

Original Alteration of Terrain Permit Application



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# A152 Transmission Line Structure Replacement Project Eversource Energy

Swanzey  
New Hampshire

NHDES Alteration of Terrain Permit Application

February 8, 2022  
File No. 04.0190999.71



PREPARED FOR:  
Eversource Energy  
Hooksett, New Hampshire

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February 14, 2022  
File No. 04.0190999.71

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  
A152 Transmission Line Structure Replacement Project  
Swanzey, 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 A152 Transmission Line Structure 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 41 existing utility structures and the removal of 2 existing utility structures along the A152 Transmission Line that exceed AoT impact thresholds. The project area crosses through portions of Swanzey, New Hampshire for a distance of approximately 2.5 miles. Replacement of the existing utility structures is necessary in order to maintain the safety and reliability of the system. In order to more efficiently conduct routine maintenance of the existing A152 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 three separate proposed work areas in Swanzey 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.

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 March 2022. 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.

Handwritten signature of Conor Madison in cursive.

Conor Madison, CPESC, CESSWI  
Assistant Project Manager

Handwritten signature of Deborah Zarta Gier in cursive.

Deborah Zarta Gier, CNRP  
Consultant/Reviewer

Handwritten signature of Tracy Tarr in cursive.

Tracy Tarr, CWS, CWB, CESSWI  
Associate Principal

CEM

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Attachments: Alteration of Terrain Permit Application

cc: Town of Swanzey, New Hampshire



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## 1.0 PROJECT BACKGROUND AND PURPOSE

The proposed overall project involves the replacement of 91 existing A152 Transmission Line structures in portions of Keene, Swanzey, and Winchester, New Hampshire. Approximately 1.4 miles of the A152 Transmission Line is located within an existing 200-foot wide utility right-of-way (ROW) that also includes the T198 Transmission line. The remaining portion of the A152 Transmission Line ROW is approximately 15.3 miles in length with a ROW width of 150-feet. In total, the A152 Transmission Line is approximately 16.7 miles in length and extends from the Emerald Street Substation in Keene to the Old Chesterfield Substation in Hinsdale, 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. Impacts have been minimized and avoided to the greatest extent practicable through site evaluations of access routes and work pad placements.

The project requires approximately 606,792 square feet (sq. ft.) of total disturbance, including 95,981 sq. ft. of temporary wetland matting and 510,811 sq. ft. of ground disturbance. Three separate portions of the proposed structure replacement project are subject to the Alteration of Terrain disturbance threshold and includes replacement of a total of 41 existing structures and the removal of 2 existing utility structures (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 (Swanzey) – approximately 82,073 sq. ft. of work pad grading and associated access improvements at A152 Structures 23 to 28.
- 2) Area B (Swanzey) – approximately 211,186 sq. ft. of work pad grading and associated access improvements at A152 Structures 29 to 45.
- 3) Area C (Swanzey) – approximately 217,552 sq. ft. of work pad grading and associated access improvements at A152 Structures 55 to 72.

## 2.0 SITE INFORMATION

### 2.1 SITE LOCATION AND DESCRIPTION

The project area includes portions of the A152 Transmission Line Right of Way (ROW) in Swanzey, New Hampshire, specifically;

- A152 Structure 23 to A152 Structure 28. The total work area in this portion of the ROW is approximately 0.5 mile in length and approximately 150-ft in width.
- A152 Structure 28 to Swayers Crossing Road in Swanzey, New Hampshire. The total work area in this portion of the ROW is approximately 1.0 miles in length and approximately 150-ft in width.
- A152 Transmission Line Right of Way (ROW) from A152 Structure 55 to Pine Street in Swanzey, New Hampshire. The total work area in this portion of the ROW is approximately 1.0 mile in length and approximately 150-ft in width.



The project area primarily crosses privately owned rural/residential properties (see Figure 1 – USGS Topographic Map). There are approximately 8 wetlands along the project route located in the town of Swanzey. 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 all parcels along the ROW (see Figure 4). There are approximately 28 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

Wetlands were delineated and classified by GZA 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 October 2021. GZA delineated 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 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. Vernal pool areas exist as confined basins and must exhibit vernal pool criteria outlined in the New Hampshire Code of Administrative Rules, Env-Wt 103.64, 104.15 and 104.44. Since vernal pool observations were conducted in October 2021 outside the typical vernal pool breeding season of April through June, dry basin surveys were conducted to the extent possible to identify potential vernal pools. No potential vernal pools were identified within the proposed project area during field data collection. 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 GZA in 2016 and reviewed in 2021 in accordance with their definition in RSA 485-A:2 XIV, 482-A:4 II and rule Env-Wt 104.33. 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.

### 2.3.3 Identification of Rare, Threatened, and Endangered Species

The Natural Heritage Bureau (NHB) has identified records of Spotted turtle (*Clemmys guttata*), Northern Leopard Frog (*Lithobates pipiens*) and wood turtle (*Glyptemys insculpta*) within the vicinity of the A152 Transmission Line ROW in the City of Keene and Town of Swanzey (See Appendix C for the NHB Report and regulatory correspondence). GZA has coordinated with NHFG and NHB. GZA can provide flyers of species including 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 wood turtle 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. Common nighthawk (*Chordeiles minor*) was documented by NHB in the City of Keene. However, no proposed work areas in the City of Keene exceeded AoT impact thresholds and is not included in this application. However, a flyer for the common nighthawk will be distributed to construction crews as well.

In addition, Eversource will incorporate the following reptile construction Best Management Practices (BMPs):

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 contracts 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 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 on vernal pools and potential vernal pools will be avoided.
6. 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 (978-578-0802 cell) for further instructions.
7. All observations of Eastern hognose snakes seen at any time must be immediately reported to the NHFG Department (Melissa Doperalski or Josh Megyesy) for further instructions. Please attempt to photograph this species to send it to us for verification.

### 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.



Commonwealth Heritage Group (CHG) completed Phase IA Archeological Assessment for the A152 ROW during in support of other maintenance work. GZA engaged Heritage Consultants (Heritage) in 2021 to complete Phase IB Archeological Survey within select archeological sensitivity areas where work is proposed. This included Phase IB Survey in fifteen 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 within the existing and maintained A152 Transmission Line ROW. The proposed project work areas subject to the Alteration of Terrain permit cross through portions of the Town of Swanzey, 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 fine sandy loams and are typically stony or very stony with some rock outcrops. Slopes are variable and generally range from 0 to 30%, with an average of approximately 8%. As previously noted, the project has three separate areas that are subject to AoT permitting throughout the proposed project, and are referred to as Areas A, B and C.

The project area includes upland and wetland areas located in primarily rural and forested areas. Upland areas consist primarily of shrubs including gray birch (*Betula populifolia*), staghorn sumac (*Rhus typhina*), sweet fern (*Comptonia peregrina*), red maple (*Acer rubrum*), steplebush (*Spiraea tomentosa*), creeping juniper (*Juniperus horizontalis*), and invasive species autumn olive (*Elaeagnus umbellata*) and glossy buckthorn (*Frangula alna*). The herbaceous layer contains goldenrod (*Solidago* spp.), white meadowsweet (*Spiraea alba*), deer tongue (*Dichanthelium clandestinum*), aster (*Asteraceae* spp.), bracken fern (*Pteridium aquilinum*), bristly dewberry (*Rubus hispida*), lowbush blueberry (*Vaccinium angustifolium*), sheep laurel (*Kalmia angustifolia*), glossy buckthorn, little bluestem grass (*Schizachyrium scoparium*), eastern teaberry (*Gaultheria procumbens*), reindeer lichen (*Cladonia rangiferina*), mosses (*Polytrichum* spp.), sedges (*Carex* spp.), and grasses (*Poaceae* spp.).

Existing conditions along the A152 Transmission Line are discussed below by areas subject to jurisdiction under the Alteration of Terrain Law and Rules and consistent with discussions with the AoT Bureau for Eversource Line projects.

#### 3.1 AOT AREA A – SWANZEY

Area A begins at A152 Structure 23 and continues to A152 Structure 28 in Swanzey, New Hampshire. This stretch includes upland and wetland areas with elevations ranging from approximately 472 feet at Structure 23 to approximately 482 feet at Structure 26. This portion of the ROW is located in primarily forested undeveloped areas of Swanzey 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 A includes:

- Structures 23 to 28 Work Pads, and
- Access from Structures 23 to 28.



3.1.1 Surface and Groundwater Protection – Area A

There is one named watercourse (Ashuelot River) within this portion of the project area associated with Wetland SW-45 (see Figure 3 – Surface Water and Groundwater Overlay Plans). This portion of the project area includes temporary wetland matting in one wetland system: Wetlands SW-45 for access and work pad placement. A NHDES Statutory Permit by Notification (SPN) will be submitted for temporary wetland impacts for the proposed project in the Town of Swanzey. 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	528
Wetland Work Pad	14,973
<i>Total</i>	<i>15,031</i>

According to Figure 3, Area A is located within the “Surface Water with Impairments Quarter Mile Buffer” AoT screening layer. The impairment is associated with the Ashuelot River and is identified as Escherichia coli.

Area B is not located within any AoT screening layers. These layers include “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 FEMA 100-year Floodplain, Shoreland Protection, Designated Rivers – Area A

According to the FEMA Flood Insurance layer on Figure 3, a portion of Area A including sections of the work areas and access at Structures 23, 24, 25 and 26 are located within a mapped 100-year floodplain area identified as Zone AE. However, the disturbance area located in this floodplain which accounts for approximately 22,184 sq. ft. of disturbance will require minimal grading due to the gentle terrain. Due to the minimal grading and gravel improvements, as well as no cut and fill activities planned within this floodplain, it is not anticipated the proposed project will result in significant impact to the 100-year floodplain.

According to the Consolidated List of Water Bodies Subject to RSA 483-B (May 11, 2020), Structures 23, 24, 25, 26, 27 and 28 and associated work pads and access is located within the 250-ft protected shoreland of the Ashuelot River subject to RSA 483-B. A NHDES Shoreland Permit by Notification has been submitted for the proposed project. In accordance with the NHDES Designated River Corridor Web Map, there are no rivers within Area A that are designated under RSA 483.

3.2 AOT AREA B – SWANZEY

Area B begins at A152 Structure 29 and continues to Sawyers Crossing Road, Swanzey. This stretch includes upland and wetland areas with elevations ranging from approximately 472 feet at A152 Structure 29 to approximately 740 feet at A152 Structure 37. This portion of the ROW is located in a primarily forested undeveloped areas of Swanzey.

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 29 to 45 Work Pads, and
- Access roads from Matthews Road to Sawyers Crossing Road.

3.2.1 Surface and Groundwater Protection – Area B

There are no named or unnamed streams within this portion of the project area associated (see Figure 3 – Surface Water and Groundwater Overlay Plans). This portion of the project area includes temporary wetland matting in 3 wetland systems; Wetland SW-45, SW-42 and SW-41 for access and work pad placement. A NHDES Statutory Permit by Notification (SPN) will be submitted for temporary wetland impacts for the proposed project in the Town of Swanzey. 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	6,452
Wetland Work Pad	14,989
<i>Total</i>	<i>15,634</i>

According to Figure 3, a portion Area B including Structures 29 to 33 and associated work pads and access routes are located within the “Surface Water with Impairments Quarter Mile Buffer” AoT screening layer. The impairment is associated with the Ashuelot River and is identified as *Escherichia coli*.

The remainder of Area B is not located within any AoT screening layers. These layers include “Class A Surface Water (RSA 485A9) 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, a portion of Area B including sections of the work area at Structure 29 is located within a mapped 100-year floodplain area identified as Zone AE. However, the disturbance area located in this floodplain which accounts for approximately 3,155 sq. ft. of disturbance will require minimal grading due to the gentle terrain. Due to the minimal grading and gravel improvements within this floodplain, it is not anticipated the proposed project will result in significant impact to the 100-year floodplain.

According to the Consolidated List of Water Bodies Subject to RSA 483-B (May 11, 2020), Structure 29 and associated work pad and access is located within the 250-ft protected shoreland of the Ashuelot River subject to RSA 483-B. A NHDES Shoreland Permit by Notification has been submitted for the proposed project. In accordance with the NHDES Designated River Corridor Web Map, there are no rivers within Area A that are designated under RSA 483.

3.3 AOT AREA C – SWANZEY

Area B begins at A152 Structure 55 and continues to Pine Street, Swanzey. This stretch includes upland and wetland areas with elevations ranging from approximately 464 feet at A152 Structure 55 to approximately 490 feet at A152 Structure 68. This portion of the ROW is located in a primarily forested undeveloped areas of Swanzey.



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 55 to 72 Work Pads, and
- Access roads from Structure 55 to Pine Street.

3.3.1 Surface and Groundwater Protection – Area C

There are two unnamed streams within this portion of the project area associated (see Figure 3 – Surface Water and Groundwater Overlay Plans). This portion of the project area includes temporary wetland matting in 5 wetland systems; Wetland SW-26, SW-27, SW-28, SW-29 and SW-30 for access and work pad placement. A NHDES Statutory Permit by Notification (SPN) will be submitted for temporary wetland impacts for the proposed project in the Town of Swanzey. 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	10,686
Wetland Work Pad	48,353
<i>Total</i>	<i>59,039</i>

According to Figure 3, a portion Area C including Structures 55 to 68 and associated work pads and access routes are located within the “Surface Water with Impairments Quarter Mile Buffer” AoT screening layer. The impairment is associated with the Ashuelot River and is identified as *Escherichia coli*.

The remainder of Area C is not located within any AoT screening layers. These layers include “Class A Surface Water (RSA 485A9) 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.”

3.3.2 FEMA 100-year Floodplain, Shoreland Protection, Designated Rivers – Area C

According to the FEMA Flood Insurance layer on Figure 3, a portion of Area C including sections of the work area at Structure 29 is located within a mapped 100-year floodplain area identified as Zone AE. However, the disturbance area located in this floodplain which accounts for approximately 41,165 sq. ft. of disturbance will require minimal grading and gravel improvements due to the gentle terrain a. Due to the minimal grading and gravel improvements within this floodplain, it is not anticipated the proposed project will result in significant impact to the 100-year floodplain.

According to the Consolidated List of Water Bodies Subject to RSA 483-B (May 11, 2020), Structures 55, 56, 57, 61 and 62 and associated work pads and access is located within the 250-ft protected shoreland of the Ashuelot River subject to RSA 483-B. A NHDES Shoreland Permit by Notification has been submitted for the proposed project. In accordance with the NHDES Designated River Corridor Web Map, there are no rivers within Area A that are designated under RSA 483.



## 4.0 PROJECT DESCRIPTION

### 4.1 STRUCTURE REPLACEMENT AND MAINTENANCE

As previously mentioned, the proposed project includes the replacement of 41 existing utility structures and the removal of 2 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. Excess soils 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 project utilizes existing access routes within the existing A152 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 CONSTRUCTION SEQUENCE

This proposed project is scheduled to begin mid-March 2022. The work is proposed to be undertaken during the summer of 2022 into fall 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 three distinct AoT regulated areas (referred to respectively as Areas A, B and C) along the A152 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 Waiver Request: Stormwater Drainage Report; Drainage Area Plan; Hydrologic Soil Group Plans (Env-WQ 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

The project requires approximately 606,792 square feet (sq. ft.) of total disturbance, including 95,981 sq. ft. of temporary wetland matting and 510,811 sq. ft. of ground disturbance along the A152 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 - Swanzey  
 A152 Structure 23 to A152 Structure 28  
 Map Sheets 1 to 2

Disturbance Type	Impact (sq. ft)
New Access	15,603
Gravel Work Pad	66,470
<u>Total AoT Disturbed Area</u>	<u>82,073</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 or cumulatively exceeds 50,000 square feet of contiguous area if any portion of the disturbance is within the protected shoreland as defined in RSA 483-B"

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



AoT Area B - Swanzey  
 Matthew Road to Sawyers Crossing Road  
 Map Sheets 3 to 6

Disturbance Type	Impact (sq. ft)
New Access	73,283
Gravel Work Pad	137,903
<b><u>Total AoT Disturbed Area</u></b>	<b><u>211,186</u></b>

-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 C - Swanzey  
 A152 Structure 55 to Pine Street  
 Map Sheets 7 to 11

Disturbance Type	Impact (sq. ft)
New Access	73,311
Gravel Work Pad	144,241
<b><u>Total AoT Disturbed Area</u></b>	<b><u>217,552</u></b>

-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 OTHER REGULATORY PROGRAMS

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

Agency	Permit/Notification	Status
<i>Local</i>		
Town of Swanzey	Special Exception Permit	Approved
<i>State</i>		
NHDES	Statutory Permit by Notification	
	Town/City	SPN File No.
	Swanzey	2022-XXXX
NHDES	Shoreland Permit by Notification - 2022-00184	Approved
NHDOT	Driveway Permits	Pending
<i>Federal</i>		
EPA (Construction General Permit)	Stormwater Pollution Prevention Plan (SWPPP)	Pending



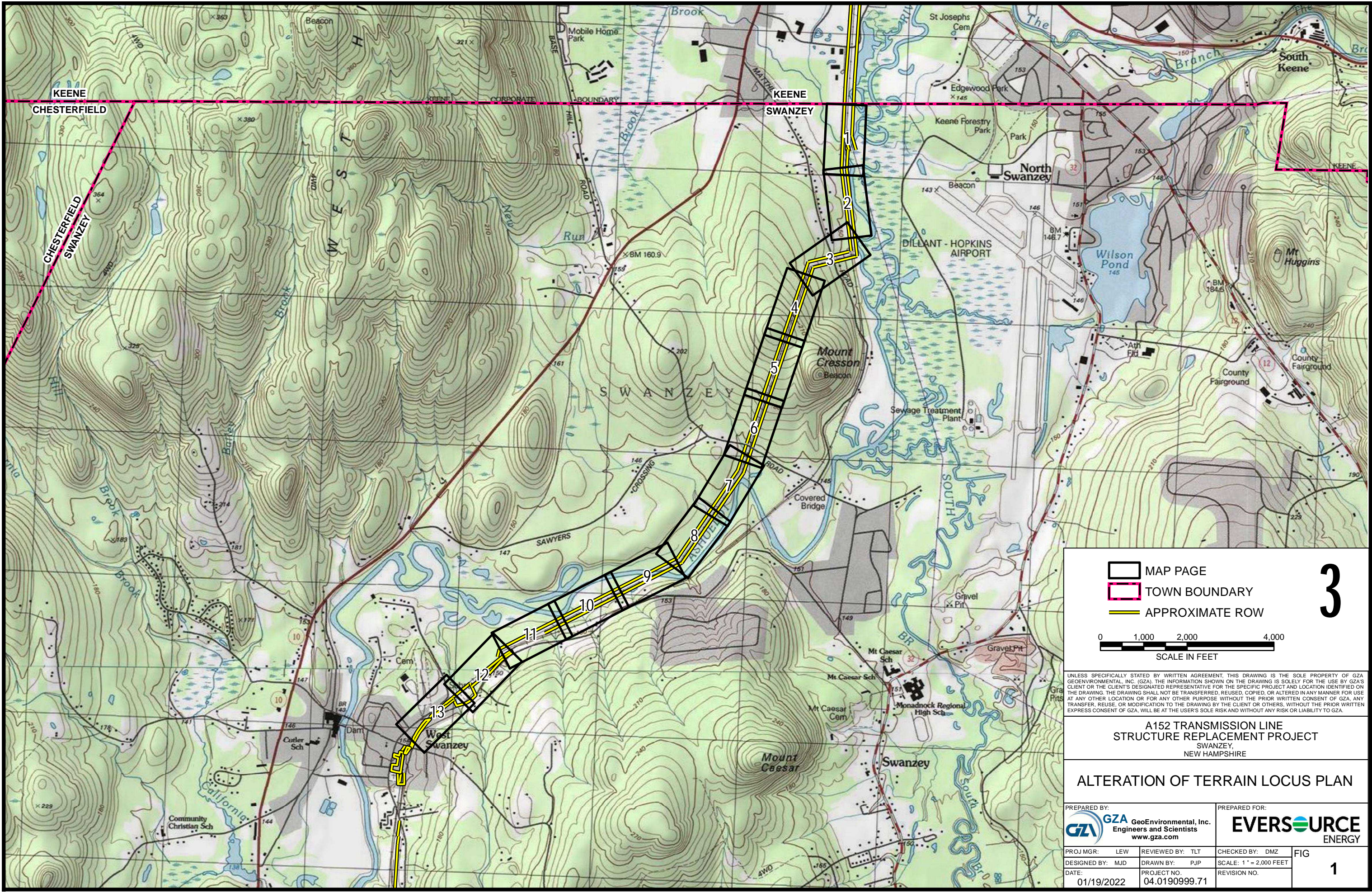
The proposed project includes the replacement of 41 existing utility structures and the removal of 2 existing utility structures along the A152 Transmission Line that exceed the AoT impact thresholds. This includes a total of approximately 510,811 sq. ft. of impact associated with access improvements and work pad grading in three separate work areas. Area A includes the replacement of A152 Structures 23 to 27 for approximately 82,073 sq. ft. of impact. Area B includes the replacement of A152 Structures 28 to 45 for approximately 211,186 sq. ft. of impact. Area C includes the replacement of A152 Structures 55 to 72 for approximately 217,552 sq. ft. of impact. The proposed project is necessary for routine maintenance of the A152 Transmission Line, and to ensure the long-term safety and reliability of the electrical infrastructure.






Figure 1 – USGS Topographic Map



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-  MAP PAGE
-  TOWN BOUNDARY
-  APPROXIMATE ROW

3



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**A152 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT**  
SWANZEY,  
NEW HAMPSHIRE

**ALTERATION OF TERRAIN LOCUS PLAN**

PREPARED BY:  
 **GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

PREPARED FOR:  
**EVERSOURCE**  
ENERGY

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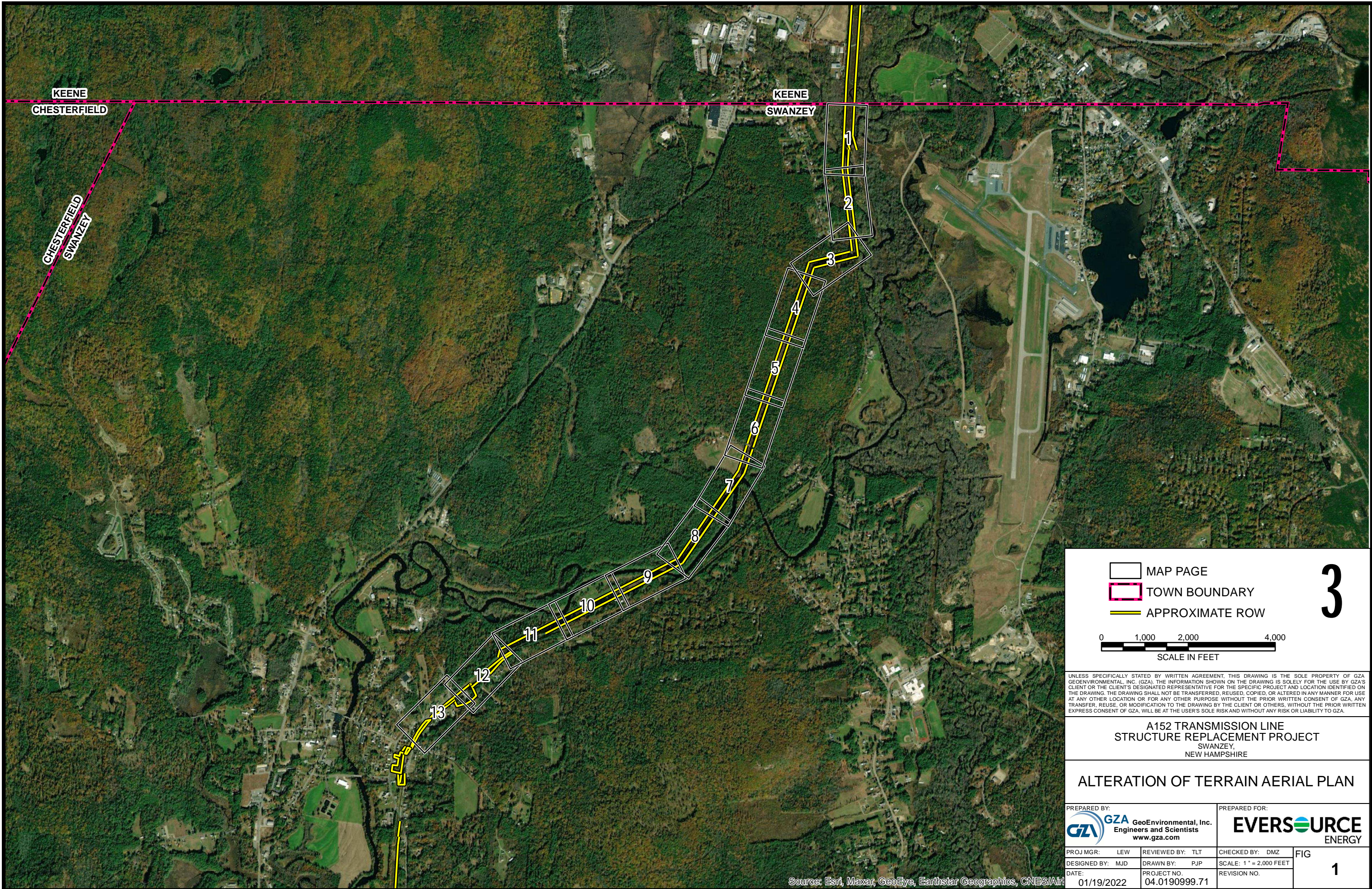







Figure 2 – Orthophotograph Site Map

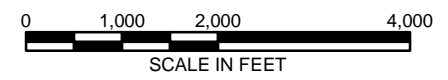


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-  MAP PAGE
-  TOWN BOUNDARY
-  APPROXIMATE ROW

3



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A152 TRANSMISSION LINE  
STRUCTURE REPLACEMENT PROJECT  
SWANZY,  
NEW HAMPSHIRE

ALTERATION OF TERRAIN AERIAL PLAN

PREPARED BY:  
 **GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

PREPARED FOR:  


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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Air





