# Draft Environmental Impact Report

# WT-11 Transmission Right-of-Way Reliability Program (TRRP) Project

# Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, Ludlow, Massachusetts

**AUGUST 2025**

PREPARED FOR

**NSTAR Electric Company d/b/a**
**Eversource Energy**
**Westwood, Massachusetts**

PREPARED BY

**SWCA Environmental Consultants**

SWCA Project No. 70492

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August 7, 2025

Secretary Rebecca Tepper
Executive Office of Energy and Environmental Affairs
Attn: MEPA Unit
100 Cambridge Street, Suite 900
Boston, Massachusetts 02144

RE: Draft Environmental Impact Report
EEA No. 16570
Eversource Energy
WT-11 Transmission Right-of-way Reliability Program
Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, Ludlow, Massachusetts

Dear Secretary Tepper,

NSTAR Electric Company d/b/a Eversource Energy (Eversource or the Company) is submitting this Draft Environmental Impact Report (DEIR) for its WT-11 Transmission Right-of-Way Reliability Program (TRRP) Project (the Project). This DEIR has been prepared in response to the Massachusetts Environmental Policy Act (MEPA) Certificate on the Expanded Environmental Notification Form (EENF) that was issued on September 30, 2022.

The TRRP is a long-term transmission system reliability and resiliency program that increases the maintained width of the right-of-way (ROW) to up to 100 feet from the outermost conductors or the easement edge, whichever is closer. This program improves system reliability by reducing the number of tree fall-in risks and has proven to be an effective way to create a sustainable vegetative community that can safely coexist with the transmission lines. Eversource's long-term management objective is to manage these newly cleared areas as early succession habitat and encourage the growth of grasses, forbs, and shrubs. Controlling vegetation growth on its ROW through the implementation of this Project increases Eversource's ability to more reliably serve its electric customers as well as support recent local, state and Federal climate change and electrification policies that are aimed at addressing the adverse effects of climate change and eliminating reliance on fossil fuels by increasing the use of electric vehicles and electric heating applications.

The TRRP on ROW WT-11 extends approximately 29.3 miles from the Northfield Substation in Northfield, Massachusetts, south through the towns of Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, and Granby, to the Ludlow Substation in Ludlow, Massachusetts. The WT-11 ROW contains the 345-kilovolt (kV) overhead Line 354 for its entire length, the 345-kV Line 312 from the Northfield Substation to Erving Junction, and the 115-kV Line 1604 from the Northfield Substation to the Erving Substation. While Eversource has easement rights for a ROW width ranging from 300 to 500 feet, ROW WT-11 has a maintained width between 125–335 feet. The proposed TRRP will increase the maintained ROW width to an average width of 250-500 feet by cutting trees from within the currently unmaintained/forested portions of the ROW, which increases the distance between the overhead transmission lines and the adjacent trees.

The Project will improve the reliability of the entire regional electric grid connected to Lines 354, 312, and 1604. Power outages can disrupt communications, water, and transportation services. They can be especially dangerous if they occur during extreme cold or hot temperatures and for those who rely on electricity to operate essential medical devices. Decreasing the potential for power outages will have a positive impact on the stability of communities that depend on the electricity distributed by these transmission lines. This has become increasingly important over the last several years as severe weather events resulting in extended outages have become more common. Eversource already has implemented the TRRP in its Eastern Massachusetts service territory (and across its New Hampshire and Connecticut service territories) and plans to implement the TRRP along all its transmission ROWs in its Western Massachusetts service territory over the next 5 to 7 years.

Should you have any questions regarding the materials submitted herein, please do not hesitate to contact me at (508) 233-8769 or Rebecca.weissman@swca.com, or Jonathan Roberge with Eversource at (860) 665-6327 or jonathan.roberge@eversource.com.

Very truly yours,
SWCA Environmental



Rebecca Weissman, PWS
Strategic Growth Director – Northeast

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# MEPA CERTIFICATE ON THE EXPANDED ENVIRONMENTAL NOTIFICATION FORM

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*Executive Office of Energy and Environmental Affairs*
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September 30, 2022

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

| | |
|---|---|
| PROJECT NAME | : WT-11 Transmission Right-of Way Reliability Project (TRRP) |
| PROJECT MUNICIPALITY | : Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, Ludlow |
| PROJECT WATERSHED | : Connecticut River, Millers River, and Chicopee River |
| EEA NUMBER | : 16567 (WT-02) and 16570 (WT-11) |
| PROJECT PROPONENT | : NSTAR Electric Company d/b/a Eversource Energy |
| DATE NOTICED IN MONITOR | : June 24, 2022 |

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Section 11.06 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Expanded Environmental Notification Form (EENF) and hereby determine that this project **requires** the preparation of a Draft Environmental Impact Report (DEIR). Among other items, the DEIR should provide a complete alternatives analysis that provides full justification for dismissing the No Build alternative, and also describes one or more "Reduced Build" alternatives to avoid or minimize impacts to environmental resources and the extent of tree clearing. A full description of mitigation measures, in the event impacts cannot be avoided or minimized, should be provided. As an adequate alternatives analysis is a central component of the MEPA review process, the request to file a Single EIR is denied.

Project Description

As described in the EENF, the project consists of tree removal within the Proponent's existing WT-11 right-of-way (ROW) which extends ±29.3 miles from the substation in the Town of Northfield through the Towns of Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, and Granby to the substation in Ludlow. The WT-11 ROW contains a 345-kilovolt (kV) overhead transmission line (Line 354) and is 300 feet wide with an existing maintained width of approximately 125 feet (though this cleared width is variable along the length of the WT-011 ROW).

The project will increase the maintained ROW width to up to 200 feet (increase of approximately 75 feet on average from existing cleared width) by cutting trees from within the currently unmaintained/forested portions of the ROW; this will increase the distance between the overhead transmission lines and adjacent trees. The maintained width of the ROW will increase to the edge of the Proponent's easement or 100 feet from the outermost conductor, whichever is closer. The EENF describes tree clearing in several ways that can be confusing and comments noted this. The DEIR should be clear and consistent in descriptions about the area to be cleared.[1] The Proponent will maintain the newly cleared areas as early successional habitat and encourage the growth of grasses, forbs, and shrubs. The EENF maintains that tall-growing trees located in electric transmission ROWs pose a risk to the safe operation of the system, which can result in widespread electric power outages or other public safety issues. The project is proposed to minimize risk to public safety, enhance reliability, and improve system performance during severe weather events.

Project Corridor

The ±1,065-acre project corridor contains the existing WT-11 ROW and/or easements owned by the Proponent between the substation in Northfield through the towns of Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, and Granby, to the substation in Ludlow. The cleared areas within the existing ROW is routinely managed by the Proponent consistent with vegetation management standards for overhead transmission lines as outlined in its Vegetation Management Plan (VMP). The project area is ±29.3 linear miles within this ROW; the ROW contains Line 354, which is a 345- kV overhead transmission line. Conditions within the project area consist of upland and wetland areas, including streams, with generally shrubby and herbaceous vegetation communities. Mature woody vegetation exists along the edges of the corridor. Land use adjacent to or within the project area includes agricultural, lower-density residential, and several land conservation areas.

The project corridor crosses Outstanding Resource Waters (ORWs) including Nurse Brook, Dean Brook, Amethyst Brook, Higher Brook, two public water supply watersheds (Atkins Reservoir Watershed in Shutesbury and Ludlow Reservoir Watershed in Belchertown and Ludlow), and certified vernal pools (CVPs).[2] The ROW is also within a Zone II wellhead protection area in Amherst and Belchertown. It contains Bordering Vegetated Wetlands (BVW), Isolated Vegetated Wetlands (IVW), Inland Bank, Land Under Water (LUW), Bordering Land Subject to Flooding (BLSF), Riverfront Area (RFA), and associated buffer zones. According to the Federal Emergency Management Act (FEMA) Flood Insurance Rate Maps (FIRMs), the project corridor includes nine areas mapped as areas inundated during a 100-year storm. The project corridor crosses six areas (111.6 acres) of Priority Habitat of Rare Species identified in the 15th Edition of the Massachusetts Natural Heritage Atlas. The site contains several historic and archaeological sites previously recorded in the Massachusetts Historical Commission's (MHC) Inventory of Historic and Archaeological Assets of the Commonwealth.

The project corridor crosses two Environmental Justice (EJ) populations, one in Wendell characterized by Income and one in Amherst characterized by Minority, and is within one mile of two EJ populations in Amherst designated as Minority and Minority and Income. As described below, the

[1] Comments from PVPC state that a passage at the beginning of the EENF and in Attachment 8, Section 2.1, indicates that clearing in the right of way would only be up to 200 feet. In contrast, Attachment 8, Section 1.3, indicates that clearing could be to the limits of the 300-foot right of way.

[2] The project confirmed the presence of 20 vernal pools in the towns of Erving, Montague, Leverett, Shutesbury, Pelham, Granby, and Ludlow. Only one pool is certified.

EENF identified the "Designated Geographic Area" (DGA) for the project as 1 mile around EJ populations and included a review of potential impacts and benefits to EJ populations within this DGA; the EENF also describes public outreach efforts undertaken to date.

Environmental Impacts and Mitigation

According to the EENF and supplemented by information circulated by the Proponent on August 5, 2022[3], potential environmental impacts associated with the project include the alteration of ±381 acres of land consisting of 371 acres of permanent impacts associated with tree clearing and 10 acres of temporary impacts associated with use of construction mats. Potential impacts to wetland resource areas are listed in the table below.

| Wetland Resource Area | Temporary Construction Mat square feet/acre | Permanent Wetland Conversion sf/acre | Total Impact sf/acre |
|---|---|---|---|
| BVW | 365,336 / 8.4 | 1,494,916 / 34.4 | 1,860,252 / 42.8 |
| IVW | 10,847/0.25 | 86,038 / 2 | 96,885 /2.25 |
| BLSF | 64,978 / 1.49 | 364,858 / 8.38 | 429,836 / 9.87 |
| RFA | 84,579 / 1.94 | 1,484,916 / 34.09 | 1,569,495 / 36.03 |
| Bank | 560 linear feet (lf) | 18,073 lf | 18,633 lf |

The project will permanently convert 20,952 square feet (ft) of CVPs, which are also ORWs, from forested to scrub-shrub communities. The project will result in 111.6 acres of permanent tree clearing in priority habitat of state-listed rare species. Greenhouse Gas (GHG) emissions and other air pollutants are associated with the clearing of trees and loss of carbon sequestration.

Measures to avoid, minimize, and mitigate project impacts include use of existing access roads and other improved surfaces by vehicles and equipment to the maximum extent practicable; use of temporary construction mats where crossing wetlands or water courses is unavoidable; use of low-impact tree clearing methods that incorporate a variety of approaches to minimize site disturbance, including clearing by hand in certain sensitive areas where appropriate; use of erosion and sedimentation controls and other best management practices (BMPs) during construction; restoration of any disturbed areas to existing grades which will be allowed to revegetate with compatible species; and restoration of temporarily impacted wetland resources to pre-construction conditions. No tree stumping (no root removal) will be conducted. BMPs will be implemented to avoid impacting areas of archaeological sensitivity including excavation or grading; no tree felling on stone walls, cellar holes, or other surface features, and no stockpiling of brush or storing of equipment. Protection measures, including habitat enhancements and time-of-year (TOY) restrictions, are being developed with the Massachusetts Division Fisheries and Wildlife (DFW) Natural Heritage and Endangered Species Program (NHESP) to minimize impacts to state-listed species. The Proponent intends to provide mitigation through a monetary contribution towards the eastern box turtle conservation fund, where minimization measures are not sufficient to avoid a potential Take. In addition, a compensatory mitigation plan will be developed in consultation with the Massachusetts Department of Environmental Protection (MassDEP) and the eleven local conservation commissions to mitigate for permanent wetland conversion and to form the conditions for a 401 Water Quality Certification (WQC) to be issued by MassDEP. A more

[3] Email from SWCA Environmental Consultants, dated August 5, 2022.

comprehensive discussion of mitigation measures, including for the extensive tree clearing proposed by the project, should be provided in the DEIR.

Jurisdiction and Permitting

The project is undergoing MEPA review and is subject to a mandatory EIR pursuant to 301 CMR 11.03(1)(a)1. and 301 CMR 11.03(3)(a)1.a. & b. of the MEPA regulations because it requires Agency Actions and will result in the alteration of 50 or more acres of land, one or more acres of BVW, and ten or more acres of any other wetland, respectively. Additionally, the project exceeds the Environmental Notification Form (ENF) threshold at 301 CMR 11.03(2)(b)(2) for greater than two acres of disturbance of designated priority habitat. The project requires a WQC from MassDEP and review by NHESP. The project may require an Access Permit from the Massachusetts Department of Transportation (MassDOT). The project is subject to review under the May 2010 MEPA GHG Emissions Policy and Protocol (GHG Policy).

The project requires Orders of Conditions from the Northfield, Erving, Wendell, Montague, Leverette, Shutesbury, Pelham, Belchertown, Amherst, Granby, and Ludlow Conservation Commissions (or in the case of an appeal, a Superseding Order of Conditions from MassDEP); a Section 404 General Permit from the U.S. Army Corps of Engineers (USACE); a National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) from the U.S. Environmental Protection Agency (EPA); Section 7 clearance renewal from the U.S. Fish and Wildlife Service; and review by MHC acting as the State Historic Preservation Officer (SHPO) pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800).

The project is not receiving Financial Assistance from the Commonwealth. Therefore, MEPA jurisdiction is limited to those aspects of the project that are within the subject matter of any required or potentially required Agency Actions and that may cause Damage to the Environment, as defined in the MEPA regulations.

Segmentation

The MEPA regulations include provisions (301 CMR 11.01 (2)(c)) to ensure that a project is not phased or segmented to evade, defer or curtail MEPA review. In determining whether a project is subject to MEPA jurisdiction or meets or exceeds any review thresholds, and during MEPA review, the Proponent, any Participating Agency, and the Secretary shall consider the entirety of the project, including any likely future Expansion, and not separate phases or segments thereof. The Proponent, any Participating Agency, and the Secretary must consider all circumstances as to "whether various work or activities constitute one Project, including but not limited to: whether the work or activities, taken together, comprise a common plan or independent undertakings, regardless of whether there is more than one Proponent; any time interval between the work or activities; and whether the environmental impacts caused by the work or activities are separable or cumulative."

The EENF states that the Proponent plans to conduct Transmission Right-of-Way Reliability Program (TRRP) along all of its transmission ROWs in its western Massachusetts service territory over the next 5-7 years. The Proponent indicates that it intends to submit individual ROW segments for MEPA review as plans and designs are developed. The first such segment (WT-02) was previously reviewed as EEA #16567. While each segment is anticipated to exceed mandatory EIR thresholds and undergo full MEPA review, the underlying purpose and need of each segment appear related, and all

segments are physically connected as part of a common transmissions ROW corridor owned by the Proponent. Specific design details, including impact calculations, however, may be unique to each segment and not available for review until later phases. In consideration of the relatedness of the multiple segment projects to be proposed (and already proposed) by the Proponent, and to enable review of the cumulative impacts of all such projects, I am hereby directing the Proponent to include, as part of each project filed with MEPA, a conceptual overview of impacts for the entirety of the TRRP effort along all of the Proponent's transmission ROWs in its western Massachusetts service territory. This overview shall be included with the DEIR filed for the first ROW project (EEA #16567) (Certificate issued on July 15, 2022), and shall be updated with each subsequent filing, including the DEIR to be filed for the project reviewed herein. The EEA numbers assigned to each project component shall be related to one another, and all related EEA numbers shall appear on the first page of each Certificate issued for this series of projects. At the Proponent's option, it may also propose a Special Review Procedure (SRP) with the MEPA Office, which would consolidate project numbering under one EEA number and set forth rules for review of future segments. As directed in the Scope below, the DEIR should include a conceptual overview of impacts and a methodology for tracking cumulative impacts in the western Massachusetts region. The Proponent should consider a common mitigation framework, particularly for tree removal, that could be applied across all ROW segments covered by the Western Massachusetts TRRP effort.

Request for Single EIR

The MEPA regulations at 301 CMR 11.06(8) indicate that a Single EIR may be allowed provided I find that the EENF:

a) describes and analyzes all aspects of the project and all feasible alternatives, regardless of any jurisdictional or other limitation that may apply to the Scope;
b) provides a detailed baseline in relation to which potential environmental impacts and mitigation measures can be assessed; and,
c) demonstrates that the planning and design of the project use all feasible means to avoid potential environmental impacts.

For any Project for which an EIR is required in accordance with 301 CMR 11.06(7)(b), I must also find that the EENF:

d) describes and analyzes all aspects of the Project that may affect Environmental Justice Populations located in whole or in part within the Designated Geographic Area around the Project; describes measures taken to provide meaningful opportunities for public involvement by Environmental Justice Populations prior to filing the expanded ENF, including any changes made to the Project to address concerns raised by or on behalf of Environmental Justice Populations; and provides a detailed baseline in relation to any existing unfair or inequitable Environmental Burden and related public health consequences impacting Environmental Justice Populations in accordance with 301 CMR 11.07(6)(n)1.

Consistent with this request, the EENF was subject to an extended comment period under 301 CMR 11.05(8).

Review of the EENF

The EENF provides a description of existing and proposed conditions; preliminary project plans; a limited analysis of alternatives; an assessment of impacts; a spill prevention and control plan; and a discussion of the project's compliance with the MEPA Greenhouse Gas (GHG) Policy. It also included a description of measures taken to enhance public involvement by EJ populations and a baseline assessment of any existing unfair or inequitable Environmental Burden and related public health consequences impacting EJ Populations in accordance with 301 CMR 11.07(6)(n)1. Consistent with the MEPA Interim Protocol on Climate Change Adaptation and Resiliency, the EENF contained an output report from the Climate Resilience Design Standards Tool prepared by the Resilient Massachusetts Action Team (RMAT) (the "MA Resilience Design Tool"),[4] together with information on climate resilience strategies to be undertaken by the project.

I received over 339 comment letters from legislators, elected officials, residents, organizations, agencies, and concerned citizens across the Commonwealth. Many commenters requested additional information regarding the purpose and need for the project, the need for additional alternatives and more information on mitigation including the possibility of protecting other forested areas. Commenters expressed concern for endangered species and wildlife habitat, sensitive wetland areas including drinking water supplies and cold water fisheries, and the future use of herbicides on the newly cut areas. Many commenters cited concern for protected open spaces crossed by the ROW, many of which are a refuge for residents in the summer months during periods of high temperatures.

Two 30-day extensions of the comment period were granted at the request of the Proponent. The first was granted for the Proponent to revise maps and impact tables following a GIS error in calculating the area to be cleared. The second extension was to allow for additional public review of the EENF and revisions. The extended comment period closed on September 23, 2022.

*Alternatives Analysis*

The EENF asserts that the Proponent must maintain a minimum vegetation clearance distance (MVCD) to protect the electric transmission infrastructure from trees that may fall into the ROW in accordance with Federal Energy Regulatory Commission (FERC) standards[5]. The Proponent has a routine, cyclical VMP that focuses on removing tall growing, non-compatible woody species within already cleared portions of the ROW. The VMP seeks to ensure that the woody species do not grow or fall into the MVCD, and, in turn, to maintain compliance with FERC regulations to minimize the risk to public safety and ensure reliability. The EENF notes that over the last several years severe weather events resulting in extended outages have become more common as trees outside the MVCD fall into the powerlines during storm events. Power outages can disrupt communications, water, and transportation services throughout the region and can be dangerous if they occur during extreme temperatures.

According to the EENF, the project purpose is to remove non-compatible woody vegetation within 100 feet of the outside conductor (outermost wire on the transmission line), or to the edge of the Proponent's easement to maintain the horizontal clearance between vegetation and the overhead transmission lines and thereby minimize the risk of tree falls that could result in power outages or safety hazards. In addition to the Preferred Alternative (as described herein), the EENF only includes an

[4] https://resilientma.org/rmat_home/designstandards/
[5] https://www.ferc.gov/sites/default/files/2020-04/fac-003-4.pdf

analysis of the No Build Alternative, which would leave the project corridor in its existing state without tree removal in the unmaintained/forested portions of the ROW. According to the EENF, while this alternative would not result in significant additional environmental impacts to the project area, it would not address the project goal of minimizing risks to the system associated with trees coming into contact with electric facilities, as well as risks from power outages. The EENF asserts that reliance on the existing system is at higher risk due to the increasing severity of storms in recent years which increases the potential for nearby trees to interfere with power lines. Extended power outages could occur from time-consuming distribution transfer switching and dangerous transmission line repairs necessary to restore the electric supply. As such, the No Build Alternative was not considered viable.

While the need for resiliency from power outages is generally described in the EENF, public comments note that the EENF does not fully justify dismissing the No Build Alternative, as there is no factual evidence or documentation to show that interference with power lines is an active problem that requires ±371 acres of tree clearing. As noted above, the Proponent has indicated that additional clearing over multiple additional lines will be proposed as part of future filings, and a prior filing proposes clearing in the WT-02 ROW. The DEIR should provide additional information to justify the purpose and need of the project and explain why ROW clearing of such an expansive scale is deemed necessary to address those goals. The DEIR should continue to carry the No Build alternative until such justification is provided. Any prior studies or evaluations that have been conducted with regard to the frequency or severity of power outages due to tree damage should be attached to the DEIR. The DEIR should also provide a full explanation of federal or state regulatory requirements that govern ROW clearing for electric utilities.

The EENF does not describe any alternatives that consider reduced or varying tree clearing widths or a scenario that would avoid or reduce clearing within sensitive environmental resource areas such as wetland resource areas, ORWs, vernal pools, and rare species habitat. Public comments also note that site plans in the EENF do not indicate the height of the lines and consideration has not been given to topography such that transmission lines may be higher than the existing trees. The EENF indicates that the Preferred Alternative will best address the identified need and will improve transmission system reliability. As stated in the Scope, the DEIR should evaluate "Reduced Build" alternatives that avoid or minimize environmental impacts.

*Environmental Justice*

As noted above, the project site is located within two Environmental Justice (EJ) populations, one in Wendell characterized by Income and one in Amherst characterized by Minority, and within one mile of two additional EJ populations characterized by Minority and Minority and Income (also in Amherst). The site is located within five miles of 36 EJ populations characterized by Minority, Income, and Minority and Income. Within the census tracts containing the above EJ populations within 1 mile of the project site, the following languages are identified as those spoken by 5% of more of residents who also identify as not speaking English very well: Chinese. The corresponding languages identified for a 5 mile radius around the project site are as follows: Chinese, Spanish or Spanish Creole, and Portuguese or Portuguese Creole.

Effective January 1, 2022, all new projects in the DGA (as defined in 301 CMR 11.02, as amended) around EJ populations are subject to new requirements imposed by Chapter 8 of the Acts of 2021: *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* (the "Climate

Roadmap Map") and amended MEPA regulations at 301 CMR 11.00.[6] Two related MEPA protocols – the MEPA Public Involvement Protocol for Environmental Justice Populations (the "MEPA EJ Public Involvement Protocol") and MEPA Interim Protocol for Analysis of project Impacts on Environmental Justice Populations (the "MEPA Interim Protocol for Analysis of EJ Impacts") – are also in effect for new projects filed on or after January 1, 2022.[7] Under the new regulations and protocols, all projects located in a DGA around one or more EJ populations must take steps to enhance public involvement opportunities for EJ populations and must submit analysis of impacts to such EJ populations in the form of an EIR.

The EENF describes public involvement activities conducted prior to filing, including advance notification of the project circulated to a list of community-based organizations (CBOs) and tribes/indigenous organizations (the "EJ Reference List") provided by the MEPA Office in consultation with the EEA EJ Director. The EENF indicates that no additional CBOs, tribes/indigenous, or other EJ community individuals or entities were identified during the outreach program that would require continued notices during the course of MEPA review. Circulated information included the EJ Screening Form, including a copy translated into traditional and simplified Chinese, and information on ways to request additional information or a community meeting including language interpretation. The EENF identified additional public involvement conducted prior to filing the EENF including a "pop-up" event at a community park in the Town of Wendell. A copy of the EENF and supporting documentation, as well as the MEPA remote consultation meeting notice, were distributed to the EJ Reference List.

Prior to the commencement of work, the Proponent will contact municipal officials within the project area to advise of the upcoming activities and provisions for mitigation. Site visits with landowners and abutting residents will be offered. Additional pop-up events and open houses (in public and virtual) will be offered prior to the commencement of work to inform the EJ community and abutting landowners/residents along the corridors in each municipality to provide up-to-date information on the project. In addition, door-to-door activities will continue throughout the project life cycle, advising abutting residents to the corridor and those identified within the EJ community of the phases of work. Communications tools, such as a website, hotline, and email portal will be established to allow for direct communications from affected stakeholders to the Proponent to allow for quick mitigation of issues. Additionally, the public will have the opportunity to participate in the regulatory process as the project proceeds to Conservation Commission and MassDEP permitting. While the Proponent appears to have robust plans for future outreach, comment letters received from the public indicate a need for broader outreach, including to EJ populations, during the remainder of the MEPA review process. The Proponent should conduct further public engagement activities prior to filing the DEIR as outlined in the Scope.

The EENF contains a baseline assessment of existing unfair or inequitable Environmental Burden and related public health consequences impacting EJ Populations in accordance with 301 CMR 11.07(6)(n)1 and the MEPA Interim Protocol for Analysis of EJ Impacts. The EENF indicates that "vulnerable health EJ criteria" for municipalities located within one mile of the project area were identified using the Massachusetts Department of Public Health (DPH) EJ Tool; this term is defined in the DPH EJ Tool to include any one of four environmentally related health indicators that are measured

[6] MEPA regulations have been amended to implement Sections 55-60 of the Climate Roadmap Act and took effect on December 24, 2021. More information is available at https://www.mass.gov/service-details/information-about-upcoming-regulatory-updates.
[7] Available at https://www.mass.gov/service-details/eea-policies-and-guidance.

to be 110% above statewide rates based on a five-year rolling average.[8] Within the project's DGA, the following "vulnerable heath EJ criteria" were exhibited for the following municipalities[9]:

- Northfield: No vulnerable health EJ criteria are met
- Erving: No vulnerable health EJ criteria are met
- Wendell: Childhood blood lead criterion is met for year ranges: 2012-2016 and 2015-2019 (most current data range). Due to the low number of cases the rate is considered unstable and therefore unreliable.
- Montague: Heart attack criterion are met for year ranges 2009-2013, 2010-2014, 2011-2015, 2012- 2016, and 2013-2017 (most current data range). Childhood blood lead criterion are met for year ranges 2012-2016, 2013-2017, 2014- 2018, and 2015-2019 (most current data range).
- Leverett: No vulnerable health EJ criteria are met.
- Shutesbury: No vulnerable health EJ criteria are met.
- Pelham: No vulnerable health EJ criteria are met.
- Belchertown: No vulnerable health EJ criteria are met.
- Amherst: Childhood blood lead criterion are met for year range 2015-2019 (most current data range).
- Granby: No vulnerable health EJ criteria are met.
- Ludlow: No vulnerable health EJ criteria are met.

The EENF does not include a review of the mapping layers available in the DPH EJ Tool to identify sources of potential pollution existing within the identified EJ population. The DEIR should provide an updated analysis of baseline conditions within the identified EJ populations within the project DGA as outlined in the Scope.

In addition to the baseline assessment of existing burdens impacting EJ populations, the EENF includes an analysis of the project's potential impacts on the identified EJ populations. The EENF does not conclude whether or not there is an existing "unfair or inequitable" burden; however, it asserts that the project will not result in disproportionate adverse effects on the EJ population. In particular, the EENF indicates that the project will provide environmental benefits to the adjacent EJ population by strengthening the electric system associated with Line 354 and decreasing the potential for power outages and disruption to communications, water and transportation services. The EENF asserts that the project will limit construction period activities to areas within the ROW and plans to minimize short-term construction-phase impacts through the use of BMPs. The project is anticipated to create varying levels of construction noise; however, work will take place only during daylight hours with vehicles equipped with mufflers. It will not generate a significant increase in truck traffic to and from the project corridor. As discussed in the Climate Change section below, the project has a high exposure and risk rating based on the project's location for extreme precipitation (riverine flooding) and extreme heat. The project plans to engage in large-scale tree removal along the entirety of the WT-011 line. The implications for GHG emissions and heat island effects should continue to be analyzed as set forth in the Climate Change Scope below. To the extent tree clearing will affect adjacent EJ populations with

[8] See https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html. Four vulnerable health EJ criteria are tracked in the DPH EJ Viewer.
[9] Only Amherst and Wendell are identified as having EJ populations located within 1-mile the project. There are no EJ Populations in the towns of Northfield, Erving, Leverett, Shutesbury, Pelham, Belchertown, and Granby.

heightened vulnerabilities as shown by the DPH EJ Tool or EPA EJ Screen, specific mitigation should be considered.

*Land Alteration*

Tree clearing will permanently convert 371 acres of forested land to successional scrub-shrub habitat; this includes approximately 34 acres of BVW and 44 acres of other wetlands (i.e., IVW, BLSF, and RFA). Further, the placement of construction mats to support equipment through wetlands during tree clearing activities will temporarily impact approximately 8 acres of BVW and 4 acres of other wetlands.

Within the currently forested portion of the ROW that the Proponent proposes to clear, all vegetation with the capability to grow to a mature height of 25 feet or greater will be removed. However, within this area, due to the nature of the work (i.e., large land clearing equipment cutting and removing large trees), it is likely that much of the non-target vegetation will also be cut or in some way impacted. These newly cleared areas will develop into and be maintained as managed ROW dominated by low-growing herbaceous and woody shrub cover. The EENF states that below ground portions of trees and shrubs will be left in place so as not to compromise soil stability. The EENF contains a table identifying the 101 different soil map units crossed by the project. Included in the list are over 40 soil types where the erosion potential is described as severe where erosion is very likely and erosion control measures, including revegetation of bare areas, are advised.[10] The DEIR should provide greater detail regarding proposed mitigation to prevent erosion and stabilize soils in these areas. Further analysis of land alteration impacts, including GHG and EJ implications, should be conducted as indicated in the Scope.

*Rare Species*

According to the EENF and the *Massachusetts Natural Heritage Atlas* (15th Edition), portions of the project area are mapped as *Priority* and *Estimated Habitat* for state-listed species, including eastern box turtle (*Terrapene Carolina*; Special Concern), marbled salamander (*Ambystoma opacum*' Threatened), wood turtle (*Glyptemys insculpta*; Special Concern), and climbing fern (*Lygodium palmatum*; special concern). These species and their habitats are protected pursuant to the Massachusetts Endangered Species Act (M.G.L. c.131A) and its implementing regulations (MESA; 321 CMR 10.00). The project will permanently convert 111.6 acres of state-listed rare species designated Priority Habitat from forested land to successional scrub-shrub habitat as a result of tree clearing. Temporary impacts to 4.3 acres of Priority Habitat will result from the placement of construction mats.

The Proponent has engaged NHESP in pre-filing consultations to discuss the project and opportunities to avoid or minimize impacts to state-listed species and their habitats. NHESP anticipates that the project may not be able to avoid a Take (321 CMR 10.18 (2)(b)) determination for eastern box turtle, thereby needing to apply for a MESA Conservation and Management Permit (CMP) and mitigation for that species. The EENF indicates that for all other state-listed species, it is anticipated that the project can avoid a Take determination through TOY restrictions for rare animal species and avoidance of climbing fern populations. NHESP comments indicate the Proponent is proactively consulting with the Division to address rare species concerns and anticipates that that the details of the

[10] Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Series Classification Database. Available online.

long-term net benefit required under a CMP can be addressed during the MESA review process.

*Wetlands*

Water resources, including wetlands and streams, were delineated within the project area in Fall of 2021 and January and Winter of 2022. According to the EENF, the project is proposed to result in significant unavoidable impacts to BVW, IVW, Bank, BLSF, RFA and associated buffer zones of resource areas. The project will also impact CVPs, which are ORWs that require enhanced protection. The 11 Town Conservation Commissions will review the project for its consistency with the Limited Project provisions of the Wetlands Protections Act (WPA), the Wetland Regulations (310 CMR 10.00), and associated performance standards. Wetland replications is not proposed for permanently impacted BVW; however, the EENF describes potential mitigation including offsite Riverfront Area and wetland preservation.

MassDEP will review the project for its consistency with the 401 WQC regulations (314 CMR 9.00). The project requires a 401 WQC from MassDEP as it will result in the significant cumulative alteration of over 5,000 sf of BVW (including in forested areas), IVW and potentially LUW (total of over 36 acres). Comments from MassDEP state that mitigation for impacts is a requirement of the 401 WQC regulations and mitigation will be determined as part of the WQC application process. The DEIR should provide an update on consultations with the MassDEP WQC program, and discuss whether a common framework could be established for mitigation across multiple projects.

*Climate Change*

Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth (September 16, 2016) recognizes the serious threat presented by climate change and directs Executive Branch agencies to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for its impacts. The urgent need to address climate change was again recognized by Governor Baker and the Massachusetts Legislature with the recent passage of St. 2021, c. 8, An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy, which sets a goal of Net Zero emissions by 2050. The MEPA statute directs all Agencies to consider reasonably foreseeable climate change impacts, including additional GHG emissions, and effects, such as predicted sea level rise, when issuing permits, licenses and other administrative approvals and decisions (M.G.L. c. 30, § 61).

*Adaptation and Resiliency*

As noted above, portions of the project site are mapped as 100-year floodplain associated with the Millers River, Sawmill River, Hop Brook, Bachelor Brook, Weston Brook, and Turkey Hill Brook. The EENF indicates that the project will minimize tree clearing during periods of high flow within waterbodies to minimize potential impacts of flash floods. Measures will be implemented to ensure construction mats are secured within floodplains and across waterbodies. Flooding events are not expected to impact or be impacted by the long-term objective of the project, as the project is anticipated to make it less likely that trees uprooted during a flash flood would fall on and damage lines. In addition, the wider ROW simplifies repairs should damage occur. The EENF asserts that by reducing the probability and duration of damage to this line, the project also increases the resiliency of the electrical grid which will be placed under increased stress if climate change increases the frequency of future damaging weather events.

Effective October 1, 2021, all MEPA projects are required to submit an output report from the MA Resilience Design Tool to assess the climate risks of the project. Based on the output report attached to the EENF, the project has a high exposure and risk rating based on the project's location for extreme precipitation (riverine flooding) and extreme heat, and moderate exposure and risk rating for extreme precipitation (urban flooding). Based on the 40-year useful life identified and the self-assessed criticality of the project asset (Line 354), the Tool recommends a planning horizon of 2070 and a return period associated with a 25-year (4% chance) storm event when designing the project (a "utilities" asset) for the extreme precipitation parameter. This recommendation appears to be based on a "Moderate" criticality assessment of project assets, based on user inputs.[11] For "High" critical assets, the Tool recommends planning for a 50-year (2% chance) storm over a 11 to 50 year planning horizon (through 2070), and a 100-year (1% chance) storm for a 50 to 100 year planning horizon. The EENF does not assess whether the proposed clearing would improve resiliency as measured by future storm scenarios. It indicates that vegetation clearing can result in a "heat sink"; however, the EENF indicates that, since this work is proposed in a rural and largely forested area, it is not expected to reduce overall public shade availability.

In addition to flooding, the EENF describes measures incorporated into the project's design relative to additional natural hazards identified in the 2018 State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) including landslides, temperature increases, wildfires, invasive species, and extreme weather. However, the FEIR does not address the potential for cutting to increase impacts related to these hazards include potentially a decrease in restoration success following tree clearing due to drought, increase landslide potential as a result of increased precipitation and tree clearing, and an increase in the potential for invasive species to spread. Comments from the Pelham Conservation Commission note concerns for Amethyst Brook including downstream erosion and water quality. The stream includes tributaries and cold water fisheries which were the focus of recent ecological restoration projects. As stated in the EENF, proposed mitigation includes monitoring of restoration areas, leaving stumps in place and installing temporary and/or permanent slope breakers, adhering to BMPs to reduce the spread of invasive plants, and adhering to applicable state regulations on the movement of wood products to prevent the spread of invasive insects. The project is expected to reduce the impacts from temperature increases and extreme weather by reducing the potential from power outages related to down trees and powerlines.

*Land Alteration*

The project is subject to the MEPA GHG Policy because it exceeds thresholds for a mandatory EIR. This project will alter ±381 acres of land, of which 371 acres represents permanent impact. In accordance with the GHG Policy, projects that alter over 50 acres of land are generally required to analyze the carbon associated with land and soil disturbance during the construction period and loss of carbon sequestration. The purpose of this analysis is to develop an estimate, not an exact accounting of GHG emissions associated with land alteration, including removal of trees and release of sequestered carbon in soil. The DEIR should provide an analysis consistent with the Scope included in this Certificate.

[11] See Climate Resilience Standards Design Outputs guidance, https://eea-nescaum-dataservices-assets-prd.s3.amazonaws.com/cms/GUIDELINES/V1.2_SECTION_4.pdf at p. 27.

The EENF indicates that the net effect of the project on GHG emissions will be estimated as the sum of the direct GHG emissions resulting from tree clearing; carbon sequestration loss due to the conversion of forested land to scrub-shrub habitat and GHG not emitted because of project-related reduction in outages when fossil-fuel-fired peaking facilities would be used to supply power (either during outages or when electricity demand exceeds the grid's supply). The project will convert 371 acres of existing ROW that is currently forested into habitat maintained as grass-scrub/shrub for 40 years. GHG emissions will be estimated to account for the following effects: some carbon currently sequestered in woody biomass will be released into the atmosphere during tree clearing; some carbon currently stored in soil will be released into the atmosphere when soil is disturbed during tree clearing; and some carbon will not be sequestered by ROW vegetation in future years because the annual carbon sequestration rate for grass and scrub/shrub habitat that will replace the forest is lower than the annual sequestration rate of forested habitat. The project-related reduction in future carbon sequestration will be calculated as the difference between the amount of carbon that would have been sequestered in the future by the affected forest had it not been cleared and the amount of carbon that will be sequestered by grass-scrub/shrub habitat that replaces the forest.

The EENF indicates that the estimate will be reported as tons of carbon dioxide equivalents ($CO_2e$). The values required to convert GHG into $CO_2e$ will be taken from EPA's Greenhouse Gas Equivalencies Calculator. In addition, the Proponent will report the minutes of fossil fuel electricity generation that would need to be avoided because of the project to ensure that the project resulted in a net reduction in GHG emissions. The EENF describes the methodology the Proponent will use to determine the GHG emissions related to tree clearing. The methodology will include determining the type/age of forest that will be affected by the project, estimating the amount of carbon currently stored in woody biomass and soil across the affected acreage using various resources detailing carbon stocks for forested and grass-scrub/shrub habitats, and estimating the proportion of the carbon currently stored in woody biomass and soils that will be released during the tree clearing process.

*Transportation*

According to the EENF, construction activities are not expected to impact roadways; however, some tree work will be necessary adjacent to public roads. Measures will be implemented to ensure that construction activities will not prevent the passage of emergency vehicles, including creation of temporary travel lanes and employment of a police detail to ensure traffic flow and safety of pedestrians and vehicles as needed. Any required road access permits, either from the applicable town or the MassDOT will be obtained prior to the proposed tree clearing activities. The EENF did not quantify the extent of truck traffic that may be required to remove trees cleared as a result of the project.

*Historic and Archaeological Resources*

The project is subject to review under Section 106 of the National Historic Preservation Act of 1966 as amended (36 CFR 800) and M.G.L. c. 9, ss. 26-27C (950 CMR 71). A cultural resources due diligence review and archaeological sensitivity assessment was conducted for the project which identified an historical period archaeological site in Leveret and a potential ancient period site in Montague. The ROW was ranked into zones of high and low archaeological sensitivity for its potential to contain archaeological resources based on the information collected during the background research and field review: 41 distinct sensitivity areas were assessed as having archaeological sensitivity (±31% of the ROW). The remaining 78% was assessed as having no/low archaeological sensitivity. On May 19, 2022, a Project Notification Form and the cultural resource due diligence report was submitted to the

MHC.

*Construction Period*

During the construction-phase of the project there may be intermittent and localized increases in noise, dust and emissions from construction vehicles and related equipment. The EENF states that there will be BMPs implemented to minimize and mitigate these temporary impacts.

All construction activities should be managed in accordance with applicable MassDEP's regulations regarding Air Pollution Control (310 CMR 7.01, 7.09-7.10), and Solid Waste Facilities (310 CMR 16.00 and 310 CMR 19.00, including the waste ban provision at 310 CMR 19.017 and the handling of clean wood associated with tree removal). The project should include measures to reduce construction period impacts (e.g., noise, dust, odor, solid waste management) and emissions of air pollutants from equipment. The Proponent will incorporate anti-idling measures in accordance with the Air Quality regulations (310 CMR 7.11) including no unnecessary idling. On- and off-road vehicles and engines used during construction will minimize emissions by using vehicles adhering to the more stringent EPA Tier 3 and 4 emissions standards to the extent practical. Construction equipment must use ultra-low sulfur diesel fuel. If oil and/or hazardous materials are found during construction, the Proponent should notify MassDEP in accordance with the Massachusetts Contingency Plan (310 CMR 40.00). All construction activities should be undertaken in compliance with the conditions of all State and local permits.

Conclusion

The EENF identifies baseline environmental conditions and potential environmental impacts, but contains an inadequate alternatives analysis and a limited description of mitigation measures. Based on review of the EENF and consultation with Agencies, I hereby require the Proponent to submit a DEIR that provides further analysis of alternatives which avoid impacts to sensitive resources and describes a robust package of mitigation for project impacts. A carbon analysis of tree clearing activities should also be provided. The Proponent should submit a DEIR that provides updated project information and analyses as specified in the Scope below.

## SCOPE

General

The DEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope. Recommendations provided in this Certificate may result in a modified design that would further avoid, minimize, and/or mitigate Damage to the Environment. The DEIR should identify measures the Proponent will include to further reduce the impacts of the project since the filing of the EENF, or, if certain measures are infeasible, the DEIR should discuss why these measures will not be adopted.

Project Description and Permitting

The DEIR should describe the project and identify any changes to the project since the filing of the EENF. It should include updated site plans for existing and post-development conditions. Conceptual plans should be legible and provided at a reasonable scale. Plans should clearly identify: all major project components (structures, transmission lines, access roads, etc.); public areas; wetland resource areas; impervious areas; ownership of parcels including easements; and stormwater and utility infrastructure. The DEIR should include revised maps (provided in Attachment 2 of the EENF and Attachment B of the Supplemental information) to illustrate the width of the transmission line, which is approximately 35 feet between outer conductors, as a thin stripe rather than a line to consistent with the maps' scale of one inch = 100 feet. The revised maps should show the height of the transmission lines in each map section. The DEIR should indicate if additional permanent and temporary easements will be required to facilitate tree clearing and create access to the ROW.

The DEIR should provide a brief description and analysis of all applicable statutory and regulatory standards and requirements, and describe how the project will meet those standards. It should include a list of required State Permits, Financial Assistance, or other State or local approvals and provide an update on the status of each.

Alternatives Analysis

The EENF does not explore any alternatives to clearing trees within a uniform width of 200 feet in the ROW. The Preferred Alternatives proposes significant impacts to wetland resource areas, including BVW, and to sensitive resources such as vernal pools.

The DEIR should include an expanded alternatives analysis that provides full justification for dismissing the No Build alternative and evaluates an alternative that considers reduced or varying tree clearing widths and a scenario that avoids and minimizes environmental impacts and tree clearing within sensitive resource areas such as vernal pools, ORWs, wetlands, and rare species habitat. The DEIR should document proposed conditions for these alternatives, quantify environmental impacts and provide a conceptual plan. It should compare the environmental impacts with the Preferred Alternatives, in particular, with respect to land alteration, wetland resource areas, vernal pools, ORWs, rare species habitat, archaeological resources, GHG emissions impacts and climate resiliency. Impacts should be reported in total and broken out for each community. The DEIR should justify why, within the new area proposed to be cleared, it is likely that much of the non-target vegetation will also be cut or in some way impacted, as it appears that this impact may be avoided. The DEIR should describe how more vegetation could be preserved in more sensitive areas. The DEIR should consider and describe opportunities to vary the width of the clearing particularly in areas where the topography is low, and transmission wires are high.

The DEIR should provide additional justification for the proposed new maintained ROW of 200 feet including the findings of the constructability review that was conducted by the Proponent or other guidance documents. This should include the identification of tall growing trees or other vegetation within the ROW that pose a risk of vegetation-related outages, to the extent this information is available. The Proponent asserts that maintaining a MVCD is required in accordance with FERC standards and references FERC's factsheet FAC-003-4 (*Transmission Vegetation Management).* The DEIR should identify the applicable portions of the fact sheet and its specific requirements that apply to this project. This should include a description of how the width of the MVCD is determined. The DEIR should also

address the comments from the Berkshire Environmental Action Team which question the project's purpose and need.

Segmentation

As discussed above, the DEIR for this project, as well as all past and future filings related to the TRRP effort along the Proponent's ROW segments in Western Massachusetts, should include a conceptual overview of the cumulative impacts of the entirety of the Western Massachusetts TRRP effort, which shall be updated over time as more exact calculations are provided with each future filing. For instance, the DEIR for this project should update the cumulative impacts table provided in the DEIR for EEA #16567 (for WT-02) to include the specific impacts of this project. The DEIR should discuss how many of the Proponent's transmission lines (ROW segments) in western Massachusetts have already been cleared as part of TRRP and how many additional lines will be cleared as part of the overall program. The DEIR should include a list of all of the ROW segments managed by the Proponent in the western portion of the state including acreage within in each segment. The conceptual overview of impacts should include numeric estimates of all applicable impacts, including land alteration, tree/forest clearing, wetlands impacts (BVW, RFA, etc), and rare species habitat affected. These estimates should be broken down by each ROW segment, to the extent feasible, and an approximate timeline for planning and design of each segment should be provided. This information should be displayed in tabular or graphical format for ease of review. The DEIR should provide a methodology for tracking cumulative impacts associated with TRRP in western Mass and include a conceptual discussion of mitigation to be provided for forest clearing, wetland, rare species and any other relevant impacts. Comments from FRCOG request that mitigation provide a net benefit in the same geographic area (watershed, county, town) as the impacts especially as applied to protected species, Riverfront Area, and Coldwater Fisheries. The Proponent should consider developing a common framework for mitigation that could be applied across all segments. Given the extent of forest and tree clearing proposed, I strongly urge the Proponent to make a firm commitment to mitigation that provides a net benefit for surrounding natural resources and addresses any disproportionate impacts that may be borne by EJ or other vulnerable populations.

Environmental Justice/Public Health

The DEIR should provide an update on efforts to conduct outreach and promote public involvement of nearby communities, including EJ populations to meaningfully engage those located within the DGA in decision-making for the project. It should contain a full description of measures the Proponent intends to undertake to promote public involvement by such EJ populations during the remainder of the MEPA review process including a discussion of any of the best practices listed in the MEPA EJ Public Involvement Protocol that will be employed. It is my expectation that community engagement will begin as part of the MEPA review process, and be conducted prior to filing the DEIR. The DEIR should explain what efforts were undertaken prior to filing, and how public involvement efforts will continue throughout subsequent permitting and through the construction period for the project. It should describe any outreach that will be conducted as part of local review processes, including the procedures for providing abutter notice and opportunities for public input into project design and timing. The DEIR, or a summary thereof, should be distributed to the EJ Reference List unless any such entity has requested to be excluded or the MEPA Office and EEA EJ Director have provided an alternative list.

The DEIR should provide an updated baseline assessment of any existing unfair or inequitable Environmental Burden and related public health consequences impacting EJ Populations in accordance with 301 CMR 11.07(6)(n)1 and the MEPA Interim Protocol for Analysis of EJ Impacts. The DEIR should review additional sources of potential pollution which may exist within the identified EJ population based on the mapping layers available in the DPH EJ Tool to fully characterize existing unfair or inequitable Environmental Burdens. The DEIR should also survey the air-related environmental indicators identified in EPA EJ Screen to determine whether any of the identified EJ populations are subject to elevated environmental burdens measured at 80$^{th}$ percentile of statewide average or higher. For any EJ population corresponding to that metric, the DEIR should describe in detail the proximity of the project site to those neighborhoods and discuss the specific activities, including the extent of forest clearing and construction activity, that will take place near those neighborhoods. Based on the additional analyses required by the Scope included in this Certificate, the DEIR should provide an updated assessment of whether the project's impacts may result in disproportionate adverse effects, or increase the risks of climate change, on the identified EJ population, particularly in light of the GHG emissions, air pollutants, and heat island effects that may be associated with large-scale forest clearing activities. The DEIR should consider any loss of open space or recreational opportunities that may affect EJ populations that may lack access to such resources. The DEIR should discuss whether project benefits would increase "Environmental Benefits," as defined in amended 301 CMR 11.02, for EJ populations and discuss whether and how such benefits would serve to promote the equitable distribution of Environmental Benefits or reduce any existing Environmental Burdens identified for the EJ population. For instance, if power outages due to downed trees have been shown to disproportionately affect EJ populations, the DEIR should discuss whether the project would serve to improve such conditions.

As discussed below, the DEIR should contain a GHG analysis for the significant loss and conversion of forested land to a scrub-shrub habitat and a discussion of mitigation measures to reduce the GHG emissions of the project. The DEIR should analyze land alteration associated with the project including implications for potential stormwater flooding and heat effects in surrounding neighborhoods. Analysis of the stormwater should specifically assess whether flooding risks may be exacerbated for nearby EJ populations, including under future climate conditions, and whether existing conditions would be worsened or improved by the project. The DEIR should also analyze other short-term and long-term environmental or public health impacts of the project, including construction period activities. If any disproportionate adverse effects or increased risks of climate change are identified, the DEIR must include a discussion of proposed mitigation and include such measures in draft Section 61 findings.

Rare Species

The DEIR should provide an update on potential impacts to state-listed rare species habitat associated with the project and proposed measures to avoid, minimize and mitigate those impacts. As noted above, comments from NHESP indicate the project is likely to result in a Take of the eastern box turtle and may only be permitted if it meets the performance standards for a CMP. Comments from NHESP stat the exact details of the long-term net benefit required under a CMP have not been finalized but the Proponent if working with NHESP to address impacts. The DEIR should provide a summary of the outcome of continued consultation with NHESP.

Wetlands

MassDEP comments recommend that the Proponent consider waiting to file Notices of Intent (NOIs) with the Conservation Commissions until the conclusion of MEPA review to ensure sufficient opportunities for public involvement and to avoid any potential conflict with the final Certificate, Orders of Conditions, or the WQC. Should the Proponent file a NOI prior to the conclusion of MEPA review, MassDEP recommends the Proponent request that the local Conservation Commissions defer a decision on the filing and keep the meeting open until the Secretary has issued the final Certificate, and MassDEP has issued the WQC, to ensure consistency with any requirements in the Certificate and conditions of the WQC. According to MassDEP comments, the project may be eligible for review under the Limited Project provisions pursuant to 310 CMR 10.53(3)(d) at the discretion of the local Conservation Commission and to the extent practicable, work must comply with the General Performance Standards.

The DEIR should provide an update on the impact analysis for each resource area and demonstrate how the project will comply with performance standards outlined in the WPA as the project has the potential to result in significant changes to the hydrology of the affected resource areas and downstream reaches. The DEIR should consider impacts associated with surface and subsurface hydrology, wildlife habitat, and describe compliance with BMPs for stormwater management and sedimentation and erosion control. The DEIR should ensure that estimates for impacts to wetland resource areas are conservative and account for all temporary impacts including access to the ROW. The DEIR should describe tree clearing details, potential TOY restrictions, specific locations of proposed construction mats, and implementation sequencing. The EENF does not identify alteration of Bank or LUW as part of the project; it indicates that at stream crossings, construction matting will span the stream channel to the extent feasible to avoid impacts to the stream bank and bed. The proposed temporary stream-crossings have the potential to alter Inland Bank and LUW. The DEIR should describe to what extent the construction matting would necessitate alteration of Bank or LUW and provide a conservative estimate of these impacts.

The DEIR is required to provide sufficient information to adequately describe cumulative impacts to "Waters of the Commonwealth" (BVW, IVW and LUW) pursuant to 314 CMR 9.00 and identify efforts to avoid, minimize, and mitigate impacts. The EENF indicates that compensatory mitigation is not expected to be required for impacts to most resources impacted by the project. MassDEP comments provide clarification that mitigation for impacts is a requirement of the 401 WQC regulations. The DEIR should propose appropriate mitigation measures in consultation with MassDEP to demonstrate consistency with the WQC regulations. The DEIR should discussion mitigation in the form of off-site preservation of forested land or wetlands, and culvert and stream enhancements. Temporary impacts to resource areas are subject to the WPA regulations (310 CMR 9.02) and can be mitigated through "in-situ" replication and/or restoration, as well as via off-site considerations. The DEIR should describe measures to mitigate the project's significant temporary impacts to resource areas. The DEIR should address the comments from the Franklin Regional Council of Governments (FRCOG) regarding wetland impacts, proposed mitigation (including pollinator habitat conservation), and invasive species management.

The DEIR should include an analysis of potential impacts to adjacent areas from increased velocities and volumes of floodwater, under existing and future conditions. The EENF states that wetlands replication area(s) will be provided to mitigate permanent impacts to BVW; however, the details and location of these restoration areas have not been determined. The DEIR should provide an update on the development of any BVW mitigation, and possible locations of the wetland replication

areas. The DEIR should provide an invasive species management plan for wetland restoration areas.

Public water supply watersheds associated with the Atkins Reservoir and Ludlow Reservoir are crossed by the ROW and contain surface waters and wetlands that are considered ORWs. Comments from MassDEP note that Surface Water Quality Regulations (314 CMR 4.00) prohibit the discharge of fill or dredge material into a tributary to a Public Water System supply (PWS) within 400 feet of the high-water mark of the surface water supply. The EENF identifies temporary impacts to 57,487 sf of ORW associated with a public water supply and approximately 157,760 sf of permanent conversion of forested to scrub-shrub habitat type within the watersheds. The project does not propose discharge of dredge or fill material in a PWS reservoir or to tributaries to a PWS within 400 feet of the high-water mark of the surface water supply. The DEIR should demonstrate the project will employ methods to ensure that no fill or sediment will enter a tributary during and post-tree clearing. The Proponent will be required to document that appropriate and effective sediment and erosion controls are implemented and that the crossing techniques (currently identified as "spans") will result in no adverse impacts to the tributaries, adjacent wetlands, or any downstream reaches.

The ROW passes through Wendell State Forest, Montague State Forest, and the Holyoke Mountain Range State Park. The Proponent has coordinated with the Massachusetts Department of Conservation and Recreation (DCR) related to stewardship of natural and cultural resources in the ROW within the state forest properties. DCR will review the flagged work limits and work with the Proponent to identify mitigation for the loss/conversion of forest habitat. The DEIR should identify implementation of specific protection and restoration measures within wetlands and other sensitive habitats on public conservation lands.

Climate Change

*Adaptation and Resiliency*

While the EENF addresses the general resiliency benefits of the project in reducing the potential for damage to electrical lines during flood events, it does not specifically address the design recommendations from the MA Resilience Design Tool. The DEIR should include a narrative explaining whether proposed tree clearing will make the project assets more resilient to risks associated with riverine flooding from a 25-year to 50-year storm event estimated as of 2070. The DEIR should discuss the extent to which existing electrical lines are exposed to riverine flooding, and what measures the Proponent is taking to improve asset resiliency over a longer-term horizon.

The DEIR should further describe mitigation in areas where soils are classified as having severe erosion potential including temporary and permanent stabilization methods. The EENF acknowledges that drought may impact vegetation restoration success following tree clearing but states monitoring will be conducted until success criteria have been achieved. The EENF also notes that changes in precipitation and temperature can result in stress and reduced resiliency in native ecosystems, making them more susceptible to invasion by native species. The DEIR should further describe the anticipated monitoring plan and success criteria for restoration of cleared areas.

*Land Alteration*

The DEIR should provide a quantitative carbon analysis of tree clearing activities that should consider both the one-time direct emissions from tree cutting as well as loss of potential carbon

sequestration over a certain time period (e.g., 30 or 40 years). To the extent tree cover is replaced with scrub-shrub habitat, the net loss in carbon sequestration potential may be estimated; to the extent the project is asserted to have ancillary (indirect) benefits in reducing potential outages and thereby avoiding GHG emissions, this should be quantified and the methodology for this calculation clearly explained. To quantify GHG emissions impacts, the Proponent may rely on the various data sources listed in the EENF or conduct a site-specific forest inventory; however, the EPA GHG Emissions Calculator should be used solely for comparison purposes and may not be used as the exclusive source of estimates for carbon stocks or emissions as it is based on national data not specific to Massachusetts forests. To the extent a standardized methodology is used in lieu of a site-specific forest inventory, the Proponent should make use of the EVALIDator tool from the U.S. Forestry Service[12], which provides estimates of carbon stocks (including above ground and below ground biomass) specific to Massachusetts forests. As the EVALIDator tool does not provide an estimate of annual carbon sequestration rates, the Proponent may rely on other sources of data, including the EPA GHG Emissions Calculator, for this value. The DEIR should describe the methodology and data used to develop the analysis, identify associated impacts on GHG emissions, and identify measures to avoid, minimize and mitigate impacts. The DEIR should account for carbon sequestration from any trees that are removed and not replaced/converted to scrub shrub. The Proponent is directed to consult with the MEPA Office on the development of this analysis prior to filing the DEIR.

Given the extent of tree clearing proposed, I expect the DEIR to identify mitigation measures commensurate with the project's impacts on the project corridor's capacity to sequester and store carbon. Potential mitigation measures may include funding programs that add or maintain biomass for sequestration purposes (such as tree planting, carbon credits, forest conservation or commitments to implement forest restoration practices) and preserving/protecting forested land through a Conservation Restriction or other means. At a minimum, the Proponent should clearly explain its plan for disposition of the trees cleared through the project, including the process for identifying potential markets for reuse of wood and a process for tracking and reporting. The Proponent should commit to reuse of cleared trees for long-lived wood products to the greatest extent practicable and should indicate how the ultimate disposition of the trees will be tracked and documented. As noted, the Proponent should consider a mitigation framework that could be applied across all proposed ROW segments covered by the Western Massachusetts TRRP.

Transportation

The Proponent should work with MassDOT to address the details of the permitting process and any traffic and construction management plans that may be required for temporary work within the state highway layout. The DEIR should describe the location of roadways under MassDOT jurisdiction. The DEIR should confirm that the Proponent will implement a traffic management plan consistent with MassDOT requirements. It should describe the outcome of any consultation with MassDOT. The DEIR should describe the extent of truck traffic that will result from tree clearing activities, including the number of truck trips required to remove the cleared trees.

Historic and Archaeological Resources

Comments from MHC indicate that the Proponent should develop avoidance and protection plans for the identified historical and ancient period sites in Leverett and Montague. If the site in

[12] https://www.fia.fs.fed.us/tools-data/

Leverett cannot be avoided or protected, MHC recommends archaeological investigation. The Proponent is also coordinating with DCR's Archaeologist by sharing historical and archaeological reports for the project. The project proposes to implement BMPs to avoid and minimize impacts to cultural resources within state forest properties. The DEIR should summarize the outcome of such consultation. As requested by MHC, the DEIR should confirm that the Proponent's infrastructure maps will include map data for the locations and estimated boundaries of historical properties and archaeological sites identified in the cultural resources due diligence report. The resources can be indicated to be "sensitive resource areas" to be avoided and protected during operation and management. The Proponent should direct implementation of the sensitivity area BMPs outlined in the EENF within the boundaries of the mapped historical and archaeological resources to avoid adverse effects to historic and archaeological resources. Within sensitivity areas with a potential to contain significant archaeological resources, these BMPs prohibit excavation, trenching, grading, tree felling on stone walls, dragging of large tree trunks, grubbing of stumps, and ground disturbance.

Mitigation and Section 61 Findings

The DEIR should include a separate chapter summarizing all proposed mitigation measures including construction-period measures. This chapter should also include a comprehensive list of all commitments made by the Proponent to avoid, minimize and mitigate the impacts of the project, and should include a separate section outlining mitigation commitments relative to EJ populations. The DEIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation. The list of commitments should be provided in a tabular format organized by subject matter (traffic, water/wastewater, GHG, EJ, etc.) and identify the Agency Action or Permit associated with each category of impact. Draft Section 61 Findings should be separately included for each Agency Action to be taken on the project.

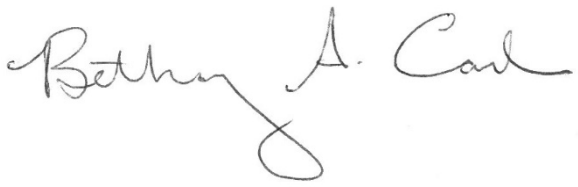
Responses to Comments

The DEIR should contain a copy of this Certificate and a copy of each comment letter received. It should include a comprehensive response to comments on the EENF that specifically address each issue raised in the comment letter; references to a chapter or sections of the DEIR alone are not adequate and should only be used, with reference to specific page numbers, to support a direct response. This directive is not intended to, and shall not be construed to, enlarge the Scope of the DEIR beyond what has been expressly identified in this certificate.

Circulation

In accordance with 301 CMR 11.16, the Proponent should circulate the DEIR to each Person or Agency who commented on the EENF, each Agency from which the project will seek Permits, Land Transfers or Financial Assistance, and to any other Agency or Person identified in the Scope. Pursuant to 301 CMR 11.16(5), the Proponent may circulate copies of the DEIR to commenters in a digital format (e.g., CD-ROM, USB drive) or post to an online website. However, the Proponent should make available a reasonable number of hard copies to accommodate those without convenient access to a computer to be distributed upon request on a first come, first served basis. The Proponent should send a letter accompanying the digital copy or identifying the web address of the online version of the DEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. If submitted in hard copy, the DEIR submitted to the

MEPA office should include a digital copy of the complete document. A copy of the DEIR should be made available for review in the Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, and Ludlow Public Libraries.



September 30, 2022
Date

Bethany A. Card

Comments received:

285 comment letters beginning with "As a resident and voter in Massachusetts, I am appalled that…"
07/07/2022 Massachusetts Historical Commission (MHC)
08/04/2022 M.S. Chenven
08-05-2022 Erving Conservation Commission
08/12/2022 R. Seelig
08/12/2022 Berkshire Environmental Action Team
08/15/2022 J. Faulkner
08/15/2022 J. Gallo
08/15/2022 M. Emanatian
08/15/2022 N. Keller
08/15/2022 S. Kutz
08/16/2022 M. Sweezy
08/16/2022 S. McCullough
08/17/2022 B. Good
08/17/2022 D. Goodman
08/17/2022 J. Levy
08/17/2022 L. Spink
08/17/2022 Wendell Conservation Commission
08/17/2022 Massachusetts Department of Conservation and Recreation (DCR)
08/18/2022 A. Spalding-Fecher
08/18/2022 M. Cherrington
08/18/2022 T. Rogers
08/18/2022 W. McMillan
08/19/2022 D. Ogden
08/19/2022 E. Hopman
08/19/2022 J. Saltman
08/19/2022 S. Kraft
08/20/2022 J. Rodar
08/20/2022 P. & M. Hepler

08/21/2022 K. Cusson
08/21/2022 P. Crowley
08/21/2022 S. Ross
08/22/2022 Franklin Regional Council of Governments (FRCOG)
08/22/2022 Pioneer Valley Planning Commission (PVPC)
08/22/2022 J. Eiseman
08/22/2022 J. Woodbridge
08/22/2022 R. Mcllwain
08/22/2022 T. Frederic Jones
08/22/2022 Pelham Conservation Commission
08/22/2022 Massachusetts Department of Environmental Protection (MassDEP), Western Regional Office (WERO)
08/23/2022 Berkshire Environmental Action Team
08/23/2022 M. Jones
08/23/2022 N. Keller
08/24/2022 A. Allen
08/24/2022 T. Smookler
08/29/2022 S. Wilpan
08/29/2022 State Senator Comerford on behalf of herself, State Senator Lesser, State Representative Blais, State Representative Whipps, State Representative Domb, State Representative Oliviera, and State Representative Carey
08/31/2022 A. Rose
09/01/2022 L. MacLeod
09/02/2022 A. Medore
09/02/2022 E. Fernandez O' Brien
09/14/2022 S. Pick
09/22/2022 Leverett Conservation Commission
09/23/2022 S. Masino
09/23/2022 Massachusetts Division of Fisheries and Wildlife (DFW) Natural Heritage and Endangered Species Program (NHESP)

BAC/JAH/jah

# DEIR CIRCULATION LIST

## WT-11 DEIR Distribution List

| Agency/Organization | Email Address | Mailing Address |
|---|---|---|
| **State** | | |
| Massachusetts Environmental Policy Act (MEPA) Office | MEPA@mass.gov;<br>tori.kim@mass.gov<br>jennifer.hughes@mass.gov | MEPA Office<br>100 Cambridge Street, Suite 900<br>Boston, MA 02144 |
| MEPA Office – EEA Environmental Justice Director | MEPA-EJ@mass.gov | MEPA Office<br>Attn: EEA EJ Director<br>100 Cambridge Street, Suite 900<br>Boston, MA 02144 |
| Massachusetts Department of Environmental Protection (MassDEP) – Boston Office | Helena.boccadoro@mass.gov | MassDEP/Commissioner's Office<br>One Winter Street<br>Boston, MA 02108 |
| MassDEP – Western Regional Office | sean.gomsalves@mass.gov,<br>Catherine.skiba@mass.gov;<br>michael.mchugh@mass.gov | MassDEP/Western Regional Office<br>Attn: MEPA Coordinator<br>State House West – 4th Floor<br>436 Dwight Street<br>Springfield, MA 01103 |
| Massachusetts Department of Transportation (MassDOT) – Boston | MassDOTPPDU@dot.state.ma.us | Public/Private Development Unit<br>10 Park Plaza, Suite #4510<br>Boston, MA 02116 |
| MassDOT – District 2 Office | Bao.lang@dot.state.ma.us<br>garrett.postema@dot.state.ma.us | MassDOT – District 2<br>Attn: MEPA Coordinator<br>811 North King Street<br>Northampton, MA 01060 |
| Massachusetts Historical Commission | N/A – hard copy only | The MA Archives Building<br>220 Morrissey Boulevard<br>Boston, MA 02125 |
| Massachusetts Natural Heritage and Endangered Species Program (NHESP) | Melany.cheeseman@mass.gov<br>Emily.holt@mass.gov<br>lauren.glorioso@mass.gov | NHESP<br>Division of Fisheries & Wildlife<br>1 Rabbit Hill Road<br>Westborough, MA 01581 |
| Department of Conservation and Recreation (DCR) | Andy.backman@mass.gov<br>mass.parks@mass.gov | DCR<br>Attn: MEPA Coordinator<br>251 Causeway Street, Suite 600<br>Boston, MA 02114 |
| **Regional** | | |
| Pioneer Valley Planning Commission (PVPC) | gmroux@pvpc.org (hard copy also required) | Gary M. Roux, Principal Planner<br>PVPC<br>60 Congress Street, 1st Floor<br>Springfield, MA 01104-3419 |
| Franklin Regional Council of Governments (FRCoG) | kMacPhee@frcog.org<br>PSloan@frcog.org<br>(2 hard copies also required) | Kimberly MacPhee and Peggy Sloan<br>FRCOG<br>12 Olive Street<br>Greenfield, MA 01301 |
| **Local** | | |
| Town of Northfield | concom@northfieldma.gov<br>northfield.conscom@gmail.com | Northfield Conservation Commission<br>69 Main Street<br>Northfield, MA 01360 |

| Agency/Organization | Email Address | Mailing Address |
|---|---|---|
| | Hard copy letter with URL | Northfield Historical Commission<br>69 Main Street<br>Northfield, MA 01360 |
| | Hard copy | Northfield Public Library<br>115 Main Street<br>Northfield, MA 01360 |
| Town of Erving | conservation@erving-ma.gov<br>mark.blatchley@erving-ma.gov | Erving Conservation Commission<br>12 East Main Street<br>Erving, MA 01344 |
| | Hard copy letter with URL | Erving Historical Commission<br>12 East Main Street<br>Erving, MA 01344 |
| | Hard copy | Erving Public Library<br>2 Care Drive<br>Erving, MA 01344 |
| Town of Wendell | concom@wendellmass.us | Wendell Conservation Commission<br>9 Morse Village Road<br>PO Box 41<br>Wendell, MA 01379 |
| | Hard copy letter with URL | Wendell Historical Commission<br>Wendell Town Hall<br>9 Morse Village Road<br>Wendell, MA 01379 |
| | Hard copy | Wendell Free Library<br>7 Wendell Road<br>Wendell, MA 01379 |
| Town of Montague | planner@montague-ma.gov | Montague Conservation Commission<br>1 Avenue A<br>Turners Fall, MA 01376 |
| | Janel.nockleby@gmail.com | Montague Historical Commission<br>Town Hall<br>1 Avenue A<br>Turner Falls, MA 01376 |
| | Hard copy | Montague Center Library<br>17 Center Street<br>Montague, MA 01351 |
| Town of Leverett | concom@leverett.ma.us | Leverett Conservation Commission<br>9 Montague Road<br>Leverett, MA 01054 |
| | Hard copy letter with URL | Leverett Historical Commission<br>9 Montague Road<br>Leverett, MA 01054 |
| | Hard copy | Leverett Public Library<br>75 Montague Road<br>Leverett, MA 01054 |
| Town of Shutesbury | concom@shutesbury.org | Shutesbury Conservation Commission<br>P. O. Box 276<br>1 Cooleyville Rd.<br>Shutesbury MA 01072-0276 |
| | historical@shutesbury.org | Shutesbury Historical Commission<br>Shutesbury Town Hall<br>1 Cooleyville Road<br>Shutesbury, MA 01072 |
| | Hard copy | M.N. Spear Memorial Library<br>10 Cooleyville Road<br>Shutesbury, MA 01072 |

| Agency/Organization | Email Address | Mailing Address |
|---|---|---|
| Town of Pelham | conservationagent@pelhamma.gov<br>conservation@pelhamma.gov | Pelham Conservation Commission<br>351 Amherst Road<br>Pelham, MA 01002 |
| | kmartini@wne.edu | Pelham Historical Commission<br>351 Amherst Road<br>Pelham, MA 01002 |
| | Hard copy | Pelham Public Library<br>2 South Valley Road<br>Pelham, MA 01002 |
| Town of Belchertown | conservation@belchertown.org | Belchertown Conservation Department<br>Town Hall<br>P.O. Box 670<br>2 Jabish Street<br>Belchertown, MA 01007-0670 |
| | Hard copy letter with URL | Belchertown Historical Commission<br>Town Hall<br>2 Jabish Street<br>Belchertown, MA 01007 |
| | Hard copy | Clapp Memorial Library<br>19 South Main Street<br>Belchertown, MA 01007 |
| Town of Amherst | conservation@amherstma.gov | Amherst Conservation Commission<br>Town Hall<br>4 Boltwood Avenue<br>Amherst, MA 01002 |
| | Powellw@amherstma.gov | Amherst Historical Commission<br>Amherst Town Hall<br>4 Boltwood Avenue<br>Amherst, MA 01002 |
| | Hard copy | Munson Memorial Library<br>1046 South East Street<br>Amherst, MA 01002 |
| Town of Granby | conscom@granby-ma.gov | Granby Conservation Commission<br>Town Hall<br>10-B West State Steet, Route 202<br>Granby, MA 01033 |
| | Hard copy letter with URL | Granby Historical Commission<br>Town Hall<br>10-B West State Street<br>Granby, MA 01033 |
| | Hard copy | Granby Free Public Library<br>297 East State Street<br>Granby, MA 01033 |
| Town of Ludlow | conservation@ludlow.ma.us | Ludlow Conservation Commission<br>Ludlow Town Hall, 3rd Floor<br>488 Chapin Street<br>Ludlow, MA 01056 |
| | Hard copy letter with URL | Ludlow Historical Commission<br>488 Chapin Street<br>Ludlow, MA 01056 |
| | Hard copy | Hubbard Memorial Library<br>24 Center Street<br>Ludlow, MA 01056 |
| **EJ Reference List – Community-Based Organizations, Indigenous Organizations, and Tribes** | | |
| Environment Massachusetts | ben@environmentmassachusetts.org | Ben Hellerstein<br>MA State Director |

| Agency/Organization | Email Address | Mailing Address |
|---|---|---|
| Clean Water Action | cluppi@cleanwater.org | Cindy Luppi<br>New England Director |
| Sierra Club MA | vick.mohanka@sierraclub.org | Vickash Mohanka<br>Director, MA Chapter |
| Neighbor to Neighbor Mass. | dalida@n2nma.org<br>lena@n2nma.org<br>miles@n2nma.org | Dalida Rocha<br>Lena Entin<br>Miles Gresham |
| Appalachian Mountain Club | hclish@outdoors.org | Heather Clish<br>Director of Conservation & Recreation Policy |
| Mass Audubon | hricci@massaudubon.org | Heidi Ricci<br>Director of Policy |
| Mass Rivers Alliance | juliablatt@massriversalliance.org | Julia Blatt<br>Executive Director |
| The Trust for Public Land | jodi.valenta@tpl.org | Jodi Valenta<br>MA State Director |
| Browning the GreenSpace | kerry@msaadapartners.com | Kerry Bowie<br>Board President |
| Environmental League of MA | aboydrabin@environmentalleague.org<br>zsaifee@environmentalleague.org | Amy Boyd Rabin<br>Zahra Saifee |
| Ocean River Institute | rob@oceanriver.org | Rob Moir<br>Executive Director |
| Conservation Law Foundation | bjenkins@clf.org<br>aestpierre@clf.org<br>pmuratore@clf.org<br>bfrank@clf.org | Britteny Jenkins<br>Alex St. Pierre<br>Paulina Muratore<br>Breanne Frank |
| Community Action Works | sylvia@communityactionworks.org | Sylvia Broude<br>Executive Director |
| Unitarian Universalist Mass Action Network | claire@uumassaction.org | Claire B.W. Muller<br>Movement Building Director |
| Kestrel Land Trust | mark@kestreltrust.org | Mark Wamsley<br>Conservation Director |
| Connecticut River Conservancy | rodonnell@ctriver.org | Ryan O'Donnell,<br>Water Quality Monitoring Coordinator |
| Public Health Institute of Western Mass | shudson@publichealthwm.org | Sarita Hudson<br>Director Programs & Development |
| Chappaquiddick Tribe of the Wampanoag Nation | tribalcouncil@chappaquiddickwampanoag.org | Alma Gordon<br>President |
| Wampanoag Tribe of Gay Head (Aquinnah) | thpo@wampanoagtribe-nsn.gov | Bettina Washington<br>Tribal Historic Preservation Officer |
| Nipmuc Nation (Hassanamisco Nipmucs) | crwritings@aol.com | Cheryll Toney Holley<br>Chair |
| Massachusetts Commission on Indian Affairs (MCIA) | john.peters@mass.gov | John Peters, Jr.<br>Executive Director |
| Herring Pond Wampanoag Tribe | melissa@herringpondtribe.org | Melissa Ferretti<br>Chair |
| Chappaquiddick Tribe of the Wampanoag Nation, Whale Clan | rockerpatriciad@verizon.net | Patricia D. Rocker<br>Council Chair |
| North American Indian Center of Boston | rhalsey@naicob.org | Raquel Halsey<br>Executive Director |
| Pocasset Wampanoag Tribe | coradot@yahoo.com | Cora Pierce |

| Agency/Organization | Email Address | Mailing Address |
|---|---|---|
| Massachusetts Tribe at Ponkapoag | Solomon.elizabeth@gmail.com | Elizabeth Solomon |
| Stockbridge-Munsee Tribe | THPO@mohican-nsn.gov | |
| Mashpee Wampanoag Tribe | Brian.Weeden@mwtribe-nsn.gov<br>david.weeden@mwtribe-nsn.gov<br>106Review@mwtribe-nsn.gov | Brian Weeden, Chair<br>David Weeden, THPO/Director<br>Nakia Hendricks, Jr, Office Manager |
| Amherst Chinese Christian Church | Accc.mail@gmail.com | |
| Amherst First Baptist Church | Hsu.c82@gmail.com | |
| Town of Amherst | giffens@amherstma.gov | Samantha Giffen, Community Manager |
| **Other Commenters on the EENF** | | |
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| Stacey Yaruss McCullough | 163ace@gmail.com | 26 N Valley Rd.<br>Pelham, MA |
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| Sheldon Ross | sheldontrumpet@gmail.com | Amherst, MA |
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| Jonathan Woodbridge | jonathanwoodbridge@gmail.com | 25 Arnold Rd.<br>Pelham, MA |
| Robert McIlwain | robertmci@comcast.net | 163 Buffam Rd.<br>Pelham, MA 01002 |
| T. Frederic Jones | tfredericjones@gmail.com | Amherst, MA |
| Michele Jones | Bookaddict10@hotmail.com | Not available |
| Nina Keller | ninakeller@crocker.com | 28 Cold Brook Rd.<br>Millers Falls, MA |
| Adrienne Allen | adriennesallen@gmail.com | Belmont, MA |
| Tali Smookler | tsmookler@uumassaction.org | 18 Vermont St.<br>Belmont, MA 02132 |
| Jo Comerford, State Senator<br>Eric Lesser, State Senator<br>Natalie Blais, State Representative<br>Susanna Whipps, State Representative<br>Mindy Domb, State Representative<br>Jacob Oliviera, State Representative<br>Daniel Carey, State Representative | Jo.comerford@masenate.gov | Not available |
| Seth Wilpan | sethwilpan@gmail.com | Florence, MA |
| Amy Rose | amyrosemusician@gmail.com | 705 Station Rd.<br>Amherst, MA 01002 |
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| Abriete Medore | abriete@hearts-journey.com | Leverett, MA |
| Elizabeth Fernandez O'Brien | fernanob@gmail.com | Not available |
| Sally Pick | sjp@crocker.com | PO Box 303<br>Montague, MA 01351 |
| Susan Masino | Susan.masino@trincoll.edu | Trinity College |

# DRAFT ENVIRONMENTAL IMPACT REPORT NARRATIVE

# WT-11 TRANSMISSION RIGHT-OF-WAY RELIABILITY PROGRAM

# NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, LUDLOW, MASSACHUSETTS

Prepared for

**NSTAR Electric Company d/b/a Eversource Energy**
247 Station Drive
Westwood, Massachusetts 02090

Prepared by

**SWCA Environmental Consultants**
153 Cordaville Road, Suite 130
Southborough, Massachusetts 01772
(508) 233-8769
www.swca.com

SWCA Project No. 70492

August 2025

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# 1 PROJECT SUMMARY

## 1.1 Name and Location of the Project and EEA File Number

**Project Name:** WT-11 Transmission Right-of-Way Reliability Program Project

**Project Municipalities:** Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, Ludlow, Massachusetts

**Project Watershed:** Connecticut River, Millers River, and Chicopee River

**EEA Number:** 16570

**Project Proponent:** NSTAR Electric Company d/b/a Eversource Energy

## 1.2 Project Description

NSTAR Electric Company d/b/a Eversource Energy (Eversource or the Company) is submitting this Draft Environmental Impact Report (DEIR) for its WT-11 Transmission Right-of-Way Reliability Program (TRRP) Project (the Project). This DEIR was prepared in response to the Massachusetts Environmental Policy Act (MEPA) Certificate on the Expanded Environmental Notification Form (EENF) that was issued on September 30, 2022, under EEA No. 16570. The purpose of the Company's TRRP is to remove all incompatible species of vegetation within the easement area and fee-owned limits of its transmission rights-of-way (ROWs) to reduce the risk to the normal operations of the transmission system from trees that fall from outside the currently maintained ROW.

The WT-11 transmission line corridor extends approximately 29.3 miles from the Northfield Substation in Northfield, Massachusetts, south through the towns of Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, and Granby, to the Ludlow Substation in Ludlow, Massachusetts. The Project location is depicted in the U.S. Geological Survey (USGS) Topographic Map provided in Attachment 1. The ROW passes through Montague State Forest and Montague Wildlife Management Area (WMA) in Montague; Mount Holyoke Range State Park in Belchertown, Amherst, and Granby; Bachelor Brook WMA in Granby; Facing Rock WMA in Ludlow; and various municipal and privately conserved parcels of land (MassGIS 2025a). It also passes through six designated areas of Priority Habitats of Rare Species, identified as Priority Habitats 1488, 1316, 1276, 2084, 1238, and 1077 (MassGIS 2021a).

The WT-11 ROW contains the overhead 345-kilovolt (kV) Line 354 for its entire length from the Northfield Substation to the Ludlow Substation, the 345-kV Line 312 from the Northfield Substation to Erving Junction, and the 115-kV Line 1604 from Northfield Substation to Erving Substation. Currently, approximately 125 to 335 feet of the corridor is regularly managed as a "two-zone" ROW to promote low-growing compatible, woody, and herbaceous vegetation. A two-zone ROW includes the "Wire Zone," which is the area under the conductor wires and extending out to 35 feet from the outer 345-kV conductors and 25 feet from the outer 115-kV conductors, and the "Border Zone," which includes the area between the outer limit of the Wire Zone to the edge of the maintained ROW. Within the Wire Zone and Border Zone, vegetation that has mature heights greater than 15 feet and 30 feet, respectively, is considered incompatible. Additional details about the vegetation management specifications for the Wire and Border Zones can be found in Section 2.

For approximately 1.3 miles south from Northfield Substation, the WT-11 ROW is approximately 500 feet wide and contains three transmission lines and a communication line. The 345-kV Line 312 is located along the west side, while the 345-kV Line 354 and 115-kV Line 1604 are located along the east side of the corridor. Currently the cleared width for Line 312 is approximately 135 feet and the cleared width of the corridor for Line 354, Line 1604, and the communication line is approximately 200 feet. Between these two cleared areas, there is an approximate 50-foot forested area that is currently not maintained during Eversource's cyclical vegetation management work. As part of the proposed TRRP Project, this forested strip, as well as an approximate 50-foot wide currently forested strip along the west edge of the corridor and an approximate 50-foot wide currently forested strip along the east edge of the corridor, will be cleared. Thus, the width of the cleared corridor will increase from 350 feet to up to 500 feet.

For the remaining 28 miles, the ROW is approximately 300 feet wide and contains only Line 354. The approximate width of this cleared portion of the corridor is 125 to 135 feet. The proposed TRRP project will increase the cleared width to approximately 250 feet, by removing an approximate 70-foot wide currently forested strip along the west side of the corridor and an approximate 50-foot wide currently forested strip along the east side. Thus, the width of the cleared corridor will increase from approximately 130 feet to up to approximately 250 feet.

Eversource is proposing the Project to provide enhanced reliability of the electric grid by expanding the currently maintained (cleared) width of the ROW to minimize the potential for outages caused by trees falling onto the lines. The expansion will consist of the removal of tall-growing trees and shrubs, those that have mature heights greater than 30 feet, such that the ROW will be maintained at an average width of approximately 250-500 feet once the Project is complete. This newly cleared area, referred to as the "Clearing Zone," will become part of the regularly managed portion of the ROW following completion of the Project and will be maintained in the future as a Border Zone.

Vegetation maintenance within the existing maintained portion of the ROW to remove incompatible vegetation that could grow into the lines from below or the sides will occur at the same time as the proposed TRRP activities; however, this routine work is an exempt maintenance activity under 301 CMR 11.03(3) and other state environmental regulations. Notably, there are two sections of the WT-11 ROW, – the Amethyst Brook and the Millers River crossings, – where tree growth under the wires has been actively managed by topping the tallest trees; however, following TRRP activities, Eversource will implement their standard vegetation management practices in this area, including tree removal, to allow Eversource work crews and equipment to safely and quickly traverse should repairs to the lines be necessary.

The WT-11 TRRP MEPA DEIR Map Set provided in Attachment 2 depicts the proposed tree removal areas, along with sensitive environmental resources and proposed temporary construction mats to be used during tree removal operations. A summary and description of the methods to be used when completing the TRRP clearing can be found in Section 2.2.

### 1.2.1 Summary of Changes Since the EENF Filing

Project design changes since the filing of the EENF include the following:

- Previously proposed wetland and stream crossings (and associated construction matting) were reviewed to identify locations where these temporary impacts could be reduced or eliminated. Some crossings were eliminated as a result of this effort. Section 5 provides revised impact numbers, and the WT-11 TRRP DEIR Map Set provided in Attachment 2 depicts the updated construction matting.
- Additional workspaces and off-ROW access roads were identified to facilitate access to tree removal areas and staging / removal of vegetation.

- Wetland delineations and cultural resources due diligence were conducted along off-ROW access roads. The results of the wetland delineation surveys are depicted on the WT-11 TRRP MEPA DEIR Map Set presented in Attachment 2. The cultural resources due diligence report was submitted to the Massachusetts Historical Commission (MHC) in May 2025, as discussed in Section 4.7.
- The location of four existing structures (Structures 34000 and 34001 on Line 354, Structure 36001 on Line 312, and Structure 7001 on Line 1604) was corrected, requiring adjustments to the extent of the TRRP tree removal in these areas.
- Eversource has continued to work with the Kestrel Land Trust (Kestrel) and local conservation commissions to identify compensatory mitigation options for unavoidable wetland impacts, as discussed in Section 7.2.
- The existing tree line within the ROW was refined. The tree line presented in the EENF was based on aerial photographic imagery interpretation that over-estimated the acreage of tree removal required. SWCA biologists field-located the tree line in February 2024 to confirm existing conditions. This resulted in a refinement of the proposed tree removal impact areas, as depicted in the WT-11 TRRP DEIR Map Set provided in Attachment 2.
- A light detection and ranging (LiDAR) survey and modeling of the ROW were performed to identify trees at risk of striking the Line 312, 354, and 1604 infrastructure, both currently and within a 40-year timeframe (the expected life span of the existing line). This analysis was used as part of an Alternatives Analysis to assess different vegetation management widths and led to the adoption of the "100-foot Modified Alternative," which consists of clearing trees up to 100 feet from the outer conductor, except in specific areas where this width could be reduced due to a low risk of tree fall-in. In some locations, the reduction in tree removal areas allowed for a reduction in the placement of construction mats within sensitive areas. More information on this analysis is presented in Section 3.4.2 of the Alternatives Analysis.
- The EENF had tree removal proposed under the wires and out 100 feet on both sides of the conductors where the WT-11 ROW crosses Amethyst Brook and Millers River. Eversource has since revised the Project in both locations to reduce the tree removal in the Border Zone. Non-compatible vegetation will now only be removed within the Wire Zones at these locations; this work is an exempt utility maintenance activity under 301 CMR 11.03(3) and other state environmental regulations.

## 1.3 Permits, Approvals, and Consultations

Because the Project requires work in state-regulated wetland resource areas and buffer zones, Notices of Intent will be filed with the Conservation Commissions of each of the 11 towns crossed by the Project, with copies submitted to the Massachusetts Department of Environmental Protection (MassDEP) Western Regional Office (WERO). An application for an Individual Water Quality Certification (WQC) will also be submitted to MassDEP WERO since the Project will result in greater than 5,000 square feet of temporary fill to wetlands from construction matting. The Project has been reviewed by the Natural Heritage and Endangered Species Program (NHESP) due to work within Priority Habitats of state-listed rare species; based on consultation with NHESP through a Project Review Checklist, the Project will require a Conservation and Management Permit (CMP).

Eversource anticipates that the Project will require pre-construction notification for Impacts to Waters of the U.S. under General Permit 24 (Temporary Construction, Access and Dewatering) of the Massachusetts Programmatic General Permit or under the Nationwide Permit (NWP) 33, depending on timing and

recommendations from the U.S. Amy Corps of Engineers (USACE). As part of their review, the USACE requires that the Project be reviewed by the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

A list of necessary permits, licenses, and clearances related to the Project is provided in Table 1-1.

**Table 1-1. WT-11 Permits and Consultations**

| PERMIT PERMIT/APPROVAL | ADMINISTERING AGENCY | STATUS |
|---|---|---|
| **Federal** | | |
| Section 404 MA GP 24 or NWP 33 Pre-Construction Notification (PCN) | U.S. Army Corps of Engineers New England District | Anticipate submittal in January 2026. |
| Section 7 Clearance | U.S. Fish and Wildlife Service | In conjunction with PCN. |
| Section 106 Clearance | MA Historical Commission | Project Notification Form and due diligence report submitted May 2022; MHC comment letter received July 2022. Due diligence report for off-ROW access roads submitted May 15, 2025. |
| **State** | | |
| MEPA ENF Certificate | Massachusetts Environmental Policy Act Office / Executive Office of Energy and Environmental Affairs | EENF filed June 15, 2022. EENF Revisions submitted August 5, 2022. Certificate issued September 30, 2022. |
| MEPA DEIR Certificate | Massachusetts Environmental Policy Act Office / Executive Office of Energy and Environmental Affairs | DEIR filed herein; anticipate Certificate issuance in late September 2025. |
| MEPA FEIR Certificate | Massachusetts Environmental Policy Act Office / Executive Office of Energy and Environmental Affairs | Anticipate submittal in mid-November 2025; anticipate Certificate issuance in early January 2026. |
| 401 Water Quality Certification | Massachusetts Department of Environmental Protection | Anticipate submittal in January 2026. |
| Conservation and Management Permit | Massachusetts Natural Heritage & Endangered Species Program | Project Review checklist submitted January 2023. Anticipate submittal of Conservation and Management Permit application in January 2026. |
| State Highway Access Permit | Massachusetts Department of Transportation | Anticipate submittal in first quarter 2026. |
| **Local** | | |
| Order of Conditions under Wetlands Protection Act | Northfield Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |
| Order of Conditions under Wetlands Protection Act | Erving Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |
| Order of Conditions under Wetlands Protection Act and the Wendell General Wetlands Protection Bylaw | Wendell Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |
| Order of Conditions under Wetlands Protection Act | Montague Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |
| Order of Conditions under Wetlands Protection Act | Leverett Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |

| PERMIT PERMIT/APPROVAL | ADMINISTERING AGENCY | STATUS |
|---|---|---|
| Order of Conditions under Wetlands Protection Act and the Shutesbury General Wetlands Protection Bylaw | Shutesbury Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |
| Order of Conditions under Wetlands Protection Act and the Pelham Wetland Bylaw (Chapter 119) | Pelham Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |
| Order of Conditions under Wetlands Protection Act and the Belchertown Wetlands Bylaw | Belchertown Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |
| Order of Conditions under Wetlands Protection Act and Amherst Wetlands Protection Bylaw | Amherst Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |
| Order of Conditions under Wetlands Protection Act | Granby Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |
| Order of Conditions under Wetlands Protection Act and Ludlow Conservation Commission Bylaws | Ludlow Conservation Commission | Anticipate submittal of Notice of Intent in first or second quarter 2026. |

## 1.4 Summary of Alternatives

Tall-growing trees pose a serious safety hazard and risk to reliability, given their potential to contact energized powerlines and infrastructure within a ROW. Eversource performed an alternatives analysis for the Project that evaluated both engineering alternatives to tree clearing that would reduce fall-in risk, as well as various tree removal scenarios.

Engineering alternatives, including installation of Lines 312, 354, and 1604 below ground or on taller structures, would require a complete re-build of the transmission lines and would involve significant ground disturbance activities. In addition, costs associated with these engineering alternatives would be approximately 17 to 58 times more expensive than a tree removal alternative. Therefore, widening of the ROW corridor via tree removal was selected as a preferred alternative to achieve the goal of enhanced future reliability of the transmission line.

Eversource investigated an alternative that would reduce tree removal areas in sensitive areas, such as wetlands, vernal pools, and rare species habitat. This alternative would create a maintained ROW corridor with a variable width – wider in areas with no sensitive resources and narrower in these sensitive areas. Although reducing tree removal in some sensitive areas could reduce the environmental impact in these areas, this alternative would likely compound the reliability problem by increasing the likelihood of tree fall-ins and, therefore, was not considered a viable Project alternative.

To evaluate alternatives for tree removal limits that balance the stated project goal and minimize impacts to the environment, Eversource conducted a LiDAR survey and modeling of the ROW to identify trees at risk of striking the Line 312, 354, and 1604 infrastructures, both currently and within a 40-year timeframe. Eversource was then able to compare the number of trees that would remain a fall-in risk under various tree clearing scenarios, including:

- No Action Alternative – the WT-11 corridor would continue to be maintained at its current width;
- 50-foot Alternative – the WT-11 corridor would be widened to 50 feet from the outer conductor or to the edge of Eversource's easement, whichever is less;
- 75-foot Alternative – the WT-11 corridor would be widened to 75 feet from the outer conductor or to the edge of Eversource's easement, whichever is less;

- 100-foot Alternative (Preferred Alternative presented in the EENF) - the WT-11 corridor would be widened to 100 feet from the outer conductor or to the edge of Eversource's easement, whichever is less; and
- 100-foot Modified Alternative (DEIR Preferred Alternative) – the WT-11 corridor would typically be widened to 100 feet from the outer conductor or to the edge of Eversource's easement, whichever is less, except in specific locations where the LiDAR analysis indicates that risk of tree fall-ins is low (e.g., due to topography).

Based on the results of the Alternatives Analysis, Eversource selected the 100-foot Modified Alternative as the new Preferred Alternative to the Project, as it minimizes tree fall-in risk compared to the No Action, 50-foot, and 75-foot Alternatives, while also reducing environmental impacts compared to the 100-foot Alternative. Additional information on the Alternatives Analysis is provided in Section 3 of this DEIR.

## 1.5 Summary of Impacts

The Project will exceed review thresholds set forth by the MEPA regulations relative to Land and Wetlands, requiring an Environmental Notification Form (ENF) and mandatory Environmental Impact Report (EIR). With the adoption of the 100-foot Modified Alternative, described in Section 1.4 above, tree removal will convert 278.1 acres of forested land to successional scrub-shrub habitat; this includes 22.9 acres of bordering vegetated wetlands (BVW), 1.3 acres of isolated vegetated wetlands (IVW), 6.3 acres of bordering land subject to flooding (BLSF), and 23.1 acres of riverfront area (RFA). Further, the placement of construction mats to support equipment through wetlands during tree removal activities will temporarily impact 9.7 acres of BVW, 0.4 acres of IVW, and 80 square feet of Land Under Waterbodies and Waterways (LUWW).

The Project will convert 86.1 acres of state-listed rare species designated Priority Habitat from forested land to successional scrub-shrub habitat as a result of tree removal. Temporary impacts to 4.0 acres of Priority Habitat will result from the placement of construction mats. Because NHESP has determined that the activity may result in an inadvertent "Take" of a listed species, the MEPA threshold for rare species is triggered, requiring an ENF and other MEPA Review if the Secretary so requires.

A summary of Project impacts by town are provided in Table 1-2 below.

