

STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION



FROM:

Sarah Large
Wetlands Program Analyst

DATE:

July 16, 2018

AT (OFFICE):

Department of
Transportation

SUBJECT

Dredge & Fill Application
Alexandria, #15937

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 is the application package prepared by NH DOT Bureau of Highway Design for the subject major impact project. This project is classified as major per Env-Wt 303.04(i). The project is located on NH Route 104 in the Town of Alexandria, NH. The proposed work consists of rehabilitating two corrugated aluminum culverts carrying unnamed streams. Location 1, a 60" x 128' long culvert, is located 850' east of Bog Rd. Location 2, a 66" x 86' long culvert, is located 275' west of Berry Rd. Both culverts will be rehabilitated by sliplining with a corrugated metal pipe liner. New stone lining will be placed at the culvert inlets and outlets, and existing stone headwalls will be repaired.

This project was reviewed at the Natural Resource Agency Coordination Meeting on April 18, 2018. A copy of the minutes has been included with this application package. A copy of this application and plans can be accessed on the Departments website via the following link:
<http://www.nh.gov/dot/org/projectdevelopment/environment/units/program-management/wetland-applications.htm>

Mitigation for this project will consist of a single and one-time payment into the ARM-Fund in the amount of \$24,520.32 as described in the mitigation narrative provided within the application package.

The lead people to contact for this project are Tobey Reynolds, Bureau of Highway Design (271-2171 or Tobey.Reynolds@dot.nh.gov) or Matt Urban, Wetlands Program Manager, Bureau of Environment (271-3226 or Matt.Urban@dot.nh.gov).

A payment voucher has been processed for this application (Voucher #536137) in the amount of \$798.02.

If and when this application meets with the approval of the Bureau, please send the permit directly to Matt Urban, Wetlands Program Manager, Bureau of Environment.

SEL:sel

Enclosures

cc:

BOE Original

Town of Alexandria (4 copies via certified mail)

David Trubey, NH Division of Historic Resources (Cultural Review Within)

Bureau of Construction

Carol Henderson, NH Fish & Game (via electronic notification)

Maria Tur, US Fish & Wildlife (via electronic notification)

Mark Kern, US Environmental Protection Agency (via electronic notification)

Michael Hicks, US Army Corp of Engineers (via electronic notification)

Kevin Nyhan, BOE (via electronic notification)



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

<input type="checkbox"/> Administrative Use Only	<input type="checkbox"/> Administrative Use Only	<input type="checkbox"/> Administrative Use Only	File No. Check No. Amount Initials
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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: 04 Day: 18 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: **NH Route 104, 850' east of Bog Rd and 290' west of Berry Road** TOWN/CITY: **Alexandria**
 TAX MAP: **NA** BLOCK: **NA** LOT: **NA** UNIT: **NA**
 USGS TOPO MAP WATERBODY NAME: **two unnamed streams** NA STREAM WATERSHED SIZE: **291ac, 251ac** NA
 LOCATION COORDINATES (if known): **43.573N, 71.776W & 43.575N, 71.771W**

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 project proposes to rehabilitate two corrugated aluminum culverts carrying unnamed streams under NH Route 104. Location 1, a 60" x 128' long culvert, is located 850' east of Bog Rd. Location 2, a 66" x 86' long culvert, is located 275' west of Berry Rd. Both culverts will be rehabilitated by sliplining with a corrugated metal pipe liner. New stone lining will be placed at the culvert inlets and outlets, and existing stone headwalls will be repaired.

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	_____	<input 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 - 1074 ; NHB-18-1075
 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.: Reynolds, Tobey L.			
TRUST / COMPANY NAME: NH DOT		MAILING ADDRESS: 7 Hazen Drive / PO Box 483	
TOWN/CITY: Concord		STATE: NH	ZIP CODE: 03302-0483
EMAIL or FAX: Bureau16@dot.nh.gov		PHONE: (603)271-2171	
ELECTRONIC COMMUNICATION: By initialing here: <u>TR</u> , 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.: NA			
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.: NA		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.			
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		Tobey Reynolds Print name legibly	7/12/2018 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
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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.

	Print name legibly	Town/City	Date
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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.

JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.		TEMPORARY Sq. Ft. / Lin. Ft.	
Forested wetland		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Scrub-shrub wetland		<input type="checkbox"/> ATF	1463	<input type="checkbox"/> ATF
Emergent wetland		<input type="checkbox"/> ATF	477	<input type="checkbox"/> ATF
Wet meadow		<input type="checkbox"/> ATF		<input type="checkbox"/> ATF
Intermittent stream	617	<input type="checkbox"/> ATF	414	<input type="checkbox"/> ATF
Perennial Stream / River	495 / 152	<input type="checkbox"/> ATF	525 / 40	<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	1112 / 152		2879 / 40	

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) 3991 sq. ft. X \$0.20 = \$ 798.20

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

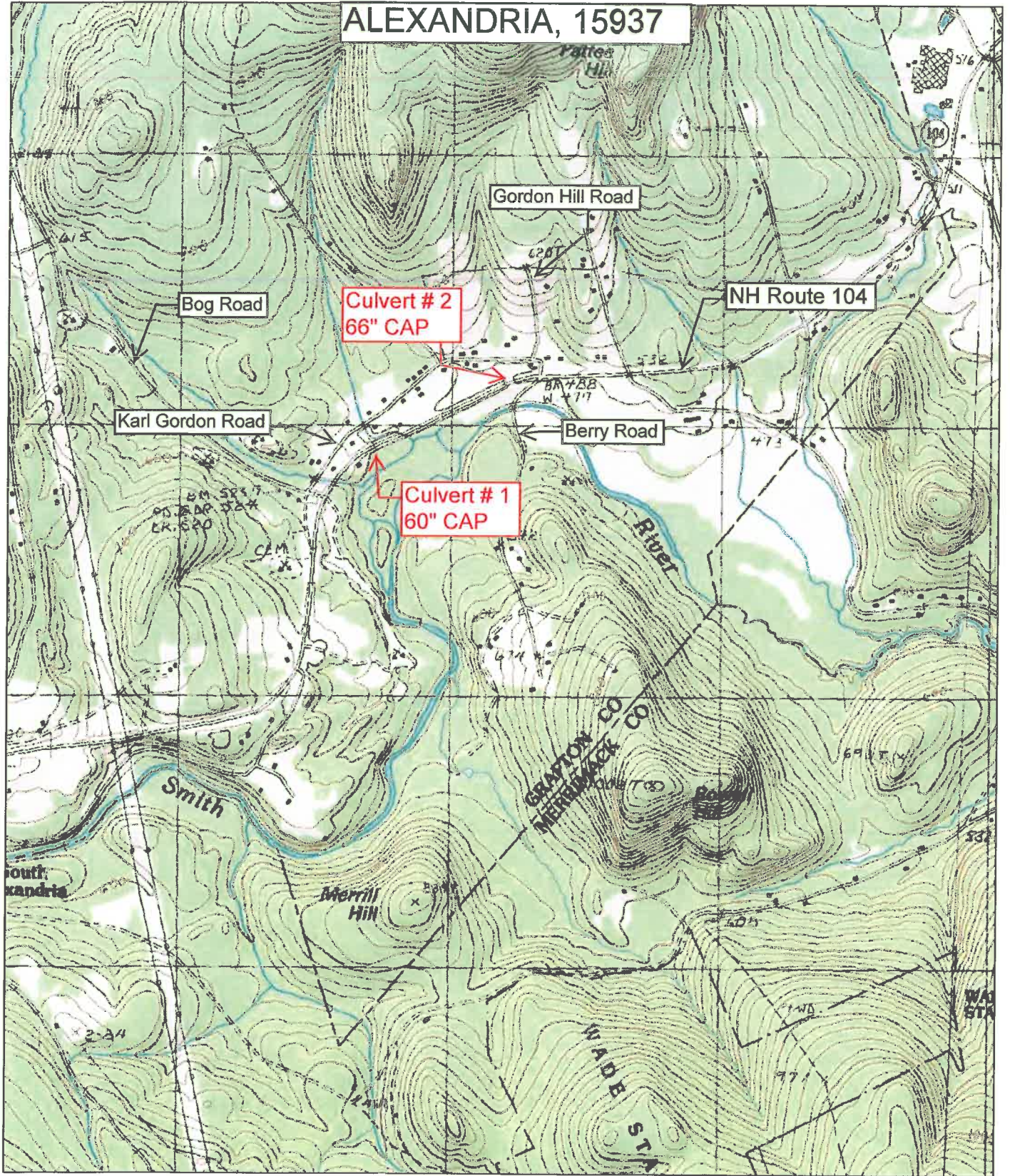
Permanent docking structure: sq. ft. X \$2.00 = \$

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

Total = \$ 798.20

The Application Fee is the above calculated Total or \$200, whichever is greater = \$ 798.20

ALEXANDRIA, 15937



0 0.5 Mi
0 3000 Ft

Map provided by MyTopo.com



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.

This project will rehabilitate two existing corrugated aluminum pipe (CAP) culverts, which both have severe corrosion along the top of the pipes, to prevent their failure and prolong their service life.

Location 1 is a 60" diameter CAP, approximately 128' long that carries an un-named perennial stream from the north to the south under NH Route 104 and is located approximately 850 feet east of the intersection of NH Route 104 and Bog Road.