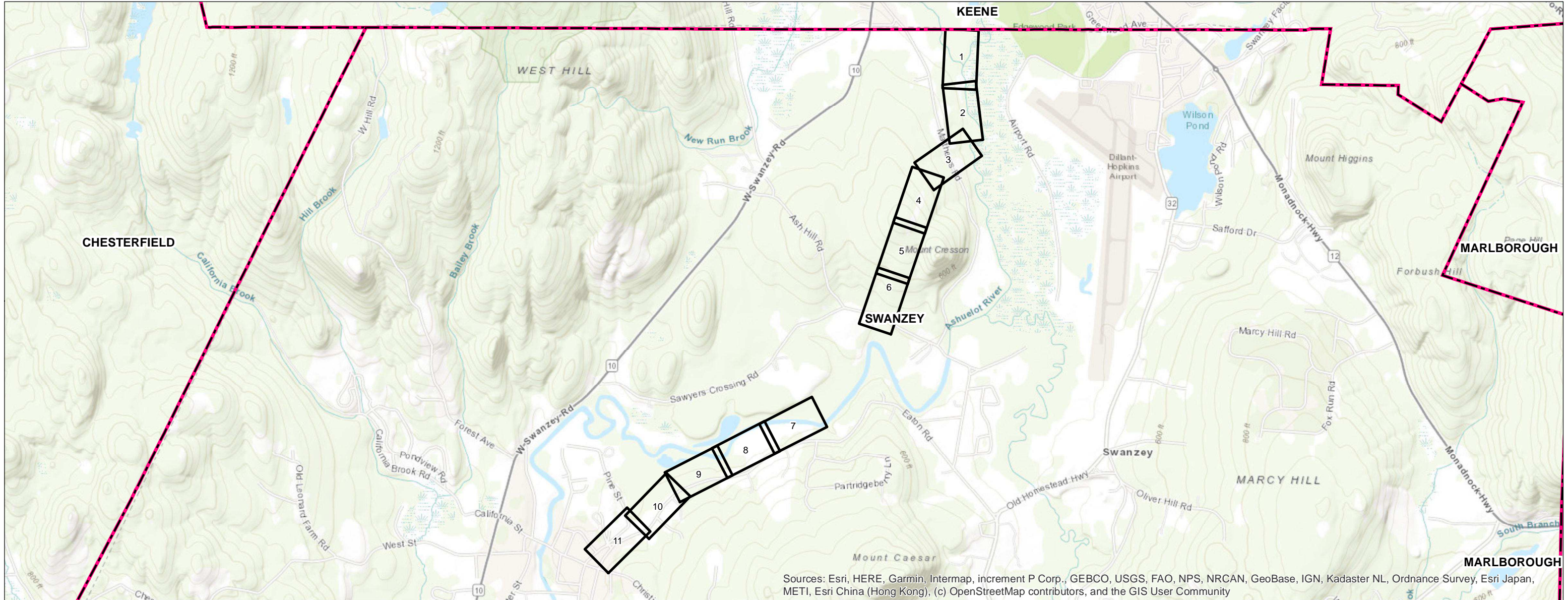
Figure 3 – Surface Water and Groundwater Overlay Plans

# A152 Line - Structure Replacement and OPGW Project

SWANZEY, NEW HAMPSHIRE

Alteration of Terrain Surface and Groundwater Overlay Planset

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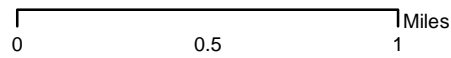


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

**Legend**

- MAP SHEET
- TOWN BOUNDARY

3



**INDEX OF FIGURES**  
 Title Sheet / Index Map  
 Map Sheets 1-11  
 Note Sheets S1-S3

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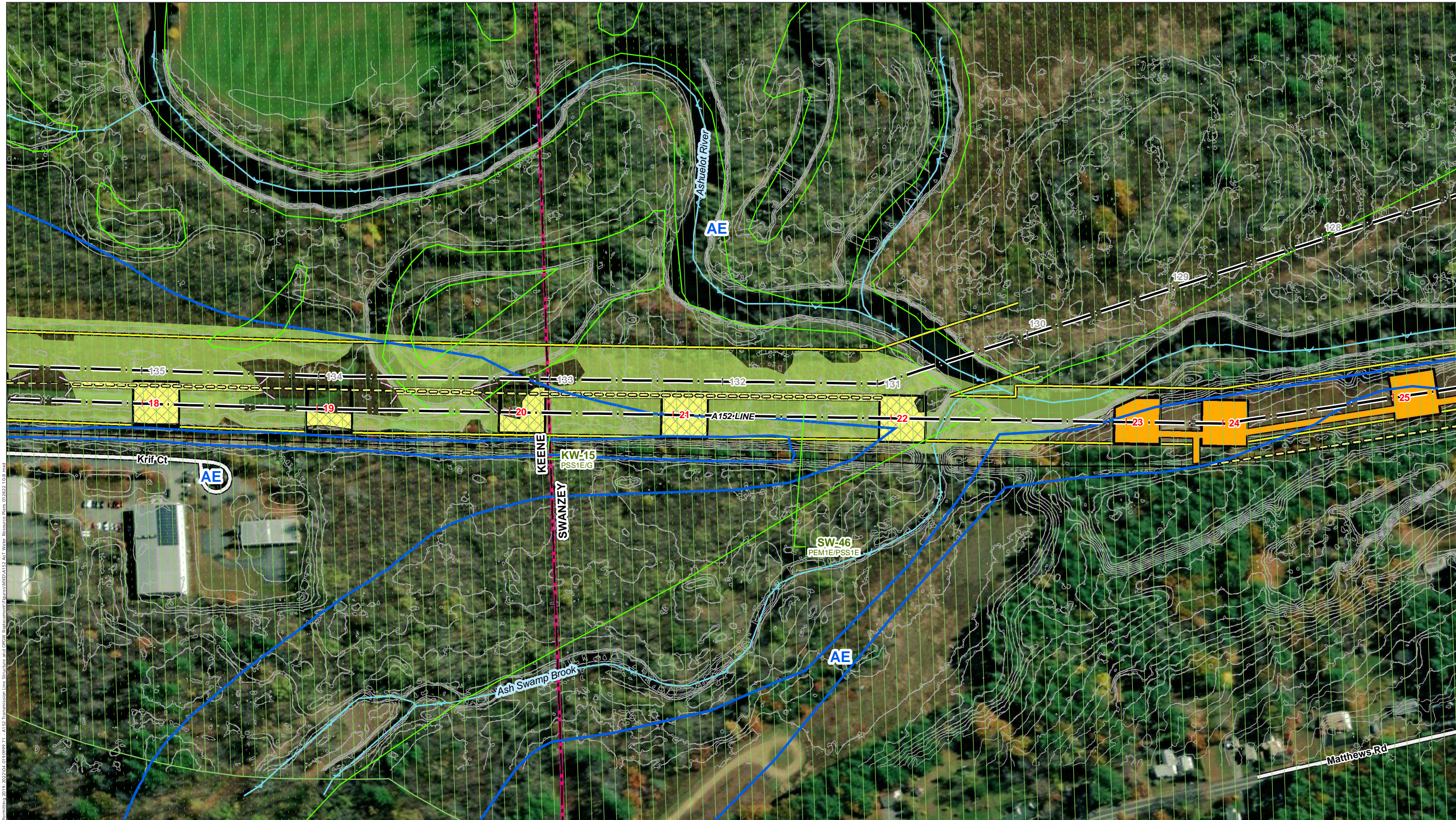
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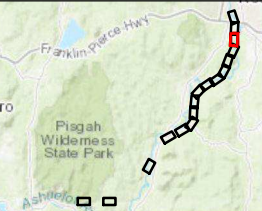
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**INDEX MAP**

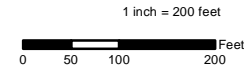


- # Local Potential Contamination Sources
- Water Supply Intake Protection Areas (None Present)
- Outstanding Resource Water Watershed (None Present)
- Groundwater Classification Areas GA1 (None Present)
- Groundwater Classification Areas GAA (None Present)
- Watersheds with Chloride Impairments 2016 (None Present)
- Wellhead Protection Areas
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- PROPOSED NEW STRUCTURE LOCATION
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- AoT AREA
- TRANSMISSION LINE
- EROSION AND SEDIMENT CONTROL
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- UPLAND MATTING

- WETLAND IMPACTS
- PRIMARY ACCESS
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- WORK AREA
- APPROXIMATE ROW
- RAILROAD
- NHDOT ROADS
- NHD FLOWLINE
- 2 FT CONTOURS
- TOWN BOUNDARY
- FIELD DELINEATED WETLAND

3



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**A152 Line Structure Replacement Project  
Surface and Groundwater Overlay Plans**

KEENE/SWANZEY, NH

MAP SHEET

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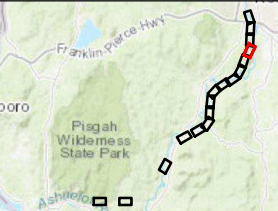




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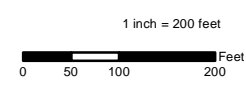
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**INDEX MAP**



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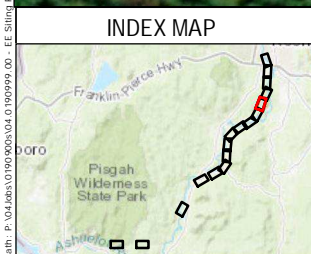


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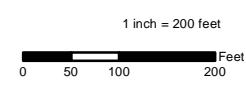


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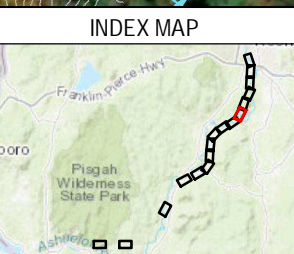
**A152 Line Structure Replacement Project  
Surface and Groundwater Overlay Plans**

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<b>#</b> Local Potential Contamination Sources Water Supply Intake Protection Areas (None Present) Outstanding Resource Water Watershed (None Present) Groundwater Classification Areas GA1 (None Present) Groundwater Classification Areas GAA (None Present) Watersheds with Chloride Impairments 2016 (None Present) Wellhead Protection Areas Surface Waters with Impairments 2016 with Quarter Mile Buffer All Lakes with a Quarter Mile Buffer Groundwater Classification Areas GA2 Class A Surface Waters RSA 485A9 Special Flood Hazard Area	EXISTING STSTRUCTURE EXISTING STRUCTURE - TO BE REPLACED EXISTING STRUCTURE - TO BE REMOVED PROPOSED NEW STRUCTURE LOCATION ADSS STUB POLE STRUCTURE - TO BE INSTALLED AoT AREA TRANSMISSION LINE EROSION AND SEDIMENT CONTROL PEATLAND HABITAT UPLAND MATTING	WETLAND IMPACTS PRIMARY ACCESS SECONDARY ACCESS WORK AREA APPROXIMATE ROW RAILROAD NHDOT ROADS NHD FLOWLINE 2 FT CONTOURS TOWN BOUNDARY FIELD DELINEATED WETLAND
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1 inch = 200 feet

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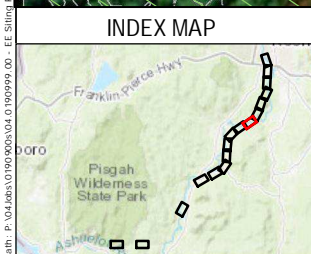
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**EVERSOURCE**  
ENERGY

**A152 Line Structure Replacement Project  
Surface and Groundwater Overlay Plans**

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**EVERSOURCE ENERGY**

**A152 Line Structure Replacement Project  
Surface and Groundwater Overlay Plans**

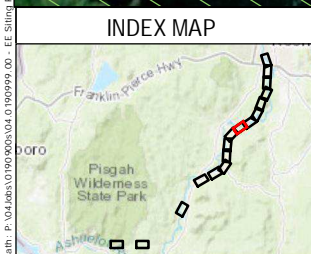
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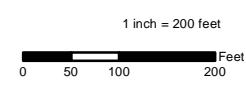


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| <p><b># Local Potential Contamination Sources</b></p> <ul style="list-style-type: none"> <li>Water Supply Intake Protection Areas (None Present)</li> <li>Outstanding Resource Water Watershed (None Present)</li> <li>Groundwater Classification Areas GA1 (None Present)</li> <li>Groundwater Classification Areas GAA (None Present)</li> <li>Watersheds with Chloride Impairments 2016 (None Present)</li> <li>Wellhead Protection Areas</li> <li>Surface Waters with Impairments 2016 with Quarter Mile Buffer</li> <li>All Lakes with a Quarter Mile Buffer</li> <li>Groundwater Classification Areas GA2</li> <li>Class A Surface Waters RSA 485A9</li> <li>Special Flood Hazard Area</li> </ul> | <p><b>! EXISTING STSTRUCTURE</b></p> <ul style="list-style-type: none"> <li>EXISTING STRUCTURE - TO BE REPLACED</li> <li>EXISTING STRUCTURE - TO BE REMOVED</li> <li>PROPOSED NEW STRUCTURE LOCATION</li> <li>ADSS STUB POLE STRUCTURE - TO BE INSTALLED</li> <li>AoT AREA</li> <li>TRANSMISSION LINE</li> <li>EROSION AND SEDIMENT CONTROL</li> <li>PEATLAND HABITAT</li> <li>UPLAND MATTING</li> </ul> | <p><b>WETLAND IMPACTS</b></p> <ul style="list-style-type: none"> <li>PRIMARY ACCESS</li> <li>SECONDARY ACCESS</li> <li>WORK AREA</li> <li>APPROXIMATE ROW</li> <li>RAILROAD</li> <li>NHDOT ROADS</li> <li>NHD FLOWLINE</li> <li>2 FT CONTOURS</li> <li>TOWN BOUNDARY</li> <li>FIELD DELINEATED WETLAND</li> </ul> |
|---|--|---|

*This mapping product has been created to comply with submittal requirements to obtain certain regulatory approvals and, as such, there is no reliance on the information contained herein for any other purpose.*



NO.	DATE	REVISIONS

**EVERSOURCE ENERGY**

**A152 Line Structure Replacement Project  
Surface and Groundwater Overlay Plans**

SWANZEY, NH	MAP SHEET
Date: January, 2022	6 OF 8











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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 WHERE REQUIRED.
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 ARE NOT INUNDATED, AS NECESSARY.
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 EVENTS.
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 UTILITY DESIGN.
2. JURISDICTIONAL WETLANDS WERE DELINEATED BY GZA IN 2016, 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 OCTOBER 2021.
3. GZA PERFORMED A WETLANDS FUNCTION AND VALUES ASSESSMENT IN ACCORDANCE WITH THE ACOE'S "HIGHWAY METHODOLOGY WORKBOOK SUPPLEMENT," SEPTEMBER 1999, IN 2016.
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.

**EROSION CONTROL NOTES:**

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 ACCOMPLISH THIS END.
4. ANY STRIPPED TOPSOIL SHALL BE STOCKPILED, WITHOUT COMPACTION, AND STABILIZED AGAINST EROSION, AS NECESSARY.
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.

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**A152 TRANSMISSION LINE  
OPGW AND STRUCTURE REPLACEMENT PROJECT  
SWANZEY AND WINCHESTER  
NEW HAMPSHIRE**

**NOTES**

PREPARED BY: <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: 	
PROJ MGR: CEM	REVIEWED BY: TLT	CHECKED BY: DMZ	SHEET <b>S1</b>
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 11/04/2021	PROJECT NO: 04.0190999.71	REVISION NO.	



## 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:

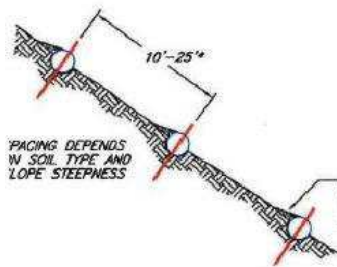
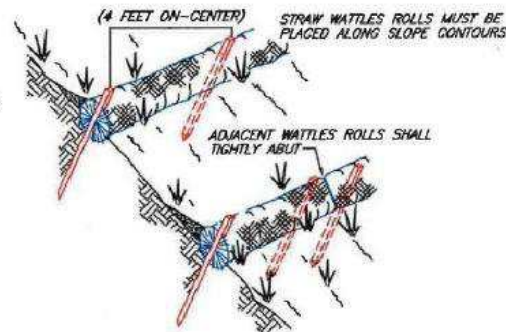
- \* Along erodible or unstabilized slopes
- \* Spread overland waterflow
- \* Trap sediment
- \* Around storm drain inlets to slow water and settle out sediment
- \* Overlap ends approximately 6 inches

### Installation:

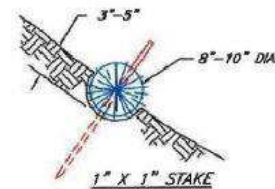
Straw wattles are installed parallel to slope contours and perpendicular to sheet flow.

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

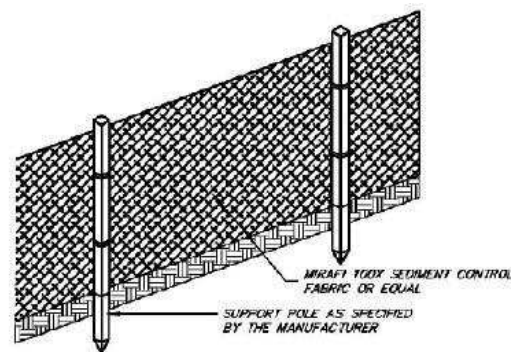
Trenching - 2"-5" inch trench  
Stacking - at each end and four foot on center (i.e. 25 foot wattle uses 6 stacks)



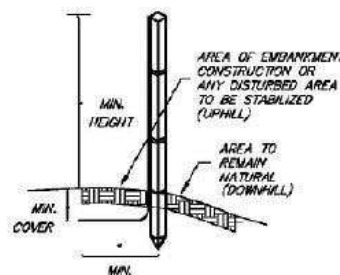
SEDIMENT, ORGANIC MATTER, AND NATIVE SEEDS ARE CAPTURED BEHIND THE WATTLE ROWS.



NOT TO SCALE



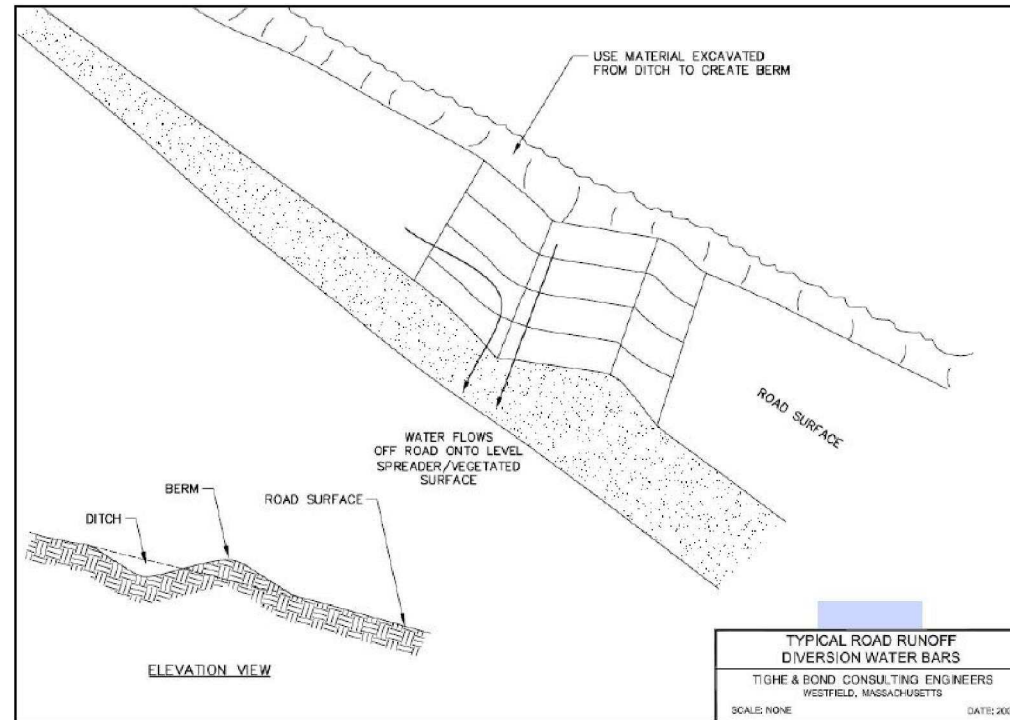
FRONT VIEW



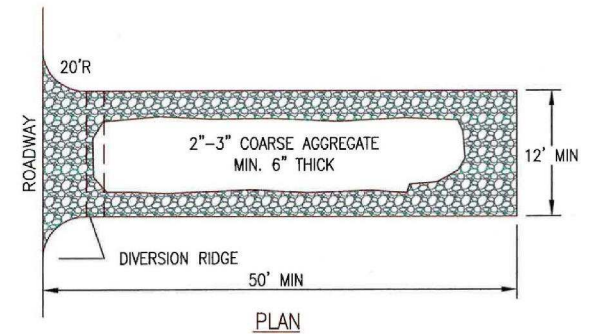
SIDE VIEW

### NOTES (SILT FENCE)

1. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 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 TO EXISTING TREES.
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.



TYPICAL ROAD RUNOFF DIVERSION WATER BARS  
TIGHE & BOND CONSULTING ENGINEERS  
WESTFIELD, MASSACHUSETTS  
SCALE: NONE DATE: 2007

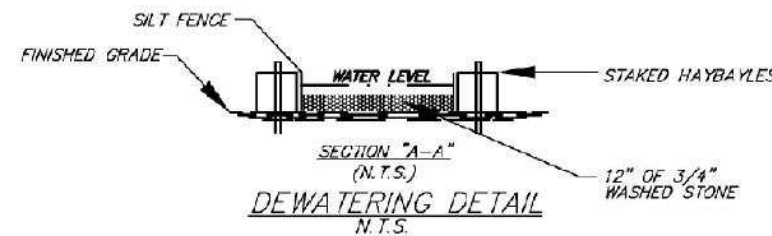
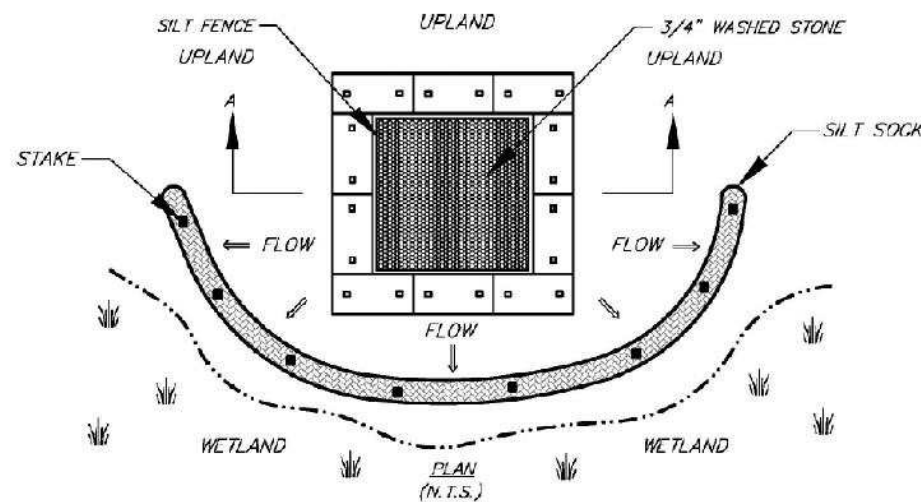


### NOTES:

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

## CONSTRUCTION ENTRANCE

NOT TO SCALE



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A152 TRANSMISSION LINE  
OPGW AND STRUCTURE REPLACEMENT PROJECT  
SWANZEY AND WINCHESTER  
NEW HAMPSHIRE

## BMP DETAILS

PREPARED BY:  
**GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

PREPARED FOR:  
**EVERSOURCE**  
ENERGY

PROJ MGR: CEM  
DESIGNED BY: MJD  
DATE: 11/04/2021

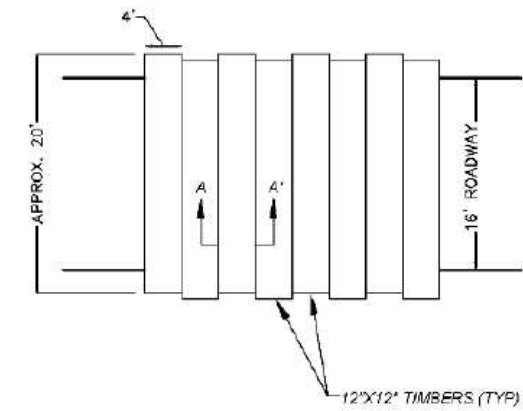
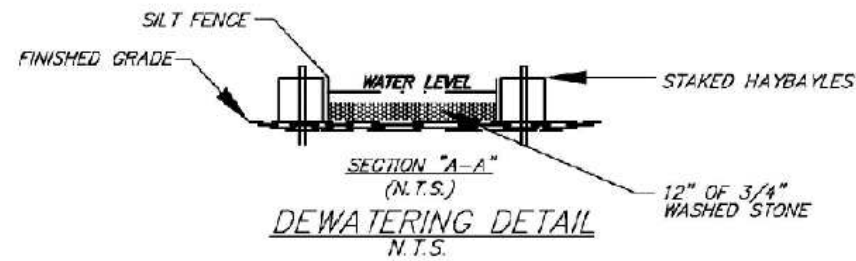
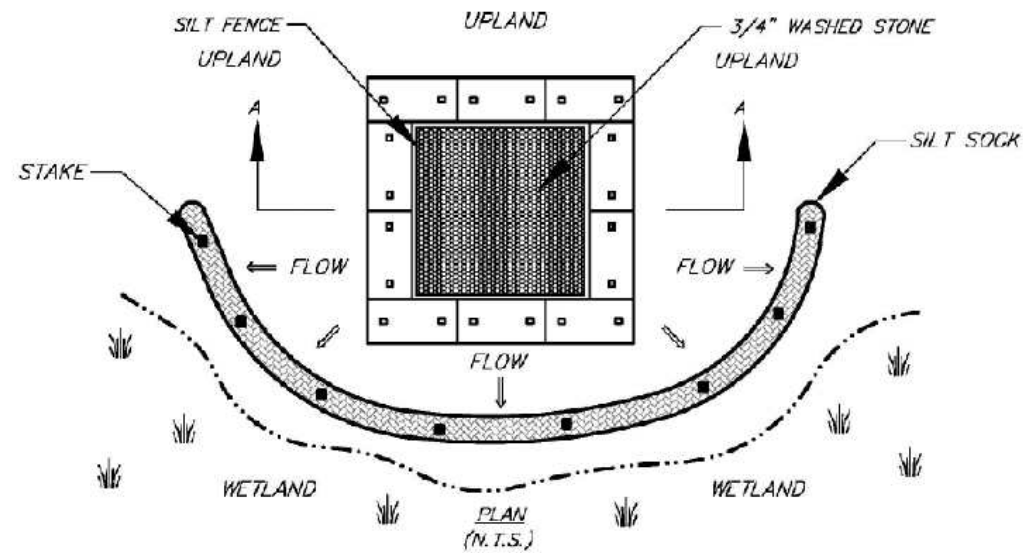
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DRAWN BY: MJD  
PROJECT NO: 04.0190999.71

CHECKED BY: DMZ  
SCALE:  
REVISION NO.

