

STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION

FROM: *AMO* Andrew O'Sullivan
Wetlands Program Manager

DATE: March 8, 2019

AT (OFFICE): Department of
Transportation

SUBJECT **Dredge & Fill Application Update**
Salem, 13933A
NHDES # 2019-00055

Bureau of
Environment

TO Gino Infascelli, Public Works Permitting Officer
New Hampshire Wetlands Bureau
29 Hazen Drive, P.O. Box 95
Concord, NH 03302-0095

Forwarded herewith are updated application documents prepared by VHB on behalf of NHDOT for the subject project. The project was previously submitted as a minimum impact project and has since been corrected to a major impact project per Env-Wt 303.02(l). The materials provided within address the major impact rules. Appendices A through N submitted with the initial application submission have not changed. Please reference the original submission for those documents.

Mitigation was previously not proposed. With this update the Department now proposes to pay a one-time in lieu fee payment of \$1,764.54 for the 350 SF of forested wetlands impacts in the town of Salem, NH. Refer to section 4.2.1 of the supplemental narrative and Appendix O provided with this package.

As part of the conditions of the 2019-00055 permit the NHDOT commits to remedial actions at the Haigh Avenue mitigation site constructed under the overall Salem-Manchester 10418C Project (NHDES #2002-02033 and #2014-03446). Please find the enclosed "Policy Brook Restoration Action Plan" that NHDOT will carry out to address the deficiencies identified during the August 1, 2018 mitigation site visit which include continued eradication of knotweed, replanting vegetation that did not successfully establish on site, as well as additional remedial efforts due to the construction of the soundwall along I-93 abutting the mitigation site. Attached is a planting plan addressing the replacement of trees removed for the soundwall.

The lead people to contact for this project are Wendy Johnson (271-3909 or wendy.johnson@dot.nh.gov) or Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment (271-3226 or andrew.o'sullivan@dot.nh.gov).

If and when the subject project's application meets with the approval of the Bureau, please send the permit directly to Andrew O'Sullivan, Wetlands Program Manager, Bureau of Environment.

AMO:sel
Enclosures
cc:
BOE Original
Town of Salem (4 copies via certified mail)
David Trubey, NH Division of Historic Resources (Cultural Review Within)
Bureau of Construction

NHDES WETLANDS PERMIT APPLICATION
NHDOT PROJECT #13933A; FHWA #A004(435)

I-93, 4th Lane Expansion from Stateline Through Exit 1

Salem, New Hampshire

PREPARED FOR

NH Department of Transportation
PO Box 483, 7 Hazen Drive
Concord, NH 03302

PREPARED BY

VHB
2 Bedford Farms Drive, Suite 200
Bedford, NH 03110
603.391.3900

December 2018
Revised February 2019

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WETLANDS PERMIT APPLICATION

Water Division/ Wetlands Bureau Land Resources Management



Check the status of your application: www.des.nh.gov/onestop

RSA/Rule: [RSA 482-A/ Env-Wt 100-900](#)

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

1. REVIEW TIME: Indicate your Review Time below. To determine review time, refer to [Guidance Document A](#) for instructions.
 Standard Review (Minimum, Minor or Major Impact) Expedited Review (Minimum Impact only)

2. MITIGATION REQUIREMENT:
 If mitigation is required a Mitigation-Pre Application meeting must occur prior to submitting this Wetlands Permit Application. To determine if Mitigation is Required, please refer to the [Determine if Mitigation is Required Frequently Asked Question](#).
 Mitigation Pre-Application Meeting Date: Month: 11 Day: 21 Year: 2018
 N/A - Mitigation is not required

3. PROJECT LOCATION:
 Separate wetland permit applications must be submitted for each municipality that wetland impacts occur within.
 ADDRESS: **Existing Roadway Right-of-Way** TOWN/CITY: **Salem**
 TAX MAP: **N/A** BLOCK: **N/A** LOT: **N/A** UNIT: **N/A**
 USGS TOPO MAP WATERBODY NAME: **Harris Brook Tributary** NA STREAM WATERSHED SIZE: **334 acres** NA
 LOCATION COORDINATES (If known): **42° 45' 5.7" N; 71° 13' 5.9" W** Latitude/Longitude UTM State Plane


4. PROJECT DESCRIPTION:
 Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. DO NOT reply "See Attached" in the space provided below.
 The I-93, 4th Lane Expansion from Stateline Through Exit 1 project proposes to dredge and fill approximately 350 SF within wetlands from the proposed widening of a 1.7-mile long segment of Interstate 93 (I-93) in Salem from the Massachusetts state line northward to Exit 1 (referred to as "Contract A"). This project is part of the greater Salem-Manchester 10418C Project, involving widening Interstate 93 (I-93) from three to four lanes, as previously permitted by NHDES (NHDES #2002-02033 and #2014-03446). This current permit application is being submitted since the previous permit for the project has expired, and to reflect any design changes within the Contract A portion of the project since initial permitting.
 Refer to the attached Supplemental Narrative, Figures, and Appendices for more information.

5. SHORELINE FRONTAGE:
 NA This does not have shoreline frontage. SHORELINE FRONTAGE:
 Shoreline frontage is calculated by determining the average of the distances of the actual natural navigable shoreline frontage and a straight line drawn between the property lines, both of which are measured at the normal high water line.

6. RELATED NHDES LAND RESOURCES MANAGEMENT PERMIT APPLICATIONS ASSOCIATED WITH THIS PROJECT:
 Please indicate if any of the following permit applications are required and, if required, the status of the application.
 To determine if other Land Resources Management Permits are required, refer to the [Land Resources Management Web Page](#).

Permit Type	Permit Required	File Number	Permit Application Status
Alteration of Terrain Permit Per RSA 485-A:17	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Individual Sewerage Disposal per RSA 485-A:2	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Subdivision Approval Per RSA 485-A	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	_____	<input type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED
Shoreland Permit Per RSA 483-B	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	2019-0056 2019-	<input checked="" type="checkbox"/> APPROVED <input type="checkbox"/> PENDING <input type="checkbox"/> DENIED

7. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:
 See the Instructions & Required Attachments document for instructions to complete a & b below.
 a. Natural Heritage Bureau File ID: NHB 18 - 2079
 b. [Designated River](#) the project is in ¼ miles of: _____; and
 date a copy of the application was sent to the [Local River Management Advisory Committee](#): Month: ___ Day: ___ Year: ___
 N/A

