning will be minimized since migration and spawning do not typically occur during the winter months.
- l. Dredging is not expected to disturb contaminated sediment. In April 2020, geotechnical borings were completed within the proposed dredge area as authorized under NHDES Wetlands Permit 2019-03224. Two sediment samples were taken and analyzed for PAH, Pesticides, PCBs, TPH, Metals, Nitrogen, TOC, PFCs and Dioxins. Analysis results for all analytes were below New Hampshire Method 1 S-1 Soil Standards. The 2018 State of Our Estuaries Report by the Piscataqua Region Estuaries Partnership (PREP) indicated that levels of contaminants are not a significant factor affecting the health of the estuary.
- m. The proposed dredging will not be located near a public water supply intake.
- n. Not applicable.

Env-Wt 307.11 Filling Activities

- j. It is anticipated that the existing soils will be used to restore the impacted areas. If fill needs to be brought from an offsite location it will not contain any material that could contaminate the surface, groundwater or tidal waters.
- k. Limits of permitted impacts will be identified prior to commencement of work to ensure that fill does not spill over or erode into areas where filling is not authorized.
- l. Slopes shall be immediately stabilized by methods specified in Env-Wq 1506 and in accordance with the NHDES Stormwater Manual to prevent erosion into adjacent wetlands and surface waters.
- m. Not applicable.
- n. The proposed project will restore existing grades and will not change the direction of surface water runoff.
- o. Timber mats are proposed to reduce construction impacts on the Durham site and will be removed upon completion of the work.
- p. Authorized temporary fill will be placed on geotextile fabric within jurisdictional areas.

- q. Temporary fill and timber mats will be not be left in place longer than one growing season and will be removed upon completion of the work. Temporary fill or mats will be removed from the site and stockpiled for reuse in a manner that prevents erosion into surface waters or wetlands.
- r. The use of corduroy is not proposed.
- s. Wetlands and surface water shall be restored to pre-construction conditions and elevations. Note, trees removed from within the water main easement for construction will not be replaced since best management practices for the maintenance of pipeline easements is to prevent tree growth that limits access to pipeline in the event of an emergency repair.
- t. Timber mats will be properly installed and not dragged into position and removed immediately upon completion of the work.
- u. This permit application is requesting authorization to fill within tidal wetlands. The proposed pipeline and concrete collars that will be exposed on the bottom of the ocean floor, a PRA, and have been characterized as permanent fill in this permit application.

Env-Wf 307.12 Restoring Temporary Impacts; Site Stabilization

- a. Within 3 days of final grading or temporary suspension of work in an area that is in or adjacent to surface waters, all exposed soil areas shall be stabilized by seeding and mulching, if during the growing season or mulching with tackifiers on slopes less than 3:1 or netting and pinning on slopes steeper than 3:1 if not within the growing season.
- b. Upon completion of construction, all disturbed wetland areas shall be stabilized with wetland seed mix containing non-invasive plant species only.
- c. Any seed mix used shall not contain plant species that are exotic aquatic weeds.
- d. Mulch used within an area being restored shall be natural straw or equivalent non-toxic, non-seedbearing organic material.
- e. Wetland soils from areas vegetated with purple loosestrife or other invasive plant species shall not be used in the area being restored.
- f. If any temporary impact area that is stabilized with seeding or plantings does not have at least 75% successful establishment of wetlands vegetation after 2 growing seasons, the area shall be replanted or reseeded, as applicable.
- g. If a temporary impact area is restored by seeding or plantings, then:
 - (1) The work shall not be deemed successful if the area is invaded by nuisance species such as common reed or purple loosestrife during the first full growing season following the completion of construction; and
 - (2) The person responsible for the work shall submit a remediation plan to the department that proposes measures to be taken to eradicate nuisance species during this same period.
- h. Unless otherwise authorized, any trees cut in an area of authorized temporary impacts shall be cut at ground level with the shrub and tree roots left intact, to prevent disruption to the wetland soil structure and to allow stump sprouts to revegetate the work area. This permit application requests authorization to remove trees and roots from the TBZ where trench excavation is proposed in order to install the new water main.
- i. Unless otherwise authorized, wetland areas where permanent impacts are not authorized shall be restored to their pre-impact conditions and elevation by replacing the removed soil and vegetation in their pre-construction location and elevation such that post-construction soil layering and vegetation schemes are as close as practicable to pre-construction conditions.

Env-Wt 307.13 Property Line Setbacks

A majority of the proposed impacts to jurisdictional areas will be completed within the existing 40-foot pipeline easement. Proposed temporary impacts necessary for the proposed construction staging areas on the privately owned property in Durham and the Town of Newington property have been discussed with the property owners. Temporary construction easements are being sought from each landowner and will be provided to NHDES when available.

Env-Wt 307.14 Rock Removal

The proposed project does not involve removing any rocks from tidal waters.

Env-Wt 307.15 Use of Heavy Equipment in Wetlands

- a. This permit application is requesting authorization to use heavy equipment within tidal wetlands.
- b. Mobile heavy equipment will be prohibited from being stored, maintained, or repaired in wetlands, except where repairing or refueling cannot practicably be complete and secondary containment is provided.
- c. Heavy equipment used in wetlands shall have low ground pressure (less than 4 psi) or not be located directly on wetland soils and vegetation or be placed on timbers mats that are adequate to support the equipment in such a way to minimize disturbance of wetland soil and vegetation.
- d. Timber mats shall be in good condition prior to installation, use and removal and thoroughly cleaned before re-use.
- e. Timbers mats shall be placed in the wetland from the upland or from equipment positioned on timber mats; be installed, used and removed so as to minimize impacts to wetland areas; and be installed with adequate erosion and sediment controls as approaches to the mats to promote a smooth transition to and minimize sediment tracking onto, the mats.

Env-Wt 307.16 Adherence to Approve Plans Required

Construction documents will require that the contractor complete all work in accordance with the approved plans. A certified wetland scientist will periodically inspect the construction site to confirm work is being performed in accordance with the approved permit conditions.

Env-Wt 307.18 Reports

All required reporting will be completed in accordance with the approved permit conditions.



5

Mitigation



**PERMITTEE RESPONSIBLE
MITIGATION PROJECT WORKSHEET**
Water Division/Land Resources Management
Wetlands Bureau
[Check the Status of your Application](#)



RSA/Rule: 482-A: / Env-Wt 800

SECTION 1. PROPOSED PERMITTEE RESPONSIBLE MITIGATION PROJECT TYPE		
UPLAND BUFFER PRESERVATION: <input type="checkbox"/> AQUATIC RESOURCE RESTORATION: <input type="checkbox"/> MITIGATION PAYMENT: <input checked="" type="checkbox"/>		
SECTION 2. PROPOSED MITIGATION PROJECT LOCATION INFORMATION (if applicable)		
STREET/ROAD:	TOWN/CITY: Durham and Newington	TAX MAP/LOT #: 12/5-2 and 1-1
SECTION 3. APPLICANT INFORMATION		
APPLICANT NAME: City of Portsmouth		
APPLICANT MAILING ADDRESS: 680 Peverly Hill Road, Portsmouth, NH 03801		
CONTACT INDIVIDUAL: Brian Goetz		
DAYTIME TELEPHONE: 603-610-7304	EMAIL (IF ANY): bggoetz@cityofportsmouth.com	
SECTION 4. RESOURCE WORKSHEET SUMMARY		
AQUATIC RESOURCES INVOLVED IN PROJECT: See Table Below.		
TOTAL PRESERVATION PROPOSED: Upland: 0 Acres Wetland: 0 Acres		
TOTAL LENGTH OF STREAM ON PROPERTY: N/A Linear Feet % having 100-ft wooded zone: in direction		
% upland: in direction		
# CONFIRMED VERNAL POOLS: None	# POTENTIAL VERNAL POOLS: None	
AREA OF WETLAND RESTORATION PROPOSED: 0 acres	AREA OF WETLAND CREATION PROPOSED: 0 acres	
AREA OF WETLAND ENHANCEMENT PROPOSED: 0 acres	AREA OF UPLAND ENHANCEMENT PROPOSED: 0 acres	
SECTION 5. BRIEF NARRATIVE DESCRIBING PROPOSED PERMITTEE RESPONSIBLE MITIGATION		
See next page and Project Narrative (Section 4)		
SECTION 6. SIGNATURE AND CERTIFICATION		
<p>- I hereby certify that:</p> <ul style="list-style-type: none"> ▪ The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief; <p>▪ I understand that:</p> <ul style="list-style-type: none"> - Submitting false, incomplete, or misleading information is grounds for denying the application or revoking any award of ARM Funds that is made based on such information; and - I am subject to the penalties for making unsworn false statements specified RSA 641:3 or any successor New Hampshire statute. 		
SIGNATURE: _____		DATE: ____ / ____ / ____

Mitigation

Since the City of Portsmouth only has access to the 40-foot easement for the water main, there are no options for within-project mitigation. In consultation with NH DES and the US Army Corps of Engineers, payment to New Hampshire’s Aquatic Resource Mitigation (ARM) Fund was determined to be appropriate mitigation for the proposed permanent wetland impacts. Calculation for payment into the In-Lieu Fee program based on the types and extent of impacts are as follows:

Town	Permanent Impact (SF)	ARM Payment
Durham	2,395	\$24,506.30
Newington	3,005	\$30,451.95
Total	5,400	\$54,958.25

The estimated in-lieu fee total based on the 2020 ARM Fund Calculator is \$54,958.25. This amount will be confirmed during the review process with NHDES and USACE, should design modifications or permit conditions result in changes in wetland impacts.

Temporary wetlands impacts will be restored in accordance with the restoration plan described in the Project Narrative in Section 4.

**NHDES AQUATIC RESOURCE MITIGATION FUND
WETLAND PAYMENT CALCULATION
INSERT AMOUNTS IN YELLOW CELLS**



Durham

1 Convert square feet of impact to acres:		
INSERT SQ FT OF IMPACT	Square feet of impact =	2395.00
		43560.00
	Acres of impact =	0.0550
2 Determine acreage of wetland construction:		
	Forested wetlands:	0.0825
	Tidal wetlands:	0.1649
	All other areas:	0.0825
3 Wetland construction cost:		
	Forested wetlands:	\$7,973.04
	Tidal Wetlands:	\$15,946.08
	All other areas:	\$7,973.04
4 Land acquisition cost (See land value table):		
INSERT LAND VALUE FROM TABLE WHICH APPEARS TO THE LEFT. (Insert the amount do not copy and paste.)	Town land value:	27135
	Forested wetlands:	\$2,237.92
	Tidal wetlands:	\$4,475.83
	All other areas:	\$2,237.92
5 Construction + land costs:		
	Forested wetland:	\$10,210.96
	Tidal wetlands:	\$20,421.92
	All other areas:	\$10,210.96
6 NHDES Administrative cost:		
	Forested wetlands:	\$2,042.19
	Tidal wetlands:	\$4,084.38
	All other areas:	\$2,042.19
***** TOTAL ARM PAYMENT*****		
	Forested wetlands:	\$12,253.15
	Tidal wetlands:	\$24,506.30
	All other areas:	\$12,253.15

**NHDES AQUATIC RESOURCE MITIGATION FUND
WETLAND PAYMENT CALCULATION
INSERT AMOUNTS IN YELLOW CELLS**



Newington

1 Convert square feet of impact to acres:		
INSERT SQ FT OF IMPACT	Square feet of impact =	3005.00
		43560.00
	Acres of impact =	0.0690
2 Determine acreage of wetland construction:		
	Forested wetlands:	0.1035
	Tidal wetlands:	0.2070
	All other areas:	0.1035
3 Wetland construction cost:		
	Forested wetlands:	\$10,003.75
	Tidal Wetlands:	\$20,007.51
	All other areas:	\$10,003.75
4 Land acquisition cost (See land value table):		
INSERT LAND VALUE FROM TABLE WHICH APPEARS TO THE LEFT. (Insert the amount do not copy and paste.)	Town land value:	25943
	Forested wetlands:	\$2,684.56
	Tidal wetlands:	\$5,369.12
	All other areas:	\$2,684.56
5 Construction + land costs:		
	Forested wetland:	\$12,688.31
	Tidal wetlands:	\$25,376.63
	All other areas:	\$12,688.31
6 NHDES Administrative cost:		
	Forested wetlands:	\$2,537.66
	Tidal wetlands:	\$5,075.33
	All other areas:	\$2,537.66
***** TOTAL ARM PAYMENT*****		
	Forested wetlands:	\$15,225.98
	Tidal wetlands:	\$30,451.95
	All other areas:	\$15,225.98

Resource Specific Information

Applicable resource specific information required by Env-Wt 311.09 is presented as follows:

- a. Project in tidal areas – Applicant shall submit information required by Env-Wt 600 – Refer to Section 7
- b. Project affecting non-tidal shoreline – Not applicable
- c. Projects within the protected shoreland:
 - 1. Reference line – HOTL, shown on Project Plans in Section 3
 - 2. Location of existing structures – shown on Project Plans in Section 3
 - 3. Location of proposed structure – Not applicable
 - 4. Projects adjacent to tidal water, landward limit of the TBZ – shown on Project Plans in Section 3
 - 5. Total disturbed area with the protected shoreland: 60,000 sq ft
- d. Stream crossing projects – Not applicable

7

Project Specific Information

The information provided below indicates how the proposed project meets the requirements of Env-Wt 600. The following Sections 1 through 8 correspond to the sections specified on the Coastal Resource Worksheet. Refer to Section 18 for the completed worksheet.

Section 1. Required Information (Env-Wt 603.02; Env-Wt 603.06; Env-Wt 603.09)

Refer to Project Narrative in Section 4 for a description of the proposed project and natural resources present at the project site.

Section 2 Data Screening

The Wetland Permit Planning Tool was used to determine the presence of the following resource areas near the project site:

- Salt marsh – Salt marsh is present within the project area.
- Eel grass beds – Not present within the project area
- Shellfish site – Aquaculture License No. 2020-18 is located within the project area.
- Projected sea-level rise (SLR) – The project area is subject to SLR.
- 100-year flood plain – The project is located with the 100-year flood plain.

Refer to Wetland Permit Planning Tool map attached to the Coastal Resources Worksheet in Section 18.

Section 3 Coastal Functional Assessment

A Coastal Functional Assessment was completed by Marc Jacobs. Refer to Section 6.

Section 4 Vulnerability Assessment

A site-specific vulnerability assessment was not completed for the project area since the proposed project is not subject to impacts by flooding due to sea level rise.

Section 5 Design Plans

Design plans are included in Section 3.

Section 6 Water Depth Supporting Information

The NOAA Dover Point subordinate tidal station was used to estimate tidal elevations for this project.

Section 7 General Criteria for Tidal Beaches, Tidal Shoreline, and Sand Dunes

Refer to the Project Narrative included in Section 4 which describes how the proposed project will meet the general criteria for projects in tidal areas.

Section 8 How Project meets Relevant Standard Conditions and Approval Criteria

Refer to the Project Narrative included in Section 4 which describe how the proposed project will meet the general criteria for projects in the tidal buffer zone.

Coastal Functional Assessment

Of

**Fox Point Road
Assessors Map 1, Lot 1-1,
Newington, NH**

And

**180 Piscataqua Road
Assessors Map 12, Lot 5-2,
Durham, NH**

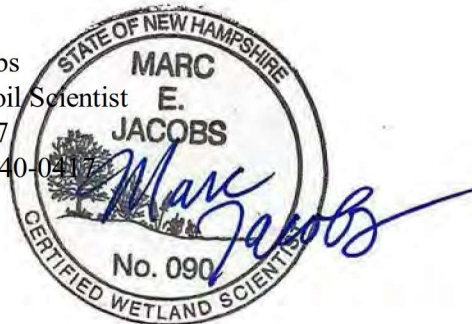
Prepared for



230 Commerce Way, Suite 302
Portsmouth, NH 03801

By

Marc E. Jacobs
Certified Wetland & Soil Scientist
P.O. Box 417
Greenland, NH 03840-0417



July 29, 2020

Coastal Functional Assessment

**Assessors Map 1, Lot 1-1,
Newington, NH**

And

**Assessors Map 12, Lot 5-2,
Durham, NH**

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Coastal Functional Assessment

**Assessors Map 1, Lot 1-1,
Newington, NH**

And

**Assessors Map 12, Lot 5-2,
Durham, NH**

1.0 Introduction

Pursuant to an anticipated request by Wright-Pierce for a wetland permit from the State of New Hampshire – Wetlands Bureau for work within jurisdictional resources at the above-referenced locations, we herewith submit this Coastal Functional Assessment (CFA) to supplement the wetland permit application as required under the NH Code of Administrative Rules – Env-Wt 100-900, specifically Env-Wt 311.10. Text in **bold** below may be useful in completing the coastal resource worksheet and wetland permit application going forward. Other important terms are underlined.

Wetland functional assessments generally involve an inventory and survey of physical attributes, such as, but not limited to, overall topographic position and vegetation / soil patterns, which then allow practitioners to predict functions that arise from those attributes. This report provides an assessment of the existing wetland functions and values at this location according to the United States Army Corps of Engineers - New England District, Highway Methodology Workbook *Supplement* – September 1999 Edition (updated in 2015). This study does not attempt to thoroughly evaluate the potential effects of global climate change, and where applicable, associated sea level rise or tidal surge, on the functions and values of wetlands at these locations.

This assessment evaluates fourteen (14) functions and values for these locations based upon current conditions. The functions and values of a wetland or adjacent wetlands may be altered, or more specifically, the effectiveness of a wetland or adjacent wetlands to provide a particular function may be altered (increased or decreased) as a result of modifications to adjacent uplands, impacts to wetlands elsewhere on site or other development in the watershed.

Attached is a copy of a composite 7.5 X 15 minute, United States Geological Survey topographic map (Dover East and Portsmouth quadrangles), upon which the subject study areas are identified. Refer to Attachment 1.

2.0 Existing Conditions

The areas-of-interest (AOI), henceforth also identified as study areas, involve tidally influenced lands and adjacent uplands which are described below. Observations were made on May 29, 2019 and July 21, 2020. Twelve (12) images obtained during site investigations are appended to this report. For additional information, refer to the delineation report dated July 19, 2019 which is appended to this report as Attachment 2. We have also included the existing conditions plan prepared by Wright-Pierce which is appended as Attachment 3.

Durham

Lot 5-2 in Durham supports an existing single-family residential dwelling and a 50-foot wide easement for the existing water line. The easement extends from conservation land known as Wagon Hill Farm that is owned by the Town of Durham. As is to be expected, the easement and areas immediately adjacent to the easement are absent any trees. These areas generally support grasses, which are infrequently mowed, and patches of ornamental shrubs. Uplands immediately adjacent to the highest observable tide line (HOTL) are generally vegetated with a dense growth of non-ornamental shrubs and saplings, including species such as glossy buckthorn (*Frangula alnus*), olive (*Elaeagnus umbellata*), honeysuckle (*Lonicera* sp.) and Japanese barberry (*Berberis thunbergii*), which are considered invasive and are likely the result of the prior site alterations associated with the installation of the original water main. Other shrubs include staghorn sumac (*Rhus typhina*). The sapling layer is dominated by poplar (*Populus tremuloides*). Trees observed adjacent to and north of the study area predominantly involve conifers and the dominant species include white pine (*Pinus strobus*). Trees observed adjacent to and south of the study area predominantly involve deciduous species and the dominant species include red oak (*Quercus rubra*).

The latitude and longitude of the waterline and easement in the approximate area where they intersect the HOTL, as obtained using a hand-held GPS unit, is N43° 7.5623' and W70° 52.0591'.

In the area of the easement, the upland areas gradually slope down to the tidal wetlands; the average slope being 15± percent. It is unclear if the original slope within the easement at the HOTL has been moderated by previous water line construction. The slope between uplands and wetlands tends to be steeper north and south of the easement.

Tidally influenced areas at this location generally include **saltmarsh** and **mud flats**. The saltmarsh extends east from the HOTL an average of 50-feet before a very distinct change to mud flat. Saltmarsh wetlands and mud flats are considered **special aquatic sites**.

Classification of non-upland site conditions according to the National Wetlands Inventory and the Cowardin system moving west to east (saltmarsh to mud flat and beyond) is:

- Estuarine, Intertidal, Emergent, Persistent, Irregularly Flooded (E2EM1P)
- Estuarine, Intertidal, Unconsolidated Shore, Mud, Regularly Exposed (E2US3N)
- Estuarine, Intertidal, Unconsolidated Shore, Mud, Irregularly Exposed (E2US3M)
- Estuarine, Subtidal, Unconsolidated Bottom, Subtidal (E1UBL)

The saltmarsh is identified as the area between the 'A' and 'B' flags series on the attached existing conditions plan. Mud flats include areas east of the 'A' flag series. Refer to Attachment 2 for more information. Refer also to images 1 – 5.

The boundary between the saltmarsh and mud flats (identified by the 'A' series flags) is experiencing high rates of erosion and there is a steep elevation drop along the 'A' series flags in the area of the easement. The elevation drop averages 3 to 4 feet. Erosion and loss of saltmarsh is not confined to the easement however and was observed to the north and south of the study area.

Dominant land use within 500-feet of the HOTL at the existing water line has changed slightly in the last 50+ years as evidenced by aerial images from 1962 and 2019. The larger area was primarily field in the 1962 image and there is no dwelling on Lot 5-2. The 2019 image depicts the dwelling on Lot 5-2 and additional forest cover, especially, though not exclusively, along property lines as the abandoned fields continue to mature. Refer to Attachments 4A and 4B respectively.

Jurisdictional resources are considered **Priority Resource Areas** (PRA) according to Env-Wt 103.66 based upon (a) documented occurrences of protected species or habitat, (c) floodplain wetlands, (f) tidal wetlands and tidal waters, and (g) any combination of these. The Oyster River empties into Little Bay approximately 750-feet south of the Durham study area and is tidally influenced at this location. The freshwater segments of the Oyster River upstream of this area are designated according to NH RSA 483. Not surprisingly, remote sensing and review of flood maps indicate 100 year **flood zone** within both study areas. Refer to Attachments 5A and 5B.

Prime wetlands are those wetlands with higher functions and values and receive additional protection under state law. Durham has not adopted municipally designated prime wetlands recognized by DES.

Regarding **predicted sea level rise and salt marsh migration**, the slopes at this location are sufficiently steep in the area of the existing waterline and easement that there is little opportunity to create additional saltmarsh resulting from predicted changes in sea level. The existing extent of saltmarsh and the predicted extent in 2100 with 1 meter of predicted sea level rise are unchanged. The scenario that predicts sea level rise approaching two meters by the year 2100 actually depicts less saltmarsh than the scenario that predicts 1 meter of sea level rise. This is likely because two meters of sea level rise will submerge the existing saltmarsh sufficiently that it will be extinguished. Refer to Attachments 6A and 6B. For comparison, Attachment 5 can be considered the existing condition.

Newington

Fox Point represents conservation land owned by the Town of Newington and is approximately 110 acres in size. The existing waterline is situated within a 60-foot wide easement. The property is currently developed with an older residential dwelling, a grange hall of sorts and two other accessory structures that appear to be storage sheds. It appears that one other residential structure was demolished shortly after the turn of the century. The latitude and longitude of the study area, where the existing water line intersects the HOTL, is N43° 7.2418' and W70° 51.5471', as obtained using a hand-held GPS unit.

A corrugated concrete boat launch and a dock as well as boat moorings exist approximately 1,000-feet northeast of Fox Point. Uplands adjacent to Little Bay and the existing water line are densely forested and slope dramatically to the water. Exposed bedrock can be observed at the HOTL north of the existing water line (near wet flag C1). The extreme western tip and south side of Fox Point are experiencing very high rates of bank erosion. The HOTL adjacent to the existing waterline is experiencing erosion at a much lower rate by comparison.

Tidally influenced areas at this location are generally comprised of **mud flats** although there is a narrow band of what could best be described as sloping **gravelly beach** between the mud flats and the HOTL. A small area of **saltmarsh** was observed towards the south edge of the easement. The

saltmarsh is eroding and appears to be all that remains of a larger area of saltmarsh. Saltmarsh wetlands and mud flats are considered **special aquatic sites**. Refer to images 6 – 12.

Classification of the predominant non-upland site conditions within the study area according to the National Wetlands Inventory and the Cowardin system, generally moving east to west is:

- Estuarine, Intertidal, Unconsolidated Shore, Mud, Regularly Exposed (E2US3N)
- Estuarine, Subtidal, Unconsolidated Bottom, Mud, Subtidal (E1UB3L)

Refer to Attachment 2 for more information.

Dominant land use on Fox Point within 500-feet of the HOTL at the existing water line has changed very little in the last 50+ years as evidenced by aerial images from 1962 and 2019. A landing, consisting of granite slab retaining walls which have been backfilled with soil, has been created from part of the bay since 1962 and a dock as well as boat moorings and the launch described earlier now exist. These changes are more than 750-feet from the existing waterline at the HOTL however. Refer to Attachments 4A and 4B respectively.

Jurisdictional resources are considered **Priority Resource Areas** (PRA) according to Env-Wt 103.66 based upon (a) documented occurrences of protected species or habitat, (c) floodplain wetlands, (f) tidal wetlands and tidal waters, and (g) any combination of these. The extent of PRA is identified on Attachment 5A. The flood plain at Fox Point is depicted as significantly expanding inland beyond areas normally flooded daily by the tides under the 1% annual flood hazard. This information seems to conflict with our direct observations of topography at the HOTL and existing water main within the study area. (The flood plain information should have little bearing on a project with temporary impacts of this type however.) Refer to Attachment 5B.

Regarding **predicted sea level rise and salt marsh migration**, the topography at this location is rather precipitous so changes in sea level will result in a de minimus change in the extent of saltmarsh at the location. This information also seems to corroborate our sense that the amount of flood zone depicted on Attachment 5B may be erroneous or exaggerated. Refer to Attachments 6A and 6B.

Newington has adopted municipally designated prime wetlands recognized by DES but there are no prime wetlands on or immediately adjacent to the subject property. Refer to Attachment 7.

The following remarks generally pertain to both the Durham and Newington study areas:

An inquiry to the New Hampshire Natural Heritage Bureau (NHB19-0978) regarding **rare, threatened or endangered species** identifies records of two natural communities and three vertebrate species in the vicinity. (Further coordination with the Natural Heritage Bureau and New Hampshire Fish and Game may be needed during permitting.) Estuarine wetlands, exemplary wetland natural community occurrences and areas that provide habitat for threatened or endangered species are considered **special wetlands** according to the General Permit issued to the State of New Hampshire by the U.S. Army Corps of Engineers. Refer to Attachment 8A.

Inquiry to the U.S. Fish and Wildlife Service regarding **endangered species** identifies the potential for one threatened mammal, northern long-eared bat (*Myotis septentrionalis*), in both study areas and one threatened plant, small whorled pogonia (*Isotria medeoloides*) in the Durham study area. Refer to the Information for Planning and Consultation (IPaC) resource lists for Durham and Newington, Attachments 8B and 8C. Neither IPaC list identifies any critical supporting habitat for the species identified. (These findings may result in the need for further surveys and/or consultations with state and federal agencies and may result in time-of-year (TOY) restrictions on any necessary tree cutting and construction activities.)

A review of information regarding the NH Fish and Game Department - Wildlife Action Plan (WAP) indicates the general study areas, including some adjacent upland areas which are likely to be impacted by a proposed project, include highest ranked habitat in New Hampshire, which is shown in magenta on the attached locus map. Refer to Attachment 8D.

Remote sensing indicates that the study areas do not contain **eel grass** (*Zostera* sp.) beds. Our direct observations confirm the absence of eel grass beds or other **submerged aquatic vegetation** in the area of the existing waterline on both sides of the bay. Refer to Attachment 9A.

Regarding **shellfish beds**, softshell clam and American oyster beds apparently exist but are closed to harvest on both sides of the bay. Blue mussel and razor clam are present and the beds are open for harvest on a limited basis. Surf clam and mahogany quahog may be present but are scarce and the beds are also open for harvest on a limited basis. The extent of shellfish beds differs depending upon the resource consulted. One resource identifies soft shell clam beds (only) and depicts the beds north of Route 4 and the Scammel Bridge. Refer to Attachments 9A, 9B and 9C.

We note an aquaculture site near the Durham study area and immediately south of Fox Point as well as numerous others located throughout Little Bay. A query to the National Oceanographic and Atmospheric Administration's **Essential Fish Habitat** (EFH) web site indicates all life stages of Atlantic Sea Scallop and Atlantic Wolffish as well as various life stages for numerous other species for the two study areas. (Any project proposed at either location may therefore require consultation with the U.S. Army Corps of Engineers and other federal agencies going forward and possible completion of a Not Likely to Adversely Affect (NLAA) Program Verification Form and an EFH Assessment Worksheet at a minimum.) Refer to Attachment 9D.

Regarding **water quality impairments**, documented impairments at the mouth of the nearby Oyster River include dissolved oxygen saturation, estuarine bioassessments, fecal coliform, light attenuation coefficient, total nitrogen and dissolved oxygen (mg/L). Documented impairments to lower Little Bay include estuarine bioassessments, fecal coliform and light attenuation coefficient. Refer to Attachment 10.

3.0 Wetland Functions and Values

Wetland functions are self-sustaining properties and physical attributes of wetlands that exist without regard to subjective human values. Wetland values are benefits derived from these functions and physical attributes. The functions assessed by the US Army Corps of Engineers Highway Methodology are identified below with a brief explanation of what each function and value considers.

3.1 Functions

- 1 - Ecological Integrity – The overall health and stability the wetland ecosystem.
- 3 - Fish & Aquatic Life Habitat – The potential for waterbodies associated with wetlands to provide suitable habitat for fish or shellfish.
- 4 - Flood Storage – The potential for a wetland to reduce flood damage by attenuating floodwaters through storage and desynchronization of peak flows.
- 5 - Groundwater Recharge / Discharge – The potential for a wetland to recharge water to an aquifer or discharge groundwater to the surface.
- 7 - Nutrient Trapping/Retention & Transformation – The effectiveness of wetlands to protect water quality and prevent adverse effects associated with excess nutrients in a watershed.
- 8 - Production Export – The ability of the wetland to produce food for humans or other organisms.
- 10 - Sediment Trapping – The potential for the wetland to protect water quality by trapping sediments, toxicants and pathogens.
- 11 - Shoreline Anchoring – The ability of a wetland to stabilize stream banks or shorelines against erosion.
- 14 - Wetland-dependent Wildlife Habitat – The effectiveness of the wetland to provide suitable habitat for important wetland wildlife.

3.2 Values

- 2 - Educational Potential – The value of the wetland as an outdoor classroom.
- 6 - Noteworthiness – The effectiveness of the wetland in supporting rare, threatened or endangered species.
- 9 - Scenic Quality – The visual or aesthetic qualities of a wetland.
- 12 - Uniqueness/Heritage – The value relating to the wetlands suitability to provide special values such as unique geologic features, archaeological sites and/or vernal pool habitat.
- 13 - Wetland-based Recreation – The suitability of the wetland and any associated waterbodies to provide consumptive and non-consumptive recreational opportunities.

3.3 Study Area

Selection of appropriate study areas is crucial to the outcome of any CFA. Determination of suitable study areas can be somewhat subjective depending upon the criteria used to define the study area, especially since wetlands are natural systems and do not recognize political boundaries such as property or town lines and because all wetland systems have variations in physical attributes within an otherwise seemingly discreet wetland area. Wetland systems are frequently comprised of numerous wetlands with differing classifications, each having differing physical attributes and therefore exhibiting differing functions and values. Altering the size of a study area can therefore influence the physical attributes which are assessed, affecting the interpretation or perception of functions and values and ultimately the results of an assessment. Further complicating the definition of a study area and thus the CFA, some considerations are focused on the watershed while others target individual wetlands. The results of this CFA however generally apply to the jurisdictional resources and supporting upland landscape along the water frontage in the area of the existing water line. Correspondingly, one CFA worksheet was completed for each side of Little Bay and is included herein by reference.

The assessment of wetland functions and values can be an inherently subjective process. The Highway Methodology strives to eliminate potential bias through implementation of a qualitative and descriptive approach to functional assessment by requiring the evaluator to review a list of considerations and qualifiers for each function or value. The list of considerations/qualifiers is referred to as Appendix A and is included as Attachment 11.

4.0 SUMMARY – DISCUSSION AND CONCLUSIONS

The Highway Methodology identifies 13 primary functions and values which can potentially be ascribed to wetlands. The presence of these functions and values provide benefits for society and the environment.

Wetlands Functional Assessment Worksheets have been completed for each study area in order to appropriately manage data collection efforts and provide consistency. It can difficult to precisely implement many of the considerations/qualifiers since the study areas and associated wetlands are part of a larger contiguous wetland system, only a portion of which falls within the study area. It is accepted however that conclusions about the effectiveness of a wetland study area to provide a particular function can change depending upon a host of factors which include the assessment area involved and the relative juxtaposition with other wetland resources. Conclusions regarding the functions and values associated with the two wetland study areas are briefly summarized below by principal function/value and in Table 1. Refer to Attachments 12A and 12B.