Location 2 is a 66" diameter CAP, approximately 86' long that carries an un-named intermittent stream from the north to the south under NH Route 104 and is located approximately 275' west of the intersection of NH Route 104 and Berry Road.

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

The project proposes to slipline both culverts with corrugated metal pipe liners, one size smaller than the existing pipes. The 60" pipe at Location 1 will be sliplined with a 54" liner pipe. The 66" pipe at Location 2 will be sliplined with a 60" liner pipe. Rehabilitation by the proposed method will address the need and purpose for the project while minimizing impacts to both unnamed streams. The proposed alternative is the most practicable considering durability, cost, and the benefit of a limited impact rehabilitation method. Replacement in-kind and replacement with larger structures was considered but would result in much more substantial stream impacts at both locations, significant disruption to traffic (due to the pipes' depth), and a higher total project cost. Other rehabilitation methods, such as spray-on linings and cured in place linings were considered; however, those methods would have impacts similar to the proposed sliplining alternatives and are typically more costly.

3. The type and classification of the wetlands involved.

Location 1 - Un-named stream:

R2UB2: lower perennial, unconsolidated bottom, sand & R2UB1/2: lower perennial, unconsolidated bottom, cobble-gravel/sand Bank

Location 2 - Un-named stream:

R4SB3/4: intermittent, streambed, cobble-gravel/sand

PEM1E/PSS1E: palustrine, emergent, persistent, seasonally flooded/saturated / scrub-shrub, broad-leaved deciduous, seasonally flooded/saturated

PSS1E: palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded saturated

4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.

Both un-named streams flow to the Smith River. The outlet of the 60" culvert (Location 1) is approximately 185 feet upstream of the Smith River. The outlet of the 66" culvert (Location 2) is approximately 350 feet upstream of the Smith River.

The stream connectivity and hydrologic landscape support provided by these crossings will not be affected by the proposed work.

5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.

The project will have permanent and temporary impacts to a perennial stream R2UB1/2 (Location 1) and an intermittent stream R4SB3/4 (Location 2), and temporary impacts to two scrub-shrub wetlands PSS1E (Location 2). The wetlands and surface waters are not considered to be rare in the State of NH. There are no rare wetlands in the project area.

6. The surface area of the wetlands that will be impacted.

Location 1 includes 525 sf of temporary channel impact (for access, water diversion, and erosion controls), 239 sf of permanent channel impact (for placement of stone), and 256 sf of permanent channel impact inside the existing pipe (for placement of the liner).

Location 2 includes 414 sf of temporary channel impact (for access, water diversion, and erosion controls), 359 sf of permanent channel impact (for placement of stone), 258 sf of permanent channel impact inside the existing pipe (for placement of the liner), and 1463 sf of temporary wetland impact (for access and erosion controls).

7. The impact on plants, fish and wildlife including, but not limited to:
- 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.

The proposed project has been reviewed by the NH Natural Heritage Bureau (NHNHB), NH Fish and Game and the US Fish and Wildlife Service. The following findings are based on coordination with these agencies.

- a) NHNHB did not identify any rare or special concern species in the project area.
- b) NHNHB did not identify any State listed threatened or endangered species in the project area.

Based on the information provided for the "Range-wide Programmatic Consultation for Indianan Bat and Northern Long-eared Bat", the USFWS has concurred that the Proposed Action may affect, but is not likely to adversely affect (NLAA) the threatened Northern Long-eared bat. As such the project satisfies the requirements under Section 7(a)(2) of the Endangered Species Act.

- c) There were no species at the extremities of their ranges identified in the project area.
- d) There were no migratory birds, fish or wildlife identified in the project area.
- e) NHNHB did not identify any exemplary natural communities in the project area.
- f) Streams and surrounding wetlands were delineated by NHDOT on April 13, 2018, several wetland systems were identified in the project area, however, no vernal pools were observed. Project impacts are limited to the channels of the two stream systems and adjacent scrub-shrub wetlands.

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

The project will have no permanent impact to public commerce, or recreation. There will be temporary impacts to NH Route 104 associated with mobilization and staging of the project, including short term lane and shoulder closures. At least one lane of traffic in each direction will remain open to traffic at all times. Delays are anticipated to be of short duration and are not expected to impact public commerce.

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.

There will be no impacts to the aesthetic value of the area, as most of the improvements are contained within the existing culverts. The project will repair existing stone headwalls by replacing stones and re-pointing mortar.

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.

There will be no permanent changes to public passage or access as a result of the project. Temporary impacts to traffic during construction will consist of short duration lane and shoulder closures which may result in minor delays. At least one lane of traffic will be maintained at all times on NH Route 104.

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.

There will be no significant impacts to abutters. The culverts and work areas are primarily within existing State right of way. Temporary construction easements are required from two abutters at Location 1. With the exception of minor tree clearing and placement of stone at the culvert outlet, the easement areas will be returned to existing conditions. The rehabilitation of the culverts is not expected to create any significant changes to the un-named streams. The proposed work will have minimal effect on the ability of the crossings to pass normal and storm level flows and there is no current history of flooding at either location. The proposed placement of stone lining at the culvert outlets is intended to dissipate energy and reduce velocity such that there will not be any significant downstream effect.

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

Rehabilitation of the culverts will prevent structural failure, which would result in the the closure of NH Route 104 and significant hardship to the general public and commerce. Best Management Practices will be implemented during construction to ensure that the water quality of the un-named streams and the Smith River are protected.

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.

The project will have no significant impact on the quantity or quality of surface water or groundwater. The design of the proposed rehabilitation was selected to minimize changes to flow through the project area. Following construction, the culverts and unnamed streams are expected to flow in the same way that they do today. BMPs will be incorporated to protect the quality of the surface and groundwater. If the culverts were not rehabilitated, future failures are anticipated, which would have negative impacts on water quality at the crossing and downstream.

14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.

The proposed rehabilitation method will not cause any significant change to the culverts' capacity, erosion potential, or sedimentation of the streams. The proposed treatment will increase culvert outlet velocities, but stone lining will be placed at the outlets to dissipate energy, reduce velocity, and prevent erosion. Best Management Practices will be used to protect water quality and prevent erosion during construction of the project. The crossings do not currently have a history of flooding and based on existing capacity, the proposed rehabilitation will not affect the crossings' ability to carry low and high flows through the project area.

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.

The project will not reflect or redirect currents or wave energy.

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.

The permanent impacts are necessary for the installation of stone lining at the culvert inlets and outlets for scour protection (at the inlets) and to dissipate energy and reduce velocity (at the outlets). The proposed work perpetuates existing conditions in the project areas, so it is unlikely that any abutting property owners would propose similar impacts to the un-named streams. The project, as proposed, will not significantly impact abutting properties or change conditions of the un-named streams, or the Smith River. Moreover, if the culverts are not rehabilitated, future failures may lead to flooding in the area and the closure of NH Route 104.

17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.

The proposed rehabilitation will perpetuate existing conditions in the project area and the wetlands impacted will continue to provide the functions and values they do today. After construction, the culverts will continue to accommodate the flows of the un-named streams, carry flow from the higher elevation to lower elevation, maintain hydrologic connectivity, and accommodate aquatic organism passage. Best Management Practices will be incorporated during construction to protect water quality.

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 are no sites included in the National Register of Natural Landmarks in the project area.

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 are no areas such as those described above located within the project area.

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

The project as design will perpetuate existing conditions and will not redirect water from one watershed to another.

Additional comments

lm@des.nh.gov or (603) 271-2147
NHDES Wetlands Bureau, 29 Hazen Drive, PO Box 95, Concord, NH 03302-0095
www.des.nh.gov

BUREAU OF ENVIRONMENT CONFERENCE REPORT

SUBJECT: NHDOT Monthly Natural Resource Agency Coordination Meeting

DATE OF CONFERENCE: April 18, 2018

LOCATION OF CONFERENCE: John O. Morton Building

ATTENDED BY:

NHDOT

Matt Urban
Sarah Large
Marc Laurin
Keith Cota
Mark Hemmerlein
Chris Carucci
Meli Dube
Bob Landry
Don Lyford
Bill Saffian
Trent Zanes
Brian Lombard
Maggie Baldwin
Kevin Nyhan
Bob Juliano
Steve Johnson
Shelly Winters

ACOE

Mike Hicks

Federal Highway

Jamie Sikora

EPA

Mark Kern

US Coast Guard – Bridges

Jim Rousseau

NHDES

Gino Infascelli
Lori Sommer
Tim Drew
Chris Williams

NHF&G

Carol Henderson

NH Natural Heritage

Bureau

Amy Lamb

**NH Office of Energy and
Planning**

Jennifer Gilbert
Samara Ebinger

**NH Department of Business
& Economic Affairs**

Jimmie Hinson

**Consultants/Public
Participants**

Chris Bean
Leo Tidd
Vicki Chase
Pete Walker
Christine Perron
Jim Fougere
Janusz Czyzowski
Colin Lentz

(When viewing these minutes online, click on an attendee to send an e-mail)

PRESENTATIONS/ PROJECTS REVIEWED THIS MONTH: *(minutes on subsequent pages)*

Finalization of March 21 st 2018 Natural Resource Agency Meeting Minutes.....	2
Derry- Londonderry, #13065 (IM-0931(201))	2
Newington-Dover, #11238S (NHS-027-1(037)).....	5
Alexandria, #15937 (X-A1(047)).....	7
Concord-Pembroke, #41267 (X-A004(575))	8
Portsmouth-Kittery, #15731 (A000(909)).....	10
Hinsdale-Brattleboro, #12210C (A004(152))	11
Haverhill-Benton, #41297 (X-A004(587)).....	13
Westmoreland, #41624 (Non-Federal).....	14

(When viewing these minutes online, click on a project to zoom to the minutes for that project)

all authorized under a single permit. NHDOT would need to apply for an amendment to that permit. If the rehabilitation alternative is chosen the work can be handled within the existing permit.