8. APPLICANT INFORMATION (Desired permit holder)			
LAST NAME, FIRST NAME, M.I.: Johnson, Wendy			
TRUST / COMPANY NAME: NH Department of Transportation		MAILING ADDRESS: PO Box 483	
TOWN/CITY: Concord		STATE: NH	ZIP CODE: 03302-0483
EMAIL or FAX: wendy.johnson@dot.nh.gov		PHONE: 603-271-3909	
ELECTRONIC COMMUNICATION: By initialing here: _____, I hereby authorize NHDES to communicate all matters relative to this application electronically.			
9. PROPERTY OWNER INFORMATION (If different than applicant)			
LAST NAME, FIRST NAME, M.I.:			
TRUST / COMPANY NAME:		MAILING ADDRESS:	
TOWN/CITY:		STATE:	ZIP CODE:
EMAIL or FAX:		PHONE:	
ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically.			
10. AUTHORIZED AGENT INFORMATION			
LAST NAME, FIRST NAME, M.I.: Walker, Peter		COMPANY NAME: VHB	
MAILING ADDRESS: 2 Bedford Farms Drive, Suite 200			
TOWN/CITY: Bedford		STATE: NH	ZIP CODE: 03110-6532
EMAIL or FAX: pwalker@vhb.com		PHONE: 603-391-3900	
ELECTRONIC COMMUNICATION: By initialing here: <u><i>PJW</i></u> , I hereby authorize NHDES to communicate all matters relative to this application electronically.			
11. PROPERTY OWNER SIGNATURE:			
See the Instructions & Required Attachments document for clarification of the below statements			
By signing the application, I am certifying that:			
<ol style="list-style-type: none"> 1. I authorize the applicant and/or agent indicated on this form to act in my behalf in the processing of this application, and to furnish upon request, supplemental information in support of this permit application. 2. I have reviewed and submitted information & attachments outlined in the Instructions and Required Attachment document. 3. All abutters have been identified in accordance with RSA 482-A:3, I and Env-Wt 100-900. 4. I have read and provided the required information outlined in Env-Wt 302.04 for the applicable project type. 5. I have read and understand Env-Wt 302.03 and have chosen the least impacting alternative. 6. Any structure that I am proposing to repair/replace was either previously permitted by the Wetlands Bureau or would be considered grandfathered per Env-Wt 101.47. 7. I have submitted a Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) to the NH State Historic Preservation Officer (SHPO) at the NH Division of Historical Resources to identify the presence of historical/ archeological resources while coordinating with the lead federal agency for NHPA 106 compliance. 8. I authorize NHDES and the municipal conservation commission to inspect the site of the proposed project. 9. I have reviewed the information being submitted and that to the best of my knowledge the information is true and accurate. 10. I understand that the willful submission of falsified or misrepresented information to the New Hampshire Department of Environmental Services is a criminal act, which may result in legal action. 11. I am aware that the work I am proposing may require additional state, local or federal permits which I am responsible for obtaining. 12. The mailing addresses I have provided are up to date and appropriate for receipt of NHDES correspondence. NHDES will not forward returned mail. 			
 Property Owner Signature		Print name legibly	Date

MUNICIPAL SIGNATURES

12. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.

	Print name legibly	Date
--	--------------------	------

DIRECTIONS FOR CONSERVATION COMMISSION

1. Expedited review ONLY requires that the conservation commission's signature is obtained in the space above.
2. Expedited review requires the Conservation Commission signature be obtained **prior** to the submittal of the original application to the Town/City Clerk for signature.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will be reviewed in the standard review time frame.

13. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 2014), 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	Print name legibly	Town/City	Date

DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3,I

1. For applications where "Expedited Review" is checked on page 1, if the Conservation Commission signature is not present, NHDES will accept the permit application, but it will NOT receive the expedited review time.
2. IMMEDIATELY sign the original application form and four copies in the signature space provided above;
3. 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.
4. 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; and
5. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

1. Submit the single, 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.

14. IMPACT AREA:

For each jurisdictional area that will be/has been impacted, provide square feet and, if applicable, linear feet of impact

Permanent: impacts that will remain after the project is complete.

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

After-the-fact (ATF): work completed prior to receipt of this application by DES. Check box to indicate ATF.

JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.	TEMPORARY Sq. Ft. / Lin. Ft.
Forested wetland	350 <input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Scrub-shrub wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Emergent wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Wet meadow	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Intermittent stream	/ <input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Perennial Stream / River	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Lake / Pond	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Bank - Intermittent stream	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Bank - Perennial stream / River	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Bank - Lake / Pond	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Tidal water	/ <input type="checkbox"/> ATF	/ <input type="checkbox"/> ATF
Salt marsh	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Sand dune	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Prime wetland	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Prime wetland buffer	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Undeveloped Tidal Buffer Zone (TBZ)	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Previously-developed upland in TBZ	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Docking - Lake / Pond	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Docking - River	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Docking - Tidal Water	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
Vernal Pool	<input type="checkbox"/> ATF	<input type="checkbox"/> ATF
TOTAL	350 /	/

15. APPLICATION FEE: See the Instructions & Required Attachments document for further instruction

Minimum Impact Fee: Flat fee of \$ 200

Minor or Major Impact Fee: Calculate using the below table below

Permanent and Temporary (non-docking) 350 sq. ft. X \$0.20 = \$ 70

Temporary (seasonal) docking structure: _____ sq. ft. X \$1.00 = \$

Permanent docking structure: _____ sq. ft. X \$2.00 = \$

Projects proposing shoreline structures (including docks) add \$200 = \$

Total = \$ 70

The Application Fee is the above calculated Total or \$200, whichever is greater = \$ 200.00*

*Minimum Impact Flat Fee



WETLANDS PERMIT APPLICATION – ATTACHMENT A
MINOR AND MAJOR - 20 QUESTIONS
Land Resources Management
Wetlands Bureau



Check the Status of your application: www.des.nh.gov/onestop

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

Env-Wt 302.04 Requirements for Application Evaluation - For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project’s design in assessing the impact of the proposed project to areas and environments under the department’s jurisdiction. Respond with statements demonstrating:

1. The need for the proposed impact.

Interstate 93 is a north-south principal arterial Interstate highway within New Hampshire and is part of the National System of Interstate and Defense Highways. The greater Salem-Manchester 10418C Project intersects a number of important highway routes in southern New Hampshire, and the Contract A corridor in Salem connects the I-93 corridor with Massachusetts. Due to population growth, development, and recreation opportunities in New Hampshire, the travel demands for I-93 between Salem and Manchester have exceeded the capacity of this existing four-lane facility for a number of years. Population and traffic projections for the next twenty to thirty years anticipate that the existing I-93 highway will be increasingly less able to function at the levels of service and safety for which it was originally designed. Decreases in the level of service are currently evident in the reduced traveling speeds, increased density of traffic flow, as well as in the traffic backups at some interchanges during peak hours.

Traffic backups and congestions routinely occur due to traffic incidents such as crashes and breakdowns. As one of the main arterials in the New Hampshire highway system, it is important that this roadway function properly to serve all users. During the weekday peak hours, motorists traveling along the I-93 corridor currently experience traffic congestion and substantial delay. The congestion not only results in increased travel times, but also contributes to safety problems, as the limited spacing between vehicles does not afford motorists desired mobility, often leading to frequent and abrupt lane change maneuvers and sudden stops.

2. That the alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site.

During the design process, the environmental team worked closely with the engineering design team to eliminate direct wetland impact. In certain cases, impacts could not be entirely avoided, but these impacts were minimized as much as possible. Attempts were made to eliminate the small areas of proposed wetland impact entirely. However, a few small impacts remain after reducing impacts as much as possible given the various site constraints and highway design requirements. These site constraints result from the close proximity of the highway to the roadside wetlands. The project design uses guardrails along the roadside in certain locations so that the road shoulder can be steeper to minimize impacts to wetlands in close proximity to the roadway.