Where functional assessment is required as part of the permitting process, the State of New Hampshire also requires the assessment of each wetland or proposed impact area for Ecological Integrity as well. The Highway Methodology does not consider the ecological integrity function. Ecological Integrity is a function identified in NH RSA 482-A: Fill and Dredge in Wetlands, specifically Section 482-A:2 XI. This functional wetland assessment utilizes the field criteria in the Method for Inventorying and Evaluating Freshwater Wetlands in New Hampshire, December 2015, to assess this function. A NH Method data sheet for the ecological integrity function is attached as well as a supporting aerial image. Refer to Attachments 13A and 13B.

TABLE 1 TALLY OF PRINCIPAL FUNCTIONS / VALUES

FUNCTION / VALUE	PRINCIPAL ? DURHAM	PRINCIPAL ? NEWINGTON
Ecological Integrity 1	Yes	Yes
Educational Potential 2	No	Yes
Fish & Aquatic Life Habitat 3	Yes	Yes
Flood Storage 4	No	No
Groundwater Recharge 5	No	No
Noteworthiness 6	Yes	Yes
Nutrient Trapping/Retention & Transport 7	Yes	No
Production Export (Nutrient) 8	Yes	No
Scenic Quality 9	Yes	Yes
Sediment Trapping 10	Yes	No
Shoreline Anchoring 11	Yes	No
Uniqueness/Heritage 12	Yes	Yes
Wetland-based Recreation 13	No	Yes
Wetland-dependent Wildlife Habitat 14	Yes	Yes
TOTAL (14)	10	8

Ecological Integrity

Ecological integrity at both locations is high although both locations are experiencing high rates of erosion. The data form for ecological integrity poses several questions regarding activities and percent impervious cover within 500-feet of the subject so we have attached aerial images which depict a 500-foot radius circle for each study area. Refer to Attachments 14A and 14B.

Educational Potential

It was our feeling that while the resources at the Durham location possess suitability for educational potential, the only access to the potential study area that does not involve private property would be by boat. Therefore, we do not consider educational potential to be a principal function of Durham wetland study area.

The Newington study area involves town owned conservation land. While the land is open to town residents, it is our expectation that the town would likely make access available to a legitimate educational or research endeavor from a non-resident upon request.

Fish and Aquatic Life Habitat

The essential fish habitat report identifies numerous species which could potentially be found in both study areas. It is our opinion that fish habitat is a principal function of both the Durham and Newington study areas. Refer to Attachment 9D.

Flood Storage

The Durham and Newington study locations experience flooding however neither location is topographically suited to provide significant flood storage capability and therefore no ability to desynchronize flood peaks. We do not consider flood storage to be a principal function of either study location. Refer to Attachment 5B.

Groundwater Recharge / Discharge

Groundwater recharge / discharge are not functions that are applicable to tidal wetlands per se. There are undoubtedly public and private wells located downstream and the potential for public and private wells to be located downstream of the study areas undoubtedly exists however the watercourse involves tidally influenced saline flows that are not appropriate for drinking water supplies. Groundwater recharge and recharge are not principal functions of this area.

Noteworthiness

The Natural Heritage Bureau identified two natural communities (sparsely vegetated intertidal system and subtidal system) and two state threatened species (Atlantic sturgeon and common tern) as well as one state endangered species (Short-nosed sturgeon) within the areas-of-interest. The US Fish and Wildlife Service IPaC's identify potential federally threatened species as well. The common tern is indicated for Hen Island, which is around the corner from Fox Point proper and approximately 1,350 feet away from the project area. (The boat launch, dock and boat moorings described earlier are located between Fox Point and Hen Island.) Noteworthiness is considered a principal function of both study areas. Refer to Attachments 8A-8D.

Nutrient Trapping / Retention and Transformation

The Durham study area possesses some of the physical attributes necessary to provide this function but limited opportunity. The Newington study area possesses few of the physical attributes necessary to provide this function but has more opportunity than the Durham study area by virtue of the high rates of bank erosion. Nutrient trapping is a principal function of the Durham study area but is provided at a modest level. We do not consider nutrient trapping to be a principal function provided by the wetlands found in the Newington study area.

Production Export

Shellfish represent a potential food source in both study areas. The Durham study area possesses high vegetation density. The Newington study area generally lacks dense vegetation, with the exception of a small area of salt marsh, which is in a serious state of decline. Production export is a principal function of the Durham study area which is provided at a modest level. We do not consider production export to be a principal function of the Newington study area.

Scenic Quality

Neither study area possesses multiple wetland classes or a diversity of vegetation. However, both locations possess an above average view of the water which is relatively unobstructed and in limited supply in New Hampshire due to the relatively short coastline. The view in Durham is unavailable to the public because the study area involves private property, although similar views are available on the abutting Wagon Hill Farm conservation property. The view in Newington is available to the public (residents of Newington). For these reasons we felt that scenic quality is a principal function of both study areas.

Sediment Trapping

The Durham study area possesses saltmarsh which affords it some of the physical attributes necessary to provide this function. The Newington study area possesses few of the physical attributes necessary to provide this function. Nutrient trapping is a principal function of the Durham study area but is provided at a modest level. It is our opinion that sediment trapping is not a principal function provided by the wetlands found in the Newington study area.

Shoreline Anchoring

The shoreline within the Durham study area is protected by an expanse of saltmarsh. Unfortunately, the saltmarsh only averages 50-feet in width and, more importantly, is experiencing significant erosion due, at least in part, to climate change and associated sea level rise. An increase in boating activity associated with continued population growth in the seacoast region also likely plays a role as does the northeast exposure. Shoreline anchoring is a principal function of the Durham study area.

The shoreline in the Newington study area where the easement intersects the HOTL faces west and is experiencing minor erosion but is relatively stable and is protected somewhat by local topography. Nearby Fox Point and the south side of Fox Point, is experiencing very high rates of bank erosion. It should be noted that the areas experiencing erosion are not proximal to the easement and existing water line nor does it appear that the installation of the original waterline initiated or exacerbated the bank erosion on the apex or south side of Fox Point. Shoreline anchoring is a principal function of the Durham study area but is not a principal function of the Newington study area.

(Regarding the potential for construction-related erosion of uplands in the 100-foot tidal buffer zone, with associated potential for sedimentation into wetlands and other jurisdictional areas; soils within uplands at the Durham study area are susceptible to erosion due to fine textures and shallow seasonal water tables. Soils within uplands within the 100-foot tidal buffer zone in the Newington study area are slightly coarser than their counterparts in the Durham study area but the prevailing slopes within the easement also make them susceptible to erosion and sedimentation.)

Uniqueness / Heritage

The frontage on Little Bay as well as the presence of natural communities and threatened / endangered species speaks to the uniqueness of both study areas. Additionally, the Newington study area is conserved for the benefit of the residents. Uniqueness /Heritage is a principal function of both study areas. Refer to Attachments 8A-8D.

Wetland-based recreation

The bay has obvious suitability for recreational activities, especially non-consumptive recreation (e.g. canoeing, kayaking, boating, photography and wildlife observation), however, access and trespass / private property issues diminish the value of the Durham study area for this function. Consumptive recreational opportunities for fishing also exist. Access to the area for these activities for anyone other than the homeowner in the Durham study area would be from Wagon Hill Farm at low tide or from the water. Access amenities such as a dock and boat launch exist for residents in the Newington study area. Opportunities for waterfowl hunting are not appropriate

within either the study area but may be appropriate for the larger wetland complex, trespassing issues notwithstanding. Wetland-based recreation is a principal function provided by the Newington study area but not by the Durham study area.

Wetland-dependent Wildlife Habitat

It is our opinion wetland-dependent wildlife habitat is a principal function of both study areas based upon review of available resources referenced earlier in this report and our direct observations. We are aware of the presence of nesting bald eagles (*Haliaeetus leucocephalis*) elsewhere in Little Bay and their presence is generally indicative of important wildlife habitat although bald eagles were removed from the state threatened and endangered species list in 2017. (We have not undertaken a survey of nearby bald eagle nesting locations – actual or potential – to determine proximity to the study areas.) Depending upon the source cited, approximately fifteen (15) mature bald eagles make the Great Bay area their home. Large numbers of horseshoe crabs (*Limulus polyphemus*) were observed breeding on the south side of Fox Point during site investigations conducted in 2019. Regarding considerations/qualifiers 4 and 5 in Appendix A, the aerial images prepared to assist with the assessment of the ecological integrity function, Attachments 14A and 14B, were also used to evaluate this function.

For those interpreting this report, caution needs to be applied when deriving conclusions about impact assessment when using the findings within. Additionally, do not be easily tempted to rank or compare the wetlands described within this report against each other or other off-site wetlands. Ranking wetlands numerically or rating wetlands low, medium or high is tempting but is inappropriate and implies a level of accuracy or understanding of the wetlands and functional assessment methodologies which may not exist.

WETLAND FUNCTIONAL ASSESSMENT

PHOTOGRAPHS & DESCRIPTIONS



Image 1 – Looking east at low tide from the easement in Durham toward Newington and Fox Point. Note saltmarsh in the foreground and mud flats in the background. (©Jacobs2020)



Image 2 – Looking south at low tide along Durham easement shoreline frontage and HOTL. (©Jacobs2020)



Image 3 – Looking south at low tide along wet flag series ‘A’ in Durham. Saltmarsh on right and mud flats on left. Note erosion. (©Jacobs2020)



Image 4 – Looking west at low tide, HOTL and easement from wet flag series ‘A’ in Durham. (©Jacobs2020)



Image 5 – Looking west at the Durham easement towards Wagon Hill Farm. Note the manhole in the foreground and the ornamental shrubs on the right / background. Both features are indicated on the existing conditions site plan. (*@Jacobs2018*)



Image 6 – Looking west from the Fox Point study area in Newington toward the Durham study area (yellow arrow). (*@Jacobs2020*)



Image 7 – Looking east at low tide at the existing water line and easement where it meets the HOTL in Newington. (*@Jacobs2020*)



Image 8 – Looking north at low tide from atop the existing water line (and the location in image 7 above) in Newington. (*@Jacobs2020*)



Image 9 – Looking south at low tide from atop the existing water line (and the location in image 7 above) in Newington. Note Fox Point and the severe bank erosion as well as salt marsh. (*@Jacobs2020*)



Image 10 – Looking east at low tide toward Fox Point in Newington. Note the severe bank erosion. (*@Jacobs2020*)



Image 11 – Looking east at low tide along the south side of Fox Point in Newington. (©Jacobs2020)



Image 12 – Looking north at low tide at the south side of Fox Point in Newington. Note the severe bank erosion. The distance from the wrack line at the bottom of the image to the top of the bank is approximately 20+ feet. Note the bird nesting cavities near the top of the bank. (©Jacobs2020)

Subaqueous Water Main



Legend

- Polygons
- Additional lines
- 7.5-Minute
- State
- County
- City/Town

ATTACHMENT 1

Map Scale

1: 12,988

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Map Generated: 7/29/2020



Notes

USGS Dover East and Portsmouth
Quadrangles



ATTACHMENT 2



Via email to britt.eckstrom@wright-pierce.com

September 19, 2019

Ms. Britt Eckstrom, P.E.
Wright-Pierce
230 Commerce Way, Suite 302
Portsmouth, NH 03801

RE: Subaqueous Water Transmission Main
Durham and Newington, NH
WP #14202A

Dear Ms. Eckstrom,

The following remarks summarize our preliminary observations made during the delineation of jurisdictional wetlands and other resources at the above-referenced location. A site inspection was conducted on May 29, 2019 to identify and delineate wetlands and other jurisdictional areas within the area-of-interest (AOI) according to the New Hampshire Department of Environmental Services (NHDES) – Code of Administrative Rules Section Env-Wt 100 – 900. The AOI and associated resources are depicted on the undated existing conditions drawing prepared by your office, which is appended to the back of this report.

Jurisdictional wetlands and other resources were identified and jurisdictional boundaries within the AOI were delineated and marked in the field with solid color pink survey flags. Each flag bears a letter and number to assist in subsequent field location by instrument survey. The flag sequences used are as follows: A1-A8, B1-B15, C1-C30 and D1-D8. A brief description of each wetland/resource area, as identified by the flag series used in the field, is provided below.

Durham, NH

Flag Series A and B

Flag series ‘A’ identifies the boundary between saltmarsh and mud flat. Flag series ‘B’ identifies the highest observable tide line (HOTL¹). The area between the ‘A’ and ‘B’ lines represents saltmarsh. Topography along the HOTL is generally distinct. Commonly observed salt marsh vegetation includes glasswort (*Salicornia* sp.), Black grass (*Juncus gerardii*), and salt marsh hay

(*Spartina* sp.). The classification² of the area between the ‘A’ and ‘B’ lines is Estuarine, Intertidal, Emergent, Persistent, Irregularly Flooded (E2EM1P). The classification of the mud flat area below³ the ‘A’ line is Estuarine, Intertidal, Unconsolidated Shore, Mud, Regularly Flooded (E2US3N). The classification of the subtidal⁴ area below the mud flat is Estuarine, Subtidal, Unconsolidated Bottom, Subtidal. (E1UBL).

Private property landward of the HOTL was not investigated or delineated but preliminary observations of vegetation communities made while accessing the AOI suggest that freshwater wetlands may also exist nearby.

Newington, NH

Flag Series C and D

Flag series ‘C’ identifies the highest observable tide line (HOTL). The area below and immediately adjacent to the HOTL identifies a combination of sandy and/or rocky beach, depending upon the exact location. The area identified by flags C1± - C16± is experiencing minor undercutting. The area identified by flags C16± - C27± is experiencing severe bank erosion with subsequent sedimentation of the rocky beach at the toe-of-slope below. It is unclear if both of these observations are a function of wave action or sea level rise or both. Large numbers of horseshoe crabs (*Limulus polyphemus*) were observed mating in the waters adjacent to flags C20± - C26± during site investigations.

With the exception of the area enclosed by the ‘D’ flags, the dominant classification of the area below the ‘C’ line is Estuarine, Intertidal, Unconsolidated Shore, Mud, Regularly Flooded (E2US3N). There are however significant areas that classify as Estuarine, Intertidal, Unconsolidated Shore, Cobble-gravel, Regularly Flooded (E2US1N) or Estuarine, Intertidal, Unconsolidated Shore, Sand, Regularly Flooded (E2US1N) within the dominant classification. These areas generally exist along flags C17± - C30±.

Flag series ‘D’ identifies an isolated patch of saltmarsh. This area is classified as E2EM1P.

Invasive Species

Invasive species observed within uplands adjacent to the HOTL in Durham generally included garlic mustard (*Alliaria petiolata*), Japanese barberry (*Berberis thunbergii*), common barberry (*Berberis vulgaris*), olive (*Elaeagnus umbellata*), glossy buckthorn (*Frangula alnus*) and honeysuckle (*Lonicera* sp.).

¹ Wherever referenced in this report, HOTL’s were identified according to Env-Wt 101.49.

² Classifications are according to the National Wetland Inventory and Cowardin system.

³ Lower in elevation.

⁴ Continuously submerged by tidal salt water.

Invasive species observed within uplands adjacent to the HOTL in Newington generally included common barberry, common buckthorn (*Rhamnus cathartica*), honeysuckle, and Asian bittersweet (*Celastrus orbiculatus*), a liana.

Special Aquatic Sites and Special Wetlands

Special aquatic sites include saltmarsh wetlands, mud flats vegetated shallows with submerged aquatic vegetation such as eelgrass (*Zostera marina*), sanctuaries and refuges, coral reefs, and riffle and pool complexes. Saltmarsh wetlands and mud flats were noted at the site as described above. We did not note any eelgrass beds during our investigations. Estuarine wetlands are considered Special Wetlands under Army Corps permitting.

We have not evaluated the site for Highest Ranked Habitat, known shellfish beds, Essential Fish Habitat or other similar fisheries or wildlife attributes using available resources but we are available to do so upon request as part of any future permit application preparation.

Vernal pools are temporary bodies of fresh water that provide essential breeding habitat for certain amphibians and invertebrates as well as important supporting habitat for numerous other species, especially reptiles such as turtles. As is to be expected given the limits of the AOI and the tidal environs which were the subject of the investigations, we did not observe any primary or secondary indicators or areas that we thought were potential vernal pools according to the NH Code of Administrative Rules – Env-Wt 101.106, Env-Wt 101.75 and Env-Wt 101.86.

State Jurisdiction

Wetlands and surface waters at this location are subject to the state Shoreland Water Quality Protection Act (RSA 483-B). The HOTL identified by the ‘B’ and ‘C’ series flags also represents the reference line for administering RSA 483-B, which includes jurisdiction of all upland and freshwater wetlands within 250 feet (landward) of the HOTL. All banks, beaches, mud flats and saltmarsh wetlands – the area between the ‘A’ and ‘B’ lines in Durham and the area enclosed by the ‘D’ series flags in Newington – are jurisdictional under NH RSA 482:A and the NH Code of Administrative Rules – Chapter Env-Wt 100-900. Uplands adjacent to the HOTL are subject to the 100-foot Tidal Buffer Zone (TBZ). The TBZ is also measured from the HOTL.

Bank is defined by Env-Wt 101.07 as the transitional slope immediately adjacent to the edge of a surface water body, the upper limit of which is *usually* defined by a break in slope, or for a wetland, where a line indicates a change from wetland to upland. Experience has demonstrated that the definition of bank can be subject to interpretation where practical application in the field is involved. The upper limit of the bank may be the upper limit of the erosion along flags C16± - C27± in Newington.

Prime Wetlands

The NHDES applies applicable rules and law to all municipally designated prime wetlands (and in certain municipalities all land within 100-feet of municipally designated prime wetlands).

Prime wetlands are those wetlands with higher functions and values and receive additional protection under the law. The town of Durham does not have municipally designated prime wetlands recognized by NHDES. The town of Newington has municipally designated prime wetlands recognized by NHDES. Wetlands within the AOI in Newington are not considered prime. Please be advised however that applications proposing impacts to tidally influenced wetlands and other resources receive considerable scrutiny at NHDES.

Local Zoning

Article XIII of the Durham Zoning Ordinance creates the Wetland Conservation Overlay District (W OCD) which takes jurisdiction over all wetlands except isolated non-tidal wetlands less than 3,000 square feet (SF) and which are not vernal pools or man-made wetlands such as ditches and swales, sedimentation/detention basins, agricultural/irrigation ponds or fire ponds/cisterns so long as they are currently functioning, maintained and have not been abandoned. Wetland buffers, which are also part of the W OCD, are required but vary by resource type and zone and range from 75-150 feet. Utility construction is allowed in the W OCD as a Conditional Use after a Conditional Use Permit is granted by the Durham Planning Board.

Article IX – Wetland Overlay District (W OD) – of the Newington Zoning Ordinance prohibits any use that alters the surface configuration of the land by the addition of fill or by dredging. The zoning creates a 75-foot limited-cut buffer⁵ to tidal wetlands and a 100-foot structure setback to wetlands greater than 3,000 square feet which are contiguous with surface waters. Buffers for other wetlands are required depending upon wetland type, size and contiguity with surface waters.

Permitted uses in wetlands include agriculture, forestry, wildlife enhancement or management, passive recreation, conservation areas and nature trails, driveways – by Conditional Use Permit (CUP) – and footbridges or similar with provisions. CUP's may be granted by the Newington Planning Board (NPB) for the construction of roads and other access ways, utility pipelines, and transmission lines provided: the proposed use is essential to the productive use of land outside the W OD; design and construction methods will minimize detrimental impact and restoration is proposed; no alternative route with lesser impact is feasible; and economic advantage is not the sole basis for the proposed construction. Applicants shall agree to submit a performance security to the Board of Selectmen prior to approval. The NPB may require applicants to prepare and submit an environmental impact assessment. The costs for the assessment and any other investigative studies deemed necessary by the NPB shall be borne by the applicant.

⁵ The zoning does not appear to specifically include vegetative buffers or structure setbacks in the W OD. It is therefore unclear if a CUP is needed to work in the buffer to wetlands. It is also unclear how the zoning is being applied in practice by land use boards in Newington.

The above represents a brief summary of the applicable local zoning and state jurisdiction. We recommend that you consult this office, the Durham or Newington Planning Departments or the NHDES for further guidance before proceeding with any design, permitting or construction at this location.

Certification Note

The following certification note should be inserted into any drawings that reflect the delineated wetland-upland boundary:

Jurisdictional resources including Highest Observable Tide Line were delineated on May 29, 2019 by Marc Jacobs, Certified Wetland Scientist number 090, according to the standards of the US Army Corps of Engineers - Wetlands Delineation Manual; the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region; and the Code of Administrative Rules, NH Department of Environmental Services - Wetlands Bureau – Env Wt 100-900. Soils were evaluated utilizing the Field Indicators for Identifying Hydric Soils in New England, Version 4, April 2019 and the Field Indicators of Hydric Soils in the United States, Version 8, 2016. The indicator status of vegetation as hydrophytic was determined according to the U.S. Army Corps of Engineers - Northcentral and Northeast 2016 Regional Wetland Plant List. Copies of site plans which have been reviewed by the wetland scientist are individually stamped, signed and dated. This note has been customized for this project.

Please contact the undersigned with any questions regarding the above-referenced information.

Cordially,

Marc Jacobs, CWS, PWS, CSS, CPESC

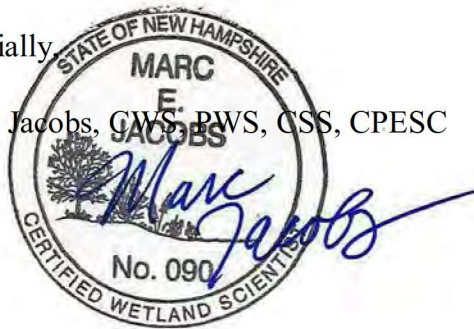




Image 1 – Looking northerly at the saltmarsh in Durham. (©Jacobs 2019)



Image 2 – Looking southerly along the 'C' line from flag C1± in Newington. (©Jacobs 2019)



Image 3 – Looking northerly from flag C20± at bank erosion along the 'C' line in Newington. (©Jacobs 2019)

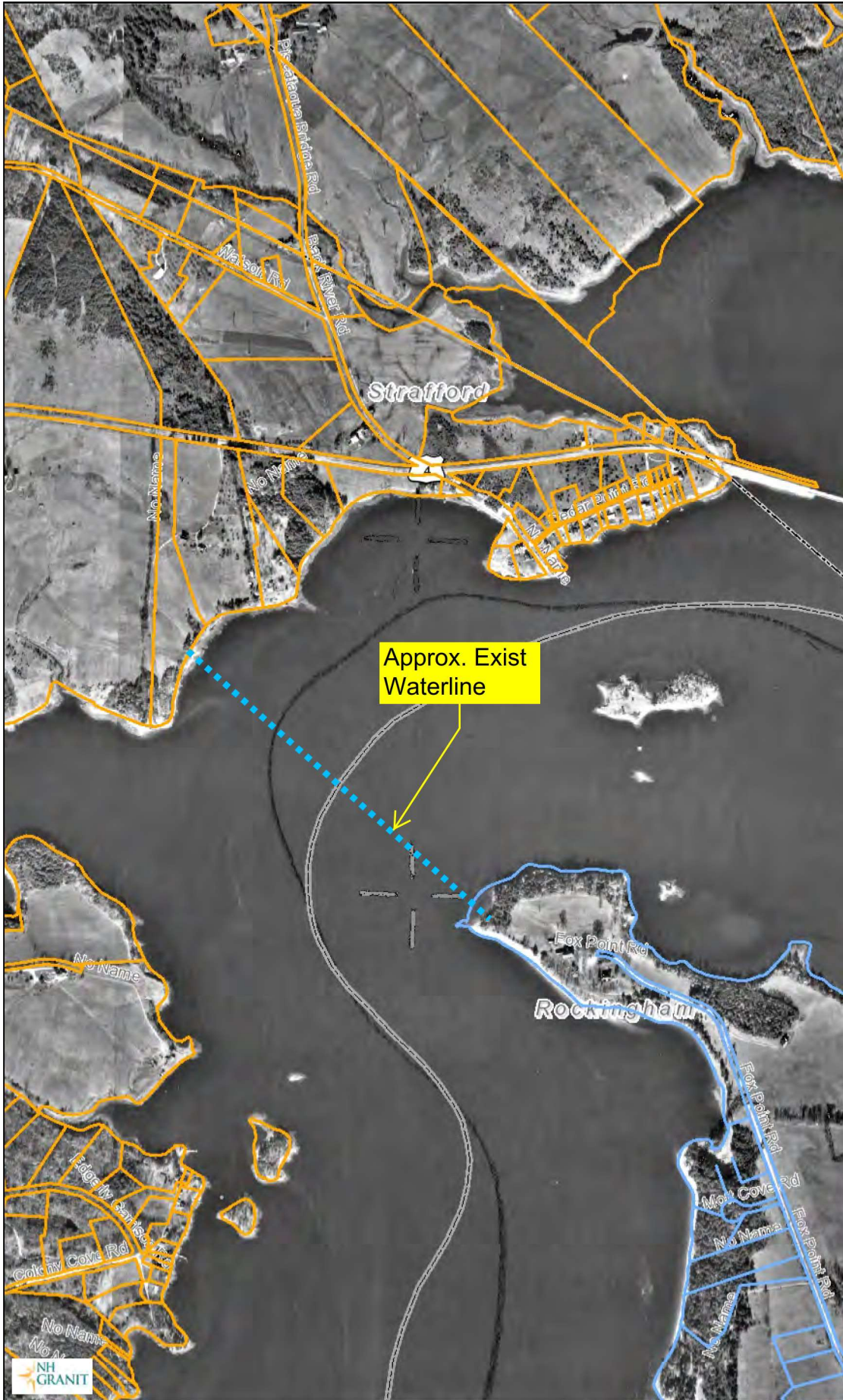


Image 4 – Looking easterly along the 'C' line from flag C20± in Newington. (©Jacobs 2019)



Image 5 – Looking northerly at the saltmarsh identified by the 'D' flags series in Newington. (©Jacobs 2019)

Subaqueous Water Main



Legend

- Polygons
- Additional lines
- State
- County
- City/Town

ATTACHMENT 4A

Map Scale

1: 12,988

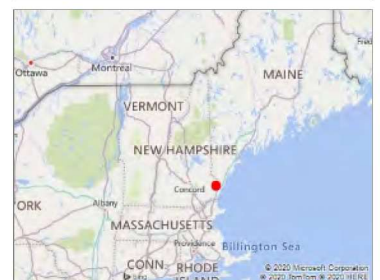
© NH GRANIT, www.granit.unh.edu

Map Generated: 7/29/2020



Notes

1962 Panchromatic



Subaqueous Water Main



Legend

- Parcels - polygons
Coastal 2019 1-foot RGB

ATTACHMENT 4B

Map Scale

1: 12,988

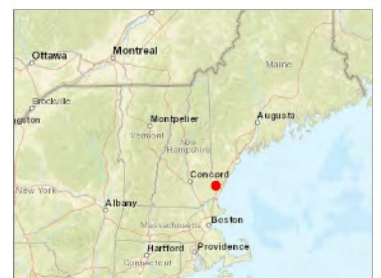
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Map Generated: 7/18/2020



Notes

2019 AERIAL





Subaqueous Water Main



0.5 0 0.25 0.5 Miles

WGS_1984_Web_Mercator_Auxiliary_Sphere
© Latitude Geographics Group Ltd.

1: 13,902



ATTACHMENT 5A

Legend

- NH Parcel Mosaic
- Prime Wetlands with 100 ft Buffer
- Prime Wetlands
- Peatlands
- Sand Dunes
 - backdune
 - foredune
 - interdune
 - other
- Tidal Waters / Tidal Wetlands
 - Tidal wetland
 - Transitional salt marsh
 - Salt marsh
 - Mud flat
 - Tidal water

Map Notes

Priority Resource Areas

This map is a user generated static output from the web-based NHDES Wetlands Permit Scanning Tool and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. No map should be printed with scale 1 to less than 7,500.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Subaqueous Water Main



Legend

- Polygons
- Additional lines
- State
- County
- City/Town
- Flood Hazard - Areas**
- 1 pct. Annual Chance Flood Hazard
- 0.2 pct. Annual Chance Flood Hazard
- Area of Undetermined Flood Hazard
- Area Protected by Levee

ATTACHMENT 5B

Approx. Existing Water Main

Map Scale

1: 12,988

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Map Generated: 8/1/2020



Notes

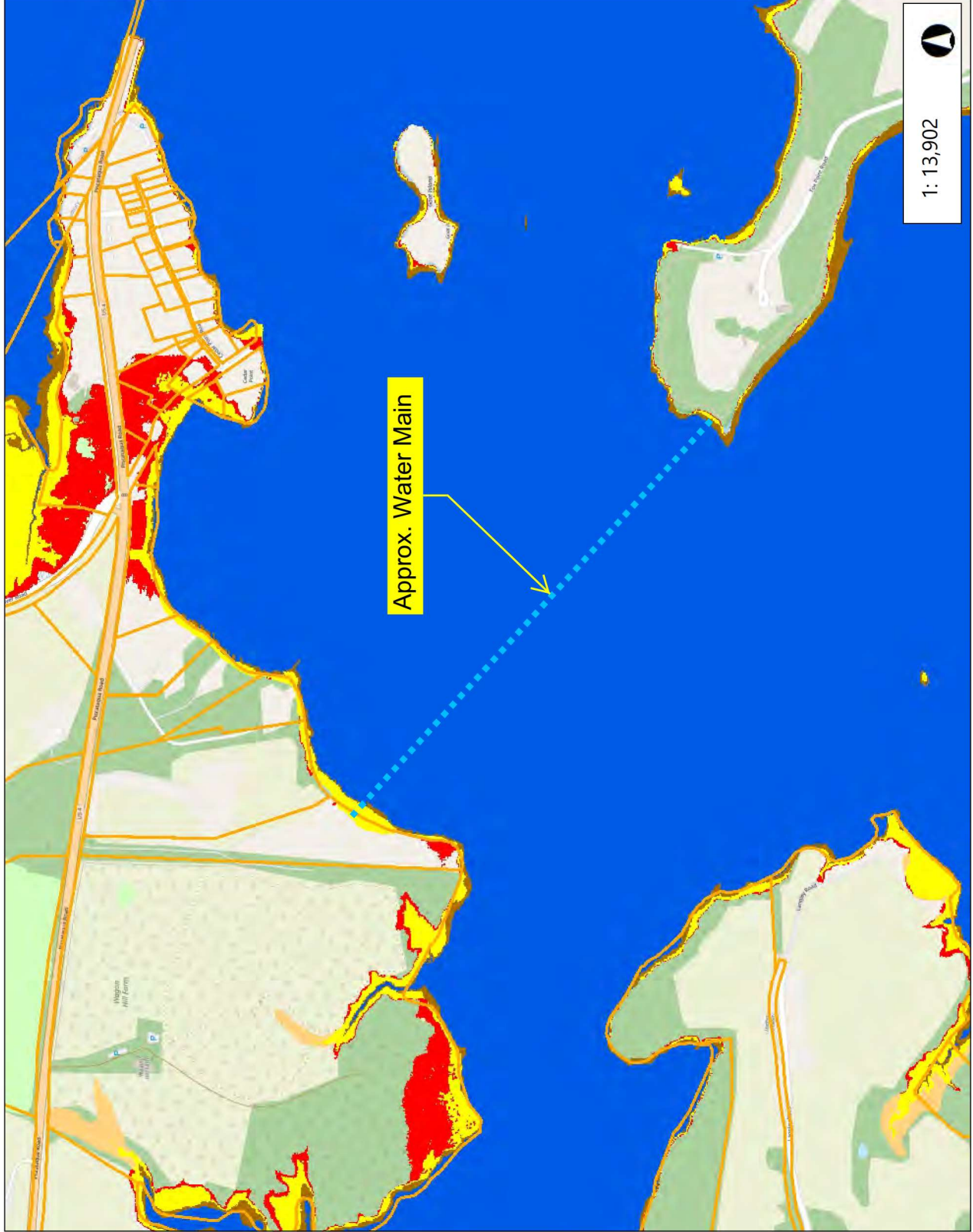
FLOOD HAZARD AREAS





Subaqueous Water Main

ATTACHMENT 6A



Legend

- NH Parcel Mosaic
- Predicted Marsh Migration 210**
 - Freshwater wetland
 - Tidal wetland
 - Transitional salt marsh
 - Salt marsh
 - Mud flat
 - Inland open water
 - Tidal water