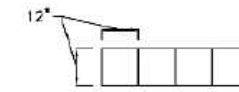
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**S2**



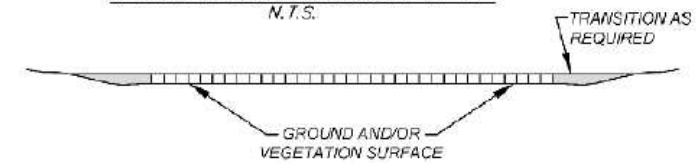
© 2021 - GZA GeoEnvironmental, Inc. P:\04\Jobs\190909\04\_0190999\_00 - EE Shing Permitting 2019-2022\04\_0190999\_71 - A152 Transmission Line Structure and OPGW Replacement\Figures\MXD\A152 Act Notesheet 3.mxd, 11/4/2021, 11:32:07 AM, matthew.deane



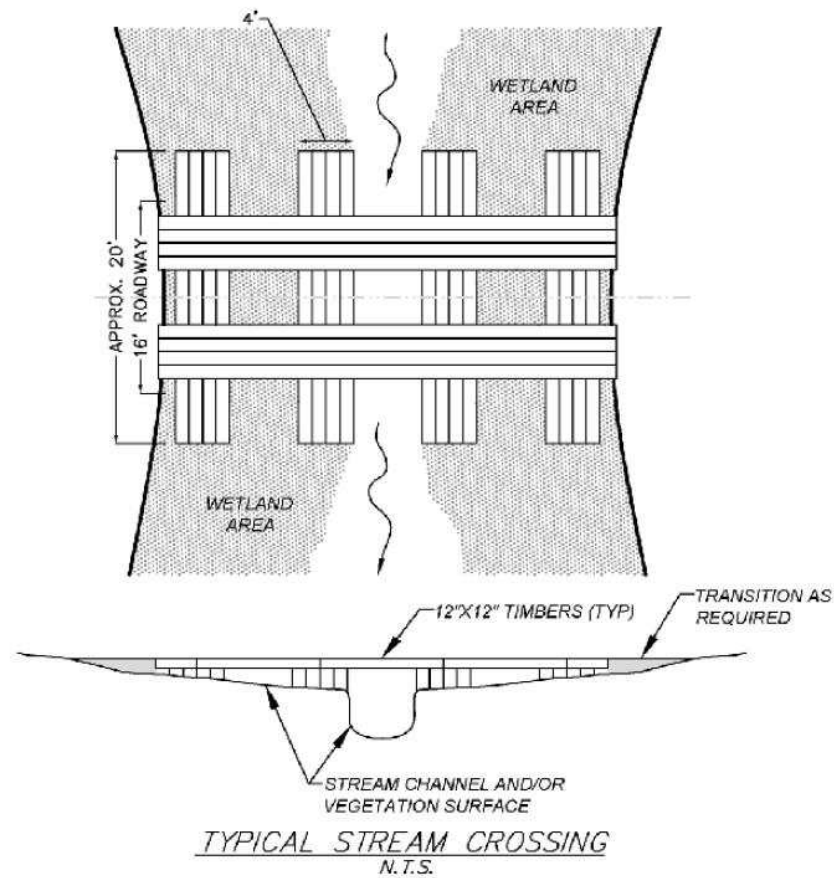
TYPICAL SWAMP MAT PLAN VIEW  
N.T.S.



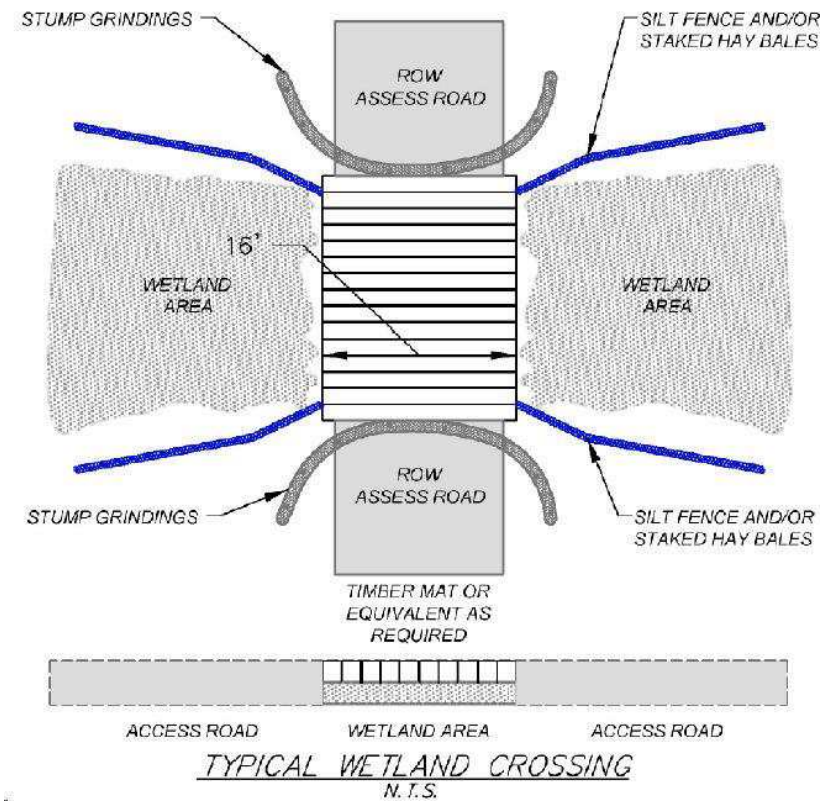
TYPICAL MAT SECTION A-A  
N.T.S.



TYPICAL SWAMP MAT SECTION DETAIL  
N.T.S.



TYPICAL STREAM CROSSING  
N.T.S.



TYPICAL WETLAND CROSSING  
N.T.S.

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A152 TRANSMISSION LINE  
OPGW AND STRUCTURE REPLACEMENT PROJECT  
SWANZEY AND WINCHESTER  
NEW HAMPSHIRE

BMP DETAILS

PREPARED BY:  
**GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com

PREPARED FOR:  
**EVERSOURCE**  
ENERGY

PROJ MGR: CEM	REVIEWED BY: TLT	CHECKED BY: DMZ
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:
DATE: 11/04/2021	PROJECT NO: 04.0190999.38	REVISION NO:

SHEET  
**S3**



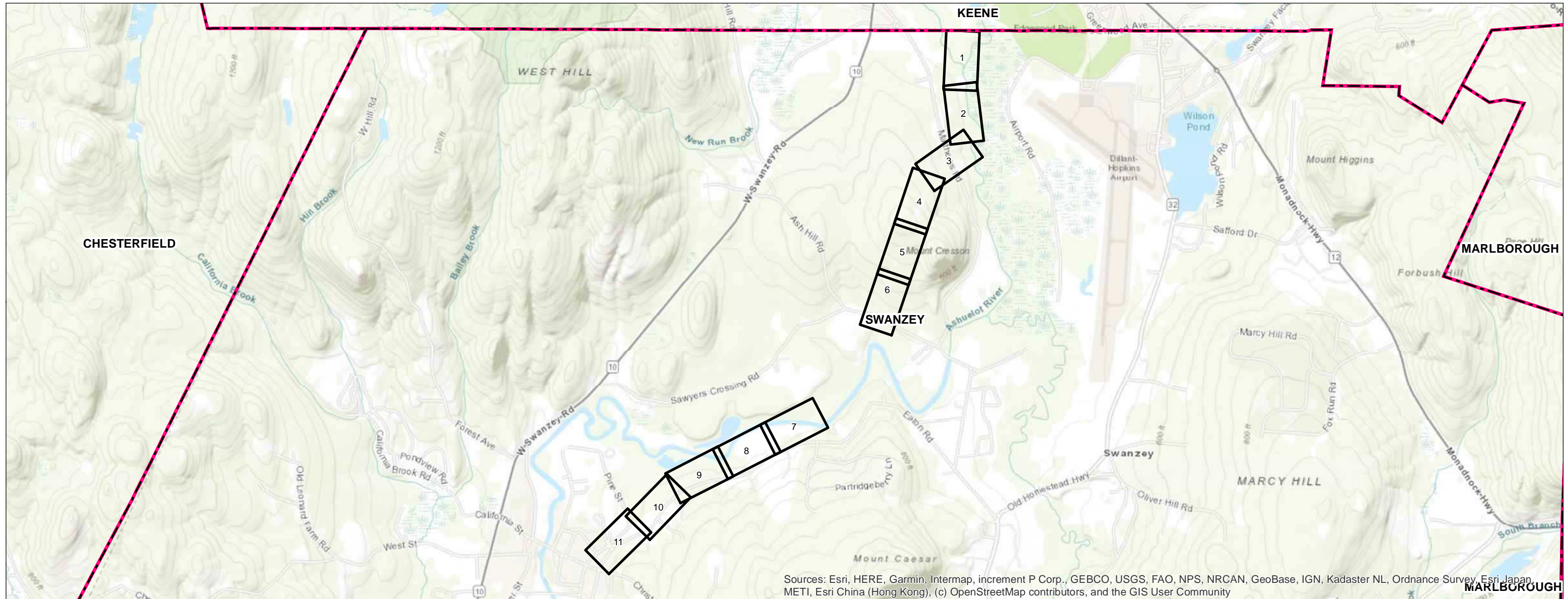
**Figure 4 – Alteration of Terrain Permitting Plans**



# A152 Line - Structure Replacement and OPGW Project



## SWANZEY NEW HAMPSHIRE Alteration of Terrain Permitting Planset

Date: February, 2022

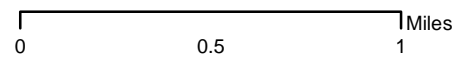


Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

### Legend

-  MAP SHEET
-  TOWN BOUNDARY

# 3



**INDEX OF FIGURES**  
Title Sheet / Index Map  
Map Sheets 1-11  
Note Sheets S1-S3

NO.	DATE	REVISIONS

PREPARED FOR:



13 Legends Drive  
Hooksett, NH 03106

PREPARED BY:



**GZA** GeoEnvironmental, Inc.  
Engineers and Scientists  
www.gza.com



**AoT Area A - Swanzey**

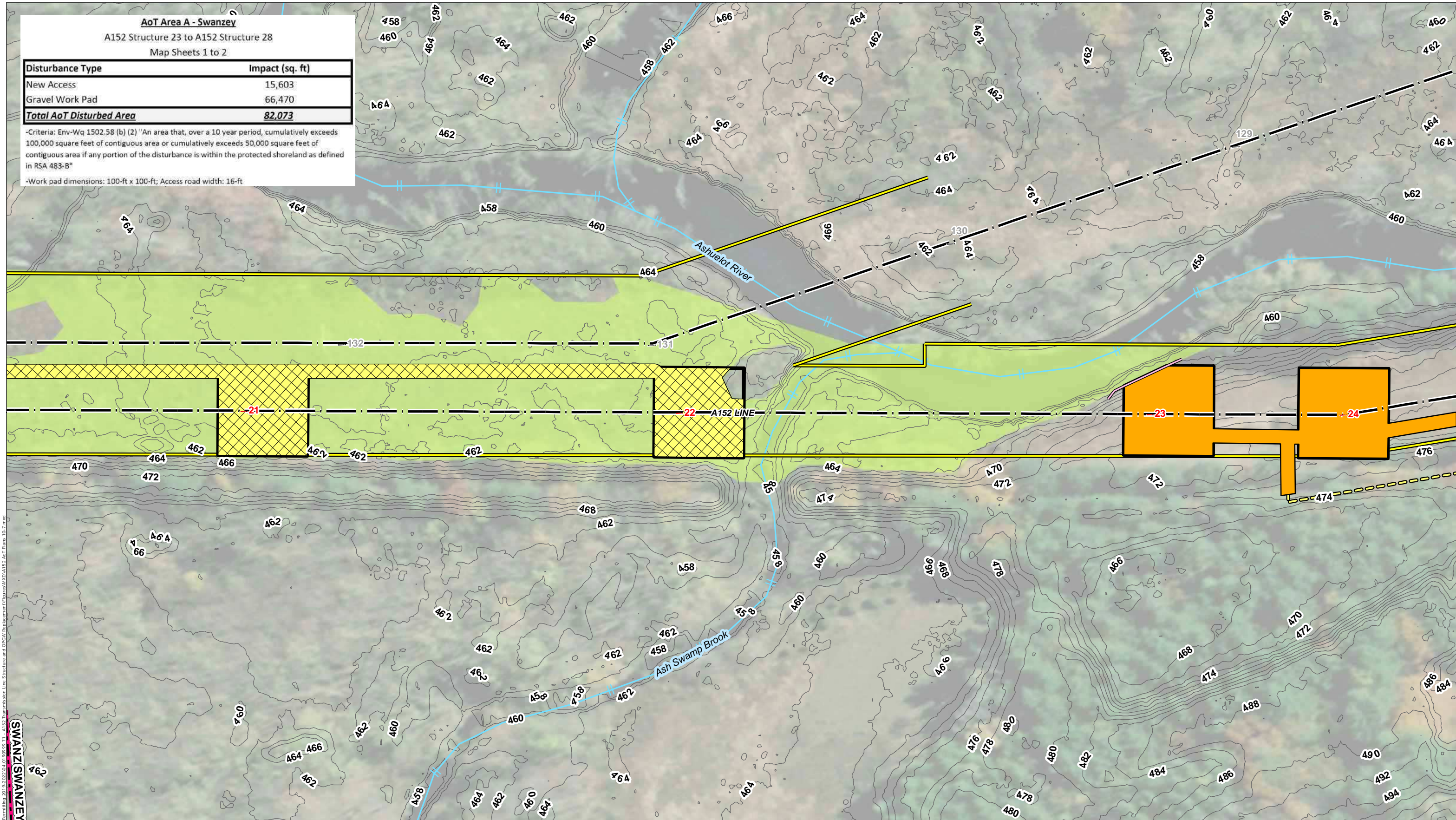
A152 Structure 23 to A152 Structure 28

Map Sheets 1 to 2

Disturbance Type	Impact (sq. ft)
New Access	15,603
Gravel Work Pad	66,470
<b>Total AoT Disturbed Area</b>	<b>82,073</b>

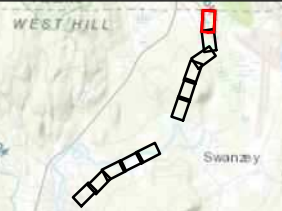
-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10 year period, cumulatively exceeds 100,000 square feet of contiguous area or cumulatively exceeds 50,000 square feet of contiguous area if any portion of the disturbance is within the protected shoreland as defined in RSA 483-B"

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



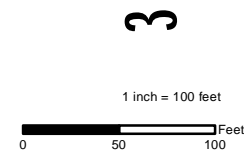
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 SWANZ/SWANZEY

**INDEX MAP**



- |  |                          |                  |
|--|--------------------------|------------------|
| ! EXISTING STSTRUCTURE                       | PRIMARY ACCESS           | RAILROAD         |
| ! EXISTING STRUCTURE - TO BE REPLACED        | SECONDARY ACCESS         | NHDOT ROADS      |
| ! EXISTING STRUCTURE - TO BE REMOVED         | FIELD DELINEATED WETLAND | 2 FT CONTOURS    |
| ! PROPOSED NEW STRUCTURE LOCATION            | AoT DISTURBANCE AREA     | EROSION CONTROLS |
| ! T198 STRUCTURE                             | WETLAND IMPACTS          | TOWN BOUNDARY    |
| ! ADSS STUB POLE STRUCTURE - TO BE INSTALLED | UPLAND MATTING           |                  |
| — TRANSMISSION LINE                          | WORK AREA                |                  |
| — APPROXIMATE ROW                            | NHD FLOWLINE             |                  |

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NO.		DATE	REVISIONS



**A152 Line Structure Replacement Project  
AoT Permitting Plans**

Swanzey, NH      MAP SHEET  
 Date: February, 2022      1 OF 11



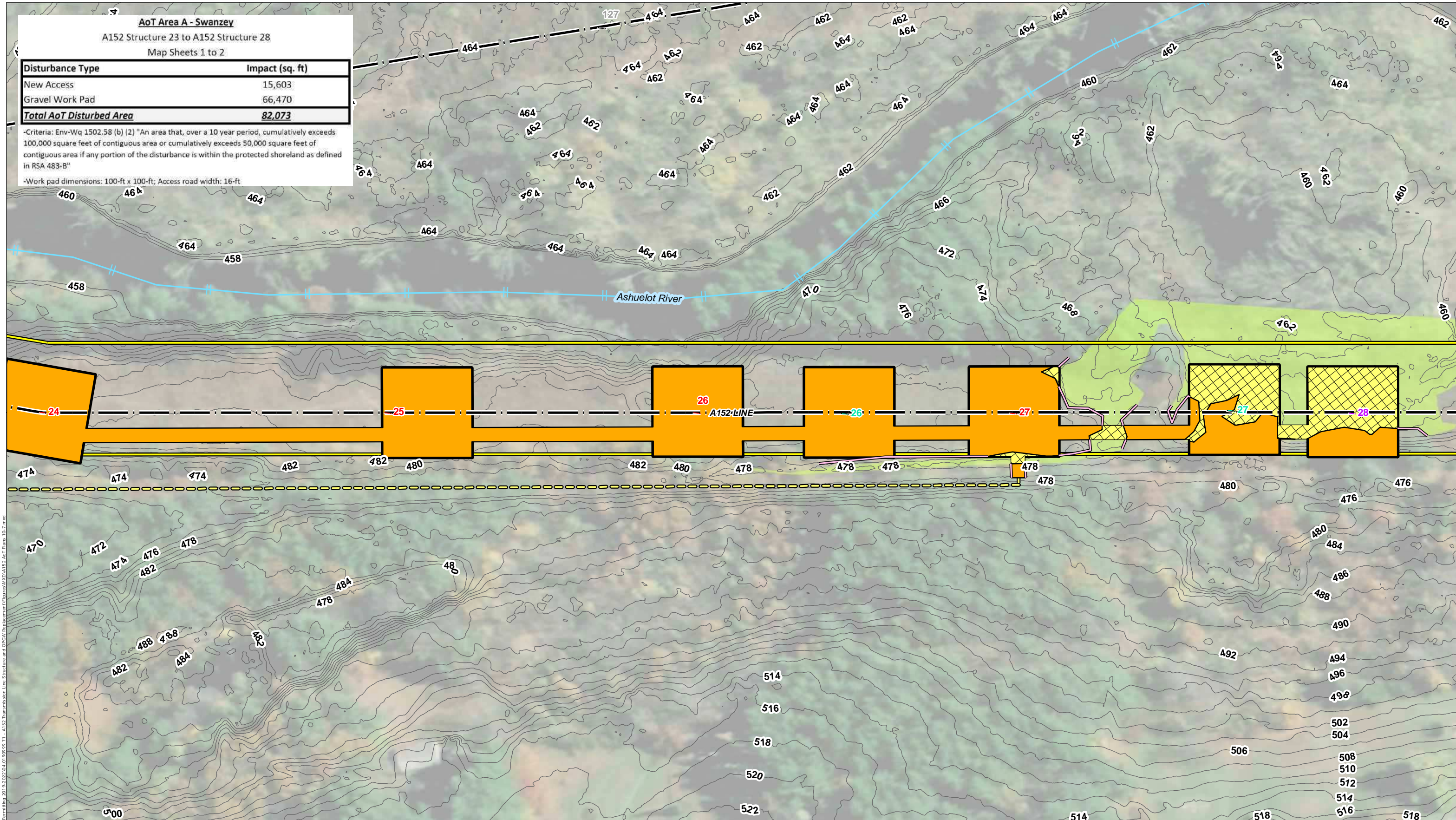
**AoT Area A - Swanzy**

A152 Structure 23 to A152 Structure 28  
Map Sheets 1 to 2

Disturbance Type	Impact (sq. ft)
New Access	15,603
Gravel Work Pad	66,470
<b>Total AoT Disturbed Area</b>	<b>82,073</b>

-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10 year period, cumulatively exceeds 100,000 square feet of contiguous area or cumulatively exceeds 50,000 square feet of contiguous area if any portion of the disturbance is within the protected shoreland as defined in RSA 483-B"

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



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**INDEX MAP**



- ! EXISTING STSTRUCTURE
- ! EXISTING STRUCTURE - TO BE REPLACED
- ! EXISTING STRUCTURE - TO BE REMOVED
- ! PROPOSED NEW STRUCTURE LOCATION
- ! T198 STRUCTURE
- ! ADSS STUB POLE STRUCTURE - TO BE INSTALLED
- TRANSMISSION LINE
- APPROXIMATE ROW
- PRIMARY ACCESS
- SECONDARY ACCESS
- FIELD DELINEATED WETLAND
- AoT DISTURBANCE AREA
- WETLAND IMPACTS
- UPLAND MATTING
- WORK AREA
- NHD FLOWLINE
- RAILROAD
- NHDOT ROADS
- 2 FT CONTOURS
- EROSION CONTROLS
- TOWN BOUNDARY

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**A152 Line Structure Replacement Project  
AoT Permitting Plans**

Swanzy, NH	MAP SHEET
Date: February, 2022	2 OF 11



**AoT Area B - Swanzy**

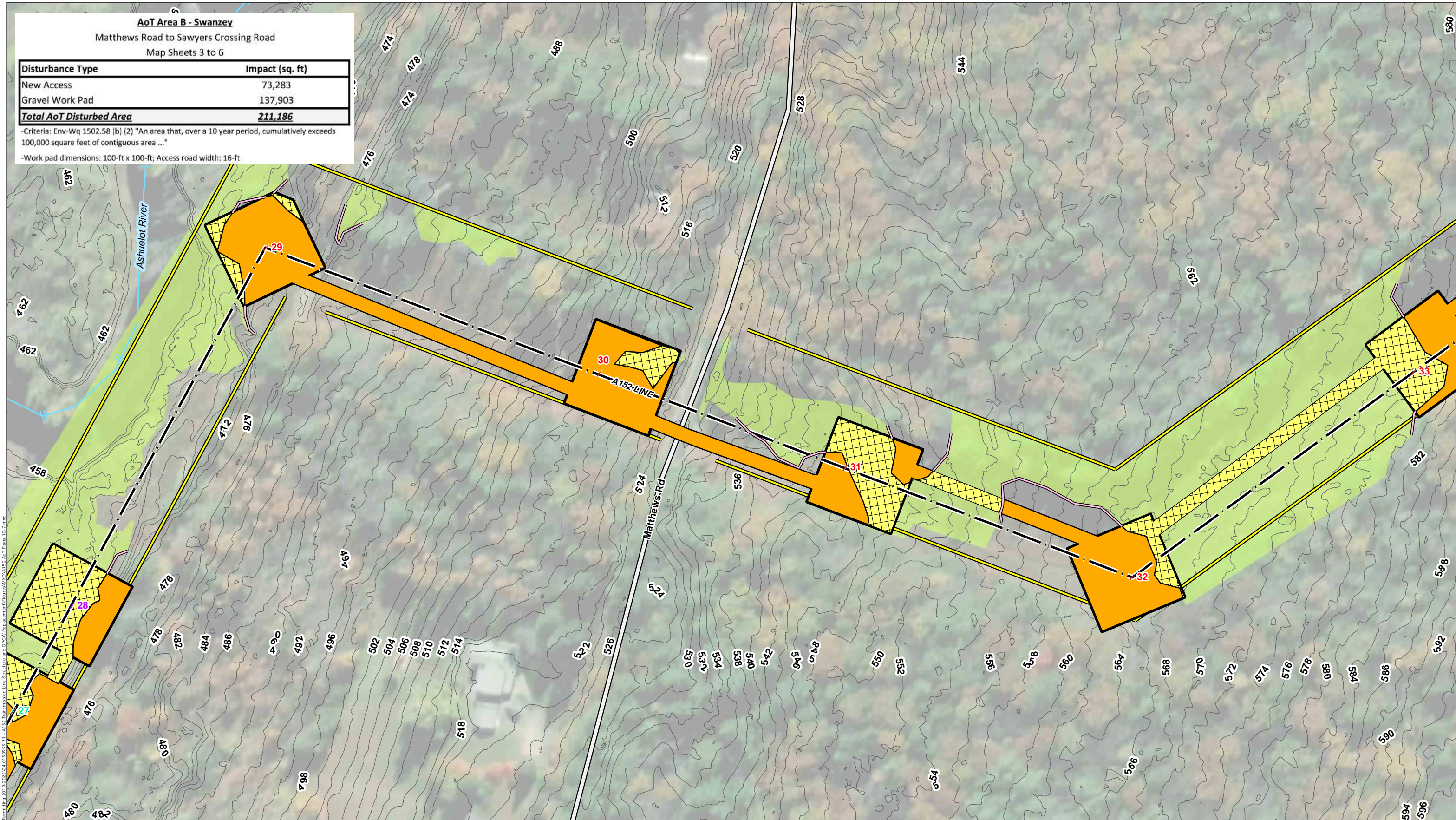
Matthews Road to Sawyers Crossing Road

Map Sheets 3 to 6

Disturbance Type	Impact (sq. ft)
New Access	73,283
Gravel Work Pad	137,903
<b>Total AoT Disturbed Area</b>	<b>211,186</b>

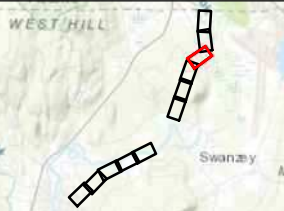
-Criteria: Env-Wq 1502.58 (b) (2) "An area that, over a 10 year period, cumulatively exceeds 100,000 square feet of contiguous area ..."