3. The type and classification of the wetlands involved.

Palustrine wetland S-9 is proposed to be impacted by the I-93 roadway widening in Salem. Wetland S-9 is a large palustrine forested (broad leaved deciduous) (PFO1) wetland which continues northwestward after the Harris Brook Tributary terminates. In spots the wetland continues into the yards of residences west of the I-93 corridor. Red maple (*Acer rubrum*) dominates the forest canopy at the USACE plot location. The herb layer consists entirely of slender wood-reed (*Cinna latifolia*). Other plants observed within the wetland include American elm (*Ulmus americana*), glossy false buckthorn (*Frangula alnus*), royal fern (*Osmundastrum spectabilis*), interrupted fern (*Osmunda claytoniana*), jewelweed (*Impatiens capensis*), northeastern manna grass (*Glyceria striata*), and numerous species of sedge (*Carex* spp.).

<p>4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.</p>
<p>The palustrine wetland proposed to be impacted is hydrologically connected to the Harris Brook Tributary which runs parallel to the western side of I-93 along the Contract A corridor. The Harris Brook Tributary ultimately flows into the Spicket River just south of the Massachusetts state line. Policy Brook also runs parallel to I-93 to the east and flows into the Spicket River within the vicinity of the Contract A corridor but is not impacted by this project. The Spicket River eventually drains into the Merrimack River approximately 4 miles south of the Contract A corridor.</p>
<p>5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.</p>
<p>The wetland proposed to be impacted are not considered rare or unusual and exhibit common wetland characteristics typical of roadside environments where they come within close proximity to I-93.</p>
<p>6. The surface area of the wetlands that will be impacted.</p>
<p>Impacts to wetland S-9 include side slope grading and the installation of drainage features along the widened portion of I-93 southbound. No direct impacts to the banks or bed of the Harris Brook Tributary, Policy Brook, or the Spicket River are proposed as part of the project. Additionally, no wetland impacts are anticipated for the widening work proposed along I-93 northbound. Approximately 350 SF of permanent impact to wetland S-9 is anticipated from roadway shoulder slope grading and the installation of drainage features along the southbound side of the roadway within the Contract A project corridor.</p>
<p>7. The impact on plants, fish and wildlife including, but not limited to:</p> <ul style="list-style-type: none"> a. Rare, special concern species; b. State and federally listed threatened and endangered species; c. Species at the extremities of their ranges; d. Migratory fish and wildlife; e. Exemplary natural communities identified by the DRED-NHB; and f. Vernal pools.
<p>A search for the occurrence of rare plant, animal, or natural communities within the vicinity of the Contract A corridor was completed using the NH Natural Heritage Bureau (NHNHB) online Data-check tool. A report provided by the NHB dated July 12, 2018 (refer to Appendix C) indicated the presence of two plant species, the state endangered meadow garlic (<i>Allium canadense</i>) and the state threatened river birch (<i>Betula nigra</i>), and one exemplary natural community, the swamp white oak floodplain forest.</p> <p>During coordination with NHNHB, it was determined that since suitable habitat for both meadow garlic and river birch (riparian floodplain wetland) is located within 0.5 miles of the Contract A corridor, potential habitat for these species may occur within the project area. During the wetland delineation conducted by FB Environmental Associates, river birch was documented within the vicinity of the Contract A corridor along the Spicket River; however no impacts are proposed to occur within the Spicket River or its associated wetlands. No river birch were documented along the Harris Brook Tributary or adjacent wetlands. Coordination with the NHNHB via email on October 30, 2018 determined that potential suitable habitat for meadow garlic occurs within the wetlands adjacent to the Harris Brook Tributary, however since wetland impacts will be linear and are proposed to occur along the toe of slope of the existing I-93 roadway shoulder, no substantial impact to meadow garlic is anticipated, if any are present. Refer to Appendix D for more information.</p> <p>Swamp white oak floodplain forests are dominated by red maple, white pine, and red oak. No swamp white oak floodplain forests were documented within the vicinity of the Contract A corridor. Furthermore, the forested wetlands associated with the Harris Brook Tributary where impacts will occur do not appear to be floodplain wetlands. Therefore, upon consultation with NHNHB, no impacts to swamp white oak floodplain forests are anticipated as part of the proposed project. Refer to Appendix D for more information.</p>

The NHHNB report also indicated the presence of three vertebrate species within the vicinity of the Contract A corridor, including state endangered spotted turtle (*Clemmys guttata*) and two state species of special concern, the American eel (*Anguilla rostrate*) and redbfin pickerel (*Esox americanus*). The New Hampshire Fish and Game Department (NHF&G) has expressed concerns regarding potential impacts to these species. Based on email correspondence with the NHF&G from November 14, 2018, the proposed work within the vicinity of the Harris Brook Tributary are not anticipated to negatively impact these species. Refer to **Appendix D** for more information.

The Contract A corridor was also reviewed for the presence of federally listed or proposed, threatened, or endangered species, designated critical habitat, or other natural resources concerning the US Fish and Wildlife Services' (USFWS) Information for Planning and Consultation (IPaC) system.

The northern long-eared bat (*Myotis septentrionalis*, NLEB) was listed as federally threatened in 2015. Results dated July 3, 2018 (refer to **Appendix E**) indicated the possible presence of NLEB within the vicinity of the project corridor. However, in anticipation of this project, a summer acoustic survey was conducted in July of 2017 to determine the presence/absence of this species. Multiple other bat species were identified within the area, but the results showed that no NLEB were present within the survey area. In correspondence dated July 20, 2018, the USFWS provided a concurrence verification letter (Consultation Code 05E1NE00-2018-I-2273) stating that Contract A is within the scope and adheres to the criteria of the *Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and the Northern Long-Eared Bat* (revised February 2018), and therefore satisfies the requirements under Section 7(a)(2) of the Endangered Species Act of 1973. The official effect determination of "not likely to adversely affect" is valid as long as applicable avoidance and minimization measures are adopted into the final plans and are observed during construction. Refer to **Appendix F** for more information.

No areas identified as potential vernal pools by FB Environmental Associates will be impacted by the proposed project.

8. The impact of the proposed project on public commerce, navigation and recreation.

Ultimately, widening I-93 from three lanes to four in both directions will improve public commerce, navigation, and recreation. This segment of I-93 connects New Hampshire with Massachusetts, thus providing an important connection point along the highway. The proposed project will positively impact road users by reducing delay times during peak hours and thus improving the safety of motorists along the highway.

9. The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake.

While the Contract A project will slightly alter the visual appearance of the I-93 roadway in Salem, these changes are not anticipated to negatively interfere with the aesthetic interests of the public. The existing roadway will be widened, and a new sound barrier approximately 16 feet tall will be constructed along the eastern side of the highway, beginning approximately 400 feet south of the existing dwellings on Haigh Avenue and extending approximately 3,400 feet north to the Salem Rest Area off-ramp. This noise barrier will be visible to the residents along Haigh Avenue. While the noise barrier will change the physical appearance of the northbound side of the highway, it is not anticipated to be a negative visual impact to highway users and is anticipated to have a positive impact to residents of Haigh Avenue by eliminating the visibility of the highway. Additionally, the project would upgrade the existing Overhead Sign Structures (OHSS) which are not anticipated to significantly change the visual appearance of the highway.

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

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www.des.nh.gov

10. The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area.

Overall the proposed project will improve public rights of passage or access by increasing the capacity of the I-93 roadway in Salem, as previously discussed in Question #8, above. The project will occur entirely within the existing ROW. This project is part of a greater widening project from Salem to Manchester. Therefore, the project will improve travel times along the roadway from existing conditions and provide a safer roadway by eliminating traffic congestion.