1: 13,902



Map Notes

Predicted Saltmarsh Migration Scenario 1
1.2 meter rise by 2100

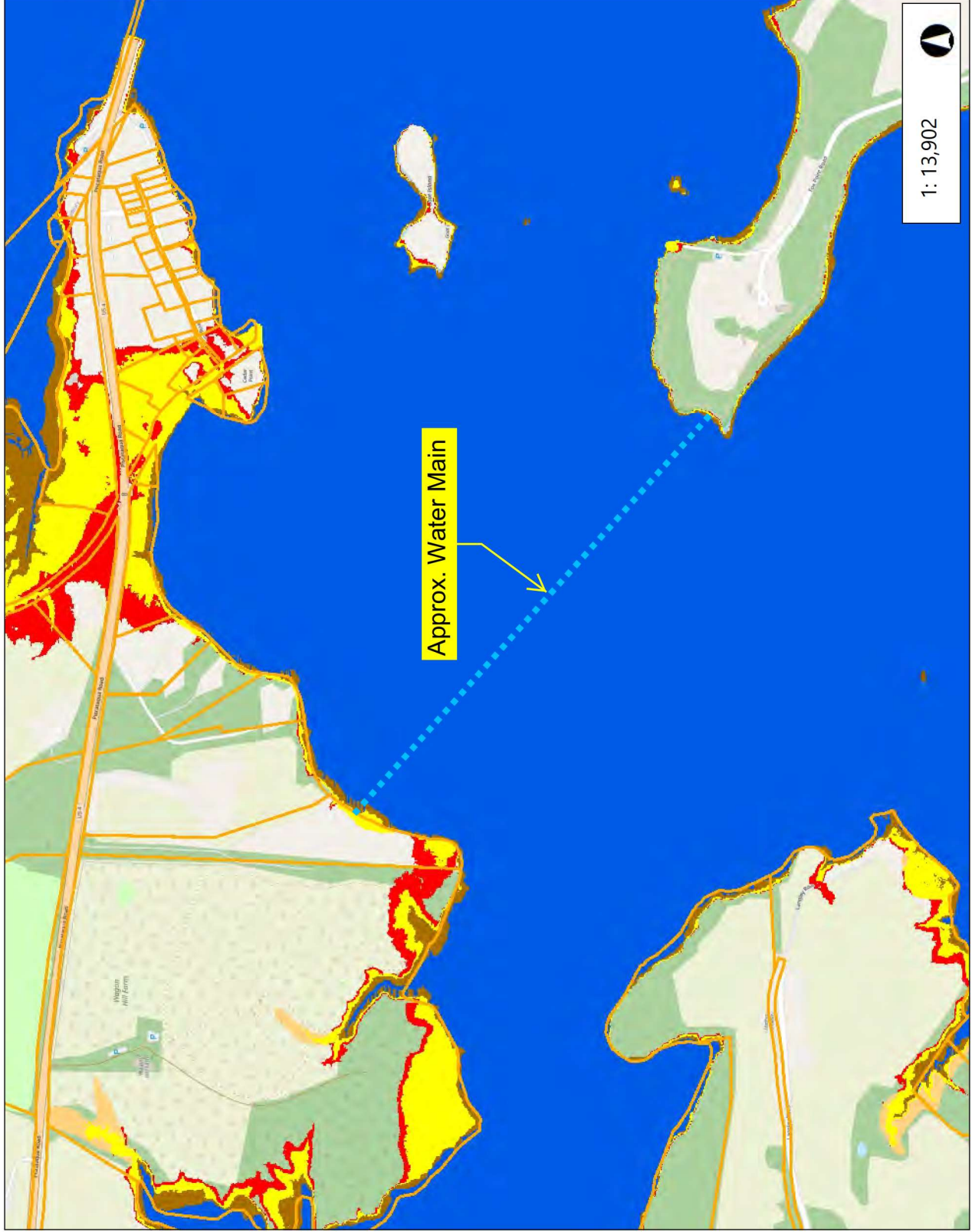
This map is a user generated static output from the web-based NHDES Wetlands Permit Scanning Tool and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. No map should be printed with scale 1 to less than 7,500.
THIS MAP IS NOT TO BE USED FOR NAVIGATION





Subaqueous Water Main

ATTACHMENT 6B



Legend

- NH Parcel Mosaic
- Predicted Marsh Migration 2100**
 - Freshwater wetland
 - Tidal wetland
 - Transitional salt marsh
 - Salt marsh
 - Mud flat
 - Inland open water
 - Tidal water

Map Notes

Predicted Saltmarsh Migration Scenario 2
2 meter rise by 2100

1: 13,902

This map is a user generated static output from the web-based NHDES Wetlands Permit Scanning Tool and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. No map should be printed with scale 1 to less than 7,500.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

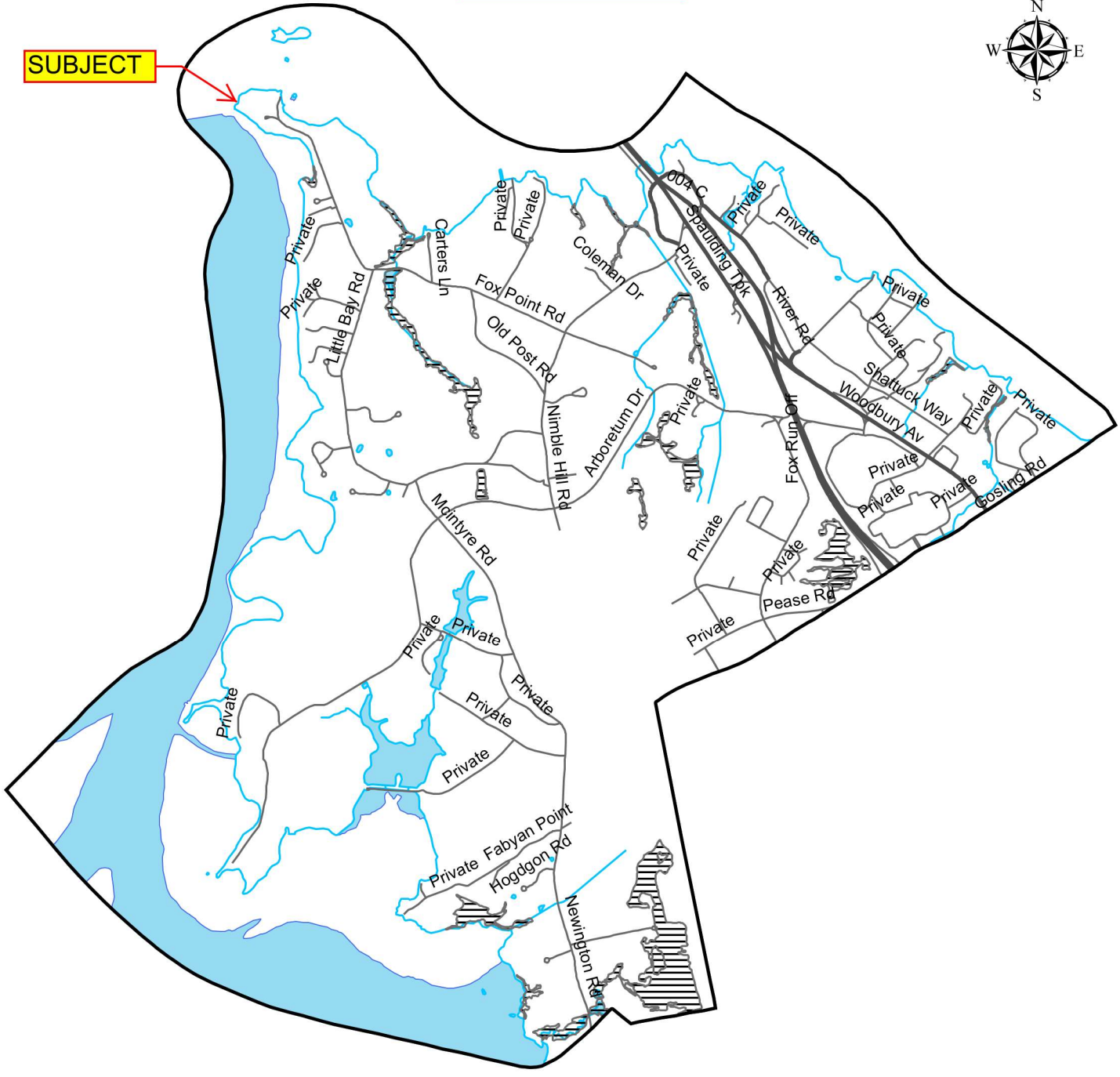
0.5 Miles
0 0.25

WGS_1984_Web_Mercator_Auxiliary_Sphere
© Latitude Geographics Group Ltd.

ATTACHMENT 7



SUBJECT



- Legend**
- Roads**
 - Town
 - State
 - Hydrography**
 - Surface Water
 - Prime Wetland 100 Foot Buffer**
 - NO
 - YES
 - 100 Foot Buffer

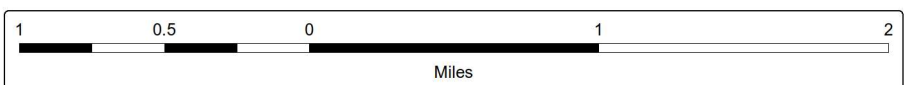
Prime Wetlands in Newington, NH

New Hampshire State Plane Coordinate System
North American Datum 1983 (feet)

The coverages presented are under constant revision as new sites or facilities are added, and may not contain all potential or existing sites or facilities. These maps were prepared using data supplied by the municipality and the information was digitized to the best of our ability. For prime wetland and prime wetland buffer locations for a specific site, please contact the municipal office where the project is proposed. NHDES is not responsible for the use or interpretation of this information by third parties.

New Hampshire Department of Environmental Services
Wetlands Bureau
29 Hazen Drive
P.O. Box 95
Concord, NH 03302-0095

DATE PRODUCED
October, 2012



CONFIDENTIAL – NH Dept. of Environmental Services review

Memo

NH Natural Heritage Bureau
HB Datacheck Results Letter

To: Jacob Shactman, Wright-Pierce
230 Commerce Way
Suite 302
Portsmouth, NH 03801

From: Amy Lamb, NH Natural Heritage Bureau

Date: 7/30/2020 (valid for one year from this date)

Re: Review by NH Natural Heritage Bureau
NHB File ID: NHB20-2107

Town: Newington, Durham

Location: Tax Maps: 5-2 (Durham), 1-1
(Newington)

Description: Repair/replacement of two existing sub-aqueous water mains crossing Little Bay in the Piscataqua River. The current approach is to install a weighted, polyethylene pipe across the bottom of the riverbed and within the footprint of the existing infrastructure to allow the existing water mains to be taken out of service. (Previous file number: NHB19-0978)

cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments: Please continue to coordinate with the NH Fish & Game Department and NHB.

Natural Community

Sparsely vegetated intertidal system

State¹ Federal Notes

-- --

Threats to these communities are primarily alterations to the hydrology of the wetland (such as alterations that might affect the sheet flow of tidal waters across the intertidal flat) and increased input of nutrients and pollutants in storm runoff.

Subtidal system

-- --

Threats to these communities are primarily alterations to the hydrology of the wetland (such as alterations that might affect the sheet flow of tidal waters across the intertidal flat) and increased input of nutrients and pollutants in storm runoff.

Vertebrate species

Atlantic Sturgeon (*Acipenser oxyrinchus*)

Common Tern (*Sterna hirundo*)

Shortnose Sturgeon (*Acipenser brevirostrum*)

State¹ Federal Notes

T T

T --

E E

Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).

Contact the NH Fish & Game Dept (see below).

Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).

¹Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

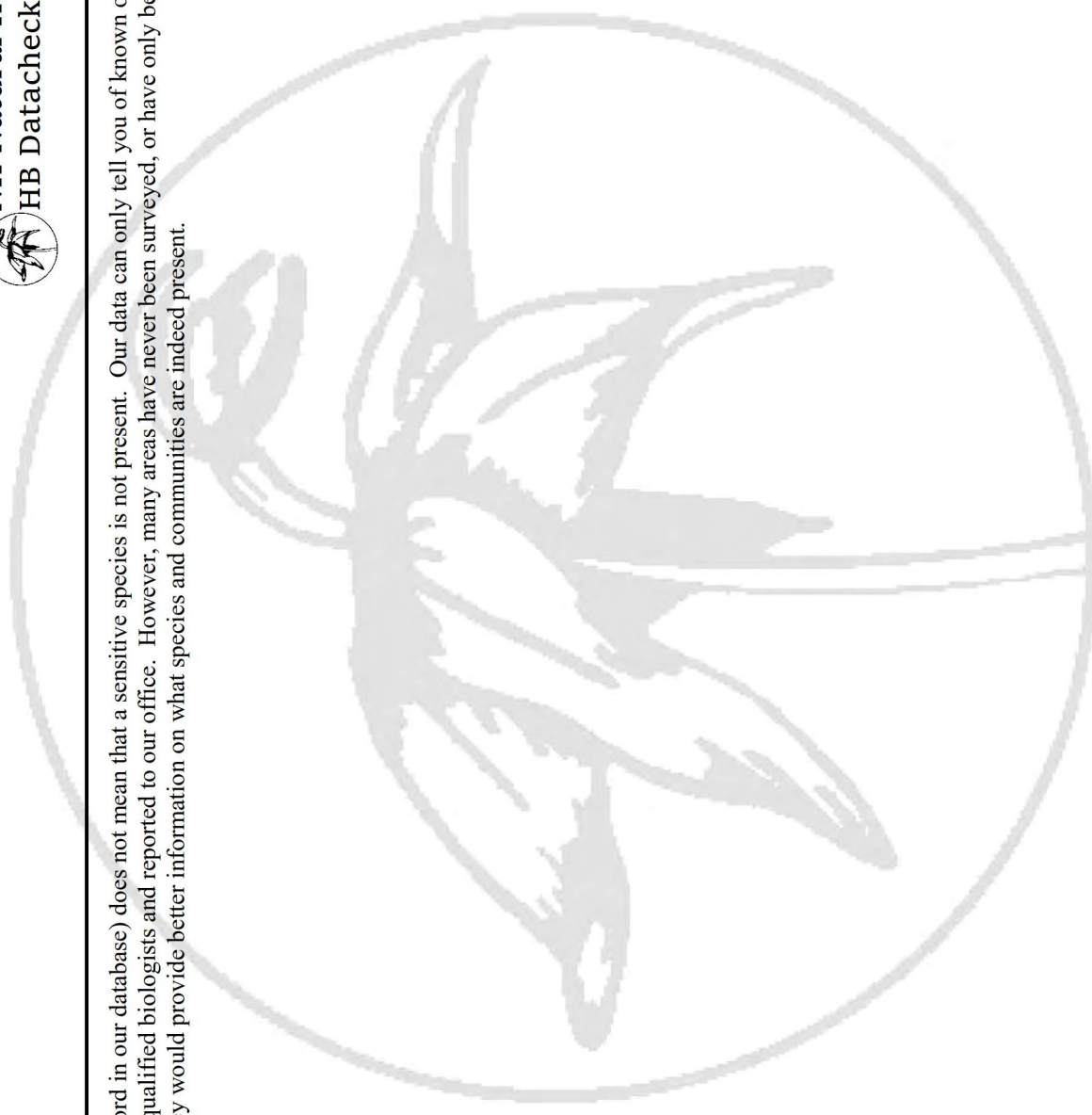
CONFIDENTIAL – NH Dept. of Environmental Services review

Memo

NH Natural Heritage Bureau
HB Datacheck Results Letter



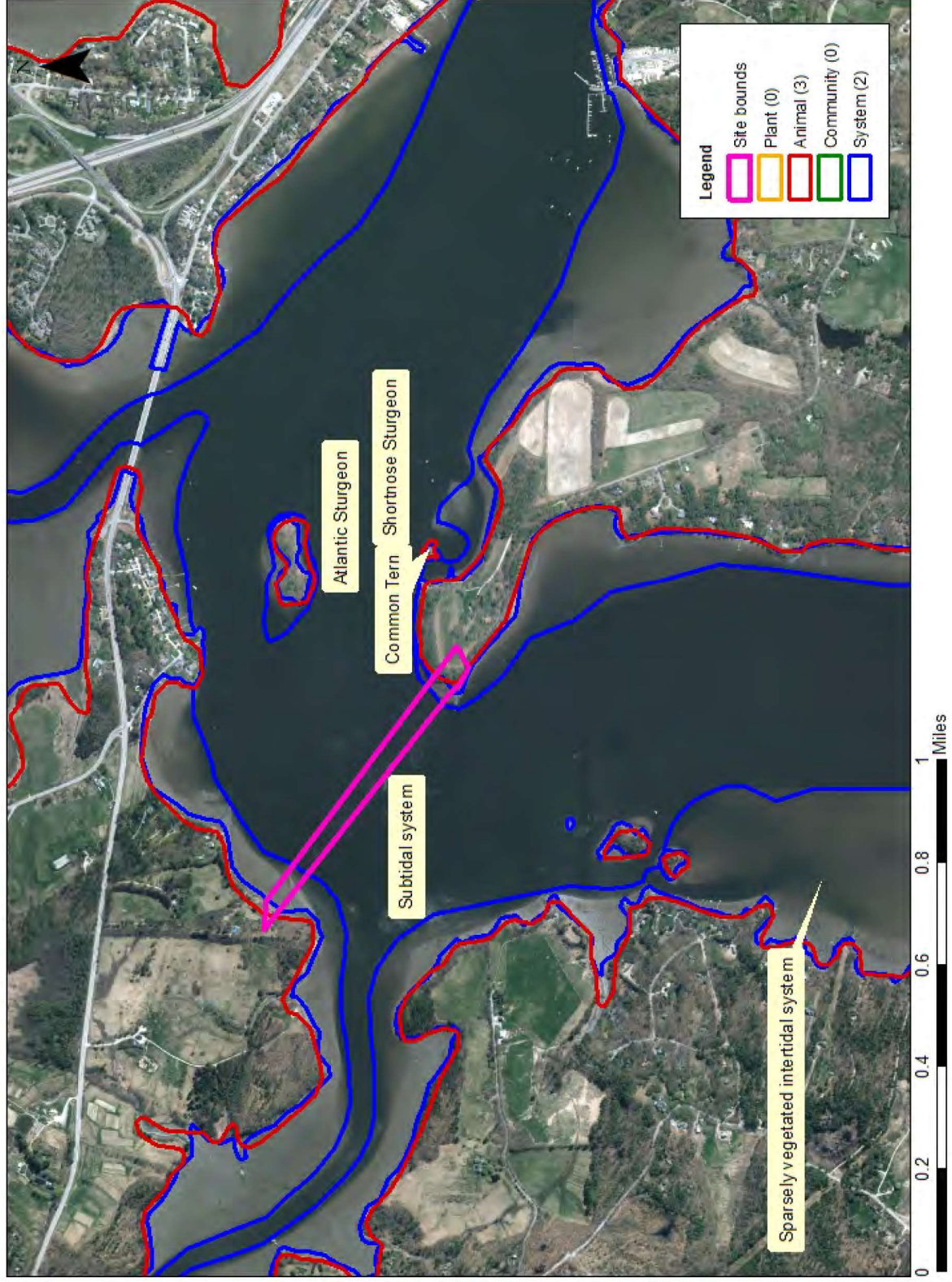
A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.



Department of Natural and Cultural Resources
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DNCR/NHB
172 Pembroke Rd.
Concord, NH 03301

NHB20-2107



New Hampshire Natural Heritage Bureau - System Record

Sparsely vegetated intertidal system

Legal Status

Federal: Not listed
State: Not listed

Conservation Status

Global: Not ranked (need more information)
State: Rare or uncommon

Description at this Location

Conservation Rank: Good quality, condition and landscape context ('B' on a scale of A-D).
Comments on Rank: --

Detailed Description: Extensive *intertidal flats* that are exposed daily at low tide, bordered in places by *intertidal rocky shore* and *coastal shoreline strand/swale* communities.

General Area: 2010: Borders **salt marsh system** landward and **subtidal system** seaward.

General Comments: --

Management: --

Comments:

Location

Survey Site Name: Great Bay

Managed By: Moody Point Open Space

County: Rockingham

Town(s): Newington

Size: 3589.5 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Occurs throughout Great Bay from the mouths of its tributaries, through Little Bay, to the confluence with the Piscataqua River.

Dates documented

First reported: 1997-06-23

Last reported: 2010-10-13

New Hampshire Natural Heritage Bureau - System Record

Subtidal system

Legal Status

Federal: Not listed
State: Not listed

Conservation Status

Global: Not ranked (need more information)
State: Rare or uncommon

Description at this Location

Conservation Rank: Good quality, condition and landscape context ('B' on a scale of A-D).
Comments on Rank: --

Detailed Description: Channels and bay bottoms that vary in width from a few feet to almost a mile across, covered by water even at low tide. Patches of subtidal *eelgrass bed* occur at the edge of the adjacent **sparsely vegetated intertidal system**.

General Area: 2010: Borders a **sparsely vegetated intertidal system**.

General Comments: --

Management: --

Comments:

Location

Survey Site Name: Great Bay

Managed By: Portsmouth Country Club

County: Rockingham

Town(s): Newington

Size: 3207.7 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Occurs throughout the Great Bay estuary, from the upper total reaches of tributary streams to the confluence of the bay with the Piscataqua River.

Dates documented

First reported: 1997-06-17

Last reported: 2010-10-13

New Hampshire Natural Heritage Bureau - Animal Record

Atlantic Sturgeon (*Acipenser oxyrinchus*)

Legal Status

Federal: Listed Threatened
State: Listed Threatened

Conservation Status

Global: Rare or uncommon
State: Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2016: 1 individual, sex unknown, detected in the lower Piscataqua River.
2015: 1 individual, sex unknown, detected in Portsmouth Harbor.
2012: 1 individual, sex unknown, detected in Little Bay.

General Area: 2016: Tidal waters in Portsmouth Harbor, Little Bay, and the Piscataqua River.

General Comments: --

Management: --

Comments:

Location

Survey Site Name: Piscataqua River

Managed By:

County:

Town(s): Out-Of-State

Size: 7749.3 acres

Elevation:

Precision: Within 1.5 miles of the area indicated on the map (location information is vague or uncertain).

Directions: 2016: Tidal waters of Portsmouth Harbor, Little Bay, and the Piscataqua River.

Dates documented

First reported: 2012-06-02

Last reported: 2016-05-27

The U.S. Fish & Wildlife Service has jurisdiction over Federally listed species. Please contact them at 70 Commercial Street, Suite 300, Concord NH 03301 or at (603) 223-2541.

New Hampshire Natural Heritage Bureau - Animal Record

Common Tern (*Sterna hirundo*)

Legal Status

Federal: Not listed
State: Listed Threatened

Conservation Status

Global: Demonstrably widespread, abundant, and secure
State: Not ranked (need more information)

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2020: Area 4555M: At least 8 adults observed from mainland, but likely many more
2011: Area 4555M: 31 adults, 11 fledglings.
2003: Area 4555M: 12 pairs, 12 fledglings.
2002: Area 4555M: 12 pairs, 12 fledglings.
2001: Area 4555M: 12 pairs, 8 fledglings.
2000: Area 4555M: 15 pairs, 12 fledglings.
1999: Area 4555M: 2 pairs, 2 fledglings.
1998: Area 4555M: 0 pairs.
1997: Area 4555M: 2 pairs, 2 fledglings.
1996: Area 4555M: 7 pairs, 6 fledglings.
1995: Area 4555M: 9 pairs, 0 fledglings.
1994: Area 4555M: 14 pairs, 5 fledglings.
1993: Area 4555M: 11 pairs, 14 fledglings.
1992: Area 4555M: 7 pairs, 13 fledglings.
1991: Area 4555M: 8 pairs, 1 fledgling.
1990: Area 4555M: 7 nests; 2 fledglings.
1989: Area 4555M: 4 pairs, 4-6 fledglings.
1986: Area 4555M: 4-5 pairs, 0 fledglings.
1985: Area 4555M: 5 pairs, 1 fledgling.
1981: Area 4555M: 2 pairs, 0 fledglings.
1980: Area 4555M: 2 pairs..

General Area: An island <0.8 ha. in area which supports small patches of sparse grasses, substantial shrub growth, and several small trees.

General Comments: 1992: Town residents launch and moor private boats in the small cove east of Fox Point and south of Hen Island. The presence of terns is well-known by those who utilize this site, and they are careful not to land on or venture too close to the island during the breeding season.

Management Comments: 1992: Contact with the town of Newington and the local residents is the most effective technique for eliminating human disturbance at this site. Traps were set for rats in the spring. 1991: All nests were lost to rats this season. Traps were set in the fall.

Location

Survey Site Name: Hen Island
Managed By: Fox Point

County: Rockingham
Town(s): Newington
Size: .4 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Area 4555: [Hen Island lies approximately 70 meters east of Fox Point on Little Bay in Newington.]

Dates documented

First reported: 1980-05-15 Last reported: 2020-06-19

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

IPaC Information for Planning and Consultation U.S. Fish & Wildlife Service

IPaC resource list

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

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

Location

Strafford County, New Hampshire



Local office

New England Ecological Services Field Office

☎ (603) 223-2541

📠 (603) 223-0104

70 Commercial Street, Suite 300

Concord, NH 03301-5094

<http://www.fws.gov/newengland>

NOT FOR CONSULTATION

Endangered species

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

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

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

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

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

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

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

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

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

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Flowering Plants

NAME	STATUS
Small Whorled Pogonia <i>Isotria medeoloides</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

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

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

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

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

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

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

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

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

Breeds Oct 15 to Aug 31

Black-billed Cuckoo *Coccyzus erythrophthalmus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9399>

Breeds May 15 to Oct 10

Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Buff-breasted Sandpiper <i>Calidris subruficollis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9488	Breeds elsewhere
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Dunlin <i>Calidris alpina arctica</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Nelson's Sparrow <i>Ammodramus nelsoni</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Sep 5
Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Red-throated Loon <i>Gavia stellata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

Semipalmated Sandpiper *Calidris pusilla*

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush *Hylocichla mustelina*

Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

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

Probability of Presence (■)

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

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

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

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

Breeding Season (■)

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

project area.

Survey Effort (!)

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

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

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

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

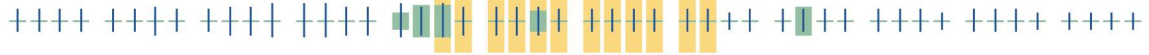


Buff-breasted Sandpiper
BCC Rangewide
(CON) (This is a Bird of Conservation Concern (BCC)



throughout its range in the continental USA and Alaska.)

Canada Warbler
BCC Rangewide
(CON) (This is a Bird of Conservation Concern (BCC)



Dunlin
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



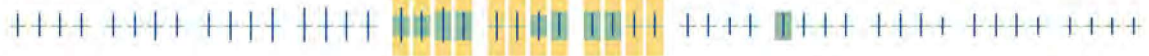
Lesser Yellowlegs
BCC Rangewide
(CON) (This is a Bird of Conservation Concern (BCC)



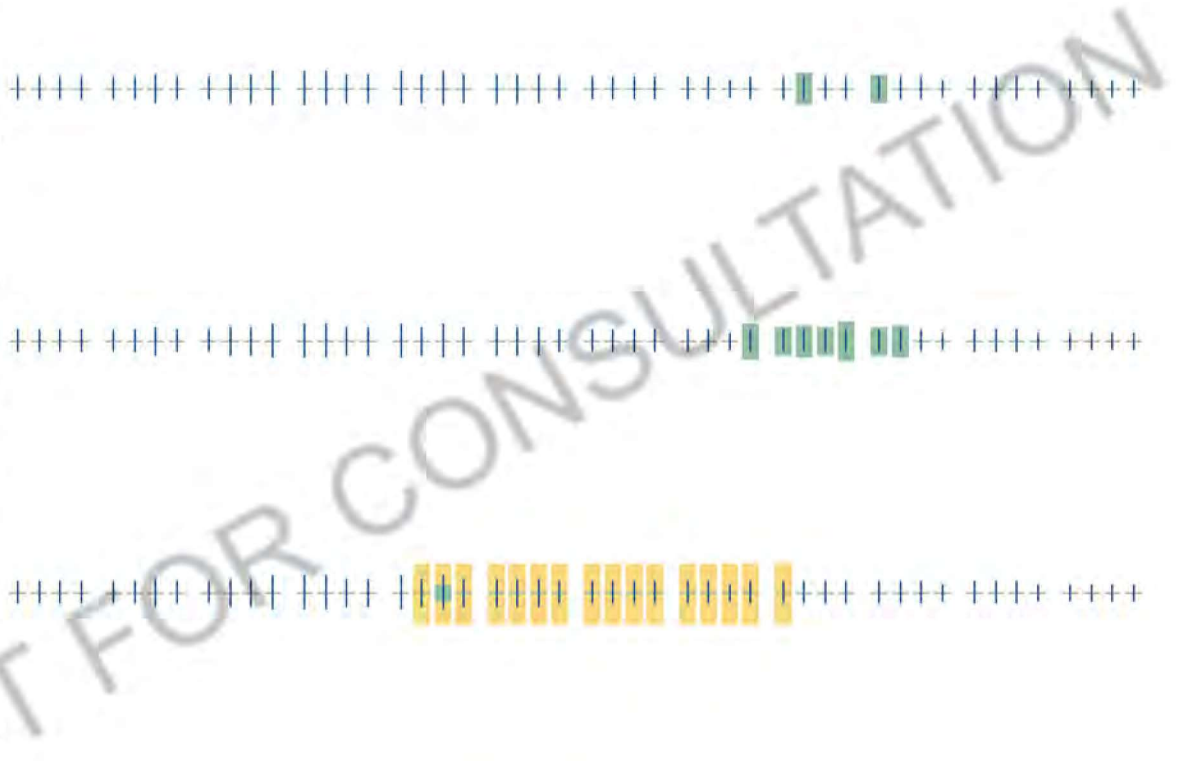
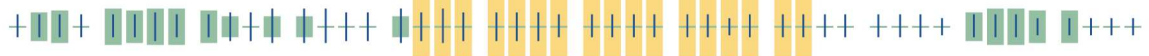
Nelson's Sparrow
BCC Rangewide
(CON) (This is a Bird of Conservation Concern (BCC)

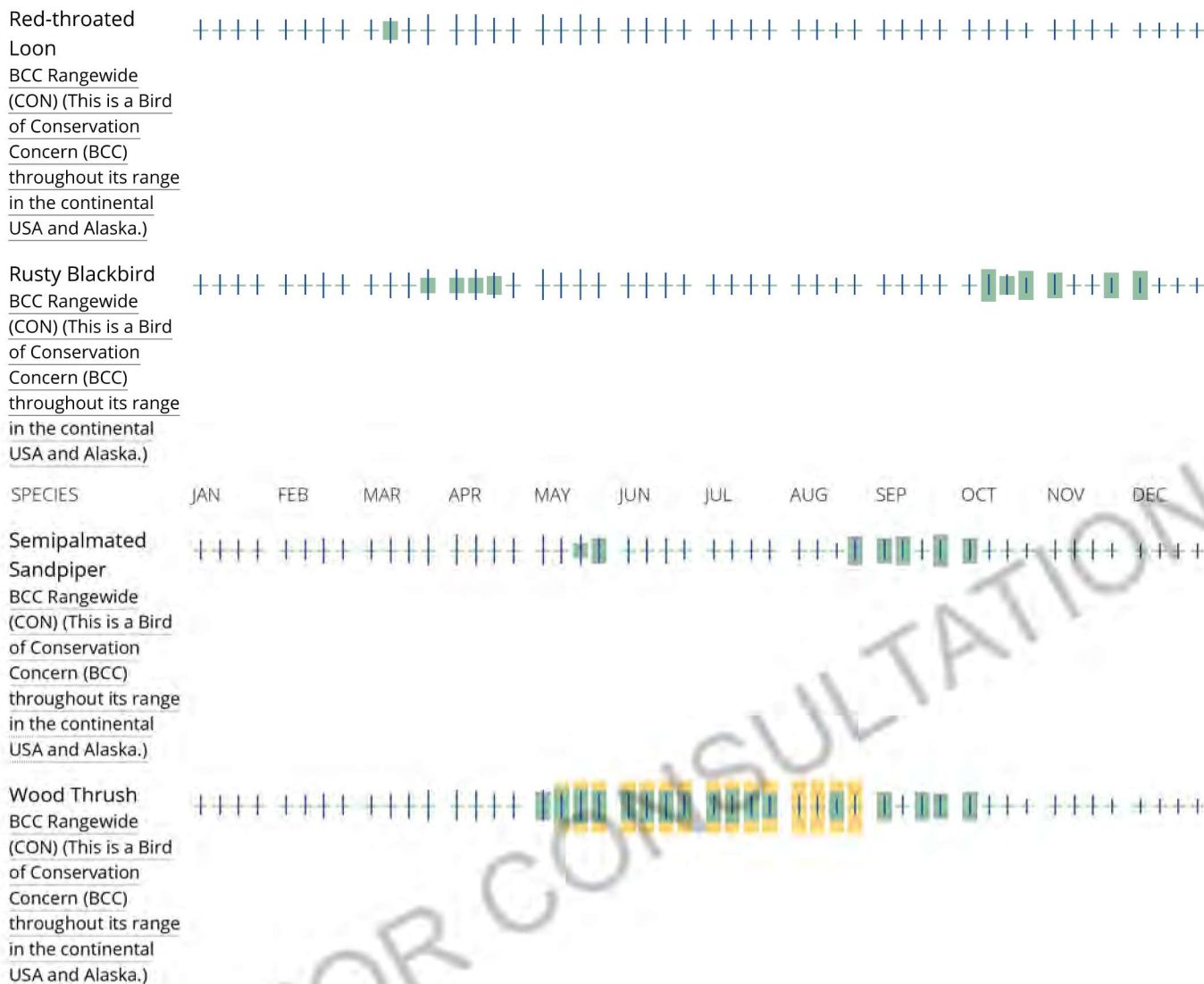


Prairie Warbler
BCC Rangewide
(CON) (This is a Bird of Conservation Concern (BCC)



Red-headed Woodpecker
BCC Rangewide
(CON) (This is a Bird of Conservation Concern (BCC)





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

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

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

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

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because

they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

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

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

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

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

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

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

What are the levels of concern for migratory birds?