**Table 1-2. Summary of Project Impacts by Town**

| RESOURCE | IMPACT TYPE | NORTHFIELD | ERVING | WENDELL | MONTAGUE | LEVERETT | SHUTESBURY | PELHAM | BELCHERTOWN | AMHERST | GRANBY | LUDLOW | TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N/A | Distance | 0.3 mi | 2.0 mi | 0.8 mi | 3.7 mi | 5.5 mi | 1.9 mi | 4.1 mi | 3.3 mi | 0.1 mi | 5.4 mi | 2.2 mi | **29.3 mi** |
| Project-wide | Tree Removal | 3.4 ac | 23.2 ac | 4.7 ac | 33.0 ac | 53.1 ac | 20.2 ac | 42.5 ac | 29.5 ac | 1.1 ac | 43.3 ac | 24.3 ac | **278.1 ac** |
| | Matting | 0 | 0.1 ac | 0.5 ac | 0.5 ac | 2.4 ac | 0.7 ac | 1.6 ac | 2.0 ac | 0 | 2.7 ac | 0.7 ac | **11.2 ac** |
| Bordering Vegetated Wetland | Tree Removal | 0 | 0.2 ac | 0.8 ac | 0.8 ac | 5.3 ac | 1.1 ac | 3.7 ac | 4.3 ac | <0.1 ac (1798 sf) | 5.4 ac | 1.3 ac | **22.9 ac** |
| | Matting | 0 | 0.1 ac | 0.4 ac | 0.3 ac | 2.1 ac | 0.4 ac | 1.3 ac | 1.9 ac | 0 | 2.5 ac | 0.5 ac | **9.7 ac** |
| Isolated Vegetated Wetland | Tree Removal | 0 | 0 | 0 | 0 | 0.1 ac | 0.6 ac | 0.2 ac | <0.1 ac (1663 sf) | 0 | 0.1 ac | 0.3 ac | **1.3 ac** |
| | Matting | 0 | 0 | 0 | <0.1 ac | 0 | 0.2 ac | 0.1 ac | 0 | 0 | 0 | 0.1 ac | **0.4 ac** |
| Bank | Tree Removal | 507 lf | 1,141 lf | 1,747 lf | 2,105 lf | 6,747 lf | 1,073 lf | 3,710 lf | 208 lf | 0 | 1,458 lf | 483 lf | **19,179 lf** |
| | Matting | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Riverfront Area | Tree Removal | 0 | 0.1 ac | 0.8 ac | 2.6 ac | 4.8 ac | 5.4 ac | 3.7 ac | 0.7 ac | 0 | 2.6 ac | 2.5 ac | **23.1 ac** |
| | Matting | 0 | 0 | 0.2 ac | <0.1 ac | 0.5 ac | 0.3 ac | 0.2 ac | 0.1 ac | 0 | 0.4 ac | 0.1 ac | **1.8 ac** |
| Bordering Land Subject to Flooding | Tree Removal | 0 | 0 | 0 | 0 | 1.4 ac | 0 | 1.3 ac | 1.6 ac | 0 | 2.0 ac | 0 | **6.3 ac** |
| | Matting | 0 | 0 | 0 | 0 | 0.4 ac | 0 | 0.2 ac | 0.3 ac | 0 | 0.6 ac | 0 | **1.5 ac** |
| 100-ft Buffer Zone | Tree Removal | 1.4 ac | 3.0 ac | 2.2 ac | 8.1 ac | 18.5 ac | 8.2 ac | 14.3 ac | 10.4 ac | 0.4 ac | 9.8 ac | 4.4 ac | **80.9 ac** |
| | Matting | 0 | 0 | 0.1 ac | 0.1 ac | 0.3 ac | 0.1 ac | 0.2 ac | 0.2 ac | 0 | 0.2 ac | 0.1 ac | **1.1 ac** |
| Confirmed Vernal Pools | Tree Removal | 0 | 0 | 0 | 0 | <0.1 ac | <0.1 ac (129 sf) | 0 | 0 | 0 | 0 | 0.1 ac | **0.1 ac** |
| | Matting | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Outstanding Resource Waters | Tree Removal | 0 | 0 | 0 | 0 | 0 | 1.7 ac | 0.4 ac | 0.4 ac | 0 | 0.5 ac | 1.4 ac | **4.4 ac** |
| | Matting | 0 | 0 | 0 | 0 | 0 | 0.6 ac | 0.1 ac | 0.2 ac | 0 | 0.2 ac | 0.5 ac | **1.7 ac** |
| Priority Habitat of Rare Species | Tree Removal | 0 | 0 | 0 | 0 | 20.4 ac | 7.5 ac | 14.7 ac | 16.3 ac | 1.1 ac | 18.5 ac | 7.6 ac | **86.1 ac** |
| | Matting | 0 | 0 | 0 | 0 | 0.9 ac | 0.1 ac | 0.3 ac | 1.4 ac | 0 | 1.2 ac | 0.1 ac | **4.0 ac** |
| Open Space (Article 97) Lands | Tree Removal | 0 | 3.9 | 1.8 ac | 16.2 ac | 37.1 ac | 13.1 ac | 5.9 ac | 4.6 ac | 1.1 ac | 11.4 ac | 19.8 ac | **114.9 ac** |
| | Matting | 0 | 0.1 | 0.3 ac | 0.1 ac | 2.0 ac | 0.5 ac | 0.1 ac | 0.4 ac | 0 | 0.4 ac | 0.6 ac | **4.5 ac** |

## 1.6 Summary of Mitigation Measures

Eversource has carefully designed and sited the proposed Project to avoid and minimize environmental impacts. Existing access roads and other improved surfaces will be used by vehicles and equipment to the maximum extent practicable. Where crossing wetlands or watercourses is unavoidable, temporary construction mats will be used to minimize impacts. Contractors will be required to use low-impact tree removal methods that incorporate a variety of approaches to minimize site disturbance, including clearing by hand in certain sensitive areas where appropriate. Sediment and erosion controls and other best management practices (BMPs) will be employed to minimize the potential for adverse indirect impacts to water quality and wetland functions and values. Disturbed areas will be stabilized appropriately and allowed to revegetate with compatible species. Protection measures, including habitat enhancements and time-of-year (TOY) restrictions, have been developed in coordination with NHESP to minimize impacts to state-listed rare species; in addition, the Project will require mitigation for potential impacts to the eastern box turtle in coordination with NHESP as part of the CMP. Detailed information on impact minimization and avoidance measures proposed for the Project regarding each resource potentially affected is provided in Section 5.

Eversource is continuing to work to develop a compensatory mitigation plan, which is expected to consist primarily of the permanent preservation of land, to mitigate impacts resulting from the conversion of forested wetlands to wetlands with low-growing cover types. Mitigation may also include a culvert removal and stream restoration project near the ROW in Erving, Massachusetts or similar projects. This mitigation package is being developed in consultation with Kestrel, MassDEP WERO, and the applicable local conservation commissions.

Additional information on compensatory mitigation measures for unavoidable wetland impacts is provided in Section 7, along with a discussion of Eversource's public engagement with local environmental justice (EJ) communities.

# 2 PROJECT DESCRIPTION

Eversource is submitting this DEIR for its WT-11 TRRP Project in response to the MEPA Certificate on the EENF that was issued on September 30, 2022 under EEA No. 16570.

Eversource is proposing the Project to provide enhanced reliability of the electric grid by expanding the existing, maintained (cleared) width of the ROW to the easement edge or up to 100 feet from the outermost conductor, whichever is nearest to the existing transmission facilities, except in specific locations where the LiDAR analysis indicates that risk of tree fall-ins is low (e.g., due to topography). The expansion will consist of the removal of tall-growing trees and shrubs, such that the ROW will be maintained at a width of 250-500 feet once the Project is complete to improve system reliability by reducing the number of tree fall-in risks. Eversource's long-term management objective is to manage these newly cleared areas as early succession habitat and encourage the growth of grasses, forbs, and low-growing shrubs to create a sustainable environment comprised of vegetation that can safely coexist with the transmission lines.

This transmission line corridor extends approximately 29.3 miles from the Northfield Substation in Northfield, Massachusetts, south through the towns of Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, and Granby, to the Ludlow Substation in Ludlow, Massachusetts. The Project location is depicted in the USGS Topographic Map provided in Attachment 1. The ROW passes through Montague State Forest and Montague WMA in Montague; Mount Holyoke Range State Park in Belchertown, Amherst, and Granby; Bachelor Brook WMA in Granby; Facing Rock WMA in Ludlow; and various municipal and privately conserved parcels of land (MassGIS 2025a). It also passes through six designated areas of Priority Habitats of Rare Species, identified as Priority Habitats 1488, 1316, 1276, 2084, 1238 and 1077 (MassGIS 2021a).

The WT-11 ROW contains the overhead 345-kV Line 354 for its entire length from the Northfield Substation to the Ludlow Substation, the 345-kV Line 312 from the Northfield Substation to Erving Junction, and the 115-kV Line 1604 from Northfield Substation to Erving Substation. Currently, approximately 125 to 335 feet of the corridor is regularly managed as a "two-zone" ROW to promote low-growing compatible, woody, and herbaceous vegetation. A two-zone ROW includes the "Wire Zone," which is the area under the conductor wires and extending out to 35 feet from the outer 345-kV conductors and 25 feet from the outer 115-kV conductors, and the "Border Zone," which includes the area between the outer limit of the Wire Zone to the edge of the maintained ROW. Within the Wire Zone and Border Zone, vegetation that has mature heights greater than 15 feet and 30 feet, respectively, is considered incompatible. Additional details about the vegetation management specifications for the Wire and Border Zones can be found in Section 2.2.2.

For approximately 1.3 miles south from Northfield Substation, the WT-11 ROW is approximately 500 feet wide and contains three transmission lines and a communication line. The 345-kV Line 312 is located along the west side, while the 345-kV Line 354 and 115-kV Line 1604 are located along the east side of the corridor. For approximately 1.3 miles south from Northfield Substation, the WT-11 ROW is approximately 500 feet wide and contains three transmission lines and a communication line. The 345-kV Line 312 is located along the west side, while the 345-kV Line 354 and 115-kV Line 1604 are located along the east side of the corridor. Currently, the cleared width for Line 312 is approximately 135 feet and the cleared width of the corridor for Line 354, Line 1604 and the communication line is approximately 200 feet. Between these two cleared areas there is an approximate 50-foot-wide forested area that is currently not maintained during Eversource's cyclical vegetation management work. As part of the proposed TRRP Project this forested strip, as well as an approximate 50-foot-wide currently forested strip along the west edge of the corridor and an approximate 50-foot-wide currently forested strip along the east edge of the

corridor, will be cleared. Thus, the width of the cleared corridor will increase from 350 feet to up to 500 feet.

For the remaining 28 miles, the ROW corridor is approximately 300 feet wide and contains only Line 354. The approximate width of this cleared portion of the corridor is 125 to 135 feet. The proposed TRRP project will increase the maintained width to approximately 250 feet, by removing an approximate 70-foot wide currently forested strip along the west side of the corridor and an approximate 50-foot wide currently forested strip along the east side. Thus, the width of the cleared corridor will increase from approximately 130 feet to up to approximately 250 feet.

Normal vegetation maintenance within the existing maintained portion of the ROW to remove incompatible vegetation that could grow into the lines from below or the sides will also occur at the same time as the proposed TRRP activities; however, this routine work is an exempt maintenance activity under 301 CMR 11.03(3) and other state environmental regulations.

The ROW cross-sections provided in Attachment 1 illustrate the existing condition of the ROW described above. The WT-11 TRRP MEPA DEIR Map Set provided in Attachment 2 depicts the proposed tree removal areas, along with sensitive environmental resources and proposed temporary construction mats to be used during tree removal operations. A summary and description of the methods to be used when completing the TRRP clearing can be found in Section 2.2.

# 2.1 Project Purpose and Need

Eversource owns and operates more than 4,300 miles of transmission lines in its tri-state service territory, providing power to more than 4.4 million customers. In Western Massachusetts, Eversource delivers electricity to approximately 210,000 customers in 48 communities. Eversource's transmission system is an integral part of the bulk power system (BPS), delivering electricity to customers in New England. Eversource must implement the TRRP for Lines 312, 354 and 1604 in the WT-11 ROW to prevent major catastrophic events on the regional electric grid that could cause extensive power outages throughout Massachusetts and New England. Controlling vegetation growth on the ROW by implementation of the TRRP will allow Eversource to reduce the likelihood of preventable vegetation-related outages. In turn, this increases Eversource's ability to reliably serve its electric customers. Maintaining system reliability is critical to support recent local, state, and Federal climate change and electrification policies that are aimed at addressing the adverse effects of climate change and eliminating reliance on fossil fuels by increasing the use of electric vehicles and electric heating applications.

As discussed below, both the TRRP and the Project are consistent with best industry practices as well as Federal and state reliability standards.

## 2.1.1 NERC Reliability Standard FAC-003-4

As a transmission provider, Eversource must maintain its system consistent with the reliability standards and criteria developed by the North American Electric Reliability Corporation (NERC), the Northeast Power Coordinating Council, Inc. (NPCC), and the Independent System Operator - New England, Inc. (ISO-NE), which are responsible for the operation of the integrated New England transmission system owned by multiple transmission owners including Eversource. NERC promulgates mandatory Federal standards to promote the reliability and adequacy of bulk power transmission in the electric utility systems of North America. NERC reliability standards establish threshold requirements for assuring the BPS is planned, operated, and maintained to minimize risks, avoid damage to major equipment, and limit system interruptions. To ensure the integrity of the BPS, Eversource is required to maintain its transmission system consistent with the reliability standards and criteria developed by NERC.

NERC Reliability Standard FAC-003 (Version 4) (FAC-003-4), a copy of which is provided in Attachment 3, was developed as a result of a catastrophic blackout that occurred on August 14, 2003, when a high-voltage transmission line in northern Ohio came into contact with overgrown trees that tripped the line and took it out of service. Subsequently, during the same event, three other lines in the region came into contact with trees and went out of service, forcing the remaining transmission lines to shoulder the extra load burden. Overtaxed by the additional load, the remaining lines also tripped and went out of service. These initial line outages resulted in a cascade of failures throughout southeastern Canada and eight northeastern states. Ultimately, 50 million people lost power for up to two days in the biggest blackout in North American history. The event contributed to at least 11 deaths in the United States and Canada and cost an estimated $6 billion. The first version of FAC-003 was adopted in 2006, and NERC began enforcing its terms and subsequent revisions in 2007.

The purpose of FAC-003-4 is to maintain a reliable electric transmission system by managing vegetation on transmission rights-of-way to prevent the risk of vegetation-related outages. FAC-003-4 applies to high-voltage transmission lines operated at 200-kV or higher, and any lower voltage lines identified as critical to the reliability of the electric system in the region. Lines 312 and 354 operate at 345-kV and, therefore, the WT-11 ROW is subject to FAC-003-4. FAC-003-4 provides requirements and measures with which transmission providers must comply to prevent and minimize vegetation-related outages. These standards require transmission providers to prevent encroachment *into* the minimum vegetation clearance distance (MVCD), which is a calculated minimum distance on each side of the live conductors. FAC-004-3 provides the MVCDs for various line voltages at different altitudes. The calculated MVCDs for 345-kV transmission lines range from 4.3 feet to 5.7 feet from the conductors, depending on the elevation of the transmission line. See FAC-004-3, Table 2, Row 2 (345-kV lines) (Attachment 3).

The MVCDs establish a protected area around the conductors, and transmission providers are required by FAC-004-3 to ensure the protection of this area from encroachment of vegetation that could interfere with the transmission lines. Vegetation growth *within* the MVCD can cause vegetation-related outages; for example, electrical discharges from live conductors can "spark over" to nearby trees causing fires that result in line outages. In addition, encroachment *into* the MVCD from vegetation fall-ins or from the blowing together of the transmission lines and vegetation falling into the MVCD also can lead to outages because of the direct interference of vegetation with the transmission lines. Therefore, prudent ROW maintenance requires that transmission providers establish clearance distances greater than the MVCD to maintain the appropriate separation between vegetation and the conductors. To that end, FAC-003-4 recommends that a transmission owner's vegetation management maintenance approach include the full extent of its easement, fee simple and other legal rights, because "a comprehensive approach that exercises the full extent of legal rights on the ROW is superior to incremental management because in the long term it reduces the overall potential for encroachments, and it ensures that future planned work and future planned inspection cycles are sufficient."

Major outages and operational problems have resulted both from vegetation growing within, as well as falling into, the MVCD. See Table 2-1 below. FAC-003-4 places the highest priority on the prevention of vegetation-related outages by requiring transmission providers to establish and follow a vegetation management program that minimizes threats to the safety and reliability of their high-voltage transmission lines and specifically requires utilities to manage vegetation along their ROWs to prevent encroachment in the MVCD. As described below, the Project will increase the distance between Line 312 and 354 conductors and incompatible vegetation within the ROW beyond the currently maintained corridor, consistent with the purpose and requirements of FAC-003-4.

## 2.1.2 ANSI A300 Standards

The American National Standards Institute (ANSI) is a private, non-profit organization that administers and coordinates the United States voluntary standards and conformity assessment system. ANSI works in

close collaboration with stakeholders from industry and government, including utilities, to identify and develop standards and conformance–based solutions to national and global priorities. The ANSI A300 Standards are developed by the Tree Care Industry Association and are the generally accepted industry standard practices for vegetation management, including Part 7 (Integrated Vegetation Management - Utility Rights-of-Way), which provides standards for managing vegetation along electric utility rights-of-way focusing on safe and reliable operation of the transmission system as well as access for line workers.

ANSI A300 promotes the Wire Zone-Border Zone vegetation management method, where a transmission owner's full ROW easement is managed to prevent the growth of trees that could interfere with the transmission lines. The Wire Zone is managed to promote a low-growing plant community dominated by grasses, herbs, and small shrubs (under three feet in height at maturity). The Border Zone is the remainder of the full extent of the utilities' rights on the ROW and is managed to establish small trees and tall shrubs (under 30 feet in height at maturity).

The Company's TRRP is consistent with ANSI A300 Standards in that the Company manages all its transmission corridors using the Wire Zone-Border Zone vegetation management method. Moreover, consistent with ANSI, the goal of the TRRP is to ensure that the Border Zone on each transmission ROW includes all areas from the Wire Zone limit to the edge of the Company's fee-owned or easement interests, except where physical features or environmental concerns require a different maintenance practice. Thus, the TRRP covers all the Company's transmission ROWs regardless of the voltage of the lines contained therein (i.e., it applies to all transmission ROWs, not just those that contain Federal Energy Regulatory Commission (FERC)/NERC lines regulated by FAC-003-4).

As described below, the Project will increase the distance between the Line 1604 conductors and incompatible vegetation within the ROW beyond the currently maintained corridor, consistent with the purpose and requirements of the ANSI 300A Standards. Line 1604 is a 115-kV transmission line that is part of the Company's BPS but is not subject to the FAC-003-4 requirements.

### 2.1.3 FERC/NERC Report on Transmission Facility Outages

After an unprecedented fall snowstorm hit the northeast in October of 2011, leaving 3.2 million homes and businesses without power, some for as long as 11 days, FERC and NERC undertook an inquiry focused on determining the causes of the transmission facility outages and the steps utilities could take to improve their performance in maintaining grid reliability during future snowstorms or similar weather events. Although the vast majority of these customer outages were caused by damage to electric distribution lines, 74 transmission lines and 44 transmission substations also experienced outages of 10 minutes or more. Twenty-four of the transmission facilities (23 lines and one substation) that experienced outages were BPS elements. These BPS lines were not limited to FERC/NERC lines subject to FAC-003-4.

The inquiry resulted in the issuance of a report entitled, "Report on Transmission Facility Outages during the Northeast Snowstorm of October 29–30, 2011 Causes and Recommendations," provided as Attachment 4 (FERC-NERC Report). The FERC-NERC Report concluded that the leading cause of transmission line outages during the October 2011 snowstorm was trees or tree branches falling onto power lines from outside and inside utility ROWs. Among other recommendations to help reduce the adverse impacts of similar weather events on the transmission system, the report recommends that utilities implement the industry best practice of ensuring that danger trees are not present within their full ROWs. In particular, to the extent a utility manages vegetation only on maintained ROWs rather than full ROWs, the FERC-NERC Report states that the utility should work toward reclaiming the full ROW width where feasible. The FERC-NERC Report found that maintaining the full width of the ROW free of vegetation reduces the number of danger trees near transmission lines and maintaining narrower areas within the full width of a ROW is not a best practice. FERC's findings are consistent with the ANSI A300 Standards.

## 2.1.4 Eversource's Western MA VMP and the TRRP

Eversource implements cyclical vegetation management, currently under the *Eversource Energy, Western MA Five Year Vegetation Management Plan 2024-2028,* pursuant to 333 CMR 11.00 (Western MA VMP). Consistent with ANSI A300's recommendation, the Western MA VMP implements a Wire Zone-Border Zone approach to manage incompatible vegetation that is undesirable, presents a safety hazard, or is unsuitable for the intended use of the ROW. According to the Western MA VMP, the overhead transmission line "Wire Zone" is managed through maintenance to allow herbaceous vegetation and/or low-growing woody vegetation to grow to a mature height of less than 3 feet. Established herbaceous or woody plants that grow up to 15 feet in height at maturity may remain in the "Wire Zone." The "Border Zone" extends from the limits of the Wire Zone to the ROW edge and is managed to promote a low-growing plant community of forbs, shrubs, and low-growing trees that have a mature height of no greater than 30 feet.

To reduce the risk to the normal operations of the transmission system from trees that fall from outside the maintained ROW, Eversource implements its TRRP (*Specification for Transmission Right of Way Reliability Program (TRRP) Section III Technical Requirements 2025*). The main purpose of the TRRP is to remove all incompatible species of vegetation within the easement area and fee-owned limits of the ROW. The TRRP mandates the removal of incompatible vegetation from the "Clearing Zone," which is the area from the established cleared limits of the maintained ROW edge to either the edge of the easement, the boundary of fee-owned property, or up to 100 feet, whichever is nearest to the existing transmission facilities. The one-hundred-foot distance is based on the typical height of mature trees in the Eversource territory and the configuration of the structures and lines.

Eversource has been implementing the TRRP on its BPS system since 2016. Eversource has 20 transmission lines in its Eastern Massachusetts service territory that are subject to FERC/NERC jurisdiction under FAC-003-04, all of which (100%) have been cleared to the edge of Eversource's ROW limits per the TRRP. In its New Hampshire service territory, 17 transmission lines are subject to FERC/NERC jurisdiction. Of those, 16 (94%) have been cleared to the TRRP standard and the remaining line is scheduled to be cleared in 2031. Of the 53 FERC/NERC jurisdictional transmission lines embedded in 33 ROWs in Eversource's Connecticut service territory, 13 ROWs have been cleared to the TRRP standard, and nine ROWs are presently being cleared, leaving 11 ROWs to be cleared in the near future. The Project's ROW WT-11 is the second of Eversource's 13 FERC/NERC jurisdictional transmission line ROWs in its Western Massachusetts service territory to be cleared to the TRRP standard. Eversource is planning to implement the TRRP along all its jurisdictional transmission ROWs in the Western Massachusetts service territory over the next five to seven years. While the Company has prioritized implementing the TRRP on FERC/NERC jurisdictional transmission lines, the Company plans to implement the TRRP on all its transmission ROWs by removing all incompatible species of vegetation within the easement area and fee-owned limits of the ROWs, to reduce the risk from trees that fail from outside the currently maintained ROWs and to ensure the reliable operation of its transmission system.

## 2.1.5 The Project's ROW WT-11 and TRRP

Eversource's TRRP, which applies to all its transmission ROWs regardless of the voltages of the lines contained therein, increases the maintained width of the ROW up to 100 feet from the outermost conductor or the easement edge, whichever is closer. The WT-11 ROW contains up to two 345-kV overhead transmission lines, is 300 to 500 feet wide, and has a maintained width between 125 and 335 feet. The structures on the ROW are predominantly "H-frame" type, and the conductors are in a horizontal configuration. The proposed Project will increase the maintained ROW width by approximately 50 to 75 feet by cutting trees from within the currently unmaintained/forested portions of the ROW. Doing so will minimize the risk of trees falling on the transmission lines and structures and causing widespread outages to customers. The WT-11 ROW also contains a 115-kV transmission line for approximately 1.5 miles.

There is abundant support for applying the TRRP to the WT-11 ROW. First, the purpose of the TRRP is to protect Eversource's transmission system from the risk of outages that result from trees that fall from outside the maintained ROW. The TRRP is consistent with both FAC-003-04 and ANSI A300 standards, which explicitly provide that industry best practice for utility companies is to remove incompatible vegetation present within the full legal limits of the ROWs. The goal of both FAC-003-04 and ANSI A300 to prevent catastrophic outages on the electric grid caused by vegetation is met when utility companies implement vegetation management practices that ensure incompatible species of vegetation are removed from the full width of their fee or easement rights in the ROWs. By implementing a Clearing Zone, the TRRP meets all criteria and is consistent with those standards.

Moreover, it is scientifically uncontroverted that global temperatures are rising, there has been an increase in frequency and severity of rain and storm events, and that sea levels are rising. According to the State Hazard Mitigation and Climate Adaptation Plan, severe weather events, such as hurricanes, severe winter storms, and tornados, are projected to increase in magnitude and frequency (Commonwealth of Massachusetts 2018). Over the last several years, severe weather events resulting in extended outages have become more common as trees fall into transmission lines during storm events. Table 2-1 summarizes outages related to contact with vegetation that have occurred on Eversource's transmission system in Massachusetts from 2011 to 2024.

**Table 2-1. Outages on the Eversource Transmission System Involving Contact with Vegetation, 2011 to 2024**

| REGION | T-LINE | VOLTAGE | OUT DATE/TIME | DURATION (D, M, H) |
|---|---|---|---|---|
| E-MA | 513-507 | 115KV | 02/03/23 18:54 | 1 day 1 hrs 56 mins |
| W-MA | 1657/ 962 | 115KV | 02/03/23 17:00 | 0 days 6 hrs 5 mins |
| W-MA | 637 | 69KV | 02/03/23 12:09 | 0 days 0 hrs 0 mins |
| E-MA | 513-507 | 115KV | 12/23/22 17:48 | 0 days 19 hrs 16 mins |
| W-MA | 1657/1962 | 115KV | 07/12/22 17:52 | 0 days 6 hrs 5 mins |
| E-MA | 191 | 115KV | 02/18/22 5:52 | 0 days 16 hrs 27 mins |
| W-MA | 1657/1962 | 115KV | 03/29/21 11:43 | 0 days 0 hrs 0 mins |
| E-MA | 211-503 | 115KV | 03/01/21 22:57 | 0 days 19 hrs 41 mins |
| W-MA | 1428 | 115KV | 10/07/20 17:05 | 0 days 22 hrs 30 mins |
| W-MA | 1039 | 115KV | 10/07/20 17:00 | 0 days 23 hrs 44 mins |
| W-MA | 312/393 | 345KV | 10/07/20 16:46 | 1 day 3 hrs 52 mins |
| W-MA | 1905 | 115KV | 08/04/20 18:26 | 1 day 4 hrs 21 mins |
| W-MA | 1853 | 115KV | 08/04/20 16:34 | 9 days 2 hrs 50 mins |
| W-MA | 1007 | 115KV | 08/04/20 16:19 | 0 days 4 hrs 1 mins |
| W-MA | 1768 | 115KV | 04/13/20 15:09 | 0 days 0 hrs 9 mins |
| E-MA | 240-510 | 115KV | 04/13/20 15:04 | 0 days 17 hrs 50 mins |
| E-MA | 282-602 | 230KV | 04/13/20 11:15 | 0 days 0 hrs 0 mins |
| E-MA | 065-502 | 115KV | 3/6/20 23:37 | 0 days 2 hrs 23 mins |
| E-MA | 191 | 115KV | 02/07/20 16:10 | 0 days 9 hrs 15 mins |
| E-MA | 191 | 115KV | 11/01/19 4:10 | 0 days 20 hrs 45 mins |
| W-MA | 1421 | 115KV | 10/17/19 21:31 | 0 days 15 hrs 50 mins |
| W-MA | 1421 | 115KV | 10/17/19 21:30 | 0 days 0 hrs 0 mins |
| W-MA | 1421 | 115KV | 10/17/19 3:00 | 0 days 0 hrs 0 mins |

| REGION | T-LINE | VOLTAGE | OUT DATE/TIME | DURATION (D, M, H) |
|---|---|---|---|---|
| E-MA | 513-507 | 115KV | 10/16/19 23:52 | 0 days 20 hrs 26 mins |
| W-MA | 3419 | 345KV | 10/16/19 23:16 | 0 days 15 hrs 51 mins |
| W-MA | F132 | 115KV | 10/16/19 22:00 | 0 days 14 hrs 50 mins |
| W-MA | 1858 | 115KV | 06/22/19 14:08 | 1 day 0 hrs 0 mins |
| W-MA | 1242 | 115KV | 04/20/19 14:27 | 0 days 16 hrs 27 mins |
| E-MA | 240-508 | 115KV | 02/28/19 10:06 | 1 day 11 hrs 38 mins |
| E-MA | 240-508 | 115KV | 02/25/19 21:25 | 0 days 0 hrs 0 mins |
| W-MA | 1657/1962 | 115KV | 02/25/19 17:50 | 0 days 21 hrs 34 mins |
| W-MA | 1657/1962 | 115KV | 01/01/19 13:08 | 0 days 0 hrs 0 mins |
| E-MA | 456-522 | 115KV | 12/18/18 4:25 | 0 days 0 hrs 27 mins |
| E-MA | 109 | 115KV | 3/13/18 10:19 | 0 days 1 hrs 40 mins |
| E-MA | D21 | 115KV | 3/13/18 10:19 | 0 days 1 hrs 43 mins |
| E-MA | 240-510 | 115KV | 03/08/18 0:52 | 0 days 0 hrs 6 mins |
| E-MA | 399 | 345KV | 03/02/18 19:15 | 0 days 0 hrs 0 mins |
| E-MA | 399 | 345KV | 03/02/18 19:09 | 0 days 0 hrs 0 mins |
| E-MA | 399 | 345KV | 03/02/18 19:08 | 0 days 22 hrs 38 mins |
| E-MA | 399 | 345KV | 03/02/18 19:08 | 0 days 22 hrs 38 mins |
| E-MA | 399 | 345KV | 03/02/18 19:08 | 0 days 22 hrs 38 mins |
| E-MA | 399 | 345KV | 03/02/18 19:08 | 0 days 22 hrs 38 mins |
| E-MA | D21 | 115KV | 03/02/18 16:17 | 0 days 23 hrs 13 mins |
| W-MA | 1657 | 115KV | 03/02/18 13:57 | 0 days 8 hrs 23 mins |
| E-MA | 456-522 | 115KV | 03/02/18 13:51 | 0 days 21 hrs 27 mins |
| W-MA | 1044 | 115KV | 11/20/17 9:00 | 0 days 3 hrs 50 mins |
| E-MA | 191 | 115KV | 10/30/17 4:11 | 0 days 0 hrs 5 mins |
| E-MA | 191 | 115KV | 10/30/17 3:15 | 0 days 0 hrs 0 mins |
| E-MA | 513-507 | 115KV | 10/30/17 2:44 | 0 days 17 hrs 49 mins |
| W-MA | 1242 | 115KV | 02/25/17 19:27 | 0 days 19 hrs 33 mins |
| W-MA | 1044 | 115KV | 11/30/16 7:46 | 0 days 8 hrs 18 mins |
| W-MA | F132 | 115KV | 10/23/16 11:13 | 0 days 2 hrs 53 mins |
| W-MA | 1657/1962 | 115KV | 08/12/16 15:02 | 0 days 13 hrs 52 mins |
| E-MA | L513-507 | 115KV | 07/22/16 20:08 | 0 days 8 hrs 47 mins |
| W-MA | 393/312 | 345kV | 03/01/16 0:42 | 0 days 11 hrs 57 mins |
| E-MA | L113 | 115kV | 10/01/15 20:21 | 0 days 0 hrs 1 mins |
| E-MA | 110-522 | 115kV | 06/25/15 15:31 | 0 days 0 hrs 3 mins |
| W-MA | 1657/1962 | 115kV | 12/25/14 23:40 | 0 days 14 hrs 24 mins |
| W-MA | 1657/1962 | 115kV | 10/08/14 4:53 | 1 day 8 hrs 11 mins |
| W-MA | Y177 | 115kV | 07/07/14 14:43 | 2 days 5 hrs 41 mins |
| E-MA | 513-507 | 115kV | 11/27/13 2:32 | 0 days 0 hrs 41 mins |
| E-MA | 115 | 115kV | 11/24/13 0:00 | 0 days 0 hrs 5 mins |
| W-MA | 1211 | 115kV | 10/7/13 15:58 | 0 days 0 hrs 0 mins |

| REGION | T-LINE | VOLTAGE | OUT DATE/TIME | DURATION (D, M, H) |
|---|---|---|---|---|
| W-MA | 1044 | 115kV | 04/06/13 9:01 | 0 days 6 hrs 24 mins |
| E-MA | 513-507 | 115kV | 01/31/13 9:23 | 0 days 7 hrs 15 mins |
| W-MA | 1113 | 115kV | 12/21/12 10:24 | 0 days 13 hrs 49 mins |
| W-MA | 1044 | 115kV | 12/21/12 10:24 | 0 days 15 hrs 39 mins |
| E-MA | 109 | 115kV | 12/22/11 0:30 | 0 days 8 hrs 43 mins |
| W-MA | 1113 | 115kV | 11/13/11 12:37 | 0 days 0 hrs 0 mins |
| W-MA | 1632 | 115kV | 11/13/11 12:37 | 4 days 2 hrs 31 mins |
| W-MA | 1230 | 115kV | 11/01/11 17:05 | 1 day 21 hrs 21 mins |
| W-MA | 1412 | 115kV | 10/30/11 9:11 | 0 days 0 hrs 13 mins |
| W-MA | 1311 | 115kV | 10/30/11 4:12 | 0 days 6 hrs 24 mins |
| W-MA | 1242 | 115kV | 10/30/11 1:08 | 7 days 14 hrs 2 mins |
| W-MA | 1361 | 115kV | 10/30/11 1:08 | 7 days 15 hrs 38 mins |
| W-MA | 1428 | 115kV | 10/29/11 23:35 | 1 day 2 hrs 12 mins |
| W-MA | 1113 | 115kV | 10/29/11 23:34 | 4 days 19 hrs 47 mins |
| W-MA | 1302 | 115kV | 10/29/11 23:05 | 2 days 21 hrs 46 mins |
| W-MA | 1394 | 115kV | 10/29/11 22:03 | 2 days 20 hrs 58 mins |
| W-MA | 1515 | 115kV | 10/29/11 22:03 | 0 days 0 hrs 0 mins |
| W-MA | 1962 | 115kV | 10/29/11 21:13 | 1 day 23 hrs 22 mins |
| W-MA | 1314 | 115kV | 10/29/11 21:09 | 2 days 19 hrs 36 mins |
| W-MA | 301 | 345kV | 10/29/11 20:13 | 0 days 0 hrs 0 mins |
| W-MA | 1962-1657 | 115kV | 10/29/11 17:47 | 2 days 18 hrs 4 mins |
| W-MA | 1050 | 115kV | 10/29/11 17:12 | 2 days 1 hrs 54 mins |
| E-MA | 111 | 115kV | 8/28/11 10:02 | 0 days 6 hrs 58 mins |
| E-MA | 338 | 345kV | 8/27/11 14:52 | 0 days 0 hrs 9 mins |

The close proximity of tall trees within the proposed limits of tree removals (Clearing Zone) to the conductor wires likely contributes to and, without the proposed tree removals, will continue to contribute to tree-related outages on Lines 312, 354 and 1604. In many areas, the Clearing Zone is densely vegetated with tall-growing species that can easily exceed the height of the structures within the WT-11 ROW. When these trees fall or drop limbs during periods of high winds, they may contact the existing conductors, structures, and/or structure guy wires and cause either momentary or sustained outages. The configuration of Lines 312 and 354 is horizontal, and if a tall-growing tree located in the Clearing Zone fell into the northernmost 1.5 miles of the ROW, there is a potential that the vegetation would contact multiple conductors of Lines 312, 354, and/or 1604.

## 2.1.6 Conclusion on Project Purpose and Need

There are many causes of outages; however, outages resulting from interference with vegetation on the ROW are preventable. The NERC FAC-003-04 requirements mandate that Eversource keep its ROW clear of incompatible vegetation and acknowledge that the ANSI A300 standard, where the full ROW easement is managed to prevent the growth of trees is the industry best practice on transmission corridors regardless of line voltage. Eversource implements these ROW best management practices with its TRRP, which establishes a Clearing Zone that includes the area from the established cleared limits of the maintained

ROW edge to either the edge of the easement, the boundary of fee-owned property or up to 100 feet from the outer conductor, whichever is nearest to the existing transmission facilities. As discussed above, Eversource has already implemented the TRRP across most of its Eastern Massachusetts service territory and is planning to conduct TRRP along all its transmission ROWs in its Western Massachusetts service territory over the next 5 to 7 years.

ROW WT-11 is currently maintained at 125 to 350 feet; accordingly, consistent with the TRRP, approximately 50 to 75 feet of the currently unmaintained/forested area will be cleared of all tall-growing trees and shrubs to increase the cleared width of the ROW. Thereafter, these newly cleared areas will develop into and be maintained as low-growing plant environments consistent with the existing maintained ROW in accordance with Eversource's Western MA VMP.

Implementing the TRRP on ROW WT-11 is necessary to reduce the risk of vegetation-related outages. Eversource's TRRP is a proactive approach, consistent with applicable Federal and state regulations, that ensures the continued reliability of Eversource's BPS transmission system and the New England power grid.

## 2.2 Vegetation Removal and Management Methods

A typical sequence for this TRRP Project is outlined in the subsections below. Tree work is typically conducted by multiple crews working through each of the steps outlined below in sequence; for instance, the first completed vegetation management area may be restored while the last area is being cleared.

### 2.2.1 Right-of-Way Preparation

Eversource will prepare the ROW for safe access for tree clearing equipment, contractors, and the protection of environmental resources. ROW preparation activities will include marking the limit of work and resource areas; installing erosion and sedimentation controls; improving existing access roads in uplands where necessary to allow safe vehicle passage; and placing construction mats for access through wetlands. These procedures are described in more detail below.

Prior to the commencement of any tree work activities, a final Vegetation Management Map Set will be developed for the Project that includes tree work details, TOY restrictions, and locations of approved construction mats. In addition, the boundaries of all wetland resources will be clearly marked in the field with highly visible plastic flagging tape to minimize the unauthorized encroachment of tree clearing equipment into wetland resource areas.

The WT-11 TRRP MEPA DEIR Map Set provided in Attachment 2 shows the anticipated access for the Project. The existing access roads, which are maintained by Eversource, are generally in good condition and are currently used to maintain and operate the existing transmission line infrastructure. These roads generally have a gravel base and have been graded to allow access for pickup trucks, utility maintenance vehicles, and vegetation maintenance clearing equipment. Improvements to existing gravel access roads are not generally anticipated to be necessary. Minor work may be undertaken as needed, including smoothing existing ruts and depressions or adding gravel or crushed stone to fill depressions and areas that have been eroded. These routes will be used for daily access by clearing crews and trucks that will transport wood products off-site.

In some locations, access roads have existing culverts or bridges installed at wetland and watercourse crossings. Where access roads do not exist through wetlands and at limited other sensitive locations, construction mats will be temporarily installed for access. Construction mats consist of heavy timbers, planking and/or other human-made materials joined to form stable platforms that are placed over the surface

of wetlands. At stream crossings, construction matting will span the stream channel to avoid impacts to the stream bank and bed. Construction matting may also include alternative forms of matting, such as composite matting, if field conditions allow. These mats allow for the safe passage of tree removal equipment across soft and unstable soils by distributing heavy loads over a broad surface area. Within wetlands and waterways, the use of construction mats helps minimize disturbances to vegetation and soils.

Although existing access roads and other improved surfaces will be used by vehicles and equipment to the maximum extent practicable, it will be necessary to operate mowing and tree removal equipment on unimproved surfaces. Access to tree removal areas via these unimproved surfaces will be solely by off-road vehicles with the ability to travel overland without improved roads. Off-road vehicles include tree harvesting equipment such as tree fellers, forwarders and skidders, and various types of mowers. The routes over unimproved surfaces will be temporary and will not be improved or maintained during or after tree work. Generally, stump removal or grading will not be required to establish these access routes. Site conditions, including ledge, walls, fences, water resources, and local microtopography, will guide the exact location of these unimproved routes. No new, permanent on- or off-ROW access roads will be created for the Project.

Proposed construction mats for the Project will be installed in accordance with the most recent version of Eversource's *Best Management Practices Manual for Massachusetts and Connecticut* (BMP Manual) (Eversource 2022) (provided in Attachment 8), the USACE New England District's *Construction Mat Best Management Practices (BMPs)* guidelines (USACE New England District 2016), and the final approved Vegetation Management Map Set. Additional erosion controls will be installed based on site-specific conditions, such as straw wattles, silt fence, and/or check dams, on an as-needed basis at the time of tree removal activities and as directed by an environmental monitor.

## 2.2.2 Clearing and Vegetation Management Areas

Eversource is seeking authorization to complete tree removals depicted on the WT-11 TRRP DEIR Map Set in Attachment 2. This includes the area from the edge of the maintained ROW to either the edge of the easement, the boundary of fee-owned property, or up to 100 feet, whichever is nearest to the existing transmission facilities. To minimize mobilizations to the ROW and temporary wetland impacts from the placement of construction matting in successive years, routine vegetation maintenance activities in the existing Wire and Border Zones will be conducted at the same time as the TRRP in the Clearing Zone under the following vegetation management specifications:

- **The Wire Zone** is the area under the wires, extending out to 35 feet from the outer conductor with voltages greater than 200-kV, and 25 feet for voltages less than 200-kV. Within the Wire Zone, the Eversource arborists regularly manage vegetation to promote a low-growing plant community dominated by species that do not exceed 3 feet in height at maturity. However, on a site-specific basis where there is an established herbaceous or woody plant community that protects the electric facility, reduces long-term maintenance, and enhances wildlife habitat, Eversource arborists can allow plants with mature heights up to 15 feet tall to remain.
- **The Border Zone** includes all areas from the outer limit of the Wire Zone to the edge of the maintained ROW. In most cases, newly cleared areas will be managed as Border Zones. Within the Border Zone, the Eversource arborists regularly manage the woody vegetation to exclude species that can obtain heights greater than 30 feet at maturity. All other trees and shrub species may remain where practical.

Within the Clearing Zone (i.e., the currently forested portion of the ROW that Eversource proposes to clear with this Project), all vegetation with the capability to grow to a mature height of 30 feet or greater will be removed. Where sensitive resources (i.e., state-listed species priority habitat, cultural resource sites and features, and water resources) occur within the Clearing Zone, appropriate BMPs will be employed in order

to avoid or minimize potential impacts. Other site constraints, such as steep slopes, the proximity of the work to energized transmission lines, public roadways, hiking trails, and the edge of Eversource's legal easement, will often dictate access routes to work areas. Due to these constraints, it is often difficult to avoid/protect compatible species (those with mature heights less than 30 feet) that are interspersed with incompatible species. Further, the cutting of compatible species may be necessary in order to access or remove mature trees to be cut.

When conducted in accordance with accepted timber harvesting BMPs, tree cutting and removal will result in limited ground disturbance. Stumps and below-ground portions of trees and shrubs will be left in place. As a result, soil stability will not be significantly compromised, and soil erosion is expected to be minimal. In upland areas, the use of water bars on steep or unstable soils can help to minimize erosion and sedimentation along access routes and other areas receiving heavy equipment traffic. If unusual weather or site conditions have the potential to create soil erosion or siltation of water resources, temporary sediment controls will be used until these areas are stabilized. Once disturbed areas are fully stabilized, the temporary sediment controls will be removed or allowed to biodegrade as appropriate.

Clearing will be accomplished using both manual and mechanical methods. Vegetation removal activities typically require flatbed trucks, brush hogs or other types of mowing equipment, skidders, forwarders, bucket trucks for canopy trimming, feller bunchers for mechanical tree cutting, woodchippers, log trucks, and chip trucks/trailers. In certain environmentally sensitive areas or where site topographic conditions do not allow access, clearing may be accomplished on foot by ground crews with chainsaws and climbing crews to trim and prune branches. Pickup trucks and/or other light-duty utility vehicles will also be necessary to transport workers and their materials and equipment.

### 2.2.3 Site Restoration and Cleanup

Restoration will begin in sequence with the completion of work at each location. Upland areas will be seeded as warranted with an appropriate mixture to promote the stabilization of soils and prevent sediment transport into adjacent wetlands. The exposed area will then be covered with a layer of straw mulch, and erosion controls will remain in place until the restoration area is properly stabilized.

As stated, construction mats will be used in wetland areas, some sensitive upland areas, and where needed in uplands to prevent rutting. Upon removal of construction mats, these areas will be allowed to revegetate, as the existing seed stock in the soils is anticipated to remain intact. A wetland scientist will monitor each wetland work area to ensure adequate revegetation in accordance with permit conditions. Additional restoration efforts will be implemented, if necessary, at the discretion of a wetland scientist and may include smoothing or raking of ruts, addition of wetland soils, seeding with a wetland seed mix, or addition of mulch.

Woody vegetation cleared as part of the Project and chipped material created during the Project will be removed from the ROW unless otherwise allowed to remain by Eversource or as requested by the property owner. In upland areas, chipped material or slash may be used to stabilize the ground, particularly on slopes. Material that is left for site stabilization will be done in such a manner that it does not inhibit revegetation to the maximum extent practicable. Chips or other wood products will not be left in agricultural lands, wetlands, or other sensitive resource areas, nor will they be stockpiled in such a manner that they may be transported into a wetland, agricultural land, or other sensitive resource area. An exception to this is where the drop and lop technique has been specifically identified to minimize impacts to certain sensitive wetlands resources; this technique involves hand-cutting of trees, thereby eliminating the need for construction matting, and placing felled trees in a manner that provides wildlife habitat value while not impacting ground elevations or surface flows.

Suitable sawlogs and other wood products are not expected to be generated in sufficient quantity from the Project to be marketable. However, Eversource has committed to donating firewood to the towns crossed by the Project upon request, to be obtained from Project-related tree removal on Eversource fee-owned land. Eversource is in the process of reaching out to the towns to determine whether any would like to accept firewood to be donated to the community and/or a local wood bank. On the remainder of the land crossed by the Project, the disposal and/or reuse of wood products are subject to the request of the property owners, the largest of which is the Commonwealth of Massachusetts, which owns 13.7% of the land crossed by the Project. Eversource will coordinate directly with landowners, including the Commonwealth of Massachusetts (i.e., Department of Conservation and Recreation [DCR] and the Massachusetts Department of Fish and Game [MA DFG]), regarding any requests for firewood, chips, or other wood products generated from the Project.

## 2.3 Environmental Compliance

Eversource's BMP Manual (provided in Attachment 8) and the contractor bid package contain relevant specifications for access, vegetation removal methods, listed species protection, and maintenance of site quality. Eversource's Environmental Affairs Department will monitor and maintain compliance with Project BMPs and permit conditions with the support of environmental consultants and internal staff who will maintain a regular presence in the field to oversee work activities.

Environmental monitors will conduct regular erosion and sediment control inspections, as warranted or required by permit conditions. Documentation identifying deficiencies of erosion controls will be forwarded to the arborist for implementation of corrective measures. As a proactive approach to ensure compliance with environmental permit requirements, all contractor personnel will receive training on Project environmental issues and permit conditions prior to beginning work. Regular Project progress meetings will be held to reinforce contractor awareness of these issues.

## 2.4 Project Time Frame

Work is planned for the third quarter of 2026, but the actual timing of commencement and completion will depend on the receipt of required environmental permits and anticipated TOY restrictions in certain sensitive areas.

At this time, the TOY restrictions provided in Table 2-2 are anticipated for work in rare species habitat, as described in Section 7.4.2.

**Table 2-2. Time-of-Year Restrictions by Structure ID Number**

| RESOURCE CROSSING | APPROXIMATE STRUCTURE NOS | MUNICIPALITY | TIME-OF-YEAR RESTRICTION |
|---|---|---|---|
| PH 1488 | Str. 34095 to 34118 | Leverett, Shutesbury | April 15 to October 31 |
| PH 1316 | Str. 34152 to 34165 | Pelham | April 15 to October 31 |
| PH 1276 | Str. 34168 to 34177 | Belchertown | April 15 to October 31 |
| PH 1238 | Str. 34189 to 34208 | Belchertown, Amherst, Granby | April 15 to October 31 |
| PH 2084 | Str. 34179 to 34186 | Belchertown | April 15 to October 31 |
| PH 1077 | Str. 34245 to 34254 | Ludlow | April 1 to September 30 |

# 3 ALTERNATIVES TO THE PROJECT

In accordance with 301 CMR 11.07(f) and the scope outlined in MEPA's Certificate on the EENF, this section describes alternatives to the Project and compares the environmental impacts of those alternatives to the proposed Project. Eversource's primary objective in performing this analysis is to develop a project that would accomplish the objective of improving the safety and reliability of the 345-kV Line 312 and Line 354 and the 115-kV Line 1604 during severe storm events, while avoiding or minimizing potential adverse environmental impacts to the greatest extent practicable. The evaluation criteria used in developing and analyzing alternatives include:

- Ability to meet the project purpose and need, as outlined in Section 2.1;
- Potential adverse environmental impacts;
- Potential human health and safety impacts;
- Unfair or inequitable environmental burden and related public health consequences impacting EJ populations;
- Construction safety and feasibility;
- Ongoing operational maintenance needs; and
- Construction and operational costs.

Based on these criteria, Eversource evaluated the following Project alternatives: (1) No Action Alternative, (2) Transmission Re-build Alternatives, and (3) Targeted Reduction of Tree Removals.

## 3.1 No Action Alternative

Under a No Action Alternative, no tree removal would occur within the currently unmaintained/forested portions of the ROW, and no other construction measures would be implemented to improve the safety and reliability of the 345-kV Line 312 and Line 354, and the 115-kV Line 1604. The No Action Alternative would avoid the temporary and permanent environmental impacts associated with the Project. However, Eversource has determined that there is a substantial amount of incompatible vegetation in the currently unmanaged portion of the ROW that is within striking distance of the lines and, by not completing the Project, potential immediate and future hazards caused by trees coming into contact with electric facilities, as well as those that can ensue from power outages, will not be addressed. The reliability of the existing transmission system will remain at higher risk due to the increasing severity of storms experienced in the region, which increases the potential for tree blowdowns, which may damage the power lines. Damage to the lines may result in extended power outages because many portions of the ROW are remote and difficult to access, particularly during storm events. As shown in Table 2-1, Eversource has documented numerous outages that have occurred on its transmission system that resulted from contact with vegetation. Federal and state reliability standards and best industry practices mandate that Eversource maintain its ROWs to ensure the integrity and reliability of the transmission system and promote vegetation management of the full ROW easement to prevent the growth of danger trees. The No Action Alternative does not advance Eversource's efforts to meet its obligation to comply with federal and regional reliability standards. For these reasons, Eversource determined that the No Action Alternative would not address the identified reliability need. Additional information on the Project's purpose and need is provided in Section 2.

# 3.2 Transmission Re-Build Alternatives

Eversource investigated options for rebuilding the existing Line 312, Line 354 and Line 1604 in a manner that would reduce the potential for tree fall-ins affecting the transmission lines during a significant storm event. Eversource identified two potential construction re-build alternatives that would serve to meet reliability obligations: (1) construction of new underground lines within the existing ROW and removal of the existing lines and structures; and (2) replacing all the structures along the existing ROW with new, taller structures and conductors within the existing ROW.

A summary of the advantages and disadvantages of each alternative, compared to the proposed Project, is provided in Table 3-1, and a detailed description of each alternative is provided below.

**Table 3-1. Comparative Analysis of Transmission Re-Build Alternatives**

| EVALUATION CRITERIA | UNDERGROUND ALTERNATIVE | INCREASED STRUCTURE HEIGHT ALTERNATIVE | TRRP – PROPOSED ALTERNATIVE |
|---|---|---|---|
| Construction Cost Estimate | $586 Million[1] | $176 Million[1] | $6 Million |
| New property or easements required? | Yes – easements to be modified to include underground line | Bachelor Brook WMA and additional off-ROW access easements | No |
| Impacted environmental resources | Wetlands<br>BLSF<br>RFA<br>Buffer Zone<br>Priority Habitat | Wetlands<br>BLSF<br>RFA<br>Buffer Zone<br>Priority Habitat | Wetlands<br>BLSF<br>RFA<br>Buffer Zone<br>Priority Habitat |
| Nature of environmental impacts | Temporary trenching<br>Temporary access | Permanent fill<br>Temporary work pads<br>Temporary access | Permanent conversion<br>Temporary access |
| Traffic impacts | Open trench public roads<br>Construction access | Aerial crossing<br>Construction access | Construction access |
| Ground disturbance | High | Moderate | Low |
| Visual impacts | Low (underground) | High (taller structures) | Moderate (wider managed corridor) |
| Permitting costs and timeline | High – EFSB review | High – EFSB review | Moderate |
| Solves reliability need? | Yes | Yes | Yes |
| Outage repair time | High | Moderate | Low |

1 Cost represents alternative for Line 354 only; additional cost would be incurred to place Lines 312 and 1604 underground or on taller structures.

## 3.2.1 Underground Alternative

Eversource considered replacing the three existing overhead transmission lines with underground conduit sited within the existing ROW as an alternative to the proposed tree removal activities. This work would involve the installation of a ductbank and manhole system. The typical construction progression for an underground installation would begin with the installation of precast concrete manholes (measuring approximately 32×10×10 feet). Excavation of a trench approximately 5 feet wide by 6 feet deep would then commence, with excavated material temporarily side-cast. The assembled ductbank, consisting of polyvinyl chloride (PVC) conduit, would be laid in the trench and encased with concrete. The trench would then be backfilled with the native side-cast soil and/or approved thermal fill as needed. To complete this process,

an additional 10- to 12-foot-wide area along one side of the trench would be required for access; on the other side, an additional 6- to 10-foot-wide area would be required to stockpile the side-cast material.[1]

Once the manholes and ductbanks are installed, the remaining construction activities would be confined to the terminals and manhole locations. These activities would consist of installing the cables in the conduits, splicing the cables at each manhole location, installing terminations at each overhead riser structure (these are necessary to transition the underground line back to an overhead configuration), and final testing. The ROW and road crossings would be restored following construction completion; vegetated areas would be reseeded, paved areas would be repaved, and the existing overhead transmission structures could be removed. The removal of the existing overhead structures would require some access road improvements and construction of work areas at some structure locations, both of which would result in additional temporary disturbance and resource impacts.

A description of the advantages and disadvantages of this alternative is provided below. In addition, a summary table comparing this alternative to the proposed Project is provided in Table 3-1 above.

#### *3.2.1.1 ADVANTAGES OF UNDERGROUND IN ROW ALTERNATIVE*

The primary advantages of installing an underground transmission line within the existing ROW include the following:

- **Reduction in tree removals –** Because the lines would be buried below ground, the need for additional tree removal along the existing maintained ROW corridor would be eliminated.
- **Reduction in routine vegetation maintenance –** Underground lines typically require an approximately 35-foot-wide corridor to be maintained to protect the conduits from tree roots and to allow for access for routine maintenance and repairs. As a result, installing Line 354 underground could allow for the current 125- to 335-foot-wide maintained corridor to be reduced to a 35-foot-wide corridor. A wider corridor may be required for the northern 1.3 miles of the WT-11 ROW that contain Lines 354, 312, and 1604.
- **Increased reliability –** The majority of interruptions in service on Eversource's transmission lines are due to vegetation and storm-related disturbances. Unplanned interruptions of underground transmission lines are relatively infrequent compared to overhead lines.
- **Reduction in visual impacts** – There would be no long-term visual impact associated with an underground line and an overall reduction in visual impacts compared with existing conditions if existing transmission structures are removed.

#### *3.2.1.2 DISADVANTAGES OF UNDERGROUND IN ROW ALTERNATIVE*

An underground alternative also offers the following considerations:

- **Lengthy outage repair times –** When an overhead transmission line experiences an outage, it can typically be repaired within 24 to 48 hours. In the case of a failure of an underground transmission cable, repair times can be in the range of 100 to 300 hours or more to get the line back into service. Therefore, there is increased exposure to loss of another transmission element during that time (known as the "N-1-1" contingency), with possible loss of load, during the extended underground

[1] The dimensions quantified are specific to the 28 miles of the ROW that contain only Line 354; additional workspace and trench depth would be required to accommodate the three overhead lines in the 1.3-mile portion of the ROW from Northfield Substation to Erving Substation.

outage. This could mean an extended loss of power to a significant number of customers until the underground line can be repaired.

- **Engineering considerations** – There are several engineering considerations when designing an underground transmission line. These include considerations related to the higher cable capacitance of underground lines compared to overhead lines and matching overhead line voltage ratings with underground cables.
- **Ground disturbance impacts** – Installation of an underground transmission line within the existing ROW would require trenching along the entire ROW route. Although these disturbances would be temporary in nature, construction-related impacts could include the following:
    - disturbance to wetlands, streams, and other environmentally sensitive areas (such as vernal pools, rare species habitat, and coldwater fisheries) from excavation and dewatering activities;
    - impacts to cultural resource areas;
    - increased likelihood of erosion and sedimentation, particularly given the steep topography in this region;
    - potential blasting impacts in order to trench through the significant visible rock along portions of the ROW;
    - potential trenchless crossings of watercourses, wetlands, and potentially other resources that minimize impacts to the resources but require large excavations at each end; and
    - impacts to farmlands, which would necessitate topsoil segregation and other measures to minimize compaction and settling.
- **Construction-related traffic impacts** – Traffic would be temporarily impacted at those locations where the line crosses a public roadway.
- **Construction-related recreational trail impacts** – Several recreational trails are crossed by the ROW, including Laura's Loop on the Poplar Mountain Conservation Area, several unnamed trails in the Montague State Forest, and the Robert Frost Trail, PowerlineTrail, and the Metacomet Monadnock Trail on the Mount Holyoke Range State Park. Crossing these areas would require active construction across these trails, which may require that they temporarily close to the public during construction.
- **Easement issues** – Eversource does not own approximately 65% of the ROW in fee but instead has easements rights for the transmission corridor, which typically do not include the right to install underground lines. Acquisition of the underground rights would significantly increase the cost and timeframe for this alternative.
- **Permitting timeline and costs**: This alternative would require review and approval by the Energy Facilities Siting Board (EFSB) per Massachusetts General Law (M.G.L.) c. 164, § 69T, which would add significant costs and timing (at least two to three years) to the Project. It would also require coverage under the National Pollution Discharge Elimination System (NPDES) Construction General Permit and a Stormwater Pollution Prevention Plan (SWPPP), based on the amount of ground disturbance.
- **Construction cost** – The general cost of recent underground installation is approximately $20M per mile. A high-level cost estimate of rebuilding this 29.3-mile-long transmission line underground is approximately $586M. This cost estimate would vary depending on the final design and the cost of acquiring all the necessary rights to install it.

## 3.2.2 Increase Structure Heights within Existing ROW

Based on the suggestion of one commenter on the EENF, Eversource considered increasing the heights of the transmission structures within the existing ROW as an alternative to the Project. This alternative would require the installation of new sets of taller tower structures with new conductors on the same structure centerlines (i.e., the new, taller structures would not be shifted toward one side of the ROW or the other) that is currently in place. In order to avoid tree fall-ins while maintaining the existing corridor width, it is anticipated that new horizontal H-frame structures would need to be approximately 155 feet tall above grade. Alternatively, if the existing structures were replaced with vertical configuration monopole structures on the same construction centerline, the new monopole structures would need to be approximately 180 feet above grade. In addition to the potential height and distance of nearby trees, design considerations for structure heights and spacing often need to consider multiple conditions, such as the combination of span length to mitigate conductor swing and uplift, distribution line crossings, and adjustments for steep topography with gradual span changes.

To construct structures of this height, approximately 150- by 150-foot work pads would be required at each new structure location. In addition, while the existing network of gravel access roads could be used for access to each structure location, some upgrades to the road network would be required. The structures would need to be installed approximately 15 feet in-line ahead or behind existing structures. Typical construction sequence includes vegetation clearing for work pad and access road construction, drilling foundations, setting poles under outage, installing hardware, pulling and sagging conductor and fiber, re-energizing the line, removing the existing structures, conductors, and hardware, and reclaiming the ROW. Outage durations are dependent on construction sequencing specific to each project. Outages also limit some construction to TOY restrictions along with additional restrictions from environmental permitting. During construction, lines are required to be made safe when recalled due to impending, unplanned storms.

### *3.2.2.1 ADVANTAGES TO STRUCTURE HEIGHT INCREASE ALTERNATIVE*

Increasing structure height would offer the following advantage:

- **Reduction in conversion of forest to scrub-shrub land –** By installing new taller structures, the need for tree removal to minimize fall-in risk would be reduced.

### *3.2.2.2 DISADVANTAGES TO STRUCTURE HEIGHT INCREASE ALTERNATIVE*

There are several disadvantages to increasing structure height compared to other alternatives:

- **Permanent wetland/habitat loss from structure pads** – Construction of new structures would require new structure pads, resulting in permanent loss of wetlands and rare species habitat where unavoidable.
- **Permitting timeline and costs** – This alternative would require review and approval by the EFSB, which would significantly increase costs and timing by an additional two to three years. It would also require coverage under the NPDES Construction General Permit and a SWPPP, based on the amount of ground disturbance, and would require review and approval by the Federal Aviation Administration (FAA) to ensure that the structure height would not interfere with airspace safety.
- **Visual impacts** – Increasing structure height would result in a visual impact, as structures will now be visible over surrounding trees. This visual impact may need approval from the EFSB.
- **Ground disturbance impacts** – The replacement of existing structures with taller H-frame or vertical structures would require custom steel poles and custom drilled shaft foundations. Typically, taller structures require foundations of larger diameter and/or deeper embedment than the existing

structures, and vertical monopole structures even more so than H-frame structures. In addition to the permanent impact of proposed structure foundations, installation of new structures could have the following temporary impacts:

- disturbance to wetlands, streams, and other environmentally sensitive areas (such as vernal pools, rare species habitat, and coldwater fisheries) from drilling, structure work pads, and dewatering activities;
- impacts to cultural resource areas; and
- increased likelihood of erosion and sedimentation, particularly given the steep topography in this region, which may require grading to achieve level work pads.

- **Construction cost** – The general cost of recent overhead construction is approximately $6M per mile. A high-level cost estimate of rebuilding these structures on Line 354 is approximately $176M. This cost estimate would vary depending on final design, and additional cost would be required to also include Lines 312 and 1604 on new, taller structures.

### 3.2.3 Transmission Re-Build Alternatives Conclusion

Replacement of this line with construction of a new underground transmission line or a new, taller overhead line cannot be justified based on costs and environmental impacts and is unlikely to receive approval from the EFSB when the significantly less expensive and less environmentally impactful TRRP Project is available.

## 3.3 Targeted Reduction of Tree Removal Width in Sensitive Areas

Eversource investigated an alternative that would reduce tree removal areas in sensitive areas, such as wetlands, vernal pools, and rare species habitat. This alternative would create a maintained ROW corridor with a variable width – wider in areas with no sensitive resources and narrower in these sensitive areas.

Although reducing tree removal in some sensitive areas could reduce the environmental impact in these areas, it is not a viable Project alternative because it would not achieve the Project's goal of reducing tree fall-ins and improving the safety and reliability of the grid. In fact, this alternative would likely compound the reliability problem by increasing the likelihood of tree fall-ins. This is because a variable width corridor is more susceptible to the impacts of wind. By clearing trees in uplands around a sensitive resource, the wind protection offered by those adjacent trees would be eliminated, and the trees in that sensitive resource would now be exposed on multiple sides to wind effects. The increased likelihood of tree fall-ins is further exacerbated by the fact that these sensitive resources are typically wetland areas with high groundwater tables where trees are already more susceptible to wind due to shallow rooting.

Because a targeted reduction of clearing areas in many of the sensitive resource areas would likely increase the risk of fall-ins rather than reduce it, this was not considered a viable alternative to this Project. However, reducing tree removals in some sensitive resource areas remained a part of the alternatives analysis and was further considered as part of the alternative discussed in Section 3.4.2.

## 3.4 Width Analysis for TRRP on ROW WT-11

The MEPA Office and several commenters on the EENF requested justification for the proposed tree removal width of 100 feet from the outer conductors and inquired whether that width could be reduced along the entire 29.3-mile ROW or whether targeted reductions can be made in specific locations based on

either topography and species composition or within sensitive environmental areas (e.g., rare species habitat or wetlands). As discussed in Section 3.3, Eversource evaluated and dismissed from further consideration targeted reductions in clearing width based on the presence of sensitive resource areas.

To address whether the clearing width can be reduced along the entire ROW or whether targeted width reductions can be made along certain portions of the ROW based on topography, Eversource surveyed the WT-11 ROW with LiDAR technology to create three-dimensional mapping of the entire length of the ROW corridor. LiDAR is an optical remote-sensing technique that uses reflected laser light to map the structure of an object or a surface. For the WT-11 TRRP Project, the main features that were mapped using LiDAR include vegetation height, density, and topography. Through processing and further analysis of the data, trees were identified as either coniferous or deciduous and were assigned a tree health (good /poor) designation. The data obtained from the LiDAR survey were then used to identify existing trees that are currently located within striking distance of Line 312, Line 354, and Line 1604 should they partially or completely fail. However, the purpose of TRRP is to identify and remove trees that have the potential to grow into strike hazards in the future, not just the existing hazardous trees. Therefore, a growth model was generated to predict the height of vegetation along the ROW within a 40-year timeframe, the expected lifespan of the transmission structures in the ROW.[2]

The growth modeling methodology used for the WT-11 is summarized as follows:

- Using U.S. Forest Service Forest Inventory and Analysis (FIA) program data, red oak (deciduous) and white pine (coniferous) were selected as representative indicator species for the WT-11 ROW corridor.
- Since the LiDAR survey captured existing height data for thousands of trees within the WT-11 corridor, the sample size we have for how tall trees can grow is quite large. As a result, the existing tree heights obtained through the LiDAR survey were used as the basis to establish the maximum heights to which the trees could be expected to grow. Currently, the tallest coniferous tree height as of September 2022 is 133 feet, and the tallest deciduous tree height is 128 feet. Because only a small number of the thousands of trees had existing heights close to these current maximums, it was presumed that trees at these heights were likely close to the maximum that could be expected. Therefore, to account for possible growth beyond the September 2022 conditions, 8 feet were added to these current tree heights to establish a maximum expected tree height of 140 feet for coniferous trees and 135 feet for deciduous trees along the WT-11 corridor. This is intended to reflect both the potential for growth beyond 2022 conditions (i.e., it is unknown if maximum heights were reached as of 2022) and potential height increases due to predicted increases in mean annual temperature and precipitation over the 2022 to 2062 study period.
- Site quality was estimated as either “good,” “moderate,” or “poor” using a MassGIS data set developed by The University of Massachusetts at Amherst’s (UMass) Department of Natural Resource Conservation for classifying the forest productivity of land in Massachusetts. The methodology is based on Natural Resource Conservation Service (NRCS) and MassGIS soils data, aspect, land cover, riparian corridors, slope position, wetland soils, hydrologic soil association, and unique areas to “classify potentially forested land into nine different categories, organized into three classes, based on potential average timber productivity of white pine and red oak." Tree height growth rate numbers were developed using site index tables contained within the *Massachusetts Department of Conservation and Recreation’s Manual for Continuous Forest Inventory Field Procedures* (DCR 2014). Additional sources of site index curves published by the U.S. Forest Service were also consulted for validation of data within the DCR document. For the two indicator species, growth rates were derived for good, moderate, and poor-quality growing sites. Trees

[2] This 40-year life expectancy for the transmission line was similarly used in both the RMAT and the GHG analysis.

identified as having poor health were considered dead or dying, with no future height growth expected.

Heights of the LiDAR-identified trees were predicted using this methodology for each year of the 40-year study period. This allowed Eversource to predict which trees could grow into strike hazards in the future and, thus, more accurately analyze where tree removals needed to occur now in order to minimize future risk.

## 3.4.1 Tree Removal Width Analysis

Once the growth modeling and 40-year strike potential were determined for the entirety of the line, Eversource assessed the following five alternative tree clearing widths:

- Alternative 1: No Action
- Alternative 2: 50 feet from outer conductor;
- Alternative 3: 75 feet from outer conductor;
- Alternative 4: 100 feet from outer conductor (as proposed in the EENF); and
- Alternative 5: Full ROW-width clearing.

A quantitative analysis of the environmental impacts and number of potential tree strikes that would remain under each scenario was conducted, and the results are provided in Table 3-2 below.

**Table 3-2. Comparison of Tree Removal Width Alternatives**

| EVALUATION CRITERIA | ALTERNATIVE 1: NO ACTION | ALTERNATIVE 2: 50 FEET | ALTERNATIVE 3: 75 FEET | ALTERNATIVE 4: 100 FEET | ALTERNATIVE 5: FULL ROW-WIDTH |
|---|---|---|---|---|---|
| Total tree clearing (acres) | 0 | 11.7 | 134.8 | 284.1 | 425.4 |
| Tree removal in wetlands (acres) | 0 | 1.3 | 12.9 | 26.8 | 39.3 |
| Tree removal in Outstanding Resource Water (ORW) (acres) | 0 | 0.2 | 2.2 | 4.5 | 6.5 |
| Tree removal in Riverfront Area (acres) | 0 | 1.7 | 12.8 | 25.1 | 36.8 |
| Tree removal in Bordering Land Subject to Flooding (acres) | 0 | 0.4 | 3.2 | 6.7 | 9.2 |
| Tree removal in state-listed rare species habitat (acres) | 0 | 3.9 | 41.7 | 87.7 | 132.0 |
| Tree removal in vernal pools (acres) | 0 | 0.01 | 0.07 | 0.13 | 0.18 |
| Temporary impacts to wetlands from construction matting (acres) | 0 | 4.7 | 10.4 | 10.8 | 12.3 |
| Net Change in GHG Emissions[2] | 0 | ↑ | ↑ | ↑↑ | ↑↑ |
| Climate resiliency[3] | 0 | ↑ | ↑↑ | ↑↑↑ | ↑↑↑ |

| EVALUATION CRITERIA | ALTERNATIVE 1: NO ACTION | ALTERNATIVE 2: 50 FEET | ALTERNATIVE 3: 75 FEET | ALTERNATIVE 4: 100 FEET | ALTERNATIVE 5: FULL ROW-WIDTH |
|---|---|---|---|---|---|
| Number (%) of Existing Trees within Striking Distance Remaining | 6,475 (100%) | 5,542 (86%) | 1,578 (24%) | 186 (3%) | 0 (0%) |
| Number (%) of Trees within Striking Distance Remaining after 40 Years of Estimated Growth | 10,021 (100%) | 7,695 (77%) | 2,976 (30%) | 228 (2%) | 0 (0%) |

1 – Matting layouts for alternatives 2 and 3 were based on desktop review; actual matting layout may be higher for these alternatives based on a field constructability review were this alternative selected.

2 – Relative to the No Action Alternative, all alternatives are likely to result in a net decrease in GHG emissions. The number of downward pointing arrows indicates the magnitude of the expected decrease in GHG emissions.

3 – Relative to the No Action Alternative, all alternatives are likely to result in a net improvement to the climate resiliency of the lines by preventing potential tree strikes. The number of upward pointing arrows indicates the expected increase in climate resiliency.

As summarized in Table 3-2, impacts to all resources increase as tree removal width increases. However, Alternatives 1, 2, and 3 leave a large number of potential current and future trees within striking distance of Lines 312 and 354, a risk that exposes these important 345-kV lines to potential outages and reliability concerns. Alternative 5 represents full ROW-width tree removal and would be preferred by Eversource from a reliability perspective as it eliminates 100% of current and future estimated strike trees within the ROW; however, Eversource has determined that the environmental and permitting implications of this alternative are outweighed by the small reliability improvements afforded by it compared to Alternative 4. Therefore, Alternative 4, which removes trees up to 100 feet from the outer conductor or the limit of Eversource's ROW, whichever is less, has been determined to be the preferred alternative that meets the Project's purpose and need while minimizing environmental impacts to the extent feasible.

## 3.4.2 LiDAR Analysis-based Width Modifications

Once Eversource determined that the 100-foot tree removal width best serves the Project's purpose and need, the results of the LiDAR analysis and growth modeling were used to identify specific locations where tree removal widths could be reduced from 100 feet based on topography or expected vegetation heights. Unlike the alternative discussed in Section 3.3 (Targeted Reduction of Tree Removal Width in Sensitive Areas), which did not meet the Project's purpose and need, this analysis used LiDAR data to identify areas where the typical 100-foot tree removal width could be modified based on lack of trees within striking distance due to topography, low growth potential, or site quality factors.

Of note, the LiDAR analysis indicated that tree removal within portions of the Border Zone at the Millers River and Amethyst Brook crossings could be eliminated. Tree removal within the Wire Zone is still required in these areas for safety and reliability reasons and is considered an exempt maintenance activity, but the adoption of the 100-foot Modified Alternative has eliminated approximately 0.65 acre of tree removal at Amethyst Brook and 0.75 acre of tree removal at Millers Brook.

A comparison of the typical 100-foot removal width discussed in Section 3.4.1 and the modified 100-foot removal width is provided in Table 3-3 below.

**Table 3-3. Comparison of LiDAR Analysis-based Tree Clearing Width Modifications**

| EVALUATION CRITERIA | ALTERNATIVE 3A: 100 FEET | ALTERNATIVE 3B: 100 FEET MODIFIED |
|---|---|---|
| Total tree clearing (acres) | 284.1 | 278.1 |
| Tree removal in wetlands (acres) | 26.8 | 24.2 |

| EVALUATION CRITERIA | ALTERNATIVE 3A: 100 FEET | ALTERNATIVE 3B: 100 FEET MODIFIED |
|---|---|---|
| Tree removal in Outstanding Resource Water (ORW) (acres) | 4.5 | 4.4 |
| Tree removal in Riverfront Area (acres) | 25.1 | 23.1 |
| Tree removal in Bordering Land Subject to Flooding (acres) | 6.7 | 6.3 |
| Tree removal in state-listed rare species habitat (acres) | 87.7 | 86.1 |
| Tree removal in vernal pools (acres) | 0.13 | 0.09 |
| Temporary impacts to wetlands from construction matting (acres) | 10.8 | 10.1 |
| Net change in GHG emissions[1] | ↑↑ | ↑↑ |
| Climate resiliency[2] | ↑↑↑ | ↑↑↑ |
| Number (%) of Existing Trees within Striking Distance Remaining | 186 (3%) | 183 (3%) |
| Number (%) of Trees within Striking Distance Remaining after 40 Years of Growth | 228 (2%) | 226 (2%) |

1 – The number of upward pointing arrows indicates the magnitude of the expected increase in GHG emissions.

2 – Relative to the No Action Alternative, all alternatives are likely to result in a net improvement to the climate resiliency of the lines by preventing potential tree strikes. The number of upward pointing arrows indicates the expected increase in climate resiliency.

## 3.5 Alternatives Analysis Conclusion

Eversource developed a detailed Alternatives Analysis for the Project that compared the environmental impacts, risk of tree strikes, and costs associated with several alternatives. Alternatives considered included the No Action Alternative, an underground transmission alternative, replacing the existing structures with taller structures, and various tree removal width alternatives.

The No Action Alternative was dismissed because it does not meet the Project's purpose and need. By continuing to maintain the existing corridor as is, approximately 126 trees would remain within striking distance of Line 312 and approximately 6,349 additional trees would be within striking distance of Line 354 under current conditions. In 40 years (the anticipated lifespan of this 345-kV line), an estimated 149 trees would remain within striking distance of Line 312 and approximately 9,872 additional trees would remain within striking distance of Line 354.

The underground transmission and structure height increase alternatives represent complete rebuilds of an existing operational line. These alternatives were dismissed due to the significant amount of soil disturbance that would be required within areas of steep topography, additional permitting and easement negotiations, as well as the construction and permitting costs and timelines, which are substantially higher than tree removal alternatives. An alternative that eliminated tree removals within sensitive areas was also considered but was dismissed due to concerns that wind effects would exacerbate tree fall-in risks.

Eversource then completed a detailed LiDAR analysis to assess various tree removal widths. The 100-foot alternative, which would remove incompatible trees within 100 feet of the outer conductors or the edge of the easement, whichever is less, will result in more conversion of forested land to early successional community types compared to the 50-foot and 75-foot alternatives, but less than a full ROW-width alternative. The 100-foot alternative was determined to satisfy the reliability need for the Project because it will remove over 97% of the current potential strike trees and 98% of the future potential strike trees on the ROW while reducing environmental impacts compared to a full ROW width alternative. Therefore, the 100-foot alternative was selected as the preferred tree removal width.

Finally, Eversource examined the results of the LiDAR analysis growth model to determine if there are specific locations along the ROW where topography and site quality indicated a reduced tree fall-in risk. These areas were field-confirmed during additional constructability reviews, and a "100-foot modified" alternative was developed that will continue to remove over 97% of existing potential strike trees and 98% of future potential strike trees, while allowing for a 2% reduction in forested land conversion compared to a standard 100-foot tree clearing width. Thus, Eversource determined that the 100-foot Modified Alternative best meets the needs of the Project while minimizing environmental impacts.

# 4 EXISTING ENVIRONMENT

This section provides a description and analysis of the existing environmental conditions of the Project site, its immediate surroundings, and the region.

## 4.1 Topography, Geology, and Soils

The northern boundary of the Project begins along the western edge of Northfield Mountain in Northfield, Massachusetts. Elevations rise from about 150 feet to approximately 300 feet as the ROW crosses Poplar Mountain in Erving. Following a steep descent on the southern edge of Poplar Mountain, elevations sink below 100 feet at the Millers River crossing, marking the town line of Erving and Wendell. Elevations stay below 200 feet until the ROW enters Montague and begins climbing the gradual slope of Dry Hill, finally reaching the eastern edge of its peak at 400 feet. A gradual decent begins, bottoming out at elevations near 250 feet at the Williams Brook crossing as the ROW enters Leverett. Here, Diamond Match Ridge borders Williams Brook in the east and the ROW continues through its slopes ranging in elevation from 210 feet to 270 feet before the next decline associated with the Sawmill River. Elevations below 170 feet persist for a little more than a half mile and then begin to steepen again as the ROW extends into the slopes of Brushy Mountain. The topography stays between 200 and 330 feet through the January Hills in Shutesbury and past Poverty Mountain in Pelham, with the exception of slight declines around the Roaring, Nurse, and Dean Brooks. Beyond Dean Brook, the ROW stays in the shallower valley along the eastern edge of Mount Orient but begins to climb to higher elevations through the slopes of Butter Hill, reaching 550 feet. As it approaches Belchertown, elevations sink back below 400 feet, dropping as low as 190 feet around Hop Brook and then rising into the Mount Holyoke Range at the intersection of Amherst and Granby. The ROW remains mostly above 350 feet until it approaches Bachelor Brook at elevations as low as 280 feet. Outcrops through the Facing Hills raise the corridor to nearly 750 feet. Elevations continue to remain above 450 feet through Jefferson Peak in Ludlow before reaching the Ludlow Substation. A USGS topographic map of the Project area is provided in Attachment 1.

The Project is almost entirely in a region of glacial till or bedrock, with a few sand and gravel or floodplain alluvium sections where lower-lying elevations exist. It falls within two geologic provinces: the Bronson Hill Sequence and the Mesozoic Basin. Each province group shares common features of lithology, age of formation, geologic setting, and tectonic history. They generally occur as northeast trending belts that follow the structure fabric of the Appalachian fold belt and faults in New England. The Bronson Hill Sequence is localized along the eastern Connecticut valley from Connecticut to western New Hampshire and northern Maine and encompasses the majority of the Project area. This geologic province is principally composed of Ordovician igneous and metavolcanic rocks overlain by Ordovician to Devonian metasedimentary rocks. Sulfidic schists and mafic rocks are common, and it is intruded by Devonian granites. The Mesozoic Basin underlies about 3.3 miles of the Project area as it crosses through Belchertown, Amherst, and Granby. This province is composed of Triassic to Jurassic age sediments and basalt flows deposited in a localized rift basin in central Connecticut and Massachusetts. It is intruded by Jurassic diabase and basalt dikes (Robinson and Kapo 2003).

The Project area crosses 100 different soil map units. Soil characteristics, based on the Official Soil Series Descriptions prepared by the NRCS (2022a), of each soil type association and series crossed by the Project are summarized in Table 4-1.

**Table 4-1. Types and Characteristics of Soils Crossed by the WT-11 TRRP Project**

| Map Unit | Map Unit Name | Percent of Project Area | Erosion Potential [a] | Compaction Hazard [b] | Drainage Class | Hydric | Depth to Restrictive Feature (inches) | Depth to Water Table (inches) | Farmland Class |
|---|---|---|---|---|---|---|---|---|---|
| 103C | Charlton-Hollis-Rock outcrop complex, 8 to 15% slopes | 0.2 | Severe | Medium | Well drained | No | >80 | >80 | No |
| 103E | Charlton-Hollis-Rock outcrop complex, steep | 2.5 | Severe | Medium | Well drained | No | 24 | >80 | No |
| 109B | Chatfield-Hollis complex, 3 to 8% slopes, rocky | 1.9 | Moderate | Medium | Well drained | No | >80 | 37 | No |
| 109C | Chatfield-Hollis complex, 8 to 15% slopes, rocky | 6.6 | Severe | Medium | Well drained | No | >80 | 30 | No |
| 109D | Chatfield-Hollis complex, 15 to 25% slopes, rocky | 2.8 | Severe | Medium | Well drained | No | >80 | 37 | No |
| 109F | Chatfield-Hollis complex, 25 to 60% slopes, rocky | 1.7 | Severe | Medium | Well drained | No | >80 | 37 | No |
| 112B | Canton-Chatfield-Hollis complex, 0 to 8% slopes, rocky | 0.4 | Moderate | Medium | Well drained | No | >80 | 22 | No |
| 112C | Canton-Chatfield-Hollis complex, 8 to 15% slopes, rocky | 1.1 | Severe | Medium | Well drained | No | >80 | 22 | No |
| 112D | Canton-Chatfield-Hollis complex, 15 to 35% slopes, rocky | 0.5 | Severe | Medium | Well drained | No | >80 | 22 | No |
| 114C | Hollis-Chatfield complex, 8 to 15% slopes, very rocky | 1.1 | Severe | Medium | Somewhat excessively drained | No | >80 | 15 | No |
| 128B | Millsite-Chichester complex, 3 to 8% slopes, rocky | 0.0 | Severe | Medium | Well drained | No | >80 | 33 | No |
| 128C | Millsite-Chichester complex, 8 to 15% slopes, rocky | 1.7 | Severe | Medium | Well drained | No | >80 | 33 | No |
| 129B | Millsite-Woodstock complex, 3 to 8% slopes, very rocky | 0.2 | Moderate | Medium | Well drained | No | >80 | 33 | No |

| Map Unit | Map Unit Name | Percent of Project Area | Erosion Potential [a] | Compaction Hazard [b] | Drainage Class | Hydric | Depth to Restrictive Feature (inches) | Depth to Water Table (inches) | Farmland Class |
|---|---|---|---|---|---|---|---|---|---|
| 129C | Millsite-Woodstock complex, 8 to 15% slopes, very rocky | 1.2 | Severe | Medium | Well drained | No | >80 | 33 | No |
| 129F | Millsite-Woodstock complex, 25 to 60% slopes, very rocky | 1.0 | Severe | Medium | Well drained | No | >80 | 33 | No |
| 15A | Scarboro-Rippowam complex, 0 to 3% slopes | 0.3 | Slight | Low | Very poorly drained | Yes | 0 | >80 | No |
| 229F | Windsor and Merrimac soils, 25 to 60% slopes | 0.9 | Severe | Low | Excessively drained | No | >80 | >80 | No |
| 245A | Hinckley loamy sand, 0 to 3% slopes | 0.3 | Slight | Low | Excessively drained | No | >80 | >80 | Statewide Importance |
| 245B | Hinckley loamy sand, 3 to 8% slopes | 1.8 | Moderate | Low | Excessively drained | No | >80 | >80 | Statewide Importance |
| 245C | Hinckley loamy sand, 8 to 15% slopes | 1.0 | Moderate | Low | Excessively drained | No | >80 | >80 | Statewide Importance |
| 245D | Hinckley loamy sand, 15 to 25% slopes | 0.8 | Severe | Low | Excessively drained | No | >80 | >80 | No |
| 253A | Hinckley loamy sand, 0 to 3% slopes | 0.7 | Slight | Low | Excessively drained | No | >80 | >80 | Statewide Importance |
| 253B | Hinckley loamy sand, 3 to 8% slopes | 1.5 | Moderate | Low | Excessively drained | No | >80 | >80 | Statewide Importance |
| 253C | Hinckley loamy sand, 8 to 15% slopes | 1.9 | Moderate | Low | Excessively drained | No | >80 | >80 | Statewide Importance |
| 253E | Hinckley loamy sand, 25 to 35% slopes | 0.9 | Severe | Low | Excessively drained | No | >80 | >80 | No |
| 254A | Merrimac fine sandy loam, 0 to 3% slopes | 0.9 | Slight | Medium | Somewhat excessively drained | No | >80 | >80 | Yes |
| 254B | Merrimac fine sandy loam, 3 to 8% slopes | 0.6 | Moderate | Medium | Somewhat excessively drained | No | >80 | >80 | Yes |
| 254C | Merrimac fine sandy loam, 8 to 15% slopes | 0.4 | Severe | Medium | Somewhat excessively drained | No | >80 | >80 | Statewide Importance |
| 255A | Windsor loamy sand, 0 to 3% slopes | 0.1 | Slight | Low | Excessively drained | No | >80 | >80 | Statewide Importance |
| 255B | Windsor loamy sand, 3 to 8% slopes | 1.8 | Slight | Low | Excessively drained | No | >80 | >80 | Statewide Importance |

| Map Unit | Map Unit Name | Percent of Project Area | Erosion Potential [a] | Compaction Hazard [b] | Drainage Class | Hydric | Depth to Restrictive Feature (inches) | Depth to Water Table (inches) | Farmland Class |
|---|---|---|---|---|---|---|---|---|---|
| 255C | Windsor loamy sand, 8 to 15% slopes | 0.2 | Moderate | Low | Excessively drained | No | >80 | >80 | Statewide Importance |
| 255D | Windsor loamy sand, 15 to 25% slopes | 0.1 | Severe | Low | Excessively drained | No | >80 | >80 | No |
| 260A | Sudbury fine sandy loam, 0 to 3% slopes | 0.4 | Slight | Medium | Moderately well drained | No | 27 | >80 | Yes |
| 260B | Sudbury sandy loam, 3 to 8% slopes | 0.6 | Moderate | Medium | Moderately well drained | No | 8 | >80 | Yes |
| 275A | Agawam fine sandy loam, 0 to 3% slopes | 0.1 | Slight | Medium | Well drained | No | >80 | 26 | Yes |
| 275B | Agawam fine sandy loam, 3 to 8% slopes | 0.0 | Moderate | Medium | Well drained | No | >80 | 26 | Yes |
| 275C | Agawam fine sandy loam, 8 to 15% slopes | 0.1 | Moderate | Medium | Well drained | No | >80 | 26 | Statewide Importance |
| 276A | Ninigret fine sandy loam, 0 to 3% slopes | 0.0 | Slight | Medium | Moderately well drained | No | 26 | 26 | Yes |
| 300B | Montauk fine sandy loam, 3 to 8% slopes | 0.2 | Moderate | Medium | Well drained | No | 30 | 34 | Yes |
| 301B | Montauk fine sandy loam, 0 to 8% slopes, very stony | 0.5 | Moderate | Medium | Well drained | No | 32 | 36 | Statewide Importance |
| 301C | Montauk fine sandy loam, 8 to 15% slopes, very stony | 2.0 | Severe | Medium | Well drained | No | 32 | 36 | Statewide Importance |
| 301E | Montauk fine sandy loam, 15 to 35% slopes, very stony | 0.3 | Severe | Medium | Well drained | No | 32 | 36 | No |
| 307C | Paxton fine sandy loam, 8 to 15% slopes, extremely stony | 0.4 | Severe | Low | Well drained | No | 26 | 28 | No |
| 307D | Paxton fine sandy loam, 15 to 25% slopes, extremely stony | 0.4 | Severe | Low | Well drained | No | 26 | 28 | No |
| 312B | Woodbridge fine sandy loam, 0 to 8% slopes, extremely stony | 0.1 | Moderate | Medium | Moderately well drained | No | 20 | 32 | No |

| Map Unit | Map Unit Name | Percent of Project Area | Erosion Potential [a] | Compaction Hazard [b] | Drainage Class | Hydric | Depth to Restrictive Feature (inches) | Depth to Water Table (inches) | Farmland Class |
|---|---|---|---|---|---|---|---|---|---|
| 315B | Scituate fine sandy loam, 3 to 8% slopes | 0.0 | Moderate | Medium | Moderately well drained | No | 21 | 27 | Yes |
| 315C | Scituate fine sandy loam, 8 to 15% slopes | 0.4 | Severe | Medium | Moderately well drained | No | 18 | 31 | Statewide Importance |
| 316B | Scituate fine sandy loam, 3 to 8% slopes, very stony | 3.5 | Moderate | Medium | Moderately well drained | No | 18 | 31 | Statewide Importance |
| 316C | Scituate fine sandy loam, 8 to 15% slopes, very stony | 1.3 | Severe | Medium | Moderately well drained | No | 21 | 27 | Statewide Importance |
| 317B | Scituate fine sandy loam, 3 to 8% slopes, extremely stony | 0.1 | Moderate | Medium | Moderately well drained | No | 21 | 27 | No |
| 317C | Scituate fine sandy loam, 8 to 15% slopes, extremely stony | 0.9 | Moderate | Medium | Moderately well drained | No | 21 | 27 | No |
| 317D | Scituate fine sandy loam, 15 to 25% slopes, extremely stony | 2.2 | Severe | Medium | Moderately well drained | No | 21 | 27 | No |
| 31A | Walpole sandy loam, 0 to 3% slopes | 0.8 | Slight | Medium | Poorly drained | Yes | 2 | >80 | No |
| 32A | Wareham loamy sand, 0 to 3% slopes | 0.0 | Slight | Low | Poorly drained | Yes | 9 | >80 | No |
| 349B | Henniker sandy loam, 3 to 8% slopes, very stony | 1.6 | Moderate | Medium | Well drained | No | 24 | 29 | Statewide Importance |
| 349C | Henniker sandy loam, 8 to 15% slopes, very stony | 1.1 | Severe | Medium | Well drained | No | 24 | 29 | Statewide Importance |
| 349D | Henniker sandy loam, 15 to 25% slopes, very stony | 0.9 | Severe | Medium | Well drained | No | 24 | 29 | No |
| 369B | Metacomet fine sandy loam, 3 to 8% slopes, very stony | 1.7 | Moderate | Medium | Moderately well drained | No | 18 | 32 | Statewide Importance |
| 369C | Metacomet fine sandy loam, 8 to 15% slopes, very stony | 0.0 | Moderate | Medium | Moderately well drained | No | 18 | 32 | Statewide Importance |

| Map Unit | Map Unit Name | Percent of Project Area | Erosion Potential [a] | Compaction Hazard [b] | Drainage Class | Hydric | Depth to Restrictive Feature (inches) | Depth to Water Table (inches) | Farmland Class |
|---|---|---|---|---|---|---|---|---|---|
| 386D | Essex sandy loam, 15 to 25% slopes, very stony | 0.0 | Severe | Medium | Well drained | No | 20 | 26 | No |
| 39A | Scarboro mucky fine sandy loam, 0 to 3% slopes | 0.1 | Slight | Low | Very poorly drained | Yes | 0 | >80 | No |
| 406B | Charlton fine sandy loam, 3 to 8% slopes, very stony | 0.1 | Moderate | Medium | Well drained | No | >80 | >80 | Statewide Importance |
| 417C | Narragansett very fine sandy loam, 8 to 15% slopes, extremely stony | 2.1 | Severe | Medium | Well drained | No | >80 | >80 | No |
| 417D | Narragansett very fine sandy loam, 15 to 25% slopes, extremely stony | 3.3 | Severe | Medium | Well drained | No | >80 | >80 | No |
| 420B | Canton fine sandy loam, 3 to 8% slopes | 0.3 | Moderate | Medium | Well drained | No | >80 | 26 | Yes |
| 420C | Canton fine sandy loam, 8 to 15% slopes | 0.7 | Severe | Medium | Well drained | No | >80 | 26 | Statewide Importance |
| 421B | Canton fine sandy loam, 0 to 8% slopes, very stony | 0.7 | Moderate | Medium | Well drained | No | >80 | 22 | Statewide Importance |
| 421C | Canton fine sandy loam, 8 to 15% slopes, very stony | 1.7 | Severe | Medium | Well drained | No | >80 | 22 | Statewide Importance |
| 421D | Canton fine sandy loam, 15 to 25% slopes, very stony | 2.3 | Severe | Medium | Well drained | No | >80 | 22 | No |
| 421F | Canton fine sandy loam, 25 to 45% slopes, very stony | 0.9 | Severe | Medium | Well drained | No | >80 | 28 | No |
| 426B | Newfields fine sandy loam, 3 to 8% slopes | 0.5 | Moderate | Medium | Moderately well drained | No | 17 | 17 | Yes |
| 440B | Gloucester gravelly fine sandy loam, 3 to 8% slopes | 0.7 | Moderate | Medium | Somewhat excessively drained | No | >80 | >80 | Statewide Importance |
| 441B | Gloucester fine sandy loam, 3 to 8% slopes, very stony | 3.7 | Moderate | Medium | Somewhat excessively drained | No | >80 | >80 | Statewide Importance |

| Map Unit | Map Unit Name | Percent of Project Area | Erosion Potential [a] | Compaction Hazard [b] | Drainage Class | Hydric | Depth to Restrictive Feature (inches) | Depth to Water Table (inches) | Farmland Class |
|---|---|---|---|---|---|---|---|---|---|
| 441C | Gloucester fine sandy loam, 8 to 15% slopes, very stony | 2.7 | Moderate | Medium | Somewhat excessively drained | No | >80 | >80 | Statewide Importance |
| 441D | Gloucester fine sandy loam, 15 to 25% slopes, very stony | 1.0 | Severe | Medium | Somewhat excessively drained | No | >80 | >80 | No |
| 441F | Gloucester sandy loam, 25 to 45% slopes, very stony | 0.2 | Severe | Medium | Somewhat excessively drained | No | >80 | >80 | No |
| 442B | Gloucester gravelly fine sandy loam, 3 to 8% slopes, extremely stony | 1.2 | Moderate | Medium | Somewhat excessively drained | No | >80 | >80 | No |
| 442C | Gloucester gravelly fine sandy loam, 8 to 15% slopes, extremely stony | 2.7 | Moderate | Medium | Somewhat excessively drained | No | >80 | >80 | No |
| 442D | Gloucester fine sandy loam, 15 to 25% slopes, extremely stony | 1.6 | Severe | Medium | Somewhat excessively drained | No | >80 | >80 | No |
| 447E | Gloucester and Canton soils, steep, extremely stony | 1.3 | Severe | Medium | Somewhat excessively drained | No | >80 | >80 | No |
| 51A | Swansea muck, 0 to 1% slopes | 1.0 | Slight | Low | Very poorly drained | Yes | 0 | >80 | No |
| 52A | Freetown muck, central lowland, 0 to 1% slopes | 1.7 | Slight | Low | Very poorly drained | Yes | 0 | >80 | No |
| 534B | Gloucester fine sandy loam, 3 to 8% slopes, stony | 0.2 | Moderate | Medium | Somewhat excessively drained | No | >80 | >80 | Statewide Importance |
| 53A | Freetown muck, ponded, 0 to 1% slopes | 1.1 | Slight | Low | Very poorly drained | Yes | 0 | >80 | No |
| 5A | Saco mucky silt loam, 0 to 2% slopes, frequently flooded | 0.2 | Slight | Low | Very poorly drained | Yes | 0 | >80 | No |
| 600 | Pits, gravel | 0.1 | not rated | not rated | | Unranked | >80 | >80 | No |
| 651 | Udorthents, smoothed | 0.5 | not rated | not rated | Well drained | No | >80 | >80 | No |
| 711C | Charlton-Rock outcrop-Hollis complex, sloping | 0.0 | Severe | Medium | Well drained | No | >80 | >80 | No |

| Map Unit | Map Unit Name | Percent of Project Area | Erosion Potential [a] | Compaction Hazard [b] | Drainage Class | Hydric | Depth to Restrictive Feature (inches) | Depth to Water Table (inches) | Farmland Class |
|---|---|---|---|---|---|---|---|---|---|
| 711D | Charlton-Rock outcrop-Hollis complex, 15 to 25% slopes | 0.1 | Severe | Medium | Well drained | No | >80 | >80 | No |
| 711E | Charlton-Rock outcrop-Hollis complex, steep | 1.3 | Severe | Medium | Well drained | No | >80 | >80 | No |
| 71A | Ridgebury fine sandy loam, 0 to 3% slopes, extremely stony | 1.5 | Slight | Medium | Poorly drained | Yes | 3 | 19 | No |
| 71B | Ridgebury fine sandy loam, 3 to 8% slopes, extremely stony | 2.7 | Moderate | Medium | Poorly drained | Yes | 3 | 19 | No |
| 730E | Charlton and Narragansett soils, 25 to 35% slopes, extremely stony | 0.9 | Severe | Medium | Well drained | No | >80 | >80 | No |
| 73A | Whitman fine sandy loam, 0 to 3% slopes, extremely stony | 0.2 | Slight | Low | Very poorly drained | Yes | 0 | 17 | No |
| 743E | Charlton and Gloucester fine sandy loams, 25 to 35% slopes, very stony | 0.1 | Severe | Medium | Well drained | No | >80 | >80 | No |
| 748E | Rock outcrop-Narragansett-Holyoke complex, 25 to 35% slopes | 3.6 | not rated | not rated | not rated | Unranked | >80 | 0 | No |
| 75B | Pillsbury fine sandy loam, 0 to 8% slopes, very stony | 0.2 | Moderate | Low | Poorly drained | Yes | 6 | 23 | No |
| 771A | Walpole fine sandy loam, 0 to 3% slopes, very stony | 0.1 | Slight | Medium | Poorly drained | Yes | 2 | >80 | No |
| 88A | Ridgebury fine sandy loam, 0 to 3% slopes, very stony | 0.3 | Slight | Medium | Poorly drained | Yes | 3 | 19 | No |
| 88B | Ridgebury fine sandy loam, 3 to 8% slopes, very stony | 0.2 | Moderate | Medium | Poorly drained | Yes | 3 | 19 | No |

Source: USDA-NRCS (2022b)

[a] The erosion potential for each of the soils was determined by reviewing the erosion hazard of soil loss after disturbance activities that expose the soil surface, as provided by the NRCS Web Soil Survey (NRCS 2022b). The NRCS has evaluated soils based on slope, soil erosion factor K, and content of rock fragments.