During construction of the Contract A project, construction phase traffic control would be staged to accommodate two to three lanes of through traffic. This would be accomplished through temporary shoulder reductions, temporary traffic diversions, and lane shifts. A traffic management plan will be developed and followed throughout the duration of construction.

11. The impact upon abutting owners pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to rip-rap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties.

The Contract A project is not anticipated to negatively impact abutting landowners. The project will not require additional property acquisition beyond what was already acquired through the greater Salem-Manchester 10418C Project. As discussed previously, landowners adjacent to the northbound side of the Contract A corridor would be visually impacted by a new soundwall that is proposed to be installed near the Haigh Avenue neighborhood, however this visual impact is anticipated to benefit this neighborhood since the wall would reduce noise and visual impacts of the highway.

12. The benefit of a project to the health, safety, and well being of the general public.

Widening I-93 in Salem will improve the health, safety, and well-being of the general public by improving the roadway conditions so that there will be less traffic congestion and improved safety for those traveling along the roadway. Congestion along the roadway during peak hours leads to substantial delay, which increases travel times and contributes to safety problems. The limited spacing during times of congestion does not provide motorists with desired mobility, leading to frequent and abrupt lane change maneuvers and sudden stops. The proposed roadway widening would improve not only mobility for the general public but also improved safety along the roadway.

13. The impact of a proposed project on quantity or quality of surface and ground water. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and the difference in the quality of water entering and exiting the site.

No public water supply wells are located within or adjacent to the Contract A corridor. The proposed roadway improvements would result in an increase of approximately 3.1 acres of paved area from the existing conditions, which is not anticipated to have measurable effects on surface and groundwater resources, as demonstrated in **Section 3.2** in the Supplemental Narrative, attached. There are no wellhead protection areas within or adjacent to the Contract A corridor. Through the effective design and development of surface water mitigation measures, following the NHDES *Recommendations for Groundwater Protection Measures When Sitting or Improving Roadways*, and adhering to the conditions of the Water Quality Certificate, any impacts would be avoided or mitigated. Additionally, the project would follow applicable Best Management Practices (BMPs) to prevent impacts to water quality as outlined in **Section 4.2.2** in the Supplemental Narrative, attached.

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

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

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<p>14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.</p>
<p>Portions of the Contract A corridor are located within the Special Flood Hazard Area (SFHA) Zone AE of the Harris Brook Tributary and Zone A of Policy Brook, as shown on the effective Flood Insurance Rate Maps; Panels 33015C0677E, 33015C0564E, and 33015C0563E, dated May 17, 2005.</p> <p>A floodplain analysis was conducted in 2018 using a corrected floodplain map which was developed by incorporating the 2005 Digital Flood Insurance Rate Map (DFIRM) data with the topographic and roadway data included in the project plans (refer to Appendix J). This enabled the identification of areas where the DFIRM flood boundary clearly did not reflect or was inconsistent within the existing topography information. The floodplain boundary was then modified to reflect topographic conditions and the resultant floodplain data was developed into a computer file containing the digital floodplain and floodway mapping.</p> <p>Based on the most recent floodplain review, the Contract A project would impact approximately 1.9 acres of floodplain. However, this proposed floodplain impact is less than the impact estimated for Contract A in previous project-wide floodplain impact analyses. And, floodplain mitigation for the proposed impacts in Salem has already been completed as part of the greater Salem-Manchester 10418C Project. This mitigation is located at the terminus of Haigh Avenue in Salem, referred to as the Policy Brook Stream Restoration Project. The completed floodplain mitigation work provides ecological benefits with a more sinuous riverine corridor and added flood storage for the smaller, more frequent storm events. Additional measures to mitigate for flood storage impacts include minimizing direct impacts to the 100-year floodplain and floodway of the Spicket River, Policy Brook, and Porcupine Brook.</p> <p>Erosion and sedimentation will be minimized to the maximum extent possible during project construction. As described in Section 4.2.2 in the Supplemental Narrative (attached), standard BMPs will be used during project construction to reduce the risk of erosion and sediment-laden run-off from entering surface waters and wetlands adjacent to the project corridor. Perimeter controls such as silt fence and/or silt sock will be installed upslope of wetlands and streams to ensure that surface water run-off from unstabilized areas does not carry silt, sediment, or other debris outside the limits of work. Upon the completion of the proposed work, all disturbed and graded areas located upslope of the erosion control measures will be seeded and mulched as needed. Refer to the Supplemental Narrative for further information.</p>
<p>15. The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards.</p>
<p>The proposed project is not anticipated to reflect or redirect currents or wave energy within surface waters since no work is proposed to occur within open water areas as part of the proposed construction. Perimeter controls such as silt fence and/or silt sock will be installed upslope of project wetlands and streams before project work begins and will be used throughout the duration of the project to protect the water quality of the Harris Brook Tributary and other surface waters during construction.</p>
<p>16. The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alterations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage of ownership of that wetland and the percentage of that ownership that would be impacted.</p>
<p>The proposed project serves the public, including the local landowners, and therefore is not directly comparable to an individual landowner's desire to fill wetlands for private use. Additionally, it is difficult to predict further development or alterations of abutting properties and their current relationship to the subject wetlands beyond what was delineated within the project corridor. Much of the land adjacent to the Contract A corridor is already developed, however there is a large amount of undeveloped forest land remaining.</p>
<p>17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.</p>
<p>The project is not anticipated to have measurable impacts on the functions and values of the wetland proposed to be impacted. Principal functions for wetland S-9 are floodflow alteration, sediment/toxicant retention, and nutrient removal. Other suitable functions consist of groundwater recharge/discharge, production export, sediment/shoreline stabilization, and wildlife habitat. While the project proposes to fill a small portion of this wetland, the fill is limited to roadside portions of the system and will not impede the flow of water within the wetland. Additionally, the wetland is large, therefore the amount of fill proposed is not anticipated to have any detrimental impacts on the wetland's ability to continue providing the current functions and values.</p>

18. The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication.

There would be no impacts to Listed Natural Landmarks as a result of the project since none are located within or near the Contract A corridor. The nearest Landmark to the project is Spruce Hole Bog in Durham, approximately 30 miles away.

19. The impact upon the value of areas named in acts of congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries.

There would be no impact on these named natural resources as none occur within the Contract A corridor. The nearest named resource area to the project is the Lamprey River, approximately 30 miles away.

20. The degree to which a project redirects water from one watershed to another.

Currently, stormwater from the existing impervious areas along the roadway drains either west to the Harris Brook Tributary or east to Policy Brook. Existing stormwater flow releases from the highway consist of a combination of sheet flow via a closed drainage system with catch basin outlets discharging to either side of the highway. Under existing conditions, a majority of the stormwater runoff within the median along the southern segment drains to the Harris Brook Tributary.