Mike Hicks asked if the current Newington-Dover permit addressed the GSB rehabilitation, and if a new permit application would be submitted or would a permit amendment be requested? Keith replied that NHDOT would be requesting an amendment of the Corps permit, but that the NHDES permit will be expired, so a new application would be submitted to NHDES. Mike asked that NHDOT send a pdf of the presentation used during the meeting. Mike also asked whether the existing piers would be modified? Keith explained that alternative 4 is the only one that would propose any work on the existing piers. All other alternatives would re-use the existing piers.

This project has been previously discussed at the 12/20/2017, 8/20/2014, 6/18/2014, 3/19/2014, 3/21/2012, 8/17/2011, 8/19/2009, 10/15/2008, 3/21/2007, 2/21/2006, 12/14/2005, 11/2/2005, 8/17/2005, 7/20/2005, Monthly Natural Resource Agency Coordination Meetings.

Alexandria, #15937 (X-A1(047))

Chris Carucci described the culvert rehabilitation project funded under the Federal Culvert Rehabilitation Program at two locations on NH 104 in Alexandria. The existing culverts are 60 inch and 66 inch corrugated aluminum pipes that were constructed in 1965 and have severe corrosion at the top of the pipes. The proposed advertising date is August 2018 with construction occurring in the Summer of 2019. Both culvert outlets are about 200 feet from the Smith River and within Shoreland jurisdiction.

Location 1 is a 128 foot long 60 inch culvert with stone headwalls. The culvert conveys a Tier 2 perennial stream with a 294 acres watershed. Hydraulic capacity is about 200 cfs. Bypass flows would be directed to an adjacent wetland where an existing 18 inch pipe would convey the water under NH 104. Location 2 is a 86 foot long 66 inch culvert with stone headwalls. The culvert conveys a Tier 2 intermittent stream with a 224 acre watershed. Hydraulic capacity is estimated at 280 cfs. Neither culvert is within the Smith River floodplain.

Replacement options were evaluated. Due to the height of the fill, around 16 - 18 feet at Location 1, and 8 -10 feet for Location 2, replacement would involve the closure of NH 104 for about a month. Traffic volume is about 2,800 vpd, with no easy detour on State routes with east-west through traffic needing to go through Franklin to access NH 11 and US 4. The replacement structures with a 1.2 X bankfull width, would be box culverts with 9 to 10 feet spans, with a cost estimate of \$500,000 each, not including PE and ROW costs.

The preferred alternative is to slip line the culverts with smaller corrugated metal pipes of 54 inch at Location 1 and 60 inch at Location 2. Existing capacity can be maintained using a liner with spiral corrugation, which has a roughness coefficient similar to concrete pipe. The inlet efficiency would be enhanced by constructing a 45% bevel. These changes will increase the outlet velocity, so a 20 to 25 foot long stone apron / channel lining is proposed at the outlets to dissipate energy and reduce velocity. A small amount of stone is also proposed at the inlets to protect the headwalls. The existing headwalls will be repaired. Cost for the slipline option would be \$50,000 to \$60,000 per location. The new pipes are anticipated to be pushed from the outlets. Access to

construct them would be through the guardrail along the existing fill slopes. There may be temporary impacts to an adjacent scrub-shrub wetland at Location 2 to access its outlet side.

Location 1 upstream impacts are estimated at 35 square feet permanent wetland, with 5 linear feet of stream and 500 square feet of temporary; and downstream impacts at 250 square feet permanent wetland, with 20 linear feet of stream and 200 square feet of temporary. Location 2 upstream impacts are estimated at 50 square feet permanent wetland, with 5 linear feet of stream and 500 square feet of temporary; and downstream impacts at 350 square feet permanent wetland, with 20 linear feet of stream and 1,600 square feet of temporary (including access through the adjacent scrub-shrub wetland). For total impacts of 650 square feet permanent wetland, 50 linear feet of stream and 3,000 square feet of temporary.

Matt Urban stated that the new stone apron impacts will be mitigated through an ARM fund payment. Carol Henderson and Lori Sommer inquired about the potential for perched conditions. Chris C. stated that the potential perched conditions will be eliminated with the addition of stone aprons to match the inlets and outlets elevations. Carol H. stated that corrugated is more beneficial for aquatic organism passage. Amy Lamb stated that there were no endangered species concerns. Jim Rousseau mentioned that the culverts were deemed as bridges, but are non-navigable. There were no objections to the project as presented.

This project has not been previously discussed at a Monthly Natural Resource Agency Coordination Meeting.

Concord-Pembroke, #41267 (X-A004(575))

Chris Carucci, NHDOT Bureau of Highway Design, gave an introduction to the project including the location and scope of work. This is a culvert rehabilitation project funded under the Federal Culvert Rehabilitation Program and includes two locations under I-393, a single 84" corrugated metal pipe (CMP) and twin 54" CMPs, both constructed in 1987 with moderate rusting of the invert area. This effort is being made to repair these pipes while it is still feasible and before further deterioration occurs and costs and impacts associated with rehabilitation increase.

Location 1 includes the single 84" CMP which carries Cemetery Brook under I-393 just west of Exit 3 in Concord. This pipe is 394' long with stone headwalls, a 2.2% slope, and 9'-11' of roadway fill over the pipe. Streamstats indicated a drainage area of 0.68 square miles, or 435 acres. A field check incorporating closed drainage system inputs indicated a drainage area of 455 acres, both measurements would classify this as a Tier 2 stream crossing. The Streamstats Q50 is 77 cubic feet per second (CFS), the TR55 method predicts a Q50 of 130 CFS (based on 6.2" of rain over 24 hours), and one FHWA regression method predicts a range of 122 – 187 CFS. The current hydraulic capacity is approximately 345 CFS, based on a headwater depth of 8' which is the elevation of the lowest connected catch basin (CB).

Location 2 includes the twin 54" CMPs which carry an unnamed tributary under I-393 to outlet into the Soucook River. These pipes are 275' long with stone headwalls, a 10% slope and 8'-16' of roadway fill over the pipes. Streamstats indicated a drainage area of 0.82 square miles, or 528 acres. A field check incorporating closed drainage system inputs indicated a drainage area of 540 acres, both measurements would classify this as a Tier 2 stream crossing. The Streamstats Q50 is

Alexandria, #15937

Mitigation Narrative

The Department is proposing to rehabilitate two corrugated aluminum culverts carrying unnamed streams under NH Route 104. Location 1 is a 60" x 128' long culvert and is located 850' east of Bog Road. Location 2 is a 66" x 86' long culvert and is located 290' east of Berry Road. Both culverts will be rehabilitated by sliplining with a corrugated metal pipe liner. New stone lining will be placed at the culvert inlets and outlets, and existing stone headwalls will be repaired.

The Department is proposing a single one-time payment into the arm fund in the amount of \$24,520.32. The Department discussed mitigation with NHDES at the April 18, 2018 Natural Resource Agency meeting (see minutes). It was agreed that the new stone graded aprons would need to be mitigated and would be through an in-lieu ARM fund payment. Impacts through the pipe are for protection of existing infrastructure (Envt-wt 302.03(C)(2)c.) and are not included in the mitigation calculation.

That said, the Department is proposing to mitigate 24LF of bank left, 24LF of bank right, and 24LF of channel impact at location one to a perennial stream and 27 LF of channel impact to an intermittent stream at location two. Using the Arm-Fund calculator this equates to a total of \$24,520.32.