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

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

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

Details about birds that are potentially affected by offshore projects

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

[Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

Facilities

National Wildlife Refuge lands

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

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

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

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

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

This location overlaps the following wetlands:

ESTUARINE AND MARINE DEEPWATER

[E1UBL](#)

ESTUARINE AND MARINE WETLAND

[E2US3M](#)

[E2EM1P](#)

[E2US3N](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

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

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

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

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or

submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

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

NOT FOR CONSULTATION

ATTACHMENT 8C

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

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

Location

Rockingham County, New Hampshire



Local office

New England Ecological Services Field Office

☎ (603) 223-2541

📠 (603) 223-0104

70 Commercial Street, Suite 300

Concord, NH 03301-5094

<http://www.fws.gov/newengland>

NOT FOR CONSULTATION

Endangered species

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

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

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

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

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

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

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

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

Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

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

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

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

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

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

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the

[E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

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

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<https://ecos.fws.gov/ecp/species/1626>

Breeds Oct 15 to Aug 31

Black-billed Cuckoo *Coccyzus erythrophthalmus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9399>

Breeds May 15 to Oct 10

Bobolink *Dolichonyx oryzivorus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Jul 31

Buff-breasted Sandpiper <i>Calidris subruficollis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9488	Breeds elsewhere
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Dunlin <i>Calidris alpina arctica</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Nelson's Sparrow <i>Ammodramus nelsoni</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Sep 5
Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Red-throated Loon <i>Gavia stellata</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Semipalmated Sandpiper <i>Calidris pusilla</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere

Wood Thrush *Hylocichla mustelina*

Breeds May 10 to Aug 31

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

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

Probability of Presence (■)

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

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

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

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

Breeding Season (■)

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

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The

number of surveys is expressed as a range, for example, 33 to 64 surveys.

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

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

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



Canada Warbler
BCC Rangewide
(CON) (This is a Bird



of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)

Dunlin
BCC - BCR (This is a
Bird of Conservation
Concern (BCC) only
in particular Bird
Conservation
Regions (BCRs) in
the continental USA)



Lesser Yellowlegs
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Nelson's Sparrow
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



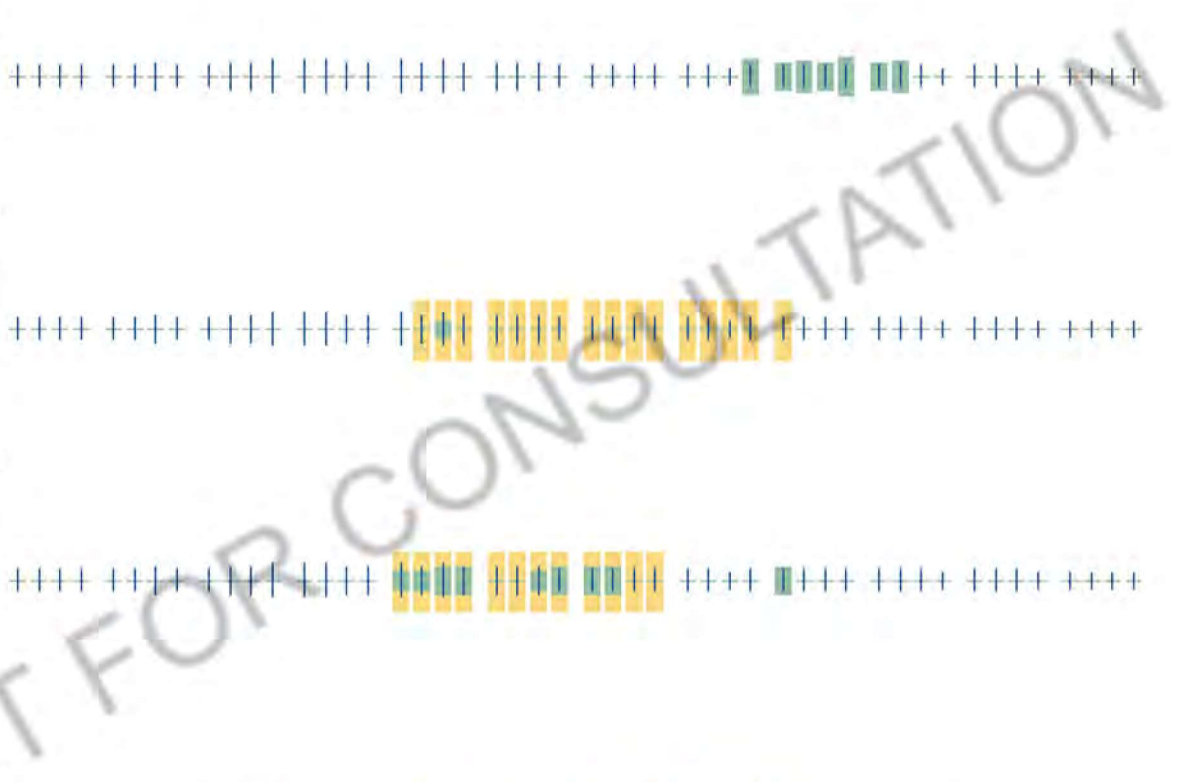
Prairie Warbler
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)

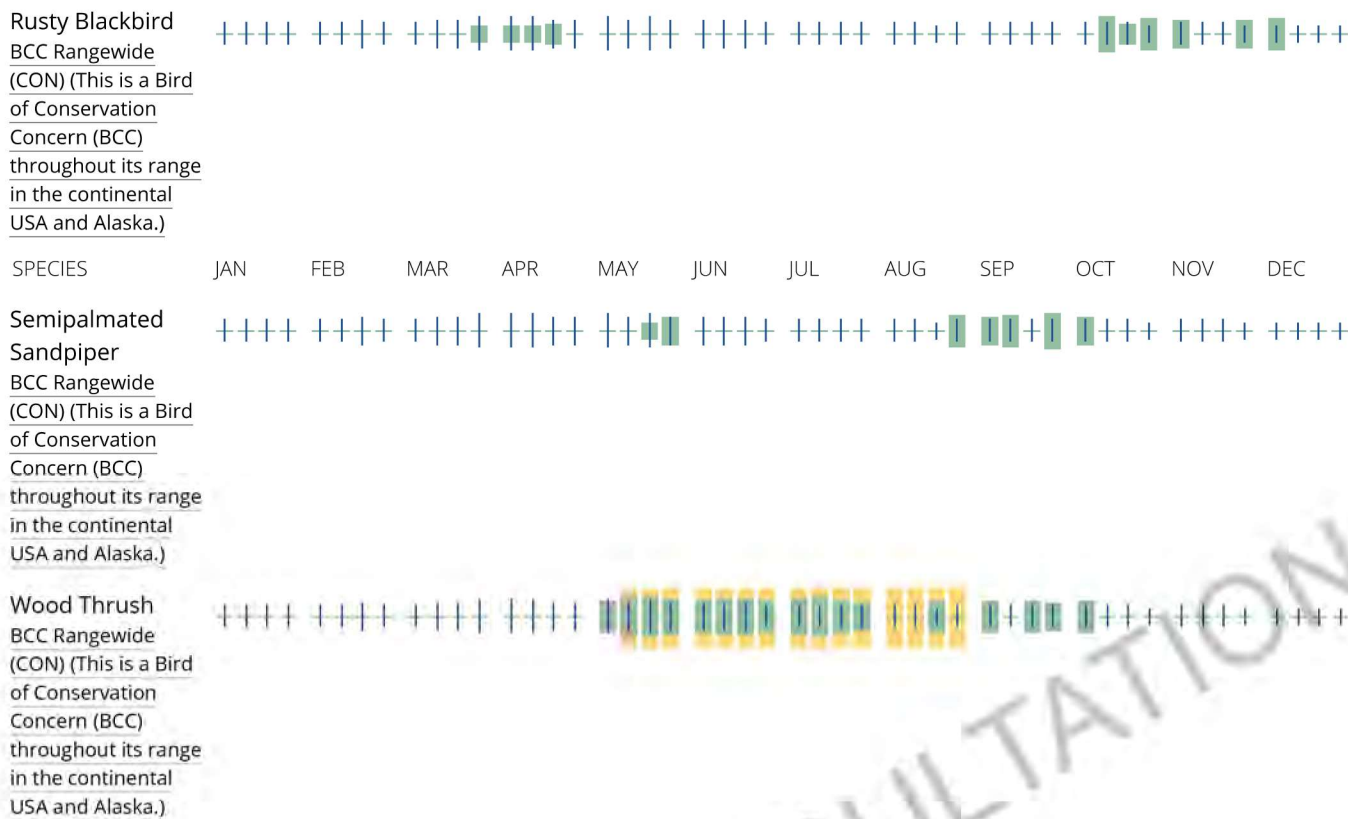


Red-headed
Woodpecker
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)



Red-throated
Loon
BCC Rangewide
(CON) (This is a Bird
of Conservation
Concern (BCC)
throughout its range
in the continental
USA and Alaska.)





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

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

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

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

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

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

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially

occurring in my specified location?

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

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

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

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

What are the levels of concern for migratory birds?

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

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

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

Details about birds that are potentially affected by offshore projects

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

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

What if I have eagles on my list?

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

Proper Interpretation and Use of Your Migratory Bird Report

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

Facilities

National Wildlife Refuge lands

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

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under

Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

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

This location overlaps the following wetlands:

ESTUARINE AND MARINE DEEPWATER

[E1UBL](#)

ESTUARINE AND MARINE WETLAND

[E2US3N](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

Data limitations

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

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

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

Data exclusions

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

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies.

Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

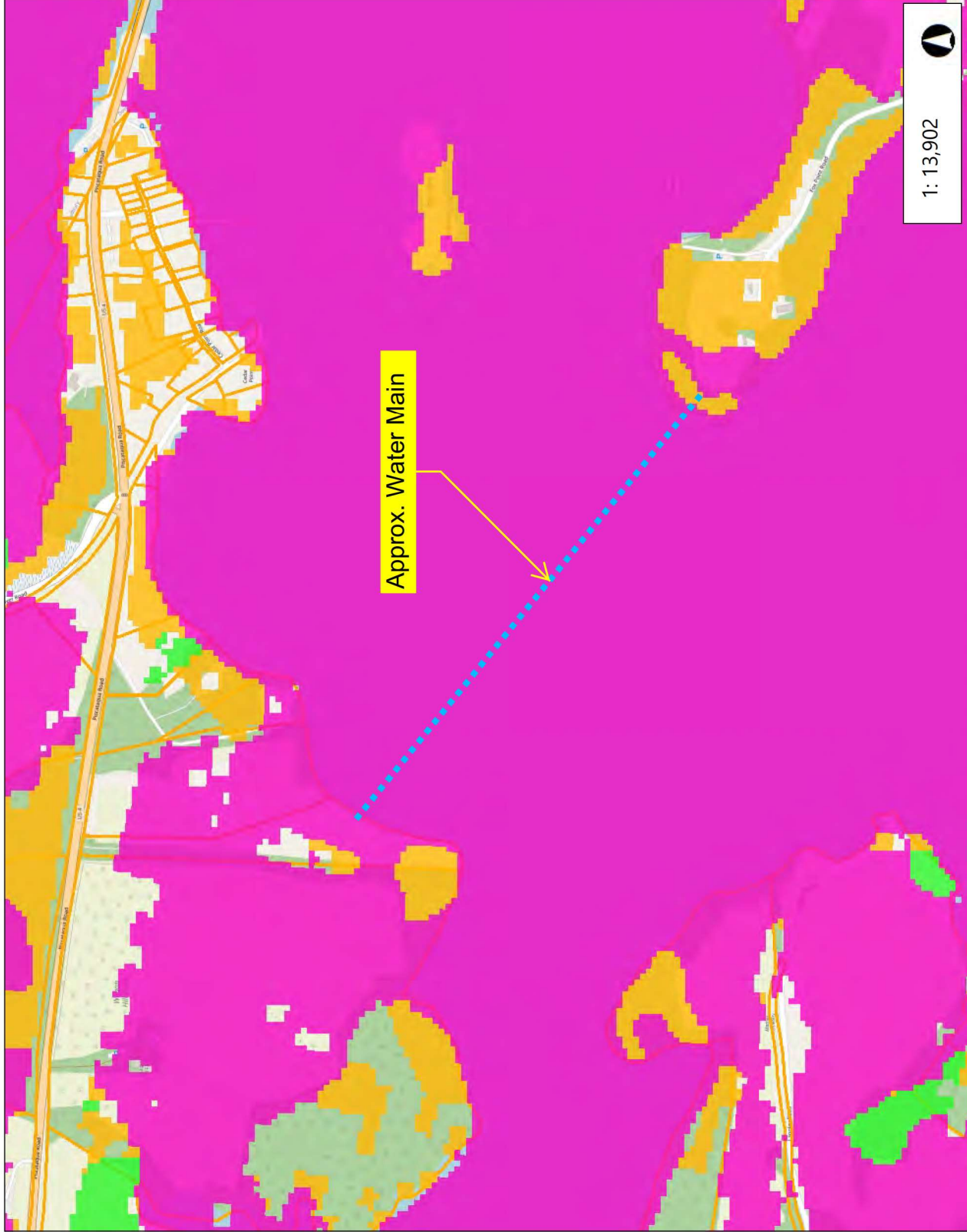


Subaqueous Water Main

ATTACHMENT 8D

Legend

- Highest Ranked Wildlife Habitat
- 0
 - 1 Highest Ranked Habitat in NH
 - 2 Highest Ranked Habitat in Region
 - 3 Supporting Landscape
 - NH Parcel Mosaic



1: 13,902



0.5 Miles
0 0.25

WGS_1984_Web_Mercator_Auxiliary_Sphere
© Latitude Geographics Group Ltd.

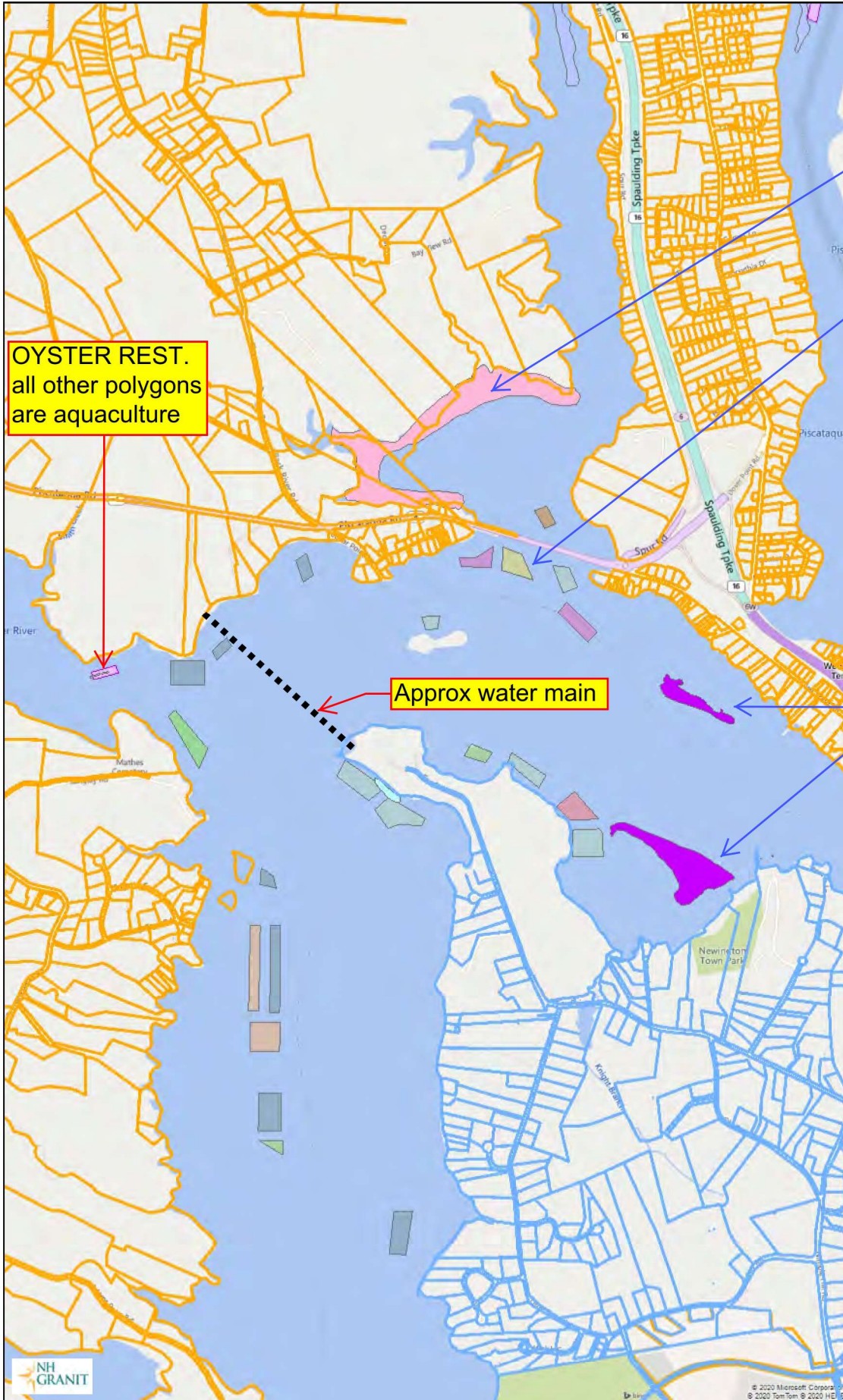
Map Notes

Wildlife Action Plan

This map is a user generated static output from the web-based NHDES Wetlands Permit Scanning Tool and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. No map should be printed with scale 1 to less than 7,500.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Subaqueous Water Main

ATTACHMENT 9A



Legend

- Additional lines
- ▭ Parcels - polygons
- Current Shellfish Beds
 - ▭ Blue Mussel
 - ▭ Oyster
 - ▭ Razor Clam
 - ▭ Softshell Clam
 - ▭ Surf Clam
- ▭ Oyster Restoration Sites
- Shellfish Aquaculture
 - ▭ American Oyster
 - ▭ American Oyster, Hard Clam
 - ▭ American Oyster, Soft Shell Clam
 - ▭ American Oyster, Soft Shell Clam, I Clam
 - ▭ American Oyster, Soft Shell Clam, I Clam, Algae
 - ▭ American Oyster, Soft Shell Clam, I Clam, European Oyster
 - ▭ American Oyster, Soft Shell Clam, I Clam, Razor Clam
 - ▭ American Oyster, Soft Shell Clam, I Clam, Razor Clam, Blue Mussels
 - ▭ American Oyster, Soft-Shell Clam, I Clam
 - ▭ American Oyster, Soft-Shell Clam, I Clam, Razor Clam
 - ▭ American Oyster, Soft-Shell Clam, I Clam, Sea Scallop, Great Scallop, I Scallop, Green Sea Urchin
 - ▭ Blue Mussel
 - ▭ Blue Mussel, European Oyster, Sea Scallops, Sugar Kelp, Horse Tail Kelp, Winged Kelp, Sea Lettuce, Nori
 - ▭ Steelhead Trout, Blue Mussel
 - ▭ Sugar Kelp, Horse Tail Kelp, Dulse, Kelp/Wakame, Sea Lettuce, Gracile
- 2019 Eelgrass

Map Scale

1: 25,977

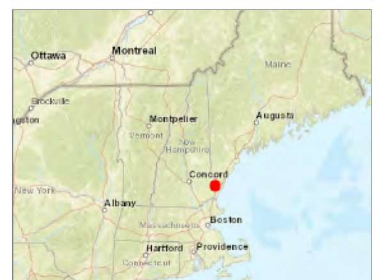
© NH GRANIT, www.granit.unh.edu

Map Generated: 8/1/2020



Notes

Restored Oyster Beds, Eelgrass Beds (2019-Deep pink), Current Shellfish Beds, Shellfish Aquaculture



ATTACHMENT 9B

Durham Point

Harvest Area Information

Species Available for Harvest:

Softshell Clam	Closed
American Oyster	Closed
Blue Mussel	Open (Sat. only, 9AM-sunset)
Razor Clam	Open (Sat. only, 9AM-sunset)
Surf Clam, Mahogany Quahog	Open (Sat. only, 9AM-sunset)**

*This species is either scarce or not present in the area indicated.

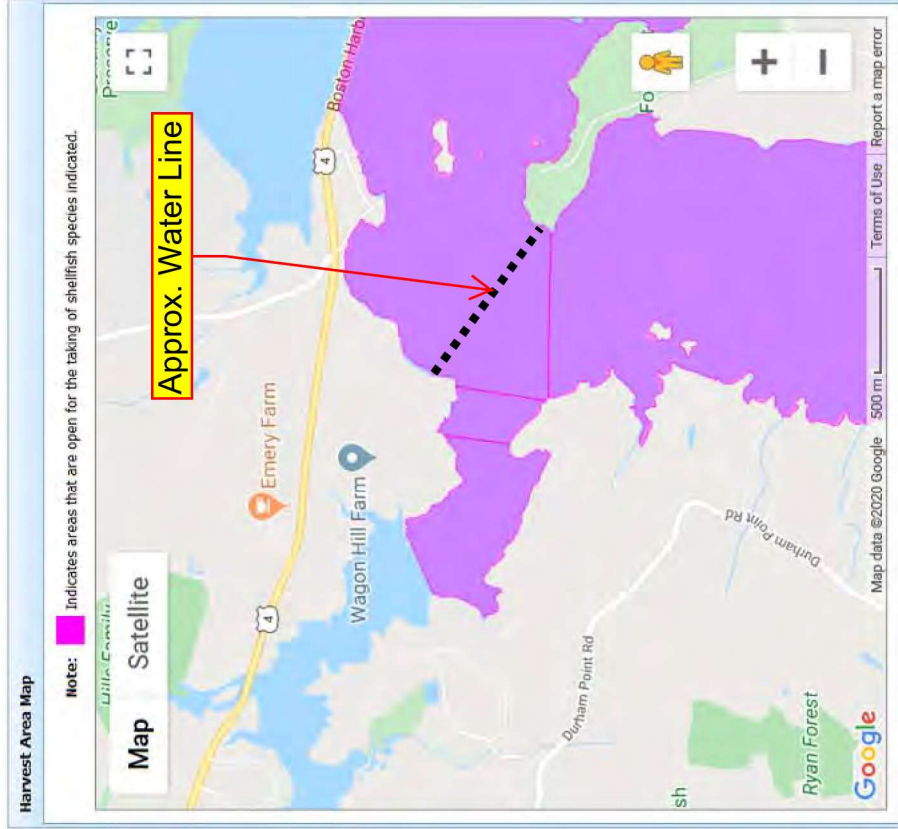
Most Recent Update: Friday, July 10, 2020

Next Scheduled Update: Friday, July 17, 2020

Closure Comments: Open for recreational harvest Saturdays only, 9AM-sunset. The softshell clam season is closed. The oyster season is closed.

Other Information:
 National Weather Service (current conditions and forecast)
[NOAA Tide Predictions: Dover Point, NH](#)

Shellfish Links



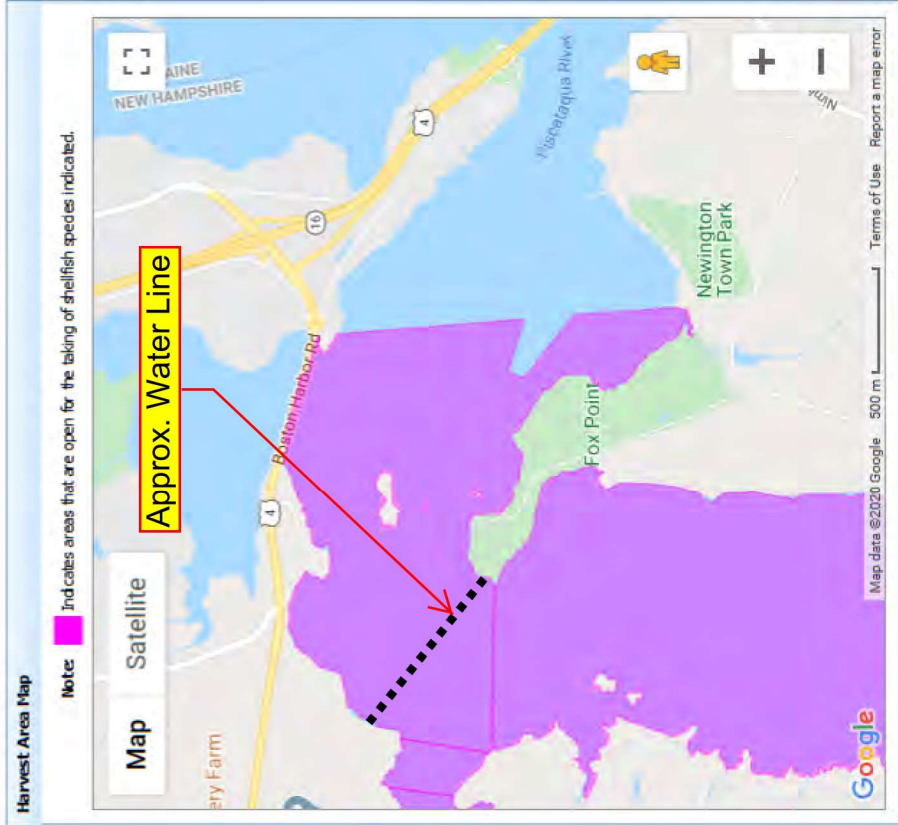


Lower Little Bay

Harvest Area Information

Species Available for Harvest:	
Softshell Clam	Closed
American Oyster	Closed
Blue Mussel	Open (Sat. only, 9AM-sunset)
Razor Clam	Open (Sat. only, 9AM-sunset)
Surf Clam, Mahogany Quahog	Open (Sat. only, 9AM-sunset) *
*This species is either scarce or not present in the area indicated.	
Most Recent Update:	Friday, July 10, 2020
Next Scheduled Update:	Friday, July 17, 2020
Closure Comments: Open for recreational harvest Saturdays only, 9AM-sunset. The softshell clam season is closed. The oyster season is closed.	
Other Information: National Weather Service (current conditions and forecast) NOAA Tide Predictions: Dover Point, NH	

[Shellfish Links](#)



EFH Data Notice: Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional Fishery Management Councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

Greater Atlantic Regional Office
 Atlantic Highly Migratory Species Management Division

Query Results

Degrees, Minutes, Seconds: Latitude = 43°7'27" N, Longitude = 71°8'10" W
 Decimal Degrees: Latitude = 43.12, Longitude = -70.86













The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.













*** WARNING ***

Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

EFH

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			Atlantic Sea Scallop	ALL	New England	Amendment 14 to the Atlantic Sea Scallop FMP
			Atlantic Wolffish	ALL	New England	Amendment 14 to the Northeast Multispecies FMP
			Winter Flounder	Eggs Juvenile Larvae/Adult	New England	Amendment 14 to the Northeast Multispecies FMP
			Little Skate	Juvenile Adult	New England	Amendment 2 to the Northeast Skate Complex FMP

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			Atlantic Herring	Juvenile Adult Larvae	New England	Amendment 3 to the Atlantic Herring FMP
			Atlantic Cod	Larvae Eggs	New England	Amendment 14 to the Northeast Multispecies FMP
			Pollock	Juvenile Eggs Larvae	New England	Amendment 14 to the Northeast Multispecies FMP
			Red Hake	Adult Eggs/Larvae /Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP
			Windowpane Flounder	Adult Larvae Eggs Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP
			Winter Skate	Juvenile	New England	Amendment 2 to the Northeast Skate Complex FMP
			Smooth Skate	Juvenile	New England	Amendment 2 to the Northeast Skate Complex FMP
			White Hake	Adult Eggs Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP
			Thorny Skate	Juvenile	New England	Amendment 2 to the Northeast Skate Complex FMP

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			Bluefin Tuna	Adult	Secretarial	Amendment 10 to the 2006 Consolidated HMS FMP: EFH
			Atlantic Mackerel	Eggs Larvae Juvenile	Mid-Atlantic	Atlantic Mackerel, Squid, & Butterfish Amendment 11
			Bluefish	Adult Juvenile	Mid-Atlantic	Bluefish
			Atlantic Butterfish	Adult	Mid-Atlantic	Atlantic Mackerel, Squid, & Butterfish Amendment 11

HAPCs

No Habitat Areas of Particular Concern (HAPC) were identified at the report location.

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data.

****For links to all EFH text descriptions see the complete data inventory: [open data inventory -->](#)**

Mid-Atlantic Council HAPCs,

No spatial data for summer flounder SAV HAPC.

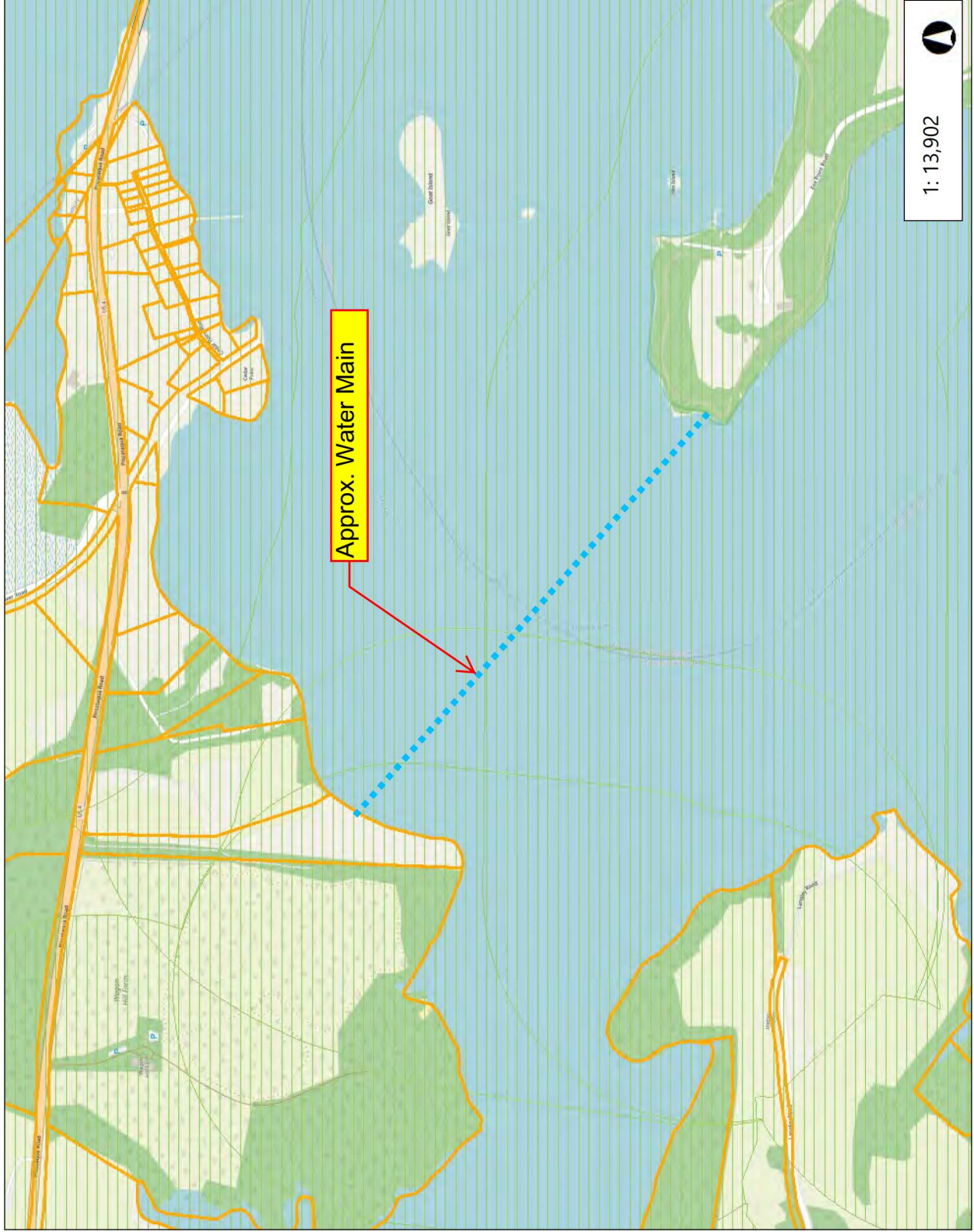


Subaqueous Water Main

ATTACHMENT 10

Legend

- NH Parcel Mosaic
- Watersheds with Chloride Impairment
- Surface Waters with Impaired Quarter Mile Buffer



1: 13,902

Map Notes

Impaired Waters

This map is a user generated static output from the web-based NHDES Wetlands Permit Scanning Tool and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. No map should be printed with scale 1 to less than 7,500.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Appendix A

Wetland evaluation supporting documentation; Reproducible forms.

Below is an example list of considerations that was used for a New Hampshire highway project. Considerations are flexible, based on best professional judgment and interdisciplinary team consensus. This example provides a comprehensive base, however, and may only need slight modifications for use in other projects.



