





# D121 Transmission Line Structure and Optical Ground Wire Replacement Project Eversource Energy

Bow and Hooksett, New Hampshire

NHDES Alteration of Terrain Permit Application

May 17, 2021 File No. 04.0190999.38



PREPARED FOR: Eversource Energy Hooksett, New Hampshire

# GZA GeoEnvironmental, Inc.

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May 17, 2021 File No. 04.0190999.38

GEOTECHNICAL

ENVIRONMENTAL

ECOLOGICAL

WATER

CONSTRUCTION MANAGEMENT

5 Commerce Park North Suite 201 Bedford, NH 03110 T: 603.623.3600 F: 603.624.9463 www.gza.com Mr. Ridgely Mauck, P.E.
Program Supervisor - Permitting
NHDES Land Resources Management
Alteration of Terrain Bureau
29 Hazen Drive, PO Box 95
Concord, New Hampshire 03302

Re: Alteration of Terrain Permit
D121 Transmission Line Structure and Optical Ground Wire Replacement Project
Bow and Hooksett, New Hampshire

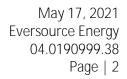
Dear Mr. Mauck:

On behalf of Public Service Company of New Hampshire dba Eversource Energy (Eversource), GZA GeoEnvironmental, Inc. (GZA) is submitting this Alteration of Terrain (AoT) Permit Application for the proposed D121 Transmission Line Structure and Optical Ground Wire (OPGW) Replacement Project in accordance with Terrain Alteration Law (RSA 485-A:17), Administrative Rules (Env-Wq 1500 Alteration of Terrain), and discussions between New Hampshire Department of Environmental Services (NHDES) AoT Bureau and Eversource.

The proposed project includes the replacement of 13 existing utility structures along the D121 Transmission Line. The project area crosses through portions of Bow and Hooksett, New Hampshire for a distance of approximately 2.2 miles. Replacement of the existing utility structures is necessary in order to maintain the safety and reliability of the system. Additionally, OPGW is proposed to replace existing static wire and improve the transmission line by serving to shield conductor wires below it from lightning and serve as a telecommunications path for internal communications. In order to more efficiently conduct routine maintenance of the existing D121 Transmission Line, work pad grading and access road improvements are proposed as part of this project. Based on the planned scope of work, we identified two separate proposed work areas in Bow and Hooksett that are subject to the Terrain Alteration Law and Rules referenced above.

The proposed project will require disturbance subject to AoT permitting through the NHDES as a result of impact areas cumulatively exceeding 100,000 square feet of contiguous disturbed area, (50,000 sq. ft. if within a protected shoreland).

In addition, included with this submittal is a copy of the application fee check, a completed AoT Permit Application Form, a detailed project overview narrative,





required plans and figures, and additional required materials. In addition, a waiver request for the preparation of a stormwater drainage report, drainage area plans, and hydrologic soil group plans is enclosed as required by Env-Wq 1509.04. The proposed project is scheduled to start in June 2021. Eversource appreciates the efforts of the Alteration of Terrain Bureau in helping to maintain the anticipated construction schedule, which is dependent on scheduled outages dictated by regional outage planning.

Please feel free to contact us with any questions.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Lindsey White

Lindsey White, Apprentice Wetland Scientist

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Attachments: Alteration of Terrain Permit Application

cc: Town of Bow, New Hampshire Town of Hooksett, New Hampshire



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# 1.0 PROJECT BACKGROUND AND PURPOSE

The proposed overall project involves the replacement of select D121 Transmission Line structures and OPGW replacement in portions of Bow, Hooksett, and Manchester, New Hampshire. Approximately 1.4 miles of the D121 Transmission Line is located within an existing 270-foot wide utility right-of-way (ROW) that includes the A253, C196, and Q171 Transmission Lines, and then turns southerly towards Manchester. In total, the D121 Transmission Line is approximately 11.2 miles in length and extends from the Merrimack Substation in Bow to the Eddy Substation in Manchester, New Hampshire. The proposed replacement structures are old and worn and must be replaced in order for the transmission line to continue to function safely and reliably. The proposed structure replacements were selected based on site visit evaluations, including pole and equipment condition, of the D121 Transmission Line. Additionally, Eversource plans to install OPGW to replace existing static wire and improve the transmission line by serving to shield conductor wires below it from lightning and serve as a telecommunications path for internal communications. Impacts have been minimized and avoided to the greatest extent practicable through site evaluations of access routes and work pad placements.

Recent transmission line inspections determined that a total of 13 existing utility structures along the D121 Transmission Line must be replaced due to environmental damage. The project requires approximately 303,075 square feet (sq. ft.) of total disturbance, including 28,824 sq. ft. of temporary wetland matting and 274,251 sq. ft. of ground disturbance. Two separate portions of the proposed structure replacement project are subject to the Alteration of Terrain disturbance threshold (Env-Wq 1500 and RSA 485-A:17), including (See Figure 4- Alteration of Terrain Permitting Plans and Appendix A – Alteration of Terrain Application Form):

- 1) Area A (Bow) approximately 151,297 sq. ft. of work pad grading and associated access improvements at D121 Structure 22 and Structures 26 to 31.
- 2) Area B (Hooksett)– approximately 122,954 sq. ft. of work pad grading and associated access improvements at D121 Structures 88 to 89 and Structures 95 to 98.

# 2.0 SITE INFORMATION

# 2.1 SITE LOCATION AND DESCRIPTION

The project area includes a small portion of the shared Q171, C196, and A253 Transmission Line ROW, and a portion of the D121 Transmission Line Right of Way (ROW) from Morgan Drive to Dicandra Drive in Bow, New Hampshire. The total work area in this portion of the ROW is approximately 1.4 miles in length and varies in width from approximately 500-ft (shared Q171, C196, and A253 ROW) to approximately 375-ft (D121 ROW).

The project area also includes the portion of the D121 Transmission Line ROW from D121 Structure 86 to Poore Road in Hooksett, New Hampshire. The total work area in this portion of the ROW is approximately 0.8 miles in length and approximately 375-ft in width.

The total project area is approximately 2.2 miles in length and includes the replacement of 13 utility structures in total. The project area primarily crosses privately owned rural/residential properties (see Figure 1 – USGS Topographic Map). There are approximately 37 wetlands along the project route located in the towns of Bow



and Hooksett. The majority of ground disturbance resulting from the project will be related to access and work pad preparations.

# 2.2 TAX MAP AND LOT(S)

Eversource holds easements across the majority of the parcels along the ROW with the exception of 3 Eversource-owned parcels located in Hooksett: Tax Map 28 Lot 17, Tax Map 37 Lot 50, and Tax Map 37 Lot 52 (see Figure 4).

There are approximately 17 abutting properties that contain existing Eversource easements for the ROW involved in the project. In those project locations, the easements are considered to be the "subject property" because Eversource is the applicant/owner and only has control over the easement. These abutters have been identified and listed on the enclosed abutters list. See Appendix B for Abutters List.

# 2.3 IDENTIFICATION OF NATURAL AND CULTURAL RESOURCES

GZA GeoEnvironmental, Inc. (GZA) has been retained by Eversource to provide professional services on this project that relate to natural and cultural resource identification and assessment as well as permit applications for natural resource and alteration of terrain impacts required to complete the project. GZA has conducted field evaluations and has corresponded with the appropriate agencies to identify natural and cultural resources present in the vicinity of the proposed project.

### 2.3.1 Identification of Jurisdictional Wetlands and Vernal Pools

Eversource provided GZA with delineated wetland data and classification of wetlands. Wetlands were delineated and classified by Normandeau Associates, Inc. in 2016. GZA confirmed wetland boundaries, photographed resources, completed additional wetland documentation, and recorded data relevant to functions and values provided by these natural resources within the ROW in March 2021. GZA confirmed wetland boundaries in accordance with the United States Army Corps of Engineers (ACOE) Wetlands Delineation Manual using the Routine Determinations Method, and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual as required by the New Hampshire Department of Environmental Services (NHDES) Wetlands Bureau and the ACOE.

GZA conducted a vernal pool evaluation in March 2021 in accordance with "Identification and Documentation of Vernal Pools in New Hampshire," 2016, New Hampshire Fish and Game Department, Nongame and Endangered Wildlife Program. Additional observations of vernal pools were conducted by GZA on April 20, 22, and 23, 2021 as part of a wildlife assessment (see Appendix D). Vernal pool areas exist as confined basins and must exhibit vernal pool criteria outlined in the New Hampshire Code of Administrative Rules, Env-Wt 101.75, 101.86, and 101.106. GZA staff encountered five areas considered potential vernal pools based on observed signs of hydrology. Two of these areas were confirmed as vernal pools by GZA during wildlife assessment field work on April 20, 22, and 23, 2021. All potential vernal pools are considered vernal pools for the purposes of impact avoidance and minimization for this project. Therefore, no temporary or permanent impacts are proposed to any potential vernal pools as a result of this project.

# 2.3.2 Identification of Surface Waters

Jurisdictional limits of surface waters of the State of New Hampshire were delineated by Normandeau Associates, Inc. in 2006 and updated by GZA in March 2021 in accordance with their definition in RSA 485-A:2 XIV, 482-A:4 II and





rule Env-Wt 101.97. Surface waters include wherever fresh water flows or stands and tidal waters. This includes, but is not limited to, rivers, perennial and intermittent streams, lakes, ponds, intertidal zones, and tidal waters. In addition, jurisdiction extends to the portion of any bank or shore which borders such surface waters, and to any swamp or bog subject to periodic flooding by fresh water including the surrounding shore. The limit of jurisdiction for surface water areas were confirmed as the top of bank, where a natural bank occurs or its ordinary high water mark where a natural bank is not present. There were no perennial streams identified within the project area.

# 2.3.3 Identification of Rare, Threatened, and Endangered Species

The Natural Heritage Bureau (NHB) has identified records of Blanding's turtle (*Emydoidea blandigii*), wood turtle (*Glyptemys insculpta*), and northern black racer (*Coluber constrictor constrictor*) within the vicinity of the D121 Transmission Line ROW (See Appendix C for the NHB Report and regulatory correspondence). GZA can provide flyers of species including northern black racer and various turtle species to construction personnel prior to the start of work. GZA is retained to complete construction oversight and construction personnel will be made aware of the potential presence of northern black racer in this area. In addition, construction personnel will be made aware of the potential to encounter Blanding's turtle, wood turtle and spotted turtle more frequently during turtle nesting season from late May through the beginning of July. GZA will notify the NHFG and NHB of any rare species observations for inclusion in the statewide database.

Additionally, in accordance with Env-Wq 1503.19(h), a wildlife assessment report has been included in this permit submittal to detail and assess the potential for threatened, endangered, and special concern wildlife species on the Site. Recommendations for best management practices have been included in this report (see Appendix D).

# 2.3.4 Identification of Cultural and Historical Resources

GZA will submit a Request for Project Review (RPR) to the New Hampshire Division of Historical Resources (NHDHR) for the proposed project.

Independent Archaeological Consulting, LLC (IAC) completed Phase IA Archeological Assessment for the A253 ROW during 2017 which overlaps a portion of the D121 ROW from the Merrimack Substation to D121 Structure 22, in support of other maintenance work. Additional Phase IA Archeological Assessment was completed by Independent Archeological Consultants (IAC) for 13 structures including Structures 5, 8-10, 41, 42, 54, 55, 96, 105, 121, 127, and 140 in 2016 to support storm hardening maintenance work. GZA engaged Victoria Bunker, Inc. (VBI) in 2021 to complete Phase IA Archeological Assessment for the remaining 117 structures along the D121 Transmission Line. GZA will retain VBI to conduct a Phase IB survey within identified Phase IA archeological sensitivity areas. Results of this work will be submitted to DHR consistent with the response to the RPR.

# 3.0 EXISTING CONDITIONS

The proposed project is located primarily within the existing and maintained D121 Transmission Lines ROW with a small portion of access located in the shared Q171, C196, and A253 Transmission Line ROW. The proposed project work areas subject to the Alteration of Terrain permit cross through portions of the Towns of Bow and Hooksett, New Hampshire. Existing dirt and/or grass access routes currently used for access to existing utility structures within the ROW are proposed to be improved using gravel and stone as a part of a routine structure maintenance project. Proposed access road improvements include 12- to 16-foot-wide gravel and stone roads



with a 20-foot total width limit of disturbance. Based on NRCS soil mapping, existing upland soils are primarily sandy, fine sandy, and gravelly fine sandy loams and are typically stony or very stony. Slopes are variable and generally range from 0 to 140%, with an average of approximately 10%. As previously noted, the project has two separate areas that are subject to AoT permitting throughout the proposed project, and are referred to as Areas A and B.

The project area includes upland and wetland areas located in primarily rural areas (see Appendix D for additional habitat descriptions). Upland areas consist primarily of shrubs including eastern white pine (*Pinus strobus*), gray birch (*Betula populifolia*) saplings, and red maple (*Acer rubrum*) saplings. Wetlands in the ROW primarily consist of palustrine emergent (PEM) or palustrine scrub shrub (PSS) systems that are seasonally saturated. Vegetation in the wetlands were dominated by meadowsweet (*Spiraea alba*), steeplebush (*Spiraea tomentosa*), speckled alder (*alnus incanca* spp. *rugosa*), winterberry holly (*Ilex verticillata*), highbush blueberry (*Vaccinium corymbosum*), gray birch, broad-leaved cattail (*Typha latifolia*), rattlesnake grass (*Glyceria canadensis*), cinnamon fern (*Osmundastrum cinnamomeum*), royal fern (*Usmunda regalis*), and sphagnum moss (*Sphagnum* spp.)

Existing conditions along the D121 Transmission Line are discussed below by areas subject to jurisdiction under the Alteration of Terrain Law and Rules and consistent with recent discussions with the AoT Bureau for Eversource Line projects.

# 3.1 AOT AREA A – BOW

Area A begins at Morgan Drive and continues to Dicandra Drive in Bow, New Hampshire. This stretch includes upland and wetland areas with elevations ranging from approximately 534 feet at the Morgan Drive entrance to approximately 406 feet at Structure 27. This portion of the ROW is located in primarily forested undeveloped areas of Bow and lacks documented drainage structures in the proposed access route.

Land disturbance subject to Alteration of Terrain Law and Rules due to *Env-Wq 1502.58 (b) (2)* (see *Section 5.1.2* below) within Area C includes;

- Structures 22 and 26 through 31 Work Pads
- Access road from Morgan Drive to Dicandra Drive

### 3.1.1 Surface and Groundwater Protection – Area A

There are two unnamed streams within this portion of the project area associated with Wetlands BWW-13 and BWW-12 (see Figure 3 – Surface Water and Groundwater Overlay Plans). This portion of the project area includes temporary wetland matting in 8 wetland systems: Wetland BWW-30, BWW-28, BWW-13, BWW-12.2, BWW-12.1, BWW-12, BWW-6, and BWW-5 for access and work pad placement. Temporary wetland matting totals are summarized in the table below. AoT disturbance area is summarized in *Section 5.1.2*.

Temporary Matting	Impact (sq. ft.)
Wetland Access Matting	15,226
Wetland Work Pad	8,330

According to Figure 3, Area A is not located within any AoT screening layer. These layers include "Surface Water with Impairments Quarter Mile buffer," "Class A Surface Water (RSA 485 A9) Watersheds," "Watersheds with



Chloride Impairments 2016," "All Lakes within a Quarter Mile Buffer," "Wellhead Protection Areas," "Groundwater Classification Areas," "Designated Rivers Quarter Mile Buffer," and "Water Supply Intake Protection."

# 3.1.2 <u>FEMA 100-year Floodplain, Shoreland Protection, Designated Rivers – Area A</u>

According to the FEMA Flood Insurance layer on Figure 3, there are no mapped 100-year floodplain areas within Area A.

According to the Consolidated List of Water Bodies Subject to RSA 483-B (January 23, 2019), and the NHDES Designated River Corridor Web Map, there are no rivers within Area A that are protected under RSA 483-B.

# 3.2 <u>AOT AREA B – HOOKSETT</u>

Area B begins at Structure 88 and continues to Parker Road in Hooksett, New Hampshire. This stretch includes upland and wetland areas with elevations ranging from approximately 382 feet west of Structures 88 and 89 to approximately 276 feet between Structure 98 and Poore Road. This portion of the ROW is located in a primarily forested undeveloped areas of Hooksett.

Land disturbance subject to Alteration of Terrain Law and Rules due to *Env-Wq 1502.58 (b) (2)* (see *Section 5.1.2* below) within Area B includes;

- Structures 88 and 89, and 95 through 98 Work Pads
- Access roads between Structure 88 and Poore Road

# 3.2.1 Surface and Groundwater Protection – Area B

There are no named or unnamed surface waters within this portion of the project area (see Figure 3 – Surface Water and Groundwater Overlay Plans). This portion of the project area includes temporary wetland matting in 6 wetland systems; Wetland HOW-20, HOW-18, HOW-16, HOW-3, HOW-2, and HOW-1 for access and work pad placement. Temporary wetland matting totals are summarized in the table below. AoT disturbance area is summarized in *Section 5.1.2*.

Temporary Matting	Impact (sq. ft.)	
Wetland Access Matting	2,881	
Wetland Work Pad	2,607	

According to Figure 3, Area B is not located within any AoT screening layer. These layers include "Surface Water with Impairments Quarter Mile buffer," "Class A Surface Water (RSA 485 A9) Watersheds," "Watersheds with Chloride Impairments 2016," "All Lakes within a Quarter Mile Buffer," "Wellhead Protection Areas," "Groundwater Classification Areas," "Designated Rivers Quarter Mile Buffer," and "Water Supply Intake Protection."

# 3.2.2 FEMA 100-year Floodplain, Shoreland Protection, Designated Rivers – Area B

According to the FEMA Flood Insurance layer on Figure 3, there are no mapped 100-year floodplain areas within Area B.



According to the Consolidated List of Water Bodies Subject to RSA 483-B (January 23, 2019), and the NHDES Designated River Corridor Web Map, there are no rivers within Area B that are protected under RSA 483-B.

# 4.0 PROJECT DESCRIPTION

# 4.1 STRUCTURE REPLACEMENT AND MAINTENANCE

As previously mentioned, the proposed project includes the replacement of 13 existing utility structures that must be replaced due to environmental damage. The process for replacing structures consists of drilling approximately 4-ft diameter holes to install a caisson approximately 7 to 15 ft below the ground surface. New structures will be installed in caissons and backfilled with clean, suitable materials. Spoils produced from drilling will be disposed in approved upland areas at a minimum distance of 100 ft from wetland areas. Any disturbed upland and wetland areas will be restored or stabilized upon completion of work. Anchors will also be installed to stabilize new structures. Anchors will be installed by excavating trenches, installing the concrete block anchors, and backfilling trenches. Backfill for anchors in wetlands will consist of hydric soils to maintain hydric conditions in the soil.

Old structures will be cut at the ground surface. In addition to removal of old structures, old cross-arms, wires and accessory equipment will be removed off site and disposed. Old structure butts will not be dug up and removed unless they impact the structural integrity of new structures.

### 4.1.1 Access

The proposed structure replacement project utilizes existing access routes within the existing D121 ROW to the greatest extent practicable. The majority of existing access routes are comprised of dirt or grassy areas and are proposed to be improved as part of this project. Proposed access routes are shown on the plans in both Figures 3 and 4. Access into the existing ROW will be obtained from various state and local roadways, and private properties where permission has been obtained. Proposed access routes as shown on Figures 3 and 4 were identified to minimize ground disturbance to the greatest extent practicable while providing safe and efficient access to existing utility structures. Access through existing wetlands within the project area will be completed using temporary timber matting.

# 4.1.1.1 Road Construction

Proposed access road improvements include 12- to 16-foot-wide gravel and stone roads with a 20-foot total width limit of disturbance. The roads will provide access to existing utility structures for routine maintenance activities. Improved access will provide reliable, permanent and quick efficient access to utility structures for future maintenance activities and when emergency repairs are required. The majority of the proposed access road improvements are located within already existing dirt and grass access routes (see Appendix F – Photo Log).

# 4.1.1.2 Wetland and Upland Temporary Matting

Access through existing wetlands in the project area will be completed using temporary timber matting to minimize and prevent rutting in the wetlands (see Figure 4- Alteration of Terrain Permitting Plans). In addition, upland matting may be used rather than improving access with gravel and stone if access is necessary through maintained property owner lawns or farm fields.



# 4.1.2 Work Pad Construction

The proposed project includes the construction of 100-foot by 100-foot gravel work pads to stage construction equipment and vehicles necessary to replace utility structures. Work pads will be constructed using clean modified riprap (6- to 8-inch diameter) or equivalent stone. In addition, the work pad will be top dressed with 1.5- to 3-inch diameter clean stone. Lastly, disturbed areas in proximity to the final work pad configuration will be stabilized with upland seed mix.

Proposed work pads in wetland areas will be constructed using temporary timber matting and removed upon completion of work.

# 4.2 <u>CONSTRUCTION SEQUENCE</u>

This proposed project is scheduled to begin at the end of June 2021. The work is proposed to be undertaken during the summer of 2021 into winter of 2022 following the receipt of all regulatory approvals. The following is a description of anticipated construction sequence for this type of routine maintenance work. Once contractor(s) are scheduled, a more finalized sequence and schedule will be determined.

- 1) Install sediment and erosion controls in proposed locations as shown on Figure 4.
- 2) Upgrade access routes and build work pads. Timber matting to be used in uplands and wetlands as designated by Figure 4.
- 3) Conduct structure replacement activities including installation of new structures, removal of old structures, removal of old wire, and installation of OPGW wire.
- 4) Remove temporary timber matting and stabilized exposed soils within the ROW and restore temporarily disturbed wetland areas with appropriate wetland seed mix.
- 5) Remove erosion and sedimentation controls following stabilization.

# 4.3 BEST MANAGEMENT PRACTICES

Work will be conducted in accordance with Eversource's standard Best Management Practices (BMPs) as designated by the NHDES Best Management Practices Manual for Utility Maintenance in and Adjacent to Wetlands and Waterbodies in New Hampshire dated March 2019. By implementing these BMPs, impacts to both wetland and upland areas will be minimized and prevented to the greatest extent practicable.

Where necessary, perimeter protective measures consisting of silt fence, straw wattle, mulch, and straw bales will be installed around the structures to minimize potential impacts to nearby resource areas. Water bars will be installed in areas of road improvements with steep slopes as identified by the Contractor. If necessary and based on localized site conditions, silt fence may be used. Disturbed soil will be seeded and mulched with hay or straw for stabilization as needed following completion of work. No equipment or material will be stored within wetland areas. Erosion controls will be implemented during construction as detailed in Notesheets 1 and 2 of Figures 3 and 4 to minimize potential impacts during construction (see Figure 3 – Surface Water and Groundwater Overlay Plans and Figure 4 – Alteration of Terrain Permitting Plans).



Timber matting will be used in wetlands and in some upland areas to minimize impacts and provide level work pads. Upon completion of work where timber matting is implemented in upland areas, those upland areas will be restored and stabilized to pre-existing conditions and areas of exposed soils will be seeded and/or mulched. Additionally, should any removal of BMPs be necessary, it will occur during restoration activities.

# 5.0 REGULATORY COMPLIANCE

# 5.1 ALTERATION OF TERRAIN

The NHDES requires an AoT permit whenever a project proposes to disturb more than 100,000 sq. ft. of terrain (50,000 sq. ft. if within a protected shoreland). This NHDES requirement, which is found in Administrative Rule Env-Wq-1500, is intended to protect New Hampshire surface waters by controlling soil erosion and managing stormwater runoff from developed areas. The project contains four distinct AoT regulated areas (referred to respectively as Areas A and B) along the D121 Transmission Line ROW based on continuous areas of disturbance. Details on impacts in each regulated area are provided below in *Section 5.1.2* Quantification of Impacts Subject to AoT.

# 5.1.1 <u>Waiver Request: Stormwater Drainage Report; Drainage Area Plan; Hydrologic Soil Group Plans (Env-WQ</u> 15.09)

Per Env-Wq 1509.02, a waiver is being requested from the requirements to prepare a Stormwater Drainage Report, Drainage Area Plans and Hydrologic Soil Group Plans because new impervious surface is limited to the footprint of new transmission line structures. It is not anticipated that the proposed structures will have a significant impact on site drainage patterns. Accordingly, stormwater treatment practices are not proposed. A formal waiver request is provided in Appendix G.

# 5.1.2 Quantification of Impacts Subject to AOT

There are approximately 303,075 sq. ft. of total disturbance, including 28,824 sq. ft. of temporary wetland matting and 274,251 of ground disturbance along the D121 Transmission Line ROW that requires an AoT permit in accordance with Env-Wq 1502.58. Specific areas and construction activities that significantly alter the terrain are detailed below. Additional details are shown in Figure 4.

# AoT Area A - Bow Morgan Drive to Dicandra Drive

Map Sheets 1 to 5

Disturbance Type	Impact (sq. ft)	
New Access	90,974	
Gravel Work Pad	60,323	
Total AoT Disturbed Area	<u>151,297</u>	

-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10-year period, cumulatively exceeds 100,000 square feet of contiguous area..."

-Work pad dimensions: 100-ft x 100-ft; Access road width: 16-ft



# AoT Area B - Hooksett D121 Structure 86 to Poore Road Map Sheets 6 to 9

Disturbance Type	Impact (sq. ft)	
New Access	64,952	
Gravel Work Pad	58,002	
Total AoT Disturbed Area	<u>122,954</u>	

-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10-year period, cumulatively exceeds 100,000 square feet of contiguous area..."

-Work pad dimensions: 100-ft x 100-ft; Access road width: 16-ft

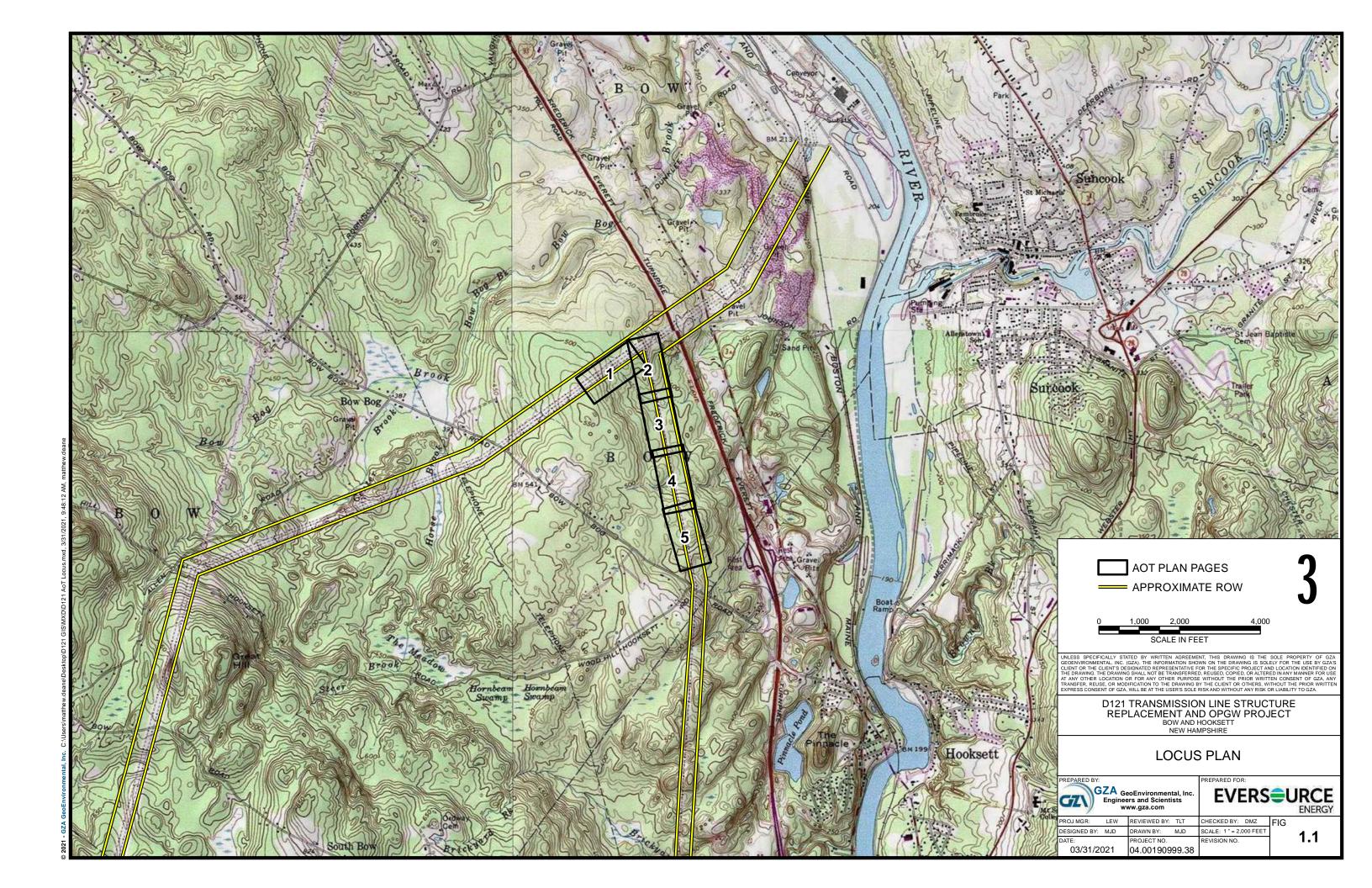
# 5.2 <u>OTHER REGULATORY PROGRAMS</u>

Other regulatory permits and notifications required for the proposed project are summarized below.