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

INSERT LINEAR FEET OF IMPACT on BOTH BANKS AND CHANNEL		
	Right Bank	24.00
	Left Bank	24.0000
	Channel	51.0000
	TOTAL IMPACT	99.0000
	Stream Impact Cost:	\$20,433.60
	NHDES Administrative cost:	
		\$4,086.72
***** TOTAL ARM FUND STREAM PAYMENT*****		
		\$24,520.32

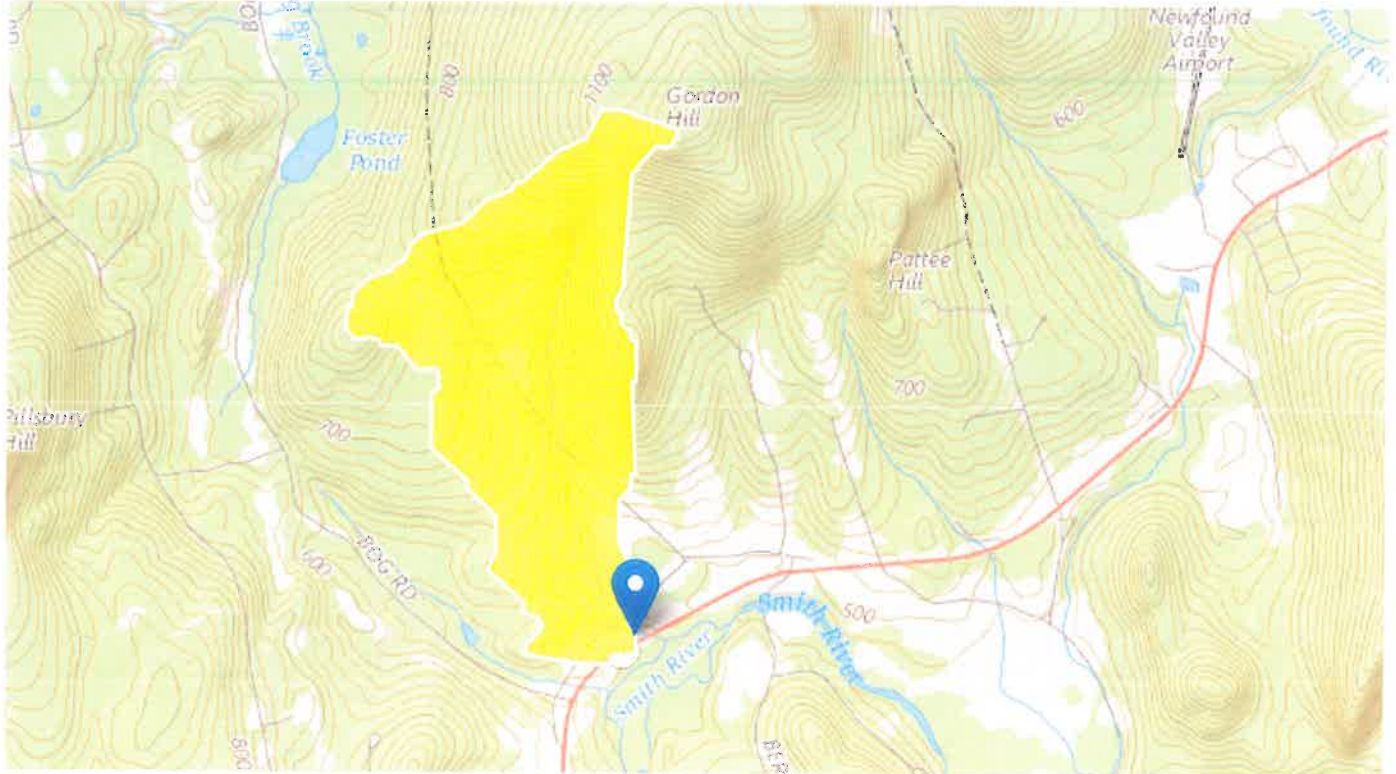
Alexandria 15937 - Culvert 1 StreamStats Report

Region ID: NH

Workspace ID: NH20180406121142318000

Clicked Point (Latitude, Longitude): 43.57288, -71.77661

Time: 2018-04-06 08:11:56 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.45	square miles
WETLAND	Percentage of Wetlands	0.3005	percent
ELEVMAX	Maximum basin elevation	1197.221	feet
BSLDEM30M	Mean basin slope computed from 30 m DEM	14.756	percent



PROJECT	Alexandria	ROUTE	NH Route 104
PROJECT NO.	15937	DATE	6/1/2018
CALCULATED BY	CAC	DATE	6/5/2018
CHECKED BY	JUN	SHEET	1 OF 2
SUBJECT	Stream Crossings		

Location 1

NH 104 Sta 317+50 Un-named stream Wetland ID# P1 & P2, Class R2UB1/2 Tier 2 Stream Crossing

Existing Conditions: **Drainage Area** 0.46 sq miles (293 acres) from Streamstats

Existing Pipe	60" Corrugated Alum	Upstream Inv	491.39	
	Length (ft)	128	Downstream Inv	488.75
	Slope	2.1%	Manning's n - 0.028	

General:

The existing pipe was constructed by Project P4948, Plans dated 1963.
No significant changes or repairs observed or documented.
No reports of flooding or damage to roadway or private property related to this crossing.
Field review of the drainage boundary compared favorably with Streamstats. Minor smoothing of the boundary resulted in an area of 291.5 AC
Elevations are from NHDOT Survey unless otherwise noted.

Inlet Conditions:

Top of headwall elevation approx 497.5 (about 6' above invert).
Top of roadway embankment is about El 515 (approx 20' of fill over top of pipe)
Headwater is contained within the 499' contour. At headwater elevations above El 499.2 flow will bypass to the east and flow to the next culvert crossing (an 18 pipe at Sta 319+90).
No public or private infrastructure evident below El 499
The headwall has some loose / missing stones and mortar needs re-pointing.
The barrel has significant corrosion along the top. The remainder of the barrel is in good condition with good shape and alignment.
The upstream channel has some bank erosion, sediment deposits, and a large amount of dead woody debris.

Outlet conditions:

Top of headwall elevation approx 495.1 (about 6.3' above invert).
Top of roadway embankment is about El 514.5 (approx 20' of fill over top of pipe).
The headwall has some loose / missing stones and mortar needs re-pointing.
The barrel condition similar to inlet side. Outlet invert matches streambed.
Field review found no evidence of erosion or sedimentation in the vicinity of the outlet.
Downstream channel width varies from 5' to 7', with an average slope of 1%.
The channel extends about 200' through a wooded area and connects to the Smith River.

Design Flow:

Streamstats Q50 = 121 cfs Drainage area is under the minimum limit of 0.7 sq miles, so a confidence interval is not provided.
An alternate regression method (FHWA Report RD-77-159) predicts the Q50 between 115 cfs and 148 cfs
The SCS Method (TR-55) predicts a Q50 of 194 cfs, based on 6.04" of rain in a 24 hour period.
Design flows will be set at the high end of the regression range. Q50 = 150 cfs

Hydraulic capacity:

Hydraulic analysis is from FHWA's HY-8 culvert analysis program.
Q50 Headwater elevation is 497.0 (about 5.6' Depth over invert, HW/D = 1.12) (Inlet Control)
Q50 outlet velocity 10 ft/s
Hydraulic capacity just prior to bypass flow (El 499.2) is 203 cfs (about 7.8' depth, HW/D = 1.56) (Outlet Control)
The change from inlet control to outlet control occurs at about 150 cfs.



PROJECT	Alexandria	ROUTE	NH Route 104
PROJECT NO.	15937	DATE	6/1/2018
CALCULATED BY	CAC	DATE	6/5/2018
CHECKED BY	JUN	SHEET	2 OF 2
SUBJECT	Stream Crossings		

Location 1

NH 104 Sta 317+50 Un-named stream Wetland ID# P1 & P2, Class R2UB1/2 Tier 2 Stream Crossing

Proposed Design: Drainage Area Same as existing

The proposed treatment is rehabilitation by sliplining. Allowing for clearance, the maximum size liner is 54" diameter. A corrugated interior is preferred for aquatic organism passage.

For culverts operating in inlet control, headwater elevation can be decreased by improving inlet geometry. Include a 1.5:1 (33 degree) beveled transition from the 54" liner to the 60" existing diameter at the inlet end. Since the culvert operates in outlet control at high flows, a smoother barrel will improve performance. Use a metal liner with spiral corrugations ($n = 0.012$). Significant velocity increase anticipated. Stone fill will be placed within the limits of the upstream headwall, to make a smooth transition from existing stream bed to the new pipe invert and to protect the headwall from scour. The downstream channel will be lined with stone fill to dissipate energy and reduce velocity and will make a smooth transition from new outlet invert to existing stream bed.

Design Flow:

No change to Design Flow as a result of the project. **Q50 = 150 cfs**

Hydraulic capacity:

Hydraulic analysis is from FHWA's HY-8 culvert analysis program.

54" metal liner, spiral corrugations ($n=0.012$), 1.5:1 beveled inlet:

Q50 Headwater elevation is 497.36 (about 5.8' Depth over invert, $HW/D = 1.29$) (Inlet Control)

Q50 outlet velocity 16 ft/s

At the Design Flow, headwater increase (about 4") will not be significant and the increased outlet velocity will be mitigated by the proposed stone lining.

Hydraulic capacity just prior to bypass flow (EI 499.2) is 199 cfs (about a 2% decrease)

The rehabilitated culvert will operate in inlet control at all flows.

Alternatives:

The culvert has performed well for 50 years, with no reports of flooding or damage, and analysis indicates the crossing has adequate capacity.

Replacement would involve significantly more costs and impacts to NH 104 due to the fill height and more wetland impacts for access and water diversion.

Replacement in-kind or with a larger structure are not considered to be practicable alternatives.

Other rehabilitation methods such as cured in place and sprayed on linings were considered, but are typically more expensive and do not provide the same level of structural capacity as a grouted liner.