GROUNDWATER RECHARGE/DISCHARGE— This function considers the potential for a wetland to serve as a groundwater recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

CONSIDERATIONS/QUALIFIERS

1. Public or private wells occur downstream of the wetland.
2. Potential exists for public or private wells downstream of the wetland.
3. Wetland is underlain by stratified drift.
4. Gravel or sandy soils present in or adjacent to the wetland.
5. Fragipan does not occur in the wetland.
6. Fragipan, impervious soils, or bedrock does occur in the wetland.
7. Wetland is associated with a perennial or intermittent watercourse.
8. Signs of groundwater recharge are present or piezometer data demonstrates recharge.
9. Wetland is associated with a watercourse but lacks a defined outlet or contains a constricted outlet.
10. Wetland contains only an outlet, no inlet.
11. Groundwater quality of stratified drift aquifer within or downstream of wetland meets drinking water standards.
12. Quality of water associated with the wetland is high.
13. Signs of groundwater discharge are present (e.g., springs).
14. Water temperature suggests it is a discharge site.
15. Wetland shows signs of variable water levels.
16. Piezometer data demonstrates discharge.
17. Other



FLOODFLOW ALTERATION (Storage & Desynchronization) — This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of floodwaters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

CONSIDERATIONS/QUALIFIERS

1. Area of this wetland is large relative to its watershed.
2. Wetland occurs in the upper portions of its watershed.
3. Effective flood storage is small or non-existent upslope of or above the wetland.
4. Wetland watershed contains a high percent of impervious surfaces.
5. Wetland contains hydric soils which are able to absorb and detain water.
6. Wetland exists in a relatively flat area that has flood storage potential.
7. Wetland has an intermittent outlet, ponded water, or signs are present of variable water level.
8. During flood events, this wetland can retain higher volumes of water than under normal or average rainfall conditions.
9. Wetland receives and retains overland or sheet flow runoff from surrounding uplands.
10. In the event of a large storm, this wetland may receive and detain excessive flood water from a nearby watercourse.
11. Valuable properties, structures, or resources are located in or near the floodplain downstream from the wetland.
12. The watershed has a history of economic loss due to flooding.
13. This wetland is associated with one or more watercourses.
14. This wetland watercourse is sinuous or diffuse.
15. This wetland outlet is constricted.
16. Channel flow velocity is affected by this wetland.
17. Land uses downstream are protected by this wetland.
18. This wetland contains a high density of vegetation.
19. Other

FISH AND SHELLFISH HABITAT (FRESHWATER) — This function considers the effectiveness of seasonal or permanent watercourses associated with the wetland in question for fish and shellfish habitat.



CONSIDERATIONS/QUALIFIERS

1. Forest land dominant in the watershed above this wetland.
2. Abundance of cover objects present.

STOP HERE IF THIS WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE

3. Size of this wetland is able to support large fish/shellfish populations.
4. Wetland is part of a larger, contiguous watercourse.
5. Wetland has sufficient size and depth in open water areas so as not to freeze solid and retain some open water during winter.
6. Stream width (bank to bank) is more than 50 feet.
7. Quality of the watercourse associated with this wetland is able to support healthy fish/shellfish populations.
8. Streamside vegetation provides shade for the watercourse.
9. Spawning areas are present (submerged vegetation or gravel beds).
10. Food is available to fish/shellfish populations within this wetland.
11. Barrier(s) to anadromous fish (such as dams, including beaver dams, waterfalls, road crossing) are absent from the stream reach associated with this wetland.
12. Evidence of fish is present.
13. Wetland is stocked with fish.
14. The watercourse is persistent.
15. Man-made streams are absent.
16. Water velocities are not too excessive for fish usage.
17. Defined stream channel is present.
18. Other

Although the above example refers to freshwater wetlands, it can also be adapted for marine ecosystems. The following is an example provided by the National Marine Fisheries Service (NMFS) of an adaptation for the fish and shellfish function.

FISH AND SHELLFISH HABITAT (MARINE) — This function considers the effectiveness of wetlands, embayments, tidal flats, vegetated shallows, and other environments in supporting marine resources such as fish, shellfish, marine mammals, and sea turtles.

CONSIDERATIONS/QUALIFIERS

1. Special aquatic sites (tidal marsh, mud flats, eelgrass beds) are present.
2. Suitable spawning habitat is present at the site or in the area.
3. Commercially or recreationally important species are present or suitable habitat exists.
4. The wetland/waterway supports prey for higher trophic level marine organisms.
5. The waterway provides migratory habitat for anadromous fish.
6. Essential fish habitat, as defined by the 1996 amendments to the Magnuson-Stevens Fishery & Conservation Act, is present (consultation with NMFS may be necessary).
7. Other



SEDIMENT/TOXICANT/PATHOGEN RETENTION — This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens in runoff water from surrounding uplands or upstream eroding wetland areas.

CONSIDERATIONS/QUALIFIERS

1. Potential sources of excess sediment are in the watershed above the wetland.
2. Potential or known sources of toxicants are in the watershed above the wetland.
3. Opportunity for sediment trapping by slow moving water or deepwater habitat are present in this wetland.
4. Fine grained mineral or organic soils are present.
5. Long duration water retention time is present in this wetland.
6. Public or private water sources occur downstream.
7. The wetland edge is broad and intermittently aerobic.
8. The wetland is known to have existed for more than 50 years.
9. Drainage ditches have not been constructed in the wetland.

STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.

10. Wetland is associated with an intermittent or perennial stream or a lake.
11. Channelized flows have visible velocity decreases in the wetland.
12. Effective floodwater storage in wetland is occurring. Areas of impounded open water are present.
13. No indicators of erosive forces are present. No high water velocities are present.
14. Diffuse water flows are present in the wetland.
15. Wetland has a high degree of water and vegetation interspersion.
16. Dense vegetation provides opportunity for sediment trapping and/or signs of sediment accumulation by dense vegetation is present.
17. Other



NUTRIENT REMOVAL/RETENTION/TRANSFORMATION — This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands and the ability of the wetland to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers, or estuaries.

CONSIDERATIONS/QUALIFIERS

1. Wetland is large relative to the size of its watershed.
2. Deep water or open water habitat exists.
3. Overall potential for sediment trapping exists in the wetland.

4. Potential sources of excess nutrients are present in the watershed above the wetland.
 5. Wetland saturated for most of the season. Pondered water is present in the wetland.
 6. Deep organic/sediment deposits are present.
 7. Slowly drained fine grained mineral or organic soils are present.
 8. Dense vegetation is present.
 9. Emergent vegetation and/or dense woody stems are dominant.
 10. Opportunity for nutrient attenuation exists.
 11. Vegetation diversity/abundance sufficient to utilize nutrients.
- STOP HERE IF WETLAND IS NOT ASSOCIATED WITH A WATERCOURSE.
12. Waterflow through this wetland is diffuse.
 13. Water retention/detention time in this wetland is increased by constricted outlet or thick vegetation.
 14. Water moves slowly through this wetland.
 15. Other

PRODUCTION EXPORT (Nutrient) — This function evaluates the effectiveness of the wetland to produce food or usable products for humans or other living organisms.



CONSIDERATIONS/QUALIFIERS

1. Wildlife food sources grow within this wetland.
2. Detritus development is present within this wetland.
3. Economically or commercially used products found in this wetland.
4. Evidence of wildlife use found within this wetland.
5. Higher trophic level consumers are utilizing this wetland.
6. Fish or shellfish develop or occur in this wetland.
7. High vegetation density is present.
8. Wetland exhibits high degree of plant community structure/species diversity.
9. High aquatic vegetative diversity/abundance is present.
10. Nutrients exported in wetland watercourses (permanent outlet present).
11. "Flushing" of relatively large amounts of organic plant material occurs from this wetland.
12. Wetland contains flowering plants that are used by nectar-gathering insects.
13. Indications of export are present.
14. High production levels occurring, however, no visible signs of export (assumes export is attenuated).
15. Other

SEDIMENT/ShORELINE STABILIZATION — This function considers the effectiveness of a wetland to stabilize streambanks and shorelines against erosion.



CONSIDERATIONS/QUALIFIERS

1. Indications of erosion or siltation are present.
2. Topographical gradient is present in wetland.
3. Potential sediment sources are present up-slope.
4. Potential sediment sources are present upstream.
5. No distinct shoreline or bank is evident between the waterbody and the wetland or upland.
6. A distinct step between the open waterbody or stream and the adjacent land exists (i.e., sharp bank) with dense roots throughout.
7. Wide wetland (>10') borders watercourse, lake, or pond.
8. High flow velocities in the wetland.
9. The watershed is of sufficient size to produce channelized flow.
10. Open water fetch is present.
11. Boating activity is present.
12. Dense vegetation is bordering watercourse, lake, or pond.
13. High percentage of energy-absorbing emergents and/or shrubs border a watercourse, lake, or pond.
14. Vegetation is comprised of large trees and shrubs that withstand major flood events or erosive incidents and stabilize the shoreline on a large scale (feet).
15. Vegetation is comprised of a dense resilient herbaceous layer that stabilizes sediments and the shoreline on a small scale (inches) during minor flood events or potentially erosive events.
16. Other



WILDLIFE HABITAT — This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and the wetland edge. Both resident and/or migrating species must be considered. Species lists of observed and potential animals should be included in the wetland assessment report.¹

CONSIDERATIONS/QUALIFIERS

1. Wetland is not degraded by human activity.
2. Water quality of the watercourse, pond, or lake associated with this wetland meets or exceeds Class A or B standards.
3. Wetland is not fragmented by development.
4. Upland surrounding this wetland is undeveloped.
5. More than 40% of this wetland edge is bordered by upland wildlife habitat (e.g., brushland, woodland, active farmland, or idle land) at least 500 feet in width.
6. Wetland is contiguous with other wetland systems connected by a watercourse or lake.
7. Wildlife overland access to other wetlands is present.
8. Wildlife food sources are within this wetland or are nearby.
9. Wetland exhibits a high degree of interspersion of vegetation classes and/or open water.
10. Two or more islands or inclusions of upland within the wetland are present.
11. Dominant wetland class includes deep or shallow marsh or wooded swamp.
12. More than three acres of shallow permanent open water (less than 6.6 feet deep), including streams in or adjacent to wetland, are present.
13. Density of the wetland vegetation is high.
14. Wetland exhibits a high degree of plant species diversity.
15. Wetland exhibits a high degree of diversity in plant community structure (e.g., tree/shrub/vine/grasses/mosses)
16. Plant/animal indicator species are present. (List species for project)
17. Animal signs observed (tracks, scats, nesting areas, etc.)
18. Seasonal uses vary for wildlife and wetland appears to support varied population diversity/abundance during different seasons.
19. Wetland contains or has potential to contain a high population of insects.
20. Wetland contains or has potential to contain large amphibian populations.
21. Wetland has a high avian utilization or its potential.
22. Indications of less disturbance-tolerant species are present.
23. Signs of wildlife habitat enhancement are present (birdhouses, nesting boxes, food sources, etc.).
24. Other

¹In March 1995, a rapid wildlife habitat assessment method was completed by a University of Massachusetts research team with funding and oversight provided by the New England Transportation Consortium. The method is called WETHings (wetland habitat indicators for non-game species). It produces a list of potential wetland-dependent mammal, reptile, and amphibian species that may be present in the wetland. The output is based on observable habitat characteristics documented on the field data form. This method may be used to generate the wildlife species list recommended as backup information to the wetland evaluation form and to augment the considerations. Use of this method should first be coordinated with the Corps project manager. A computer program is also available to expedite this process.

RECREATION (Consumptive and Non-Consumptive) — This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting, and other active or passive recreational activities. Consumptive opportunities consume or diminish the plants, animals, or other resources that are intrinsic to the wetland. Non-consumptive opportunities do not consume or diminish these resources of the wetland.



CONSIDERATIONS/QUALIFIERS

1. Wetland is part of a recreation area, park, forest, or refuge.
2. Fishing is available within or from the wetland.
3. Hunting is permitted in the wetland.
4. Hiking occurs or has potential to occur within the wetland.
5. Wetland is a valuable wildlife habitat.
6. The watercourse, pond, or lake associated with the wetland is unpolluted.
7. High visual/aesthetic quality of this potential recreation site.
8. Access to water is available at this potential recreation site for boating, canoeing, or fishing.
9. The watercourse associated with this wetland is wide and deep enough to accommodate canoeing and/or non-powered boating.
10. Off-road public parking available at the potential recreation site.
11. Accessibility and travel ease is present at this site.
12. The wetland is within a short drive or safe walk from highly populated public and private areas.
13. Other

EDUCATIONAL/SCIENTIFIC VALUE — This value considers the suitability of the wetland as a site for an “outdoor classroom” or as a location for scientific study or research.



CONSIDERATIONS/QUALIFIERS

1. Wetland contains or is known to contain threatened, rare, or endangered species.
2. Little or no disturbance is occurring in this wetland.
3. Potential educational site contains a diversity of wetland classes which are accessible or potentially accessible.
4. Potential educational site is undisturbed and natural.
5. Wetland is considered to be a valuable wildlife habitat.
6. Wetland is located within a nature preserve or wildlife management area.
7. Signs of wildlife habitat enhancement present (bird houses, nesting boxes, food sources, etc.).
8. Off-road parking at potential educational site suitable for school bus access in or near wetland.
9. Potential educational site is within safe walking distance or a short drive to schools.
10. Potential educational site is within safe walking distance to other plant communities.
11. Direct access to perennial stream at potential educational site is available.
12. Direct access to pond or lake at potential educational site is available.
13. No known safety hazards exist within the potential educational site.
14. Public access to the potential educational site is controlled.
15. Handicap accessibility is available.
16. Site is currently used for educational or scientific purposes.
17. Other



UNIQUENESS/HERITAGE — This value considers the effectiveness of the wetland or its associated waterbodies to provide certain special values. These may include archaeological sites, critical habitat for endangered species, its overall health and appearance, its role in the ecological system of the area, its relative importance as a typical wetland class for this geographic location. These functions are clearly valuable wetland attributes relative to aspects of public health, recreation, and habitat diversity.

CONSIDERATIONS/QUALIFIERS

1. Upland surrounding wetland is primarily urban.
2. Upland surrounding wetland is developing rapidly.
3. More than 3 acres of shallow permanent open water (less than 6.6 feet deep), including streams, occur in wetlands.
4. Three or more wetland classes are present.
5. Deep and/or shallow marsh or wooded swamp dominate.
6. High degree of interspersion of vegetation and/or open water occur in this wetland.
7. Well-vegetated stream corridor (15 feet on each side of the stream) occurs in this wetland.
8. Potential educational site is within a short drive or a safe walk from schools.
9. Off-road parking at potential educational site is suitable for school buses.
10. No known safety hazards exist within this potential educational site.
11. Direct access to perennial stream or lake exists at potential educational site.
12. Two or more wetland classes are visible from primary viewing locations.
13. Low-growing wetlands (marshes, scrub-shrub, bogs, open water) are visible from primary viewing locations.
14. Half an acre of open water or 200 feet of stream is visible from the primary viewing locations.
15. Large area of wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons.
16. General appearance of the wetland visible from primary viewing locations is unpolluted and/or undisturbed.
17. Overall view of the wetland is available from the surrounding upland.
18. Quality of the water associated with the wetland is high.
19. Opportunities for wildlife observations are available.
20. Historical buildings are found within the wetland.
21. Presence of pond or pond site and remains of a dam occur within the wetland.
22. Wetland is within 50 yards of the nearest perennial watercourse.
23. Visible stone or earthen foundations, berms, dams, standing structures, or associated features occur within the wetland.
24. Wetland contains critical habitat for a state- or federally-listed threatened or endangered species.
25. Wetland is known to be a study site for scientific research.
26. Wetland is a natural landmark or recognized by the state natural heritage inventory authority as an exemplary natural community.
27. Wetland has local significance because it serves several functional values.
28. Wetland has local significance because it has biological, geological, or other features that are locally rare or unique.
29. Wetland is known to contain an important archaeological site.
30. Wetland is hydrologically connected to a state or federally designated scenic river.
31. Wetland is located in an area experiencing a high wetland loss rate.
32. Other

VISUAL QUALITY/AESTHETICS — This value considers the visual and aesthetic quality or usefulness of the wetland.



CONSIDERATIONS/QUALIFIERS

1. Multiple wetland classes are visible from primary viewing locations.
2. Emergent marsh and/or open water are visible from primary viewing locations.
3. A diversity of vegetative species is visible from primary viewing locations.
4. Wetland is dominated by flowering plants or plants that turn vibrant colors in different seasons.
5. Land use surrounding the wetland is undeveloped as seen from primary viewing locations.
6. Visible surrounding land use form contrasts with wetland.
7. Wetland views absent of trash, debris, and signs of disturbance.
8. Wetland is considered to be a valuable wildlife habitat.
9. Wetland is easily accessed.
10. Low noise level at primary viewing locations.
11. Unpleasant odors absent at primary viewing locations.
12. Relatively unobstructed sight line exists through wetland.
13. Other

ENDANGERED SPECIES HABITAT — This value considers the suitability of the wetland to support threatened or endangered species.

ES

CONSIDERATIONS/QUALIFIERS

1. Wetland contains or is known to contain threatened or endangered species.
2. Wetland contains critical habitat for a state or federally listed threatened or endangered species.



**WETLANDS FUNCTIONAL ASSESSMENT
WORKSHEET**
Water Division/Land Resource Management
Wetlands Bureau



[Check the Status of your Application](#)

RSA/Rule: RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

APPLICANT LAST NAME, FIRST NAME, M.I.: Wright-Pierce on behalf of City of Portsmouth, NH

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the Coastal Area Worksheet for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the Written Narrative (NHDES-W-06-089) or Avoidance and Minimization Checklist (NHDES-W-06-050) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached with the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)

ADJACENT LAND USE: Sparse density single-family residential

CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? Yes No

DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): 400' to dwelling

SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Marc Jacobs, CWS

DATE(S) OF SITE VISIT(S): 07/21/20

DELINEATION PER ENV-WT 406 COMPLETED? Yes No

CONFIRM THAT THE EVALUATION IS BASED ON:

- Office and
 Field examination.

METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in field if "other"):

- USACE Highway Methodology.
 Other scientifically supported method (enter name/ title):

irm@des.nh.gov or (603) 271-2147

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SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
WETLAND ID: Durham	LOCATION: (LAT/ LONG) N 43° 7.5623'/W 70° 52.0591'
WETLAND AREA: 50' wide easement at the HOTL	DOMINANT WETLAND SYSTEMS PRESENT: Estuarine
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? too numerous to count but includes Oyster River	COWARDIN CLASS: E2EM1P, E2US3N, E2US3M
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No if not, where does the wetland lie in the drainage basin? 	IS THE WETLAND PART OF: <input checked="" type="checkbox"/> A wildlife corridor or <input type="checkbox"/> A habitat island?
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE VERNAL POOLS PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If yes, complete the Vernal Pool Table)
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
PROPOSED WETLAND IMPACT TYPE: TBD	PROPOSED WETLAND IMPACT AREA: TBD
SECTION 4 - WETLANDS FUNCTIONS AND VALUES* (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)	
<p>The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:</p> <ol style="list-style-type: none"> 1. Ecological Integrity (from RSA 482-A:2, XI) 2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value) 3. Fish & Aquatic Life Habitat (from USACE Highway Methodology: Fish & Shellfish Habitat) 4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration) 5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge) 6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat) 7. Nutrient Trapping/Retention & Transformation (from USACE Highway Methodology: Nutrient removal) 8. Production Export (Nutrient) (from USACE Highway Methodology) 9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics) 10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention) 11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization) 12. Uniqueness/Heritage (from USACE Highway Methodology) 13. Wetland-based Recreation (from USACE Highway Methodology: Recreation) 14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat) <p>First, determine if a wetland is suitable for particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE <i>The Highway Methodology Workbook Supplement</i>. Second, indicate which functions and values are principal (Principal Function/value?" column). As described in <i>The Highway Methodology Workbook Supplement</i>, "functions and values can be principal if they are an important physical component of a wetland ecosystem (function only) and/or are considered of special value to society, from a local, regional, and/or national perspective". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.</p>	

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	see NH Method data form	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	see aerial image
2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1-5, 11-14	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	private property
3	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1-6	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1-salt marsh and mud flats
4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3,5-7,11,13,18	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	no storage
5	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1,2,7,12,15	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	not applicable
6	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1-2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	see NHB and Ipac reports
7	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2-11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
8	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,4-7,11-13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
9	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2,6-8,10-12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	viewshed largely unspoiled
10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1-9,16	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,4,6-7, 9-13,15	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	active erosion
12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3,5,7,10-14,16-19,22,24,26,28	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Little Bay
13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2-3,5-7,9	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	private property-access possible from water
14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,5-8,11-13,16,18-19,21	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See Wildlife Action Program locus, massive numbers of snails observed on mud flats

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SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)

Delineations of vernal pools shall be based on the characteristics listed in the definition of “vernal pool” in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3rd Ed.*, 2016, published by NHF&G; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

“Important Notes” are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE “Vernal Pool Assessment” form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1					Not applicable
2					
3					
4					
5					
6					
7					
8					

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SECTION 6 - STREAM RESOURCES SUMMARY

DESCRIPTION OF STREAM: Not applicable STREAM TYPE (ROSGEN):

HAVE FISHERIES BEEN DOCUMENTED? DOES THE STREAM SYSTEM APPEAR STABLE?
 Yes No Yes No

OTHER KEY ON-SITE FUNCTIONS OF NOTE:

The following table can be used to compile data on stream resources. "Important Notes" are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.

FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
13	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
14	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	

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SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

- Wildlife and vegetation diversity/abundance list.
- Photograph of wetland attached.
- Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.
- For projects in tidal areas only: additional information required by Env-Wt 603.03/603.04 (please refer to the Coastal Area Worksheet for more information)

Seagulls
Great Blue Heron
Cormorant
Numerous insects including crickets and butterflies
Chipmunk
Black grass,
Spartina
Seaside goldenrod
glossy buckthorn
honeysuckle
Japanese barberry
Olive
Staghorn sumac
Large numbers of marine snails



**WETLANDS FUNCTIONAL ASSESSMENT
WORKSHEET**
Water Division/Land Resource Management
Wetlands Bureau



[Check the Status of your Application](#)

RSA/Rule: RSA 482-A / Env-Wt 311.03(b)(10); Env-Wt 311.10

APPLICANT LAST NAME, FIRST NAME, M.I.: Wright-Pierce on behalf of City of Portsmouth, NH

As required by Env-Wt 311.03(b)(10), an application for a standard permit for minor and major projects must include a functional assessment of all wetlands on the project site as specified in Env-Wt 311.10. This worksheet will help you compile data for the functional assessment needed to meet federal (US Army Corps of Engineers (USACE); if applicable) and NHDES requirements. Additional requirements are needed for projects in tidal area; please refer to the Coastal Area Worksheet for more information.

Both a desktop review and a field examination are needed to accurately determine surrounding land use, hydrology, hydroperiod, hydric soils, vegetation, structural complexity of wetland classes, hydrologic connections between wetlands or stream systems or wetland complex, position in the landscape, and physical characteristics of wetlands and associated surface waters. The results of the evaluation are to be used to select the location of the proposed project having the least impact to wetland functions and values (Env-Wt 311.10). This worksheet can be used in conjunction with the Written Narrative (NHDES-W-06-089) or Avoidance and Minimization Checklist (NHDES-W-06-050) to address Env-Wt 313.03 (Avoidance and Minimization). If more than one wetland/ stream resource is identified, multiple worksheets can be attached with the application. All wetland, vernal pools, and stream identification (ID) numbers are to be displayed and located on the wetlands delineation of the subject property.

SECTION 1 - LOCATION (USACE HIGHWAY METHODOLOGY)

ADJACENT LAND USE: Conservation/Recreation/Residential

CONTIGUOUS UNDEVELOPED BUFFER ZONE PRESENT? Yes No

DISTANCE TO NEAREST ROADWAY OR OTHER DEVELOPMENT (in feet): 500' to shed

SECTION 2 - DELINEATION (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

CERTIFIED WETLAND SCIENTIST (if in a non-tidal area) or QUALIFIED COASTAL PROFESSIONAL (if in a tidal area) who prepared this assessment: Marc Jacobs, CWS

DATE(S) OF SITE VISIT(S): 07/21/20

DELINEATION PER ENV-WT 406 COMPLETED? Yes No

CONFIRM THAT THE EVALUATION IS BASED ON:

- Office and
 Field examination.

METHOD USED FOR FUNCTIONAL ASSESSMENT (check one and fill in field if "other"):

- USACE Highway Methodology.
 Other scientifically supported method (enter name/ title):

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SECTION 3 - WETLAND RESOURCE SUMMARY (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

WETLAND ID: Newington	LOCATION: (LAT/ LONG) N43° 7.2418/W70° 51.5471'
WETLAND AREA: 60' wide easement at HOTEL	DOMINANT WETLAND SYSTEMS PRESENT: Estuarine
HOW MANY TRIBUTARIES CONTRIBUTE TO THE WETLAND? Too many to count	COWARDIN CLASS: E2US3N and E1UB3L
IS THE WETLAND A SEPARATE HYDRAULIC SYSTEM? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No if not, where does the wetland lie in the drainage basin? 	IS THE WETLAND PART OF: <input checked="" type="checkbox"/> A wildlife corridor or <input type="checkbox"/> A habitat island?
IS THE WETLAND IN A 100-YEAR FLOODPLAIN? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	IS THE WETLAND HUMAN-MADE? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
ARE ANY WETLANDS PART OF A STREAM OR OPEN-WATER SYSTEM? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	ARE VERNAL POOLS PRESENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (If yes, complete the Vernal Pool Table)
PROPOSED WETLAND IMPACT TYPE: TBD	ARE ANY PUBLIC OR PRIVATE WELLS DOWNSTREAM/ DOWNGRADIENT? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	PROPOSED WETLAND IMPACT AREA: TBD

SECTION 4 - WETLANDS FUNCTIONS AND VALUES* (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

The following table can be used to compile data on wetlands functions and values. The reference numbers indicated in the "Functions/ Values" column refer to the following functions and values:

1. Ecological Integrity (from RSA 482-A:2, XI)
2. Educational Potential (from USACE Highway Methodology: Educational/Scientific Value)
3. Fish & Aquatic Life Habitat (from USACE Highway Methodology: Fish & Shellfish Habitat)
4. Flood Storage (from USACE Highway Methodology: Floodflow Alteration)
5. Groundwater Recharge (from USACE Highway Methodology: Groundwater Recharge/Discharge)
6. Noteworthiness (from USACE Highway Methodology: Threatened or Endangered Species Habitat)
7. Nutrient Trapping/Retention & Transformation (from USACE Highway Methodology: Nutrient removal)
8. Production Export (Nutrient) (from USACE Highway Methodology)
9. Scenic Quality (from USACE Highway Methodology: Visual Quality/Aesthetics)
10. Sediment Trapping (from USACE Highway Methodology: Sediment /Toxicant Retention)
11. Shoreline Anchoring (from USACE Highway Methodology: Sediment/Shoreline Stabilization)
12. Uniqueness/Heritage (from USACE Highway Methodology)
13. Wetland-based Recreation (from USACE Highway Methodology: Recreation)
14. Wetland-dependent Wildlife Habitat (from USACE Highway Methodology: Wildlife Habitat)

First, determine if a wetland is suitable for particular function and value ("Suitability" column) and indicate the rationale behind your determination ("Rationale" column). Please use the rationale reference numbers listed in Appendix A of USACE *The Highway Methodology Workbook Supplement*. Second, indicate which functions and values are principal (Principal Function/value?" column). As described in *The Highway Methodology Workbook Supplement*, "functions and values can be principal if they are an important physical component of a wetland ecosystem (function only) and/or are considered of special value to society, from a local, regional, and/or national perspective". "Important Notes" are to include characteristics the evaluator used to determine the principal function and value of the wetland.

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FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE (Reference #)	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See NH Method data form	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See aerial image
2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1-2, 4-6,8,11-14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Newington residents only
3	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1-6	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1-mud flats
4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3,6,7,11,13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	no storage or desynchronization
5	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	1-2, 4-5,7,12,15	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	not applicable, 1-2 assumed
6	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1-2	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See NHB and Ipac reports
7	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2,4-7	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
8	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4-6	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
9	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2, 5-12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10-Pease ANG base nearby
10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,2,4,7-10,13	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	source-no sump
11	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,6,9-11	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	extreme erosion-sea level rise
12	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3,10-11,14,16-19,22,24,26	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Little Bay
13	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1-2,5-10	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8&10-nearby, Newington residents only
14	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1,3-8,12,16,18	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	See WAP, horseshoe crab

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SECTION 5 - VERNAL POOL SUMMARY (Env-Wt 311.10)

Delineations of vernal pools shall be based on the characteristics listed in the definition of “vernal pool” in Env-Wt 104.44. To assist in the delineation, individuals may use either of the following references:

- *Identifying and Documenting Vernal Pools in New Hampshire 3rd Ed.*, 2016, published by NHF&G; or
- The USACE *Vernal Pool Assessment* draft guidance dated 9-10-2013 and form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

All vernal pool ID numbers are to be displayed and located on the wetland delineation of the subject property.

“Important Notes” are to include documented reproductive and wildlife values, landscape context, and relationship to other vernal pools/wetlands.

Note: For projects seeking federal approval from the USACE, please attach a completed copy of The USACE “Vernal Pool Assessment” form dated 9-6-2016, Appendix L of the USACE New England District *Compensatory Mitigation Guidance*.

VERNAL POOL ID NUMBER	DATE(S) OBSERVED	PRIMARY INDICATORS PRESENT (LIST)	SECONDARY INDICATORS PRESENT (LIST)	LENGTH OF HYDROPERIOD	IMPORTANT NOTES
1					Not applicable
2					
3					
4					
5					
6					
7					
8					

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SECTION 6 - STREAM RESOURCES SUMMARY

DESCRIPTION OF STREAM: Not applicable STREAM TYPE (ROSGEN):

HAVE FISHERIES BEEN DOCUMENTED? DOES THE STREAM SYSTEM APPEAR STABLE?
 Yes No Yes No

OTHER KEY ON-SITE FUNCTIONS OF NOTE:

The following table can be used to compile data on stream resources. "Important Notes" are to include characteristics the evaluator used to determine principal function and value of each stream. The functions and values reference number are defined in Section 4.