Agency	Permit/Notification		Status					
Local								
Town of Bow	Conditional Use Permit		Approved					
State								
	Statutory Permit by Notification							
	Town/City	SPN File No.						
NHDES	Bow Hooksett	2020-03192 2020-03201	Approved					
Federal								
EPA (Construction General Permit)	Stormwater Pollution Prevention Plan (SWPPP)		Pending					



Figure 1 – USGS Topographic Map



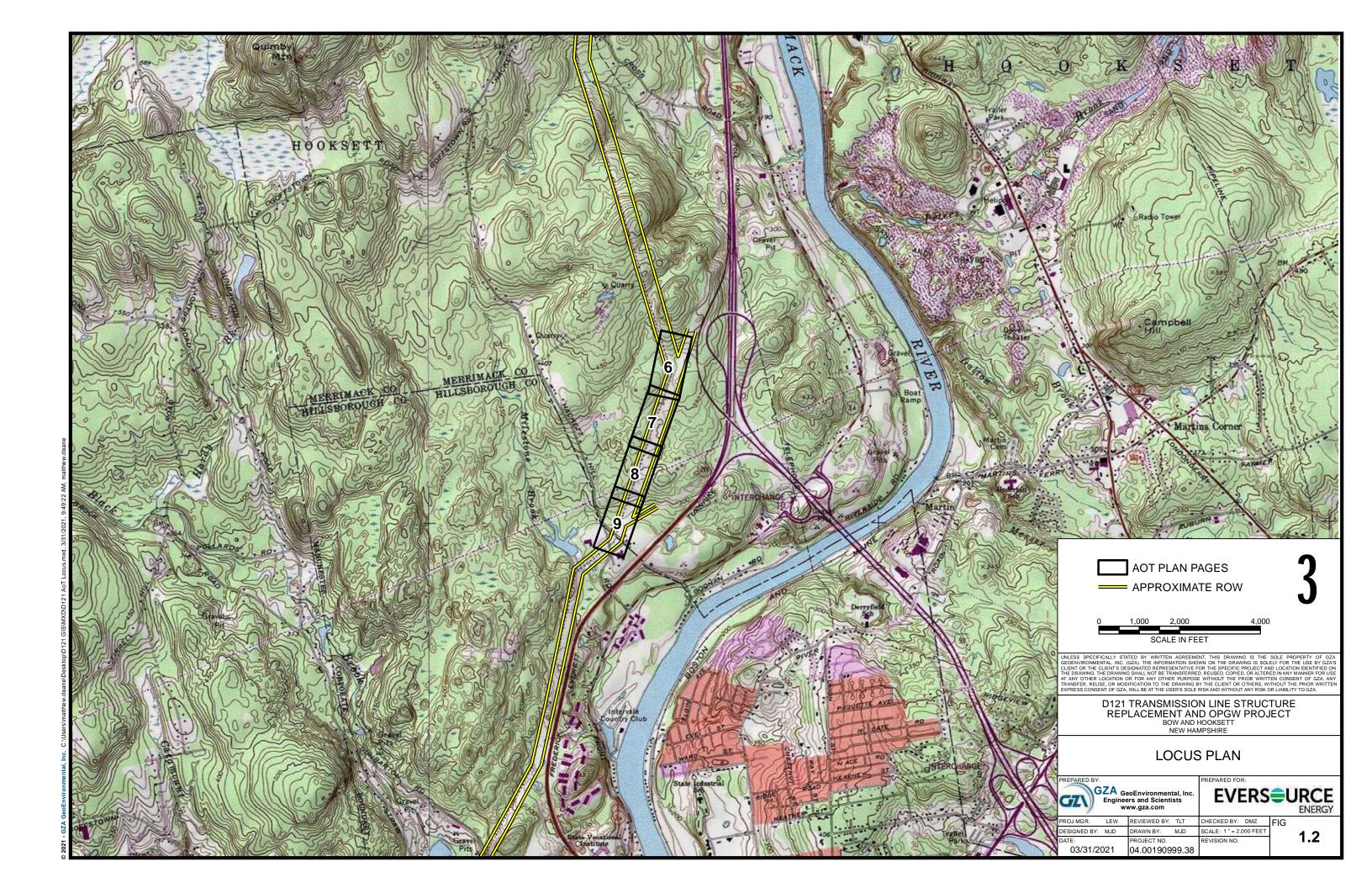




Figure 2 – Orthophotograph Site Map



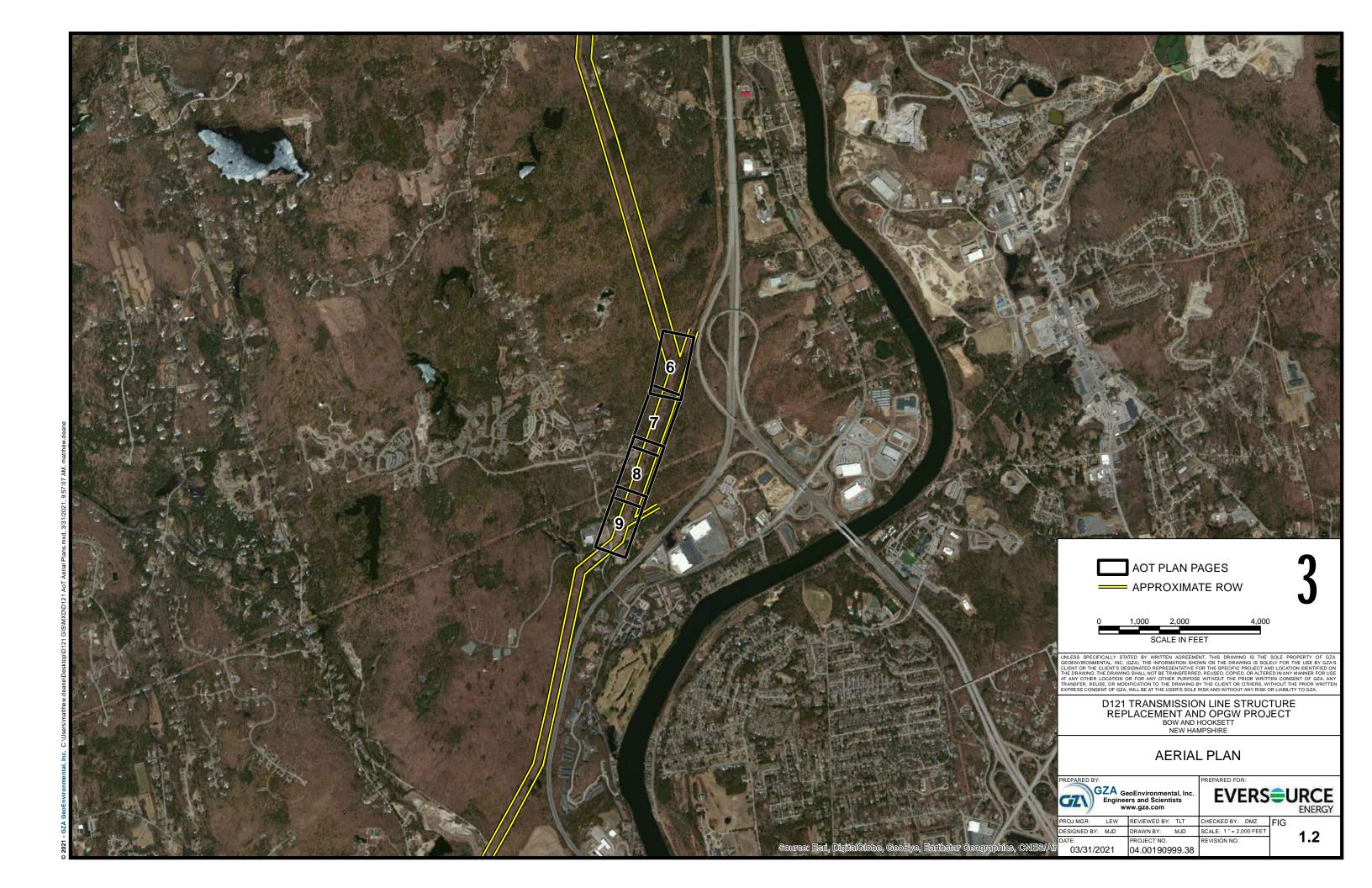


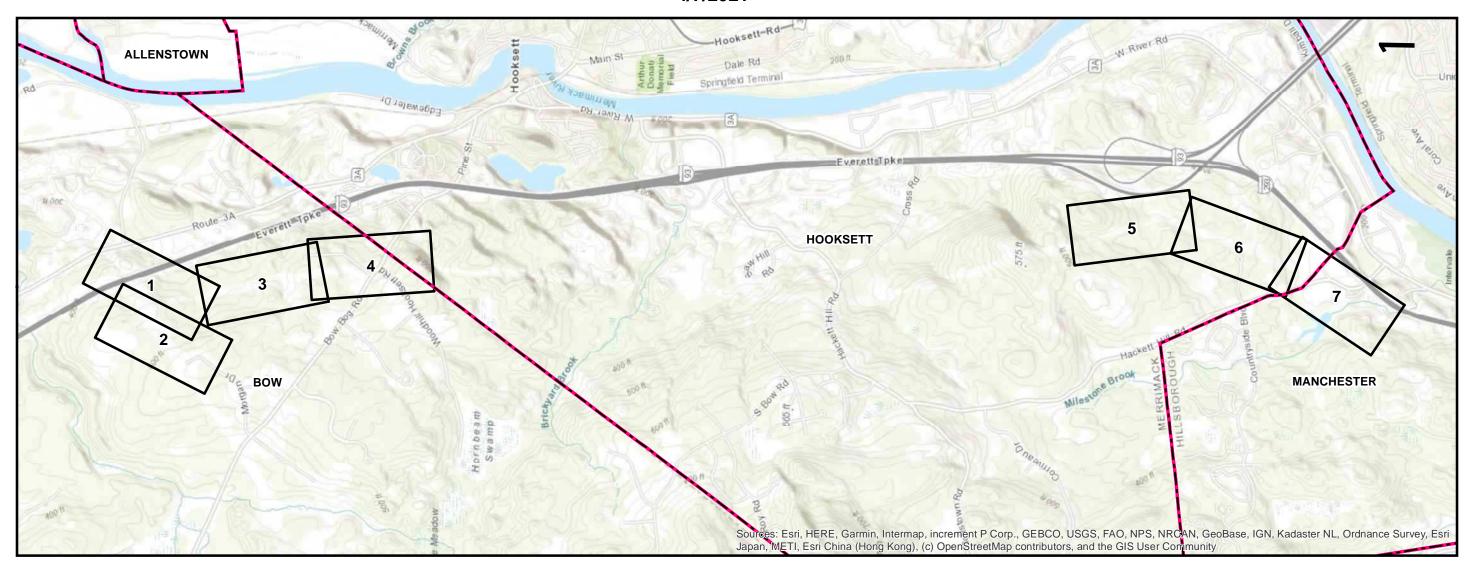


Figure 3 – Surface Water and Groundwater Overlay Plans

# **D121 TRANSMISSION LINE OPGW AND STRUCTURE REPLACEMENT PROJECT**

# SURFACE WATER AND GROUNDWATER OVERLAY PLANS

BOW AND HOOKSETT NEW HAMPSHIRE 4/7/2021



PREPARED FOR



# **INDEX OF FIGURES**

1 inch = 2,500 feet

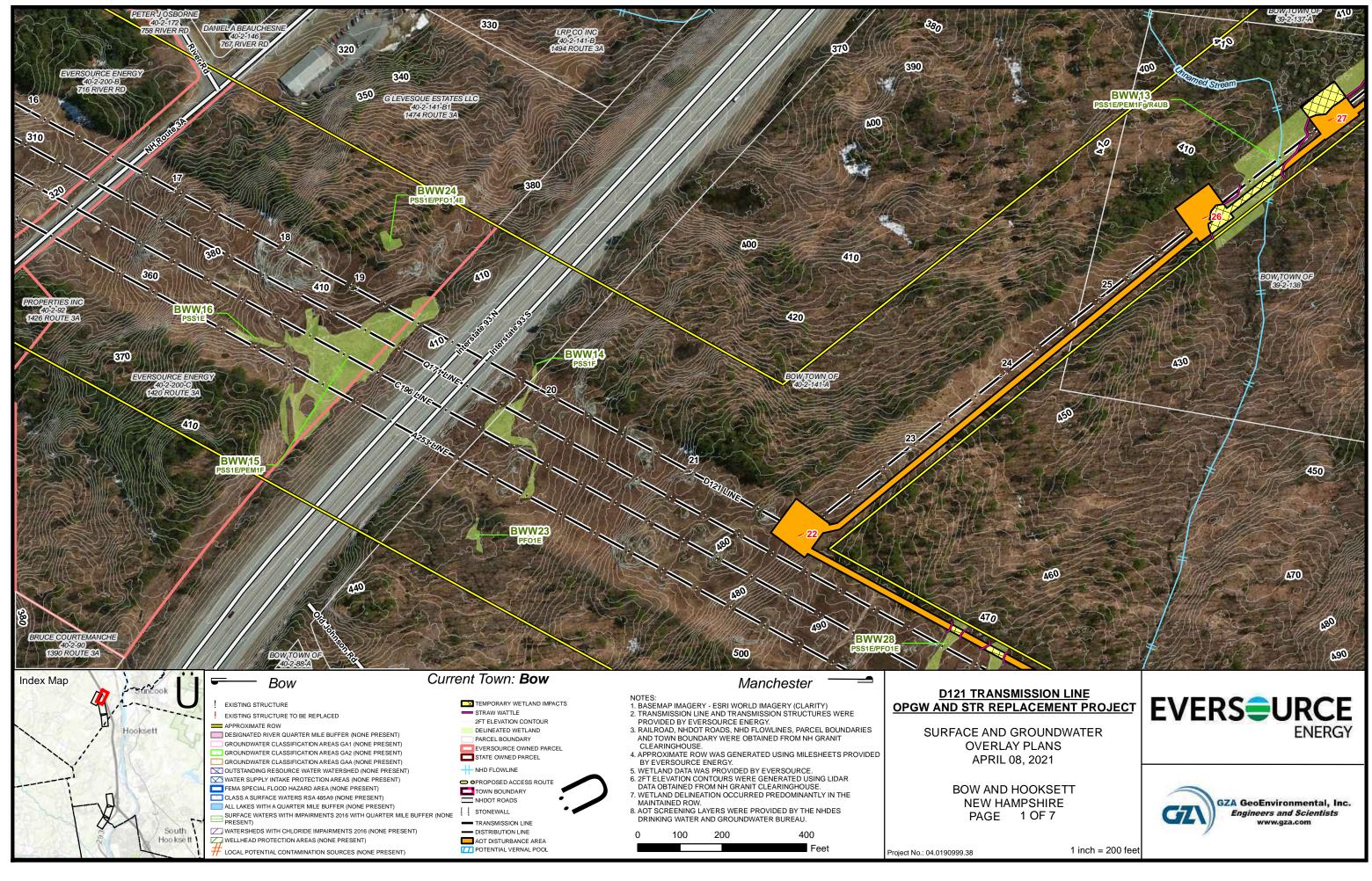
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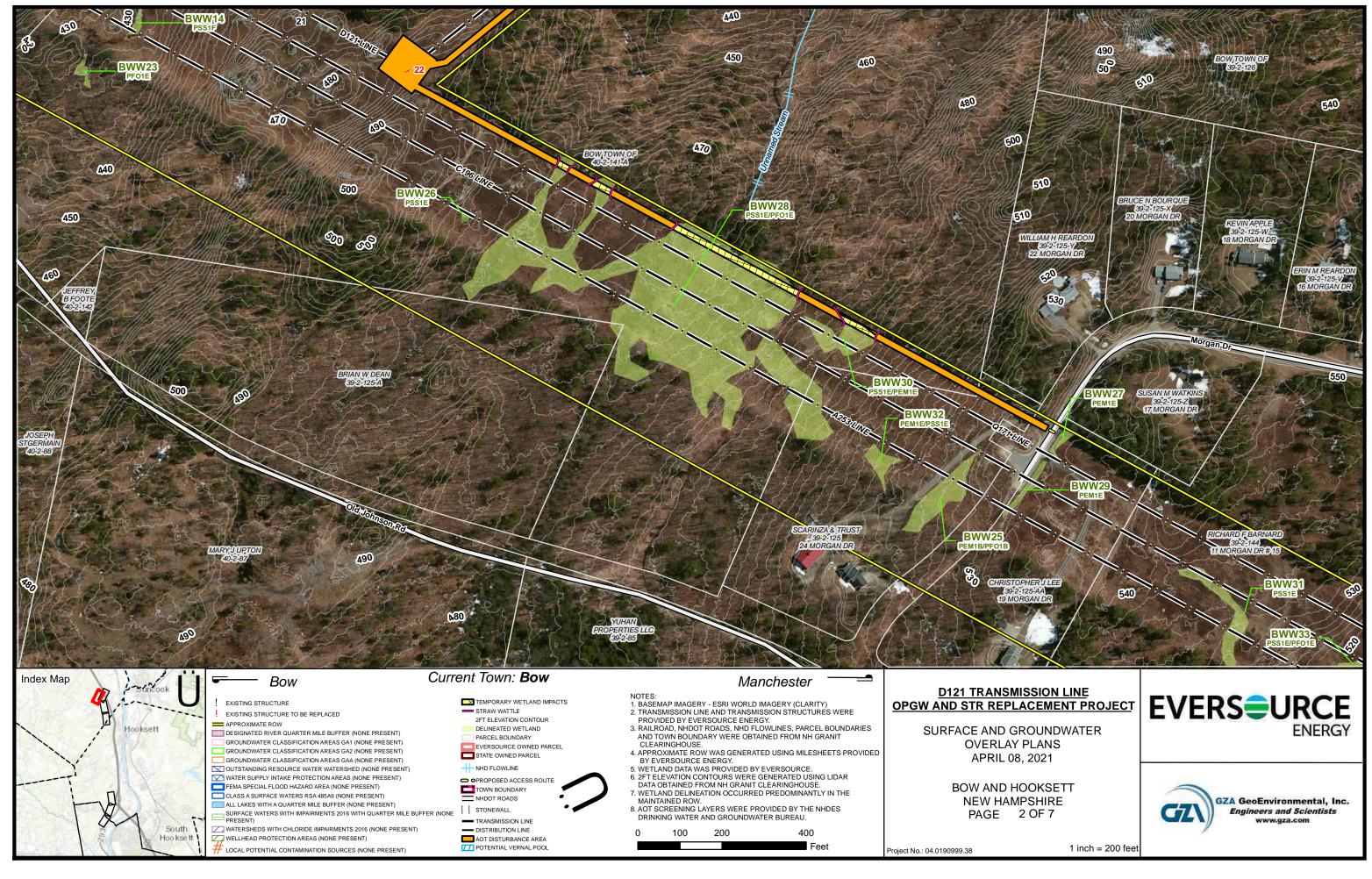
S1: NOTES S2: DETAILS

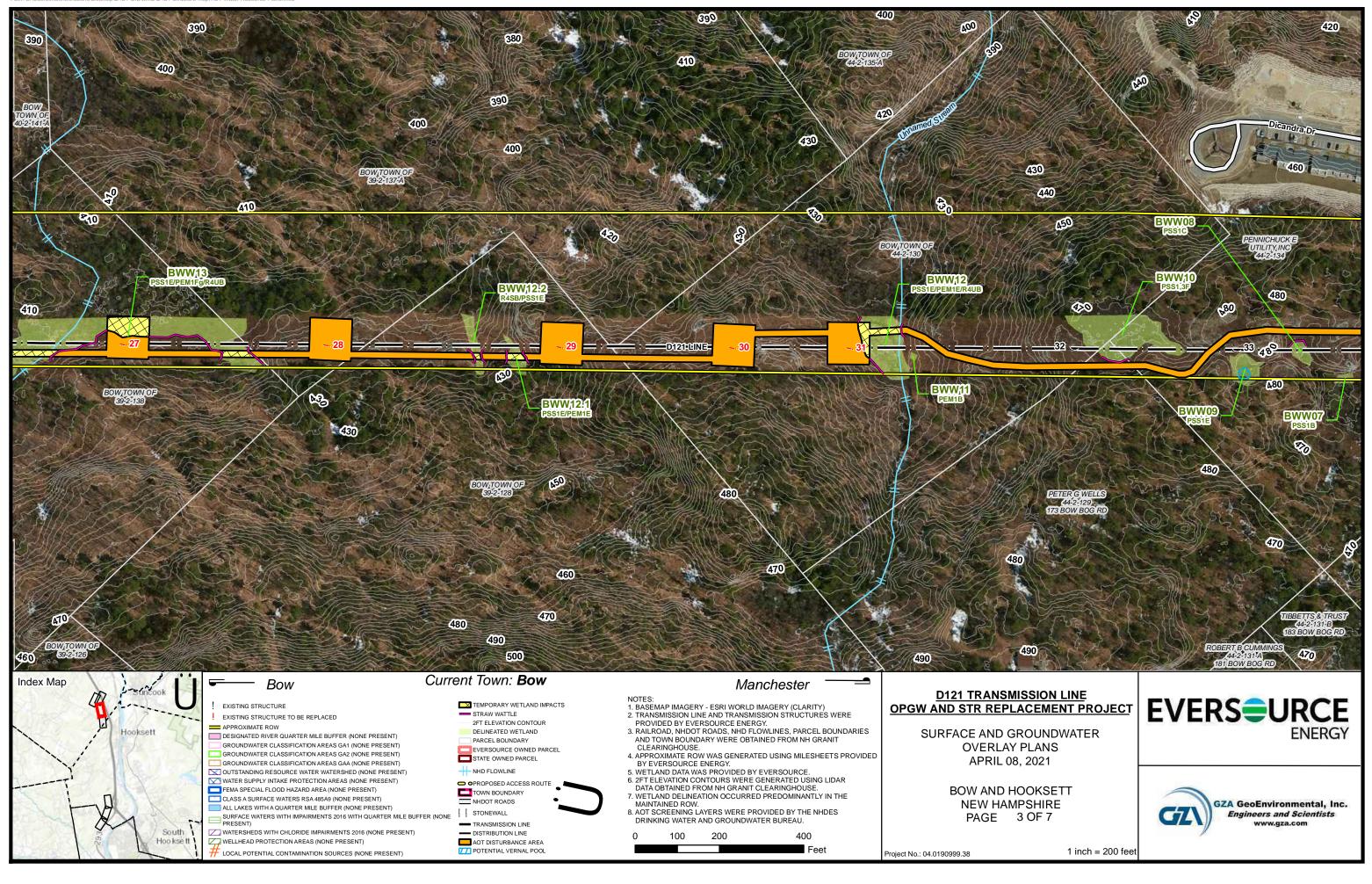
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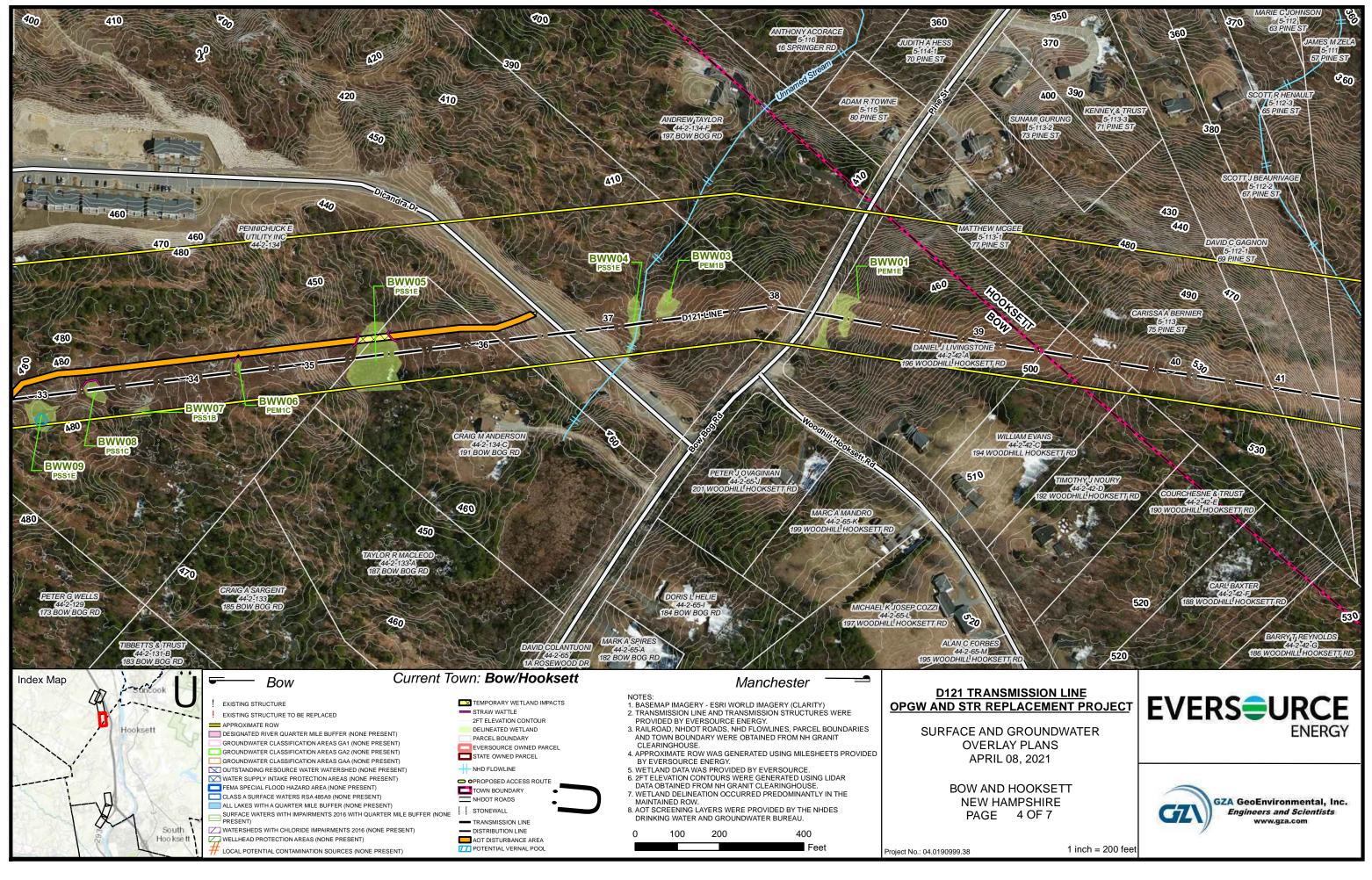
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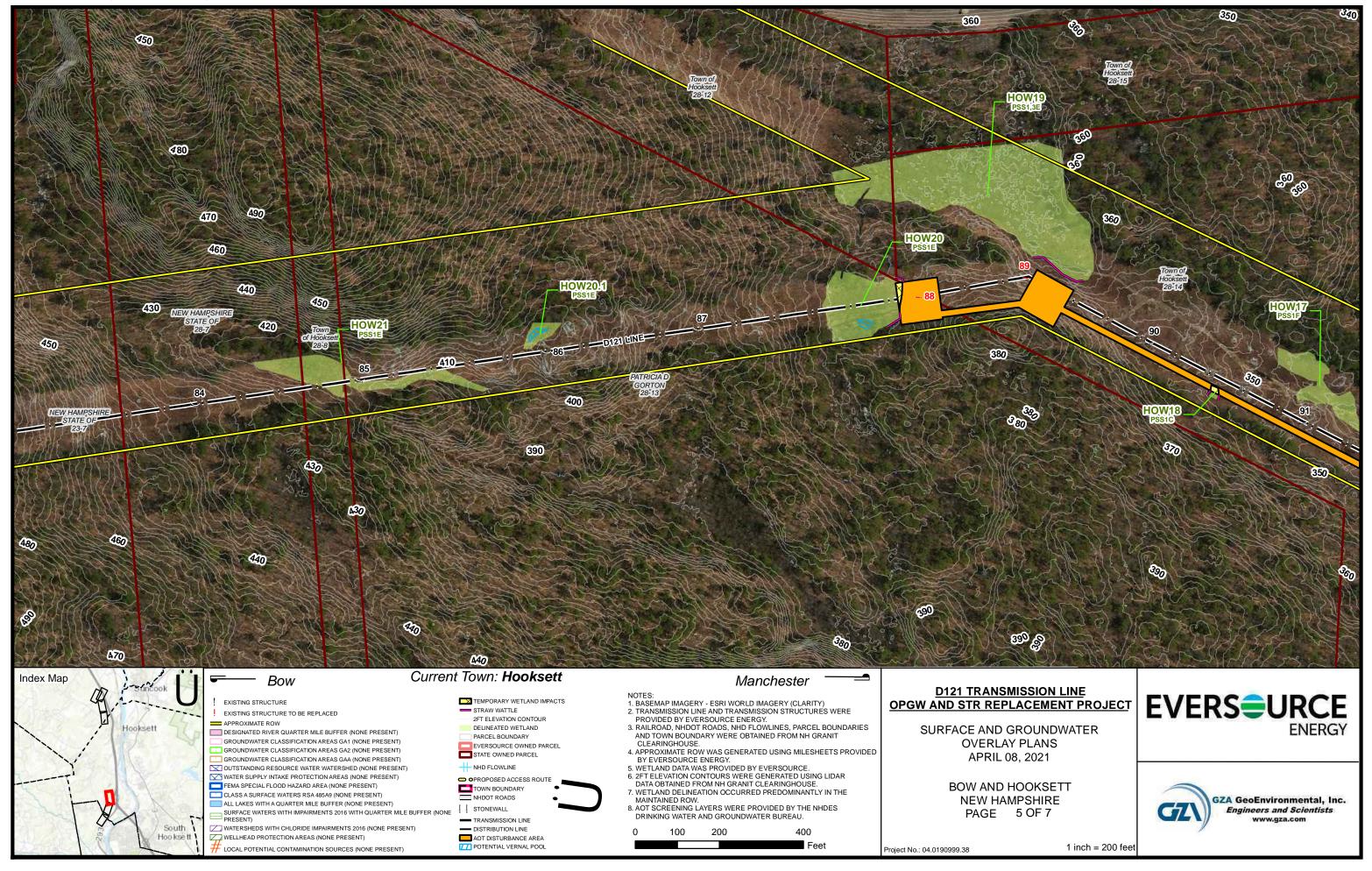