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



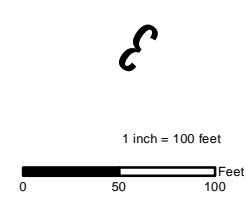
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**INDEX MAP**



- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>! EXISTING STRUCTURE</li> <li>! EXISTING STRUCTURE - TO BE REPLACED</li> <li>! EXISTING STRUCTURE - TO BE REMOVED</li> <li>! PROPOSED NEW STRUCTURE LOCATION</li> <li>! T198 STRUCTURE</li> <li>! ADSS STUB POLE STRUCTURE - TO BE INSTALLED</li> <li>— TRANSMISSION LINE</li> <li>— APPROXIMATE ROW</li> </ul> | <ul style="list-style-type: none"> <li>— PRIMARY ACCESS</li> <li>— SECONDARY ACCESS</li> <li>— FIELD DELINEATED WETLAND</li> <li>— AoT DISTURBANCE AREA</li> <li>— WETLAND IMPACTS</li> <li>— UPLAND MATTING</li> <li>— WORK AREA</li> <li>— NHD FLOWLINE</li> </ul> | <ul style="list-style-type: none"> <li>— RAILROAD</li> <li>— NHDOT ROADS</li> <li>— 2 FT CONTOURS</li> <li>— EROSION CONTROLS</li> <li>— TOWN BOUNDARY</li> </ul> |
|--|--|---|

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NO.	DATE	REVISIONS

**EVERSOURCE ENERGY**

**A152 Line Structure Replacement Project  
AoT Permitting Plans**

Swanzy, NH	MAP SHEET
Date: February, 2022	3 OF 11

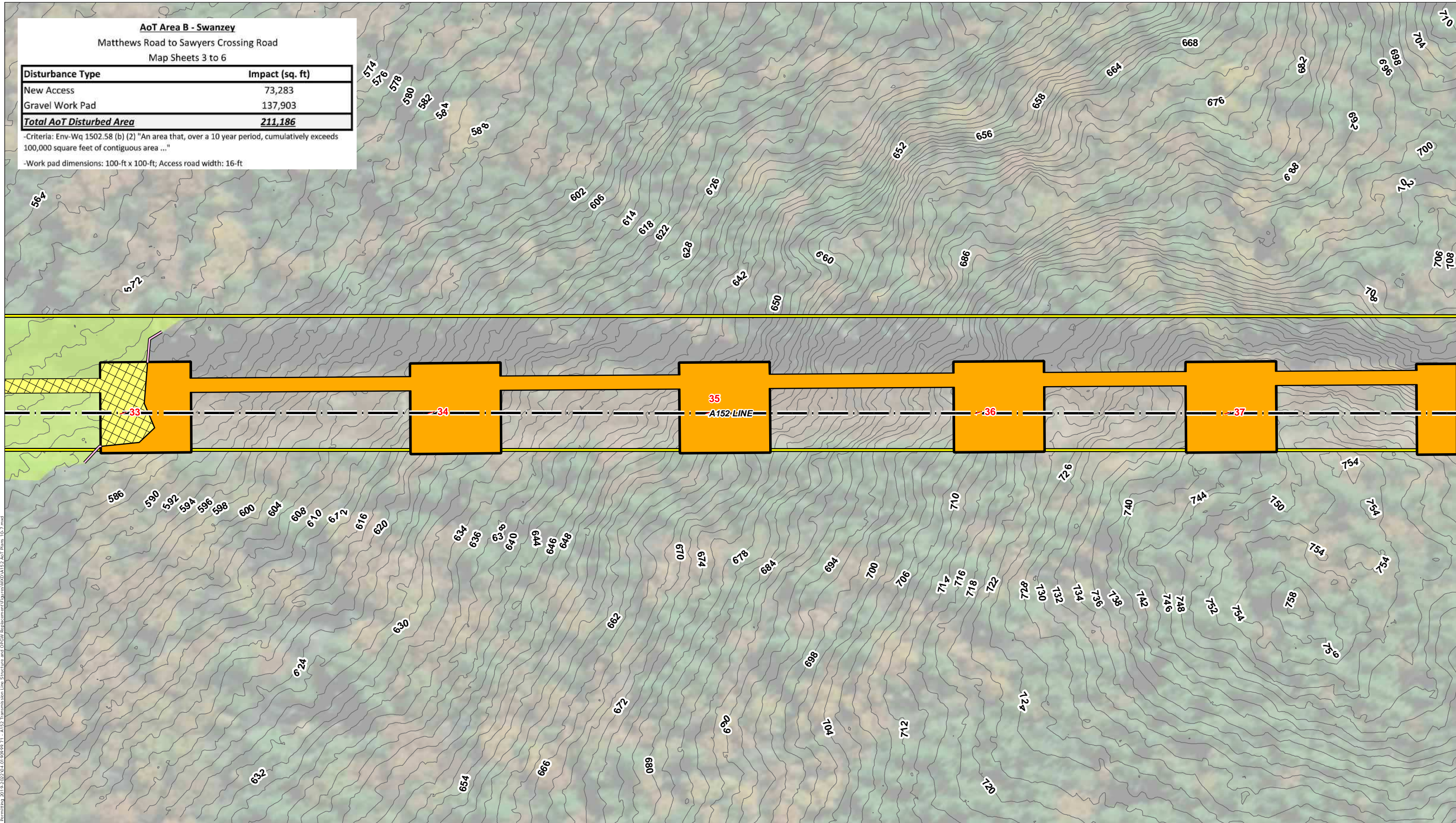


**AoT Area B - Swanzy**

Matthews Road to Sawyers Crossing Road  
Map Sheets 3 to 6

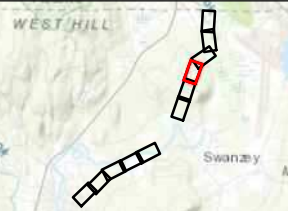
Disturbance Type	Impact (sq. ft)
New Access	73,283
Gravel Work Pad	137,903
<b>Total AoT Disturbed Area</b>	<b>211,186</b>

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



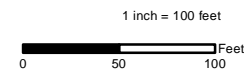
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**INDEX MAP**



- |  |                          |                  |
|--|--------------------------|------------------|
| ! EXISTING STSTRUCTURE                       | PRIMARY ACCESS           | RAILROAD         |
| ! EXISTING STRUCTURE - TO BE REPLACED        | SECONDARY ACCESS         | NHDOT ROADS      |
| ! EXISTING STRUCTURE - TO BE REMOVED         | FIELD DELINEATED WETLAND | 2 FT CONTOURS    |
| ! PROPOSED NEW STRUCTURE LOCATION            | AoT DISTURBANCE AREA     | EROSION CONTROLS |
| ! T198 STRUCTURE                             | WETLAND IMPACTS          | TOWN BOUNDARY    |
| ! ADSS STUB POLE STRUCTURE - TO BE INSTALLED | UPLAND MATTING           |                  |
| — TRANSMISSION LINE                          | WORK AREA                |                  |
| — APPROXIMATE ROW                            | NHD FLOWLINE             |                  |

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NO.	DATE	REVISIONS

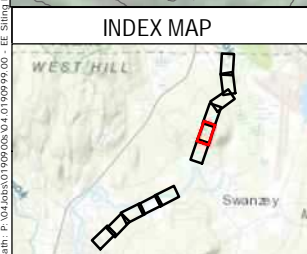
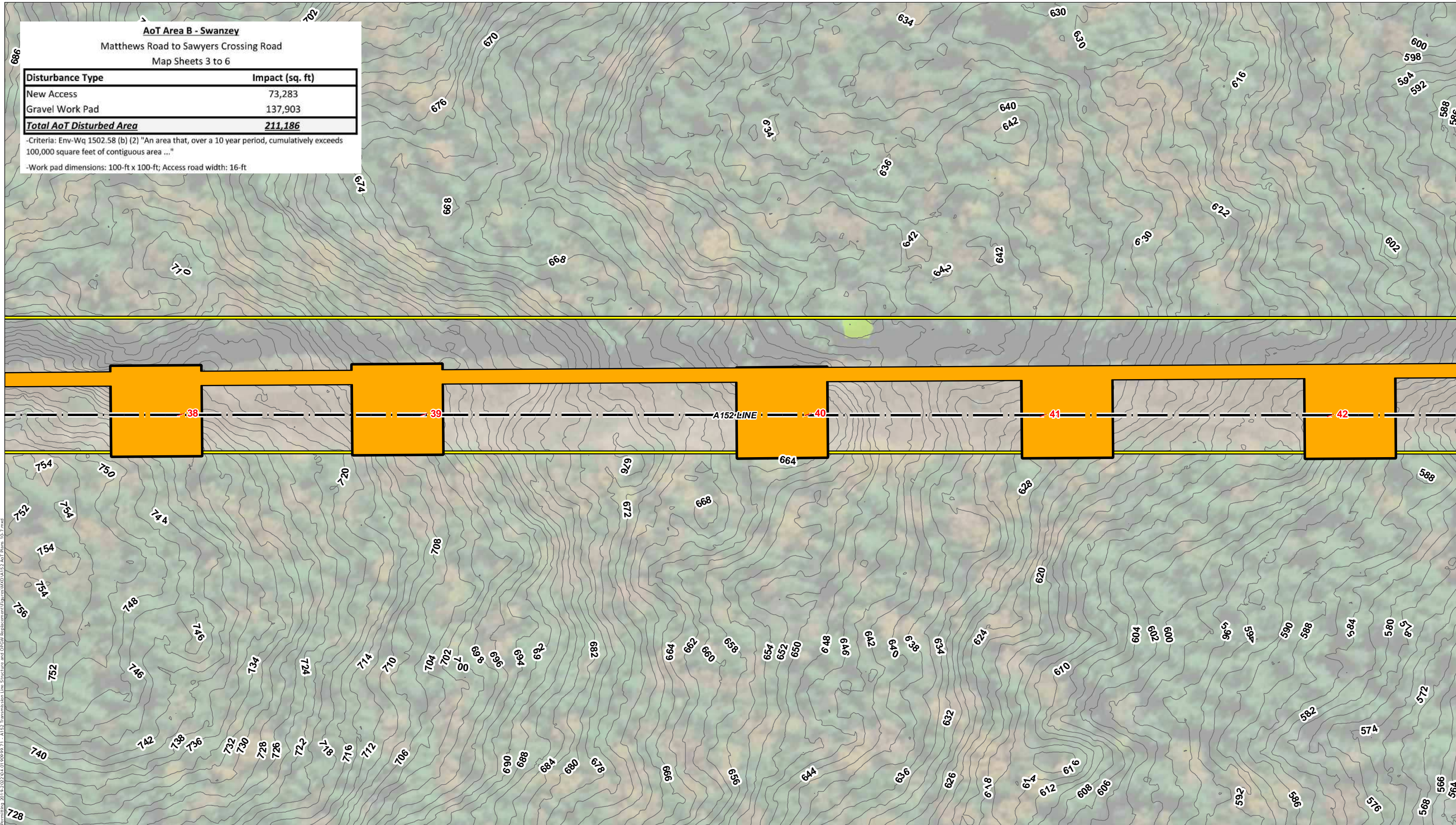


**A152 Line Structure Replacement Project  
AoT Permitting Plans**

Swanzy, NH	MAP SHEET
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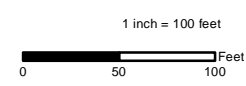


AoT Area B - Swanzey	
Matthews Road to Sawyers Crossing Road	
Map Sheets 3 to 6	
<b>Disturbance Type</b>	<b>Impact (sq. ft)</b>
New Access	73,283
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- |  |                          |                  |
|--|--------------------------|------------------|
| ! EXISTING STSRTUCTURE                       | PRIMARY ACCESS           | RAILROAD         |
| ! EXISTING STRUCTURE - TO BE REPLACED        | SECONDARY ACCESS         | NHDOT ROADS      |
| ! EXISTING STRUCTURE - TO BE REMOVED         | FIELD DELINEATED WETLAND | 2 FT CONTOURS    |
| ! PROPOSED NEW STRUCTURE LOCATION            | AoT DISTURBANCE AREA     | EROSION CONTROLS |
| ! T198 STRUCTURE                             | WETLAND IMPACTS          | TOWN BOUNDARY    |
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| — TRANSMISSION LINE                          | WORK AREA                |                  |
| — APPROXIMATE ROW                            | NHD FLOWLINE             |                  |

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NO.	DATE	REVISIONS

**EVERSOURCE ENERGY**

**A152 Line Structure Replacement Project  
AoT Permitting Plans**

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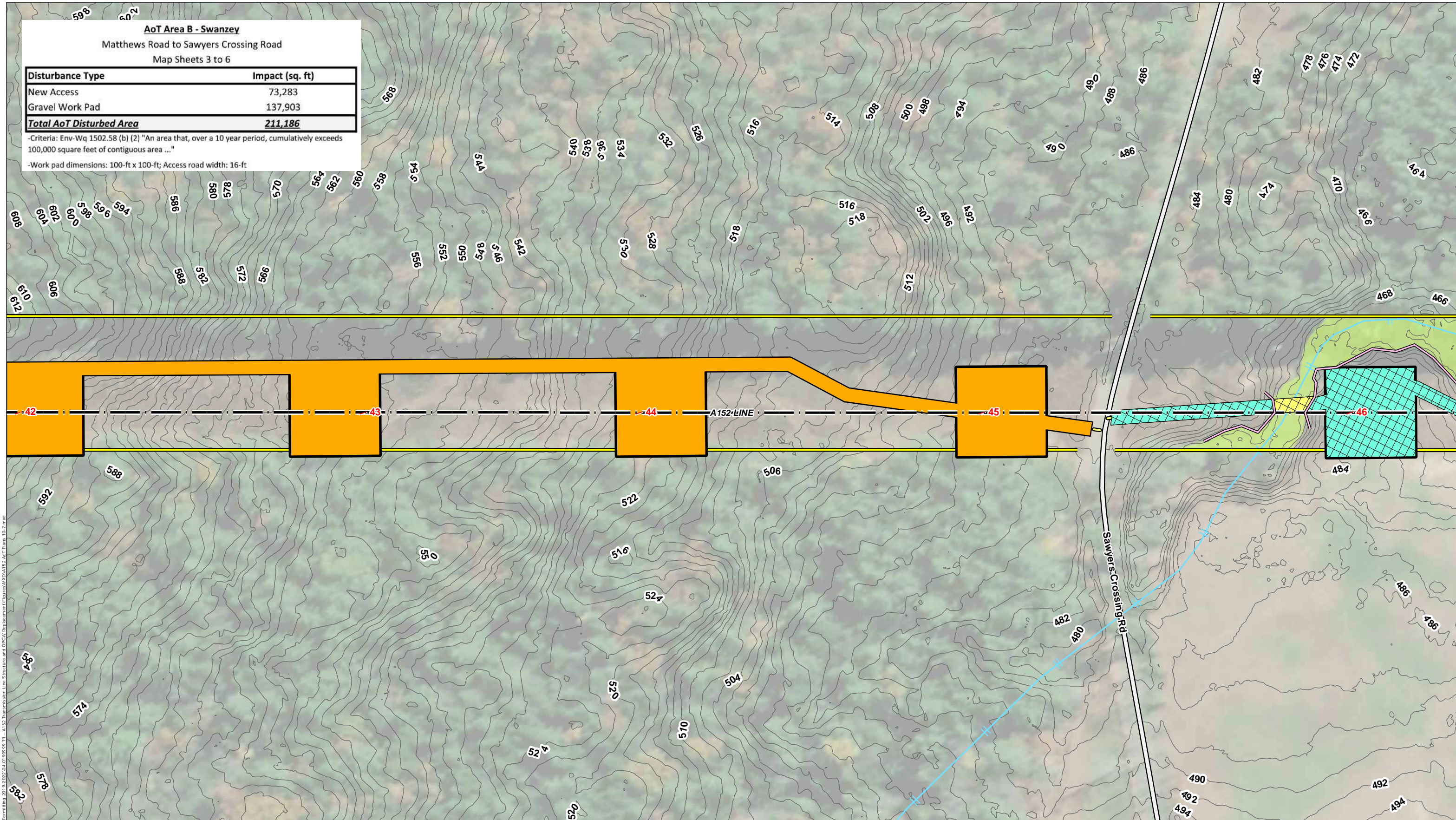
**AoT Area B - Swanzy**

Matthews Road to Sawyers Crossing Road  
Map Sheets 3 to 6

Disturbance Type	Impact (sq. ft)
New Access	73,283
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-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



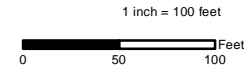
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**INDEX MAP**



- |  |                            |                    |
|--|----------------------------|--------------------|
| — EXISTING STRUCTURE                         | — PRIMARY ACCESS           | — RAILROAD         |
| — EXISTING STRUCTURE - TO BE REPLACED        | — SECONDARY ACCESS         | — NHDOT ROADS      |
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| — PROPOSED NEW STRUCTURE LOCATION            | — AoT DISTURBANCE AREA     | — EROSION CONTROLS |
| — T198 STRUCTURE                             | — WETLAND IMPACTS          | — TOWN BOUNDARY    |
| — ADSS STUB POLE STRUCTURE - TO BE INSTALLED | — UPLAND MATTING           |                    |
| — TRANSMISSION LINE                          | — WORK AREA                |                    |
| — APPROXIMATE ROW                            | — NHD FLOWLINE             |                    |

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NO.	DATE	REVISIONS



**A152 Line Structure Replacement Project  
AoT Permitting Plans**

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Date: February, 2022	6 OF 11

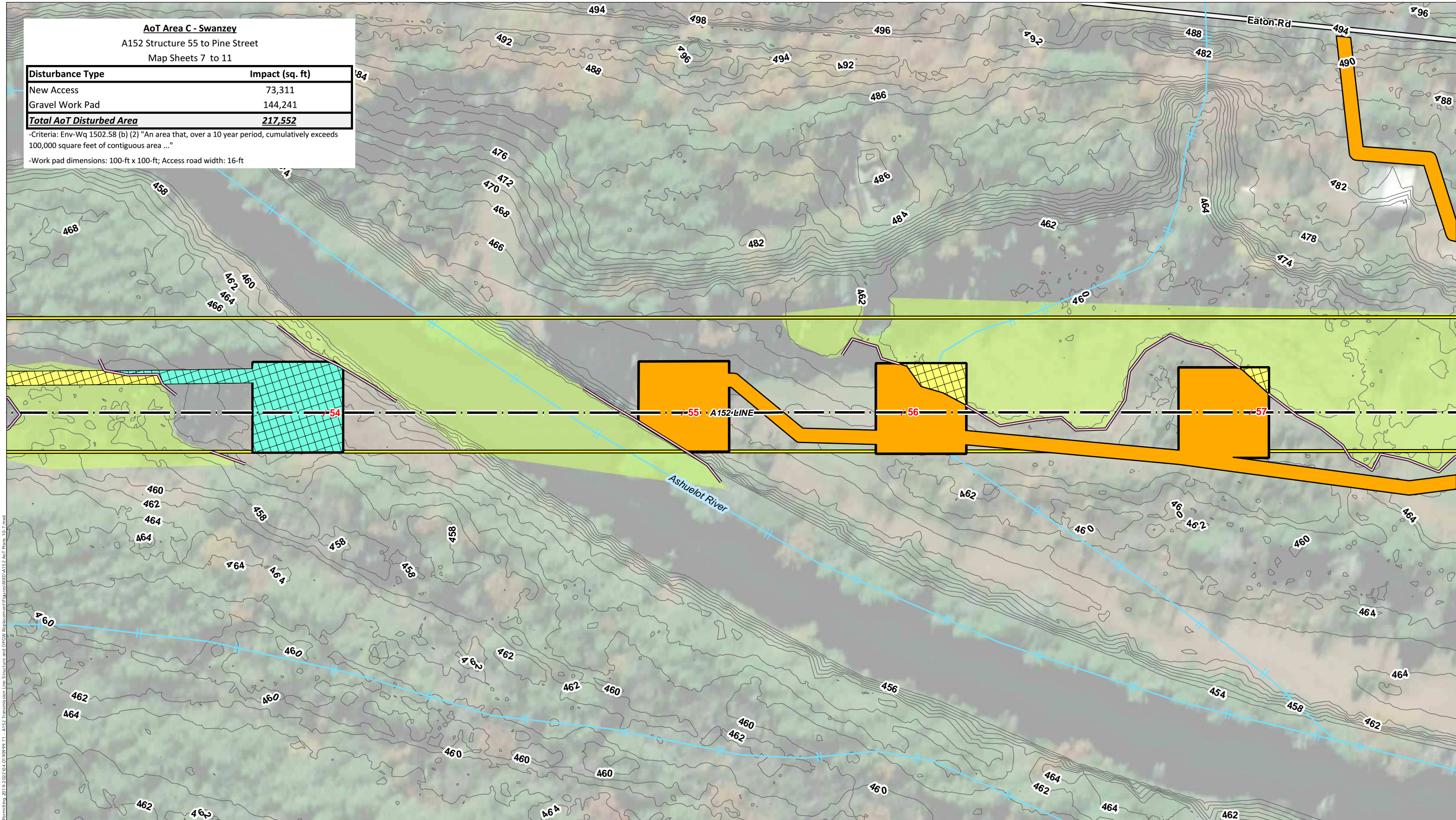


**AoT Area C - Swanzy**

A152 Structure 55 to Pine Street  
Map Sheets 7 to 11

Disturbance Type	Impact (sq. ft)
New Access	73,311
Gravel Work Pad	144,241
<b>Total AoT Disturbed Area</b>	<b>217,552</b>

-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



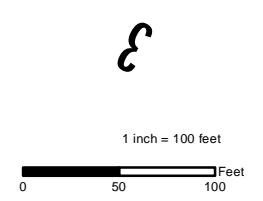
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**INDEX MAP**



- |  |                            |                    |
|--|----------------------------|--------------------|
| ! EXISTING STSTRUCTURE                       | — PRIMARY ACCESS           | — RAILROAD         |
| ! EXISTING STRUCTURE - TO BE REPLACED        | — SECONDARY ACCESS         | — NHDOT ROADS      |
| ! EXISTING STRUCTURE - TO BE REMOVED         | — FIELD DELINEATED WETLAND | — 2 FT CONTOURS    |
| ! PROPOSED NEW STRUCTURE LOCATION            | — AoT DISTURBANCE AREA     | — EROSION CONTROLS |
| ! T198 STRUCTURE                             | — WETLAND IMPACTS          | — TOWN BOUNDARY    |
| ! ADSS STUB POLE STRUCTURE - TO BE INSTALLED | — UPLAND MATTING           |                    |
| — TRANSMISSION LINE                          | — WORK AREA                |                    |
| — APPROXIMATE ROW                            | — NHD FLOWLINE             |                    |

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										A152 Line Structure Replacement Project
								Swanzey, NH		MAP SHEET
								Date: February, 2022		7 OF 11
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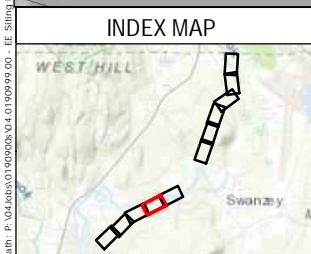
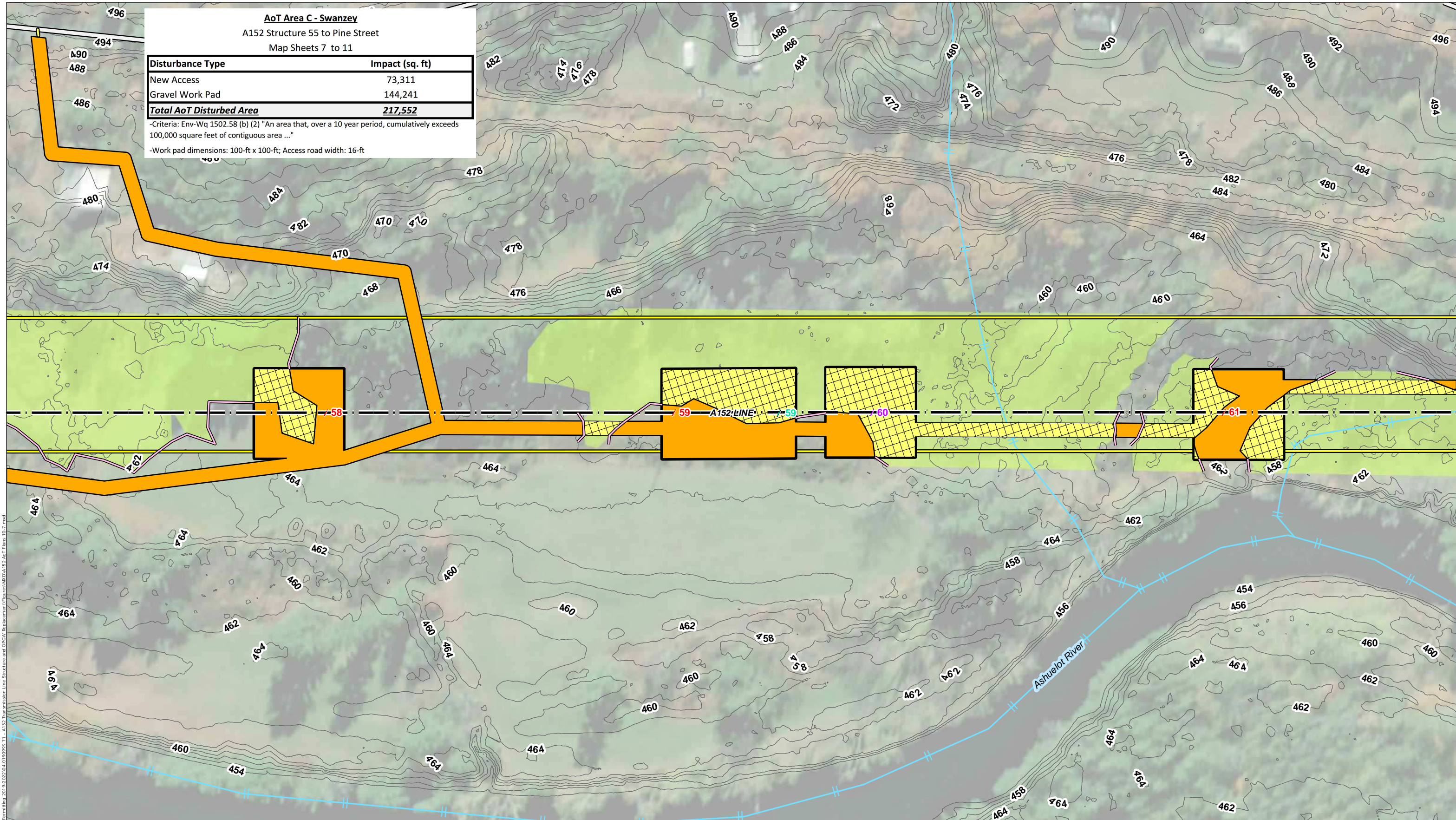