FUNCTIONS/ VALUES	SUITABILITY (Y/N)	RATIONALE	PRINCIPAL FUNCTION/VALUE? (Y/N)	IMPORTANT NOTES
1	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
2	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
3	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
4	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
5	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
6	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
7	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
8	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
9	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
10	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
11	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
12	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
13	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	
14	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No	

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SECTION 7 - ATTACHMENTS (USACE HIGHWAY METHODOLOGY; Env-Wt 311.10)

- Wildlife and vegetation diversity/abundance list.
- Photograph of wetland attached.
- Wetland delineation plans showing wetlands, vernal pools, and streams in relation to the impact area and surrounding landscape. Wetland IDs, vernal pool IDs, and stream IDs must be indicated on the plans.
- For projects in tidal areas only: additional information required by Env-Wt 603.03/603.04 (please refer to the Coastal Area Worksheet for more information)

Various crab species including horseshoe
Kelp
Brown seaweed
Blue mussel (shells)
Razor clam (shells)
Oyster (shells)
Distinct topo at HOTL

NH METHOD FOR THE EVALUATION OF FRESHWATER WETLANDS (revised December, 2015)

Wetland Name/Code: Durham Evaluation Date: July 21, 2020 Evaluator: Marc Jacobs, CWS

1 – ECOLOGICAL INTEGRITY

Evaluation Questions	Observations & Notes	Answers	Score
<p>1. Are there land uses in the wetland's watershed that could degrade water quality in the wetland? eroding road banks/ditches, const. sites, impervious surf., such as roads/parking lots/industrial parks/airports/land fills, active cropland & areas w/little or no vegetation</p>	<p>Erosion of saltmarsh locally</p> <p>Watershed of Little/Great Bay contains all land uses cited</p>	<p>a. Less than 5% of the watershed has land uses that could degrade water quality.</p> <p>b. 5-10% of the watershed has land uses that could degrade water quality.</p> <p>c. > 10% of the watershed has land uses that could degrade water quality.</p>	<p>10</p> <p>5</p> <p>1</p>
<p>2. Is there evidence of fill in the wetland? railroads, borrow pits, transportation, residential, comm., or industrial development</p>	<p>Existing water line - no apparent fill however</p>	<p>a. Less than 1 %</p> <p>b. From 1-3 %</p> <p>c. More than 3 %</p>	<p>10</p> <p>5</p> <p>1</p>
<p>3. What percentage of the wetland has been altered by agricultural activities? pastures, mowed areas, agricultural drainage ditches</p>	<p>no apparent recent alteration, historic alteration minimal</p>	<p>a. Less than 5 %</p> <p>b. From 5 to 25 %</p> <p>c. More than 25 %</p>	<p>10</p> <p>5</p> <p>1</p>
<p>4. What percentage of the wetland has been adversely impacted by logging activity within the last 10 years? logging roads, rutting, altered hydrology, sedimentation</p>	<p>not applicable</p>	<p>a. Less than 1%</p> <p>b. From 1 to 10 %</p> <p>c. More than 10 %</p>	<p>10</p> <p>5</p> <p>1</p>
<p>5. How much human activity is taking place in the wetland (e.g. ATV use, trails, cars, dumping of brush and garbage, etc.)? other than agriculture & logging</p>	<p>none observed</p>	<p>a. Low: Few trails in use, little or no traffic, and little or no litter.</p> <p>b. Moderate: Some used trails, roads, litter</p> <p>c. High: Many trails, roads, and/or litter</p>	<p>10</p> <p>5</p> <p>1</p>
<p>6. What percentage of the wetland is occupied by invasive plant species?</p>	<p>glossy buckthorn, honeysuckle, olive, Japanese barberry observed along HOTL</p>	<p>a. None</p> <p>b. 1-5% of the wetland has invasive species</p> <p>c. > 5% of the wetland has invasive species</p>	<p>10</p> <p>5</p> <p>1</p>
<p>7. Are there roads, driveways and/or railroads crossing or adjacent to the wetland or come within 500 ft. of the wetland? inc. roads at the edges of AOI</p>		<p>a. No roads, driveways or railroads. within 500 ft. of, or in the wetland</p> <p>b. Roads, driveways, railroads are within 500 ft of the wetland</p> <p>c. Roads, driveways, railroads cross, or are adjacent to, the wetland</p>	<p>10</p> <p>5</p> <p>1</p>
<p>8. How much human activity is taking place in the upland within 500 feet of the wetland edge? land dist., clearing, logging, active trails, development, roads</p>		<p>a. Less than 5% or no activity</p> <p>b. Human activity evident in up to 25% of the 500 ft zone</p> <p>c. Human activity evident in more than 25% of the 500 ft zone</p>	<p>10</p> <p>5</p> <p>1</p>
<p>9. What is the percent of impervious surface within 500 feet of the wetland edge?</p>		<p>a. Less than 3% impervious area within 500 ft of the wetland edge</p> <p>b. 3-10% impervious area within 500 ft of the wetland edge</p> <p>c. Greater than 10% impervious area within 500 ft of the wetland edge</p>	<p>10</p> <p>5</p> <p>1</p>
<p>10. Is there a human-made structure that regulates the flow of water through the wetland? W/IN 1/2 MILE dams, bridge abutments, culverts, roads exc beaver dams</p>		<p>a. No human made structures present upstream of, or in the wetland.</p> <p>b. One or more human made structures present upstream of, or in the wetland but hydrologic modification is slight</p> <p>c. One or more human made structures present upstream of, or in the wetland that severely block or alter surface water hydrology</p>	<p>10</p> <p>5</p> <p>1</p>

AVERAGE SCORE FOR ECOLOGICAL INTEGRITY

(Add scores for each question and divide by 10)

80/10 = 8

NH METHOD FOR THE EVALUATION OF FRESHWATER WETLANDS *(revised December, 2015)*

Wetland Name/Code: Newington-Fox Point Evaluation Date: July 21, 2020 Evaluator: Marc Jacobs, CWS

1 – ECOLOGICAL INTEGRITY

Evaluation Questions	Observations & Notes	Answers	Score
<p>1. Are there land uses in the wetland's watershed that could degrade water quality in the wetland? eroding road banks/ditches, const. sites, impervious surf., such as roads/parking lots/industrial parks/airports/land fills, active cropland & areas w/little or no vegetation</p>	Little/Great Bay watershed contains all lands uses cited	<p>a. Less than 5% of the watershed has land uses that could degrade water quality.</p> <p>b. 5-10% of the watershed has land uses that could degrade water quality.</p> <p>c. > 10% of the watershed has land uses that could degrade water quality.</p>	<p>10</p> <p style="color: red; font-weight: bold;">5</p> <p>1</p>
<p>2. Is there evidence of fill in the wetland? railroads, borrow pits, transportation, residential, comm., or industrial development</p>	Existing water line - no apparent fill however	<p>a. Less than 1 %</p> <p>b. From 1-3 %</p> <p>c. More than 3 %</p>	<p style="color: red; font-weight: bold;">10</p> <p>5</p> <p>1</p>
<p>3. What percentage of the wetland has been altered by agricultural activities? pastures, mowed areas, agricultural drainage ditches</p>	Not applicable	<p>a. Less than 5 %</p> <p>b. From 5 to 25 %</p> <p>c. More than 25 %</p>	<p style="color: red; font-weight: bold;">10</p> <p>5</p> <p>1</p>
<p>4. What percentage of the wetland has been adversely impacted by logging activity within the last 10 years? logging roads, rutting, altered hydrology, sedimentation</p>	Not applicable	<p>a. Less than 1%</p> <p>b. From 1 to 10 %</p> <p>c. More than 10 %</p>	<p style="color: red; font-weight: bold;">10</p> <p>5</p> <p>1</p>
<p>5. How much human activity is taking place in the wetland (e.g. ATV use, trails, cars, dumping of brush and garbage, etc.)? other than agriculture & logging</p>	some footpath use along eroded bank	<p>a. Low: Few trails in use, little or no traffic, and little or no litter.</p> <p>b. Moderate: Some used trails, roads, litter</p> <p>c. High: Many trails, roads, and/or litter</p>	<p style="color: red; font-weight: bold;">10</p> <p>5</p> <p>1</p>
<p>6. What percentage of the wetland is occupied by invasive plant species?</p>	None observed	<p>a. None</p> <p>b. 1-5% of the wetland has invasive species</p> <p>c. > 5% of the wetland has invasive species</p>	<p style="color: red; font-weight: bold;">10</p> <p>5</p> <p>1</p>
<p>7. Are there roads, driveways and/or railroads crossing or adjacent to the wetland or come within 500 ft. of the wetland? inc. roads at the edges of AOI</p>	None, see aerial image	<p>a. No roads, driveways or railroads. within 500 ft. of, or in the wetland</p> <p>b. Roads, driveways, railroads are within 500 ft of the wetland</p> <p>c. Roads, driveways, railroads cross, or are adjacent to, the wetland</p>	<p style="color: red; font-weight: bold;">10</p> <p>5</p> <p>1</p>
<p>8. How much human activity is taking place in the upland within 500 feet of the wetland edge? land dist., clearing, logging, active trails, development, roads</p>	Active trail, see aerial image	<p>a. Less than 5% or no activity</p> <p>b. Human activity evident in up to 25% of the 500 ft zone</p> <p>c. Human activity evident in more than 25% of the 500 ft zone</p>	<p style="color: red; font-weight: bold;">10</p> <p>5</p> <p>1</p>
<p>9. What is the percent of impervious surface within 500 feet of the wetland edge?</p>	Zero, see aerial image	<p>a. Less than 3% impervious area within 500 ft of the wetland edge</p> <p>b. 3-10% impervious area within 500 ft of the wetland edge</p> <p>c. Greater than 10% impervious area within 500 ft of the wetland edge</p>	<p style="color: red; font-weight: bold;">10</p> <p>5</p> <p>1</p>
<p>10. Is there a human-made structure that regulates the flow of water through the wetland? W/IN 1/2 MILE dams, bridge abutments, culverts, roads exc beaver dams</p>	None	<p>a. No human made structures present upstream of, or in the wetland.</p> <p>b. One or more human made structures present upstream of, or in the wetland but hydrologic modification is slight</p> <p>c. One or more human made structures present upstream of, or in the wetland that severely block or alter surface water hydrology</p>	<p style="color: red; font-weight: bold;">10</p> <p>5</p> <p>1</p>

AVERAGE SCORE FOR ECOLOGICAL INTEGRITY

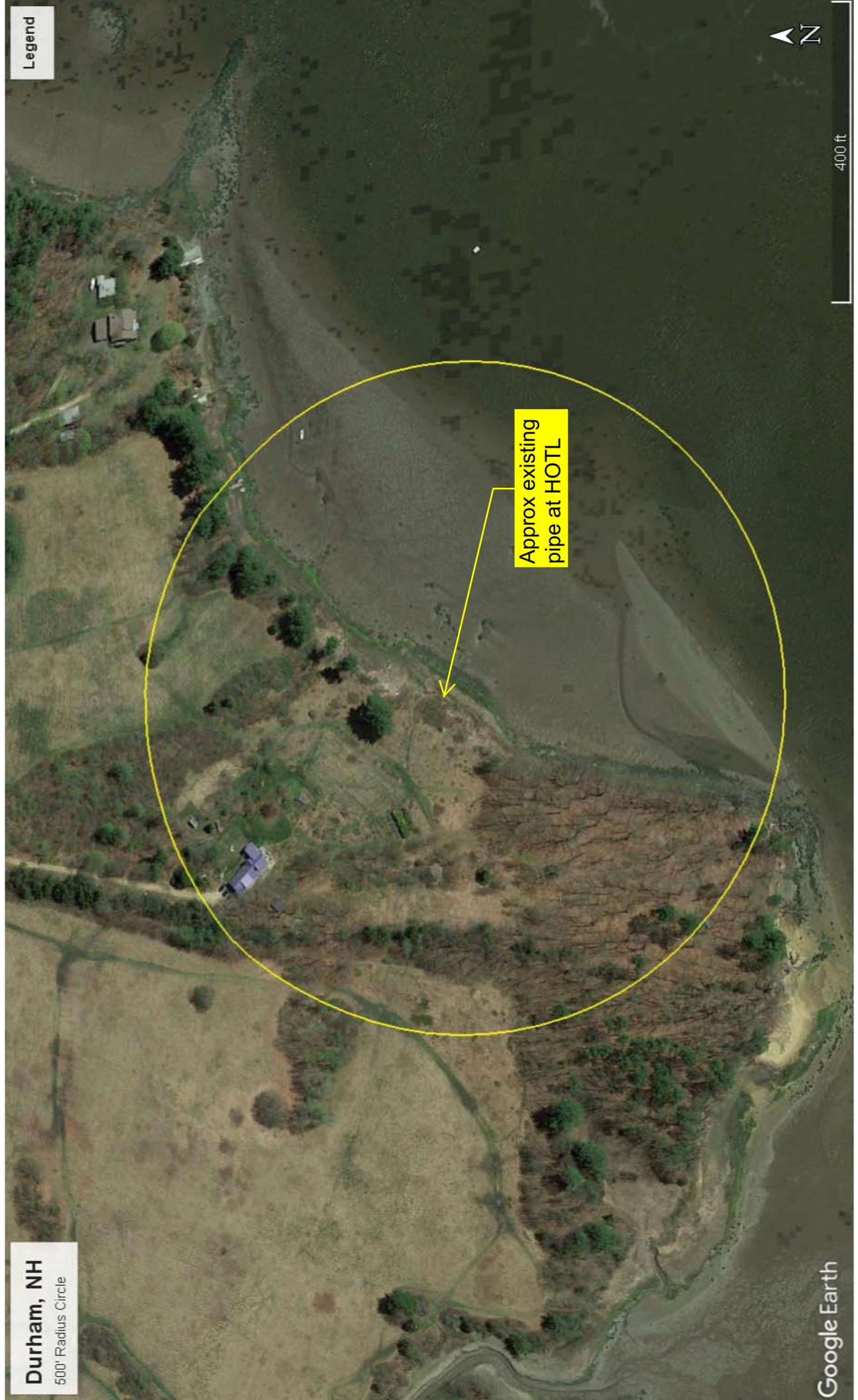
(Add scores for each question and divide by 10)

95/10 = 9.5

ATTACHMENT 14A

Durham, NH
500' Radius Circle

Legend



Google Earth

400 ft

ATTACHMENT 14B

Fox Point
Newington, NH
500' Radius Circle

Legend



Approx existing
pipe at HOTL



400 ft

8

Abutter Notification

Abutter Notification

Abutter notification has not been completed for the project area within the existing utility right-of-way (ROW) per Env-Wt 306.06(c)(4) which states abutter notification is not required for utility maintenance or repair projects within a utility ROW.

The City has had ongoing outreach with the property owner on the Durham side and the Town of Newington. The City will continue to conduct pro-active outreach actions throughout the Project permitting and construction.



Map 12






PROPERTY MAP
DURHAM
NEW HAMPSHIRE

See Map 12A

Project Location

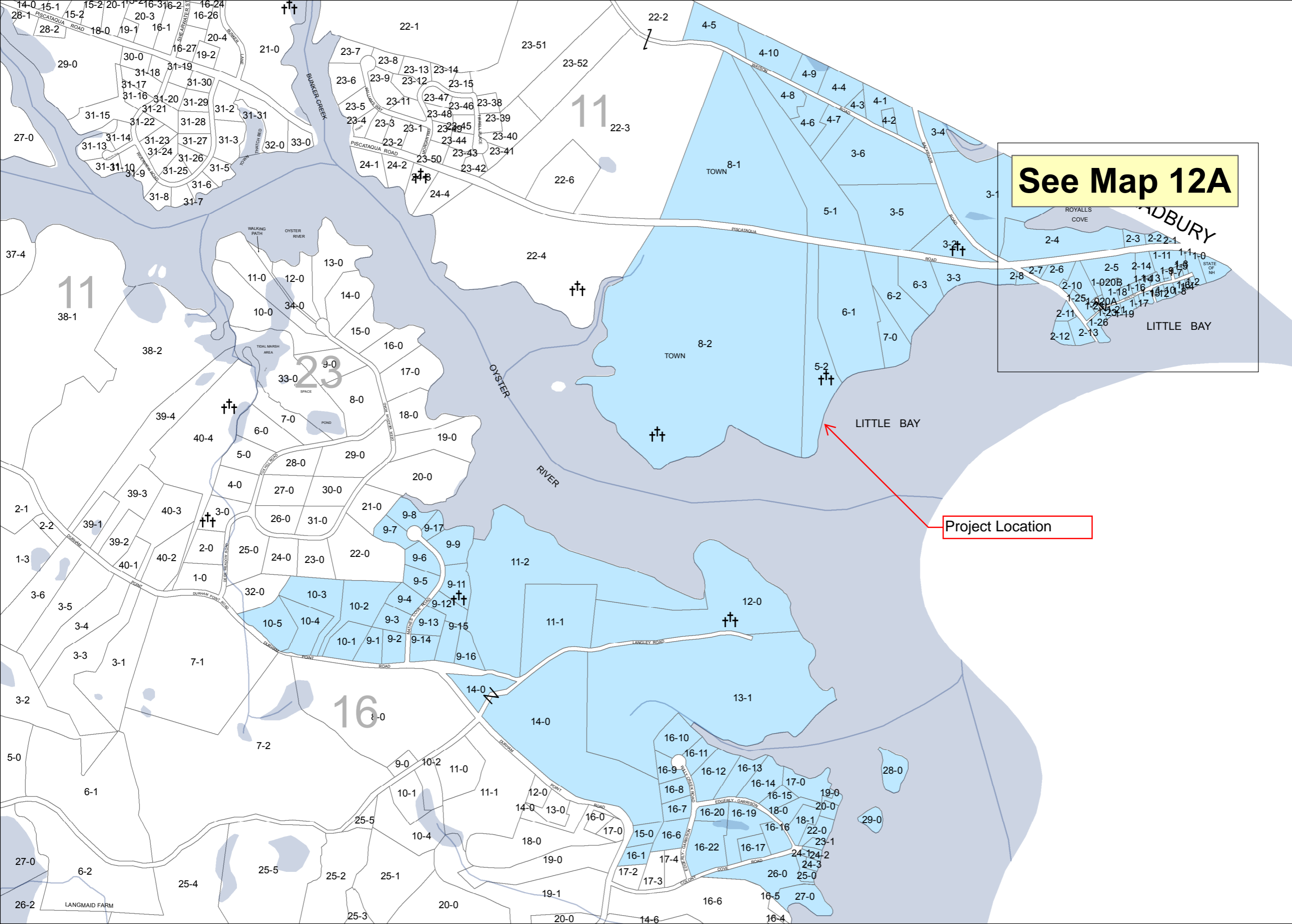
Legend

-  Adjacent Map Sheets
-  Current Map Sheet
-  Cemetery

1 inch = 910 feet

This map was updated by
Strafford Regional Planning
and the Town of Durham
January 2019.

**THIS MAP IS FOR
ASSESSMENT PURPOSES.
IT IS NOT INTENDED
FOR LEGAL DESCRIPTION
OR CONVEYANCE.**



Project Location



GREAT BAY

1-1-1
TOWN OF NEWINGTON
2.06

HEN ISLAND

FOX POINT

1-1
TOWN OF NEWINGTON
110.00 AC.

FOX POINT ROAD

S 10.270

GREAT BAY



LEGEND	LOT NO. 12-12	DIMENSIONS 123.45'
TOWN LINE	---	---
ROW - PUBLIC	---	---
ROW - PRIVATE	---	---
ROW - PAPER	---	---
LOTLINE	---	---
EASEMENT	---	---
BROOKS/STREAMS	---	---
LAKES/RIVERS	---	---
FORMER LOT LINE	---	---
PDA / BNDY.	---	---
BUILDINGS/DRIVES	---	---
WETLANDS / WATER BODIES	---	---
PRIME WETLAND	---	---

MERIDIAN LAND SERVICES, INC.
31 OLD NASHUA ROAD, AMHERST, N.H. 03110
TEL: 603-873-3441 FAX: 603-873-3444
ENGINEERS - LAND SURVEYORS - SCIENTISTS - LAND PLANNERS

THIS DOCUMENT HAS BEEN PREPARED TO SHOW APPROXIMATE LOT LOCATIONS ONLY. INFORMATION SHOWN IS NOT TO BE USED FOR DEED DESCRIPTIONS.

NEWINGTON, N.H.

TAX MAP SCALE
24"x36" PLOT - 1"=100'
11"x17" PLOT - 1"=220 +/-'
AUGUST 2015
DATE OF LATEST REVISION

GRAPHIC SCALE
0 50' 00' 200'

57	2
4	5

10

Photographs



Photographs



Photo 1: View Across Bay from Durham Shoreline



Photo 2: View of Durham Shoreline



Photo 3: View of Durham Shoreline Facing Northeast



Photo 4: View of Durham Shoreline Facing Southwest



Photo 5: View of Newington Existing Pipe Crossing Location




Photo 6: View of Newington Shoreline from Survey Vessel

11

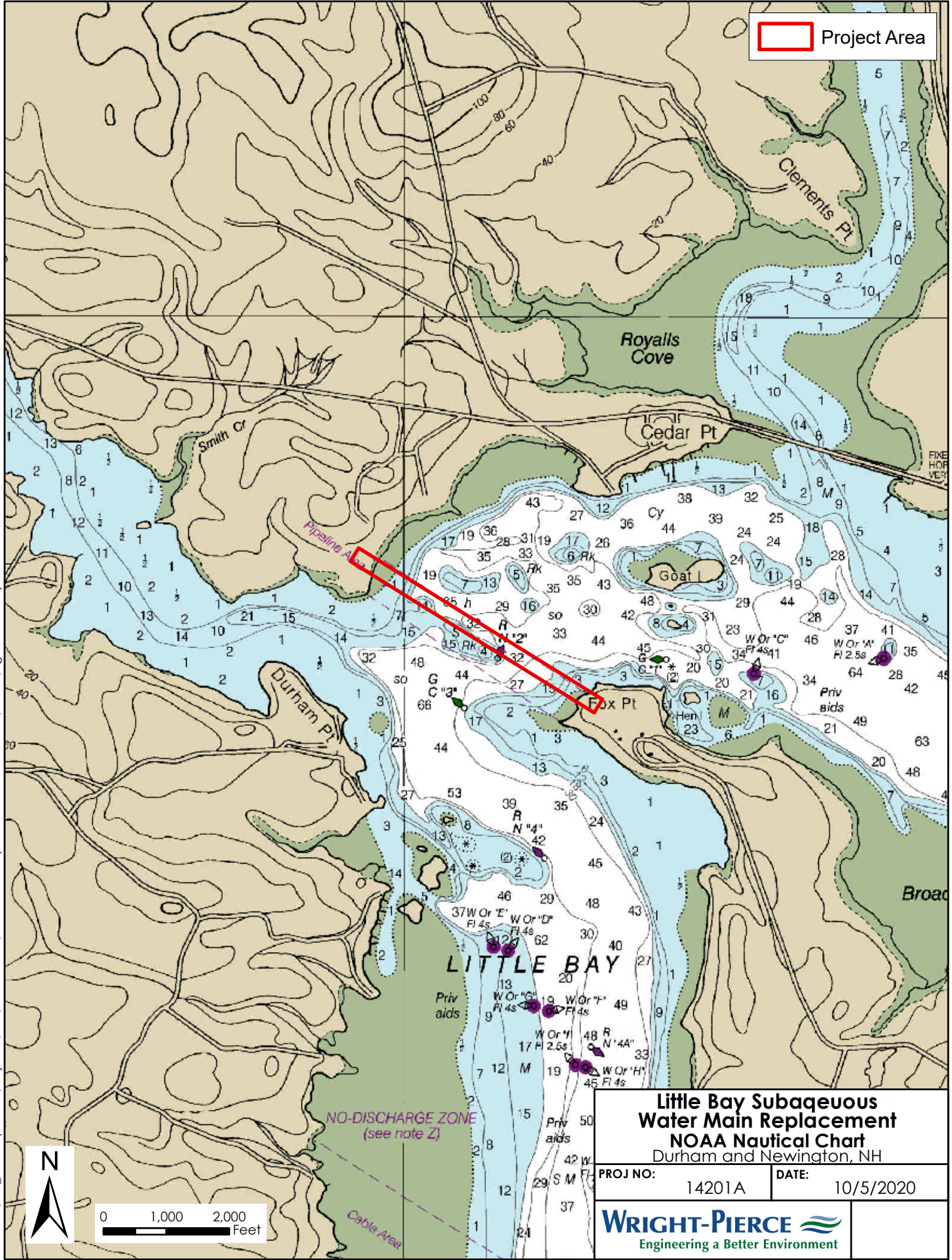
USGS Map

JDM: w:\GIS_Development\Projects\NH\Portsmouth\14202A-SubaqueousWaterTransMain_VXD\Figure-LittleBayFocusArea-8x11.mxd



 Project Area

J:\Development\Projects\NH\Portsmouth\14202A-SubaqueousWaterTransMain\XMDs\Figure-LittleBay-NOAANauticalChart-8x11.mxd



12

Proposed Construction Sequence

The proposed project is anticipated to be constructed in Fall/Winter 2021/2022. A general sequence of construction activities is provided below. The estimated construction duration is six months. The final schedule will be determined by the City and contractor upon receipt of permit approvals.

General Schedule:

1. Contractor mobilizes to project area (Fall 2021).
2. Install perimeter silt fence and other applicable erosion and sedimentation controls practices.
3. Construct access roads and prepare staging area.
4. Install timber mats.
5. Remove trees within limit of work after August 1, 2021.
6. Remove and stockpile salt marsh block in accordance with salt marsh restoration plan.
7. Install turbidity curtains.
8. Commence in-water trench excavation in accordance with approved plans after November 15, 2021.
9. Completed trench excavation on land.
10. Fuse HDPE pipe on Newington site.
11. Float HDPE pipe into Little Bay, install collars and sink into excavated trench.
12. Commence backfilling under water and on land.
13. Once disturbed sediment has settled, remove turbidity curtains.
14. Excavate land as necessary to connect new water main to existing water main and install valves.
15. Stabilize disturbed areas with riprap, loam, seed, and salt marsh restoration as indicated on the plans.
16. Remove accumulated sediment from sediment barriers as necessary.
17. Once the site is permanently stabilized, remove all temporary erosion control measures.
18. Monitor restored areas for two growing seasons to confirm restoration was successful.



13

Easements

Easements

A majority of the proposed project area is located within the water line easement boundaries established for the water main when installed by US Air Force in 1958. The City acquired the easement and the water infrastructure from the US Air Force when Pease Air Force based was decommissioned in 1990s. The easement crosses property owned by a private landowner on the Durham side and over land owned by the Town of Newington on the Newington side. Refer to an abridged copy of US Air Force easement included in this section.

The City of Portsmouth is coordinating with the private landowner on the Durham side to secure permission from the land owner for temporary impacts associated with construction and construction access.

The City of Portsmouth is coordinating with the Town of Newington to secure permission for temporary impacts associated with construction, construction laydown area, and construction access.

Copies of the executed agreements will be provided when available.

Irrelevant portions of the document omitted. Full document available upon request.

KNOW ALL MEN BY THESE PRESENTS

THAT, WHEREAS, the UNITED STATES OF AMERICA pursuant to an Act of Congress approved September 28, 1951 (Public Law 155 - 82nd Congress) is authorized to construct an Air Force Base in the City of Portsmouth and Town of Newington, Rockingham County, State of New Hampshire, known as the Pease Air Force Base; and

WHEREAS, in the construction and operation of said facility it was necessary to relocate and replace all that portion of the water supply system owned and operated by the City of Portsmouth located within the perimeter of the Air Force Base; and

WHEREAS, the City is the owner of other land within the Air Force Base; and

WHEREAS, under the provisions of Section 501a of said Public Law 155 the Secretary of Air Force is authorized to acquire lands or rights pertaining thereto or other interests therein by donation, purchase, exchange of Government owned lands, or otherwise in pursuance of the undertaking authorized by said Act; and

WHEREAS, the City of Portsmouth has agreed by Contract No. DA-19-016-ENG-2924 dated 27 January 1954, as subsequently amended, among other provisions, to the acquisition by the UNITED STATES OF AMERICA of its fee titles and all easements, permits and licenses comprising all of the lands and rights owned by the City within the project area and which includes part of the present water supply system in exchange for a conveyance from the UNITED STATES OF AMERICA to the City of Portsmouth of fee title and other real estate rights upon which the new water supply system has been constructed.

NOW, THEREFORE, the UNITED STATES OF AMERICA acting by and through
Joseph S. Imirie, the Acting Secretary of the Air Force,
under and pursuant to the powers and authorities vested in him under said Act of Congress approved 28 September 1951 (Public Law 155 Section 501a)

hereinafter called the Grantor, where the context so admits, and in consideration of the acquisition by the Grantor from the City of Portsmouth of all its real estate rights, title and interest comprising all its real estate including the portion of its present water supply system within the Air Force Base by condemnation proceedings to be filed and to be recorded herewith, does hereby remise, release and forever QUITCLAIM unto the said CITY OF PORTSMOUTH, a municipal corporation duly organized and existing under the Laws of the State of New Hampshire in Rockingham County, its successors and assigns, hereinafter called the Grantee, where the context so admits, all right, title and interest of the Grantor in and to the following described real estate interests, together with the buildings and improvements thereon and appurtenant facilities and easements attached thereto, being more specifically bounded and described as follows:

I - BELLAMY RIVER DAM AND RESERVOIR PROJECT

Two certain parcels of land with the buildings and improvements thereon situated partly in the City of Dover, partly in the Town of Madbury and partly in the Town of Barrington, County of Strafford, State of New Hampshire:

1. Bellamy River Dam and Reservoir - Fee Area

A certain parcel of land situated partly in the Towns of Madbury and Barrington, and partly in the City of Dover, County of Strafford, State of New Hampshire, being more particularly bounded and described as follows:

Beginning at the point of intersection of the centerlines of Mill Hill Road and the Bellamy River; thence running Southerly along the centerline of Mill Hill Road about 440 feet to land, now or formerly, of Irving A. Hayes, et ux; thence turning and running by land, now or formerly, of Irving A. Hayes, et ux South $86^{\circ} 30'$ West about 835 feet and South $4^{\circ} 30'$ West about 930 feet to land, now or formerly, of Beatrice L. Gerrish, et al; thence running by land, now or formerly, of Beatrice L. Gerrish, et al the following courses and distances: South $4^{\circ} 30'$ West about 210 feet, North $71^{\circ} 30'$ West about 720 feet, North $2^{\circ} 30'$ West about 785 feet and South $74^{\circ} 00'$ West about 110 feet to land, now or formerly, of the Heirs of Thomas W. Fernald; thence running by land, now or formerly, of the Heirs of Thomas W. Fernald the following courses and distances: South $74^{\circ} 00'$ West about 690 feet, South $87^{\circ} 00'$ West about 530 feet, North $82^{\circ} 30'$ West about 215 feet, North $52^{\circ} 30'$ East about 310 feet, North $33^{\circ} 00'$ West about 190 feet, North $15^{\circ} 00'$ East about 350 feet, North $18^{\circ} 30'$ West about 270 feet, North $68^{\circ} 30'$ West about 325 feet, North $30^{\circ} 00'$ West about 265 feet, North $41^{\circ} 30'$ East about 485 feet, North 10°

TRACT NO. E-527E

A certain parcel of land situated in the Town of Durham, County of Strafford, State of New Hampshire, being a strip of land 40 feet in width and approximately 2515 feet long, 10 feet on the Easterly side and 30 feet on the Westerly side of a survey line which is described as follows:

Beginning at a point on the boundary line between land of Elizabeth W. Chesley and land of Forrest S. Emery, said point being in Route No. 4, approximately 10 feet south of the center line of said Route 4 and approximately 55 feet east of an 18" concrete culvert; thence running along a curve to the right of radius of 215.0 feet and a distance of 118 feet, more or less, to a point of tangency; thence turning and running South $9^{\circ} 29' 15''$ East 667.86 feet to the point of curvature; thence turning and running by a curve to the left of a radius of 246.00 feet and a distance of 128.81 feet to a point of tangency; thence turning and running South $39^{\circ} 29' 15''$ East 833.85 feet to a point of curvature; thence turning and running by a curve to the left of radius 770 feet and a distance of 571.68 feet to a point of tangency; thence turning and running South $82^{\circ} 01' 35''$ East 195 feet, more or less, to land of Edward L. Emerson.

Containing 2.31 acres, more or less.

Reserving, however, to Elizabeth W. Chesley the right to the continuous use of the water pipe which leads from the spring over and across the proposed construction to her home.

TRACT NO. E-528E

A strip of land forty (40) feet in width and approximately 420 feet in length, 10 feet on the northerly side and 30 feet on the southerly side of a survey line which is described as follows:

Beginning at a point on the boundary line between land of Edward L. Emerson and land of Elizabeth Chesley, said point being 190 feet, more or less, southerly from the southwesterly corner of a cemetery; thence running South $82^{\circ} 01' 35''$ East 420 feet, more or less, to the Oyster River.

Containing 0.39 acre, more or less.

TRACT NO. E-531L

Crossing approximately 2900 feet of Little Bay, from the property of Edward L. Emerson, southwest of Cedar Point in Durham, to the land of William J. Mott on Fox Point in Newington.

TRACT NO. E-534L

Beginning at a point on the southerly side of Drew Road, 210 feet, more or less, westerly from a corner in fence on land of Saul J. Cote; thence running northerly crossing Drew Road and continuing along Freshet Road 300 feet, more or less, to the east side of said Freshet Road, located in the Town of Durham, County of Strafford, State of New Hampshire.

TRACT NO. E-536P

Route U.S. 4, Bellamy Bridge Road, in the Town of Durham,
at a location approximately 2 miles from intersection of Routes
U.S. 4 and N.H. 108, Coes Corner, Durham, New Hampshire.

Meaning and intending to convey the same easements, permits
and licenses acquired by the Government from the following listed
owners as follows:

<u>TRACT NO.</u>	<u>OWNER</u>	<u>INSTRUMENT</u>	<u>DATE</u>	<u>STRAFFORD COUNTY REGISTRY OF DEEDS</u>	
E-524E	Saul J. Cote, et ux	Deed	12/10/53	Bk 625	Pg 1
E-525E-1, E-2	Forrest S. Emery,	Civil Action No. 1263	3/26/54	628	473
E-526E	Loring V. Tirrell, et ux	Deed	11/12/53	623	455
E-527E	Elizabeth W. Chesley	Deed	10/15/53	622	316
E-528E	Edward L. Emerson	Deed	11/2/53	623	285
E-534L	Town of Madbury	License	4/29/53	Unrecorded	
E-531L	State of New Hamp- shire	License	5/27/53	Unrecorded	
E-536P	State of New Hamp- shire	Permit	4/28/53	Unrecorded	

All of the above-described and conveyed real estate interests, privileges,
rights, permits and licenses, and tract number designations are further shown
on the following listed plans which are marked as follows, and which are to
be recorded herewith, and a copy of each is attached hereto:

1. Pease Air Force Base, Portsmouth, New Hampshire, Surface Water Supply, Segment 1, Drawing No. 1524 dated July 1959.
2. Pease Air Force Base, Portsmouth, New Hampshire, Surface Water Supply, Segment 2, Drawing No. 1525 dated May 1960.
3. Pease Air Force Base, Portsmouth, New Hampshire, Surface Water Supply, Segment 3, Drawing No. 1526 dated May 1960.
4. Pease Air Force Base, Portsmouth, New Hampshire, Surface Water Supply, Segment 4, Drawing No. 1527, dated June 1959.
5. Pease Air Force Base, Military Reservation, Segment "E", Drawing No. MED-PA-877, dated July 1952, Sheet 5 of 8.
6. Pease Air Force Base, Military Reservation, Segment "H", Drawing No. MED-PA-877, dated February 1952, Sheet 8 of 8.