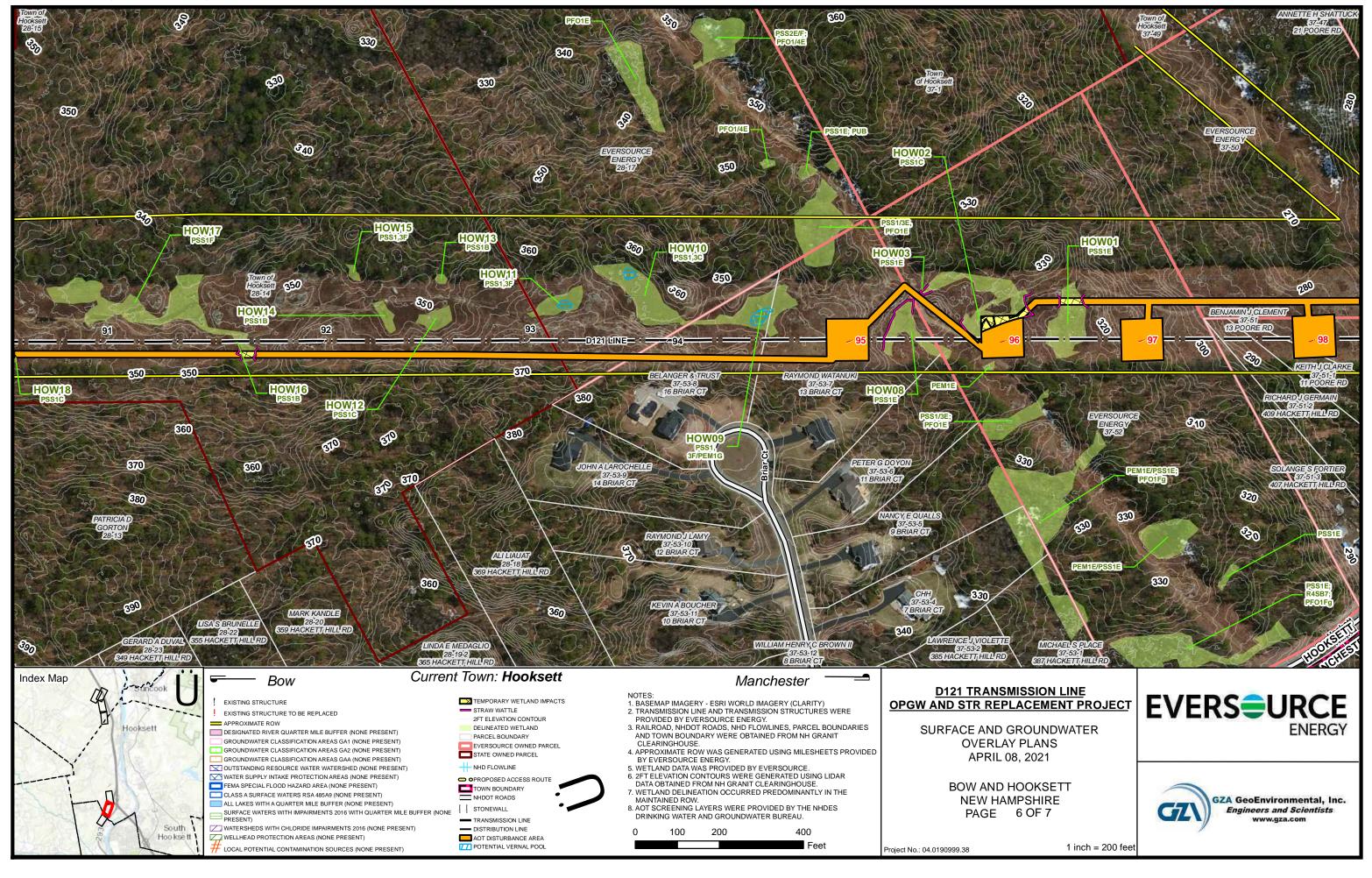


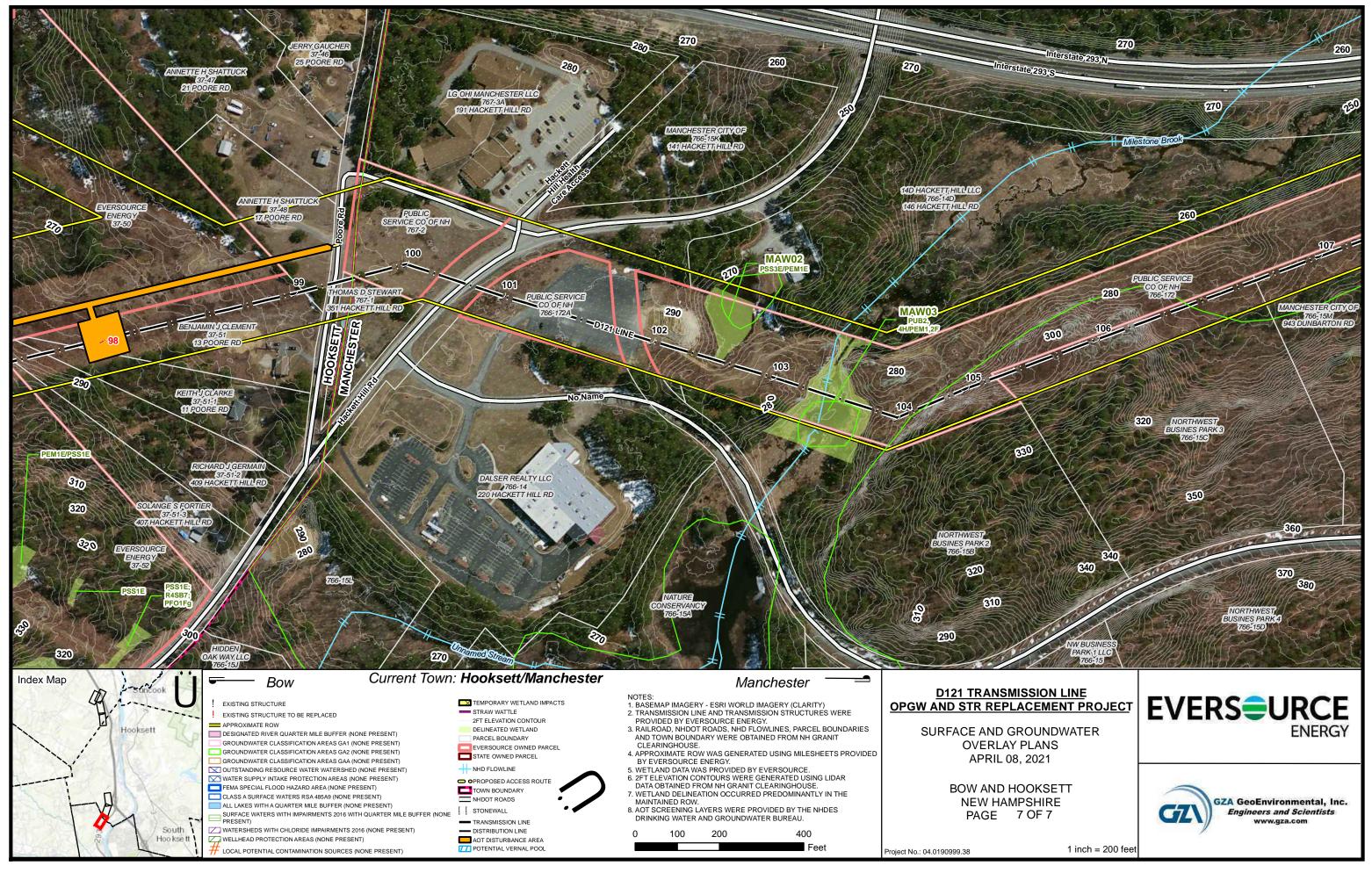












### CONSTRUCTION SEQUENCE:

- 1. WETLAND BOUNDARIES TO BE CLEARLY MARKED PRIOR TO THE START OF CONSTRUCTION.
- 2. SEDIMENT AND EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH THE DETAIL PROVIDED, AS NECESSARY.
- 3. WETLAND IMPACTS ASSOCIATED WITH WETLAND CROSSINGS ARE REQUIRED FOR ACCESS BETWEEN STRUCTURES WITHIN THE RIGHT OF WAY.
- 4. ADEQUATE PRECAUTION SHALL BE EXERCISED TO AVOID SPILLAGE OF FUEL OILS, CHEMICALS, OR SIMILAR SUBSTANCES; NO FUELS, LUBRICANTS, CHEMICALS OR SIMILAR SUBSTANCES SHALL BE STORED BENEATH TREES OR IN THE VICINITY OF ANY WETLANDS, RIVER, STREAM OR OTHER BODY OF WATER; OR IN THE VICINITY OF NATURAL OR MAN-MADE CHANNELS LEADING THERETO. NO POWER EQUIPMENT SHALL BE STORED, MAINTAINED, OR FUELED IN ANY AREA ADJACENT TO A WETLAND, RIVER, STREAM OR OTHER BODY OF WATER.
- 5. REMOVE COMPLETELY ALL CONTAMINATION FROM ANY SPILLAGE OF CHEMICALS OR PETROLEUM PRODUCT WITH COMPLETE REHABILITATION OF THE AFFECTED AREA.
- 6. ACCESS ROUTES HAVE BEEN SELECTED TO PREVENT DEGRADATION OF THE RIGHT-OF-WAY AND MINIMIZE ENVIRONMENTAL IMPACT. OPERATIONS SHALL BE CONFINED TO THE SPECIFIED ACCESS ROUTES WITHIN THE PROPOSED WETLAND IMPACT AREA. ACCESS ROUTES SHALL NOT EXCEED A 16 FOOT-WIDTH.
- 7. IMPACT TO VEGETATION WITHIN WETLANDS WILL BE LIMITED TO THE EXTENT NECESSARY TO PLACE THE TIMBER MATS
- 8. LOW GROWING VARIETIES OF VEGETATION ADJACENT TO WETLANDS SHALL BE PRESERVED TO THE EXTENT POSSIBLE. STUMPS AND ROCKS SHALL NOT BE REMOVED, AND THERE SHALL BE NO EXCAVATIONS, FILLS OR GRADING DONE ADJACENT TO WETLANDS, UNLESS MINOR EXCAVATIONS IS NEEDED FOR ACCESS.
- 9. TIMBER MATS WILL BE USED ALONG ACCESS ROUTES WITHIN WETLAND AREAS. THESE MATS ARE CONSTRUCTED OF HEAVY TIMBERS OR COMPOSITE MATERIAL, BOLTED TOGETHER, AND ARE PLACED END-TO-END IN THE WETLAND TO SUPPORT HEAVY EQUIPMENT. ALL SWAMP MATS SHALL BE PLACED AND REMOVED SO AS NOT TO CAUSE ANY RUTS, CHANNELS OR DEPRESSIONS, OR OTHERWISE CAUSE ANY UNDUE DISTURBANCE TO WETLANDS.
- 10. IF TIMBER MAT BMP IS NOT SUFFICIENT DUE TO HIGH WATER, ADDITIONAL BMP'S MAY INCLUDE THE PLACEMENT OF GEOTEXTILE FABRIC, 3"-4" STONE, AND GRAVEL TO PROVIDE A SUITABLE ROAD BED. A TEMPORARY CULVERT MAY BE REQUIRED IN AREAS OF HIGH FLOW TO MAINTAIN HYDROLOGIC CONNECTIVITY. ALL MATERIAL WILL BE REMOVED FROM JURISDICTIONAL AREAS AFTER CONSTRUCTION COMPLETION.
- 11. NO MATERIAL SHALL BE PLACED IN ANY LOCATION OR IN ANY MANNER SO AS TO IMPAIR SURFACE WATER FLOW INTO, THROUGH OR OUT OF ANY WETLAND AREA. NO INSTALLATION SHALL CREATE AN IMPOUNDMENT THAT WILL IMPEDE THE FLOW OF WATER OR CAUSE FLOODING.
- 12. NO MATERIAL SHALL BE TAKEN FROM THE WETLANDS AREA EXCEPT THAT WHICH MUST NECESSARILY BE REMOVED FOR THE STRUCTURE OR FOUNDATION PLACEMENT OR STABILIZATION. ALL EXCESS MATERIAL TAKEN FROM THE WETLAND WILL BE REMOVED FROM THE SITE.
- 13. ANY PROPOSED SUPPORT FILLS SHALL BE CLEAN GRAVEL AND STONE, FREE OF WASTE METAL PRODUCTS, ORGANIC MATERIALS AND SIMILAR DEBRIS AND SHALL NOT EXCEED THE AMOUNT PERMITTED. THIS ALLOWABLE FILL IS THE ONLY FILL THAT MAY REMAIN IN THE WETLAND AFTER CONSTRUCTION. ALL CUT AND FILLS SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- 14. INSTALL NEW POLES IN THE LOCATIONS DESIGNATED ON THE PERMITTING PLANS.
- 15. CABLE INSTALLATION WILL BE PERFORMED IN A MANNER SO AS TO AVOID, OR LIMIT TO THE MAXIMUM EXTENT POSSIBLE TRAVERSING WETLANDS WITH HEAVY EQUIPMENT. IN SOME CASES, A HELICOPTER MAY BE USED DURING THE INSTALLATION TO MINIMIZE IMPACTS.
- 16. ALL SWAMP MATS, MATERIAL, AND DEBRIS WILL BE REMOVED FROM THE WORK AREA UPON THE COMPLETION OF CONSTRUCTION.
- 17. UPLAND DISTURBED AREAS SHALL BE RESTORED AND STABILIZED UPON COMPLETION OF CONSTRUCTION. WORK PAD RESTORATION SHOULD INCLUDE REDUCING THE WORK PAD TO A 30 BY 60 FOOT AREA, AND REDUCING SLOPES TO A MAXIMUM OF 25%. STOCKPILED MATERIAL SHOULD BE SPREAD TO REDUCE ANY UNNECESSARY SLOPES. GRAVEL WORK PADS AND SLOPES SHOULD BE SCARIFIED TO A MINIMUM OF 3" BEFORE SPREADING TOPSOIL/LOAM.
- 18. ALL TEMPORARY WETLAND IMPACTS WILL BE RE-GRADED TO ORIGINAL CONTOURS FOLLOWING CONSTRUCTION, NEW ENGLAND EROSION CONTROL/RESTORATION MIX, AVAILABLE THROUGH NEW ENGLAND WETLAND PLANTS, INC., 820 WEST STREET, AMHERST, MA 01002, 413-548-8000, OR EQUIVALENT SEED MIX SHALL BE APPLIED IN WETLAND AREAS THAT
- 19. SEDIMENT AND EROSION CONTROL MEASURES WILL BE EVALUATED AND REMOVED IF NECESSARY UPON THE COMPLETION OF CONSTRUCTION.
- 20. COMMERCIAL LOAM WILL NOT BE USED AS PART OF RESTORATION. ONLY IN-SITU TOPSOIL WILL BE USED TO RESTORE DISTURBED AREAS.
- 21. WHERE OPTIMAL TURTLE BREEDING AREAS OVERLAP WITH DISTURBANCE (AS DETERMINED BY AN ENVIRONMENTAL MONITOR), MINERAL SOILS WILL BE SCARIFIED TO ALLEVIATE COMPACTION AND BECOME MORE SUITED FOR TURTLE BREEDING.

### WINTER CONSTRUCTION NOTES

- 1. PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED. STABILIZATION METHODS SHALL INCLUDE SEEDING AND MULCH, AND INSTALLATION OF EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT
- 2. DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE TEMPORARILY STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.

3. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL (NHDOT 304.3)

### GENERAL NOTES

OWNER: EVERSOURCE ENERGY 13 LEGENDS DRIVE HOOKSETT, NH 03106

- 1. BASE PLAN PROVIDED BY EVERSOURCE ENERGY. EVERSOURCE ENERGY PROVIDED THE WETLAND DATA. EVERSOURCE ENERGY PROVIDED THE UTILITY DESIGN.
- 2. JURISDICTIONAL WETLANDS WERE DELINEATED BY TIGHE AND BOND IN 2018, IN ACCORDANCE WITH THE 1987 U.S. ARMY CORPS OF ENGINEERS' "WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1," AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTHEAST REGION," JANUARY 2012. WETLANDS WERE REVIEWED BY GZA GEOENVIRONMENTAL, INC. IN JANUARY
- 3. GZA PERFORMED A WETLANDS FUNCTION AND VALUES ASSESSMENT IN ACCORDANCE WITH THE ACOE'S "HIGHWAY METHODOLOGY WORKBOOK SUPPLEMENT," SEPTEMBER 1999, IN THE TOWN OF STRAFFORD.
- 4. SITE PLAN IS FOR PERMITTING PURPOSES ONLY AND DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY.
- 5. THE PROJECT WILL BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
- 6. IN ACCORANCE WITH ENV-WQ 1505.02, THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
  - A MINIMUM 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL HAS BEEN INSTALLED OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
- 7. IN THE EVENT THAT A RARE OR THREATENED SPECIES IS OBSERVED, THE NEW HAMPSHIRE FISH AND GAME AND NEW HAMPSHIRE NATURAL HERITAGE BUREAU WILL BE NOTIFIED. TURTLE NESTING SEASON EXTENDS FROM LATE MAY THROUGH THE BEGINNING OF JULY. IF WOOD, BLANDING'S OR SPOTTED TURTLES ARE FOUND LAYING EGGS IN THE WORK AREA, CONTACT MELISSA DOPERALSKI AT 603-271-1738 OR JOSH MEGYESY AT 603-271-1125 FOR FURTHER INSTRUCTIONS. OBSERVATIONS OF NORTHERN BLACK RACER SNAKES SEEN IN ANY AREA FROM THE END OF SEPTEMBER THROUGH THE MONTH OF APRIL MUST BE IMMEDIATELY REPORTED TO THE NHFG DEPARTMENT (BRENDAN CLIFFORD AT 603-271-0463 OR MELISSA DOPERALSKI AT 603-271-1738). IF NORTHERN BLACK RACER IS FOUND IN A WORK AREA FROM NOVEMBER THROUGH THE MONTH OF APRIL, WORK SHALL IMMEDIATELY CEASE AND THE OBSERVATION MUST BE REPORTED TO THE NHFG (BRENDAN CLIFFORD OR MELISSA DOPERALSKI).
- 8. TEMPORARY OR PERMANENT IMPACTS TO IDENTIFIED POTENTIAL OR SUSPECT VERNAL POOLS ARE PROHIBITED. ANY OBSERVATION OF ANY ADDITIONAL SUSPECT VERNAL POOLS ARE TO BE REPORTED TO NHFG PERSONNEL.

- 1. INSTALLATION OF EROSION CONTROL GRINDINGS AND/OR SILT FENCES SHALL BE COMPLETE PRIOR TO THE START OF WORK IN ANY GIVEN AREA. EROSION CONTROLS SHALL BE USED DURING CONSTRUCTION AND REMOVED WHEN ALL SLOPES HAVE A HEALTHY STAND OF VEGETATION COVER. EROSION CONTROL MEASURES SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER .25" OR GREATER RAINFALL EVENTS.
- 2. AS REQUIRED, CONSTRUCT TEMPORARY BERMS, SILTATION FENCES, SEDIMENT TRAPS, ETC. TO PREVENT EROSION & SEDIMENTATION OF WETLANDS.
- 3. THE WORK AREA SHALL BE GRADED AND OTHERWISE SHAPED IN SUCH A MANNER AS TO MINIMIZE SOIL EROSION, SILTATION OF DRAINAGE CHANNELS, DAMAGE TO EXISTING VEGETATION, AND DAMAGE TO PROPERTY OUTSIDE LIMITS OF THE WORK AREA. EROSION CONTROL GRINDINGS WILL BE NECESSARY TO
- 4. ANY STRIPPED TOPSOIL SHALL BE STOCKPILED, WITHOUT COMPACTION, AND STABILIZED AGAINST EROSION, AS
- 5. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS, PLANT ANNUAL RYEGRASS PRIOR TO OCTOBER 15TH
- 6. EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
- 7. EROSION CONTROL MATTING, IF REQUIRED, WILL CONSIST OF JUTE MATTING. MATTING WITH WELDED PLASTIC OR 'BIODEGRADABLE PLASTIC' NETTING OR THREAD WILL BE AVOIDED TO LIMIT UNINTENTIONAL MORTALITY TO SNAKES.

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOGN/PROMENTAL, INC. (GZA), THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA CLIENT OR THE CLIENTS DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANINER FOR USE AT ANY OTHER LOCATION OF FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA, ANY THAN SHALL OF THE CONSENT OF GZA, ANY THE CONSENT OF GZA, CHANCH OF THE PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LUBTIVE OF GZA.

# D121 TRANSMISSION LINE OPGW AND STRUCTURE REPLACEMENT PROJECT

**BOW AND HOOKSETT** NEW HAMPSHIRE

NOTES



# **EVERS**URCE **ENERGY** SHEET

REVIEWED BY: TLT CHECKED BY: DMZ LEW DESIGNED BY: MJD DRAWN BY: MJD SCALE: ROJECT NO EVISION NO 03/31/2021 04.0190999.38

**S1** 

### Best Management Practices (BMP's) for Straw wattles

### Definition and purpose:

Straw wattles are burlap rolls filled with straw that trap sediment and interrupt water flow by reducing slope lengths.

### Applications:

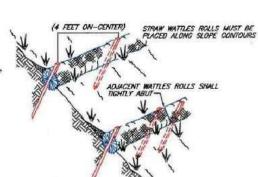
- \* Along erodible or unstablizied slopes
- \* Spread overland waterflow
- \* Trap sediment
- \* Around storm drain inlets to slow water and settle out sediment
- \* Overlap ends approximately 6 inches

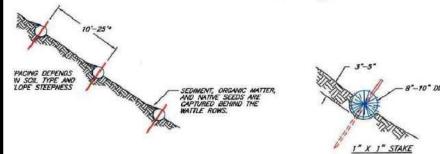
### Installation:

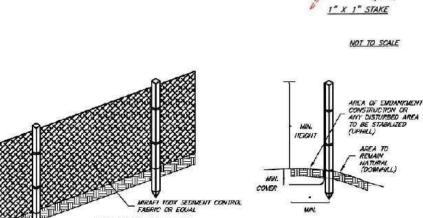
Straw wattles are installed parallel to slope contours and perpendicular to sheet flow.

Spacing\* - Dependent on slope length, soil steepness and soil type (general range 10 - 25').

Trenching - 2"-5" inch trench Stacking - at each end and four foot on center (i.e. 25 foot wattle uses 6 stacks)







SUPPORT POLE AS SPECIFIED BY THE MANUFACTURER FRONT VIEW

SIDE VIEW

### NOTES (SILT FENCE)

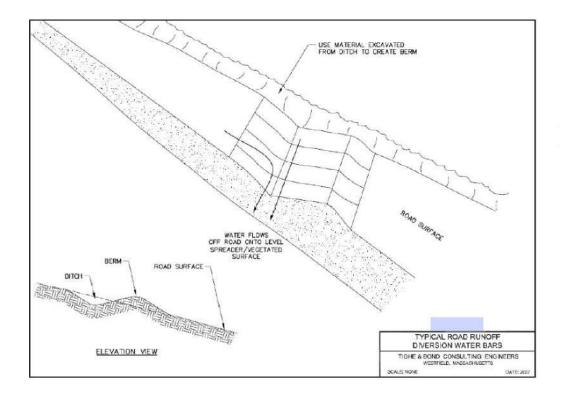
1. THE HEIGHT OF THE BARRIER SHALL NOT EXEED 36 INCHES.

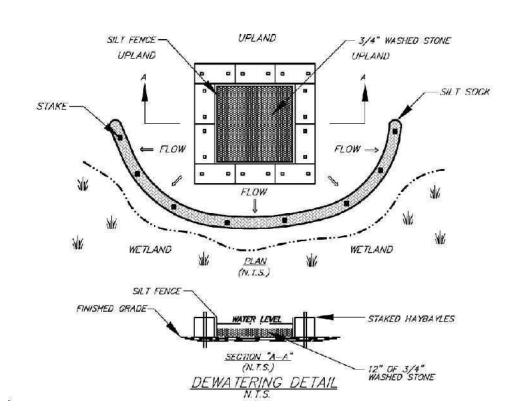
2. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST. WITH A MINIMUM 6—INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATIONS.

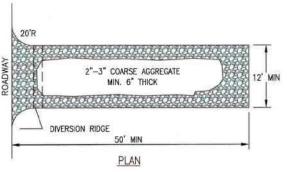
3 POSTS SHALL BE PLACED AT A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN
SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL BE AS MANUFACTURER RECOMMENDS.

4. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE

- OF POSTS AND UPSLOPE OF THE BARRIER IN ACCORDANCE WITH RECOMMENDATIONS
- 5. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE, AND WILL EXTEND A MINIMUM OF 8 INCHES INTO THE TRENCH. FILTER FABRIC SHALL NOT BE STAPLED 6. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC. 7. FABRIC BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT
- BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
  8. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST ONCE DAILY DURING PROLONGED RAINFALL AND ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
- 9. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY. 10. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE—HALF THE HEIGHT OF THE BARRIER
- 11. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.







1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO

2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.

# **CONSTRUCTION ENTRANCE**

NOT TO SCALE

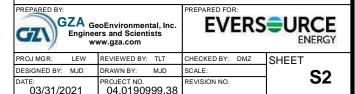
03/31/2021

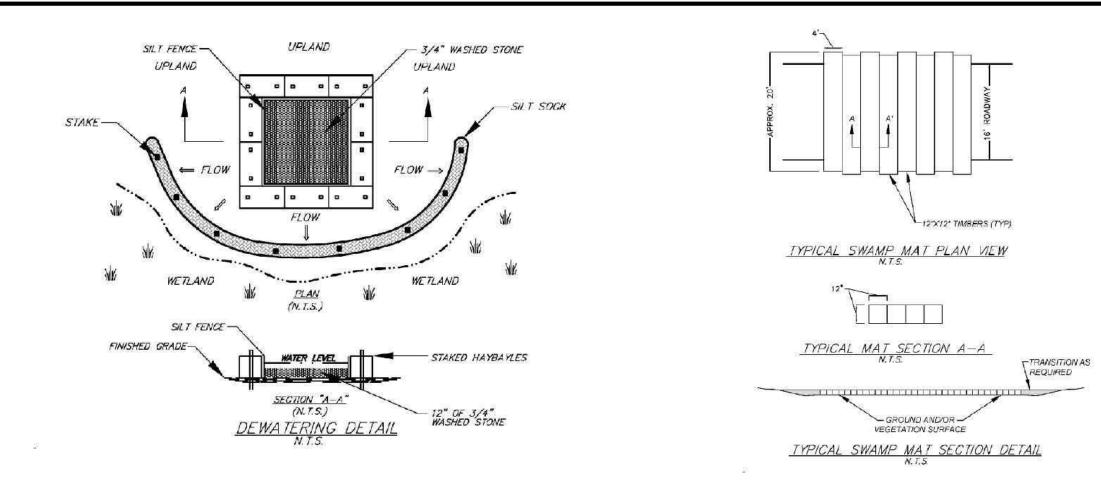
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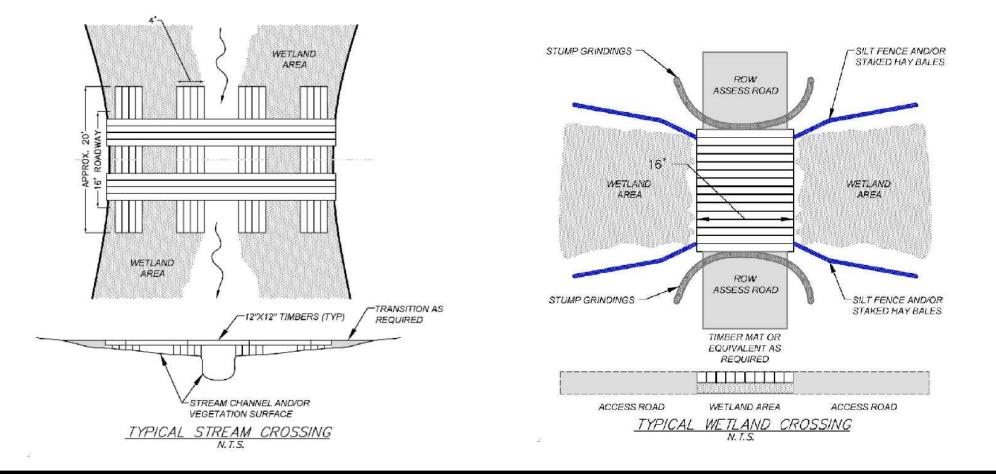
# **D121 TRANSMISSION LINE** OPGW AND STRUCTURE REPLACEMENT PROJECT

**BOW AND HOOKSETT** NEW HAMPSHIRE

# **BMP DETAILS**







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BOW AND HOOKSETT NEW HAMPSHIRE

# BMP DETAILS

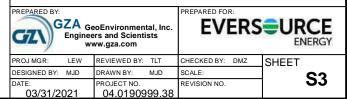


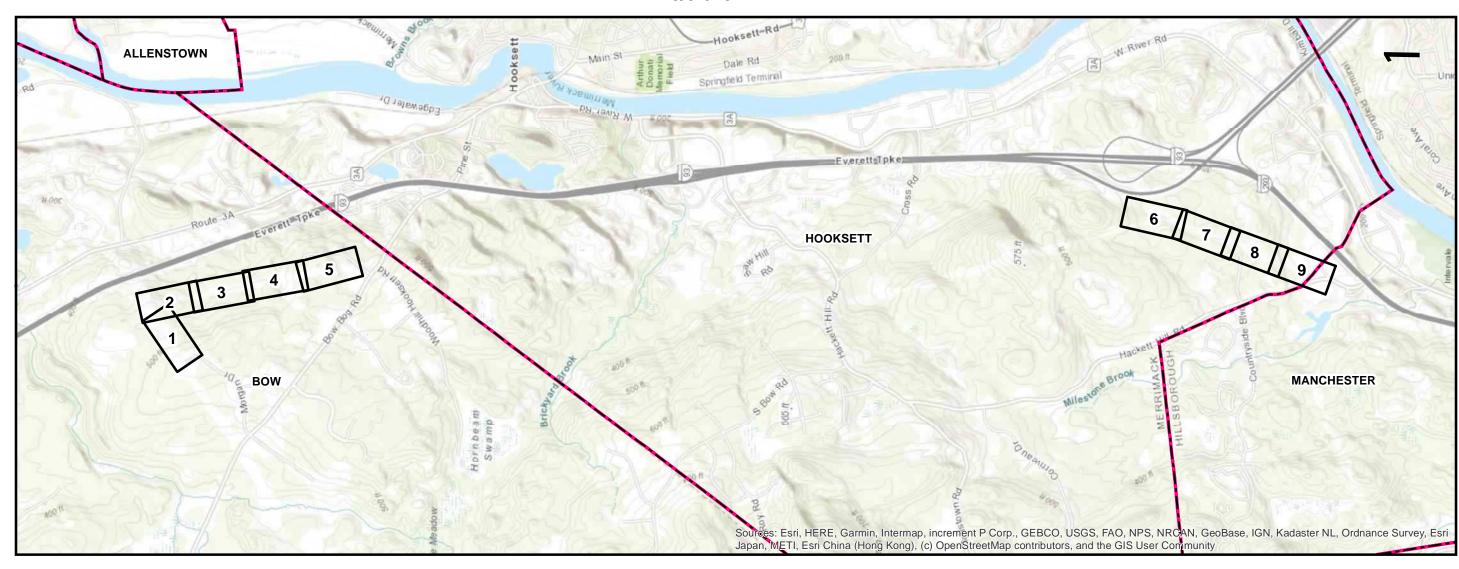


Figure 4 – Alteration of Terrain Permitting Plans

# D121 TRANSMISSION LINE OPGW AND STRUCTURE REPLACEMENT PROJECT

# **ALTERATION OF TERRAIN PERMITTING PLANS**

BOW AND HOOKSETT NEW HAMPSHIRE 3/31/2021



PREPARED FOR



# **INDEX OF FIGURES**

1 inch = 2,500 feet

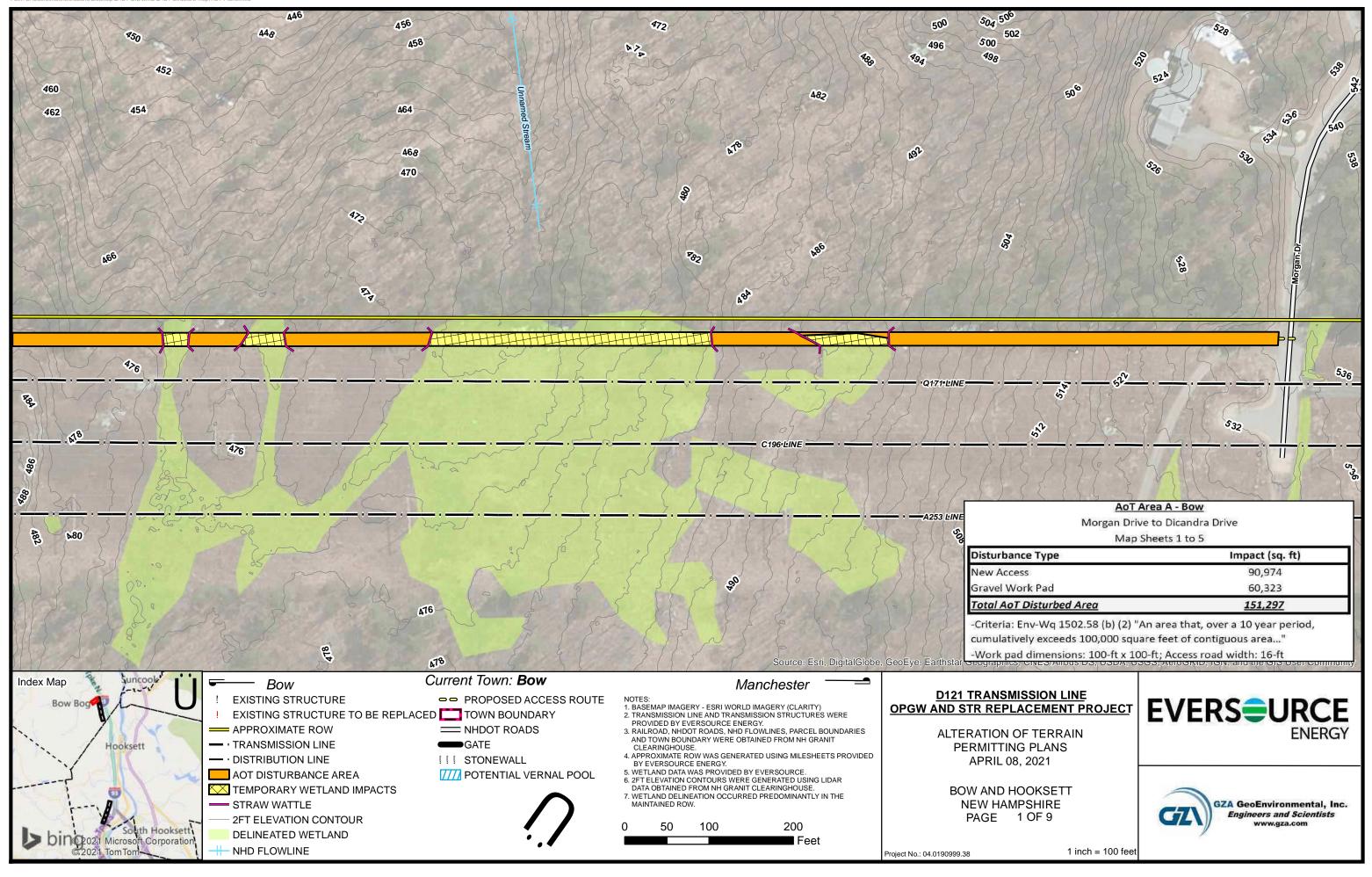
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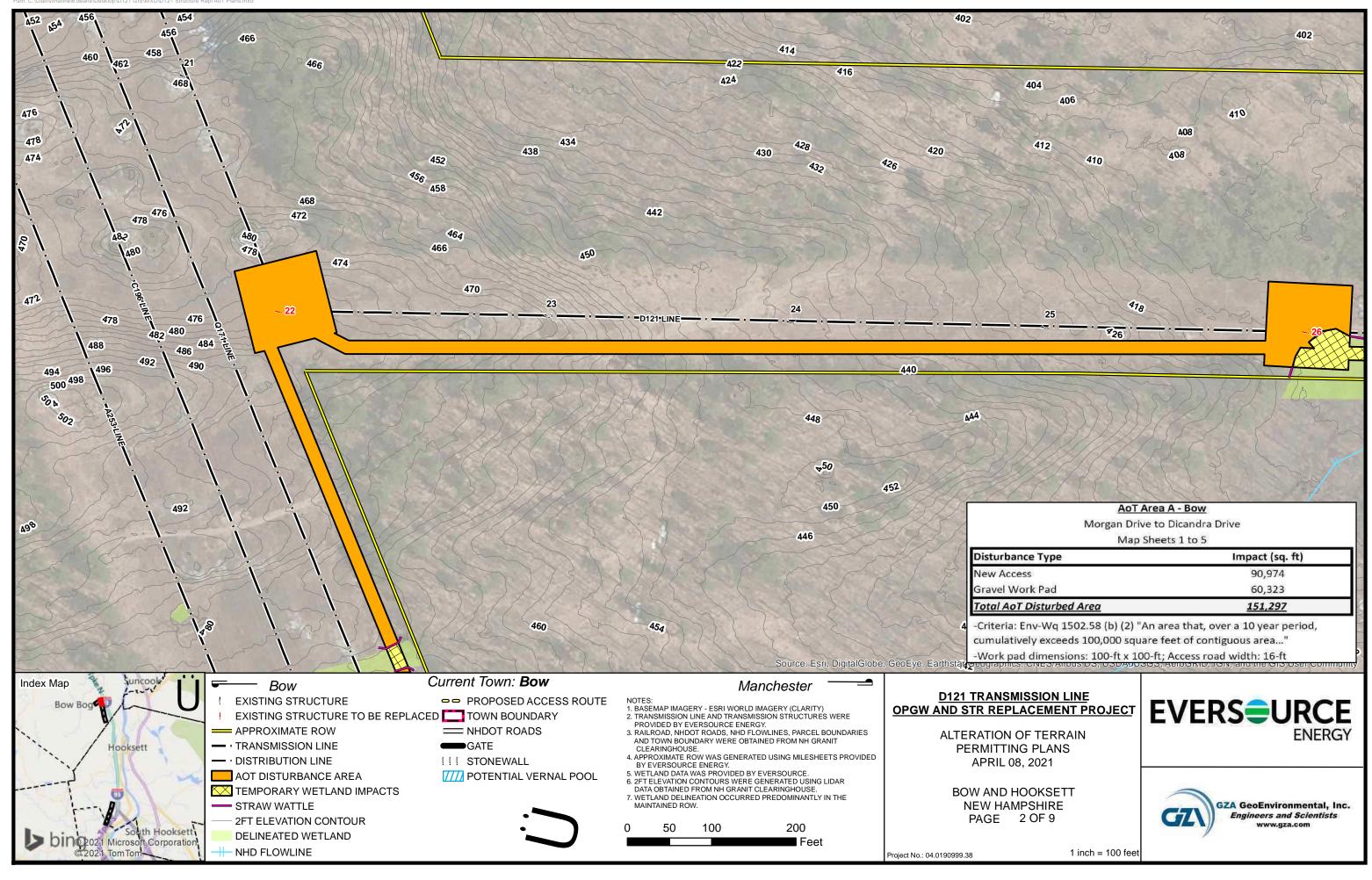
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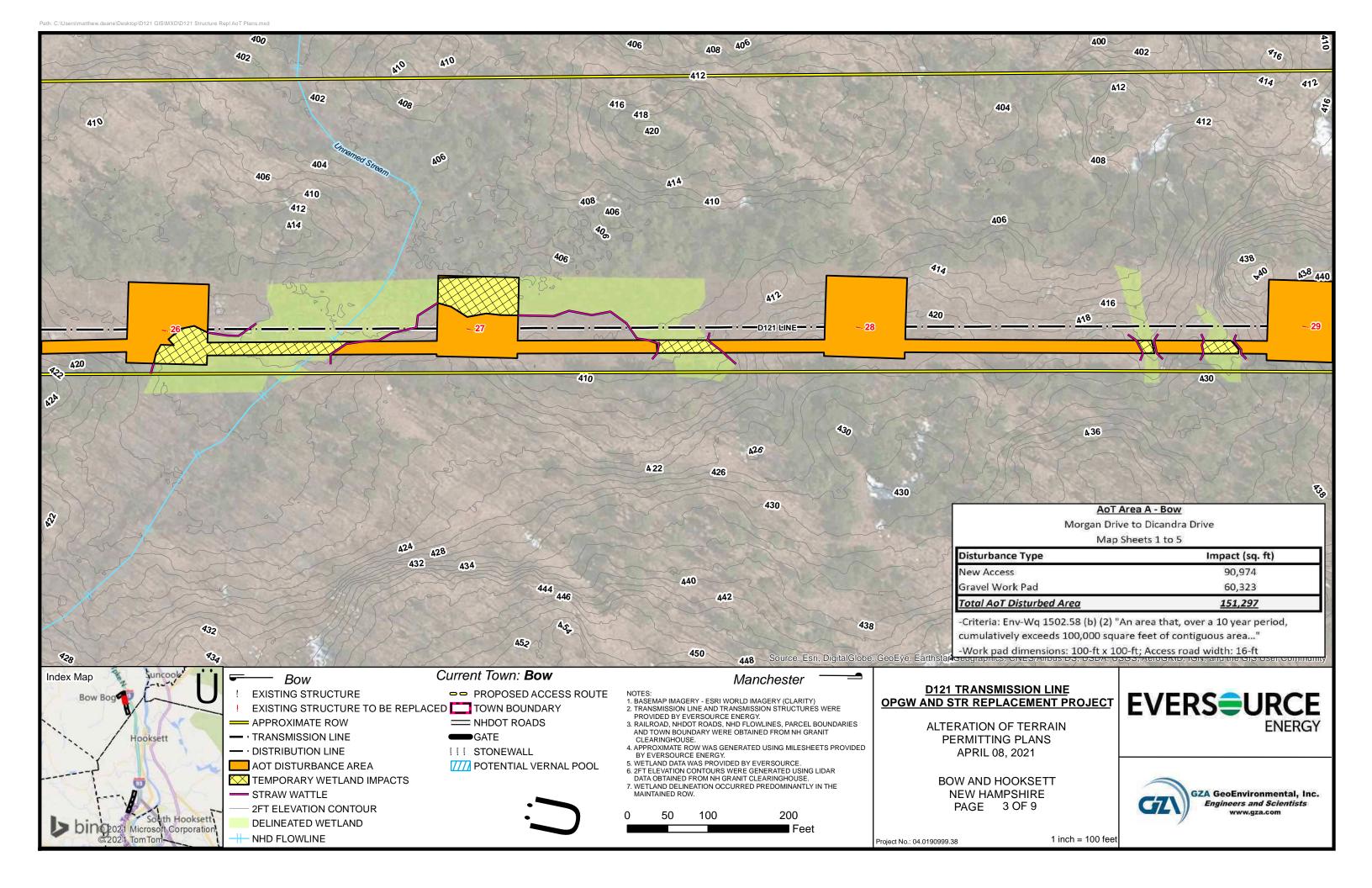
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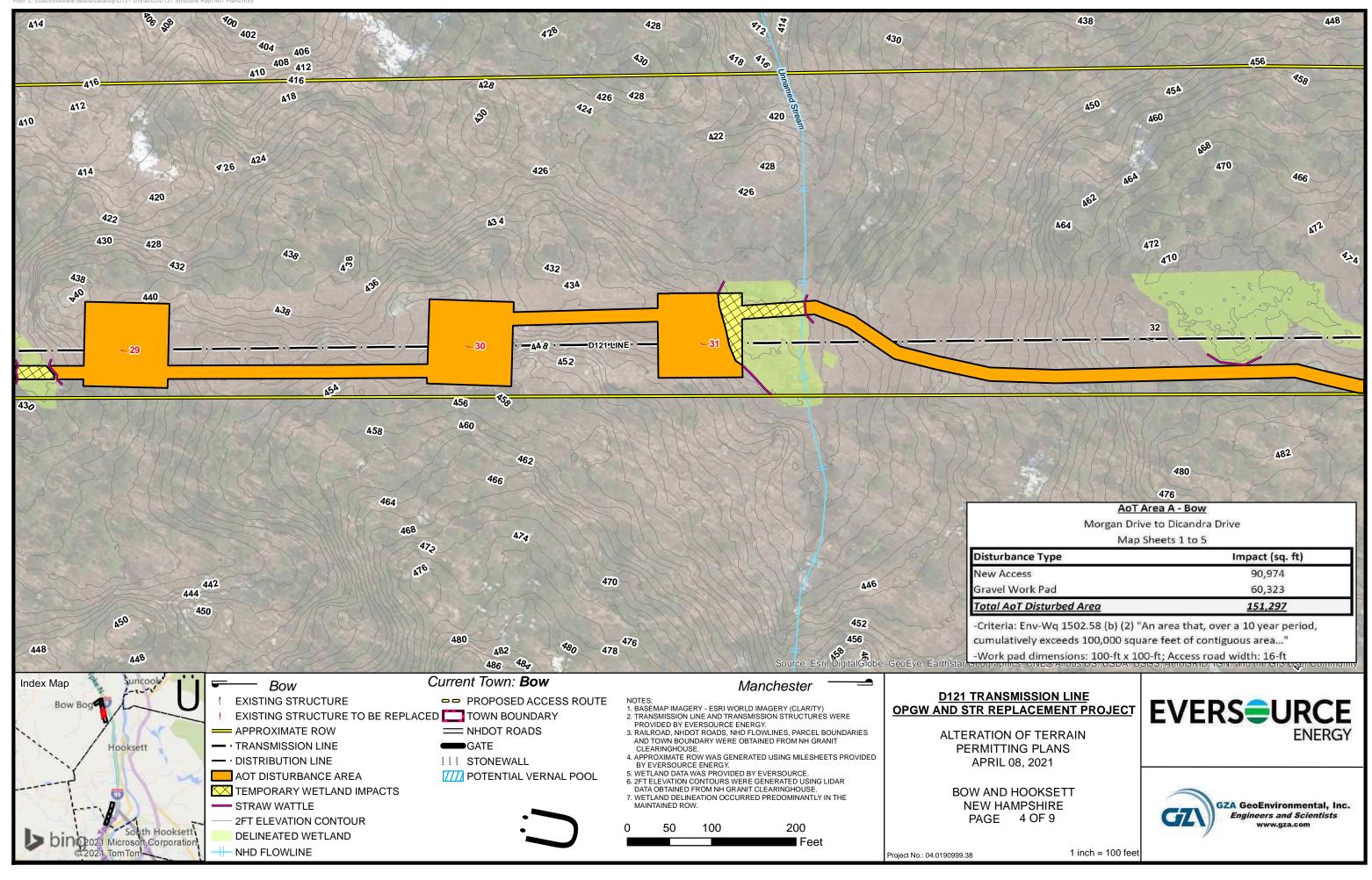
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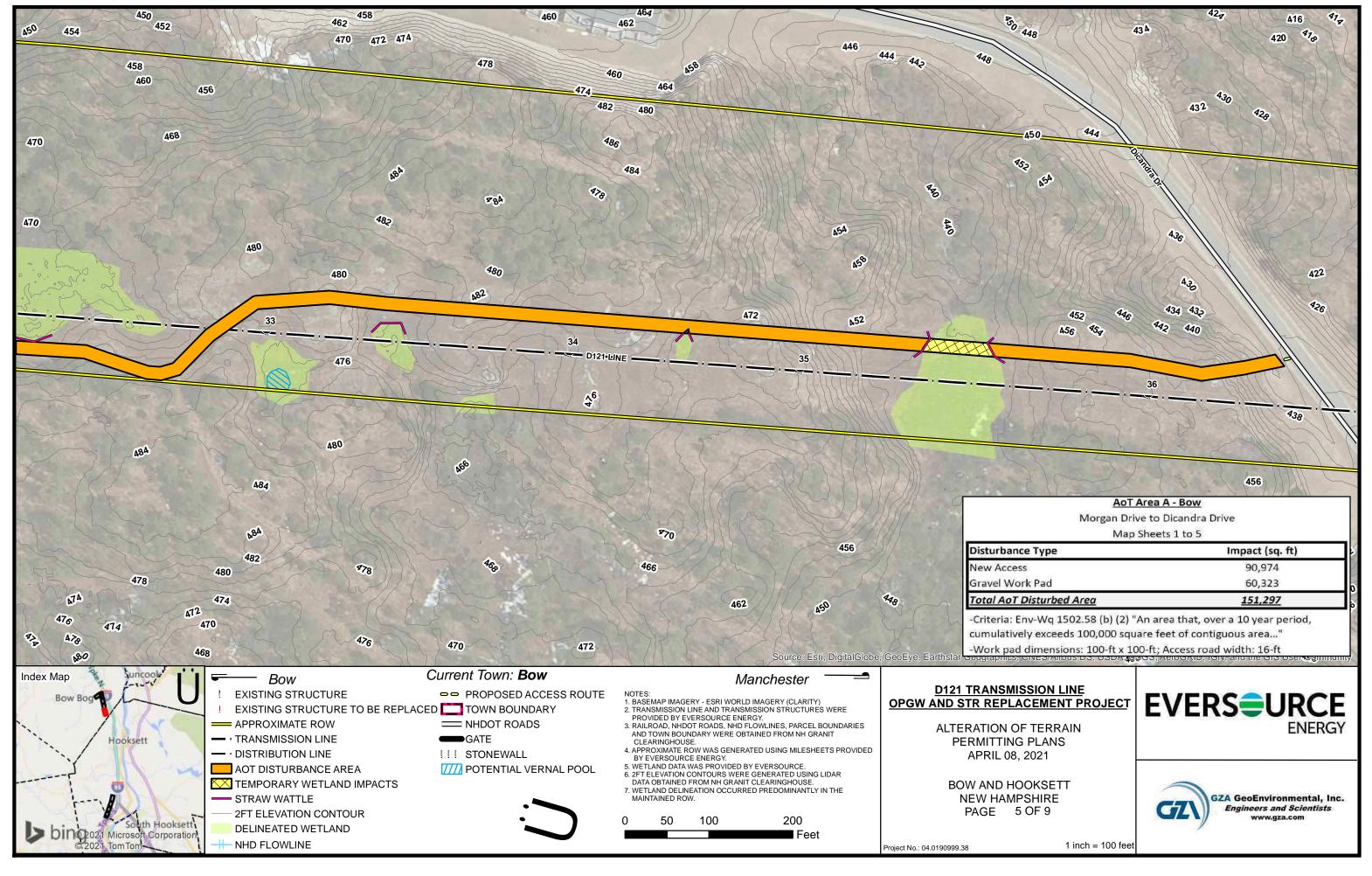