- Slight - erosion is unlikely during ordinary climatic conditions.
- Moderate - some erosion is likely and erosion control measures may be needed.
- Severe - erosion is very likely and erosion control measures, including revegetation of bare areas, are advised.
- Very Severe - significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion control measures are costly and generally impractical.

[b] The compaction hazard, or compaction susceptibility is based on soil properties in the upper 12 inches of the profile. Factors considered are soil texture, soil organic matter content, soil structure, rock fragment content, and the existing bulk sensitivity. Ratings are defined as follows:

- Low - The potential for compaction is insignificant. This soil is able to support standard equipment with minimal compaction. The soil is moisture insensitive, exhibiting only small changes in density with changing moisture content.
- Medium - The potential for compaction is significant. The growth rate of seedlings may be reduced following compaction. After the initial compaction (i.e., the first equipment pass), this soil is able to support standard equipment with only minimal increases in soil density. The soil is intermediate between moisture insensitive and moisture sensitive.
- High - The potential for compaction is significant. The growth rate of seedlings will be reduced following compaction. After initial compaction, this soil is still able to support standard equipment, but will continue to compact with each subsequent pass. The soil is moisture sensitive, exhibiting large changes in density with changing moisture content.

# 4.2 Surface and Groundwater Hydrology and Quality

This subsection provides information on groundwater and surface water resources in the vicinity of the Project, including fisheries, wetlands, and waterbodies. On behalf of Eversource, SWCA Environmental Consultants (SWCA) determined the nature and location of these resources by performing on-site verification and delineation surveys in October-November 2021; January, March and July 2022; and April 2024.

## 4.2.1 Groundwater Resources

### *4.2.1.1 AQUIFERS*

An aquifer is a geologic formation, a group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs. A principal aquifer is defined as a regionally extensive aquifer or aquifer system that has the potential to be used as a source of potable water (USGS 2017).

The U.S. Environmental Protection Agency (USEPA) administers the Sole Source Aquifer (SSA) Program, which is implemented across the entire country to protect groundwater aquifers that supply at least 50% of the drinking water consumed in the area overlying the aquifer. USEPA guidelines also require that the area overlying the aquifer has no alternative drinking water sources that could physically, legally, and economically supply water to all who depend on the aquifer for drinking water (USEPA 2022). Based on a review of available data from MassGIS (1996), the closest SSA to the Project is the Broad Brook Basin/Barnes Aquifer SSA. This SSA is part of the Connecticut River watershed, is approximately nine square miles in area, and encompasses portions of the Towns of Easthampton, Southampton (Hampshire County), and the City of Holyoke (Hampden County) in Massachusetts (USEPA 1995). The Project is approximately 10 miles west of this SSA.

Aquifers of high and medium yield are mapped by MassGIS (2007). The definition of high and medium yield categories varies between panels, though the medium yield for most basins is between 100 and 300 gallons per day. The WT-11 ROW crosses two medium-yield aquifers; the location of each aquifer coincides with mapped glacial fine-textured stratified deposits. A medium-yield aquifer underlying approximately 4,800 feet of the ROW is mapped north of the Norwottuck Rail Trail southward to Orchard Road in Belchertown. The second medium-yield aquifer is mapped in the Forge Pond / Bachelor Brook area underlying approximately 4,300 feet of the ROW between George Hannum Street and Fred Ruel Road in Granby. A third medium-yield aquifer is mapped within the southeastern corner of the Ludlow Substation off Center Street in Ludlow (the southern extent of the Project), but no TRRP activities are proposed where this aquifer is mapped. No other high or medium-yield aquifers are located within 0.25 mile of the Project; therefore, yields from underlying aquifers in the rest of the Project area are expected to be low (MassGIS 2007).

### *4.2.1.2 GROUNDWATER PUBLIC AND PRIVATE WATER SUPPLIES*

The Project area crosses one Zone I Wellhead Protection Area just south of the Northfield Substation in Northfield (MassGIS 2024a). This Zone I has a 200-foot radius and is generally located around structure 36001 and continues south to structure 36002 in the Line 312 portion of the WT-11 ROW. It is associated with the Mountain Station Visitor Station (Public Water Supply# 1217003), which is a non-transient non-community public water system that regularly supplies water to at least 25 of the same people at least six months per year. A second Zone I, with a 500-foot radius, is mapped for a Town of Amherst community

groundwater well and is west of the ROW in Amherst by structure 34184 (MassGIS 2024a). As stated in 310 CMR 22.02, Zone I is defined as the protective radius required around a public water supply well or wellfield.

The WT-11 ROW crosses two wellhead protection areas: an approved Zone II Wellhead Protection Area associated with the Town of Amherst groundwater community well, and an Interim Wellhead Protection Area (IWPA) for the non-community ground well south of the Northfield Substation (MassGIS 2024a). The Zone II WPA covers approximately 15,550 linear feet of the ROW between structures 34161 and 34166 in Pelham and Belchertown and structures 34175 and 34193 in Belchertown, Amherst, and Granby. Zone II is a wellhead protection area that has been determined by hydro-geologic modeling and approved by the MassDEP's Drinking Water Program. The Mountain Station Visitor Station well in Northfield has a 500-foot radius IWPA that extends into the eastern side of the WT-11 ROW. In the absence of an approved Zone II, MassDEP has adopted the IWPA as the primary, protected recharge area for public water supply groundwater sources.

Certain land uses may be either prohibited or restricted in approved (Zone II) and IWPA wellhead protection areas. As stated in 310 CMR 22.02, a Zone II is:

> *That area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at safe yield, with no recharge from precipitation). It is bounded by the groundwater divides which result from pumping the well and by the contact of the aquifer with less permeable materials such as till or bedrock. In some cases, streams or lakes may act as recharge boundaries. In all cases, Zone IIs shall extend up gradient to its point of intersection with prevailing hydrogeologic boundaries (a groundwater flow divide, a contact with till or bedrock, or a recharge boundary).*

A discussion of public surface water supplies is provided in Section 4.2.2.2.

### *4.2.1.3 GROUNDWATER HAZARDS*

SWCA conducted database research to identify, to the extent feasible, properties within 0.25 mile of the Project having the potential to impact the proposed workspace with oil and/or hazardous materials. A list of identified sites within 0.25 mile is presented in Table 4-2.

**Table 4-2. Potential Groundwater Hazards within 0.25 Mile of the WT-11 TRRP Project**

| SITE NAME | ADDRESS | DISTANCE AND DIRECTION TO ROW | CLOSEST STRUCTURE NUMBER | STATUS | WASTE TYPE | NOTES |
|---|---|---|---|---|---|---|
| **Northfield** | | | | | | |
| Site No. 1-0020923 | 99 Millers Falls Road | 0.16 mile north | 36001 | Closed | Mineral oil dielectric fluid (MODF) | PN RAO (01/03/2020): Release was due to a fire and failure of pad-mounted station service voltage transformer (SSVT). Cleanup included removal of impacted soils. |

| SITE NAME | ADDRESS | DISTANCE AND DIRECTION TO ROW | CLOSEST STRUCTURE NUMBER | STATUS | WASTE TYPE | NOTES |
|---|---|---|---|---|---|---|
| Northfield Mountain Recreation and Environmental Center RTN: 1-0020189 | 99 Millers Falls Road | 0.16 mile north | 36001 | Closed | Hydraulic fluid | PN RAO (07/28/2017): Hydraulic hose ruptured on snow grooming equipment. The cleanup generated seven (7) drums of snow and soil. Field screening indicated minimal soil impacts remained. |
| Northfield Mountain Substation RTN: 1-0013057 | 99 Millers Falls Road | 0.16 mile north | 36001 | Closed | Petroleum hydrocarbons in soils | Class B-1 RAO (08/14/2000): Follow-up soil testing after initial detection indicated no significant risk. |
| Northfield Mountain Substation RTN: 1-0020259 | 99 Millers Falls Road | 0.16 mile north | 36001 | Closed | Hydraulic fluid | PN RAO (10/24/2017): Impacted trap rock and soil from ruptured hose were excavated. |
| **Erving** | | | | | | |
| None | | | | | | |
| **Wendell** | | | | | | |
| Wendell Landfill RTN: 1-0013460 | Mormon Hollow Road | Abuts west side of the ROW | 34019 | Open site | Contaminated soil | Commercial landfill. Adequately regulated landfill other than MassDEP that accepts\demolition waste. |
| **Montague** | | | | | | |
| None | | | | | | |
| **Leverett** | | | | | | |
| Pole 25/94 RTN: 1-0011874 | North Leverett Road | 0.18 mile west | 34070 | Closed | Transformer oil | Class A-2 RAO (07/16/1997): The release impacted an asphalt road surface and gravel shoulder. No sensitive receptors were impacted. |
| **Shutesbury** | | | | | | |
| None | | | | | | |
| **Pelham** | | | | | | |
| Residence | 30 Arnold Road | 0.21 mile west | 34151 | Closed | #2 Fuel Oil | Class A-2 RAO (08/26/2009). Remediation of wetlands, a stream, and groundwater from the release of fuel oil. |

| SITE NAME | ADDRESS | DISTANCE AND DIRECTION TO ROW | CLOSEST STRUCTURE NUMBER | STATUS | WASTE TYPE | NOTES |
|---|---|---|---|---|---|---|
| **Belchertown** | | | | | | |
| Duffy Residence | 18 Overlook Dr. | 0.21 mile west | 34230 | Closed | #2 fuel oil | Class A-2 RAO (12/12/2002): AST in basement ruptured. Most of the fuel oil that was released was contained on the concrete floor and removed during initial response actions. |
| **Amherst** | | | | | | |
| None | | | | | | |
| **Granby** | | | | | | |
| None | | | | | | |
| **Ludlow** | | | | | | |
| WMECO Substation RTN: 1-0017113 | 938 Center Street | 0.24 mile southwest | 34263 | Closed | Nickel contaminated soil | Class A-1 RAO: Removal of contaminated soil. |
| Substation Access Road RTN: 1-0017386 | Center Street | Directly south | 34263 | Closed | Lead impacted soil | Class A-1 RAO (April 2009) |
| Residence RTN: 1-0020052 | 1077 Center Street | 0.25 mile east | 34263 | Closed | Petroleum impacted soil and groundwater | PSNC (August 11 2017) |

Source: MassDEP (2022a, 2025).

AST = Aboveground storage tank, PCE = Tetrachloroethylene, MTBE = Methyl tert-butyl ether, RAO = Response Action Outcome
RAO Classes:

PSNC (Permanent Solution with No Conditions): A site/release where a Permanent Solution Statement was submitted indicating that response actions were sufficient to achieve a level of No Significant Risk for all current and foreseeable future uses of the site without the need to restrict the use of the property.
PN: Permanent solution with no conditions (unrestricted use)
Class A-1: A permanent solution has been achieved. Contamination has been reduced to background levels or a threat of release has been eliminated.
Class A-2: A permanent solution has been achieved. Contamination has not been reduced to background.
Class B-1: Remedial actions have not been conducted because a level of No Significant Risk exists.

All listed sites have either been sufficiently remediated, are a sufficient distance from the Project workspaces and/or are downgradient of the Project. Accordingly, no impact is anticipated to the Project workplace from oil and/or hazardous materials.

## 4.2.2 Surface Water Resources

Most of the Project falls within the Connecticut River Watershed, which constitutes the largest river basin in New England and drains approximately 670 square miles in Massachusetts (Commonwealth of Massachusetts 2008a). About 3 miles of the Project is within the Millers River Watershed, which covers an area of 392 square miles in Massachusetts and New Hampshire, ultimately discharging into the Connecticut River (Commonwealth of Massachusetts 2004). The last 2.5 miles at the southern end of the Project area contribute to the 723 square mile drainage area of the Chicopee River Watershed (Commonwealth of Massachusetts 2008b).

The Massachusetts Wetlands Protection Act (WPA) protects two resource areas associated with surface waters – Bank and LUWW. Bank is defined in the WPA regulations at 310 CMR 10.54(2) as that portion

of the land surface that normally abuts and confines waterways and waterbodies and extends from the mean annual low-flow level to the mean annual flood level or first observable break in slope, whichever is lower. For intermittent streams, the entire channel below the "top of bank" line is the resource area Bank. LUWW is present in perennial streams only and is defined in 301 CMR 10.56(2) as that area beneath a creek, river, stream, pond, or lake below the mean annual low water level. The WPA regulates a 100-foot buffer zone from Bank and LUWW.

Wetland scientists with SWCA delineated waterbodies on behalf of Eversource in October-November 2021; January, March and July 2022; and April 2024. Desktop review of USGS topographic maps and StreamStats were used to determine the flow status of each surface water and categorize each as either intermittent or perennial. In addition to the protection provided by the Massachusetts WPA, the Massachusetts Rivers Protection Act provides additional protection to land adjacent to perennial streams (RFA). The RFA is "…a 200-foot-wide corridor on each side of a perennial river or stream, measured from the mean annual high-water line of the river." No open waterbodies (i.e., lakes or ponds) were identified within the Project area. A summary of each surface water crossed by the Project from north to south is provided in Table 4-3, as identified and delineated by SWCA.

**Table 4-3. Intermittent and Perennial Waterbodies Associated with the Project**

| WATERBODY ID / NAME | ASSOCIATED WETLAND ID | FLOW REGIME | STATE WATER QUALITY DESIGNATION[a] / FISHERY CLASSIFICATION[B] |
|---|---|---|---|
| NOS1B / UNT Connecticut River | NOW1B | intermittent | B / W |
| NOS2B / UNT Connecticut River | NOW2B | intermittent | B / W |
| NOS3B / UNT Connecticut River | NOW5B | intermittent | B / W |
| NOS4B / UNT Connecticut River | NOW5B | intermittent | B / W |
| NOS5B / UNT Connecticut River | NOW5B | intermittent | B / W |
| NOS6B / UNT Connecticut River | ERW5B | intermittent | B / W |
| NOS7B / UNT Connecticut River | ERW4B, ERW5B | intermittent | B / W |
| NOS8B / UNT Connecticut River | ERW4B, ERW5B | intermittent | B / W |
| ERS1B / UNT Connecticut River | ERW6B, ERW7B | intermittent | B / W |
| ESTMOS1 / Millers River | N/A | perennial | B / W |
| WES4B / UNT Millers River | N/A | intermittent | B / W |
| WES5B / UNT Millers River | WEW5B | intermittent | B / W |
| WES1B / UNT Lyons Brook | WEW4B | intermittent | B / C |
| WES2B / Lyons Brook | WEW4D | perennial | B / C |
| WES3B / UNT Lyons Brook | WEW4D | perennial | B / C |
| MOS1B / UNT Lyons Brook | MOW1B | perennial | B / C |
| MOS3B / UNT Lyons Brook | MOW1B | perennial | B / C |
| MOS2B / UNT Lyons Brook | N/A | perennial | B / C |
| MOS4B / UNT Lyons Brook | MOW2B | intermittent | B / C |
| MOS5B / UNT Lyons Brook | MOW5B | intermittent | B / C |
| MOS6B / UNT Lyons Brook | MOW5B | intermittent | B / C |
| MOS7A / UNT Lyons Brook | MOW4A | intermittent | B / C |
| MOS8A / UNT Lyons Brook | MOW5A | intermittent | B / C |

| WATERBODY ID / NAME | ASSOCIATED WETLAND ID | FLOW REGIME | STATE WATER QUALITY DESIGNATION[a] / FISHERY CLASSIFICATION[B] |
|---|---|---|---|
| MOS9A / UNT Lyons Brook | MOW6A | intermittent | B / C |
| MOS10B / Chestnut Hill Brook | N/A | perennial | B / C |
| ESTMOS2 / Williams Brook | MOW7B | perennial | B / C |
| LES1B / UNT Williams Brook | N/A | intermittent | B / C |
| LES2B / UNT Sawmill River | LEW3B, LEW4B | intermittent | B / C |
| LES3B / UNT Sawmill River | LEW5B | intermittent | B / C |
| LES4A / UNT Sawmill River | LEW6B | Intermittent | B / C |
| LES4B / UNT Sawmill River | N/A | intermittent | B / C |
| ESTLES1 / UNT Sawmill River | LEW8B | intermittent | B / C |
| LES5B / Sawmill River | LEW9B | perennial | B / C |
| LES6B / UNT Sawmill River | LEW11B | intermittent | B / C |
| LES7B / UNT Sawmill River | LEW11B | intermittent | B / C |
| LES8B / UNT Sawmill River | N/A | intermittent | B / C |
| LES9B / UNT Sawmill River | LEW13B, LEW15B LEW19B | intermittent | B / C |
| LES10B / UNT Sawmill River | LEW14B, LEW16B LEW17B | intermittent | B / C |
| LES11B / UNT Sawmill River | LEW13B | intermittent | B / C |
| LES12B / UNT Sawmill River | LEW17B | intermittent | B / C |
| LES13B / UNT Sawmill River | LEW18B | intermittent | B / C |
| LES14B / UNT Mountain Brook | LEW25B | intermittent | B / C |
| LES2D / UNT Roaring Brook | LEW2D | intermittent | B / C |
| LES15A / UNT Roaring Brook | LEW27A | intermittent | B / C |
| LES16A / Roaring Brook | LEW27A | perennial | B / C |
| LES17A / UNT Roaring Brook | LEW28A | perennial | B / C |
| LES18B / UNT Roaring Brook | LEW29B | intermittent | B / C |
| LES19B / UNT Roaring Brook | LEW29B | intermittent | B / C |
| SHS1B / UNT Atkins Reservoir | SHW4B | intermittent | B / C |
| SHS1A / UNT Nurse Brook | SHW5A | intermittent | A / C |
| SHS2A / Nurse Brook | SHW5A | perennial | A / C |
| SHS3A / UNT Nurse Brook | SHW6A | perennial | A / C |
| SHS4A / Dean Brook | SHW10A | perennial | A / C |
| SHS1C / UNT Dean Brook | SHW1C | perennial | A / C |
| SHS2C / UNT Dean Brook | SHW1C | intermittent | A / C |
| PES14C / UNT Dean Brook | SHW1C | intermittent | A / C |
| PES15C / UNT Hearthstone Brook | PEW20C | perennial | B / C |
| PES16A / UNT Hearthstone Brook | PEW20C, PEW20A | intermittent | B / C |
| PES13C / UNT Buffam Brook | PEW17C | intermittent | B / C |
| PES13B / UNT Buffam Brook | PEW16C | intermittent | B / C |

| WATERBODY ID / NAME | ASSOCIATED WETLAND ID | FLOW REGIME | STATE WATER QUALITY DESIGNATION[a] / FISHERY CLASSIFICATION[B] |
|---|---|---|---|
| PES12A / UNT Buffam Brook | PEW15C | intermittent | B / C |
| PES11A / Amethyst Brook | PEW13AA | perennial | A / C |
| PES8C / UNT Amethyst Brook | PEW11C | intermittent | A / C |
| PES7C / UNT Amethyst Brook | N/A | intermittent | A / C |
| PES6C / UNT Amethyst Brook | N/A | intermittent | A / C |
| PES5C / UNT Hop Brook | PEW6C | intermittent | B / C |
| PES4C / UNT Hop Brook | N/A | intermittent | B / C |
| PES3C / UNT Hop Brook | PEW5C | intermittent | B / C |
| PES1C / UNT Hop Brook | PEW2C | perennial | B / C |
| PES2C / UNT Hop Brook | PEW2C | perennial | B / C |
| BES2C / UNT Hop Brook | BEW8C | intermittent | B / C |
| BES1C / UNT Hop Brook | BEW6C | perennial | B / C |
| BES0C / UNT Hop Brook | BEW1C | intermittent | B / C |
| ESTBES1 / Hop Brook | BEW4C | perennial | B / C |
| GRS9C / UNT Forge Pond | GRW17C | intermittent | B / W |
| ESTGR2 / Bachelor Brook | GRW13AC | perennial | B / W |
| ESTGR1 / Weston Brook | GRW13C | perennial | B / C |
| GRS5C / UNT Forge Pond | GRW10C | perennial | B / W |
| GRS6C / UNT Forge Pond | GRW10A | perennial | B / W |
| GRS7C / UNT Turkey Hill Brook | GRW12C | intermittent | B / C |
| GRS4C / UNT Turkey Hill Brook | GRW5C | intermittent | B / C |
| GRS1C / UNT Turkey Hill Brook | GRW3C | intermittent | B / C |
| LUS3C / Higher Brook | LUW9C | intermittent | A / C |
| LUS2C / Higher Brook | LUW7C | perennial | A / C |
| LUS1C / Higher Brook | N/A | perennial | A / C |

Note: UNT = unnamed tributary

Source: Delineations by SWCA, 2021-2024.

a: State Water Quality Classifications: All waterbodies are assumed to be the same classification as their watershed designation pursuant to 314 CMR 4.00. In Massachusetts, surface waters are given a designation based on the following criteria:

- Class A: These waters include waters designated as a source of public water supply and their tributaries. They are designated as excellent habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth, and other critical functions, and for primary and secondary contact recreation, even if not allowed. These waters shall have excellent aesthetic value and are protected as Outstanding Resource Waters (ORWs).
- Class B: These waters are designated as a habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth, and other critical functions, and for primary and secondary recreation. Where designated in 314 CMR 4.06, they shall be suitable as a source of public water supply with appropriate treatment. Class B waters are suitable for irrigation and other agricultural uses and for compatible industrial cooling process uses. These waters shall have consistently good aesthetic value.
- Class C: These waters are designated as a habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth, and other critical functions, and for secondary contact recreation. These waters shall be suitable for the irrigation of crops used for consumption after cooking and for compatible industrial cooling and process uses. These waters shall have good aesthetic value.

b: State Fishery Classifications: C = Coldwater Fisheries Resource; W = Warmwater Fisheries Resource based on Massachusetts Division of Fisheries and Wildlife's Coldwater Fisheries Resources data layer (MassGIS 2022).

### *4.2.2.1 WILD AND SCENIC RIVERS*

The federal Wild and Scenic Rivers Act established a national system to identify outstanding values and protect the free-flowing condition of rivers through a Wild & Scenic River nomination and designation

process that recognizes certain rivers as having "outstandingly remarkable" attributes. There are no designated Wild & Scenic Rivers crossed by the Project. The proposed Project does not cross any federally listed sensitive surface waters or sensitive waterbodies (National Park Service [NPS] 2021; National Wild and Scenic Rivers System 2021).

#### 4.2.2.2 OUTSTANDING RESOURCE WATERS

The designation of Outstanding Resource Water (ORW) is applied to those waters in Massachusetts with exceptional socioeconomic, recreational, ecological, and/or aesthetic values. They are regulated by 314 CMR 4.02, which defines ORWs as "Waters designated for protection in 314 CMR 4.06, which include Class A Public Water Supplies (314 CMR 4.06(1)(d)1.) and their tributaries, certain wetlands as specified in 314 CMR 4.06(2), certain surface waters designated in 314 CMR 4.06(6)(b), and other waters as determined by the Department based on their outstanding socioeconomic, recreational, ecological and/or aesthetic values." ORWs have more stringent requirements than other waters because the existing use is so exceptional or the perceived risk of harm is such that no lowering of water quality is permissible. ORWs include certified vernal pools, all designated Class A Public Water Supplies, and may include surface waters found in National Parks, state forests and parks, Areas of Critical Environmental Concern, and those protected by special legislation (Rojko et al. 1993). Wetlands that border ORWs are designated as ORWs to the boundary of the wetland resource area.

Most streams crossed by the Project ROW have not been assigned a designation according to the Massachusetts Surface Water Quality Standards at 314 CMR 4.00. Each tributary is presumed to have the same classification as its watershed. MassGIS (2010 and 2021b) identifies the Project crossing two surface public water supply watersheds: Atkins Reservoir Watershed in Shutesbury between Structures 34113 to 34131 (owned by the Town of Amherst), and the Ludlow Reservoir Watershed in Belchertown and Ludlow between structures 34241 to 34262 (owned by the Springfield Water & Sewer Commission). The Project is also located approximately 0.28 miles west of the Amethyst Brook Hawley/Hill/Intake public water supply in Pelham and Shutesbury. Certain waters within these public water supply watersheds are afforded Outstanding Resource Water (ORW) protection under the Massachusetts Surface Water Quality Standards, 314 CMR 4.00. It is important to note that the areas delineated by MassGIS (2010) are not themselves ORWs, and second, that only certain waters within the delineated areas are ORWs. In all, the Project crosses four named ORW streams, Nurse Brook, Dean Brook, Amethyst Brook, and Higher Brook, plus tributaries of these designated waters are classified as ORWs in accordance with 314 CMR 4.02. See Table 4-3 for a detailed listing of ORWs (identified as Class A waters) crossed by the Project.

#### 4.2.2.3 FISHERIES

Based on the Massachusetts Division of Fisheries and Wildlife (MassWildlife) Coldwater Fish Resources (MassGIS 2022), 11 named perennial waterbodies that cross the Project area are designated Coldwater Fish Resources (CFRs), which are defined in 314 CMR 4.00 as "waters in which the mean of the maximum daily temperature over a seven-day period generally does not exceed 68 degrees Fahrenheit (20 degrees Celsius) and, when other ecological factors are favorable (such as habitat), are capable of supporting a year-round population of stenothermal aquatic life, such as trout (*Salmonidae* spp.)." These include Lyons Brook, Chestnut Hill Brook, Williams Brook in Montague; Williams Brook, Sawmill River, Mountain Brook, Roaring Brook in Leverett; Nurse Brook and Dean Brook in Shutesbury; Dean Brook and Hearthstone Brook in Pelham; Hop Brook in Belchertown; Turkey Hill Brook and Weston Brook in Granby; and Higher Brook in Ludlow. Several tributaries to each of these CFRs, detailed in Table 4-3, exist within the Project area. All tributaries to designated CFRs are also classified as such, in accordance with 321 CMR 5.02, which states: "Coldwater Fish Resource (CFR) means a waterbody that contains Coldwater Fish that were reproduced in that waterbody or a tributary thereto and use such waters to meet one or more of their life history requirements."

### 4.2.2.4 FLOODPLAINS

The WPA protects the 100-year floodplain of surface waters as BLSF. A floodplain is the land area along a stream or river that is subject to periodic flooding. The area subject to a 1% chance of flooding in any given year is classified as the 100-year floodplain. An area subject to a 0.2% chance of flooding in any given year is classified as the 500-year floodplain.

SWCA reviewed National Flood Insurance Program Flood Insurance Rate Maps issued by the Federal Emergency Management Agency (FEMA) to identify proposed crossings of areas subject to flooding. Floodplain data indicates that there are five areas where 100-year floodplains occur within the Project area. Details on each floodplain crossed by the Project are summarized in Table 4-4. Areas of 100-year floodplain locations, which are regulated as BLSF outside of Bordering Vegetated Wetlands and Land Under Water and Waterbodies, are depicted in the WT-11 TRRP MEPA DEIR Map Set in Attachment 2.

**Table 4-4. 100-Year Floodplains Associated with the Project**

| ASSOCIATED WATERBODY ID / NAME | ASSOCIATED WETLAND ID | FEMA FLOOD ZONE DESIGNATION |
|---|---|---|
| BES1C / Montague Brook | BEW6C | A |
| ESTBES1 / Hop Brook | BEW4C | A |
| ESTGR2 / Bachelor Brook | GRW13AC | A |
| ESTGR1 / Weston Brook | GRW13C | A |
| GRS1C / Turkey Hill Brook | GRW3C | A |

Source: MassGIS (2023)

*FEMA Flood Zone Designations: A = high risk - Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage.

### 4.2.2.5 VERNAL POOLS

Vernal pools are small, shallow ponds characterized by a lack of fish and by periods of dryness. Vernal pool habitat is extremely important to a variety of wildlife species, including some amphibians that breed exclusively in vernal pools and other organisms such as fairy shrimp, which spend their entire life cycles confined to vernal pool habitat. Many additional wildlife species use vernal pools for breeding, feeding, and other important functions. Certified vernal pools (CVPs) are protected if they fall under the jurisdiction of the WPA regulations (310 CMR 10.00). In total, the NHESP has mapped one CVP and multiple unverified potential vernal pools (PVPs) within or in proximity to the Project area (MassGIS 2013 and 2024b).

SWCA reviewed all wetlands in the WT-11 ROW for vernal pool habitat between March 31, 2022 and April 20, 2022, pursuant to the official *Guidelines for the Certification of Vernal Pool Habitat* (MassWildlife 2009). In addition to the CVP, SWCA confirmed that eight mapped PVPs and 12 other depressions provide vernal pool habitat. SWCA delineated the boundary of the certified and confirmed vernal pools in accordance with the *Guidelines for the Certification of Vernal Pool Habitat* (MassWildlife 2009). Mapped locations and boundaries of each vernal pool are depicted in the WT-11 TRRP MEPA DEIR Map Set in Attachment 2 and are identified in Table 4-5 below.

**Table 4-5. Confirmed Vernal Pools Associated with the Project**

| VERNAL POOL ID | TOWN | ASSOCIATED WETLAND ID | NHESP DESIGNATION |
|---|---|---|---|
| ERVP8A | Erving | ERW8B | PVP |
| MOVP7A | Montague | MOW7A | N/A |
| LEVP9A | Leverett | LEW9B | PVP |
| LEVP25A | Leverett | LEW25B | N/A |
| LEVP25B | Leverett | LEW25B | N/A |
| SHVP3A | Shutesbury | SHW3B | N/A |
| SHVP4A | Shutesbury | SHW4B | CVP |
| SHVP8A | Shutesbury | SHW8A | N/A |
| SHVP1C | Shutesbury | SHW1C | PVP |
| PEVP18A | Pelham | PEW18A | N/A |
| PEVP22C | Pelham | PEW22A | PVP |
| PEVP22B | Pelham | PEW22A | PVP |
| PEVP22A | Pelham | PEW22A | PVP |
| PEVP20A | Pelham | PEW18C | N/A |
| GRVP23C | Granby | GRW23C | N/A |
| GRVP9C | Granby | GRW9C | N/A |
| GRVP2A* | Granby | GRW2C | PVP |
| GRVP2B* | Granby | GRW2C | N/A |
| LUVP8A | Ludlow | LUW8C | N/A |
| LUVP6A | Ludlow | LUW6C | N/A |
| LUVP2A | Ludlow | LUW2C | PVP |

* Vernal pool identified immediately outside the Eversource ROW.

### *4.2.2.6 303(D) IMPAIRED WATERS*

Section 303(d) of the Clean Water Act and the implementing regulations at 40 CFR 130.7 require states to identify those waterbodies that are not expected to meet state water quality standards after the implementation of technology-based controls and to prioritize and schedule them for the development of total maximum daily loads (TMDLs). A TMDL establishes the maximum amount of a pollutant that may be introduced into a waterbody and still ensures the attainment and maintenance of water quality standards. A TMDL must also allocate that acceptable pollutant load among all potential sources. States provide their 303(d) *List of Impaired Waters* to the USEPA for approval and categorize waterbodies into one of the following five categories:

1. Unimpaired and not threatened for all designated uses.
2. Unimpaired for some uses and not assessed for others.
3. Insufficient information to make assessments for any uses.
4. Impaired or threatened for one or more uses, but not requiring the calculation of a TMDL.
5. Impaired or threatened for one or more uses and requiring a TMDL.

In accordance with the most recently USEPA-approved *Massachusetts Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle* (Massachusetts Division of Watershed Management 2021), three waterbodies crossed by the Project are on the 303(d) List: Millers River and Lyons Brook are listed as a Category 5 water due to polychlorinated Biphenyls (PCBs) in fish tissue, and Weston Brook is listed as a Category 5 water due to total phosphorus.

### 4.2.3 Wetland Resources

Wetlands are regulated under Section 401 of the federal Clean Water Act (33 USC 1251), the Massachusetts Clean Water Act (M.G.L. c. 21 s. 26-53), and its implementing regulations at 314 CMR 9.00. The USACE and the USEPA define wetlands in 33 CFR 328.3(b) as "those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." To be considered a wetland, an area must show hydrophytic vegetation, hydric soils, and wetland hydrology under normal conditions (USACE 2007).

In Massachusetts, wetlands are regulated by the MassDEP under the WPA (M.G.L. c. 131 s. 40). The WPA defines BVWs as "freshwater wetlands which border on creeks, rivers, streams, ponds, and lakes and includes wet meadows, marshes, swamps, and bogs. BVWs are areas where the soils are saturated and/or inundated such that they support a predominance of wetland indicator plants." IVWs are not regulated by the WPA unless they are located within another resource area (e.g., BLSF or RFA) or meet the definition of Isolated Land Subject to Flooding, which is an isolated depression or closed basin without an inlet or outlet that confines standing water to a volume of at least ¼-acre-feet at an average depth of 6 inches at least once a year.

Wetlands along the proposed Project route were delineated by SWCA in October 2021 and March 2022. SWCA identified the wetland boundary in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (Version 2.0) (USACE 2012), the WPA regulations at 310 CMR 10.55(2)I, and MassDEP's guidance document *Massachusetts Handbook for Delineation of Bordering Vegetated Wetlands* (MassDEP 2022b). The state methodology differs slightly from the federal methodology in that the state considers hydric soils to be one possible indicator of wetland hydrology rather than a third required wetland parameter. However, there were no instances observed where the wetland boundaries under these two methodologies differed sufficiently to warrant separate state and federal delineations; where slight differences were observed, SWCA delineated the more conservative (i.e., inclusive) boundary. The wetland boundaries were marked with flags and surveyed with a Juniper Systems Geode global positioning system (GPS) unit capable of submeter accuracy.

Wetlands were classified according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). The delineated wetlands fell within the Palustrine wetland system, which occurs in freshwater wetland systems above the ordinary high-water mark. Typically, in these environments, the most common classifications of wetlands include palustrine emergent wetlands (PEM) dominated by herbaceous wetland vegetation, palustrine scrub-shrub wetlands (PSS) dominated by shrub and sapling vegetation, and palustrine forested wetlands (PFO) dominated by mature trees. Routine vegetation management maintains wetlands within the ROW in a PSS or PEM cover types. Outside the existing maintained ROW, these wetlands typically occur as PFO except in areas where inundation prohibits the establishment of trees.

As part of its field surveys, SWCA biologists conducted a rapid functional assessment for delineated wetlands based on the USACE's Highway Methodology, which identifies 13 functions and values that are considered by the USACE in making permit decisions. Many of these functions and values are also

described as 310 CMR 10.55(1) as significant contributions that BVWs have on protecting the Interests of the WPA. SWCA found that the principal functions and values provided by the wetlands collectively in the Project ROW are wildlife habitat, groundwater recharge/discharge, sediment/toxicant retention, and nutrient removal. Others may or may not apply for a specific wetland location.

Most of the wetlands occur in similar undulating glacial till settings and support similar plant associations, so the wetland descriptions have been grouped by town. Summarized wetland descriptions are provided in Tables 4-6 to 4-16. A brief description of dominant soil associations as they appear along the ROW is provided and based on the Official Soil Series Descriptions prepared by the NRCS (2022a).

### 4.2.3.1 WETLANDS IN NORTHFIELD

The existing WT-11 transmission line ROW covers approximately 0.4 linear mile from the Northfield Substation to the Northfield/Erving town line. This portion of the ROW falls within the Connecticut River Watershed and contains two wetlands, detailed in Table 3-3 below. Soils are Chatfield-Hollis complex, which are composed of fine sandy loam that becomes increasingly gravellier before hitting bedrock at about 30 to 40 inches. Moderately decomposed plant material overlies the soil to a depth of about one inch. The soils are well drained and classified as hydrologic soil group (HSG) B, indicating a moderate infiltration rate when thoroughly wet. The mosaic PFO/PSS wetlands here are vegetated with sassafras (*Sassafras albidum*) and staghorn sumac (*Rhus typhina*). The herbaceous layer is dominated by wrinkle-leaf goldenrod (*Solidago rugosa*) and sensitive fern (*Onoclea sensibilis*) with some common red raspberry (*Rubus idaeus*).

**Table 4-6. Summary of Wetlands in the Northfield Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| NOW1B | BVW | PSS1E<br>PFO1E | Connects to UNT Connecticut River (NOSB1). Extends off the eastern edge of the ROW. |
| NOW2B | BVW | PSS1E | Connects to UNT Connecticut River (NOS2B). |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PAB = palustrine aquatic bottom, PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semipermanently flooded, G = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

### 4.2.3.2 WETLANDS IN ERVING

Erving covers the next stretch of the ROW as it continues south for approximately two miles before reaching the Wendell town line. North of wetland ERW9B, waters drain into the Connecticut River Watershed. The southern portion of the corridor containing wetland ERW9B and extending to Millers River, marking the Wendell town line, is within the Millers River Watershed.

A little less than half of the soils here are the previously described Chatfield-Hollis Complex with varying slopes. This complex is broken up by a section of Canton fine sandy loam in the north, which also falls within HSG B but has a slightly deeper layer of decomposed plant material and a deeper layer of fine sandy loam (up to 16 inches) atop more gravelly loamy sand. Hollis-Chatfield complex breaks through in three places father south. These soil profiles have a thicker layer of decomposed plant material atop 3-4 inches of fine sandy loam that becomes more cobbly before hitting bedrock at 15-65 inches. They fall in HSG D, indicating a very slow infiltration rate and high runoff potential. Agawam fine sandy loam and Windsor and Merrimac soils are found at the southern edge of Erving adjacent to Millers River. These soils are much

sandier and are classified as HSGs A (highest infiltration rate and lowest runoff potential) and B (moderate infiltration rate), respectively.

Only two PFO wetlands are found in Erving. Dominant species here include red maple (*Acer rubrum*), Eastern hemlock (*Tsuga canadensis*), yellow birch (*Betula alleghaniensis*), white pine (*Pinus strobus*), bitternut hickory (*Carya cordiformis*), and witch hazel (*Hamamelis virginiana*). PSS wetlands support high densities of maleberry (*Lyonia ligustrina*), winterberry (*Ilex verticillata*), meadowsweets or steeplebushes (*Spiraea* spp.), and grey alder (*Alnus incana*). Some invasive glossy buckthorn (*Frangula alnus*) is also found in PSS wetlands. The herb stratum of PEM wetlands is dominated by various species of goldenrod (*Solidago* spp.); sensitive, New York, and cinnamon ferns (*Onoclea sensibilis*, *Parathelypteris noveboracensis*, and *Osmundastrum cinnamomeum*, respectively); soft rush (*Juncus effusus*); dewberry (*Rubus pubescens*); and woolgrass (*Scirpus cyperinus*).

**Table 4-7. Summary of Wetlands in the Erving Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| NOW3B | IVW | PEM1B | Western edge of ROW. Adjacent to NOW4B. |
| NOW4B | BVW | PFO1B | Western edge of ROW. Adjacent to NOW3B. |
| NOW5B | BVW | PSS1E | Connects to UNTs Connecticut River (NOS3B, NOS4B, and NOS5B). Western edge of ROW. |
| ERW4B | BVW | PSS1J | Connects to UNTs Connecticut River (NOS6B, NOS7B and NOS8B). |
| ERW5B | BVW | PSS1E | Connects to UNTs Connecticut River (NOS6B, NOS7B and NOS8B). |
| ERW6B | BVW | PSS1J | Connects to UNT Connecticut River (ERS1B). East of access road. |
| ERW7B | BVW | PSS1J | Connects to UNT Connecticut River (ERS1B). West of access road. |
| ERW6C | IVW | PEM | Adjacent to Erving Substation. |
| ERW6D | IVW | PEM | Adjacent to Erving Substation. |
| ERW8B | IVW | PSS1E | Contains confirmed vernal pool. East of access road. |
| ERW9B | BVW | PFO1/4BPSS1B | Within Poplar Mountain Conservation Area. Extends east and west off ROW. |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested, UNK = unknown

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semipermanently flooded, g = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

### *4.2.3.3 WETLANDS IN WENDELL*

About 0.8 miles of the ROW fall within the Millers River Watershed in Wendell. Millers River is located at the northern boundary and Lyons Brook marks the southern boundary. Several tributaries to each cross the ROW in Wendell. Previously described Canton fine sandy loam dominate the soils here with significant portions of Scituate fine sandy loam and Hinckley loamy sand mixed in. Where tributaries to Millers River cross the ROW, Scituate fine sandy loam provides slow infiltration rates (hydrologic groups C/D) and moderately drained soils. These profiles have 0-2 inches of highly decomposed plant material, fine sandy loam to about eight inches, and stonier, sandier loam beneath that. More gravelly loamy sand with high infiltration potential (HSG A) is found with the Hinckley loamy sand that is adjacent to Lyons Brook.

PFO wetlands are forested with red maple, Eastern hemlock, yellow birch, white pine, and green ash (*Fraxinus pennsylvanica*). The scrub-shrub community of PSS wetlands primarily consists of highbush

blueberry (*Vaccinium corymbosum*), witch hazel, winterberry, grey alder, and some invasive common buckthorn. The herbaceous layer of PEM wetlands primarily consists of sensitive and cinnamon ferns, soft rush, mannagrass (*Glyceria melicaria*), and woolgrass.

**Table 4-8. Summary of Wetlands in the Wendell Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| WEW5B | BVW | PFO1E<br>PSS1E | Connects to UNT Millers River (WES5B). Adjacent to Mormon Hollow Road. Extends off eastern edge of ROW. |
| WEW1B | BVW | PFO1/4E<br>PEM1E | Adjacent to Mormon Hollow Road. Cow pasture. Extends across ROW. |
| WEW3B | BVW | PEM1E | Cow pasture. Extends off western edge of ROW. |
| WEW2B | IVW | PEM1E | Cow pasture. Centered in ROW. |
| WEW4B | BVW | PFO1E<br>PSS1/4E | Connects to UNT Lyons Brook (WES1B). Extends across ROW. |
| WEW4C | BVW | PEM1E | Adjacent to off-ROW access road. |
| WEW4D | BVW | PFO1E | Adjacent to off-ROW access road. |
| WEW4E | BVW | PEM1E | Adjacent to off-ROW access road. |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semipermanently flooded, G = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

### *4.2.3.4 WETLANDS IN MONTAGUE*

The Montague stretch of the ROW is approximately 3.7 miles long. Stream crossings here include tributaries leading to Lyons Brook in the north, Chestnut Hill Brook near the middle, and Williams Brook at the southern border where it meets the Leverett town line. Wetland MOW7A and all those to the north of it are within the Millers River Watershed while the rest are within the Connecticut River Watershed. The Montague State Forest crosses the ROW in two areas: at its northern border and at the center of this portion of the ROW north of Chestnut Hill Brook. The southern section of Montague State Forest overlaps with Montague Wildlife Management Area and is south of adjacent Montague Water Supply Land.

Most soils in the Millers River Watershed are previously described Chatfield-Hollis complex and Canton fine sandy loam. A transition to Henniker sandy loam and Millsite-Woodstock/Millsite-Chichester complexes occurs at the Connecticut River Watershed boundary. These soils have moderate infiltration rates and are classified as HSG B. Henniker sandy loam can have a thin layer (one inch or less) of moderately decomposed plant material and up to 24 inches of sandy loam atop deeper layers of loamy sand. Millsite complexes can have slightly thicker layers of decomposed plant material (0-3 inches) overlaying finer sandy loam, eventually hitting bedrock between 33-65 inches. Slower infiltration rates occur farther south in areas with Newfields fine sandy loam (HSGs C/D) and Gloucester sandy loam (HSG C). Both are composed of layers of sandy loam or fine sandy loam atop gravelly or coarse loamy sand to depths up to 65 inches. Freetown muck encompasses the large wetland area associated with Williams Brook. These soils have profiles of up to two inches of mucky peat over up to 79 inches of muck and have variable infiltration rates, categorized as HSG B/D.

Mature trees within PFO wetlands include Eastern hemlock, red maple, yellow birch, sweet birch (*Betula lenta*), and white pine. PSS wetlands are dominated by associated tree saplings as well as witch hazel, meadowsweets or steeplebushes, grey alder, gray and black willows (*Salix nigra* and *Salix bebbiana*), mountain laurel (*Kalmia latifolia*), winterberry, and maleberry. Various species of goldenrod; sensitive, New York, and cinnamon ferns; soft rush; woolgrass; and raspberries (*Rubus idaeus* and Rubus *pubescens*) are consistently found in PEM wetlands.

**Table 4-9. Summary of Wetlands in the Montague Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| MOW1B | BVW | PFO1/4E<br>PSS1E | Connects to UNTs Lyons Brook (MOS1B, MOS2B, and MOS3B). Within Montague State Forest. Extends off eastern edge of ROW. |
| MOW2B | BVW | PSS1E | Connects to UNT Lyons Brook (MOS4B). Within Montague State Forest. Extends off western edge of ROW. |
| MOW5B | BVW | PSS1E<br>PEM1E | Connects to UNT Lyons Brook (MOS5B, and MOS6B). Extends off eastern edge of ROW. |
| MOW4A | BVW | PSS1E | Connects to UNT Lyons Brook (MOS7A). Extends across ROW. |
| MOW5A | BVW | PFO1C<br>PSS1C | Connects to UNT Lyons Brook (MOS8A). Within Montague Water Supply Land. Extends across ROW. East of access road and MOW6A. |
| MOW6A | BVW | PFO1E<br>PSS1E | Connects to UNT Lyons Brook (MOS9A). Within Montague Water Supply Land. Extends from access road to western edge of ROW. Across from MOW5A. |
| MOW7A | BVW | PSS1E | Contains confirmed vernal pool. Within Montague State Forest. Centered on ROW on either side of the access road. |
| MOW8A | BVW | PFO1E<br>PSS1E | Within Montague State Forest. Extends off eastern edge of ROW. |
| MOW9A | BVW | PFO1E<br>PSS1E | Within Montague State Forest. Hydrologic connection across access road. |
| MOW3B | BVW | PSS1E | Extends off western edge of ROW. |
| MOW4B | IVW | PSS1B | Centered on ROW. |
| MOW6B | BVW | PFO1F<br>PSS1F | Adjacent to Chestnut Hill Loop. Extends across ROW. |
| MOW7B | BVW | PSS1H<br>PEM1H | Connects to Williams Brook (ESTMOS2). Adjacent to Chestnut Hill Loop. Extends across ROW. |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semi permanently flooded, G = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

### *4.2.3.5 WETLANDS IN LEVERETT*

The longest stretch of the ROW encompasses about 5.5 miles between Montague and Shutesbury in Leverett. This portion of the ROW contributes to the Connecticut River Watershed, beginning with Williams Brook at the northern border. The Sawmill River and Roaring Brook, as well as several of their tributaries, also cross the Project in Leverett. One tributary to Mountain Brook is found between these two river systems. Just north of UNT Mountain Brook, a NHESP Priority Habitat of Rare Species begins and carries south covering the ROW into Shutesbury, encompassing the Roaring Brook Conservation Area.

Freetown muck is found within the large wetland associated with Williams Brook. South of that, soils are predominantly mixed with moderate infiltration rated soils including Canton fine sandy loam and Chatfield-Hollis complex, as well as the less well drained Scituate fine sandy loam. Montauk fine sandy loam is also found amongst the three main soil types throughout the region. These have slow infiltration rates (HSG C), with fine sandy loam reaching depths up to 28 inches before becoming gravellier. Soils with high infiltration rate potential, including Merrimac fine sandy loam, Hinckley loamy sand, and Windsor Loamy sand, surround the Sawmill River and Roaring Brook crossings.

PFO wetlands are host to the typical mix of Eastern hemlock, red maple, yellow birch, and white pine, with smaller populations of sweet birch, green ash, American elm (*Ulmus americana*), and American beech (*Fagus grandifolia*). Typical PSS species include witch hazel, mountain laurel, meadowsweet (*Spiraea alba*), highbush blueberry, grey alder, winterberry, and sweet fern (*Comptonia peregrina*). A few wetlands were found to have significant invasive glossy buckthorn coverage. Various species of goldenrod, sensitive, New York, and cinnamon ferns, woolgrass, deer-tongue grass (*Dichanthelium clandestinum*), boneset (*Eupatorium perfoliatum*), sedges (*Carex* spp.), and raspberries/blackberries (*Rubus* spp.) are the most common species in Leverett PEM wetlands.

**Table 4-10. Summary of Wetlands in the Leverett Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| LEW1B | IVW | PEM1E | Centered on ROW. |
| LEW2B | IVW | PFO1B | Western edge of ROW. |
| LEW3B | BVW | PFO1E | Connects to UNT Sawmill River (LES2B). Extends off ROW east of access road. |
| LEW4B | BVW | PFO1E | Connects to UNT Sawmill River (LES2B). West of access road. |
| LEW5B | BVW | PEM1E | Connects to UNT Sawmill River (LES3B). Extends off ROW west of access road. |
| LEW6B | BVW | PEM1E | Connects to UNT Sawmill River (LES4A). Extends off ROW west of access road. |
| LEW7B | IVW | PSS1E | Centered on ROW. |
| LEW8B | BVW | PSS1H PEM1H | Connects to UNT Sawmill River (ESTLES1). Extends across ROW. |
| LEW9B | BVW | PFO1E PSS1E | Connects to Sawmill River (LES5B). Contains confirmed vernal pool. Extends across ROW. |
| LEW10B | IVW | PEM1A | West of access road. |
| LEW11B | BVW | PSS1E | Connects to UNTs Sawmill River (LES6B, LES7B, and LES8B). Extends off eastern edge of ROW. |
| LEW12B | BVW | PSS1E | Extends off ROW west of access road. |
| LEW13B | BVW | PSS1E | Connects to UNTs Sawmill River (LES9B and LES11B). |
| LEW14B | BVW | PSS1E | Connects to UNTs Sawmill River (LES9B and LES10B). |
| LEW15B | BVW | PSS1E | Connects to UNT Sawmill River (LES9B). Extends off ROW east of access road. |
| LEW16B | BVW | PSS1E | Connects to UNT Sawmill River (LES10B). Extends off ROW west of access road. |
| LEW17B | BVW | PSS1E | Connects to UNT Sawmill River (LES10B and LES12B). Extends off ROW west of access road. |
| LEW18B | BVW | PSS1E | Connects to UNT Sawmill River (LES13B). West of access road. |

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| LEW19B | BVW | PFO1E<br>PSS1E | Connects to UNT Sawmill River (LES9B). Extends off ROW east of access road. |
| LEW20B | BVW | PEM1E | Centered on ROW. |
| LEW21B | BVW | PSS1E | Extends off ROW west of access road. |
| LEW22B | BVW | PFO1E<br>PSS1E | Extends off ROW west of access road. |
| LEW23B | IVW | PSS1E | Centered on ROW east of access road. |
| LEW24B | IVW | PSS1E | Centered on ROW east of access road. |
| LEW25B | BVW | PFO1E<br>PSS1E<br>PEM1E | Connects to UNT Mountain Brook (LES14B). Within NHESP Priority Habitat of Rare Species. Contains two confirmed vernal pools. Extends across ROW. |
| LEW1D | BVW | PFO1E<br>PEM1E | Within NHESP Priority Habitat of Rare Species. Extends off eastern edge of ROW. |
| LEW2D | BVW | PFO1E<br>PEM1E | Connects to UNT Roaring Brook (LES2D). Within NHESP Priority Habitat of Rare Species. Extends off eastern and western edge of the ROW. |
| LEW26A | IVW | PSS1E | Within NHESP Priority Habitat of Rare Species. Centered on ROW. Hydrologic connection across access road. |
| LEW27A | BVW | PSS2E | Connected to Roaring Brook (LES16A) and UNT Roaring Brook (LES15A). Within Roaring Brook Conservation Area. Within NHESP Priority Habitat of Rare Species. |
| LEW28A | BVW | PSS1E<br>PEM1E | Connected to UNT Roaring Brook (LES17A). Within NHESP Priority Habitat of Rare Species. Extends off eastern edge of ROW. |
| LEW29B | BVW | PFO1E<br>PSS1E | Connects to UNTs Roaring Brook (LES18B and LES19B). Within NHESP Priority Habitat of Rare Species. Extends across ROW. |
| LEW30B | BVW | PEM1C | Within NHESP Priority Habitat of Rare Species. West of access road. |
| LEW31B | IVW | PSS1B | Within NHESP Priority Habitat of Rare Species. East of access road. |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested, UNK = unknown

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semipermanently flooded, G = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

### *4.2.3.6 WETLANDS IN SHUTESBURY*

South of Leverett, the ROW continues within the Connecticut River Watershed for approximately 1.8 miles through Shutesbury towards the Pelham town line. NHESP Priority Habitat of Rare Species covers the northern portion of the ROW and Amherst Watershed land is crossed near the southern border. Tributaries to the Atkins Reservoir, including Nurse Brook and Dean Brook, flow through the ROW in Shutesbury, south of a second transmission line that intersects the WT-11 corridor.

The most prominent soil types north of the majority of stream crossings include Chatfield-Hollis complexes and Ridgebury fine sandy loam, which allow for very slow infiltration. Deep, moderately drained Scituate fine sandy loam enables slightly faster infiltration father south, before soils transition to high infiltration rated Hinckley loam sand that surrounds the Dean Brook system.

Eastern hemlock, red maple, yellow birch, and green ash continue to be the most common species in this region of the ROW. Denser populations of invasive glossy buckthorn exist within PSS wetlands as well as native species like meadowsweet, mountain laurel, grey alder, and winterberry. Sedges, raspberries/blackberries, sensitive and cinnamon ferns, boneset, and woolgrass are frequently found in PEM wetlands.

**Table 4-11. Summary of Wetlands in the Shutesbury Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| SHW1B | BVW | PEM1E | Within NHESP Priority Habitat of Rare Species. West of access road. |
| SHW2B | IVW | PESS1B | Within NHESP Priority Habitat of Rare Species. West of access road. |
| SHW3B | IVW | PFO1J | Within NHESP Priority Habitat of Rare Species. Contains confirmed vernal pool. East of access road. |
| SHW4B | BVW | PSS1H | Connects to UNT Atkins Reservoir (SHS1B). Within NHESP Priority Habitat of Rare Species. Contains CVP. Extends across ROW. Located at intersection with another transmission line corridor. |
| SHW11A | BVW | PFO1 | East side of ROW. Appears to connect SHW4B off-ROW. |
| SHW5A | BVW | PFO1E<br>PSS1E | Connects to Nurse Brook (SHS1A and SHS2A). West of access road. Extends off eastern edge of ROW. |
| SHW6A | BVW | PFO7B | Borders portions of UNT Nurse Brook (SHS3A) as it crosses the ROW. |
| SHW7A | IVW | PFO1E<br>PSS1E | Located on both sides of the access road with hydrologic drainage connection. |
| SHW8A | IVW | PSS1E | Contains confirmed vernal pool. East of access road. |
| SHW9A | BVW | PSS1H<br>PEM1H | Assumed to connect to Dean Brook (SHS4A) off western edge of ROW. Within Amherst Watershed Land. Extends across ROW. |
| SHS10A | BVW | PSS1E | Borders Dean Brook (SHS4A) on both sides as it crosses ROW. Within Amherst Watershed Land. |
| SHW1C | BVW | PFO1H<br>PSS1H<br>PEM1H | Borders UNTs Dean Brook (SHS1C and SHS2C) in Shutesbury and Pelham (PES14C). Contains confirmed vernal pool. Extends across ROW and crosses access road in two areas via 3ft concrete culverts. |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested, UNK = unknown

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semipermanently flooded, G = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

### *4.2.3.7 WETLANDS IN PELHAM*

In Pelham, the transmission corridor continues south for another 4.1 miles before crossing into Belchertown. Stream crossings include Amethyst Brook as well as tributaries to Dean Brook, Hearthstone Brook, Buffam Brook, and Hop Brook. A second area of NHESP Priority Habitat of Rare Species covers the southern edge of the Project, overlapping crossings of the Harkness Conservation Area, Bitternut Hill Wildlife Sanctuary, and 100-year floodplain associated with Hop Brook.

Soil types north of Amethyst Brook are a combination of poorly drained (HSG D) Ridgebury fine sandy loam and excessively drained (HSG A) Gloucester gravelly fine sandy loam. Scituate fine sandy loam allows for slow drainage after the ROW crosses over high infiltration rate Hinckley loamy sand that surrounds Amethyst Brook. A large span of Charlton-Hollis-Rock outcrop complex is found at the southern end of the Project area in Pelham. This well drained, HSG A soil is composed of fine sandy loam that reaches depths up to 65 inches. Gloucester and Ridgebury soil types are found again near the Belchertown border where the 100-year floodplain covers the ROW.

Typical PFO wetlands support mature tree species found in other portions of the ROW including Eastern hemlock, red maple, and yellow birch. Scrub-shrub communities of PSS wetlands are often dominated by meadowsweets or steeplebushes, mountain laurel, grey alder, and winterberry and are commonly host to stands of invasive glossy buckthorn. More raspberries/blackberries, sensitive, New York, and cinnamon ferns, grass-leaved goldenrod (*Euthamia graminifolia*), papillose peatmoss (*Spagnum papillosum*), and woolgrass are the most common herbaceous species in PEM wetlands.

**Table 4-12. Summary of Wetlands in the Pelham Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| PEW18A | BVW | PFO1E | Contains confirmed vernal pool. Extends off ROW east of access road. Across from PEW19C. |
| PEW19C | BVW | PFO1F<br>PEM1F | Extends off ROW west of access road. Across from PEW18A. |
| PEW20C | BVW | PFO1E<br>PSS1E | Borders UNTs Hearthstone Brook (PES15C and PES16A) where PES15C crosses the ROW. Connection across access road via 2ft concrete culvert. Hydrologic connection across access road with PEW20A. |
| PEW20A | BVW | PSS1E | Contains confirmed vernal pool. Borders UNT Hearthstone Brook (PES16A) as it extends off the eastern edge of the ROW. Hydrologic connection across access road with PEW20C. |
| PEW22A | BVW | PSS1E | Contains three confirmed vernal pools. Extends off ROW in both directions and crosses access road via hydrologic drainage. |
| PEW18C | IVW | PSS1E | Contains confirmed vernal pool. East of the access road. Across from PEW21A. |
| PEW21A | IVW | PFO1E | West of the access road. Across from PEW18C. |
| PEW17C | BVW | PEM1E | Connects to UNT Buffam Brook (PES13C) which is located west of the access road and extends off the ROW. |
| PEW16C | BVW | PSS1E | Borders UNT Buffam Brook (PES13B) on both sides as it crosses ROW. |
| PEW15C | BVW | PSS1E | Connects to UNT Buffam Brook (PES12A) which is located east of the access road and extends off the ROW. |
| PEW14A | BVW | PFO1E<br>PSS1E | Extends off ROW on both sides of access road. Connected across access road via culvert. |
| PEW13A | BVW | PSS1E | Narrow portion extends off eastern edge of ROW. Located between two sections of access road. |
| PEW13AA | BVW | PFO1E | Connects to the southern side of Amethyst Brook (PES11A), which extends across the ROW. Entirely within the ROW, closest to the western edge. No access road here. |
| PEW12C | IVW | PEM1C | Centered on ROW west of access road. |

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| PEW11C | BVW | PEM1C | Borders 2ft wide ephemeral drainage (PES8C) as it extends from forested region to the western edge of the access road. |
| PEW10C | IVW | PSS1C | West of access road. |
| PEW9C | IVW | PEM1C | Small wetland west of the access road. |
| PEW8C | IVW | PEM1C | Adjacent to western edge of access road and connected to culvert. No wetland or flow observed at culvert on the eastern side of the access road. |
| PEW7C | IVW | PEM1C | West of the access road. Across from PEW6C. |
| PEW6C | IVW | PSS1C | Connects to unnamed stream (PES5C). Adjacent to eastern edge of the access road. Across from PEW7C. |
| PEW5C | BVW | PFO1E<br>PSS1E | Borders unnamed stream (PES3C) on the western side of the access road as the stream crosses the ROW. |
| PEW4C | IVW | PSS1E | West of the access road. |
| PEW3C | IVW | PEM1F | Centered on ROW. Hydrologic connection across access road. |
| PEW2C | BVW | PFO1/4E<br>PSS1E | Borders UNTs Hop Brook (PES1C and PES2C) as it crosses the ROW. Within 100-yr floodplain associated with Hop Brook. |
| PEW1C | IVW | PSS1E | Falls within 100-yr floodplain associated with Hop Brook. East of access road. |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested, UNK = unknown

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semipermanently flooded, G = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

### *4.2.3.8 WETLANDS IN BELCHERTOWN*

About 3.1 miles of the transmission line corridor are located between Pelham and Amherst in Belchertown. Still within the Connecticut River Watershed, two sections of 100-year floodplain cross the Project over the main channels of Montague Brook and Hop Brook. Three NHESP Priority Habitats of Rare Species cover most of the ROW in Belchertown and contain Amherst Water Supply land.

Dominant soil types in this region include poorly drained Ridgebury fine sandy loam and Walpole sandy loam, and contrasting HSG A, well drained Hinckley loamy sand, Gloucester gravelly fine sandy loam, and Windsor loamy sand. Poorly drained soils are found at river crossings within floodplains.

Tree species in PFO wetlands remain consistent with the rest of the Project area with Eastern hemlock, red maple, and yellow birch being the most dominant species. Buttonbush (*Cephalanthus occidentalis*), highbush blueberry, winterberry, silky dogwood (*Cornus amomum*), meadowsweet, and grey alder are most prominent in PSS wetlands. Invasive species glossy buckthorn and reed canary grass (*Phalaris arundinacea*) were found amongst scrub-shrub and herbaceous communities. PEM wetlands also support a diverse array of native species including sedges, asters (*Symphyotrichum novi-belgii* and *Symphyotrichum lateriflorum*), soft rush, sensitive, New York, and cinnamon ferns, woolgrass, deer-tongue grass, boneset, arrow-leaved tearthumb (*Persicaria sagittata*), bulrush (*Typha latifolia*), and raspberries/blackberries.

**Table 4-13. Summary of Wetlands in the Belchertown Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| BEW19C | BVW | PFO1H<br>PSS1H | The northern portion of this wetland falls within 100-yr floodplain associated with Hop Brook (PES2C). Extends from access road off ROW to the east. |
| BEW18C | BVW | PFO1H<br>PSS1H | Extends from access road off ROW to the east. |
| BEW17C | BVW | PFO1E<br>PSS1E<br>PEM1E | Northern portion is surrounded by 100-yr floodplain associated with Hop Brook (PES2C) on three sides. Extends from access road off ROW to the west. Assumed to intersect with floodplain off ROW. |
| BEW16C | BVW | PFO1/4H<br>PSS1H<br>PEM1H | Extends off western edge of ROW. |
| BEW15A | IVW | PFO1 | Adjacent to access road west of ROW. |
| BEW15C | BVW | PFO1/4F<br>PSS1F<br>PEM1F | Adjacent to Federal Street and local business: Orchard Hill Farm Equipment. Access road cuts to a southwesterly direction. Wetland is connected across the access road in two places: west of the ROW via a metal culvert and in the ROW via hydrological drainage. Extends off both ROW edges. |
| BEW14C | BVW | PFO1E<br>PSS1E | Adjacent to Federal Street. Separated from BEW13C by Zee Enterprises Drive. Extends off eastern edge of ROW. |
| BEW13C | BVW | PSS1E | Adjacent to Federal Street. Connected to 3ft inlet concrete culvert which is across the street from BEW15C. Separated from BEW14C by Zee Enterprises Drive. Extends off western edge of ROW. |
| BEW12C | BVW | PSS1E | Adjacent to Old Amherst Road. Extends from center of ROW off eastern edge. Adjacent to residential properties. |
| BEW11C | BVW | PFO1/4<br>PSS1E | Extends off eastern edge of ROW and borders access road on both sides. |
| BEW10C | BVW | PFO1/4E<br>PSS1E | Adjacent to North Street and extends west off ROW towards 4/5 residential properties. Located west of access road. |
| BEW9C | BVW | PFO1E<br>PSS1E | Adjacent to North Street and extends west off ROW towards 3 residential properties. |
| BEW8C | BVW | PFO1E<br>PSS1E | Borders UNT Hop Brook (BES2C) on both sides of the access road as it crosses the ROW. |
| BEW7C | IVW | PSS1H | Falls between two sections of 100-yr floodplain associated with Hop Brook (ESTBES1) and BEW6C. East of access road. |
| BEW6C | BVW | PFO1/4J<br>PSS1J<br>PEM1J | Falls within 100-yr floodplain associated with Hop Brook (ESTBES1). The northern section borders UNT Hop Brook (BES1C) as it crosses the ROW. BVW extends off ROW in both directions in two sections. Adjacent to agricultural land in the south. |
| BEW5C | BVW | PSS1H<br>PEM1H | Extends off ROW in both directions. Agricultural lands are found north and south of this wetland. |
| BEW4C | BVW | PFRO1/4H<br>PSS1H<br>PEM1H | Borders Hop Brook (ESTBES1) and falls within its associated 100-yr floodplain. Adjacent to agricultural land in the north and Hulst Road in the south. Connects to BEW3C via a culvert. Extends off ROW in both directions. |
| BEW3C | BVW | PSS1E | Adjacent to Hulst Road and connected to BEW4C via a culvert. Extends off ROW in both directions. Adjacent to residential properties in the west. |
| BEW2C | BVW | PSS1E | Centered on ROW. Residential properties located west of the ROW. Wetland is crossed by Robert Frost Trail. |

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| BEW1C | BVW | PFO1/4E<br>PSS1E | BES0C enters ROW from eastern edge and diffuses into wetland before it crosses the access road and extends off the ROW in the west. Western edge of ROW overlaps Amherst town line. |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested, UNK = unknown

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semipermanently flooded, G = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

### 4.2.3.9 WETLANDS IN AMHERST

The last wetland in Belchertown (BEW1C) is partially located in the 0.1 mile of ROW that fall in Amherst, Massachusetts.

**Table 4-14. Summary of Wetlands in the Amherst Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| BEW1C | BVW | PFO1/4E<br>PSS1E | BES0C enters ROW from eastern edge and diffuses into wetland before it crosses the access road and extends off the ROW in the west. The western edge of wetland in the ROW overlaps Belchertown town line. |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested, UNK = unknown

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semipermanently flooded, G = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

### 4.2.3.10 WETLANDS IN GRANBY

The last wetland in Belchertown (BEW1C) is partially located in the 0.1 mile of ROW that fall in Amherst, Massachusetts. The ROW then crosses the Amherst town line into Granby. Once in Granby, the ROW continues south for five miles along the Belchertown border, through Mount Holyoke Range State Park, Bachelor Brook WMA, and Emily Partyka Conservation Area. It briefly crosses back over into Belchertown for 0.3 mile, then back into Granby for another 0.3 mile before reaching the Ludlow town line. The southernmost wetland, GRW1C, lies within the Chicopee River Watershed. All others and stream crossings including Bachelor Brook, Weston Brook, and tributaries to Forge Pond and Turkey Hill Brook, are within the Connecticut River Watershed. Each major stream crossing is linked to a 100-year floodplain, and one tributary to Forge Pond has a 500-year floodplain.

Before reaching any floodplains, Freetown muck and Swansea muck soils (HSGs B/D) are separated by a large span of Rock outcrop-Narragansett-Holyoke complex, which allows for moderate filtration (HSG B) and has a deep layer of very fine sandy loam atop gravelly sandy loam. Excessively well drained Hinckley loamy sand and Gloucester fine sandy loam become dominant through the floodplains in the southern half of the ROW.

The typical mix of Eastern hemlock, red maple, yellow birch, and green ash compose the majority of mature tree species in PFO wetlands, and some oak species (*Quercus* spp.) were identified as well. Northern spicebush (*Lindera benzoin*), highbush blueberry, winterberry, arrowwood (*Viburnum dentatum*), silky

dogwood, meadowsweets and steeplebushes, and grey alder are most dominant in PSS wetlands. Most PEM wetlands contained a mix of species consisting of spotted touch-me-not (Impatiens capensis), goldenrods, asters, soft rush, sensitive, New York, and cinnamon ferns, woolgrass, deer-tongue grass, boneset, sedges, woolgrass, soft rush, and raspberries/blackberries. Small stands of invasive species were identified in PSS and PEM wetlands including glossy buckthorn, autumn olive (*Elaeagnus umbellata*), and common reed (*Phragmites australis*).

**Table 4-15. Summary of Wetlands in the Granby Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| GRW19C | BVW | PFO1H<br>PSS1H<br>PEM1H | Located partially within Mount Holyoke Range State Forest. Extends off ROW in both directions, into 100-yr floodplain associated with Bachelor Brook on the eastern edge of the ROW. Break in access road through this wetland. |
| GRW18C | IVW | PSS1E | Located within Mount Holyoke Range State Forest. Adjacent to north side of access road that branches off main access road to the west. |
| GRW17C | BVW | PFO1E<br>PSS1E | Hydrologic connection with UNT Forge Pond (GRS9C) which extends opposite it from the eastern side of the access road off the ROW. Located within Mount Holyoke Range State Forest. Linear shape extends west of the access road and off ROW. |
| GRW24C | BVW | PFO1/3E<br>PSS1E | Off of ROW west of access road. Extension of GRW17C. |
| GRW23C | IVW | PFO3F | Contains confirmed vernal pool. Off of ROW west of access road. |
| GRW22C | IVW | PFO3F | Off of ROW west of access road. |
| GRW19AC | BVW | PFO3E | Off of ROW east of access road. |
| GRW16C | BVW | PFO1/4B<br>PSS1B | Located within Mount Holyoke Range State Forest. Extends off both edges of ROW through break in access road. |
| GRW15C | BVW | PFO4E<br>PSS1E | Located within Mount Holyoke Range State Forest. Extends from a break in the access road in the center of ROW and off eastern edge of ROW. Across from GRW14C. |
| GRW14C | BVW | PFO4E<br>PSS1E | Located within Mount Holyoke Range State Forest. Extends from a break in the access road in the center of ROW and off western edge of ROW. Across from GRW15C. |
| GRW13AC | BVW | PFO1H<br>PSS1H<br>PEM1H | Connected to Bachelor Brook (ESTGR2) and its associated 100-yr floodplain. Extends off both edges of the ROW. Abuts residential property in the east. |
| GRW20B | IVW | PSS1E | Eastern edge of ROW. |
| GRW13C | BVW | PFO1H<br>PSS1H<br>PEM1H | Connected to Weston Brook (ESTGR1) and its associated 100-yr floodplain. Extends off both edges of the ROW. Abuts residential property in the east. |
| GRW9C | IVW | PSS1H | Contains confirmed vernal pool. East of access road. 100-yr floodplain associated with Bachelor Brook is within 100-ft northwest of wetland. |
| GRW10A | BVW | PFO | Borders UNT Forge Pond (GRS6C) along the northeast side of the ROW. |
| GRW10C | BVW | PFO1H<br>PSS1H<br>PEM1H | UNT Forge Pond (GRS5C) is bordered on both sides by wetlands in the north. |
| GRW11C | BVW | PFO1E<br>PSS1E<br>PEM1E | Extends off ROW in both directions. Connected across access road via hydrologic connection. |

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| GRW12C | BVW | PSS1E<br>PEM1E | Borders UNT Turkey Hill Brook (GRS7C) as it crosses the ROW through a break in the access road. |
| GRW8C | BVW | PFO1E<br>PSS1E | Extends off eastern edge of ROW. |
| GRW7C | BVW | PSS1E | Located west of access road and extends off western edge of ROW. Across from GRW6C. |
| GRW6C | BVW | PFO1E<br>PSS1E | Located east of access road and extends off eastern edge of ROW. Across from GRW7C. |
| GRW5C | BVW | PSS1E | Borders UNT Turkey Hill Brook (GRS4C) as it crosses the ROW via a culvert under the access road. Adjacent to gun range off ROW. |
| GRW4C | BVW | PFO1E<br>PSS1E | West of the access road; extends off ROW. Adjacent to gun range off ROW. |
| GRW3C | BVW | PSS1E | Borders UNT Turkey Hill Brook (GRS1C) as it crosses the ROW through a culvert under the access road. Falls within 100-yr floodplain. |
| GRW2C | IVW | PSS1H | Contains two confirmed vernal pools. Extends off ROW west of the access road. |
| GRW1C | BVW | PFO1E<br>PSS1E | Extends off ROW east and west of the access road. Connected hydrologically across access road. |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested, UNK = unknown

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semipermanently flooded, G = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

### *4.2.3.11 WETLANDS IN LUDLOW*

The final extension of the ROW heads due south through Ludlow for 2.2 miles before reaching the Ludlow Substation. It crosses the town line into Facing Rock WMA, which extends the entire length of the Project until it reaches the substation. Now entirely within the Chicopee River Watershed, a tributary to Higher Brook crosses the ROW in three places. Soil types alternate between poorly drained, HSG D, Ridgebury fine sandy loam and well drained, HSG B, Narragansett very fine sandy loam. Nearer to the substation, well drained, HSG A, Charlton and Narragansett soils cover the ROW.

Red maple and yellow birch continue to be dominant species in PFO wetlands here, in addition to white pine and bitternut hickory. Scrub-shrub species in PSS wetlands consist of northern spicebush, highbush blueberry, winterberry, arrowwood, silky dogwood, meadowsweet, and grey alder. Some invasive reed canary grass (*Phalaris arundinacea*) and purple loosestrife (*Lythrum salicaria*) was found in PEM wetlands and dominant native species are a combination of spotted touch-me-not, goldenrods, asters, soft rush, sensitive, wood, marsh, and cinnamon ferns, woolgrass, American bur-reed (*Sparganium americanum*), sedges, and grass-leaved goldenrod.

**Table 4-16. Summary of Wetlands in the Ludlow Portion of the WT-11 ROW**

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| LUW9C | BVW | PSS1E PFO1E | Borders UNT Higher Brook (LUS3C) on the eastern edge of the ROW. Located east of the access road. |

| WETLAND ID | STATE RESOURCE DESIGNATION | COVER TYPES | ASSOCIATED WATER / COMMENTS |
|---|---|---|---|
| LUW8C | BVW | PSS1F<br>PEM1F | Contains confirmed vernal pool. Hydrologic connection across access road. Extends off eastern and western edge of ROW. |
| LUW7C | BVW | PSS1E | Borders UNT Higher Brook (LUS2C) as it crosses the ROW over the access road. |
| LUW6C | IVW | PFO1B | Contains confirmed vernal pool. East of access road. Across from LUW5C. |
| LUW5C | BVW | PSS1E | Extends from west of access road off ROW. Across from LUW6C. |
| LUW4C | BVW | PFO1C<br>PSS1C | Extends off ROW west of the access road. |
| LUW3C | BVW | PFO1E<br>PSS1E | Extends off ROW west of the access road. |
| LUW2C | IVW | PFO1E<br>PSS1E | Contains confirmed vernal pool. Centered on ROW through break in the access road. |
| LUW1C | BVW | PFO1F<br>PEM1F | Located east of the substation. |

*State Resource Designation: BVW = bordering vegetated wetland, IVW = isolated vegetated wetland

*Cover Types: PEM = palustrine emergent, PSS – palustrine scrub-shrub, PFO = palustrine forested, UNK = unknown

1 = limnetic, 2 = littoral

A = temporarily flooded, B = saturated, C = seasonally flooded, E = seasonally flooded/saturated, F = semipermanently flooded, G = intermittently exposed, H = permanently flooded, J = intermittently flooded, K = artificially flooded

*UNT = unnamed tributary

# 4.3 Air and Noise Quality

Section 107 of the Clean Air Act directs the USEPA to designate air quality control regions (AQCR) for any interstate area or major intrastate area where communities share common air pollution problems. An implementation plan is developed for each AQCR describing how ambient air quality standards will be achieved and/or maintained. For each applicable pollutant and averaging period, USEPA designates an area's attainment status based on monitoring data from the region. Areas that meet the National Ambient Air Quality Standards (NAAQS) are deemed "attainment areas." Areas that do not meet the NAAQS are termed "nonattainment areas." Areas for which insufficient data are available to determine attainment status are termed "unclassifiable areas." Finally, areas formerly designated as nonattainment that subsequently reached attainment are deemed "maintenance areas." The attainment status designations appear in 40 CFR 81. The attainment status of a region, in conjunction with project emission rates or emissions increases, determines the regulatory review process for a new project.

The current attainment designations for Massachusetts are found in 40 CFR 81.322 and are listed in Table 4-17 for the areas of the Project. The proposed Project is located in the towns of Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, and Ludlow, Massachusetts in Franklin, Hampshire, and Hampden Counties, all of which are part of the Central Massachusetts AQCR 118. This region is considered in attainment/unclassifiable areas for all criteria pollutants.

**Table 4-17. Attainment Designations in Central Massachusetts AQCR 118**

| POLLUTANT A | ATTAINMENT STATUS |
|---|---|
| Total Suspended Particulate | Better than national standard |
| $SO_2$ (1971) | Better than national standard (effective 4/9/2018) |

| POLLUTANT A | ATTAINMENT STATUS |
|---|---|
| $SO_2$ (2010) | Attainment / Unclassifiable (effective 4/9/2018) |
| CO | Attainment / Unclassifiable (effective 11/15/1990) |
| $NO_2$ (1971 Annual Standard) | Better than national standard |
| $NO_2$ (2010 1-Hour Standard) | Attainment / Unclassifiable (effective 90 days after 10/31/2011) |
| $O_3$ (2015 8-Hour Standard) | Attainment / Unclassifiable (effective 8/3/2018) |
| $PM_{2.5}$ (2012 Annual Standard) | Attainment / Unclassifiable (effective 4/15/2015) |
| $PM_{2.5}$ (2006 24-Hour Standard) | Attainment / Unclassifiable (effective 30 days after 11/13/2009) |
| Lead | Attainment / Unclassifiable (effective 12/31/2011) |

[a] $SO_2$ = sulfur dioxide; CO = carbon monoxide; $NO_2$ = nitrogen dioxide; $O_3$ = ozone; $PM_{2.5}$ = fine particulate matter with a diameter less than 2.5 microns

# 4.4 Plant and Animal Species and Habitat

## 4.4.1 Typical Vegetation Communities and Wildlife Habitats

The USEPA has divided Massachusetts into 13 "ecoregions," which denote areas within which ecosystems (type, quality, and quantity of environmental resources) are generally similar. The Project crosses through three of these ecoregions (MassGIS 1999), which are described by the USEPA (Griffith et al. 1994) as follows:

- *Ecoregion #587 - Worcester Plateau:* This area includes the most hilly areas of the central upland with a few high monadnocks and mountains. Forests are transition hardwoods and some northern hardwoods. Forested wetlands are common. Surface waters are acidic. Many major rivers drain this area.
- *Ecoregion #591 - Connecticut River Valley*: The borders of this region are easily defined by the bedrock geology. It has rich soils, a mild climate and low rolling topography. The valley floor is primarily cropland and built land. Central hardwoods and transition hardwood forests cover the ridges.
- *Ecoregion #592 - Lower Worcester Plateau*: Comprises of open hills and transition hardwood and central hardwood forests. Most parts drain to the Chicopee and Quinebaug Rivers.

Upland and wetland vegetation communities were assessed during SWCA's field survey/delineation effort in October-November 2021; January, March and July 2022; and April 2024. The general cover types and associated wildlife habitats crossed by the Project include open upland, open wetlands, agricultural land, commercial/industrial land, forested upland, and forested wetland.

- **Open uplands** generally occur within the WT-11 ROW's existing maintained corridor, which is approximately 125–335 feet wide. The open upland communities typically consist of grasslands and shrublands, primarily dominated by goldenrods (*Solidago* and *Euthamia* spp.), New York and hay-scented ferns (*Parathelypteris noveboracensis* and *Dennstaedtia punctilobula*), grasses (*Carex* and *Phleum* spp.), asters (*Symphotrichum* spp.), blackberry/raspberry (*Rubus* spp.). Utility corridors may provide edge habitat and migratory corridors for wildlife, as well as providing needed grassland and early successional habitat for many wildlife species, including grassland birds. Grasslands, old fields, and brushy areas can be used as foraging and nesting habitat by mammals and songbirds. Shrublands provide sources of food and nesting sites for various birds, as well as cover for invertebrates, reptiles, and amphibians. Species such as the eastern cottontail (*Sylvilagus*

*floridanus*), gray squirrel (*Sciurus carolinensis*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and red fox (*Vulpes vulpes*) utilize these types of habitats.

- **Open wetlands** include emergent marsh and scrub-shrub wetlands. These wetland communities are often associated with areas containing standing water for extended periods of time or areas that are maintained in an emergent state by regular vegetation maintenance (e.g., utility corridors). The emergent marshes along the Project ROW are dominated by goldenrods, woolgrass, sweet joe-pye weed (*Eutrochium purpureum*), soft rush, and sensitive and cinnamon ferns. Where scrub-shrub wetlands occur, they include the species above mixed with invasive buckthorns (*Frangula alnus*), honeysuckles (*Lonicera* spp.), and multiflora rose (*Rosa multiflora*), as well as native species like speckled alder (*Alnus rugosa*), witch hazel, meadowsweet, willow (*Salix* spp.), alder (*Alnus* spp.), and striped maple (*Acer pennsylvanica).* Common species of birds associated with emergent wetlands include red-winged blackbird (*Agelaius phoeniceus*) and great blue heron (*Ardea herodias*). Common mammals associated with this habitat type include star-nosed mole (*Condylura cristata*) and muskrat (*Ondatra zibethicus*). White-tailed deer (*Odocoileus virginianus*) capitalize on the abundance of grasses and forbs. A large variety of amphibians and reptiles are also commonly found within these areas, for example bullfrog (*Rana catesbeiana*), common snapping turtle (*Chelydra serpentina*), painted turtle (*Chrysemys picta*), and pickerel frog (*Lithobates palustris*).

- **Agricultural lands** crossed by the Project include cropland and pastureland for grazing livestock. Those agricultural lands that are not in active crop production are generally dominated by maintained or grazed grasses, goldenrods, and asters. Although these areas generally provide poor to moderate cover habitat, they often provide forage and nesting for a number of species, such as European starlings (*Sturnus vulgaris*) and mourning doves (*Zenaida macroura*). Pastures also provide grazing habitat for species such as the white-tailed deer.

- **Commercial/industrial lands** crossed by the Project consist of paved roads, landscaped areas, and maintained lawns. Small portions of the existing ROW cross commercial/industrial land at public roadways and where land associated with businesses are found adjacent to the Project area. These developed lands provide low-quality wildlife habitat. Species present in landscaped and lawn areas associated with these properties may include grey squirrels and common songbirds that are tolerant of human activity, such as American robin (*Turdus migratorius*), mockingbirds (*Mimus polyglottos*), American crow (*Corvus brachyrhynchos*), and house sparrows (*Passer domesticus*). Occasional visitors to these areas may also include raccoons and striped skunk (*Mephitis mephitis*).

- **Forested uplands** are located outside of the existing maintained portion of the ROW. The canopy and shrub/sapling layers are dominated by northern red oak (*Quercus rubra),* sweet birch, Eastern hemlock, eastern white pine, gray birch (*Betula populifolia*), and American beech. The understory is sparse and dominated by tree saplings. These oak-hickory-white pine forests may provide habitat for a variety of wildlife species. Tree cavities and large woody material provided by upland forests provide den sites and/or cover for a variety of birds, mammals, amphibians, and reptiles. Acorns and beech nuts provide an important source of wildlife food. There is a large suite of neotropical migratory birds that may be found here, including 15–16 warbler species, Eastern wood-pewee (*Contopus virensi),* and great-crested flycatcher (*Miarchus crinitus*) (Swain and Kearsley 2001). Large mammals may include white-tailed deer, coyote (*Canis latrans*), red fox, and fisher (*Martes pennanti).* Common small mammals may include shrews (*Sorex* spp.), white-footed mouse (*Peromyscus leucopus*), and red squirrels (*Tamiasciourus hudsonicus*). A variety of snakes and terrestrial amphibians and turtles may also be present in these areas.

- **Forested wetlands** are located in low-lying areas outside of the existing maintained ROW. These are dominated by Eastern hemlock, red maple, yellow birch, green ash, and American beech with associated saplings throughout the sparsely vegetated understory. Forested wetlands provide food, shelter, migratory and wintering areas, and breeding areas for wildlife species, including American toad (*Bufo americanus*), northern spring peeper (*Pseudacris crucifer*), and gray treefrog (*Hyla versicolor*).

## 4.4.2 State-Listed Rare Species Habitat

State-listed rare species and their habitats are protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and, where their habitat occurs within wetlands, by the Massachusetts Wetlands Protection Act. MESA protects rare species and their habitats by prohibiting the "Take" of any plant or animal species listed as endangered, threatened, or special concern. The Massachusetts NHESP administers MESA by requiring projects within mapped rare species habitats to undergo project review and, if a Take is anticipated, to obtain a Conservation and Management Permit that will require mitigation sufficient to result in a net benefit to the species.

The WT-11 ROW crosses six designated areas of Priority Habitat (PH) of Rare Species, identified as PH 1488, 1316, 1276, 2084, 1238 and 1077. Each of these areas provide habitat suitable for one or more of the following species: eastern box turtle (*Terrapene carolina*), marbled salamander (*Ambystoma opacum*), wood turtle (*Glyptemys insculpta*), and climbing fern (*Lygodium palmatum*). Each species is described in more detail in the following subsections. Information on Project impacts and the Project's compliance with MESA are discussed in Sections 5.4.2 and 6.4, respectively.

### *4.4.2.1 EASTERN BOX TURTLE*

The eastern box turtle is a small (4.5–6.6 inches in length) terrestrial turtle that has an oval, high-domed shell with variable coloration and markings, usually dark brown or black with numerous irregular yellow, orange, or reddish blotches. Their populations range from southeastern Maine, south to northern Florida, and west to Michigan, Illinois, and Tennessee. Although they occur in many towns in Massachusetts, they are more heavily concentrated in the southeastern section of the state and designated as a Species of Special Concern (NHESP 2006).

Eastern box turtles inhabit many types of terrestrial areas including both dry and moist woodlands, brushy fields, thickets, marsh edges, bogs, swales, fens, stream banks, and well-drained bottomland. They emerge from overwintering in spring and begin to forage and mate in the forest and fields. In summer, they are most active in the morning and evening, particularly after a rainfall. They often seek shelter under rotting logs or masses of decaying leaves, in mammal burrows, or in mud. Females nest in June or early July (NHESP 2006).

### *4.4.2.2 MARBLED SALAMANDER*

The marbled salamander is a stout, medium-sized salamander (3–5 inches) with a stocky body, short limbs, and a broad, rounded snout. Dorsal coloration is black, marked with bold, variable-shaped grayish to whitish crossbands that create a "marbled" pattern from head to tail. They are listed as Threatened in Massachusetts, where they are distributed primarily among parts of Bristol, Franklin, Hampden, Hampshire, Norfolk, and Worcester counties. Their full habitat range extends from southern New England south to northern Florida and west to eastern Texas and Oklahoma (NHESP 2015a).

Adult and juvenile marbled salamanders inhabit relatively mature deciduous and mixed deciduous-coniferous forest and woodlands. Elevation and forest type vary greatly among local populations across

Massachusetts, but dry sites seem to be preferred. Breeding/larval habitat is also variable, but consistently are always fishless, occur within or adjacent to forests, and hold water continuously during a minimum period of January through May. In late August or early September, adult marbled salamanders emerge from their underground retreats and migrate to their breeding pools. Unlike most Ambystomatid salamanders that breed during early spring and deposit gelatinous egg masses in water, marbled salamanders breed during late summer and deposit clutches of loose eggs in dried wetland basins. In Massachusetts, egg deposition peaks in mid-September (NHESP 2015a).

#### *4.4.2.3 WOOD TURTLE*

The wood turtle is a medium-sized turtle (14–20 cm) that can be recognized by its sculpted shell and orange coloration on the legs and neck. They can be found throughout New England, north to Nova Scotia, west to eastern Minnesota, and south to northern Virginia. In Massachusetts, they are classified as a Species of Special Concern. Though its occupancy appears to be widespread across the state, most towns have fewer than five known siting occurrences (NHESP 2015b).

The preferred habitat of the wood turtle is in riparian areas. Slower moving mid-sized streams are favored, with sandy bottoms and heavily vegetated stream banks. The stream bottom and muddy banks provide hibernating sites for overwintering, and open areas with sand or gravel substrate near the stream edge are used for nesting. Wood turtles spend most of the spring and summer in mixed or deciduous forests, fields, hay fields, and riparian wetlands, including wet meadows, bogs, and beaver ponds. They return to the streams in late summer or early fall to their favored overwintering location. In Massachusetts, most nesting occurs over a 4-week period, primarily in June, and their active season occurs outside of November 1 – April 15 (NHESP 2015b).

#### *4.4.2.4 CLIMBING FERN*

Climbing fern (*Lygodium palmatum*) does not have the characteristic overall shape of most ferns. It is an evergreen, ivy-like plant which sprawls over the ground or climbs clockwise short distances up shrubs and course herbs. It grows in moist pine-oak-maple woods with an open understory, in moist thickets, and along stream margins, preferring acidic soils that are sandy and rich in humus, but nutrient poor. Regenerating woodlands and powerline corridors also provide habitat for this species in Massachusetts. Its population range occurs from southern New Hampshire and northwestern Vermont, west to Michigan, and south to Georgia and Alabama. Climbing fern continues to decline in Massachusetts due to loss of habitat through draining and filling of wetlands, land development projects, and the maturation of woodlands (NHESP 2009).

### 4.4.3 Federally Listed Rare Species

Based on a review of the USFWS Information for Planning and Conservation (IPaC) online consultation process, the Project area is within the range of the northern long-eared bat (*Myotis septentrionalis*), and the northeastern bulrush (*Scirpus ancistrochaetus)*. Both species are federally listed as endangered. In addition, the IPaC indicated that the tricolored bat (*Perimyotis subflavusas*), which is proposed for listing as endangered under the Endangered Species Act, may be present in the Project area. The Project is not located within a critical habitat or an NHESP-mapped Priority Habitat for these three species, and it is not within 0.25 miles of a known bat hibernacula or 150 feet of a known bat maternity roost.

#### *4.4.3.1 FEDERALLY LISTED BATS*

In coordination with NHESP and the USFWS, SWCA conducted acoustic bat surveys in July and August 2023; the results of the surveys will be provided to NHESP and USFWS. Eversource anticipates continued

coordination with NHESP and USFWS to avoid impacts to federal listed bat species, including the implementation of additional TOY restrictions as needed.

#### 4.4.3.2 NORTHEASTERN BULRUSH

To confirm the potential presence of northeastern bulrush, SWCA conducted a botanical survey for northeastern bulrush within the Project corridor through the towns of Wendell and Montague on October 11, 17, and 18, 2023. Because it is an obligate wetland species, survey efforts for the northeastern bulrush focused on wetland habitats, which had been previously delineated by SWCA. The Survey Areas associated with each wetland encompass the existing maintained portion of the ROW, as well as the proposed tree removal areas.

Northeastern bulrush was observed in several wetlands in Montague along the ROW access road. SWCA summarized its findings in a report submitted to the USFWS – New England Field Office and NHESP on November 29, 2023, will continue to coordinate with these agencies on behalf of Eversource to avoid impacts to the population.

## 4.5 Transportation Resources

Table 4-18 lists the public roads crossed by the Project and identifies the jurisdiction for each. Jurisdiction indicates the owner of the road, which is typically the party responsible for maintenance activities and initiation of roadwork projects. Five of these roads are state-owned and the rest are under local jurisdiction. The Federal Highway Administration has designated the Mohawk Trail as a Scenic Byway within the Commonwealth of Massachusetts (MassDOT 2024a).

**Table 4-18. Public Roads Crossed by the Project**

| LOCATION | ROADWAY | JURISDICTION |
|---|---|---|
| Erving | Old State Road | MassDOT |
| Erving | Mohawk Trail (MA-2 & -2A) | MassDOT |
| Wendell | Mormon Hollow Road | Local |
| Wendell | Davis Road | Local |
| Montague | Wendell Road | Local |
| Montague | Cross Road | Local |
| Montague | East Chestnut Hill Road | Local |
| Montague | Chestnut Hill Loop Road | Local |
| Leverett | North Leverett Road | Local |
| Leverett | Rattlesnake Gutter Road | Local |
| Leverett | Old Mountain Road (paper) | Local |
| Leverett | Shutesbury Road | Local |
| Shutesbury | Pratt Corner Road | Local |
| Shutesbury | Sand Hill Road | Local |
| Pelham | North Valley Road | Local |
| Pelham | Amherst Road | Local |
| Belchertown | Federal Street (MA-9) | MassDOT |

| LOCATION | ROADWAY | JURISDICTION |
|---|---|---|
| Belchertown | Old Amherst Road | Local |
| Belchertown | North Street | Local |
| Belchertown | Warren Wright Road | Local |
| Belchertown | Orchard Road | Local |
| Belchertown | Bay Road | Local |
| Granby | Bachelor Street | Local |
| Granby | George Hannum Street | Local |
| Granby | Fred Ruel Road | Local |
| Granby | East State Street (US-202) | MassDOT |
| Granby | Carver Street | Local |
| Ludlow | Higher Brook Canal Road | Local |
| Ludlow | Center Street (MA-21) | MassDOT |

Source: MassDOT (2024b)

# 4.6 Scenic Qualities, Open Space, and Recreational Resources

Land use adjacent to or within the Project area includes agricultural areas, lower-density residential, forestland, and several land conservation areas. Each resource identified within 1 mile of the Project area is detailed in Table 4-19. Resources that were considered scenic, open space, or recreational include National Forests, lands administered by federal agencies such as Indian reservations or designated wilderness areas, Areas of Critical Environmental Concern (ACECs), open space lands, state agricultural preservation areas, state scenic landscapes, mapped trails, NPS scenic trails, scenic roads, wild and scenic rivers, nature preserves, wildlife management areas, registered natural landmarks, state parks and public natural resource lands (e.g., parks, forests, reserves, conservation lands) are protected under Article 97.

**Table 4-19. Open Space/Recreational Lands Crossed by the WT-11 TRRP Project**

| RESOURCE | TYPE | LOCATION | OWNERSHIP |
|---|---|---|---|
| Amherst Water Supply Land | Water Supply | Belchertown | Town of Belchertown |
| Amherst Watershed | Conservation | Shutesbury | Town of Amherst |
| Bachelor Brook WMA | Conservation | Granby | MA DFG |
| Butternut Hill Wildlife Sanctuary | Conservation | Pelham | Town of Pelham |
| Chicopee Sportsmens Club | Recreation | Granby | Private |
| Emily Partyka Conservation Area | Conservation | Granby | Town of Granby |
| Facing Rock WMA | Conservation | Ludlow | MA DFG |
| Fairview Fish and Game Club | Recreation | Granby and Belchertown | Private |
| Granby Bow and Gun Club | Recreation | Granby | Private |
| Harkness Conservation Area | Conservation | Pelham | Town of Pelham |
| Hunting CR | Conservation | Montague | Private |
| Keller CR | Conservation | Wendell | Private |

| RESOURCE | TYPE | LOCATION | OWNERSHIP |
|---|---|---|---|
| Land Edward C Jr Agricultural Preservation Restriction (APR) | Agricultural Land | Belchertown | Private |
| Ludlow Reservoir WCE | Conservation | Ludlow | City of Springfield |
| Montague State Forest | Conservation and Recreation | Montague | MA DCR |
| Montague Water Supply Land | Water Supply | Montague | Town of Montague |
| Montague Wildlife Management Area (WMA) | Conservation | Montague | MA DFG |
| Mount Holyoke Range State Park | Conservation and Recreation | Belchertown, Amherst, and Granby | MA DCR |
| Paul C. Jones Working Forest Wildlife Conservation Easement (WCE) | Conservation | Leverett | Private |
| Poplar Mountain Conservation Area | Conservation | Erving | Town of Erving |
| Roaring Brook Conservation Area | Conservation | Leverett | Town of Leverett |
| Smith CR | Conservation | Wendell | Private |
| Sugarbush Farm CR | Conservation | Wendell | Private |
| Topping Farm Conservation Area | Conservation | Belchertown | Town of Belchertown |
| Walter Cowls Jones Working Forest WCE | Conservation | Leverett and Shutesbury | Private |
| Water Department Land | Water Supply | Amherst | Town of Amherst |

Source: MassGIS (2025a)

The existing WT-11 ROW crosses 26 open space and recreational lands. Eversource has been routinely maintaining the Wire and Border Zones in the Project corridor by removing non-compatible trees and tall shrubs where the ROW crosses these lands. Where Amethyst Brook crosses the ROW adjacent to Buffam Falls Conservation Area is one location where these zones are currently non-compliant; the Wire Zone in this area has been historically managed through yearly monitoring and topping trees to maintain minimum clearances. No TRRP activities are proposed within the Buffam Falls Conservation Area.