**AoT Area C - Swanzey**

A152 Structure 55 to Pine Street  
Map Sheets 7 to 11

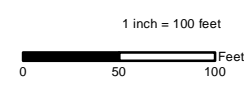
Disturbance Type	Impact (sq. ft)
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<b>Total AoT Disturbed Area</b>	<b>217,552</b>

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- |  |                            |                    |
|--|----------------------------|--------------------|
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| ! T198 STRUCTURE                             | — WETLAND IMPACTS          | — TOWN BOUNDARY    |
| ! ADSS STUB POLE STRUCTURE - TO BE INSTALLED | — UPLAND MATTING           |                    |
| — TRANSMISSION LINE                          | — WORK AREA                |                    |
| — APPROXIMATE ROW                            | — NHD FLOWLINE             |                    |

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**EVERSOURCE ENERGY**

**A152 Line Structure Replacement Project  
AoT Permitting Plans**

Swanzey, NH      MAP SHEET

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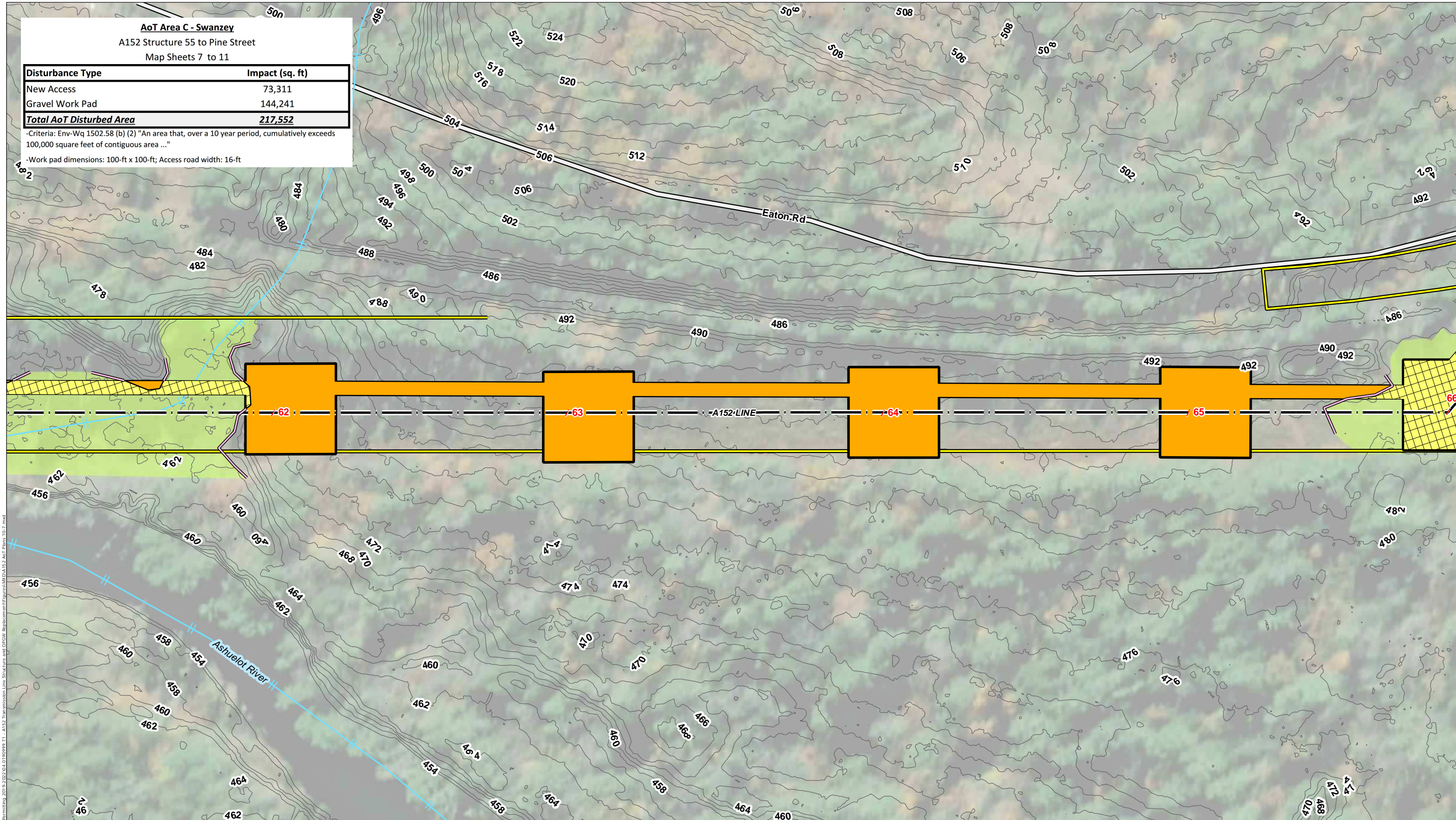
**AoT Area C - Swanzey**

A152 Structure 55 to Pine Street  
Map Sheets 7 to 11

Disturbance Type	Impact (sq. ft)
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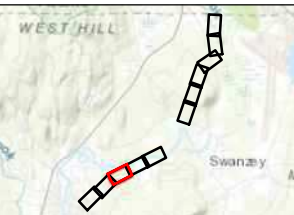
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-Work pad dimensions: 100-ft x 100-ft; Access road width: 16-ft



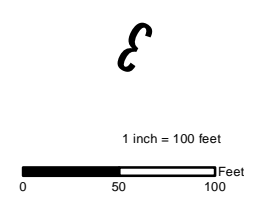
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**INDEX MAP**



- |  |                          |                  |
|--|--------------------------|------------------|
| ! EXISTING STRUCTURE                         | PRIMARY ACCESS           | RAILROAD         |
| ! EXISTING STRUCTURE - TO BE REPLACED        | SECONDARY ACCESS         | NHDOT ROADS      |
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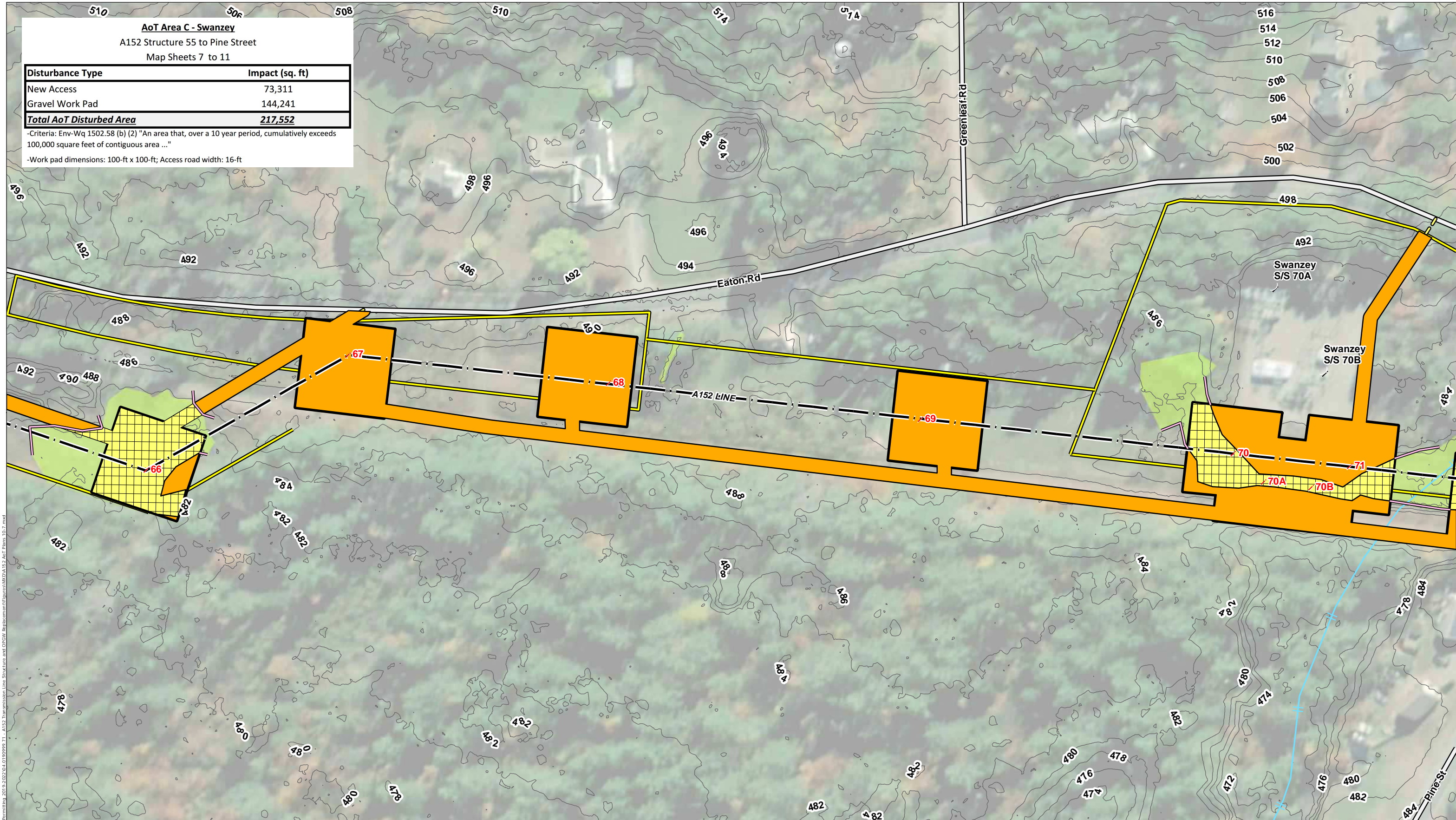
NO.	DATE	REVISIONS

**EVERSOURCE ENERGY**  
**A152 Line Structure Replacement Project**  
**AoT Permitting Plans**

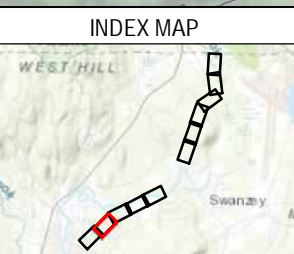
Swanzey, NH	MAP SHEET
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AoT Area C - Swanzey	
A152 Structure 55 to Pine Street	
Map Sheets 7 to 11	
<b>Disturbance Type</b>	<b>Impact (sq. ft)</b>
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! EXISTING STRUCTURE	PRIMARY ACCESS	RAILROAD
! EXISTING STRUCTURE - TO BE REPLACED	SECONDARY ACCESS	NHDOT ROADS
! EXISTING STRUCTURE - TO BE REMOVED	FIELD DELINEATED WETLAND	2 FT CONTOURS
! PROPOSED NEW STRUCTURE LOCATION	AoT DISTURBANCE AREA	EROSION CONTROLS
! T198 STRUCTURE	WETLAND IMPACTS	TOWN BOUNDARY
! ADSS STUB POLE STRUCTURE - TO BE INSTALLED	UPLAND MATTING	
— TRANSMISSION LINE	WORK AREA	
— APPROXIMATE ROW	NHD FLOWLINE	

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1 inch = 100 feet

NO.	DATE	REVISIONS

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**AoT Permitting Plans**

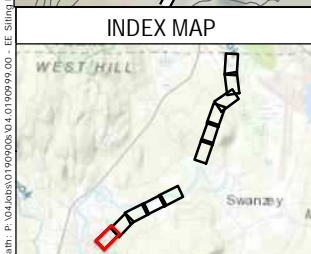
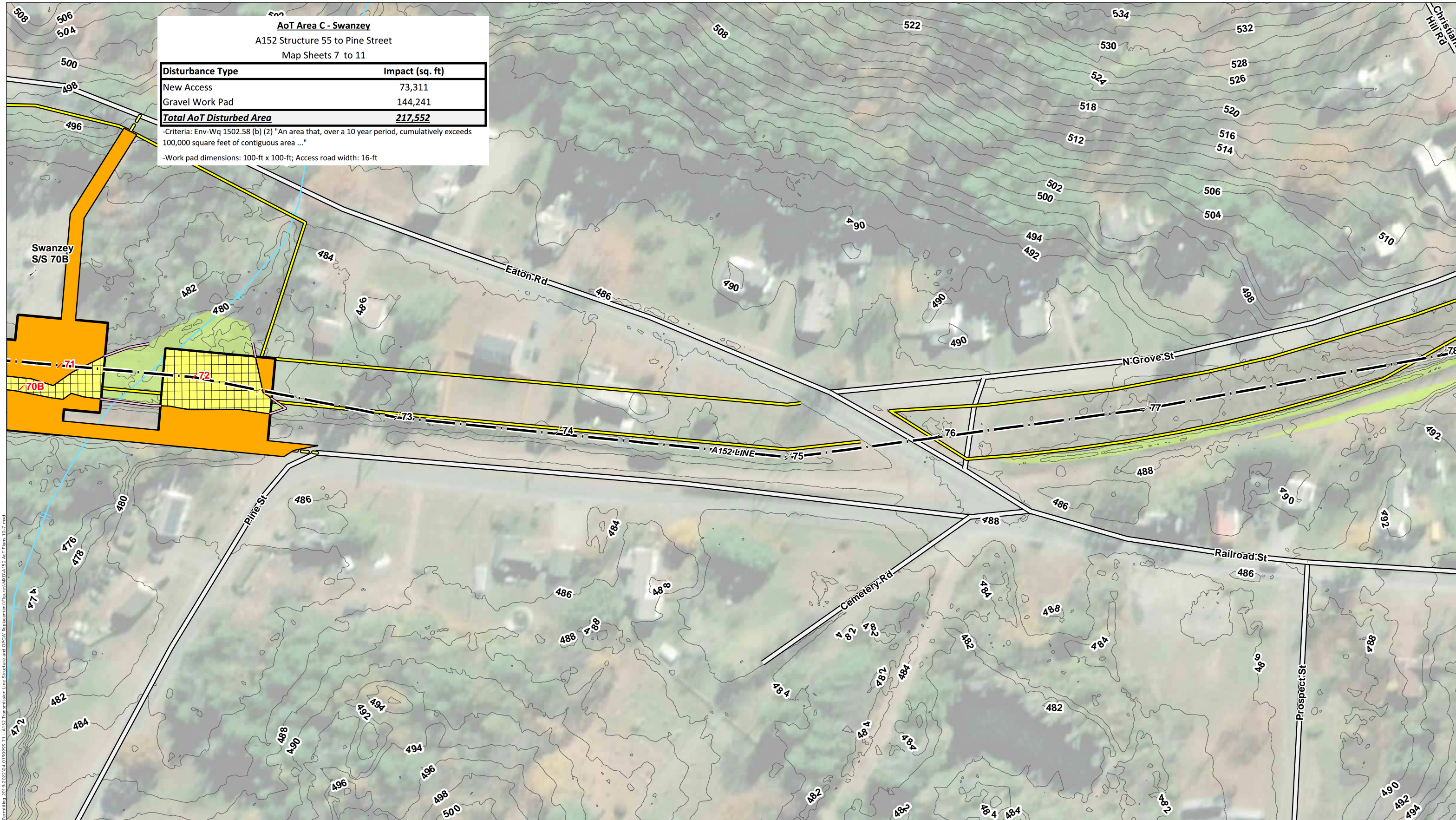
Swanzey, NH      MAP SHEET  
 Date: February, 2022      10 OF 11



**AoT Area C - Swanzev**  
 A152 Structure 55 to Pine Street  
 Map Sheets 7 to 11

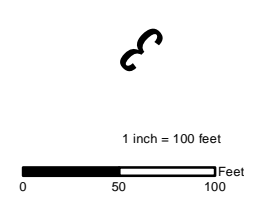
Disturbance Type	Impact (sq. ft)
New Access	73,311
Gravel Work Pad	144,241
<b>Total AoT Disturbed Area</b>	<b>217,552</b>

-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



! EXISTING STRUCRURE	PRIMARY ACCESS	RAILROAD
! EXISTING STRUCTURE - TO BE REPLACED	SECONDARY ACCESS	NHDOT ROADS
! EXISTING STRUCTURE - TO BE REMOVED	FIELD DELINEATED WETLAND	2 FT CONTOURS
! PROPOSED NEW STRUCTURE LOCATION	AoT DISTURBANCE AREA	EROSION CONTROLS
! T198 STRUCTURE	WETLAND IMPACTS	TOWN BOUNDARY
! ADSS STUB POLE STRUCTURE - TO BE INSTALLED	UPLAND MATTING	
TRANSMISSION LINE	WORK AREA	
APPROXIMATE ROW	NHD FLOWLINE	

This mapping product has been created to comply with submittal requirements to obtain certain regulatory approvals and, as such, there is no reliance on the information contained herein for any other purpose.



NO.	DATE	REVISIONS

**EVERSOURCE ENERGY**

**A152 Line Structure Replacement Project  
 AoT Permitting Plans**

Swanzy, NH      MAP SHEET

Date: February, 2022      11 OF 11

Path: P:\010101000005\_014\_01000000\_00 - E:\Siting\Permitting\2019\2022\04\_01000000\_01 - A152 Transmission Line Structure and Detail Replacement\Figures\Map\A152 AoT Plans\_01.mxd





## 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: [www.des.nh.gov/onestop](http://www.des.nh.gov/onestop)

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

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

**1. APPLICANT INFORMATION (INTENDED PERMIT HOLDER)**

Applicant Name: Eversource Energy	Contact Name: Jeremy Fennell
Email: jeremy.fennell@eversource.com	Daytime Telephone: 603-634-3396
Mailing Address: 13 Legends Drive	
Town/City: Hooksett	State: NH      Zip Code: 03106

**2. APPLICANT'S AGENT INFORMATION**      If none, check here:

Business Name: GZA GeoEnvironmental, Inc.	Contact Name: Conor Madison
Email: conor.madison@gza.com	Daytime Telephone: 603-232-8784
Address: 5 Commerce Park North, Suite 201	
Town/City: Bedford	State: NH      Zip Code: 03110

**3. PROPERTY OWNER INFORMATION (IF DIFFERENT FROM APPLICANT)**

Applicant Name: ROW consists of existing easements	Contact Name:
Email:	Daytime Telephone:
Mailing Address:	
Town/City:	State:      Zip Code:

**4. PROPERTY OWNER'S AGENT INFORMATION**      If none, check here:

Business Name:	Contact Name:
Email:	Daytime Telephone:
Address:	
Town/City:	State:      Zip Code:

**5. CONSULTANT INFORMATION**      If none, check here:

Engineering Firm: GZA GeoEnvironmental, Inc.	Contact Name: Conor Madison
Email: conor.madison@gza.com	Daytime Telephone: 603-232-8784
Address: 5 Commerce Park North, Suite 201	
Town/City: Bedford	State: NH      Zip Code: 03110



<b>6. PROJECT TYPE</b>					
<input type="checkbox"/> Excavation Only	<input type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input type="checkbox"/> Golf Course	<input type="checkbox"/> School	<input type="checkbox"/> Municipal
<input type="checkbox"/> Agricultural	<input type="checkbox"/> Land Conversion	<input checked="" type="checkbox"/> Other: Utility			
<b>7. PROJECT LOCATION INFORMATION</b>					
Project Name: A152 Transmission Line Structure Replacement Project					
Street/Road Address: Existing Utility Right-of-Way					
Town/City: Swanzey			County: Cheshire		
Tax Map: See attached		Block:		Lot Number:	
Unit:					
Location Coordinates: 813903N, 139516E		<input type="checkbox"/> Latitude/Longitude	<input type="checkbox"/> UTM	<input checked="" type="checkbox"/> State Plane	
Post-development, will the proposed project withdraw from or directly discharge to any of the following? If yes, identify the purpose.					
1. Stream or Wetland Purpose:		<input type="checkbox"/> Yes	<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Discharge	
		<input checked="" type="checkbox"/> No			
2. Man-made pond created by impounding a stream or wetland Purpose:		<input type="checkbox"/> Yes	<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Discharge	
		<input checked="" type="checkbox"/> No			
3. Unlined pond dug into the water table Purpose:		<input type="checkbox"/> Yes	<input type="checkbox"/> Withdrawal	<input type="checkbox"/> Discharge	
		<input checked="" type="checkbox"/> No			
Post-development, will the proposed project discharge to:					
• A surface water impaired for phosphorus and/or nitrogen? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen					
• A Class A surface water or Outstanding Resource Water? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes - include information to demonstrate that project will not cause net increase in phosphorus and/or nitrogen					
• A lake or pond not covered previously? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes - include information to demonstrate that project will not cause net increase in phosphorus in the lake or pond					
Is the project a High Load area? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, specify the type of high load land use or activity: _____					
Is the project within a Water Supply Intake Protection Area (WSIPA)?		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No		
Is the project within a Groundwater Protection Area (GPA)?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
Will the well setbacks identified in Env-Wq 1508.02 be met?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
Note: Guidance document titled " <a href="#">Using NHDES's OneStop WebGIS to Locate Protection Areas</a> " 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?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
If yes: Cut volume: <u>N/A</u> cubic feet within the 100-year floodplain Fill volume: <u>N/A</u> cubic feet within the 100-year floodplain					
<input type="checkbox"/> Project IS within ¼ mile of a designated river		Name of River: _____			
<input checked="" type="checkbox"/> Project is NOT within ¼ mile of a designated river					
<input type="checkbox"/> Project IS within a Coastal/Great Bay Region community - include info required by Env-Wq 1503.08(l) if applicable					
<input checked="" type="checkbox"/> Project is NOT within a Coastal/Great Bay Region community					
<b>8. BRIEF PROJECT DESCRIPTION (PLEASE DO NOT REPLY "SEE ATTACHED")</b>					
The proposed project includes the replacement of 41 existing utility structures and the removal of 2 utility poles in areas exceeding AoT thresholds along the existing A152 Transmission Line, which crosses through portions of Swanzey, New Hampshire. Access road improvements and work pad grading are proposed as part of this project for continued maintenance of the existing transmission lines.					
<b>9. IF APPLICABLE, DESCRIBE ANY WORK STARTED PRIOR TO RECEIVING PERMIT</b>					
N/A - work has not started prior to receiving a permit.					



<b>10. ADDITIONAL REQUIRED INFORMATION</b>				
A. Date a copy of the application was sent to the municipality as required by Env-Wq 1503.05(e) <sup>1</sup> : <u>3/23/2022</u> . (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> : <u>3/23/2022</u> . (Attach proof of delivery)				
C. Type of plan required: <input type="checkbox"/> Land Conversion <input type="checkbox"/> Detailed Development <input checked="" type="checkbox"/> Excavation, Grading & Reclamation <input type="checkbox"/> Steep Slope				
D. Additional plans required: <input type="checkbox"/> Stormwater Drainage & Hydrologic Soil Groups <input type="checkbox"/> Source Control <input type="checkbox"/> Chloride Management				
E. Total area of disturbance: <u>510,811</u> square feet				
F. Additional impervious cover as a result of the project: _____ square feet (use the "-" symbol to indicate a net reduction in impervious coverage). Total final impervious cover: <u>0</u> square feet				
G. Total undisturbed cover: <u>0</u> 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): <u>0</u>				
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		
		Pending	If Issued:	
1. Water Supply Approval	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/>	Permit number:	
2. Wetlands Permit	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input checked="" type="checkbox"/>	Permit number:	
3. Shoreland Permit	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/>	Permit number: 2022-00184	
4. UIC Registration	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/>	Registration date:	
5. Large/Small Community Well Approval	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/>	Approval letter date:	
6. Large Groundwater Withdrawal Permit	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/>	Permit number:	
7. Other:	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>	Permit number:	
L. List all species identified by the Natural Heritage Bureau as threatened or endangered or of concern: <u>Northern leopard frog, wood turtle, spotted turtle,</u>				
M. Using NHDES's Web GIS OneStop program ( <a href="http://www2.des.state.nh.us/gis/onestop/">www2.des.state.nh.us/gis/onestop/</a> ), with the Surface Water Impairment layer turned on, list the impairments identified for each receiving water. If no pollutants are listed, enter "N/A." <u>ESCHERICHIA COLI</u>				
N. Did the applicant/applicant's agent have a pre-application meeting with AOT staff? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, name of staff member: <u>Ridgely Mauck</u>				
O. Will blasting of bedrock be required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, estimated quantity of blast rock: _____ cubic yards If yes, standard blasting BMP notes must be placed on the plans, available at: <a href="http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf">http://des.nh.gov/organization/commissioner/pip/publications/wd/documents/wd-10-12.pdf</a> NOTE: If greater than 5,000 cubic yards of blast rock will be generated, a groundwater monitoring program must be developed and submitted to NHDES. Contact AOT staff for additional detail.				

<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>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)

## LOOSE:

- Signed application form: [des.nh.gov/organization/divisions/water/aot/index.htm](http://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](http://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.