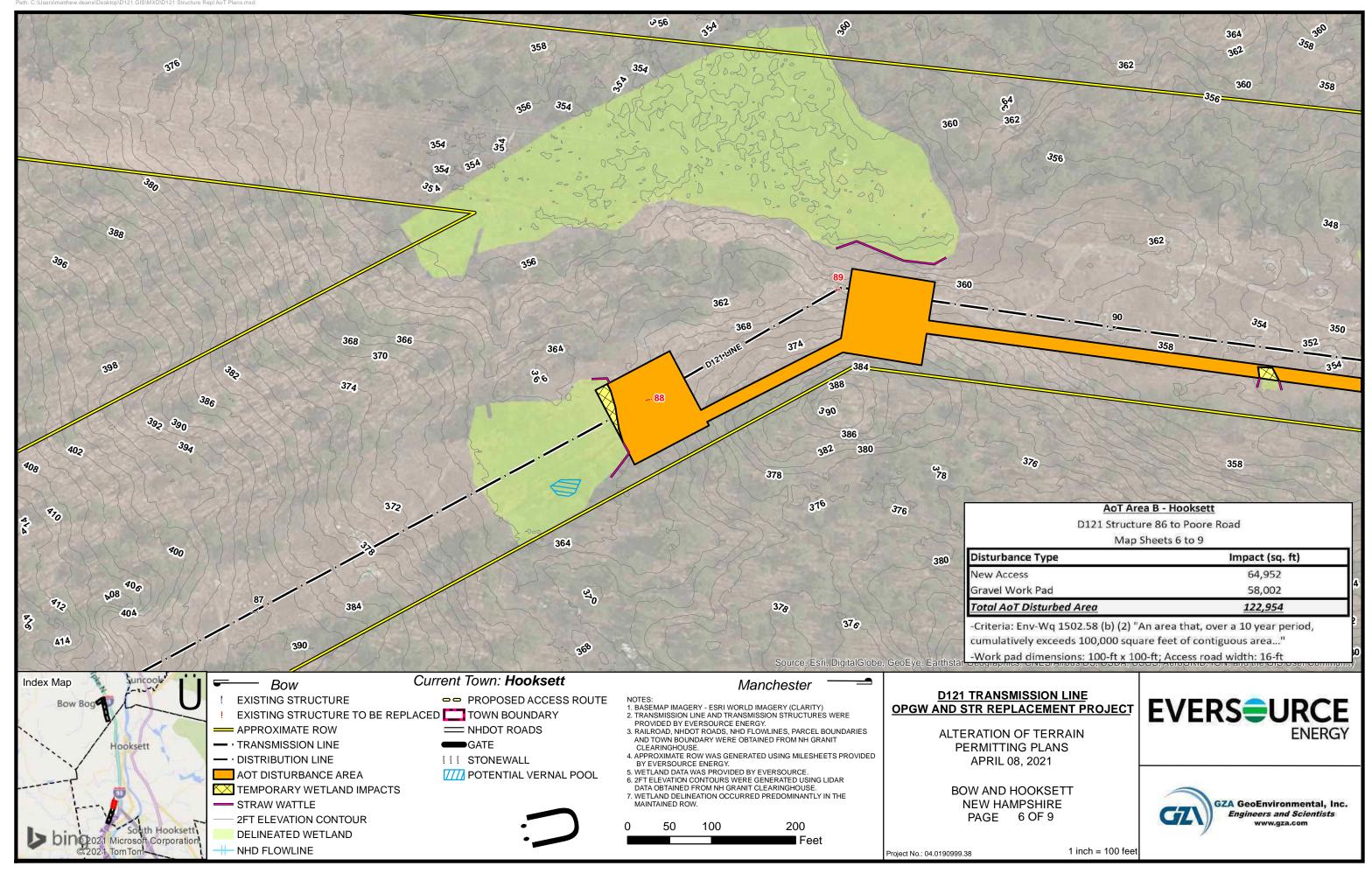


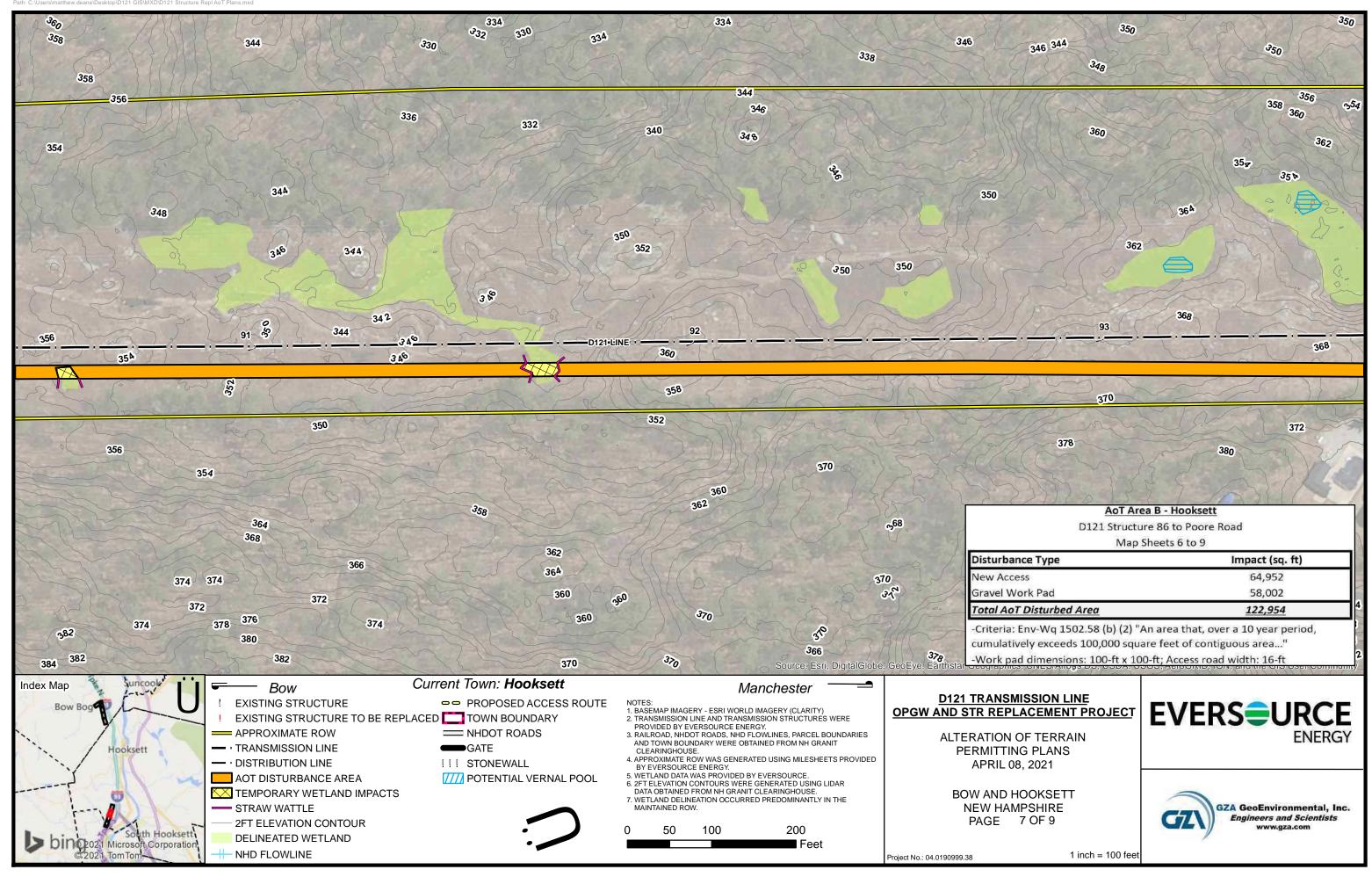


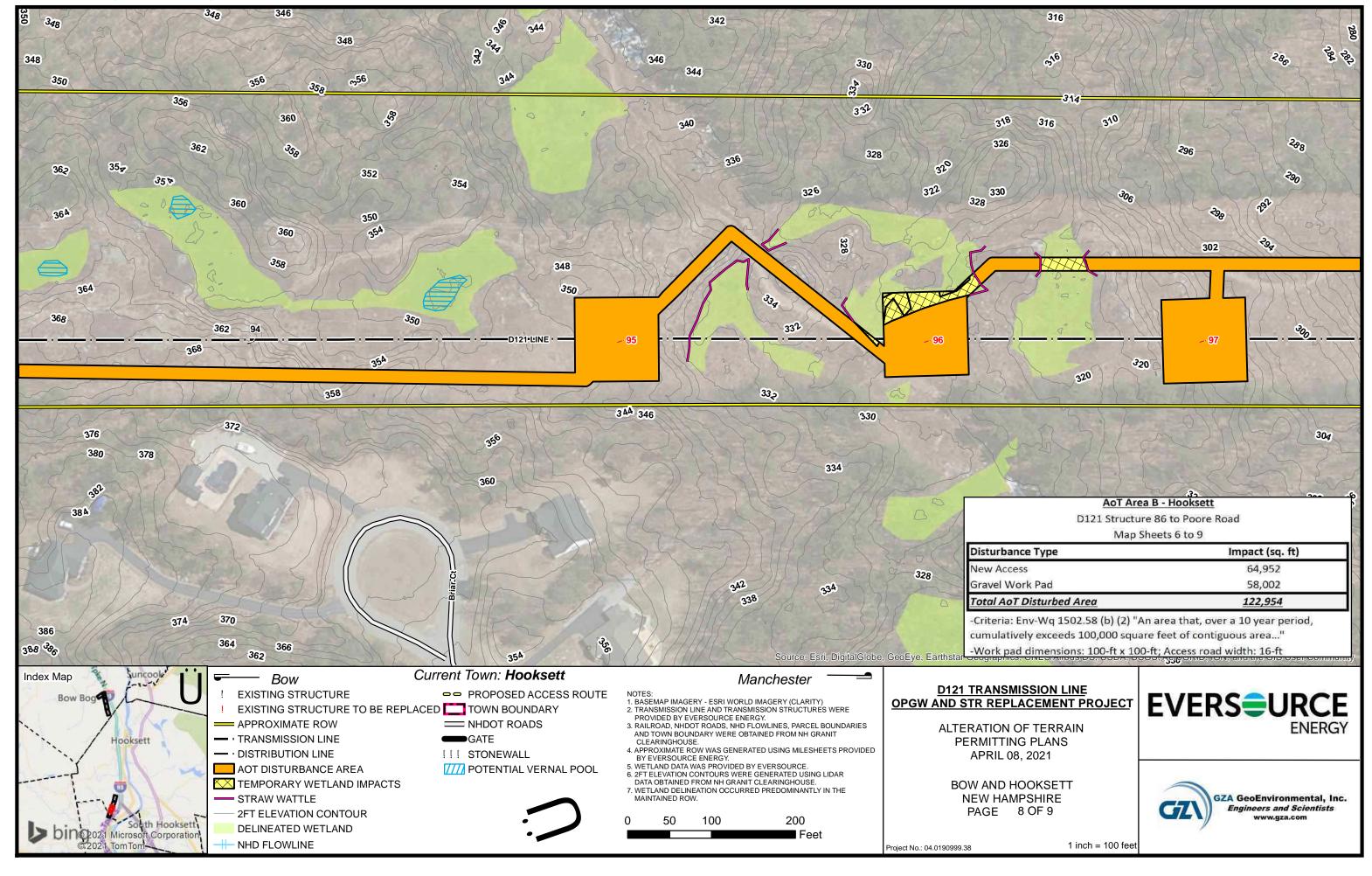


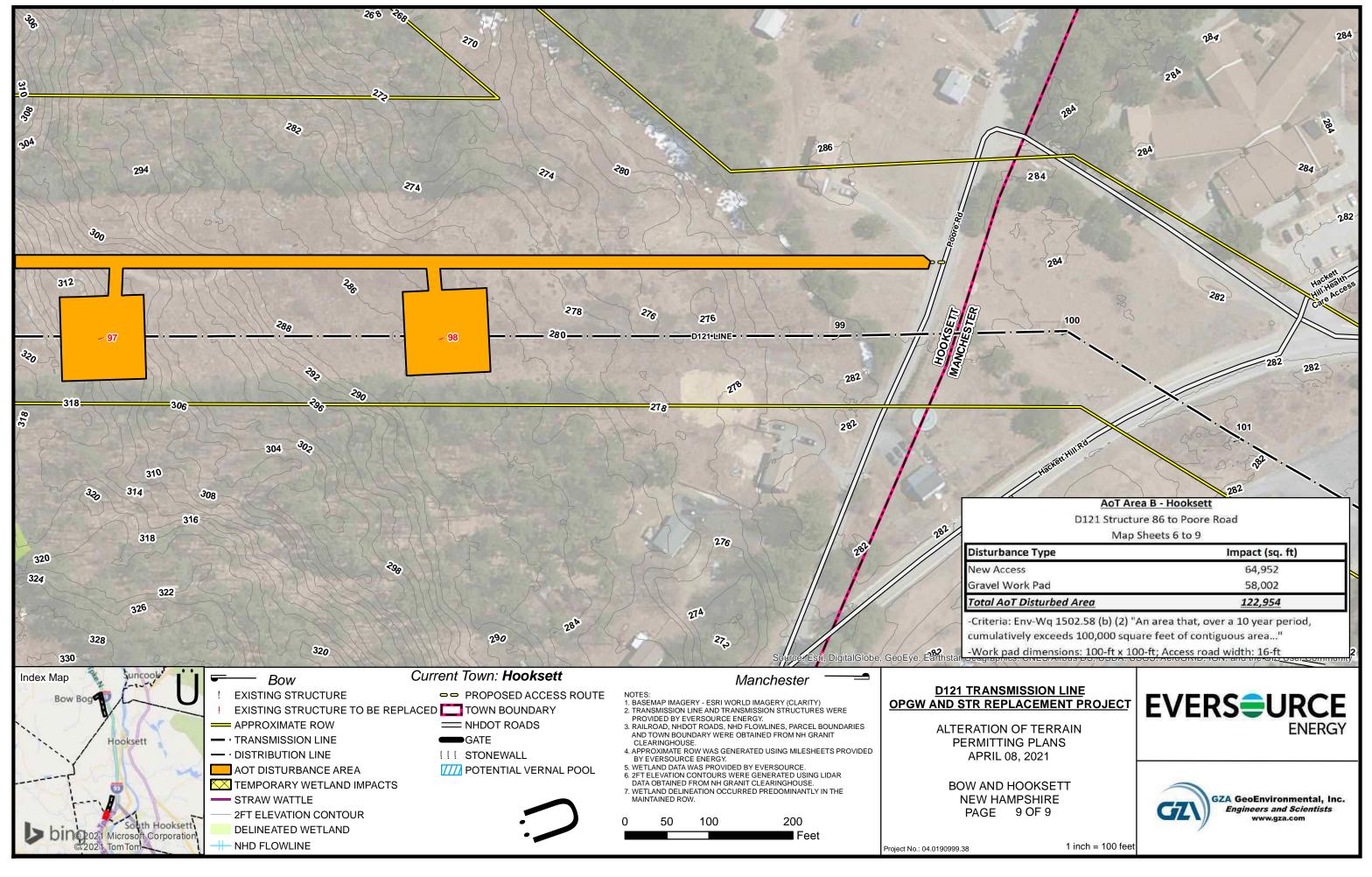












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- 6. ACCESS ROUTES HAVE BEEN SELECTED TO PREVENT DEGRADATION OF THE RIGHT-OF-WAY AND MINIMIZE ENVIRONMENTAL IMPACT. OPERATIONS SHALL BE CONFINED TO THE SPECIFIED ACCESS ROUTES WITHIN THE PROPOSED WETLAND IMPACT AREA. ACCESS ROUTES SHALL NOT EXCEED A 16 FOOT-WIDTH.
- 7. IMPACT TO VEGETATION WITHIN WETLANDS WILL BE LIMITED TO THE EXTENT NECESSARY TO PLACE THE TIMBER MATS
- 8. LOW GROWING VARIETIES OF VEGETATION ADJACENT TO WETLANDS SHALL BE PRESERVED TO THE EXTENT POSSIBLE. STUMPS AND ROCKS SHALL NOT BE REMOVED, AND THERE SHALL BE NO EXCAVATIONS, FILLS OR GRADING DONE ADJACENT TO WETLANDS, UNLESS MINOR EXCAVATIONS IS NEEDED FOR ACCESS.
- 9. TIMBER MATS WILL BE USED ALONG ACCESS ROUTES WITHIN WETLAND AREAS. THESE MATS ARE CONSTRUCTED OF HEAVY TIMBERS OR COMPOSITE MATERIAL, BOLTED TOGETHER, AND ARE PLACED END-TO-END IN THE WETLAND TO SUPPORT HEAVY EQUIPMENT. ALL SWAMP MATS SHALL BE PLACED AND REMOVED SO AS NOT TO CAUSE ANY RUTS, CHANNELS OR DEPRESSIONS, OR OTHERWISE CAUSE ANY UNDUE DISTURBANCE TO WETLANDS.
- 10. IF TIMBER MAT BMP IS NOT SUFFICIENT DUE TO HIGH WATER, ADDITIONAL BMP'S MAY INCLUDE THE PLACEMENT OF GEOTEXTILE FABRIC, 3"-4" STONE, AND GRAVEL TO PROVIDE A SUITABLE ROAD BED. A TEMPORARY CULVERT MAY BE REQUIRED IN AREAS OF HIGH FLOW TO MAINTAIN HYDROLOGIC CONNECTIVITY. ALL MATERIAL WILL BE REMOVED FROM JURISDICTIONAL AREAS AFTER CONSTRUCTION COMPLETION.
- 11. NO MATERIAL SHALL BE PLACED IN ANY LOCATION OR IN ANY MANNER SO AS TO IMPAIR SURFACE WATER FLOW INTO, THROUGH OR OUT OF ANY WETLAND AREA. NO INSTALLATION SHALL CREATE AN IMPOUNDMENT THAT WILL IMPEDE THE FLOW OF WATER OR CAUSE FLOODING.
- 12. NO MATERIAL SHALL BE TAKEN FROM THE WETLANDS AREA EXCEPT THAT WHICH MUST NECESSARILY BE REMOVED FOR THE STRUCTURE OR FOUNDATION PLACEMENT OR STABILIZATION. ALL EXCESS MATERIAL TAKEN FROM THE WETLAND WILL BE REMOVED FROM THE SITE.
- 13. ANY PROPOSED SUPPORT FILLS SHALL BE CLEAN GRAVEL AND STONE, FREE OF WASTE METAL PRODUCTS, ORGANIC MATERIALS AND SIMILAR DEBRIS AND SHALL NOT EXCEED THE AMOUNT PERMITTED. THIS ALLOWABLE FILL IS THE ONLY FILL THAT MAY REMAIN IN THE WETLAND AFTER CONSTRUCTION. ALL CUT AND FILLS SLOPES SHALL BE SEEDED/LOAMED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- 14. INSTALL NEW POLES IN THE LOCATIONS DESIGNATED ON THE PERMITTING PLANS.
- 15. CABLE INSTALLATION WILL BE PERFORMED IN A MANNER SO AS TO AVOID, OR LIMIT TO THE MAXIMUM EXTENT POSSIBLE TRAVERSING WETLANDS WITH HEAVY EQUIPMENT. IN SOME CASES, A HELICOPTER MAY BE USED DURING THE INSTALLATION TO MINIMIZE IMPACTS
- 16. ALL SWAMP MATS, MATERIAL, AND DEBRIS WILL BE REMOVED FROM THE WORK AREA UPON THE COMPLETION OF CONSTRUCTION.
- 17. UPLAND DISTURBED AREAS SHALL BE RESTORED AND STABILIZED UPON COMPLETION OF CONSTRUCTION. WORK PAD RESTORATION SHOULD INCLUDE REDUCING THE WORK PAD TO A 30 BY 60 FOOT AREA, AND REDUCING SLOPES TO A MAXIMUM OF 25%. STOCKPILED MATERIAL SHOULD BE SPREAD TO REDUCE ANY UNNECESSARY SLOPES. GRAVEL WORK PADS AND SLOPES SHOULD BE SCARIFIED TO A MINIMUM OF 3" BEFORE SPREADING TOPSOIL/LOAM.
- 18. ALL TEMPORARY WETLAND IMPACTS WILL BE RE-GRADED TO ORIGINAL CONTOURS FOLLOWING CONSTRUCTION, NEW ENGLAND EROSION CONTROL/RESTORATION MIX, AVAILABLE THROUGH NEW ENGLAND WETLAND PLANTS, INC., 820 WEST STREET, AMHERST, MA 01002, 413-548-8000, OR EQUIVALENT SEED MIX SHALL BE APPLIED IN WETLAND AREAS THAT
- 19. SEDIMENT AND EROSION CONTROL MEASURES WILL BE EVALUATED AND REMOVED IF NECESSARY UPON THE COMPLETION OF CONSTRUCTION.
- 20. COMMERCIAL LOAM WILL NOT BE USED AS PART OF RESTORATION. ONLY IN-SITU TOPSOIL WILL BE USED TO RESTORE DISTURBED AREAS.
- 21. WHERE OPTIMAL TURTLE BREEDING AREAS OVERLAP WITH DISTURBANCE (AS DETERMINED BY AN ENVIRONMENTAL MONITOR), MINERAL SOILS WILL BE SCARIFIED TO ALLEVIATE COMPACTION AND BECOME MORE SUITED FOR TURTLE BREEDING.

#### WINTER CONSTRUCTION NOTES

- 1. PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED. STABILIZATION METHODS SHALL INCLUDE SEEDING AND MULCH, AND INSTALLATION OF EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT
- 2. DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE TEMPORARILY STABILIZED WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.

3. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL (NHDOT 304.3)

#### GENERAL NOTES

OWNER: EVERSOURCE ENERGY 13 LEGENDS DRIVE HOOKSETT, NH 03106

- 1. BASE PLAN PROVIDED BY EVERSOURCE ENERGY. EVERSOURCE ENERGY PROVIDED THE WETLAND DATA. EVERSOURCE ENERGY PROVIDED THE UTILITY DESIGN.
- 2. JURISDICTIONAL WETLANDS WERE DELINEATED BY TIGHE AND BOND IN 2018, IN ACCORDANCE WITH THE 1987 U.S. ARMY CORPS OF ENGINEERS' "WETLANDS DELINEATION MANUAL, TECHNICAL REPORT Y-87-1," AND REGIONAL SUPPLEMENT TO THE CORPS OF ENGINEERS WETLAND DELINEATION MANUAL: NORTH CENTRAL AND NORTHEAST REGION," JANUARY 2012. WETLANDS WERE REVIEWED BY GZA GEOENVIRONMENTAL, INC. IN JANUARY
- 3. GZA PERFORMED A WETLANDS FUNCTION AND VALUES ASSESSMENT IN ACCORDANCE WITH THE ACOE'S "HIGHWAY METHODOLOGY WORKBOOK SUPPLEMENT," SEPTEMBER 1999, IN THE TOWN OF STRAFFORD.
- 4. SITE PLAN IS FOR PERMITTING PURPOSES ONLY AND DOES NOT REPRESENT A PROPERTY BOUNDARY SURVEY.
- 5. THE PROJECT WILL BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
- 6. IN ACCORANCE WITH ENV-WQ 1505.02, THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
  - A MINIMUM 85 PERCENT VEGETATED GROWTH HAS BEEN ESTABLISHED A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL HAS BEEN INSTALLED OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED.
- 7. IN THE EVENT THAT A RARE OR THREATENED SPECIES IS OBSERVED, THE NEW HAMPSHIRE FISH AND GAME AND NEW HAMPSHIRE NATURAL HERITAGE BUREAU WILL BE NOTIFIED. TURTLE NESTING SEASON EXTENDS FROM LATE MAY THROUGH THE BEGINNING OF JULY. IF WOOD, BLANDING'S OR SPOTTED TURTLES ARE FOUND LAYING EGGS IN THE WORK AREA, CONTACT MELISSA DOPERALSKI AT 603-271-1738 OR JOSH MEGYESY AT 603-271-1125 FOR FURTHER INSTRUCTIONS. OBSERVATIONS OF NORTHERN BLACK RACER SNAKES SEEN IN ANY AREA FROM THE END OF SEPTEMBER THROUGH THE MONTH OF APRIL MUST BE IMMEDIATELY REPORTED TO THE NHFG DEPARTMENT (BRENDAN CLIFFORD AT 603-271-0463 OR MELISSA DOPERALSKI AT 603-271-1738). IF NORTHERN BLACK RACER IS FOUND IN A WORK AREA FROM NOVEMBER THROUGH THE MONTH OF APRIL, WORK SHALL IMMEDIATELY CEASE AND THE OBSERVATION MUST BE REPORTED TO THE NHFG (BRENDAN CLIFFORD OR MELISSA DOPERALSKI).
- 8. TEMPORARY OR PERMANENT IMPACTS TO IDENTIFIED POTENTIAL OR SUSPECT VERNAL POOLS ARE PROHIBITED. ANY OBSERVATION OF ANY ADDITIONAL SUSPECT VERNAL POOLS ARE TO BE REPORTED TO NHFG PERSONNEL.

- 1. INSTALLATION OF EROSION CONTROL GRINDINGS AND/OR SILT FENCES SHALL BE COMPLETE PRIOR TO THE START OF WORK IN ANY GIVEN AREA. EROSION CONTROLS SHALL BE USED DURING CONSTRUCTION AND REMOVED WHEN ALL SLOPES HAVE A HEALTHY STAND OF VEGETATION COVER. EROSION CONTROL MEASURES SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER .25" OR GREATER RAINFALL EVENTS.
- 2. AS REQUIRED, CONSTRUCT TEMPORARY BERMS, SILTATION FENCES, SEDIMENT TRAPS, ETC. TO PREVENT EROSION & SEDIMENTATION OF WETLANDS.
- 3. THE WORK AREA SHALL BE GRADED AND OTHERWISE SHAPED IN SUCH A MANNER AS TO MINIMIZE SOIL EROSION, SILTATION OF DRAINAGE CHANNELS, DAMAGE TO EXISTING VEGETATION, AND DAMAGE TO PROPERTY OUTSIDE LIMITS OF THE WORK AREA. EROSION CONTROL GRINDINGS WILL BE NECESSARY TO
- 4. ANY STRIPPED TOPSOIL SHALL BE STOCKPILED, WITHOUT COMPACTION, AND STABILIZED AGAINST EROSION, AS
- 5. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS, PLANT ANNUAL RYEGRASS PRIOR TO OCTOBER 15TH
- 6. EROSION CONTROLS SHALL BE INSPECTED WEEKLY AND AFTER EVERY HALF-INCH OF RAINFALL.
- 7. EROSION CONTROL MATTING, IF REQUIRED, WILL CONSIST OF JUTE MATTING. MATTING WITH WELDED PLASTIC OR 'BIODEGRADABLE PLASTIC' NETTING OR THREAD WILL BE AVOIDED TO LIMIT UNINTENTIONAL MORTALITY TO SNAKES.