# 4.7 Historical and Archaeological Resources

The Public Archaeology Laboratory, Inc. (PAL) conducted a cultural resource due diligence review and archaeological sensitivity assessment for the Project. The due diligence review identified four historic areas that overlap the ROW, two of which are listed in the National Register of Historic Places as historic districts. Two archaeological sites also fall within the ROW. PAL conducted a field review of the Project ROW to assess the integrity of the ground surface, to collect data on current environmental settings, and to look for any surface indications of archaeological sites. No surface indications of pre- or post-contact archaeological sites were observed during the walkover of the ROW; however, one unrecorded post-contact site was identified.

PAL stratified the ROW into zones of high and low archaeological sensitivity for its potential to contain archaeological resources based on the information collected during the background research and field review. Forty-one distinct sensitivity areas were assessed as having archaeological sensitivity, which is approximately 31% (232 acres) of the Project ROW. The remaining 69% (524 acres) was assessed as having no/low archaeological sensitivity. On May 19, 2022, PAL submitted a Project Notification Form (PNF) and the cultural resource due diligence report (Doucette 2022) to the MHC for the Project ROW.

In January 2024, PAL prepared a cultural resource due diligence report for 12 off-ROW access roads. Seven of the 12 access roads were located at least partially in areas of high archaeological sensitivity and avoidance of ground disturbance was recommended. PAL is currently in the process of conducting field reviews and a due diligence report of additional off-ROW access roads and staging areas that have been identified for potential use. PAL submitted a PNF and the two due diligence reports for these off-ROW areas to the MHC in May 2025; MHC has not responded to the submittal and, therefore, concurrence is presumed.

# 4.8 Built Environment

The Centers for Disease Control (2019) describes the term built environment, as the human-made environment that provides the setting for human activity, including homes, buildings, zoning, streets, sidewalks, open spaces, transportation options, and more. Land use types considered to be associated with the built environment and human use of the Project site include commercial/industrial and residential lands (discussed in Section 4.4.1), existing transportation infrastructure (discussed in Section 4.5), and human-utilized open lands, including conservation, recreation, agricultural, and water supply lands (discussed in Section 4.6). As identified in Table 4-20, most of the WT-11 ROW is zoned for low-density residential (i.e., rural, roadside), agriculture, and forest/forest conservation; no commercial or industrial zones are crossed.

**Table 4-20. Zoning and Overlay Districts Crossed by the WT-11 Project**

| MUNICIPALITY | ZONING | OVERLAY DISTRICTS |
|---|---|---|
| Northfield | Recreation Tourism District 1 | N/A |
| Erving | Rural Residential (RR) | French King District (FK) |
| Wendell | Residential Agricultural Zoning District | Agricultural Overlay District |
| Montague | Agricultural - Forest 4 (AF4) | N/A |
| Leverett | Rural Outlying Residential (RO),<br>Rural Residential (RR)<br>Residential/Village (RV). | Aquifer Protection (in the areas of Willams Brook and North Leverett Road.<br>Rattlesnake Gutter (along Rattlesnake Gutter Road) |
| Shutesbury | Forest Conservation District (FC)<br>Roadside Residential District (RR)(only along Pratts Corner Road and Sand Hill Road. | N/A |
| Pelham | Residential (R))<br>Village Center Rural Edge (VC-RE) . | Solar District ID: NW 01 (1 Installation) |
| Belchertown | Primary Agricultural (AG-A)<br>Rural Residential (AG-B),<br>General Business (B-2) (along Federal Street) | Aquifer Protection District Overlay |
| Amherst | Low Density Residence (R-LD) | Aquifer Recharge Protection |
| Granby | Residential - Single Family Units | Professional Office Overlay District (only along East State Street) |
| Ludlow | Easement / Agriculture (A) | N/A |

Note: Zoning and Overlay Districts are listed per municipality in order of greatest length of crossing by the WT-11 ROW. The Project corridor does not cross any of the identified overlay districts for its entire length within that municipality; most crossings are of a relatively short distance.

The Project is located entirely within Eversource easements or Eversource fee-owned lands, with the exception of one location along Route 2 and Millers River in Erving, where Eversource does not have a legal easement for the existing utility line corridor, a common issue at large highway crossings and navigable rivers. At this location, Eversource will coordinate with MassDOT to ensure the appropriate rights for the Project are obtained for the proposed activities through the permitting process. Rights for the

use of off-ROW access roads are currently being established through consultations with the applicable landowners.

# 4.9 Rare or Unique Features and Public Health Conditions

Rare or unique features include environmental or social conditions of the Project site and its immediate surroundings in which any increase in environmental impacts, however small or gradual, may result in an unusual or disproportionate effect on environmental resources or the quality of public health. The Project area is relatively typical of the region regarding environmental and social conditions. However, EJ communities have been identified within one- and five-mile radiuses of the Project area. No other rare or unique features were identified from field surveys or desktop review of aerial photographs, MassGIS data layers, and other sources.

## 4.9.1 Environmental Justice Communities

In Massachusetts, a neighborhood is defined as an EJ population if one or more of the following four criteria are met:

1. The annual median household income is not more than 65% of the statewide annual median household income.

2. Minorities comprise 40% or more of the population.

3. Twenty-five percent or more of households lack English language proficiency.

4. Minorities comprise 25% or more of the population, and the annual median household income of the municipality in which the neighborhood is located does not exceed 150% of the statewide annual median household income.

EJ communities within a 1-mile and 5-mile radius of the Project are depicted in maps provided in Attachment 3 and are listed in Table 4-21 based on MassGIS Data: 2020 EJ Populations (MassGIS 2021c). While this EJ population data was updated in 2022, guidance received from the EOEA is to use the information identified in the EENF throughout the MEPA process for consistency. Accordingly, information on the EJ populations in Table 4-21 is what was presented in the EENF.

Four EJ communities are located within 1 mile of the Project area, the Designated Geographic Area (DGA) applicable to this Project. Two of these EJ communities are crossed by the Project and are located in Wendell and Amherst. The EJ community in Wendell meets EJ criteria due to annual median household income, while the EJ community in Amherst meets EJ criteria due to minority composition. The two EJ communities that are not crossed by the Project but are located within 1 mile, are both located in Amherst. One meets EJ criteria due to minority and income, and the other due to minority composition. In addition, 36 additional EJ populations were identified within a 5-mile radius of the Project area.

Since the filing of the EENF, the community in Wendell is no longer mapped as meeting EJ criteria, and the EJ communities in Amherst have shifted with three EJ communities located within the 1-mile DGA but none crossed by the Project. However, as stated previously, the following analysis is based on data available at the time the EENF was submitted.

#### 4.9.1.1 SOCIAL CONDITIONS IN ENVIRONMENTAL JUSTICE COMMUNITIES

Characteristics related to social conditions within each of the 40 EJ communities located within five miles of the Project area as they relate to both state and municipal characteristics were obtained from MassGIS Data: 2020 EJ Populations (MassGIS 2021c) at the time the EENF was filed and are detailed in Table 4-21. The Project does not meet or exceed MEPA review thresholds under 301 CMR 11.03(8)(a)–(b) and will not add 150 or more new average daily trips of diesel vehicle traffic over a duration of one year or more. Therefore, the Project is not subject to a five-mile radius for assessment of impacts.

**Table 4-21. Characteristics of EJ Communities within 5 Miles of the WT-11 TRRP Project (2022 Data)**

| Census Block Group # | Census Tract # | Distance from project site | Town | EJ Criteria | Median Household Income (MHHI) | Income Percent of the MA MHHI Median | Total Minority Population | Households with Language Isolation per Block Group | Municipality MHHI | Municipality Percent of MA MHHI | 2019 Block Group Population | 2019 Block Group Households | Languages other than English spoken by 5% or more of the population per census tract who do not speak English very well |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 404 | within 1 mile (overlaps) | Wendell | income | $53,875 | 63% | 12% | 1% (Spanish + Other Indo-European) | $53,875 | 63% | 862 | 383 | N/A |
| 1 | 8207 | within 1 mile | Amherst | minority and income | $38,558 | 45% | 43% | 2% (Spanish + Chinese) | $56,905 | 66% | 2,144 | 705 | N/A |
| 2 | 8207 | within 1 mile | Amherst | minority | $64,643 | 75% | 40% | 7% (Spanish + Chinese) | $56,905 | 66% | 1,454 | 562 | N/A |
| 2 | 8208.01 | within 1 mile (overlaps) | Amherst | minority | $96,800 | 113% | 25% | 0% | $56,905 | 66% | 1,486 | 692 | Chinese: 7.8% |
| 2 | 407.01 | within 5 miles | Montague | minority and income | $24,234 | 28% | 26% | 2% | $54,430 | 63% | 1,207 | 594 | N/A |
| 4 | 407.01 | within 5 miles | Montague | income | $54,219 | 63% | 3% | 0% | $54,430 | 63% | 766 | 440 | N/A |
| 3 | 407.01 | within 5 miles | Montague | income | $53,425 | 62% | 19% | 7% | $54,430 | 63% | 1,112 | 491 | N/A |
| 1 | 407.01 | within 5 miles | Montague | income | $31,288 | 36% | 9% | 0% | $54,430 | 63% | 799 | 340 | N/A |
| 4 | 408 | within 5 miles | Sunderland | income | $55,081 | 64% | 20% | 3% | $55,625 | 65% | 1,494 | 730 | N/A |
| 3 | 8001.01 | within 5 miles | Springfield | minority | $60,556 | 71% | 50% | 2% | $39,432 | 46% | 1,564 | 632 | Spanish or Spanish Creole: 5% |
| 2 | 8001.01 | within 5 miles | Springfield | minority and income | $33,191 | 39% | 83% | 12% | $39,432 | 46% | 1,485 | 463 | Spanish or Spanish Creole: 5% |

| Census Block Group # | Census Tract # | Distance from project site | Town | EJ Criteria | Median Household Income (MHHI) | Income Percent of the MA MHHI Median | Total Minority Population | Households with Language Isolation per Block Group | Municipality MHHI | Municipality Percent of MA MHHI | 2019 Block Group Population | 2019 Block Group Households | Languages other than English spoken by 5% or more of the population per census tract who do not speak English very well |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8001.01 | within 5 miles | Springfield | minority and income | $38,750 | 45% | 56% | 11% | $39,432 | 46% | 988 | 442 | Spanish or Spanish Creole: 5% |
| 1 | 8001.02 | within 5 miles | Springfield | minority | $57,321 | 67% | 69% | 2% | $39,432 | 46% | 2,029 | 691 | Spanish or Spanish Creole: 6.8% |
| 2 | 8001.02 | within 5 miles | Springfield | minority and income | $41,741 | 49% | 68% | 19% | $39,432 | 46% | 1,192 | 377 | Spanish or Spanish Creole: 6.8% |
| 3 | 8001.02 | within 5 miles | Springfield | minority and income | $25,446 | 30% | 66% | 16% | $39,432 | 46% | 1,218 | 562 | Spanish or Spanish Creole: 6.8% |
| 1 | 8002.02 | within 5 miles | Springfield | minority and income | $44,563 | 52% | 51% | 7% | $39,432 | 46% | 1,482 | 555 | Spanish or Spanish Creole: 7.2% |
| 3 | 8015.03 | within 5 miles | Springfield | minority and income | $49,375 | 58% | 61% | 0% | $39,432 | 46% | 1,099 | 329 | Spanish or Spanish Creole: 9.2% |
| 1 | 8015.03 | within 5 miles | Springfield | minority and income | $39,128 | 46% | 79% | 1% | $39,432 | 46% | 1,522 | 543 | Spanish or Spanish Creole: 9.2% |
| 2 | 8015.03 | within 5 miles | Springfield | minority and income | $41,434 | 48% | 58% | 10% | $39,432 | 46% | 1,839 | 708 | Spanish or Spanish Creole: 9.2% |
| 1 | 8016.03 | within 5 miles | Springfield | minority and income | $51,071 | 59% | 60% | 5% | $39,432 | 46% | 1,405 | 572 | N/A |
| 2 | 8016.03 | within 5 miles | Springfield | minority and income | $54,590 | 64% | 35% | 2% | $39,432 | 46% | 2,291 in 1 | 93 | N/A |
| 1 | 8102 | within 5 miles | Palmer | income | $48,864 | 57% | 6% | 0% | $64,651 | 75% | 936 | 376 | N/A |
| 2 | 8103 | within 5 miles | Palmer | minority | $74,938 | 87% | 27% | 1% | $64,651 | 75% | 1,791 | 687 | N/A |

| Census Block Group # | Census Tract # | Distance from project site | Town | EJ Criteria | Median Household Income (MHHI) | Income Percent of the MA MHHI Median | Total Minority Population | Households with Language Isolation per Block Group | Municipality MHHI | Municipality Percent of MA MHHI | 2019 Block Group Population | 2019 Block Group Households | Languages other than English spoken by 5% or more of the population per census tract who do not speak English very well |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 8104.03 | within 5 miles | Ludlow | income | $41,528 | 48% | 6% | 14% | $73,458 | 86% | 1,105 | 479 | Portuguese or Portuguese Creole: 9.1% |
| 1 | 8104.14 | within 5 miles | Ludlow | minority | $82,798 | 96% | 35% | 0% | $73,458 | 86% | 2,205 | 629 | N/A |
| 2 | 8203 | within 5 miles | Amherst | minority | $80,194 | 93% | 31% | 2% | $56,905 | 66% | 1,529 | 647 | N/A |
| 5 | 8203 | within 5 miles | Amherst | income | $17,593 | 20% | 10% | 5% | $56,905 | 66% | 1,038 | 383 | N/A |
| 4 | 8203 | within 5 miles | Amherst | minority and income | $41,250 | 48% | 79% | 9% | $56,905 | 66% | 1,415 | 529 | N/A |
| 2 | 8204 | within 5 miles | Amherst | minority | $0 | 0% | 36% | 0% | $56,905 | 66% | 6,841 | 4 | N/A |
| 1 | 8204 | within 5 miles | Amherst | minority and income | $25,00 | 3% | 26% | 3% | $56,905 | 66% | 6,357 | 177 | N/A |
| 1 | 8205 | within 5 miles | Amherst | income | $52,885 | 62% | 15% | 0% | $56,905 | 66% | 1,353 | 512 | N/A |
| 4 | 8205 | within 5 miles | Amherst | income | $35,833 | 42% | 13% | 0% | $56,905 | 66% | 858 | 282 | N/A |
| 6 | 8205 | within 5 miles | Amherst | income | $40,956 | 48% | 9% | 0% | $56,905 | 66% | 997 | 385 | N/A |
| 5 | 8205 | within 5 miles | Amherst | minority | $67,237 | 78% | 29% | 2% | $56,905 | 66% | 1,359 | 620 | N/A |
| 1 | 8206 | within 5 miles | Amherst | minority | $0 | 0% | 32% | 0% | $56,905 | 66% | 1,788 | 20 | N/A |
| 3 | 8208.01 | within 5 miles | Amherst | minority and income | $37,440 | 44% | 63% | 4% | $56,905 | 66% | 2,186 | 741 | Chinese: 7.8% |
| 4 | 8208.01 | within 5 miles | Amherst | minority | $113,333 | 132% | 76% | 18% | $56,905 | 66% | 633 | 206 | Chinese: 7.8% |

| Census Block Group # | Census Tract # | Distance from project site | Town | EJ Criteria | Median Household Income (MHHI) | Income Percent of the MA MHHI Median | Total Minority Population | Households with Language Isolation per Block Group | Municipality MHHI | Municipality Percent of MA MHHI | 2019 Block Group Population | 2019 Block Group Households | Languages other than English spoken by 5% or more of the population per census tract who do not speak English very well |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8208.02 | within 5 miles | Amherst | minority | $0 | 0% | 30% | 0% | $56,905 | 66% | 1,153 | 0 | N/A |
| 4 | 8214 | within 5 miles | Hadley | minority | $83,712 | 98% | 29% | 2% | $74,364 | 87% | 1,977 | 827 | N/A |
| 2 | 8106.01 | within 5 miles | Chicopee | minority and income | $43,482 | 51% | 27% | 7% | $53,225 | 62% | 2,194 in 1 | 134 | N/A |

Source: Massachusetts Department of Public Health EJ Tool 2023

#### 4.9.1.1.1 Existing Potential Sources of Pollution

The DPH EJ Tool and MassDEP data were used to identify potential sources of pollution within the boundaries of the four EJ census blocks within the 1-mile DGA of the Project. Based on the mapping, the following potential sources of pollution are not mapped within any of the four EJ populations within the 1-mile DGA: air operating permits, hazardous waste treatment/storage disposal sites, hazardous waste recyclers, large quantity toxic users, or mapped 21E (Tier 1) sites (MassGIS 2024c and 2025b). There is one mapped Activity and Use Limitation (AUL) associated with a sewage pump station on Pelham Road in Amherst (MassGIS 2025c) and three mapped underground storage tanks, one located off West Street and two located off Belchertown Road in Amherst (MassGIS 2016a).

The DPH EJ Tool displays "Vulnerable Health by EJ by Census Tract" data layers based on the 2010 census tracts and have not been updated to the 2020 census tracts, which are used in this DEIR. The DPH EJ Tool shows no vulnerable health conditions for the EJ population mapped in Wendell. The census tract extents for this EJ population in 2010 and 2020 are the same and include all of Wendell. One census tract from 2010, which is part of the larger 2020 census tract for the one EJ population crossed by the Project in Amherst is shown by the DPH EJ Tool as having a health vulnerability for Low Birth Weight. No other part of this 2020 census tract, including the Project area, is depicted with this health condition

#### 4.9.1.1.2 Existing Potential Climate Change Risks

Existing potential climate change risks of the EJ community in Wendell and Amherst were assessed by reviewing the Resilient Massachusetts Action Team (RMAT) Climate Resilience Design Standards Tool Project Report, discussed in more detail below. High risk ratings were identified in the Project area for the following climate risk parameters:

- **Extreme precipitation / riverine flooding** – Neither of the two EJ populations crossed by the Project are located in portions of the 100-year floodplain where the Project is proposed (see Section 4.2.2.4). Therefore, the Project is not expected to make these communities more susceptible to potential climate change risks resulting from extreme precipitation events.

- **Extreme heat** – Existing site conditions that resulted in a high-risk designation for extreme heat included the existing 10-40% canopy cover in the Project area and the location of portions of the project within 100 feet of existing waterbodies.

#### 4.9.1.1.3 Statewide Environmental Comparisons

The Public Environmental Data Partners' "EJ Screen" Environmental Justice Screening and Mapping Tool (Version 2.3) was reviewed to compare percentile ranking by census block group to statewide averages for 12 environmental indicators (Public Environmental Data Partners 2025). Table 4-21 below provides a comparison of the two EJ communities in the Project DGA to state percentiles.

**Table 4-21. Environmental Indicators of EJ Community Census Block Compared to Statewide Averages**

| ENVIRONMENTAL INDICATOR | STATE PERCENTILE | | | |
|---|---|---|---|---|
| | WENDELL BLOCK 3 TRACT 404 GEOID 250110404003 | AMHERST BLOCK 1 TRACT 8207 GEOID 250158207001 | AMHERST BLOCK 2 TRACT 8207 GEOID 250158207002 | AMHERST BLOCK 2 TRACT 8208.01 GEOID 250158208012 |
| Particulate Matter 2.5 | 63 | 85 | 92 | 67 |
| Ozone | 7 | 75 | 86 | 61 |
| Diesel Particulate Matter | 5 | 37 | 41 | 19 |
| Toxic Releases to Air | 24 | 48 | 59 | 32 |
| Traffic Proximity and Volume Count of Vehicles | 3 | 25 | 20 | 15 |
| Lead Paint | 41 | 45 | 18 | 16 |
| Superfund Site Proximity | 0 | 0 | 0 | 0 |
| RMP (Risk Management Plan / Hazardous Waste Cleanup) Facility Proximity | 0 | 55 | 0 | 0 |
| Hazardous Waste Proximity | 5 | 35 | 25 | 12 |
| Underground Storage Tanks | 0 | 53 | 0 | 22 |
| Wastewater Discharge Toxicity | 46 | 50 | 51 | 38 |

Source: Public Environmental Data Partners (2025).

### *4.9.1.1.4 Public Concerns*

As described in Section 5.9.1 below, Eversource has initiated outreach with community-based organizations (CBOs), tribes, and members of the public through pre-filing consultations, MEPA public meetings and site visits, door-to-door and mailing communications, and organized pop-up events. During these consultations, unfair or inequitable environmental burdens were not brought to our attention. The most common question/concern raised during the events in Wendell was whether the landowners could keep any felled trees for firewood, which may indicate that inexpensive sources of heat may be a primary concern to residents in this low-income and rural area. Other concerns raised by Wendell were similar to landowner concerns in other towns, including:

- Width of clearing
- Erosion controls and stumping
- Fate of wood products
- Purpose and need
- Herbicide use
- Restoration efforts beyond individual abutters
- Carbon impacts and mitigation

Attempts to schedule community meetings in Amherst have been unsuccessful to date, as discussed in Section 5.9.1.

#### 4.9.1.1.5 Existing Unfair or Inequitable Environmental Burden Assessment Conclusions

To help address the disproportionate environmental burdens experienced by lower-income people and individuals of color, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) established a statewide Environmental Justice Policy in 2021. This policy was developed based on the principle that all people have the right to be protected from environmental pollution, and to live in and enjoy a clean, healthy environment. The following sections address the step-by-step process outlined in the policy for assessing the existing unfair or inequitable environmental burdens.

##### 4.9.1.1.5.1 Existing Health Burdens

EEA has established considerations for four primary health outcomes regarding environmentally related health indicators to identify populations with evidence of higher-than-average rates of environmentally related health outcomes. Health outcomes identified as vulnerable to environmental exposures include heart attack, childhood blood lead, low birth weight, and childhood asthma. In accordance with the new MEPA Interim Protocol for Analysis of Project Impacts on Environmental Justice Populations (effective January 1, 2022), vulnerable health criteria for EJ communities located within 1 mile of the Project area were identified using the Massachusetts Department of Public Health EJ Tool. Each is listed by town below.

- Northfield: No vulnerable health EJ criteria are met.
- Erving: No vulnerable health EJ criteria are met.
- Wendell:
    - Childhood blood lead criteria are met for year ranges 2015–2019, 2016–2020, 2018–2022, and 2019–2023 (most current data range). Due to the low number of cases the rate is considered unstable and therefore unreliable.
    - Low birth weight criteria are met for year ranges 2007–2011, 2008–2012, 2009–2013, and 2010–2014. Low birth weight was not met for year range 2011–2015 (most current data range). Due to the low number of cases the rate is considered unstable and therefore unreliable.
- Montague:
    - Heart attack criteria are met for year ranges 2013–2017, 2014–2018, 2015–2019, 2016–2020, and 2017–2021 (most current data range).
    - Childhood blood lead criteria are met for year ranges 2015–2019, 2016–2020, 2017–2021, 2018–2022, and 2019–2023 (most current data range).
    - Asthma criteria are met for year range 2017–2021 (most current data range). Due to the low number of cases the rate is considered unstable and therefore unreliable.
- Leverett: No vulnerable health EJ criteria are met.
- Shutesbury: No vulnerable health EJ criteria are met.
- Pelham: No vulnerable health EJ criteria are met.
- Belchertown: No vulnerable health EJ criteria are met.
- Amherst:
    - Childhood blood lead criteria are met for year range 2015–2019, 2016–2020, and 2017–2021. However, criterion have not been met for years 2018–2022 or 2019–2023 (most current data range).
- Granby: No vulnerable health EJ criteria are met.
- Ludlow:
    - Heart attack criteria are met for year ranges 2015–2019, 2016–2020, and 2017–2021 (most current data range).
    - Low birth weight criteria are met for year ranges 2007–2011 and 2008–2012. However, criterion have not been met for years 2009–2013, 2010–2014, or 2011–2015 (most

current data range). Due to the low number of cases the rate is considered unstable and therefore unreliable.

Based on these results, some existing unfair or inequitable health burdens, specifically childhood blood lead levels, may be experienced by the EJ communities in Wendell and Amherst and those that are located within the Project's 1-mile DGA.

#### 4.9.1.1.5.2 Existing Climate Change Burdens

Based on a review of the RMAT Tool, although certain climate change criteria were met, it does not appear that these criteria indicate an unfair or inequitable environmental burden compared to other communities in the Commonwealth. Riverine flooding from extreme precipitation was considered high risk due to the presence of a mapped 100-year floodplain; however, mapped floodplains are common across the Commonwealth. Extreme heat was also considered high risk; however, according to the RMAT Tool this is largely due to the tree removal associated with the project and the life expectancy of the facilities, rather than representative of an existing unfair or inequitable burden. Further, according to MEPA's Interim Protocol for Analysis of Project Impacts on Environmental Justice Populations, the risk rating for the "extreme heat" parameter should not be used as a definitive indicator of elevated climate risks.

# 4.10 Tidelands

No tidelands are located in or near the Project. The Project is located at an inland Massachusetts site, approximately 70 miles from the nearest coastal zone or mapped area of tidelands jurisdiction (MassGIS 2011).

# 5 ASSESSMENT OF IMPACTS

This section provides a description and assessment of the negative and positive potential environmental impacts of the Project, including direct and indirect effects.

## 5.1 Topography, Geology, and Soils

There are no impacts to topography or geologic resources anticipated as a result of the Project. The Project will not require any leveling or grading of any new surfaces nor will it require excavation or fill. All work is confined to vegetation management and minor improvements made to existing access roads. Where trees are removed, stumps are to remain in place to help prevent any potential ground disturbance or erosion.

Soil impacts may result from clearing vegetation and by heavy machinery traveling along the ROW during tree removal activities. Depending on the soil conditions, these impacts can include: (1) loss of newly exposed soil from water and wind erosion; or (2) soil compaction from equipment.

Soil erosion is defined by the NRCS as the breakdown, detachment, transport, and redistribution of soil particles by forces of water, wind, or gravity (NRCS 2022c). Erosion is a natural process which, over time, may remove all or part of soils formed in the natural landscape. The process may be accelerated by human activity, such as tillage, over-grazing, or timber harvesting. Soil susceptibility to erosion is determined by many physical and environmental characteristics, including texture and structure, topography and slope, surface roughness, vegetative cover, and climate. The NRCS rates potential erosion hazards for soils after disturbance activities that expose the soil surface, such as tree removal. These ratings are based on soil erosion factor K and slope. A rating of "severe" erosion potential indicates that erosion is very likely and that erosion control measures, including revegetation of bare areas, are advised. Erosion potential for the soils crossed by the Project is provided in Table 4-1. Approximately 70% of the Project area crosses soil with severe erosion potential. Eversource will implement additional protective measures, in accordance with its BMP Manual, for work to occur in those locations that have been identified as having severe erosion potential at the recommendation and discretion of the environmental compliance monitor.

Soil compaction is the process in which soil particles are pressed together more closely than in the original state. In general, as shown in Table 4-1, the potential for soil compaction in the Project area is low to medium, based on soil compaction susceptibility ratings defined by the NRCS (2022b). Soils are rated based on their susceptibility to compaction from the operation of ground-based equipment when soils are moist. Typically, the soil must be moist to be compacted because the mineral grains must slide together. Compaction reduces the abundance of most large pores in the soil by damaging the structure of the soil. This produces several effects, including limiting the transmission of water and air through soil. Compaction also increases the soil strength, which can limit root penetration and growth. The degree of soil compaction is measured by its bulk density, which is the mass per unit volume, generally expressed in grams per cubic centimeter.

Ratings are based on soil properties in the upper 12 inches of the profile. Factors considered are soil texture, soil organic matter content, soil structure, rock fragment content, and the existing bulk density. Each of these is thought to contribute to resisting the susceptibility of soil to compaction when present. Organic matter in the soil provides resistance to compaction and the resilience to ameliorate the effects with time. Soil structure adds strength as discrete aggregates, and it is the aggregates that are deformed or destroyed by compactive forces; thus, strong soil structure lowers the susceptibility to compaction. Similarly, rock

fragments in the soil can bridge and provide a framework to resist compaction. Finally, if a soil is already fairly dense, causing further compaction is more difficult.

Definitions of the ratings (NRCS 2022b):

- Low - The potential for compaction is insignificant. This soil is able to support standard equipment with minimal compaction. The soil is moisture insensitive, exhibiting only small changes in density with changing moisture content.
- Medium - The potential for compaction is significant. The growth rate of seedlings may be reduced following compaction. After the initial compaction (i.e., the first equipment pass), this soil is able to support standard equipment with only minimal increases in soil density. The soil is intermediate between moisture insensitive and moisture sensitive.
- High - The potential for compaction is significant. The growth rate of seedlings will be reduced following compaction. After initial compaction, this soil is still able to support standard equipment but will continue to compact with each subsequent pass. The soil is moisture sensitive, exhibiting large changes in density with changing moisture content.

Just under half of the Project area has been rated as having medium potential for compaction. The rest of the ROW consists of soils that received a low rating for potential compaction. Regeneration may also be impacted by soil compaction. However, the majority of the soils in the Project area have a high revegetation potential, with the exception of the six hydric soils crossed by the Project. These soils are expected to have high seedling mortality rates, which typically require a greater degree of management for successful revegetation. Where work is to occur, Eversource will apply mitigation measures described in Section 7.1, with special consideration.

Soils have also been classified in accordance with their suitability for agricultural purposes. Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. The introduction of rock into topsoil in agricultural fields may result in a reduction of soil quality, potential difficulty in tilling, and damage to farm equipment. An examination of the soil survey information showed that the depth to a restrictive feature is greater than 6 feet throughout approximately half of the Project area; therefore, the probability of the introduction of rock into the topsoil is low. Where the Project crosses soil map units with shallower soil depth and stony composition, rock may be encountered that could be introduced into topsoil; notably, none of these soils overlap agricultural fields, and none are classified as suitable for farmland.

The Project will not involve earth-moving activities. To minimize potential soil impacts from tree removal, Eversource will construct the Project in accordance with its BMP Manual, which identifies erosion control measures designed to reduce potential short-term and long-term impacts on soil and water resources. A compliance monitor will ensure that contractors implement and maintain erosion and sediment control measures during tree removal and restoration until all disturbed areas are permanently stabilized.

In general, the use of construction matting and existing access roads will minimize soil disturbance, compaction, and erosion. Where necessary, based on site-specific topography and weather conditions, additional measures may be installed at the direction of the environmental monitor, including slope breakers, erosion control fabrics, temporary sediment barriers, and the stabilization of exposed soils through revegetation and mulching. Following restoration and cleanup, Eversource will monitor the disturbed areas to maintain erosion control structures and repair any developing erosion until permanent stabilization is attained.

The following are brief descriptions of some of the methods Eversource will utilize during tree removal to minimize the impact on soils:

- Cut trees at base with no stumping or grubbing;
- Install construction mats in wetlands to minimize soil rutting and compaction of wet soils;
- Install and maintain erosion and sediment control measures, where needed, based on site-specific conditions and weather;
- Reestablish vegetation as soon as possible after ground disturbance and following construction mat removal; and
- Inspect the ROW and maintain erosion and sediment controls as necessary until final stabilization is achieved.

# 5.2 Surface and Groundwater Hydrology and Quality

## 5.2.1 Groundwater Resources

The proposed Project will have no long-term impact on groundwater quality. Short-term impacts will be avoided and/or minimized by the implementation of Eversource's Spill Prevention and Control Plan (SPCP) during tree removal activities. The SPCP includes measures to minimize the potential for a spill of petroleum products or a hazardous or toxic substance and, in the event that a spill does occur, to contain and control the release to minimize the effects.

During tree removal activities, spill containment kits will be kept at each active work site. Personnel will be available to respond quickly in the case of a leak or spill. Equipment will be kept in a condition that decreases the potential for leakage or discharge of pollutants. Fuel, oil, hydraulic fluids, petroleum products and/or other chemicals will be stored in water-tight containers to minimize their exposure to precipitation and stormwater.

If on-site fueling of equipment is necessary, it will be conducted outside of wetland resource areas and the 100-foot buffer zone, within paved areas, to the extent practical. The contractor will be required to maintain spill cleanup materials on-site during construction. Refer to Section 7.2.1 for more details on spill prevention and response practices.

Because excavation will not be necessary for this Project, there is no potential to disturb existing contaminated sites in or around the Project area. Additionally, no sites with an AUL have been identified within a mile of the Project area. Any hazardous waste generated by the Project (e.g., waste oil) will be disposed of in accordance with 310 CMR 30.

## 5.2.2 Surface Water Resources

Construction activities near streams have the potential for temporary impacts to surface water quality. Downstream habitat alteration due to increased suspended solids concentrations and sedimentation may eliminate or degrade fish spawning and nursery areas, resulting in a temporary reduction in reproductive potential. These impacts are typically short-term in nature as the sediments are flushed during subsequent storm events, and aquatic communities re-colonize the affected area. During tree removal activities, Eversource will protect streams crossed by temporary access roads by spanning the streams with temporary construction matting. Although this will avoid direct impacts to the stream bed and bank, short-term indirect impacts may result from the temporary placement of the construction mats, which could result in vegetation disturbance adjacent to the stream bank and temporary shading at the span.

Impacts to state-regulated resource areas provided by these stream channels are quantified in Table 5-1 below. In general, the Project involves expanding the Border Zone by removing non-compatible trees up

to 100 feet away from the outermost wire, while continuing to maintain the Wire Zone through Eversource's approved vegetative management plans. The exceptions are at the ROW crossing of Millers Brook and Amethyst Brook, which are currently non-compliant and maintained with yearly monitoring and topping trees to maintain minimum clearances; in these locations, the Project involves removing non-compatible trees and tall shrubs in the Wire Zone only to minimize alterations to the canopy cover and view scape.

**Table 5-1. Surface Water Resource Impacts**

| WATERBODY ID /NAME | TEMPORARY CONSTRUCTION MATS | | | TREE REMOVAL | | |
|---|---|---|---|---|---|---|
| | LUWW (SF) | BANK (LF) | RFA (SF) | LUWW (SF) | BANK (LF) | RFA (SF) |
| NOS1B / UNT Connecticut River | - | - | - | - | 299 | - |
| NOS2B / UNT Connecticut River | - | - | - | - | 208 | - |
| NOS3B / UNT Connecticut River | - | - | - | - | 109 | - |
| NOS4B / UNT Connecticut River | - | - | - | - | 115 | - |
| NOS5B / UNT Connecticut River | - | - | - | - | 190 | - |
| NOS6B / UNT Connecticut River | - | - | - | - | 92 | - |
| NOS7B / UNT Connecticut River | - | - | - | - | 354 | - |
| NOS8B / UNT Connecticut River | - | - | - | - | 31 | - |
| ERS1B / UNT Connecticut River | - | - | - | - | 250 | - |
| ESTMOS1 / Millers River | - | - | - | - | - | 13,451 |
| WES4B / UNT Millers River | - | - | - | - | 1,169 | - |
| WES5B / UNT Millers River | - | - | - | - | 98 | - |
| WES1B / UNT Lyons Brook | - | - | - | - | 82 | - |
| WES2B and WES3B / Lyons Brook | - | - | 7,880 | - | 398 | 71,462 |
| MOS1B, MOS2B, and MOS3B / UNT Lyons Brook | - | - | 620 | - | 371 | 35,425 |
| MOS4B / UNT Lyons Brook | - | - | - | - | 99 | - |
| MOS5B / UNT Lyons Brook | - | - | - | - | 189 | - |
| MOS6B / UNT Lyons Brook | - | - | - | - | 19 | - |
| MOS7A / UNT Lyons Brook | - | - | - | - | 312 | - |
| MOS8A / UNT Lyons Brook | - | - | - | - | 545 | - |
| MOS9A / UNT Lyons Brook | - | - | - | - | 312 | - |
| MOS10B / Chestnut Hill Brook | - | - | - | - | 258 | 37,597 |
| ESTMOS2 / Williams Brook | - | - | 966 | - | - | 11,505 |
| LES1B / UNT Williams Brook | - | - | - | - | 227 | - |
| LES2B / UNT Sawmill River | - | - | - | - | 388 | -- |
| LES3B / UNT Sawmill River | - | - | - | - | 534 | - |
| LES4A / UNT Sawmill River | - | - | - | - | 62 | - |
| LES4B / UNT Sawmill River | - | - | - | - | 116 | - |
| ESTLES1 / UNT Sawmill River | - | - | - | - | - | - |
| LES5B / Sawmill River | - | - | 17,866 | - | 718 | 129,029 |
| LES6B / UNT Sawmill River | - | - | - | - | 183 | - |
| LES7B / UNT Sawmill River | - | - | - | - | 18 | - |

| WATERBODY ID /NAME | TEMPORARY CONSTRUCTION MATS | | | TREE REMOVAL | | |
|---|---|---|---|---|---|---|
| | LUWW (SF) | BANK (LF) | RFA (SF) | LUWW (SF) | BANK (LF) | RFA (SF) |
| LES8B / UNT Sawmill River | - | - | - | - | 85 | - |
| LES9B / UNT Sawmill River | - | - | - | - | 2,351 | - |
| LES10B / UNT Sawmill River | - | - | - | - | 800 | - |
| LES11B / UNT Sawmill River | - | - | - | - | 63 | - |
| LES12B / UNT Sawmill River | - | - | - | - | 82 | - |
| LES13B / UNT Sawmill River | - | - | - | - | - | - |
| LES14B / UNT Mountain Brook | - | - | - | - | 321 | - |
| LES2D / UNT Roaring Brook | - | - | - | - | 46 | - |
| LES15A / UNT Roaring Brook | 80 | - | - | - | 259 | - |
| LES16A / Roaring Brook | - | - | 285 | - | 142 | 35,925 |
| LES17A / UNT Roaring Brook | - | - | 1,377 | - | 142 | 43,582 |
| LES18B / UNT Roaring Brook | - | - | - | - | 100 | - |
| LES19B / UNT Roaring Brook | - | - | - | - | 110 | - |
| SHS1B / UNT Atkins Reservoir | - | - | - | - | - | - |
| SHS1A / UNT Nurse Brook | - | - | - | - | 108 | - |
| SHS2A / Nurse Brook | - | - | 7,381 | - | 366 | 103,374 |
| SHS3A / UNT Nurse Brook | - | - | - | - | 199 | 44,393 |
| SHS4A / Dean Brook | - | - | 2,769 | - | 293 | 54,555 |
| SHS1C / UNT Dean Brook | - | - | 2,871 | - | 107 | 43,495 |
| SHS2C / UNT Dean Brook | - | - | - | - | - | - |
| PES14C / UNT Dean Brook | - | - | - | - | 117 | - |
| PES15C / UNT Hearthstone Brook | - | - | 1,149 | - | 255 | 39,979 |
| PES16A / UNT Hearthstone Brook | - | - | - | - | 195 | - |
| PES13C / UNT Buffam Brook | - | - | - | - | 545 | - |
| PES13B / UNT Buffam Brook | - | - | - | - | 756 | - |
| PES12A / UNT Buffam Brook | - | - | - | - | 192 | - |
| PES11A / Amethyst Brook | - | - | - | - | 108 | 38,207 |
| PES8C / UNT Amethyst Brook | - | - | - | - | - | - |
| PES7C / UNT Amethyst Brook | - | - | - | - | 78 | - |
| PES6C / UNT Amethyst Brook | - | - | - | - | 68 | - |
| PES5C / UNT Hop Brook | - | - | - | - | - | - |
| PES4C / UNT Hop Brook | - | - | - | - | 217 | - |
| PES3C / UNT Hop Brook | - | - | - | - | 240 | - |
| PES1C and PES2C / UNT Hop Brook | - | - | 7,774 | - | 939 | 78,722 |
| BES2C / UNT Hop Brook | - | - | - | - | 208 | - |
| BES1C / UNT Hop Brook | - | - | 3,630 | - | - | 22,531 |
| BES0C / UNT Hop Brook | - | - | - | - | - | - |
| ESTBES1 / Hop Brook | - | - | - | - | - | 8,412 |
| GRS9C / UNT Forge Pond | - | - | - | - | - | - |

| WATERBODY ID /NAME | TEMPORARY CONSTRUCTION MATS | | | TREE REMOVAL | | |
|---|---|---|---|---|---|---|
| | LUWW (SF) | BANK (LF) | RFA (SF) | LUWW (SF) | BANK (LF) | RFA (SF) |
| ESTGR2 / Bachelor Brook | - | - | 8,159 | - | - | 23,769 |
| ESTGR1 / Weston Brook | - | - | 3,313 | - | - | 14,596 |
| GRS5C / UNT Forge Pond | - | - | 4,020 | - | 100 | 28,203 |
| GRS6C / UNT Forge Pond | - | - | 2,521 | - | 545 | 46,094 |
| GRS7C / UNT Turkey Hill Brook | - | - | - | - | 286 | - |
| GRS4C / UNT Turkey Hill Brook | - | - | - | - | 316 | - |
| GRS1C / UNT Turkey Hill Brook | - | - | - | - | 211 | - |
| LUS3C / Higher Brook | - | - | - | - | - | - |
| LUS2C / Higher Brook | - | - | 2,987 | - | 377 | 53,481 |
| LUS1C / Higher Brook | - | - | - | - | 106 | 53,782 |
| **TOTALS** | **80** | **560** | **75,568 (1.7 ac)** | **0** | **19,179** | **1,031,569 (24.0 ac)** |

Care will be taken to fell trees away from stream channels and to avoid pulling trees across stream beds. Through these measures and by allowing stumps to remain in place, direct ground disturbance of stream Banks and LUWW will be minimized. The stumps and roots that remain will also continue to serve as Bank stabilization following tree removal activities until compatible, low-growing vegetation has a chance to fully establish and stabilize the stream banks.

As mentioned, Eversource proposes to span stream crossings with construction matting to avoid direct impacts to LUWW and Bank. The use of standard construction matting to entirely span LES15A, an intermittent unnamed tributary of Roaring Brook, may be precluded due to steep topography and the stream's width, which exceeds what typical matting can safety span. Eversource therefore anticipates stacking construction mats in the streambed Eversource is continuing to investigate options at this location to avoid the direct placement of matting within 64 square feet of the stream bed (regulated as LUWW).

While construction matting will avoid direct disturbance of the soil/substrate associated with a stream's LUWW and Bank, permanent indirect impacts may result from the removal of trees along 19,179 linear feet of stream Bank. As discussed in Section 5.2.2.2 below, these indirect impacts include a reduction in shading provided by trees. According to the USEPA (2023), removing trees from riparian areas can lead to an increase in water temperatures by allowing solar radiation to reach the stream surface and by decreasing evapotranspiration, which reduces evaporative cooling. However, the impacts from the Project are expected to be minor and largely temporary given the largely forested condition of the associated watersheds. Eversource will allow compatible, small trees and shrubs to revegetate around stream channels, which will provide increased shading over time to the streams. Further, this work is anticipated along relatively short stretches of stream channels within a region that is generally heavily forested. Therefore, these impacts are not expected to be significant.

### *5.2.2.1 OUTSTANDING RESOURCE WATERS*

As described in Section 4.2.2.2, ORWs within the WT-11 ROW include Nurse Brook, Dean Brook, Amethyst Brook, and Higher Brook, and their tributaries. The placement of construction mats will temporarily impact approximately 75,087 square feet (1.7 acres) of ORWs, and approximately 191,205 square feet (4.4 acres) of ORWs will be permanently converted from forested to scrub-shrub habitat types. This work is not anticipated to have a long-term impact on the ability of these ORWs to contribute to or protect the quality of the public water supply. As compatible scrub-shrub vegetation re-establishes, it will

provide sediment/toxicant/pathogen retention functions, reducing or preventing degradation of water quality. In addition, it will provide nutrient removal/retention/transformation functions, preventing adverse effects of excess nutrients from entering aquifers or surface water public water supplies.

ORWs also include certified vernal pools, which are discussed in Section 5.2.2.4 below.

### 5.2.2.2 FISHERIES

Since each stream crossed is designated as a CFR or tributary thereto, removal of any mature streamside trees or vegetation may result in reduced shaded regions and, therefore, could result in elevated water temperature within these shorter segments of the stream channel. An elevated water temperature may lead to a reduction in levels of dissolved oxygen and could influence fish survival and fitness.

Within the Connecticut River Watershed, the streams' passage through tree removal areas represents only 0.08% of the length of CFR streams located in this watershed based on MassGIS (2022). Within the Millers River Watershed, the streams' passage through tree removal areas represents only 0.04% of the length of CFR streams located in this watershed. There are no CFR streams crossed by the Project within the Chicopee River Watershed. As a result, significant adverse impacts on fisheries from tree removal are not anticipated. Further, Eversource will limit vegetation maintenance in these areas to the extent practical, and the existing seed and root stock will promote revegetation by compatible shrubby and herbaceous species along stream banks that will provide the needed shading and cover habitat to sufficiently maintain CFR habitat characteristics.

### 5.2.2.3 FLOODPLAINS

A total of 1.4 acres of the 100-year floodplain will be temporarily impacted by the placement of construction mats, and 6.3 acres will be permanently altered by the conversion of forested floodplain to scrub-shrub habitat types. However, no temporary or permanent topographic changes and no new impervious areas will be created as a result of the Project, so direct impacts to the flood storage capacity will not occur.

Vegetation reduces flood water velocity and erosive power and reduces peak storm flows by slowing surface runoff. These benefits can be obtained from all vegetation; trees, shrubs, and herbaceous plants all aid in flood control by physically impeding the flow of floodwaters, although wooded swamps are more effective than open water or emergent vegetation (Golet et al. 1993). Roughness or resistance coefficients represent the resistance to flood flows in channels and floodplains. Manning's roughness coefficient ($n$) is typically used in floodplain studies and is dependent in part on vegetation cover type and density. The Manning's coefficient is typically around 0.1 for forested land and could range from less than 0.1 to 0.2 for scrub/shrub land, depending on the density of the shrubs (Arcement and Schneider 1989). Trees have also been shown to provide more runoff protection than shrubs due to increased interception, transpiration, and soil infiltration (Rahman et al. 2023).

Large-scale forest clearing efforts could have an indirect impact on flood water flow velocity and flood storage capacity. However, the Project's 6.4 acres of forest conversion to scrub-shrub within the 100-year floodplain represent only 0.4% of the total floodplain acreage (1,474 acres) provided by those portions of the affected floodplain systems within Massachusetts, and therefore potential impacts to flood storage capacity and flow velocities are expected to be negligible.

### 5.2.2.4 VERNAL POOLS

Eversource has carefully sited construction mats to avoid all impacts to CVPs and confirmed vernal pools. However, clearing of incompatible trees within vernal pools cannot be completely avoided. In total,

approximately 3,960 square feet (0.09 acre) of vernal pools will be permanently converted from forested to scrub-shrub communities.

Tree removal is not expected to result in the loss of vernal pool habitat; however, tree removal in vernal pools and adjacent buffers may reduce shading and cover for vernal pool species. Mitigation measures proposed for work in vernal pools and their buffers are discussed in Section 7.2.

### 5.2.3 Wetland Resources

Temporary impacts to wetlands due to construction matting and accessing work areas may include soil disturbance, alteration of hydrology, and loss of vegetation. Permanent impacts caused by the conversion of some PFO wetlands to PSS wetlands due to tree removal are also anticipated. Temporary and permanent impacts to wetlands expected to occur as a result of the Project are summarized in Table 5-2 below and are depicted in the WT-11 TRRP MEPA DEIR Map Set in Attachment 2.

**Table 5-2. Wetland Resource Impacts**

| WETLAND ID | WETLAND TYPE (IVW OR BVW) | IMPACT TYPE | |
|---|---|---|---|
| | | TEMPORARY CONSTRUCTION MATS (SF) | PERMANENT PFO TO PSS CONVERSION (SF) |
| NOW1B | BVW | - | - |
| NOW2B | BVW | - | - |
| NOW3B | IVW | - | - |
| NOW4B | BVW | - | 217 |
| NOW5B | BVW | - | 438 |
| ERW4B | BVW | - | 529 |
| ERW5B | BVW | - | 833 |
| ERW6B | BVW | - | 12 |
| ERW7B | BVW | - | - |
| ERW6C | IVW | - | - |
| ERW6D | IVW | - | - |
| ERW8B | IVW | - | - |
| ERW9B | BVW | 4,366 | 6,855 |
| WEW5B | BVW | 2,721 | 6,520 |
| WEW1B | BVW | 5,120 | 9,828 |
| WEW3B | BVW | - | - |
| WEW2B | IVW | - | - |
| WEW4B | BVW | 10,812 | 19,518 |
| WEW4C | BVW | - | - |
| WEW4D | BVW | - | 347 |
| WEW4E | BVW | - | - |
| MOW1B | BVW | 345 | 215 |
| MOW2B | BVW | 392 | - |
| MOW5B | BVW | - | 99 |
| MOW4A | BVW | 1,064 | 219 |

| WETLAND ID | WETLAND TYPE (IVW OR BVW) | IMPACT TYPE | |
|---|---|---|---|
| | | TEMPORARY CONSTRUCTION MATS (SF) | PERMANENT PFO TO PSS CONVERSION (SF) |
| MOW5A | BVW | 2,796 | 9,060 |
| MOW6A | BVW | 515 | 7,681 |
| MOW7A | BVW | - | 1,381 |
| MOW8A | BVW | 1,643 | 4,426 |
| MOW9A | BVW | - | 1,412 |
| MOW3B | BVW | 2,179 | 5,449 |
| MOW4B | IVW | 811 | - |
| MOW6B | BVW | 6,271 | 3,034 |
| MOW7B | BVW | 1,088 | 1,711 |
| LEW1B | IVW | - | - |
| LEW2B | IVW | - | 1,121 |
| LEW3B | BVW | - | - |
| LEW4B | BVW | 240 | 3,062 |
| LEW5B | BVW | - | 3,054 |
| LEW6B | BVW | 634 | 3,786 |
| LEW7B | IVW | - | 105 |
| LEW8B | BVW | 5,167 | 14,415 |
| LEW9B | BVW | 17,310 | 43,696 |
| LEW10B | IVW | - | - |
| LEW11B | BVW | 2,611 | 3,264 |
| LEW12B | BVW | - | - |
| LEW13B | BVW | 1,668 | 3,433 |
| LEW14B | BVW | 194 | - |
| LEW15B | BVW | 8,677 | 20,415 |
| LEW16B | BVW | - | - |
| LEW17B | BVW | - | 2,842 |
| LEW18B | BVW | - | - |
| LEW19B | BVW | 13,600 | 35,363 |
| LEW20B | BVW | 1,010 | - |
| LEW21B | BVW | 6,805 | 13,201 |
| LEW22B | BVW | 601 | 1,955 |
| LEW23B | IVW | - | 552 |
| LEW24B | IVW | - | - |
| LEW25B | BVW | 17,600 | 37,638 |
| LEW1D | BVW | - | 1,147 |
| LEW2D | BVW | 6,157 | 18,704 |
| LEW26A | IVW | - | - |
| LEW27A | BVW | 134 | 487 |

| WETLAND ID | WETLAND TYPE (IVW OR BVW) | IMPACT TYPE | |
|---|---|---|---|
| | | TEMPORARY CONSTRUCTION MATS (SF) | PERMANENT PFO TO PSS CONVERSION (SF) |
| LEW28A | BVW | 1,164 | 774 |
| LEW29B | BVW | 7,637 | 21,593 |
| LEW30B | BVW | - | - |
| LEW31B | IVW | - | 2,017 |
| SHW1B | BVW | - | 1,309 |
| SHW2B | IVW | - | - |
| SHW3B | IVW | - | 495 |
| SHW4B | BVW | - | 956 |
| SHW11A | BVW | 2,490 | 6,476 |
| SHW5A | BVW | 6,470 | 12,869 |
| SHW6A | BVW | - | 810 |
| SHW7A | IVW | 2,162 | 4,894 |
| SHW8A | IVW | - | - |
| SHW9A | BVW | 8,703 | 21,144 |
| SHW10A | BVW | 1,865 | 5,715 |
| SHW1C | BVW | 11,702 | 34,998 |
| PEW18A | BVW | - | 524 |
| PEW19C | BVW | - | 1,375 |
| PEW20C | BVW | 6,636 | 21,821 |
| PEW20A | BVW | 4,932 | 14,434 |
| PEW22A | BVW | 20,223 | 45,468 |
| PEW18C | IVW | - | - |
| PEW21A | IVW | 3,271 | 8,744 |
| PEW17C | BVW | 4,431 | 11,035 |
| PEW16C | BVW | 255 | 6,563 |
| PEW15C | BVW | - | 1,039 |
| PEW14A | BVW | 4,741 | 12,338 |
| PEW13A | BVW | - | - |
| PEW13AA | BVW | - | - |
| PEW12C | IVW | - | - |
| PEW11C | BVW | - | - |
| PEW10C | IVW | - | 605 |
| PEW9C | IVW | - | - |
| PEW8C | IVW | - | - |
| PEW7C | IVW | - | - |
| PEW6C | IVW | - | 82 |
| PEW5C | BVW | - | 1,731 |
| PEW4C | IVW | - | - |

| WETLAND ID | WETLAND TYPE (IVW OR BVW) | IMPACT TYPE | |
|---|---|---|---|
| | | TEMPORARY CONSTRUCTION MATS (SF) | PERMANENT PFO TO PSS CONVERSION (SF) |
| PEW3C | IVW | - | - |
| PEW2C | BVW | 12,212 | 30,105 |
| PEW1C | IVW | - | 93 |
| BEW19C | BVW | - | 1,433 |
| BEW18C | BVW | 2,098 | 5,041 |
| BEW17C | BVW | - | 1,315 |
| BEW16C | BVW | - | 123 |
| BEW15C | BVW | 13,596 | 17,341 |
| BEW15A | BVW | - | - |
| BEW14C | BVW | 2,189 | 7,892 |
| BEW13C | BVW | - | 2,899 |
| BEW12C | BVW | 2,582 | 6,306 |
| BEW11C | BVW | 5,009 | 12,662 |
| BEW10C | BVW | 13,674 | 33,301 |
| BEW9C | BVW | 6,267 | 16,226 |
| BEW8C | BVW | - | 736 |
| BEW7C | IVW | - | 1,663 |
| BEW6C | BVW | 13,265 | 31,673 |
| BEW5C | BVW | 3,719 | 1,074 |
| BEW4C | BVW | 10,774 | 29,597 |
| BEW3C | BVW | - | 390 |
| BEW2C | BVW | - | - |
| BEW1C | BVW | 774 | 1,788 |
| GRW19C | BVW | 31,286 | 55,205 |
| GRW18C | IVW | - | - |
| GRW17C | BVW | 1,021 | 2,396 |
| GRW24C | BVW | - | - |
| GRW23C | IVW | - | - |
| GRW22C | IVW | - | - |
| GRW19AC | BVW | - | - |
| GRW16C | BVW | 16,795 | 62,753 |
| GRW15C | BVW | - | 4,101 |
| GRW14C | BVW | - | 1,750 |
| GRW13AC | BVW | 22,711 | 30,068 |
| GRW20B | IVW | - | - |
| GRW13C | BVW | 4,573 | 4,819 |
| GRW9C | IVW | - | - |
| GRW10C | BVW | 13,304 | 21,025 |

| WETLAND ID | WETLAND TYPE (IVW OR BVW) | IMPACT TYPE | |
|---|---|---|---|
| | | TEMPORARY CONSTRUCTION MATS (SF) | PERMANENT PFO TO PSS CONVERSION (SF) |
| GRW10A | BVW | 2,496 | 3,837 |
| GRW11C | BVW | - | 2,436 |
| GRW12C | BVW | 879 | 2,729 |
| GRW8C | BVW | 1,765 | 1,885 |
| GRW7C | BVW | 1,120 | 8,012 |
| GRW6C | BVW | 2,373 | 3,828 |
| GRW5C | BVW | 1,561 | 2,806 |
| GRW4C | BVW | - | 1,762 |
| GRW3C | BVW | - | 138 |
| GRW2C | IVW | - | 3,073 |
| GRW1C | BVW | 18,072 | 41,889 |
| LUW9C | BVW | 3,251 | 5,215 |
| LUW8C | BVW | - | 3,417 |
| LUW7C | BVW | 2,832 | 8,788 |
| LUW6C | IVW | - | 3,169 |
| LUW5C | BVW | 2,131 | 3,981 |
| LUW4C | BVW | 11,330 | 25,750 |
| LUW3C | BVW | 4,081 | 9,206 |
| LUW2C | IVW | 2,812 | 8,733 |
| LUW1C | BVW | - | - |
| **TOTALS**** | | **439,765 SF (10.1 ac)** | **1,052,262 SF (24.2 ac)** |

*SF = square feet

** Totals may not equal sum of addends due to rounding.

As identified in Table 5-2, the Project will result in temporary impacts to approximately 9.9 acres of BVW and 0.2 acre of IVW as a result of construction matting for access. Additionally, tree removal is proposed in approximately 23.0 acres of BVW and 0.8 acre of IVW, permanently converting PFO wetlands to PSS wetlands.

The permanent removal of the forest canopy in PFO habitat creating PSS habitat will alter the nature of the functions and values provided by these wetlands. A summary of the anticipated changes to the 13 functions and values identified in the USACE's Highway Methodology are provided in Table 5-3 below.

**Table 5-3. Matrix Identifying Impacts to Wetland Functions and Values from PFO to PSS Conversion**

| FUNCTION/VALUE | PROJECT EFFECT | COMMENTS |
|---|---|---|
| Groundwater Recharge / Discharge | Temporary | With tree removal, the potential for surface runoff and soil evaporation are relatively high compared to forested conditions, leading to lower groundwater recharge despite low transpiration. Small isolated/headwater wetlands are perhaps most at risk from hydrologic changes because their hydrologic inputs are usually the least. Impacts on groundwater recharge should lessen over time as vegetative cover in affected wetland areas naturally re-establishes. |
| Floodflow Alteration | Negligible | Conversion of PFO to PSS may have a negative impact on floodflows due to decreased interception, transpiration, and soil infiltration from tree removal. However, this impact will be negligible compared to the overall flood storage capacity of associated floodplain systems. |
| Fish and Shellfish Habitat | Negligible | Removal of mature trees or vegetation within the catchment area of a stream may result in reduced shaded regions and elevated water temperatures within these stream channels. Elevated water temperature may lead to a reduction in dissolved oxygen levels, thereby affecting fish survival and fitness. However, this impact is expected to be negligible in consideration of the overall length of these streams through this heavily forested region. Additional information of fisheries impacts is provided in Section 5.2.2.2. |
| Sediment / Toxicant / Pathogen Retention | Temporary | The removal of trees and other vegetation, at least in the short-term, can lower the capacity of wetlands to trap sediment, detoxify pesticides, and provide other water quality functions. These conditions are largely a function of altered water tables, hydrology, and water temperatures. Impacts on water quality functions should lessen over time as vegetative cover naturally re-establishes. |
| Nutrient Removal / Retention / Transformation | Temporary | Higher water tables from tree removal can lower infiltration rates and increase surface runoff, which can lead to the loss of nutrients at or near the soil surface as well as restrict nitrogen and phosphorous uptake by roots. The increase in soil temperature from canopy removal in wetlands can elevate the activity of soil microbes, leading to increases in the production of ammonium and nitrate. Phosphorus has a much lower mobility in most soils and is less susceptible to leaching than nitrogen. Impacts on nutrient removal/retention should lessen over time as vegetative cover naturally re-establishes. |
| Production Export | Negligible | Both PFO and PSS wetland systems contain valuable food bearing vegetation. Leaf litter inputs are also an important nutrient resource in PFO wetlands and play an important role in the nutrient cycle of the wetland ecosystem. Leaf litter is the most important food resource for many wetland organisms including aquatic invertebrates. Thus, the reduction in leaf litter through the conversion of PFO to PSS may change the level of available nutrients. |
| Sediment / Shoreline Stabilization | Negligible | The conversion of PFO to PSS may negligibly reduce sediment and bank stabilization. A forest canopy can intercept up to 80% of rainfall, reducing the amount of water that reaches the forest floor. Tree leaves and other forest debris create a ground cover that protects soil from the impact of rainfall. This ground cover helps absorb rainwater, which then seeps slowly into the soil, rather than running off and causing erosion. PSS habitats provide the same benefits but to a lesser degree. |
| Wildlife Habitat | Net positive effect | Forested wetlands provide diversity in vegetative structure height that allow for vertical opportunities for foraging, nesting and escaping from predators. However, scrub-shrub and emergent wetland communities within ROWs provide migratory corridors for wildlife, including large mammals and bats. Berry-producing wetland shrubs provide forage for a variety of birds and mammals, and flowering shrubs and herbaceous vegetation provide needed pollinator habitat. Finally, the use of Integrated Vegetation Management creates Wire and Border Zones that allow for diverse structure in habitat types. |

| FUNCTION/VALUE | PROJECT EFFECT | COMMENTS |
|---|---|---|
| Recreation | No impact | Existing recreational opportunities will continue unaffected once the proposed vegetation management activities are completed. |
| Education / Scientific Value | No impact | The Project does not cross any wetlands or associated waterbodies known to serve as an "outdoor classroom" or as a location for scientific study or research. |
| Uniqueness / Heritage | No impact | The Project does not cross any wetlands or associated waterbodies considered to possess unique or special values. |
| Visual Aesthetics | Negligible | The widening of an existing maintained powerline corridor into wetland resources should only have a negligible effect on visual aesthetic. |
| Threatened or Endangered Species Habitat | No impact | With the implementation of measures recommended by NHESP, no adverse impact on state-listed rare species is anticipated. |

### 5.2.4 Buffer Zone

In total, the Project will result in temporary impacts to approximately 1.1 acres of the 100-foot buffer zone of Bank and BVW as a result of construction matting for access. Additionally, tree removal will result in the permanent conversion of approximately 80.9 acres of forested land to scrub-shrub land in the 100-foot buffer zone.

Wetland buffer zones reduce adverse impacts from development on a wetland's functions and values. The most effective buffers are typically undisturbed lands that are not a source of water quality impairment. Vegetation, together with organic debris, play an important role in the effectiveness of buffer zones to protect water quality as roots help maintain the capacity of soils to infiltrate water, plants transpire sufficient soil moisture to keep soils unsaturated and receptive of runoff, and carbon added by plants supports microbial communities essential for removing some pollutants. In addition, forested wetland buffers provide cover, thereby helping to maintain lower temperatures in summer and lessen temperature decreases in winter. Other characteristics that affect a buffer's effectiveness include width, ground surface roughness, flow pattern (concentrated vs. diffuse), slope, soil texture and organic content, and aspect.

The installation of timber mats and tree removal in the buffer zone can lead to water quality impacts on wetlands without the proper mitigative measures and controls. Such impacts can include, but are not limited to, more sediment runoff and nutrient loading in wetlands collectively caused by increased runoff velocities, reduced groundwater infiltration, less trapping of sediments and other insoluble pollutants, and changing ground surface and water temperatures. The severity of the impact of vegetation removal in the buffer zone on water temperatures and other characteristics depends partly on the amount, type, and configuration of tree, shrub, and ground cover that remains in the powerline corridor immediately after the vegetative management activities. These impacts can persist to some degree from the proposed actions until comparative vegetative conditions return.

Eversource will allow compatible vegetation to reestablish in the Buffer Zone, which is expected to reduce the impacts of tree removal activities. Section 7.2 discusses mitigation measures, including the use of BMPs to minimize impacts and a compensatory wetland mitigation plan to offset adverse impacts to wetlands from buffer zone tree removal.

# 5.3 Air and Noise Quality

## 5.3.1 Air

The Project will result in short-term (lasting only for the duration of the tree removal period), highly localized effects on air quality during tree removal activities, primarily from fugitive dust and from combustion emissions associated with the operation of the equipment. No federal or state air permits will be required for these temporary air emissions, and no operational source of air emissions will result from the Project.

Compliance with MEPA's Greenhouse Gas Policy, including an assessment of carbon sequestration impacts resulting from the Project, is provided in Section 6.1.2.

## 5.3.2 Noise

Noise impacts associated with the Project will be temporary and will result primarily from vegetation cutting equipment and vehicles. Noise levels will vary throughout tree removal activities depending on the phase of the work, number and locations of operating equipment, distance of the noise receptor from the noise source, atmospheric conditions, and any intervening topography or barriers (i.e., walls, buildings, and vegetation).

# 5.4 Plant and Animal Species and Habitat

## 5.4.1 Typical Vegetation and Wildlife Habitat Communities

Temporary impacts due to construction matting will occur on 11.2 acres of land within the Project area. Additionally, temporary impacts to compatible vegetation may unavoidably occur during tree removal activities, as further discussed in Section 2.2.2, due to equipment operation and site constraints. All disturbed areas that were vegetated with scrub-shrub or emergent species will be restored after the proposed work has been completed. Impacts to these vegetation communities will be short-term and are expected to regenerate after one to two growing seasons.

Temporary habitat loss will result from general disturbance from construction activities during vegetation clearing activities. Wildlife will vacate active work areas and expend energy finding an alternate habitat. However, disruption due to the Project will be temporary in nature, and wildlife will be able to utilize the area once vegetation management work is completed in that portion of the ROW.

BMPs to be used during tree removal activities to minimize impacts to vegetation and wildlife are discussed in Section 7.4.1. Following work activities, forested areas will be allowed to revegetate with low-growing plant communities. Long-term impacts to wildlife habitat will be limited to tree removal along the unmaintained edges of the transmission line corridor. However, areas cleared to expand the width of the ROW will quickly regenerate and provide additional open land habitat. These areas will continue to be maintained to ensure a permanent conversion of forested habitat to early successional (low-growing) ecological communities that do not interfere with the electric system. These habitat communities are becoming increasingly rare and provide important functions for pollinator and grassland species.

Eversource's TRRP is designed to promote low-growing plant communities that support nature's ability to regulate itself by inhibiting the germination and growth of tree seedlings through competition (for light, moisture, nutrients) and depredation of wildlife (browsing/feeding). This program allows for the safe

delivery of reliable electric service while supporting a healthier, more diverse habitat for wildlife that depends upon early successional landscapes.

To promote the transition to appropriate low-growing vegetation and encourage the growth of native species, Eversource will implement their VMP on the newly cleared areas as part of their routine maintenance of the ROW in the future. The VMP incorporates an Integrated Vegetation Management (IVM) approach that promotes desirable, stable, low-growing plant communities. Regeneration of low-growing native plants is a vital part of Eversource's IVM program because native plants have a much better chance for survival, especially during adverse growing conditions, whereas planted vegetation is more likely to fail due to site-species incompatibility. Further, establishing these early successional ecological communities lowers future dependence on chemical and mechanical controls.

Permanent impacts are limited to the clearing of forested areas primarily located outside of the currently maintained width of the ROW. Total tree removal impacts within resource and upland areas will result in 278.1acres of forested tree conversion to scrub-shrub community types. A study by Wagner et al. (2014) found that plant species richness was significantly higher (nearly double) under transmission lines compared to woodlands. They further note that many common plant species found along transmission line corridors form the basis of food webs that include animals of conservation interest; in particular, the prevalence of goldenrods plays a central role in supplying late-season nectar and pollen for pollinator species.

## 5.4.2 State-Listed Rare Species Habitat

Tree removal in designated Priority Habitats for Rare Species will result in the permanent conversion of 86.1 acres of forested land to scrub-shrub habitat. Utilization of construction matting for access to work areas will result in 4.0 acres of temporary impacts to Priority Habitats.

SWCA completed surveys to document the climbing fern within a section of the WT-11 ROW where it passes through Priority Habitat for this species (PH 2084) in Belchertown, Massachusetts. SWCA conducted one round of surveys on February 17, 2022, and April 13, 2022, following an approved survey protocol and scientific collection permit with NHESP. SWCA then conducted a second round of surveys on April 15, 2024 and April 25, 2024. During both survey dates, SWCA identified the plant in the survey area, but no populations or individual occurrences of the climbing fern were identified where tree removal is proposed. Therefore, direct impacts to this species will be avoided. All observation data collected for the climbing fern and turtles, which were also observed at the time of these surveys, were submitted to NHESP via the Heritage Hub reporting system.

NHESP provided a response to the Project Review Checklist, which SWCA submitted to NHESP on December 15, 2022. First, NHESP concluded that the proposed Project is located within the actual habitat of eastern box turtle, wood turtle, marbled salamander, and the climbing fern. These species and their habitats are protected in accordance with the MESA. Second, NHESP determined that the Project will result in a prohibited Take of eastern box turtle, thereby requiring the filing of a Conservation and Management Permit (CMP). To avoid a Take of the other state-listed species, NHESP requested that Eversource develop a Rare Plant Protection Plan for the state-listed plants identified in and near proposed work areas during construction and that such a plan be implemented by a qualified botanist. It also required TOY work restrictions and habitat enhancement activities when working in priority habitats for the marbled salamander as well as TOY work restrictions when working in priority habitats of the wood turtle. Mitigation measures that Eversource will implement to avoid and minimize impacts on state-listed species are described in Section 7.4.2.

### 5.4.3 Federally Listed Species

To confirm the potential presence of northeastern bulrush, SWCA conducted a botanical survey for northeastern bulrush within the Project corridor through the towns of Wendell and Montague on October 11, 17, and 18, 2023. Because it is an obligate wetland species, survey efforts for the northeastern bulrush focused on wetland habitats, which had been previously delineated by SWCA. Northeastern bulrush was observed in two wetlands along the ROW access road. All observation data collected for the northeastern bulrush were submitted to NHESP via the Heritage Hub reporting system and to the USFWS.

SWCA conducted acoustic bat surveys in July and August 2023 along the entire length of the WT-11 ROW; the results of the surveys will be provided to the USACE and USFWS as part of the PCN submittal under the Clean Water Act.

## 5.5 Transportation Resources

No construction activities are expected to impact roadways; however, some tree work will be necessary adjacent to public roads. Eversource will incorporate measures to ensure that construction activities will not prevent the passage of fire and emergency vehicles, including the creation of temporary travel lanes during construction, if needed. Where necessary, Eversource's contractor will employ a police detail to ensure traffic flow and safety of pedestrians and vehicles during any temporary interference with roadways. Any required road access permits, either from the applicable town or MassDOT, would be obtained prior to the proposed work.

Impacts to transportation may result from minor increases in roadway use by vehicles. Eversource estimates that a total of 1,200 truck trips to/from the site will be required for this Project, with an average daily trip (adt) of eight diesel vehicles estimated, which is well below the 150 adt MEPA threshold. Any temporary increase in traffic generation will not meet or exceed review thresholds as stated in 301 CMR 11.03(6).

In general, the diesel-powered low boy trucks will deliver excavators, skid steers, feller bunchers, and forwarders to each work location from other work locations on the WT-11 ROW and/or the contractor's marshalling yard. Once mobilized, most of the diesel-related heavy-duty vehicle trips throughout the workday would be hauling timber mats to or from other parts of the WT-11 ROW and hauling cut timber to off-site disposal locations. Work crews may also drive diesel-powered work trucks to and from their work locations.

Truck routing will be dependent on the locations of daily work areas and disposal sites. Truck routes will follow roadways appropriate for the equipment being transported and in a manner that minimizes travel times and distances to the extent possible. Under no circumstances will the presence or absence of EJ communities be used as a factor when selecting truck routes.

## 5.6 Scenic Qualities, Open Space, and Recreational Resources

Conservation/recreational areas include outdoor recreational facilities owned by federal, state, county, municipal, and non-profit enterprises as well as ACECs. Conservation land refers to habitat protection areas with minimal recreation, such as walking trails. Recreation land consists of outdoor facilities such as town parks, commons, playing fields, school fields, golf courses, bike paths, scout camps, and fish and game clubs. As listed in Table 4-10 above, the Project crosses open space and recreational lands, including the Poplar Mountain Conservation Area, Montague State Forest, and the Smith Conservation Restriction (CR). All work on these open space lands will be within Eversource's existing utility easement.

Eversource will work to minimize impacts from the Project on the continued recreational use of these areas during tree removal activities. Equipment will access the ROW from public roads to the extent practicable. Where tree work is required across trail routes or off-ROW access roads are proposed to be used, Eversource will implement safety precautions and divert pedestrian traffic during active tree removal. Indirect impacts, such as noise from tree removal equipment and visual impacts on any passersby from contractor personnel and activities, would occur on a temporary basis.

Tree removal activities will permanently expand the maintained ROW corridor from 150–350 feet wide to up to 250-500 feet wide through these lands, resulting in the permanent conversion of forested land to scrub-shrub vegetation cover types. Although there will be some visual impact from the ROW expansion, it is within an existing utility easement. Measures to reduce impacts to these areas will be implemented as described in previous sections regarding soil, water resources, vegetation, and wildlife. Construction matting will result in temporary impacts in conservation/recreation areas, but these areas will quickly revegetate once work is complete. The compliance monitor will track progress on the revegetation of these areas until compliance with permit conditions is achieved.

All-terrain vehicle (ATV) use is recognized as an ongoing issue on utility ROWs. Signage and gates are typically used at public roadway crossings of the ROW, but enforcement can be challenging, particularly when ATVs are accessing from adjacent properties and open space lands. Eversource will continue to work with adjacent landowners and open space managers to determine the best means of preventing ATV access to the ROW.

Additional impacts to open space and recreational lands are summarized in Table 5-4 and discussed below.

**Table 5-4. Open Space/Recreational Land Impacts**

| OPEN SPACE / RECREATIONAL LAND | IMPACT TYPE | | | | | |
|---|---|---|---|---|---|---|
| | TOTAL TREE REMOVAL (AC) | WETLAND TREE REMOVAL (AC) | RIVERFRONT AREA TREE REMOVAL (AC) | STREAM BANK TREE REMOVAL (LF) | LENGTH OF TRAIL TREE REMOVAL (LF) | VERNAL POOL TREE REMOVAL (AC) |
| Amherst Water Supply Land | 2.5 | 0.5 | 0.4 | 293 | - | - |
| Amherst Watershed | 3.5 | 0.6 | 1.3 | - | - | - |
| Bachelor Brook WMA | 3.4 | 0.1 | - | - | - | - |
| Butternut Hill Wildlife Sanctuary | 4.6 | 0.3 | 0.1 | - | 22 | - |
| Chicopee Sportsmen's Club | 6.4 | 1.5 | - | - | - | - |
| Emily Partyka Conservation Area | 0.5 | 0.2 | 0.2 | - | - | - |
| Facing Rock WMA | 19.8 | 1.5 | 1.9 | 435 | - | 0.1 |
| Fairview Fish & Game Club | 4.4 | 0.3 | - | 211 | - | - |
| Granby Bow & Gun Club | 4.7 | 0.2 | - | 286 | - | - |
| Harkness Conservation Area | 1.3 | - | - | 146 | - | - |
| Hunting CR | - | - | - | - | - | - |
| Keller CR | 0.8 | 0.4 | 0.5 | 335 | - | - |
| Land Edward C Jr APR | 0.6 | 0.2 | - | - | - | - |
| Ludlow Reservoir WCE | 0.1 | - | >0.1 | - | - | - |
| Montague State Forest | 11.2 | 0.1 | 1.4 | 515 | 203 | - |

| OPEN SPACE / RECREATIONAL LAND | IMPACT TYPE | | | | | |
|---|---|---|---|---|---|---|
| | TOTAL TREE REMOVAL (AC) | WETLAND TREE REMOVAL (AC) | RIVERFRONT AREA TREE REMOVAL (AC) | STREAM BANK TREE REMOVAL (LF) | LENGTH OF TRAIL TREE REMOVAL (LF) | VERNAL POOL TREE REMOVAL (AC) |
| Montague Water Supply Land | 4.3 | 0.3 | - | 340 | - | - |
| Montague WMA | 0.6 | >0.1 | - | - | - | - |
| Mount Holyoke Range State Park | 9.8 | 0.3 | - | - | 365 | - |
| Paul C. Jones Working Forest WCE | 27.1 | 3.7 | 2.8 | 4,621 | - | >0.1 |
| Poplar Mountain Conservation Area | 3.9 | 0.2 | - | - | 127 | - |
| Roaring Brook Conservation Area | 2.6 | >0.1 | 1.4 | 185 | - | - |

# 5.7 Historical and Archaeological Resources

Following PAL's submittal of the Project ROW PNF and Due Diligence Report to MHC on May 29, 2022, MHC responded on July 7, 2022 requesting that PAL develop an avoidance and protection plan (ASAAP) for an historic period site identified in Leverett and a potential ancient period site identified in Montague. PAL developed ASAAPs for these areas, which are further discussed in Section 7.7 of this DEIR.

In addition to the ASAAP for the sites noted above, to avoid impacting any other archaeological sites and Tribal areas of significance, Eversource will avoid physical impacts and ground disturbance to aboveground cultural resources and areas assessed as archaeologically sensitive. Where off-ROW access roads cross areas that may be identified by PAL as having potential high archaeological significance, Eversource will mat the access roads and/or ensure that no grading of existing soils within these areas will be conducted. With this avoidance and the implementation of the cultural resources BMPs discussed in Section 7.7 of this DEIR, the Project is not expected to affect any historic or archaeological resources.

# 5.8 Built Environment

The footprint of the proposed corridor widening will be entirely within Eversource fee-owned land and Eversource-controlled utility easements. No new permanent easements are needed. In limited locations, Eversource will require the use of existing, temporary off-ROW access roads; landowner permission will be obtained prior to the use of these off-ROW access roads. The ability of property owners to continue to use their land as currently allowed under the existing easement language will not be affected.

The Project crosses largely through agricultural, low-densely residential, forestland/forestland preservation zoned areas. The Project will have minimal impact on these areas. Work will be limited to Eversource's existing easement across these properties, which are already encumbered by easement restrictions, and limited off-ROW access roads on which Eversource will obtain temporary easement rights. Construction activities may have a temporary impact on noise and traffic in these areas, as discussed in Sections 5.3.2 and 5.5, respectively. Permanent impacts on these properties from tree removal may include visual impacts resulting from the widening of the ROW corridor. This change would be visible from road crossings, and it may increase visibility of the transmission lines from adjacent residential homes and businesses.

# 5.9 Rare or Unique Features, Public Health Conditions, and Environmental Justice

## 5.9.1 Environmental Justice Outreach

Eversource recognizes that EJ considerations must be part of its everyday business operations, community support, and project considerations as they strive to modernize the energy sector. Eversource is committed to enabling purposeful inclusion in public engagement and effectively communicating with the EJ communities that they are proud to serve. Eversource is committed to recognizing and understanding historical and current issues of racial inequality in its communities and take to heart the importance of fair treatment and meaningful engagement of all people, regardless of race, color, national origin, English language proficiency or income – including individuals who may be marginalized in any way.

### *5.9.1.1 INITIAL OUTREACH APPROACH*

The public engagement program launched by Eversource for the Project focused on measures to promote public involvement through meaningful community outreach and engagement of EJ populations by connecting directly with impacted communities and providing a means for their input to inform decision outcomes. A list of all community-based organizations and Tribes that received advance notification regarding details of the proposed Project is provided in Attachment 5, along with a copy of the advance notification letter and the Environmental Justice Screening Form.

The following EJ Outreach efforts have been undertaken:

- **EJ Community Meetings:**
    - On May 13, 2022, from 10 a.m. to 1 p.m., a "pop-up" event was held at 4 Reynold Street in the Town of Erving in a community park; this location was selected due to its proximity to the EJ community in Wendell.
    - On January 3, 2025 from 4-6pm, the Project team held a pop-up event at the Wendell Free Library in the town of Wendell, attended by 12 local residents. Feedback from the community is provided in Sectio 5.9.1.2.
    - Eversource is in the process of planning a meeting at the Munson Memorial Library.
    - Eversource has made multiple attempts to schedule community meetings with the Amherst Chinese EJ community. As identified in Section 5.9.1.2 below, community leaders contacted have indicated that the community meeting approach was not recommended and could cause the community to feel unjustly singled out.
- **Mailings –** Eversource sent letters to all abutters in EJ communities within 1 mile of the Project on February 7, 2025. Eversource also sent letters to all direct abutters of the Project on February 7, 2025. The documents were translated into both traditional and simplified Chinese to satisfy the language requirement for the Amherst polygon.

### *5.9.1.2 SUMMARY OF INPUT GATHERED THROUGH INITIAL OUTREACH*

From conversations with community members in Wendell, Eversource heard some recurring themes and questions from residents. These included:

- Questions about tree clearing width and justification
- Use of wood and availability to residents
- Plans for erosion control and stumping on hillsides

- Use of pesticides

In Amherst, the Chinese community had the following comments and questions:

- Chinese community leaders indicated that the Chinese community is private and unlikely to show interest in the Project, unless they are a directly affected landowner.
- Community leaders suggested that we notify the EJ population of the Project through mailings only.
- Questions and concerns about why the Chinese community is being singled out in Amherst.

Eversource received no responses to the advanced notification letter and EJ Screening Form, which were sent on May 25, 2022.

#### *5.9.1.3 ONGOING AND PLANNED OUTREACH OVER PROJECT LIFE*

Based on the responses and feedback to date during outreach efforts in both Wendell and Amherst, different community approaches are recommended in these areas.

In Wendell, the community is actively seeking participation and involvement in the permitting and decision process. As such, Eversource will continue to pursue additional pop-up events and open houses (both public and virtual) prior to the commencement of work to update the local EJ community and abutting landowners and residents along the corridors about project details and development. Door-to-door outreach will also continue through the Project's lifecycle.

In Amherst, the community leaders have indicated that the EJ population is private and prefers not to be singled out compared to the rest of the local population. Open houses and pop-up events were actively discouraged. Eversource therefore proposes to focus outreach efforts in this area on mailings and/or door hangings. The mailings will provide information on the Project and will provide links to online communication tools for additional information and submittal of questions.

For both communities, prior to the commencement of work, Eversource representatives will continue to contact municipal officials within the Project area to advise of the upcoming activities. Communications tools, such as a website, hotline, and email portal, will be established to allow for direct communication between these stakeholders and Eversource/the Project team, allowing for the prompt resolution and mitigation of any issues. Additionally, site visits for landowners and abutting residents will be offered and encouraged. Finally, a data management system will be maintained by Eversource/the Project team to catalog questions, commitments, and requests for future resolution.

### 5.9.2 Assessment of Project Impacts to Determine Disproportionate Adverse Effect

As noted in Section 4.9.1, four EJ communities were identified within one mile of, and two are crossed by, the Project in Wendell and Amherst. Energy reliability projects often disproportionately **benefit** EJ communities. This is because adverse effects are generally limited to small areas during construction, while operation often reduces greenhouse gas (GHG) emissions by allowing for transmission of clean energy sources, increased energy reliability, and lower energy costs within EJ populations.

With regards to the WT-11 TRRP Project, no short-term or long-term environmental or public health impacts are expected to affect EJ populations. Tall-growing trees will be cut at the base, but compatible, low-growing vegetation will be allowed to remain, resulting in the permanent conversion of forested land into early successional/scrub-shrub habitat. All work for the proposed Project will occur within the existing

WT-11 transmission line ROW. Therefore, no impacts to local businesses or environmental resources that influence the existing tourist economy are anticipated. The existing ROW passes largely through rural areas occupied by remote forest lands and agricultural areas, and impacts are expected to be limited to the properties crossed by Eversource's ROW.

The Project specifically will benefit surrounding communities, including EJ populations, by strengthening the electric system associated with Lines 354, 312, and 1604. Power outages can disrupt communications, water, and transportation services. They can be especially dangerous if they occur during extreme cold or hot temperatures and for those who rely on electricity to operate essential medical devices. Decreasing the potential for power outages to occur will have a positive impact on the stability of communities that depend on the electricity distributed by this transmission line, especially those communities that may not have the financial resources to purchase generators, find temporary housing, or replace lost food in the event of a power outage.

Table 5-5 below identifies potential impacts to the EJ community from the Project.

**Table 5-5. Matrix Identifying Impacts to EJ Communities**

| IMPACT CATEGORY | IMPACT TO EJ COMMUNITY | MAGNITUDE | DURATION | PROPORTIONALITY |
|---|---|---|---|---|
| Construction noise | Increase at the source during daylight hours from tree removal equipment | Minor | Short-term | Proportional |
| Air Quality | Negligible emissions from tree removal equipment | Negligible | N/A | N/A |
| Water Availability / Quality | Erosion and sedimentation controls expected to avoid/minimize impacts to water quality during tree removal activities; no impact during construction | Negligible | N/A | N/A |
| Viewshed | Contractors and vehicles in viewshed during tree removal; expansion of ROW maintained in scrub-shrub state long-term | Minor | Long-term | Proportional |
| Temperature / Heat effects | This work is proposed in a rural and largely forested area not expected to reduce overall public shade availability. | Negligible | N/A | N/A |
| Stormwater flooding | The project does not involve an increase in impervious areas that would reduce infiltration rates and thereby exacerbate flooding. Conversion of forested land to scrub-shrub is expected to only have a negligible effect on stormwater flows. | Negligible | Long-term | Proportional |
| Vibration | Tree-clearing vibration not detectable at property boundary | Negligible | N/A | N/A |
| Traffic Congestion | Commute-related (early morning/later afternoon) congestion during tree removal activities | Minor | Short-term | Proportional |
| Burden on Public Services | None identified | Negligible | N/A | N/A |
| Public Safety | Risks related to heavy equipment use during tree removal activities, transitioning to negatable public safety risks during operation | Minor | Short-term | Proportional |
| Property values | No effect on property values expected; properties already encumbered by easements | Negligible | N/A | N/A |
| Energy Price and Reliability | Project operation will increase grid reliability | Minor | Long-term | Disproportionately benefits EJ populations |

| IMPACT CATEGORY | IMPACT TO EJ COMMUNITY | MAGNITUDE | DURATION | PROPORTIONALITY |
|---|---|---|---|---|
| Public Comments | Request for firewood | Minor | Short-term | Benefit |
| | Carbon sequestration | Minor | Long-term | Proportional |
| | Herbicides | N/A | N/A | N/A |

As summarized in Table 5-5 above, the Project is not anticipated to have any disproportionate adverse effects or increased risk of climate change on EJ populations. As identified in Section 4.9.1, existing disproportionate environmental burdens were generally limited to one mapped AUL and three mapped underground storage tanks, which will not be impacted by the Project; further, an SPCP will be implemented to ensure that any unanticipated soil or groundwater hazards are addressed during construction activities. Existing vulnerable health criteria in the EJ communities were generally related to childhood lead levels, which would not be affected by the Project. Finally, as described in more detail in Section 6.1.1.5, the Project will involve tree removal within 500 feet of eight identified hot spots based on present-day land surface temperature indices available through the Resilient MA Climate Change Projections Dashboard (EEA 2024); however, none of the eight hot spots that intersect the Project corridor occur within the EJ community in Wendell or Amherst. As a result, the four EJ populations mapped within the 1-mile DGA do not have existing disproportionate environmental burdens or vulnerable health EJ criteria that would be exacerbated by the Project.

# 6 STATUTORY AND REGULATORY STANDARDS AND COMPLIANCE

The following sections describe statutory and regulatory standards and requirements associated with the Project, including state and local agency requirements.

## 6.1 Climate Change Adaptation and Resiliency

The Massachusetts Global Warming Solutions Act of 2008 includes a requirement for the Commonwealth to consider the reasonably foreseeable climate change impacts and GHG emissions of projects and effects, such as predicted sea level rise. This section discusses consistency with the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, MEPA's Interim Protocol on Climate Change Adaptation and Resiliency, the MEPA Greenhouse Gas Policy and Protocol (GHG Policy), and Executive Order 618 on Biodiversity Conservation in Massachusetts.

### 6.1.1 State Hazard Mitigation and Climate Adaptation Plan

In September 2023, Massachusetts adopted the ResilientMass Plan: 2023 Massachusetts State Hazard Mitigation and Climate Adaptation Plan (SHMCAP) (Commonwealth of Massachusetts 2023), which updates the previous 2018 SHMCAP (Commonwealth of Massachusetts 2018). The SHMCAP is designed to be consistent with Massachusetts Executive Order 569, issued in 2016, which directed state agencies to develop and implement an integrated strategy to combat climate change and prepare for its impacts.

As detailed in the following bullets, The SHMCAP identifies three major changes that may occur in Massachusetts over the next 100 years as a result of global climate change: increases in temperature; changes in precipitation; and sea level rise.

1. **Temperature:** The average annual temperature is increasing, particularly in winter months, resulting in less snow and ice, more invasive species, challenging timber harvests, and other issues. In addition, there may be a material increase in days over 90 degrees.
2. **Precipitation:** Annual total precipitation is expected to increase across Massachusetts overall but occur over fewer days. The most significant changes are expected to occur during winter months. The SHMCAP highlights that these changing precipitation patterns will result in more concentrated precipitation events, which may be associated with severe outcomes.
3. **Sea Level Rise:** Sea level may rise 0.6 to 1.1 feet above 2000 levels by 2030, and up to 4.2 feet above 2000 levels by 2070, resulting in an increase of duration, intensity, and frequency of both tidal and storm-related flooding.

The SHMCAP identifies 15 natural hazards that could be associated with the three major changes identified above so that the hazards can be analyzed for planning, risk assessment, and mitigation purposes. The natural hazards evaluated are:

- With changes in precipitation, increased risk of inland flooding, drought, landslides, and extreme weather and changes in groundwater;
- With sea level rise, increased risk of coastal flooding, coastal erosion, and tsunamis; and

- With rising temperatures, increased average temperatures, and risk of extreme temperatures, wildfires, invasive species.
- With extreme weather, higher risk from hurricanes and tropical storms, severe winter storms, tornados, and other severe weather events.

Eversource has evaluated the impacts to and resiliency of the Project to these potential future changes. The measures incorporated into the Project's design relative to these natural hazards identified in the SHMCAP are discussed in Sections 6.1.1.1 to 6.1.1.9 below. Note that the SHMCAP also addresses earthquake risk, which is not a climate-change-associated hazard and is therefore not discussed herein.

### 6.1.1.1 INLAND FLOODING

Projections of hazards that may result from changing climate include an increase in the frequency and intensity of precipitation events, which could result in more frequent inland flooding events, and an increase in the land area susceptible to flooding. The risks from flooding events are higher for areas located within the floodplain.

SWCA reviewed National Flood Insurance Program Flood Insurance Rate Maps issued by FEMA to identify areas where the Project may be at risk of flood-related impacts. The Project crosses the FEMA 100-year floodplain associated with Montague Brook, Hop Brook, Bachelor Brook, Weston Brook, and Turkey Hill Brook.

In general, precipitation events appear to produce flash flooding less commonly in the northeastern United States as compared to other regions. Precipitation events have been found to differ from those in the central and western United States because they are more disorganized in the northeast (Jessup and Colucci 2012). The National Oceanic and Atmospheric Administration (NOAA) National Weather Service Flash Flood Guidance (NOAA 2022) provides an estimate of the amount of rainfall required over a given area and duration to cause waterbodies to flood. These estimates are based on the current soil moisture and stream flow conditions for the area. Flash flooding is possible within the floodplain and at streams in the area of the Project. The average precipitation required to begin flooding in the counties within the Project area is at a rate of 1.6 to 2.0 inches an hour (NOAA 2022).

Flash flooding events could impact tree removal activities, particularly as it relates to the use of construction mats across waterbody crossings and within floodplains. To minimize the potential impact of flash floods during tree removal activities, Eversource will minimize tree removal activities during periods of high flow within waterbodies. Measures will be implemented to ensure construction mats are secured within floodplains and across waterbodies or removed prior to anticipated high-water events.

Flooding events are not expected to impact or be impacted by the long-term objective of the Project. Once completed, the Project will make Lines 354, 312, and 1604 more resilient to risks associated with riverine flooding, as it will be less likely that trees uprooted during a flash flood would fall on and damage lines. In addition, the wider ROW simplifies and expedites repairs should damage occur. By reducing the probability and duration of damage to this line, the Project also increases the resiliency of the northeast's electrical grid which will be placed under increased stress if climate change increases the frequency of future damaging weather events.

### 6.1.1.2 DROUGHT

Decreases in predicted average summer precipitation and increased consecutive days without precipitation, along with increased average temperature and high temperature extremes, have the potential to affect evapotranspiration and result in higher and more severe drought occurrence in the northeastern U.S. These

drought conditions can weaken or kill trees, resulting in the increased likelihood of trees falling into and damaging powerlines.

Impacts to the Project from drought would include impacts to potential vegetation restoration success following tree removal. Because restoration of areas temporarily disturbed by tree removal is a relatively near-term activity, it is unlikely to be affected by any long-term effects of climate change. Proper restoration of vegetation along the ROW will be in accordance with permit requirements, and revegetation will be monitored until success criteria have been achieved. Construction-related water use is not anticipated during tree removal activities.

This Project does not require operational water use, and climate-induced changes to drought conditions are not expected to be impacted by the Project. The Project is expected to alleviate the additional risk of trees damaged by severe drought conditions from falling into the 345-kV Lines 354 and 312 and 115-kV Line 1604.

#### 6.1.1.3 LANDSLIDES

Mapping from the Massachusetts Geological Survey indicates that the area of the Project varies in terms of landslide potential, ranging from "very low" in the more low-lying areas of the Project ROW to "High" in limited areas of steep topography (Mabee and Duncan 2013). Although landslides could become more frequent with increased precipitation due to climate change, based on its general topography, this area would be expected to remain an area of relatively low susceptibility except in those localized areas of steep topography.

Earth-moving activities are not proposed as part of this Project, and the use of tree removal equipment on steep slopes will be minimized to the maximum extent practicable. In addition, trees are planned to be cut at the base and stumps left in place, which will allow for continued slope stabilization until compatible vegetation becomes fully established. Where appropriate, Eversource will also install temporary and/or permanent slope breakers diagonally across project workspaces on slopes to control erosion by reducing and shortening the length and concentration of runoff. The degree of slope, soil characteristics, runoff area, and location of suitable outlets will determine the number and shape of slope breakers required.

During operations, routine inspection of the ROW will be conducted to identify any potential problems that may develop and address them accordingly.

#### 6.1.1.4 COASTAL HAZARDS

Climate change is expected to enhance coastal hazards through increased coastal storm severity and sea level rise. The rise in relative mean sea level is projected to range from approximately 0.6 to 1.1 feet in the near term (between 2000 and 2030) and up to 4.2 feet by 2070. The Project is not located in a coastal area and will not be affected by the 4.2 feet of anticipated sea level rise.

#### 6.1.1.5 TEMPERATURE INCREASES

Climate change projections predict an increase in annual average temperatures, increased fluctuation, higher winter temperatures, and changes to the frequency of extreme temperatures. Temperature changes are not expected to result in any physical impact to facilities associated with the Project. The main impact from future temperature changes could be changes in market demand for electricity. If projections are correct, higher annual temperatures and changes in the frequency of extreme temperatures will result in increased peak summer demand for electricity. To meet this increased peak and to do so in a manner that minimizes the need to call up fossil-fuel-fired peaking facilities, the grid will need to be resilient. Once

completed, the Project will be an important component of the effort to ensure that the grid can reliably meet electricity demand as the climate changes and as Massachusetts moves toward a lower carbon future.

The Project will involve tree removal within 500 feet of eight identified hot spots based on present-day land surface temperature indices available through the Resilient MA Climate Change Projections Dashboard (EEA 2024). Six of these hot spots are located collectively in Northfield and Erving off the northern extent of the Project and include the Northfield and Erving Substations and several agricultural fields and commercial properties west of the corridor. A seventh hotspot is mapped for a commercial property off Route 9 in Belchertown west of the Project. The southern extent of the Project is in proximity to a hotspot identified for the Ludlow Substation in Ludlow.