The project proposes to add approximately 3.1 acres of new pavement area within the project corridor, including the replacement of the current grassed median with a barrier median which will require a closed drainage system to capture stormwater from the inner two northbound and southbound lanes and will outlet to Policy Brook. The proposed drainage system along this roadway segment will result in approximately 4.0 acres of pavement being redirected to Policy Brook that previously discharged to the Harris Brook Tributary. This shift or reduction of water flow will reduce the amount of pavement draining to the Harris Brook Tributary by approximately 0.9 acres. A peak flow analysis was conducted on the potential changes in peak flow rates for the Harris Brook Tributary and Policy Brook to account for the proposed changes in pavement area and flow redirection. The results of the peak flow analysis indicate that there are no meaningful changes in peak flow rates for either the Harris Brook Tributary or the Policy Brook watersheds. See Section 4.1 of the permit narrative for more detailed information addressing this issue.

Additional comments

Supplemental Narrative

1. Introduction

On behalf of the NH Department of Transportation (“the Applicant”), this Wetlands Permit Application was prepared by VHB pursuant to the New Hampshire Revised Statutes Annotated (RSA) Chapter 482-A, Fill and Dredge in Wetlands, and Wetland Bureau Code of Administrative Rules, Chapters Env-Wt 100 through Env-Wt 900. This project involves the expansion of a 1.7-mile long segment in Salem from the Massachusetts state line northward to Exit 1 (referred to as “Contract A”). This project is being submitted as a major project per Env-Wt 303.02(l) since the previously submitted wetlands permits for this project (NHDES Wetlands Application #2002-02033 and #2014-03446) collectively propose wetland impacts greater than 20,000 square feet (SF). Contract A is part of the greater Salem-Manchester 10418C Project, that involves the widening of an approximately 19.8-mile segment of I-93 from the Massachusetts/New Hampshire state line to Manchester, which was previously permitted under NHDES Wetlands Application #2002-02033 and #2014-03446.¹ This current application is being submitted since the previous permit for this section of the project has expired, and to reflect design changes within the Contract A portion of the project since initial permitting.

2. Site Description and Existing Conditions

The Contract A corridor is a 1.7-mile segment of I-93 located within the southern portion of Salem, New Hampshire near the Massachusetts state line (refer to **Figure 1**, USGS Site Location Map). The landscape of this area is characterized by low rolling hills with streams running within areas of lower elevation.

Interstate 93 is a limited (fully controlled) access highway originally constructed in the early 1960s. At present, it consists of six lanes (three lanes northbound, three lanes southbound). The north and southbound barrels follow independent vertical profiles. The Exit 1 interchange is located at the northern limits of Contract A. The median width (distance between lanes of opposing direction) of I-93 within the Contract A corridor is typically 30 to 40 feet. Additionally, Cross Street passes over I-93 approximately 1,000 feet south of Exit 1.

The area adjacent to I-93 southbound in Salem is zoned as Rural District.² Most of the land use within the vicinity of the Contract A corridor is residential with areas of undeveloped forestland and a small amount of agricultural fields. Additionally, the Salem Rest Area is located on the northbound side of I-93 approximately in the center of the Contract A corridor.

Representative site photos of the Contract A corridor are provided in **Appendix H**.

3. Proposed Project Description

Contract A will include widening both the north- and south-bound barrels of I-93 from three to four lanes. Related work includes minor ramp work to accommodate the widened

¹ Gray shading indicates revised or new text relative to the permit narrative submitted in December 2018.

² Town of Salem, NH. *Chapter 490: Zoning*. Accessed July 12, 2018. <https://ecode360.com/27551953>.

mainline, drainage improvements, and construction of a soundwall. More detail is provided below.

3.1 Mainline Widening

Contract A would reconstruct and widen I-93 from a three-lane section to a four-lane section in each direction, starting at the Massachusetts state line and continuing north to Exit 1. This is the last mainline segment to be constructed as part of the Salem-Manchester project, and would tie into the previously constructed improvements at Exit 1 (previously constructed as part of Project 13933D or "Contract D").

Under Contract A, work on the northbound barrel would begin at the Massachusetts state line, adding a fourth lane primarily towards the median (west). The four-lane section would continue north to the Salem Rest Area ramps, where it would match into the existing roadway section that already accommodates four through lanes. The Salem Rest Area ramps would be retained in their current location. The northbound limit would extend northerly to a point just south of the Exit 1 ramps bridge to accommodate traffic control to complete the construction of the four-lane segment.

The southbound highway work would consist of adding a fourth lane by step-box widening off the existing travel way. The proposed highway widening is located along the east side into the median (approximately Sta. 3001+50 to Sta. 3027+00 RT) and along the west side, beginning near the Exit 1 southbound on-ramp and continuing south to the Massachusetts state line where the fourth lane is dropped to meet the three-lane section at the state line (approximately Sta. 3001+50 to Sta. 3057+00 LT). The northerly southbound project limit is located just south of the Exit 1 ramps bridge. Minor pavement widening on existing embankment and roadway sub-base placed by the 13933D contract is proposed to widen I-93 southbound to four lanes approximately from Sta. 3072+00 to Sta. 3090+00 RT.

Only minor work is proposed at the Exit 1 on-ramp. The Exit 1 southbound two-lane on-ramp would remain as previously constructed, with minor on-ramp concrete island reconstruction and step-box widening off the existing I-93 southbound travel way (approximately Sta. 3062+80 to Sta. 3074+00) to accommodate the proposed southbound four-lane section through the Exit 1 southbound on-ramp interface. The northbound off-ramp work would also be minor, since Contract D already constructed the northbound ramp to accommodate a four-lane section.

The mainline reconstruction efforts would consist of pavement rehabilitation including cold planning and pavement shimming of existing and step box widening as required, consisting of the full depth of select materials and full depth pavement.

3.2 Drainage Improvements

The proposed project will alter some of the existing drainage features within the Contract A corridor to accommodate the widened I-93 and to improve stormwater runoff and snow melt drainage within the highway, however most of the existing drainage features will be maintained. Two previously-constructed stormwater BMP features will be retained as part of

the project, which are two sand filter swales located within the median of the Contract A corridor and a detention basin just north of the rest area northbound on-ramp along the east side of the roadway.

Under existing conditions, much of the stormwater runoff along this segment of the roadway drains to the Harris Brook Tributary. Under proposed conditions a closed drainage system will be constructed to collect stormwater from the inside lanes of both northbound and southbound barrels for approximately 1,800 feet north of the state line. As a result of this closed drainage system, stormwater from approximately 3.6 acres of roadway area will be shifted to Policy Brook and the amount of pavement that drains to the Harris Brook Tributary will be reduced by approximately 0.9 acres. The shifting of flow ensures that pollutant loading to the Harris Brook Tributary will not increase. And, for the overall project, there will be no additional pollutant load to Policy Brook, accounting for the cumulative treatment from the previously constructed stormwater BMPs within the Policy Brook watershed during previous roadway contracts. The estimated pollutant load reductions associated with these BMPs will more than accommodate the estimated additional pollutant loads associated with added pavement draining to Policy Brook. The hydrological impacts of this stormwater system is discussed in **Section 4.2** below.

3.3 Soundwall at Haigh Avenue Neighborhood

As part of the proposed work, Contract A would construct a soundwall along the northbound barrel, approximately 16 feet tall, beginning approximately 400 feet south of the existing dwellings on Haigh Avenue and extending approximately 3,400 feet north to the Salem Rest Area off-ramp. Noise analyses along the Contract A corridor indicate that the design-year noise levels would approach or exceed the FHWA noise abatement criteria at 35 residential receptors on the northbound side of I-93 south of the Salem Rest Area. This soundwall would not have any direct impacts on wetlands or surface waters, including the adjacent Policy Brook system. An existing soundwall on the northbound side of I-93 north of Cross Street would not be affected by Contract A and would continue to be effective at attenuating highway noise.