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#### D121 TRANSMISSION LINE OPGW AND STRUCTURE REPLACEMENT PROJECT

**BOW AND HOOKSETT** NEW HAMPSHIRE

NOTES





REVIEWED BY: TLT CHECKED BY: DMZ LEW DESIGNED BY: MJD DRAWN BY: MJD SCALE: ROJECT NO EVISION NO 03/31/2021 04.0190999.38

**S1** 

#### Best Management Practices (BMP's) for Straw wattles

#### Definition and purpose:

Straw wattles are burlap rolls filled with straw that trap sediment and interrupt water flow by reducing slope lengths.

#### Applications:

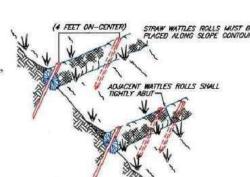
- \* Along erodible or unstablizied slopes
- \* Spread overland waterflow
- \* Trap sediment
- \* Around storm drain inlets to slow water and settle out sediment
- \* Overlap ends approximately 6 inches

#### Installation:

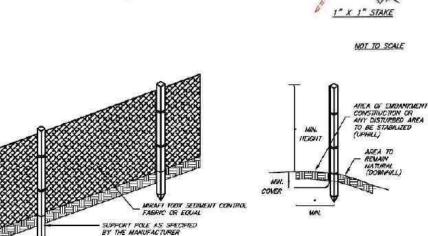
Straw wattles are installed parallel to slope contours and perpendicular to sheet flow.

Spacing\* - Dependent on slope length, soil steepness and soil type (general range 10 - 25').

Trenching - 2"-5" inch trench Stacking - at each end and four foot on center (i.e. 25 foot wattle uses 6 stacks)







NOTES (SILT FENCE)

FRONT VIEW

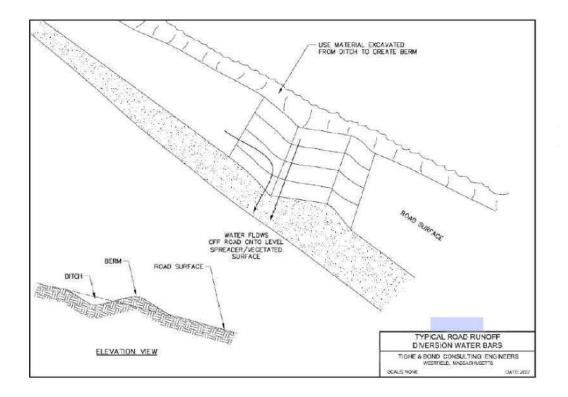
1. THE HEIGHT OF THE BARRIER SHALL NOT EXEED 36 INCHES. 2. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST. WITH A MINIMUM 6—INCH OVERLAP, AND SECURELY SEALED. SEE MANUFACTURER'S RECOMMENDATIONS.

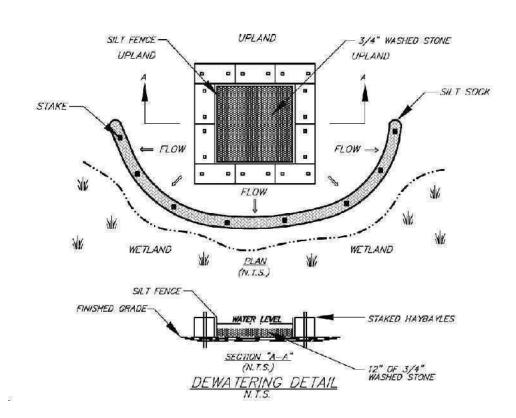
3 POSTS SHALL BE PLACED AT A MAXIMUM OF 10 FEET APART AT THE BARRIER LOCATION AND DRIVEN
SECURELY INTO THE GROUND (MINIMUM OF 12 INCHES). WHEN EXTRA STRENGTH FABRIC IS USED WITHOUT THE WIRE SUPPORT FENCE, POST SPACING SHALL BE AS MANUFACTURER RECOMMENDS.

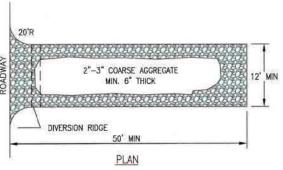
4. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 6 INCHES WIDE AND 6 INCHES DEEP ALONG THE LINE

SIDE VIEW

- OF POSTS AND UPSLOPE OF THE BARRIER IN ACCORDANCE WITH RECOMMENDATIONS
- 5. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE, AND WILL EXTEND A MINIMUM OF 8 INCHES INTO THE TRENCH. FILTER FABRIC SHALL NOT BE STAPLED
- 6. THE TRENCH SHALL BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC. 7. FABRIC BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED. 8. FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST ONCE
- DAILY DURING PROLONGED RAINFALL AND ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY. 9. SHOULD THE FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY. 10. SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE—HALF THE HEIGHT OF THE BARRIER
- 11. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.







1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO

2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.

#### **CONSTRUCTION ENTRANCE**

NOT TO SCALE

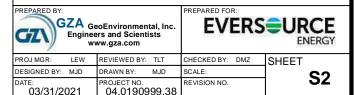
03/31/2021

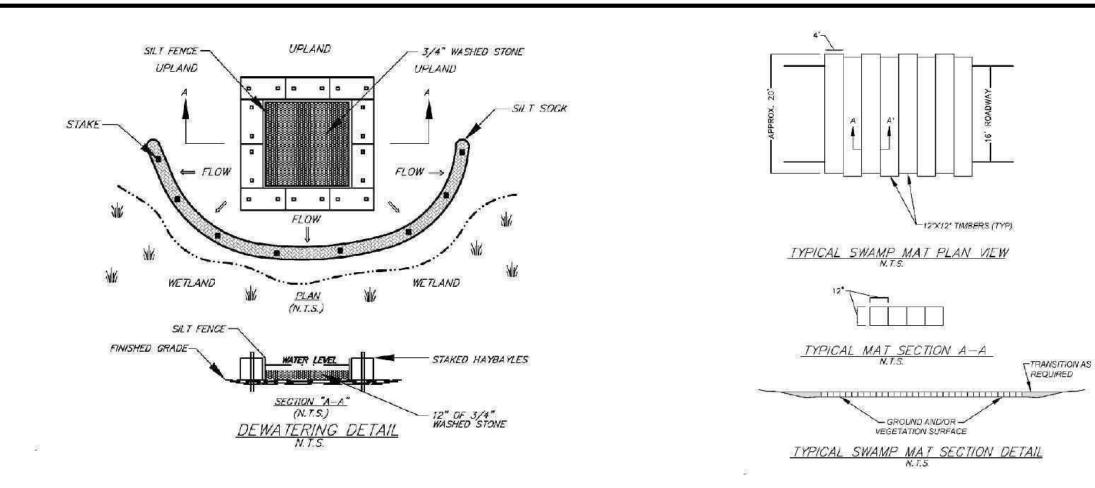
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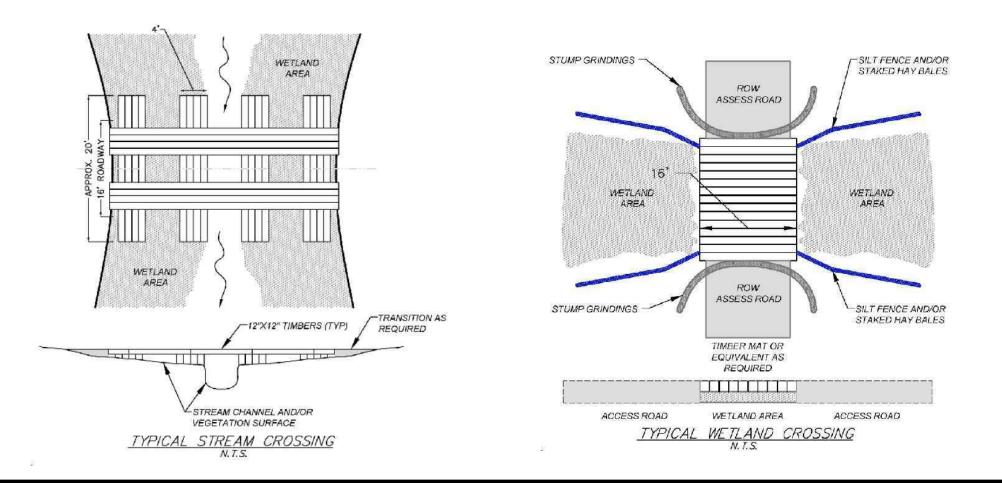
#### **D121 TRANSMISSION LINE** OPGW AND STRUCTURE REPLACEMENT PROJECT

**BOW AND HOOKSETT** NEW HAMPSHIRE

#### **BMP DETAILS**







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## D121 TRANSMISSION LINE OPGW AND STRUCTURE REPLACEMENT PROJECT

BOW AND HOOKSETT NEW HAMPSHIRE

### BMP DETAILS





Appendix A – Alteration of Terrain Permit Application Form



## ALTERATION OF TERRAIN PERMIT APPLICATION



Water Division/ Alteration of Terrain Bureau/ Land Resources Management Check the Status of your Application: <a href="www.des.nh.gov/onestop">www.des.nh.gov/onestop</a>

RSA/ Rule: RSA 485-A:17, Env-Wq 1500

				File Num		
Administrative				Check No.		
Use Only		Use Only		Amount:		
				Initials:		
1. APPLICANT INFORMATION (IN	TENDED PERMIT HOLDER)		<u>'</u>			
Applicant Name: Eversource Ener	gy	Contact Name: Matth	new Cardin			
Email: matthew.cardin@eversour	rce.com	Daytime Telephone: 6	03-988-6635	5		
Mailing Address: 13 Legends Driv	е					
Town/City: Hooksett			State: NH		Zip Code: 03106	
2 APPLICANT'S AGENT INFORMA	TION If none, check here:	]			•	
Business Name: GZA GeoEnvironr	Contact Name: Lindse	Contact Name: Lindsey White				
Email: lindsey.white@gza.com	Daytime Telephone: 6	Daytime Telephone: 603-232-8753				
Address: 5 Commerce Park North	ı, Suite 201	•				
Town/City: Bedford		State: NH		Zip Code: 03110		
3. PROPERTY OWNER INFORMAT	ION (IF DIFFERENT FROM APPLICAN	IT)				
Applicant Name: ROW consists of	f existing easements	Contact Name:				
Email:	Daytime Telephone:					
Mailing Address:						
Town/City:		State:		Zip Code:		
4. PROPERTY OWNER'S AGENT IN	IFORMATION If none, check	chere: 🔀				
Business Name:	Contact Name:					
Email:		Daytime Telephone:				
Address:						
Town/City:			State:		Zip Code:	
5. CONSULTANT INFORMATION	If none, check here:					
Engineering Firm: GZA GeoEnviro	Contact Name: Lindsey White					
Email: lindsey.white@gza.com	Daytime Telephone: 603-232-8753					
Address: 5 Commerce Park North	, Suite 201					
Town/City: Bedford		State: NH		Zip Code: 03110		
<del></del>					<del></del>	

Excavation Only Residential	Commercial	Golf Course	School	Municipal		
☐ Agricultural ☐ Land Conversion ☐ Other: Utility						
7. PROJECT LOCATION INFORMATION						
	Project Name: D121 Transsmission Line Optical Ground Wire (OPGW) and Structure Replacement Project					
Street/Road Address: Existing Utility Right-of-Way						
Town/City: Bow and Hooksett County: Merrimack & Hillsborough						
Tax Map: See attached Block:		Lot Number:		Unit:		
Location Coordinates: 225363N, 1032646E	Latitude/Lo			State Plane		
Post-development, will the proposed project withdraw from						
Stream or Wetland		Yes	Withdrawal	Discharge		
Purpose:		 ⊠ No		_ ,		
2. Man-made pond created by impounding a stream or w	etland	Yes	Withdrawal	Discharge		
Purpose:		⊠ No				
3. Unlined pond dug into the water table		Yes	☐ Withdrawal	Discharge		
Purpose:		⊠ No				
Post-development, will the proposed project discharge to:						
<ul> <li>A surface water impaired for phosphorus and/or nitrogen cause net increase in phosphorus and/or nitrogen</li> </ul>	? ⊠ No	es - include informa	ition to demonstra	ite that project will not		
• A Class A surface water or Outstanding Resource Water?	⊠ No □	Yes - include info	ormation to demor	nstrate that project will not		
cause net increase in phosphorus and/or nitrogen	Voc. include infe	armatian to domar	actrata that project	t will not couse not increase		
• A lake or pond not covered previously? No in phosphorus in the lake or pond	res - include init	ormation to demor	istrate that projec	t will not cause net increase		
Is the project a High Load area? Yes No If yes, specify the type of high load land use or activity:						
		□ Vas P	ZI No			
Is the project within a Water supply intake Protection Area (GPA)?	s the project within a Water Supply Intake Protection Area (WSIPA)?  s the project within a Groundwater Protection Area (GPA)?  Yes  No					
Will the well setbacks identified in Env-Wq 1508.02 be			No			
Note: Guidance document titled "Using NHDES's OneStop WebGIS to Locate Protection Areas" is available online. For more details on the						
restrictions in these areas, read Chapter 3.1 in Volume 2 of the NH Stormwater Manual.						
Is any part of the property within the 100-year floodplain?  Yes No  If yes: Cut yolume: 0, cubic feet within the 100-year floodplain.						
If yes: Cut volume: 0 cubic feet within the 100-year floodplain  Fill volume: 0 cubic feet within the 100-year floodplain						
Project IS within ¼ mile of a designated river  Name of River:						
Project is NOT within ¼ mile of a designated river						
Project IS within a Coastal/Great Bay Region community - include info required by Env-Wq 1503.08(I) if applicable						
Project is NOT within a Coastal/Great Bay Region community						
8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")						
The proposed project includes the replacement of 13 utility structure along the existing D121 Transmission Line, which crosses through portions of Bow and Hooksett, New Hampshire. Access road improvements and work pad grading are proposed as part of this project for continued maintenance of the existing transmission lines.						
9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT						
No work has been started prior to receiving a permit.						
the work has been started prior to receiving a permit.						

#### NHDES-W-01-003

10. ADDITIONAL REQUIRED INFORMATION	10. ADDITIONAL REQUIRED INFORMATION				
A. Date a copy of the application was sent to the municipality as required by Env-Wq 1503.05(e) <sup>1</sup> : 5 / 19 / 2021.  (Attach proof of delivery)					
B. Date a copy of the application was sent to the local river advisory committee if required by Env-Wq 1503.05(e) <sup>2</sup> : / / N/A (Attach proof of delivery)					
C. Type of plan required: Land Conversion	C. Type of plan required:   Land Conversion   Detailed Development   Excavation, Grading & Reclamation   Steep Slope				
D. Additional plans required: Stormwater Dra	ninage & Hydrologic	Soil Groups	☐ Source C	Control 🔲 Chloride Management	
E. Total area of disturbance: <u>274,251</u> square feet	t				
F. Additional impervious cover as a result of the proverage).  Total final impervious cover: <u>0</u> square feet	project: squai	re feet (use	the "-" symb	ool to indicate a net reduction in impervious	
G. Total undisturbed cover: O square feet					
H. Number of lots proposed: <u>0</u>					
I. Total length of roadway: <u>0</u> linear feet					
J. Name(s) of receiving water(s): 0					
K. Identify all other NHDES permits required for the project, and for each indicate whether an application has been filed and is pending, or if the required approval has been issued provide the permit number, registration date, or approval letter number, as applicable.					
Type of Approval	Application Filed?		Status		
Туре от Арргочаг			Pending	If Issued:	
1. Water Supply Approval	☐ Yes ☒ No	□N/A		Permit number:	
2. Wetlands Permit		□N/A		Permit number: 2020-03192, 2020-03201	
3. Shoreland Permit	☐ Yes ☒ No	□N/A		Permit number:	
4. UIC Registration	I. UIC Registration			Registration date:	
5. Large/Small Community Well Approval	☐ Yes ☒ No	□N/A		Approval letter date:	
6. Large Groundwater Withdrawal Permit	☐ Yes ☒ No	□N/A		Permit number:	
7. Other:					
L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern: <u>Blandings turtle</u> , <u>northern black racer</u> , <u>wood turtle</u> , <u>eastern hognose snake</u> , <u>peregrine falcon</u>					
M. Using NHDES's Web GIS OneStop program (www2.des.state.nh.us/gis/onestop/), with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A."  N/A					
N. Did the applicant/applicant's agent have a pre-application meeting with AOT staff?  If yes, name of staff member:					
O. Will blasting of bedrock be required?					

<sup>&</sup>lt;sup>1</sup> Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the governing body of each municipality in which the project is proposed.

<sup>&</sup>lt;sup>2</sup> Env-Wq 1503.05(c)(6), requires proof that a completed application form, checklist, plans and specifications, and all other supporting materials have been sent or delivered to the Local River Advisory Committee, if the project is within ¼ mile of a designated river.

11.	CHECK ALL APPLICATION ATTACHMENTS THAT APPLY (SUBMIT WITH APPLICATION IN ORDER LISTED)
	OSE:  Signed application form: des.nh.gov/organization/divisions/water/aot/index.htm (with attached proof(s) of delivery)  Check for the application fee: des.nh.gov/organization/divisions/water/aot/fees.htm  Color copy of a USGS map with the property boundaries outlined (1" = 2,000 scale)  If Applicant is not the property owner, proof that the applicant will have a legal right to undertake the project on the property if a permit is issued to the applicant.
	DIN A REPORT IN THE FOLLOWING ORDER:
PL#	<ul> <li>ANS:</li> <li>One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)</li> <li>Pre &amp; post-development color coded soil plans on 11" x 17" (see Application Checklist for details)</li> <li>Pre &amp; post-development drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)</li> </ul>
100-	0-YEAR FLOODPLAIN REPORT:  All information required in Env-Wq 1503.09, submitted as a separate report.
	DITIONAL INFORMATION RE: NUTRIENTS, CLIMATE See Checklist for Details
$\boxtimes$	REVIEW APPLICATION FOR COMPLETENESS & CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.

#### NHDES-W-01-003

Signature:

Name (print or type): \_\_\_\_\_

#### 12. REQUIRED SIGNATURES MC By initialing here, I acknowledge that I am required by Env-Wq 1503.20(e) to submit a copy of all approved documents to the department in PDF format on a CD within one week after permit approval. By signing below, I certify that: • The information contained in or otherwise submitted with this application is true, complete, and not misleading to the best of my knowledge and belief; • I understand that the submission of false, incomplete, or misleading information constitutes grounds for the department to deny the application, revoke any permit that is granted based on the information, and/or refer the matter to the board of professional engineers established by RSA 310-A:3 if I am a professional engineer; and • I understand that I am subject to the penalties specified in New Hampshire law for falsification in official matters, currently RSA 641. X APPLICANT APPLICANT'S AGENT: Name (print or type): Matthew Cardin Title: Eversource Permitting Coordinator 7 PROPERTY OWNER PROPERTY OWNER'S AGENT:

Date:

Title:

## ATTACHMENT A: ALTERATION OF TERRAIN PERMIT APPLICATION CHECKLIST

Check the box to indicate the item has been provided or provide an explanation why the item does not apply. DESIGN PLANS

DESIGN FE WAS
Plans printed on 34 - 36" by 22 - 24" white paper
☐ PE stamp
✓ Wetland delineation
Treatment for all stormwater runoff from impervious surfaces such as roadways (including gravel roadways), parking areas, and non-residential roof runoff. Guidance on treatment BMPs can be found in Volume 2, Chapter 4 of the NH Stormwater Management Manual.
☐ Pre-existing 2-foot contours
Proposed 2-foot contours
☐ Drainage easements protecting the drainage/treatment structures
Compliance with the Wetlands Bureau, RSA 482- A <a href="http://des.nh.gov/organization/divisions/water/wetlands/index.htm">http://des.nh.gov/organization/divisions/water/wetlands/index.htm</a> . Note that artificial detention in wetlands is not allowed.
$\begin{tabular}{l} \hline \end{tabular} Compliance with the Comprehensive Shoreland Protection Act, RSA 483-B. \\ \underline{\end{tabular} $
Benches. Benching is needed if you have more than 20 feet change in elevation on a 2:1 slope, 30 feet change in elevation on a 3:1 slope, 40 feet change in elevation on a 4:1 slope.
Check to see if any proposed ponds need state Dam permits. <a href="http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf">http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf</a>
DETAILS
Typical roadway x-section
☐ Detention basin with inverts noted on the outlet structure
☐ Stone berm level spreader
Outlet protection – riprap aprons
A general installation detail for an erosion control blanket
☑ Silt fences or mulch berm
Storm drain inlet protection. Note that since hay bales must be embedded 4 inches into the ground, they are not to be used on hard surfaces such as pavement.
☐ Hay bale barriers
☐ Stone check dams
Gravel construction exit
☐ Temporary sediment trap
☐ The treatment BMP's proposed
Any innovative BMP's proposed

### NHDES-W-01-003 CONSTRUCTION SEQUENCE/EROSION CONTROL Note that the project is to be managed in a manner that meets the requirements and intent of RSA 430:53 and Chapter Agr 3800 relative to invasive species. Note that perimeter controls shall be installed prior to earth moving operations. Note that temporary water diversion (swales, basins, etc) must be used as necessary until areas are stabilized. Note that ponds and swales shall be installed early on in the construction sequence (before rough grading the site). Note that all ditches and swales shall be stabilized prior to directing runoff to them. Note that all roadways and parking lots shall be stabilized within 72 hours of achieving finished grade. Note that all cut and fill slopes shall be seeded/loamed within 72 hours of achieving finished grade Note that all erosion controls shall be inspected weekly AND after every half-inch of rainfall. Note the limits on the open area allowed, see Env-Wq 1505.02 for detailed information. Example note: The smallest practical area shall be disturbed during construction, but in no case shall exceed 5 acres at any one time before disturbed areas are stabilized. Note the definition of the word "stable" Example note: An area shall be considered stable if one of the following has occurred: Base course gravels have been installed in areas to be paved. A minimum of 85 percent vegetated growth has been established. A minimum of 3 inches of non-erosive material such stone or riprap has been installed. Or, erosion control blankets have been properly installed. Note the limit of time an area may be exposed Example note: All areas shall be stabilized within 45 days of initial disturbance. Provide temporary and permanent seeding specifications. (Reed canary grass is listed in the Green Book; however, this is a problematic species according to the Wetlands Bureau and therefore should not be specified) Provide winter construction notes that meet or exceed our standards. Standard Winter Notes: All proposed vegetated areas that do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events. All ditches or swales which do not exhibit a minimum of 85 percent vegetative growth by October 15, or which are disturbed after October 15, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions. After October 15, incomplete road or parking surfaces, where work has stopped for the winter season, shall be protected with a minimum of 3 inches of crushed gravel per NHDOT item 304.3. Note at the end of the construction sequence that "Lot disturbance, other than that shown on the approved plans, shall not commence until after the roadway has the base course to design elevation and the associated drainage is complete and stable." - This note is

DRAINAGE ANALYSES

applicable to single/duplex family subdivisions, when lot development is not part of the permit.

NHDES-W-01-003  Please double-side 8 ½" × 11" sheets where possible but, do not reduce the text such that more than one page fits on one side.
PE stamp
Rainfall amount obtained from the Northeast Regional Climate Center- <a href="http://precip.eas.cornell.edu/">http://precip.eas.cornell.edu/</a> . Include extreme precipitation table as obtained from the above referenced website.
Drainage analyses, in the following order:
Pre-development analysis: Drainage diagram.
Pre-development analysis: Area Listing and Soil Listing.
Pre-development analysis: Node listing 1-year (if applicable), 2-year, 10-year and 50-year.
Pre-development analysis: Full summary of the 10-year storm.
Post-development analysis: Drainage diagram.
Post-development analysis: Area Listing and Soil Listing.
Post-development analysis: Node listing for the 2-year, 10-year and 50-year.
Post-development analysis: Full summary of the 10-year storm.
Review the Area Listing and Soil Listing reports
Hydrologic soil groups (HSG) match the HSGs on the soil maps provided.
There is the same or less HSG A soil area after development (check for each HSG).
There is the same or less "woods" cover in the post-development.
Undeveloped land was assumed to be in "good" condition.
The amount of impervious cover in the analyses is correct.
Note: A good check is to subtract the total impervious area used in the pre analysis from the total impervious area used in the post-analysis. For residential projects without demolition occurring, a good check is to take this change in impervious area, subtract out the roadway and divide the remaining by the number of houses/units proposed. Do these numbers make sense?
Check the storage input used to model the ponds.
Check to see if the artificial berms pass the 50-year storm, i.e., make sure the constructed berms on ponds are not overtopped.
☐ Check the outlet structure proposed and make sure it matches that modeled.
Check to see if the total areas in the pre and post analyses are same.
Confirm the correct NRCS storm type was modeled (Coos, Carroll & Grafton counties are Type II, all others Type III).
PRE- AND POST-DEVELOPMENT DRAINAGE AREA PLANS
Plans printed on 34 - 36" by 22 - 24" on white paper.
Submit these plans separate from the soil plans.
A north arrow.
☐ A scale.
Labeled subcatchments, reaches and ponds.
☐ Tc lines.
A clear delineation of the subcatchment boundaries.
Roadway station numbers.
Culverts and other conveyance structures.

ridge.mauck@des.nh.gov or (603) 271-2147
NHDES Alteration of Terrain Bureau, PO Box 95, Concord, NH 03303-0095
www.des.nh.gov
Alteration of Terrain Permit Application Form – 2017 – revised 12/2019

PRE AND POST-DEVELOPMENT COLOR-CODED SOIL PLANS

NHDES-W-01-003  11" × 17" sheets suitable, as long as it is readable.
Submit these plans separate from the drainage area plans.
A north arrow.
A scale.
☐ Name of the soil scientist who performed the survey and date the soil survey took place.
2-foot contours (5-foot contours if application is for a gravel pit) as well as other surveyed features.
Delineation of the soil boundaries and wetland boundaries.
Delineation of the subcatchment boundaries.
Soil series symbols (e.g., 26).
A key or legend which identifies each soil series symbol and its associated soil series name (e.g., 26 = Windsor).
The hydrologic soil group color coding (A = Green, B = yellow, C= orange, D=red, Water=blue, & Impervious = gray).
Please note that excavation projects (e.g., gravel pits) have similar requirements to that above, however the following are common exceptions/additions:
☐ Drainage report is not needed if site does not have off-site flow.
5 foot contours allowed rather than 2 foot.
☐ No PE stamp needed on the plans.
Add a note to the plans that the applicant must submit to the Department of Environmental Services a written update of the project and revised plans documenting the project status every five years from the date of the Alteration of Terrain permit.
Add reclamation notes.
See NRCS publication titled: <i>Vegetating New Hampshire Sand and Gravel Pits</i> for a good resource, it is posted online at: <a href="http://des.nh.gov/organization/divisions/water/aot/categories/publications">http://des.nh.gov/organization/divisions/water/aot/categories/publications</a> .
ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE
☐ If project will discharge stormwater to a surface water impaired for phosphorus and/or nitrogen, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.
☐ If project will discharge stormwater to a Class A surface water or Outstanding Resource Water, include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen.
If project will discharge stormwater to a lake or pond not covered previously, include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond.
If project is within a Coastal/Great Bay Region community, include info required by Env-Wg 1503.08(I) if applicable.



Appendix B – Abutters List



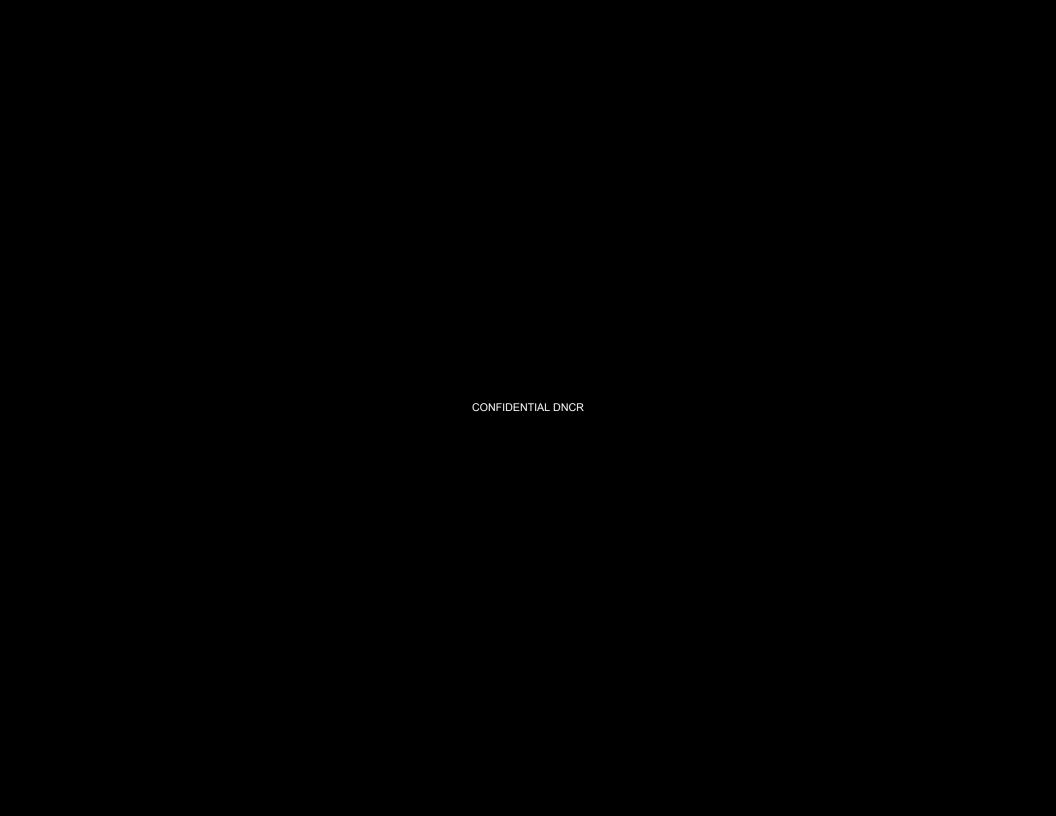
# Eversource D121 Transmission Line OPGW and Structure Replacement Project Bow and Hooksett New Hampshire

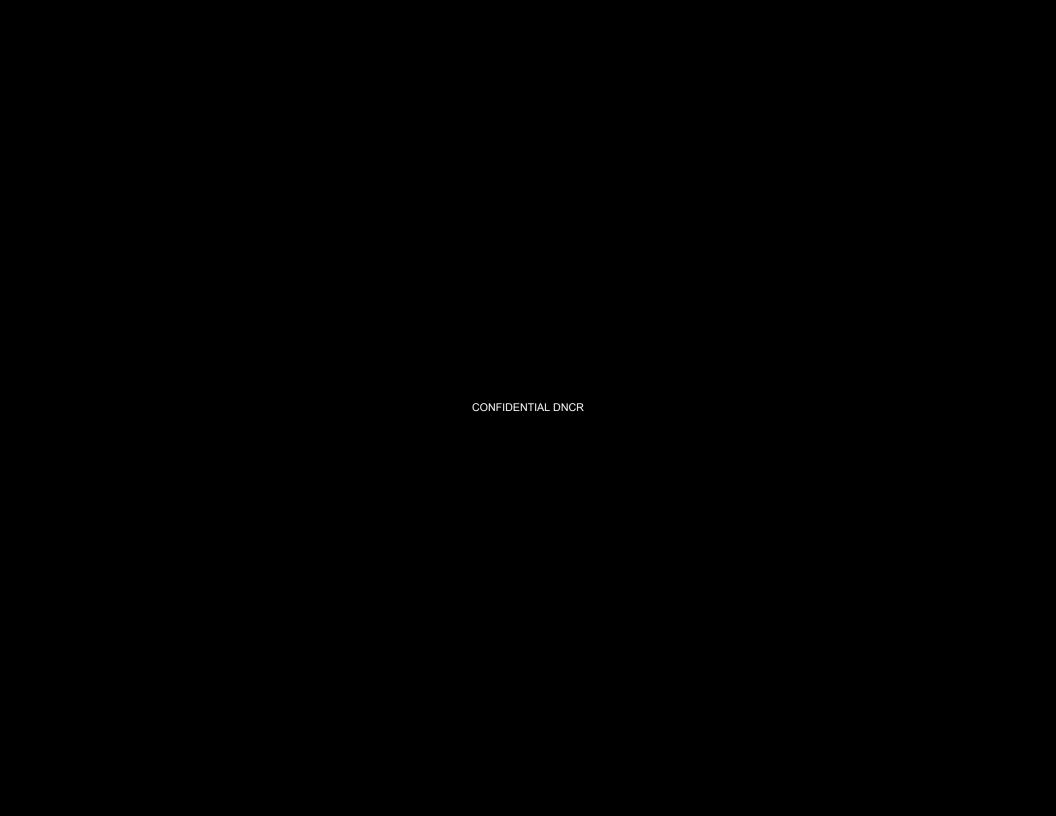
Table 1. Parcels Intersecting Project Area