None of the eight hot spots that intersect the Project corridor occur within the EJ community in Wendell or Amherst or are in residential areas. The hot spots are mapped in agricultural, commercial, and industrial land uses. Accordingly, it is Eversource's determination that the conversion of forest to scrub-shrub habitat along a utility ROW is not expected to meaningfully affect hot spot distributions or magnitudes and that the Project does not require tree planting or other direct mitigative measures.

#### 6.1.1.6 WILDFIRES

Hotter, drier summers and more consecutive days without rainfall have the potential to increase the risk of wildfires in the Northeast. A risk assessment was conducted by the Northeast Wildfire Risk Assessment Geospatial Work Group for fire risk in the U.S. Forest Service Northeastern Area, which includes Massachusetts. To identify areas with the highest risk for wildfires to occur, factors such as availability of fuels, presence of wildland-urban interface, and topography were reviewed. Although the spatial data set from the risk assessment is not available for detailed analysis, the mapping included in the 2023 SHMCAP shows that Franklin, Hampden and Hampshire Counties, including the Project area, generally has a very low to moderate wildfire risk.

Eversource's facility design and emergency response procedures are designed to address the safety of its facilities during natural catastrophes, including events such as fires and severe weather events. In addition, an ancillary benefit of the TRRP work is that once completed, the risk of fire will be reduced by the removal of trees that have the current or future potential to fall on energized power lines, in accordance with federal safety standards.

#### 6.1.1.7 INVASIVE SPECIES

Noxious weeds and invasive plants can disrupt native ecosystems by displacing native species and altering habitat characteristics. Invasive species may also include insects, agricultural pests, and aquatic species that can cause significant damage to native ecosystems and economic costs for agriculture, forestry, commercial and recreational fishing, and other industries. Changes in precipitation and temperatures can result in stress and reduced resiliency in native ecosystems, making them more susceptible to invasion, while at the same time, a decrease in winter days below freezing may make environmental conditions in the Northeast more favorable to certain invasive species.

Impacts from tree removal and movement of equipment from areas with invasive species already present have the potential to result in the spread of invasive plant species post-tree removal activities. However, Eversource's contractor will be required to adhere to best practices identified in the Eversource BMP Manual, provided in Attachment 8, during tree removal activities to minimize the spread or introduction of invasive plants. Eversource and its contractor will also adhere to applicable state regulations on the movement of wood products intended to prevent the spread of invasive insect species.

During operations, Eversource will maintain low-growing vegetation within the ROW in accordance with their VMP. Impacts to invasive species from climatic changes are likely to occur over a wide region, and the effects of the proposed Project will be negligible in that context.

#### 6.1.1.8 EXTREME WEATHER

Extreme weather events include hurricanes, tropical storms, severe winter storms, tornados, and severe thunderstorms, which have been projected to increase in duration, frequency, and severity with changing climate.

Most impacts to powerlines from extreme weather would be due to secondary effects from flooding, fires, landslides, or erosion damage that might be triggered by these severe events. These impacts are discussed in the above sections. In addition, hurricanes, tornados, winter storms, and thunderstorms are accompanied by strong winds, which can have the potential to bring down trees and powerlines and damage buildings and other structures. Severe winter storms are often accompanied by heavy snowfall and ice, which can also cause hazardous roadway conditions and power outages.

Eversource's TRRP has been specifically developed to address the reliability of its facilities during natural catastrophes, including severe weather events. Following tree removal activities, Eversource's existing emergency response procedures will continue to be implemented along Lines 354, 312, and 1604; these procedures include measures to be followed when responding to, investigating, and correcting the cause of an emergency, such as natural disasters, severe weather conditions, disruptions to normal operations, and catastrophic failure and damage.

#### 6.1.1.9 CHANGES IN GROUNDWATER

According to the 2023 SHMCAP, there are three primary risks associated with groundwater in Massachusetts: increase in groundwater levels; groundwater resource depletions; and contamination of groundwater by pollution and salinity changes from coastal flooding. The Project will result in the conversion of forested land to scrub-shrub, which may result in a negligible, temporary increase in groundwater levels until the area naturally revegetates with compatible vegetation that provide evapotranspiration. With the implementation of an SPCP, as described in Section 7.2.1, the Project is not anticipated to result in contamination of groundwater by pollution.

### 6.1.2 MEPA Interim Protocol on Climate Change Adaptation and Resiliency

The MEPA Interim Protocol on Climate Change Adaptation and Resiliency builds on the analysis and recommendations of the SHMCAP. It includes the efforts of RMAT, the inter-agency steering committee responsible for the implementation, monitoring, and maintenance of the SHMCP.

Three main categories have been identified by RMAT to guide stakeholders in climate resilience design standards and processes. These include Site Suitability (SS), Regional Coordination (RC), and Flexible Adaptation Pathways (AP). Since SS guidelines pertain to the assessment of alternative locations and routes considered to complete the Project, these are not applicable to the site-specific WT-11 TRRP Project. Regional Coordination and Flexible Adaptation Pathways are addressed in Sections 6.1.2.1 and 6.1.2.2 below. Section 6.1.2.3 discusses the recommendations from the RMAT Climate Resilience Design Standards Tool; a copy of the output from the RMAT Climate Resilience Design Standards Tool is provided in Attachment 6 of this DEIR.

### 6.1.2.1 REGIONAL COORDINATION

Regional coordination guidelines focus on actions recommended to identify regional considerations and partnerships to achieve collaborative benefits to the Commonwealth. These guidelines have been broken down into four approaches which are addressed in relation to the Project below.

RC-1. Assess regional context of vulnerability:

The North American Eastern Interconnection electric grid is the largest machine in the world, comprised of thousands of generation, transmission, and distribution elements, and ideally the system is in normal operating condition with no elements out of service. The outage of any facility impacts the reliability, flexibility, and capability of the grid. Line 312, Line 354, and Line 1604 are notable transmission elements which deliver power to and from Western Massachusetts, Vermont, and New York. The loss of Line 312, Line 354, or Line 1604 or any combination would impact the ability of the Northfield Mountain pumped storage generating station to operate. This station is the largest electric energy storage system in New England and one of the largest electric energy storage systems in North America. For example, this station can store excess electric energy produced by renewable resources during daylight hours and provide electric energy back to the power grid at night. The loss of Line 312 or Line 354 would impact the ability of New England to import electric energy, including that produced by renewable resources, from New York, Pennsylvania, or beyond. New England is connected to the rest of the Eastern Interconnection primarily by two 345-kV paths and Line 312 and Line 354 are along one of those routes. Therefore, the outage of either of these two lines would have a significant impact on the capability to obtain electric power generated outside of the New England region or sell renewably produced electric power to regions outside of New England.

A discussion of the regional context of vulnerability in relation to specific hazards is provided in Section 6.1.1 above.

RC-2. Evaluate impacts beyond site-specific design:

The Project will enhance the climate resiliency of Eversource's transmission grid, thereby providing a substantial net benefit to the region beyond the footprint of the Project.

RC-3. Optimize capital investment opportunities:

Investment in proactive vegetation management reduces the potential need for future expenses on the repair of existing facilities. Additionally, financial losses incurred by reliant communities that may result due to power outages can be avoided with the implementation of the Project.

RC-4. Prioritize services and assets that serve vulnerable communities:

As described in Section 5.9.2, energy reliability projects often disproportionately benefit EJ communities. This is because adverse effects are generally limited to small areas during construction, while operation often reduces GHG emissions by allowing for the transmission of clean energy sources, increased energy reliability, and lower energy costs within EJ populations.

### 6.1.2.2 FLEXIBLE ADAPTATION PATHWAYS

Flexible adaptation pathways guidelines encourage project design that functions under current climate conditions while preparing for adaptation over time and changing conditions. The five pathways identified are addressed in relation to the Project below.

AP-1. Embed future capacity and design for uncertainty:

The Project is designed to proactively respond to changing climate conditions by increasing the maintained width of the ROW, thereby decreasing the potential for tall-growing vegetation to come in contact with the power lines in the event of a severe storm. By completing the Project, the transmission lines will be less vulnerable during predicted climate conditions and poised for less future vegetation maintenance should severe storm occurrence continue to increase.

AP-2. Design for incremental change:

An increased occurrence of severe weather events resulting in extended power outages in recent years prompted the design of this Project. The Project will address current and future needs for increased clearance area surrounding electric resources to maintain and enhance their reliability.

AP-3. Encourage climate mitigation and other co-benefits:

Because the Project requires the removal of tall-growing vegetation, mitigation regarding the overall carbon footprint of the Project will involve allowing any temporarily disturbed areas to revegetate with compatible, low-growing vegetation.

AP-4. Prioritize nature-based solutions:

Forested land will be permanently converted to scrub-shrub communities as a result of the Project. However, the post-work restoration will ensure that these lands will continue to provide ecological functions and values. These living systems will provide self-sustaining, nature-based solutions regarding climate resiliency. Additionally, new low-growing vegetation communities will provide increased pollinator habitat within the Project area.

Ap-5. Prepare for current and future operational and maintenance needs:

The Project goals align with future planning for operational and maintenance needs by reducing the potential risks involved in the operation of the transmission line and decreasing potential maintenance required should detrimental severe storm events occur.

### *6.1.2.3 RMAT DESIGN TOOL RECOMMENDATIONS*

The RMAT Climate Resilience Design Standards Tool offers several "factors to improve output." A discussion of each factor as it relates to the Project is provided below.

- *Incorporate nature-based solutions that may provide flood protection*

  As described in Section 6.1.2.2, the Project is designed to proactively respond to changing climate conditions by increasing the maintained width of the ROW, thereby decreasing the potential for tall-growing vegetation to come in contact with the power lines in the event of a flood event. By completing the Project, the transmission lines will be less vulnerable during predicted climate conditions and poised for less future vegetation maintenance should severe storm occurrence continue to increase.

- *Protect public water supply by reducing the risk of contamination, pollution, and/or runoff of surface and groundwater sources used for human consumption*

The Project crosses two public water supply watersheds (Atkins Reservoir and Ludlow Reservoir), multiple Class A protected streams and wetlands, one approved Zone II Wellhead Protection Area for a public groundwater well (Town of Amherst), and Zone I Wellhead Protection Area and IWPA for non-community well in Northfield (see Section 4.2.1.2) (MassGIS 2021b and 2024a). To protect the public water supply,

the Project will implement a SPCP during tree removal activities. The SPCP includes measures to minimize the potential for a spill of petroleum products or a hazardous or toxic substance and, in the event that a spill does occur, to contain and control the release to minimize the effects. Additional information on the SPCP is provided in Section 7.2.1.

- *Incorporate green infrastructure or nature-based solutions that recharge groundwater*

  This factor is not applicable. The Project consists of tree removal. The construction of new impervious surfaces that would impact groundwater recharge is not proposed. Potential short-term impacts to groundwater recharge from tree removal would be mitigated once compatible vegetation re-establishes.

- *Incorporate green infrastructure to filter stormwater*

  This factor is not applicable. The Project consists of tree removal. The construction of new impervious surfaces or changes in topography that would impact stormwater quality is not proposed. BMPs would be implemented as necessary to manage stormwater during tree removal activities. Potential short-term impacts to stormwater following tree removal would be mitigated once compatible vegetation re-establishes.

- *Incorporate nature-based solutions that improve water quality*

  This factor is not applicable. The Project consists of tree removal. The construction of new impervious surfaces or changes in topography that would impact water quality is not proposed. BMPs would be implemented as necessary to protect water quality during tree removal activities. Potential short-term impacts to water quality following tree removal would be mitigated once compatible vegetation is reestablished.

- *Incorporate nature-based solutions that sequester carbon*

  As discussed in the quantitative carbon analysis discussion provided in Attachment 7, although the removal of trees will result in a loss of carbon sequestration potential provided by those trees, some of this loss would be offset by two Project-related benefits. First, increasing the resiliency of Lines 354, 312, and 1604 will reduce the probability that carbon intense generation sources will need to be dispatched in lieu of renewably generated electricity to meet peak demand. Second, increasing the reliability of the grid will reduce the risk of an outage; each time the Project prevents an outage-related spike in GHG emissions, approximately 59 tons of $CO_2e$ that would otherwise be released into the atmosphere remain sequestered.

- *Preserve, enhance, and/or restore coastal shellfish habitats*

  This factor is not applicable. This Project is located in western Massachusetts, outside any coastal communities.

- *Identify opportunities to remediate existing sources of pollution*

  Although sources of potential contamination were identified within 0.25 mile of the Project, as summarized in Section 4.1.2.3, no known active source of potential contamination was identified within Eversource's easement that would offer an opportunity for pollution remediation.

- *Provide opportunities for passive and/or active recreation through open space*

Eversource's ROW crosses several existing open space properties; recreational use of the ROW across these properties is allowed and will continue to be allowed after the Project is completed. During periods of active tree removal, safety measures will be implemented to protect recreational trail users, as described in Section 7.6.

- *Increase plants, trees, and/or other vegetation to provide oxygen production*

  Although the Project will remove trees, compatible vegetation will reestablish, allowing for continued oxygen production.

- *Identify opportunities to prevent pollutants from impacting ecosystems*

  The Project will implement a SPCP during tree removal activities. The SPCP includes measures to minimize the potential for a spill of petroleum products or a hazardous or toxic substance and, in the event that a spill does occur, to contain and control the release to minimize the effects. Additional information on the SPCP is provided in Section 7.2.1.

- *Incorporate education and/or protect cultural resources as part of your project*

  As described in Section 5.7, the Project has been designed to avoid impacts to cultural resources.

## 6.1.3 Greenhouse Gas Emissions Policy

The MEPA GHG Policy requires that an EIR include quantification of the potential GHG emissions from a proposed project. The proposed Project will not result in direct GHG emissions (e.g., from stationary sources or operational traffic generation). Pursuant to the GHG Policy, quantification of biomass conversion associated with land clearing and construction period emissions are not typically included in the GHG emissions calculations unless the Secretary so requires. The Secretary's EENF Certificate required that the DEIR provide a quantitative carbon analysis of tree removal activities, which is provided in Attachment 7.

To summarize the carbon analysis, from a GHG accounting perspective, the Project is likely to bring about the following changes:

- Up to 61,062 U.S. tons of $CO_2e$ may be released from aboveground live biomass and forest soils;
- Up to 18,735 U.S. tons of $CO_2e$ may not be sequestered in the future because wooded habitat will be converted to low-growing herbaceous and woody shrub habitat; and
- More than 944 U.S. tons of CO2e will likely not be emitted because of Project-reduction in the probability of a power outage.
- An unquantified amount of GHG will not be released each time increased grid resiliency enables peak demand to be met by generation at the Northfield Mountain Pumped Storage Hydropower Facility rather than a fossil-fuel-fired peaking unit.

Thus, the Project may increase CO2e emissions by approximately 78,853 U.S. tons over its 40-year lifespan. This equates to approximately 1,971 U.S. tons CO2e annually which is equivalent to the annual emissions associated with about 75 Massachusetts households.

## 6.1.4 Biodiversity Conservation in Massachusetts

In 2023, Governor Healey signed Executive Order No. 618, which directs the MA DFG to develop biodiversity conservation goals for 2030, 2040, and 2050, along with strategies to meet those goals. Although these goals have not yet been formalized as of the date of this filing, MA DFG anticipates that

their plan will include endangered species protection, conservation of key habitats, restoration of free-flowing rivers and wildlife migration, supporting pollinators, and improving access to nature in neighborhoods and schools (MA DFG 2024).

The proposed Project will further the state's biodiversity goals. MassWildlife's State Wildlife Action Plan (SWAP) designates "cultural shrublands," which includes utility corridors, as SWAP Habitat because they support a variety of plant and wildlife species of greatest conservation need (MassWildlife 2025a). Cultural shrublands are habitats dominated by low woody vegetation with varying amounts of herbaceous plants and sparse young tree cover. They frequently support state and federally listed rare species that prefer open habitats and benefit from cyclical vegetation management. Several of the state and federally listed species that occur in the Project area rely heavily on powerline corridors and other open habitats for part or all of their life cycle, including climbing fern (MassWildlife 2025b), northeastern bulrush (MassWildlife 2025c), and eastern box turtle (MassWildlife 2025d).

This is further corroborated by research studies. As noted in Section 5.4.1, a study by Wagner et al. (2014) found that plant species richness was significantly higher (nearly double) under transmission lines compared to woodlands. They further note that many common plant species found along transmission line corridors form the basis of food webs that include animals of conservation interest; in particular, the prevalence of goldenrods plays a central role in supplying late-season nectar and pollen for pollinator species.

In a University of Massachusetts Amherst study by King et al. (2009) of powerline corridors in Franklin and Hampshire Counties, powerline corridors were found to provide habitat for early successional birds of conservation concern, **with wider corridors (>50m) contributing more to regional conservation of these species.**

# 6.2 Massachusetts Wetlands Protection Act

The Massachusetts WPA regulates activities within wetland resource areas and their buffer zones. The local Conservation Commissions are empowered under state law to issue Orders of Conditions, approving or denying jurisdictional activities. MassDEP has the authority to intervene in projects and to act on appeals of Orders of Conditions.

Notices of Intent (NOIs) will be filed under the Massachusetts WPA to the conservation commissions in each town crossed by the Project. The NOIs will detail the Project description, short- and long-term impacts from the Project, and the proposed mitigation for impacts. Attention will be given to how the Project and the proposed mitigation activities conform to the performance standards for each of the affected resource areas, as detailed below.

## 6.2.1 Limited Project Provisions

As outlined at 310 CMR 10.53(3)(d), electric transmission lines are "limited projects" that may be approved by the issuing authority even if the activity cannot comply with the wetland performance standards, provided that the project proponent demonstrates that they have conducted an alternatives analysis to avoid, minimize, and mitigate any impacts. However, it is within the issuing authority's discretion to consider the magnitude of the alteration and the significance of the Project site to the interests identified in M.G.L. c. 131, s. 40, the availability of reasonable alternatives to the proposed activities, the extent to which the adverse impacts are minimized, and the extent to which mitigation measures, including replication or restoration, are provided to contribute to the protection of the interests identified in M.G.L. c. 131, s. 40. However, no such project may be permitted that will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59.

As outlined at 310 CMR 10.53(3)(d), maintenance of transmission lines are "limited projects" that may be approved by the issuing authority even if the activity cannot comply with the wetland performance standards, provided that the following conditions are met:

*(a) The issuing authority may require a reasonable alternative route with fewer adverse effects for a local distribution or connecting line not reviewed by the Energy Facility Siting Council*;

There are no reasonable alternative routes for the Project that would have fewer adverse effects. The Project involves expanding the maintained ROW on an established utility corridor. Building a new underground or overhead transmission line on a new route would result in more, not fewer, adverse impacts than the Project. Also, as demonstrated in Section 3 of this DEIR, there are no reasonable alternatives to the Project that would meet the Project goal of protecting existing Lines 312, 354, and 1604 from outages and hazardous conditions resulting from tree falls, while minimizing environmental impacts to the extent practicable. Eversource evaluated several alternatives to the Project, including a new underground line, a new overhead line with taller structures, and tree removal width alternatives. The nature of a linear facility such as the existing transmission line, coupled with the varied dispersal of wetlands in glaciated terrain, results in some unavoidable intersection of the transmission line tree removal activities with wetland resources. Eversource has carefully reviewed the existing corridor and determined areas where temporary construction matting impacts can be reduced to the extent feasible and where tree removal can be reduced based on the results of a LiDAR analysis.

*(b) Best available measures shall be used to minimize adverse effects during construction;*

Best available measures shall be used to minimize adverse effects during tree removal. Section 5 of this DEIR describes the Project's impacts and discusses the BMPs that will be applied during tree removal activities. Section 7 provides additional information on BMPs and mitigation measures proposed to minimize and mitigate Project impacts. Minimization measures were considered during design and planning to adjust the Project layout (e.g., placement of construction matting) to avoid sensitive resource areas and wetlands to the extent practicable. In addition, Eversource will require its contractor to implement the provisions of the Eversource BMP Manual and comply with all permit conditions during tree removal and restoration. Impacts resulting from construction mat access will be temporary and will be restored in-situ. Impacts associated with the conversion of forested land to successional scrub-shrub community habitats will be mitigated by the development of a compensatory mitigation plan, as discussed in Section 7.

*(c) The surface vegetation and contours of the area shall be substantially restored; and*

This standard has been met. While this Project does involve tree removal and other vegetation maintenance activities, wetland areas will be allowed to naturally revegetate with compatible species. As necessary, wetland areas that are slow to naturally revegetate on their own will be seeded with an appropriate wetland mix and covered with straw mulch. Upland areas will be stabilized as necessary with temporary erosion and sedimentation controls until they have revegetated. No grading or other changes to surface contours are proposed.

*(d) All sewer lines shall be constructed to minimize inflow and leakage.*

This standard is not applicable. No sewer lines are proposed as part of this Project.

## 6.2.2 Land Under Waterbodies and Waterways

The use of stacked timber mats to create a mat span of stream LES15A will result in 80 square feet of temporary impacts to LUWW. The Project meets the performance standards for LUWW under 310 CMR 10.56(4):

*(a) Any proposed work within Land Under Water Bodies and Waterways shall not impair the following:*

*1. The water carrying capacity within the defined channel, which is provided by said land in conjunction with the banks;*

The proposed temporary in-water work will be conducted during the low-flow period. Stacked mats will be positioned in such a way that the low-flow channel would be maintained at all times. Further, the mats are expected to be in place for only a few days and will be timed during a period when no significant rainfall is anticipated. Mat installation and removal will be overseen by an environmental monitor to ensure that they do not impede or restrict flows.

*2. Ground and surface water quality;*

The proposed work in stream LES15A will be temporary and is not expected to have a negative impact on ground and surface water quality.

*3. The capacity of said land to provide breeding habitat, escape cover and food for fisheries;*

As described previously, the placement of mats within the stream will be conducted during the low-flow period and will be temporary, lasting only a few days. Therefore, it is not expected to impact the capacity of the LUWW to provide breeding habitat, escape cover, and food for fisheries.

*4. The capacity of said land to provide important wildlife habitat functions. A project or projects on a single lot, for which Notices(s) of Intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 5,000 feet (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions. Additional alterations beyond the above threshold may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures contained in 310 CMR 10.60.*

The Project will result in temporary impacts to only 80 square feet of LUWW and therefore meets this performance standard.

*5. Work on a stream crossing shall be presumed to meet the performance standard set forth in 310 CMR 10.56(4)(a) provided the work is performed in compliance with the Massachusetts Stream Crossing Standards by consisting of a span or embedded culvert in which, at a minimum, the bottom of a span structure or the upper surface of an embedded culvert is above the elevation of the top of the bank, and the structure spans the channel width by a minimum of 1.2 times the bankfull width. This presumption is rebuttable and may be overcome by the submittal of credible evidence from a competent source. Notwithstanding the requirements of 310 CMR 10.56(4)(a)4., the impact on Land under Water Bodies and Waterways caused by the installation of a stream crossing is exempt from the requirement to perform a habitat evaluation in accordance with the procedures established under 310 CMR 10.60.*

The proposed mats are temporary BMPs. Compliance with the Massachusetts Stream Crossing Standards would require more impacts for construction of a culvert than would result from the placement of these temporary mats for a short period of time.

*(b) Notwithstanding the provisions of 310 CMR 10.56(4)(a), the issuing authority may issue an Order in accordance with M.G.L. c. 131, § 40 to maintain or improve boat channels within Land under*

*Water Bodies and Waterways when said work is designed and carried out using the best practical measures so as to minimize adverse effects such as the suspension or transport of pollutants, increases in turbidity, the smothering of bottom organisms, the accumulation of pollutants by organisms or the destruction of fisheries habitat or nutrient source areas.*

This standard is not applicable.

*(c) Notwithstanding the provisions of 310 CMR 10.56(4)(a) or (b), no project may be permitted which will have any adverse effect on specified habitat sites of rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59.*

As discussed in Section 5.4.2, SWCA has filed a Project Review Checklist with NHESP, which has determined that the Project will result in a Take of eastern box turtle habitat; Eversource will submit a CMP to NHESP that will ensure that the Project will implement sufficient mitigation to result in a net benefit to the eastern box turtle. Details regarding required NHESP conditions to avoid a Take of other state-listed species, including TOY restrictions and other mitigation measures, are described in Section 7.4.2.

## 6.2.3 Inland Bank

The use of timber mat spans across stream channels, as described in Section 6.2.2 above, will avoid direct impacts to Bank associated with the streams. Indirect impacts may result from the permanent conversion of 19,179 linear feet of Inland Bank from forested cover to scrub-shrub cover. The Project meets the performance standards for Bank under 310 CMR 10.54(4), as follows:

*(a) Any proposed work on Bank shall not impair the following:*

*1. The physical stability of the Bank;*

The proposed timber mat spans will avoid direct impacts to the associated Bank Vegetation removal along the Bank will consist of cutting aboveground with the roots left intact. These roots will continue to provide stability to the Bank until the compatible vegetation has been established.

*2. The water carrying capacity of the existing channel within the Bank;*

The proposed tree removal along the Bank will not alter the physical characteristics of the Bank and, therefore, will not alter the stream's carrying capacity.

*3. Ground water and surface water quality;*

Following construction, all equipment mats will be removed, and the area will be restored to pre-construction conditions. With the implementation of BMPs and the SPCP, no measurable impacts to ground water and surface water quality are expected.

*4. The capacity of the Bank to provide breeding habitat, escape cover, and food for fisheries;*

Vegetation removal along the stream bank may alter shading and input of organic matter from fallen leaves, which, in turn, affects the macroinvertebrates that the fish feed on. These impacts are expected to be largely temporary, as compatible vegetation re-establishes along the stream edge and provides low-growth shade and macronutrients. Long-term effects of shrub growth compared to forested canopy may arise but will be negligible and localized when taking into consideration the overall length of the streams. Additional information on potential impacts on fisheries is provided in Section 5.2.2.2.

5. *The capacity of the Bank to provide important wildlife habitat functions. A project or projects on a single lot, for which Notices(s) of Intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 50 feet (whichever is less) of the length of the bank found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions. In the case of a bank of a river or an intermittent stream, the impact shall be measured on each side of the stream or river. Additional alterations beyond the above threshold may be permitted if they will have no adverse effects on wildlife habitat, as determined by procedures contained in 310 CMR 10.60.*

Indirect impacts from tree canopy removal will occur along 19,179 linear feet of Bank along the 29.3-mile ROW. Based on the extent of suitable similar upstream and downstream habitat adjacent to the Project corridor in this region, no significant impacts to wildlife are anticipated from widening of the WT-11 corridor. Eversource is in the process of developing a compensatory mitigation plan, described in Section 7.2.3.2, which is expected to provide mitigation for impacts to Bank.

6. *Work on a stream crossing shall be presumed to meet the performance standard set forth in 310 CMR 10.54(4)(a) provided the work is performed in compliance with the Massachusetts Stream Crossing Standards by consisting of a span or embedded culvert in which, at a minimum, the bottom of a span structure or the upper surface of an embedded culvert is above the elevation of the top of the bank, and the structure spans the channel width by a minimum of 1.2 times the bankfull width. This presumption is rebuttable and may be overcome by the submittal of credible evidence from a competent source. Notwithstanding the requirements of 310 CMR 10.56(4)(a)4., the impact on LUWW caused by the installation of a stream crossing is exempt from the requirement to perform a habitat evaluation in accordance with the procedures established under 310 CMR 10.60.*

The proposed activities do not include the "construction, repair, replacement, or expansion" of any permanent "span" or "culvert" and, therefore, the Massachusetts Stream Crossing Standards do not apply.

*(b) Notwithstanding the provisions of 310 CMR 10.54(4)(a), structures may be permitted in or on a Bank when required to prevent flood damage to facilities, buildings and roads constructed prior to the effective date of 310 CMR 10.51 through 10.60 or constructed pursuant to a Notice of Intent filed prior to the effective date of 310 CMR 1.51 through 10.60 (April 1, 1983), including the renovation or reconstruction (but not substantial enlargement of such facilities, buildings and roads, provided that the following requirements are met:*

1. *The proposed protective structure, renovation or reconstruction is designed and constructed using best practical measures so as to minimize adverse effects on the characteristics and functions of the resource area;*
2. *The applicant demonstrates that there is no reasonable method of protecting, renovating or rebuilding the facility in question other than the one proposed.*

This standard is not applicable. The proposed activities do not include the use of structures in or on Bank for the purpose of flood damage prevention.

*(c) Notwithstanding the provisions of 310 CMR 10.54(4)(a) or (b), no project may be permitted which will have any adverse effect on specified habitat sites of Rare Species, as identified by procedures established under 310 CMR 10.59.*

As discussed in Section 5.4.2, SWCA has filed a Project Review Checklist with NHESP, which has determined that the Project will result in a Take of eastern box turtle habitat; Eversource will submit a CMP

to NHESP that will ensure that the Project will implement sufficient mitigation to result in a net benefit to the eastern box turtle. Details regarding required NHESP conditions to avoid a Take of other state-listed species, including TOY restrictions and other mitigation measures, are described in Section 7.4.2.

## 6.2.4 Land Subject to Flooding

BLSF has the following performance standards to adhere to that are outlined in 310 CMR 10.57(4)(a). The Project's compliance with these performance standards is outlined below.

1. *Compensatory storage shall be provided for all flood storage volume that will be lost as the result of a proposed project within Bordering Land Subject to Flooding, when in the judgment of the issuing authority said loss will cause an increase or will contribute incrementally to an increase in the horizontal extent and level of flood waters during peak flows…*

This standard has been met. The proposed tree removal and other vegetative management activities in the BLSF would not decrease flood storage volume. No new permanent fill or changes in ground contours are proposed. As compatible vegetation re-establishes, it is expected to replace the lost evapotranspiration, interception, and physical impediment functions provided by the trees to reduce flooding impacts.

Eversource has specifically prohibited its contractor from permanently stockpiling cut timber and brush as well as broadcasting wood chips in BLSF and other wetland resource areas. The temporary use of construction matting during vegetation removal is not anticipated to result in an increase in the horizontal extent and level of flood waters during peak flow.

2. *Work within Bordering Land Subject to Flooding, including that work required to provide the above-specified compensatory storage, shall not restrict flows so as to cause an increase in flood stage or velocity.*

This standard has been met. The Project will not restrict flows so as to cause an increase in flood storage or velocity. In accordance with Eversource's BMPs, mat anchoring will be used in areas prone to flooding, including floodplains where known base elevations are 2 feet or greater above the ground surface; the use of anchoring is intended to secure mats such that they do not relocate during a flood event to a location where they could further restrict flows or cause damage.

3. *Work in those portions of bordering land subject to flooding found to be significant to the protection of wildlife habitat shall not impair its capacity to provide important wildlife habitat functions. Except for work which would adversely affect vernal pool habitat, a project or projects on a single lot, for which Notice(s) of Intent is filed on or after November 1, 1987, that (cumulatively) alter(s) up to 10% or 5,000 square feet (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat, shall not be deemed to impair its capacity to provide important wildlife habitat functions.*

The total alteration to BLSF from temporary construction mats is 1.4 acres, and the conversion from tree removal is approximately 6.3 acres. As of the date of this DEIR, wildlife habitat evaluations have not yet been performed in BLSF impact areas but are planned in Spring 2025. Based on the extent of suitable similar habitat adjacent to the Project corridor in this region, no significant impacts to wildlife are anticipated as a result of the widening of the WT-11 corridor. As explained in Section 3.0 (Alternatives Analysis), there is no feasible alternative to the proposed actions that meet the Project goals. Any alteration to BLSF that may exceed the threshold established by this performance standard is allowable as a limited project under the provisions of 310 CMR 10.53(3)(d). Section 6.2.1 describes the Project's limited project status.

## 6.2.5 Riverfront Area

The Project has been designed to meet the performance standards for work within Riverfront Area, as described below.

1. *Protection of other resources.*

Work in Riverfront Area is required to meet performance standards for all other resource areas within the Riverfront Area. The proposed work within RFA will either be in compliance with performance standards for all other resource areas, as described throughout Section 6.2, or is allowed pursuant to the Limited Project provisions of 310 CMR 10.53(3)(d).

2. *Protection of rare species.*

As discussed in Section 5.4.2, SWCA has filed a Project Review Checklist with NHESP, which has determined that the Project will result in a Take of eastern box turtle habitat; Eversource will submit a CMP to NHESP that will ensure that the Project will implement sufficient mitigation to result in a net benefit to the eastern box turtle. Details regarding required NHESP conditions to avoid a Take of other state-listed species, including TOY restrictions and other mitigation measures, are described in Section 7.4.2.

3. *Practicable and substantially equivalent economic alternatives.*

Performance standards for Riverfront Area require there are no practicable and substantially equivalent economic alternatives to the proposed project with less adverse effects on the protected interests identified for Riverfront Area. Eversource has undertaken an alternatives analysis for the Project, which is provided in Section 3 of this DEIR, which demonstrates that there are no alternatives to the Project that will meet the Project need with less adverse effects on Riverfront Area interests.

4. *No significant adverse impact.*

Work within Riverfront Area, including proposed mitigation, can have no significant adverse impact on the protected interests of Riverfront Area. Within the 200-foot Riverfront Area, the regulations presume that a significant adverse impact would result from certain threshold of alterations that apply to individual lots, single family homes, or building construction. However, the Project is a linear utility project that crosses multiple lots within a combination of easements or Eversource fee-owned lands, this standard is not applicable, and the Limited Project provisions would instead apply.

Notwithstanding the Riverfront Area thresholds of alteration, the Project is not expected to result in a significant adverse impact on the protected interests of Riverfront Area, which are outlined below:

- **Protection of private or public water supply** – The proposed Project will be conducted in a manner that minimizes impacts on private and public water supplies. Eversource's contractor will be required to implement Eversource's BMP manual to prevent erosion and sedimentation during vegetation removal activities and will be required to implement the Project-specific SPCP to minimize the potential for spills of petroleum products and other contaminants from entering the water supply during work activities. The long-term functions of the riverfront area in filtration of pollution and prevention of erosion will be restored as compatible vegetation becomes reestablished.
- **Protection of groundwater -** The proposed Project will be conducted in a manner that minimizes impacts on groundwater. Eversource's contractor will be required to implement Eversource's BMP manual to prevent erosion and sedimentation during vegetation removal activities and will be required to implement the Project-specific SPCP to minimize the potential for spills of petroleum

products and other contaminants from entering the water supply during work activities. The long-term functions of the riverfront area in filtration of pollution and prevention of erosion will be restored as compatible vegetation becomes reestablished.

- **Flood control** – As described in Section 5.2.2.3, large-scale forest clearing efforts could have an indirect impact on flood water flow velocity and flood storage capacity. However, the Project's 6.4 acres of forest conversion to scrub-shrub within the 100-year floodplain represent only 0.4 % of the total floodplain acreage (1,474 acres) provided by those portions of the affected floodplain systems within Massachusetts, and therefore potential impacts to flood storage capacity and flow velocities are expected to be negligible.
- **Prevention of storm damage** – The Project's stated purpose and need (provided in Section 2.1) is to prevent storm damage on essential utility infrastructure by preventing tree fall-ins onto Lines 354, 312, and 1604. Further, the Project is not anticipated to have a long-term negative impact on the ability of the Riverfront Area to prevent storm damage; although the Project will require tree removal, the area will be reestablished with compatible vegetation that will continue to slow flood flows, intercept rainfall, and provide other storm damage prevention functions.
- **Prevention of pollution -** The proposed Project will be conducted in a manner that minimizes impacts on groundwater. Eversource's contractor will be required to implement Eversource's BMP manual to prevent erosion and sedimentation during vegetation removal activities and will be required to implement the Project-specific SPCP to minimize the potential for spills of petroleum products and other contaminants from entering the water supply during work activities. The long-term functions of the riverfront area in filtration of pollution and prevention of erosion will be restored as compatible vegetation becomes reestablished.
- **Protection of land containing shellfish** – This interest is not applicable in this region.
- **Protection of wildlife –** The removal of trees adjacent to an existing maintained utility corridor is not anticipated to have a significant, long-term adverse impact on wildlife. Forested habitat will be replaced with low-growth habitat that offers additional pollinator and scrub-shrub/emergent communities that are relatively uncommon in this heavily forested region of the state. In addition to providing needed edge habitat, utility corridors provide migratory corridors for large mammal species. Additional discussion of the Project's short and long-term impacts on wildlife is provided in Section 5.4.1.
- **Protection of fisheries –** The proposed Project is not anticipated to have adverse impacts on fisheries. The removal of trees and other vegetation along CFRs and their tributaries could influence fish survival and fitness from elevated water temperatures and reduced levels of dissolved oxygen. However, any such negative effects are expected to be minimal as the proposed tree removal represents only 0.08% of the length of CFR streams located within the Connecticut River watershed in Massachusetts and 0.04% of the length of CFR streams in the Millers River watershed in Massachusetts. Further, these impacts are anticipated to be temporary in nature as vegetative cover from shrubs and compatible tree species will reestablish. A discussion of the Project's short and long-term impacts on fisheries is provided in Section 5.2.2.2.

## 6.2.6 Bordering Vegetated Wetlands

BVW has the following performance standards to adhere to that are outlined in 310 CMR 10.55(4). The Project's compliance with these performance standards is outlined below.

1. *Any proposed work in a Bordering Vegetated Wetland shall not destroy or otherwise impair any portion of said area.*

The conversion of forested BVW to non-forested cover types, which is consistent with vegetative management practices elsewhere in this transmission line ROW, will not impair the overall capacity of these wetland systems to continue providing wetland functions and values. Woody vegetation (trees, shrubs, etc.) would be cut at or above ground level and not uprooted, thereby preventing disruption to the wetland soil structure. Any ground that is inadvertently disturbed from equipment access and clearing would be allowed to regenerate naturally or, if necessary, be seeded and mulched with straw to promote its revegetation. The use of construction mats is temporary and once removed, the area will be restored.

2. *Notwithstanding the provisions of 310 CMR 10.55(4)(a), the issuing authority may issue an Order of Conditions permitting work which results in the loss of up to 5000 square feet of Bordering Vegetated Wetland when said area is replaced in accordance with the following general conditions and any additional, specific conditions the issuing authority deems necessary to ensure that the replacement area will function in a manner similar to the area that will be lost…*

This Project does not involve any permanent loss of BVW. However, it will have temporary impacts to 10.1 acres of BVW from construction matting and will convert approximately 23.2 acres of forested habitat to non-forested wetland cover types. The proposed work in BVW represents the best alternative to meet the Project's stated objectives while minimizing environmental impacts, as discussed in detail in the Alternatives Analysis provided in Section 3.

BVW that has been temporarily impacted from construction matting will be allowed to restore naturally in-situ. The conversion of 23.2 acres of PFO to PSS habitat is not anticipated to significantly affect the functions and values of the BVW and will be mitigated through a compensatory wetland mitigation plan that will be developed to mitigate for wetland impacts, primarily through permanent preservation. Section 7.2 discusses the proposed wetland compensatory mitigation plan that Eversource is developing in coordination with Kestrel Land Trust, the local conservation commissions, and MassDEP.

3. *Notwithstanding the provisions of 310 CMR 10.55(4)(a), the issuing authority may issue an Order of Conditions permitting work which results in the loss of a portion of Bordering Vegetated Wetland when;*
    1. *Said portion has a surface area less than 500 square feet;*
    2. *Said portion extends in a distinct linear configuration ("finger-like") into adjacent uplands; and*
    3. *In the judgment of the issuing authority, it is not reasonable to scale down, redesign or otherwise change the proposed work so that it could be completed without loss of said wetland.*

This performance standard is not applicable. No permanent wetland loss is proposed.

4. *Notwithstanding the provisions of 310 CMR 10.55(a), (b) and (c), no project may be permitted which will have any adverse effect on specified habitat sites or rare vertebrate or invertebrate species, as identified by procedures established under 310 CMR 10.59.*

As discussed in Section 5.4.2, SWCA has filed a Project Review Checklist with NHESP, which has determined that the Project will result in a Take of eastern box turtle habitat; Eversource will submit a CMP to NHESP that will ensure that the Project will implement sufficient mitigation to result in a net benefit to the eastern box turtle. Details regarding required NHESP conditions to avoid a Take of other state-listed species, including TOY restrictions and other mitigation measures, are described in Section 7.4.2.

5. *Any proposed work shall not destroy or otherwise impair any portion of Bordering Vegetated Wetland that is within an Area of Critical Environmental Concern designated by the Secretary of*

*Energy and Environmental Affairs under M.G.L. c. 21A, § 2(7) and 301 CMR 12.00: Areas of Critical Environmental Concern…*

This standard has been met. The Project is not located in an ACEC.

## 6.3 Water Quality Certification

Section 401 of the federal Clean Water Act and 314 CMR 9.00 require that construction and operation comply with the Massachusetts Water Quality Standards at 314 CMR 4.00. Much of the same information reviewed under the WPA is independently reviewed during this process. A 401 WQC is required for activities that result in impacts to more than 5,000 square feet of wetlands (including BVW, IVW, and land under water), as well as activities that result in the discharge of dredged or fill material to any ORWs.

The WQC regulations provide that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. Eversource has determined that there are no practicable alternatives with less adverse impact, as presented in Section 3 of this DEIR.

1. *No discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge that would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences.*

As described in Section 3, there is no practicable alternative to the proposed Project that would have less adverse impact on the aquatic ecosystem. Appropriate and practicable steps have been taken to avoid and minimize potential adverse impacts to the BVW and other Waters of the U.S. within the Commonwealth (WUSWC).

2. *No discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken, which will avoid and minimize potential adverse impacts to the bordering or isolated vegetated wetlands, land under water or ocean, or the intertidal zone. However, no such project may be permitted which will have any adverse effect on specified habitat sites of Rare Species.*

As discussed in Section 5.4.2, SWCA has filed a Project Review Checklist with NHESP, which has determined that the Project will result in a Take of eastern box turtle habitat; Eversource will submit a CMP to NHESP that will ensure that the Project will implement sufficient mitigation to result in a net benefit to the eastern box turtle. Details regarding required NHESP conditions to avoid a Take of other state-listed species, including TOY restrictions and other mitigation measures, are described in Section 7.4.2.

3. *Except as otherwise provided in 314 CMR 9.06(3), no discharge of dredged or fill material shall be permitted to Outstanding Resource Waters. The discharge of dredged or fill material to an Outstanding Resource Water in association with an activity listed in 314 CMR 9.06(3)(a) through (k) may be permitted without requiring the applicant to obtain a variance in accordance with 314 CMR 9.08 provided that the Department determines that the discharge of dredged or fill material may be permitted in accordance with 314 CMR 9.06(1), (2), (4), (5), and (7), and is not identified in 314 CMR 9.06(4) as a discharge of dredged or fill material that requires a variance.*

The Project requires the placement of temporary construction mats and tree removal within wetlands regulated as ORWs. Discharge of dredged or fill material within an ORW is typically prohibited under the WQC regulations unless a variance is obtained. Projects that may be permitted without a variance include maintenance and construction of utilities, public or private roadways, or other access (314 CMR 9.06(3)(f)).

These activities require the use of a span or other bridging techniques unless MassDEP determines, based on information contained in a Department 401 alternatives analysis, a USACE Section 404 alternatives analysis, or an Environmental Impact Report and the Secretary's certificate, that this alternative is not practicable, would not have less adverse impact on the aquatic ecosystem, or would have other significant adverse environmental consequences. As presented in Section 3, there are no alternatives to the Project that would otherwise prevent tree falls onto the energized power lines, which could potentially result in unsafe conditions and significant power outages, which come with their own potentially significant environmental consequences. Eversource is continuing to consult with MassDEP regarding measures to minimize impacts to ORWs as a result of the Project.

4. *The discharge of dredged or fill material into wetlands or waters of the Commonwealth within 400 feet of the high water mark of a Class A surface water (exclusive of tributaries) requires a variance issued by the Department pursuant to 314 CMR 9.08 unless the discharge of dredged or fill material is associated with an activity conducted by a public water system under 310 CMR 22.00: Drinking Water or by a public agency or authority for the maintenance or repair of existing public roads or railways. The discharge of dredged or fill material to a vernal pool certified by the Division of Fisheries and Wildlife requires a variance pursuant to 314 CMR 9.08.*

Eversource will discuss with MassDEP whether a variance from this standard would be required. The installation of equipment mats is necessary in WUSWC within 400 feet of the high-water mark of the following Class A waters – Nurse Brook, Dean Brook, High Brook, and Amethyst Brook.

5. *No discharge of dredged or fill material is permitted for the impoundment or detention of stormwater for purposes of controlling sedimentation or other pollutant attenuation. Discharge of dredged or fill material may be permitted to manage stormwater for flood control purposes only where there is no practicable alternative and provided that best management practices are implemented to prevent sedimentation or other pollution. No discharge of dredged or fill material is permitted for the impoundment or detention of stormwater in Outstanding Resource Waters for any purpose.*

This standard has been met. The Project will not result in a discharge of dredged or fill material for the impoundment or detention of stormwater.

6. *Except as otherwise provided in 314 CMR 9.06, stormwater discharges shall be provided with best management practices to attenuate pollutants and to provide a setback from the receiving water or wetlands in accordance with the following Stormwater Management Standards as further defined and specified in the Massachusetts Stormwater Handbook:*

    1. *No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

This standard is not applicable. No new stormwater conveyances are proposed as part of this Project.

    2. *Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for land subject to coastal storm flowage as defined in 310 CMR 10.04: Definitions.*

This standard has been met. The Project will not result in a change in topography, drainage, or impervious surfaces within any regulated areas that would alter peak discharge rates or require construction of a stormwater management system.

3. *Loss of annual recharge to ground water shall be eliminated or minimized through the use of infiltration measures, including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.*

This standard has been met. The Project will not result in a change in topography, drainage, or impervious surfaces within any regulated areas that would alter annual recharge to groundwater or require construction of a stormwater management system.

4. *Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids ("TSS"). This Standard is met when: a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan and thereafter are implemented and maintained; bb. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.*

This standard has been met. The Project will not result in a change in topography, drainage, or impervious surfaces within any regulated areas that would alter the quality of stormwater discharges or require construction of a stormwater management system.

5. *For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If, through source control and/or pollution prevention, all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such use as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26 through 53, and 314 CMR 3.00: Surface Water Discharge Permit Program, 4.00: Massachusetts Surface Water Quality Standards and 5.00: Ground Water Discharge Permit Program.*

This standard does not apply. The Project does not represent a land use with higher potential pollutant loads.

6. *Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such area as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area, if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1. or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00: Surface Water Discharge Permit Program and 4.00: Massachusetts Surface Water Quality*

*Standards. Stormwater discharges to a Zone I or Zone A are prohibited, unless essential to the operation of the public water supply.*

This standard is not applicable. No stormwater discharges, as defined in 314 CMR 3.04(2)(a)1. or (b), are proposed as part of this Project. These provisions generally refer to a conveyance or system of conveyances (including pipes, conduits, ditches, and channels) primarily used for collecting and conveying stormwater runoff.

7. *A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable. Standard 2, Standard 3, and the pretreatment and structural stormwater best management requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

This standard is not applicable. The Project in regulated areas will not alter topography, drainage patterns, or impervious surfaces.

8. *A plan to control construction related impacts, including erosion, sedimentation, and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation and pollution prevention plan) shall be developed and implemented.*

This standard has been met. Eversource will adhere to their BMP Manual as well as applicable permit conditions during construction to control impacts related to erosion and sedimentation.

9. *A long term operation and maintenance plan shall be developed and implemented to ensure that the stormwater management system functions as designed.*

This standard does not apply. The Project will not alter topography, drainage patterns, or impervious surfaces, so it will not require the development of a stormwater management system.

10. *All illicit discharges to the stormwater management system are prohibited.*

This standard has been met. This Project does not involve illicit discharges.

11. *No discharge of dredged or fill material shall be permitted in the rare circumstances where the activity meets the criteria for evaluation but will result in substantial adverse impacts to the physical, chemical, or biological integrity of surface Waters of the Commonwealth.*

This standard has been met. The Project meets the compliance standards outlined in 314 CMR 10.06 and will not result in substantial adverse impacts to the physical, chemical, or biological integrity of surface WUSWC. No WUSWC will be permanently filled or lost by the Project. Impacts to WUSWC from the placement of timber mats are temporary in nature and will be restored in-situ. As described in Section 7.2, Eversource is developing a compensatory wetland mitigation plan specific to the Project for the conversion of 24.4 acres of forested WUSWC to scrub-shrub WUSWC.

## 6.4 Massachusetts Endangered Species Act

The Massachusetts NHESP administers the MESA by requiring projects within mapped rare species habitats to undergo project review and, if a Take is anticipated, to obtain a Conservation and Management Permit (CMP) that will require mitigation sufficient to result in a net benefit to the species. Projects resulting in a Take of state-listed species may only receive a CMP if the Applicant demonstrates compliance with

the following performance standards set forth in 321 CMR 10.23: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species, (b) demonstrate that an insignificant portion of the local population will be impacted, and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species.

The Project crosses Priority Habitats of rare species, as identified in Section 4.4.2. As discussed in Section 5.4.2, SWCA has filed a Project Review Checklist with NHESP. NHESP determined that the Project will result in a Take of eastern box turtle habitat, thereby requiring the filing of a CMP consistent with 321 CMR 10.23. Details regarding required NHESP conditions to avoid a Take of other state-listed species, including TOY restrictions and other mitigation measures, are described in Section 7.4.2.

Pursuant to 321 CMR 10.23(2), the following performance standards must be met for the issuance of a CMP.

*a. The applicant has adequately assessed alternatives to both temporary and permanent impacts to State-listed Species;*

A detailed Alternatives Analysis has been provided in Section 3 of this DEIR.

*b. An insignificant portion of the local population would be impacted by the Project or Activity; and*

Eversource will develop a turtle protection plan in coordination with NHESP in order to avoid an incidental Take of individual eastern box turtles during tree removal activities.

*c. The applicant agrees to carry out a conservation and management plan that provides a long-term Net Benefit to the conservation of the State-listed Species that has been approved by the Director, as provided in 321 CMR 10.23(5), and shall be carried out by the applicant.*

Eversource is working with NHESP on developing an appropriate mitigation plan that provides at least 1:1 mitigation for eastern box turtle habitat conversion. This mitigation plan will include a monetary contribution to the eastern box turtle mitigation bank and/or the permanent preservation of land within the eastern box turtle priority habitat.

## 6.5 Local Wetland Protection Wetland Bylaws

Of the 11 municipalities crossed by the Project, six (Wendell, Shutesbury, Pelham, Belchertown, Amherst, and Ludlow) have a municipal wetlands bylaw. Through these bylaws, the towns protect some additional resource areas, such as isolated freshwater wetlands, the 100-foot Buffer Zone, land within 200 feet of a waterbody that is a public water supply, and land within 200 feet of a lake or pond tributary to a public water supply; and presume that these areas are important to the protection of their adjacent wetland areas. Amherst and Ludlow bylaw regulations also have additional performance standards and/or restriction of work activities near wetlands in addition to what the WPA regulations stipulate, which are reviewed below.

### 6.5.1 Amherst Wetland Protection Bylaw Regulations

With minor exceptions, the Amherst Wetlands Protection Bylaw Regulations (amended 2022) has the same performance standards for Bank, Bordering Vegetated Wetlands, BLSF, Riverfront Area as provided in 310 CMR 10.00. The Project's relationship with performance standards established in the Bylaw for isolated wetlands, buffer zone, and limited projects are discussed below.

### 6.5.1.1 GENERAL PERFORMANCE STANDARDS FOR ISOLATED WETLANDS

Performance standards for isolated wetlands and vernal pools are provided in Section IV.C.4.a of the Amherst Wetland Protection Bylaw Regulations, which requires that any proposed work in, or within 100 feet of Isolated Vegetated Wetland or Vernal Pool shall not result in the following:

> *i. Any impairment of the capacity of the Isolated Vegetated Wetland or Vernal Pool*

This standard is not applicable. The Project does not involve any TRRP activities in an isolated vegetated wetland or a vernal pool in Amherst.

> *ii. Any impairment of the area within 100 feet of the boundary Isolated Vegetated Wetland or Vernal Pool (or setback determined to be appropriate by the Conservation Commission to protect said wetland),*

This standard is not applicable. The Project does not involve any TRRP activities within 100 feet of an isolated vegetated wetland or vernal pool in Amherst.

> *iii. Any impairment or adverse impact to wildlife habitat within and surrounding Isolated Vegetated Wetlands or Vernal Pools.*

This standard is not applicable. The Project does not involve any TRRP activities in or within 100 feet of an isolated vegetated wetland or a vernal pool in Amherst.

> *iv. Flood damage due to filling that causes lateral displacement of water which would otherwise be confined within said area.*

This standard is met. No permanent wetland fills or encroachments in stream channels are proposed, and no temporary placement of equipment mats in BVW is proposed in Amherst.

> *v. An adverse effect of public and private water supply or groundwater supply.*

The Project crosses an approved Zone II Wellhead Protection Area for a public groundwater well operated by the Town of Amherst. To protect the public water supply, the Project will implement a SPCP during tree removal activities. The SPCP includes measures to minimize the potential for a spill of petroleum products or a hazardous or toxic substance and, in the event that a spill does occur, to contain and control the release to minimize the effects. Additional information on the SPCP is provided in Section 7.2.1.

> *vi. An adverse effect on the capacity of an Isolated Vegetated Wetland(s) or Vernal Pool(s) to prevent pollution of groundwater.*

This standard is not applicable. The Project does not involve any TRRP activities in an isolated vegetated wetland or a vernal pool in Amherst.

> *vii. An adverse effect on or impairment of specified wildlife habitat of rare vertebrate, invertebrate and/or plant species, as identified by procedures established under 310 CMR 10.59.*

This standard is met. Eversource will be submitting a CMP to NHESP for work within PH 1238 (EH 892) in Amherst. The CMP requires that the Project will have a long-term Net Benefit to the conservation of the state-listed species. Proposed mitigation for state-listed species under the CMP is discussed in Section 7.4.2.

### 6.5.1.2 GENERAL PERFORMANCE STANDARDS FOR BUFFER ZONES

The Commission presumes that utility work located within 50 feet of a locally regulated resource area will result in alteration of the resource area. Work includes operating construction equipment and altering vegetation. Work in the buffer zone must conform to the following performance standards set forth in Section IV.G.4 of the Bylaw regulations:

*a. Work in the Buffer Zone shall not alter a resource area.*

In Amherst, tree removal will result in the permanent conversion of approximately 0.35 acres of forested land to scrub-shrub land in the 100-foot Buffer Zone. Eversource will allow compatible vegetation to reestablish in the Buffer Zone, which is expected to reduce the impacts of tree removal activities. Section 7 discusses mitigation measures, including the use of BMPs to minimize impacts and a compensatory wetland mitigation plan to offset impacts to wetlands from buffer zone tree removal. The Project does not involve the temporary placement of equipment mats in the Buffer Zone in Amherst.

*b. If the Commission, at its discretion allows Buffer Zone alteration, all work must comply with the applicable performance standards.*

This standard is met. The proposed TRRP activities in the Buffer Zone will be in compliance with all applicable performance standards.

*c. In the case of work within the Buffer Zone that will result in an alteration of Vegetated Wetlands, the Commission may require wetland replication in accordance with Section IV.B.4 of the Bylaw. Replication shall be required for work occurring in the 30 Ft No-Work Distance for the type of project outlined in Section IV.G.3.a of the Bylaw, at a ratio of 2:1. If the Commission determines that it is unfeasible to create a replacement wetland on site, it may require the applicant to contribute financially to the construction of an off-site wetland replication area, or habitat or infrastructure improvement in lands under the control of the Commission, the contribution not to exceed the actual cost of the wetland replacement.*

This standard is met. Section 7 discusses mitigation measures, including the use of BMPs in the Buffer Zone to minimize impacts on wetland resource areas as well as a compensatory wetland mitigation plan to offset impacts to wetlands from buffer zone tree removal.

*d. For projects where the Massachusetts Stormwater Standards do not apply, such as single-family lots, point discharge of surface runoff within or through a Buffer Zone shall be designed and controlled to minimize increase in peak flow in the watercourse downstream of the discharge point for the runoff, as determined for the 2-year, 10-year, and 100-year storms, and to cause no increase in flood elevations outside the project site.*

The Project does not involve the construction of aboveground buildings, structures, or new roads, or the addition of impervious surface cover. As proposed, the TRRP activities in the 100-foot buffer zone are not expected to increase peak flow rates to downstream waters or increase flood elevations outside of the Project area.

### 6.5.1.3 LIMITED PROJECTS

According to IV.H of the Bylaw Regulations, the Amherst Conservation Commission may issue a Permit and impose such conditions as will contribute to the interests identified in the bylaw permitting limited projects as specified in the state Wetlands Protection Act Regulations, 310 CMR 10.53(3). In determining whether to exercise its discretion to approve the limited projects listed in 310 CMR 10.53(3), the Issuing

Authority shall consider the following factors: the magnitude of the alteration and the significance of the project site to the interests identified in M.G.L. c. 131, § 40, the availability of reasonable alternatives to the proposed activity, the extent to which adverse impacts are minimized, and the extent to which mitigation measures, including replication or restoration, are provided to contribute to the protection of the interests identified in M.G.L. c. 131, § 40.

This standard is met. The Project's consistency with the limited project provisions is reviewed in Section 6.2.1.

## 6.5.2 Ludlow Wetlands Protection Bylaw

The Ludlow Wetlands Protection Bylaw establishes a 25-foot No Disturb Zone from all locally jurisdictional resource areas for activities that are not specifically exempt from the WPA. However, per Section 2.A (Exceptions), the Commission can grant a variance to this no disturbance policy for public utilities where no feasible alternatives exist, and no permanent damage will occur to the wetland.

## 6.5.3 Shutesbury Wetland Protection Bylaw Regulations

The Shutesbury Wetlands Protection Bylaws and Regulations treats vernal pools and the 100-foot Adjacent Upland Resource Area (same as 100-foot Buffer Zone) as wetland resource areas. Per these regulations, proposed work and activities within the AURA and other resource areas must be avoided, and reasonable options must be considered to the extent possible. Accordingly, the Shutesbury Conservation Commission shall presume that the AURA and other resource areas should be left undisturbed and natural. The Project's attainment of performance standards in the Bylaw Regulations for vernal pools and the AURA are discussed below. Compliance with local performance standards for other wetland resource areas crossed by the Project in Shutesbury are similar to what is discussed in Section 6.2.

### *6.5.3.1 VERNAL POOL PERFORMANCE STANDARDS (SECTION 3.4 OF THE LOCAL WETLAND REGULATIONS)*

1. *No activity or work that will result in altering the Vernal Pool or the AURA of any Vernal Pool shall be permitted by the Commission, except upon a preponderance of evidence from a Credible Source showing that any proposed work and its natural and consequential cumulative impacts and effects shall have no unacceptable significant or cumulative effect upon any of the Values.*

This standard is met. The Project has been designed to avoid the replacement of timber mats in any vernal pools; however, it will involve tree removal from approximately 128 square feet of one vernal pool and tree removal within 100 feet of four vernal pools in Shutesbury converting forestland to scrub-shrub habitat. Tree removal is not expected to result in the loss of vernal pool habitat; however, tree removal in vernal pools and adjacent buffers may reduce shading and cover for vernal pool species. Mitigation measures proposed for work in vernal pools and their buffers are discussed in Section 7.2.

2. *The Commission may require habitat connectivity within the AURA be maintained between clusters of Vernal Pools and may consider development between Vernal Pools as habitat alteration, where fragmentation will adversely impact wildlife habitat associated with Vernal Pool(s).*

This standard is met. The vernal pools in the Project in Shutesbury are not clustered together. Nevertheless, the conversion of AURA by vernal pools from forested to scrub-shrub habitat does not exclude such areas from providing wildlife habitat or serving as wildlife corridors. The Project does not involve the construction of new structures, permanent roadways, or other developments that can restrict wildlife from moving to or from these vernal pools.

3. *Notwithstanding the provisions above in Section 3.4.1 above, no project may be permitted which will have any adverse effect on specified habitat sites of rare species, as identified on the most recent Priority Habitat and Estimated Habitat Map of state-listed rare wetland plants as well as wildlife published by the MA NHESP.*

The standard is met. As discussed in Section 5.4.2, SWCA has filed a Project Review Checklist with NHESP, which has determined that the Project will result in a Take of eastern box turtle habitat; Eversource will submit a CMP to NHESP that will ensure that the Project will implement sufficient mitigation to result in a net benefit to the eastern box turtle. Details regarding required NHESP conditions to avoid a Take of other state-listed species, including TOY restrictions and other mitigation measures, are described in Section 7.4.2.

### 6.5.4 100-Foot Adjacent Upland Resource Area (AURA) Performance Standards (6.4 of the Local Wetland Regulations)

1. *Where work is proposed in the AURA, the Applicant shall present a consideration of Reasonable Options to prove by a preponderance of credible evidence from a Competent Source that the project as proposed has met the standard of avoid, minimize, and mitigate and there are no Reasonable Options to the proposed project with materially less adverse or cumulative effects on the Values, and that the work, including proposed mitigation, will have no significant adverse impacts.*

As demonstrated in Section 3 of this DEIR, there are no reasonable alternatives to the Project that would meet the Project goal of protecting the existing Line 354 in Shutesbury from outages and hazardous conditions resulting from tree falls, while minimizing environmental impacts to the extent practicable. Eversource evaluated several alternatives to the Project, including a new underground line, a new overhead line with taller structures, and tree removal width alternatives. The nature of a linear facility such as the existing transmission line, coupled with the varied dispersal of wetlands in glaciated terrain, results in some unavoidable intersection of the transmission line tree removal activities with wetland resources. Eversource has carefully reviewed the existing corridor and determined areas where temporary construction matting impacts can be reduced to the extent feasible and where tree removal can be reduced based on the results of a LiDAR analysis.

2. *Any proposed work within the AURA of a Resource Area shall not result in any impairment of the Values and functions of the Resource Area nor shall it result in any impairment in the Values and functions of the AURA.*

In Shutesbury, tree removal will result in the permanent conversion of approximately 8.2 acres of forested land to scrub-shrub land in the 100-foot Buffer Zone/AURA. Eversource will allow compatible vegetation to reestablish in the Buffer Zone, which is expected to reduce the impacts of tree removal activities. Section 7 discusses mitigation measures, including the use of BMPs to minimize impacts and a compensatory wetland mitigation plan to offset impacts to wetlands from buffer zone tree removal. The Project does not involve the temporary placement of equipment mats in the Buffer Zone.

3. *The first inner fifty (50) feet of the 100-foot AURA (measured horizontally from a Resource Area specified in Article I is considered a "No Disturb" Protection Area. No activities or work, other than passive passage, Resource Area enhancement, and construction of Title 5 septic systems as set forth in Article III, Section 10 above, are permitted within the first fifty (50) feet of the AURA.*

See the response to the performance standard below.

4. *The 50-foot "No Disturb" restriction in the AURA shall not apply to any structure existing before the adoption of these Regulations. However, removed and replaced structures must comply with*

*the Regulations in effect at the time of the reconstruction. For pre-existing structures within the inner first fifty (50) feet of the AURA, which are not being removed but for which the footprint is changing, any increase in footprint area must occur in the outer 50 feet of the AURA.*

This standard is met. The proposed tree removal within the inner 50 feet of the AURA is associated with maintaining existing structures in accordance with FAC-003-4. No new structures are proposed as part of this Project.

5. *When an Applicant proposes a project with impact to the AURA, the Commission may require mitigation involving restoration, including but not limited to a wider undisturbed, vegetated area within the AURA; or new structures set back greater than fifty (50) feet.*

In Shutesbury, tree removal will result in the permanent conversion of approximately 8.2 acres of forested land to scrub-shrub land in the AURA. Eversource will allow compatible vegetation to reestablish in the 100-foot Buffer Zone/AURA, which is expected to reduce the impacts of tree removal activities. Section 7 discusses mitigation measures, including the use of BMPs to minimize impacts and a compensatory wetland mitigation plan to offset impacts to wetlands from buffer zone tree removal.

6. *In the case of new lots or work in undeveloped lots when partial encroachment into the AURA is unavoidable, in addition to the requirements noted above, the Applicant must mitigate the intrusion by creating or expanding an area of native vegetation within the first twenty-five (25) feet of the AURA on the lot. For unavoidable encroachment, as mitigation, the Commission may require improvements to remaining undisturbed AURA function.*

This standard is not applicable. The Project is located entirely within Eversource fee-owned land and Eversource-controlled utility easements in Shutesbury that contain the existing Line 354. No new easements or lots are required in Shutesbury.

7. *Impervious surface:*

   - *The total area of impervious surface within the AURA shall not increase over existing total area unless the Commission determines, based on sufficient proposed mitigation, that there is no permanent, significant impact on Resource Area Values.*

   - *Impervious surfaces shall not intrude farther into the AURA than pre-project conditions unless the Commission determines that the total area of impervious surface is significantly decreased, or other sufficient mitigation is provided that serves to protect the Resource Area Values. Impervious surface shall be kept as close as possible to the outer (upland) boundary of the AURA.*

This standard is not applicable. The Project does not involve an increase in impervious surface.

8. *Work in the AURA shall not adversely affect the hydrology of the site including runoff rates, volume, water quality, flood storage capacity, or flow paths.*

This standard has been met. The Project will not result in a change in topography, drainage, or impervious surfaces within any regulated areas that would alter peak discharge rates or require construction of a stormwater management system.

9. *For permitted projects in the AURA, landowners shall follow 330 CMR 31.00 Plant Nutrient Application Requirements for Agricultural Land and Land Not Used for Agricultural Purposes.*

This standard is not appliable. 330 CMR 31.00 establishes limitations on the application of plant nutrients to lawns and non-agricultural turf to prevent these non-point source pollutants from entering the surface and groundwater resources of the Commonwealth of Massachusetts. The Project does not involve the application of fertilizer or other plant nutrients.

10. *The Commission may allow temporary, limited, or permanent disturbance in the AURA as appropriate and consistent with this Section if the Applicant proves that there are no other Reasonable Options to the project with materially less adverse and cumulative effects on the Values protected by this Bylaw and convinces the Commission by a preponderance of credible evidence from a Competent Source that the area or part of it may be altered without harm to the Values taking into consideration the characteristics of the Resource Area, including but not limited to the following: slope, soil characteristics, drainage patterns, extent and type of existing native vegetation, extent and type of invasive vegetation, amount of impervious surface, wildlife and wildlife habitat, intensity and extent of use, and intensity and extent of adjacent and nearby uses. This approach is intended to allow flexibility for use of property while maintain necessary levels of protection of Resource Area Values protected by the Bylaw.*

The Project is not likely to have a significant or cumulative effect on the Values protected by the Bylaw. As demonstrated in Section 3 of this DEIR, there are no reasonable alternatives to the Project that would meet the Project goal of protecting the existing Line 312 in Shutesbury from outages and hazardous conditions resulting from tree falls, while minimizing environmental impacts to the extent practicable. The Project will not result in a change in topography, drainage, or impervious surfaces within any regulated areas that would alter peak discharge rates or require construction of a stormwater management system. While the Project does not result in the loss of wetlands, Eversource recognizes that there will be some changes to the wetland functions and values from the conversion of forestland to scrub-shrub habitat and, therefore, is proposing a compensatory wetland mitigation plan to be developed in consultation with the MassDEP Western Regional Office (WERO) and the local conservation commissions.

11. *Some activities in the AURA, which are deemed not likely to have a significant or cumulative effect on the Values, may be reviewed by the Commission provided that the other provisions of these Regulations are satisfied. Requirements for these proposed activities are addressed in Article V, Administrative Approval Requests.*

Eversource will file its Notice of Intent with the Shutesbury Conservation Commission in accordance with Article V of the Bylaw Regulations.

## 6.6 Town of Belchertown Stormwater Management Bylaws

The Town of Belchertown has established the Stormwater Management Bylaws (Chapter 112) and implementing regulations to provide reasonable guidance for the administration of site planning and stormwater management for the purpose of protecting local water resources from degradation. This bylaw applies to construction and post-construction stormwater runoff from new development and redevelopment projects. This bylaw is intended to integrate with other parts of the Town's land use regulations and not replace requirements, particularly of the Town of Belchertown Wetlands Protection Bylaw, The Belchertown Conservation Commission administers this bylaw.

Eversource will consult with the Belchertown Conservation Commission on whether the Project requires a Stormwater Permit or a waiver from the Chapter 112 filing requirements. Section 112-7 of the bylaw instructs that no person may initiate construction, any land clearing and grubbing, land grading, earth-moving, or other development activities without approval or waiver of the requirement for a stormwater management permit. Under the bylaw, development activities include land disturbing activities on land that

is currently in a natural vegetated state and does not contain alteration by man-made activities, much like parts of the WT-11 corridor where tree removal is proposed. However, the bylaw defines land disturbing activities as actions that cause a change in the position, location, or arrangement of soil, sand, rock, gravel or similar earth material. The Project does not involve these types of changes, particularly since grubbing is not proposed, nor will it involve land alteration, which the bylaw defines as any activity that will measurably change the ability of a ground surface area to absorb water or will change existing surface drainage patterns." The Project does not involve any new impervious surface, grading, or changes in drainage patterns.

The Project is consistent with the stormwater criteria in Section 7 of the Stormwater Regulations. All projects subject to the Bylaw must comply with the Massachusetts Stormwater Management Standards and must consider environmentally sensitive site design and Low Impact Development (LID) techniques identified in Section 7: Many of the Massachusetts Stormwater Management Standards and LID techniques are not applicable to the Project as it does not result in a change in topography, drainage, or impervious surfaces and would not alter peak discharge rates or require construction of a stormwater management system. Eversource has taken steps to reduce the amount of tree removal and will implement BMPs to protect wetland resource areas during the Project and stabilize disturbed ground surfaces.

## 6.7 Municipal Land Use and Open Space Plans

Several of the municipalities crossed by the Project have approved master plans, land use plans and/or open space and recreation plans. In general, the Project will have no negative effect upon the ability of these municipalities to execute those plans. The Project is located entirely within Eversource fee-owned land and Eversource-controlled utility easements, and no new easements are required. The ability of property owners to continue to use the land as currently allowed under the existing easement language will not be affected. In addition, as explained in Section 7.2.3.2, Eversource is currently evaluating potentially developable land to be conserved as part of the Project's compensatory wetland mitigation plan, which could add open space and recreational opportunities within or in proximity to one or more of the municipalities crossed by the Project.

## 6.8 State Highway Permit

Massachusetts Department of Transportation (MassDOT) permits are required for temporary construction access at state highway access points and associated overhead wire crossings along Old State Road, Mohawk Trail (MA-2 and MA-2A), Federal Street (MA-9), East State Street (US-202) and Center Street (MA-21). Eversource will submit the highway permit applications to the MassDOT District 2 Office in Northampton, Massachusetts prior to the start of construction. Eversource will fully comply with permit conditions to ensure a safe environment for traffic flow and construction crews in and around the roadways. Draft Section 61 Findings addressing compliance with the conditions of the issued permits are provided in Section 9.0 of this DEIR.

# 7 MITIGATION

This section provides a discussion of mitigation measures, including implementation of BMPs and compensatory mitigation, proposed for impacts to resources affected by the Project.

## 7.1 Topography, Geology, and Soils

As stated in Section 5.1, no impacts to topography or geology are anticipated as a result of the Project, as no leveling or grading of any new surfaces is proposed, and no excavation or filling will be required. Impacts to soils that may result from vegetation removal, disturbance or compaction by heavy machinery will be mitigated through the implementation of Eversource's BMP Manual, provided in Attachment 8.

The following are brief descriptions of some of the methods Eversource will utilize during tree removal activities to minimize impact upon soils:

- Cut trees at base with no stumping or grubbing;
- Install construction mats in wetlands to minimize soil rutting and compaction of wet soils;
- Install and maintain erosion and sediment control measures, where needed, based on site-specific conditions and weather;
- Reestablish vegetation as soon as possible following construction mat removal; and
- Inspect the ROW and maintain erosion and sediment controls as necessary until final stabilization is achieved.

## 7.2 Surface and Groundwater Hydrology and Quality

### 7.2.1 Groundwater Resources

As stated in Section 5.2.1, impacts to groundwater resources are not anticipated for this Project. Any potential for impacts to occur due to a spill of toxic or hazardous substances, which may include fuel, oil, hydraulic fluids, or other petroleum products, will be mitigated with the implementation of a Spill Prevention and Control Plan (SPCP).

The SPCP focuses first on minimizing the potential for a spill by requiring:

- Equipment inspection and maintenance;
- Appropriate fuel and material storage; and
- Appropriate equipment, refueling and parking.

Some procedures that are detailed in the SPCP to address a spill if it occurs include:

- Providing appropriate spill containment and cleanup equipment for use as needed;
- Implementing measures for the containment and control of the release to minimize the impact of the spill and to implement appropriate cleanup action;
- Providing necessary spill notifications; and

- Responding promptly to and conducting cleanup of all spills using appropriate containment and cleanup measures.

## 7.2.2 Surface Water Resources

Implementation of BMPs from both the BMP Manual and the SPCP, described in Sections 7.1 and 7.2.1, respectively, will aid in the protection of surface water resources throughout the Project area and its downstream reaches. Compliance with the BMP Manual and the SPCP will result in stormwater discharges being controlled as necessary to meet applicable water quality standards, including those that may apply to any impaired receiving waters with established TMDLs. Furthermore, Eversource anticipates mitigating potential impacts resulting from the Project through adherence to applicable permit conditions.

In addition to implementing the BMP Manual and SPCP, the following practices to avoid, minimize, and mitigate potential adverse impacts to surface waters will be implemented:

- Avoid the need for crossing streams to the maximum extent practicable. Where it is necessary, streams will be spanned with construction matting to avoid direct impacts to stream LUWW and Inland Bank and maintain ambient downstream flow rates.
- Coordinate tree removal activities and use of spans to avoid high flow and spawning periods, as practicable.
- Install additional erosion controls where needed to prevent sediment and siltation from entering streams.
- Permanently stabilize adjacent upland areas after tree removal activities.
- Inspect ROWs regularly during and after tree removal activities, repair any erosion controls and/or perform restoration, as needed, in a timely manner.
- Maintain existing low-growing, compatible vegetation in place on stream banks to the extent practicable.

As discussed in Section 5.2.2, the Project will require tree removal along 19,830 linear feet of Inland Bank. To offset these unavoidable impacts, Eversource is in the process of developing a compensatory mitigation plan, discussed in more detail in Section 7.2.3.2 below.

## 7.2.3 Wetland Resources

### *7.2.3.1 BEST MANAGEMENT PRACTICES*

Throughout tree removal activities, Eversource will protect and minimize the potential for adverse impacts to wetlands through the implementation of their BMP Manual and an SPCP developed for the Project (described in Sections 7.1 and 7.2.1 respectively), as well as through adherence with applicable permit conditions. An environmental monitor will conduct routine inspections on-site to oversee work within wetland areas and compliance with permit requirements.

Measures that will be taken to protect and minimize the potential for adverse impacts to wetlands to the extent practicable will include:

- Expedite work and limit the amount of equipment and activities in wetlands.
- Maximize the use of uplands for clearing access routes.

- Maintain existing vegetation while minimizing the amount of clearing to the extent practicable by targeting trees, as described by the typical tree pruning and removal methodology described in Section 2.2, within the Wire Zone, Border Zone, and ROW edge.
- Use construction matting for equipment access to avoid rutting and compaction of wetland soils.
- Install additional erosion controls where needed to prevent sediment and siltation from entering wetlands.
- Use a variety of tree removal methods/equipment to minimize impacts to wetland resources and sensitive areas, such as vernal pools. These techniques may include:
    - manual cutting;
    - use of equipment operating from uplands; and/or
    - drop and lop, which involves selectively cutting trees and leaving them in place to avoid dragging trees out of sensitive wetlands.
- Fell trees directionally (parallel to and within the ROW) to minimize impacts to residual vegetation where practical.
- Remove work materials, including construction matting, following Project completion.
- Remove large-diameter cut timber, or chip and stockpile it, and any other smaller cut timber and brush, only in uplands.
- Restore wetland resource areas to their original configurations and contours following construction mat removal.
- Permanently stabilize the ROW after Project completion.
- Inspect the ROW regularly during tree removal and repair any erosion controls and/or perform restoration, as needed, in a timely manner.
- Prohibit parking and refueling of equipment within at least 100 feet of a wetland.
- Prohibit the storage of hazardous materials, including chemicals, fuels, and lubricating oils, within 100 feet of a wetland.

Tree removal will result in the conversion of PFO wetlands into PSS wetlands. Tree stumps will be cut low to the ground and left in place so existing root systems can provide additional soil stability as new lower-growing vegetative communities become established. These areas will be allowed to revegetate naturally, but on slopes or other areas of concern, they will be seeded, as needed, with an appropriate mixture to ensure stabilization of soils and prevent sediment transport. Seeded and/or exposed areas will be covered with a layer of straw mulch, and erosion controls will remain in place until the restoration area is properly stabilized. Any wood or chipped material left on site as a result of tree removal activities will be placed in a manner that will not inhibit revegetation. Chips will not be left in wetlands or other sensitive resource areas, nor will they be stockpiled in such a manner that they may be transported into a wetland or other sensitive resource area.

Once activities for tree work are complete, all areas temporarily disturbed by construction matting will be restored to prework conditions and stabilized as necessary to minimize erosion and sedimentation to on- and off-site resource areas. Upon removal of construction mats, areas will be allowed to revegetate, as the existing seed stock in the soil will remain intact. A wetland scientist will review each disturbed area to ensure adequate revegetation in accordance with permit conditions. Additional restoration efforts will be implemented, if necessary, at the discretion of a wetland scientist and may include smoothing or raking of any ruts, the addition of wetland soils, seeding with a wetland seed mix, or the addition of straw mulch.

### 7.2.3.2 COMPENSATORY WETLAND MITIGATION PLAN

A compensatory wetland mitigation plan is being developed to offset environmental effects resulting from unavoidable impacts to wetlands and waterbodies as a result of the Project. The **primary goal** of the compensatory mitigation package will be to meet the wetland mitigation requirements under the state Water Quality Certification regulations, the Massachusetts WPA, and the local municipal wetland bylaws to the extent practicable. The state Water Quality Certification regulations at 314 CMR 9.06(2)(a) include general mitigation requirements for discharges to bordering or isolated vegetated wetlands, consisting of a minimum of 1:1 restoration or replication. Similarly, the state WPA regulations at 310 CMR 10.55(4)(b) require at least a 1:1 ratio of "replacement area" to "the lost area." Notably, the Project does not involve the permanent discharge of fill material or permanent loss of BVW as all equipment and construction matting will be removed from wetland areas and impacted areas revegetated and stabilized. Tree removal in wetland areas and stream banks from this TRRP Project will permanently convert forested wetlands to scrub-shrub wetlands, which will alter some of the functions and values that these forested wetlands provide the ecosystem but will not result in a loss of wetlands. Although the Project does not result in the loss of wetlands, Eversource recognizes that there will be some changes to the wetland functions and values as a result of tree removal and, therefore, is proposing land preservation as a primary means of compensatory wetland mitigation, in consultation with the MassDEP Western Regional Office (WERO) and the local conservation commissions.

In addition to Eversource's primary goal of developing a compensatory mitigation plan that meets state and local wetland requirements, Eversource has a number of **priorities** in identifying mitigation opportunities, including the following:

1. **Permanent land preservation** is Eversource's preferred method of mitigation. Permanently preserving forested wetland resource areas can offset the impacts from tree removal activities associated with the Project, while minimizing the risk of failure of the mitigation effort and the need for long-term monitoring. This forested land can also have the added benefits of sequestering carbon in both above and below-ground biomass and actively removing carbon dioxide from the atmosphere both today and in the future.

2. **Focusing on communities directly impacted by the Project**. Identifying potential parcels to provide this mitigation will be focused on those municipalities with the most Project-related forestland conversion in wetland resource areas. The plan will also be dictated by the availability of suitable mitigation sites in and in proximity to these municipalities, and the willingness of the local conservation commissions to assist with the identification of potential mitigation parcels in town.

3. **Focusing on mitigation projects with an EJ benefit.** If available, preference may be given to mitigation projects that may have a direct benefit to EJ communities**.** This may consist of identifying land preservation opportunities in or adjacent to the EJ community and/or identifying land preservation in a public water supply watershed that services an EJ community. Eversource will continue to work with the EJ communities and the local applicable conservation commissions in the Project area to identify whether such opportunities exist.

4. **Preference to mitigation projects that benefit multiple environmental resources.** Preference would be given to identifying sites and/or projects that provide benefits to multiple sensitive

resources, including wetland resource areas, priority habitat of rare species, coldwater fisheries resources, wildlife habitat corridors, and recreational trail opportunities.

5. **Preference to mitigation sites that are within mapped BioMap habitats.** BioMap habitats have been designated and mapped by MA DFG and The Nature Conservancy as lands and waters which are priorities for conserving biological diversity in Massachusetts.

6. **Timing of funding needs.** Identifying potential mitigation properties requires careful coordination of funding needs, given the conflicting fast-paced real estate market and the comparatively slow permitting process. Funding typically cannot be provided until environmental permits have been received, but identifying mitigation sites well in advance is often required to meet permitting requirements.

Eversource has teamed with the Kestrel to begin identifying potential mitigation sites. Kestrel is a highly respected land trust that has conserved more than 27,000 acres of wildlands, woodlands, and farmland since 1970 in partnership with landowners, communities, the Commonwealth and federal agencies. Eversource continues to coordinate with the Kestrel and local conservation commissions on identifying potential sites, with a number of opportunities recently presented by Kestrel and the conservation commissions that Eversource is currently investigating.

# 7.3 Air and Noise Quality

## 7.3.1 Air Quality

Eversource will apply BMPs during tree removal activities to reduce emissions from equipment and vehicles. On and off-road vehicles used during construction will minimize emissions by utilizing engines that adhere to the more stringent USEPA Tier 3 and 4 emissions standards when available and practical. Eversource will comply with Massachusetts state law related to engine idling time. All non-road engines will be operated using only ultra-low sulfur diesel (ULSD), which will not exceed 15 parts per million (ppm) sulfur concentration, in accordance with 40 CFR 80.510.

Dust control measures will be implemented as needed if construction access road conditions create airborne dust. These measures will be used on disturbed soil surfaces and exposed soil surfaces, especially during hot or dry weather periods in areas with excessively well-drained soils. Repetitive treatments will be used as needed, until the surface is permanently stabilized. Water will be applied as required to minimize the generation of dust from the construction area and exit points. Dust control methods will use water only and avoid other liquids, such as solutions containing calcium chloride. These practices reduce the amount of dust in the air and decrease the potential for accidents, respiratory problems, and airborne sedimentation. Table 7-1 includes types and specifications for dust control methods that may be used throughout the duration of the Project.

**Table 7-1. Dust Control Methods**

| TYPE | DESCRIPTION/USE |
|---|---|
| Vegetative cover | • Most effective and practical method.<br>• Use in disturbed areas not subject to traffic.<br>• Follow seeding requirements as directed by local guidelines or permit requirements. |
| Stone | • Cover soil surface with crushed stone/coarse gravel |

| TYPE | DESCRIPTION/USE |
|---|---|
| Water/Sprinkling | • Sprinkle exposed soils until wet, utilizing water trucks as applicable.<br>• Do not excessively wet the soils as this causes runoff and also wastes water. |
| Barriers | • Board fences, wind fences, and sediment fences control air currents and blowing soil.<br>• Wind barriers protect soil downgradient for a distance of 10 times the barrier height.<br>• Perennial grasses and stands of existing trees also serve as wind barriers, stressing the importance of planning work phasing properly and minimizing the amount of exposed soil. |

Given these mitigation measures, Eversource believes associated potential impacts from engine emissions and airborne dust will be negligible throughout the Project. Eversource will take all necessary precautions to prevent air pollution in accordance with 310 CMR 7.01(1) and will implement dust control measures as described in this section to prevent emissions that cause or contribute to a condition of air pollution in accordance with applicable provisions in 310 CMR 7.09.

### 7.3.2 Noise

The following measures will be taken to mitigate the noise impacts during the construction of the Project:

- Tree removal activities will be restricted to daylight hours.
- Vehicles and equipment will be equipped with mufflers.
- Vehicles and equipment will be maintained in accordance with manufacturers' recommendations.

With the implementation of the above minimization measures, it is not anticipated that noise levels during construction will be disruptive to nearby noise sensitive areas. No long-term noise impacts will result following the completion of this Project.

## 7.4 Plant and Animal Species and Habitat

### 7.4.1 Typical Vegetation and Wildlife Communities

Prior to the commencement of any tree removal activities, all workspace limits will be clearly marked in the field and depicted on the Construction Map Set. All water resource areas will also be clearly marked so that all Project personnel and inspectors will know where these sensitive environmental areas are located and where specialized mitigation measures and techniques must be implemented.

When pruning is necessary to clear the ROW, the work will adhere to ANSI A300 industry best practices, which include, among other things, the following requirements:

- Cuts will be smooth.
- Branch collars will not be cut (i.e., cuts should be made immediately in front of the branch collar).
- Large, heavy branches will be precut on the underside to prevent splitting or peeling of bark.
- Climbing spurs will not be used for tree climbing.

Eversource will follow the guidelines laid out in its BMP Manual to further minimize any potential impacts. Some of the measures that will be implemented to minimize impacts to vegetation include the following:

- Take into consideration soil and weather conditions when scheduling vegetation removal activities.
- Maximize the use of uplands for clearing access routes.

- Maintain existing vegetation while minimizing the amount of clearing to the extent practicable by targeting trees within the previously described vegetation management zones.
- Use a variety of tree cutting methods/equipment, including manual cutting, as appropriate, to minimize impacts to sensitive areas.
- Fell trees directionally (parallel to and within the ROW) to minimize impacts to residual vegetation where practical.
- Cut trees close to the ground, leaving root systems and stumps, where practical, to provide additional soil stability.
- Remove large-diameter cut timber or chip and stockpile it, and any other smaller cut timber and brush, only in uplands.

While tree work is in progress, Eversource will also apply invasive species management techniques to minimize the spread and introduction of invasive plant species within the Project work zone through the use of BMPs that will include the following:

- Require that equipment and vehicles arrive at the work site clean and free of soil and debris capable of transporting seeds or other propagules.
- Require the contractor to use compressed air or other means to remove soil and propagules from machinery and vehicles following work at invasive plant infested sites to control their transport.
- Require the construction contractor to use weed-free straw bales for sediment barrier installations and/or mulch.
- Use weed-free seed mixes, if needed, for restoration.

## 7.4.2 State-Listed Rare Species Habitat

NHESP issued a response to the MESA Project Review Checklist on March 3, 2023. NHESP determined that the Project will result in a Take of the Eastern Box Turtle and, as such, will require a Conservation and Management. In addition, NHESP has determined that the Project will not result in a Take of wood turtles, marbled salamander and climbing fern, with the implementation of the protection measures described in Sections 7.4.2.2 – 7.4.2.4. In addition to these measures, a contractor training program will be implemented to educate all contractor personnel on species life history, identification, and protection protocols.

### *7.4.2.1 EASTERN BOX TURTLE*

The Conservation and Management Permit for the Eastern Box Turtle must demonstrate a long-term net benefit to the species. This net benefit may take the form of permanent land preservation within the Priority Habitat(s) for Eastern Box Turtle that are affected by the Project or through a donation to the Eastern Box Turtle fund. Given the anticipated challenges to identifying sufficient land for preservation within the Priority Habitat(s), Eversource anticipates mitigation in the form of donation to the Eastern Box Turtle fund.

### *7.4.2.2 WOOD TURTLE*

All work within areas mapped as Priority Habitat for wood turtle will occur during the period of November 1 to April 14 of any year, unless otherwise approved in writing by the NHESP.

#### 7.4.2.3 MARBLED SALAMANDER

All work within areas mapped as Priority Habitat for marbled salamander shall occur during the period of October 1 through March 31 of any year, unless otherwise approved in writing by NHESP. Eversource will implement habitat enhancement measures for the marbled salamander near confirmed vernal pool areas in the Priority Habitat, by protecting native, compatible vegetation, such as shrubs, in wooded areas within 100 feet of confirmed vernal pools during the completion of the work. If native, compatible vegetation is not present, or is limited, woody plantings will be added in consultation with the NHESP.

In addition, Eversource will leave 5- to 8-foot coarse woody debris in a "spokes on a wheel" configuration surrounding the confirmed vernal pool within the Priority Habitat. This woody debris will be placed at the direction of an on-site wildlife biologist during tree removal activities using trees obtained from the Project area. The woody debris will serve as wildlife habitat feature and will provide shelter, food source, and assistance with navigation to the vernal pool. A brief report, including photographs of final site conditions, will be submitted to the NHESP within 30 days of the completion of enhancement work.

#### 7.4.2.4 CLIMBING FERN AND NORTHEASTERN BULRUSH

Prior to the start of work, Eversource will submit a Rare Plant Protection Plan to the NHESP for review and written approval. Said plan will detail procedures and best management practices for delineating and avoiding impacts to state-listed plants identified in and near proposed work areas during construction and be prepared and implemented by a qualified botanist. The Rare Plant Protection Plan will be implemented as approved by the NHESP, and any change to the Plan must be submitted to the NHESP for review and written approval prior to implementation of any requested changes.

## 7.5 Transportation Resources

The following measures will be taken to mitigate any impacts on transportation resources during the construction of the Project:

- A traffic management plan that may employ a police detail will be implemented to ensure traffic flow and the safety of pedestrians and vehicles during temporary interferences with roadways.

- Prior to construction, Eversource will photo or video document the pre-construction condition of each public roadway crossing of the WT-11 ROW. Should Project-related road damage result from the Project's vegetation removal activities, Eversource commits to notifying the appropriate highway agency and coordinating with that agency to provide any needed road repairs.

## 7.6 Scenic Qualities, Open Space, and Recreational Resources

Eversource and the construction contractor will employ appropriate best practices when conducting tree removal activities at trail crossings and recreation lands, including installing temporary barricades or construction fences, to avoid or minimize any impact on pedestrian use of these recreational areas. Where trail access is kept open, based on consultation with the appropriate property managers, signage and the use of spotters to protect pedestrians during tree removal activities and vehicle passage will be provided at trail crossings.

As part of agency consultations, Eversource and its representatives have developed site-specific mitigation to alleviate potential Project-related impacts on scenic resources and the recreational use of the Amethyst Brook/Buffam Falls Conservation Area. These measures are described below.

### 7.6.1 Amethyst Brook/Buffam Falls Conservation Area

In response to this concern, Eversource evaluated LiDAR data developed as part of the alternatives analysis, discussed in more detail in 3.4.2, and was able to identify multiple locations where tree removal could be reduced based on topography and site quality. These reductions were adopted as part of the 100-foot Modified Alternative and are depicted in the WT-11 TRRP DEIR Map Set provided in Attachment 2.

One such location where Eversource has reduced the extent of tree removal due to terrain considerations is at the Amethyst Brook crossing. Map Sheet 58 in Attachment 2 shows that the proposed tree removal within the Border Zone along the southern bank of the watercourse (opposite North Valley Road) has been eliminated. No new tree removal along Buffam Brook or the Buffam Falls Conservation Area is proposed.

## 7.7 Historic and Archaeological Resources

Eversource and PAL have developed BMPs to avoid impacts to cultural resources. These BMPs were provided to MHC as part of PAL's May 2022 Cultural Resources Due Diligence and Archaeological Sensitivity Assessment. MHC requested in a letter dated July 7, 2022, that the construction map sets be clearly marked to identify sensitive resource areas subject to these BMPs. The maps provided to the contractor will be marked with the appropriate required BMP measures.

By adhering to the BMPs outlined below, the Project will minimize ground disturbance in areas of archaeological sensitivity. The Eversource BMPs to be implemented during vegetation maintenance within archaeologically sensitive areas include no tree stumping, excavation, or grading; no tree felling on stone walls, cellar holes, or other surface features; and no stockpiling of brush or storing of equipment within these areas.

Two sets of BMPs are provided to avoid impacts to cultural resources: one for areas exhibiting archaeological sensitivity and one for areas that contain known cultural resources, including archaeological sites.

- **Sensitivity Areas** are those areas that have the potential to contain significant archaeological resources, but no archaeological sites or other cultural resources have been identified within them to date.
- **Known Resources** are those areas that contain previously identified cultural resources, including buried resources such as archaeological sites, aboveground resources such as historic structures or sites, Tribal areas of significance, which often take the form of piles or other concentrations of stone material, or combination resources such as cemeteries. BMPs will not be applied to archaeological resources that have been recommended as Not Eligible for inclusion in the National Register of Historic Places.

To avoid impacting archaeological sites, historic structures or sites, and Tribal areas of significance, Eversource will avoid physical impacts and significant ground disturbance to aboveground cultural resources and areas assessed as archaeologically sensitive. The most effective BMPs to avoid ground disturbance will vary depending on variables such as ground conditions and topography; therefore, the following BMPs are provided to guide Eversource staff and contractors with options for different situations.

### 7.7.1 Sensitivity Areas BMPs

- No excavation, trenching, or grading.
- Tree felling may not occur on stone walls, cellar holes, or other surface features. Large tree trunks, or portions thereof, shall not be dragged over culturally sensitive areas such that they create significant ground disturbances.
- Grubbing of stumps is not allowed. If stump grinding is necessary, it should be only completed down to the ground surface, and all disturbance below grade should be avoided.
- Minimize stockpiling large quantities of cut material unless approved by Eversource vegetation management compliance or oversight staff and licensing and permitting staff.
- If the use of mechanized equipment is required, ground disturbance (e.g., rutting) should be avoided. Avoidance/protection measures include avoiding "zero radius" turns, completing the work during winter months when the ground is frozen (as determined by Eversource vegetation management compliance or oversight staff and licensing and permitting staff), and by restricting equipment to already improved surfaces. If any significant rutting occurs, the activities causing the ground disturbance should be terminated until the ground surface is either stabilized (e.g., dried out or frozen) or mats can be employed to better distribute weight.
- If timber mats are used in these areas, they must be carefully placed and removed with appropriate equipment and shall not be dragged during installation or removal.

### 7.7.2 Known Sites BMPs

- No excavation, trenching, or grading.
- Tree felling may not occur on stone walls, cellar holes, or other surface features. Large tree trunks, or portions thereof, shall not be dragged over these areas.
- Grubbing of stumps is not allowed. If stump grinding is necessary, it should be only completed down to the ground surface, and all disturbance below grade should be avoided.
- No stockpiling of cut material or chips on these areas unless approved by Eversource vegetation management compliance or oversight staff and licensing and permitting staff.
- Hand-cutting must be prioritized in these areas, but if mechanized equipment is required and cannot be restricted to already improved surfaces, timber mats (or other acceptable products as determined in consultation with Eversource vegetation management compliance or oversight staff and licensing and permitting staff) must be used to either stage or traverse equipment over the area.
- Timber mats must be carefully placed and removed with appropriate equipment and shall not be dragged during installation or removal.
- Mower decks should be set at an appropriate level to avoid ground disturbance.

### 7.7.3 Archaeological Site Avoidance, Protection, and Post-Review Discoveries Plan

MHC requested the development of an ASAPP to avoid and protect impacts to historic period sites and potential ancient period sites identified in the Due Diligence Report. PAL developed an ASAPP for these sites and submitted it to MHC on April 10, 2023. The ASAPP sets forth measures to provide for the avoidance of project effects on historic properties identified during PAL's due diligence review and archaeological assessment. The ASAPP will be implemented before, during and after vegetation

maintenance activities within the three site areas identified within the Project's area of potential effect. These measures include:

- Cultural resources training
- Protective fencing
- Documentation of sensitive resource measures, including identification of "No Impact Areas" in construction documents and plans
- Post-vegetation maintenance documentation of sensitive resource areas by PAL
- Long-term resource protection measures through establishment of a GIS database identifying sensitive resource areas for future Eversource maintenance activities

In addition, the ASAPP includes several plans and procedures establishing protocols in the event of an unanticipated discovery during the proposed vegetation maintenance activities, including a post-review discoveries plan, unanticipated archaeological discovery procedures, and post-review discovery of human remains procedures.

# 7.8 Built Environment

The Project is located within existing utility easements and Eversource fee-owned land and will not alter the ability of property owners to continue to use the land as currently allowed under the existing easement language.