XERO COPY XERO COPY XERO COPY XERO COPY

Meaning and intending to convey to the Grantee all the right, title and interest of the Grantor in the real estate interests, permits and licenses comprising the replacement water supply system constructed by the Grantor located in Strafford County, pursuant to the terms and conditions of Contract No. DA-19-016-ENG-2924, dated January 27, 1954, between the parties, and as subsequently modified by Supplemental Agreement No. 1, dated June 2, 1955, Supplemental Agreement No. 2, dated August 3, 1960, and Supplemental Agreement No. 3, dated August 1, 1961. The remaining portion of this replacement water supply system is located in Rockingham County and is being conveyed to the Grantee by the Grantor by another deed simultaneously with this transaction. All of said real estate interests, fee simple title and easements were acquired by the United States of America by deeds and condemnation proceedings which are recorded in the Registry of Deeds for Strafford and Rockingham Counties where said real estate interests lie. The permits and licenses conveyed herein were executed by the proper authorities having jurisdiction over the waters, highways, and rights of way crossings and affected by said easements; and copies of all of said licenses and permits have been furnished the Grantee. This conveyance is made in accordance with the terms and conditions of said deeds, condemnation proceedings, permits, licenses, and is also made pursuant to the terms and conditions of said Contract No. DA-19-016-ENG-2924 as amended, and which provides for simultaneous acquisition by Grantor from Grantee of all of its real estate interests, rights, and privileges within Pease Air Force Base by instrument to be recorded herewith.

TO HAVE AND TO HOLD the same to the said City of Portsmouth and its successors and assigns forever.

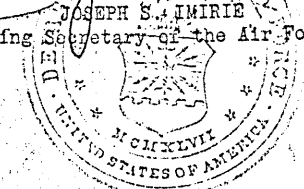
This deed is executed and delivered to said Grantee without any covenants whatsoever, either expressed or implied.

IN WITNESS WHEREOF, the United States of America has caused these presents to be executed in its name by Joseph S. Imirie, Acting the/Secretary of the Air Force and the seal of the Department of the Air Force to be affixed hereto this 11th day of October, 1962.

WITNESSES:

James M. Olsen
Muriel L. Hartley

THE UNITED STATES OF AMERICA
By *Joseph S. Imirie*
Secretary of the Air Force
JOSEPH S. IMIRIE
Acting Secretary of the Air Force



STATE OF VIRGINIA) SS.
COUNTY OF ARLINGTON)

On this 11th day of October 1962, before me personally appeared Joseph S. Imirie, Acting Secretary of the Air Force of the United States of America, to me personally known, who, being by me duly sworn did depose and say that he is the Acting Secretary of the Air Force of THE UNITED STATES OF AMERICA; and that he knows the Seal of the Department of the Air Force of THE UNITED STATES OF AMERICA; and that the seal affixed to the foregoing instrument is the official seal of the Department of the Air Force and the said instrument was signed and sealed on behalf of THE UNITED STATES OF AMERICA by authority of the Act of Congress cited therein, and the said acknowledged said instrument to be the true and legal deed of THE UNITED STATES OF AMERICA, for the uses and purposes therein expressed.

14

NHB Correspondence

CONFIDENTIAL – NH Dept. of Environmental Services review

Memo



NH Natural Heritage Bureau
HB Datacheck Results Letter

To: Jacob Shactman, Wright-Pierce
230 Commerce Way
Suite 302
Portsmouth, NH 03801

From: Amy Lamb, NH Natural Heritage Bureau
Date: 7/30/2020 (valid for one year from this date)
Re: Review by NH Natural Heritage Bureau
NHB File ID: NHB20-2107

Town: Newington, Durham

Location: Tax Maps: 5-2 (Durham), 1-1
(Newington)

Description: Repair/replacement of two existing sub-aqueous water mains crossing Little Bay in the Piscataqua River. The current approach is to install a weighted, polyethylene pipe across the bottom of the riverbed and within the footprint of the existing infrastructure to allow the existing water mains to be taken out of service. (Previous file number: NHB19-0978)

cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments: Please continue to coordinate with the NH Fish & Game Department and NHB.

Natural Community	State ¹	Federal	Notes
Sparsely vegetated intertidal system	--	--	Threats to these communities are primarily alterations to the hydrology of the wetland (such as alterations that might affect the sheet flow of tidal waters across the intertidal flat) and increased input of nutrients and pollutants in storm runoff.
Subtidal system	--	--	Threats to these communities are primarily alterations to the hydrology of the wetland (such as alterations that might affect the sheet flow of tidal waters across the intertidal flat) and increased input of nutrients and pollutants in storm runoff.

Vertebrate species	State ¹	Federal	Notes
Atlantic Sturgeon (<i>Acipenser oxyrinchus</i>)	T	T	Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).
Common Tern (<i>Sterna hirundo</i>)	T	--	Contact the NH Fish & Game Dept (see below).
Shortnose Sturgeon (<i>Acipenser brevirostrum</i>)	E	E	Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).

¹Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

CONFIDENTIAL – NH Dept. of Environmental Services review

Memo



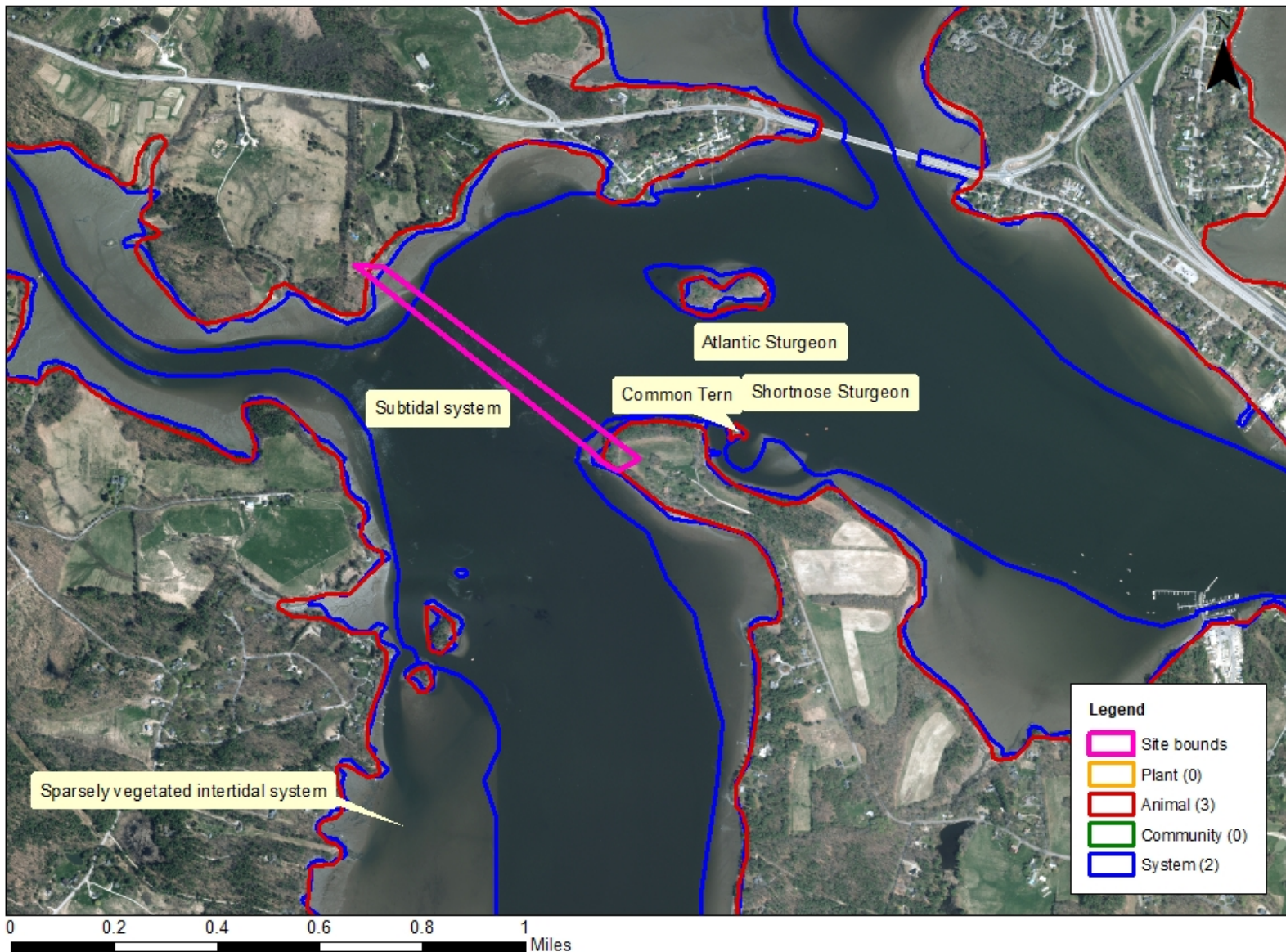
NH Natural Heritage Bureau
HB Datacheck Results Letter

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.



CONFIDENTIAL – NH Dept. of Environmental Services review

NHB20-2107



New Hampshire Natural Heritage Bureau - System Record

Sparsely vegetated intertidal system

Legal Status

Federal: Not listed
State: Not listed

Conservation Status

Global: Not ranked (need more information)
State: Rare or uncommon

Description at this Location

Conservation Rank: Good quality, condition and landscape context ('B' on a scale of A-D).
Comments on Rank: --

Detailed Description: Extensive *intertidal flats* that are exposed daily at low tide, bordered in places by *intertidal rocky shore* and *coastal shoreline strand/swale* communities.

General Area: 2010: Borders **salt marsh system** landward and **subtidal system** seaward.

General Comments: --

Management: --

Comments:

Location

Survey Site Name: Great Bay

Managed By: Moody Point Open Space

County: Rockingham

Town(s): Newington

Size: 3589.5 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Occurs throughout Great Bay from the mouths of its tributaries, through Little Bay, to the confluence with the Piscataqua River.

Dates documented

First reported: 1997-06-23

Last reported: 2010-10-13

New Hampshire Natural Heritage Bureau - System Record

Subtidal system

Legal Status

Federal: Not listed
State: Not listed

Conservation Status

Global: Not ranked (need more information)
State: Rare or uncommon

Description at this Location

Conservation Rank: Good quality, condition and landscape context ('B' on a scale of A-D).
Comments on Rank: --

Detailed Description: Channels and bay bottoms that vary in width from a few feet to almost a mile across, covered by water even at low tide. Patches of subtidal *eelgrass bed* occur at the edge of the adjacent **sparsely vegetated intertidal system**.

General Area: 2010: Borders a **sparsely vegetated intertidal system**.

General Comments: --

Management: --

Comments:

Location

Survey Site Name: Great Bay

Managed By: Portsmouth Country Club

County: Rockingham

Town(s): Newington

Size: 3207.7 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Occurs throughout the Great Bay estuary, from the upper total reaches of tributary streams to the confluence of the bay with the Piscataqua River.

Dates documented

First reported: 1997-06-17

Last reported: 2010-10-13

New Hampshire Natural Heritage Bureau - Animal Record

Common Tern (*Sterna hirundo*)

Legal Status

Federal: Not listed
State: Listed Threatened

Conservation Status

Global: Demonstrably widespread, abundant, and secure
State: Not ranked (need more information)

Description at this Location

Conservation Rank: Not ranked
Comments on Rank: --

Detailed Description: 2020: Area 4555M: At least 8 adults observed from mainland, but likely many more
2011: Area 4555M: 31 adults, 11 fledglings.
2003: Area 4555M: 12 pairs, 12 fledglings.
2002: Area 4555M: 12 pairs, 12 fledglings.
2001: Area 4555M: 12 pairs, 8 fledglings.
2000: Area 4555M: 15 pairs, 12 fledglings.
1999: Area 4555M: 2 pairs, 2 fledglings.
1998: Area 4555M: 0 pairs.
1997: Area 4555M: 2 pairs, 2 fledglings.
1996: Area 4555M: 7 pairs, 6 fledglings.
1995: Area 4555M: 9 pairs, 0 fledglings.
1994: Area 4555M: 14 pairs, 5 fledglings.
1993: Area 4555M: 11 pairs, 14 fledglings.
1992: Area 4555M: 7 pairs, 13 fledglings.
1991: Area 4555M: 8 pairs, 1 fledgling.
1990: Area 4555M: 7 nests; 2 fledglings.
1989: Area 4555M: 4 pairs, 4-6 fledglings.
1986: Area 4555M: 4-5 pairs, 0 fledglings.
1985: Area 4555M: 5 pairs, 1 fledgling.
1981: Area 4555M: 2 pairs, 0 fledglings.
1980: Area 4555M: 2 pairs..

General Area: An island <0.8 ha. in area which supports small patches of sparse grasses, substantial shrub growth, and several small trees.

General Comments: 1992: Town residents launch and moor private boats in the small cove east of Fox Point and south of Hen Island. The presence of terns is well-known by those who utilize this site, and they are careful not to land on or venture too close to the island during the breeding season.

Management Comments: 1992: Contact with the town of Newington and the local residents is the most effective technique for eliminating human disturbance at this site. Traps were set for rats in the spring. 1991: All nests were lost to rats this season. Traps were set in the fall.

Location

Survey Site Name: Hen Island
Managed By: Fox Point

County: Rockingham
Town(s): Newington
Size: .4 acres

Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: Area 4555: [Hen Island lies approximately 70 meters east of Fox Point on Little Bay in Newington.]

Dates documented

First reported: 1980-05-15 Last reported: 2020-06-19

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

15

Conservation Commission Correspondence

Conservation Commission Correspondence

The Town of Durham and Town of Newington Conservation Commissions were introduced to this project in October 2019 when the City sought a wetlands permit to authorize temporary impacts associated with the geotechnical exploration.

Both Commissions will be sent a copy of this application when it is submitted to the NHDES Wetlands Bureau for project review. A presentation is planned at each Commission at their next regularly scheduled meeting to present the project and receive comments on the application. Comments received from the Conservation Commissions will be addressed in the project design and will be forwarded to NHDES Wetlands Bureau.

16

Federal Agency Correspondence

Federal Agency Correspondence

The US Army Corps of Engineers (USACE) and US Environmental Protection Agency (USEPA) were introduced to this project during a preapplication meeting held at NHDES on April 18, 2019. A subsequent preapplication meeting was held on June 16, 2020 which USACE attended. USACE concluded the proposed project will require an USACE Individual Permit. Refer to preapplication meeting notes in Section 20.

17

Avoidance and Minimization



AVOIDANCE AND MINIMIZATION CHECKLIST
 Water Division/Land Resources Management
 Wetlands Bureau



[Check the Status of your Application](#)

RSA/Rule: RSA 482-A/ Env-Wt 311.07(c)

This checklist can be used in lieu of the written narrative required by Env-Wt 311.07(a) to demonstrate compliance with requirements for Avoidance and Minimization (A/M), pursuant to RSA 482-A:1 and Env-Wt 311.07(c).

For construction or modification of non-tidal shoreline structures over areas of surface waters having an absence of wetland vegetation, complete only Sections 1, 2, and 4 only (or the applicable sections in [Attachment A: Minor and Major Projects \(NHDES-W-06-013\)](#)).

“A/M BMPs” stands for [Wetlands Best Management Practice Techniques for Avoidance and Minimization](#) dated 2019, published by the New England Interstate Water Pollution Control Commission (Env-Wt 102.18).

“Practicable” means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes (Env-Wt 103.62).

SECTION 1 - CONTACT/LOCATION INFORMATION		
APPLICANT LAST NAME, FIRST NAME, M.I.: City of Portsmouth		
PROJECT STREET ADDRESS: Little Bay	PROJECT TOWN: Durham/Newington	
TAX MAP/LOT NUMBER: Durham: 12-5-2 / Newington: 1-1		
SECTION 2 - PRIMARY PURPOSE OF THE PROJECT		
Env-Wt 311.07(b)(1)	Indicate whether the primary purpose of the project is to construct a water-access structure or requires access through wetlands to reach a buildable lot or the buildable portion thereof.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If you answered “no” to this question, describe the purpose of the “non-access” project type you have proposed. The purpose of the proposed project is to replace existing drinking water transmission mains that have reached the end of their service life. Refer to attached Alternatives Analysis.		

irm@des.nh.gov or (603) 271-2147

NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095

www.des.nh.gov

SECTION 3 - AVOIDANCE & MINIMIZATION PROJECT DESIGN TECHNIQUES		
Check the appropriate boxes below in order to demonstrate that these items have been considered in the planning of the project. Use N/A (not applicable) for each technique that is not applicable to your project.		
Env-Wt 311.07(b)(2)	For any project that proposes permanent impacts of more than one acre or that proposes permanent impacts to a Priority Resource Area (PRA), or both, whether any other properties reasonably available to the applicant, whether already owned or controlled by the applicant or not, could be used to achieve the project's purpose without altering the functions and values of any jurisdictional area, in particular wetlands, streams, and PRAs.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 311.07(b)(3)	Whether alternative designs or techniques, such as different layouts, construction sequencing, or alternative technologies could be used to avoid impacts to jurisdictional areas or their functions and values.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(1) Env-Wt 311.10(c)(2)	The results of the functional assessment required by Env-Wt 311.03(b)(10) were used to select a location, and design for the proposed project that has the least impact to wetland functions.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 311.07(b)(4) Env-Wt 311.10(c)(3)	Where impact to wetland functions is unavoidable, the proposed impacts are limited to the wetlands with the least valuable functions on the site while avoiding and minimizing impacts to the wetlands with the highest and most valuable functions.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 313.01(c)(1) Env-Wt 313.01(c)(2) Env-Wt 313.03(b)(1)	No practicable alternative would reduce adverse impact on the area and environments under the department's jurisdiction and the project will not cause random or unnecessary destruction of wetlands.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 313.01(c)(3)	The project would not cause or contribute to the significant degradation of waters of the state or the loss of any PRAs.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 313.03(b)(3) Env-Wt 904.07(c)(8)	The project maintains hydrologic connectivity between adjacent wetlands or stream systems.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	Buildings and/or access are positioned away from high function wetlands or surface waters to avoid impact.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	The project clusters structures to avoid wetland impacts.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 311.10 A/M BMPs	The placement of roads and utility corridors avoids wetlands and their associated streams.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
A/M BMPs	The width of access roads or driveways is reduced to avoid and minimize impacts. Pullouts are incorporated in the design as needed.	<input checked="" type="checkbox"/> Check <input type="checkbox"/> N/A
A/M BMPs	The project proposes bridges or spans instead of roads/driveways/trails with culverts.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A

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A/M BMPs	The project is designed to minimize the number and size of crossings, and crossings cross wetlands and/or streams at the narrowest point.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 500 Env-Wt 600 Env-Wt 900	Wetland and stream crossings include features that accommodate aquatic organism passage and wildlife passage.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 900	Stream crossings are sized to address hydraulic capacity and geomorphic compatibility.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
A/M BMPs	Disturbed areas are used for crossings wherever practicable, including existing roadways, paths, or trails upgraded with new culverts or bridges.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
SECTION 4 - NON-TIDAL SHORELINE STRUCTURES		
Env-Wt 313.03(c)(1)	The non-tidal shoreline structure has been designed to use the minimum construction surface area over surfaces waters necessary to meet the stated purpose of the structure.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(2)	The type of construction proposed for the non-tidal shoreline structure is the least intrusive upon the public trust that will ensure safe docking on the frontage.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(3)	The non-tidal shoreline structure has been designed to avoid and minimize impacts on the ability of abutting owners to use and enjoy their properties.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(4)	The non-tidal shoreline structure has been designed to avoid and minimize impacts to the public's right to navigation, passage, and use of the resource for commerce and recreation.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(5)	The non-tidal shoreline structure has been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A
Env-Wt 313.03(c)(6)	The non-tidal shoreline structure has been designed to avoid and minimize the removal of vegetation, the number of access points through wetlands or over the bank, and activities that may have an adverse effect on shoreline stability.	<input type="checkbox"/> Check <input checked="" type="checkbox"/> N/A

TO:	Brian Goetz, Al Pratt, Zach Cronin City of Portsmouth	DATE:	10/14/2020
FROM:	Darrin Lary, Britt Eckstrom Wright-Pierce	PROJECT NO.:	14202A
SUBJECT:	Little Bay Subaqueous Water Main Replacement Alternatives		

BACKGROUND

The City of Portsmouth owns and maintains a 6 mile cross-country drinking water transmission main that brings treated drinking water from the Madbury Water Treatment Plant to the Newington Booster Pump Station. The 24-inch reinforced concrete main carries approximately 60% of the water serving the City's regional water system that includes Portsmouth, Newington, Greenland, New Castle and portions of Madbury, Dover, Durham and Rye. The main crosses the Little Bay, approximately 4,000 ft to the southwest of the Scammell Bridge (US Route 4). At the crossing, the main transitions to two 20-inch cast iron pipes from the Durham shore to Fox Point shore in Newington. The two parallel transmission mains, installed in the 1950s, are approximately 3,200 feet in length across the bay.

An evaluation of the entire transmission main was completed for the City by Stantec in 2017. The evaluation included a dive inspection of the subaqueous main in 2016. Divers observed that portions of the two cast iron pipes have become exposed to salt water and have experienced significant corrosion, with pits greater than 50% of the pipe wall thickness in some instances. The 2017 evaluation identified several short- and long- term replacement and rehabilitation alternatives to address the deficiencies observed in the underwater main including: installing two, new 20-inch pipelines using Horizontal Directional Drilling (HDD), pipe bursting of existing pipelines with equal or larger diameter water mains, lining existing pipelines with a structural liner, laying a new high density polyethylene (HDPE) pipe along the bottom of Little Bay, and constructing a new pipeline along Boston Harbor Road Bridge and Route 3 bridge.

The City of Portsmouth has opted to evaluate these alternatives in further detail to determine the most cost effective and efficient method of pipeline replacement in order to select and implement an alternative to ensure the reliability of this critical water main.

To assess the feasibility of alternatives for pipe rehabilitation or replacement, several field investigations have been completed. These include:

- Marine Survey – A geophysical survey was performed by Ocean Surveys, Inc. in October 2018 along the existing pipeline corridor. The multi-sensor survey acquired sounding, sub-bottom profiling, side scan sonar and magnetometer data. The results of the survey included hydrography of the riverbed channel, side scan sonar mapping indicating the composition of the riverbed (glacial till or bedrock in some areas, fine grain unconsolidated sediments in other areas), and the apparent location of the two pipelines based on side scan sonar and magnetometer data.
- Survey – A physical feature survey was completed by Doucet Survey, Inc. in both the Durham and Newington crossing locations. The existing pipeline easement was located using the record drawings and easement deeds.
- Geotechnical Exploration – Geotechnical borings were completed on land and from water to further characterize subsurface conditions. Seven borings were completed on land at the Durham and Newington sites. Subsurface materials consisted of fine to medium sand, silt and clay. Eight borings were completed from a barge. The borings indicated varying depth of clay/silt and bedrock. Sediment samples were taken at two of the borings completed in the water. Analysis results indicate sediment was below New Hampshire S-1 Standards.
- Wetland and resource delineation – Marc Jacobs, Certified Wetland Scientists, completed a delineation of jurisdiction wetlands, the highest observable tide line (HOTL), and other resource areas at the Durham and Newington sites in 2019. Saltmarsh and mudflats were observed within the intertidal area at the Durham site. A combination of sandy and/or rocky beach was observed within the intertidal area at the Newington site. A Coastal Functional Assessment was also completed by Marc Jacobs to assess the functions and values of the wetlands present at the project site.

ALTERNATIVES ANALYSIS

Horizontal Directional Drilling

Horizontal directional boring, commonly called horizontal drilling or HDD, is a steerable trenchless method of installing underground pipes, conduits, and cables in a shallow arc along a prescribed bore path by using a surface launched drilling rig, with minimal impact on the surrounding area. Directional boring is used when trenching or excavating is not practical and

subsurface conditions are suitable. Installation lengths up to 6,500 ft have been completed with diameters up to 56 inches.

The beginning of the process starts with receiving hole and entrance pits. These pits will allow the drilling fluid to be collected and reclaimed to reduce costs and prevent waste. The first stage drills a pilot hole on the designed path, and the second stage enlarges the hole by passing a larger cutting tool known as the back reamer. The reamer's diameter depends on the size of the pipe. The driller increases the diameter according to the material being cut and creates a bore path for optimal production. The third stage pulls the new pipe through the alignment behind the reamer to allow centering of the pipe in the newly reamed path. Typically, high density polyethylene (HDPE) or fusible PVC pipe is used in HDD installation due to uniform outside pipe diameters.

The subsurface investigation completed along the pipeline indicate varying subsurface conditions with bedrock at or near the surface for a large portion of the pipeline alignment. Large diameter (greater than 8-inch) HDD through bedrock requires highly specialized HDD equipment and will be a time consuming and expensive construction method. The overall length of this installation (over 3,000 ft) will also add to the complexity of the installation. HDD is not a feasible alternative for this project because of the difficulty and complexity of HDD in bedrock.

Pipe Bursting

Another trenchless technology alternative involves pipe bursting of existing pipe and replacement with new larger or same size diameter pipe. The existing pipe is shattered into small pieces and pushed outward into the surrounding soil. A new pipe of the same size or larger is then pulled into the borehole. The process begins with the expanding device, called an expander head. An expander head can be either pneumatic or hydraulic. The head is introduced into the defective pipeline through a launching pit. As it travels through the pipeline toward the receiving pit it breaks the pipe into many smaller pieces into the surrounding soil. A new pipe is then attached to the back of the expander head, replacing the line immediately.

This method is not feasible for replacing the Little Bay water main for several reasons. First, the joints of the existing heavy-duty ball-and-socket cast iron pipe would be difficult, if not impossible, to burst due to the thickness of the existing joint materials. Second, the existing cast iron pipe joints allow for significant deflection of the pipe (up to 20 degrees at each joint). Excessive deflection in a pipe line typically does not allow the expander head to successfully pass through the existing pipe. Third, this method requires stopping flow through the existing pipes while installing the new pipe within the existing pipe. This is not feasible since the existing valves are inoperable and stopping flow through the pipeline that supplies 60% of the water user's supply is operationally not feasible.

Lining

Cured in place structural liner is another trenchless technology used to repair existing pipelines. The first step involves removing all debris and irregularities within the pipe. The existing pipe is cleaned and then the interior of the pipe gets lined with an epoxy pipe lining or a cured-in-place lining, completing the pipe lining process. The lining length between access points to the original pipe is limited to about 500 to 1,000 feet. Since the pipeline crossing is over 3,000 feet in length, no intermediate access points are available, so lining is not a feasible alternative. In addition, this method requires taking each pipe offline which introduces more operational risk and is not operationally feasible.

New Pipeline Alignment

Alternative pipeline alignments within existing road right-of-way were considered in Stantec's evaluation of the watermain. A route along Route 4 and the Spaulding Turnpike was identified which would require installing 4 miles of new pipeline to bypass the existing Little Bay crossing. Two major bridge crossings would be required and it's unlikely the bridges have the capacity to support a new 24-inch pipe line, requiring the construction of utility bridges. The construction of the two bridges alone was estimated at \$20 million.

New HDPE pipe along Little Bay

A new pipeline can be installed within the existing pipeline alignment by floating a new HDPE pipeline out into Little Bay and lowering into place. Since the HDPE pipe is buoyant, concrete anchor collars are required to sink the pipeline. In this application, the concrete anchors are designed to be installed while the pipeline is floating and full of air. Upon the evacuation of the air from the pipe, the pipe sinks to the bottom at the desired location. This method requires trenching at both banks to sufficiently bury the pipe to protect it from anchor drag, freezing and tidal currents. By installing new "insertion" type valves in the existing pipeline, this alternative can be installed while the existing pipelines remain in operation, minimizing operational risk. This alternative results in significant excavation in environmentally sensitive areas and will require extensive restoration and monitoring efforts.

RECOMMENDED ALTERNATIVE

The recommended alternative is installing a new HDPE pipe along Little Bay within the existing pipeline corridor. The trenchless rehabilitation methods considered were all found to be infeasible due to the length and nature of the subaqueous crossing and the subsurface conditions. The installation along existing roadways is also infeasible given the extensive amount of new infrastructure required and associated impacts. Installing a new water main within the

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existing corridor allows for the continuous operation of existing the pipelines while the new main is installed, minimizing operational risk.

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Coastal Resources Worksheet



COASTAL RESOURCE WORKSHEET
 Water Division/Land Resources Management
 Wetlands Bureau



[Check the Status of your Application](#)

RSA/Rule: RSA 482-A/ Env-Wt 600

APPLICANT LAST NAME, FIRST NAME, M.I.: City of Portsmouth

Applicability: This worksheet may be used to present the information required for projects in coastal areas in addition to the information required for Lower-Scrutiny Approvals, Expedited Permits, and Standard Permits under Env-Wt 603.01.

Please refer to Env-Wt 605.03 for impacts requiring compensatory mitigation.

SECTION 1 - REQUIRED INFORMATION (Env-Wt 603.02; Env-Wt 603.06; Env-Wt 603.09)

The following information is required for projects in coastal areas.

Describe the purpose of the proposed project, including the overall goal of the project, the core project purpose including a concise description of the facilities and work that could impact jurisdictional areas, and the intended project outcome. Specifically identify all natural resource assets in the area proposed to be impacted and include maps created through a data screening in accordance with Env-Wt 603.03 (refer to Section 2) and Env-Wt 603.04 (refer to Section 3) as attachments.

The City of Portsmouth owns and maintains a 6 mile cross-country drinking water transmission main that brings treated drinking water from the Madbury Water Treatment Plant to the Newington Booster Pump Station. The pipeline supplies over 60% of the water drinking water serving the City's regional water system. The transmission main has a subaqueous crossing of Little Bay between Durham and Newington (Fox Point) that consists of two, parallel cast iron water mains, approximately 3,200 ft long. The mains have experience significant corrosion. Replacement of this crossing is critical to ensure the reliability of this critical drinking water transmission main. The proposed replacement involves installing a 24" HDPE water main on the ocean floor within the existing pipeline cooridor with connection to the existing main at either shore. The project will require temporary impacts to tidal wetlands and the tidal buffer zone and permanent impacts to subtidal wetlands.

Refer to the Project Narrative provided as Section 4 for description of the natural resources in the project area and description of the work that wil will impact jurisdictional areas.

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For standard permit projects, provide:

- A Coastal Functional Assessment (CFA) report (refer to Section 3); and
- A vulnerability assessment (refer to Section 4).

Explain all recommended methods and other considerations to protect the natural resource assets during and as a result of project construction in accordance with Env-Wt 603.04, Env-Wt 311.07, and Env-Wt 313.

Proposed methods to protect natural resources include the use of typical construction best management practices, turbidity curtains, water quality monitoring, time of year restrictions and salt marsh restoration.

See additional detail in the Project Narrative included as Section 4.

Provide a narrative showing how the project meets the standard conditions in Env-Wt 307 and the approval criteria in Env-Wt 313.01.

A description of how the project will meet standard conditions and approval criteria in provided in the Project Narrative included as Section 4.

Provide a project design narrative that includes the following:

- A discussion of how the proposed project:
 - Uses best management practices and standard conditions in Env-Wt 307;
 - Meets all avoidance and minimization requirements in Env-Wt 311.07 and Env-Wt 313.03;
 - Meets approval criteria in Env-Wt 313.01;
 - Meets evaluation criteria in Env-Wt 313.01(c);
 - Meets CFA requirements in Env-Wt 603.04; and
 - Considers sea-level rise and potential flooding evaluated pursuant to Env-Wt 603.05;
- A construction sequence, erosion/siltation control methods to be used, and a dewatering plan; and
- A discussion of how the completed project will be maintained and managed.

The completed project will be maintained by the City's Public Works Drinking Water Division.

- Provide design plans that meet the requirements of Env-Wt 603.07 (refer to Section 5);
- Provide water depth supporting information required by Env-Wt 603.08 (refer to Section 6); and
- For any major project that proposes to construct a structure in tidal waters/wetlands or to extend an existing structure seaward, provide a statement from the Pease Development Authority Division of Ports and Harbors (“DP&H”) chief harbormaster, or designee, for the subject location relative to the proposed structure’s impact on navigation. If the proposed structure might impede existing public passage along the subject shoreline on foot or by non-motorized watercraft, the applicant shall explain how the impediments have been minimized to the greatest extent practicable.

Not applicable

SECTION 2 - DATA SCREENING (Env-Wt 603.03, in addition to Env-Wt 306.05)

Please use the Wetland Permit Planning Tool, or any other database or source, to indicate the presence of:

- Existing salt marsh and salt marsh migration pathways;
- Eelgrass beds;
- Documented shellfish sites;
- Projected sea-level rise; and
- 100-year floodplain.

Conduct data screening as described to identify documented essential fish habitat, and tides and currents that may be impacted by the proposed project, by using the following links:

- [National Oceanic and Atmospheric Administration \(NOAA\) Tides & Currents](#); and
- [NOAA Essential Fish Habitat Mapper](#).
- Verify or correct the information collected from the data screenings by conducting an on-site assessment of the subject property in accordance with Env-Wt 406 and Env-Wt 603.04.

SECTION 3 - COASTAL FUNCTIONAL ASSESSMENT/ AVOIDANCE AND MINIMIZATION (Env-Wt 603.04; Env-Wt 605.01; Env-Wt 605.02; Env-Wt 605.03)

Projects in coastal areas shall:

- Not impair the navigation, recreation, or commerce of the general public; and
- Minimize alterations in prevailing currents.