## BIND IN A REPORT IN THE FOLLOWING ORDER:

- Copy of the signed application form & application checklist ([des.nh.gov/organization/divisions/water/aot/index.htm](http://des.nh.gov/organization/divisions/water/aot/index.htm))
- Copy of the check
- Copy of the USGS map with the property boundaries outlined (1" = 2,000' scale)
- Narrative of the project with a summary table of the peak discharge rate for the off-site discharge points
- Web GIS printout with the "Surface Water Impairments" layer turned on - <http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx>
- Web GIS printouts with the AOT screening layers turned on - <http://www4.des.state.nh.us/onestopdatamapper/onestopmapper.aspx>
- NHB letter using DataCheck Tool - [www.nhdfi.org/about-forests-and-lands/bureaus/natural-heritage-bureau/](http://www.nhdfi.org/about-forests-and-lands/bureaus/natural-heritage-bureau/)
- The Web Soil Survey Map with project's watershed outlined - [websoilsurvey.nrcs.usda.gov](http://websoilsurvey.nrcs.usda.gov)
- Aerial photograph (1" = 2,000' scale with the site boundaries outlined)
- Photographs representative of the site
- Groundwater Recharge Volume calculations (one worksheet for each permit application): [des.nh.gov/organization/divisions/water/aot/documents/bmp\\_worksh.xls](http://des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls)
- BMP worksheets (one worksheet for each treatment system): [des.nh.gov/organization/divisions/water/aot/documents/bmp\\_worksh.xls](http://des.nh.gov/organization/divisions/water/aot/documents/bmp_worksh.xls)
- Drainage analysis, stamped by a professional engineer (see Application Checklist for details)
- Riprap apron or other energy dissipation or stability calculations
- Site Specific Soil Survey report, stamped and with a certification note prepared by the soil scientist that the survey was done in accordance with the Site Specific Soil Mapping standards, *Site-Specific Soil Mapping Standards for NH & VT, SSSNNE Special Publication No. 3*.
- Infiltration Feasibility Report (example online) [Env-Wq 1503.08(f)(3)]
- Registration and Notification Form for Storm Water Infiltration to Groundwater (UIC Registration-for underground systems only, including drywells and trenches): [http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw\\_discharge](http://des.nh.gov/organization/divisions/water/dwgb/dwspp/gw_discharge)
- Inspection and maintenance manual with, if applicable, long term maintenance agreements [Env-Wq 1503.08(g)]
- Source control plan

## PLANS:

- One set of design plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)
- Pre & post-development color coded soil plans on 11" x 17" (see Application Checklist for details)
- Pre & post-development drainage area plans on 34 - 36" by 22 - 24" white paper (see Application Checklist for details)

## 100-YEAR FLOODPLAIN REPORT:

- All information required in Env-Wq 1503.09, submitted as a separate report.

## ADDITIONAL INFORMATION RE: NUTRIENTS, CLIMATE

- See Checklist for Details
- REVIEW APPLICATION FOR COMPLETENESS & CONFIRM INFORMATION LISTED ON THE APPLICATION IS INCLUDED WITH SUBMITTAL.



12. REQUIRED SIGNATURES


JF 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.

APPLICANT

APPLICANT'S AGENT:

Signature: 

Date: 2/8/22

Name (print or type): Jeremy Fennell

Title: Licensing and Permitting Specialist

PROPERTY OWNER

PROPERTY OWNER'S AGENT:

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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

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

- Plans printed on 34 - 36" by 22 - 24" white paper
- PE stamp
- Wetland delineation
- Temporary erosion control measures
- 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 <http://des.nh.gov/organization/divisions/water/wetlands/index.htm>. Note that artificial detention in wetlands is not allowed.
- Compliance with the Comprehensive Shoreland Protection Act, RSA 483-B. <http://des.nh.gov/organization/divisions/water/wetlands/cspa>
- 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.  
<http://des.nh.gov/organization/divisions/water/dam/documents/damdef.pdf>

## 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



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

DRAINAGE ANALYSES



Please double-side 8 1/2" x 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- <http://precip.eas.cornell.edu/>. 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.

PRE AND POST-DEVELOPMENT COLOR-CODED SOIL PLANS



- 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: *Vegetating New Hampshire Sand and Gravel Pits* for a good resource, it is posted online at: <http://des.nh.gov/organization/divisions/water/aot/categories/publications>.

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-Wq 1503.08(l) if applicable.





## Appendix B – Abutters List





Eversource A152 Transmission Line Structure Replacement Project  
Swanzy, New Hampshire  
Appendix B - Parcels Intersecting Project Area

Swanzy
Tax Map - Lot
058-078-000
058-076-000
057-106-000
058-075-000
058-074-000
039-007-000
058-010-000
049-008-000
049-005-000
058-077-000
057-130-000
049-007-000
038-037-000
038-008-000
039-003-000
038-041-000
038-042-000
038-044-000
038-043-000
038-039-000
038-045-000
038-040-000
039-004-000
038-038-000
038-005-000
040-016-000
040-013-000
040-012-000





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



# Memo

## NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.

Maps and NHB record pages are confidential and should be redacted from public documents.

**To:** Lindsey White, GZA GeoEnvironmental  
5 Commerce Park North  
Suite 201  
Bedford, NH 03110

**From:** NHB Review, NH Natural Heritage Bureau

**Date:** 11/30/2021 (valid until 11/30/2022)

**Re:** Review by NH Natural Heritage Bureau

**Permits:** NHDES - Alteration of Terrain Permit, NHDES - Utility Statutory Permit by Notification (SPN)

**NHB ID:** NHB21-3643

**Town:** Swanzey

**Location:** EversourceEnergy right of way

**Description:** Eversource is proposing select utility pole replacements in 2022.

**cc:** Kim Tuttle

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

**Comments** **NHB: The Silver maple-false nettle-sensitive fern floodplain forest exemplary natural community has been provided for your information. NHB expects that all work will occur within the ROW.**  
**F&G: Please submit AoT-related documents for NHFG review, AoT review inquiries or wildlife biologist questions to NHFGreview@wildlife.nh.gov. If project related: Include the NHB datacheck results letter number (i.e. NHB21-3643) in the email subject line at a minimum. Not including this number will affect our response time and delays of our review. Please include the NHB number in the title of the assessment along with a date (year,month,day).**

<b>Invertebrate Species</b>	<b>State<sup>1</sup></b>	<b>Federal</b>	<b>Notes</b>
Dwarf Wedge Mussel ( <i>Alasmidonta heterodon</i> )	E	E	Contact the NH Fish & Game Dept and the US Fish & Wildlife Service (see below).
<b>Natural Community</b>	<b>State<sup>1</sup></b>	<b>Federal</b>	<b>Notes</b>
Silver maple - false nettle - sensitive fern floodplain forest*	--	--	Threats are primarily changes to the hydrology of the river, land conversion and fragmentation, introduction of invasive species, and increased input of nutrients and pollutants.



## Memo

## NH Natural Heritage Bureau NHB DataCheck Results Letter

Please note: portions of this document are confidential.

Maps and NHB record pages are confidential and should be redacted from public documents.

<b>Vertebrate species</b>	<b>State<sup>1</sup></b>	<b>Federal</b>	<b>Notes</b>
Northern Leopard Frog ( <i>Lithobates pipiens</i> )	SC	--	Contact the NH Fish & Game Dept (see below).
Spotted Turtle ( <i>Clemmys guttata</i> )	T	--	Contact the NH Fish & Game Dept (see below).
Wood Turtle ( <i>Glyptemys insculpta</i> )	SC	--	Contact the NH Fish & Game Dept (see below).

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

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

---

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



CONFIDENTIAL DNCR



CONFIDENTIAL DNCR



























## Conor Madison

---

**From:** Bouchard, Jessica <Jessica.R.Bouchard@dncr.nh.gov>  
**Sent:** Friday, January 7, 2022 5:01 PM  
**To:** Conor Madison  
**Subject:** RE: NHB21-3643 Response

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

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Hi Conor,

Thank you. No concerns from NHB.

Jessica Bouchard  
Environmental Reviewer / Ecological Information Specialist  
New Hampshire Natural Heritage Bureau (NHB)  
Division of Forests & Lands  
NH Dept. of Natural & Cultural Resources  
172 Pembroke Rd  
Concord, NH 03301  
(603) 271-2834 (office)

[NHB DataCheck Tool](#)

---

**From:** Conor Madison <Conor.Madison@gza.com>  
**Sent:** Wednesday, January 5, 2022 10:25 AM  
**To:** Bouchard, Jessica <Jessica.R.Bouchard@dncr.nh.gov>  
**Subject:** NHB21-3643 Response

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---

Hi Jessica,

In response to NHB21-3643, all construction will occur within the ROW and the Silver maple-false nettle-sensitive fern floodplain exemplary natural community will not be impacted.

Thanks,  
Conor

**Conor Madison, CPESC, CESSWI**  
**Assistant Project Manager**

GZA | 5 Commerce Park North | Bedford, NH 03110  
o: 603.232.8784 | c: 207.331.6629 | [conor.madison@gza.com](mailto:conor.madison@gza.com) | [www.gza.com](http://www.gza.com) | [LinkedIn](#)

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## Conor Madison

---

**From:** Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>  
**Sent:** Tuesday, February 8, 2022 8:46 AM  
**To:** Conor Madison  
**Subject:** [EXTERNAL] RE: NHB21-3643 Eversource pole replacements Swanzey

That sounds good Conor, thank you.

Thanks,

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

---

**From:** Conor Madison <Conor.Madison@gza.com>  
**Sent:** Tuesday, February 8, 2022 8:40 AM  
**To:** Tuttle, Kim <Kim.A.Tuttle@wildlife.nh.gov>  
**Subject:** RE: NHB21-3643 Eversource pole replacements Swanzey

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---

Hi Kim,

Thank you for the flyers, we will provide these to the contractors and workers. There will be no impact to the banks or bed of the Ashuelot River & South Branch Ashuelot. Welded plastic erosion controls will not be used and only fabric silt sock will be used on the site. Additionally we will include the language below for any observations (incidental mortalities included) and all wetlands and vernal pools will be flagged prior to work. Impacts to vernal pools will be avoided.

Please let me know if you need any more information on the site!

Thanks,

Conor

**Conor Madison, CPESC, CESSWI**

**Assistant Project Manager**

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o: 603.232.8784 | c: 207.331.6629 | [conor.madison@gza.com](mailto:conor.madison@gza.com) | [www.gza.com](http://www.gza.com) | [LinkedIn](#)

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**From:** Tuttle, Kim <[Kim.A.Tuttle@wildlife.nh.gov](mailto:Kim.A.Tuttle@wildlife.nh.gov)>  
**Sent:** Monday, February 7, 2022 9:19 AM  
**To:** Conor Madison <[Conor.Madison@gza.com](mailto:Conor.Madison@gza.com)>  
**Subject:** [EXTERNAL] RE: NHB21-3643 Eversource pole replacements Swanzey



Hi Conor,

Please verify that there will be no impacts to the banks or bed of the Ashuelot River, South Branch Ashuelot otherwise coordination with the USFWS will be needed. Please verify that only wildlife friendly erosion control matting will be used, if needed. All observations of rare, threatened and endangered species should be photographed for verification. Also include any mortality incidentally observed at any time in the area even if not related to the work. Please add the following note to the BMPs:

Vernal pools will be flagged prior to work and all impacts avoided.

**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.**

**Any mortality to listed species will be documented, photographed and the carcass retained and reported immediately to Melissa Doperalski at 603-479-1129 cell.**

Thanks,

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

---

**From:** Conor Madison <[Conor.Madison@gza.com](mailto:Conor.Madison@gza.com)>  
**Sent:** Sunday, February 6, 2022 6:38 PM  
**To:** Tuttle, Kim <[Kim.A.Tuttle@wildlife.nh.gov](mailto:Kim.A.Tuttle@wildlife.nh.gov)>  
**Subject:** RE: NHB21-3643 Eversource pole replacements Swanzey

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---

Hi Kim,

Just wanted to follow up on NHB21-3643. If you would like anymore information please let me know!

Thanks,  
Conor

**Conor Madison, CPESC, CESSWI**  
**Assistant Project Manager**  
GZA | 5 Commerce Park North | Bedford, NH 03110  
o: 603.232.8784 | c: 207.331.6629 | [conor.madison@gza.com](mailto:conor.madison@gza.com) | [www.gza.com](http://www.gza.com) | [LinkedIn](#)

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**From:** Conor Madison  
**Sent:** Thursday, January 27, 2022 2:41 PM  
**To:** Tuttle, Kim <[Kim.A.Tuttle@wildlife.nh.gov](mailto:Kim.A.Tuttle@wildlife.nh.gov)>  
**Subject:** RE: NHB21-3643 Eversource pole replacements Swanzey

Hi Kim,

GZA, GeoEnvironmental, Inc. (GZA) is working with Eversource Energy on an upcoming utility pole replacement project along the A152 Transmission Line which crosses through portions of Keene, Swanzey and Winchester, New Hampshire.

The proposed project includes the replacement of 62 existing utility poles in the Town of Swanzey. Consistent with similar Eversource utility pole maintenance projects, the proposed work requires temporary wetland impacts for access and work pad placement around poles and Eversource intends to submit an SPN. The wooden poles will be offset 10 feet from their existing location and will be replaced with steel structures. Upon completion of work, timber mats will be removed and temporarily disturbed wetland areas will be restored. Work will be consistent with the March 2019 Best Management Practices Manual for Utility Maintenance in and Adjacent to Wetlands and Waterbodies in New Hampshire. In addition, Eversource will conduct construction monitoring to ensure BMPs are followed and to monitor for wildlife during construction and safely relocate as necessary. The project is proposed this winter (March) and into the summer 2022. The project is proposed to start in the south and work up north towards the City of Keene.

Proposed temporary wetland impacts are necessary within wetland systems adjacent to Tier 3+ stream (Ashuelot River, South Branch Ashuelot River) which we understand is a Priority Resource Area (PRA) and we have coordinated with NHDES and have filed a Statutory Permit by Notification. There will not be any permanent wetland impacts and temporary wetland impacts account for approximately 121,000 sqft of impact throughout Swanzey. Vernal pools will be flagged prior to work.

Thanks in advance for comments and if you have any questions please feel free to reach out.

Thanks,  
Conor

**Conor Madison, CPESC, CESSWI**  
**Assistant Project Manager**

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o: 603.232.8784 | c: 207.331.6629 | [conor.madison@gza.com](mailto:conor.madison@gza.com) | [www.gza.com](http://www.gza.com) | [LinkedIn](#)

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**From:** Tuttle, Kim <[Kim.A.Tuttle@wildlife.nh.gov](mailto:Kim.A.Tuttle@wildlife.nh.gov)>  
**Sent:** Thursday, January 27, 2022 1:22 PM  
**To:** Conor Madison <[Conor.Madison@gza.com](mailto:Conor.Madison@gza.com)>  
**Subject:** [EXTERNAL] RE: NHB21-3643 Eversource pole replacements Swanzey

Hi Conor,



I will need a job narrative describing the project- how many poles and what kind, same or different footprint, timing and what end are you starting at? What DES permits will be needed? Will there be any wetland impacts? If so, describe temporary and permanent impacts - sq. footage and wetland type. Vernal pools must be flagged prior to work.  
Thanks,

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

---

**From:** Conor Madison <[Conor.Madison@gza.com](mailto:Conor.Madison@gza.com)>  
**Sent:** Thursday, January 27, 2022 12:51 PM  
**To:** Tuttle, Kim <[Kim.A.Tuttle@wildlife.nh.gov](mailto:Kim.A.Tuttle@wildlife.nh.gov)>  
**Subject:** NHB21-3643

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---

Hi Kim,

In response to NHB21-3643 we are no longer submitting AoT related documents. Please see below for our typical reptile construction BMPs.

Eversource intends to incorporate typical 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 contracts to include guidance on protocols for snakes and provide identification for spotted turtles, Blanding's turtle and eastern hognose snake.
2. Observed snakes and turtles will be moved off 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 the 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.
6. Any mortality to listed species will be immediately reported to the NHFG Nongame Program and will be documented, photographed, collected and preserved.

Eversource will report on any rare species observation as typically requested.

Please let me know if you have any questions or comments. GZA will be the environmental monitor on Site and we will incorporate your feedback into the project and daily tailboards with contractors.

Thanks,  
Conor

**Conor Madison, CPESC, CESSWI**



**Assistant Project Manager**

GZA | 5 Commerce Park North | Bedford, NH 03110

o: 603.232.8784 | c: 207.331.6629 | [conor.madison@gza.com](mailto:conor.madison@gza.com) | [www.gza.com](http://www.gza.com) | [LinkedIn](#)

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## Appendix D – Natural Resources Conservation Service Web Soil Survey





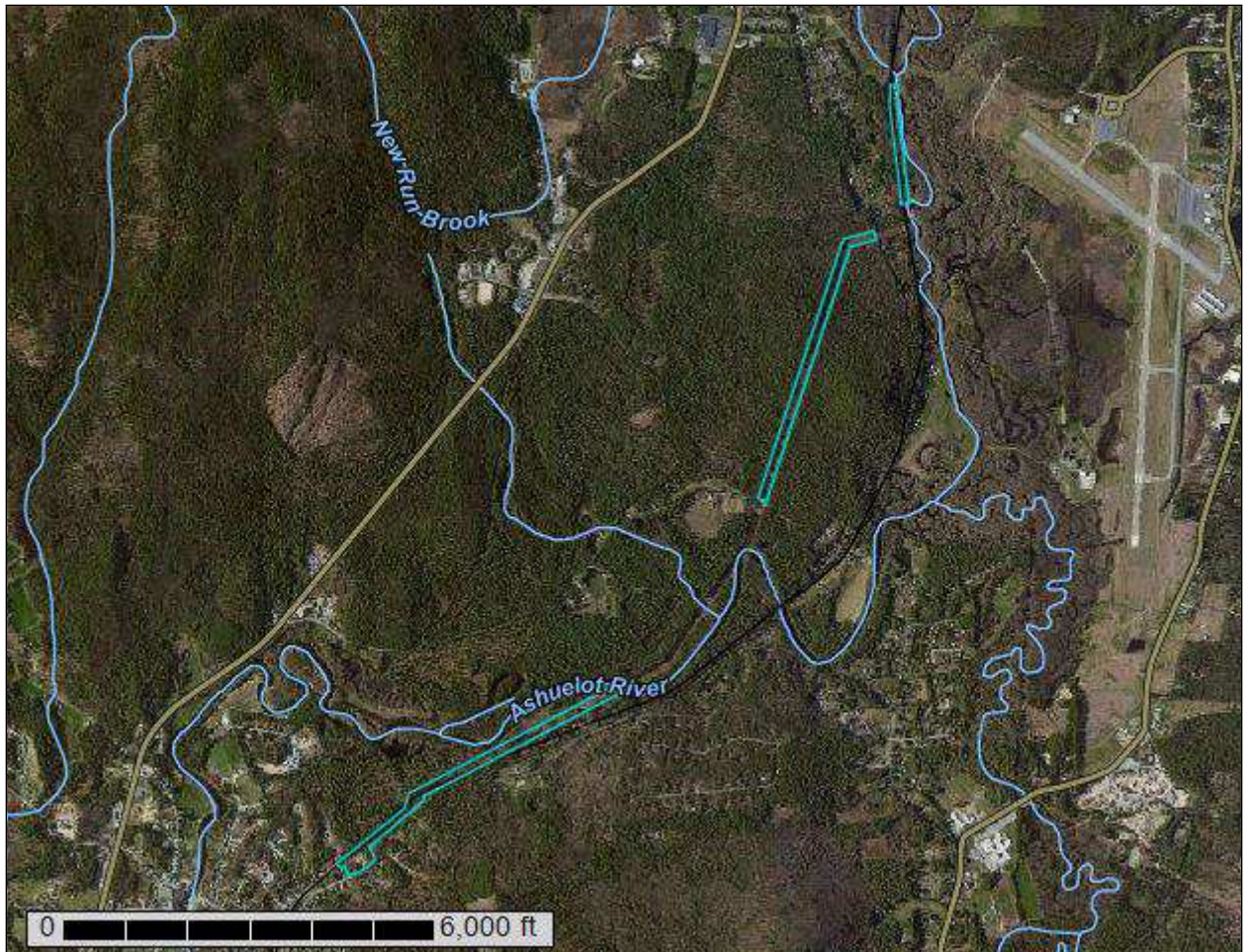
United States  
Department of  
Agriculture

**NRCS**

Natural  
Resources  
Conservation  
Service

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

# Custom Soil Resource Report for Cheshire County, New Hampshire





# Preface

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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](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951)).

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

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

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

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# How Soil Surveys Are Made

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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



## Custom Soil Resource Report

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



## Custom Soil Resource Report

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



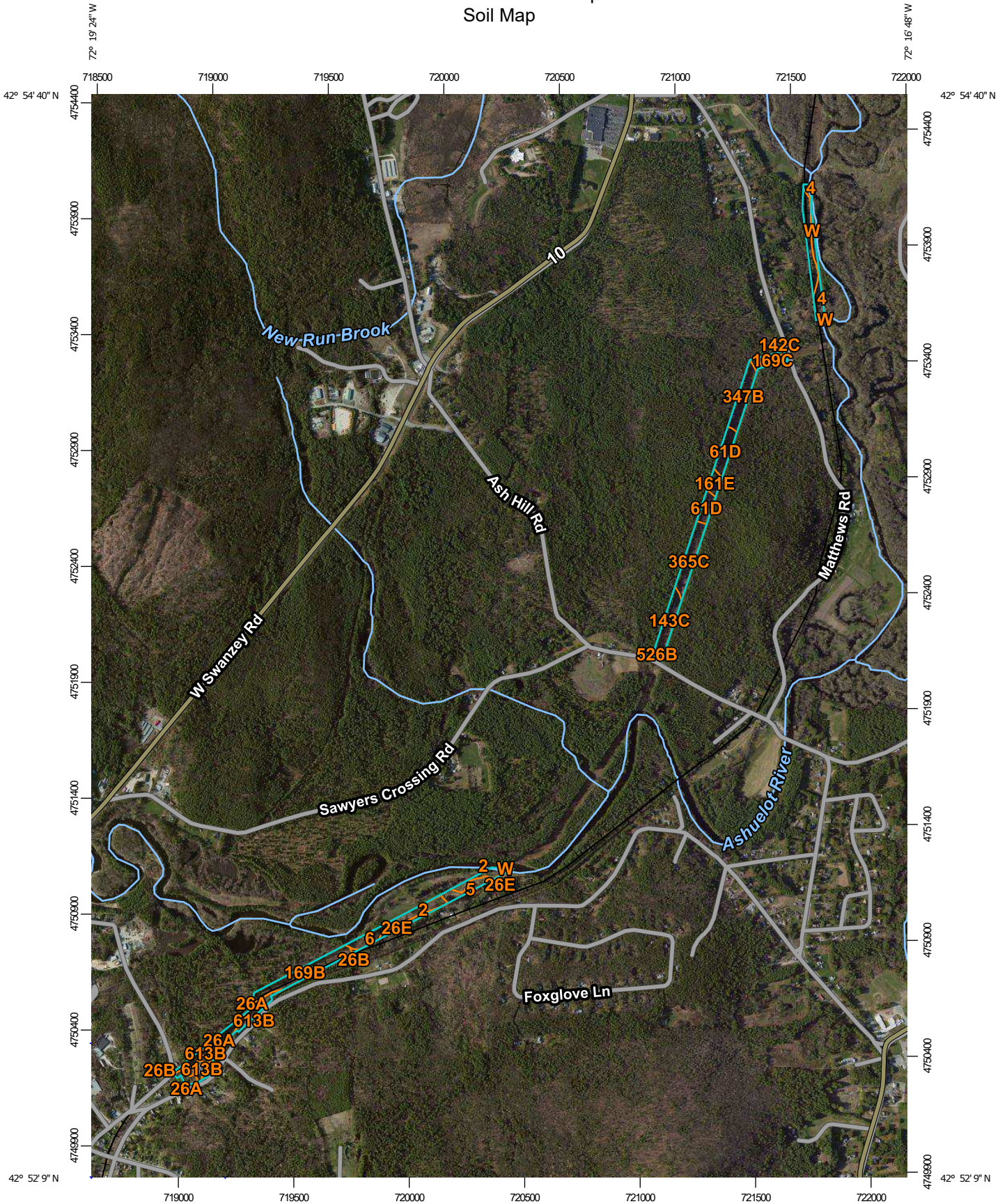
# Soil Map

---

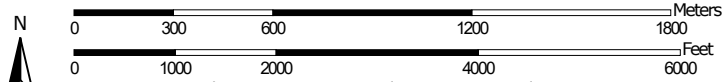
The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



# Custom Soil Resource Report Soil Map



Map Scale: 1:22,800 if printed on A portrait (8.5" x 11") sheet.




Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84



### MAP LEGEND

**Area of Interest (AOI)**

 Area of Interest (AOI)




















**Soils**







 Soil Map Unit Polygons

 Soil Map Unit Lines


 Soil Map Unit Points

**Special Point Features**






-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features


**Water Features**

 Streams and Canals

**Transportation**

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

**Background**

 Aerial Photography

### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

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: Cheshire County, New Hampshire  
 Survey Area Data: Version 25, Aug 31, 2021

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

Date(s) aerial images were photographed: Apr 9, 2011—May 12, 2011

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
2	Suncook loamy fine sand	3.6	8.3%
4	Pootatuck fine sandy loam	1.5	3.5%
5	Rippowam fine sandy loam	1.8	4.1%
6	Saco mucky silt loam	2.1	4.8%
26A	Windsor loamy sand, 0 to 3 percent slopes	2.7	6.2%
26B	Windsor loamy sand, 3 to 8 percent slopes	0.3	0.6%
26E	Windsor loamy sand, 15 to 60 percent slopes	1.0	2.3%
61D	Tunbridge-Lyman-Rock outcrop complex, 15 to 25 percent slopes	3.8	8.6%
107	Rippowam-Saco complex	1.2	2.8%
142C	Monadnock fine sandy loam, 8 to 15 percent slopes	0.1	0.3%
143C	Monadnock fine sandy loam, 8 to 15 percent slopes, very stony	3.0	6.9%
161E	Lyman-Tunbridge-Rock outcrop complex, 25 to 60 percent slopes	1.0	2.4%
168B	Sunapee fine sandy loam, 3 to 8 percent slopes	0.4	0.9%
169B	Sunapee fine sandy loam, 0 to 8 percent slopes, very stony	5.5	12.6%
169C	Sunapee fine sandy loam, 8 to 15 percent slopes, very stony	1.1	2.6%
347B	Lyme and Moosilauke soils, 0 to 5 percent slopes, very stony	3.2	7.4%
365C	Monadnock and Berkshire soils, 8 to 15 percent slopes, extremely stony	3.6	8.3%
526B	Caesar loamy sand, 3 to 8 percent slopes	3.1	7.2%
613B	Croghan loamy fine sand, 0 to 8 percent slopes	3.3	7.5%
W	Water	1.2	2.6%
<b>Totals for Area of Interest</b>		<b>43.7</b>	<b>100.0%</b>



## 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



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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.