# 7.9 Rare or Unique Features, Public Health Conditions, and Environmental Justice Communities

## 7.9.1 Environmental Justice Communities

As described in Section 5.9.1.3, Eversource will continue outreach efforts to EJ populations, municipal officials, and landowners to identify potential mitigation opportunities in these communities.

# 7.10 Summary of Mitigation Commitments

As required under the EENF Certificate, Eversource has provided Table 7-2 to identify each mitigation commitment by impact category, the timing of the commitment, associated costs, and responsible parties.

**Table 7-2. Summary of Mitigation Commitments**

| SUBJECT MATTER CATEGORY | AGENCY ACTION OR PERMIT | MITIGATION COMMITMENT | APPROX. COST[1] | TIMELINE | RESPONSIBLE PARTY |
|---|---|---|---|---|---|
| Surface and Groundwater Hydrology and Quality | 401 Water Quality Certification and Orders of Condition | Implementation of Eversource BMP Manual | N/A | Construction Phase | Contractor |
| | | Implementation of SPCP | N/A | Construction Phase | Contractor |
| | | Environmental compliance monitor to ensure implementation of Eversource | $400,000 | Construction Phase | Environmental contractor |

| SUBJECT MATTER CATEGORY | AGENCY ACTION OR PERMIT | MITIGATION COMMITMENT | APPROX. COST[1] | TIMELINE | RESPONSIBLE PARTY |
|---|---|---|---|---|---|
| | | BMP Manual and Permit Conditions | | | |
| | | Monitoring by a wetland scientist of in-situ restoration areas for two years post-construction to ensure revegetation | $70,000 | Restoration Phase | Eversource and environmental contractor |
| | | Compensatory wetland mitigation to be coordinated with MassDEP and local conservation commissions | TBD | Pending issuance of Orders of Conditions and 401 Water Quality Certification | Eversource |
| Air and Noise Quality | N/A | Eversource will comply with Massachusetts state law related to engine idling time. All non-road engines will be operated using only ultra-low sulfur diesel (ULSD), which will not exceed 15 parts per million (ppm) sulfur concentration. | N/A | Construction Phase | Contractor |
| | | Tree removal activities will be restricted to daylight hours. | N/A | Construction Phase | Contractor |
| | | Vehicles and equipment will be equipped with mufflers. | N/A | Construction Phase | Contractor |
| | | Vehicles and equipment will be maintained in accordance with manufacturers' recommendations. | N/A | Construction Phase | Contractor |
| State-listed Rare Species | CMP | Contribution to the Eastern Box Turtle Mitigation Bank | Approx. $403,645 | Pre-construction | Eversource |
| | | Implementation of NHESP requested TOY restrictions in rare species habitat | N/A | Construction Phase | Contractor / Eversource |
| | | Placement of habitat enhancements in marbled salamander habitat and reporting | TBD | Restoration Phase | Contractor with oversight by wildlife biologist |
| | | Development and implementation of a turtle protection plan and rare plant protection plan | $20,000 | Construction and restoration phase | Wildlife biologist |
| | | Rare species contractor training | $5,000 | Pre-construction Phase | Eversource |
| Transportation Resources | MassDOT Access Permit – Old State Road, MA-2/2A, MA-9, US-202, and MA-21 | Implementation of traffic management plans | TBD | Construction Phase | Eversource |
| | | Pre-construction photo or video documentation of road crossing conditions | N/A | Pre-construction Phase | Eversource |
| | | Restoration of roads that are damaged by Project activities | TBD | Restoration Phase | Contractor |
| | | Truck Mounted Attenuators will be used on roadways with speeds of 45 miles per hour or greater | TBD | Construction Phase | Contractor |

| SUBJECT MATTER CATEGORY | AGENCY ACTION OR PERMIT | MITIGATION COMMITMENT | APPROX. COST[1] | TIMELINE | RESPONSIBLE PARTY |
|---|---|---|---|---|---|
| | | Safety signs, lights, cones, & barriers will be furnished, erected, and maintained for the duration of the work. Cones or non-reflectorized warning devices will be removed from operating position on the highway when the daytime operations have ceased. | TBD | Construction Phase | Contractor |
| | | Uniformed traffic police to be present when work involves blocking a portion of the traveled way. | TBD | Construction Phase | Contractor |
| | | Trees to be cut as close to the ground as possible; remove all cut trees, limbs, and brush from the State Highway Layout. | TBD | Construction Phase | Contractor |
| | | When weather conditions are suitable and proper settlement has occurred, disturbed areas will be restored to their original condition with like material. Grass areas will be returned to original condition with 4 inches of loam and seed. | TBD | Restoration Phase | Contractor |
| Historic and Archaeological Resources | Section 106 review by MHC | No tree stumping, excavation, or grading; no tree felling on stone walls, cellar holes, or other surface features; and no stockpiling of brush or storing of equipment. | N/A | Construction Phase | Contractor |
| | | Implementation of ASAAPs | N/A | Construction Phase | Contractor / Eversource |
| Carbon Sequestration | N/A – there is no state Agency Action or Permit requiring carbon mitigation for tree removal | Eversource will offer to donate firewood from trees removed from the ROW to each community | N/A | Construction Phase | Contractor / Eversource |
| Environmental Justice | N/A – there is no state Agency Action or Permit requiring EJ mitigation for tree removal | Donation of firewood to communities | N/A | Construction Phase | Eversource |

1 – N/A = Not applicable (i.e., either there is no cost associated with this mitigation commitment or cost cannot be determined as it is incorporated into the contractor bid); TBD = To Be Determined

# 8 CUMULATIVE IMPACTS FROM TRRP– WESTERN MA

In accordance with the Certificate on the EENF, Eversource was requested to provide a conceptual overview of the cumulative impacts of the entirety of the Western Massachusetts TRRP. Table 8-1 below provides a list of each ROW managed by Eversource in Western Massachusetts, its total site area, and a conceptual, quantitative overview of impacts from TRRP and the approximate timeline for each ROW's TRRP effort. Eversource will maintain this table internally, updating it for each Project as they go through the MEPA process for each project. As such, the table provides an updated quantification of impacts for the WT-02 TRRP Project, which is planned to commence this year.

Eversource anticipates that mitigation will focus on the preservation of sites within the affected watershed in cooperation with local land trusts. Eversource is committed to providing appropriate wetland mitigation, largely in the form of preservation of forested land, and developed in consultation with local conservation commissions, MassDEP WERO, and EJ community-based organizations.

**Table 8-1. TRRP Western Massachusetts Program-Wide Cumulative Impact Estimates**

| YEAR | PROJECT | ACRES OF TREE REMOVAL | | | | | | | | | TREE REMOVAL IN VERNAL POOLS (COUNT) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TOTAL | WETLANDS | 100-FT WETLAND BUFFER ZONE | OUTSTANDING RESOURCE WATERS | 200-FT RIVERFRONT AREA | BLSF | STATE AND ARTICLE 97 LANDS | NHESP PRIORITY HABITAT | UPLANDS | |
| 2025 | WT-02 | 122.8 | 14.0 | 39.6 | 1.4 | 7.0 | 3.7 | 43.8 | 7.0 | 108.8 | 3 |
| | *Subtotals* | *122.8* | *14.0* | *39.6* | *1.4* | *7.0* | *3.7* | *43.8* | *7.0* | *108.8* | *3* |
| 2026 | WT-11 | 278.1 | 24.2 | 80.9 | 4.4 | 23.1 | 6.3 | 114.9 | 86.1 | 253.8 | 7 |
| | WT-23 | 28.9 | 5.9 | 10.7 | 0.0 | 7.1 | 0.4 | 0.0 | 10.1 | 23.0 | 0 |
| | *Subtotals* | *307.9* | *30.1* | *91.6* | *4.4* | *30.2* | *6.7* | *114.9* | *96.2* | *276.8* | *7* |
| 2027 | WT-01 | 143.0 | 17.9 | 56.7 | 4.5 | 16.9 | 2.1 | 22.9 | 19.2 | 125.1 | 6 |
| | WT-24 | 27.1 | 5.8 | 12.8 | 0.0 | 4.9 | 1.3 | 0.7 | 2.9 | 21.3 | 5 |
| | *Subtotals* | *170.1* | *23.7* | *69.5* | *4.5* | *21.9* | *3.4* | *23.6* | *22.2* | *146.4* | *11* |
| 2028 | WT-03 | 190.8 | 15.7 | 57.3 | 0.2 | 27.3 | 9.9 | 23.7 | 63.5 | 175.2 | 1 |
| | *Subtotals* | *190.8* | *15.7* | *57.3* | *0.2* | *27.3* | *9.9* | *23.7* | *63.5* | *175.2* | *1* |
| 2029 | WT-13 | 49.0 | 3.3 | 17.4 | 0.0 | 4.6 | 0.2 | 25.8 | 3.8 | 45.7 | 4 |
| | WT-14 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0 |
| | *Subtotals* | *49.4* | *3.3* | *17.4* | *0.0* | *4.6* | *0.2* | *25.8* | *3.8* | *46.1* | *4* |
| 2030 | WT-25 | 91.5 | 16.4 | 32.7 | 0.0 | 17.6 | 10.5 | 1.9 | 9.7 | 75.1 | 7 |
| | WT-26 | 104.5 | 28.2 | 51.0 | 0.0 | 39.7 | 28.3 | 0.1 | 53.8 | 76.3 | 3 |
| | WT-27 | 5.4 | 0.3 | 1.8 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 5.1 | 0 |
| | *Subtotals* | *201.4* | *44.9* | *85.6* | *0.0* | *57.4* | *40.6* | *2.0* | *63.5* | *156.5* | *10* |
| 2031 | WT-04 | 26.7 | 4.9 | 10.0 | 0.0 | 3.7 | 4.0 | 0.5 | 1.3 | 21.9 | 0 |
| | WT-05 | 77.2 | 6.2 | 13.4 | 0.6 | 10.0 | 5.4 | 29.5 | 1.4 | 71.1 | 1 |
| | WT-21 | 85.5 | 12.0 | 33.4 | 0.0 | 10.5 | 21.8 | 11.8 | 20.9 | 73.5 | 1 |
| | WT-22 | 46.2 | 9.4 | 22.7 | 0.0 | 8.4 | 15.9 | 9.9 | 11.0 | 36.8 | 3 |
| | WT-31 | 83.1 | 21.0 | 37.9 | 0.0 | 10.8 | 22.2 | 14.0 | 14.5 | 62.0 | 1 |
| | *Subtotals* | *318.7* | *53.5* | *117.5* | *0.6* | *43.5* | *69.3* | *65.8* | *49.1* | *265.2* | *6* |

| YEAR | PROJECT | ACRES OF TREE REMOVAL | | | | | | | | | TREE REMOVAL IN VERNAL POOLS (COUNT) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | TOTAL | WETLANDS | 100-FT WETLAND BUFFER ZONE | OUTSTANDING RESOURCE WATERS | 200-FT RIVERFRONT AREA | BLSF | STATE AND ARTICLE 97 LANDS | NHESP PRIORITY HABITAT | UPLANDS | |
| 2032 | WT-12 | 164.0 | 27.6 | 83.6 | 0.0 | 23.1 | 5.6 | 25.9 | 45.5 | 136.4 | 2 |
| | WT-32 | 101.4 | 13.0 | 29.0 | 0.0 | 7.9 | 7.1 | 19.9 | 19.9 | 88.4 | 0 |
| | WT-33 | 315.7 | 13.4 | 73.3 | 2.7 | 26.7 | 6.7 | 98.3 | 13.4 | 302.2 | 0 |
| | WT-34 | 7.7 | 0.4 | 1.7 | 0.3 | 0.0 | 0.0 | 5.9 | 1.5 | 7.4 | 0 |
| | Subtotals | 588.8 | 54.4 | 187.6 | 3.0 | 57.7 | 19.3 | 149.9 | 80.3 | 534.4 | 2 |
| **TOTAL** | | **1,949.4** | **238.9** | **666.1** | **14.1** | **249.6** | **153.1** | **449.5** | **385.6** | **1,709.4** | **44** |

Green text represents actual impacts approved by MassDEP and municipal conservation commissions.
Blue text represents impacts based on current project design and are likely to change based on permitting and continued refinement of project elements.
Black text represents estimated impacts developed based on available data. See notes below.

Notes:
1: Data is intended for review purposes only. To be verified/revised for submitted version(s).
2: Approximate limits of vegetation management (i.e., "cutlines") used for calculations assume a 113-foot offset from 69-kV and 115-kV centerlines and 126-foot offset from 345-kV centerlines (i.e., H-frames, or the maximum offset per TRRP guidelines).
3: Forested areas to be cleared ("treelines") used for calculations are based on airphoto digitization for WT-02, WT-11, WT-13, and WT-24. Calculations for other projects are based on MassGIS "LandCoverLandUse" data "forested" categories.
4a – Comparison of 2016 LULC data and treeline data for four projects (WT-02, WT-11, WT-13, WT-24) suggests a tree removal area over-estimated of up to 30% in some places, especially in more urbanized locations.
4b – For three projects (WT-21, WT-31, and WT-33), TRRP type clearing in non-jurisdictional areas occurred in 2018/2019; thus, the clearing acreages obtained from the MassGIS 2016b "LandCoverLandUse" data overestimate what will actually occur.
4: Wetland and 100-foot wetland buffer impacts for WT-02, WT-11, WT-13, and WT-24 are based on delineated wetland data. Wetland and 100-ft buffer impacts for other projects are based on a composite of delineated wetland data and MassGIS DEP Wetland data (2017).
5: Wetlands data did not include attributes to allow BVW vs. IVW breakdown.
6: Outstanding Resource Waters impacts include wetlands within MassGIS (2010) ORW polygons. See Note 2.
7: 200-ft Riverfront Area impacts for WT-02, WT-11, WT-13, and WT-24 are based on delineated stream data. Riverfront Area impacts for other projects are based on a composite of delineated stream data and MassGIS DEP Stream data attributed as both perennial and USGS-sourced.
8: BLSF impact calculations are based on FEMA's 1% annual chance flood areas, where available. Digital FEMA data is not available for portions of WT-03 and WT-12.
9: State and Article 97 Lands boundaries are based on MassGIS (2025a).
10: NHESP Priority Habitat data is dated August 2021 (latest available) (MassGIS 2021a).
11: CVP polygon data is only available for the WT-02 and WT-11. Other projects' counts are based on 50-ft buffers from a composite of NHESP CVP and PVP point data. Vernal pool counts are within the subject ROW and not necessarily within to-be-cleared areas.
12: Upland tree removal (calculated) is the difference between Total and Wetlands tree removal categories.

# 9 SECTION 61 FINDINGS

This section provides a draft template for Section 61 Findings pursuant to the Secretary's EENF Certificate and in accordance with M.G.L. Ch. 30, Sec. 61, which states: "Any determination made by any agency of the Commonwealth shall include a finding describing the environmental impact, if any, of the project and a finding that all feasible measures have been taken to avoid or minimize said impact."

This section contains draft Section 61 Findings for those issues that are within the scope of this DEIR, including the following state agencies, actions and/or statutory requirements:

- MassDEP - Individual Water Quality Certification
- MassDOT – State Highway Access Permit
- NHESP – Conservation and Management Permit

**EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS**

**DIVISION OF WETLANDS AND WATERWAYS**

**MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION**

## DRAFT FINDING PURSUANT TO M.G.L. C 30, SECTION 61

**PROJECT NAME:** WT-11 Transmission Right-of-Way Reliability Program (TRRP) Project

**PROJECT LOCATION:** Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, Ludlow

**PROJECT PROPONENT:** Eversource Energy (Eversource)

**EEA NUMBER:** 16570

**PERMIT**: 401 Water Quality Certification (M.G.L. c. 21; 314 CMR 9.00)

**PROJECT DESCRIPTION:** To maintain compliance with industry standards, minimize risk to public safety, enhance reliability, and improve system performance during severe weather events, Eversource has developed their transmission right-of-way reliability program (TRRP), a long-term transmission system reliability and resiliency program that increases the maintained width of the right-of-way (ROW) to 100 feet from the outermost conductor or the easement edge, whichever is closer. The WT-11 ROW contains the overhead 345-kilovolt (kV) Lines 312 and 354 and the 115-kV Line 1604 from the Northfield Substation to Erving Junction and only contains Line 354 from Erving Junction to the Ludlow substation. The WT-11 ROW is 300-500 feet wide and has an existing maintained width between 125-335 feet. The proposed TRRP will increase the maintained ROW width to an average width of 250-500 feet by cutting trees from within the currently unmaintained/forested portions of the ROW, which increases the distance between the overhead transmission lines and the adjacent trees.

**MEPA HISTORY:** Eversource initiated the Massachusetts Environmental Policy Act (MEPA) review by filing an Expanded Environmental Notification Form (EENF) on June 15, 2022, which was noticed in the *Environmental Monitor* on June 24, 2022. On August 5, 2022, revisions to the EENF were filed with MEPA. On September 30, 2022, the EOEEA Secretary issued a Certificate stating that the Project required the filing of a Draft Environmental Impact Report (DEIR) and Final Environmental Impact Report (FEIR). The DEIR was submitted on August 7, 2025.

**PROJECT IMPACTS AND MITIGATION:** Refer to Table A for a list of impacts and corresponding mitigation relative to wetlands and waters.

**Table A. Summary of Proposed Wetlands / Waterways Mitigation**

| Category | Impact | Mitigation Measures |
|---|---|---|
| Waters of the U.S. within the Commonwealth – Bordering and Isolated Vegetated Wetlands | Temporary alteration of 10.1 acres during vegetation removal activities from construction matting | Remove construction matting and restore temporary wetland alterations in-situ in accordance with the standards required at 314 CMR 9.06(1). |
| Waters of the U.S. within the Commonwealth – Bordering and Isolated Vegetated Wetlands | Permanent conversion of 24.2 acres of forested wetland to scrub-shrub wetland | Permanent wetland conversion will be offset by the development of a compensatory mitigation plan that would provide a minimum 1:1 ration of wetland mitigation. |
| Waters of the U.S. within the Commonwealth – Bank | Permanent conversion of 19,714 linear feet of forested Inland Bank to scrub-shrub | Permanent Bank conversion will be offset by the development of a compensatory mitigation plan to provide a minimum 1:1 ratio of Bank mitigation. |

**FINDINGS:** Based on its review of the MEPA documents, the permit application, public comments, and Massachusetts Department of Environmental Protection's regulations, MassDEP finds the terms and conditions to be incorporated into the permits required for the Project and the mitigation commitments set forth in the attached Table A will constitute all feasible measures to avoid damage to the environment and will minimize and mitigate such damage to the maximum extent practicable for those impacts subject to MassDEP's authority. Appropriate conditions consistent with this Section 61 Finding are included in the Section 401 Water Quality Certification issued by the Department to describe more fully and ensure implementation of said measures.

**DEPARTMENT OF ENVIRONMENTAL PROTECTION**

_____ _____

**BY** **DATE**

**MASSACHUSETTS DEPARTMENT OF TRANSPORTATION**

**HIGHWAY DIVISION – DISTRICT 2**

**DRAFT FINDING PURSUANT TO M.G.L. C 30, SECTION 61**

**PROJECT NAME:** WT-11 Transmission Right-of-Way Reliability Program (TRRP) Project

**PROJECT LOCATION:** Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, Ludlow

**PROJECT PROPONENT:** Eversource Energy (Eversource)

**EEA NUMBER:** 16570

**PERMIT**: MassDOT State Highway Access Permit (M.G.L. Chapter 81, Section 21 and Chapter 85, Section 2)

**PROJECT DESCRIPTION:** To maintain compliance with industry standards, minimize risk to public safety, enhance reliability, and improve system performance during severe weather events, Eversource has developed their transmission right-of-way reliability program (TRRP), a long-term transmission system reliability and resiliency program that increases the maintained width of the right-of-way (ROW) to 100 feet from the outermost conductor or the easement edge, whichever is closer. The WT-11 ROW contains the overhead 345-kilovolt (kV) Lines 312 and 354 and the 115-kV Line 1604 from the Northfield Substation to Erving Junction and only contains Line 354 from Erving Junction to the Ludlow substation. The WT-11 ROW is 300-500 feet wide and has an existing maintained width between 125-335 feet. The proposed TRRP will increase the maintained ROW width to an average width of 250-500 feet by cutting trees from within the currently unmaintained/forested portions of the ROW, which increases the distance between the overhead transmission lines and the adjacent trees.

**MEPA HISTORY:** Eversource initiated the Massachusetts Environmental Policy Act (MEPA) review by filing an Expanded Environmental Notification Form (EENF) on June 15, 2022, which was noticed in the *Environmental Monitor* on June 24, 2022. On August 5, 2022, revisions to the EENF were filed with MEPA. On September 30, 2022, the EOEEA Secretary issued a Certificate stating that the Project required the filing of a Draft Environmental Impact Report (DEIR) and Final Environmental Impact Report (FEIR). The DEIR was submitted on August 7, 2025.

**PROJECT IMPACTS AND MITIGATION:** Refer to Table A for a list of impacts and corresponding mitigation relative to state road crossings.

**Table A. Summary of Proposed State Road Crossing Mitigation**

| Category | Impact | Mitigation Measures |
|---|---|---|
| State Roads | Crossing of Old State Road in Erving during construction. | Eversource will apply for a MassDOT permit via the State Highway Access Permits System (SHAPS) for landscape/vegetation – selective trimming. Eversource will adhere to all permit conditions, which we anticipate will include implementation of a traffic management plan. |
| State Roads | Crossing of Mohawk Trail (MA-2 & 2A) in Erving during construction. | Eversource will apply for a MassDOT permit via the State Highway Access Permits System (SHAPS) for landscape/vegetation – selective trimming. Eversource will adhere to all permit conditions, which we anticipate will include implementation of a traffic management plan. |
| State Roads | Crossing of Federal Street (MA-9) in Belchertown during construction. | Eversource will apply for a MassDOT permit via the State Highway Access Permits System (SHAPS) for landscape/vegetation – selective trimming. Eversource will adhere to all permit conditions, which we anticipate will include implementation of a traffic management plan. |
| State Roads | Crossing East State Street (US-202) in Granby during construction. | Eversource will apply for a MassDOT permit via the State Highway Access Permits System (SHAPS) for landscape/vegetation – selective trimming. Eversource will adhere to all permit conditions, which we anticipate will include implementation of a traffic management plan. |
| State Roads | Crossing of Center Street (MA-21) in Ludlow during construction. | Eversource will apply for a MassDOT permit via the State Highway Access Permits System (SHAPS) for landscape/vegetation – selective trimming. Eversource will adhere to all permit conditions, which we anticipate will include implementation of a traffic management plan. |

**FINDINGS:** Based on its review of the MEPA documents, the permit application, public comments, and MassDOT's regulations, MassDOT finds the terms and conditions to be incorporated into the permits required for the Project and the mitigation commitments set forth in the attached Table A will constitute all feasible measures to avoid damage to the environment and will minimize and mitigate such damage to the maximum extent practicable for those impacts subject to MassDOT's authority. Appropriate conditions consistent with this Section 61 Finding are included in the Access Permit issued by MassDOT to describe more fully and ensure implementation of said measures.

**MASSACHUSETTS DEPARTMENT OF TRANSPORTATION**

_____ _____

**BY** **DATE**

## MASSACHUSETTS NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM

## DRAFT FINDING PURSUANT TO M.G.L. C 30, SECTION 61

**PROJECT NAME:** WT-11 Transmission Right-of-Way Reliability Program (TRRP) Project

**PROJECT LOCATION:** Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, Ludlow

**PROJECT PROPONENT:** Eversource Energy (Eversource)

**EEA NUMBER:** 16570

**PERMIT/ACTION:** Conservation and Management Permit (M.G.L. Chapter 131, 321 CMR 10.00)

**PROJECT DESCRIPTION:** To maintain compliance with industry standards, minimize risk to public safety, enhance reliability, and improve system performance during severe weather events, Eversource has developed their transmission right-of-way reliability program (TRRP), a long-term transmission system reliability and resiliency program that increases the maintained width of the right-of-way (ROW) to 100 feet from the outermost conductor or the easement edge, whichever is closer. The WT-11 ROW contains the overhead 345-kilovolt (kV) Lines 312 and 354 and the 115-kV Line 1604 from the Northfield Substation to Erving Junction and only contains Line 354 from Erving Junction to the Ludlow substation. The WT-11 ROW is 300-500 feet wide and has an existing maintained width between 125-335 feet. The proposed TRRP will increase the maintained ROW width to an average width of 250-500 feet by cutting trees from within the currently unmaintained/forested portions of the ROW, which increases the distance between the overhead transmission lines and the adjacent trees.

**MEPA HISTORY:** Eversource initiated the Massachusetts Environmental Policy Act (MEPA) review by filing an Expanded Environmental Notification Form (EENF) on June 15, 2022, which was noticed in the *Environmental Monitor* on June 24, 2022. On August 5, 2022, revisions to the EENF were filed with MEPA. On September 30, 2022, the EOEEA Secretary issued a Certificate stating that the Project required the filing of a Draft Environmental Impact Report (DEIR) and Final Environmental Impact Report (FEIR). The DEIR was submitted on August 7, 2025.

**PROJECT IMPACTS AND MITIGATION:** Refer to Table A for a list of impacts and corresponding mitigation relative to state road crossings.

**Table A. Summary of Conservation and Management Permit Mitigation**

| Category | Impact | Mitigation Measures |
|---|---|---|
| Rare Species | Potential inadvertent Take of Eastern Box Turtle during construction activities. Conversion of forested habitat to scrub-shrub habitat from long-term vegetation maintenance within the expanded maintained corridor. | Eversource will perform construction under the Project's BMP Manual. Eversource will develop and implement a turtle protection plan during construction. Eversource will provide compensatory mitigation at a minimum 1:1 ratio of conversion: mitigation within Eastern Box Turtle Priority Habitat through land preservation and/or contributions to the Eastern Box Turtle Scientific Fund. |

**FINDINGS:** Based on its review of the MEPA documents, the documents and data uploaded through the PLPA Portal, public comments, and the Environmental regulations, NHESP finds the terms and conditions to be incorporated into the land disposition approval required for the Project and the mitigation commitments set forth in the attached Table A will constitute all feasible measures to avoid damage to the environment and will minimize and mitigate such damage to the maximum extent practicable for those impacts subject to NHESP's authority. Appropriate conditions consistent with this Section 61 Finding are included in the Conservation and Management Permit issued by NHESP to describe more fully and ensure implementation of said measures.

**MASSACHUSETTS NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM**

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**BY** **DATE**

# 10 RESPONSE TO COMMENTS

Table 10-1 provides Eversource's responses to comments received during the EENF comment period. Comment letters with comment numbers assigned by Eversource are provided in Attachment 9.

**Table 10-1. Response to Comments during EENF Comment Period**

| COMMENT NUMBER | COMMENTS | RESPONSES |
|---|---|---|
| **Response to Comments from EENF Certificate, MEPA Certificate Scope (9/30/2022)** | | |
| A-1 | The DEIR should identify measures the Proponent will include to further reduce the impacts of the project since the filing of the EENF, or, if certain measures are infeasible, the DEIR should discuss why these measures will not be adopted. | Eversource has carefully reviewed the Project design to identify measures to further reduce impacts. This review has resulted in the adoption of the "100-ft Modified" alternative, as described in the Alternatives Analysis provided in Section 3 of this DEIR. |
| A-2 | The DEIR should describe the project and identify any changes to the project since the filing of the EENF. | Section 2 of this DEIR describes the Project. Changes to the Project since the filing of the EENF are presented in Section 1.2.1. |
| A-3 | It should include updated site plans for existing and post-development conditions. Conceptual plans should be legible and provided at a reasonable scale. Plans should clearly identify: all major project components (structures, transmission lines, access roads, etc.); public areas; wetland resource areas; impervious areas; ownership of parcels including easements; and stormwater and utility infrastructure. The DEIR should include revised maps to illustrate the width of the transmission line, which is approximately 35 feet between out conductors, as a thin stripe rather than a line to be consistent with the maps' scale of one inch = 100 feet. The revised maps should show the height of the transmission lines in each map section. | Updated site plans are provided in the DEIR Map Set provided in Attachment 2. The maps depict the individual transmission lines present on the transmission structures in order to illustrate the width occupied by the lines. Height of transmission line structures is provided in the Cross-Section drawings provided in Attachment A. |
| A-4 | The DEIR should indicate if additional permanent and temporary easements will be required to facility tree clearing and create access to the ROW. | As discussed in Section 4.8, no new permanent easements are required as part of the Project. Off-ROW access roads are required in select locations where sensitive environmental features, topography, or other features are present that need to be avoided for safety and/or impact minimization. |
| A-5 | The DEIR should provide a brief description and analysis of all applicable statutory and regulatory standards and requirements and describe how the project will meet those standards. | Section 6 describes the statutory and regulatory standards and requirements associated with the Project, including state and local agency requirements |
| A-6 | It should include a list of required State Permits, Financial Assistance, or other State or local approvals and provide an update on the status of each. | Section 1.3 of the DEIR provides a list of required permits needed for the Project and an update on the status of each. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
|---|---|---|
| A-7 | The DEIR should include an expanded alternatives analysis that provides full justification for dismissing the No Build alternative and evaluates an alternative that considers reduced or varying tree clearing widths and a scenario that avoids and minimizes environmental impacts and tree clearing within sensitive resource areas such as vernal pools, ORWs, wetlands, and rare species habitat. The DEIR should document proposed conditions for these alternatives, quantify environmental impact and provide a conceptual plan. It should compare the environmental impacts with the Preferred Alternatives, in particular, with respect to land alteration, wetland resource areas, vernal pools, ORWs, rare species habitat, archaeological resources, GHG emission impacts and climate resiliency. Impacts should be reported in total and broken out for each community. | A detailed Alternatives Analysis is presented in Section 3. This Alternatives Analysis discusses the No Build Alternative; alternative engineering designs; alternative tree clearing widths; and targeted tree clearing reductions. Impacts to land alteration, wetland resource areas, vernal pools, ORWs, rare species habitat, archaeological resources, GHG emission impacts, and climate resiliency are provided for the various tree clearing width scenarios. |
| A-8 | The DEIR should justify why, within the new area proposed to be cleared, it is likely that much of the non-target vegetation will also be cut or in some way impacted, as it appears that this impact may be avoided. | Section 2.2.2 of this DEIR provides justification as to why it is likely that much of the non-targeted vegetation will also be cut down within the area proposed for tree removal. |
| A-9 | The DEIR should describe how more vegetation could be preserved in more sensitive areas. | Eversource investigated an alternative that would reduce tree removal throughout the Project corridor, including sensitive areas, such as wetlands, vernal pools, and rare species habitat. This alternative would create a maintained ROW corridor with a variable width – wider in areas with no sensitive resources and narrower in these sensitive areas. Although reducing tree removal in some sensitive areas could reduce the environmental impact in these areas, this alternative would likely compound the reliability problem by increasing the potential for tree fall-ins from wind and, therefore, was not considered a viable Project alternative. The assessment of this alternative is described in Section 3.3 of this DEIR. |
| A-10 | The DEIR should consider and describe opportunities to vary the width of the clearing particularly in areas where topography is low, and transmission wires are high. | Eversource conducted a tree removal analysis using LiDAR technology to create three-dimensional mapping of the entire ROW corridor to assess if there are locations or conditions, such as topography, where the clearing width can be reduced. The results of the analysis are described in Section 3.4 of this DEIR. |
| A-11 | The DEIR should provide additional justification for the proposed new maintained ROW of 200 feet including the findings of the constructability review that was conducted by the Proponent or other guidance documents. This should include the identification of tall growing trees or other vegetation within the ROW that pose a risk of vegetation-related outages, to the extent this information is available. | The Project involves the removal of tall-growing trees and shrubs, such that the ROW will be maintained at an average width of approximately 200-250 feet or 100 feet from the outer conductors to reduce the number of tree fall-in risks. A detailed alternatives analysis that discusses various tree removal widths is provided in Section 3.4 of this DEIR, resulting in the selection of the 100-foot Modified Alternative. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
|---|---|---|
| A-12 | The DEIR should identify the applicable portions of the factsheet [FERC FAC-003-4] and its specific requirement that apply to this project. This should include a description of how the width of the MVCD is determined. | There are two reliability goals of FAC-003. The first is to prevent encroachment of vegetation into the ~4.15-foot MVCD, which is the calculated minimum distance to prevent spark-over between live conductors and vegetation. The second purpose is to prevent vegetation from interfering with the operation of the lines, including fall-ins. To implement both purposes, FAC-003-04 acknowledges that a transmission owner's vegetation management maintenance approach should use the full extent of its easement, fee simple, and other legal rights, recognizing that "a comprehensive approach that exercises the full extent of legal rights on the ROW is superior to incremental management because in the long term it reduces the overall potential for encroachments, and it ensures that future planned work and future planned inspection cycles are sufficient." |
| A-13 | The DEIR should also address the comments from the Berkshire Environmental Action team which question the project's purpose and need. | See the response to Comments E-1 to E-10. A more detailed Purpose and Need is provided in Section 2.1. |
| A-14 | The DEIR for this project, as well as all past and future filings related to the TRRP effort along the Proponent's ROW segments in Western Massachusetts, should include a conceptual overview of the cumulative impacts of the entirety of the Western Massachusetts TRRP effort, which shall be updated over time as more exact calculations are provided with each future filing. | A cumulative impacts table for all anticipated Western Massachusetts TRRP efforts is provided in Section 8. The impacts in this table will be updated over time as more exact calculations are provided with each future filing. For example, impacts from the WT-02 TRRP Project, which is anticipated to be implemented this year, have been updated in the table to reflect the permitted impacts. |
| A-15 | The DEIR should discuss how many of the Proponent's transmission lines (ROW segments) in western Massachusetts have already been cleared as part of TRRP and how many additional lines will be cleared as part of the overall program. | The cumulative impacts table in Section 8 provides estimates for the timeline of each TRRP project in Western Massachusetts. |
| A-16 | The DEIR should include a list of all of the ROW segments managed by the Proponent in the western portion of the state including acreage within each segment. | Total acreage of each ROW segment in Western Massachusetts is provided in the cumulative impacts table in Section 8. |
| A-17 | The conceptual overview of impacts should include numeric estimates of all applicable impacts, including land alteration, tree/forest clearing, wetlands impacts (BVW, RFA, etc.) and rare species habitat affected. These estimates should be broken down by each ROW segment, to the extent feasible, and an approximate timeline for planning and design of each segment should be provided. This information should be displayed in tabular or graphical format for ease of review. | The cumulative impacts table in Section 8 provides the conceptual overview of impacts by ROW segment. |
| A-18 | The DEIR should provide a methodology for tracking cumulative impacts associated with TRRP in western Mass and include a conceptual discussion of mitigation to be provided for forest clearing, wetland, rare species and any other relevant impacts. | Tracking cumulative impacts will be accomplished by continuous updates to the cumulative impacts table provided in Section 8 with each subsequent MEPA submittal.<br>Mitigation for project impacts is ultimately subject to the approval by the regulatory authorities, including MassDEP, NHESP, and the local conservation commissions. Eversource will have frequent pre-application discussions with each regulatory authority during the MEPA process and prior to the submittal of applications to ensure coordination on mitigation efforts. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
|---|---|---|
| A-19 | The Proponent should consider developing a common framework for mitigation that could be applied across all segments. | Although Eversource's preference would be establishing a common framework that can be agreed upon with the regulatory agencies and applied across all TRRP Projects, based on experience as well as conversations with MassDEP Western Regional Office, this is typically not feasible due to the "home rule" nature of the WPA authority. Each local conservation commission is unique and ultimately has the authority to determine whether the mitigation plan adequately addresses impacts in their town under the WPA and their local Bylaw. A general proposed framework for development of a compensatory mitigation plan for this Project, which can be applied to future TRRP Projects, is provided in Section 7.7 of this DEIR. It includes frequent pre-application meetings with the regulatory authorities, including the local conservation commissions, as well as a list of priorities in identifying a compensatory mitigation project. |
| A-20 | Given the extent of forest and tree clearing proposed, I strongly urge the Proponent to make a firm commitment to mitigation that provides a net benefit for surrounding natural resources and addresses any disproportionate impacts that may be borne by EJ or other vulnerable populations. | As described in Section 7.7, Eversource is in the process of developing a compensatory mitigation plan for the Project. Providing a benefit to EJ communities is a priority identified by Eversource in identifying a suitable mitigation project. |
| A-21 | The DEIR should provide an update on efforts to conduct outreach and promote public involvement of nearby communities, including EJ populations to meaningfully engage those located with the DGA in decision-making for the project. It should contain a full description of measures the Proponent intends to undertake to promote public involvement by such EJ populations during the remainder of the MEPA review process including a discussion of any of the best practices listed in the MEPA EJ Public Involvement Protocol that will be employed. It is my expectation that community engagement will begin as part of the MEPA review process and be conducted prior to filing the DEIR. | Updated outreach efforts in the EJ communities is discussed in Section 5.9.1 of this DEIR. |
| A-22 | The DEIR should explain what efforts were undertaken prior to filing, and how public involvement efforts will continue throughout subsequent permitting and through the construction period for the project. | Section 5.9.1.1 discusses Eversource's outreach efforts to date, and Section 5.9.1.2 discusses the ongoing and planned outreach over the course of the Project. |
| A-23 | It should describe any outreach that will be conducted as part of local review processes, including the procedures for providing abutter notice and opportunities for public input into project design and timing. | Section 5.9.1 discusses EJ outreach efforts; input gathered through this process is documented and brought to the attention of the Project team. Input received to date from the EJ outreach efforts is provided in Section 5.9.1.2.<br><br>As part of the permitting of the Project, Eversource is required to publish public notice of the submittal of the Water Quality Certification. Abutters will also be notified as required as part of the WPA filings with the local conservation commissions. |
| A-24 | The DEIR, or a summary thereof, should be distributed to the EJ Reference List unless any such entity has requested to be excluded or the MEPA Office and EEA EJ Director have provided an alternative list. | The DEIR has been distributed to the individuals on the EJ Reference List, as identified in the DEIR Circulation List. |
| A-25 | The DEIR should provide an updated baseline assessment of any existing unfair or inequitable Environmental Burden and related public health consequences impacting EJ Populations in accordance with 301 CMR 11.07(6)(n)1 and the MEPA Interim Protocol for Analysis of EJ Impacts. | A baseline assessment of any existing unfair or inequitable Environmental Burden and related public health consequences impacting EJ populations within the 1-mile DGA is provided in Section 4.9.1. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
|---|---|---|
| A-26 | The DEIR should review additional sources of potential pollution which may exist within the identified EJ population based on the mapping layers available in the DPH EJ Tool to fully characterize existing unfair or inequitable Environmental Burdens. | The DPH EJ Tool was used to identify other potential sources of pollution within the boundaries of the former EJ population. Based on the mapping, there are no known existing potential sources of pollution mapped within this EJ population (see Section 4.9.1). |
| A-27 | The DEIR should also survey the air-related environmental indicators identified in the EPA EJ Screen to determine whether any of the identified EJ populations are subject to elevated environmental burdens measured at the 80th percentile of statewide average or higher. For any EJ population corresponding to that metric, the DEIR should describe in detail the proximity of the project site to those neighborhoods and discuss the specific activities, including the extent of forest clearing and construction activity, that will take place near those neighborhoods. | The EPA EJScreen tool is no longer available; however, pursuant to MEPA's latest guidance published in the Environmental Monitor on February 26, 2025, an alternative website (https://pedp-ejscreen.azurewebsites.net/) was used for this analysis and is provided in Section 4.9.1.1.3. |
| A-28 | Based on the additional analyses required by the Scope included in this Certificate, the DEIR should provide an updated assessment of whether the project's impacts may result in disproportionate adverse effects, or increase the risks of climate change, on the identified EJ population, particularly in light of the GHG emissions, air pollutants, and heat island effects that may be associated with large-scale forest clearing activities. | The Project is not expected to have short-term or long-term environmental or public health impacts on EJ populations. This determination is based on an assessment of project impacts and whether such impacts constitute a disproportionate adverse effect on EJ populations (see 5.9.2 of this DEIR). |
| A-29 | The DEIR should consider any loss of open space or recreational opportunities that may affect EJ populations that may lack access to such resources. | The Project will not result in a loss of open space or recreational opportunities. On open space and recreational lands, all work is proposed within Eversource's existing easement and will have no long-term impacts on the ability of the public, including EJ communities, to utilize these spaces. Access may be temporarily affected during tree removal activities, but these impacts will be short-term. |
| A-30 | The DEIR should discuss whether project benefits would increase "Environmental Benefits," as defined in amended 301 CMR 11.02, for EJ populations and discuss whether and how such benefits would serve to promote the equitable distribution of Environmental Benefits or reduce any existing Environmental Burdens identified for the EJ population. For instance, if power outage due to downed trees have been shown to disproportionately affect EJ populations, the DEIR should discuss whether the project would serve to improve such conditions. | As discussed in Section 5.9.2, the Project specifically will benefit surrounding communities, including EJ populations, by strengthening the electric system associated with Line 354. Power outages can disrupt communications, water, and transportation services. They can be especially dangerous if they occur during extreme cold or hot temperatures and for those who rely on electricity to operate essential medical devices. Decreasing the potential for power outages to occur will have a positive impact on the stability of communities that depend on the electricity distributed by this transmission line, especially those communities that may not have the financial resources to purchase generators, find temporary housing, or replace lost food in the event of a power outage. |
| A-31 | The DEIR should contain a GHG analysis for the significant loss and conversion of forested land to a scrub-shrub habitat and discussion of mitigation measure to reduce the GHG emissions of the project. | A Quantitative Carbon Analysis is provided in Attachment 7 and summarized in Section 6.1.3. |
| A-32 | The DEIR should analyze land alteration associated with the project including implications for potential stormwater flooding and heat effects in surrounding neighborhoods. Analysis of the stormwater should specifically assess whether flooding risks may be exacerbated for nearby EJ populations, including under future climate conditions, and whether existing conditions would be worsened or improved by the project. | Section 6.1 discusses the Project's implications for stormwater flooding and heat effects. Table 5-5 in Section 5.9.2 specifically addresses potential heat effects and flooding impacts to EJ populations. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| A-33 | The DEIR should also analyze other short-term and long-term environmental or public health impacts of the project, including construction period activities. | Environmental impacts of the Project, including construction period activities, are discussed throughout Section 5. |
| A-34 | If any disproportionate adverse effects or increased risks of climate change are identified, the DEIR must include a discussion of proposed mitigation and include such measures in draft Section 61 findings. | No disproportionate adverse effects or increased risks of climate change have been identified, as outlined in Sections 5.9.1 and 6.1, respectively. |
| A-35 | The DEIR should provide an update on potential impacts to state-listed rate species habitat associated with the project and proposed measures to avoid, minimize and mitigate those impacts. | Section 5.4.2 provides an update on potential impacts to state-listed rare species habitat. Section 7.4.2 provides proposed measures to avoid, minimize and mitigate those impacts in coordination with NHESP. |
| A-36 | The DEIR should provide a summary of the outcome of continued consultation with NHESP. | Sections 5.4.2 and 7.4.2 provide a summary of the outcome of continued consultation with NHESP. |
| A-37 | The DEIR should provide an update on the impact analysis for each resource area and demonstrate how the project will comply with performance standards outlined in the WPA as the project has the potential to result in significant changes to the hydrology of the affected resource areas and downstream reaches. | An updated impact analysis for wetland and water resources is provided in Section 5.2. Performance standards under the WPA are addressed in Section 6.2. |
| A-38 | The DEIR should consider impacts associated with surface and subsurface hydrology, wildlife habitat, and describe compliance with BMPs for stormwater management and sedimentation and erosion control. | Section 5.2 discusses impacts associated with surface and subsurface hydrology. Section 5.4.1 discusses impacts associated with wildlife habitat. BMPs for stormwater management and sedimentation and erosion control are discussed in Section 7.2 and Eversource's BMP Manual, provided in Attachment 8. |
| A-39 | The DEIR should ensure that estimates for impacts to wetland resource areas are conservative and account for all temporary impacts including access to the ROW. | Impacts to the wetland resource areas are conservatively quantified in Section 5.2.3 and take access into consideration. |
| A-40 | The DEIR should describe tree clearing details, potential TOY restrictions, specific locations of proposed construction mats, and implementation sequencing. | Section 2.2 provides details on tree clearing and construction mat use. Section 2.4 discusses the Project's time frame, including TOY restrictions identified to date. A detailed in-situ alternatives analysis that justifies the location of all Project construction matting placement will be provided to MassDEP with the Water Quality Certification application. |
| A-41 | The DEIR should describe to what extent the construction matting would necessitate alteration of Bank or LUW and provide a conservative estimate of these impacts. | As described in Section 5.2.2, construction matting will not impact Bank or LUW resources. Construction mats will be spanned across all watercourses in order to avoid any alteration to Bank or LUW. |
| A-42 | The DEIR is required to provide sufficient information to adequately describe cumulative impacts to "Waters of the Commonwealth" (BVW, IVW, and LUW) pursuant to 314 CMR 9.00 and identify efforts to avoid, minimize, and mitigate impacts. | Impacts to Waters of the Commonwealth, including BVW, IVW, and watercourses, are quantified in Section 5.2. Measures to avoid, minimize, and mitigate impacts are discussed in Section 3 (Alternatives Analysis) and Section 7.2 (Mitigation). |
| A-43 | The DEIR should propose appropriate mitigation measures in consultation with MassDEP to demonstrate consistency with the WQC regulations. The DEIR should discuss mitigation in the form of off-site preservation of forested land or wetlands, and culvert and stream enhancements. | Eversource's proposed mitigation measures for wetlands are discussed in Section 7.2.3.2. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| A-44 | The DEIR should describe measures to mitigate the project's significant temporary impacts to resource areas. | Measures to mitigate temporary impacts to wetland resource areas are discussed in Section 7.2.3.1. |
| A-45 | The DEIR should address the comments from the FRCOG regarding wetland impacts, proposed mitigation (including pollinator habitat conservation) and invasive species management. | Please see response to FRCOG's comments (GG-1 to GG-21) in this table. |
| A-46 | The DEIR should include an analysis of potential impacts to adjacent areas from increased velocities and volumes of floodwater, under existing and future conditions. | Inland flooding is addressed in Sections 5.2.2.3 and 6.1.1.1. |
| A-47 | The DEIR should provide an update of the development of any BVW mitigation, and possible locations of the wetland replication areas. | Compensatory mitigation for wetland impacts is discussed in Section 7.2.3.2. |
| A-48 | The DEIR should provide an invasive species management plan for wetland restoration areas. | Section 3.10.4 of Eversource's BMP Manual (Attachment 8) provides measures to be implemented to address invasive plant species during Projects. Further, the restoration areas will be monitored by a wetland scientist for two years to ensure that the mitigation standards are met pursuant to 314 CMR 10.06(2) and 310 CMR 10.55(4)(b). |
| A-49 | The DEIR should demonstrate the project will employ methods to ensure that no fill or sediment will enter a tributary during and post-tree clearing. The Proponent will be required to document that appropriate and effective sediment and erosion controls are implemented and that the crossing techniques (currently identified as "spans") will result in no adverse impacts to the tributaries, adjacent wetlands, or any downstream reaches. | Sediment and erosion controls and other BMPs will be employed to minimize the potential for any adverse indirect impacts on waters being spanned by the Project. At stream crossings, construction matting or alternative forms of matting will span the stream channel to avoid impacts to the stream bank and bed. The BMPs to be utilized on this Project to protect wetlands and watercourses are identified in the Eversource BMP Manual in Attachment 8. |
| A-50 | The DEIR should identify implementation of specific protection and restoration measures within wetlands and other sensitive habitats on public conservation lands. | All wetlands are required to be protected and restored in accordance with the same high standards required under the WQC and WPA regulations. |
| A-51 | The DEIR should include a narrative explaining whether proposed tree clearing will make the project assets more resilient to risks associated with riverine flooding from a 25-year to 50-year storm event estimated as of 2070. | Section 6.1.1.1 of the DEIR provides a narrative explaining that the proposed tree clearing will make the project assets more resilient to risks associated with riverine flooding. |
| A-52 | The DEIR should discuss the extent to which existing electrical lines are exposed to riverine flooding, and what measures the Proponent is taking to improve asset resiliency over a longer-term horizon. | Section 4.2.6 of this DEIR identifies the areas where the WT-11 corridor is located in the 100-year floodplain. While this Project does not address resiliency as it relates directly to flooding, it does address long-term improvements in resiliency by removing trees that may become compromised during a flooding event and impact the electrical lines. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| A-53 | The DEIR should further describe mitigation in areas where soils are classified as having severe erosion potential including temporary and permanent stabilization methods. | Trees will be cut at the base and no stumping / grubbing is proposed in order to avoid soil disturbance. As discussed in Section 5.2.3, Eversource acknowledges that the conversion of PFO to PSS may negligibly reduce sediment and bank stabilization. A forest canopy can intercept up to 80% of rainfall, reducing the amount of water that reaches the forest floor. Tree leaves and other forest debris create a ground cover that protects soil from the impact of rainfall. This ground cover helps absorb rainwater, which then seeps slowly into the soil, rather than running off and causing erosion. PSS habitats provide the same benefits but to a lesser degree. In areas of severe erosion potential, Eversource will preserve compatible vegetation to the extent practicable. An environmental compliance monitor will oversee the tree clearing activities and confirm that these areas are adequately restored. Where deemed necessary, the compliance monitor will direct measures to further stabilize the soils, which may include water bars, erosion control blankets, and/or application of an appropriate erosion control seed mix or measures. |
| A-54 | The DEIR should further describe the anticipated monitoring plan and success criteria for restoration of cleared areas. | Wetland monitoring and restoration are dictated by the WQC regulations at 314 CMR 9.06(b) and the WPA regulations at 310 CMR 10.55(4)(b). Eversource will adhere to the WQC conditions, which would likely require post-restoration monitoring; completion of data forms in each restoration would be required to demonstrate that the area continues to meet wetland criteria for soils, hydrology and vegetation. As noted in Section 7.2.3.1, the restoration areas would be monitored by a wetland scientist to confirm that the areas meet the performance standards of the WPA regulations at 310 CMR 10.55(4)(b), which require that the area is fully stabilized and reestablished with at least 75% coverage by indigenous wetland plant species within two growing seasons. |
| A-55 | The DEIR should provide a quantitative carbon analysis of tree clearing activities that should consider both the one-time direct emissions from tree cutting as well as loss of potential carbon sequestration over a certain time period (e.g., 30 or 40 years). To the extent tree cover is replaced with scrub-shrub habitat, the net loss in carbon sequestration potential may be estimated; to the extent the project is asserted to have ancillary (indirect) benefits in reducing potential outages and thereby avoiding GHG emissions, this should be quantified and the methodology for this calculation clearly explained. | The DEIR provides a quantitative carbon analysis of tree clearing activities that considers both the one-time direct emissions from tree removal as well as loss of potential carbon sequestration over 40 years. Section 6.1.3 of this DEIR presents the summary of this analysis. Attachment 7 provides the Quantitative Carbon Analysis. |
| A-56 | To quantify GHG emissions impacts, the Proponent may rely on the various data sources listed in the EENF or conduct a site-specific forest inventory; however, the EPA GHG Emissions Calculator should be used solely for comparison purposes and may not be used as the exclusive source of estimates for carbon stocks or emissions as it is based on national data not specific to Massachusetts. To the extent a standardized methodology is used in lieu of a site-specific forest inventory, the Proponent should make use of the EVALIDator tool from the U.S. Forestry Service, which provides estimates of carbon stocks (including above ground and below-ground biomass) specific to Massachusetts forests. As the EVALIDator tool does not provide an estimate of annual carbon sequestration rates, the Proponent may rely on other sources of data, including the EPA GHG Emissions Calculator, for this value. | Please refer to the Quantitative Carbon Analysis provided in Attachment 7 for the methodologies used to quantify GHG emission impacts. |

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| A-57 | The DEIR should describe the methodology and data used to develop the analysis, identify associated impacts on GHG emissions, and identify measures to avoid, minimize and mitigate impacts. | Attachment 7 of this DEIR describes the methodology and data used to develop the quantitative carbon analysis of tree removal activities; associated impacts in GHG emissions; and measures to avoid, minimize, and mitigate impacts on GHG emissions. |
| A-58 | The DEIR should account for carbon sequestration from any trees that are removed and not replaced/converted to scrub-shrub. | It is anticipated that all areas of tree removal activity will be converted to scrub-shrub. |
| A-59 | The proponent is directed to consult with the MEPA Office on the development of this analysis prior to filing the DEIR. | Eversource consulted with the MEPA Office on the development of this analysis for both the WT-02 TRRP Project and the WT-11 TRRP Project on January 26, 2023. |
| A-60 | Given the extent of tree clearing proposed, I expect the DEIR to identify mitigation measures commensurate with the project's impacts on the project corridor's capacity to sequester and store carbon. Potential mitigation measures may include funding programs that add or maintain biomass for sequestration purposes (such as tree planting, carbon credits, forest conservation or commitments to implement forest restoration practices) and preserving/protecting forested land through a Conservation Restriction or other means. | Because the Project requires the removal of tall-growing vegetation, mitigation regarding the overall carbon footprint of the Project will involve allowing any temporarily disturbed areas on-site to revegetate with compatible, low-growing vegetation. Eversource maintains that additional mitigation is not required for any net change in GHG emissions.<br>None-the-less, Eversource is evaluating potential off-site compensatory wetland mitigation areas that can be permanently preserved through a conservation restriction or similar mechanism. Forested land that is permanently preserved for the purpose of compensatory wetland mitigation would have the additional benefit of sequestering carbon in both above and below-ground biomass and actively removing carbon dioxide from the atmosphere both today and in the future. |
| A-61 | At a minimum, the Proponent should clearly explain its plan for disposition of the trees cleared through the project, including the process for identifying potential markets for reuse of wood and a process for tracking and reporting. The Proponent should commit to reuse of cleared trees for long-lived wood products to the greatest extent practicable and should indicate how the ultimate disposition of the trees will be tracked and documented. | Suitable sawlogs and other wood products are not expected to be generated in sufficient quantity from the Project to be marketable. However, Eversource will be contacting the DPW of each town regarding donations of firewood obtained from Project-related tree removal on Eversource fee-owned land. On the remainder of the land crossed by the Project, the disposal and/or reuse of wood products are subject to the request of the property owners, the largest of which is the Commonwealth of Massachusetts, which owns 13.7% of the land crossed by the Project. Eversource will coordinate directly with landowners, including the Commonwealth of Massachusetts (i.e., DCR and the Department of Fish and Game), regarding any requests for firewood, chips, or other wood products generated from the Project. |
| A-62 | The Proponent should consider a mitigation framework that could be applied across all proposed ROW segments covered by the Western Massachusetts TRRP. | Please refer to our response to Comment A-19. |
| A-63 | The Proponent should work with MassDOT to address the details of the permitting process and any traffic and construction management plans that may be required for temporary work within the state highway layout. | Eversource will work with MassDOT to address the details of the permitting process and any traffic and construction management plans that may be required for temporary work within the state highway layout. Eversource anticipates that these discussions with MassDOT will occur prior to the submittal of any state highway access permits and that they will include the development of appropriate traffic management plans. |

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| A-64 | The DEIR should describe the location of roadways under MassDOT jurisdiction. | Table 4-18 in Section 4.5 provides a table of MassDOT roads crossed by the Project. |
| A-65 | The DEIR should confirm that the proponent will implement a traffic management plan consistent with MassDOT requirements. | Eversource will work with MassDOT to address the details of the permitting process and any traffic and construction management plans that may be required for temporary work within the state highway layout. Eversource anticipates that these discussions with MassDOT will occur prior to the submittal of any state highway access permits and that they will include the development of appropriate traffic management plans. |
| A-66 | It should describe the outcome of any consultation with MassDOT. | Eversource will consult with MassDOT prior to the submittal of any permit applications. |
| A-67 | The DEIR should describe the extent of truck traffic that will result from tree clearing activities, including the number of truck trips required to remove the cleared trees. | Eversource estimates approximately 1,200 total truck trips over the course of the Project activities, which is anticipated to take one year to complete. |
| A-68 | The DEIR should summarize the outcome of such consultation [with DCR's Archaeologist]. | PAL submitted the PNF and cultural resource due diligence report to Jonathan Patton, DCR Archaeologist, in May 2022 and submitted the ASAPPs in April 2023. Mr. Patton responded in an email dated April 12, 2023 that the proposed ASAPPs are appropriate. |
| A-69 | The DEIR confirm that the Proponent's infrastructure maps will include map data for the locations and estimated boundaries of historical properties and archaeological sites identified in the cultural resources due diligence report. The resources can be indicated to be "sensitive resource areas" to be avoided and protected during operation and management. | Sensitivity Areas and Known Resource Areas will be depicted on the final Project maps provided to the contractor, along with measures required in these areas. |
| A-70 | The Proponent should direct implementation of the sensitivity area BMPs outlined in the EENF within the boundaries of the mapped historical and archaeological resources to avoid adverse effects to historic and archaeological resources. | Eversource will direct its contractors to properly implement sensitivity area BMPs outlined in Section 7.7 within the boundaries of the mapped historical and archaeological resources to avoid adverse effects to historic and archaeological resources. |
| A-71 | The DEIR should include a separate chapter summarizing all proposed mitigation measures including construction-period measures. This chapter should also include a comprehensive list of all commitments made by the Proponent to avoid, minimize, and mitigate the impacts of the project, and should include a separate section outlining mitigation commitments relative to EJ populations. The DEIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation. The list of commitments should be provided in tabular format organized by subject (traffic, water/wastewater, GHG, EJ, etc.) and identify the Agency Action or Permit association with each category of impact. | Chapter 7 of this DEIR specifically describes all proposed mitigation measures, including construction-period measures. This chapter also includes a list of commitments in tabular form organized by subject matter is provided in Table 7-2. This list includes an estimation of individual costs for each mitigation measure and identifies the parties responsible for implementation as well as the Agency Action or Permit associated with each category of impact. |
| A-72 | Draft Section 61 Findings should be separately included for each Agency Action to be taken on the project. | The Draft Section 61 Findings are included in Section 9 of this DEIR for each Agency Action to be taken on this Project. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| A-73 | The DEIR should contain a copy of this Certificate and a copy of each comment letter received. | This DEIR contains a copy of this Certificate and a copy of each comment letter received (Attachment 9). |
| A-74 | It should include a comprehensive response to comments on the EENF that specifically address each issue raised in the comment letter; references to a chapter or sections of the DEIR alone are not adequate and should only be used, with reference to specific page numbers, to support a direct response. | A response adequate to address each issue raised in the comment letter is provided in the table herein. |
| A-75 | The Proponent should circulate the DEIR to each Person or Agency who commented on the EENF, each Agency from which the project will seek Permits, Land Transfers or Financial Assistance, and to any other Agency or Person identified in the Scope. The Proponent may circulate copies of the DEIR to commenters in a digital format or post to an online website. However, the Proponent should make available a reasonable number of hard copies to accommodate those without convenient access to a computer to be distributed upon request on a first come, first served basis. The Proponent should send a letter accompanying the digital copy or identifying the web address of the online version of the DEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate address for submission of comments. If submitted in hard copy, the DIR submitted to the MEPA office should include a digital copy of the complete document. | Eversource will circulate the DEIR in accordance with all applicable requirements set forth in 301 CMR 11.16 and this comment. A circulation list is provided. |
| A-76 | A copy of the DEIR should be made available for review in the Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, and Ludlow Public Libraries. | The DEIR circulation list includes providing hard copies to each of these 11 public libraries. |
| **Response to Comments from EENF Certificate, 285 form comment letters beginning with "As a resident and voter in Massachusetts, I am appalled that…"** | | |
| B-1 | The MEPA analysis should be done using the traditional 2-stage process (Draft and Final EIR) | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| B-2 | The MEPA analysis should consider a full range of alternatives, including the No Action Alternative, and the mitigation necessary to minimize or eliminate all environmental impacts. | Section 3 of this DEIR provides a detailed alternatives analysis. Section 7 includes proposed mitigation measures to minimize impacts. |
| B-3 | The proponent should fully evaluate all associated climate impacts per Section 61, including proposing actions to completely mitigate all negative climate impacts. | A discussion of the Project's compliance with state climate goals is discussed in Section 6.1. The Project is a critical component of maintaining and upgrading the ISO New England Grid in support of increased electrification and incorporating generating sources that will reduce the carbon intensity of electricity generation in New England. |
| B-4 | The analysis should consider climate impact mitigation by permanently protecting at least twice as much mature forest land as is being proposed for clear cutting or degradation/ disturbance as part of this project, by using a "forever wild" conservation restriction. Such protected land should be of equal or greater ecological condition, such as mature/intact forest land and/or old growth. | See response to Comment A-60. |

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| B-5 | Full mitigation should be required for all potential impacts to sensitive, rare, threatened, and endangered species, and no "regulatory taking" of such species should be allowed. | Eversource is coordinating with NHESP on state-listed protected species. NHESP has determined that the Project will not result in a Take for climbing fern, marbled salamander or wood turtle, but that a Take will result to eastern box turtle, necessitating the filing of a Conservation Management Permit (CMP). As part of the CMP, Eversource will be required to provide sufficient mitigation necessary to achieve a “long-tern Net Benefit” to the species. For eastern box turtle, a Special Concern Species, this will require mitigation at a ratio of 1:1.5, typically either through land preservation or donation to the eastern box turtle conservation fund. |
| B-6 | The MEPA analysis should include a full accounting of the past 20 years of herbicide use for vegetation treatment and make projections for herbicide use over the next several decades. | Herbicide use on electric transmission ROWs is under the jurisdiction of the Massachusetts Department of Agricultural Resources (MDAR). Eversource operates under an approved 5-year Vegetation Management Plan, which requires the submittal of a Yearly Operation Plan to MDAR on an annual basis and is available for public comment through that process. |
| B-7 | If any increase in herbicide use is proposed, the applicant should be required to install surface water collection points and groundwater monitoring wells along the 29-mile route (to ensure that any chemical impacts are being monitored) and those sample results should be reported annually to the Towns. | No herbicide use is proposed as part of this Project. Herbicide use from routine maintenance is discussed in the response to Comment B-6. |
| **Response to Comments from EENF Certificate, Massachusetts Historical Commission (7/07/2022)** | | |
| C-1 | The MHC recommends that the PAL develop an avoidance and protection plan for that historical period site. If that historical period site cannot be avoided and protected, then archaeological investigation is recommended (PAL report pg. 37). · | PAL has developed an avoidance and protection plan for the historical period site and provided it to MHC on April 10, 2023. |
| C-2 | The MHC recommends that the PAL develop avoidance and protection plans also for 19-FR-127 and for the other potential ancient period site within that same sensitivity area in Montague (see PAL report pp. 21, 24, Appendix B Sheet 9, SA-04, the other potential ancient period site location estimated boundaries to be added to that figure). | PAL has developed an avoidance and protection plan for the ancient period site and provided it to MHC on April 10, 2023. |
| C-3 | In addition to implementing the "Best Management Practices" (BMPs) outlined in the ENF (Attachment 8, pp. 5-14 to 5-16), the MHC recommends that Eversource Energy· include on the company's infrastructure maps the map data for the locations and estimated boundaries of the historical properties and archaeological sites from the PAL study. The resources can be indicated to be "sensitive resource areas" to be avoided and protected during operations and management. | Sensitivity Areas and Known Resource Areas will be depicted on the final Project maps provided to the contractor, along with measures required in these areas. |
| C-4 | Project managers and crew supervisors should direct the implementation of the BMPs within the boundaries of the mapped historical and archaeological resources to avoid adversely affecting historic and archaeological resources. | Eversource will direct its contractors to properly implement sensitivity area BMPs outlined in Section 7.7 within the boundaries of the mapped historical and archaeological resources to avoid adverse effects to historic and archaeological resources. |

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| **Response to Comments from EENF Certificate, Erving Conservation Commission, Mark Blathcley (8/05/2022)** | | |
| D-1 | When cutting within the boundary of a pond, stream, or vernal pool (including the protected zone), all work [should] be done when the area is driest or solidly frozen, all logs and slash be removed beyond the protected zone and timber matting be used to minimize damage. | Within vernal pools, all cutting will be conducted by hand or equipment operating from outside the vernal pool area in order to minimize damage. Within streams and other inundated areas, it is Eversource's intention to conduct work during dry or frozen conditions to the extent practicable and/or from equipment working on timber matting to minimize damage. In general, logs and slash will be removed from beyond protected zones; however, select logs may remain in place at the direction of the wildlife biologist if they provide wildlife habitat value and do not interfere with hydrology. |
| D-2 | In the area above the one marked and mapped body of water (under consideration for posting as a Vernal Pool by the state of Massachusetts) on Poplar Mountain Conservation Area and in the vicinity of the Yellow Trail crossing the ROW we would appreciate that slash be left as a pile of chips for our use if possible. | Eversource can accommodate this request for slash to chip and stockpile any slash removed in this area for reuse by the Erving Conservation Commission. Any stockpiling of material will be outside wetland resource areas and would only occur where access is feasible. |
| D-3 | In all other areas of the Conservation Area we request that logs and slash be left on the ground and not obstruct trails. | Eversource can accommodate this request. Any stockpiling of material will be outside wetland resource areas and would only occur where feasible. |
| **Response to Comments from EENF Certificate, Berkshire Environmental Action Team (8/11/2022)** | | |
| E-1 | Please require Eversource to evaluate the TOTAL impacts throughout the state including total number of acres proposed to be cut, number of acres of rare species habitat to be permanently and temporarily impacted, number of acres of bordering vegetated wetland to [be] permanently and temporarily impacted, and total greenhouse gas emissions from the entire operation. | Eversource has provided cumulative impacts analysis in Section 8 of this DEIR which addresses impacts resulting from the Western Massachusetts TRRP Program. |
| E-2 | How high off the ground are these lines and how wide is their span? | Distance of the lines from the ground and span widths are provided in the ROW Profile Drawings provided in Attachment 1. |
| E-3 | How tall are the trees in general that currently grow at the area of the new to be clear cut area? How many trees are even close to being able to reach the powerlines if they were to fall by coming up from their roots? | Based on a LiDAR survey in September 2022, the tallest coniferous tree height is 133 feet, and the tallest deciduous tree height is 128 feet. Based on the results of the LiDAR analysis, a total of 6,475 trees is currently close enough to reach the powerlines. Applying growth models, Eversource estimates that a total of 10,021 trees will be within striking distance of the powerlines within 40 years. |
| E-4 | Over the last five years how many outages cause[d] by trees falling or touching these transmission lines along this proposed route? And what were the dates of those occurrences? | Table 2-1 provides a list of all vegetation-related outages on Eversource's transmission lines, including Line 312, from 2011–2024. The last outrage on Line 312 from a tree strike occurred on October 7, 2020. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| E-5 | Wouldn't any need be better served by just cutting those trees that could possibly grow tall enough to reach the lines within the next 5 years? | The purpose of the Project is to manage the utility corridor under both present and future conditions to minimize the likelihood of tree strikes and maintain compliance with NERC Reliability Standard FAC-003-4, which is provided in Attachment 3. The focus of FAC-003-4 is maintaining a reliable electric transmission system by managing vegetation on transmission ROWs and minimizing encroachments from vegetation located adjacent to ROWs to prevent the risk of vegetation-related outages. A complete description of the Project's purpose and need is provided in Section 2.0 of the DEIR.<br><br>Eversource has conducted a LiDAR analysis of current conditions and tree growth modeling to project future tree growth in the WT-11 corridor relative to the height of the powerlines. Based on the results of this analysis, Eversource has identified locations where, based on topography and existing/projected tree heights, tree removal limits can be reduced. The tree removal areas are depicted on the WT-11 TRRP Map Set provided in Attachment 2, and additional information on Eversource's use of LiDAR to establish these new Project limits is provided in Section 3.4.2. |
| E-6 | Greenhouse gas emissions should include emissions from the project across the entire state, including emissions from the equipment to harvest, emissions from the end use of the wood - and if that end use is being chipped, dried by burning wood, then once dried burned - ALL the emissions from that should be included. In addition, greenhouse gas emissions from wetland disturbance and conversion should be included, as well as the loss of the carbon sequestration that would have occurred if the trees had continued to grow and sequester carbon both above ground and in the soil. | See response to Comment B-3. |
| E-7 | We do not believe Eversource did adequate Environmental Justice outreach, especially because our organization was not notified of either project. We do expect to receive notice of projects with potential EJ impacts in the Berkshires. | Eversource is conducting its outreach to EJ communities in accordance with MEPA protocols.<br><br>BEAT was provided advance notification of the WT-02 TRRP Project on March 31, 2022. Proof of email distribution of the advance notification letter, including the Environmental Justice Screening Form, was provided to the MEPA Office on June 6, 2022. The EENF for the WT-02 TRRP Project was distributed to BEAT via email on May 27, 2022.<br><br>With regards to the WT-11 TRRP Project, BEAT was provided advance notification, including the Environmental Justice Screening Form, on March 31, 2022, and the EENF on June 15, 2022. |
| E-8 | We believe that in order to truly reach members of the EJ communities, proponents should contract with local organizations who have established relationships with these communities to do door-to-door, social media, email, and/or email outreach. And from personal experience dealing with Eversource, do not let them design the outreach materials! | Based on the responses and feedback to date during outreach efforts in both Wendell and Amherst, different community approaches are recommended in these areas moving forward. These approaches are discussed in Section 5.9.1.3. |

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| E-9 | Eversource appears to be focused on projects where they will receive a guaranteed rate of return on their work, rather than on projects that will really increase reliability and resilience. | Contrary to the assertion made in this comment, Eversource takes seriously its commitment to provide its customers with reliable electric power service in accordance with all applicable statutory and regulatory requirements and policies and to do so in the most cost-effective manner for its ratepayers. Eversource is an industry leader in generating renewable energy as well as in developing the infrastructure to store and transport it in New England, and this Project in no way deters Eversource from moving forward with these pursuits.<br>The Project is needed to comply with Federal reliability standards to ensure the continued reliable operation of three existing transmission lines. Eversource evaluated alternatives to the Project that would meet the Project need – minimizing the risk of vegetation on the ROW from coming into contact with the existing lines - and concluded that the Project is the most cost effective, but also the least environmentally impactful, alternative to maintaining the ROW in compliance with NERC Reliability Standards. |
| E-10 | "Eversource should compare the benefits of tree cutting to more important solutions such as:<br>1. Increasing grid stability by installing grid-scale storage solutions at every substation. This could be standard lithium-ion batteries, or less toxic iron-flow batteries such as ESS or other non-toxic, long-duration batteries, as well as FORM multi-day batteries. FORM is a Massachusetts company and could be a viable partner if they are found to be out of the experimental stage.<br>2. Grid mapping would determine where the grid needs upgrading. This would allow injection of distributed, zero emissions electricity into the grid, opening the floodgates to allow more renewables and battery storage to serve grid demand. Proper grid mapping and upgrades would facilitate adoption of a largely untapped supply of distributed energy, lowering demand on central generation facilities and lowering emissions in the electric generation sector. It would also incentivize more individual properties to add on-site generation if they could more easily participate in supplying power to the grid.<br>Furthermore, the cost of assessing parts of the grid should not be borne by those wishing to add small amounts of generation to the grid, and mapping should not be done piecemeal but rather in a comprehensive fashion to allow utilities and grid operator to determine where injection of electricity into the grid would be most beneficial. " | The Project's purpose is to minimize vegetation fall-ins and outages on the three existing transmission lines co-located in an existing ROW, thereby improving reliability and maintaining compliance with NERC Reliability Standard FAC-003-4, which is provided in Attachment 3. The focus of FAC-003-4 is to manage vegetation on transmission ROWs and minimize encroachments from vegetation located adjacent to ROWs specifically to maintain a reliable electric transmission system by preventing the risk of vegetation-related outages. While there are other means of improving system reliability, such as those noted in this comment, none of them would meet the Project goal of minimizing outages on the existing transmission system by managing vegetation on the ROW. Notably, the Company's compliance with NERC Reliability Standard FAC-003-04 is not voluntary. The Company, like other transmission providers, is required to comply with NERC Reliability Standards, including FAC-003-04, by maintaining its ROWs free of vegetation. |

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| **Response to Comments from EENF Certificate, Richard Seelig (8/12/2022)** | | |
| F-1 | I want to know the parameters that were used to develop the plan to expand the cleared area out to 100 feet from the power lines. | The "100-foot Modified Alternative," consists of clearing trees up to 100 feet from the outer conductor, except in specific areas where this width could be reduced due to a low risk of tree fall-in. The selection of 100 feet is based on a LiDAR survey of trees in the WT-11 ROW and a growth model that allowed Eversource to predict which trees could grow into strike hazards over a 40-year period. Once the growth modeling and 40-year strike potential were determined for the entirety of the line, Eversource assessed the following five alternative tree clearing widths - 0', 50', 75', 100, and full-width ROW clearing. The clearing width less than 100 feet leaves a large number of potential current and future trees within striking distance of Lines 312, 354, and 1604, a risk that exposes these important 345-kV lines to potential outages and reliability concerns. Eversource determined that the alternative to remove trees up to 100 feet from the outer conductor or the limit of Eversource's ROW, whichever is less, meets the Project's purpose and need while minimizing environmental impacts to the extent feasible. A comparison of the different widths is provided in Table 3-2. |
| F-2 | The high-voltage towers and transmission lines should not be at risk from tree fall, but I believe that the proposed cutting plan is grossly oversized. The transmission tower that we saw on our site visit is 105 feet tall. By my estimate, the lowest wire on the tower is at about 90 feet. The tallest trees in our region are white pines, and the tallest ones are approximately 100 feet tall; the next tallest trees are red oaks which top out at around 85 feet. Simple geometry leads to the conclusion that at a tower, trees do not need to be cut beyond a distance of 52 feet from the tower to protect the wires for tree fall, not the 100 feet that is proposed. Moreover, that distance accounts for the tallest white pines; where white pines are not so tall or where other species predominate, the cutting distance could be even less. Looking at the maps provided, it appears that in many places trees have already been cleared out to approximately that distance. | See response to Comment E-5. |
| F-3 | As has been pointed out, between towers the wires are typically at a lower height than at the towers, which is lowest during hot summer days when the load is greatest. I concede that trees may need to be cut further from the wires at these locations; but it is also possible that, given terrain considerations, there may be no need to cut at all. | See response to Comment F-2. |
| **Response to Comments from EENF Certificate, Jennifer Faulkner (8/15/2022)** | | |
| G-1 | While some clearing is necessary for the protection on power lines, I request that Eversource be required to substantially revise the plan to apply more discretion over the clearing of trees so that more trees than necessary are not removed, especially from wetlands and areas supporting rare habitats. | See response to Comment A-9. |

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| **Response to Comments from EENF Certificate, Jacqueline Gallo (8/15/2022)** | | |
| H-1 | I'd like to see a substantially revised plan-minimizing harm to just the amount that's unavoidable in regard to reducing risk. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. This alternative is further discussed in the response to Comment F-1. |
| **Response to Comments from EENF Certificate, Michele Emanatian (8/15/2022)** | | |
| I-1 | I believe that Eversource could take a bit more time to improve their proposal, which as it stands, calls for blanket (indiscriminate) cutting. Care should be taken to not remove trees which (will) pose no threat or are crucial to the survival of some life-forms. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. This alternative is further discussed in the response to Comment F-1. |
| **Response to Comments from EENF Certificate, Nina Keller (8/15/2022)** | | |
| J-1 | Being an abutter to said property, it was a legal requirement and more so, essential to have been directly notified by the utility involved or by your representative consulting firm in a respectful manner about changes to that and any neighboring stretch, be it commercial, private or town owned land under consideration. | Eversource has made all legally required notifications. Eversource circulated the EENF and DEIR in accordance with MEPA regulations (301 CMR 11.16), conducted outreach for EJ populations in accordance with 301 CMR 11.05, and provided public notice of these MEPA filings in local newspapers in accordance with 301 CMR 11.15. Abutter notifications of the Project will be provided as part of the public hearing process conducted by each local conservation commission under the Massachusetts Wetlands Protection Act and adopted local wetland protection bylaw/ordinance once the Notice of Intent is filed. Eversource will also notify each abutter of the TRRP schedule at least one month prior to it starting as required per MA 220 CMR 22. |
| J-2 | Along with a prior alert, an explanation and proof of need should be available. Without this communication, you and the corporations you represent, take citizenry for granted as if we should glibly be expected to yield the life of trees for an unproven expansive electric need or commodity. | See response to Comment E-5. |
| **Response to Comments from EENF Certificate, Steve Kurtz (8/15/2022)** | | |
| K-1 | A selective harvest of dangerous trees near power lines is rational. A clearcut is perhaps cheaper, but results in significant habitat loss for wildlife, along with maximum reduction in the carbon sink and oxygen generation of the area. Dollars should not be the deciding factor. Non-financial losses count for society and must be considered. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. This alternative is further discussed in the response to Comment F-1. |

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| **Response to Comments from EENF Certificate, Martha Sweezy (8/16/2022)** | | |
| L-1 | I'd like to see Eversource substantially revise their plan to just cutting the number of trees that must be cut to reduce risk of them falling on power lines. This will minimize harm to the surrounding habitat, which is home to some rare species, particularly where Buffam Brook joins Amethyst Brook in Pelham. Eversource should use a rubric for determining what to cut, taking into account maximum tree height by species, power line heights, given tower positions, terrain, and so on. | The "100-foot Modified Alternative," consists of clearing trees up to 100 feet from the outer conductor, except in specific areas where this width could be reduced due to a low risk of tree fall-in. One such location where Eversource has reduced the extent of tree clearing due to terrain considerations is where Amethyst Brook crosses the WT-11 corridor. The WT-11 TRRP DEIR Map Set in Attachment 2 (map sheet 58) shows that the proposed tree clearing along the southern bank of the watercourse (opposite North Valley Road) has been eliminated from the Border Zone. Tree removal within the Wire Zone is needed to access the WT-11 facilities in the event of an emergency and for maintenance purposes and is an exempt maintenance activity; tree removal within the Wire Zone is not being undertaken to reduce or eliminate tree strike potential. No tree clearing along Buffam Brook or the Buffam Falls Conservation Area is proposed. |
| **Response to Comments from EENF Certificate, Stacy Yaruss McCullough (8/16/2022)** | | |
| M-1 | There's a particular spot that's special to me personally, where two big brooks converge in a shady gorge -- Buffam and Amethyst Brooks, in Pelham. It's a beautiful spot that I cherish, and I know that many others feel the same. It's also the site of a very steep, rocky slope down to the brook's edge. Per Pelham's Conservation Commission, that site was subject to a rockslide into the brook in the 1950s, which raised the waters so much that they took out a high bridge downstream. I now live next to that bridge's old footings, and they are half our house high. So, any destabilization of that slope not only threatens an unusually beautiful spot, but also the safety of our home and other properties on the brook. | Eversource acknowledges the scenic value that area residents have for where Amethyst Brook and Buffam Brook converge. Since the EENF was filed, Eversource has reduced the removal of trees within the Border Zone at this location, as explained in the above response to Comment L-1.<br><br>When conducted in accordance with accepted timber harvesting BMPs, tree cutting and removal will result in limited ground disturbance. Stumps and below-ground portions of trees and shrubs will be left in place. As a result, soil stability will not be significantly compromised, and soil erosion is expected to be minimal. In upland areas, the use of water bars on steep or unstable soils can help to minimize erosion and sedimentation along access routes and other areas receiving heavy equipment traffic. If unusual weather or site conditions have the potential to create soil erosion or siltation of water resources, temporary sediment controls will be used until these areas are stabilized. Once disturbed areas are fully stabilized, the temporary sediment controls will be removed or allowed to biodegrade as appropriate.<br><br>An environmental compliance monitor will oversee the tree clearing activities and confirm that these areas are adequately restored. Where deemed necessary, the compliance monitor will direct measures to further stabilize the soils, which may include water bars, erosion control blankets, the use of tackifers, and/or application of an appropriate erosion control seed mix. |
| M-2 | Eversource's plan proposes cutting down all the trees in that location. It'd be one thing if that were necessary for the safety of the grid. But the elevation at brook-side, noted on Eversource's maps, is 360.. The bases — not tops — of the towers on each side are at 500' and 530'. The tallest tree in MA is 163', and unsurprisingly, it's a white pine -- other species' maximum heights are of course much lower. That means that at least some of the trees by the brooks aren't any risk to the grid. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. As further discussed in the response to Comment L-1, the selection of this alternative as the Project's Preferred Alternative has reduced tree clearing along Amethyst Brook and by the Buffam Falls Conservation Area. |

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| M-3 | The same principle applies along the project's entire length. Eversource's plan doesn't take terrain or tree species into account at all. It doesn't even note heights of the towers or the wires between them, or calculate the height of a tree that would be able to reach wires at those heights from a given distance away. A reasonably responsible plan would take these basic measures to minimize harm to just the amount that's unavoidable for reducing risk. | The clearing locations depicted on the map set in Attachment 2 are explicitly based on terrain and tree species, among other factors. A LiDAR survey and modeling of the ROW were performed to identify trees at risk of striking the Line 312, 354 and 1604 infrastructure, both currently and within a 40-year timeframe (the expected life span of the existing line). The main features that were mapped using LiDAR include vegetation height, density, and topography. Through processing and further analysis of the data, trees were identified as either coniferous or deciduous and were assigned a tree health (good /poor) designation. This information was evaluated and resulted in the selection of the 100-foot Modified Alternative as the Project's preferred alternative, which is further described in the response to Comment F-1 and in Section 3.2 of the DEIR. Under the preferred alternative, the WT-11 corridor would typically be widened to 100 feet from the outer conductor or to the edge of Eversource's easement, whichever is less, except in specific locations where the LiDAR analysis indicates that risk of tree fall-ins is low (e.g., due to topography). |
| M-4 | Eversource claims that a benefit of their project is Habitat enhancement: This project will expand and sustainably manage the early successional scrub/shrub habitat of our ROW. These habitats are becoming increasingly rare due to development, but are critical for a variety of wildlife, including numerous pollinators and rare and endangered species. I find this disingenuous. While that habitat is certainly valuable, I'm skeptical that any ecologist would recommend that the way to get more of it is to cut down forests. | The purpose of the Project is to minimize vegetation fall-ins and outages on the line, thereby improving reliability and maintaining compliance with NERC Reliability Standard FAC-003-4. The increase in pollinator habitat from the conversion of forestland to low-growth habitat is a by-product of the Project. |
| **Response to Comments from EENF Certificate, Bambi Good (8/17/2022)** | | |
| N-1 | I am appalled that in this time of Climate Emergency, a project intended to destroy 370 acres of forest could be approved without a full environmental impact study and complete review by MEPA. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR) to review the Project. Eversource has reduced the conversion of forestland to low vegetative growth to approximately 278.1 acres through the selection of the 100-ft. Modified alternative as the Preferred Alternative. |
| **Response to Comments from EENF Certificate, Doug Goodman (8/17/2022)** | | |
| O-1 | At this point, destroying over 300 acres of trees is something not to be done without careful consideration of alternatives. Can we defer this corridor, or at least allow only necessary trees to be removed - ones that pose an immediate danger to the lines - until we can study the issue and make a counter proposal that would be less extreme? | Based on the results of the Alternatives Analysis, Eversource selected the 100-foot Modified Alternative as the new Preferred Alternative to the Project, as it minimizes tree fall-in risk compared to the No Action, 50-foot, and 75-foot Alternatives, while also reducing environmental impacts compared to the 100-foot Alternative. Additional information on the Alternatives Analysis is provided in Section 3 of this DEIR. |

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| **Response to Comments from EENF Certificate, Douglas Rice, Department of Conservation and Recreation (8/22/2022)** | | |
| P-1 | DCR's Senior Ecologist requests the opportunity to review the flagged work limits and work with the Proponent to identify mitigation for the loss/conversion of forest habitat. We look forward to reviewing specific protection and restoration measures to be taken within wetland and other sensitive habitats on public conservation lands. | Eversource looks forward to working with the DCR staff on this Project and will coordinate ROW access as needed so work locations and BMPs/restoration measures can be reviewed. |
| **Response to Comments from EENF Certificate, Joan Levy (8/17/2022)** | | |
| Q-1 | At this point, destroying over 300 acres of trees is something not to be done without careful consideration of alternatives. Can we defer this corridor, or at least allow only necessary trees to be removed - ones that pose an immediate danger to the lines - until we can study the issue and make a counter proposal that would be less extreme? | See response to Comment O-1. |
| **Response to Comments from EENF Certificate, Linda Spink (8/17/2022)** | | |
| R-1 | I strongly support the alterative effort to restrict the indiscriminate clearcutting of the trees. Instead, Eversource should be required to selectively cut only those trees that truly pose a risk to the power lines and avoid cutting the trees in the conservation area that are well below the power lines. This may not be the most efficient way for Eversource to cut trees, but I believe it is necessary to selectively cut those trees that pose the risk, even if it costs more in time and money. | See response to Comment O-1. |
| **Response to Comments from EENF Certificate, Town of Wendell Conservation Commission (8/17/2022)** | | |
| S-1 | Only trees which are truly a hazard to transmission line infrastructure [should] be cut. | See response to Comment O-1. |
| S-2 | Use of herbicides should be used as sparingly as possible. | See response to Comment B-6. |
| S-3 | The right-of-way should be carefully inspected to identify all wetlands regardless of size as well as all certified or potential vernal pools. | Eversource has completed surveys of the entire WT-11 ROW and off-site access roads for wetlands and vernal pools. The wetland and vernal pool locations are depicted on WT-11 TRRP MEPA DEIR Map Set in Attachment 2. |
| S-4 | We request that the utility conduct a cultural resources study in coordinate with the Tribes and the Wendell Historical commission, since the Public Archaeology Laboratory, Inc. review indicates that there are cultural resources in the ROW. | Neither of the two sites identified by PAL are in Wendell. At the request of MHC, PAL has developed an avoidance and protection plan for an historic period site identified in Leverett and a potential ancient period site identified in Montague.<br>Where off-ROW access roads cross areas that may be identified by PAL as having potential high archaeological significance, Eversource will mat the access roads and/or ensure that no grading of existing soils within these areas will be conducted. With this avoidance and the implementation of the cultural resources BMPs discussed in Section 7.7 of this DEIR, the Project is not expected to affect any historic or archaeological resources. |

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| S-5 | We also request that this project be required to undergo a draft and final Environmental Impact Review rather than the single EIR that was requested. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| **Response to Comments from EENF Certificate, Amy Spalding-Fecher (8/17/2022)** | | |
| T-1 | Is this [the proposed Eversource tree cutting plan] on top of the spraying of carcinogenic glyphosate to keep the corridor clear? | The TRRP Project itself does not involve the application of herbicides.<br>Eversource maintains its ROWs in Western MA in accordance with its annual Integrated Vegetation Management (IVM) plan that follows a New England conditions-based variation of the ANSI Standards 300, Part 7 Integrated Vegetation Management. It involves a combination of mechanical (mowing, hand-cutting, side pruning, tree removal) and herbicide applications and treatments that support and maintain early successional ecological communities. This treatment cycle, which has and will continue to occur on the maintained portion of the WT-11 ROW, takes place every three to five years.<br>Eversource's IVM approach reduces the amount of herbicide used by using selective herbicides/application techniques at the lowest effective label rate, timing applications for maximum effect, avoiding fixed application schedules, using mechanical control techniques where appropriate, and encouraging low-growing plant communities. By combining all methods, the VMP allows for treatment cycles to be lengthened with fewer incompatible species on the ROW that require control. See Section 5.4.1 of the DEIR for more information on Eversource's IVM.<br>Herbicide use on electric transmission ROWs is under the jurisdiction of the Massachusetts Department of Agricultural Resources (MDAR). Eversource submits their Integrated Vegetation Management Herbicide Program to MDAR on an annual basis and it is available for public comment through that process. |
| T-2 | While I understand the need to keep power line free from trees, cutting 300' is excessive. | Justification for the "100-foot Modified Alternative," which is the Preferred Alternative for the WT-11 TRRP, is explained in the response to Comment F-1. |
| **Response to Comments from EENF Certificate, Mark Cherrington (8/18/2022)** | | |
| U-1 | I'm particularly concerned about the Buffam Fall Conservation Area in Pelham… that cutting is unnecessary. Because the landscape there is a deep ravine, the power lines already run well over the tops of the trees; higher, in fact, than any New England tree can grow. | See response to Comment M-1 regarding the reduction of tree clearing in the deep ravine where Amethyst Brook crosses the WT-11 corridor. No TRRP activities are proposed within the Buffam Falls Conservation Area. |
| U-2 | As for the far side of the ravine, where the land is more level, Eversource's proposal mentions using select hand-cutting in sensitive areas, but it does not specify where, exactly, that technique will be applied. If it is not already planned, that selective cutting should be applied in that part of the conservation area. For that matter, I would advocate Eversource using that approach for the full length of the right of way. | See response to Comment M-1. No TRRP activities are proposed within the Buffam Falls Conservation Area. |

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| **Response to Comments from EENF Certificate, Tony Rogers (8/18/2022)** | | |
| V-1 | At this point, destroying over 370 acres of trees is something not to be done without careful consideration of alternatives. Can this project be deferred, or at least allow only necessary trees to be removed - ones that pose an immediate danger to the lines - until a better less extreme proposal is put forward, one that would allow for less wholesale removal of this most important natural resource. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative as the new Preferred Alternative for the Project (see Section 3 in the DEIR). The 100-foot Modified Alternative consists of clearing trees up to 100 feet from the outer conductor, except in specific areas where this width could be reduced due to a low risk of tree fall-in. The selection of 100 feet is based on a LiDAR survey of trees in the WT-11 ROW and a growth model that allowed Eversource to predict which trees could grow into strike hazards over a 40-year period. With the adoption of the 100-foot Modified Alternative, Eversource has reduced forest conversion from 371 acres reported in the EENF to 278.1 acres. |
| V-2 | A critical part of the state's efforts to address climate change include the preservation and even expansion of forested land in the state. Trees are a critical carbon sink necessary for the state to achieve net-zero emissions by 2050. Any proposal to remove trees unnecessarily should be very carefully considered. In their application, Eversource neither mentions the value of the forest they intend to remove nor provides mitigation for the damage that would be done nor provides alternatives to their plan that would address this. | The DEIR provides a Quantitative GHG Analysis in Attachment 7. The analysis considers: the one-time direct emissions; the potential loss of future carbon sequestration due to habitat conversion and the reduction in GHG emissions brought about by increased grid reliability. The Quantitative Carbon Analysis is summarized in Section 6.1.3.<br>Eversource finds that additional mitigation, beyond the benefits of the Project itself, is not required. However, it is noted that compensatory mitigation for wetland impacts is anticipated to include forested land preservation, which would have the additional benefit of sequestering carbon in both above and below-ground biomass and actively removing carbon dioxide from the atmosphere both today and in the future. |
| V-3 | Have there been issues along the power line with trees outside of the current maintained 125-foot corridor. The corridor has remained unchanged for years. Why now does Eversource feel the need to expand the corridor now? Why to 100 feet from the outer power cables? Trees would have to be about 120 feet high at that distance to strike a power line 60 feet in the air. I'm sure a study of the trees along the route would rarely or never find anything near that height. If expansion of the right of way were indeed needed, then it's width at any point should be planned based on the threat that is being mitigated. Furthermore, some of the land between transmission towers is at the same elevation as the towers themselves. On the other hand, in some cases, the transmission cables span areas of lower elevation where the distance between treetops and cables means that trees pose no danger whatsoever to the Eversource power lines. Why, then, is corridor expansion and clearing being proposed everywhere? Avoiding clearing in such lower areas would save rate payers money and conserve precious carbon sequestration resources. | The Project is in response to publication of the NERC Reliability Standard FAC-003-4 on February 11, 2016 (see Attachment 3). The objective of FAC-003-4 is to maintain a reliable electric transmission system by using multiple layers of action to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW, thus preventing the risk of those vegetation related outages that could lead to cascading. The "100-foot Modified Alternative," which is the Preferred Alternative for this Project, consists of clearing trees up to 100 feet from the outer conductor, except in specific areas where this width could be reduced due to a low risk of tree fall-in. |
| V-4 | Eversource needs to give due consideration to the interests of other users of the land. Can they be required to get feedback from local conservation committees in town in which the corridor passes through conservation or recreation land? | Eversource has and will continue to solicit feedback from the local conservation commissions. First, each of the 11 conservation commissions were provided a copy of the EENF per the MEPA circulation requirements (301 CMR 11.16). Another avenue for feedback will be through the public hearing proceedings pursuant to the Massachusetts Wetlands Protection Act and any adopted local wetland protection bylaws/ordinances as part of the Notice of Intent review process. |

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| V-5 | The Buffam Falls Conservation Area in Pelham... is crossed by the transmission line but the land is over 150 feet below the bases of the transmission towers on each side of the gorge that makes up the conservation area. Why would Eversource need to clear that land? And what consideration has been given to the conservation and recreation areas crossed by the transmission line? | No tree clearing or any related Project activities, such as temporary access, are proposed within the Buffam Falls Conservation Area. See the response to Comment L-1 for proposed TRRP activities near the Buffam Falls Conservation Area.<br>The WT-11 corridor crosses 26 open space, conservation, and/or recreational properties. The recreational use of the ROW across these properties is allowed and will continue to be allowed after the Project is completed. During periods of active tree removal, safety measures will be implemented to protect recreational trail users, as described in Section 7.6. |
| **Response to Comments from EENF Certificate, Will McMillan (8/18/2022)** | | |
| W-1 | The MEPA analysis should be done using the traditional 2-stage process (Draft and Final EIR). | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| W-2 | The MEPA analysis should consider a full range of alternatives, including the No Action Alternative, and the mitigation necessary to minimize or eliminate all environmental impacts. | See response to Comment B-2. |
| W-3 | The proponent should evaluate all associated climate impacts per Section 61, including proposing actions to completely mitigate all negative climate impacts. | See response to Comment B-3. |
| W-4 | The analysis should consider climate impact mitigation by permanently protecting at least twice as much mature forest land as is being proposed for clear cutting or degradation/ disturbance as part of this project, by using a "forever wild" conservation restriction. Such protected land should be of equal or greater ecological condition, such as mature/intact forest land and/or old growth. | See response to Comment A-60. |
| W-5 | Full mitigation should be required for all potential impacts to sensitive, rare, threatened, and endangered species, and no "regulatory taking" of such species should be allowed. | See response to Comment B-5. |
| W-6 | The MEPA analysis should include a full accounting of the past 20 years of herbicide use for vegetation treatment and make projections for herbicide use over the next several decades. | See response to Comment B-6. |
| W-7 | If any increase in herbicide use is proposed, the applicant should be required to install surface water collection points and groundwater monitoring wells along the 29-mile route (to ensure that any chemical impacts are being monitored) and those sample results should be reported annually to the Towns. | See response to Comment B-7. |
| **Response to Comments from EENF Certificate, Don Ogen, The Enviro Show (8/19/2022)** | | |
| X-1 | A more complete survey of height and tree species needs to be completed, submitted and reviewed, as well as the need for information on post-project maintenance. | LiDAR technology was used to inventory trees in the WT-11 corridor. See response to Comment M-3 for more information on the LiDAR survey and how it was used to inform the tree removal plan. The response to Comment T-1 describes post-project maintenance. |

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| X-2 | Trees… are an important part of carbon accounting in Massachusetts law for reaching net zero emissions by 2050. | See response to Comment V-2. |
| **Response to Comments from EENF Certificate, Ellen Hopman (8/19/2022)** | | |
| Y-1 | We need trees to sequester carbon. | See response to Comment A-60. |
| Y-2 | We need the trees to hold water and preserve habitat for animals, birds, and pollinators. | Unlike other development project types, this Project involves the conversion of forestland to low vegetative growth (i.e., grasses, compatible shrubs and trees), which also provides valuable habitat for animals, birders, and pollinators. No part of the WT-11 corridor is being converted to impervious surfaces or other urban land uses that eliminate or significantly reduce wildlife habitat. This Project will also involve compensatory mitigation for its alteration to forested wetland areas that will serve to offset the loss of tree cover. |
| Y-3 | Clearcuts ruin the area for humans as well. | Eversource acknowledges that some perceive this Project as negatively affecting area residents, however, Eversource believes it has developed a plan that achieves its stated purpose of increasing system reliability per FAC-003-4 standards, while minimizing tree clearing to only what is required and incorporating BMPs and other mitigative measures that reduce the Project's effects on area residents. These measures include compensatory mitigation likely in the form of land preservation, use of sediment and erosion controls and equipment matting to protect water quality, use of low sulfur diesel fuels by heavy equipment, and limiting work hours to 7am to 5pm. The proposed mitigative measures for this Project are described in Section 7 of the DEIR. |
| **Response to Comments from EENF Certificate, Joanne Saltman (8/19/2022)** | | |
| Z-1 | Burying these lines would prevent future problems and save our trees. | Eversource has evaluated burying its lines within the WT-11 corridor as part of its alternatives analysis (see Section 3.2.1). While there are advantages to this alternative, it was ultimately discounted because it cannot be justified based on costs and environmental impacts and is unlikely to receive approval from the EFSB when the significantly less expensive and less environmentally impactful TRRP Project is available. |
| **Response to Comments from EENF Certificate, Stephanie Kraft (8/19/2022)** | | |
| AA-1 | Forested areas are vital mitigation areas for climate change and must be protected. The cutting should be absolutely minimal. | Eversource believes it has developed a plan that achieves its stated purpose of increasing system reliability per FAC-003-4 standards, while minimizing tree clearing to only what is required through the selection of the "100-foot Modified Alternative" as its Preferred Alternative. This alternative consists of clearing trees up to 100 feet from the outer conductor, except in specific areas where this width could be reduced due to a low risk of tree fall-in. This alternative is further explained in the response to Comment F-1. |