An applicant for a permit for work in or adjacent to tidal waters/wetlands or the tidal buffer zone shall demonstrate that the following have been avoided or minimized as required by Env-Wt 313.04:

- Adverse impacts to beach or tidal flat sediment replenishment;
- Adverse impacts to the movement of sediments along a shore;
- Adverse impacts on a tidal wetland's ability to dissipate wave energy and storm surge; and
- Adverse impacts of project runoff on salinity levels in tidal environments.

For standard permit applications submitted for minor or major projects:

- Attach a CFA based on the data screening information and on-site evaluation required by Env-Wt 603.03. The CFA for tidal wetlands or tidal waters shall be:
 - Performed by a qualified coastal professional; and
 - Completed using one of the following methods:
 - a. The US Army Corps of Engineers (USACE) Highway Methodology Workbook, dated 1993, together with the USACE New England District *Highway Methodology Workbook Supplement*, dated 1999; or
 - b. An alternative scientifically-supported method with cited reference and the reasons for the alternative method substantiated.

For any project that would impact tidal wetlands or tidal waters or associated sand dunes, the applicant shall:

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- Use the results of the CFA to select the location of the proposed project having the least impact to tidal wetlands, tidal waters or associated sand dunes;
- Design the proposed project to have the least impact to tidal wetlands, tidal waters or associated sand dunes;
- Where impact to wetland and other coastal resource functions is unavoidable, limit the project impacts to the least valuable functions, avoiding and minimizing impact to the highest and most valuable functions; and
- Include on-site minimization measures and construction management practices to protect coastal resource areas.

Projects in coastal areas shall use results of this CFA to:

- Minimize adverse impacts to finfish, shellfish, crustacea, and wildlife;
- Minimize disturbances to groundwater and surface water flow;
- Avoid impacts that could adversely affect fish habitat, wildlife habitat, or both; and
- Avoid impacts that might cause erosion to shoreline properties.

SECTION 4 - VULNERABILITY ASSESSMENT (Env-Wt 603.05)

Refer to the New Hampshire Coastal Flood Risk Summary Part 1: Science and New Hampshire Coastal Flood Risk Summary Part II: Guidance for Using Scientific Projections or other best available science to:

- a. Determine the time period over which the project is designed to serve;

The typical expected service life of an HDPE water main is 50 years. Although the water distribution system from Madbury to Portsmouth is expected to be in service well beyond 50 years, the proposed project will be considered to have a 50-year useful life (2070).

- b. Identify the project's relative risk tolerance to flooding and potential damage or loss likely to result from flooding to buildings, infrastructure, salt marshes, sand dunes and other valuable coastal resource areas;

The relative flood risk tolerance for the proposed project is "high" since the pipe line will be buried and anchored to the ocean floor. The salt marsh in the project area also has a high risk tolerance since salt marsh can survive prolonged flooding by seawater.

- c. Reference the projected sea-level rise (SLR) scenario that most closely matches the end of the project design life and the project's tolerance to risk or loss;

The anticipated 2070 sea-level rise (SLR) at this location is approximately 2 feet, based on RCP 4.5, project timeframe and tolerance for flood risk, per Table 3A in the New Hampshire Coastal Flood Risk Summary Part II: Guidance.

- d. Identify areas of the proposed project site subject to flooding from SLR;

The Durham site could be subject to flooding from SLR. However, since there is several feet of elevation change between the HOTL and the upland areas, flooding from SLR is not expected to result in flooding of this area until well past the project timeframe. The Newington site is not subject to flooding because of the steep slopes from the HOTL to the upland areas.

- e. Identify areas currently located within the 100-year floodplain and subject to coastal flood risk;

The current FEMA flood map for the project shows that a portion of the Durham project area and all of the Newington project area is within the 100-year floodplain. However given the steep slopes on the Newington side, much of the Newington project area in uplands is above the 100-year flood plain.

- f. Describe how the project design will consider and address the selected SLR scenario within the project design life, including in the design plans;

The proposed project will not be impacted by SLR as the pipeline will be buried and anchored to the ocean floor.

- g. Where there are conflicts between the project's purpose and the vulnerability assessment results, schedule a pre-application meeting with the department to evaluate design alternatives, engineering approaches, and use of the best available science.

Pre-application meeting date held:

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SECTION 5 - DESIGN PLANS (Env-Wt 603.07, in addition to Env-Wt 311)

Submit design plans for the project in both plan and elevation views that clearly depict and identify all required elements:

- The plan view shall depict the following:
- The engineering scale used, which shall be no larger than one inch equals 50 feet;
 - The location of tidal datum lines depicted as a line with the associated elevation noted, based on North American Vertical Datum of 1988 (NAVD 88), derived from https://tidesandcurrents.noaa.gov/datum_options.html, as described in Section 6.
 - An imaginary extension of property boundary lines into the waterbody and a 20-foot setback from those property line extensions;
 - The location of all special aquatic sites at or within 100 feet of the subject property;
 - Existing bank contours;
 - The name and license number, if applicable, of each individual responsible for the plan, including:
 - a. The agent for tidal docking structures who determined elevations represented on plans; and
 - b. The qualified coastal professional who completed the CFA report and located the identified resources on the plan; and
 - The location and dimensions of all existing and proposed structures and landscape features on the property;
 - Tidal datum(s) with associated elevations noted, based on NAVD 88; and
 - Location of all special aquatic sites within 100-feet of the property.
- The elevation view shall depict the following:
- The nature and slope of the shoreline;
 - The location and dimensions of all proposed structures, including permanent piers, pilings, float stop structures, ramps, floats, and dolphins; and
 - Water depths depicted as a line with associated elevation at highest observable tide, mean high tide, and mean low tide, and the date and tide height when the depths were measured. Refer to Section 6 for more instructions regarding water depth supporting information.
- See specific design and plan requirements for certain types of coastal projects:
- Overwater structures (Env-Wt 606);
 - Tidal shoreline stabilization (Env-Wt 609);
 - Dredging activities (Env-Wt 607);
 - Protected tidal zone (Env-Wt 610);
 - Tidal beach maintenance (Env-Wt 608);
 - Sand Dunes (Env-Wt 611).

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SECTION 6 - WATER DEPTH SUPPORTING INFORMATION REQUIRED (Env-Wt 603.08)

Using current predicted NOAA tidal datum for the location, and tying field measurements to NAVD 88, field observations of at least 3 tide events, including at least one minus tide event, shall be located to document the range of the tide in the proposed location showing the following levels:

- Mean lower low water;
- Mean low water;
- Mean high water;
- Mean tide level;
- Mean higher high water;
- Highest observable tide line; and
- Predicted sea-level rise as identified in the vulnerability assessment in Env-Wt 603.05.

The following data shall be presented in the application project narrative to support how water depths were determined:

- The date, time of day, and weather conditions when water depths were recorded; and
- The name and license number of the licensed land surveyor who conducted the field measurements.
- For tidal stream crossing projects, provide water depth information to show how the tier 4 stream crossing is designed to meet Env-Wt 904.07(c) and (d), and for repair, rehabilitation or replacement of tier 4 stream crossings, demonstrate how the requirements of Env-Wt 904.09 are met.

SECTION 7 - GENERAL CRITERIA FOR TIDAL BEACHES, TIDAL SHORELINE, AND SAND DUNES (Env-Wt 604.01)

Any person proposing a project in or on a tidal beach, tidal shoreline, or sand dune, or any combination thereof, shall evaluate the proposed project based on:

- The standard conditions in Env-Wt 307;
- The avoidance and minimization requirements in Env-Wt 311.07 and Env-Wt 313.03;
- The approval criteria in Env-Wt 313.01;
- The evaluation criteria in Env-Wt 313.05;
- The project specific criteria in Env-Wt 600;
- The CFA required by Env-Wt 603.04; and
- The vulnerability assessment required by Env-Wt 603.05.

New permanent impacts to sand dunes that provide coastal storm surge protection for protected species or habitat shall not be allowed except:

- To protect public safety; and
- Only if constructed by a state agency, coastal resiliency project, or for a federal homeland security project.

Projects in or on a tidal beach, tidal shoreline, or sand dune shall support integrated shoreline management that:

- Optimizes the natural function of the shoreline, including protection or restoration of habitat, water quality, and self-sustaining stability to flooding and storm surge; and
- Protects upland infrastructure from coastal hazards with a preference for living shorelines over hardened shoreline practices.

SECTION 8 - GENERAL CRITERIA FOR TIDAL BUFFER ZONES (Env-Wt 604.02)

The 100-foot statutory limit on the extent of the tidal buffer zone shall be measured horizontally. Any person proposing a project in or on an undeveloped tidal buffer zone shall evaluate the proposed project based on:

- The standard conditions in Env-Wt 307;
- The avoidance and minimization requirements in Env-Wt 311.07 and Env-Wt 313.03;
- The approval criteria in Env-Wt 313.01;
- The evaluation criteria in Env-Wt 313.05;
- The project specific criteria in Env-Wt 600;
- The CFA required by Env-Wt 603.04; and
- The vulnerability assessment required by Env-Wt 603.05.

Projects in or on a tidal buffer zone shall preserve the self-sustaining ability of the buffer area to:

- Provide habitat values;
- Protect tidal environments from potential sources of pollution;
- Provide stability of the coastal shoreline; and
- Maintain existing buffers intact where the lot has disturbed area defined under RSA 483-B:4, IV.

SECTION 9 - GENERAL CRITERIA FOR TIDAL WATERS/WETLANDS (Env-Wt 604.03)

Except as allowed under Env-Wt 606, permanent new impacts to tidal wetlands shall be allowed only to protect public safety or homeland security. Evaluation of impacts to tidal wetlands and tidal waters shall be based on:

- The standard conditions in Env-Wt 307;
- The avoidance and minimization requirements in Env-Wt 311.07 and Env-Wt 313.03;
- The approval criteria in Env-Wt 313.01;
- The evaluation criteria in Env-Wt 313.05;
- The project specific criteria in Env-Wt 600;
- The CFA required by Env-Wt 603.04; and
- The vulnerability assessment required by Env-Wt 603.05.

Projects in tidal surface waters or tidal wetlands shall:

- Optimize the natural function of the tidal wetland, including protection or restoration of habitat, water quality, and self-sustaining stability to storm surge;
- Be designed with a preference for living shorelines over hardened stabilization practices; and
- Be limited to public infrastructure or restoration projects that are in the interest of the general public, including a road, a bridge, energy infrastructure, or a project that addresses predicted sea-level rise and coastal flood risk.

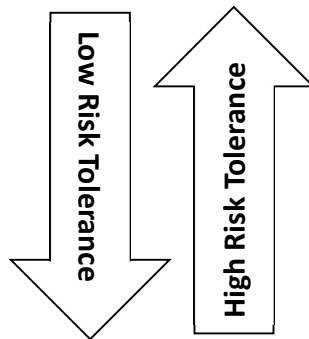
SECTION 10 – GUIDANCE

Your application must follow the New Hampshire Coastal Risk and Hazards Commission’s Guiding Principles or other best available science. Below are some of these guidance principles:

- Incorporate science-based coastal flood risk projections into planning;
- Apply risk tolerance* to assessment, planning, design and construction;
- Protect natural resources and public access;
- Create a bold vision, start immediately, and respond incrementally and opportunistically as projected coastal flood risks increase over time; and
- Consider the full suite of actions including effectiveness and consequences of actions.

*Risk tolerance is a project’s willingness to accept a higher or lower probability of flooding impacts. The diagram below gives examples of project with lower and higher risk tolerance:

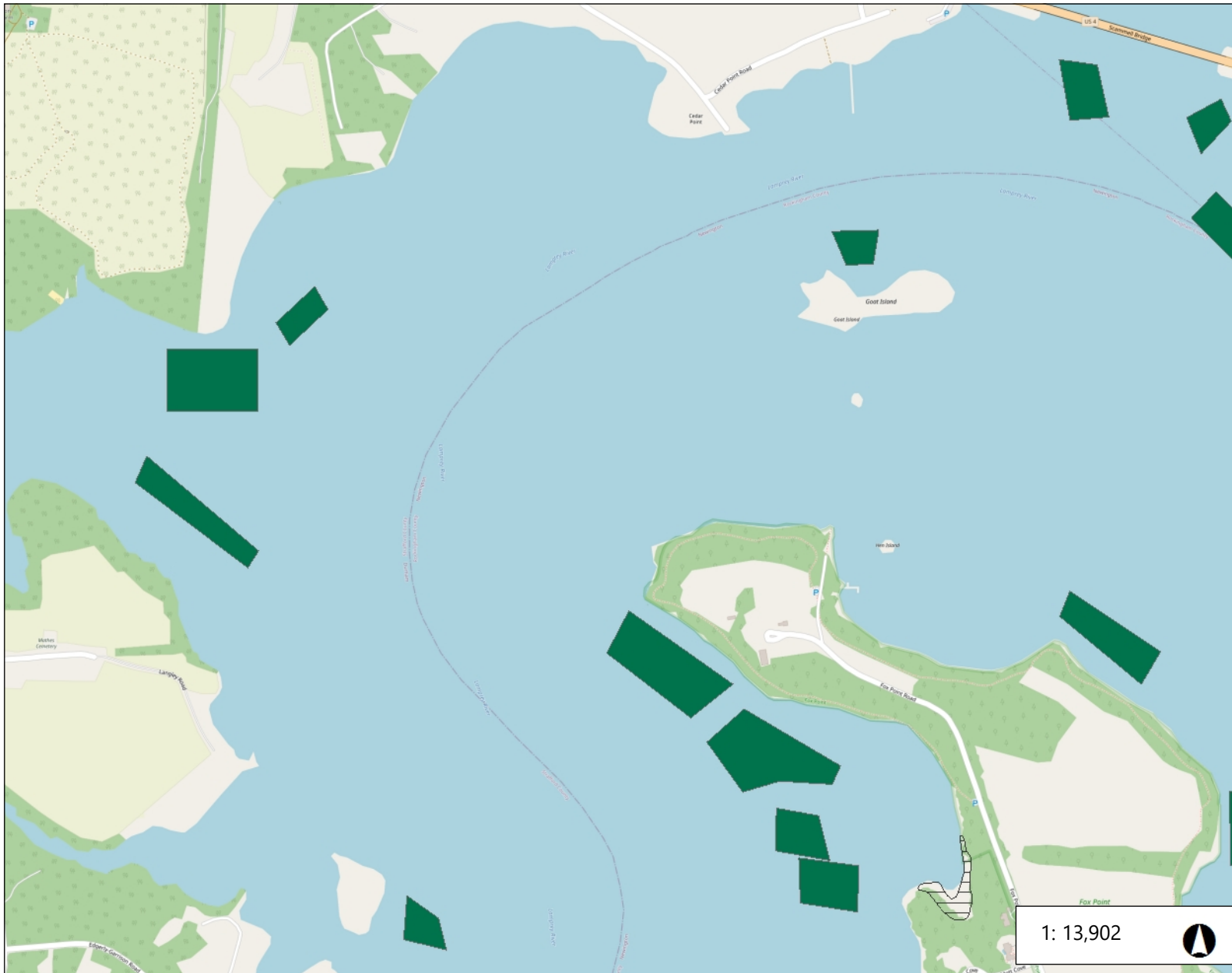
Critical Infrastructures, historic sites, essential ecosystems, and high value assets typically have lower risk tolerance, and thus should be planned, designed, and constructed using higher coastal flood risk projections.



Sheds, pathways, and small docks typically have higher risk tolerance and thus may be planned, designed, and constructed using less protective coastal flood risk projections.



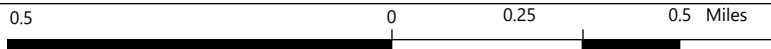
Wetland Permit Planning Tool



Legend

- Aquaculture Sites - 2015
- Prime Wetlands with 100 ft Buffer
- Prime Wetlands
- Peatlands
- Designated Rivers**
 - Subject to SWQPA
 - Not Subject to SWQPA
- Sand Dunes**
 - backdune
 - foredune
 - interdune
 - other
- Eelgrass 2017

1: 13,902



WGS_1984_Web_Mercator_Auxiliary_Sphere
© Latitude Geographics Group Ltd.

This map is a user generated static output from the web-based NHDES Wetlands Permit Scanning Tool and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. No map should be printed with scale 1 to less than 7,500.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Map Notes

Attachment A – Minor and Major Projects



STANDARD DREDGE AND FILL
WETLANDS PERMIT APPLICATION
ATTACHMENT A: MINOR AND MAJOR PROJECTS



Water Division/Land Resources Management
Wetlands Bureau

[Check the Status of your Application](#)

RSA/ Rule: RSA 482-A/ Env-Wt 311.10; Env-Wt 313.01(a)(1); Env-Wt 313.03

APPLICANT'S NAME: City of Portsmouth

TOWN NAME: Durham/Newington

Attachment A is required for *all minor and major projects*, and must be completed *in addition* to the [Avoidance and Minimization Narrative](#) or [Checklist](#) that is required by Env-Wt 307.11.

For projects involving construction or modification of non-tidal shoreline structures over areas of surface waters having an absence of wetland vegetation, only Sections I.X through I.XV are required to be completed.

PART I: AVOIDANCE AND MINIMIZATION

In accordance with Env-Wt 313.03(a), the Department shall not approve any alteration of any jurisdictional area unless the applicant demonstrates that the potential impacts to jurisdictional areas have been avoided to the maximum extent practicable and that any unavoidable impacts have been minimized, as described in the [Wetlands Best Management Practice Techniques For Avoidance and Minimization](#).

SECTION I.I - ALTERNATIVES (Env-Wt 313.03(b)(1))

Describe how there is no practicable alternative that would have a less adverse impact on the area and environments under the Department's jurisdiction.

THE PROPOSED PROJECT HAS BEEN DESIGNED TO MINIMIZE IMPACTS TO JURISDICTIONAL AREAS TO THE MAXIMUM EXTENT PRACTICAL. REFER TO ALTERNATIVES ANALYSIS PROVIDED IN SECTION 17 FOR ADDITIONAL INFORMATION ON THE PROPOSED PIPELINE INSTALLATION METHOD.

SECTION I.II - MARSHES (Env-Wt 313.03(b)(2))

Describe how the project avoids and minimizes impacts to tidal marshes and non-tidal marshes where documented to provide sources of nutrients for finfish, crustacean, shellfish, and wildlife of significant value.

Proposed impacts to the salt marsh present on the Durham side have been minimized to the maximum extent possible. Unavoidable salt marsh impacts will be restored in accordance with the Salt Marsh Restoration Plan included in Section 4.

SECTION I.III - HYDROLOGIC CONNECTION (Env-Wt 313.03(b)(3))

Describe how the project maintains hydrologic connections between adjacent wetland or stream systems.

Hydrologic connections between adjacent wetland or stream systems do not exist within the project area.

SECTION I.IV - JURISDICTIONAL IMPACTS (Env-Wt 313.03(b)(4))

Describe how the project avoids and minimizes impacts to wetlands and other areas of jurisdiction under RSA 482-A, especially those in which there are exemplary natural communities, vernal pools, protected species and habitat, documented fisheries, and habitat and reproduction areas for species of concern, or any combination thereof.

A New Hampshire Natural Heritage Bureau Datacheck report indicates the presence of two Natural Communities: sparsely vegetated intertidal system and subtidal system and three threatened or endangered vertebrate species: Atlantic Sturgeon (*Acipenser oxyrinchus*), Common Tern (*Sterna hirundo*) and Shortnose Sturgeon (*Acipenser brevirostrum*) have been observed near the project area. There are no vernal pools with the proposed project area.

Impacts to the intertidal and subtidal system will be minimized through the use of best management practices during construction. Impacts to Atlantic Sturgeon and Shortnose Sturgeon will be minimized by performing dredging between November 15 and March 15. Common Tern habitat does not exist within the proposed project area.

SECTION I.V - PUBLIC COMMERCE, NAVIGATION, OR RECREATION (Env-Wt 313.03(b)(5))

Describe how the project avoids and minimizes impacts that eliminate, depreciate or obstruct public commerce, navigation, or recreation.

The proposed project will not permanently impact public commerce, navigation, or recreation. Temporary disruptions to navigation within Little Bay will occur when the pipeline is floated out and sunk to its final location. Applicable safety and best management practices will be followed during the pipe line installation. Coordination with appropriate authorizes and advanced notification of navigation disruptions will further minimize the extent of anticipated temporary disruptions.

SECTION I.VI - FLOODPLAIN WETLANDS (Env-Wt 313.03(b)(6))

Describe how the project avoids and minimizes impacts to floodplain wetlands that provide flood storage.

The proposed project does not involve permanent impacts to floodplain wetlands.

SECTION I.VII - RIVERINE FORESTED WETLAND SYSTEMS AND SCRUB-SHRUB – MARSH COMPLEXES (Env-Wt 313.03(b)(7))

Describe how the project avoids and minimizes impacts to natural riverine forested wetland systems and scrub-shrub – marsh complexes of high ecological integrity.

There are no natural riverine forested wetland systems or scrub-shrub marsh complexes affected by the proposed project.

SECTION I.VIII - DRINKING WATER SUPPLY AND GROUNDWATER AQUIFER LEVELS (Env-Wt 313.03(b)(8))

Describe how the project avoids and minimizes impacts to wetlands that would be detrimental to adjacent drinking water supply and groundwater aquifer levels.

The project is located immediately upstream and within a tidal system, thus the project will not impact drinking water supplies or groundwater aquifers within or adjacent to the project area.

SECTION I.IX - STREAM CHANNELS (Env-Wt 313.03(b)(9))

Describe how the project avoids and minimizes adverse impacts to stream channels and the ability of such channels to handle runoff of waters.

There are no stream channels located within the project area.

SECTION I.X - SHORELINE STRUCTURES - CONSTRUCTION SURFACE AREA (Env-Wt 313.03(c)(1))

Describe how the project has been designed to use the minimum construction surface area over surface waters necessary to meet the stated purpose of the structures.

The proposed project does not involve shoreline structures over surface waters.

SECTION I.XI - SHORELINE STRUCTURES - LEAST INTRUSIVE UPON PUBLIC TRUST (Env-Wt 313.03(c)(2))

Describe how the type of construction proposed is the least intrusive upon the public trust that will ensure safe docking on the frontage.

The proposed project does not involve shoreline structures over surface waters

SECTION I.XII - SHORELINE STRUCTURES – ABUTTING PROPERTIES (Env-Wt 313.03(c)(3))

Describe how the structures have been designed to avoid and minimize impacts on ability of abutting owners to use and enjoy their properties.

The proposed project does not involve shoreline structures over surface waters

SECTION I.XIII - SHORELINE STRUCTURES – COMMERCE AND RECREATION (Env-Wt 313.03(c)(4))

Describe how the structures have been designed to avoid and minimize impacts to the public's right to navigation, passage, and use of the resource for commerce and recreation.

The proposed project does not involve shoreline structures over surface waters

SECTION I.XIV - SHORELINE STRUCTURES – WATER QUALITY, AQUATIC VEGETATION, WILDLIFE AND FINFISH HABITAT (Env-Wt 313.03(c)(5))

Describe how the structures have been designed, located, and configured to avoid impacts to water quality, aquatic vegetation, and wildlife and finfish habitat.

The proposed project does not involve shoreline structures over surface waters

SECTION I.XV - SHORELINE STRUCTURES – VEGETATION REMOVAL, ACCESS POINTS, AND SHORELINE STABILITY (Env-Wt 313.03(c)(6))

Describe how the structures have been designed to avoid and minimize the removal of vegetation, the number of access points through wetlands or over the bank, and activities that may have an adverse effect on shoreline stability.

The proposed project does not involve shoreline structures over surface waters

PART II: FUNCTIONAL ASSESSMENT	
REQUIREMENTS	Ensure that project meets the requirements of Env-Wt 311.10 regarding functional assessment (Env-Wt 311.04(j); Env-Wt 311.10).
FUNCTIONAL ASSESSMENT METHOD USED:	A Coastal Functional Assessment has been prepared for the project area by Marc Jacobs, CWS. The report provided an assessment of the existing wetland functions and values according to the United States Army Corps of Engineers - New England District, Highway Methodology Workbook Supplement - September 1999 Edition (updated in 2015).
NAME OF CERTIFIED WETLAND SCIENTIST (FOR NON-TIDAL PROJECTS) OR QUALIFIED COASTAL PROFESSIONAL (FOR TIDAL PROJECTS) WHO COMPLETED THE ASSESSMENT:	MARC JACOBS
DATE OF ASSESSMENT:	JULY 21, 2020
Check this box to confirm that the application includes a NARRATIVE ON FUNCTIONAL ASSESSMENT:	<input checked="" type="checkbox"/>
For minor or major projects requiring a standard permit without mitigation, the applicant shall submit a wetland evaluation report that includes completed checklists and information demonstrating the RELATIVE FUNCTIONS AND VALUES OF EACH WETLAND EVALUATED. Check this box to confirm that the application includes this information, if applicable:	<input type="checkbox"/>
<p>Note: The Wetlands Functional Assessment worksheet can be used to compile the information needed to meet functional assessment requirements.</p>	

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Pre-Application Notes



TO:	Meeting Attendees	DATE:	7/8/2020
FROM:	Britt Eckstrom	PROJECT NO.:	14202A
SUBJECT:	Portsmouth Little Bay Water Crossing Pre-Application Meeting Notes		

A pre-application meeting was held by video conference on June 16, 2020. The attached slides were presented. The following notes are a summary of the presentation and subsequent project discussion.

ATTENDEES

NHDES: Lori Sommer	NHB: Amy Lamb
Stefanie Giallongo	EPA: Beth Alafat
Dave Price	City of Portsmouth: Brian Goetz
Ridge Mauck	Al Pratt
ACOE: Lindsey Lefebvre	Zach Cronin
	Wright-Pierce Rick Davee
	Darrin Lary
	Britt Eckstrom

Project Introduction

Overview of City of Portsmouth water system:

- City of Portsmouth provides water to Portsmouth, Newington, Greenland, Newcastle and portions of Rye
- Approximately 60% of the City’s water supply is from the Madbury water treatment plant (WTP)
- A 24” precast concrete cross country pipe extends from the WTP toward Wagon Hill (Durham). Where it crosses Little Bay toward Fox Point (Newington), the pipe transitions to two 20” cast iron pipes that are approximately 3,200 feet long. The cast iron mains were installed in the 1950s.

Little Bay Crossing:

- The City conducted a dive inspection in 2016 to evaluate the condition of the cast iron pipes. The divers found heavy pitting of the pipe in the exposed areas. Section loss of 50% is estimated. Isolation valves on both shore inoperable. Replacement or rehabilitation of the cast iron pipes at the crossing is critical for the City to continue to provide reliable distribution of drinking water to its customers.

- A bathymetric and multi-sensor array survey was completed in Fall 2018 to determine the location of the pipes and soil conditions beneath the channel. The survey was able to pick up the location of the existing cast irons mains and also provide an estimated depth to bedrock throughout the project area.
- Geotechnical exploration has been completed. Land borings completed March 2020. Barge borings were completed in May 2020. Borings show varying depth of clay/silt and bedrock.
- Sediment samples were collected at 2 boring locations. Sediment was analyzed for PAH, pesticides, PCBs, TPH, metals, nitrogen, TOC, PFCs and Dioxins. Analysis results for all analytes were below NH S-1 standards. Only Chromium and Nickel results were slightly above NHDES background standards.

Proposed Project

- Installation of a new 24” HDPE pipeline between the existing cast iron water mains. HPDE pipe is industry standard for ocean crossing pipes.
- Connection of the new pipe to the existing water main on either shore allowing abandonment of the non-operating valves and deep valve pits.
- Pipe shallow buried on either shore and beneath the intertidal area. New water main will sit on ocean floor where water depth is great enough to avoid any potential impacts from boats, anchored by concrete.
- Proposed temporary impacts at both shore for excavation for pipe installation and for construction access.
- Proposed permanent impacts will be for pipe and pipe anchors resting on ocean floor.
- Proposed impacts areas based on the preliminary design were calculated. These areas will be recalculated as the design is finalized. The following summarize the anticipated impacts:

Activity	Temporary			Permanent
	Tidal Waters (sq ft)	Tidal March (sq ft)	Tidal Buffer Zone (sq ft)	Tidal Waters (sq ft)
Trench excavation and construction access – Durham	22,000	3,600	10,300	
Trench excavation and construction access – Newington	16,300		8,800	
Submerged pipe with anchors				5,400
Total	38,300	3,600	19,100	5,400

- NHB Datacheck found several occurrence of rare communities and threatened or endangers species known to have occurred near the project area:
 - Natural Communities:
 - Sparsely vegetated intertidal system
 - Subtidal system
 - Species
 - Atlantic sturgeon
 - Shortnose sturgeon
 - Common tern
- There are several aquaculture farming licenses located near the project area. According to mapping available on NH GRANIT, once bed is located within the existing water main corridor.
- Proposed project construction is anticipated to include temporary disturbance on each shoreline wetlands to excavate and install new pipeline, corridor in same location as existing pipes, surface restoration to same condition as existing, sedimentation curtains to minimize excavation impacts, construction timing to minimize natural resource impacts, buoys and lights to minimize navigation hazards, good staging areas for pipe fusion on Newington side and possibly on Durham side
- Permitting approach anticipated to include:
 - NHDES Standard Dredge and Fill Permit impacts within Little Bay and which in the 100 ft tidal buffer zone. Major application will require approval from Governor & Council
 - NHDES Shoreland Permit by Notification for impacts within 250 ft and 100 ft of HOTL.
- Anticipated Schedule:
 - Preliminary Replacement Pipeline Design – Spring/Summer 2020
 - Final Design & Permitting for Replacement Pipeline – 2020/2021
 - Bidding – Summer 2021
 - Construction – Fall 2021

Question/Comments from attendees

1. Lori Sommer – How long is construction estimated to take? *Response: Construction estimated to take two to four months. Will there be any impacts related to construction access? Response: Construction access is still being considered. It's likely that the Town of Newington property will be the staging area. There is a large open area that would make an excellent staging area. Impacts to wetlands or other natural resources are not anticipated with the use of that area.*
2. Beth Arafat – Do you anticipate any eel grass impacts during the project? *Response: Recent eel grass bed mapping shows the project site is north of the eel grass beds of Great Bay. Marc Jacobs did not observe any eel grass while completing the resource delineation. We don't anticipate any impacts to eel grass during the project. Essential Fish Habitat*

consultation will be needed. Lindsey Lefebvre; Confirmed EFH consultation will be need and well as Endangered Species consultation.

3. Lori Sommer – Has mitigation for the permanent impacts been considered? *Response: Options for mitigation are still being considered.*
4. Lindsey Lefebvre – An Individual Permit (IP) from Army Corps will be required for the project per General Permit 6 Utility Line Activities. IP permit has a 120 day review window and 30 days for public comment. The IP permit application will require the submission on an Alternatives Analysis as well as an individual 401 Water Quality Certificate from NHDES. Stefanie Giallongo said Gregg Comstock is the NHDES contact for water quality certificate.
5. Lori Sommer – Subtidal impacts should be broken out by Town for the purposed of in lieu fee calculation. Suggest time for Governor & Executive Council approval be built into the schedule. Stefanie Giallongo suggested planning on 6 weeks for G&C approval. Lori Sommer requested any mitigation notes be sent to her.
6. Dave Price – What is the proposed turbidity monitoring plan? *Response: Visual turbidity monitoring is typical for these types of pipe projects.* Dave: SRP had significant turbidity monitoring program. This may be a requirement of the water quality certificate. Rick Davee: Was the SRP jet plowing done without out a turbidity curtain. Dave: Yes.
7. Dave Price – What will be the depth of pipe burial? *Response: 5 feet. Need to provide sufficient cover to avoid any impact from boats or anchors.* Dave Price: Will the turbidity curtain extend to the ocean floor? *Response: Yes. The design of the turbidity curtain system is in progress. It's anticipated there will be a dual curtain system.* Dave: Will there be a salt marsh restoration plan? *Response: Yes. The restoration plan is being developed. It's anticipated it will be similar to the SRP restoration plan.*
8. Amy Lamb – How deep will the excavation be at the shores? *Response: Excavation will be 20 to 25 feet in order to connect to the existing pipe. It's anticipated the turbidity curtain system will consist of an interior pervious curtain and exterior impervious curtain.* Amy – How is excavated material dealt? *Response: It's cast to the side of the trench (within the turbidity curtain system).* Amy – Has any coordination been done with Marine Fisheries? *Response: None yet but is anticipated.*
9. Lindsey Lefebvre – Has any sediment sampling been completed? *Response: Yes, sediment samples were taken at each shore when the geotechnical borings were completed.* Dave Price: Has any coordination with NHDES Waste Management taken place regarding the sediment sampling? *Response: No. A sediment analysis protocol similar to what was done for SRP was completed.* Dave suggested follow up consultation with NHDES WM. Once material is disturbed it is considered mobilized.
10. Stefanie Giallongo – Suggested coordination with NH Ports and Harbors. Tracy Shattuck is the Harbor Master.
11. Dave Price – Is coordination with the Coast Guard needed? Lindsey Lefebvre responded that Army Corps will coordinate with Coast Guard during the IP review. *Response: It's anticipated that access through the channel will only need to be restricted for a short period when the pipe is floated out (1 to 2 days).*



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