## Cheshire County, New Hampshire

### 2—Suncook loamy fine sand

#### Map Unit Setting

*National map unit symbol:* 9cyw  
*Elevation:* 180 to 770 feet  
*Mean annual precipitation:* 44 to 46 inches  
*Mean annual air temperature:* 46 degrees F  
*Frost-free period:* 145 to 150 days  
*Farmland classification:* Farmland of local importance

#### Map Unit Composition

*Suncook and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Suncook

##### Typical profile

*H1 - 0 to 8 inches:* loamy fine sand  
*H2 - 8 to 26 inches:* stratified loamy fine sand to coarse sand  
*H3 - 26 to 60 inches:* stratified loamy fine sand to gravelly coarse sand

##### Properties and qualities

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Excessively drained  
*Runoff class:* Negligible  
*Capacity of the most limiting layer to transmit water (Ksat):* High to very high (6.00 to 20.00 in/hr)  
*Depth to water table:* About 36 to 72 inches  
*Frequency of flooding:* NoneOccasional  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 4.1 inches)

##### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 3s  
*Hydrologic Soil Group:* A  
*Ecological site:* F144AY006CT - High Floodplain Levee  
*Hydric soil rating:* No

#### Minor Components

##### Occum

*Percent of map unit:* 4 percent  
*Hydric soil rating:* No

##### Not named

*Percent of map unit:* 3 percent  
*Hydric soil rating:* No

##### Not named wet

*Percent of map unit:* 3 percent  
*Landform:* Flood plains



*Hydric soil rating:* Yes

#### **4—Pootatuck fine sandy loam**

##### **Map Unit Setting**

*National map unit symbol:* 9d0n  
*Elevation:* 200 to 1,210 feet  
*Mean annual precipitation:* 44 to 46 inches  
*Mean annual air temperature:* 46 degrees F  
*Frost-free period:* 140 to 150 days  
*Farmland classification:* All areas are prime farmland

##### **Map Unit Composition**

*Pootatuck and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

##### **Description of Pootatuck**

###### **Setting**

*Parent material:* Sandy and/or coarse-loamy alluvium derived from granite, gneiss or schist

###### **Typical profile**

*H1 - 0 to 9 inches:* fine sandy loam  
*H2 - 9 to 28 inches:* fine sandy loam  
*H3 - 28 to 60 inches:* stratified loamy fine sand to very gravelly coarse sand

###### **Properties and qualities**

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately well drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)  
*Depth to water table:* About 18 to 30 inches  
*Frequency of flooding:* NoneOccasional  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Moderate (about 6.0 inches)

###### **Interpretive groups**

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2w  
*Hydrologic Soil Group:* B  
*Ecological site:* F144AY012CT - Sandy Low Floodplain  
*Hydric soil rating:* No

##### **Minor Components**

###### **Rippowam**

*Percent of map unit:* 5 percent



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*Landform:* Flood plains  
*Hydric soil rating:* Yes

### **Suncook**

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

### **Occum**

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

## **5—Rippowam fine sandy loam**

### **Map Unit Setting**

*National map unit symbol:* 9d0w  
*Elevation:* 200 to 1,380 feet  
*Mean annual precipitation:* 44 to 48 inches  
*Mean annual air temperature:* 45 to 46 degrees F  
*Frost-free period:* 140 to 150 days  
*Farmland classification:* Farmland of local importance

### **Map Unit Composition**

*Rippowam and similar soils:* 90 percent  
*Minor components:* 10 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### **Description of Rippowam**

#### **Setting**

*Landform:* Flood plains  
*Parent material:* Sandy and/or coarse-loamy alluvium derived from granite, gneiss or schist

#### **Typical profile**

*H1 - 0 to 9 inches:* fine sandy loam  
*H2 - 9 to 30 inches:* fine sandy loam  
*H3 - 30 to 60 inches:* stratified loamy fine sand to very gravelly coarse sand

#### **Properties and qualities**

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)  
*Depth to water table:* About 0 to 18 inches  
*Frequency of flooding:* NoneFrequent  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Moderate (about 6.2 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified



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*Land capability classification (nonirrigated): 4w*

*Hydrologic Soil Group: A/D*

*Ecological site: F144BY110ME - Broad Floodplain Riparian Complex*

*Hydric soil rating: Yes*

### Minor Components

#### Pootatuck

*Percent of map unit: 4 percent*

*Hydric soil rating: No*

#### Occum

*Percent of map unit: 3 percent*

*Hydric soil rating: No*

#### Saco

*Percent of map unit: 3 percent*

*Landform: Flood plains*

*Hydric soil rating: Yes*

## 6—Saco mucky silt loam

### Map Unit Setting

*National map unit symbol: 9d1k*

*Elevation: 50 to 1,480 feet*

*Mean annual precipitation: 30 to 50 inches*

*Mean annual air temperature: 45 to 52 degrees F*

*Frost-free period: 105 to 180 days*

*Farmland classification: Not prime farmland*

### Map Unit Composition

*Saco and similar soils: 80 percent*

*Minor components: 20 percent*

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

### Description of Saco

#### Setting

*Landform: Flood plains*

*Parent material: Sandy and/or coarse-loamy alluvium derived from granite, gneiss or schist*

#### Typical profile

*H1 - 0 to 5 inches: mucky silt loam*

*H2 - 5 to 12 inches: silt loam*

*H3 - 12 to 60 inches: silt loam*

#### Properties and qualities

*Slope: 0 to 2 percent*

*Depth to restrictive feature: More than 80 inches*

*Drainage class: Very poorly drained*

*Runoff class: Low*



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*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high  
(0.60 to 2.00 in/hr)

*Depth to water table:* About 0 to 6 inches

*Frequency of flooding:* NoneFrequent

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Very high (about 13.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6w

*Hydrologic Soil Group:* B/D

*Ecological site:* F144BY110ME - Broad Floodplain Riparian Complex

*Hydric soil rating:* Yes

### Minor Components

#### Limerick

*Percent of map unit:* 5 percent

*Landform:* Flood plains

*Hydric soil rating:* Yes

#### Rippowam

*Percent of map unit:* 5 percent

*Landform:* Flood plains

*Hydric soil rating:* Yes

#### Ossipee

*Percent of map unit:* 5 percent

*Landform:* Swamps

*Hydric soil rating:* Yes

#### Chocorua

*Percent of map unit:* 5 percent

*Landform:* Swamps

*Hydric soil rating:* Yes

## 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 supply, 0 to 60 inches:* 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, tal

*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):* Head slope, nose slope, side slope, crest, 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 supply, 0 to 60 inches:* Low (about 4.5 inches)

#### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* A

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*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):* Head slope, nose slope, side slope, crest, 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

## **26E—Windsor loamy sand, 15 to 60 percent slopes**

### **Map Unit Setting**

*National map unit symbol:* 2w2ws  
*Elevation:* 0 to 760 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:* 85 percent  
*Minor components:* 15 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



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### Typical profile

*Oe - 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:* 15 to 60 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Excessively drained  
*Runoff class:* Medium  
*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 supply, 0 to 60 inches:* Low (about 4.5 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7e  
*Hydrologic Soil Group:* A  
*Ecological site:* F144AY022MA - Dry Outwash  
*Hydric soil rating:* No

### Minor Components

#### Hinckley

*Percent of map unit:* 10 percent  
*Landform:* Outwash plains, eskers, kames, deltas  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Head slope, nose slope, side slope, crest, rise  
*Down-slope shape:* 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, tal  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

## 61D—Tunbridge-Lyman-Rock outcrop complex, 15 to 25 percent slopes

### Map Unit Setting

*National map unit symbol:* 2trpk  
*Elevation:* 520 to 1,970 feet  
*Mean annual precipitation:* 31 to 95 inches  
*Mean annual air temperature:* 27 to 52 degrees F  
*Frost-free period:* 60 to 160 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Tunbridge, very stony, and similar soils:* 40 percent  
*Lyman, very stony, and similar soils:* 29 percent  
*Rock outcrop:* 18 percent  
*Minor components:* 13 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Tunbridge, Very Stony

#### Setting

*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Mountaintop, mountainflank, crest, side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

#### Typical profile

*Oe - 0 to 3 inches:* moderately decomposed plant material  
*Oa - 3 to 5 inches:* highly decomposed plant material  
*E - 5 to 8 inches:* fine sandy loam  
*Bhs - 8 to 11 inches:* fine sandy loam  
*Bs - 11 to 26 inches:* fine sandy loam  
*BC - 26 to 28 inches:* fine sandy loam  
*R - 28 to 38 inches:* bedrock

#### Properties and qualities

*Slope:* 15 to 25 percent  
*Surface area covered with cobbles, stones or boulders:* 1.5 percent  
*Depth to restrictive feature:* 20 to 40 inches to lithic bedrock  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to high (0.00 to 14.03 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None



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*Available water supply, 0 to 60 inches:* Moderate (about 6.1 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* C

*Ecological site:* F144BY702ME - Shallow and Moderately-deep Till

*Hydric soil rating:* No

### Description of Lyman, Very Stony

#### Setting

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountaintop, mountainflank, side slope, crest

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

#### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material

*A - 1 to 3 inches:* loam

*E - 3 to 5 inches:* fine sandy loam

*Bhs - 5 to 7 inches:* loam

*Bs1 - 7 to 11 inches:* loam

*Bs2 - 11 to 18 inches:* channery loam

*R - 18 to 28 inches:* bedrock

#### Properties and qualities

*Slope:* 15 to 25 percent

*Surface area covered with cobbles, stones or boulders:* 1.5 percent

*Depth to restrictive feature:* 11 to 24 inches to lithic bedrock

*Drainage class:* Somewhat excessively drained

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to high (0.00 to 14.03 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Low (about 3.4 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* D

*Ecological site:* F144BY702ME - Shallow and Moderately-deep Till

*Hydric soil rating:* No

### Description of Rock Outcrop

#### Setting

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountaintop, mountainflank, crest, side slope

## Custom Soil Resource Report

*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Igneous and metamorphic rock

### Typical profile

*R - 0 to 10 inches:* bedrock

### Properties and qualities

*Slope:* 15 to 25 percent  
*Depth to restrictive feature:* 0 inches to lithic bedrock  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to very high  
(0.00 to 14.17 in/hr)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 8s  
*Hydric soil rating:* Unranked

### Minor Components

#### Peru, very stony

*Percent of map unit:* 6 percent  
*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Mountaintop, mountainflank, side slope, crest  
*Microfeatures of landform position:* Open depressions, open depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* No

#### Moosilauke, very stony

*Percent of map unit:* 4 percent  
*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Mountaintop, mountainflank, crest, side slope  
*Microfeatures of landform position:* Open depressions, open depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

#### Monadnock, very stony

*Percent of map unit:* 3 percent  
*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Mountaintop, mountainflank, crest, side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No



## 107—Rippowam-Saco complex

### Map Unit Setting

*National map unit symbol:* 9cyb  
*Elevation:* 50 to 1,540 feet  
*Mean annual precipitation:* 30 to 50 inches  
*Mean annual air temperature:* 45 to 52 degrees F  
*Frost-free period:* 105 to 180 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Rippowam and similar soils:* 40 percent  
*Saco and similar soils:* 35 percent  
*Minor components:* 25 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Rippowam

#### Setting

*Landform:* Flood plains  
*Parent material:* Sandy and/or coarse-loamy alluvium derived from granite, gneiss or schist

#### Typical profile

*H1 - 0 to 9 inches:* fine sandy loam  
*H2 - 9 to 30 inches:* fine sandy loam  
*H3 - 30 to 60 inches:* stratified loamy fine sand to very gravelly coarse sand

#### Properties and qualities

*Slope:* 0 to 3 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)  
*Depth to water table:* About 0 to 18 inches  
*Frequency of flooding:* NoneFrequent  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Moderate (about 6.2 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 4w  
*Hydrologic Soil Group:* A/D  
*Ecological site:* F144AY014CT - Wet Sandy Low Floodplain  
*Hydric soil rating:* Yes

**Description of Saco**

**Setting**

*Landform:* Flood plains

*Parent material:* Sandy and/or coarse-loamy alluvium derived from granite, gneiss or schist

**Typical profile**

*H1 - 0 to 5 inches:* mucky silt loam

*H2 - 5 to 12 inches:* silt loam

*H3 - 12 to 60 inches:* silt loam

**Properties and qualities**

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Very poorly drained

*Runoff class:* Low

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 2.00 in/hr)

*Depth to water table:* About 0 to 6 inches

*Frequency of flooding:* NoneFrequent

*Frequency of ponding:* None

*Available water supply, 0 to 60 inches:* Very high (about 13.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6w

*Hydrologic Soil Group:* B/D

*Ecological site:* F144AY016MA - Very Wet Low Floodplain

*Hydric soil rating:* Yes

**Minor Components**

**Occum**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

**Limerick**

*Percent of map unit:* 5 percent

*Landform:* Flood plains

*Hydric soil rating:* Yes

**Suncook**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

**Pootatuck**

*Percent of map unit:* 5 percent

*Hydric soil rating:* No

**Chocorua**

*Percent of map unit:* 3 percent

*Landform:* Swamps

*Hydric soil rating:* Yes

**Ossipee**

*Percent of map unit:* 2 percent

*Landform:* Swamps



## Custom Soil Resource Report

*Hydric soil rating:* Yes

### 142C—Monadnock fine sandy loam, 8 to 15 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2wlm4

*Elevation:* 390 to 1,640 feet

*Mean annual precipitation:* 31 to 95 inches

*Mean annual air temperature:* 27 to 55 degrees F

*Frost-free period:* 90 to 150 days

*Farmland classification:* Farmland of statewide importance

#### Map Unit Composition

*Monadnock and similar soils:* 81 percent

*Minor components:* 19 percent

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

#### Description of Monadnock

##### Setting

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist over sandy and gravelly supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

##### Typical profile

*Ap - 0 to 7 inches:* fine sandy loam

*Bs1 - 7 to 9 inches:* fine sandy loam

*Bs2 - 9 to 19 inches:* gravelly fine sandy loam

*BC - 19 to 22 inches:* gravelly fine sandy loam

*2C1 - 22 to 42 inches:* gravelly loamy sand

*2C2 - 42 to 65 inches:* gravelly loamy sand

##### Properties and qualities

*Slope:* 8 to 15 percent

*Depth to restrictive feature:* 15 to 30 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.03 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)

## Custom Soil Resource Report

*Available water supply, 0 to 60 inches:* Low (about 3.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 3e

*Hydrologic Soil Group:* B

*Ecological site:* F144BY505ME - Loamy over Sandy

*Hydric soil rating:* No

### Minor Components

#### Berkshire

*Percent of map unit:* 10 percent

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Hydric soil rating:* No

#### Skerry

*Percent of map unit:* 6 percent

*Landform:* Mountains, hills

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Microfeatures of landform position:* Closed depressions, closed depressions, open depressions, open depressions

*Down-slope shape:* Convex, concave

*Across-slope shape:* Linear, concave

*Hydric soil rating:* No

#### Cabot

*Percent of map unit:* 2 percent

*Landform:* Hills, mountains

*Landform position (two-dimensional):* Footslope, toeslope

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Microfeatures of landform position:* Closed depressions, open depressions, closed depressions, open depressions

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

#### Tunbridge

*Percent of map unit:* 1 percent

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Hydric soil rating:* No



## 143C—Monadnock fine sandy loam, 8 to 15 percent slopes, very stony

### Map Unit Setting

*National map unit symbol:* 2wlm7

*Elevation:* 360 to 1,670 feet

*Mean annual precipitation:* 31 to 95 inches

*Mean annual air temperature:* 27 to 55 degrees F

*Frost-free period:* 90 to 150 days

*Farmland classification:* Farmland of local importance

### Map Unit Composition

*Monadnock, very stony, and similar soils:* 79 percent

*Minor components:* 21 percent

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

### Description of Monadnock, Very Stony

#### Setting

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist over sandy and gravelly supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

#### Typical profile

*Oe - 0 to 3 inches:* moderately decomposed plant material

*E - 3 to 8 inches:* fine sandy loam

*Bs1 - 8 to 10 inches:* fine sandy loam

*Bs2 - 10 to 12 inches:* fine sandy loam

*Bs3 - 12 to 22 inches:* gravelly fine sandy loam

*BC - 22 to 25 inches:* gravelly fine sandy loam

*2C1 - 25 to 45 inches:* gravelly loamy sand

*2C2 - 45 to 65 inches:* gravelly loamy sand

#### Properties and qualities

*Slope:* 8 to 15 percent

*Surface area covered with cobbles, stones or boulders:* 1.1 percent

*Depth to restrictive feature:* 18 to 36 inches to strongly contrasting textural stratification

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.03 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

## Custom Soil Resource Report

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* B  
*Ecological site:* F144BY505ME - Loamy over Sandy  
*Hydric soil rating:* No

### Minor Components

#### Becket, very stony

*Percent of map unit:* 11 percent  
*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Skerry, very stony

*Percent of map unit:* 5 percent  
*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope  
*Microfeatures of landform position:* Closed depressions, closed depressions, open depressions, open depressions  
*Down-slope shape:* Convex, concave  
*Across-slope shape:* Linear, concave  
*Hydric soil rating:* No

#### Tunbridge, very stony

*Percent of map unit:* 4 percent  
*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Lyme, very stony

*Percent of map unit:* 1 percent  
*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope  
*Microfeatures of landform position:* Closed depressions, open depressions, closed depressions, open depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes



## 161E—Lyman-Tunbridge-Rock outcrop complex, 25 to 60 percent slopes

### Map Unit Setting

*National map unit symbol:* 2trpr  
*Elevation:* 460 to 2,490 feet  
*Mean annual precipitation:* 31 to 95 inches  
*Mean annual air temperature:* 27 to 55 degrees F  
*Frost-free period:* 60 to 160 days  
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Lyman, very stony, and similar soils:* 50 percent  
*Tunbridge, very stony, and similar soils:* 26 percent  
*Rock outcrop:* 12 percent  
*Minor components:* 12 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Lyman, Very Stony

#### Setting

*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Mountainflank, side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

#### Typical profile

*Oe - 0 to 1 inches:* moderately decomposed plant material  
*A - 1 to 3 inches:* loam  
*E - 3 to 5 inches:* fine sandy loam  
*Bhs - 5 to 7 inches:* loam  
*Bs1 - 7 to 11 inches:* loam  
*Bs2 - 11 to 18 inches:* channery loam  
*R - 18 to 28 inches:* bedrock

#### Properties and qualities

*Slope:* 25 to 60 percent  
*Surface area covered with cobbles, stones or boulders:* 1.5 percent  
*Depth to restrictive feature:* 11 to 24 inches to lithic bedrock  
*Drainage class:* Somewhat excessively drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to high (0.00 to 14.03 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 3.4 inches)

## Custom Soil Resource Report

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* D  
*Ecological site:* F143XY702ME - Shallow And Moderately Deep Till  
*Hydric soil rating:* No

### Description of Tunbridge, Very Stony

#### Setting

*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Mountainflank, side slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Parent material:* Loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist

#### Typical profile

*Oe - 0 to 3 inches:* moderately decomposed plant material  
*Oa - 3 to 5 inches:* highly decomposed plant material  
*E - 5 to 8 inches:* fine sandy loam  
*Bhs - 8 to 11 inches:* fine sandy loam  
*Bs - 11 to 26 inches:* fine sandy loam  
*BC - 26 to 28 inches:* fine sandy loam  
*R - 28 to 38 inches:* bedrock

#### Properties and qualities

*Slope:* 25 to 60 percent  
*Surface area covered with cobbles, stones or boulders:* 1.5 percent  
*Depth to restrictive feature:* 20 to 40 inches to lithic bedrock  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to high (0.00 to 14.03 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Moderate (about 6.1 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* C  
*Ecological site:* F143XY702ME - Shallow And Moderately Deep Till  
*Hydric soil rating:* No

### Description of Rock Outcrop

#### Setting

*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Backslope  
*Landform position (three-dimensional):* Mountainflank, free face, side slope, free face  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex



## Custom Soil Resource Report

*Parent material:* Igneous and metamorphic rock

### **Typical profile**

*R - 0 to 10 inches:* bedrock

### **Properties and qualities**

*Slope:* 25 to 60 percent

*Depth to restrictive feature:* 0 inches to lithic bedrock

*Capacity of the most limiting layer to transmit water (Ksat):* Very low to very high  
(0.00 to 14.17 in/hr)

### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 8s

*Hydric soil rating:* Unranked

### **Minor Components**

#### **Monadnock, very stony**

*Percent of map unit:* 7 percent

*Landform:* Hills, mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountainflank, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Hydric soil rating:* No

#### **Marlow, very stony**

*Percent of map unit:* 3 percent

*Landform:* Hills, mountains

*Landform position (two-dimensional):* Backslope

*Landform position (three-dimensional):* Mountainflank, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Hydric soil rating:* No

#### **Cabot, very stony**

*Percent of map unit:* 2 percent

*Landform:* Mountains, hills

*Landform position (two-dimensional):* Footslope, toeslope

*Landform position (three-dimensional):* Mountainflank, side slope

*Microfeatures of landform position:* Open depressions, open depressions

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

## 168B—Sunapee fine sandy loam, 3 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2trs5  
*Elevation:* 460 to 1,640 feet  
*Mean annual precipitation:* 31 to 95 inches  
*Mean annual air temperature:* 27 to 54 degrees F  
*Frost-free period:* 70 to 150 days  
*Farmland classification:* All areas are prime farmland

### Map Unit Composition

*Sunapee and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Sunapee

#### Setting

*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Mountainbase, interflue, base slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Parent material:* Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

#### Typical profile

*Ap - 0 to 8 inches:* fine sandy loam  
*Bs1 - 8 to 17 inches:* gravelly fine sandy loam  
*Bs2 - 17 to 26 inches:* gravelly fine sandy loam  
*C1 - 26 to 38 inches:* gravelly sandy loam  
*C2 - 38 to 65 inches:* gravelly sandy loam

#### Properties and qualities

*Slope:* 3 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.03 in/hr)  
*Depth to water table:* About 18 to 36 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Moderate (about 7.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified



Custom Soil Resource Report

*Land capability classification (nonirrigated): 2e*  
*Hydrologic Soil Group: C*  
*Hydric soil rating: No*

**Minor Components**

**Lyme**

*Percent of map unit: 5 percent*  
*Landform: Hills, mountains*  
*Landform position (two-dimensional): Foothlope, toeslope*  
*Landform position (three-dimensional): Mountainbase, interfluve, base slope*  
*Microfeatures of landform position: Closed depressions, closed depressions*  
*Down-slope shape: Concave*  
*Across-slope shape: Concave*  
*Hydric soil rating: Yes*

**Monadnock**

*Percent of map unit: 5 percent*  
*Landform: Hills, mountains*  
*Landform position (two-dimensional): Summit, shoulder, backslope*  
*Landform position (three-dimensional): Mountainbase, interfluve, base slope*  
*Microfeatures of landform position: Rises, rises*  
*Down-slope shape: Convex*  
*Across-slope shape: Convex*  
*Hydric soil rating: No*

**Moosilauke**

*Percent of map unit: 3 percent*  
*Landform: Mountains, hills*  
*Landform position (two-dimensional): Foothlope, toeslope*  
*Landform position (three-dimensional): Mountainbase, interfluve, base slope*  
*Microfeatures of landform position: Closed depressions, closed depressions*  
*Down-slope shape: Concave*  
*Across-slope shape: Concave*  
*Hydric soil rating: Yes*

**Berkshire**

*Percent of map unit: 2 percent*  
*Landform: Hills, mountains*  
*Landform position (two-dimensional): Summit, shoulder, backslope*  
*Landform position (three-dimensional): Mountainbase, interfluve, base slope*  
*Microfeatures of landform position: Rises, rises*  
*Down-slope shape: Convex*  
*Across-slope shape: Convex*  
*Hydric soil rating: No*

**169B—Sunapee fine sandy loam, 0 to 8 percent slopes, very stony**

**Map Unit Setting**

*National map unit symbol: 2trs7*  
*Elevation: 620 to 1,800 feet*

## Custom Soil Resource Report

*Mean annual precipitation:* 31 to 95 inches  
*Mean annual air temperature:* 27 to 54 degrees F  
*Frost-free period:* 70 to 160 days  
*Farmland classification:* Farmland of local importance

### Map Unit Composition

*Sunapee, very stony, and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Sunapee, Very Stony

#### Setting

*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Mountainbase, interfluve, base slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Linear  
*Parent material:* Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

#### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material  
*A - 2 to 3 inches:* fine sandy loam  
*E - 3 to 5 inches:* gravelly fine sandy loam  
*Bhs - 5 to 6 inches:* gravelly fine sandy loam  
*Bs1 - 6 to 8 inches:* gravelly fine sandy loam  
*Bs2 - 8 to 17 inches:* gravelly fine sandy loam  
*Bs3 - 17 to 26 inches:* gravelly fine sandy loam  
*C1 - 26 to 38 inches:* gravelly sandy loam  
*C2 - 38 to 65 inches:* gravelly sandy loam

#### Properties and qualities

*Slope:* 0 to 8 percent  
*Surface area covered with cobbles, stones or boulders:* 1.1 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.03 in/hr)  
*Depth to water table:* About 18 to 36 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Moderate (about 7.8 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 6s  
*Hydrologic Soil Group:* C  
*Ecological site:* F144BY501ME - Loamy Slope (Northern Hardwoods)  
*Hydric soil rating:* No

### Minor Components

#### Berkshire, very stony

*Percent of map unit:* 5 percent  
*Landform:* Hills, mountains



## Custom Soil Resource Report

*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Mountainbase, interfluve, base slope  
*Microfeatures of landform position:* Rises, rises  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

### **Lyme, very stony**

*Percent of map unit:* 4 percent  
*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Mountainbase, interfluve, base slope  
*Microfeatures of landform position:* Closed depressions, closed depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

### **Monadnock, very stony**

*Percent of map unit:* 4 percent  
*Landform:* Hills, mountains  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Mountainbase, interfluve, base slope  
*Microfeatures of landform position:* Rises, rises  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

### **Moosilauke, very stony**

*Percent of map unit:* 2 percent  
*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Footslope, toeslope  
*Landform position (three-dimensional):* Mountainbase, interfluve, base slope  
*Microfeatures of landform position:* Closed depressions, closed depressions  
*Down-slope shape:* Concave  
*Across-slope shape:* Concave  
*Hydric soil rating:* Yes