**NH Department of Transportation
Bureau of Highway Design
Env-Wt 904.06 Repair or Rehabilitation of Tier 1 or Tier 2 Existing Legal Crossings**

15937 Alexandria Location 1 Existing 60" Corrugated Aluminum Pipe

See attached Stream Crossing Summary information

- In order to qualify under this section, the crossing cannot have a history of causing or contributing to flooding that damages the crossing or other infrastructure. Does the crossing have a history of flooding?
No, this culvert crossing (60" CAP) has no history of flooding.
- Repair or rehabilitation pursuant to this section may be accomplished by concrete repair, slip lining, cured-in-place lining, or concrete invert lining. Please describe how this applies to the subject project.
The culvert will be rehabilitated by slip lining with a corrugated metal liner pipe.

If the above criteria do not apply to this project, the crossing does not qualify under this section and must be designed according to 904.02 (Tier 1 crossings) or 904.05 (Tier 2 crossings).

If the above criteria apply to this project, please provide the following information.

The project may qualify as a **minimum** impact project if:

The crossing does not diminish the hydraulic capacity of the crossing.

The proposed rehabilitation will not have a significant effect on capacity. The rehabilitated culvert can pass the 50 year design flow without bypass, overtopping, or damage to public or private infrastructure.

The crossing does not diminish the capacity of the crossing to accommodate aquatic life passage.

The stream bed will be graded to meet the culvert's new inlet and outlet inverts, maintaining the capacity to accommodate passage of aquatic life. See Stream Crossings Summary Sheet and the Detail sheet (sheet 6) for more information.

The crossing meets the general design criteria specified in Env-Wt 904.01, as follows:

Env-Wt 904.01

(a) Not be a barrier to sediment transport;

The proposed rehabilitation will not reduce the culvert's ability to transport sediment.

(b) Prevent the restriction of high flows and maintain existing low flows;

The proposed rehabilitation will not significantly change high flow or low flow conditions. The rehabilitated culvert can pass the 50 year design flow without bypass, overtopping, or damage to public or private infrastructure.

(c) Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction;

The proposed rehabilitation will not obstruct or otherwise disrupt the movement of aquatic life beyond the actual duration of construction. Barrel roughness of the liner pipe is similar to concrete pipe (Manning's $n = 0.012$).

(d) Not cause an increase in the frequency of flooding or overtopping of banks;

The proposed rehabilitation will not have a significant effect on capacity. The Design Flow (Q50) is contained within the banks in existing and proposed conditions. Headwater elevation at the Design Flow does not impact any public or private infrastructure. See Stream Crossings Summary Sheet for more information.

(e) Preserve watercourse connectivity where it currently exists;

The proposed rehabilitation allows for the watercourse connectivity to remain as it is today. The placed riprap at the outlet and inlet of the structure will be graded to meet the inverts to maintain connectivity. See Stream Crossings Summary Sheet and the Detail sheet (sheet 6) for more information.

(f) Restore watercourse connectivity where: (1) Connectivity previously was disrupted as a result of human activity(ies); and(2) Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both;

The proposed rehabilitation will maintain the current connectivity. The existing structure is at grade with the stream. The corrugated lining will raise the invert of the pipe by about 2" at both the inlet and the outlet. Connectivity will be preserved by the placement of graded riprap to match the streambed to the new inlet and outlet invert elevations.

(g) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and

The proposed rehabilitation will not cause erosion, aggradation, or scouring. Stone lining will be added at the inlet side to prevent scouring under the headwall. Stone lining will be added to the downstream channel to dissipate energy and reduce velocity.

(h) Not cause water quality degradation.

The proposed rehabilitation will not have a permanent effect on water quality. Erosion control best management practices will be used to prevent degradation to water quality during construction.

If the project does not qualify as a minimum impact project due to reasons stated above, it may qualify as a **minor** impact project if:

The crossing does not adversely impact the stability of the stream banks or stream bed upstream or downstream of the crossing.

The proposed rehabilitation will not adversely impact the stability of the stream banks or stream bed upstream or downstream of the crossing. Stone lining will be added to the downstream channel to dissipate energy and reduce velocity.

The crossing does not cause an increase in the frequency of flooding or overtopping of banks.

The proposed rehabilitation will not have a significant effect on capacity. The Design Flow (Q50) is contained within the banks in existing and proposed conditions. Headwater elevation at the Design Flow does not impact any public or private infrastructure.

If the project does not meet the above criteria for minimum OR minor, the crossing does not qualify under this section and must be designed according to 904.02 (Tier 1 crossings) or 904.05 (Tier 2 crossings).

Alexandria 15937 - Culvert 2 StreamStats Report

Region ID:

Workspace ID:

Clicked Point (Latitude, Longitude):

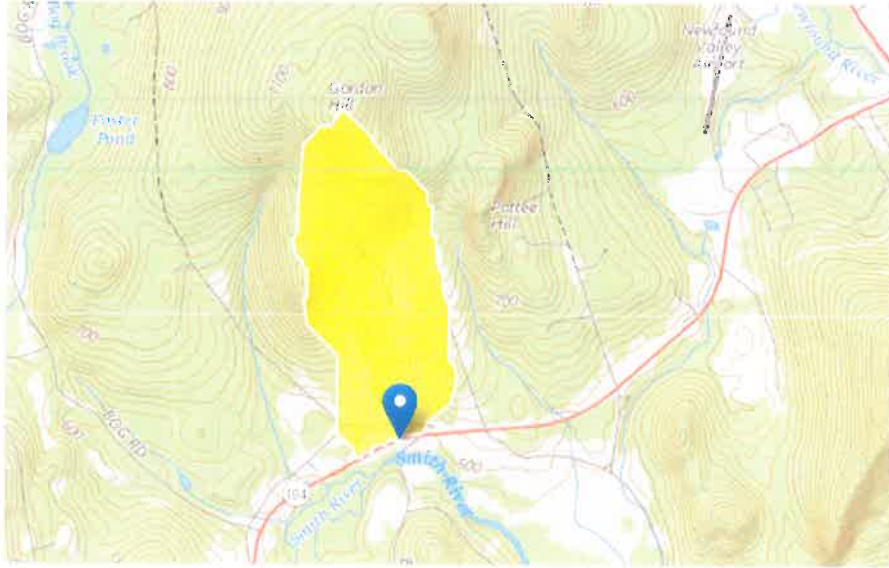
Time:

NH

NH20180406122229560000

43.57486, -71.77096

2018-04-06 08:22:43 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.35	square miles
WETLAND	Percentage of Wetlands	0	percent
ELEVMAX	Maximum basin elevation	1200.831	feet
BSLDEM30M	Mean basin slope computed from 30 m DEM	16.685	percent



PROJECT	Alexandria	ROUTE	NH Route 104
PROJECT NO.	15937	DATE	6/1/2018
CALCULATED BY	CAC	DATE	6/5/2018
CHECKED BY	JJN	SHEET	1 OF 2
SUBJECT	Stream Crossings		

Location 2

NH 104 Sta 336+15 Un-named stream Wetland ID# P8, Class R4SB3/4 Tier 2 Stream Crossing

Existing Conditions:	Drainage Area	0.35 sq miles (223.5 acres) from Streamstats	
		0.39 sq miles (251.5 acres) from field review	See Exhibit 1
	Existing Pipes	66" Corrugated Alum	Upstream Inv 481.07
		Length (ft) 86	Downstream Inv 479.93
		Slope 1.3%	Manning's n - 0.028

General:

The existing pipe was constructed by Project P4948, Plans dated 1963.
 No significant changes or repairs observed or documented.
 No reports of flooding or damage to roadway or private property related to this crossing.
 Field review indicated about 27 acres of additional drainage area flows to this culvert in the southwest corner of the boundary, due to a culvert crossing under Karl Gordon Rd.
 Elevations are from NHDOT Survey unless otherwise noted.

Inlet Conditions:

Top of headwall elevation approx 487.5 (about 6.4' above invert).
 Top of roadway embankment is about EI 496.5 (approx 10' of fill over top of pipe).
 The barrel has significant corrosion along the top. The remainder of the barrel is in good condition with good shape and alignment.
 Field review found no evidence of erosion. There is a small mound of sediment with vegetation about 3' upstream of the inlet and minor sediment accumulation in the barrel. Headwall has some loose stones and missing mortar.
 Headwater is contained within the 496' contour, which includes a substantial amount of field / pasture.
 At headwater elevations above EI 497, flow will overtop NH 104 at the culvert location, which is at the low point in the NH 104 profile.
 At headwater elevations above 487 (about 6' depth), the adjacent fields will have significant ponding.

Outlet conditions:

Top of headwall elevation approx 486.5 (about 6.5' above invert).
 Top of roadway embankment is about EI 495 (approx 10' of fill over top of pipe)
 The barrel condition similar to inlet side. Outlet invert matches streambed.
 Field review found no evidence of erosion or sedimentation in the vicinity of the outlet.
 Downstream channel is about 4' wide, with an average slope of 1.5%.
 The channel extends about 100' through a wooded area to the next downstream structure, a 46" wide x 71" high metal arch culvert crossing under Berry Rd.

Design Flow:

Streamstats Q50 = 104 cfs (based on the 0.35 sq mile area). Drainage area is under the minimum limit of 0.7 sq miles, so a confidence interval is not provided.
 An alternate regression method (FHWA Report RD-77-159) predicts the Q50 between 154 cfs and 178 cfs
 The SCS Method (TR-55) predicts a Q50 of 199 cfs, based on 6.04" of rain in a 24 hour period.