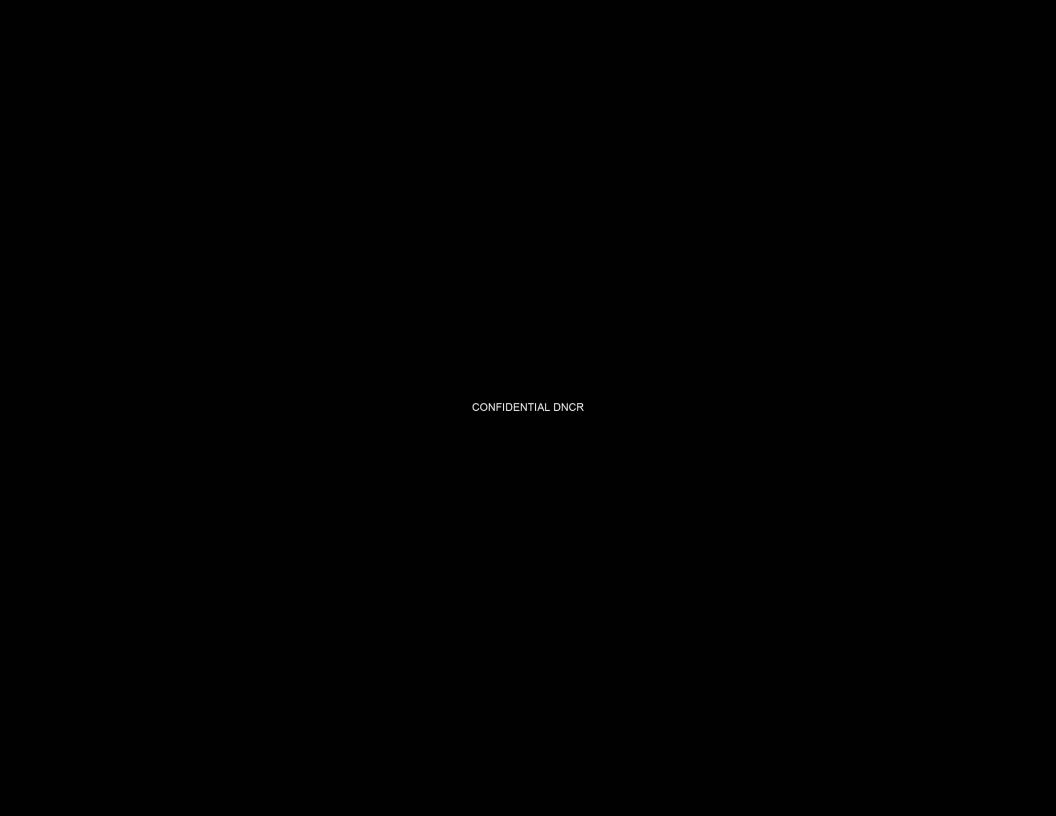
Bow	Hooksett
Tax Map-Lot	Tax Map-Lot
40-2-141-A	37-48
39-2-125	37-51
39-2-138	37-51-1
39-2-137-A	37-50
39-2-128	37-52
44-2-130	37-53-7
44-2-134	37-53-8
44-2-129	28-17
44-2-134-C	28-14
	28-12
	28-13

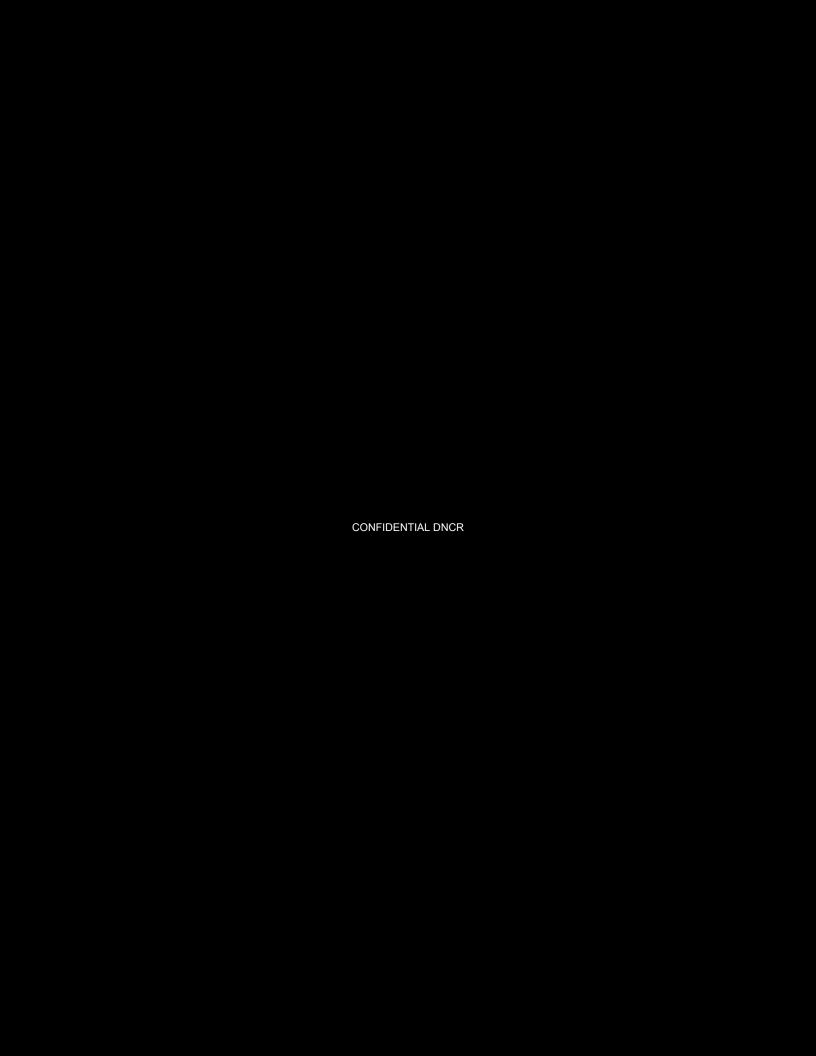


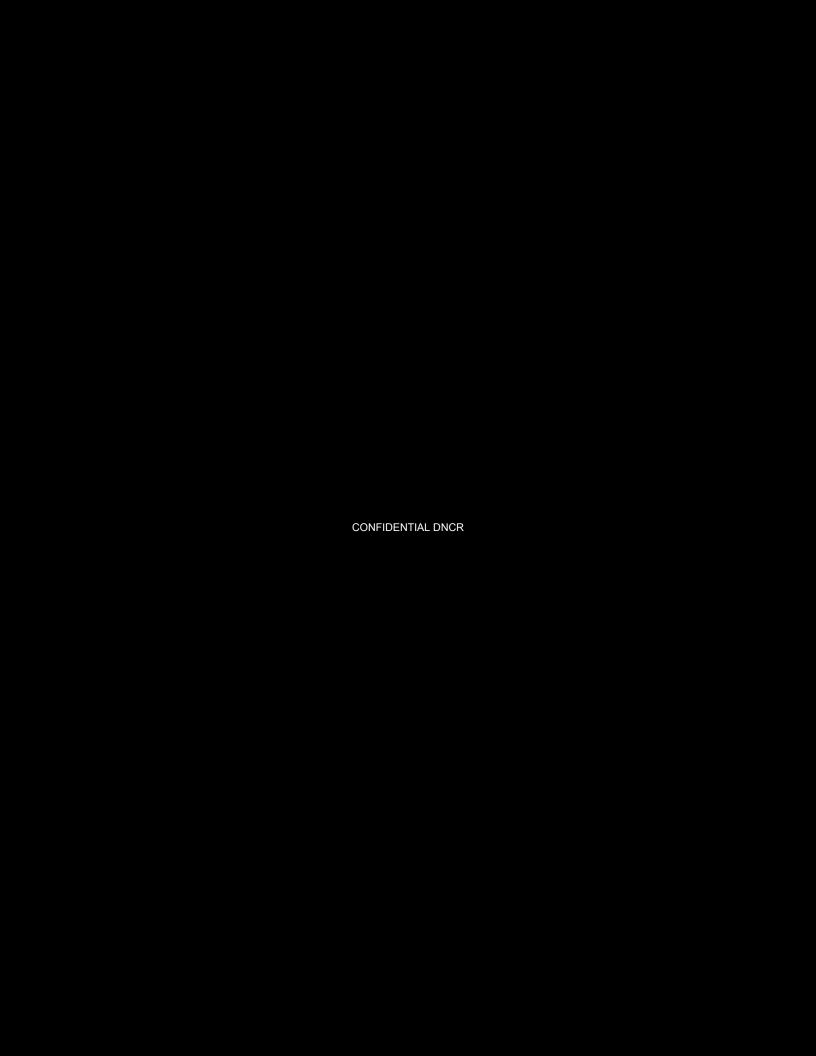
Appendix C – New Hampshire Natural Heritage Bureau Report and E-Mail Review from NHB and New Hampshire Fish and Game