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| **Response to Comments from EENF Certificate, Jodi Rodar (8/20/2022)** | | |
| BB-1 | Have there been issues along this power line with trees outside of the current maintained 125-foot corridor? The corridor has remained unchanged for years. Why now does Eversource feel the need to expand the corridor now? Why to 100 feet from the outer power cables? | See the response to Comment V-3. |
| BB-2 | If expansion of the right of way were indeed needed, then it's width at any point should be planned based on the threat that is being mitigated. Furthermore, some of the land between transmission towers is at the same elevation as the towers themselves. On the other hand, in some cases, the transmission cables span areas of lower elevation where the distance between treetops and cables means that trees pose no danger. Why, then, is corridor expansion and clearing being proposed everywhere? Avoiding clearing in such lower areas would save rate payers money and conserve precious carbon sequestration resources. | The Project plan considers tree height and ground elevation relative to the height of the powerline cable to determine what trees get removed. Eversource's selection of the 100-foot Modified Alternative as the project's Preferred Alternative eliminates trees from being cleared that represent a low risk of tree. This alternative is further explained in the response to Comment F-1. |
| BB-3 | Some of the land crossed by transmission corridor is conservation land or recreation land, enjoyed by the nearby residents. Much of this land is crisscrossed by hiking trails. Eversource needs to give due consideration to the interests of other users of the land. Can they be required to get feedback from local conservation committees in town in which the corridor passes through conservation or recreation land? | See response to Comment V-4. |
| BB-4 | One example of a variety of these issues, is the Buffam Falls Conservation Area in Pelham. It is enjoyed by many people for its beauty Why would Eversource need to clear that land? And what consideration has been given to the conservation and recreation areas crossed by the transmission line? | See response to Comment V-5. |
| **Response to Comments from EENF Certificate, Margaret Hepler (8/20/2022)** | | |
| CC-1 | I am very concerned about potential damage to our neighborhood conservation area proposed by the Eversource power line corridor widening project. Our regional land trust, the Kestrel Land Trust, has worked for several decades to persuade land owners to sell their woodland properties to the town for the Buffam Brook Town Forest. | The Project does not cross the Buffam Brook Community Forest. It is located approximately 0.6 mile west of this conservation land. Aside, Eversource is working with the Kestrel Land Trust and local conservation commissions to identify potential properties within and near the municipalities crossed by the Project that can be used for compensatory mitigation. |
| CC-2 | The trails that so many now come to enjoy, and the forest, which has become the front line of defense against climate change in its carbon sequestration, would be badly damaged by the project, which seems to be much more intrusive than necessary. | The Project will not result in a loss of open space or recreational opportunities. On open space and recreational lands, all work is proposed within Eversource's existing easement and will have no long-term impacts on the ability of the public to utilize these spaces. Access may be temporarily affected where work is being done but these impacts will be short-term. |

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| CC-3 | Of course our power grid must be improved and protected from damage, but cutting all trees in the corridor, when only one or two species would grow tall enough to impact the lines, seems excessive. The width of the corridor is also excessive. In this era of rapid loss of biodiversity, such pristine forests and habitat need to be protected and preserved. We strongly object to the scope of this project and hope it can be revised to be less damaging. | Eversource believes it has developed a plan that achieves its stated purpose of increasing system reliability per FAC-003-4 standards, while minimizing tree clearing to only what is required through the selection of the "100-foot Modified Alternative." This alternative consists of clearing trees up to 100 feet from the outer conductor, except in specific areas where this width could be reduced due to a low risk of tree fall-in. This alternative is further explained in the response to Comment F-1. |
| **Response to Comments from EENF Certificate, Kelly Cusson (8/21/2022)** | | |
| DD-1 | There doesn't appear to be a thorough survey done of which trees along the transmission corridor pose a threat to the power lines. Only trees shown to be geometrically positioned in relation to the power lines in a way that they could do damage, or those likely to grow to that height in the next few years, should be removed. | LiDAR technology was used to inventory trees in the WT-11 corridor. See response to Comment M-3 for more information on the LiDAR survey and how it was used to inform the tree removal plan. |
| DD-2 | MEPA should not grant a certificate until this survey of line height and tree species and placement is completed, submitted, and reviewed. | Eversource has completed a survey of line height and the location and type of trees (coniferous vs. deciduous) in the WT-11 corridor using LiDAR technology. See response to Comment M-3. |
| DD-3 | Power lines in danger of damage by trees falling could also be protected by raising them in height. This method was employed in the last few years along some segments of Eversource's transmission corridor. | A detailed alternatives analysis is provided in Section 3.0 of this DEIR, resulting in the selection of the 100-foot Modified Alternative. As discussed in Section 3.2, Eversource evaluated replacing all the structures along the existing ROW with new, taller structures and conductors within the existing ROW. This alternative was discounted because replacement of this line with the construction of a new taller overhead line cannot be justified based on costs and environmental impacts and is unlikely to receive approval from the EFSB when the significantly less expensive and less environmentally impactful TRRP Project is available. |
| DD-4 | We need trees to act as a carbon sink. This is a key part of carbon accounting in state law for reaching net zero emissions by 2050. MEPA should not be approving a broad tree cutting plan. | See response to Comment to V-2. |

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| DD-5 | This project is illegally segmented. There are identical proposals for other sections of the transmission corridor, each filed under a different docket number and with different MEPA officials. This creates an unrealistically reduced impact assessment. Eversource should be required to file the FULL impacts of all similar proposals combined. | The Project is not illegally segmented but rather incorporates specific powerline segments between the Northfield and Ludlow Substations. In accordance with the Certificate on the EENF, Eversource was requested to provide a conceptual overview of the cumulative impacts of the entirety of the Western Massachusetts TRRP. Table 8-1 in the DEIR provides a list of each ROW managed by Eversource in Western Massachusetts, its total site area, and a conceptual, quantitative overview of impacts from TRRP and the approximate timeline for each ROW's TRRP effort. Eversource will maintain this table internally, updating it for each Project as they go through the MEPA process for each project.<br><br>It should be noted that Eversource does not gain any advantage regulatory-wise from separating the TRRP activities into manageable projects. There are no regulatory thresholds that would otherwise be exceeded if the WT-11 TRRP was combined with other TRRP projects. For instance, the WT-11 TRRP is allowable as a limited project under the Massachusetts Wetlands Protection Act (WPA) and would still be allowable as a limited project if the Project was combined with other TRRP projects. Each local conservation commission responsible for administrating the WPA within its jurisdiction will review the TRRP project; the number of municipalities crossed by a particular TRRP project does not affect each local commission's authority. The determination of compensatory mitigation is relative to the size of the resource areas being altered, therefore, separating the TRRP projects into smaller does not lessen the amount of mitigation that would be required. |
| DD-6 | Alternatives analysis should include other grid reliability measures such as full-system grid mapping and installation of distributed electric storage facilities at all feasible substations. | Grid mapping and distributed electric storage were not considered in the Alternative Analysis because they would not meet the Project's purpose and need of eliminating outages from tree fall-ins in accordance with FAC-003-4. See response to comment E-10. |
| DD-7 | Outreach to Environmental Justice communities and host communities has been inadequate. The comment period for this preceding should be extended and public information sessions held. | See response for Comment E-8. |
| DD-8 | A full estimate of greenhouse gas emissions including downstream emissions from use of tree materials harvested has not been provided. The certificate should not be granted until this is completed, submitted and reviewed. | The DEIR provides a quantitative carbon analysis of tree clearing activities that considers both the one-time direct emissions from tree removal as well as loss of potential carbon sequestration over 40 years. Section 6.1.3 of this DEIR presents the summary of this analysis. Attachment 7 provides the Quantitative Carbon Analysis. |

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| **Response to Comments from EENF Certificate, Peter Crowley (8/21/2022)** | | |
| EE-1 | The goal of TRRP to protect Eversource's transmission lines from damage from tree fall is important, but, the >200 foot wide cleared-corridor mandated by TRRP creates needless environmental damage to the transmission corridor. Similar benefits could be achieved within a significantly narrower cleared-corridor. The existing corridor is cleared approximately 50' from the outer transmission line, making it unlikely to be struck by a tree that is less than 70' tall. The tallest trees along the ROW are white pines, a species that is rarely taller than 80'. Widening the corridor by <15' would be sufficient for 80' white pine trees to fall without hitting a transmission line 50' in the air. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. This alternative is further discussed in the response to Comment F-1. |
| **Response to Comments from EENF Certificate, Sheldon Ross (8/21/2022)** | | |
| FF-1 | Urging you to insist on adjusting the plan to limit indiscriminate cutting. Make Eversource only cut what is truly necessary to realistically prevent potential tree damage to power lines. Insist that experienced, licensed arborists consult to aid in the evaluation of potential tree hazards. We need to preserve as much wooded area as possible! | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. This alternative is further discussed in the response to Comment F-1. |
| **Response to Comments from EENF Certificate, Franklin Regional Council of Governments, Kimberly Noake MacPhee, Climate Resiliency Specialist (8/22/2022)** | | |
| GG-1 | FRCOG requests that EEA and its agencies review the entire TRRP within Massachusetts and look at cumulative impacts of the TRRP. We believe that some components of the MEPA review process should be completed for the implementation of TRRP across Massachusetts, not just transmission line by transmission line as they are currently being submitted to the MEPA office. Does MEPA consider the implementation of Eversource's TRRP on a line-by-line basis as "segmentation" under 301 CMR 11.01(2)c, even if work on each line triggers MEPA review? | See response to Comment A-14. |
| GG-2 | FRCOG requests that the proponent consider alternatives that include less land clearing and that any necessary land clearing be done in a way that more accurately reflects on the ground conditions and avoids work in sensitive locations. Sensitive locations to be completely avoided include priority habitat for state-listed species, all wetland areas, Riverfront Areas, Coldwater Fisheries habitat, vernal pools (the EENF shows proposed cutting and temporary matting going right through documented vernal pools), historical and culturally sensitive locations, wellhead protection areas, areas near private wells, or combinations of any of these features. | See response to Comment A-9. |
| GG-3 | It would be useful to understand the current and future projected number of downed lines under each alternative and the methodology for evaluation in order to evaluate potential project alternatives, including the proposed alternative and the "do nothing" alternative. | A comparison of projected tree strikes per alternative clearing width evaluated is provided in Table 3-2. |

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| GG-4 | We request that the impacts, such as those summarized in Section II(C) of the ENF form, be summarized by town in the EIR, so that it's clear what the impacts are in each community. It would also be useful to know the forested acreage proposed to be cut in each town. | Eversource has summarized impacts by municipality in Section 1.5 of the DEIR. |
| GG-5 | We request that future filings include a project-specific schematic diagram that shows the actual towers in this line, and include actual dimensions or ranges of dimensions of the height of the towers, the heights of the power lines, the width of the wire zone, the width of the current border zone, and the widths of the additional ROW to be cleared. It appears from the revised maps provided to MEPA that the proposed maintained width will be closer to 250 ft. of the 300 ft. ROW. | The WT-11 ROW contains the 345-kilovolt (kV) overhead Line 354 for its entire 29.3-mile length, as well as the 345-kV Line 312 and 115-kV Line 1604 from the Northfield Substation to Erving Junction. While Eversource has easement rights for a ROW width ranging from 300 to 500 feet, ROW WT-11 has a maintained width between 125–335 feet. The proposed TRRP will increase the maintained ROW width to an average width of 250-500 feet by cutting trees from within the currently unmaintained/forested portions of the ROW, which increases the distance between the overhead transmission lines and the adjacent trees.<br><br>The DEIR Map Sheet in Attachment 2 depicts information requested by the MEPA Office. ROW cross-section drawings are provided in Attachment 1. |
| GG-6 | Please require Eversource to provide details about annual and long-term vegetation management techniques along this corridor, including what is or is not planned for herbicide treatment and the type and quantity of herbicides involved. In particular, we are concerned about herbicide use and its impacts on pollinators. | Herbicide use on electric transmission ROWs is under the jurisdiction of the Massachusetts Department of Agricultural Resources (MDAR). Eversource submits their Yearly Operational Plan to MDAR on an annual basis and it is available for public comment through that process. |
| GG-7 | We reviewed Eversource's Five Year Vegetation Management Plan for Western Massachusetts 2019-2024 and the 2022 Operational Plan for Eastern and Western Massachusetts, and neither included any mention of pollinator habitat or techniques to ensure pollinators are protected from herbicide application and other vegetation management practices, such as time of year vegetation cutting/clearing. | The purpose of Eversource's 2025 IVM for Western MA is to remove vegetation that obscures the ROW corridors and grows tall enough to interfere with the safe, efficient, and legal operation of an electrical power line. In the Wire Zone, trees and brush are targeted, and native, low-growing plant communities that have a mature height less than three feet are encouraged. In the Border Zone, incompatible trees and brush are targeted, and the growth of native trees and shrubs that have a mature height less than 30 feet is encouraged. Woody invasive species, such as multiflora rose and autumn olive, are also targeted where appropriate. While managing the Wire Zone for pollinators is not specifically mentioned in the IVM, it encourages the permanent establishment of low-growing plant communities where pollinators are found.<br><br>The IVM control practices, which includes the selective use of herbicides in compliance with the requirements of Chapter 132b and 333 CMR 11.00, targets non-compatible and invasive woody species. Herbaceous plant species, which pose no threat to the safe operation of the powerlines, are not targeted.<br><br>It should be noted that for 2025 IVM herbicide applications, Eversource is only using "sensitive area" MDAR-approved herbicides on their entire ROW system: Sensitive areas are those areas within a ROW in which public health, environmental concerns or agricultural interests warrant special protection to minimize the risk of unreasonable adverse effects. |

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| GG-8 | Further, we are concerned that the listed herbicides might be harmful to pollinators and if so, alternatives should be identified and used. These publicly-available Eversource plans and additional related plans should be referenced and additional information provided about current and future vegetation management practices that are protective of the life cycle needs of pollinators. | The current (2025) Yearly Operational Plan detailing Western MA's Integrated Vegetative Management (IVM) Herbicide Program for is available for review here: https://www.mass.gov/doc/eversource-western-ma-2025-yop/download. Chapter VII identifies the proposed herbicides, carriers, adjuvants and associated rates to be used. These plans are submitted to the MDAR and published annually and are specific to the lines that Eversource intends to conduct IVM activities on that year. |
| GG-9 | Section 4.2.1 in the EENF narrative provides information about aquifers and groundwater public water supplies in the project area. FRCOG requests that the proponent include information in an EIR about private wells particularly any wells that are shallow. Future vegetation management techniques near private wells should avoid the use of herbicides. | No herbicide treatments will take place within 50 feet of any identified private wells located within one hundred (100) feet of the ROW In accordance with 333 CMR 11.02. Eversource notifies all "abutters" (houses and businesses that abut the rights-of-way being treated in that year) within view of the ROWs before treatments begin. Treatment contractors are required to leave door hangers or talk personally with abutters which allow the contractor to answer site-specific questions and identify private wells.<br>The well locations are depicted on "Sensitive Area" maps provided with each yearly IVM plan. Eversource updates its private well records based on available data. Eversource asks that municipalities assist in the identification process and the MDAR will be consulted again prior to the treatment to keep the private drinking water supply information up to date. Identified private drinking supplies within one hundred (100) feet of a ROW will be permanently recorded on appropriate maps. |
| GG-10 | Surface Water Protection Areas for drinking water sources, such as those in Shutesbury, also need to be identified in the narrative and clearly marked on the maps. The EIR should fully describe vegetation management in Surface Water Protection Areas, and describe how the boundaries of these areas will be marked in the field for both the project and for future vegetative management rounds. | Eversource is required to show surface water protection areas on its Sensitive Area maps and have these locations marked in the field by an experienced vegetation management treatment crew point person trained in the use of GIS (geographic information systems) and GPS equipment. Per 333 CMR 11.02, no herbicide spraying is allowed within the following:<br>• 100 feet of any Class A Surface Water Source<br>• 100 feet of any tributary or associated surface water body where the tributary or associated surface water body runs within 400 feet of a Class A surface water source<br>• 10 feet of any tributary or associated surface water body where the tributary or associated surface water body is at a distance greater than 400 feet from a Class A surface water source<br>• a lateral distance of 100 feet for 400 feet upstream, on both sides of the river, of a Class B Drinking Water Intake<br>Limited spraying is allowed within the following:<br>• between 100 feet and 400 feet of any Class A Surface Water Source<br>• between 10 and 200 feet of any tributary or associated surface water body where the tributary or associated surface water body runs outside the Zone A for the Class A surface water source. |

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| GG-11 | FRCOG recommends Eversource review local stormwater and wetlands bylaws and identify in the EIR which towns in the project area have local bylaws that will need to be considered as the project moves forward. | Section 6.5 discusses the Project's regulatory compliance with the local stormwater and wetlands bylaws. |
| GG-12 | The FRCOG requests that Eversource consult the Regional Pollinator Plan and other documents such as EPRI's "Overview of Power Companies and Pollinators" published in 2018, and EPRI's "Conservation Actions for Electric Power Companies to Support Monarch Butterflies" published in 2019. These ideas should be incorporated into Eversource's overall planning for the TRRP, for this project as well as others. There are a number of state-listed butterfly, moth, bee, and bird species that could benefit from planning this project to encourage pollinator habitat. Notwithstanding the project impacts, this project also represents an opportunity that should not be lost. | Eversource will continue to follow MESA regulations on how it manages its ROWs with respect to protected state-listed species. |
| GG-13 | Through our work on the pollinator plan, FRCOG is aware of State-listed species that are present or have been historically present in the affected towns along this corridor.2 For example, the American bumblebee (endangered), golden-eyed warbler (endangered), scrub euchlaena (a moth; special concern), pine barrens zale (a moth; special concern), and the buck moth (special concern), are all listed as being in the area. We do not know if there have been priority or estimated habitats mapped out for these species. Given the large extent of the project and project impacts, FRCOG requests that MEPA and the Natural Heritage and Endangered Species Program (NHESP) meet to discuss whether or not the project proponent should be required to assess the area to be disturbed by the Project to determine if these or other State-listed species are present (see 321 CMR 10.13(1)b(1)). | Eversource is coordinating with the NHESP and will adhere to all MESA regulations and permit conditions for this Project. |
| GG-14 | Additionally, the project could ultimately create habitat for State-listed species (outside of the listed species mentioned as being impacted in the EENF), and this could also be evaluated, encouraged, and managed by Eversource. | Eversource will continue to follow MESA regulations on how it manages its ROWs with respect to protected state-listed species. |
| GG-15 | "Section 5.7 in the EENF narrative states, "The Project is not expected to affect any historic or archaeological resources." However, section 4.7 indicates that Public Archaeology Laboratory, Inc. (PAL) was hired to conduct a due diligence review and archaeological sensitivity assessment for the Project, and this section indicates that there are historic and archaeological resources that fall within the Project ROW. Please clarify or correct. It is unclear how the vegetation clearing contractors will know which BMP to implement when in the area of a historic or cultural resource. Will there be any process to delineate these sensitive areas in the field and is there a process for monitoring during the implementation of the project?" | The MHC has requesting that PAL develop an avoidance and protection plan (ASAAP) for an historic period site identified in Leverett and a potential ancient period site identified in Montague. PAL developed ASAAPs for these areas, which are further discussed in Section 7.7. Eversource is awaiting feedback from the MHC regarding a due diligence report that PAL prepared and submitted for off-site access roads. The ASAAP will be amended in accordance with any further instruction from MHC.<br>In addition to the ASAAP for the sites noted above, to avoid impacting any other archaeological sites and Tribal areas of significance, Eversource will avoid physical impacts to aboveground resources and significant ground disturbance. Where off-ROW access roads cross areas that may be identified by PAL as having potential high archaeological significance, Eversource will mat the access roads and/or ensure that no grading of existing soils within these areas will be conducted. With this avoidance and the implementation of the cultural resources BMPs discussed in Section 7.7 of this DEIR, the Project is not expected to affect any historic or archaeological resources. |

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| GG-16 | The Shutesbury Historical Commission has recently published a document entitled "Introduction to Indigenous Cultural Sites in Shutesbury." The Shutesbury Historical Commission, representatives from the Nolumbeka Project, and state and federally recognized indigenous groups should be consulted to ensure that culturally sensitive locations and sites are not disturbed. | Eversource and their cultural resources consultant PAL have consulted with the MHC and the four federally recognized tribes. At the request of FRCOG, copies of the cultural resource reports were provided to the municipal historical commissions on May 15, 2025. |
| GG-17 | The Town of Wendell has a Memorandum of Understanding dated 2017 that lays out an agreement for the Historical Commission to work collaboratively with four Tribal Historical Preservation Offices with respect to ceremonial stone landscapes in Wendell. It would seem advisable that the utility conduct a cultural resources study in coordination with the Tribes and the Shutesbury and Wendell Historic Commissions, since the PAL review indicates that there are cultural resources in the ROW. | Eversource and their cultural resources consultant PAL have consulted with the MHC and the four federally recognized tribes. Copies of the cultural resource reports were provided to the municipal historical commissions on May 15, 2025. |
| GG-18 | Stone walls are shown on map sheets 6, 12, 15, and 20. It is not clear which non-impact method will be used, based on a review of Eversource's Best Management Practices Manual for Massachusetts and Connecticut (April 2022). Eversource should have a specific plan in place for moving large equipment near or over each of these stone walls. | The sensitive area BMPs discussed in Section 7.7.1 include measures to protect stone walls during the TRRP activities. Eversource has surveyed all access routes to tree removal locations and did not identify any stone walls that would restrict access. In the unlikely event that such a stone wall is encountered, Eversource would consult with the property owner before temporarily removing a section of the wall necessary for access and then rebuilding it after work in that area is completed. |
| GG-19 | Given the lack of project alternatives, the lack of description provided about long-term maintenance of the cleared area, and the lack of the greenhouse gas emissions estimates provided in the EENF, we request that this project be required to undergo a draft and final EIR rather than a single EIR as requested. | Eversource will be filing a DEIR and FEIR, per the MEPA Certificate on the EENF. |
| GG-20 | The MEPA office should consider requiring a joint draft and final EIR (or a hybrid of individual/joint analyses) for the two projects and possibly additional phases. The cumulative impacts of tree loss, carbon impacts, impacts to priority habitat, wetlands, and riverfront areas, and impacts to natural and historic/cultural resources should be fully considered and weighed against the projected gains in reliability. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| GG-21 | FRCOG requests that any agreement for mitigation funds set up for protected species be written to provide a net benefit for the species in the same geographic area (watershed, county, or town) as the impacted habitat. We also request that the agreement include specific provisions for mitigating the project impacts to Riverfront Areas and Coldwater Fisheries Resources (headwaters and watersheds), such as riparian plantings that provide pollinator habitat, bank stabilization and shading, culvert and stream crossing right-sizing, and permanent conservation of land in Riverfront Areas and mapped river corridors (Sawmill River watershed). | Eversource commits to working to develop a compensatory mitigation plan that comports to all applicable regulatory requirements. As discussed in Section 7, Eversource continues to develop a compensatory mitigation plan that is expected to consist primarily of the permanent preservation of land to mitigate impacts resulting from the conversion of forested wetlands to wetlands with low-growing cover types. Mitigation will also include a culvert removal and stream restoration project near the ROW in Erving, Massachusetts. This mitigation package is being developed in consultation with Kestrel Land Trust, MassDEP, and the applicable local conservation commissions. |

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| **Response to Comments from EENF Certificate, Judith Eiseman (8/22/2022)** | | |
| HH-1 | Segmentation of this project into small town by town or regional projects rather than a full scope noting the overall effect of this ROW widening throughout the Commonwealth. The full impact should have been discussed prior to the approvals already granted elsewhere or which are planned for similar widening of the ROW. | See response to Comment A-14. |
| HH-2 | Lack of complete evaluation of the loss of carbon sequestration benefits of the acres of trees proposed to be removed and/or prevented from regrowing | The DEIR provides a quantitative carbon analysis of tree clearing activities that considers both the one-time direct emissions from tree removal as well as loss of potential carbon sequestration over 40 years. Section 6.1.3 of this DEIR presents the summary of this analysis. Attachment 7 provides the Quantitative Carbon Analysis. |
| HH-3 | Lack of clarity as to what happens to the trees once cut. It should be left on the ground in place to continue its role in carbon sequestration. Chipping just uses more fossil fuels. | End users for cut timber will include Wendell and Amherst townships, landowners, and sawmills (see Section 8.3). Eversource will coordinate directly with landowners, including the Commonwealth of Massachusetts (i.e., DCR and the Department of Fish and Game), regarding any requests for firewood, chips, or other wood products generated from the Project. Eversource's vegetation management will be responsible for tracking the distribution of cut timber that is provided to the townships, landowners, sawmills, and other end users. Low value timber (i.e., damaged) and slash will likely be chipped and disposed of off-site. |
| HH-4 | Lack of real alternatives to the effect this extensive intrusion will have on protected land, wildlife habitat corridors, rare species, and wetlands. No real consideration has been given to terrain or species or probability of trees actually hitting these lines. Also, no discussion of the possibility of raising the lines rather than cutting trees has been provided. I understand this has been done elsewhere. A one size fits all approach is insulting to the public's intelligence. | Eversource evaluated several alternatives including raising the pole heights to reduce tree clearing but ultimately selected the 100-foot Modified Alternative as the Project's Preferred Alternative. The 100-foot Modified Alternative specifically reduces the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. The Alternatives Analysis is further discussed in the response to Comment A-7. |
| HH-5 | Stormwater management and erosion control in areas where the soils indicate high probability for damage downstream or down gradient must be addressed. | See response to Comment A-53. |

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| HH-6 | Refusal to discuss abandoning the use of herbicides and pesticides. Minor increases in shrub habitat may be a small benefit, but continuing to poison the land is not. The town of Pelham is entirely zoned as a water supply protection district, and we have been working for many years to reduce the use of these chemicals. The Eversource public relation spokesperson's promises notwithstanding, the YOP always manages to insist that chemicals rather than physical labor are required. | Herbicide use is only one component of Eversource's Integrated Vegetated Management (IVM) program for Western MA. It involves a combination of mechanical (mowing, hand-cutting, side pruning, tree removal) and herbicide applications and treatments that support and maintain early successional ecological communities. More information on the IVM is provided in the response to Comment GG-7 and in Section 5.4.1 of the DEIR.<br>It should be noted that for 2025 IVM herbicide applications in Western MA, Eversource is only using "sensitive area" MDAR-approved herbicides on their entire ROW system. Sensitive areas are those areas within a ROW in which public health, environmental concerns or agricultural interests warrant special protection to minimize the risk of unreasonable adverse effects. The MDAR has specifically permitted the use of these herbicides in Wellhead Protection Areas because they are designed to bind tightly to soil particles, preventing them from easily moving through the soil profile and reaching the groundwater table. Restrictions on herbicide use by wetlands, watercourses, surface water protection areas, and public/private wells apply, nevertheless.<br>Eversource's IVM approach reduces the amount of herbicide used by using selective herbicides/application techniques at the lowest effective label rate, timing applications for maximum effect, avoiding fixed application schedules, using mechanical control techniques where appropriate, and encouraging low-growing plant communities. By combining all methods, the VMP allows for treatment cycles to be lengthened with fewer incompatible species on the ROW that require control. See Section 5.4.1 of the DEIR for more information on Eversource's IVM. |
| HH-7 | Given the reality of Climate Change, this plan is an affront, not a solution, toward the crisis we face. I certainly do not dismiss the need to provide adequate electricity, but this project seems guaranteed to increase rather than in any way curtail electrical or any other energy use. With no educational component or even a nod toward reduction rather than constant and ultimately insupportable growth of the grid, it fails to look far enough into the future to envision where this sort of profit motivated thinking will lead. | The purpose of the Project is to minimize vegetation fall-ins and outages on the line, thereby improving reliability and maintaining compliance with NERC Reliability Standard FAC-003-4. It is not associated with changing energy usage. |
| HH-8 | Finally, over the years I have noted that these major projects continue to avoid real public participation as a result of deadlines coming at major holidays, near the end of the year, or during the summer months. Whereas that no doubt fits into corporate, MEPA, or other regulatory staff schedules, this has the effect of curtailing the ability of the actively informed public to reach the less informed people who are willing to understand and comment if only they can be made aware. The insistence by Eversource that this process is in "an early stage" means that the public never gets to comment once full scoping and plan development is done. We're just stuck with it and the results. | The Project was at an "early-planning" stage when the EENF was filed with the MEPA Office. Since the EENF filing, Eversource has conducted a LiDAR survey of the trees and terrain in the WT-11 corridor and has completed growth modeling, which allowed Eversource to assess the effectiveness of different clearing widths in the corridor to meet the Project's purpose, while minimizing environmental impacts. The result was the development and selection of the 100-foot Modified Alternative as the new Preferred Alternative for the Project (see Section 3 in the DEIR). With the adoption of the 100-foot Modified Alternative, Eversource has reduced areas of proposed tree clearing from 371 acres reported in the EENF to 278.1 acres reported in the DEIR. |

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| **Response to Comments from EENF Certificate, Jonathan Woodbridge (8/22/2022)** | | |
| II-1 | We have lived close to the lines in Pelham and have walked on the paths under the lines for 20 years. Every one of the many outages we have had have not been due to main line damage, but rather to tree damage to the lines that run along roads that were inadequately maintained for many years. So the need does not appear great. | The purpose of the Project is to manage the utility corridor under both present and future conditions to minimize the likelihood of tree strikes and maintain compliance with NERC Reliability Standard FAC-003-4, which is provided in Attachment 3.Over the last several years, severe weather events resulting in extended outages have become more common as trees fall into transmission lines during storm events. Table 2-1 summarizes outages related to contact with vegetation that have occurred on Eversource's transmission system in Massachusetts from 2011 to 2023 (thus far). |
| II-2 | Areas are marked for cutting without regard to whether they are a hazard to the line: several areas of lower trees that I know near Amherst Rd, and an area where the lines run far above the tree canopy in as the line crosses Buffam brook valley near N. Valley Rd. There is no reason to cut these as they pose no hazard to the lines. This is just looking at the area of the proposed cutting that I know best. The cut plan should be reworked to focus on selective cutting of those heights and positions of trees that pose line risks. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. As further discussed in the response to Comment L-1, the selection of this alternative as the Project's Preferred Alternative has reduced tree clearing in locations such as south of North Valley Road. |
| **Response to Comments from EENF Certificate, Catherine V. Skiba, P.G. for Michael Gorski, MassDEP (8/22/2022)** | | |
| JJ-1 | To ensure full opportunities for public involvement and to avoid any potential conflict with the final Certificate from the Secretary or the WQC, MassDEP recommends that no such filing occur until after the Project has received a final Certificate from the Secretary. Should the Proponent file NOIs prior to the issuance of a final Certificate from the Secretary, MassDEP recommends the Proponent request that the local conservation commissions defer a decision and keep the meeting open until the Secretary has issued the final Certificate, and MassDEP has issued the WQC | As shown in Table 1-1 (WT-11 Permits and Consultations), Eversource is planning to submit the NOIs to the Conservation Commissions after the conclusion of the MEPA review for the reasons indicated in Comment JJ-1. |
| JJ-2 | The project, as described, may be eligible for review under the Limited Project provisions contained at 310 CMR 10.53(3)(d). As for all Limited Projects, allowance under these provisions is at the discretion of the local Commission and to the extent practicable, work must comply with the General Performance Standards. | The NOIs submitted to the Conservation Commissions will demonstrate how the Project will protect the interests of the Act. WPA permitting documents will include tree work details, potential time-of-year restrictions, specific locations of proposed construction mats, and implementation sequencing. Section 6.2 describes the Project's relationship to applicable resource area performance standards and the limited project provision of 310 CMR 10.53(3)(d) for electric transmission lines. |
| JJ-3 | The Proponent has identified 14 Cold Water Fisheries that may be impacted by the project. The proposed project also has the potential to result in significant changes to the hydrology of the affected resource areas and downstream reaches. Therefore, the WPA permit applications for this project should consider both surface and subsurface hydrology, wildlife habitat, fisheries habitat, and shading impacts. | The NOIs to be submitted by Eversource for this Project will assess potential resource area alterations from tree removal and ROW access activities, including the potential effects on surface and subsurface hydrology and wildlife habitat. WPA permitting documents will include tree-work details, potential time-of-year restrictions, specific locations of proposed construction mats, and implementation sequencing. The NOIs and accompanying plans will also demonstrate compliance with Best Management Practices for stormwater management and sedimentation and erosion control. |

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| JJ-4 | As part of the WQC permitting process the Proponent is required to document efforts to avoid, minimize, and mitigate impacts. | The WQC application that Eversource will submit for this Project will provide sufficient information to describe cumulative impacts to "Waters of the Commonwealth" and demonstrate how impacts have been avoided, minimized, and/or mitigated. Eversource is proposing compensatory mitigation from the conversion of roughly 14.4 acres of PFO habitat to PSS habitat as well as from the removal of trees from 19,179 linear feet of Bank (this plan is described in Section 7.2.3 of this DEIR). Temporal alterations to Waters of the Commonwealth from temporary activities will be mitigated through in-situ restoration. |
| JJ-5 | Mitigation for impacts is a requirement of the regulations. Appropriate mitigation measures will be determined as part of the WQC application process. | Eversource understands that appropriate mitigation measures for wetlands and watercourses will be determined as part of the WQC application process. |
| JJ-6 | In accordance with the MEPA process, some resource area and waters of the Commonwealth impacts are listed as “temporary” in the EENF; the Proponent should be aware that the WPA and associated regulations do not have a designation of “temporary impacts” to resource areas. The activities proposed in the EENF meet the definition of “Alter” contained in 310 CMR 10.04 and the WQC regulations specifically include “temporary” activities as being subject to the regulations (310 CMR 9.02). Please note, that temporal impacts to resource areas can be mitigated through “in-situ” replication and/or restoration, as well as via off-site considerations. | Eversource's understanding of the definition of "alter" in 310 CMR 10.04 is consistent with what is explained in Comment F-5. Some resource area alterations of this Project are temporal in nature and will be mitigated through in-situ restoration; other alterations, namely tree removal, are permanent in nature and will be mitigated through off-site compensatory mitigation. Since there is no wetland loss associated with this Project, Eversource is providing compensatory mitigation in accordance with the 33 CFR Parts 325 and 332 (“Mitigation Rule”) that requires mitigating for the wetland functions that were lost from the alteration. |
| JJ-7 | If NHESP determines the project will result in a “take”, the Proponent must document it has received and will comply with a Conservation and Management Permit issued by NHESP as part of the WQC permit application. | NHESP has determined that the Project will result in a Take for the eastern box turtle, necessitating the filing of a Conservation Management Permit (CMP) application. Eversource will comply with a Conservation and Management Permit (CMP) issued by NHESP. |
| JJ-8 | WPA permitting documents should include details of tree work, potential time-of-year restrictions, specific locations of proposed construction mats, and implementation sequencing. In addition, documents must describe how any wetland resource areas disturbed as a result of the project will be restored. | The NOIs to be submitted by Eversource for this Project will include details of tree work, potential time-of-year restrictions, specific locations of proposed construction mats, and implementation sequencing. In addition, documents will describe how any wetland resource areas disturbed as a result of the project will be restored. |
| JJ-9 | Given the length of the project and presence of public surface water supplies in the affected communities, the Proponent should be aware of those surface water supplies designated as Outstanding Resource Water (ORW). The Surface Water Quality Standards regulations prohibit the discharge of fill or dredge material into a tributary to a Public Water System supply or within 400 feet of the high-water mark of the surface water supply (an ORW). As part of its WQC permit application, the Proponent will be required to demonstrate methods to ensure that no fill or sediment will enter a tributary as a result of this project. | As part of its WQC permit application, Eversource understands that it will be required to demonstrate methods to ensure that no fill or sediment will enter a tributary to a public water system supply or within 400 feet of the high-water mark of the surface water supply (an ORW) because of this project. |
| JJ-10 | The Proponent will be required to document that appropriate and effective sediment and erosion controls are implemented and that the crossing techniques (currently identified as “spans”) will result in no adverse impacts to the tributaries, adjacent wetlands, or any downstream reaches. | As part of its WQC permit application, Eversource understands that it will be required to document that appropriate and effective sediment and erosion controls are implemented and that the crossing techniques will result in no adverse impacts to the tributaries, adjacent wetlands, or any downstream reaches. |

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| JJ-11 | Construction activity must conform to current Air Pollution Control Regulations. The Proponent should implement measures to alleviate dust, noise, and odor nuisance conditions that may occur. Such measures must comply with the MassDEP's Bureau of Air and Waste (BAW) Regulations 310 CMR 7.01, 7.09, and 7.10. | Eversource will apply BMPs during tree clearing activities to reduce emissions (and associated odors) from equipment, control dust, and mitigate noise generated from construction equipment. These BMPs for air and noise are described in Section 7.3.1 and 7.3.2 of this DEIR, respectively. As such, the Project will conform to MassDEP's Bureau of Air and Waste (BAW) Regulations 310 CMR 7.01, 7.09, and 7.10. |
| JJ-12 | All non-road engines shall be operated using only ultra-low sulfur diesel (ULSD) with a sulfur content of no greater than 15 ppm pursuant to 40 CFR 80.510. | All non-road engines will be operated using only ultra-low sulfur diesel (ULSD), which will not exceed 15 parts per million (ppm) sulfur concentration, in accordance with 40 CFR 80.510 (see Section 7.3.1 of this DEIR). |
| JJ-13 | The Proponent shall properly manage and dispose of all solid waste generated by this proposed project pursuant to 310 CMR 16.00 and 310 CMR 19.000, including the regulations at 310 CMR 19.017 (waste ban). | All solid waste generated by this Project will be managed and disposed of pursuant to 310 CMR 16.00 and 310 CMR 19.000, including the regulations at 310 CMR 19.017. Only approved solid waste facilities in Massachusetts will be utilized. |
| JJ-14 | Any hazardous wastes generated must be properly managed in accordance with 310 CMR 30.0000. If any hazardous waste, including waste oil, is generated at any of the sites, the Proponent must ensure that such generation is properly registered with MassDEP and managed in accordance with 310 CMR 30.0000 managed in accordance with 310 CMR 30.0000 | Any hazardous waste generated by the Project (e.g., waste oil) will be disposed of in accordance with 310 CMR 30.0000. |
| JJ-15 | The Proponent is advised to retain a Licensed Site Professional to review MassDEP's oil and/or hazardous material disposal sites list and associated files periodically throughout the duration of the project to determine the current status of existing sites and if there are any newly listed contaminated sites within or adjacent proposed activities. The MCP details procedures to follow for the parties conducting work in these areas. In particular, in accordance with 310 CMR 40.1070 (2), activities conducted near sites with an AUL must be consistent with the obligations and conditions specified within the AUL. | Section 4.2.1.3 provides an LSP's assessment of potential groundwater contamination in the Project area. Further, the selected Contractor for this Project will be required to retain an LSP, as requested, in the unlikely event that any contaminated materials are identified during Project activities. |
| JJ-16 | In addition, a spills contingency plan addressing prevention and management of potential releases of oil and/or hazardous materials from pre- and post-construction should be presented to workers at the site and enforced. The plan should include but not be limited to, refueling of machinery, storage of fuels, and potential releases. MassDEP wishes to emphasize the importance of this specifically in proximity to Cold Water Fisheries and<br>ORW. | A spills contingency plan addressing prevention and management of potential releases of oil and/or hazardous materials from pre- and post-construction should be presented to workers at the site and enforced. The plan will include but not be limited to: refueling of machinery, storage of fuels, and potential releases. |
| JJ-17 | The Proponent has requested the Secretary allow the submittal of a Single Environmental Impact Report (SEIR). MassDEP has no objection should the Secretary approve submittal of an SEIR. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| JJ-18 | The Proponent has stated GHG impacts will be submitted in the SEIR. MassDEP recommends distinguishing both short-term (construction) and any long-term impacts from the proposed work. | See response to Comment A-55. |

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| JJ-19 | Section 61 Findings were not included in the EENF however, a summary of mitigation measures to avoid and minimize environmental impacts was discussed. Proposed Section 61 Findings must be included in the filing of the SEIR | Section 61 Findings are presented in Chapter 9 of this DEIR. |
| **Response to Comments from EENF Certificate, PVPC Comment Letter, Kimberly H. Robinson, MUP (8/22/2022)** | | |
| KK-1 | Given the large scale of the proposed project we believe the traditional filing of a Draft and Final EIR would allow for a more thorough review process and increase the opportunity for concerned parties to offer comments. Utilizing the full EIR process would be an excellent opportunity for the project proponent to develop more detailed project alternatives that could be more beneficial to the surrounding habitat. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| KK-2 | Project planning for control of stormwater flows as detailed in the EENF is inadequate and needs far more attention in the DEIR. Given the sloping landscape, nature of soils in the project area (many of which are categorized to have “severe” erosion potential), as well as the location of cold-water fisheries and certified vernal pools in the project area, far greater attention to control of stormwater flows and erosion and sedimentation is key to minimizing impacts on natural resources. | See response to Comment A-53. |
| KK-3 | The Permits and Consultations list should include stormwater management permitting in the MS4 communities listed above. | The Project does not require a NPDES construction stormwater permit in MS4 or non-MS4 communities. |
| KK-4 | Tree clearing is articulated in confusing ways within the EENF, though we acknowledge there are likely variations in site constraints along the 29.3 mile stretch of this transmission line. One passage at the beginning of the EENF and in Attachment 8, Section 2.1, indicates that clearing in the right of way would only be up to 200 feet. In contrast, Attachment 8, Section 1.3, indicates that clearing could be to the limits of the 300-foot right of way. For the DEIR, there should be clear and consistent descriptions about the area to be cleared. | The WT-11 ROW contains the 345-kV overhead Line 354 for its entire 29.3-mile length, as well as the 345-kV Line 312 and 115-kV Line 1604 from the Northfield Substation to Erving Junction. While Eversource has easement rights for a ROW width ranging from 300 to 500 feet, ROW WT-11 has a maintained width between 125–335 feet. The proposed TRRP will increase the maintained ROW width to an average width of 250-500 feet by cutting trees from within the currently unmaintained/forested portions of the ROW, which increases the distance between the overhead transmission lines and the adjacent trees. |
| KK-5 | It is also requested that FERC clearance requirements for 345kv transmission lines be described in the DEIR. It would be helpful to include an updated project-specific cross section that includes the width of the existing transmission towers along with the proposed clearance zones. Further, to build a clear understanding of the rationale for the 100-foot clearance plan, PVPC recommends listing some of the historic outage events due to tree falls in the northeast that have led to the development of this plan. | As described in Section 2.1, Eversource is required to comply with NERC Reliability Standard FAC-003-4, which is provided in Attachment 3. |
| KK-6 | For the DEIR, please also explain what measures will be taken to prevent soil compaction/ensure soil permeability where heavy equipment (flatbed trucks, brush hogs, mowing equipment, etc.) is used to bring down trees. | The Project will use construction matting, low-pressure clearing equipment, and existing access roads to minimize soil disturbance, compaction, and erosion. Low ground pressure equipment refers to heavy machinery specifically designed to distribute its weight over a larger area, allowing it to operate on soft, wet, or muddy terrain without causing significant damage to the ground, such as rutting or ground compaction. |

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| KK-7 | Additional information is requested in the DEIR to demonstrate that site investigations made during winter months—when the ground is frozen—provide accurate information about avoiding and minimizing impacts. | The wetland surveys were not done while the ground was frozen. Wetland determination data forms to be submitted with the WQC application and Notice of Intents have soil profile information and subsurface hydrologic information used in the boundary determinations. |
| KK-8 | Given that this project intersects in PVPC's region with both Zone 1 and 2 groundwater drinking water supply protection areas (namely in Amherst and Belchertown) and two surface public water supply watersheds (Atkins Reservoir Watershed in Shutesbury/owned by the Town of Amherst, and the Ludlow Reservoir Watershed in Belchertown and Ludlow/owned by the Springfield Water & Sewer Commission), it seems essential to directly solicit input from drinking water operators overseeing these resources to determine if they have any specific concerns and recommendations about project work in these areas. | Herbicide use on electric transmission ROWs is under the jurisdiction of MDAR. Eversource operates under an approved 5-year Vegetation Management Plan, which requires the submittal of a Yearly Operation Plan to MDAR on an annual basis and is available for public comment through that process. Public water suppliers are specifically notified as part of the YOP process for their review and comment. |
| KK-9 | Also, given the identification of these drinking water supply locations within the project area, we would request the DEIR include information on the practices for maintaining right of way clearance over the long term. This should include information on prohibitions to herbicide use for vegetation control to protect the drinking water supply. | Section 5.4.1 of the DEIR describes Eversource's Integrated Vegetation Management (IVM). See response to Comment GG-10 for prohibitions to herbicide use in drinking water supply locations prescribed in the VMP consistent with 333 CMR 11.02. |
| KK-10 | PVPC recommends that the carbon sequestration analysis give serious consideration to the fate of wood in this project with estimates not only for volume removed, but including what will be chipped and what will be of higher value that can be sold for processing into lumber, wood products, etc. | The DEIR provides a quantitative carbon analysis of tree clearing activities that considers both the one-time direct emissions from tree removal as well as loss of potential carbon sequestration over 40 years. Section 6.1.3 of this DEIR presents the summary of this analysis. Attachment 7 provides the Quantitative Carbon Analysis. |
| KK-11 | We believe the project could benefit from enhancements to EJ community engagement. The outreach materials provided by Eversource lack sufficient detail to promote a full understanding of the potential project impacts. Further, we are not aware of any local conversations in regard to project permitting to generate dialogue. | Based on the responses and feedback to date during outreach efforts in both Wendell and Amherst, different community approaches are recommended in these areas moving forward. These approaches are discussed in Section 5.9.1.3. |
| KK-12 | While it may not be possible to provide all details about the 41 distinct areas assessed as having archaeological sensitivity as part of the public outreach process due to the protected nature of this information, it would be beneficial for the proponent to list all resources that are part of the publicly accessible inventory, as well as the unrecorded post- contact site in the DEIR. Please recognize as well that there could be general references to other archaeological sites. | Eversource and their cultural resources consultant PAL have consulted with the MHC and the four federally recognized tribes. Copies of the cultural resource reports were provided to the municipal historical commissions on May 15, 2025. |
| KK-13 | There are known built and archaeological resources as well as potential unknown resources within and in proximity to the project Right of Way. Due to the potential for ground disturbance as a result of the project, an Unanticipated Discoveries Plan is requested to be included in the DEIR to compliment the Best Management Practices (BMP) listed in the EENF. | PAL has prepared an avoidance and protection plan (ASAAP) for two known historic/ancient period sites, and developed cultural resources BMPs to avoid impacting any other archaeological sites and Tribal areas of significance. The ASAAP and BMPs are sufficient to protected any known or unknown cultural resources in the Project area given that the Project does not involve excavation, tree grubbing, or any other significant ground disturbing activities. |

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| KK-14 | It would also be helpful to provide a more detailed explanation regarding locations of and mitigation to protect stone walls, recently identified by Preservation Massachusetts as a "Most Endangered Resource" as it is hard to determine where they are located on the project maps. These resources are not specifically mentioned as part of the Attachment 8 Expanded Environmental Notification Form Narrative 2.2.1 ROW Preparation, 2.2.2 Clearing Areas, or 2.2.3 Site Restoration and Cleanup. | Stone walls are shown on the DEIR Map Set. See response to Comment GG-18. |
| KK-15 | Additionally, please clarify in the DEIR if the Sensitivity Areas and Known Resource Areas will be mapped out and clearly identified for the ground crew as there are specific sets of BMPs for each type of site. | Sensitivity Areas and Known Resource Areas will be depicted on the final Project maps provided to the contractor, along with measures required in these areas. |
| **Response to Comments from EENF Certificate, Robert McIlwain (8/22/2022)** | | |
| LL-1 | Nowhere on the maps from the proposal, for Pelham MA where I live, are exceptions made to this pair of 100- foot swaths of tree removal - - even when there would be no chance of a tree falling on a power line (and I presume that no exceptions are made all the way down to the CT border and up to NH either). | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the potential for tree fall-in is low based on terrain and distance to the powerline lines. This alternative is further discussed in the response to Comment F-1. |
| LL-2 | The transmission wires that cross this [Buffam Falls Conservation] area are very high above it, because the towers are set on much higher ground than the small ravine where the streams are. It does not appear to me that the trees here would, at maturity, reach the transmission wires. Therefore, clearing trees would not be necessary for protecting the transmission lines. If, however, it turned out there were some trees whose bases are on higher elevation in this Conservation Area – of a species that reaches a height that would pose a risk to the transmission lines – then those specific trees could be identified and culled, if necessary, but without removing other trees that pose no significant risk to the power lines. If such were needed, then very effort of seeking to clear trees only if truly necessary, and doing it with an attitude of care and reverence, can help the spirit of the place in its recovery. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. As further discussed in the response to Comment L-1, the selection of this alternative as the Project's Preferred Alternative has reduced tree clearing in the Amethyst Brook Riverfront Area and by the Buffam Falls Conservation Area. |
| LL-3 | Full evaluation of the impact on the wildlife, on erosion, on plant life, and on the overall ecosystem of this special area - if Eversource is pressing forward with removal of trees from this area anything more than where absolutely necessary - should be absolutely necessary, and required. | Eversource has conducted a comprehensive evaluation of resource area impacts from the Project, which is detailed in the DEIR. |
| LL-4 | The bases of trees on the east side of the transmission lines are downhill from the power lines in many places. Where this is so, the 100-foot width of tree clearing could be reduced significantly. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. This response is further discussed in the response to Comment L-1. |

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| LL-5 | There is a perennial watercourse labelled "SHS4A". According to the proposed map of tree clearing, half of the trees around it would be removed. But here too accommodations could be made: a buffer of trees around 30' – 40' in height could be left as a border around the northeast edge of this watercourse – with trees larger than that being removed to protect the power lines. Every few years, Eversource can cull the trees that had grown too big, while letting the younger trees grow. The shade of the medium-sized trees would protect the water and this small ecosystem and its inhabitants from the sun, and maintain the habitat closer to its original state. | The commentor is referring to Dean Brook (SHS4A), a Class A perennial watercourse that the WT-11 corridor crosses in Shutesbury. |
| **Response to Comments from EENF Certificate, T. Frederic Jones (8/22/2022)** | | |
| MM-1 | Think carbon capture, think about the wildlife, think about the uglification of our landscape. | The DEIR addresses the Project's potential impacts on carbon sequestration (Section 6.1.3), wildlife (Section 5.4.1), and scenic resources (Section 5.6). |
| **Response to Comments from EENF Certificate, Pelham Conservation Commission (8/22/2022)** | | |
| NN-1 | Of most critical concern to the Commission is the extent of cutting proposed in the Riverfront of Amethyst Brook and connected tributaries (Map Sheet 28 of 50 Revised) and located south of North Valley Rd. There are extensive geomorphological attributes (slope steepness, historical location of large rotational slip, and slope wetness) that combine to make forestry management in this area a risk to the stability of North Valley Rd., the ecological integrity of the stream, the downstream bridge crossing, and potentially a newly planned and permitted 31-unit affordable housing complex at 20-22 Amherst Rd. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. This response is further discussed in the response to Comment L-1. |
| NN-2 | In addition, tower elevations at 34146 and 34147 well exceed 500 ft. msl above a stream base elevation of about 370 ft. msl, and suggest work adjacent to the stream is apparently unnecessary due to the height of the lines, and additionally will impact the water quality of Amethyst Brook and tributaries, cold water fisheries which were the focus of two recent publicly funded dam demolition and restoration projects on Amethyst Brook. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. As further discussed in the response to Comment L-1, the selection of this alternative as the Project's Preferred Alternative has reduced tree removal in the Amethyst Brook Riverfront Area and by the Buffam Falls Conservation Area. |
| NN-3 | Currently, the rotational slip threat of the north side of Amethyst Brook and more broadly the ecological sensitivity of the site has previously acknowledged by Eversource. This fact, advocated by the Commission, prompted the re-siting of the recently constructed access road from its originally proposed location under the power line in the slip area to immediately west of the power line easement outside of the slip zone and Riverfront areas. | Along the southern embankment to North Valley Road down to the north side of Amethyst Brook, the Project will involve removing trees in the Border Zone. Measures to be used on this embankment and other steeply sloping areas to avoid destabilization are discussed in the response to Comment M-1. |
| NN-4 | While the Commission acknowledges the importance of addressing utility resiliency in the face of increasing storminess, the above concerns on Map Sheet 28 of 50 Revised would have to be addressed at minimum by reduced cutting in this area, as well as a Forest Cutting Plan over seen by a profession forester of the Commission's choosing emphasizing low impact practices protecting the stability of the Riverfront and enforced as an "in perpetuity" condition in the ensuing Notice of Intent. | The TRRP tree removal plans are developed by and overseen in the field by Eversource's Professional Arborists. The reduction of tree removal within the Border Zone of the Amethyst Brook Riverfront Area is discussed in the response to Comment L-1. |

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| NN-5 | There could be some significant possibilities for mitigation and cooperation, even progress on ecological restoration and rare species management in this process. Some possibilities discussed by the Commission could include conservation of forest land to offset the forestry/carbon storage impacts, a joint 5-year survey/study of Eastern Box turtle use of power lines in Pelham as we know these lines are preferably used from other work, and a cooperative invasive species removal plan through the Soil Conservation Service at Buffam Brook Community Forest bisected by another Eversource line and a key ecological restoration goal for this federally funded forest, among others. | A compensatory mitigation plan is being developed in consultation with MassDEP, the local conservation commissions, and other stakeholders to mitigate permanent wetland conversion. The plan and its development are described in Section 7.2.3 of this DEIR. |
| **Response to Comments from EENF Certificate, Jane Winn, Berkshire Environmental Action Team (BEAT) (8/23/2022)** | | |
| OO-1 | We are requesting that the MEPA Office demand Draft and Final Environmental Impact Reports (DEIR and FEIR) regarding WT-11. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| OO-2 | If MEPA demands Draft *and* Final Environmental Impact Report (DEIR and FEIR), it would allow the public input on the scope of the report during the DEIR, and later on the final plan submitted for the FEIR. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| OO-3 | There doesn't appear to be a thorough survey of the transmission line corridor, with respect to power line height and trees likely to threaten them. | Eversource has completed a survey of line height and the location and type of trees (coniferous vs. deciduous) in the WT-11 corridor using LiDAR technology. See response to Comment M-3. |
| OO-4 | Only trees shown to be geometrically positioned in relation to the power lines in a way that they could do damage, or those likely to grow to that height in the next few years, should be removed. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. See the response to Comment L-1. |
| OO-5 | In areas where tree height is shown to be a threat, raising the power lines could be a way to prevent damage without removal of trees, our crucial carbon sink needed to reach net zero as mandated by Massachusetts law. | Eversource evaluated an alternative that involved raising the pole heights to reduce tree clearing but it was ultimately discounted in favor of the 100-foot Modified Alternative. See the response to Comment DD-3. |
| OO-6 | Eversource should be required to document the height of the lines at any given point along the transmission corridor in question, and calculate risk in each segment of the path accordingly. | Eversource evaluated tree fall-in risk based upon a survey of line height and trees in the WT-11 corridor using LiDAR technology together with growth modeling. See response to Comment M-3. |
| OO-7 | They should also be required to identify individual trees of a species capable of growing to sufficient height to make contact*. ONLY those trees likely to do so within the project period should be removed. This would preserve small and intermediate sized trees, allowing them to continue to act as carbon sink instead of being cut down and only trees with a mature height of 25 ft. or less to slowly grow back. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree removal where the risk of tree fall-in is low based on terrain and distance to the powerline lines. See the response to Comment L-1. |
| OO-8 | MEPA should not grant a certificate until a segment by segment survey of line height and tree species and placement is completed, submitted and reviewed. | Eversource evaluated tree fall-in risk based upon a survey of line height and trees in the WT-11 corridor using LiDAR technology together with growth modeling. See response to Comment M-3. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| OO-9 | Over the lifetime of this transmission line corridor, how many outages caused by trees falling or touching these transmission lines along this proposed route have occurred? Eversource should be required to list the dates and locations of those occurrences. | Table 2-1 provides a list of all vegetation-related outages on Eversource's transmission lines, including Line 312, from 2011-2023. The last outrage on Line 312 from a tree strike occurred on October 7, 2020. |
| OO-10 | Alternatives analysis...should include a plan that scales back on full the 100 ft. wide clearance in areas with vernal pools, cold water fisheries, sensitive habitats, etc. | See response to Comment A-9 |
| OO-11 | [Alternatives analysis] should also include other grid reliability technologies like full system grid mapping and installation of distributed electric storage facilities at all feasible sub-stations. | Grid mapping was not considered in the Alternative Analysis because it would not meet the Project's purpose and need of eliminating outages from tree fall-ins in accordance with FAC-003-4. See response to comment E-10. |
| OO-12 | A full estimate of greenhouse gas emissions including downstream emissions from use of tree materials harvested has not been provided. The certificate should not be granted until this is completed, submitted and reviewed.<br>This should include:<br>- emissions from the equipment to harvest<br>- emissions from the end use of the wood<br>- if that end use is being chipped, dried by burning wood, then burned when dried, ALL the<br>emissions from that should be included<br>- greenhouse gas emissions from wetland disturbance and conversion<br>- loss of the carbon sequestration that would have occurred if the trees had continued to<br>grow and sequester carbon both above ground and in the soil. | The DEIR provides a quantitative carbon analysis of tree clearing activities that considers both the one-time direct emissions from tree removal as well as loss of potential carbon sequestration over 40 years. Section 6.1.3 of this DEIR presents the summary of this analysis. Attachment 7 provides the Quantitative Carbon Analysis. |
| OO-13 | Eversource is filing dockets for the same work in several locations across the state, all under separate dockets, and not referring to other projects on any of them. This is called project segmentation and is creating an illusion of several smaller projects, diminishing the scope of impacts. MEPA Office has assigned the ENFs of the two projects to two separate MEPA analysts. | A cumulative impacts table for all anticipated Western Massachusetts TRRP efforts is provided in Section 8. The impacts in this table will be updated over time as more exact calculations are provided with each future filing. For example, impacts from the WT-02 TRRP Project, which is anticipated to be implemented this year, have been updated in the table to reflect the permitted impacts. |
| OO-14 | Require Eversource to evaluate the TOTAL impacts from ALL projects throughout the state including:<br>- total number of acres proposed to be cut<br>- number of acres of rare species habitat to be permanently and temporarily impacted<br>- number of acres of bordering vegetated wetland to the permanently and temporarily impacted<br>- total greenhouse gas emissions from the entire operation | See response to Comment OO-13. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| **Response to Comments from EENF Certificate, Michele Jones (8/22/2022)** | | |
| PP-1 | PLEASE do what you can to limit the tree cutting proposed by Eversource. It should be kept to an absolute minimum. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree clearing where the risk of tree fall-in is low based on terrain and distance to the powerline lines. See the response to Comment L-1. |
| **Response to Comments from EENF Certificate, Nina Keller (8/23/2022)** | | |
| QQ-1 | Kindly cease all activity until abutters are all respectfully notified as to timeline, purpose, plan, contact names and numbers. | See response to Comment J-1. |
| QQ-2 | [Provide] proof of number of actual and projected tree fall damage incidents within the current corridor, response times, means of reparations and costs. | See response to Comment E-4. |
| QQ-3 | [Provide] complete yearly costs of clear cutting proposal for the corridor v manual cutting of only threatening trees. | Section 2.1 of this DEIR discusses the Purpose and Need for the Project and Section 3 provides the Alternatives Analysis; this Alternatives Analysis discusses why the 100-foot Modified Alternative, which eliminates 97% of existing potential strike trees, was selected over the No Action Alternative (i.e., continuing to manually cut only immediate Hazard and Danger trees). |
| QQ-4 | [Provide] utility recorded and estimated financial data and comparative costs between manual maintenance of the corridor v herbicide usage, crew budget, licensing, duration of herbicide effectiveness, required repetitious applications, impact on ecosystems, runoff and legal proximity to water systems, private or town wells, wetlands. | Please refer to *Eversource Energy, Western MA Five Year Vegetation Management Plan 2024-2028* for information on Eversource's herbicide program. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| QQ-5 | [Provide] transparency in regard to future programs for utility corridors including rationale of prior decision to having replaced poles apx. two years ago, with higher metal poles. Those cedar poles were not rotten. | Utilizing appropriate maintenance and operational strategies, Eversource operates each overhead transmission line to its maximum achievable life. Upon condition-based need or indication of future need of an existing overhead transmission line, Eversource performs an assessment to repair, refurbish, and/or replace the line components based on specific conditions and event related to that line. On a project level and based on specific conditions, the assessment might suggest a need to replace a total structure or the total line. The decisions made about short-term and long-term repairs versus major replacement will consider asset obsolescence, transmission system planning future needs, and right-of-way needs.<br><br>Eversource is focused on safe and reliable operation of the transmission system. Therefore, a proactive approach is used to routinely evaluate the condition of transmission structures and assess their capacity to perform their intended design function. To accomplish this effort, a series of inspections are performed in accordance with the Eversource Maintenance Program. The following inspections are performed based on the frequency stipulated in the program: foot patrol, aerial patrol, round line inspections, climbing inspections, high resolution photography, thermography inspection. Engineering reviews the inspection reports to identify deficiencies using the Electric Power Research Institute (EPRI) Maintenance Priority Rating scale.<br><br>The prior decision to replace structures on Line 354 was made to take a proactive approach to system reliability. The structures that were replaced were originally installed in 1970 and had identified asset condition concerns from air and ground inspections. The asset condition concerns associated with this project were wood structures had woodpecker damage, rot damage, cracks deteriorating steel mechanical connections, and/or damaged insulators.<br><br>The current WT-11 TRRP Project is being proposed to protect the infrastructure that exists now. If any new project were proposed in this ROW in the future, it would be reviewed and designed to meet all necessary clearances with existing transmission lines and ROW boundaries taken into consideration. |
| QQ-6 | [Provide] data proving environmental changes to symbiotic/ecosystems by loss of oxygen, shade, water retention, erosion, systemic tree root nutritional interactivity. | Section 5 describes potential environmental impacts of the Project. |
| QQ-7 | [Provide] comparative estimates, projections and research from several environmental forestry experts. | The TRRP tree removal plans are developed by and overseen in the field by Eversource's Professional Arborists. |
| QQ-8 | [Provide] data about who receives sales benefits from logging, cord wood, wood chip sales. | See response to Comment HH-3. |
| **Response to Comments from EENF Certificate, Adrienne Allen (8/24/2022)** | | |
| RR-1 | MEPA to reject the request for a Single Environmental Impact Report (SEIR), and have Draft AND Final Environmental Impact Report. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| RR-2 | Modify the proposal to cut only trees of a certain height | The "100-foot Modified Alternative," which Eversource selected as the Project's Preferred Alternative, consists of clearing trees up to 100 feet from the outer conductor, except in specific areas where this width could be reduced due to a low risk of tree fall-in. The selection of removing trees up to 100 feet is based on a LiDAR survey of trees in the WT-11 ROW and a growth model that allowed Eversource to predict which trees could grow into strike hazards over a 40-year period. |
| RR-3 | Consider raising power lines instead of clear cutting trees | See the response to Comment DD-3. |
| RR-4 | During a summer of unprecedented heat and drought - forests are a much needed carbon sink and provide a microclimate of moisture and cooling. | The response to Comment A-60 describes the Project's effects on greenhouse gas emissions based on a Quantitative Carbon Analysis. |
| **Response to Comments from EENF Certificate, Tali Smookler (8/24/2022)** | | |
| SS-1 | Eversource has stated that they see the MEPA process as an "early stage", and that they plan to resolve the many undefined parts of the plan through the MEPA and Conservation Commission processes. The problem with that is that the only statewide comment period on this "early stage" plan is this MEPA comment period. As it is, there are many details missing that would define exactly how much of the work proposed is necessary. | See the response to Comment HH-8. In addition, Eversource does not expect the project plans to change in any material way after completion of the MEPA process with the issuance of a Final Certificate on the FEIR, |
| SS-2 | MEPA needs to reject the request for a Single Environmental Impact Report (SEIR), and demand a Draft AND Final Environmental Impact Report. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| **Response to Comments from EENF Certificate, Joanne Comerford (8/29/22)** | | |
| TT-1 | As legislators representing municipalities through which this Eversource TRRP will occur, we wish to associate ourselves with the attached comments submitted by FRCOG and PVPC. We share the concerns raised and the points made in the attached comments and we look forward to remaining engaged throughout this process. | Eversource appreciates your continued involvement in the MEPA process. |
| **Response to Comments from EENF Certificate, Seth Wilpan (8/29/2022)** | | |
| UU-1 | It is MEPA's responsibility to require both a Draft and Final Environmental Impact Report (DEIR and FEIR) so that the final plans are made known and the public has an adequate opportunity to evaluate them and comment. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| UU-2 | Alternatives need to be considered, such as raising the height of power lines instead of cutting down trees to accommodate them. | See response to Comment DD-3. |
| UU-3 | There are questions about the legality of the segmentation of the project, and many other questionable aspects of the project and the approval process. | See response to Comment DD-5. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| **Response to Comments from EENF Certificate, Amy Rose (8/31/22)** | | |
| VV-1 | Is selective tree cutting not possible? | Selectively cutting trees each year that may pose a tree fall-in risk to the powerlines is not feasible. The Preferred Alternative (100-foot Modified Alternative) consists of clearing trees up to 100 feet from the outer conductor, except in specific areas where this width could be reduced due to a low risk of tree fall-in. The selection of 100 feet is based on a LiDAR survey of trees in the WT-11 ROW and a growth model that allowed Eversource to predict which trees could grow into strike hazards over a 40-year period. This alternative is further discussed in the response to Comment F-1. |
| **Response to Comments from EENF Certificate, Laura MacLeod (9/1/22)** | | |
| WW-1 | You must STOP Eversource to continue the destruction of OUR MA natural resources. | Eversource takes its commitment to environmental stewardship seriously. The land in ROWs often contains features that make it a unique habitat for plants and animals. Our environmental specialists work to help us maintain this land in a way that minimizes impacts of our operation and preserves the biodiversity of the region. Furthermore, our Eversource Land Trust consists of nearly 1,000 acres of permanently protected open space, which is open to the public for recreational use. |
| **Response to Comments from EENF Certificate, Abriete Medore (9/2/22)** | | |
| XX-1 | We would like to strongly express our alarm at Eversource's plan to destroy the beautiful local environment of Western MA by expanding clearcutting around their power lines, especially in Buffam Falls in Pelham, but everywhere. We live in Leverett right next to the power lines and already we feel accosted by the clearcut area right next to our home. | Since the filing of the EENF, Eversource has developed the 100-foot Modified Alternative, which does reduce the width of tree removal where the risk of tree fall-in is low based on terrain and distance to the powerline lines. As further discussed in the response to Comment L-1, the selection of this alternative as the Project's Preferred Alternative has reduced tree removal within the Amethyst Brook Riverfront Area. No tree removal is proposed within the Buffam Falls Conservation Area. |
| XX-2 | We are afraid that they will be taking all the trees between our house and their power lines and we are very upset at that for ourselves, but also, Buffam Falls and other places are sacred lands used by all as very important spots for recreation and for the healing of the earth. | Based on assessor records, the commenter's property (58 Depot Street, Leverett) is approximately two miles west of the WT-11 corridor and therefore no tree removal associated with this TRRP Project would occur on or adjacent to this property. While there is a powerline corridor in proximity to 58 Depot Street, it is not the WT-11 corridor. See response to Comment XX-1 for more information on Buffam Falls. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| **Response to Comments from EENF Certificate, Elizabeth Fernandex O'Brien (9/2/22)** | | |
| YY-1 | Please know every tree costs all of us too much to be cut down in the name of energy. We have options, put solar on roofs. | Eversource promotes the use of solar in many ways, including providing development support for customers to install their own solar projects and offering Community Solar, which allows its customers to support green energy without installing panels on their own roofs.<br>Nevertheless, the powerlines with the WT-11 corridor transmit critical electrical service to area residences and Eversource must maintain this infrastructure in accordance with all applicable federal and state applicable laws, regulations, and policies. The Project is in response to publication of the NERC Reliability Standard FAC-003-4 on February 11, 2016, which is further discussed in the response to Comment E-5. |
| **Response to Comments from EENF Certificate, Sally Pick SJP Environmental Consulting, LLC (9/14/22)** | | |
| ZZ-1 | Eversource has not yet identified any project alternatives such as avoiding Priority Habitats and wetlands. It also does not justify the significant widening of the right of way aside from expressing reliability concerns. | Section 3 of the DEIR provides an Alternatives Analysis that assess reducing clearing widths in sensitive resource areas. The justification for the Project and the extent of proposed tree removal is discussed in the response to Comment E-5. |
| ZZ-2 | To allow for public input on the plan as it is being developed and more clearly defined, I strongly urge MEPA to require Eversource to submit a Draft and a Final Environmental Impact Report (DEIR and FEIR). | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| ZZ-3 | In addition, I ask that that EEA and its agencies review the entire Transmission Right-of Way Reliability Project across Massachusetts and evaluate at its aggregate impacts. not just transmission line by transmission line, as they are currently being submitted to MEPA. | See response to Comment A-14. |
| **Response to Comments from EENF Certificate, Leverett Conservation Commission (9/22/22)** | | |
| AAA-1 | The Leverett Conservation Commission requests that this project be required to undergo a full Environmental Impact Report rather than the single, partial EIR that was requested by Eversource Energy. | MEPA Office has required that Eversource submit using the traditional 2-stage process (DEIR and Final EIR). The DEIR is provided herein. |
| **Response to Comments from EENF Certificate, Everose Schluter Mass Division of Fisheries and Wildlife (9/22/22)** | | |
| BBB-1 | As discussed in the EENF, the Proponent is proactively consulting with the Division to address rare species concerns. Based on the information provided in the EENF and information submitted to the Division, and in advance of a formal MESA filing, we anticipate that the Project is likely to avoid a Take for several state-listed species through implementation of Division-approved protection plans. However, the Division does anticipate that the Project is likely to result in a Take of the Eastern Box Turtle (*Terrapene carolina*), state-listed as Special Concern. | Eversource anticipates filing a CMP for the Eastern Box Turtle with NHESP in fourth quarter 2025. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| BBB-2 | Projects resulting in a Take of state-listed species may only be permitted if they meet the performance standards for a Conservation and Management Permit (CMP; 321 CMR 10.23). In order for a project to qualify for a CMP, the applicant must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species, (b) demonstrate that an insignificant portion of the local population will be impacted, and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species. | Section 6.4 describes the Project's consistency with the performance standards established by 321 CMR 10.23. |
| BBB-3 | Although the exact details of the long-term net benefit required under a CMP have not yet been finalized, the Proponent is working cooperatively with the Division to address impacts to state-listed species and their habitats, and we anticipate that any outstanding details can be addressed during the MESA review process. We recommend that the Proponent continue coordinating with the Division to avoid, minimize and mitigate impacts to state-listed species consistent the CMP performance standards. | Eversource commits to working cooperatively with the NHESP to satisfactorily address any outstanding issues through the MESA process, as it has done on other TRRP projects. |
| BBB-4 | The Division will not render a final decision until the MEPA review process and associated public and agency comment period is completed, and until all required MESA filing materials are submitted to the Division. | Eversource commits to continue coordinating with the NHESP to avoid, minimize and mitigate impacts to state-listed species consistent the CMP performance standards. |
| BBB-5 | As our MESA review is ongoing, no alteration to the soil, surface, or vegetation and no work associated with the Project shall occur until the Division has made a final determination. | Eversource will not begin Project-related activities until all required permits, final determinations, and approvals are obtained. |
| **Response to Comments from EENF Certificate, Susan Masino (9/23/22)** | | |
| CCC-1 | Please read the attached information sheet on the high value of Roadside Trees. Trees in transmission signs are similar. | Eversource acknowledges the high value that trees provide and has developed a Preferred Alternative (100-foot Modified Alternative) that balances its regulatory obligations to prevent tree strikes and outages with preserving forestland to the extent possible and fostering a high-quality ecosystem within its WT-11 corridor. This alternative is further discussed in the response to Comment F-1. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| CCC-2 | In addition to Roadside Trees, this is a corridor across the land. Intruding on and compacting the land with equipment and moving and removing vegetation throughout the corridor will have multiple negative effects, including worse flooding, and spreading invasives. | Eversource will construct the Project in accordance with its BMP Manual (see Attachment 8), which identifies erosion control measures designed to reduce potential short-term and long-term impacts on soil and water resources. Soil compaction will be minimized through the temporary installation of timber mats in wetland areas. A compliance monitor will ensure that contractors implement and maintain erosion and sediment control measures during tree removal and restoration until all disturbed areas are permanently stabilized.<br>Impacts from tree removal and movement of equipment from areas with invasive species already present have the potential to result in the spread of invasive plant species post-tree removal activities. However, Eversource's contractor will be required to adhere to best practices identified in the Eversource BMP Manual during tree removal activities to minimize the spread or introduction of invasive plants. Eversource and its contractor will also adhere to applicable state regulations on the movement of wood products intended to prevent the spread of invasive insect species. Eversource's Integrated Vegetated Management (IVM) program, which is further described in the response to Comment T-1. |
| CCC-3 | In CT you have been offering to take down healthy trees for free on private land now, and tell people they would have to bear the cost personally later. This is unfair to a homeowner who may not know that many of the trees growing now will still be standing for another 100 or even 200 years. | This Project involves removing trees on Eversource owned properties and Eversource-controlled easements along the WT-11 corridor that have pose a fall-in risk to the powerline over a 40-year period. |
| **Response to Comments from EENF Certificate, NHESP, MADFW (9/22/2022)** | | |
| DDD-1 | As discussed in the EENF, the Proponent is proactively consulting with the Division to address rare species concerns. Based on the information provided in the EENF and information submitted to the Division, and in advance of a formal MESA filing, we anticipate that the Project is likely to avoid a Take for several state-listed species through implementation of Division-approved protection plans. However, the Division does anticipate that the Project is likely to result in a Take of the Eastern Box Turtle (*Terrapene carolina*), state-listed as Special Concern. | Eversource anticipates filing a Conservation and Management Permit application for the Eastern Box Turtle in January 2026. |
| DDD-2 | Projects resulting in a Take of state-listed species may only be permitted if they meet the performance standards for a Conservation and Management Permit (CMP; 321 CMR 10.23). In order for a project to qualify for a CMP, the applicant must demonstrate that the project has avoided, minimized and mitigated impacts to state-listed species consistent with the following performance standards: (a) adequately assess alternatives to both temporary and permanent impacts to the state-listed species, (b) demonstrate that an insignificant portion of the local population will be impacted, and (c) develop and agree to carry out a conservation and management plan that provides a long-term net benefit to the conservation of the state-listed species. | Section 6.4 describes the Project's consistency with the performance standards established by 321 CMR 10.23. |

| COMMENT NUMBER | COMMENTS | RESPONSES |
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| DDD-3 | Although the exact details of the long-term net benefit required under a CMP have not yet been finalized, the Proponent is working cooperatively with the Division to address impacts to finalized, the Proponent is working cooperatively with the Division to address impacts to state-listed species and their habitats, and we anticipate that any outstanding details can be addressed during the MESA review process. | Eversource commits to working cooperatively with the NHESP to satisfactorily address any outstanding issues through the MESA process, as it has done on other TRRP projects. |
| DDD-3 | We recommend that the Proponent continue coordinating with the Division to avoid, minimize and mitigate impacts to state-listed species consistent the CMP performance standards. | Eversource commits to continue coordinating with the NHESP to avoid, minimize and mitigate impacts to state-listed species consistent the CMP performance standards. |
| DDD-4 | The Division will not render a final decision until the MEPA review process and associated public and agency comment period is completed, and until all required MESA filing materials are submitted to the Division. As our MESA review is ongoing, no alteration to the soil, surface, or vegetation and no work associated with the Project shall occur until the Division has made a final determination. | Eversource will not begin Project-related activities until all required permits, final determinations, and approvals are obtained. |

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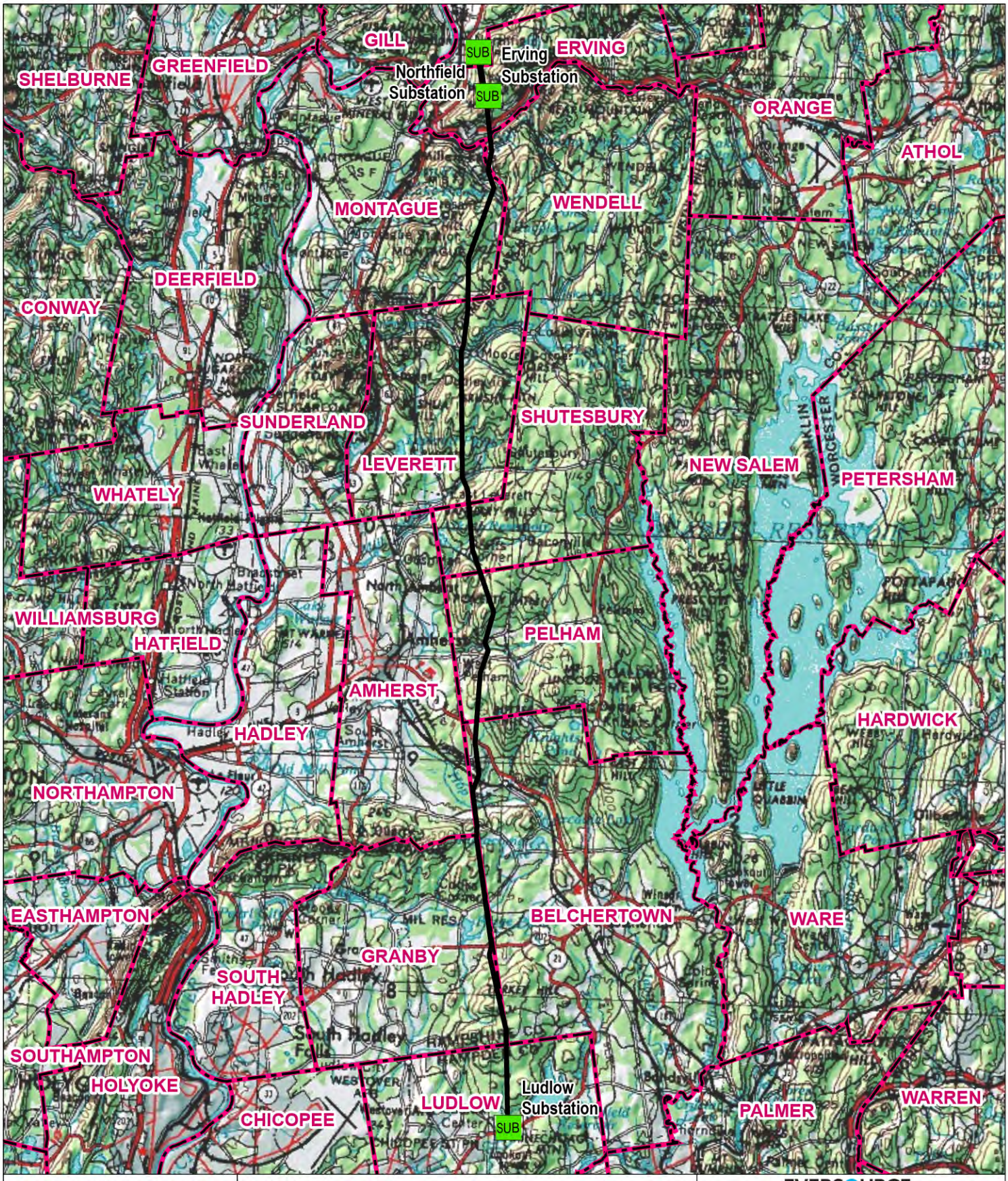
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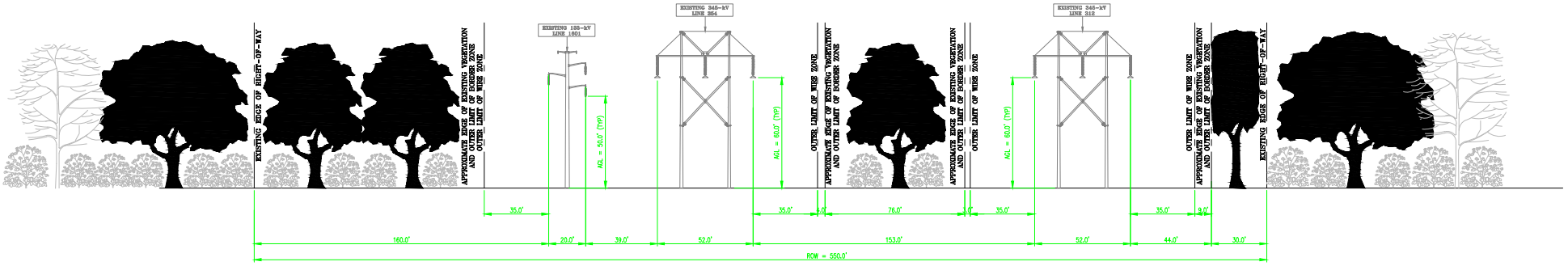
# ATTACHMENT 1
# FIGURES:

## USGS TOPOGRAPHIC MAP
## WT-11 ROW CROSS-SECTIONS
## CONCEPTUAL MAPS OF TREE REMOVAL WIDTH ALTERNATIVES

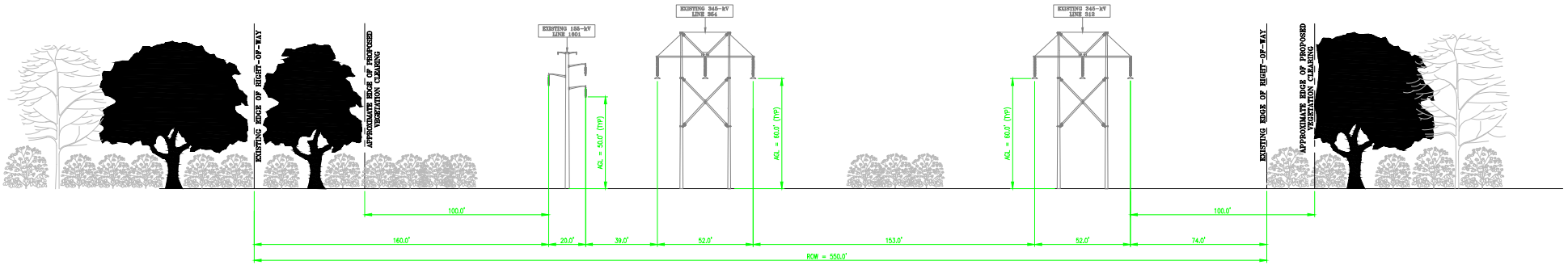
# USGS Topographic Figure


GILL
GREENFIELD
SHELBURNE
Northfield
Substation
SUB
Erving
Substation
SUB
ERVING
ORANGE
ATHOL
WENDELL
MONTAGUE
DEERFIELD
CONWAY
SUNDERLAND
SHUTESBURY
LEVERETT
NEW SALEM
PETERSHAM
WHATELY
WILLIAMSBURG
HATFIELD
PELHAM
AMHERST
HARDWICK
HADLEY
NORTHAMPTON
EASTHAMPTON
BELCHERTOWN
WARE
GRANBY
SOUTH
HADLEY
SOUTHAMPTON
HOLYOKE
CHICOPEE
LUDLOW
Ludlow
Substation
SUB
PALMER
WARREN
INDEX MAP
Legend
SUB Substation
Project Area
Municipal Boundary
N
1:220,000
0
2
4 Miles
EVERSOURCE ENERGY
Attachment 1
WT-11 - Project Location Map
Transmission Right-of-Way
Reliability Project (TRRP)
Northfield, Erving, Wendell, Montague,
Leverett, Shutesbury, Pelham, Belchertown,
Amherst, Granby, and Ludlow, MA
Date: May 12, 2022

# WT-11 ROW Cross-Sections




**EXISTING R.O.W. CONFIGURATION**
**LOOKING SOUTHWEST FROM STR. #34006 TO STR. #34007**
**IN THE TOWN OF ERVING, MA**




**PROPOSED R.O.W. CONFIGURATION**
**LOOKING SOUTHWEST FROM STR. #34006 TO STR. #34007**
**IN THE TOWN OF ERVING, MA**

| NO. | DATE | AS BUILT REVISIONS | BY | CHK | APP | APP |
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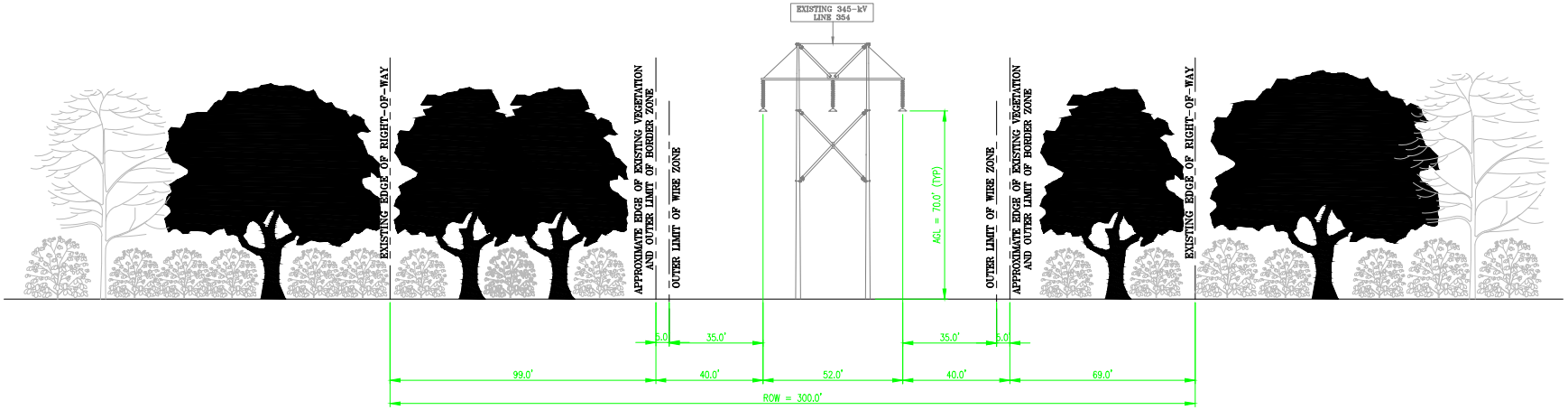
REVISIONS DURING CONSTRUCTION

EVERSOURCE ENERGY

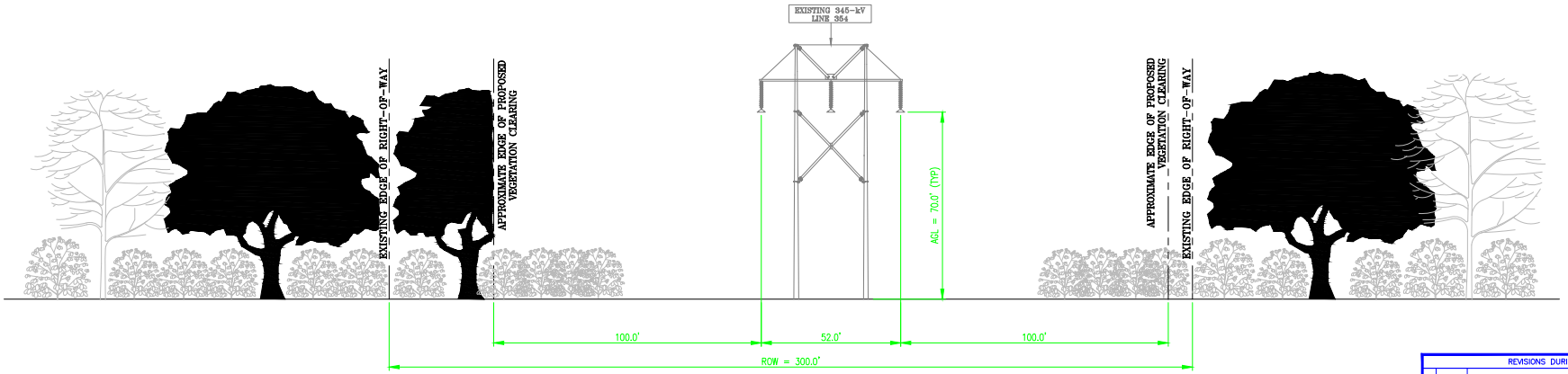
NORTHFIELD S/S - LUDLOW S/S
345-kV TRANSMISSION LINE
TRRP ROW CROSS SECTION
ERVING, MASSACHUSETTS

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**EXISTING R.O.W. CONFIGURATION**
**LOOKING SOUTHWEST FROM STR. #34017 TO STR. #34018**
**IN THE TOWN OF ERVING & WENDELL, MA**




**PROPOSED R.O.W. CONFIGURATION**
**LOOKING SOUTHWEST FROM STR. #34017 TO STR. #34018**
**IN THE TOWN OF ERVING & WENDELL, MA**

REVISIONS DURING CONSTRUCTION

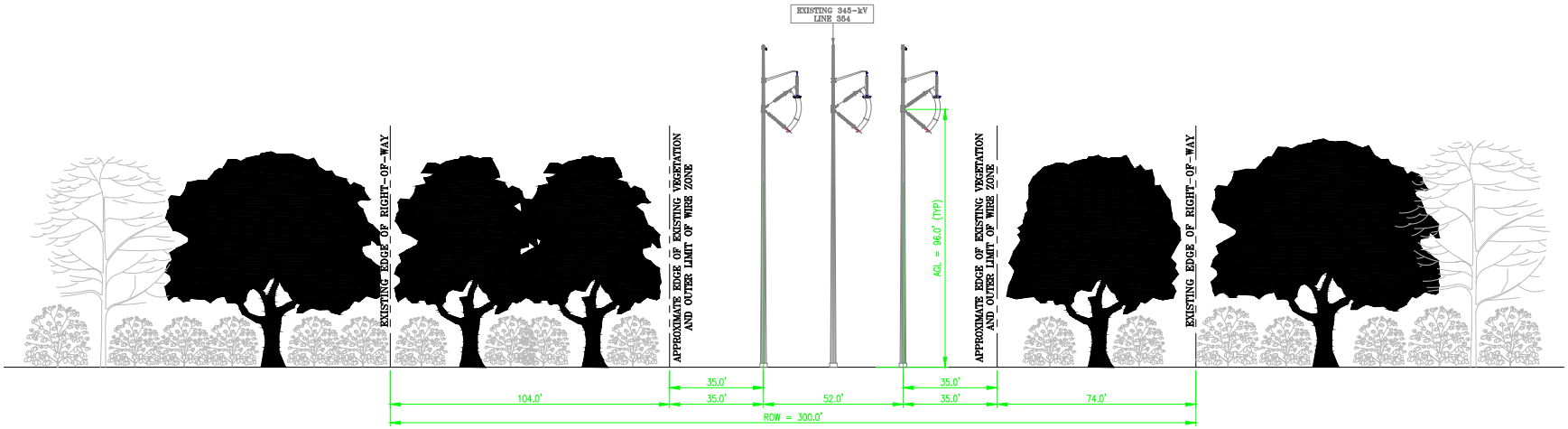
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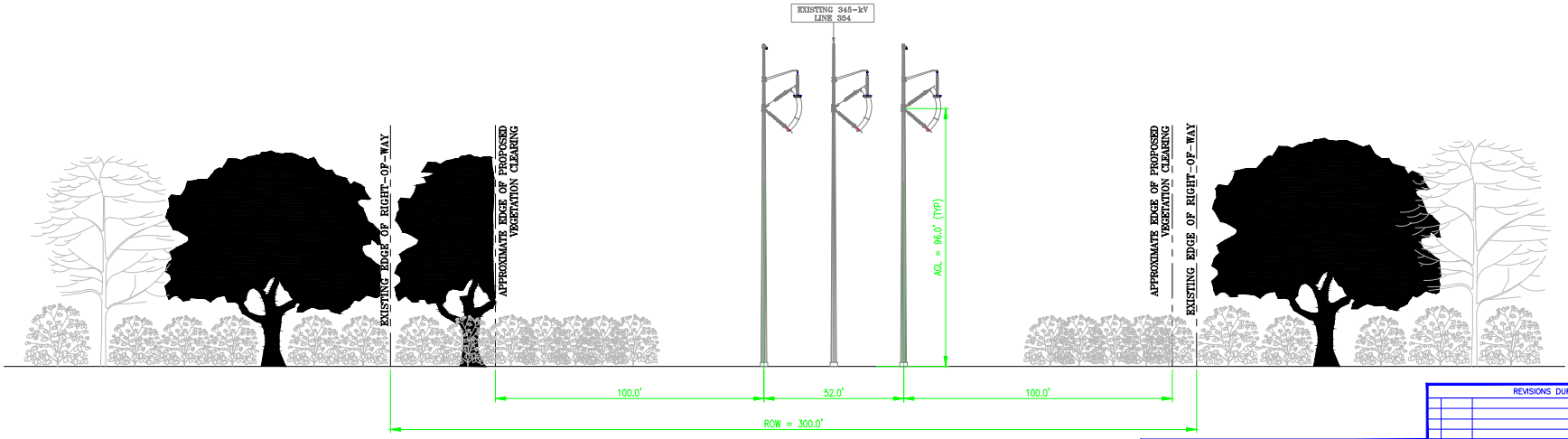
NORTHFIELD S/S - LUDLOW S/S
345-kV TRANSMISSION LINE
TRRP ROW CROSS SECTION
WENDELL, MASSACHUSETTS

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**EXISTING R.O.W. CONFIGURATION**
**LOOKING SOUTH FROM STR. #34055 TO STR. #34057**
**IN THE TOWN OF MONTAGUE, MA**