Design flows will be set at the high end of the regression range. Q50 = 175 cfs

Hydraulic capacity:

Hydraulic analysis is from FHWA's HY-8 culvert analysis program.
 Q50 Headwater elevation is 487.16 (about 6.1' Depth over invert, HW/D = 1.1) (Outlet Control)
 Q50 outlet velocity 10.3 ft/s
 Hydraulic capacity just prior to overtopping (EI 497) is 391 cfs (about 16' depth, HW/D = 2.9) (Outlet Control)



PROJECT	Alexandria	ROUTE	NH Route 104
PROJECT NO.	15937	DATE	6/1/2018
CALCULATED BY	CAC	DATE	6/5/2018
CHECKED BY	JJN	SHEET	2 OF 2
SUBJECT	Stream Crossings		

Location 2

NH 104 Sta 336+15 Un-named stream Wetland ID# P8, Class R4SB3/4 Tier 2 Stream Crossing

Proposed Design: **Drainage Area** Same as existing

The proposed treatment is rehabilitation by sliplining. Allowing for clearance, the maximum size liner is 60" diameter. A corrugated interior is preferred for aquatic organism passage.

For culverts operating in inlet control, headwater elevation can be decreased by improving inlet geometry. Include a 1.5:1 (33 degree) beveled transition from the 54" liner to the 60" existing diameter at the inlet end. Since the culvert operates in outlet control at high flows, a smoother barrel will improve performance. Use a metal liner with spiral corrugations ($n = 0.012$). Significant velocity increase anticipated. Stone fill will be placed within the limits of the upstream headwall, to make a smooth transition from existing stream bed to the new pipe invert and to protect the headwall from scour. The downstream channel will be lined with stone fill to dissipate energy and reduce velocity and will make a smooth transition from new outlet invert to existing stream bed.

Design Flow:

No change to Design Flow as a result of the project. **Q50 = 175 cfs**

Hydraulic capacity:

Hydraulic analysis is from FHWA's HY-8 culvert analysis program.
60" metal liner, spiral corrugations ($n=0.012$), 1.5:1 beveled inlet:
Q50 Headwater elevation is 487.15 (about 5.9' Depth over invert, $HW/D = 1.16$) (Inlet Control)
Q50 outlet velocity 14 ft/s
At the Design Flow, headwater is about the same as existing and the increased outlet velocity will be mitigated by the proposed stone lining.
Hydraulic capacity just prior to overtopping (EI 497.0) is 417 cfs (about a 7% increase)
The rehabilitated culvert will operate in inlet control at all flows.

Alternatives:

The culvert has performed well for 50 years, with no reports of flooding or damage, and analysis indicates the crossing has adequate capacity.
Replacement would involve significantly more costs and impacts to NH 104 due to the fill height and more wetland impacts for access and water diversion.
Replacement in-kind or with a larger structure are not considered to be practicable alternatives.
Other rehabilitation methods such as cured in place and sprayed on linings were considered, but are typically more expensive and do not provide the same level of structural capacity as a grouted liner.

**NH Department of Transportation
Bureau of Highway Design
Env-Wt 904.06 Repair or Rehabilitation of Tier 1 or Tier 2 Existing Legal Crossings**

15937 Alexandria Location 2 Existing 66" Corrugated Aluminum Pipe

See attached Stream Crossing Summary information

- In order to qualify under this section, the crossing cannot have a history of causing or contributing to flooding that damages the crossing or other infrastructure. Does the crossing have a history of flooding?
No, this culvert crossing (66" CAP) has no history of flooding.
- Repair or rehabilitation pursuant to this section may be accomplished by concrete repair, slip lining, cured-in-place lining, or concrete invert lining. Please describe how this applies to the subject project.
The culvert will be rehabilitated by slip lining with a corrugated metal liner pipe.

If the above criteria do not apply to this project, the crossing does not qualify under this section and must be designed according to 904.02 (Tier 1 crossings) or 904.05 (Tier 2 crossings).

If the above criteria apply to this project, please provide the following information.

The project may qualify as a **minimum** impact project if:

The crossing does not diminish the hydraulic capacity of the crossing.

The proposed rehabilitation will not have a significant effect on capacity. The rehabilitated culvert can pass the 50 year design flow without bypass, overtopping, or damage to public or private infrastructure.

The crossing does not diminish the capacity of the crossing to accommodate aquatic life passage.

The stream bed will be graded to meet the culvert's new inlet and outlet inverts, maintaining the capacity to accommodate passage of aquatic life. See Stream Crossings Summary Sheet and the Detail sheet (sheet 7) for more information.

The crossing meets the general design criteria specified in Env-Wt 904.01, as follows:

Env-Wt 904.01

(a) Not be a barrier to sediment transport;

The proposed rehabilitation will not reduce the culvert's ability to transport sediment.

(b) Prevent the restriction of high flows and maintain existing low flows;

The proposed rehabilitation will not significantly change high flow or low flow conditions. The rehabilitated culvert can pass the 50 year design flow without bypass, overtopping, or damage to public or private infrastructure.

(c) Not obstruct or otherwise substantially disrupt the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction;

The proposed rehabilitation will not obstruct or otherwise disrupt the movement of aquatic life beyond the actual duration of construction. Barrel roughness of the liner pipe is similar to concrete pipe (Manning's $n = 0.012$).

(d) Not cause an increase in the frequency of flooding or overtopping of banks;

The proposed rehabilitation will not have a significant effect on capacity. Headwater elevation and extent of ponding will not be significantly different from the existing condition. See Stream Crossings Summary Sheet for more information.

(e) Preserve watercourse connectivity where it currently exists;

The proposed rehabilitation allows for the watercourse connectivity to remain as it is today. See Stream Crossings Summary Sheet and the Detail sheet (sheet 7) for more information.

(f) Restore watercourse connectivity where: (1) Connectivity previously was disrupted as a result of human activity(ies); and(2) Restoration of connectivity will benefit aquatic life upstream or downstream of the crossing, or both;

The proposed rehabilitation will maintain the current connectivity. The corrugated lining will raise the invert of the pipe by about 2" at both the inlet and the outlet. Connectivity will be preserved by the placement of graded riprap to match the streambed to the new inlet and outlet invert elevations.

(g) Not cause erosion, aggradation, or scouring upstream or downstream of the crossing; and

The proposed rehabilitation will not cause erosion, aggradation, or scouring. Stone lining will be added at the inlet side to prevent scouring under the headwall. Stone lining will be added to the downstream channel to dissipate energy and reduce velocity.

(h) Not cause water quality degradation.

The proposed rehabilitation will not have a permanent effect on water quality. Erosion control best management practices will be used to prevent degradation to water quality during construction.

If the project does not qualify as a minimum impact project due to reasons stated above, it may qualify as a **minor** impact project if:

The crossing does not adversely impact the stability of the stream banks or stream bed upstream or downstream of the crossing.

The proposed rehabilitation will not adversely impact the stability of the stream banks or stream bed upstream or downstream of the crossing. Stone lining will be added to the downstream channel to dissipate energy and reduce velocity.

The crossing does not cause an increase in the frequency of flooding or overtopping of banks.

The proposed rehabilitation will not have a significant effect on capacity. Headwater elevation and extent of ponding will not be significantly different from the existing condition.

If the project does not meet the above criteria for minimum OR minor, the crossing does not qualify under this section and must be designed according to 904.02 (Tier 1 crossings) or 904.05 (Tier 2 crossings).



US Army Corps
of Engineers[®]
New England District

U.S. Army Corps of Engineers
New Hampshire Programmatic General Permit (PGP)
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 PGP, 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, shellfish beds, special wetlands and vernal pools (see PGP, GC 26 and Appendix A)? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) website, www.nhnaturalheritage.org , specifically the book <u>Natural Community Systems of New Hampshire</u> .		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
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 size of the existing impervious surface area?	NA	
2.7 What is the size of the proposed impervious surface area?	NA	
2.8 What is the % of the impervious area (new and existing) to the overall project site?	NA	
3. Wildlife	Yes	No
3.1 Has the NHB 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 a NHB determination.)		
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: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html. 		
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 PGP, GC 21?	X	

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?	NA	
5. Historic/Archaeological Resources		
If a minor or major impact project, has a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) been sent to the NH Division of Historical Resources as required on Page 5 of the PGP?*	X	

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

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



New Hampshire Natural Heritage Bureau

To: Marc Laurin
7 Hazen Drive
Concord, NH 03301

Date: 4/5/2018

From: NH Natural Heritage Bureau

Re: Review by NH Natural Heritage Bureau of request dated 4/5/2018
NHB File ID: NHB18-1074

Applicant: NHDOT

Location: Tax Map(s)/Lot(s):
Alexandria

Project Description: Slip line the corrugated aluminum culvert due to corrosion occurring along the top of the culvert