## **169C—Sunapee fine sandy loam, 8 to 15 percent slopes, very stony**

### **Map Unit Setting**

*National map unit symbol:* 2trs8  
*Elevation:* 690 to 2,200 feet  
*Mean annual precipitation:* 31 to 95 inches  
*Mean annual air temperature:* 27 to 52 degrees F  
*Frost-free period:* 90 to 160 days  
*Farmland classification:* Farmland of local importance

### **Map Unit Composition**

*Sunapee, very stony, and similar soils:* 85 percent  
*Minor components:* 15 percent

## Custom Soil Resource Report

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

### Description of Sunapee, Very Stony

#### Setting

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Parent material:* Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

#### Typical profile

*Oe - 0 to 2 inches:* moderately decomposed plant material

*A - 2 to 3 inches:* fine sandy loam

*E - 3 to 5 inches:* gravelly fine sandy loam

*Bhs - 5 to 6 inches:* gravelly fine sandy loam

*Bs1 - 6 to 8 inches:* gravelly fine sandy loam

*Bs2 - 8 to 17 inches:* gravelly fine sandy loam

*Bs3 - 17 to 26 inches:* gravelly fine sandy loam

*C1 - 26 to 38 inches:* gravelly sandy loam

*C2 - 38 to 65 inches:* gravelly sandy loam

#### Properties and qualities

*Slope:* 8 to 15 percent

*Surface area covered with cobbles, stones or boulders:* 1.1 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Moderately well drained

*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.03 in/hr)

*Depth to water table:* About 18 to 36 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* Moderate (about 7.8 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 6s

*Hydrologic Soil Group:* C

*Ecological site:* F143XY501ME - Loamy Slope

*Hydric soil rating:* No

### Minor Components

#### Lyme, very stony

*Percent of map unit:* 6 percent

*Landform:* Hills, mountains

*Landform position (two-dimensional):* Footslope, toeslope

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Microfeatures of landform position:* Closed depressions, open depressions, closed depressions, open depressions

*Down-slope shape:* Concave

*Across-slope shape:* Concave



Custom Soil Resource Report

*Hydric soil rating:* Yes

**Berkshire, very stony**

*Percent of map unit:* 5 percent

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Microfeatures of landform position:* Rises, rises

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Hydric soil rating:* No

**Monadnock, very stony**

*Percent of map unit:* 2 percent

*Landform:* Mountains, hills

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Microfeatures of landform position:* Rises, rises

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Hydric soil rating:* No

**Peru, very stony**

*Percent of map unit:* 2 percent

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Linear

*Hydric soil rating:* No

**347B—Lyme and Moosilauke soils, 0 to 5 percent slopes, very stony**

**Map Unit Setting**

*National map unit symbol:* 9czy

*Elevation:* 10 to 2,800 feet

*Mean annual precipitation:* 34 to 50 inches

*Mean annual air temperature:* 37 to 46 degrees F

*Frost-free period:* 80 to 160 days

*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Lyme and similar soils:* 40 percent

*Moosilauke and similar soils:* 35 percent

*Minor components:* 25 percent

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

## Description of Lyme

### Setting

*Landform:* Depressions  
*Parent material:* Till

### Typical profile

*H1 - 0 to 6 inches:* fine sandy loam  
*H2 - 6 to 25 inches:* loam  
*H3 - 25 to 60 inches:* fine sandy loam

### Properties and qualities

*Slope:* 0 to 5 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 6.00 in/hr)  
*Depth to water table:* About 0 to 18 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Moderate (about 6.9 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* A/D  
*Ecological site:* F144BY305ME - Wet Loamy Flat  
*Hydric soil rating:* Yes

## Description of Moosilauke

### Setting

*Landform:* Depressions  
*Parent material:* Glacial drift

### Typical profile

*H1 - 0 to 7 inches:* fine sandy loam  
*H2 - 7 to 20 inches:* loamy sand  
*H3 - 20 to 60 inches:* loamy sand

### Properties and qualities

*Slope:* 0 to 5 percent  
*Surface area covered with cobbles, stones or boulders:* 1.6 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Poorly drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)  
*Depth to water table:* About 0 to 18 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Low (about 5.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified



## Custom Soil Resource Report

*Land capability classification (nonirrigated): 7s*  
*Hydrologic Soil Group: A/D*  
*Ecological site: F144BY303ME - Acidic Swamp*  
*Hydric soil rating: Yes*

### Minor Components

#### **Monadnock**

*Percent of map unit: 5 percent*  
*Hydric soil rating: No*

#### **Ossipee**

*Percent of map unit: 5 percent*  
*Landform: Bogs*  
*Hydric soil rating: Yes*

#### **Naumburg**

*Percent of map unit: 5 percent*  
*Landform: Depressions*  
*Hydric soil rating: Yes*

#### **Pillsbury**

*Percent of map unit: 5 percent*  
*Landform: Depressions*  
*Hydric soil rating: Yes*

#### **Searsport**

*Percent of map unit: 5 percent*  
*Landform: Depressions*  
*Hydric soil rating: Yes*

### **365C—Monadnock and Berkshire soils, 8 to 15 percent slopes, extremely stony**

#### **Map Unit Setting**

*National map unit symbol: 2wln1*  
*Elevation: 590 to 1,770 feet*  
*Mean annual precipitation: 36 to 65 inches*  
*Mean annual air temperature: 36 to 52 degrees F*  
*Frost-free period: 90 to 150 days*  
*Farmland classification: Not prime farmland*

#### **Map Unit Composition**

*Berkshire, extremely stony, and similar soils: 46 percent*  
*Monadnock, extremely stony, and similar soils: 44 percent*  
*Minor components: 10 percent*  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

## Description of Berkshire, Extremely Stony

### Setting

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist

### Typical profile

*O<sub>i</sub> - 0 to 2 inches:* slightly decomposed plant material

*A - 2 to 4 inches:* fine sandy loam

*E - 4 to 5 inches:* fine sandy loam

*B<sub>s1</sub> - 5 to 7 inches:* fine sandy loam

*B<sub>s2</sub> - 7 to 13 inches:* fine sandy loam

*B<sub>s3</sub> - 13 to 21 inches:* fine sandy loam

*BC<sub>1</sub> - 21 to 28 inches:* fine sandy loam

*BC<sub>2</sub> - 28 to 33 inches:* fine sandy loam

*C - 33 to 65 inches:* fine sandy loam

### Properties and qualities

*Slope:* 8 to 15 percent

*Surface area covered with cobbles, stones or boulders:* 6.0 percent

*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (K<sub>sat</sub>):* Moderately low to high (0.14 to 14.17 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)

*Available water supply, 0 to 60 inches:* High (about 10.0 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 7s

*Hydrologic Soil Group:* B

*Hydric soil rating:* No

## Description of Monadnock, Extremely Stony

### Setting

*Landform:* Hills, mountains

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Parent material:* Loamy supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist over sandy and gravelly supraglacial meltout till derived from phyllite and/or granite and gneiss and/or mica schist



## Custom Soil Resource Report

### Typical profile

*Oe - 0 to 3 inches:* moderately decomposed plant material  
*E - 3 to 8 inches:* fine sandy loam  
*Bs1 - 8 to 10 inches:* fine sandy loam  
*Bs2 - 10 to 12 inches:* fine sandy loam  
*Bs3 - 12 to 22 inches:* gravelly fine sandy loam  
*BC - 22 to 25 inches:* gravelly fine sandy loam  
*2C1 - 25 to 45 inches:* gravelly loamy sand  
*2C2 - 45 to 65 inches:* gravelly loamy sand

### Properties and qualities

*Slope:* 8 to 15 percent  
*Surface area covered with cobbles, stones or boulders:* 6.0 percent  
*Depth to restrictive feature:* 18 to 36 inches to strongly contrasting textural stratification  
*Drainage class:* Well drained  
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to high (0.14 to 14.17 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Maximum salinity:* Nonsaline (0.0 to 1.9 mmhos/cm)  
*Available water supply, 0 to 60 inches:* Low (about 4.3 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 7s  
*Hydrologic Soil Group:* B  
*Hydric soil rating:* No

### Minor Components

#### Skerry, extremely stony

*Percent of map unit:* 5 percent  
*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope  
*Microfeatures of landform position:* Closed depressions, closed depressions, open depressions, open depressions  
*Down-slope shape:* Convex, concave  
*Across-slope shape:* Linear, concave  
*Hydric soil rating:* No

#### Lyman, extremely stony

*Percent of map unit:* 3 percent  
*Landform:* Mountains, hills  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope  
*Microfeatures of landform position:* Rises, rises  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

**Lyme, extremely stony**

*Percent of map unit:* 1 percent

*Landform:* Hills, mountains

*Landform position (two-dimensional):* Foothlope, toeslope

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Microfeatures of landform position:* Closed depressions, closed depressions, open depressions, open depressions

*Down-slope shape:* Concave

*Across-slope shape:* Concave

*Hydric soil rating:* Yes

**Becket, extremely stony**

*Percent of map unit:* 1 percent

*Landform:* Mountains, hills

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

*Landform position (three-dimensional):* Mountainflank, mountainbase, interfluve, nose slope, side slope

*Down-slope shape:* Convex

*Across-slope shape:* Convex

*Hydric soil rating:* No

**526B—Caesar loamy sand, 3 to 8 percent slopes**

**Map Unit Setting**

*National map unit symbol:* 9d13

*Elevation:* 150 to 1,200 feet

*Mean annual precipitation:* 30 to 50 inches

*Mean annual air temperature:* 37 to 46 degrees F

*Frost-free period:* 90 to 160 days

*Farmland classification:* Farmland of local importance

**Map Unit Composition**

*Caesar and similar soils:* 90 percent

*Minor components:* 10 percent

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

**Description of Caesar**

**Setting**

*Parent material:* Outwash

**Typical profile**

*H1 - 0 to 5 inches:* loamy sand

*H2 - 5 to 18 inches:* loamy sand

*H3 - 18 to 60 inches:* coarse sand

**Properties and qualities**

*Slope:* 3 to 8 percent



## Custom Soil Resource Report

*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Excessively drained  
*Runoff class:* Very low  
*Capacity of the most limiting layer to transmit water (Ksat):* Very high (20.00 to 99.90 in/hr)  
*Depth to water table:* More than 80 inches  
*Frequency of flooding:* None  
*Frequency of ponding:* None  
*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 4s  
*Hydrologic Soil Group:* A  
*Ecological site:* F144BY601ME - Dry Sand  
*Hydric soil rating:* No

### Minor Components

#### Windsor

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

#### Croghan

*Percent of map unit:* 5 percent  
*Hydric soil rating:* No

## 613B—Croghan loamy fine sand, 0 to 8 percent slopes

### Map Unit Setting

*National map unit symbol:* 2wqp1  
*Elevation:* 150 to 2,300 feet  
*Mean annual precipitation:* 40 to 55 inches  
*Mean annual air temperature:* 37 to 46 degrees F  
*Frost-free period:* 90 to 135 days  
*Farmland classification:* Farmland of local importance

### Map Unit Composition

*Croghan and similar soils:* 85 percent  
*Minor components:* 15 percent  
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Croghan

#### Setting

*Landform:* Outwash deltas  
*Landform position (two-dimensional):* Backslope, footslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Linear  
*Across-slope shape:* Linear  
*Parent material:* Sandy glaciofluvial deposits

## Custom Soil Resource Report

### Typical profile

*Ap - 0 to 7 inches:* loamy fine sand  
*Bs - 7 to 17 inches:* loamy fine sand  
*BC - 17 to 30 inches:* fine sand  
*C - 30 to 65 inches:* sand

### Properties and qualities

*Slope:* 0 to 8 percent  
*Depth to restrictive feature:* More than 80 inches  
*Drainage class:* Moderately well drained  
*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 18 to 30 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 supply, 0 to 60 inches:* Low (about 3.6 inches)

### Interpretive groups

*Land capability classification (irrigated):* None specified  
*Land capability classification (nonirrigated):* 2w  
*Hydrologic Soil Group:* A  
*Hydric soil rating:* No

### Minor Components

#### Adams

*Percent of map unit:* 5 percent  
*Landform:* Outwash deltas  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Naumburg

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

#### Colton

*Percent of map unit:* 3 percent  
*Landform:* Outwash deltas  
*Landform position (two-dimensional):* Summit, shoulder, backslope  
*Landform position (three-dimensional):* Base slope  
*Down-slope shape:* Convex  
*Across-slope shape:* Convex  
*Hydric soil rating:* No

#### Sheepscot

*Percent of map unit:* 2 percent  
*Landform:* Outwash deltas  
*Landform position (two-dimensional):* Backslope, footslope



## Custom Soil Resource Report

*Landform position (three-dimensional):* Tread  
*Down-slope shape:* Concave  
*Across-slope shape:* Linear  
*Hydric soil rating:* No

### **W—Water**

#### **Map Unit Composition**

*Water:* 100 percent

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

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## Appendix E – Photo Log



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 1: Looking northerly at proposed access to Structure 23.



Photograph No. 2: Looking southerly at proposed access to Structure 24.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 3: Looking southerly at proposed access to Structure 25.



Photograph No. 4: Looking southerly at proposed pad location for Structure 25.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



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



Photograph No. 6: Looking northerly at proposed access to Structure 27.

**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swansey, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



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



Photograph No. 8: Looking northerly at proposed access to Structure 28



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 9: Looking southerly at proposed access to Structure 29.



Photograph No. 10: Looking southwesterly at proposed access to Structure 30.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swansey, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 11: Looking southwesterly at proposed access to Structure 31 from Matthews Road.



Photograph No. 12: Looking southerly at proposed pad location adjacent to Structure 31. Wetland SW-41 will be timber matted.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 13: Looking southwesterly at proposed access to Structure 32.



Photograph No. 14: Looking westerly at proposed pad location at Structure 32.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 15: Looking northerly at proposed access and pad location for Structure 33.



Photograph No. 16: Looking southerly at proposed access to Structure 34.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 17: Looking northerly at proposed access and pad location adjacent to Structure 35.



Photograph No. 18: Looking southerly at proposed access to Structure 36.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 19: Looking northerly at proposed pad location for Structure 37.



Photograph No. 20: Looking northerly at proposed access and pad location for Structure 38.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 21: Looking southerly at proposed access to Structure 39.



Photograph No. 22: Looking southerly at proposed access to Structure 40.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 23: Looking southerly at proposed access to Structure 41.



Photograph No. 24: Looking southerly at proposed access to Structure 42.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 25: Looking southerly at proposed pad location for Structure 43 and proposed access to Structure 44.



Photograph No. 26: Looking northerly at proposed access and pad location adjacent to Structure 44.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swansey, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 27: Looking northerly at proposed access to Structure 44.



Photograph No. 28: Looking southerly at proposed access and pad location for Structure 45.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swansey, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 29: Looking southwesterly at proposed access to Structure 45 from Sawyers Crossing Road.



Photograph No. 30: Looking northeasterly at proposed access to Structure 55 and proposed pad location at Structure 56.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 31: Looking northeasterly at proposed access to Structure 56.



Photograph No. 32: Looking northeasterly at proposed access to Structure 57.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swansey, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 33: Looking southwesterly at proposed access to Structure 58.



Photograph No. 34: Looking northeasterly at proposed pad location at Structure 58.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 35: Looking southerly at proposed access and pad location for Structure 59.



Photograph No. 36: Looking northeasterly at proposed access to Structure 60.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 37: Looking southwesterly at proposed access to Structure 61.



Photograph No. 38: Looking northeasterly at proposed pad location at Structure 61.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 39: Looking westerly at proposed pad location for Structure 62.



Photograph No. 40: Looking northeasterly at proposed access to Structure 63 and pad location for Structure 64.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 41: Looking southwesterly at proposed access to Structure 65.



Photograph No. 42: Looking southwesterly at proposed access to Structure 66.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swansey, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 43: Looking southerly at proposed access to Structure 67.



Photograph No. 44: Looking southwesterly at proposed pad location at Structure 68.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 45: Looking southwesterly at proposed access to Structure 69.



Photograph No. 46: Looking southerly at proposed pad location at Structure 69.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swanzy, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 47: Looking southwesterly at proposed access to Structure 70.



Photograph No. 48: Looking southwesterly at proposed pad location at Structure 70.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swansey, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 49: Looking northeasterly at proposed pad location at Structures 70, 70A, 70B, & 71.



Photograph No. 50: Looking southeasterly at proposed pad location at Structure 71.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swansey, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 51: Looking northeasterly at proposed access to Structures 70, 70A, 70B, & 71.



Photograph No. 52: Looking southwesterly at proposed access to Structure 72.



**AoT PHOTO LOG**  
**A152 Transmission Line Structure Replacement Project**  
**Swansey, New Hampshire**  
**Photos Taken: October 22 & 25, 2021**



Photograph No. 53: Looking easterly at proposed pad location at Structure 72.



Photograph No. 54: Looking northeasterly at proposed access to Structure 72 from Pine Street.



## Appendix F – 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		
A152 Transmission Line Structure Replacement Project Project Name		
Existing A152 Right-of-Way Street Address		
Swanzey City/Town		03446 Zip Code
Multiple – see attached Tax Map/Lot Number		

B. APPLICANT/OWNER INFORMATION		
Jeremy First Name	Fennell Last Name	
Eversource Energy Organization		
13 Legends Drive Street Address		
Hooksett City/Town	New Hampshire State	03106 Zip Code
jeremy.fennell@eversource.com Email	603-634-3396 Telephone Number	

C. APPLICANT/OWNER AGENT INFORMATION		
Conor First Name	Madison Last Name	
GZA GeoEnvironmental, Inc. Organization		
5 Commerce Park North, Suite 201 Street Address		
Bedford City/Town	New Hampshire State	03110 Zip Code
Conor.Madison@gza.com Email	603-232-8784 Telephone Number	

D. WAIVER REQUESTS	
Env-Wq 1504.09 Rule Section Waiver Request	Stormwater Drainage Report; Drainage Area Plans; Hydrologic Soil Group Plans Name of Rule
<b>Reason for Waiver Request</b> 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 A152 Transmission Line structures. The proposed access and work pad improvements for continued transmission line maintenance work will not result in new impervious surfaces as defined in Env-Wq 1502.32. As a result, stormwater treatment practices are not proposed.	
<b>Waiver Timeline</b> Permanent	
<b>Proposed Alternative</b> 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.	
<b>Compliance with Env- WQ 1509.04</b> The project includes improved 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 in uplands, while maintaining existing flow paths, 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.  Best Management Practices will be utilized to protect wetlands from erosion, sedimentation, or other environmental degradation. In addition, gravel work pads will be restored using application of 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.	



E. SIGNATURES



Applicant/Owner, Jeremy Fennell, Eversource Energy

2/16/2022

Date



Applicant/Owner Agent, Conor Madison, GZA

2/16/2022

Date



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



7017 1450 0000 3946 3002

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Certified Mail Fee	\$ 3.75
<b>Extra Services &amp; Fees (check box, add fee as appropriate)</b>	
<input checked="" type="checkbox"/> Return Receipt (hardcopy)	\$ 3.05
<input type="checkbox"/> Return Receipt (electronic)	\$
<input type="checkbox"/> Certified Mail Restricted Delivery	\$
<input type="checkbox"/> Adult Signature Required	\$
<input type="checkbox"/> Adult Signature Restricted Delivery	\$
Postage	\$ 9.25
<b>Total Postage and Fees</b>	\$ 16.05
Sent To Ashuelot Local River Acty. Cncl	
Street and Apt. No., of PO Box No. 19 Spring Street	
City, State, ZIP+4® Shawnee, NH 03446	

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions



7017 1450 0000 3946 3019

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Certified Mail Fee	\$ 3.75
<b>Extra Services &amp; Fees (check box, add fee as appropriate)</b>	
<input checked="" type="checkbox"/> Return Receipt (hardcopy)	\$ 3.05
<input type="checkbox"/> Return Receipt (electronic)	\$
<input type="checkbox"/> Certified Mail Restricted Delivery	\$
<input type="checkbox"/> Adult Signature Required	\$
<input type="checkbox"/> Adult Signature Restricted Delivery	\$
Postage	\$ 9.25
<b>Total Postage and Fees</b>	\$ 16.05
Sent To Matthews, Bachler	
Street and Apt. No., of PO Box No. 620 Homestead Hwy	
City, State, ZIP+4® Shawnee, NH 03446	

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions





GZA GeoEnvironmental, Inc.



**Revised Plan Pages**

© 2022 - GZA GeoEnvironmental, Inc. P:\04\Jobs\01909099\04.01909999.00 - EE Siting Permitting 2019-2022\04.01909999.71 - A152 Transmission Line Structure and OPGW Replacement\Figures\MXD\A152 Act Notesheet 1 10-7.mxd, 3/28/2022, 12:50:27 PM, conor.madison

**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 WHERE REQUIRED.
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 ARE NOT INUNDATED, AS NECESSARY.
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 EVENTS.
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 UTILITY DESIGN.
2. JURISDICTIONAL WETLANDS WERE DELINEATED BY GZA IN 2016, 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 OCTOBER 2021.
3. GZA PERFORMED A WETLANDS FUNCTION AND VALUES ASSESSMENT IN ACCORDANCE WITH THE ACOE'S "HIGHWAY METHODOLOGY WORKBOOK SUPPLEMENT," SEPTEMBER 1999, IN 2016.
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 ACCORDANCE 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.

**NEW HAMPSHIRE FISH AND GAME AOT PERMIT CONDITIONS RELATED TO THREATENED AND ENDANGERED SPECIES**

1. IF SPOTTED, WOOD, OR BLANDING'S TURTLES ARE FOUND LAYING EGGS IN A WORK AREA, PLEASE CONTACT MELISSA DOPERALSKI (603-479-1129) OR JOSH MEGYESY (CELL 978-578-0802) FOR FURTHER INSTRUCTIONS.
2. PRIOR TO DAILY CONSTRUCTION ACTIVITIES, TIMBER MATTING SHALL 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 TURTLES, BLANDING'S TURTLE AND EASTERN HOGNOSE SNAKE.
3. OBSERVED SNAKES AND TURTLES SHALL BE MOVED OFF CONSTRUCTION ACCESS ROADS TO LIMIT AND PREVENT MORTALITY TO SNAKES AND TURTLES DURING CONSTRUCTION.
4. EROSION CONTROL MATTING, IF UTILIZED, SHALL CONSIST OF JUTE MATTING. MATTING WITH PLASTIC MESH SHALL BE AVOIDED TO LIMIT THE UNINTENTIONAL MORTALITY TO SNAKES.
5. AT THE CONCLUSION OF THE PROJECT, A SUMMARY REPORT OF ANY RARE SPECIES OBSERVATIONS SHALL BE PROVIDED TO THE NHFG NONGAME PROGRAM.
6. IMPACTS TO VERNAL POOLS AND POTENTIAL VERNAL POOLS SHALL BE AVOIDED.
7. ANY MORTALITY TO LISTED SPECIES SHALL BE IMMEDIATELY REPORTED TO THE NHFG NONGAME PROGRAM AND WILL BE DOCUMENTED, PHOTOGRAPHED, COLLECTED AND PRESERVED.
8. 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) 2 AND 3 FOR SPECS.
9. ALL OBSERVATIONS OF THREATENED OR ENDANGERED SPECIES SHALL BE REPORTED IMMEDIATELY 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 NHFGREVIEW@WILDLIFE.NH.GOV. EMAIL SUBJECT LINE: NHB21-3643, NHB21-3644, NHB21-3645, A152 TRANSMISSION LINE STRUCTURE REPLACEMENT PROJECT, WILDLIFE SPECIES OBSERVATION. PHOTOGRAPHS SHALL BE PROVIDED FOR VERIFICATION AS FEASIBLE.
10. THE NEW HAMPSHIRE FISH AND GAME DEPARTMENT SHALL HAVE ACCESS TO THE PROPERTY DURING THE TERM OF THE PERMIT.

**EROSION CONTROL NOTES:**

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 ACCOMPLISH THIS END.
4. ANY STRIPPED TOPSOIL SHALL BE STOCKPILED, WITHOUT COMPACTION, AND STABILIZED AGAINST EROSION, AS NECESSARY.
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.

<b>A152 TRANSMISSION LINE OPGW AND STRUCTURE REPLACEMENT PROJECT</b>  SWANZEY AND WINCHESTER NEW HAMPSHIRE		<b>NOTES</b>	
		PREPARED BY:  <b>GZA</b> GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: 
PROJ MGR: CEM	REVIEWED BY: TLT	CHECKED BY: DMZ	<b>SHEET</b>  <b>S1</b>
DESIGNED BY: MJD	DRAWN BY: MJD	SCALE:	
DATE: 03/28/2022	PROJECT NO: 04.0190999.71	REVISION NO.	

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.





## REPORT EASTERN HOGNOSE SNAKE OBSERVATIONS

Report sightings immediately to NHFG Wildlife Division at 603-271-2461 (M-F 8-4) or to NHFG Wildlife Biologist Melissa Doperalski 603-479-1129 (call or text) anytime.

*Please report promptly, noting specific location and date – Photographs strongly encouraged*

---

- Black, gray or patterned appearance
- Uprturned snout
- Adults are 2-3 ft. long
- May spread neck out or hiss
- May play dead if they feel threatened.
- Rarely bite – display is a defense strategy
- Can be found in a variety of habitats throughout the season





# PLEASE REPORT OBSERVATIONS OF RARE TURTLES

*The NH Fish & Game Department is requesting  
observations of the following turtle species*



## **Blanding's turtle**

(State Endangered)

Large, dark/black domed shell  
with lighter speckles.

Distinct yellow throat/chin.

Aquatic but often moves on land.



## **Spotted turtle**

(State Threatened)

Small, mostly aquatic with  
black or dark brown with  
yellow spots.

Fairly flat shell compared  
to Blanding's turtle.

Spots vary in color and  
number.

Report sightings immediately to NHFG Wildlife Division at 603-271-2461 (M-F 8-4) or to  
NHFG Wildlife Biologist Melissa Doperalski 603-479-1129 (cell) anytime.

*Please report promptly, noting specific location and date – Photographs strongly encouraged*



# Redaction Log

Total Number of Redactions in Document: 8

## Redaction Reasons by Page

Page	Reason	Description	Occurrences
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
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

# 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.	64(1) 65(1) 66(1) 67(1) 68(1) 69(1) 70(1) 71(1)