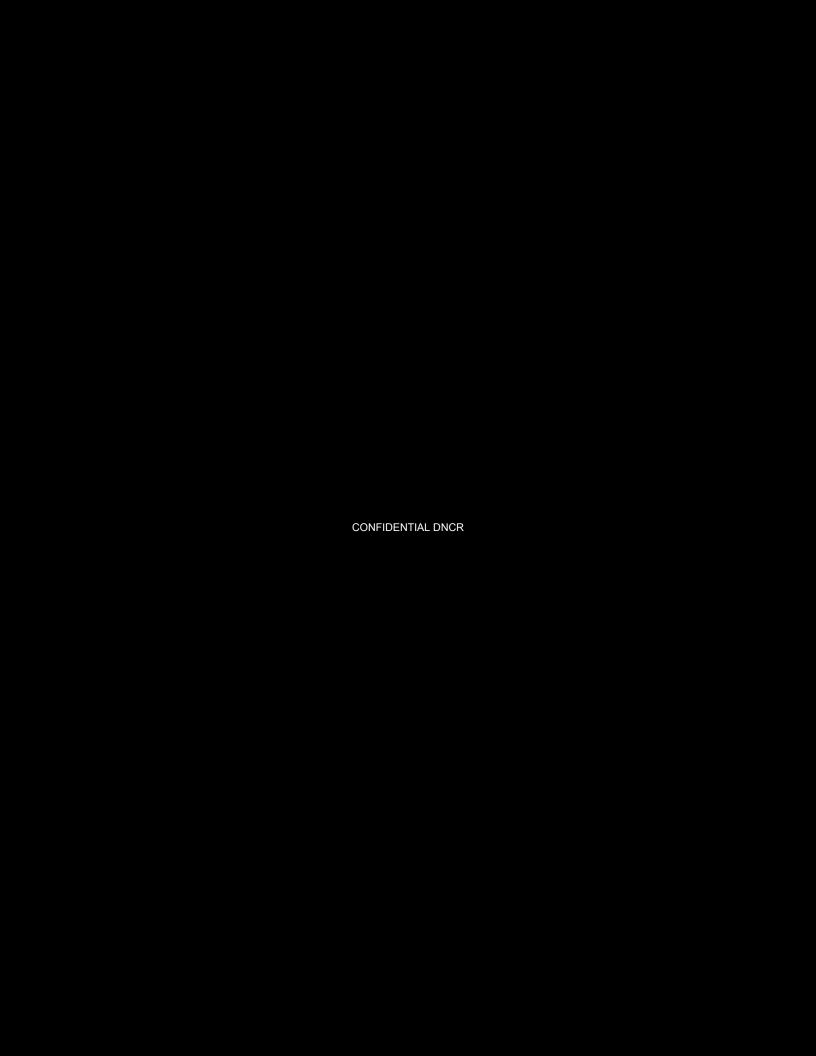


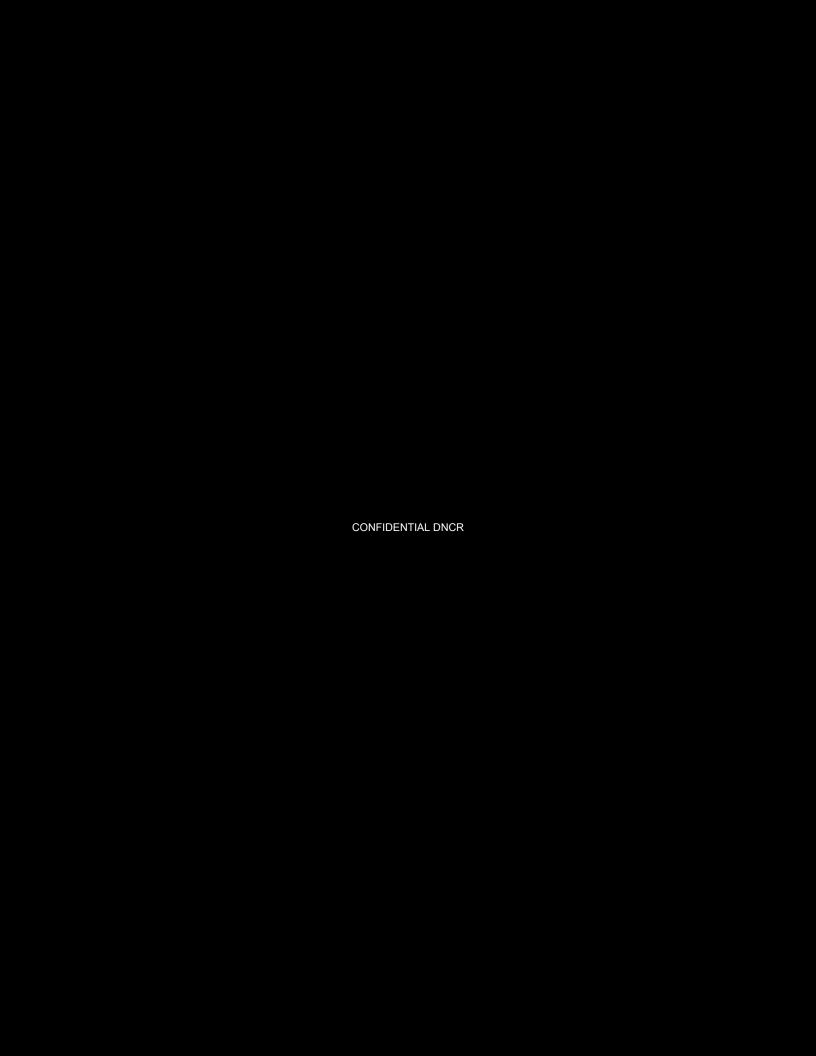


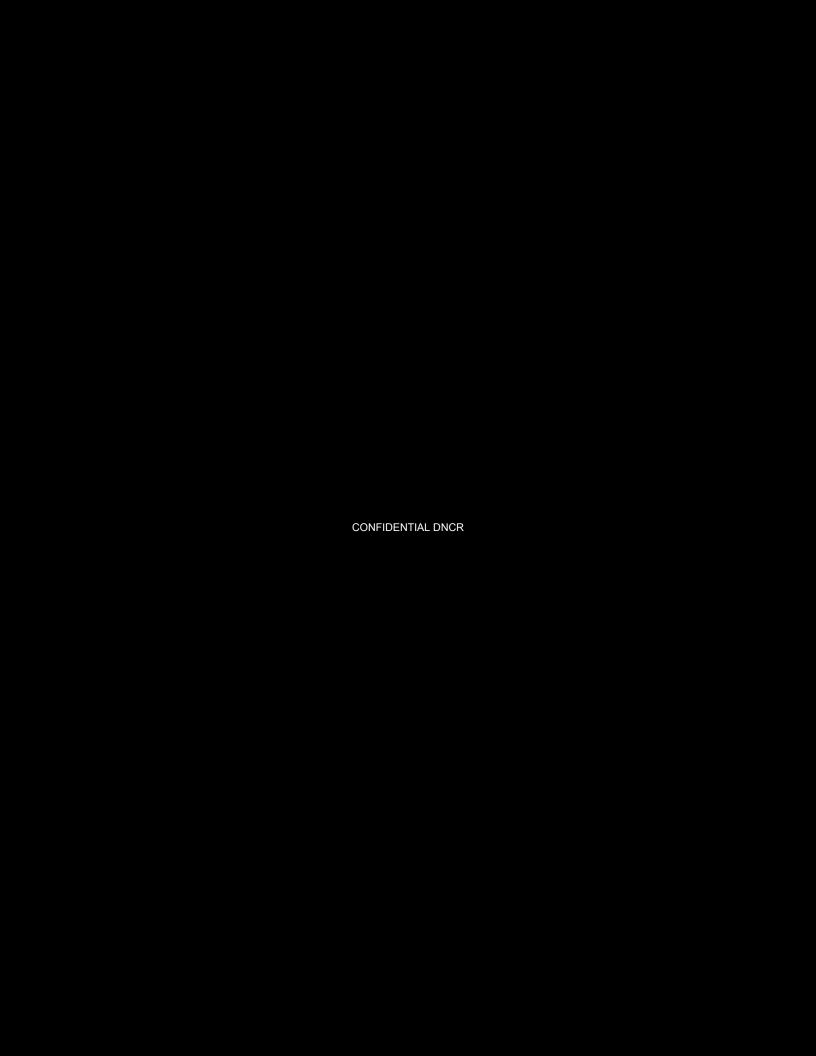


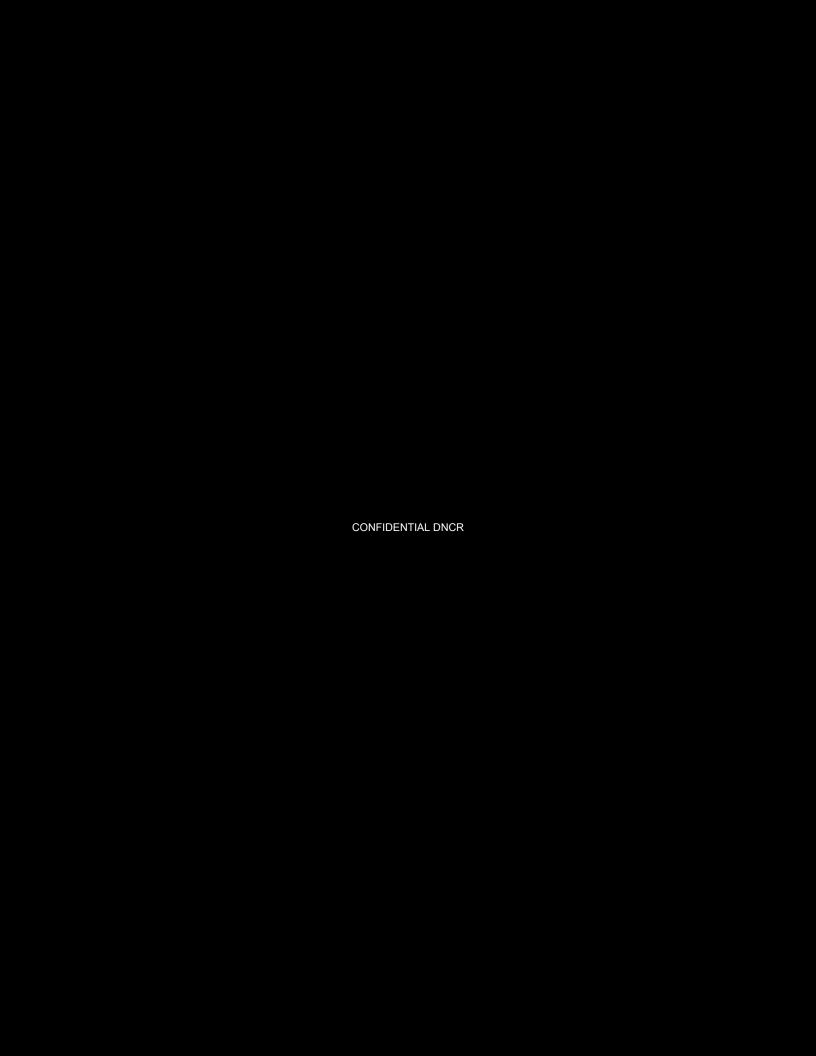


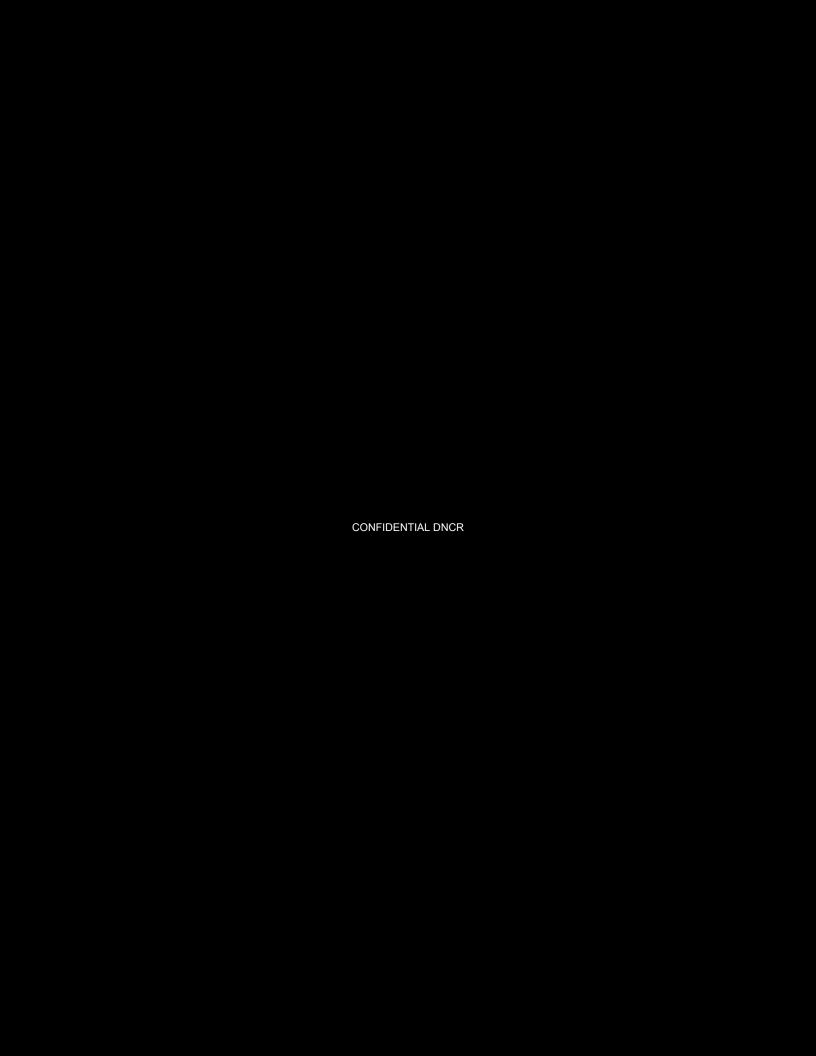


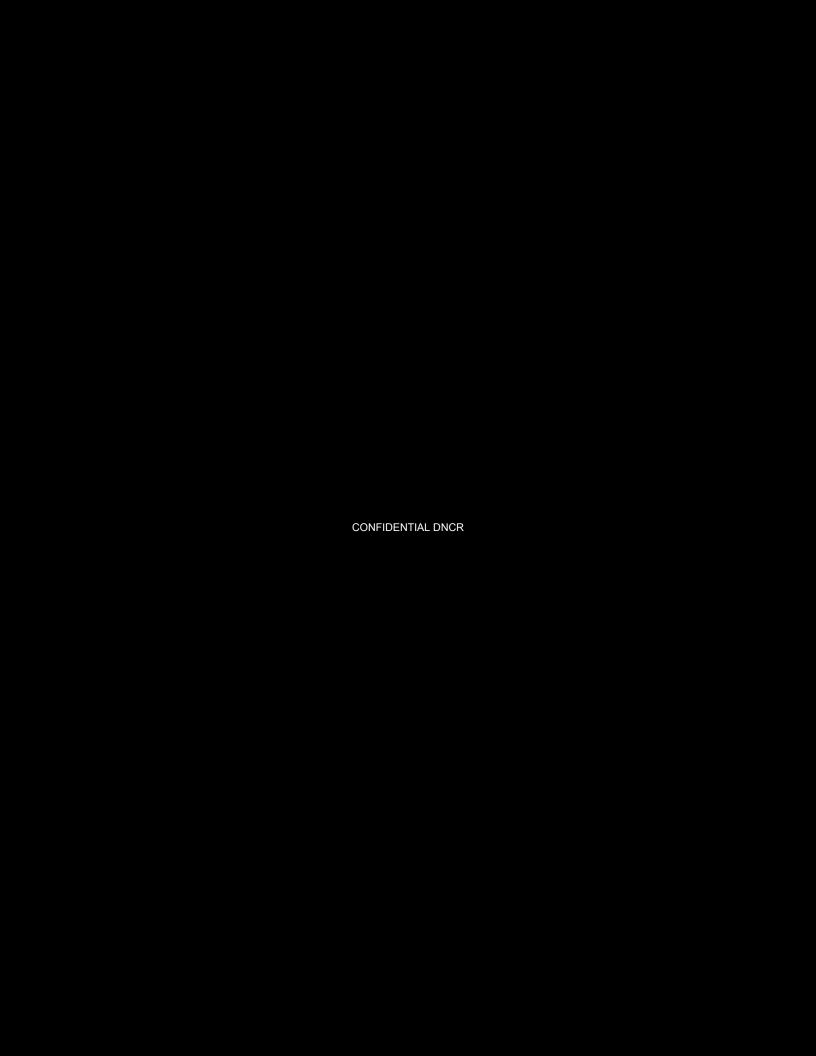


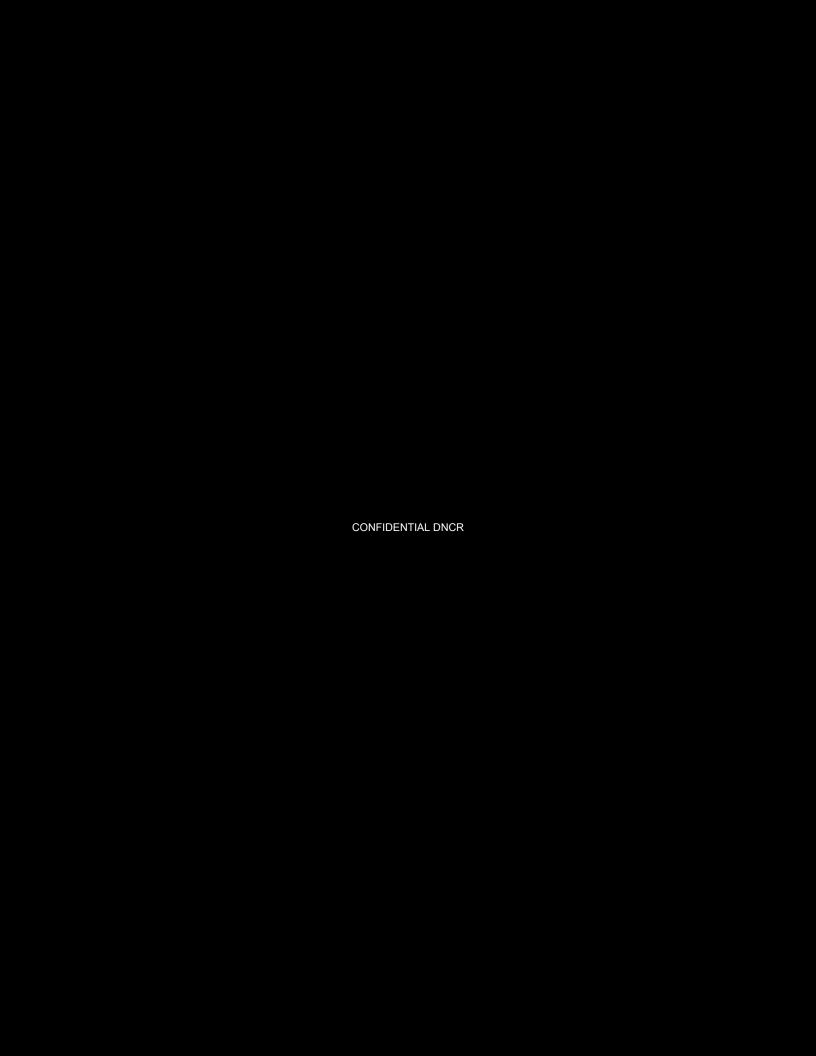


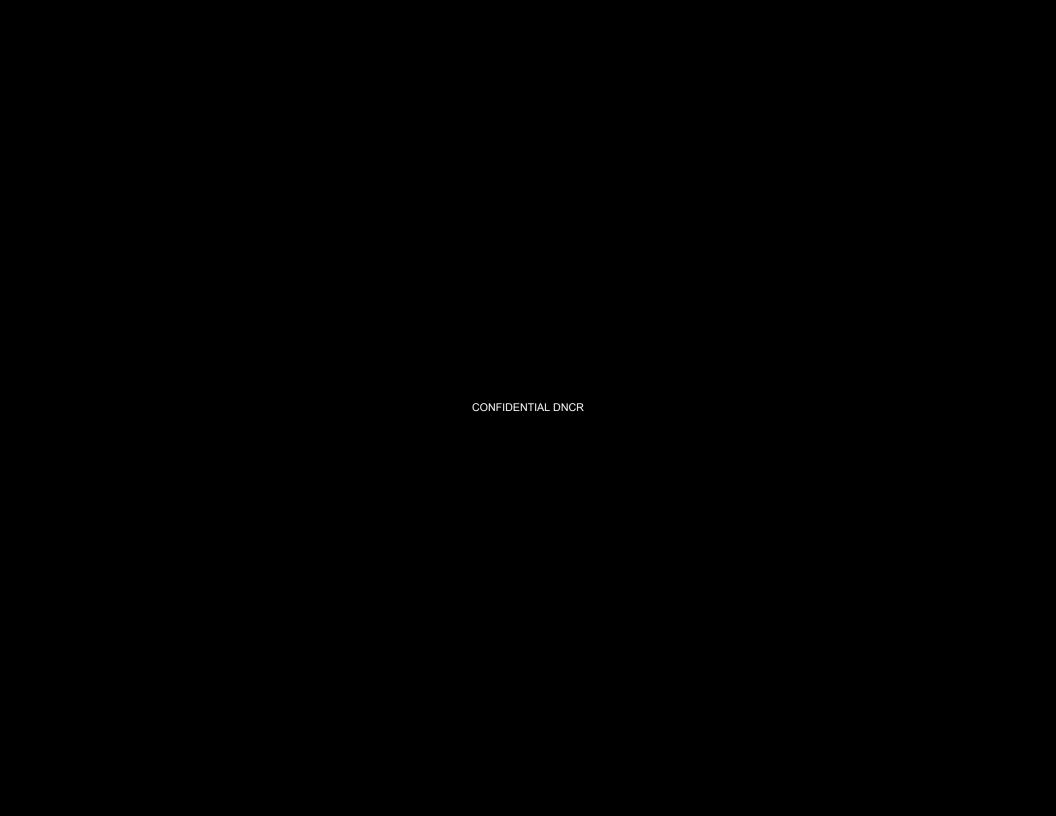


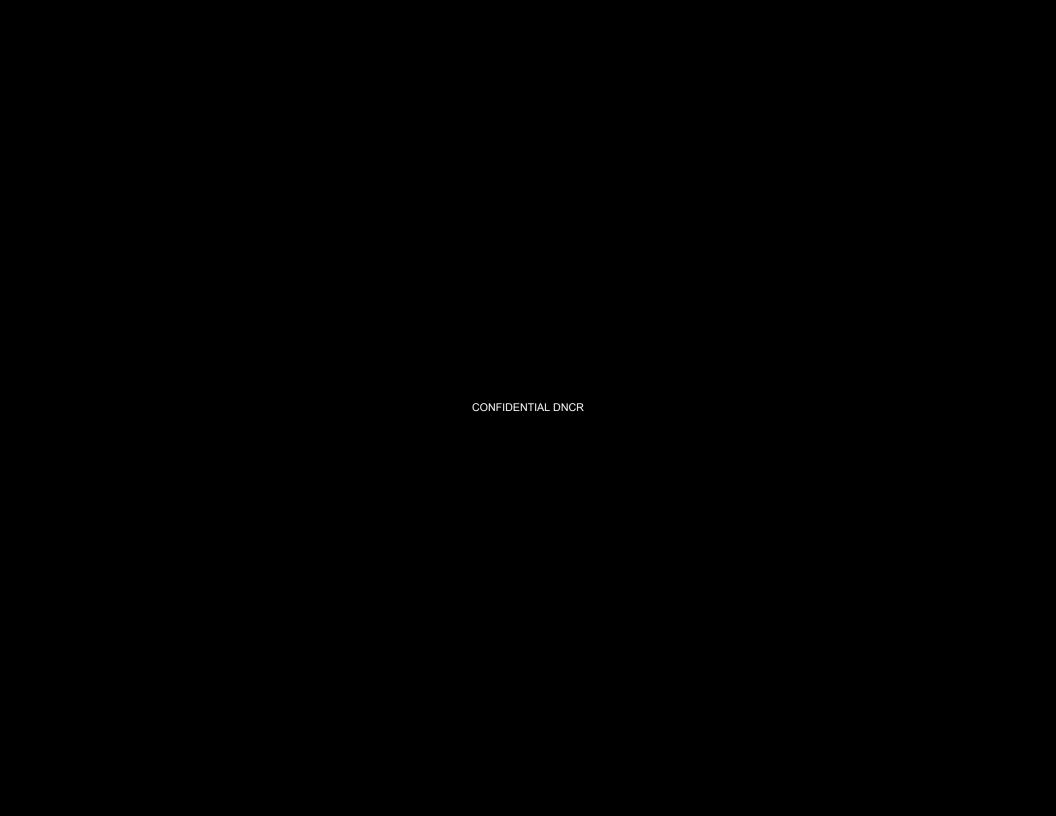


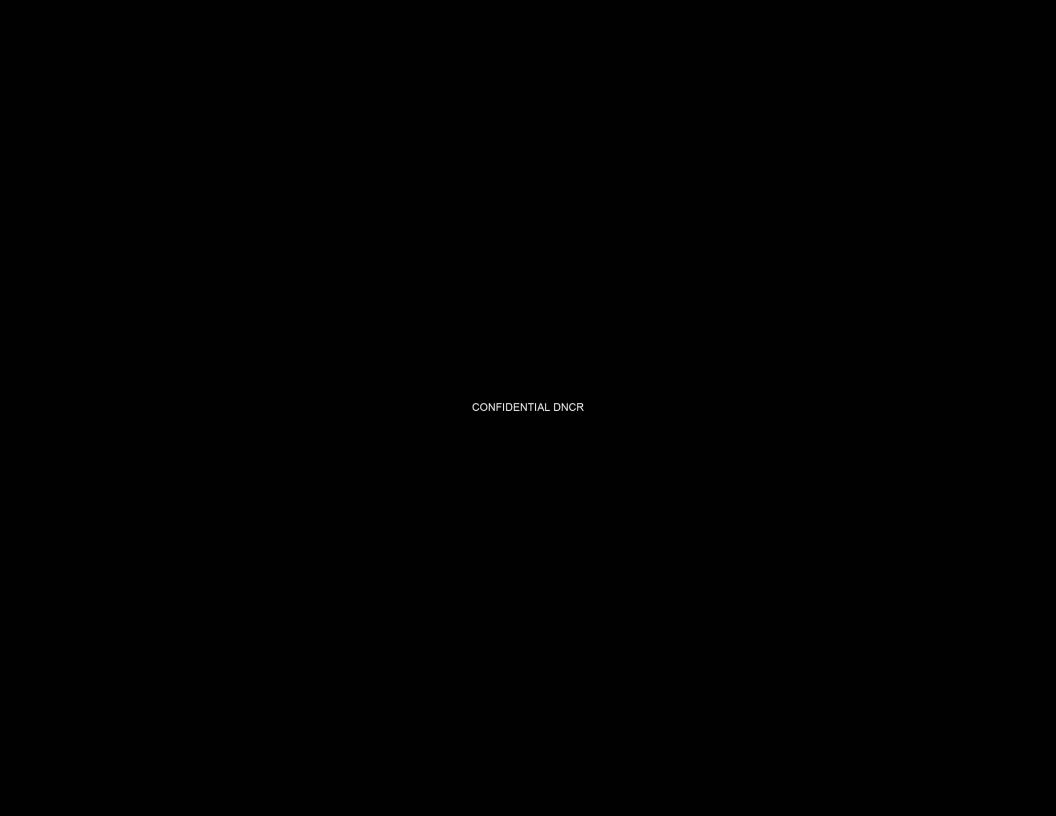


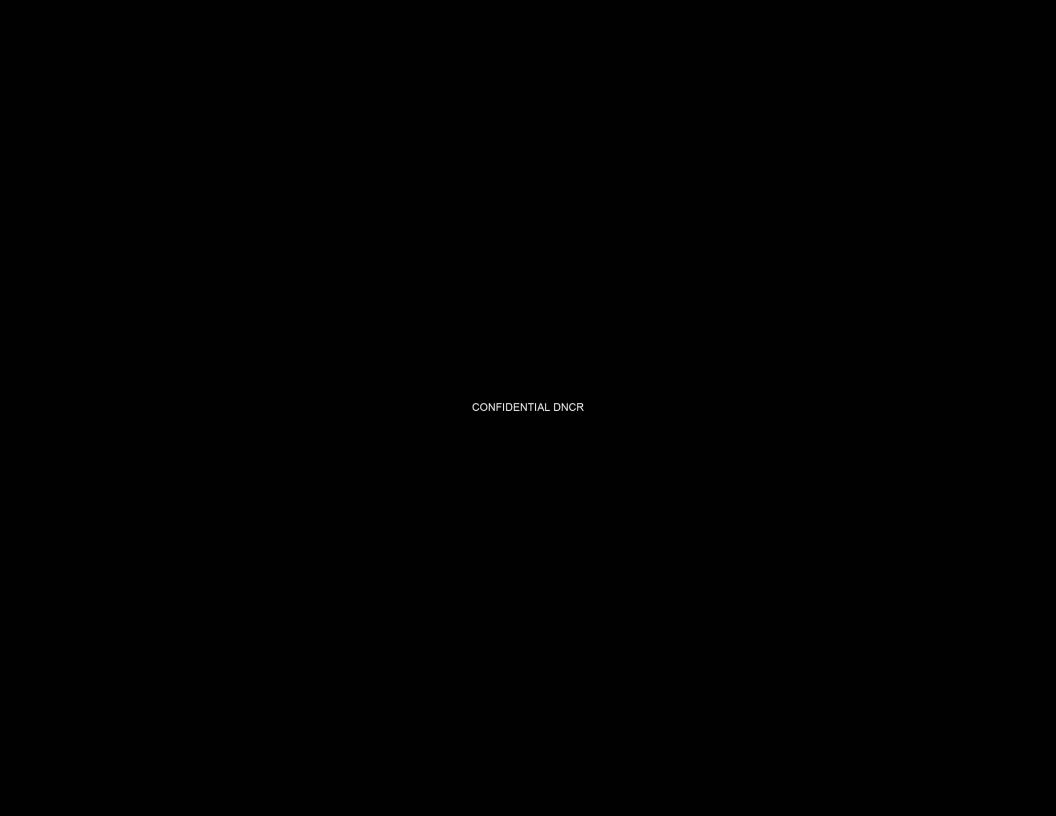


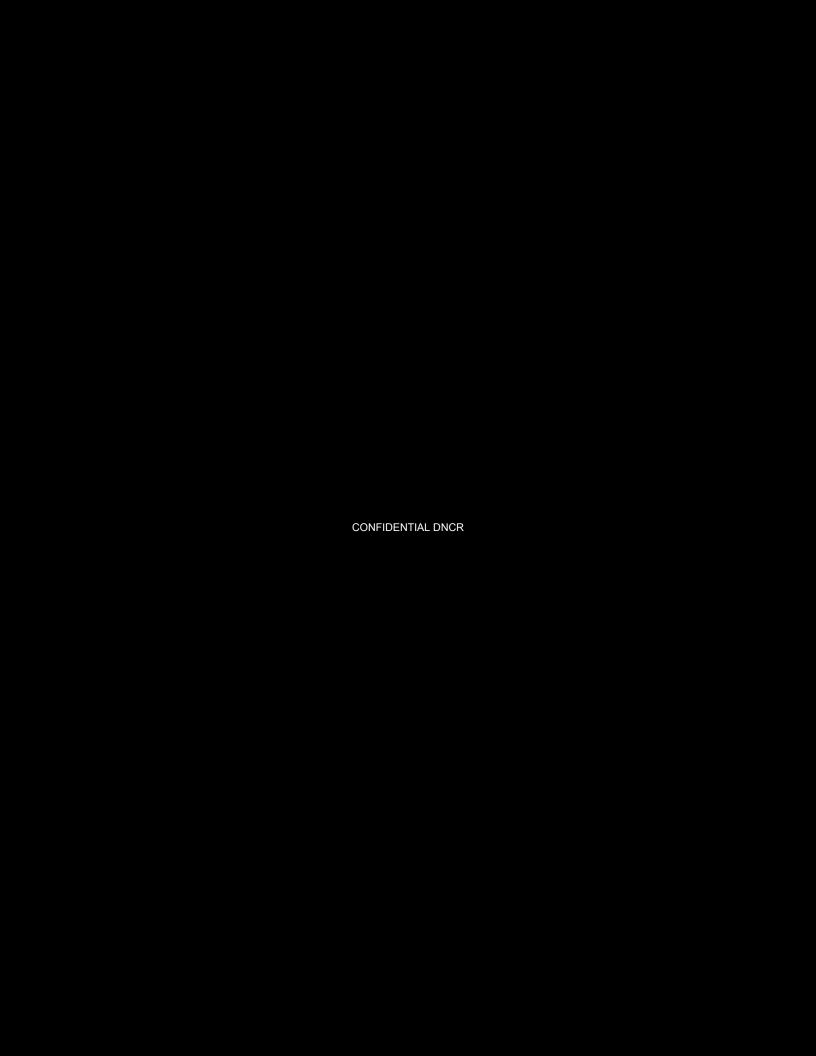












### **Lindsey White**

**From:** Tuttle, Kim < Kim.A.Tuttle@wildlife.nh.gov>

**Sent:** Friday, April 30, 2021 1:27 PM

To: Lindsey White; Lamb, Amy; Bouchard, Jessica

Cc: NHCWS Matthew Cardin (matthew.cardin@eversource.com); Deborah ZartaGier

**Subject:** RE: D121 Transmission Line Rare Species Review Summary 4-27-2021

Hello Lindsey,

### CONFIDENTIAL DNCR

Thanks,

Kim Tuttle Wildlife Biologist NH Fish and Game 11 Hazen Drive Concord, NH 03301 603-271-6544

From: Lindsey White <Lindsey.White@gza.com>

Sent: Friday, April 30, 2021 11:17 AM

To: Lamb, Amy <Amy.E.Lamb@dncr.nh.gov>; Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>; Bouchard, Jessica

<Jessica.R.Bouchard@dncr.nh.gov>

Cc: NHCWS Matthew Cardin (matthew.cardin@eversource.com) < matthew.cardin@eversource.com>; Deborah

ZartaGier <deborah.zartagier@gza.com>

Subject: D121 Transmission Line Rare Species Review Summary 4-27-2021

**EXTERNAL:** Do not open attachments or click on links unless you recognize and trust the sender.

Hi Amy, Jessica and Kim,

Thank you all for meeting with myself and Matt Cardin on Tuesday, April 27<sup>th</sup>, 2021 regarding the D121 Transmission Line Structure Replacement and OPGW Project. As we mentioned, the D121 Transmission Line begins at the Merrimack Substation in Bow, and continues southerly through Hooksett and into Manchester for approximately 11.2 miles to the Eddy Substation in Manchester, New Hampshire. Eversource is proposing to replace a total of 35 existing utility poles along the D121 Transmission Line in the summer and fall of 2021, and is proposing to replace existing static wire with Optical Ground Wire (OPGW) in the winter of 2021 into 2022. Structure replacements are proposed in Bow (NHB21-0607), Hooksett (NHB21-0608) and Manchester (NHB21-0609). The proposed project involves maintenance work within an existing and maintained utility right-of-way (ROW) and does not propose expansion of the ROW. In addition, there is no vegetation maintenance scheduled for this project.

In regards to rare, threatened and endangered vertebrate species, Blanding's turtle, eastern hognose snake, northern black racer, peregrine falcon, wood turtle, and spotted turtle were identified in or near the D121 Transmission Line ROW. Eversource intends to incorporate reptile construction BMPs including the following;

- 1. Prior to daily construction activities, timber matting will be reviewed for snakes and turtles. GZA will provide an environmental addendum to the daily tailboards by the contractors to include guidance on protocols for snakes and provide identification for spotted turtle, wood turtle, Blanding's turtle and northern black racer snake.
- 2. Observed snakes and turtles will be moved off of construction access roads to limit and prevent mortality to snakes and turtles during construction.
- 3. Erosion control matting, if utilized, will consist of jute matting. Matting with plastic mesh will be avoided to limit unintentional mortality to snakes.
- 4. At the conclusion of the project, a summary report of any rare species observations will be provided to the NHFG Nongame Program.
- 5. Impacts to vernal pools and potential vernal pools will be avoided.

### The following notes will be added as well:

- IF SPOTTED, WOOD OR BLANDING'S TURTLES ARE FOUND LAYING EGGS IN A WORK AREA, PLEASE CONTACT MELISSA DOPERALSKI (603-479-1129 cell) or JOSH MEGYESY (cell 978-578-0802) FOR FURTHER INSTRUCTIONS.
- 2. ALL OBSERVATIONS OF EASTERN HOGNOSE SNAKE SEEN AT ANY TIME MUST BE IMMEDIATELY REPORTED to the NHFG Department (MELISSA DOPERALSKI (603-479-1129 cell) or JOSH MEGYESY (cell 978-578-0802) FOR FURTHER INSTRUCTIONS. Please attempt to photograph this species to send to us for verification.
- 3. All observations of northern black racer snakes encountered from the end of September through the month of April will be immediately reported to the NHFG Department (Melissa Doperalski 603-479-1129 (cell) or Brendan Clifford 603-271-0463) as this indicates a potential hibernaculum in the area. We will attempt to photograph this species if possible.
- 4. Replacement of D121 Structures 1, 2 and 3 will begin after July 2021 to avoid/limit disturbance to nesting peregrine falcons by avoiding the typical peregrine fledgling period.

### CONFIDENTIAL DNCR

NHB confirmed that since there is no vegetation clearing proposed as part of this project, there are no concerns for giant rhododendron, and no surveys need to be conducted for this plant.

NHB confirmed that since work is to take place within the existing and maintained ROW, it is not anticipated that downy false foxglove would be impacted, and no surveys need to be conducted for this plant.

The following rare plant species surveys will occur within proposed access routes in 20-ft width swaths following proposed access and permitting plans prepared by GZA, and surveys will also occur within proposed 100-ft by 100-ft work pads as shown on proposed access and permitting plans prepared by GZA in the following locations:

### Survey Area 1:

- Licorice Goldenrod
  - Timeframe: Late May and early June
  - Surveys to be focused in areas of low lying herbaceous vegetation, and not in areas of woody vegetation, dense stands of bushes or saplings.
- Wild Lupine
  - o Timeframe: Late May and early June
  - Surveys to be focused in areas of low lying herbaceous vegetation, and not in areas of woody vegetation, dense stands of bushes or saplings

### Survey Area 2:

- Licorice Goldenrod
  - Timeframe: Late May and early June
  - Surveys to be focused in areas of low lying herbaceous vegetation, and not in areas of woody vegetation dense stands of bushes or saplings

### Survey Area 3:

- Licorice Goldenrod
  - o Timeframe: Late May and early June
  - Surveys to be focused in areas of low lying herbaceous vegetation, and not in areas of woody vegetation dense stands of bushes or saplings

### Survey Area 4:

- Long Spined Sandbur
  - Timeframe: July to September

### Survey Area 5:

- Clasping Milkweed
  - o Timeframe: Late June to July

GZA can provide survey updates as work progresses, and at the end of the rare plant survey field work (ending with Long Spined Sandbur), GZA will prepare a brief narrative report summarizing our findings.

If NHB and NHFG concur, GZA and Eversource will proceed with this plan and will submit this email correspondence as part of our wetland permit applications.

Thank you! Lindsey

Lindsey E. White Project Manager

GZA | 5 Commerce Park North | Bedford, NH 03110

o: 603.232.8753 | c: 603.770.5752 | <u>lindsey.white@gza.com</u> | <u>www.gza.com</u> | <u>LinkedIn</u>

\* Please note: Our office is currently working remotely. I can be reached at 603.770.5752.

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For information about GZA GeoEnvironmental, Inc. and its services, please visit our website at <a href="https://www.gza.com">www.gza.com</a>.



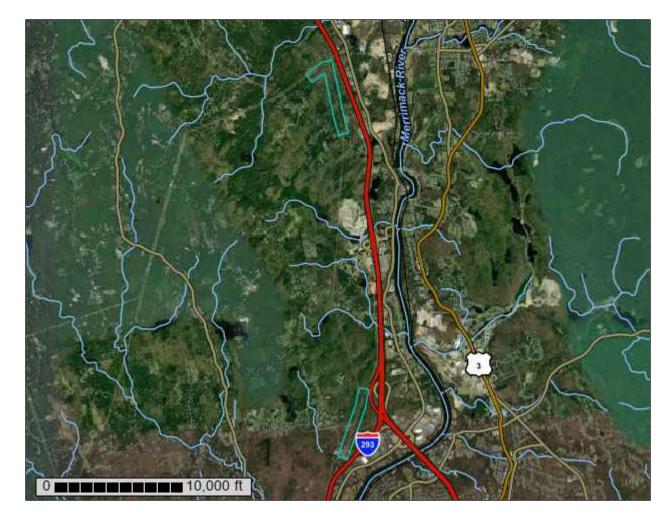
Appendix D – Wildlife Assessment Report



Appendix E – Natural Resources Conservation Service Web Soil Survey



Natural Resources Conservation Service A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants Custom Soil Resource
Report for
Hillsborough County, New
Hampshire, Eastern Part;
and Merrimack and Belknap
Counties, New Hampshire
D121 NRCS Soil Report



# **Preface**

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

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

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2 053951).

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

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

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

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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449C—Scituate fine sandy loam, 8 to 15 percent slopes, very stony	39
598B—Windsor-Urban land complex, 0 to 8 percent slopes	41
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# **How Soil Surveys Are Made**

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

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

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

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

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

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

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

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

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

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

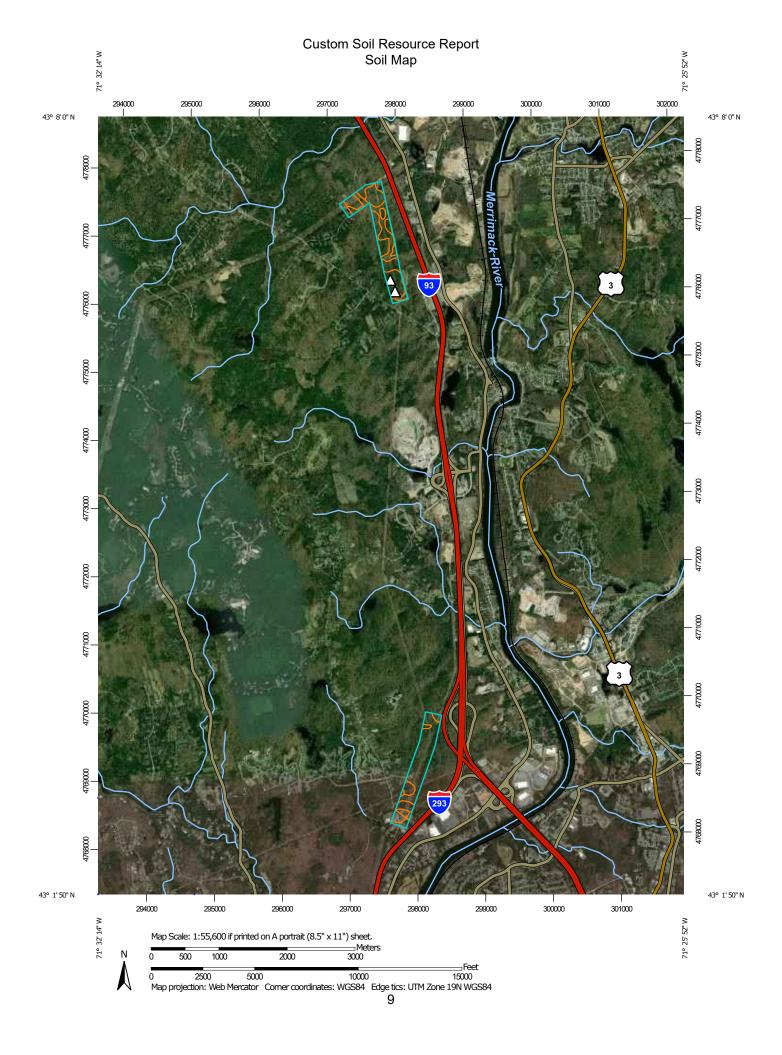
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree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

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

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

# Soil Map

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



### MAP LEGEND

### Area of Interest (AOI)

Area of Interest (AOI)

#### Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

#### **Special Point Features**

ဖ

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Sodic Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Spoil Area

å

Stony Spot

Very Stony Spot

Ŷ

Wet Spot Other

Δ

Special Line Features

#### **Water Features**

Streams and Canals

### Transportation

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Rails

Interstate Highways

**US Routes** 

Major Roads

0

Local Roads

### Background

Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:20,000 to 1:24,000.

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

Source of Map: Natural Resources Conservation Service Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Hillsborough County, New Hampshire, Eastern

Survey Area Data: Version 22. May 29. 2020

Soil Survey Area: Merrimack and Belknap Counties, New

Hampshire

Survey Area Data: Version 25, May 29, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: May 22, 2015—Aug 29, 2019

### **MAP LEGEND**

### **MAP INFORMATION**

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

# **Map Unit Legend**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI	
Ur	Urban land	5.8	2.5%	
WdA	Windsor loamy sand, 0 to 3 percent slopes	4.2	1.8%	
WdB	Windsor loamy sand, 3 to 8 percent slopes	0.0	0.0%	
Subtotals for Soil Survey Area		10.0	4.3%	
Totals for Area of Interest		233.8	100.0%	

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
26A	Windsor loamy sand, 0 to 3 percent slopes	1.0	0.4%
26B	Windsor loamy sand, 3 to 8 percent slopes	7.4	3.2%
45B	Montauk fine sandy loam, 0 to 8 percent slopes, very stony	4.3	1.8%
49A	Whitman fine sandy loam, 0 to 3 percent slopes, very stony	0.2	0.1%
141B	Hollis-Rock outcrop-Chatfield complex, 3 to 8 percent slopes	0.8	0.3%
250B	Chatfield-Montauk-Hollis complex, 0 to 8 percent slopes, very rocky	11.6	4.9%
250C	Chatfield-Montauk-Hollis complex, 8 to 15 percent slopes, very rocky	119.1	51.0%
250D	Chatfield-Montauk-Hollis complex, 15 to 35 percent slopes, very rocky	37.7	16.1%
425A	Scarboro-Ridgebury complex, 0 to 3 percent slopes, rocky	29.7	12.7%
449C	Scituate fine sandy loam, 8 to 15 percent slopes, very stony	8.7	3.7%
598B	Windsor-Urban land complex, 0 to 8 percent slopes	3.3	1.4%
Subtotals for Soil Survey A	rea	223.8	95.7%
Totals for Area of Interest		233.8	100.0%

# **Map Unit Descriptions**

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

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

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

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

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

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

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas

shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

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

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

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

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

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

## Hillsborough County, New Hampshire, Eastern Part

### Ur—Urban land

### **Map Unit Setting**

National map unit symbol: 9ffb Elevation: 0 to 1,000 feet

Mean annual precipitation: 40 to 50 inches Mean annual air temperature: 45 to 55 degrees F

Frost-free period: 140 to 200 days

Farmland classification: Not prime farmland

### **Map Unit Composition**

Urban land: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

### **Minor Components**

### Windsor

Percent of map unit: 4 percent

Hydric soil rating: No

### Hinckley

Percent of map unit: 4 percent

Hydric soil rating: No

### Not named

Percent of map unit: 2 percent

Hydric soil rating: No

# WdA—Windsor loamy sand, 0 to 3 percent slopes

### **Map Unit Setting**

National map unit symbol: 2svkg

Elevation: 0 to 990 feet

Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of local importance

### **Map Unit Composition**

Windsor, loamy sand, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

### **Description of Windsor, Loamy Sand**

### Setting

Landform: Deltas, outwash terraces, dunes, outwash plains

Landform position (three-dimensional): Riser, tread

Down-slope shape: Linear, convex Across-slope shape: Linear, convex

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy glaciofluvial deposits derived from gneiss

### **Typical profile**

O - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loamy sand Bw - 3 to 25 inches: loamy sand C - 25 to 65 inches: sand

### Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very

high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Low (about 3.6 inches)

### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

### **Minor Components**

### Deerfield, loamy sand

Percent of map unit: 10 percent

Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

### Hinckley, loamy sand

Percent of map unit: 5 percent

Landform: Kames, deltas, eskers, outwash plains

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope,

rise

Down-slope shape: Convex

Across-slope shape: Convex, linear

Hydric soil rating: No

#### WdB—Windsor loamy sand, 3 to 8 percent slopes

#### **Map Unit Setting**

National map unit symbol: 2svkf

Elevation: 0 to 1,210 feet

Mean annual precipitation: 36 to 71 inches Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of local importance

#### **Map Unit Composition**

Windsor, loamy sand, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Windsor, Loamy Sand**

#### Setting

Landform: Deltas, outwash terraces, dunes, outwash plains

Landform position (three-dimensional): Riser, tread

Down-slope shape: Linear, convex Across-slope shape: Linear, convex

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy

glaciofluvial deposits derived from gneiss

#### Typical profile

O - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loamy sand Bw - 3 to 25 inches: loamy sand C - 25 to 65 inches: sand

#### Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very

high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Low (about 4.5 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

#### **Minor Components**

#### Hinckley, loamy sand

Percent of map unit: 10 percent

Landform: Kames, deltas, eskers, outwash plains

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope,

rise

Down-slope shape: Convex

Across-slope shape: Convex, linear

Hydric soil rating: No

#### Deerfield, loamy sand

Percent of map unit: 5 percent

Landform: Terraces, deltas, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Merrimack and Belknap Counties, New Hampshire

#### 26A—Windsor loamy sand, 0 to 3 percent slopes

#### **Map Unit Setting**

National map unit symbol: 2svkg

Elevation: 0 to 990 feet

Mean annual precipitation: 36 to 71 inches Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of local importance

#### **Map Unit Composition**

Windsor, loamy sand, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Windsor, Loamy Sand**

#### Setting

Landform: Dunes, deltas, outwash terraces, outwash plains

Landform position (three-dimensional): Tread, riser

Down-slope shape: Convex, linear Across-slope shape: Convex, linear

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy

glaciofluvial deposits derived from gneiss

#### Typical profile

O - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loamy sand Bw - 3 to 25 inches: loamy sand C - 25 to 65 inches: sand

#### **Properties and qualities**

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very

high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Low (about 3.6 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

#### **Minor Components**

#### Deerfield, loamy sand

Percent of map unit: 10 percent

Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Hinckley, loamy sand

Percent of map unit: 5 percent

Landform: Outwash plains, eskers, kames, deltas

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope,

rise

Down-slope shape: Convex

Across-slope shape: Linear, convex

Hydric soil rating: No

#### 26B—Windsor loamy sand, 3 to 8 percent slopes

#### Map Unit Setting

National map unit symbol: 2svkf

Elevation: 0 to 1,210 feet

Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of local importance

#### **Map Unit Composition**

Windsor, loamy sand, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Windsor, Loamy Sand**

#### Setting

Landform: Outwash terraces, deltas, outwash plains, dunes

Landform position (three-dimensional): Tread, riser

Down-slope shape: Linear, convex Across-slope shape: Linear, convex

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy

glaciofluvial deposits derived from gneiss

#### **Typical profile**

O - 0 to 1 inches: moderately decomposed plant material

A - 1 to 3 inches: loamy sand

Bw - 3 to 25 inches: loamy sand C - 25 to 65 inches: sand

#### **Properties and qualities**

Slope: 3 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very

high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Low (about 4.5 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

#### **Minor Components**

#### Hinckley, loamy sand

Percent of map unit: 10 percent

Landform: Outwash plains, eskers, kames, deltas

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope,

rise

Down-slope shape: Convex

Across-slope shape: Linear, convex

Hydric soil rating: No

#### Deerfield, loamy sand

Percent of map unit: 5 percent

Landform: Outwash plains, terraces, deltas Landform position (two-dimensional): Footslope Landform position (three-dimensional): Tread, talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### 45B—Montauk fine sandy loam, 0 to 8 percent slopes, very stony

#### Map Unit Setting

National map unit symbol: 2w80v

Elevation: 0 to 1,070 feet

Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of local importance

#### Map Unit Composition

Montauk, very stony, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### Description of Montauk, Very Stony

#### Setting

Landform: Drumlins, hills, ground moraines, recessionial moraines Landform position (two-dimensional): Backslope, shoulder, summit

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Linear, convex Across-slope shape: Convex

Parent material: Coarse-loamy over sandy lodgment till derived from gneiss, granite, and/or schist

#### Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material

A - 2 to 6 inches: fine sandy loam Bw1 - 6 to 28 inches: fine sandy loam Bw2 - 28 to 36 inches: sandy loam

2Cd - 36 to 74 inches: gravelly loamy sand

#### Properties and qualities

Slope: 0 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent Depth to restrictive feature: 20 to 43 inches to densic material

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

high (0.00 to 1.42 in/hr)

Depth to water table: About 18 to 37 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Low (about 5.6 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C

Ecological site: F144AY007CT - Well Drained Dense Till Uplands

Hydric soil rating: No

#### **Minor Components**

#### Scituate, very stony

Percent of map unit: 6 percent

Landform: Hills, ground moraines, drumlins

Landform position (two-dimensional): Summit, footslope, backslope

Landform position (three-dimensional): Crest, side slope

Down-slope shape: Linear, convex Across-slope shape: Convex

Hydric soil rating: No

#### Canton, very stony

Percent of map unit: 5 percent

Landform: Hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Crest, side slope

Down-slope shape: Convex, linear Across-slope shape: Convex Hydric soil rating: No

Ridgebury, very stony

Percent of map unit: 4 percent

Landform: Drainageways, hills, ground moraines, depressions Landform position (two-dimensional): Footslope, toeslope Landform position (three-dimensional): Base slope, head slope

Down-slope shape: Concave Across-slope shape: Concave

Hydric soil rating: Yes

#### 49A—Whitman fine sandy loam, 0 to 3 percent slopes, very stony

#### **Map Unit Setting**

National map unit symbol: 2zggn

Elevation: 130 to 970 feet

Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

#### **Map Unit Composition**

Whitman, very stony, and similar soils: 81 percent

Minor components: 19 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### Description of Whitman, Very Stony

#### Setting

Landform: Depressions, drainageways, hills, ground moraines, drumlins

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Concave Across-slope shape: Concave

Parent material: Coarse-loamy lodgment till derived from granite and gneiss and/or

schist

#### Typical profile

Oi - 0 to 1 inches: peat

A - 1 to 10 inches: fine sandy loam

Bg - 10 to 17 inches: gravelly fine sandy loam Cdg - 17 to 61 inches: fine sandy loam

#### **Properties and qualities**

Slope: 0 to 3 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent Depth to restrictive feature: 7 to 38 inches to densic material

Drainage class: Very poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None Frequency of ponding: Frequent

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Low (about 3.0 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5s

Hydrologic Soil Group: D

Ecological site: F144AY041MA - Very Wet Till Depressions

Hydric soil rating: Yes

#### **Minor Components**

#### Ridgebury, very stony

Percent of map unit: 10 percent

Landform: Ground moraines, depressions, drumlins, drainageways, hills

Landform position (two-dimensional): Toeslope, footslope Landform position (three-dimensional): Head slope, base slope

Down-slope shape: Concave Across-slope shape: Concave

Ecological site: F144AY009CT - Wet Till Depressions

Hydric soil rating: Yes

#### Scarboro

Percent of map unit: 5 percent

Landform: Outwash deltas, outwash terraces, drainageways, depressions

Landform position (three-dimensional): Tread

Down-slope shape: Concave Across-slope shape: Concave

Ecological site: F144AY031MA - Very Wet Outwash

Hydric soil rating: Yes

#### Swansea

Percent of map unit: 3 percent Landform: Swamps, bogs, marshes Down-slope shape: Concave Across-slope shape: Concave

Ecological site: F144AY043MA - Acidic Organic Wetlands

Hydric soil rating: Yes

#### Woodbridge, very stony

Percent of map unit: 1 percent

Landform: Drumlins, hills, ground moraines

Landform position (two-dimensional): Backslope, footslope, summit

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Concave

Across-slope shape: Linear

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

#### 141B—Hollis-Rock outcrop-Chatfield complex, 3 to 8 percent slopes

#### **Map Unit Setting**

National map unit symbol: 9dh6 Elevation: 200 to 2,940 feet

Mean annual precipitation: 40 to 50 inches Mean annual air temperature: 37 to 52 degrees F

Frost-free period: 90 to 160 days

Farmland classification: Not prime farmland

#### **Map Unit Composition**

Hollis and similar soils: 35 percent

Rock outcrop: 25 percent

Chatfield and similar soils: 20 percent Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Hollis**

#### Settina

Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Till

#### **Typical profile**

Oi - 0 to 2 inches: slightly decomposed plant material

H1 - 2 to 4 inches: very fine sandy loam H2 - 4 to 11 inches: very fine sandy loam

H3 - 11 to 15 inches: bedrock

#### Properties and qualities

Slope: 3 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 10 to 20 inches to lithic bedrock

Drainage class: Well drained Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to

5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Very low (about 2.0 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D Hydric soil rating: No

#### **Description of Rock Outcrop**

#### Setting

Parent material: Granite and gneiss

#### **Properties and qualities**

Slope: 3 to 8 percent

Depth to restrictive feature: 0 inches to lithic bedrock

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Low to very high (0.01

to 20.00 in/hr)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Hydric soil rating: Unranked

#### **Description of Chatfield**

#### Setting

Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Till

#### **Typical profile**

Oi - 0 to 1 inches: slightly decomposed plant material

H1 - 1 to 2 inches: fine sandy loam

H2 - 2 to 30 inches: gravelly fine sandy loam

H3 - 30 to 34 inches: bedrock

#### **Properties and qualities**

Slope: 3 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Low to high (0.01 to

5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 4.3 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: B Hydric soil rating: No

#### **Minor Components**

#### Moosilauke

Percent of map unit: 5 percent Landform: Ground moraines

Down-slope shape: Linear Across-slope shape: Convex Hydric soil rating: Yes

#### Ridgebury

Percent of map unit: 5 percent Landform: Ground moraines Down-slope shape: Linear Across-slope shape: Convex Hydric soil rating: Yes

#### Canton

Percent of map unit: 4 percent Landform: Hillslopes

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### **Newfields**

Percent of map unit: 2 percent

Landform: Hillslopes Hydric soil rating: No

#### Montauk

Percent of map unit: 2 percent

Landform: Hills

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Scituate

Percent of map unit: 2 percent

Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

### 250B—Chatfield-Montauk-Hollis complex, 0 to 8 percent slopes, very rocky

#### **Map Unit Setting**

National map unit symbol: 2xfdx Elevation: 270 to 1,040 feet

Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of local importance

#### **Map Unit Composition**

Chatfield, very stony, and similar soils: 35 percent Montauk, very stony, and similar soils: 25 percent Hollis, very stony, and similar soils: 20 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Chatfield, Very Stony**

#### Setting

Landform: Hills, ridges

Landform position (two-dimensional): Summit, backslope, shoulder Landform position (three-dimensional): Crest, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Convex, linear

Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or

schist

#### **Typical profile**

Oi - 0 to 1 inches: slightly decomposed plant material

A - 1 to 2 inches: fine sandy loam

Bw - 2 to 30 inches: gravelly fine sandy loam

2R - 30 to 40 inches: bedrock

#### Properties and qualities

Slope: 0 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 20 to 41 inches to lithic bedrock

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water capacity: Low (about 4.3 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hvdrologic Soil Group: B

Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

#### **Description of Montauk, Very Stony**

#### Settina

Landform: Drumlins, hills, ground moraines, recessionial moraines Landform position (two-dimensional): Backslope, shoulder, summit

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Linear, convex Across-slope shape: Convex

Parent material: Coarse-loamy over sandy lodgment till derived from gneiss,

granite, and/or schist

#### Typical profile

Oe - 0 to 2 inches: moderately decomposed plant material

A - 2 to 6 inches: fine sandy loam
Bw1 - 6 to 28 inches: fine sandy loam
Bw2 - 28 to 36 inches: sandy loam

2Cd - 36 to 74 inches: gravelly loamy sand

#### Properties and qualities

Slope: 0 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent Depth to restrictive feature: 20 to 43 inches to densic material

Drainage class: Well drained Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

high (0.00 to 1.42 in/hr)

Depth to water table: About 18 to 37 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water capacity: Low (about 5.6 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C

Ecological site: F144AY007CT - Well Drained Dense Till Uplands

Hydric soil rating: No

#### **Description of Hollis, Very Stony**

#### Setting

Landform: Hills, ridges

Landform position (two-dimensional): Shoulder, backslope, summit Landform position (three-dimensional): Side slope, crest, nose slope

Down-slope shape: Convex

Across-slope shape: Linear, convex

Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or

schist

#### **Typical profile**

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 7 inches: gravelly fine sandy loam Bw - 7 to 16 inches: gravelly fine sandy loam

2R - 16 to 26 inches: bedrock

#### Properties and qualities

Slope: 0 to 8 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 8 to 23 inches to lithic bedrock

Drainage class: Somewhat excessively drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm) Available water capacity: Very low (about 2.7 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: F144AY033MA - Shallow Dry Till Uplands