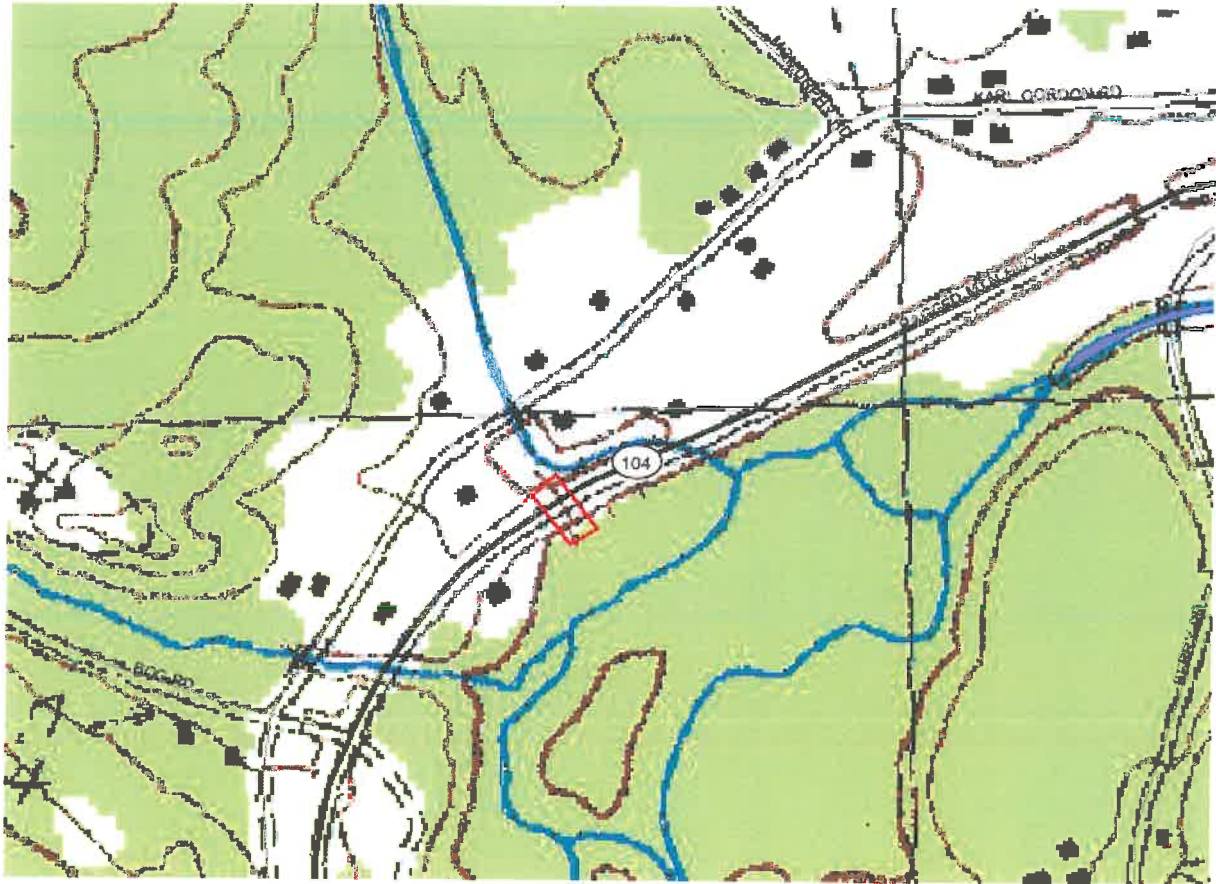
The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

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.

This report is valid through 4/4/2019.



MAP OF PROJECT BOUNDARIES FOR NHB FILE ID: NHB18-1074





New Hampshire Natural Heritage Bureau

To: Marc Laurin
7 Hazen Drive
Concord, NH 03301

Date: 4/5/2018

From: NH Natural Heritage Bureau

Re: Review by NH Natural Heritage Bureau of request dated 4/5/2018

NHB File ID: NHB18-1075

Applicant: NHDOT

Location: Tax Map(s)/Lot(s):
Alexandria

Project Description: Slip-line the corrugated aluminum culvert due to corrosion occurring along the top of the culvert.

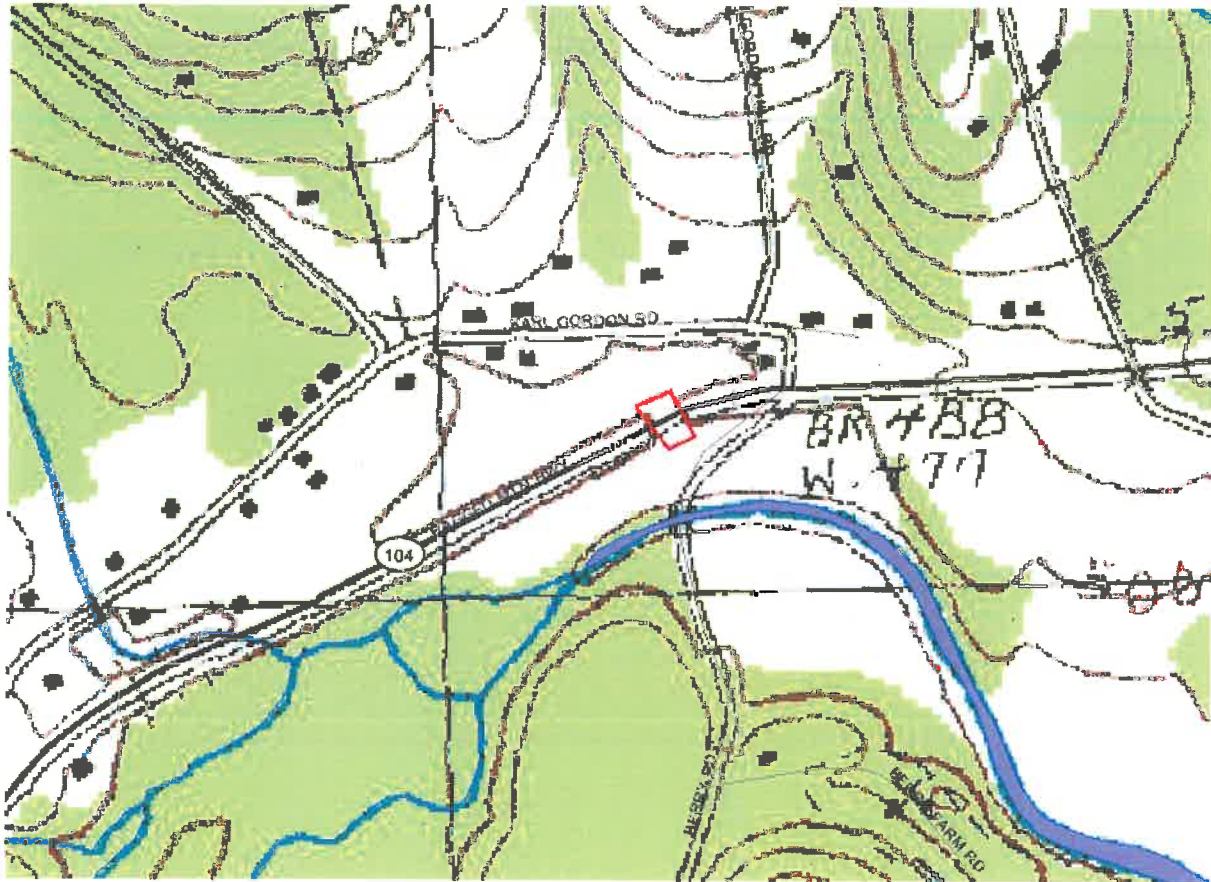
The NH Natural Heritage database has been checked for records of rare species and exemplary natural communities near the area mapped below. The species considered include those listed as Threatened or Endangered by either the state of New Hampshire or the federal government. We currently have no recorded occurrences for sensitive species near this project area.

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.

This report is valid through 4/4/2019.



MAP OF PROJECT BOUNDARIES FOR NHB FILE ID: NHB18-1075





United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:

May 11, 2018

Consultation Code: 05E1NE00-2018-SLI-1810

Event Code: 05E1NE00-2018-E-04177

Project Name: Alexandria, 15937 Culvert #1

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2018-SLI-1810

Event Code: 05E1NE00-2018-E-04177

Project Name: Alexandria, 15937 Culvert #1

Project Type: TRANSPORTATION

Project Description: Rehabilitation of 128 foot long 60 inch corrugated aluminum culvert by slip lining with a smaller 54 inch corrugated metal pipe. Project will be constructed in the Summer of 2019.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/43.57239793393815N71.77726161588421W>



Counties: Grafton, NH

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [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.

Mammals

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

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
<http://www.fws.gov/newengland>

In Reply Refer To:
Consultation Code: 05E1NE00-2018-SLI-1811
Event Code: 05E1NE00-2018-E-04179
Project Name: Alexandria, 15937 Culvert # 2

May 11, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

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A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2018-SLI-1811

Event Code: 05E1NE00-2018-E-04179

Project Name: Alexandria, 15937 Culvert # 2

Project Type: TRANSPORTATION

Project Description: Rehabilitation of an 86 foot long 66 inch corrugated aluminum culvert by slip lining with a smaller 60 inch corrugated metal pipe. Construction will occur in the Summer of 2019.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/43.5748602028208N71.7707311437631W>



Counties: Grafton, NH

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [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.