3.4 Traffic Control

Contract A would also include upgraded and additional signage, including Intelligent Transportation System (ITS) elements. Overhead Sign Structures (OHSS) would include: two full span (crossing both northbound and southbound) OHSS south of the Salem Rest Area; one OHSS along the northbound off-ramp to the Salem Rest Area, relocated from the existing location south of the Salem Rest Area; one OHSS along the northbound barrel between the off-ramp and on-ramp at the Salem Rest Area; and two full span (crossing northbound) OHSS between the Salem Rest Area and Cross Street. ITS equipment would include one new steel pole to support a closed circuit television camera (CCTV) that will be located at the Salem Rest Area, and relocation of the existing dynamic message sign from the existing cantilevered OHSS to one of the full span OHSSs south of the Salem Rest Area. Some minor wetland impacts to the Harris Brook Tributary are associated with the installation of foundations for two of the proposed OHSS.

4. Impact Analysis and Best Management Practices

4.1 Proposed Impacts

The Contract A project would result in impacts to wetlands from roadway shoulder slope grading and the installation of drainage features along the roadway. (See **Appendix L** and **M**). Approximately 350 SF of permanent impact to wetland S-9 is anticipated from roadway shoulder slope shaping and grading and the installation of drainage features along the southbound side of the roadway. No temporary wetland impacts are anticipated as part of the proposed project. No wetland impacts are required for the proposed widening along the northbound side of I-93. Additionally, no direct impacts are required within the bed and banks of any surface water, including the Harris Brook Tributary, Policy Brook, or the Spicket River.

During the design process, the environmental team worked closely with the engineering design team to eliminate direct wetland impact. In certain cases, impacts could not be entirely avoided, but these impacts were minimized as much as possible. Attempts were made to eliminate the small areas of proposed wetland impact entirely. However, a few small impacts remain after reducing impacts as much as possible given the various site constraints and highway design requirements. These site constraints result from the close proximity of the highway to the roadside wetlands. The project design uses guardrails along the roadside in certain locations so that the road shoulder can be steeper to minimize impacts to wetlands and streams in close proximity to the roadway.

Hydrological Impacts

Since the project proposes to add approximately 3.1 acres of new pavement area within the project corridor, a hydrological analysis was conducted to assess the potential increases in stormwater peak flow rates during design storms and to determine if adjustments to the existing stormwater system were needed in the project design to accommodate this increase.

Currently, stormwater from the existing impervious areas along the roadway drains either west to the Harris Brook Tributary or east to Policy Brook. Existing stormwater flow releases from the highway consist of a combination of sheet flow via a closed drainage system with catch basin outlets discharging to either side of the highway. Under existing conditions, a majority of the stormwater runoff within the median along the southern segment drains to the Harris Brook Tributary.

The proposed project widening for approximately 1,800 feet northward from the state line will replace the current grassed median with a barrier median which will require a closed drainage system to capture stormwater from the inner two northbound and southbound lanes and will outlet to Policy Brook. The proposed drainage system along this roadway segment will result in approximately 4.0 acres of pavement being redirected to Policy Brook that previously discharged to the Harris Brook Tributary. This shift or redirection of water

flow will reduce the amount of pavement draining to the Harris Brook Tributary by approximately 0.9 acres.

To account for these proposed changes in pavement area and flow redirection, potential changes in peak flow rates for the Harris Brook Tributary and Policy Brook were analyzed. The watershed analysis involved two different methodologies. For the Harris Brook Tributary, changes in peak flow rates were calculated using the Hydro-CAD model to estimate changes in peak flow rates for different design storms events. The Hydro-CAD model is appropriate for small watersheds that are less than a 0.5 square mile in size.

The Policy Brook watershed area is over 10 square miles in size and is well above the 0.5 square mile threshold considered appropriate for a HydroCAD model. Given this much larger watershed a different methodology was needed to evaluate the potential change in peak flows to Policy Brook. VHB used a methodology developed by the U.S. Geological Survey based on regression equations developed from stream gage data and watershed characteristics for over 100 different watersheds. The USGS methodology includes separate equations for rural and urban type watersheds, with the urban analysis being defined as watersheds with more than 10% impervious cover. The percent imperviousness for the Policy Brook watershed is estimated to be approximately 20% and, thus, the urban regression equations were used in this analysis.

The results of the peak flow analysis indicate that there are no meaningful changes in peak flow rates for either the Harris Brook Tributary or Policy Brook watersheds. While there are no meaningful changes, peak flows to the Harris Brook Tributary would decrease since the total amount of stormwater flow into the Tributary will be decreased because of the proposed projects' modifications to the existing roadway drainage system. The estimated net change in peak flows is less than 0.1% in Policy Brook even for the 100-year storm event. The estimated peak flow rates for Policy Brook existing and proposed conditions are presented in the following table.

Table 1. Estimated Changes in Peak Flow Rates in Policy Brook

Design Storm	Estimated Peak Flow (CFS)		Net Change (CFS)
	Existing	Proposed	
<i>2-year / 24-hr rainfall</i>	273.6	273.7	0.1
<i>10-year / 24-hr rainfall</i>	672.6	672.9	0.3
<i>50-year / 24-hr rainfall</i>	1,124.7	1,125.3	0.6
<i>100-year / 24-hr rainfall</i>	1,331.3	1,332.0	0.7

Notes: Peak flow rates for the various design storms is based on the USGS regression equation methodology for urban watersheds.

Similarly, for the Harris Brook Tributary, the estimated peak flow rates under proposed conditions using the Hydro-CAD model show no measurable change for each of the design storm events.

Table 2. Estimated Changes in Peak Flow Rates in Harris Brook Tributary

Design Storm	Estimated Peak Flow (CFS)		Net Change (CFS)
	Existing	Proposed	

<i>2-year / 24-hr rainfall</i>	43.5	43.5	0.0
<i>10-year / 24-hr rainfall</i>	111.4	111.1	-0.3
<i>50-year / 24-hr rainfall</i>	235.4	234.6	-0.8
<i>100-year / 24-hr rainfall</i>	312.3	311.2	-1.1

Notes: Peak flow rates for the various design storms is based on the Hydro-CAD model for the Harris Brook Tributary watershed.

Based on these peak flow analysis results, no additional stormwater detention or peak flow mitigation measures are considered necessary.

4.2 Mitigation and Best Management Practices

4.2.1 Mitigation

The proposed project has been designed to avoid and minimize wetland and stream impacts to the maximum extent practicable. However, because the project would result in impacts which are classified as “major” under Env-Wt 303.02(l), it is subject to compensatory mitigation requirements per Env-Wt 302.03(c).

NHDOT proposes to mitigate for permanent project wetland impacts (totaling 350 SF) by paying an In-Lieu Fee to the NH Aquatic Resource Mitigation (ARM) Fund. The In-Lieu Fee payment, totaling \$1,764.54, has been calculated in accordance with RSA 482-A:30 using the ARM Fund calculator for wetland payment calculations provided by NHDES. The ARM Fund calculations are attached.