Hydric soil rating: No

#### **Minor Components**

#### Walpole, very stony

Percent of map unit: 7 percent

Landform: Outwash terraces, depressions, outwash plains, depressions, deltas

Landform position (three-dimensional): Tread

Down-slope shape: Concave Across-slope shape: Concave Hydric soil rating: Yes

#### Scituate, very stony

Percent of map unit: 5 percent

Landform: Ground moraines, drumlins, hills

Landform position (two-dimensional): Backslope, footslope, summit

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Linear, convex Across-slope shape: Convex Hydric soil rating: No

#### Canton, very stony

Percent of map unit: 4 percent Landform: Moraines, ridges, hills

Landform position (two-dimensional): Backslope, shoulder, summit

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Convex, linear Across-slope shape: Convex

Hydric soil rating: No

#### **Rock outcrop**

Percent of map unit: 4 percent Landform: Hills, ridges Hydric soil rating: No

### 250C—Chatfield-Montauk-Hollis complex, 8 to 15 percent slopes, very rocky

#### **Map Unit Setting**

National map unit symbol: 2w69v Elevation: 200 to 1,200 feet

Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 145 to 240 days

Farmland classification: Farmland of local importance

#### **Map Unit Composition**

Chatfield, very stony, and similar soils: 35 percent Montauk, very stony, and similar soils: 25 percent Hollis, very stony, and similar soils: 20 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Chatfield, Very Stony**

#### Setting

Landform: Hills, ridges

Landform position (two-dimensional): Summit, backslope, shoulder Landform position (three-dimensional): Crest, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear, convex

Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or

schist

#### Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

A - 1 to 2 inches: fine sandy loam

Bw - 2 to 30 inches: gravelly fine sandy loam

2R - 30 to 40 inches: bedrock

#### **Properties and qualities**

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 20 to 41 inches to lithic bedrock

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Low (about 4.3 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: B

Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

#### **Description of Montauk, Very Stony**

#### Setting

Landform: Drumlins, ground moraines, recessionial moraines, hills

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope

Down-slope shape: Linear, convex

Across-slope shape: Convex

Parent material: Coarse-loamy over sandy lodgment till derived from gneiss,

granite, and/or schist

#### **Typical profile**

Oe - 0 to 2 inches: moderately decomposed plant material

A - 2 to 6 inches: fine sandy loam
Bw1 - 6 to 28 inches: fine sandy loam
Bw2 - 28 to 36 inches: sandy loam

2Cd - 36 to 74 inches: gravelly loamy sand

#### Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent Depth to restrictive feature: 20 to 43 inches to densic material

Drainage class: Well drained Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

high (0.00 to 1.42 in/hr)

Depth to water table: About 18 to 37 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Low (about 5.6 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C

Ecological site: F144AY007CT - Well Drained Dense Till Uplands

Hydric soil rating: No

#### **Description of Hollis, Very Stony**

#### Settina

Landform: Hills, ridges

Landform position (two-dimensional): Shoulder, backslope, summit Landform position (three-dimensional): Crest, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear, convex

Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

#### Typical profile

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 7 inches: gravelly fine sandy loam Bw - 7 to 16 inches: gravelly fine sandy loam

2R - 16 to 26 inches: bedrock

#### **Properties and qualities**

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 8 to 23 inches to lithic bedrock

Drainage class: Somewhat excessively drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Very low (about 2.7 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: F144AY033MA - Shallow Dry Till Uplands

Hydric soil rating: No

#### **Minor Components**

#### Ridgebury, very stony

Percent of map unit: 6 percent

Landform: Drainageways, hills, ground moraines, depressions Landform position (two-dimensional): Toeslope, footslope Landform position (three-dimensional): Base slope, head slope

Down-slope shape: Linear, concave Across-slope shape: Concave

Hydric soil rating: Yes

#### **Rock outcrop**

Percent of map unit: 5 percent

Landform: Hills, ridges Hydric soil rating: No

#### Canton, very stony

Percent of map unit: 5 percent Landform: Ridges, hills, moraines

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope

Down-slope shape: Convex, linear Across-slope shape: Convex Hydric soil rating: No

#### Scituate, very stony

Percent of map unit: 4 percent

Landform: Drumlins, hills, ground moraines

Landform position (two-dimensional): Backslope, footslope, summit

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Linear, convex Across-slope shape: Convex

Hydric soil rating: No

### 250D—Chatfield-Montauk-Hollis complex, 15 to 35 percent slopes, very rocky

#### **Map Unit Setting**

National map unit symbol: 2xfdw Elevation: 200 to 1,310 feet

Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

#### **Map Unit Composition**

Chatfield, very stony, and similar soils: 35 percent Montauk, very stony, and similar soils: 25 percent Hollis, very stony, and similar soils: 20 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Chatfield, Very Stony**

#### Setting

Landform: Hills, ridges

Landform position (two-dimensional): Shoulder, backslope, summit Landform position (three-dimensional): Crest, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Convex, linear

Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or

schist

#### **Typical profile**

Oi - 0 to 1 inches: slightly decomposed plant material

A - 1 to 2 inches: fine sandy loam

Bw - 2 to 30 inches: gravelly fine sandy loam

2R - 30 to 40 inches: bedrock

#### Properties and qualities

Slope: 15 to 35 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 20 to 41 inches to lithic bedrock

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water capacity: Low (about 4.3 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: B

Ecological site: F144AY034CT - Well Drained Till Uplands

Hydric soil rating: No

#### **Description of Montauk, Very Stony**

#### Setting

Landform: Drumlins, ground moraines, recessionial moraines, hills

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope

Down-slope shape: Linear, convex Across-slope shape: Convex

Parent material: Coarse-loamy over sandy lodgment till derived from gneiss,

granite, and/or schist

#### **Typical profile**

Oe - 0 to 2 inches: moderately decomposed plant material

A - 2 to 6 inches: fine sandy loam
Bw1 - 6 to 28 inches: fine sandy loam
Bw2 - 28 to 36 inches: sandy loam

2Cd - 36 to 74 inches: gravelly loamy sand

#### Properties and qualities

Slope: 15 to 35 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent Depth to restrictive feature: 20 to 43 inches to densic material

Drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

high (0.00 to 1.42 in/hr)

Depth to water table: About 18 to 37 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water capacity: Low (about 5.6 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: C

Ecological site: F144AY007CT - Well Drained Dense Till Uplands

Hydric soil rating: No

#### **Description of Hollis, Very Stony**

#### Settina

Landform: Ridges, hills

Landform position (two-dimensional): Shoulder, summit, backslope Landform position (three-dimensional): Side slope, nose slope, crest

Down-slope shape: Convex

Across-slope shape: Convex, linear

Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

#### **Typical profile**

Oi - 0 to 2 inches: slightly decomposed plant material

A - 2 to 7 inches: gravelly fine sandy loam Bw - 7 to 16 inches: gravelly fine sandy loam

2R - 16 to 26 inches: bedrock

#### Properties and qualities

Slope: 15 to 35 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent

Depth to restrictive feature: 8 to 23 inches to lithic bedrock

Drainage class: Somewhat excessively drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water capacity: Very low (about 2.7 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Ecological site: F144AY033MA - Shallow Dry Till Uplands

Hydric soil rating: No

#### **Minor Components**

#### Rock outcrop

Percent of map unit: 5 percent

Landform: Hills, ridges Hydric soil rating: No

#### Scituate, very stony

Percent of map unit: 5 percent

Landform: Ground moraines, drumlins, hills

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear, convex Across-slope shape: Convex Hydric soil rating: No

#### Canton, very stony

Percent of map unit: 5 percent Landform: Ridges, hills, moraines

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope

Down-slope shape: Convex, linear Across-slope shape: Convex Hydric soil rating: No

### Walpole, very stony

Percent of map unit: 5 percent

Landform: Depressions, deltas, outwash terraces, depressions, outwash plains

Landform position (three-dimensional): Tread

Down-slope shape: Concave Across-slope shape: Concave

Hydric soil rating: Yes

#### 425A—Scarboro-Ridgebury complex, 0 to 3 percent slopes, rocky

#### **Map Unit Setting**

National map unit symbol: 2xffz Elevation: 280 to 960 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 145 to 240 days

Farmland classification: Not prime farmland

#### **Map Unit Composition**

Scarboro and similar soils: 60 percent

Ridgebury, very stony, and similar soils: 30 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Scarboro**

#### Setting

Landform: Depressions, drainageways

Down-slope shape: Concave Across-slope shape: Concave

Parent material: Sandy glaciofluvial deposits derived from schist and/or gneiss

and/or granite

#### **Typical profile**

Oa - 0 to 8 inches: muck

A - 8 to 14 inches: mucky fine sandy loam

Cg1 - 14 to 22 inches: sand

Cg2 - 22 to 65 inches: gravelly sand

#### Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Very poorly drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high

(1.42 to 14.17 in/hr)

Depth to water table: About 0 to 2 inches

Frequency of flooding: None Frequency of ponding: Frequent

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Moderate (about 6.1 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: A/D

Ecological site: F144AY031MA - Very Wet Outwash

Hydric soil rating: Yes

#### Description of Ridgebury, Very Stony

#### Setting

Landform: Ground moraines, depressions, drainageways, hills, drumlins

Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Head slope, base slope

Down-slope shape: Concave Across-slope shape: Concave

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or

schist

#### **Typical profile**

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 6 inches: fine sandy loam Bw - 6 to 10 inches: sandy loam

Bg - 10 to 19 inches: gravelly sandy loam Cd - 19 to 66 inches: gravelly sandy loam

#### **Properties and qualities**

Slope: 0 to 3 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent Depth to restrictive feature: 15 to 35 inches to densic material

Drainage class: Poorly drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately

low (0.00 to 0.14 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Low (about 3.0 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D

Ecological site: F144AY009CT - Wet Till Depressions

Hydric soil rating: Yes

#### **Minor Components**

#### Freetown

Percent of map unit: 5 percent

Landform: Swamps, bogs, marshes, kettles, depressions

Down-slope shape: Concave Across-slope shape: Concave

Hydric soil rating: Yes

#### Scituate, very stony

Percent of map unit: 4 percent

Landform: Drumlins, hills, ground moraines

Landform position (two-dimensional): Summit, footslope, backslope

Landform position (three-dimensional): Crest, side slope

Down-slope shape: Linear, convex Across-slope shape: Convex Hydric soil rating: No

#### Rock outcrop

Percent of map unit: 1 percent

Landform: Hills, ridges Hydric soil rating: No

#### 449C—Scituate fine sandy loam, 8 to 15 percent slopes, very stony

#### **Map Unit Setting**

National map unit symbol: 23blj Elevation: 200 to 790 feet

Mean annual precipitation: 40 to 50 inches Mean annual air temperature: 45 to 52 degrees F

Frost-free period: 100 to 160 days

Farmland classification: Farmland of local importance

#### Map Unit Composition

Scituate and similar soils: 80 percent Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Scituate**

#### Setting

Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Basal melt-out till derived from granite, gneiss, or schist

#### Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material

H1 - 1 to 4 inches: fine sandy loam H2 - 4 to 25 inches: fine sandy loam

H3 - 25 to 65 inches: gravelly loamy fine sand

#### Properties and qualities

Slope: 8 to 15 percent

Surface area covered with cobbles, stones or boulders: 1.6 percent Depth to restrictive feature: 20 to 34 inches to densic material

Drainage class: Moderately well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to

moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 18 to 36 inches

Frequency of flooding: None Frequency of pondina: None

Available water capacity: Low (about 3.7 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: C

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

#### **Minor Components**

#### **Newfields**

Percent of map unit: 5 percent

Landform: Hillslopes Hydric soil rating: No

#### Montauk

Percent of map unit: 3 percent

Landform: Hills

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Whitman

Percent of map unit: 3 percent Landform: Depressions Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

#### Canton

Percent of map unit: 3 percent

Landform: Hillslopes
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

#### Woodbridge

Percent of map unit: 3 percent

Landform: Hillslopes Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Ridgebury

Percent of map unit: 3 percent Landform: Ground moraines Down-slope shape: Linear Across-slope shape: Convex Hydric soil rating: Yes

#### 598B—Windsor-Urban land complex, 0 to 8 percent slopes

#### **Map Unit Setting**

National map unit symbol: 2w2wq

Elevation: 0 to 920 feet

Mean annual precipitation: 36 to 71 inches Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Not prime farmland

#### Map Unit Composition

Windsor and similar soils: 45 percent

Urban land: 35 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Windsor**

#### Setting

Landform: Outwash plains, outwash terraces, deltas, dunes

Landform position (three-dimensional): Tread, riser

Down-slope shape: Linear, convex Across-slope shape: Linear, convex

Parent material: Loose sandy glaciofluvial deposits derived from granite and/or loose sandy glaciofluvial deposits derived from schist and/or loose sandy

glaciofluvial deposits derived from gneiss

#### Typical profile

A - 0 to 3 inches: loamy sand
Bw - 3 to 25 inches: loamy sand

C - 25 to 65 inches: sand

#### Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very

high (1.42 to 99.90 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm) Available water capacity: Low (about 4.4 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: A

Ecological site: F144AY022MA - Dry Outwash

Hydric soil rating: No

#### **Description of Urban Land**

#### **Typical profile**

M - 0 to 10 inches: cemented material

#### Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: 0 inches to manufactured layer

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00

in/hr

Available water capacity: Very low (about 0.0 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydrologic Soil Group: D Hydric soil rating: Unranked

#### **Minor Components**

#### **Udorthents**

Percent of map unit: 10 percent

Landform: Outwash plains, outwash terraces, deltas, dunes

Landform position (three-dimensional): Tread, riser

Down-slope shape: Linear, convex Across-slope shape: Linear, convex

Hydric soil rating: No

#### Deerfield

Percent of map unit: 5 percent

Landform: Outwash plains, terraces, deltas
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Hinckley

Percent of map unit: 5 percent

Landform: Outwash plains, eskers, kames, deltas

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Nose slope, side slope, crest, head slope,

rise

Down-slope shape: Convex

Across-slope shape: Linear, convex

Hydric soil rating: No

### References

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Appendix F – Photo Log



Photograph No. 1: Looking at proposed access and from Morgan Drive to Structure 22.



Photograph No. 2: Looking at proposed access to Structure 22.



Photograph No. 3: Looking at proposed access and pad location for Structure 22.



Photograph No. 4: Looking at proposed access to Structure 26.



Photograph No. 5: Looking at proposed access and pad location adjacent to Structure 26.



Photograph No. 6: Looking at proposed access and pad location adjacent to Structure 27.



Photograph No. 7: Looking at proposed access and pad location adjacent to Structure 28.



Photograph No. 8: Looking at proposed access and pad location adjacent to Structure 29.



Photograph No. 9: Looking at proposed access and pad location adjacent to Structure 30.



Photograph No. 10: Looking at proposed access and pad location adjacent to Structure 31.



Photograph No. 11: Looking at proposed access from Dicandra Drive to Structure 31.



Photograph No. 12: Looking at proposed access from Dicandra Drive to Structure 31.



Photograph No. 1: Looking at proposed access and from Poore Road to Structure 98.



Photograph No. 2: Looking at proposed access and pad location for Structure 98.



Photograph No. 3: Looking at proposed access and pad location for Structure 97.



Photograph No. 4: Looking at proposed access and pad location for Structure 96.



Photograph No. 5: Looking at proposed access for Structure 95.



Photograph No. 6: Looking at proposed access and pad location adjacent to Structure 95.



Photograph No. 7: Looking at proposed access adjacent to Structure 93.



Photograph No. 8: Looking at proposed access adjacent to Structure 91.



Photograph No. 9: Looking at proposed access and pad location for Structure 89.



Photograph No. 10: Looking at proposed access and pad location for Structure 88.



Appendix G – Waiver Request

## Alteration of Terrain Waiver Request RSA/Rule: RSA 485-A:17, Env – WQ 1500

Water Division / Alteration of Terrain Bureau / Land resources Management 29 Hazen Drive, PO Box 95 Concord, New Hampshire 03302-0095

A. PROJECT INFORMATION	
D121 Transmission Line OPGW and Structure Replacement Project Project Name	
Existing D121 Right-of-Way Street Address	
Bow and Hooksett	Multiple
City/Town	Zip Code
Multiple – see attached	•
Tax Map/Lot Number	

B. APPLICANT/OWNER INFO	RMATION		
Matthew First Name		Cardin Last Name	
Eversource Energy Organization			
13 Legends Drive Street Address			
Hooksett	New Hampsh	ire	03106
City/Town	State		Zip Code
Matthew.cardin@eversource.com		603-988-663	5
Email		Telephone Nu	ımber

C. APPLICANT/OWNER AGENT INFORMATION			
Lindsey First Name		White Last Name	
GZA GeoEnvironmental, Inc.	<u>.</u>		
Organization			
5 Commerce Park North, Suite 201 Street Address			
Bedford	New Hampshi	ire	03110
City/Town	State		Zip Code
Lindsey.white@gza.com		603-232-875	3
Email		Telephone Nu	umber

D. WAIVER REQUESTS	
Env-Wq 1504.09	Stormwater Drainage Report; Drainage Area Plans;
	Hydrologic Soil Group Plans
Rule Section Waiver Request	Name of Rule

#### **Reason for Waiver Request**

Eversource is requesting a waiver for preparing a Stormwater Drainage Report, Drainage Area Plans and Hydrologic Soil Group Plans for proposed access improvements and work pad grading associated with maintenance of the existing D121 Transmission Line structures. The proposed access -and work pad improvements for continued transmission line maintenance work will not result in new impervious surfaces. As a result, stormwater treatment practices are not proposed.

#### **Waiver Timeline**

Permanent

#### **Proposed Alternative**

The proposed access and work pad improvements will not result in new impervious surface. Therefore, there is no proposed alternative to substitute the requirements of Env-Wq 1504.09.

#### Compliance with Env- WQ 1509.04

The project proposes to improve access routes and work pads around utility structures for the purpose of maintaining existing utility infrastructure. This project is necessary in order to maintain the safety and reliability of the electrical infrastructure. Access and work pad improvements will be completed using stone and gravel, and therefore stormwater drainage should not be affected by the proposed project. In addition, it is not anticipated that stormwater drainage area plans would show significant differences between existing and proposed conditions. An NRCS Web Soil Survey report was generated to show general soil information within the project area. Since there is no new impervious surface area proposed and stormwater drainage is not anticipated to be affected by the proposed project, it is not anticipated that soils will be significantly impacted by the project.

Best Management Practices will be utilized to protect wetlands from erosion, sedimentation, or other environmental degradation. In addition, gravel work pads will be coated with seed and mulch to allow vegetation growth on the surface, further minimizing and preventing erosion and sedimentation. As a result, Eversource respectfully requests that a Stormwater Drainage Report, Drainage Area Plans, and Hydrologic Soil Group Plans be waived for the purposes of the proposed utility line maintenance project.

Mot Cal	5/19/2021	
Applicant/Owner, Matthew Cardin, Eversource Energy	Date	
Lindsey White	5/19/2021	
Applicant/Owner Agent, Lindsey White, GZA	Date	-

E. SIGNATURES



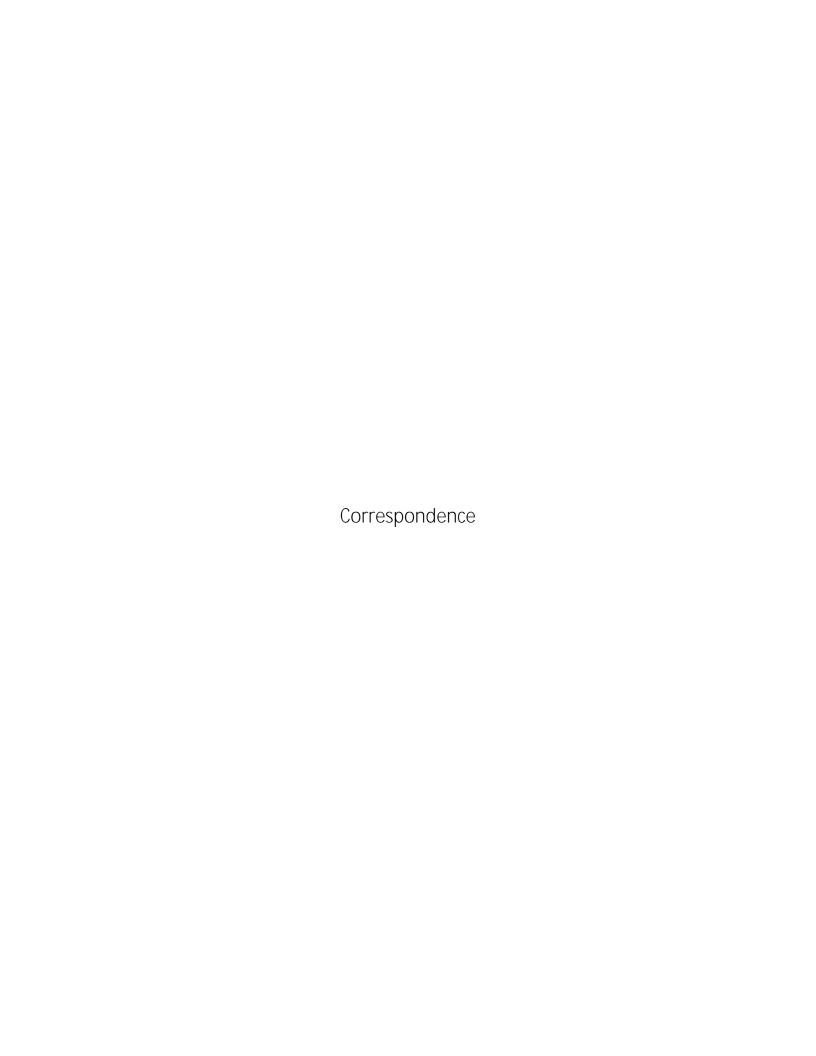
Appendix H – Certified Mail Receipts [Reserved for DES certified mailing receipts]







GZA GeoEnvironmental, Inc.



#### **Lindsey White**

From: Mauck, Ridgely <Addison.R.Mauck@des.nh.gov>

**Sent:** Tuesday, July 6, 2021 1:07 PM

To: Lindsey White

**Subject:** RE: AoT 210520-074 D121 Transmission Line Maintenance Project

**Follow Up Flag:** Follow up **Flag Status:** Flagged

Hi Lindsey,

I've completed my review of the AoT permit application for the subject project and have no comments specific to construction and stormwater management issues. I am awaiting input from NHFG before the permit can be issued, but would suggest that the notes included as *General Note* No. 7 (Sheet S1) be placed under a separate section entitled *New Hampshire Fish and Game AoT Permit Conditions Related to Threatened and Endangered Species* and the note be separated into several specific items/bullets as presented in your email communication to Kim Tuttle and NHB, dated April 30, 2021. This will make the notes more distinct from other plan notes.

Regards, Ridge

From: Mauck, Ridgely

Sent: Friday, July 2, 2021 11:17 AM

To: 'Lindsey White' <Lindsey.White@gza.com>

Subject: RE: AoT 210520-074 D121 Transmission Line Maintenance Project

Hi Lindsey,

My review will be completed early next week.

Enjoy your holiday.

-Ridge

From: Lindsey White < Lindsey. White@gza.com >

Sent: Thursday, July 1, 2021 3:14 PM

To: Mauck, Ridgely < Addison.R.Mauck@des.nh.gov >; Mauck, Ridgely < Addison.R.Mauck@des.nh.gov >

Subject: RE: AoT 210520-074 D121 Transmission Line Maintenance Project

**EXTERNAL:** Do not open attachments or click on links unless you recognize and trust the sender.

Hi Ridge,

I wanted to follow up with you on the D121 AoT permit application. Do you have an anticipated date when the review will be complete?

Thanks so much and have a great holiday!

Lindsey

Lindsey E. White Project Manager

GZA | 5 Commerce Park North | Bedford, NH 03110

o: 603.232.8753 | c: 603.770.5752 | <u>lindsey.white@gza.com</u> | <u>www.gza.com</u> | <u>LinkedIn</u>

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From: Lindsey White

Sent: Tuesday, June 1, 2021 8:17 AM

To: Mauck, Ridge < Ridgely. Mauck@des.nh.gov >; Mauck, Ridgely < Addison.R. Mauck@des.nh.gov >

Subject: AoT 210520-074 D121 Transmission Line Maintenance Project

Hi Ridge,

I just wanted to confirm that the D121 Notice of Acceptance of Permit Application for the D121 Transmission Line Optical Ground Wire and Structure Replacement Project was sent to both the Town of Bow and Town of Hooksett. I received one notice in the mail addressed to the Town of Bow and cc the Town of Hooksett, but I did not receive a notice sent to the Town of Hooksett.

Thanks!

Lindsey E. White Project Manager

GZA | 5 Commerce Park North | Bedford, NH 03110

o: 603.232.8753 | c: 603.770.5752 | <u>lindsey.white@gza.com</u> | <u>www.gza.com</u> | <u>LinkedIn</u>

\* Please note: Our office is currently working remotely. I can be reached at 603.770.5752.

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For information about GZA GeoEnvironmental, Inc. and its services, please visit our website at www.qza.com.

#### **Lindsey White**

From: Marchand, Michael < Michael.N.Marchand@wildlife.nh.gov>

Sent: Thursday, August 12, 2021 3:56 PM

**To:** Tracy Tarr; Lindsey White

**Cc:** Mauck, Ridgely

**Subject:** NHFG TEWHA Review: NHB21-0607, D121 Transmission Line,, AoT File Number 210520-074 **Attachments:** Wood Turtle Flyer\_2020.pdf; Spotted\_Blandings Flyer\_May2020.pdf; SnakeFlyer\_FinalVersion.pdf

**Importance:** High

**Follow Up Flag:** Follow up Flag Status: Flagged

RE: NHB21-0607

Lindsey and/or Tracy,

The New Hampshire Fish and Game has completed our review of the threatened and endangered wildlife and habitat assessment (TEWHA) report dated May 2021 by GZA GeoEnvironmental, Inc. for proposed replacement of 13 existing utility structures and construction of associated access located within the existing and maintained D121 Transmission Line Right-of-Way (ROW) in portions of Bow and Hooksett, New Hampshire.

Based on the NHB datacheck results letter and the information provided in the wildlife assessment, if all conservation measures are incorporated as described, the project is not likely to jeopardize the continued existence of state threatened and endangered wildlife species. We request the following recommended conservation measures be incorporated into the sheet plans as written and provide to NHDES and cc NHFG for final review. Please provide plan sheet reference locations for requested conservation measures upon submittal.

#### New Hampshire Fish and Game AoT Permit Conservation Measures Related to Threatened and Endangered Species:

- The New Hampshire Fish and Game Department shall have access to the property during the term of the permit. See Plan sheet(s) dated XXXXXX for specs.
- All manufactured erosion and sediment control products, except for silt fence installed in accordance with Env-Wq 1506.04, utilized for, but not limited to, slope protection, runoff diversion, slope interruption, perimeter control, inlet protection, check dams, and sediment traps shall not contain welded plastic, plastic, or multi-filament or monofilament polypropylene netting or mesh. See Plan sheet(s) dated XXXXXX for specs.
- Site operators shall be informed of the potential presence of eastern hognose snakes (state endangered), black racer (state threatened), Blanding's turtle (state endangered), spotted turtle (state threatened), and wood turtle (state special concern) and be provided a flier that helps to identify these species. Species information are identified on plan sheets dated XXX, Sheet Page X of X. Please include all attached fliers in sheet plans.
- All observations of threatened or endangered species <u>shall be reported immediately</u> to the New Hampshire Fish and Game Department Nongame and Endangered Wildlife Environmental Review Program by phone at 603-271-2461 and by email at <u>NHFGreview@wildlife.nh.gov</u> unless as otherwise specified below. Email subject line: <u>NHB21-0607, D121 Transmission Line, Wildlife Species Observation.</u> Photographs shall be provided for verification as feasible; See Plan sheet(s) dated <u>XXXXXXX</u> for specs.
- Turtle nesting season extends from late May through the beginning of July and hatchling turtles typically
  emerge from the ground from mid-August through early October. If wood, Blanding's, or spotted turtles are
  found laying eggs or if hatchling turtles are seen in the work area, contact NHFG (Melissa Doperalski at 603-

- 271-1738 (o)/ 603-479-1129 (cell) or Josh Megyesy at 603-271-1125 (o)/ 978-575-0802 (cell) for further instructions. See Plan sheet(s) dated XXXXXX for specs.

- Prior to daily construction activities, timber matting will be searched for snakes and turtles. See Plan sheet(s) dated XXXXXX for specs.
- GZA will provide an environmental addendum to the daily tailboards by the contractors to include guidance on protocols for snakes and provide identification for spotted turtle, wood turtle, Blanding's turtle and northern black racer snake. See Plan sheet(s) dated XXXXXXX for specs.
- Reptile "sweeps" will be completed during erosion control monitoring. If protected reptiles are observed on or near the site during construction, contact NHFG immediately upon observation, and safely relocate amphibians and reptiles out of construction areas if observed. See Plan sheet(s) dated XXXXXXX for specs.
- Observed snakes and turtles will be moved off of construction access roads to limit and prevent mortality to snakes and turtles during construction. See Plan sheet(s) dated XXXXXXX for specs.
- At the conclusion of the project, a summary report of any rare species observations will be provided to the NHFG Nongame Program. See Plan sheet(s) dated XXXXXXX for specs.
- Temporary or permanent impacts to identified potential or suspect vernal pools are prohibited. Any observation
  of any additional suspect vernal pools are to be reported to NHFG personnel (Plan date 03/31/21, Sheet S1,
  General Notes #8)
- Wetland boundaries, including vernal pools prohibited from impact, will be clearly marked prior to start of construction. See Plan sheet(s) dated XXXXXX for specs.
- Timber matting and erosion controls will be used for all temporary wetland crossings to avoid permanent wetland impacts and sedimentation, as well as to span stream channels in Wetlands BWW12 and BWW13. See Plan sheet(s) dated XXXXXXX for specs.
- Install silt fencing to create temporary barrier at Structure 95 construction area where spotted turtle was
  observed to occur to exclude turtles and snakes from active construction areas. Fencing will be maintained biweekly and after major storm events or as needed to fix any gaps or failures. See Plan sheet(s) dated XXXXXXX for
  specs.

NHFG has completed its project review consistent with the requirements of RSA 212-A and Env-Wq 1503.19(h). No further coordination with NHFG is requested if the above recommended permit conditions are incorporated into the project plan set/project design, and there are no additional plan/design modifications.

#### -Mike

Michael Marchand

Nongame & Endangered Wildlife Program Supervisor Certified Wildlife Biologist NH Fish & Game Department 11 Hazen Drive Concord NH 03301 Phone: 603-271-3016

#### **Lindsey White**

From: Mauck, Ridgely <Addison.R.Mauck@des.nh.gov>

Sent: Wednesday, August 18, 2021 10:56 AM

To: Lindsey White

**Subject:** RE: AoT 210520-074 D121 Transmission Line Maintenance Project

#### Lindsey,

It was noticed that the temporary barrier at structure 95 did not provide a full perimeter barrier. To address this please revise the following:

- 1. On Sheet S4, note #16, first sentence after "temporary" add "full perimeter". At the end of the first sentence, insert new sentences: The full perimeter barrier shall be maintained at all times, except when providing a temporary opening for access to the work area. Once access is attained, the perimeter barrier shall be immediately restored. Any gate or similar structure installed for access shall have full contact with the ground surface.
- 2. On Sheet 8, extend the silt fence line to indicate a full perimeter barrier, and add a note directing one to note 16 on Sheet S4, or copy the note to Sheet 8.

Please call me to confirm your understanding of this request.

Regards,

Ridge

From: Lindsey White <Lindsey.White@gza.com> Sent: Wednesday, August 18, 2021 9:09 AM

To: Mauck, Ridgely <Addison.R.Mauck@des.nh.gov>

Subject: FW: AoT 210520-074 D121 Transmission Line Maintenance Project

**EXTERNAL:** Do not open attachments or click on links unless you recognize and trust the sender.

Hi Ridge,

I seem to have multiple email addresses for you, but I sent this back over to you yesterday!

Which email should I keep on file for you?

Thanks!

Lindsey E. White Project Manager

GZA | 5 Commerce Park North | Bedford, NH 03110

o: 603.232.8753 | c: 603.770.5752 | <u>lindsey.white@gza.com</u> | <u>www.gza.com</u> | <u>LinkedIn</u>

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From: Lindsey White

Sent: Tuesday, August 17, 2021 2:13 PM

To: Mauck, Ridge <Ridgely.Mauck@des.nh.gov>; Mauck, Ridgely <Addison.Mauck@des.nh.gov>

Cc: Ashley Ruprecht <a href="mailto:ashley.ruprecht@eversource.com">ashley.ruprecht@eversource.com</a>

Subject: AoT 210520-074 D121 Transmission Line Maintenance Project

Hi Ridge,

Please find attached the updated Alteration of Terrain Plan Set for AoT 210520-074 which now includes all applicable flyer photos of rare snakes and turtles and descriptions for each.

If you have any questions, please don't hesitate to ask.

Thanks! Lindsey

Lindsey E. White Project Manager

GZA | 5 Commerce Park North | Bedford, NH 03110

o: 603.232.8753 | c: 603.770.5752 | <u>lindsey.white@gza.com</u> | <u>www.gza.com</u> | <u>LinkedIn</u>

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Redaction Date: 8/4/2023 10:26:55 AM

## **Redaction Log**

Total Number of Redactions in Document: 29

### Redaction Reasons by Page

Page	Reason	Description	Occurrences
61	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
62	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
63	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
64	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
65	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
66	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
67	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
68	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1

## **Redaction Log**

Page	Reason	Description	Occurrences
69	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
70	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
71	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
72	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
73	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
74	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
75	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
76	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
77	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1

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Page	Reason	Description	Occurrences
78	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
79	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
80	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
81	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
82	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
83	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
84	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
85	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
86	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1

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87	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
88	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1
89	CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	1

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## **Redaction Log**

## **Redaction Reasons by Exemption**

Reason	Description	Pages (Count)
CONFIDENTIAL DNCR	NH RSA 91-A:5, IV Confidential information. NH Department of Natural and Cultural Resources (DNCR) has asserted a claim of confidentiality. See also NH RSA 212-A, RSA 212-B, RSA 217-A, and/or RSA 227-C:11.	61(1) 62(1) 63(1) 63(1) 64(1) 65(1) 66(1) 67(1) 68(1) 69(1) 70(1) 71(1) 72(1) 73(1) 74(1) 75(1) 76(1) 77(1) 78(1) 79(1) 80(1) 81(1) 82(1) 83(1) 84(1) 85(1) 85(1) 87(1) 88(1) 89(1)