Mammals

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

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Projects with Minimal Potential to Cause Effects

Date Reviewed: 7/9/2018

Project Name: Alexandria

State Number: 15937

FHWA Number: X-A0001(047)

Environmental Contact: Marc Laurin

DOT

Email Address: marc.laurin@dot.nh.gov

Project Manager: Tobey Reynolds

Project Description: The Proposed Action consists of the rehabilitation of two culverts on NH Route 104 in Alexandria. These two large, 60 inch and 66 inch, corrugated aluminum culverts constructed in 1965 will be rehabilitated by slip-lining the culverts. Their channels will require minor reconstruction, and placing of a small amount of stone at their inlets and outlets to protect the headwalls. The existing stone headwalls will be repaired as needed by replacing missing stones and repointed.

Please select the applicable undertaking type(s):

<input type="checkbox"/>	1. Modernization and general highway maintenance that may require additional highway right-of-way or easement , and which is not within the boundaries of a historic property or district , including: f. ditching, provided excavation does not exceed 8" and is not located within 25' of a cemetery g. median barrier installation
<input checked="" type="checkbox"/>	2. Non-historic bridge and culvert maintenance, renovation, or total replacement, that may require minor additional right-of-way or easement , and which is not within the boundaries of a historic property or district , including: a. replacement of maintenance of drainage pipes and culverts made of steel, plastic and concrete <i>Choose an item</i>
<input type="checkbox"/>	3. Historic bridge maintenance activities within the limits of existing right-of-way, including: <i>Choose an item</i> <i>Choose an item</i>
<input type="checkbox"/>	4. Stream stabilization and restoration activities (including removal of debris or sediment obstructing the natural waterway, or any non-invasive action to restore natural conditions).
<input type="checkbox"/>	5. Construction of bicycle lanes and pedestrian walkways, sidewalks, shared-use paths and facilities, small passenger shelters, and alterations to facilities or vehicles in order to make them accessible for elderly and handicapped persons, not within the boundaries of a historic property or district .
<input type="checkbox"/>	6. Installation of bicycle racks, not within the boundaries of a historic property or district .
<input type="checkbox"/>	7. Recreational trail construction, not within the boundaries of a historic property or district .
<input type="checkbox"/>	8. Recreational trail maintenance when done on existing alignment.
<input type="checkbox"/>	9. Modernization, maintenance, and safety improvements of railroad facilities within the existing railroad or highway right-of-way, not within the boundaries of a historic property or district, and no historic railroad features are impacted , including, but not limited to: <i>Choose an item</i> <i>Choose an item</i>
<input type="checkbox"/>	10. Acquisition or renewal of scenic, conservation, habitat, or other land preservation easements
<input type="checkbox"/>	11. Installation of Intelligent Transportation Systems.

Please describe how this project is applicable under Appendix B of the Programmatic Agreement.

Section 106 Programmatic Agreement – Cultural Resources Review Effect Finding

Appendix B Certification – Projects with Minimal Potential to Cause Effects

The culverts are corrugated aluminum pipes constructed in 1965. A review of the impacts determined that there is no potential sensitivity for archaeological site within the APE, nor recorded within one mile of the project area. The Proposed Action will occur within the roadway Right-of Way or within previously impacted areas adjacent to the roadway. The project will not directly or indirectly impact the integrity of potential historic properties located within the project limits. These adjacent parcels contain residences, constructed in 1981, 1955, 1941 and 1935, that are located 200 feet or greater from the work area and the culverts are not visually apparent from the houses.


NHDOT in-house projects: Please append photographs, USGS maps, design plans and as-built plans, if available, for review.

LPA projects: Please submit this Certification Form along with the Transportation RPR

Coordination Efforts:

Has an RPR been submitted to NHDOT for this project?	No	NHDHR R&C # assigned?	Click here to enter text.
Please identify public outreach effort contacts; method of outreach and date:	The Department has coordinated with Town officials, including the Historical Society, through informational letters sent in November 2017. No replies/concerns were received.		

Finding: (To be filled out by NHDOT Cultural Resources Staff)

<input checked="" type="checkbox"/> No Potential to Cause Effects	<input type="checkbox"/> No Historic Properties Affected
This finding serves as the Section 106 Memorandum for your environmental documents, no further coordination is necessary.	
<input type="checkbox"/>	This project does not comply with Appendix B, and will continue under the Section 106 review process outlined in 36 CFR 800.3-800.7. Please contact NHDOT Cultural Resources Staff to determine next steps.
NHDOT comments:	
 <hr/> NHDOT Cultural Resources Staff	7/12/2018 <hr/> Date

Coordination of the Section 106 process should begin as early as possible in the planning phase of the project (undertaking) so as not to cause a delay.

Project sponsors should not predetermine a Section 106 finding under the assumption that an undertaking conforms to the types listed in Appendix B until this form is signed by the NHDOT Bureau of Environment Cultural Resources Program staff.

Every project shall be coordinated with, and reviewed by the NHDOT-BOE Cultural Resources Program in accordance with the Cultural Resources Programmatic Agreement among the Advisory Council on Historic Preservation, Federal Highway Administration, NH Department of Transportation, and the State Historic Preservation Office. In accordance with the Advisory Council's regulations, we will continue to consult, as appropriate, as this project proceeds.

If any portion of the undertaking is not entirely limited to any one or a combination of the types specified in Appendix B (with, or without a portion that is included as a type listed in Appendix A), please continue discussions with NHDOT Cultural Resources staff.

This No Potential to Cause Effect or No Historic Properties Affected project determination is your Section 106 finding, as defined in the Programmatic Agreement.

Should project plans change, please inform the NHDOT Cultural Resources staff in accordance with Stipulation VII of the Programmatic Agreement.



US Army Corps
of Engineers
New England District

**U.S. Army Corps of Engineers
New Hampshire Programmatic General Permit (PGP)
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 PGP, 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, shellfish beds, special wetlands and vernal pools (see PGP, GC 26 and Appendix A)? Applicants may obtain information from the NH Department of Resources and Economic Development Natural Heritage Bureau (NHB) website, www.nhnaturalheritage.org , specifically the book <u>Natural Community Systems of New Hampshire</u> .		X
2.3 If wetland crossings are proposed, are they adequately designed to maintain hydrology, sediment transport & wildlife passage?	X	
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 size of the existing impervious surface area?		NA
2.7 What is the size of the proposed impervious surface area?		NA
2.8 What is the % of the impervious area (new and existing) to the overall project site?		NA
3. Wildlife	Yes	No
3.1 Has the NHB 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 a NHB determination.)		
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: www.wildlife.state.nh.us/Wildlife/Wildlife_Plan/highest_ranking_habitat.htm. • Data Mapper: www.granit.unh.edu. • GIS: www.granit.unh.edu/data/downloadfreedata/category/databycategory.html. 		
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 PGP, GC 21?	X	

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?	NA	
5. Historic/Archaeological Resources		
If a minor or major impact project, has a copy of the Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) been sent to the NH Division of Historical Resources as required on Page 5 of the PGP? **	X	

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

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



Figure 1. Impact Location A: Looking downstream toward 60" pipe inlet, Wetland P1. Photo taken by the NHDOT Bureau of Environment on 4/13/2018.



Figure 2. Impact Location B: inside of 60" pipe, inlet side, Wetland P1. Photo taken by the NHDOT Bureau Of Environment on 4/13/18.



Figure 3. Impact Location C: Outlet side of 60" pipe, Wetland P2. Photo taken by the NHDOT Bureau of Environment on 4/13/18.



Figure 4. Impact Location C: Looking downstream from 60" pipe outlet, Wetland P2. Photo taken by the NHDOT Bureau of Environment on 4/13/18.



Figure 5. Impact Location D: 66" pipe inlet, Wetland P8. Photo taken by the NHDOT Bureau of Environment on 4/13/18.



Figure 6. Impact Location D: Looking upstream from 66" pipe inlet, Wetland #P7 on left, Wetland #P9 on right. Photo taken by the NHDOT Bureau of Environment on 4/13/18.



Figure 7. Impact Location E: Inside 66" pipe, looking from outlet side, Wetland P8. Photo taken by the NHDOT Bureau of Environment on 4/13/18.



Figure 8. Impact Location F: Outlet side of 66" pipe, Wetland P8. Photo taken by the NHDOT Bureau of Environment on 4/13/18.



Figure 9. Impact Location F: Looking upstream toward outlet of 66" pipe. Wetland P12 on left, Wetland P13 on right. Photo taken by the NHDOT Bureau of Environment on 4/13/18.



Figure 10. Impact Location F: Looking east from outlet of 66" pipe, Wetland P13 on left, Berry Rd in background. Photo taken by the NHDOT Bureau of Environment on 4/13/18.



Figure 11. Impact Location F: Looking west from outlet of 66" pipe, Wetland P12 in foreground, Wetland P11 in background. Photo taken by the NHDOT Bureau of Environment on 4/13/18.

Alexandria 15937 – Construction Sequence

Both the 60” and the 66” culverts will be rehabilitated in the same manner described below:

1. Clear trees and brush as needed for access.
2. Install erosion control measures.
3. Install water diversion structure. Clean water bypass shall be through the existing pipe unless otherwise approved as part of the Contractor’s Erosion Control Plan.
4. Clean and inspect culverts.
5. Insert metal liner into existing culvert. Note – impacts are based on staging and inserting the liners from the outlet ends.
6. Fill the annular space between the liner and existing culvert with grout.
7. Place stone fill at inlet and outlet sides.
8. Remove the water diversion structure.
9. Seed and mulch disturbed areas.
10. Remove the erosion control measures.