4.2.2 Best Management Practices

Standard best management practices (BMPs) will be applied throughout project construction in accordance with applicable NHDES and NHDOT BMP Manuals to reduce the risk of erosion and sediment-laden run-off from entering surface waters and wetlands adjacent to the project corridor, since much of the project work will be conducted directly adjacent to wetlands and surface waters. Perimeter controls such as silt fence and/or silt sock will be installed upslope of project wetlands and streams to ensure that surface water run-off from unstabilized areas does not carry silt, sediment, and other debris outside of the limits of work. All installed temporary erosion control measures shall be inspected daily and repaired/replaced as necessary.

Areas remaining un-stabilized for a period of more than 30 days shall be temporarily seeded and mulched. Erosion control blankets shall be installed on all slopes that are greater than 3 feet horizontal and 1 foot vertical (3:1). Upon the completion of the proposed work, all disturbed and graded areas located upslope of the erosion control measures will be seeded and mulched as needed. Disturbed areas that have been seeded and mulched will be considered stable once 85-percent vegetative growth has been achieved. Refer to the Erosion Control Plans included as **Appendix N** for further details.

Several invasive plant species were identified by FB Environmental Associated (FB) within the project area during field surveys conducted from June to September 2017. The most

common invasive plant species found within the Contract A corridor was glossy false buckthorn (*Frangula alnus*). Due to the prevalence of glossy false buckthorn within the survey area, FB did not map the locations of this species, however all of the following invasive species were mapped within the survey area.

- Japanese barberry (*Berberis thunbergii*)
- Asian bittersweet (*Celastrus orbiculatus*)
- Autumn olive (*Elaeagnus umbellata*)
- Japanese knotweed (*Fallopia japonica*)
- Glossy false buckthorn (*Frangula alnus*)
- Morrow's honeysuckle (*Lonicera morrowii*)
- Purple loosestrife (*Lythrum salicaria*)
- Common reed (*Phragmites australis*)
- Multiflora rose (*Rosa multiflora*)

Since soil disturbance is anticipated to occur as part of the proposed project, the contractor(s) will be required to adhere to NHDOT's *Best Management Practices for the Control of Invasive and Noxious Plant Species (2018)* manual during construction to minimize the spread of invasive plant species within the project area. Only clean equipment that is free of plant material and debris shall be delivered to the project site and utilized during construction. All machinery entering and leaving any area containing invasive plants will be inspected for foreign plant matter (stems, flowers, roots, etc.) and soil embedded in the tracks or wheels. If foreign plant matter/soil is present, the operator shall remove the plant material and soil from the machine using hand tools.

5. Wetland Resources

Wetlands and streams within the Contract A corridor were delineated and assessed from June to September 2017, with follow-up verification conducted in December 2018 during a period of a lack of snow-cover. Additionally, potential vernal pools were identified since the delineation was conducted outside of the vernal pool season, however none of these potential vernal pools are proposed to be impacted. A full description of the wetlands and associated function and values assessment is provided in the delineation report, located in **Appendix K**.

The most common types of wetlands delineated within the Contract A corridor are riparian forested wetlands, riparian emergent wetlands, and emergent wetlands constructed for stormwater treatment. Additionally, several non-jurisdictional drainage areas (scoured channels) were mapped within the Contract A corridor. Several constructed stormwater treatment areas and roadside ditches were found within the corridor, and all such wetlands that met the US Army Corps of Engineers wetland criteria³ were identified as jurisdictional

³ US Army Corps of Engineers. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0*. January 2012.

wetland areas. Of all the wetlands delineated within the corridor, only one wetland is proposed to be impacted by the project, which is wetland S-9.

Wetland S-9 a large palustrine forested (broad leaved deciduous) (PFO1) wetland which continues northwestward after the Harris Brook Tributary terminates. In spots the wetland continues into the yards of residences west of the I-93 corridor.

Red maple (*Acer rubrum*) dominates the forest canopy in wetland S-9 at the USACE plot location. The herb layer consists entirely of slender wood-reed (*Cinna latifolia*). Other plants observed within the wetland include American elm (*Ulmus americana*), glossy false buckthorn (*Frangula alnus*), royal fern (*Osmundastrum spectabilis*), interrupted fern (*Osmunda claytoniana*), jewelweed (*Impatiens capensis*), northeastern manna grass (*Glyceria striata*), and numerous species of sedge (*Carex* spp.).

Soils within wetland S-9 meet the criteria for field indicator F-3 – Depleted Matrix as the soil profile contains a 13+ inch layer with a depleted matrix that starts from within ten inches of the mineral soil surface. Water stained leaves (B9) constituted the sole observed indicator of hydrology.

Principal functions for wetland S-9 are floodflow alteration, sediment/toxicant retention, and nutrient removal. Other suitable functions consist of groundwater recharge/discharge, production export, sediment/shoreline stabilization, and wildlife habitat.⁴

One prime wetland is located directly adjacent to the eastern side of the Contract A corridor. The segment of the Spicket River upstream of the river's confluence with Policy Brook is designated as a prime wetland in accordance with RSA 482-A:15. This prime wetland includes a 100-foot buffer, however the buffer is located just outside of the Project's construction footprint, as shown in **Appendix L**.

6. Floodplains and Floodways

Portions of the Contract A corridor are located within the Special Flood Hazard Area (SFHA) Zone AE of the Harris Brook Tributary and Zone A of Policy Brook, as shown on the effective Flood Insurance Rate Maps; Panels 33015C0677E, 33015C0564E, and 33015C0563E, dated May 17, 2005.

A floodplain analysis was conducted in 2018 using a corrected floodplain map which was developed by incorporating the 2005 Digital Flood Insurance Rate Map (DFIRM) data with the topographic and roadway data included in the project plans (refer to **Appendix J**). This enabled the identification of areas where the DFIRM flood boundary clearly did not reflect or was inconsistent with the existing topography information. The floodplain boundary was then modified to reflect topographic conditions and the resultant floodplain data was developed into a computer file containing the digital floodplain and floodway mapping.

⁴ FB Environmental Associates. *Wetland and Stream Delineation and Functional Wetland Assessment Report*. January 2018, updated December 2018.

Based on the most recent floodplain analysis, the proposed project would impact approximately 1.9 acres of floodplain. Floodplain mitigation for the proposed impacts in Salem has already been completed as part of the greater Salem-Manchester 10418C Project. This mitigation is located at the terminus of Haigh Avenue in Salem, referred to as the Policy Brook Stream Restoration Project. The completed floodplain mitigation work provides ecological benefits with a more sinuous riverine corridor and added flood storage for the smaller, more frequent storm events. Additional measures to mitigate for flood storage impacts include minimizing direct impacts to the 100-year floodplain and floodway of the Spicket River, Policy Brook, and Porcupine Brook.

7. Rare, Threatened, and Endangered Species

The following is a discussion of rare, threatened, and endangered species identified within the vicinity of the project corridor by the New Hampshire Natural Heritage Bureau (NHNHB) Data-check tool and US Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) system.

7.1 Natural Heritage Bureau

A search for the occurrence of rare plant, animal, or natural communities within the vicinity of the Contract A corridor was completed using the NHNHB online Data-check tool. A report provided by the NHNHB dated July 12, 2018 indicated the presence of two plant species, the state endangered meadow garlic (*Allium canadense*) and the state threatened river birch (*Betula nigra*), and one exemplary natural community, the swamp white oak floodplain forest.

Both river birch and meadow garlic occur within wetland areas. During coordination with NHNHB, it was determined that suitable habitat for both meadow garlic and river birch is located within 0.5 miles of the Contract A corridor. During the wetland and surface water delineation conducted by FB Environmental Associates, river birch was documented within the vicinity of the Contract A corridor along the Spicket River, however no impacts are proposed to occur within the Spicket River or its associated wetlands. No river birch were documented along the Harris Brook Tributary or adjacent wetlands. Coordination with the NHNHB via email on October 30, 2018 determined that potential suitable habitat for meadow garlic occurs within the wetlands adjacent to the Harris Brook Tributary, however since wetland impacts will be linear and are proposed to occur along the toe of slope of the existing I-93 roadway shoulder, no substantial impact to meadow garlic is anticipated, if any are present.

Swamp white oak floodplain forests are dominated by red maple, white pine, and red oak. No swamp white oak floodplain forests were documented within the vicinity of the Contract A corridor. Furthermore, the forested wetlands associated with the Harris Brook Tributary where impacts will occur do not appear to be floodplain wetlands. Therefore, upon consultation with NHNHB, no impacts to swamp white oak floodplain forests are anticipated as part of the proposed project.

Email correspondence with the NHHNB regarding these plant species and natural communities is provided in **Appendix D**.

7.2 NH Fish and Game Department

The NHHNB report also indicated the presence of three vertebrate species within the vicinity of the Contract A corridor, including state endangered spotted turtle (*Clemmys guttata*) and two state species of special concern, the American eel (*Anguilla rostrate*) and redbfin pickerel (*Esox americanus*). The New Hampshire Fish and Game Department (NHF&G) has expressed concerns regarding potential impacts to these species. Based on email correspondence with the NHF&G from November 14, 2018, the proposed work within the vicinity of the Harris Brook Tributary are not anticipated to negatively impact these species. Refer to **Appendix D** for more information.

7.3 US Fish and Wildlife Service

The Contract A corridor was also reviewed for the presence of federally listed or proposed, threatened, or endangered species, designated critical habitat, or other natural resources concerning the USFWSs IPaC system.

The northern long-eared bat (*Myotis septentrionalis*, or NLEB) was listed as federally threatened in 2015. The IPaC Official Species List dated July 3, 2018 indicated the possible presence of NLEB within the vicinity of the project corridor. However, in anticipation of this project, a summer acoustic survey was conducted in July of 2017 to determine the presence/absence of this species. Multiple other bat species were identified within the area, but the results showed that no NLEB were present within the survey area. In correspondence dated July 20, 2018, the USFWS provided a concurrence verification letter (Consultation Code 05E1NE00-2018-I-2273) stating that Contract A is within the scope and adheres to the criteria of the *Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and the Northern Long-Eared Bat* (revised February 2018), and therefore satisfies the requirements under Section 7(a)(2) of the Endangered Species Act of 1973. The official effect determination of "not likely to adversely affect" is valid as long as applicable avoidance and minimization measures are adopted into the final plans and are observed during construction.

8. Cultural Resources

The historical architectural survey for the greater Salem-Manchester 10418C Project was initially completed in 2001 and 2002 and included reconnaissance and intensive level architectural history surveys of individual resources and districts. Two resources in Salem were identified as eligible for listing in the National Register of Historic Places: the Kinzler House (19 Cross Street, #SAL204) and the Armenian Settlement Historic District (Salem Street, Area SAL SF). The NH Division of Historical Resources (NHDHR) and the Federal Highway Administration (FHWA) recommended that the Contract A corridor in Salem be

determined as “No Historic Properties Affected” relative to both the Kinzler House and the Armenian Settlement Historic District.

A Memorandum of Agreement (MOA) was executed in August 2002 between FHWA, NHDOT, and the NH State Historic Preservation Officer (NHSHPO) that outlined stipulations to be implemented over the course of the undertaking to mitigate the adverse effect on historic properties and to conclude the Section 106 process.

Since the 2002 historic architectural survey, a clarification was made of the boundary of the Armenian Settlement Historic District, a portion of which is located within the vicinity of the Contract A corridor in Salem. The boundaries of the Armenian Settlement Historic District were updated in April 2006, during which the property located at 2 Brady Avenue in Salem (SAL0224) was added to the Historic District as a contributing resource. This historic resource was added to the Effects Memo which was signed by NHDOT, FHWA, and NHSHPO on July 16, 2009. The building was acquired and removed under Contract 13933B (or “Contract B”), which included work along the Cross Street Bridge, and the 2009 Effects Memo determined that its removal would result in an adverse effect to the property. Mitigation for the taking of the property included a NH Historic Property Documentation Form, expansion of the district area form for the Armenian Settlement District, and the installation of a state historic marker, which have been completed.

Additionally, a Phase IA sensitivity assessment was completed for the proposed project, during which the Contract A corridor was found to not be sensitive for Post-Contact archaeological resources. Two areas were identified as sensitive for Pre-Contact archaeological resources, but a Phase IB intensive archaeological investigation in the 1990s resulted in a finding of no archaeological resources within these areas.

On August 2, 2018, a revised Request for Project Review (RPR) was submitted to NHDHR for the Contract A project. This RPR was submitted because of the amount of time that had elapsed since the 2009 revised Effects Memo. NHDHR responded by indicating that there were no concerns related to archaeology. NHDHR also recommended additional surveys for certain areas, including the Haigh Avenue neighborhood and the neighborhood at MacGregor Avenue, if impacts would result to these properties. However, upon review of the proposed project, NHDOT and FHWA determined that no such impacts would result and decided that additional surveys were unnecessary.

Refer to **Appendix G** for the NHDHR RPR response, the most recent Effect Memo, and the MOA for the Contract A project.

Appendix O – ARM Fund Payment Calculation

**NHDES AQUATIC RESOURCE MITIGATION FUND
WETLAND PAYMENT CALCULATION**

INSERT AMOUNTS IN YELLOW CELLS

1 Convert square feet of impact to acres:		
INSERT SQ FT OF IMPACT	Square feet of impact =	350.00
		43560.00
	Acres of impact =	0.0080
2 Determine acreage of wetland construction:		
	Forested wetlands:	0.0121
	Tidal wetlands:	0.0241
	All other areas:	0.0121
3 Wetland construction cost:		
	Forested wetlands:	\$1,075.19
	Tidal Wetlands:	\$2,150.39
	All other areas:	\$1,075.19
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:	32795.0
	Forested wetlands:	\$395.26
	Tidal wetlands:	\$790.51
	All other areas:	\$395.26
5 Construction + land costs:		
	Forested wetland:	\$1,470.45
	Tidal wetlands:	\$2,940.90
	All other areas:	\$1,470.45
6 NHDES Administrative cost:		
	Forested wetlands:	\$294.09
	Tidal wetlands:	\$588.18
	All other areas:	\$294.09
***** TOTAL ARM PAYMENT*****		
	Forested wetlands:	\$1,764.54
	Tidal wetlands:	\$3,529.08
	All other areas:	\$1,764.54