**PROPOSED R.O.W. CONFIGURATION**
**LOOKING SOUTH FROM STR. #34055 TO STR. #34057**
**IN THE TOWN OF MONTAGUE, MA**

REVISIONS DURING CONSTRUCTION

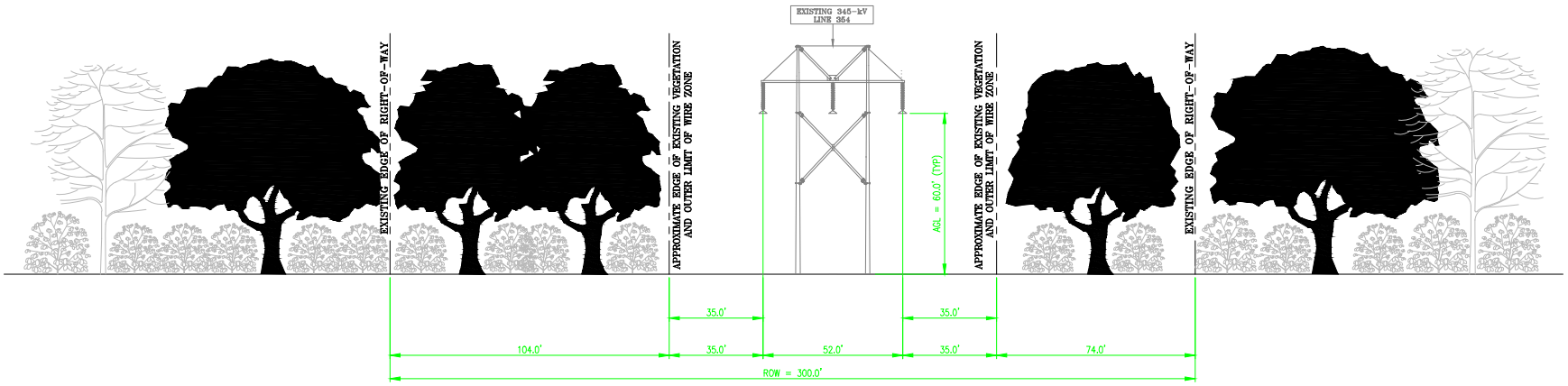
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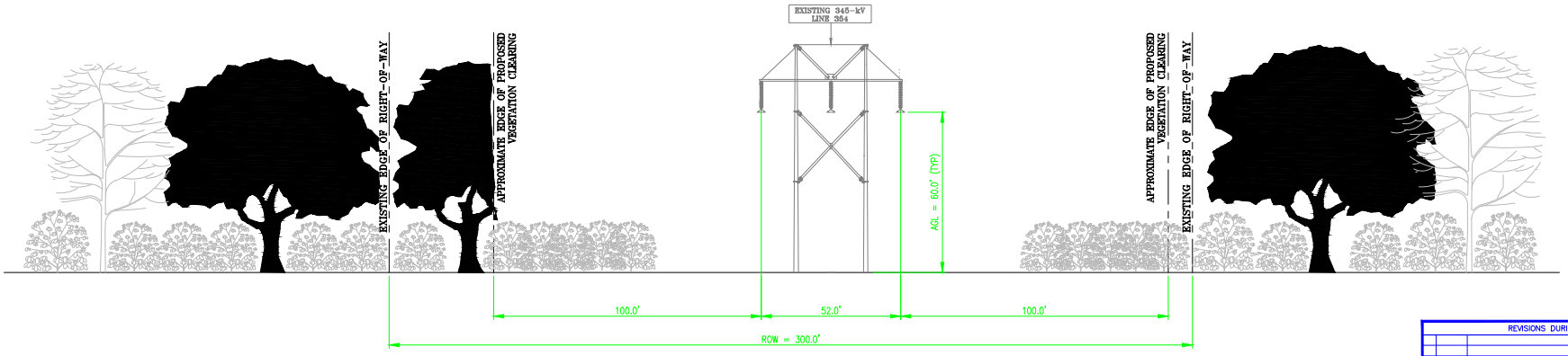
NORTHFIELD S/S - LUDLOW S/S
345-kV TRANSMISSION LINE
TRRP ROW CROSS SECTION
MONTAGUE, MASSACHUSETTS

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**EXISTING R.O.W. CONFIGURATION**
**LOOKING SOUTH FROM STR. #34125 TO STR. #34126**
**IN THE TOWN OF SHUTESBURY, MA**




**PROPOSED R.O.W. CONFIGURATION**
**LOOKING SOUTH FROM STR. #34125 TO STR. #34126**
**IN THE TOWN OF SHUTESBURY, MA**

REVISIONS DURING CONSTRUCTION

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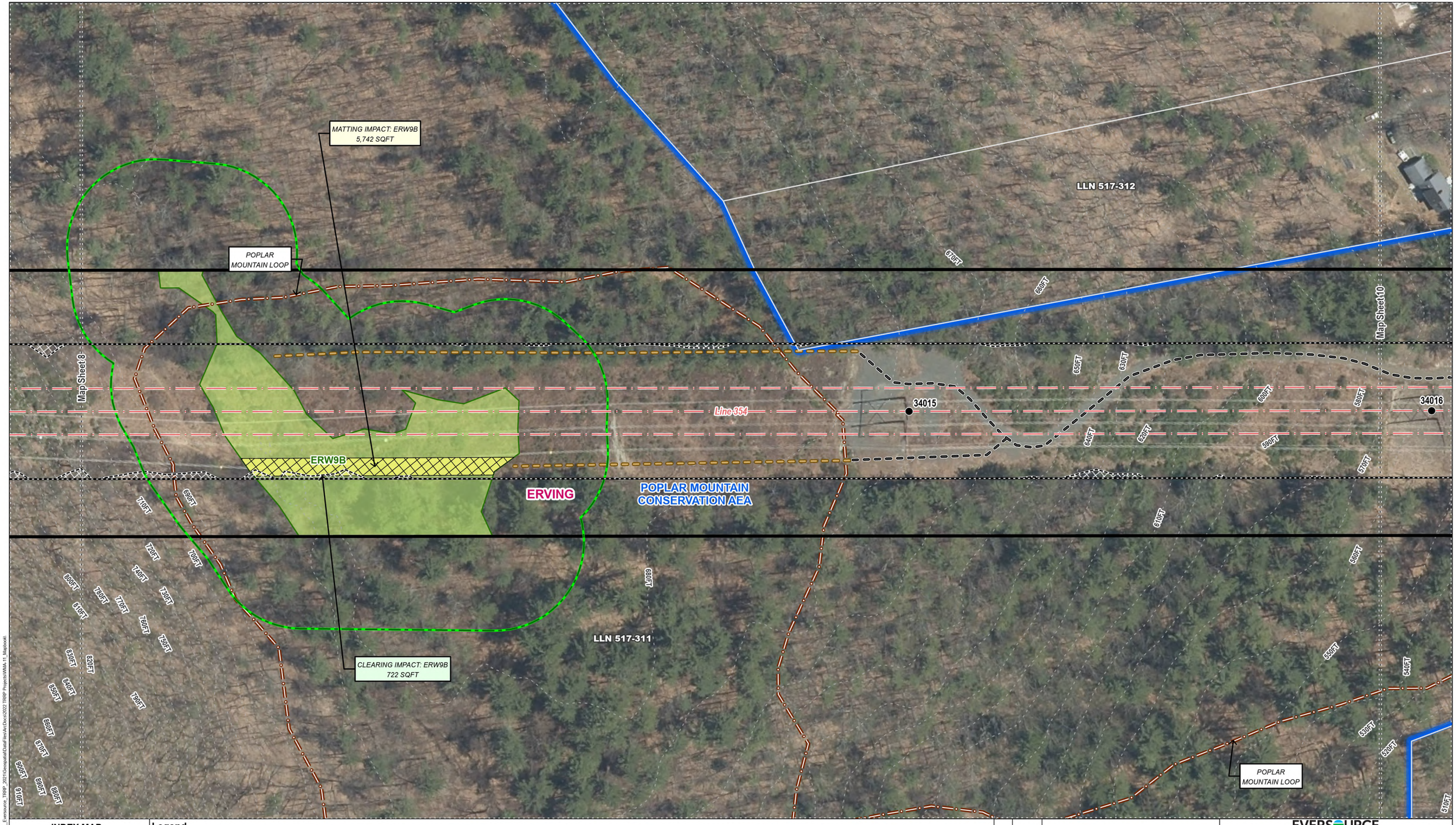
EVERSOURCE ENERGY

NORTHFIELD S/S - LUDLOW S/S
345-kV TRANSMISSION LINE
TRRP ROW CROSS SECTION
SHUTESBURY, MASSACHUSETTS

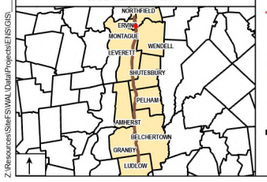
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# Conceptual Mapsheets 9-11 –
# 50ft Tree Clearing Option




## INDEX MAP




## Legend

- Overhead Eversource Line
- Existing Structure
- Culvert
- Gate
- Stonewall
- Existing Right-of-Way (ROW)
- Limit of Vegetation Management
- Proposed Tree Clearing
- Existing Access Road
- Off-ROW Access Pending Rights
- Temporary Access Route
- Hiking Trail
- Railroad
- Temporary Construction Matting
- Delineated Intermittent Watercourse
- Delineated Perennial Watercourse
- 200' Riverfront Area
- Field Delineated Wetland Boundary Outline
- Field Delineated Wetland
- 100' Wetland Buffer
- No Disturb Zone
- Confirmed Vernal Pool
- Confirmed Vernal Pool Extent
- 100' Vernal Pool Envelope
- Open Water
- Outstanding Resource Waters
- Bordering Land Subject to Flooding
- MA NHESP Priority Habitat (2/2024)
- Parcel Boundary
- Eversource Owned Property
- State-Owned Property
- Article 97 Land/Other Open Space Parcel
- Municipal Boundary
- Map Sheet Matchline

N

1 inch = 100 feet
0 25 50 100 Feet

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EVERSOURCE ENERGY

**WT-11**
**Transmission Right-Of-Way Reliability Program**
**MEPA DEIR Map Set - 50ft Tree Clearing Option**

NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

MAP SHEET 9 OF 110

Date: March 25, 2025

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OLD STATE ROAD

STATE ROAD

LLN 517-312

LLN 517-308

LLN 517-310

LLN 517-311

LLN 517-309

Miller's River

WENDELL

ESTMOS1

ERVING

Line 354

34016

34017

Map Sheet 9

Map Sheet 11

POPLAR MOUNTAIN CONSERVATION AEA

POPLAR MOUNTAIN LOOP

MOHAWK TRAIL

360FT 540FT 570FT 580FT 550FT 520FT 510FT 490FT 480FT 470FT 450FT 440FT 430FT 420FT 410FT 400FT 390FT 380FT 370FT 360FT 350FT 340FT 330FT 320FT 310FT 300FT 530FT 500FT

INDEX MAP




**Legend**

- Overhead Eversource Line
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N

1 inch = 100 feet

0 25 50 100 Feet

| NO. | DATE | REVISIONS |
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EVERSOURCE ENERGY

**WT-11**

**Transmission Right-Of-Way Reliability Program**

**MEPA DEIR Map Set - 50ft Tree Clearing Option**

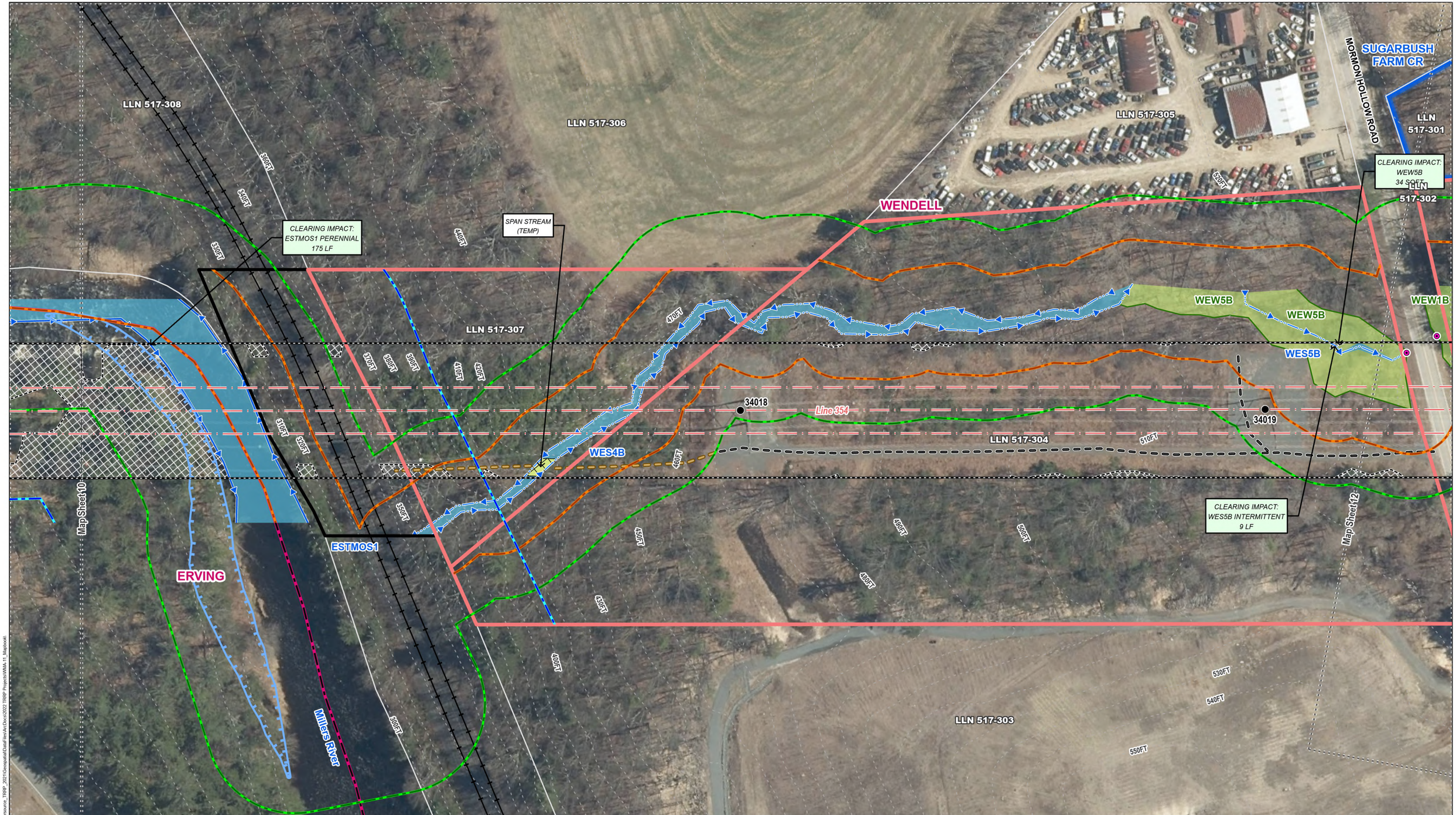
NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

MAP SHEET 10 OF 110

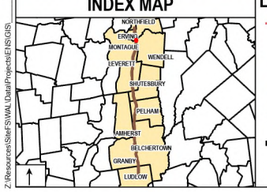
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## INDEX MAP




## Legend

- Overhead Eversource Line
- Existing Structure
- Culvert
- Gate
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- Bordering Land Subject to Flooding
- MA NHESP Priority Habitat (2/2024)
- Parcel Boundary
- Eversource Owned Property
- State-Owned Property
- Article 97 Land/Other Open Space Parcel
- Municipal Boundary
- Map Sheet Matchline

N

1 inch = 100 feet

0 25 50 100 Feet

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EVERSOURCE ENERGY

**WT-11**
**Transmission Right-Of-Way Reliability Program**
**MEPA DEIR Map Set - 50ft Tree Clearing Option**

NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

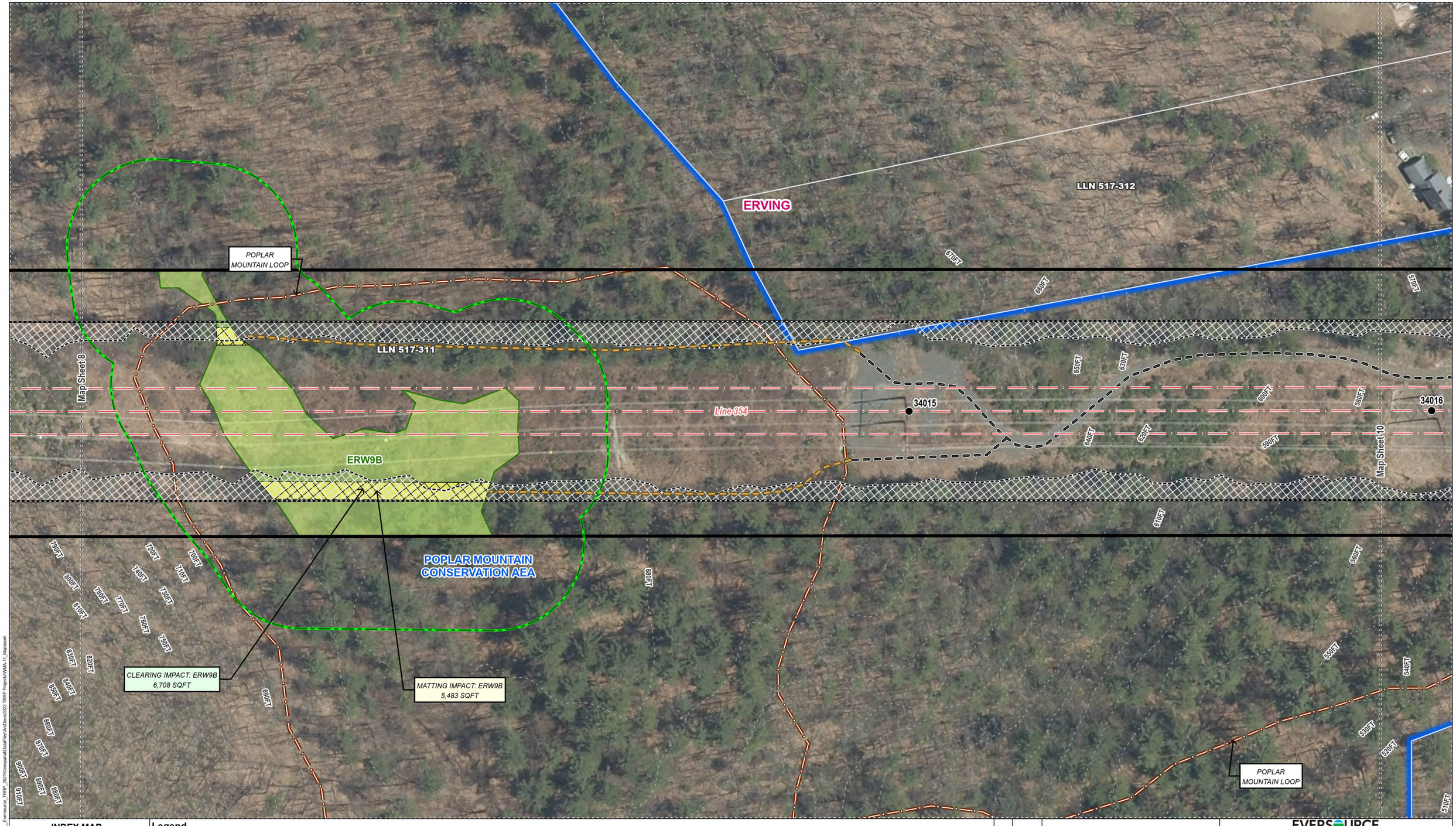
MAP SHEET 11 OF 110

Date: March 25, 2025

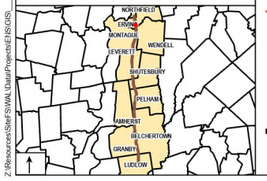
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# Conceptual Mapsheets 9-11 –
# 75ft Tree Clearing Option




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**Legend**

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N

1 inch = 100 feet

0 25 50 100 Feet

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EVERSOURCE ENERGY

**WT-11**
**Transmission Right-Of-Way Reliability Program**
**MEPA DEIR Map Set - 75ft Tree Clearing Option**

NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

MAP SHEET 9 OF 110

Date: March 25, 2025

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INDEX MAP




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N

1 inch = 100 feet

0 25 50 100 Feet

| NO. | DATE | REVISIONS |
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EVERSOURCE ENERGY

**WT-11**
**Transmission Right-Of-Way Reliability Program**
**MEPA DEIR Map Set - 75ft Tree Clearing Option**

NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

MAP SHEET 10 OF 110

Date: March 25, 2025

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LLN 517-306
LLN 517-305
SUGARBUSH FARM CR
LLN 517-301
LLN 517-302
LLN 517-307
LLN 517-304
LLN 517-303
WENDELL
ERVING
ESTMOS1
WES4B
WEW5B
WES5B
WEW1B
MORMON HOLLOW ROAD
Miller's River
Line 354
34018
34019
Map Sheet 10
Map Sheet 12

CLEARING IMPACT: ESTMOS1 PERENNIAL 201 LF

CLEARING IMPACT: WES4B INTERMITTENT 343 LF

CLEARING IMPACT: WEW5B 2,045 SQFT

MATTING IMPACT: WEW5B 2,571 SQFT

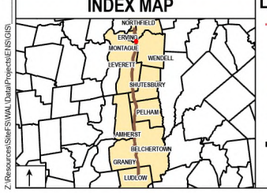
SPAN STREAM (TEMP)

SPAN STREAM (TEMP)

CLEARING IMPACT: WES5B INTERMITTENT 30 LF

310FT 320FT 330FT 340FT 350FT 360FT 370FT 380FT 390FT 400FT 410FT 420FT 430FT 440FT 450FT 460FT 470FT 480FT 490FT 500FT 510FT 520FT 530FT 540FT 550FT 800FT

## INDEX MAP




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N

1 inch = 100 feet

0 25 50 100 Feet

| NO. | DATE | REVISIONS |
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EVERSOURCE ENERGY

**WT-11**
**Transmission Right-Of-Way Reliability Program**
**MEPA DEIR Map Set - 75ft Tree Clearing Option**

NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

MAP SHEET 11 OF 110

Date: March 25, 2025

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# Conceptual Mapsheets 9-11 –
# 100ft Tree Clearing Option

MATTING IMPACT:
ERW9B
5,134 SQFT

POPLAR
MOUNTAIN LOOP

ERVING

LLN 517-312

670FT

660FT

570FT

650FT

630FT

600FT

580FT

640FT

620FT

590FT

Map Sheet 8

Map Sheet 10

Line 354

34015

34016

ERW9B

POPLAR MOUNTAIN
CONSERVATION AEA

720FT

700FT

680FT

710FT

640FT

730FT

740FT

730FT

770FT

750FT

760FT

690FT

850FT

820FT

840FT

830FT

790FT

600FT

870FT

910FT

900FT

880FT

890FT

LLN 517-311

560FT

910FT

550FT

540FT

530FT

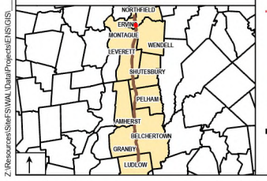
520FT

510FT

CLEARING IMPACT: ERW9B
12,688 SQFT

POPLAR
MOUNTAIN LOOP

## INDEX MAP




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N

1 inch = 100 feet

0 25 50 100 Feet

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EVERSOURCE ENERGY

**WT-11**
**Transmission Right-Of-Way Reliability Program**
**MEPA DEIR Map Set - 100ft Tree Clearing Option**

NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

MAP SHEET 9 OF 110

Date: March 25, 2025

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EVERSOURCE ENERGY

**WT-11**
**Transmission Right-Of-Way Reliability Program**
**MEPA DEIR Map Set - 100ft Tree Clearing Option**

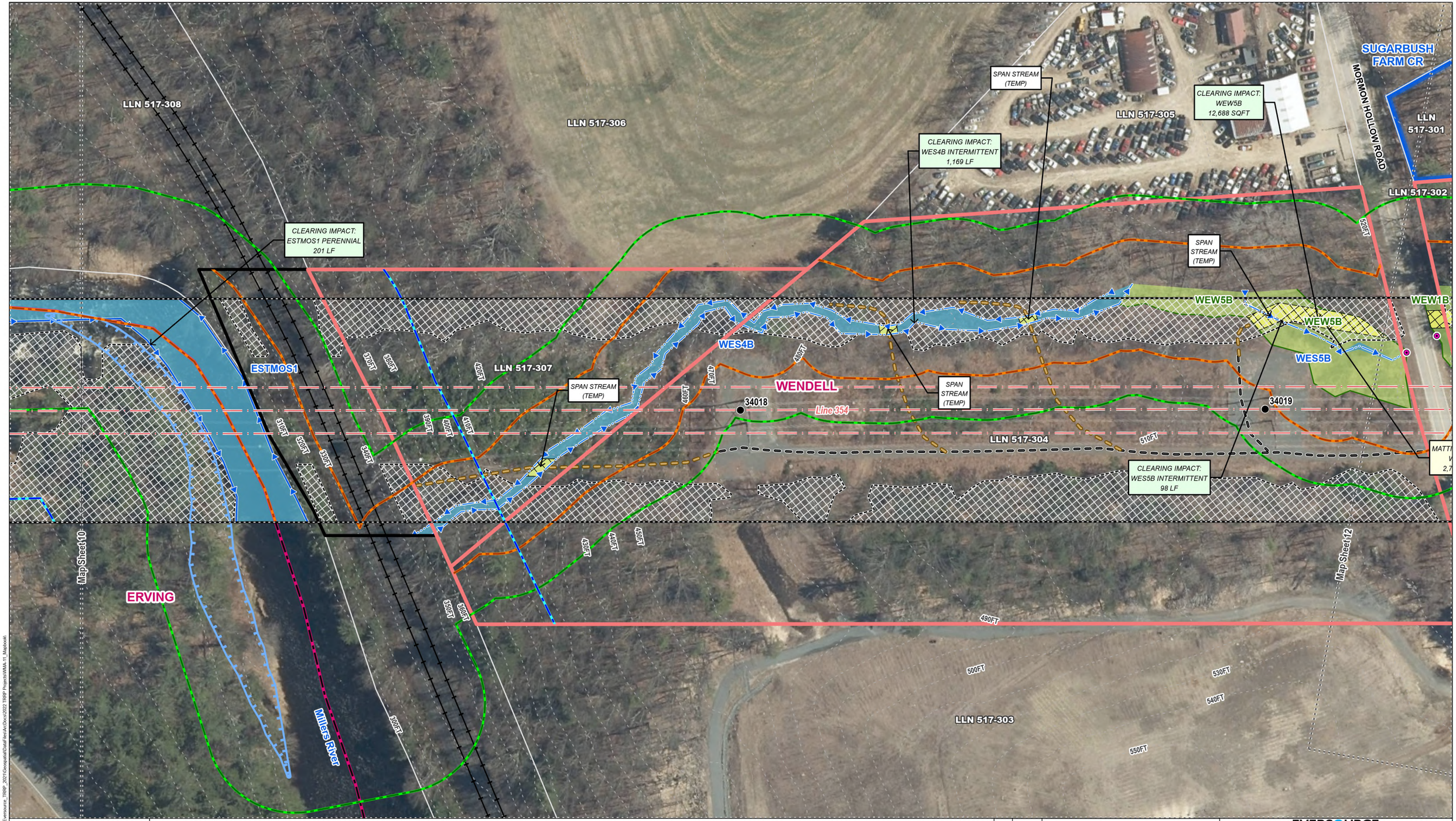
NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

MAP SHEET 10 OF 110

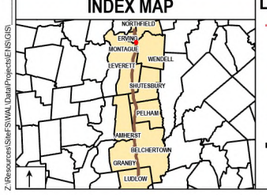
Date: March 25, 2025

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INDEX MAP




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0 25 50 100 Feet

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EVERSOURCE ENERGY

**WT-11**

**Transmission Right-Of-Way Reliability Program**

**MEPA DEIR Map Set - 100ft Tree Clearing Option**

NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

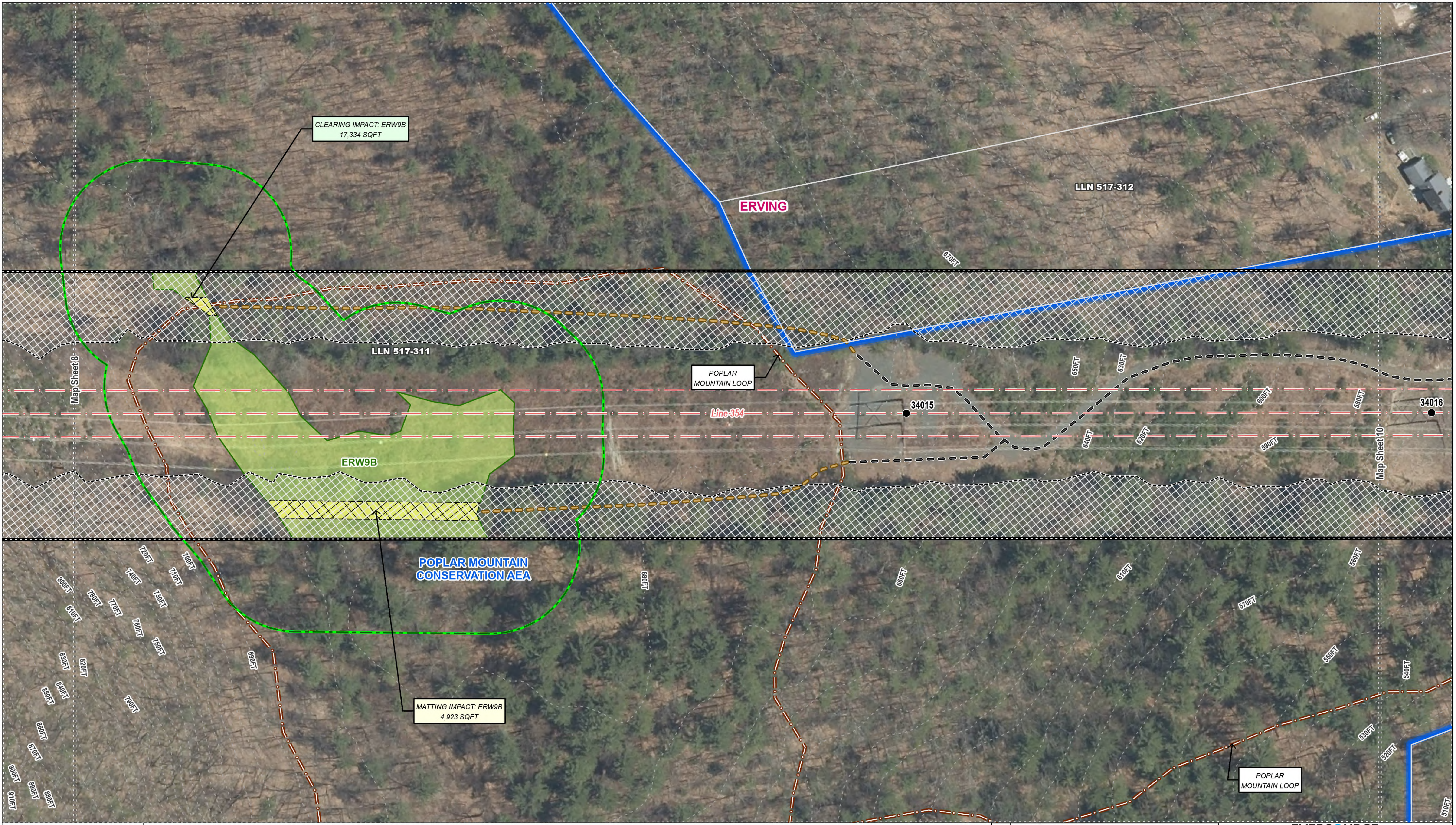
MAP SHEET 11 OF 110

Date: March 25, 2025

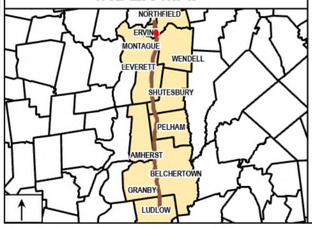
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# Conceptual Mapsheets 9-11 –
# Full ROW Width Tree Clearing Option

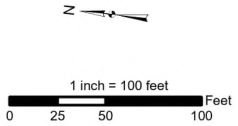


## INDEX MAP



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EVERSOURCE ENERGY

**WT-11**
**Transmission Right-Of-Way Reliability Program**
**MEPA DEIR Map Set - Edge to Edge Tree Clearing Option**

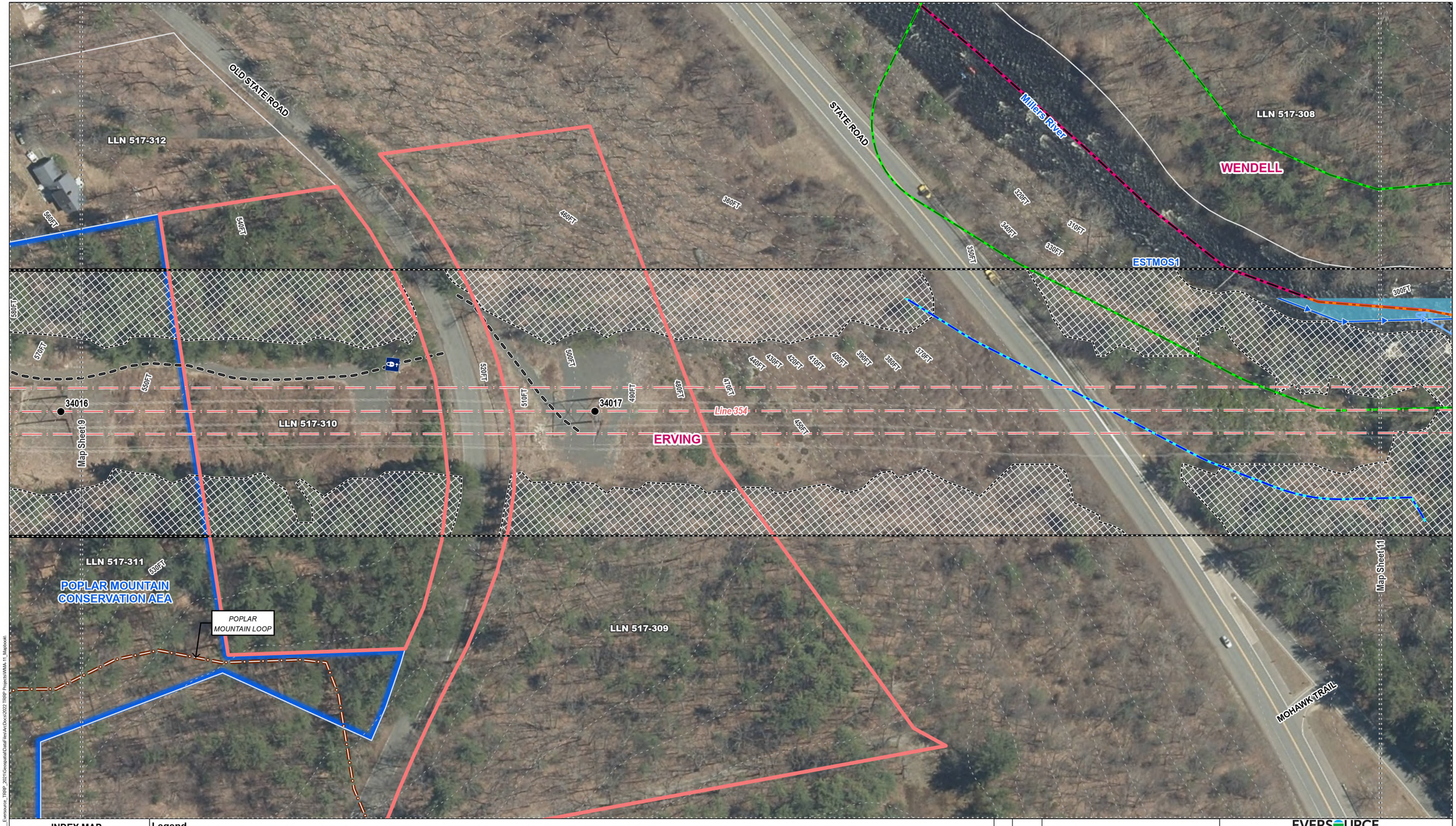
NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

MAP SHEET 9 OF 110

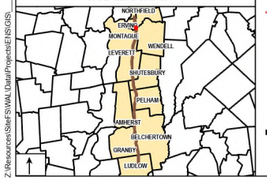
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## INDEX MAP




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N

1 inch = 100 feet

0 25 50 100 Feet

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EVERSOURCE ENERGY

**WT-11**
**Transmission Right-Of-Way Reliability Program**
**MEPA DEIR Map Set - Edge to Edge Tree Clearing Option**

NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

MAP SHEET 10 OF 110

Date: March 25, 2025

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LLN 517-308

LLN 517-306

LLN 517-305

SUGARBUSH FARM CR

LLN 517-301

LLN 517-302

WENDELL

MATTING IMPACT: WEW5B 3,986 SQFT

CLEARING IMPACT: WES4B INTERMITTENT 1,259 LF

CLEARING IMPACT: WEW5B 8,507 SQFT

SPAN STREAM (TEMP)

WES4B

WEW1B

WES5B

WEW5B

MORMON HOLLOW ROAD

CLEARING IMPACT: ESTMOS1 PERENNIAL 201 LF

LLN 517-307

SPAN STREAM (TEMP)

34018

Line 354

34019

LLN 517-304

CLEARING IMPACT: WES5B INTERMITTENT 165 LF

ESTMOS1

ERVING

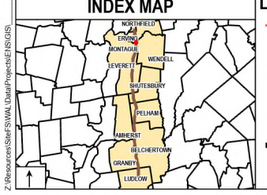
Map Sheet 10

Millers River

LLN 517-303

Map Sheet 12

## INDEX MAP




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EVERSOURCE ENERGY

**WT-11**
**Transmission Right-Of-Way Reliability Program**
**MEPA DEIR Map Set - Edge to Edge Tree Clearing Option**

NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

MAP SHEET 11 OF 110

Date: March 25, 2025

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# ATTACHMENT 2
# WT-11 TRRP MEPA DEIR MAP SET

# (PROVIDED UNDER SEPARATE COVER)

# ATTACHMENT 3
# NERC RELIABILITY STANDARD FAC-003-4

# A. Introduction

1. **Title:** **Transmission Vegetation Management**

2. **Number:** **FAC-003-4**

3. **Purpose:** **To maintain a reliable electric transmission system by using a defense-in-depth strategy to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW, thus preventing the risk of those vegetation-related outages that could lead to Cascading.**

4. **Applicability:**

   **4.1. Functional Entities:**

   **4.1.1.** Applicable Transmission Owners

   **4.1.1.1.** Transmission Owners that own Transmission Facilities defined in 4.2.

   **4.1.2.** Applicable Generator Owners

   **4.1.2.1.** Generator Owners that own generation Facilities defined in 4.3.

   **4.2. Transmission Facilities:** Defined below (referred to as "applicable lines"), including but not limited to those that cross lands owned by federal[1], state, provincial, public, private, or tribal entities:

   **4.2.1.** Each overhead transmission line operated at 200kV or higher.

   **4.2.2.** Each overhead transmission line operated below 200kV identified as an element of an IROL under NERC Standard FAC-014 by the Planning Coordinator.

   **4.2.3.** Each overhead transmission line operated below 200 kV identified as an element of a Major WECC Transfer Path in the Bulk Electric System by WECC.

   **4.2.4.** Each overhead transmission line identified above (4.2.1. through 4.2.3.) located outside the fenced area of the switchyard, station or substation and any portion of the span of the transmission line that is crossing the substation fence.

   **4.3. Generation Facilities:** Defined below (referred to as "applicable lines"), including but not limited to those that cross lands owned by federal[2], state, provincial, public, private, or tribal entities:

[1] EPAct 2005 section 1211c: *"Access approvals by Federal agencies."*

[2] *Id.*

**4.3.1.** Overhead transmission lines that (1) extend greater than one mile or 1.609 kilometers beyond the fenced area of the generating station switchyard to the point of interconnection with a Transmission Owner's Facility or (2) do not have a clear line of sight[3] from the generating station switchyard fence to the point of interconnection with a Transmission Owner's Facility and are:

**4.3.1.1.** Operated at 200kV or higher; or

**4.3.1.2.** Operated below 200kV identified as an element of an IROL under NERC Standard FAC-014 by the Planning Coordinator; or

**4.3.1.3.** Operated below 200 kV identified as an element of a Major WECC Transfer Path in the Bulk Electric System by WECC.

**5. Effective Date:** See Implementation Plan

**6. Background:** This standard uses three types of requirements to provide layers of protection to prevent vegetation related outages that could lead to Cascading:

a) Performance-based defines a particular reliability objective or outcome to be achieved. In its simplest form, a results-based requirement has four components: *who, under what conditions (if any), shall perform what action, to achieve what particular bulk power system performance result or outcome?*

b) Risk-based preventive requirements to reduce the risks of failure to acceptable tolerance levels. A risk-based reliability requirement should be framed as: *who, under what conditions (if any), shall perform what action, to achieve what particular result or outcome that reduces a stated risk to the reliability of the bulk power system?*

c) Competency-based defines a minimum set of capabilities an entity needs to have to demonstrate it is able to perform its designated reliability functions. A competency-based reliability requirement should be framed as: *who, under what conditions (if any), shall have what capability, to achieve what particular result or outcome to perform an action to achieve a result or outcome or to reduce a risk to the reliability of the bulk power system?*

The defense-in-depth strategy for reliability standards development recognizes that each requirement in a NERC reliability standard has a role in preventing system failures, and that these roles are complementary and reinforcing. Reliability standards should not be viewed as a body of unrelated requirements, but rather should be viewed as part of a portfolio of requirements designed to achieve an overall defense-in-depth strategy and comport with the quality objectives of a reliability standard.

[3] "Clear line of sight" means the distance that can be seen by the average person without special instrumentation (e.g., binoculars, telescope, spyglasses, etc.) on a clear day.

This standard uses a defense-in-depth approach to improve the reliability of the electric Transmission system by:

- Requiring that vegetation be managed to prevent vegetation encroachment inside the flash-over clearance (R1 and R2);
- Requiring documentation of the maintenance strategies, procedures, processes and specifications used to manage vegetation to prevent potential flash-over conditions including consideration of 1) conductor dynamics and 2) the interrelationships between vegetation growth rates, control methods and the inspection frequency (R3);
- Requiring timely notification to the appropriate control center of vegetation conditions that could cause a flash-over at any moment (R4);
- Requiring corrective actions to ensure that flash-over distances will not be violated due to work constrains such as legal injunctions (R5);
- Requiring inspections of vegetation conditions to be performed annually (R6); and
- Requiring that the annual work needed to prevent flash-over is completed (R7).

For this standard, the requirements have been developed as follows:

- Performance-based: Requirements 1 and 2
- Competency-based: Requirement 3
- Risk-based: Requirements 4, 5, 6 and 7

R3 serves as the first line of defense by ensuring that entities understand the problem they are trying to manage and have fully developed strategies and plans to manage the problem. R1, R2, and R7 serve as the second line of defense by requiring that entities carry out their plans and manage vegetation. R6, which requires inspections, may be either a part of the first line of defense (as input into the strategies and plans) or as a third line of defense (as a check of the first and second lines of defense). R4 serves as the final line of defense, as it addresses cases in which all the other lines of defense have failed.

Major outages and operational problems have resulted from interference between overgrown vegetation and transmission lines located on many types of lands and ownership situations. Adherence to the standard requirements for applicable lines on any kind of land or easement, whether they are Federal Lands, state or provincial lands, public or private lands, franchises, easements or lands owned in fee, will reduce and manage this risk. For the purpose of the standard the term “public lands” includes municipal lands, village lands, city lands, and a host of other governmental entities.

This standard addresses vegetation management along applicable overhead lines and does not apply to underground lines, submarine lines or to line sections inside an electric station boundary.

This standard focuses on transmission lines to prevent those vegetation related outages that could lead to Cascading. It is not intended to prevent customer outages due to tree contact with lower voltage distribution system lines. For example, localized customer service might be disrupted if vegetation were to make contact with a 69kV transmission line supplying power to a 12kV distribution station. However, this standard is not written to address such isolated situations which have little impact on the overall electric transmission system.

Since vegetation growth is constant and always present, unmanaged vegetation poses an increased outage risk, especially when numerous transmission lines are operating at or near their Rating. This can present a significant risk of consecutive line failures when lines are experiencing large sags thereby leading to Cascading. Once the first line fails the shift of the current to the other lines and/or the increasing system loads will lead to the second and subsequent line failures as contact to the vegetation under those lines occurs. Conversely, most other outage causes (such as trees falling into lines, lightning, animals, motor vehicles, etc.) are not an interrelated function of the shift of currents or the increasing system loading. These events are not any more likely to occur during heavy system loads than any other time. There is no cause-effect relationship which creates the probability of simultaneous occurrence of other such events. Therefore these types of events are highly unlikely to cause large-scale grid failures. Thus, this standard places the highest priority on the management of vegetation to prevent vegetation grow-ins.

## B. Requirements and Measures

**R1.** Each applicable Transmission Owner and applicable Generator Owner shall manage vegetation to prevent encroachments into the Minimum Vegetation Clearance Distance (MVCD) of its applicable line(s) which are either an element of an IROL, or an element of a Major WECC Transfer Path; operating within their Rating and all Rated Electrical Operating Conditions of the types shown below[4] *[Violation Risk Factor: High] [Time Horizon: Real-time]*:

[4] This requirement does not apply to circumstances that are beyond the control of an applicable Transmission Owner or applicable Generator Owner subject to this reliability standard, including natural disasters such as earthquakes, fires, tornados, hurricanes, landslides, wind shear, fresh gale, major storms as defined either by the applicable Transmission Owner or applicable Generator Owner or an applicable regulatory body, ice storms, and floods; human or animal activity such as logging, animal severing tree, vehicle contact with tree, or installation, removal, or digging of vegetation. Nothing in this footnote should be construed to limit the Transmission Owner's or applicable Generator Owner's right to exercise its full legal rights on the ROW.

**1.1.** An encroachment into the MVCD as shown in FAC-003-Table 2, observed in Real-time, absent a Sustained Outage,[5]

**1.2.** An encroachment due to a fall-in from inside the ROW that caused a vegetation-related Sustained Outage,[6]

**1.3.** An encroachment due to the blowing together of applicable lines and vegetation located inside the ROW that caused a vegetation-related Sustained Outage[7],

**1.4.** An encroachment due to vegetation growth into the MVCD that caused a vegetation-related Sustained Outage.[8]

**M1.** Each applicable Transmission Owner and applicable Generator Owner has evidence that it managed vegetation to prevent encroachment into the MVCD as described in R1. Examples of acceptable forms of evidence may include dated attestations, dated reports containing no Sustained Outages associated with encroachment types 2 through 4 above, or records confirming no Real-time observations of any MVCD encroachments. (R1)

**R2.** Each applicable Transmission Owner and applicable Generator Owner shall manage vegetation to prevent encroachments into the MVCD of its applicable line(s) which are not either an element of an IROL, or an element of a Major WECC Transfer Path; operating within its Rating and all Rated Electrical Operating Conditions of the types shown below[9] *[Violation Risk Factor: High] [Time Horizon: Real-time]*:

**2.1.** An encroachment into the MVCD, observed in Real-time, absent a Sustained Outage,[10]

**2.2.** An encroachment due to a fall-in from inside the ROW that caused a vegetation-related Sustained Outage,[11]

**2.3.** An encroachment due to the blowing together of applicable lines and vegetation located inside the ROW that caused a vegetation-related Sustained Outage,[12]

**2.4.** An encroachment due to vegetation growth into the line MVCD that caused a vegetation-related Sustained Outage.[13]

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[5] If a later confirmation of a Fault by the applicable Transmission Owner or applicable Generator Owner shows that a vegetation encroachment within the MVCD has occurred from vegetation within the ROW, this shall be considered the equivalent of a Real-time observation.

[6] Multiple Sustained Outages on an individual line, if caused by the same vegetation, will be reported as one outage regardless of the actual number of outages within a 24-hour period.

[7] *Id.*

[8] *Id.*

[9] See footnote 4.

[10] See footnote 5.

[11] See footnote 6.

[12] *Id.*

[13] *Id.*

**M2.** Each applicable Transmission Owner and applicable Generator Owner has evidence that it managed vegetation to prevent encroachment into the MVCD as described in R2. Examples of acceptable forms of evidence may include dated attestations, dated reports containing no Sustained Outages associated with encroachment types 2 through 4 above, or records confirming no Real-time observations of any MVCD encroachments. (R2)

**R3.** Each applicable Transmission Owner and applicable Generator Owner shall have documented maintenance strategies or procedures or processes or specifications it uses to prevent the encroachment of vegetation into the MVCD of its applicable lines that accounts for the following: *[Violation Risk Factor: Lower] [Time Horizon: Long Term Planning]:*

**3.1.** Movement of applicable line conductors under their Rating and all Rated Electrical Operating Conditions;

**3.2.** Inter-relationships between vegetation growth rates, vegetation control methods, and inspection frequency.

**M3.** The maintenance strategies or procedures or processes or specifications provided demonstrate that the applicable Transmission Owner and applicable Generator Owner can prevent encroachment into the MVCD considering the factors identified in the requirement. (R3)

**R4.** Each applicable Transmission Owner and applicable Generator Owner, without any intentional time delay, shall notify the control center holding switching authority for the associated applicable line when the applicable Transmission Owner and applicable Generator Owner has confirmed the existence of a vegetation condition that is likely to cause a Fault at any moment *[Violation Risk Factor: Medium] [Time Horizon: Real-time].*

**M4.** Each applicable Transmission Owner and applicable Generator Owner that has a confirmed vegetation condition likely to cause a Fault at any moment will have evidence that it notified the control center holding switching authority for the associated transmission line without any intentional time delay. Examples of evidence may include control center logs, voice recordings, switching orders, clearance orders and subsequent work orders. (R4)

**R5.** When an applicable Transmission Owner and an applicable Generator Owner are constrained from performing vegetation work on an applicable line operating within its Rating and all Rated Electrical Operating Conditions, and the constraint may lead to a vegetation encroachment into the MVCD prior to the implementation of the next annual work plan, then the applicable Transmission Owner or applicable Generator Owner shall take corrective action to ensure continued vegetation management to prevent encroachments [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*].

**M5.** Each applicable Transmission Owner and applicable Generator Owner has evidence of the corrective action taken for each constraint where an applicable transmission line was put at potential risk. Examples of acceptable forms of evidence may include initially-planned work orders, documentation of constraints from landowners, court orders, inspection records of increased monitoring, documentation of the de-rating of lines, revised work orders, invoices, or evidence that the line was de-energized. (R5)

**R6.** Each applicable Transmission Owner and applicable Generator Owner shall perform a Vegetation Inspection of 100% of its applicable transmission lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.) at least once per calendar year and with no more than 18 calendar months between inspections on the same ROW[14] [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*].

**M6.** Each applicable Transmission Owner and applicable Generator Owner has evidence that it conducted Vegetation Inspections of the transmission line ROW for all applicable lines at least once per calendar year but with no more than 18 calendar months between inspections on the same ROW. Examples of acceptable forms of evidence may include completed and dated work orders, dated invoices, or dated inspection records. (R6)

**R7.** Each applicable Transmission Owner and applicable Generator Owner shall complete 100% of its annual vegetation work plan of applicable lines to ensure no vegetation encroachments occur within the MVCD. Modifications to the work plan in response to changing conditions or to findings from vegetation inspections may be made (provided they do not allow encroachment of vegetation into the MVCD) and must be documented. The percent completed calculation is based on the number of units actually completed divided by the number of units in the final amended plan (measured in units of choice - circuit, pole line, line miles or kilometers, etc.). Examples of reasons for modification to annual plan may include [*Violation Risk Factor: Medium*] [*Time Horizon: Operations Planning*]:

**7.1.** Change in expected growth rate/environmental factors

**7.2.** Circumstances that are beyond the control of an applicable Transmission Owner or applicable Generator Owner[15]

**7.3.** Rescheduling work between growing seasons

**7.4.** Crew or contractor availability/Mutual assistance agreements

[14] When the applicable Transmission Owner or applicable Generator Owner is prevented from performing a Vegetation Inspection within the timeframe in R6 due to a natural disaster, the TO or GO is granted a time extension that is equivalent to the duration of the time the TO or GO was prevented from performing the Vegetation Inspection.

[15] Circumstances that are beyond the control of an applicable Transmission Owner or applicable Generator Owner include but are not limited to natural disasters such as earthquakes, fires, tornados, hurricanes, landslides, ice storms, floods, or major storms as defined either by the TO or GO or an applicable regulatory body.

**7.5.** Identified unanticipated high priority work

**7.6.** Weather conditions/Accessibility

**7.7.** Permitting delays

**7.8.** Land ownership changes/Change in land use by the landowner

**7.9.** Emerging technologies

**M7.** Each applicable Transmission Owner and applicable Generator Owner has evidence that it completed its annual vegetation work plan for its applicable lines. Examples of acceptable forms of evidence may include a copy of the completed annual work plan (as finally modified), dated work orders, dated invoices, or dated inspection records. (R7)

## C. Compliance

### 1. Compliance Monitoring Process

**1.1. Compliance Enforcement Authority:**
"Compliance Enforcement Authority" means NERC or the Regional Entity, or any entity as otherwise designated by an Applicable Governmental Authority, in their respective roles of monitoring and/or enforcing compliance with mandatory and enforceable Reliability Standards in their respective jurisdictions.

**1.2. Evidence Retention:**
The following evidence retention period(s) identify the period of time an entity is required to retain specific evidence to demonstrate compliance. For instances where the evidence retention period specified below is shorter than the time since the last audit, the Compliance Enforcement Authority may ask an entity to provide other evidence to show that it was compliant for the full-time period since the last audit.

The applicable entity shall keep data or evidence to show compliance as identified below unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- The applicable Transmission Owner and applicable Generator Owner retains data or evidence to show compliance with Requirements R1, R2, R3, R5, R6 and R7, for three calendar years.
- The applicable Transmission Owner and applicable Generator Owner retains data or evidence to show compliance with Requirement R4, Measure M4 for most recent 12 months of operator logs or most recent 3 months of voice recordings or transcripts of voice recordings, unless directed by its Compliance Enforcement Authority to retain specific evidence for a longer period of time as part of an investigation.

- If an applicable Transmission Owner or applicable Generator Owner is found non-compliant, it shall keep information related to the non-compliance until found compliant or for the time period specified above, whichever is longer.

### 1.3. Compliance Monitoring and Enforcement Program

As defined in the NERC Rules of Procedure, "Compliance Monitoring and Enforcement Program" refers to the identification of the processes that will be used to evaluate data or information for the purpose of assessing performance or outcomes with the associated Reliability Standard.

### 1.4. Additional Compliance Information

**Periodic Data Submittal:** The applicable Transmission Owner and applicable Generator Owner will submit a quarterly report to its Regional Entity, or the Regional Entity's designee, identifying all Sustained Outages of applicable lines operated within their Rating and all Rated Electrical Operating Conditions as determined by the applicable Transmission Owner or applicable Generator Owner to have been caused by vegetation, except as excluded in footnote 2, and including as a minimum the following:

- The name of the circuit(s), the date, time and duration of the outage; the voltage of the circuit; a description of the cause of the outage; the category associated with the Sustained Outage; other pertinent comments; and any countermeasures taken by the applicable Transmission Owner or applicable Generator Owner.

  A Sustained Outage is to be categorized as one of the following:

- Category 1A — Grow-ins: Sustained Outages caused by vegetation growing into applicable lines, that are identified as an element of an IROL or Major WECC Transfer Path, by vegetation inside and/or outside of the ROW;
- Category 1B — Grow-ins: Sustained Outages caused by vegetation growing into applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, by vegetation inside and/or outside of the ROW;
- Category 2A — Fall-ins: Sustained Outages caused by vegetation falling into applicable lines that are identified as an element of an IROL or Major WECC Transfer Path, from within the ROW;
- Category 2B — Fall-ins: Sustained Outages caused by vegetation falling into applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, from within the ROW;
- Category 3 — Fall-ins: Sustained Outages caused by vegetation falling into applicable lines from outside the ROW;
- Category 4A — Blowing together: Sustained Outages caused by vegetation and applicable lines that are identified as an element of an IROL or Major WECC Transfer Path, blowing together from within the ROW;

- Category 4B — Blowing together: Sustained Outages caused by vegetation and applicable lines, but are not identified as an element of an IROL or Major WECC Transfer Path, blowing together from within the ROW.

  The Regional Entity will report the outage information provided by applicable Transmission Owners and applicable Generator Owners, as per the above, quarterly to NERC, as well as any actions taken by the Regional Entity as a result of any of the reported Sustained Outages.

## Violation Severity Levels (Table 1)

| R # | Table 1: Violation Severity Levels (VSL) | | | |
|---|---|---|---|---|
| | Lower VSL | Moderate VSL | High VSL | Severe VSL |
| **R1.** | | | The responsible entity failed to manage vegetation to prevent encroachment into the MVCD of a line identified as an element of an IROL or Major WECC transfer path and encroachment into the MVCD as identified in FAC-003-4-Table 2 was observed in real time absent a Sustained Outage. | The responsible entity failed to manage vegetation to prevent encroachment into the MVCD of a line identified as an element of an IROL or Major WECC transfer path and a vegetation-related Sustained Outage was caused by one of the following:<br>• *A fall-in from inside the active transmission line ROW*<br>• *Blowing together of applicable lines and vegetation located inside the active transmission line ROW*<br>• *A grow-in* |
| **R2.** | | | The responsible entity failed to manage vegetation to prevent encroachment into the MVCD of a line not identified as an element of | The responsible entity failed to manage vegetation to prevent encroachment into the MVCD of a line not identified as an element of |

| | | | | |
|---|---|---|---|---|
| | | | an IROL or Major WECC transfer path and encroachment into the MVCD as identified in FAC-003-4-Table 2 was observed in real time absent a Sustained Outage. | an IROL or Major WECC transfer path and a vegetation-related Sustained Outage was caused by one of the following:<br>• *A fall-in from inside the active transmission line ROW*<br>• *Blowing together of applicable lines and vegetation located inside the active transmission line ROW*<br>• *A grow-in* |
| **R3.** | | The responsible entity has maintenance strategies or documented procedures or processes or specifications but has not accounted for the inter-relationships between vegetation growth rates, vegetation control methods, and inspection frequency, for the responsible entity's applicable lines. (Requirement R3, Part 3.2.) | The responsible entity has maintenance strategies or documented procedures or processes or specifications but has not accounted for the movement of transmission line conductors under their Rating and all Rated Electrical Operating Conditions, for the responsible entity's applicable lines. (Requirement R3, Part 3.1.) | The responsible entity does not have any maintenance strategies or documented procedures or processes or specifications used to prevent the encroachment of vegetation into the MVCD, for the responsible entity's applicable lines. |
| **R4.** | | | The responsible entity experienced a confirmed | The responsible entity experienced a confirmed |

| | | | | |
|---|---|---|---|---|
| | | | vegetation threat and notified the control center holding switching authority for that applicable line, but there was intentional delay in that notification. | vegetation threat and did not notify the control center holding switching authority for that applicable line. |
| **R5.** | | | | The responsible entity did not take corrective action when it was constrained from performing planned vegetation work where an applicable line was put at potential risk. |
| **R6.** | The responsible entity failed to inspect 5% or less of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.) | The responsible entity failed to inspect more than 5% up to and including 10% of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.). | The responsible entity failed to inspect more than 10% up to and including 15% of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.). | The responsible entity failed to inspect more than 15% of its applicable lines (measured in units of choice - circuit, pole line, line miles or kilometers, etc.). |
| **R7.** | The responsible entity failed to complete 5% or less of its annual vegetation work plan for its applicable lines (as finally modified). | The responsible entity failed to complete more than 5% and up to and including 10% of its annual vegetation work plan for its applicable lines (as finally modified). | The responsible entity failed to complete more than 10% and up to and including 15% of its annual vegetation work plan for its applicable lines (as finally modified). | The responsible entity failed to complete more than 15% of its annual vegetation work plan for its applicable lines (as finally modified). |

## D. Regional Variances

None.

## E. Associated Documents

- FAC-003-4 Implementation Plan

## Version History

| Version | Date | Action | Change Tracking |
|---|---|---|---|
| 1 | January 20, 2006 | 1. Added "Standard Development Roadmap."<br>2. Changed "60" to "Sixty" in section A, 5.2.<br>3. Added "Proposed Effective Date: April 7, 2006" to footer.<br>4. Added "Draft 3: November 17, 2005" to footer. | New |
| 1 | April 4, 2007 | Regulatory Approval - Effective Date | New |
| 2 | November 3, 2011 | Adopted by the NERC Board of Trustees | New |
| 2 | March 21, 2013 | FERC Order issued approving FAC-003-2 (Order No. 777)<br>FERC Order No. 777 was issued on March 21, 2013 directing NERC to "conduct or contract testing to obtain empirical data and submit a report to the Commission providing the results of the testing."[16] | Revisions |

[16] *Revisions to Reliability Standard for Transmission Vegetation Management, Order No. 777,* 142 FERC ¶ 61,208 (2013)

| | | | |
|---|---|---|---|
| 2 | May 9, 2013 | Board of Trustees adopted the modification of the VRF for Requirement R2 of FAC-003-2 by raising the VRF from “Medium” to “High.” | Revisions |
| 3 | May 9, 2013 | FAC-003-3 adopted by Board of Trustees | Revisions |
| 3 | September 19, 2013 | A FERC order was issued on September 19, 2013, approving FAC-003-3. This standard became enforceable on July 1, 2014 for Transmission Owners. For Generator Owners, R3 became enforceable on January 1, 2015 and all other requirements (R1, R2, R4, R5, R6, and R7) became enforceable on January 1, 2016. | Revisions |
| 3 | November 22, 2013 | Updated the VRF for R2 from “Medium” to “High” per a Final Rule issued by FERC | Revisions |
| 3 | July 30, 2014 | Transferred the effective dates section from FAC-003-2 (for Transmission Owners) into FAC-003-3, per the FAC-003-3 implementation plan | Revisions |
| 4 | February 11, 2016 | Adopted by Board of Trustees. Adjusted MVCD values in Table 2 for alternating current systems, consistent with findings reported in report filed on August 12, 2015 in Docket No. RM12-4-002 consistent with FERC’s directive in Order No. 777, and based on empirical testing results for flashover distances between conductors and vegetation. | Revisions |
| 4 | March 9, 2016 | Corrected subpart 7.10 to M7, corrected value of .07 to .7 | Errata |
| 4 | April 26, 2016 | FERC Letter Order approving FAC-003-4. Docket No. RD16-4-000. | |

## FAC-003 — TABLE 2 — Minimum Vegetation Clearance Distances (MVCD)[17]

For **Alternating Current** Voltages (feet)

| ( AC ) Nominal System Voltage (KV)[+] | ( AC ) Maximum System Voltage (kV)[18] | MVCD (feet) Over sea level up to 500 ft | MVCD feet Over 500 ft up to 1000 ft | MVCD feet Over 1000 ft up to 2000 ft | MVCD feet Over 2000 ft up to 3000 ft | MVCD feet Over 3000 ft up to 4000 ft | MVCD feet Over 4000 ft up to 5000 ft | MVCD feet Over 5000 ft up to 6000 ft | MVCD feet Over 6000 ft up to 7000 ft | MVCD feet Over 7000 ft up to 8000 ft | MVCD feet Over 8000 ft up to 9000 ft | MVCD feet Over 9000 ft up to 10000 ft | MVCD feet Over 10000 ft up to 11000 ft | MVCD feet Over 11000 ft up to 12000 ft | MVCD feet Over 12000 ft up to 13000 ft | MVCD feet Over 13000 ft up to 14000 ft | MVCD feet Over 14000 ft up to 15000 ft |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 765 | 800 | 11.6ft | 11.7ft | 11.9ft | 12.1ft | 12.2ft | 12.4ft | 12.6ft | 12.8ft | 13.0ft | 13.1ft | 13.3ft | 13.5ft | 13.7ft | 13.9ft | 14.1ft | 14.3ft |
| 500 | 550 | 7.0ft | 7.1ft | 7.2ft | 7.4ft | 7.5ft | 7.6ft | 7.8ft | 7.9ft | 8.1ft | 8.2ft | 8.3ft | 8.5ft | 8.6ft | 8.8ft | 8.9ft | 9.1ft |
| 345 | 362[19] | 4.3ft | 4.3ft | 4.4ft | 4.5ft | 4.6ft | 4.7ft | 4.8ft | 4.9ft | 5.0ft | 5.1ft | 5.2ft | 5.3ft | 5.4ft | 5.5ft | 5.6ft | 5.7ft |
| 287 | 302 | 5.2ft | 5.3ft | 5.4ft | 5.5ft | 5.6ft | 5.7ft | 5.8ft | 5.9ft | 6.1ft | 6.2ft | 6.3ft | 6.4ft | 6.5ft | 6.6ft | 6.8ft | 6.9ft |
| 230 | 242 | 4.0ft | 4.1ft | 4.2ft | 4.3ft | 4.3ft | 4.4ft | 4.5ft | 4.6ft | 4.7ft | 4.8ft | 4.9ft | 5.0ft | 5.1ft | 5.2ft | 5.3ft | 5.4ft |
| 161* | 169 | 2.7ft | 2.7ft | 2.8ft | 2.9ft | 2.9ft | 3.0ft | 3.0ft | 3.1ft | 3.2ft | 3.3ft | 3.3ft | 3.4ft | 3.5ft | 3.6ft | 3.7ft | 3.8ft |
| 138* | 145 | 2.3ft | 2.3ft | 2.4ft | 2.4ft | 2.5ft | 2.5ft | 2.6ft | 2.7ft | 2.7ft | 2.8ft | 2.8ft | 2.9ft | 3.0ft | 3.0ft | 3.1ft | 3.2ft |
| 115* | 121 | 1.9ft | 1.9ft | 1.9ft | 2.0ft | 2.0ft | 2.1ft | 2.1ft | 2.2ft | 2.2ft | 2.3ft | 2.3ft | 2.4ft | 2.5ft | 2.5ft | 2.6ft | 2.7ft |
| 88* | 100 | 1.5ft | 1.5ft | 1.6ft | 1.6ft | 1.7ft | 1.7ft | 1.8ft | 1.8ft | 1.8ft | 1.9ft | 1.9ft | 2.0ft | 2.0ft | 2.1ft | 2.2ft | 2.2ft |
| 69* | 72 | 1.1ft | 1.1ft | 1.1ft | 1.2ft | 1.2ft | 1.2ft | 1.2ft | 1.3ft | 1.3ft | 1.3ft | 1.4ft | 1.4ft | 1.4ft | 1.5ft | 1.6ft | 1.6ft |

* Such lines are applicable to this standard only if PC has determined such per FAC-014 (refer to the Applicability Section above)

[+] *Table 2 – Table of MVCD values at a 1.0 gap factor (in U.S. customary units), which is located in the EPRI report filed with FERC on August 12, 2015. (The 14000-15000 foot values were subsequently provided by EPRI in an updated Table 2 on December 1, 2015, filed with the FAC-003-4 Petition at FERC)*

[17] The distances in this Table are the minimums required to prevent Flash-over; however prudent vegetation maintenance practices dictate that substantially greater distances will be achieved at time of vegetation maintenance.

[18] Where applicable lines are operated at nominal voltages other than those listed, the applicable Transmission Owner or applicable Generator Owner should use the maximum system voltage to determine the appropriate clearance for that line.

[19] The change in transient overvoltage factors in the calculations are the driver in the decrease in MVCDs for voltages of 345 kV and above. Refer to pp.29-31 in the Supplemental Materials for additional information.

## TABLE 2 (CONT) — Minimum Vegetation Clearance Distances (MVCD)[20]

For **Alternating Current** Voltages (meters)

| ( AC ) Nominal System Voltage (KV)+ | ( AC ) Maximum System Voltage (kV)[21] | MVCD meters Over sea level up to 153 m | MVCD meters Over 153m up to 305m | MVCD meters Over 305m up to 610m | MVCD meters Over 610m up to 915m | MVCD meters Over 915m up to 1220m | MVCD meters Over 1220m up to 1524m | MVCD meters Over 1524m up to 1829m | MVCD meters Over 1829m up to 2134m | MVCD meters Over 2134m up to 2439m | MVCD meters Over 2439m up to 2744m | MVCD meters Over 2744m up to 3048m | MVCD meters Over 3048m up to 3353m | MVCD meters Over 3353m up to 3657m | MVCD meters Over 3657m up to 3962m | MVCD meters Over 3962 m up to 4268 m | MVCD meters Over 4268m up to 4572m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 765 | 800 | 3.6m | 3.6m | 3.6m | 3.7m | 3.7m | 3.8m | 3.8m | 3.9m | 4.0m | 4.0m | 4.1m | 4.1m | 4.2m | 4.2m | 4.3m | 4.4m |
| 500 | 550 | 2.1m | 2.2m | 2.2m | 2.3m | 2.3m | 2.3m | 2.4m | 2.4m | 2.5m | 2..5m | 2.5m | 2.6m | 2.6m | 2.7m | 2.7m | 2.7m |
| 345 | 362[22] | 1.3m | 1.3m | 1.3m | 1.4m | 1.4m | 1.4m | 1.5m | 1.5m | 1.5m | 1.6m | 1.6m | 1.6m | 1.6m | 1.7m | 1.7m | 1.8m |
| 287 | 302 | 1.6m | 1.6m | 1.7m | 1.7m | 1.7m | 1.7m | 1.8m | 1.8m | 1.9m | 1.9m | 1.9m | 2.0m | 2.0m | 2.0m | 2.1m | 2.1m |
| 230 | 242 | 1.2m | 1.3m | 1.3m | 1.3m | 1.3m | 1.3m | 1.4m | 1.4m | 1.4m | 1.5m | 1.5m | 1.5m | 1.6m | 1.6m | 1.6m | 1.6m |
| 161* | 169 | 0.8m | 0.8m | 0.9m | 0.9m | 0.9m | 0.9m | 0.9m | 1.0m | 1.0m | 1.0m | 1.0m | 1.0m | 1.1m | 1.1m | 1.1m | 1.1m |
| 138* | 145 | 0.7m | 0.7m | 0.7m | 0.7m | 0.7m | 0.7m | 0.8m | 0.8m | 0.8m | 0.9m | 0.9m | 0.9m | 0.9m | 0.9m | 1.0m | 1.0m |
| 115* | 121 | 0.6m | 0.6m | 0.6m | 0.6m | 0.6m | 0.6m | 0.6m | 0.7m | 0.7m | 0.7m | 0.7m | 0.7m | 0.8m | 0.8m | 0.8m | 0.8m |
| 88* | 100 | 0.4m | 0.4m | 0.5m | 0.5m | 0.5m | 0.5m | 0.6m | 0.6m | 0.6m | 0.6m | 0.6m | 0.6m | 0.6m | 0.6m | 0.7m | 0.7m |
| 69* | 72 | 0.3m | 0.3m | 0.3m | 0.4m | 0.4m | 0.4m | 0.4m | 0.4m | 0.4m | 0.4m | 0.4m | 0.4m | 0.4m | 0.5m | 0.5m | 0.5m |

* Such lines are applicable to this standard only if PC has determined such per FAC-014 (refer to the Applicability Section above)

+ *Table 2 – Table of MVCD values at a 1.0 gap factor (in U.S. customary units), which is located in the EPRI report filed with FERC on August 12, 2015. (The 14000-15000 foot values were subsequently provided by EPRI in an updated Table 2 on December 1, 2015, filed with the FAC-003-4 Petition at FERC)*

[20] The distances in this Table are the minimums required to prevent Flash-over; however prudent vegetation maintenance practices dictate that substantially greater distances will be achieved at time of vegetation maintenance.

[21] Where applicable lines are operated at nominal voltages other than those listed, the applicable Transmission Owner or applicable Generator Owner should use the maximum system voltage to determine the appropriate clearance for that line.

[22] The change in transient overvoltage factors in the calculations are the driver in the decrease in MVCDs for voltages of 345 kV and above. Refer to pp.29-31 in the supplemental materials for additional information.

## TABLE 2 (CONT) — Minimum Vegetation Clearance Distances (MVCD)[23]

For **Direct Current** Voltages feet (meters)

| ( DC ) Nominal Pole to Ground Voltage (kV) | MVCD meters<br>Over sea level up to 500 ft<br>(Over sea level up to 152.4 m) | MVCD meters<br>Over 500 ft up to 1000 ft<br>(Over 152.4 m up to 304.8 m | MVCD meters<br>Over 1000 ft up to 2000 ft<br>(Over 304.8 m up to 609.6m) | MVCD meters<br>Over 2000 ft up to 3000 ft<br>(Over 609.6m up to 914.4m | MVCD meters<br>Over 3000 ft up to 4000 ft<br>(Over 914.4m up to 1219.2m | MVCD meters<br>Over 4000 ft up to 5000 ft<br>(Over 1219.2m up to 1524m | MVCD meters<br>Over 5000 ft up to 6000 ft<br>(Over 1524 m up to 1828.8 m) | MVCD meters<br>Over 6000 ft up to 7000 ft<br>(Over 1828.8m up to 2133.6m) | MVCD meters<br>Over 7000 ft up to 8000 ft<br>(Over 2133.6m up to 2438.4m) | MVCD meters<br>Over 8000 ft up to 9000 ft<br>(Over 2438.4m up to 2743.2m) | MVCD meters<br>Over 9000 ft up to 10000 ft<br>(Over 2743.2m up to 3048m) | MVCD meters<br>Over 10000 ft up to 11000 ft<br>(Over 3048m up to 3352.8m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ±750 | 14.12ft (4.30m) | 14.31ft (4.36m) | 14.70ft (4.48m) | 15.07ft (4.59m) | 15.45ft (4.71m) | 15.82ft (4.82m) | 16.2ft (4.94m) | 16.55ft (5.04m) | 16.91ft (5.15m) | 17.27ft (5.26m) | 17.62ft (5.37m) | 17.97ft (5.48m) |
| ±600 | 10.23ft (3.12m) | 10.39ft (3.17m) | 10.74ft (3.26m) | 11.04ft (3.36m) | 11.35ft (3.46m) | 11.66ft (3.55m) | 11.98ft (3.65m) | 12.3ft (3.75m) | 12.62ft (3.85m) | 12.92ft (3.94m) | 13.24ft (4.04m) | 13.54ft (4.13m) |
| ±500 | 8.03ft (2.45m) | 8.16ft (2.49m) | 8.44ft (2.57m) | 8.71ft (2.65m) | 8.99ft (2.74m) | 9.25ft (2.82m) | 9.55ft (2.91m) | 9.82ft (2.99m) | 10.1ft (3.08m) | 10.38ft (3.16m) | 10.65ft (3.25m) | 10.92ft (3.33m) |
| ±400 | 6.07ft (1.85m) | 6.18ft (1.88m) | 6.41ft (1.95m) | 6.63ft (2.02m) | 6.86ft (2.09m) | 7.09ft (2.16m) | 7.33ft (2.23m) | 7.56ft (2.30m) | 7.80ft (2.38m) | 8.03ft (2.45m) | 8.27ft (2.52m) | 8.51ft (2.59m) |
| ±250 | 3.50ft (1.07m) | 3.57ft (1.09m) | 3.72ft (1.13m) | 3.87ft (1.18m) | 4.02ft (1.23m) | 4.18ft (1.27m) | 4.34ft (1.32m) | 4.5ft (1.37m) | 4.66ft (1.42m) | 4.83ft (1.47m) | 5.00ft (1.52m) | 5.17ft (1.58m) |

[23] The distances in this Table are the minimums required to prevent Flash-over; however prudent vegetation maintenance practices dictate that substantially greater distances will be achieved at time of vegetation maintenance.

# Guideline and Technical Basis

**Effective dates:**

The Compliance section is standard language used in most NERC standards to cover the general effective date and covers the vast majority of situations. A special case covers effective dates for (1) lines initially becoming subject to the Standard, (2) lines changing in applicability within the standard.

The special case is needed because the Planning Coordinators may designate lines below 200 kV to become elements of an IROL or Major WECC Transfer Path in a future Planning Year (PY). For example, studies by the Planning Coordinator in 2015 may identify a line to have that designation beginning in PY 2025, ten years after the planning study is performed. It is not intended for the Standard to be immediately applicable to, or in effect for, that line until that future PY begins. The effective date provision for such lines ensures that the line will become subject to the standard on January 1 of the PY specified with an allowance of at least 12 months for the applicable Transmission Owner or applicable Generator Owner to make the necessary preparations to achieve compliance on that line. A line operating below 200kV designated as an element of an IROL or Major WECC Transfer Path may be removed from that designation due to system improvements, changes in generation, changes in loads or changes in studies and analysis of the network.

| Date that Planning Study is completed | PY the line will become an IROL element | Date 1 | Date 2 | Effective Date<br>The later of Date 1 or Date 2 |
|---|---|---|---|---|
| 05/15/2011 | 2012 | 05/15/2012 | 01/01/2012 | 05/15/2012 |
| 05/15/2011 | 2013 | 05/15/2012 | 01/01/2013 | 01/01/2013 |
| 05/15/2011 | 2014 | 05/15/2012 | 01/01/2014 | 01/01/2014 |
| 05/15/2011 | 2021 | 05/15/2012 | 01/01/2021 | 01/01/2021 |

**Defined Terms:**

**Explanation for revising the definition of ROW:**
The current NERC glossary definition of Right of Way has been modified to include Generator Owners and to address the matter set forth in Paragraph 734 of FERC Order 693. The Order pointed out that Transmission Owners may in some cases own more property or rights than are needed to reliably operate transmission lines. This definition represents a slight but significant departure from the strict legal definition of “right of way” in that this definition is based on engineering and construction considerations that establish the width of a corridor from a technical basis. The pre-2007 maintenance records are included in the current definition to allow the use of such vegetation widths if there were no engineering or construction standards that

referenced the width of right of way to be maintained for vegetation on a particular line but the evidence exists in maintenance records for a width that was in fact maintained prior to this standard becoming mandatory. Such widths may be the only information available for lines that had limited or no vegetation easement rights and were typically maintained primarily to ensure public safety. This standard does not require additional easement rights to be purchased to satisfy a minimum right of way width that did not exist prior to this standard becoming mandatory.

**Explanation for revising the definition of Vegetation Inspection:**
The current glossary definition of this NERC term was modified to include Generator Owners and to allow both maintenance inspections and vegetation inspections to be performed concurrently. This allows potential efficiencies, especially for those lines with minimal vegetation and/or slow vegetation growth rates.

**Explanation of the derivation of the MVCD:**
The MVCD is a calculated minimum distance that is derived from the Gallet equation. This is a method of calculating a flash over distance that has been used in the design of high voltage transmission lines. Keeping vegetation away from high voltage conductors by this distance will prevent voltage flash-over to the vegetation. See the explanatory text below for Requirement R3 and associated Figure 1. Table 2 of the Standard provides MVCD values for various voltages and altitudes. The table is based on empirical testing data from EPRI as requested by FERC in Order No. 777.

**Project 2010-07.1 Adjusted MVCDs per EPRI Testing:**
In Order No. 777, FERC directed NERC to undertake testing to gather empirical data validating the appropriate gap factor used in the Gallet equation to calculate MVCDs, specifically the gap factor for the flash-over distances between conductors and vegetation. See, Order No. 777, at P 60. NERC engaged industry through a collaborative research project and contracted EPRI to complete the scope of work. In January 2014, NERC formed an advisory group to assist with developing the scope of work for the project. This team provided subject matter expertise for developing the test plan, monitoring testing, and vetting the analysis and conclusions to be submitted in a final report. The advisory team was comprised of NERC staff, arborists, and industry members with wide-ranging expertise in transmission engineering, insulation coordination, and vegetation management. The testing project commenced in April 2014 and continued through October 2014 with the final set of testing completed in May 2015. Based on these testing results conducted by EPRI, and consistent with the report filed in FERC Docket No. RM12-4-000, the gap factor used in the Gallet equation required adjustment from 1.3 to 1.0. This resulted in increased MVCD values for all alternating current system voltages identified. The adjusted MVCD values, reflecting the 1.0 gap factor, are included in Table 2 of version 4 of FAC-003.

The air gap testing completed by EPRI per FERC Order No. 777 established that trees with large spreading canopies growing directly below energized high voltage conductors create the

greatest likelihood of an air gap flash over incident and was a key driver in changing the gap factor to a more conservative value of 1.0 in version 4 of this standard.

**Requirements R1 and R2:**
R1 and R2 are performance-based requirements. The reliability objective or outcome to be achieved is the management of vegetation such that there are no vegetation encroachments within a minimum distance of transmission lines. Content-wise, R1 and R2 are the same requirements; however, they apply to different Facilities. Both R1 and R2 require each applicable Transmission Owner or applicable Generator Owner to manage vegetation to prevent encroachment within the MVCD of transmission lines. R1 is applicable to lines that are identified as an element of an IROL or Major WECC Transfer Path. R2 is applicable to all other lines that are not elements of IROLs, and not elements of Major WECC Transfer Paths.

The separation of applicability (between R1 and R2) recognizes that inadequate vegetation management for an applicable line that is an element of an IROL or a Major WECC Transfer Path is a greater risk to the interconnected electric transmission system than applicable lines that are not elements of IROLs or Major WECC Transfer Paths. Applicable lines that are not elements of IROLs or Major WECC Transfer Paths do require effective vegetation management, but these lines are comparatively less operationally significant.

Requirements R1 and R2 state that if inadequate vegetation management allows vegetation to encroach within the MVCD distance as shown in Table 2, it is a violation of the standard. Table 2 distances are the minimum clearances that will prevent spark-over based on the Gallet equations. These requirements assume that transmission lines and their conductors are operating within their Rating. If a line conductor is intentionally or inadvertently operated beyond its Rating and Rated Electrical Operating Condition (potentially in violation of other standards), the occurrence of a clearance encroachment may occur solely due to that condition. For example, emergency actions taken by an applicable Transmission Owner or applicable Generator Owner or Reliability Coordinator to protect an Interconnection may cause excessive sagging and an outage. Another example would be ice loading beyond the line's Rating and Rated Electrical Operating Condition. Such vegetation-related encroachments and outages are not violations of this standard.

Evidence of failures to adequately manage vegetation include real-time observation of a vegetation encroachment into the MVCD (absent a Sustained Outage), or a vegetation-related encroachment resulting in a Sustained Outage due to a fall-in from inside the ROW, or a vegetation-related encroachment resulting in a Sustained Outage due to the blowing together of the lines and vegetation located inside the ROW, or a vegetation-related encroachment resulting in a Sustained Outage due to a grow-in. Faults which do not cause a Sustained outage and which are confirmed to have been caused by vegetation encroachment within the MVCD are considered the equivalent of a Real-time observation for violation severity levels.

With this approach, the VSLs for R1 and R2 are structured such that they directly correlate to the severity of a failure of an applicable Transmission Owner or applicable Generator Owner to manage vegetation and to the corresponding performance level of the Transmission Owner's

vegetation program's ability to meet the objective of "preventing the risk of those vegetation related outages that could lead to Cascading." Thus violation severity increases with an applicable Transmission Owner's or applicable Generator Owner's inability to meet this goal and its potential of leading to a Cascading event. The additional benefits of such a combination are that it simplifies the standard and clearly defines performance for compliance. A performance-based requirement of this nature will promote high quality, cost effective vegetation management programs that will deliver the overall end result of improved reliability to the system.

Multiple Sustained Outages on an individual line can be caused by the same vegetation. For example initial investigations and corrective actions may not identify and remove the actual outage cause then another outage occurs after the line is re-energized and previous high conductor temperatures return. Such events are considered to be a single vegetation-related Sustained Outage under the standard where the Sustained Outages occur within a 24 hour period.

If the applicable Transmission Owner or applicable Generator Owner has applicable lines operated at nominal voltage levels not listed in Table 2, then the applicable TO or applicable GO should use the next largest clearance distance based on the next highest nominal voltage in the table to determine an acceptable distance.

**Requirement R3:**
R3 is a competency based requirement concerned with the maintenance strategies, procedures, processes, or specifications, an applicable Transmission Owner or applicable Generator Owner uses for vegetation management.

An adequate transmission vegetation management program formally establishes the approach the applicable Transmission Owner or applicable Generator Owner uses to plan and perform vegetation work to prevent transmission Sustained Outages and minimize risk to the transmission system. The approach provides the basis for evaluating the intent, allocation of appropriate resources, and the competency of the applicable Transmission Owner or applicable Generator Owner in managing vegetation. There are many acceptable approaches to manage vegetation and avoid Sustained Outages. However, the applicable Transmission Owner or applicable Generator Owner must be able to show the documentation of its approach and how it conducts work to maintain clearances.

An example of one approach commonly used by industry is ANSI Standard A300, part 7. However, regardless of the approach a utility uses to manage vegetation, any approach an applicable Transmission Owner or applicable Generator Owner chooses to use will generally contain the following elements:

1. *the maintenance strategy used (such as minimum vegetation-to-conductor distance or maximum vegetation height) to ensure that MVCD clearances are never violated*

2. *the work methods that the applicable Transmission Owner or applicable Generator Owner uses to control vegetation*
3. *a stated Vegetation Inspection frequency*
4. *an annual work plan*

The conductor's position in space at any point in time is continuously changing in reaction to a number of different loading variables. Changes in vertical and horizontal conductor positioning are the result of thermal and physical loads applied to the line. Thermal loading is a function of line current and the combination of numerous variables influencing ambient heat dissipation including wind velocity/direction, ambient air temperature and precipitation. Physical loading applied to the conductor affects sag and sway by combining physical factors such as ice and wind loading. The movement of the transmission line conductor and the MVCD is illustrated in Figure 1 below.

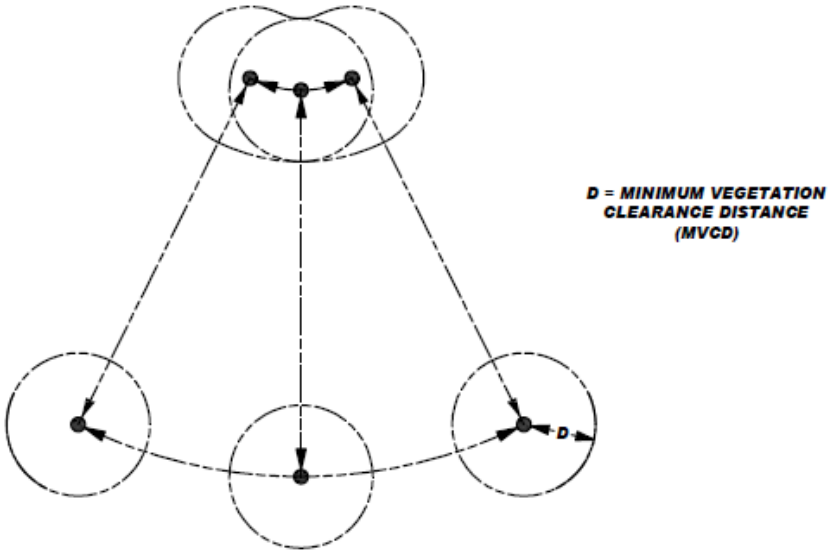



**Figure 1**

A cross-section view of a single conductor at a given point along the span is shown with six possible conductor positions due to movement resulting from thermal and mechanical loading.

**Requirement R4:**
R4 is a risk-based requirement. It focuses on preventative actions to be taken by the applicable Transmission Owner or applicable Generator Owner for the mitigation of Fault risk when a vegetation threat is confirmed. R4 involves the notification of potentially threatening vegetation conditions, without any intentional delay, to the control center holding switching authority for that specific transmission line. Examples of acceptable unintentional delays may

include communication system problems (for example, cellular service or two-way radio disabled), crews located in remote field locations with no communication access, delays due to severe weather, etc.

Confirmation is key that a threat actually exists due to vegetation. This confirmation could be in the form of an applicable Transmission Owner or applicable Generator Owner employee who personally identifies such a threat in the field. Confirmation could also be made by sending out an employee to evaluate a situation reported by a landowner.

Vegetation-related conditions that warrant a response include vegetation that is near or encroaching into the MVCD (a grow-in issue) or vegetation that could fall into the transmission conductor (a fall-in issue). A knowledgeable verification of the risk would include an assessment of the possible sag or movement of the conductor while operating between no-load conditions and its rating.

The applicable Transmission Owner or applicable Generator Owner has the responsibility to ensure the proper communication between field personnel and the control center to allow the control center to take the appropriate action until or as the vegetation threat is relieved. Appropriate actions may include a temporary reduction in the line loading, switching the line out of service, or other preparatory actions in recognition of the increased risk of outage on that circuit. The notification of the threat should be communicated in terms of minutes or hours as opposed to a longer time frame for corrective action plans (see R5).

All potential grow-in or fall-in vegetation-related conditions will not necessarily cause a Fault at any moment. For example, some applicable Transmission Owners or applicable Generator Owners may have a danger tree identification program that identifies trees for removal with the potential to fall near the line. These trees would not require notification to the control center unless they pose an immediate fall-in threat.

**Requirement R5:**
R5 is a risk-based requirement. It focuses upon preventative actions to be taken by the applicable Transmission Owner or applicable Generator Owner for the mitigation of Sustained Outage risk when temporarily constrained from performing vegetation maintenance. The intent of this requirement is to deal with situations that prevent the applicable Transmission Owner or applicable Generator Owner from performing planned vegetation management work and, as a result, have the potential to put the transmission line at risk. Constraints to performing vegetation maintenance work as planned could result from legal injunctions filed by property owners, the discovery of easement stipulations which limit the applicable Transmission Owner's or applicable Generator Owner's rights, or other circumstances.

This requirement is not intended to address situations where the transmission line is not at potential risk and the work event can be rescheduled or re-planned using an alternate work methodology. For example, a land owner may prevent the planned use of herbicides to control incompatible vegetation outside of the MVCD, but agree to the use of mechanical clearing. In

this case the applicable Transmission Owner or applicable Generator Owner is not under any immediate time constraint for achieving the management objective, can easily reschedule work using an alternate approach, and therefore does not need to take interim corrective action.

However, in situations where transmission line reliability is potentially at risk due to a constraint, the applicable Transmission Owner or applicable Generator Owner is required to take an interim corrective action to mitigate the potential risk to the transmission line. A wide range of actions can be taken to address various situations. General considerations include:

- Identifying locations where the applicable Transmission Owner or applicable Generator Owner is constrained from performing planned vegetation maintenance work which potentially leaves the transmission line at risk.
- Developing the specific action to mitigate any potential risk associated with not performing the vegetation maintenance work as planned.
- Documenting and tracking the specific action taken for the location.
- In developing the specific action to mitigate the potential risk to the transmission line the applicable Transmission Owner or applicable Generator Owner could consider location specific measures such as modifying the inspection and/or maintenance intervals. Where a legal constraint would not allow any vegetation work, the interim corrective action could include limiting the loading on the transmission line.
- The applicable Transmission Owner or applicable Generator Owner should document and track the specific corrective action taken at each location. This location may be indicated as one span, one tree or a combination of spans on one property where the constraint is considered to be temporary.

**Requirement R6:**
R6 is a risk-based requirement. This requirement sets a minimum time period for completing Vegetation Inspections. The provision that Vegetation Inspections can be performed in conjunction with general line inspections facilitates a Transmission Owner's ability to meet this requirement. However, the applicable Transmission Owner or applicable Generator Owner may determine that more frequent vegetation specific inspections are needed to maintain reliability levels, based on factors such as anticipated growth rates of the local vegetation, length of the local growing season, limited ROW width, and local rainfall. Therefore it is expected that some transmission lines may be designated with a higher frequency of inspections.

The VSLs for Requirement R6 have levels ranked by the failure to inspect a percentage of the applicable lines to be inspected. To calculate the appropriate VSL the applicable Transmission Owner or applicable Generator Owner may choose units such as: circuit, pole line, line miles or kilometers, etc.

For example, when an applicable Transmission Owner or applicable Generator Owner operates 2,000 miles of applicable transmission lines this applicable Transmission Owner or applicable

Generator Owner will be responsible for inspecting all the 2,000 miles of lines at least once during the calendar year. If one of the included lines was 100 miles long, and if it was not inspected during the year, then the amount failed to inspect would be 100/2000 = 0.05 or 5%. The "Low VSL" for R6 would apply in this example.

**Requirement R7:**
R7 is a risk-based requirement. The applicable Transmission Owner or applicable Generator Owner is required to complete its annual work plan for vegetation management to accomplish the purpose of this standard. Modifications to the work plan in response to changing conditions or to findings from vegetation inspections may be made and documented provided they do not put the transmission system at risk. The annual work plan requirement is not intended to necessarily require a "span-by-span", or even a "line-by-line" detailed description of all work to be performed. It is only intended to require that the applicable Transmission Owner or applicable Generator Owner provide evidence of annual planning and execution of a vegetation management maintenance approach which successfully prevents encroachment of vegetation into the MVCD.

When an applicable Transmission Owner or applicable Generator Owner identifies 1,000 miles of applicable transmission lines to be completed in the applicable Transmission Owner's or applicable Generator Owner's annual plan, the applicable Transmission Owner or applicable Generator Owner will be responsible completing those identified miles. If an applicable Transmission Owner or applicable Generator Owner makes a modification to the annual plan that does not put the transmission system at risk of an encroachment the annual plan may be modified. If 100 miles of the annual plan is deferred until next year the calculation to determine what percentage was completed for the current year would be: 1000 – 100 (deferred miles) = 900 modified annual plan, or 900 / 900 = 100% completed annual miles. If an applicable Transmission Owner or applicable Generator Owner only completed 875 of the total 1000 miles with no acceptable documentation for modification of the annual plan the calculation for failure to complete the annual plan would be: 1000 – 875 = 125 miles failed to complete then, 125 miles (not completed) / 1000 total annual plan miles = 12.5% failed to complete.

The ability to modify the work plan allows the applicable Transmission Owner or applicable Generator Owner to change priorities or treatment methodologies during the year as conditions or situations dictate. For example recent line inspections may identify unanticipated high priority work, weather conditions (drought) could make herbicide application ineffective during the plan year, or a major storm could require redirecting local resources away from planned maintenance. This situation may also include complying with mutual assistance agreements by moving resources off the applicable Transmission Owner's or applicable Generator Owner's system to work on another system. Any of these examples could result in acceptable deferrals or additions to the annual work plan provided that they do not put the transmission system at risk of a vegetation encroachment.
In general, the vegetation management maintenance approach should use the full extent of the applicable Transmission Owner's or applicable Generator Owner's easement, fee simple and

other legal rights allowed. A comprehensive approach that exercises the full extent of legal rights on the ROW is superior to incremental management because in the long term it reduces the overall potential for encroachments, and it ensures that future planned work and future planned inspection cycles are sufficient.

When developing the annual work plan the applicable Transmission Owner or applicable Generator Owner should allow time for procedural requirements to obtain permits to work on federal, state, provincial, public, tribal lands. In some cases the lead time for obtaining permits may necessitate preparing work plans more than a year prior to work start dates. Applicable Transmission Owners or applicable Generator Owners may also need to consider those special landowner requirements as documented in easement instruments.

This requirement sets the expectation that the work identified in the annual work plan will be completed as planned. Therefore, deferrals or relevant changes to the annual plan shall be documented. Depending on the planning and documentation format used by the applicable Transmission Owner or applicable Generator Owner, evidence of successful annual work plan execution could consist of signed-off work orders, signed contracts, printouts from work management systems, spreadsheets of planned versus completed work, timesheets, work inspection reports, or paid invoices. Other evidence may include photographs, and walk-through reports.

**Notes:**

The SDT determined that the use of IEEE 516-2003 in version 1 of FAC-003 was a misapplication. The SDT consulted specialists who advised that the Gallet equation would be a technically justified method. The explanation of why the Gallet approach is more appropriate is explained in the paragraphs below.

The drafting team sought a method of establishing minimum clearance distances that uses realistic weather conditions and realistic maximum transient over-voltages factors for in-service transmission lines.

The SDT considered several factors when looking at changes to the minimum vegetation to conductor distances in FAC-003-1:

- avoid the problem associated with referring to tables in another standard (IEEE-516-2003)
- transmission lines operate in non-laboratory environments (wet conditions)
- transient over-voltage factors are lower for in-service transmission lines than for inadvertently re-energized transmission lines with trapped charges.

FAC-003-1 used the minimum air insulation distance (MAID) without tools formula provided in IEEE 516-2003 to determine the minimum distance between a transmission line conductor and vegetation. The equations and methods provided in IEEE 516 were developed by an IEEE Task Force in 1968 from test data provided by thirteen independent laboratories. The distances provided in IEEE 516 Tables 5 and 7 are based on the withstand voltage of a dry rod-rod air gap,

or in other words, dry laboratory conditions. Consequently, the validity of using these distances in an outside environment application has been questioned.

FAC-003-1 allowed Transmission Owners to use either Table 5 or Table 7 to establish the minimum clearance distances. Table 7 could be used if the Transmission Owner knew the maximum transient over-voltage factor for its system. Otherwise, Table 5 would have to be used. Table 5 represented minimum air insulation distances under the worst possible case for transient over-voltage factors. These worst case transient over-voltage factors were as follows: 3.5 for voltages up to 362 kV phase to phase; 3.0 for 500 - 550 kV phase to phase; and 2.5 for 765 to 800 kV phase to phase. These worst case over-voltage factors were also a cause for concern in this particular application of the distances.

In general, the worst case transient over-voltages occur on a transmission line that is inadvertently re-energized immediately after the line is de-energized and a trapped charge is still present. The intent of FAC-003 is to keep a transmission line that is in service from becoming de-energized (i.e. tripped out) due to spark-over from the line conductor to nearby vegetation. Thus, the worst case transient overvoltage assumptions are not appropriate for this application. Rather, the appropriate over voltage values are those that occur only while the line is energized.

Typical values of transient over-voltages of in-service lines are not readily available in the literature because they are negligible compared with the maximums. A conservative value for the maximum transient over-voltage that can occur anywhere along the length of an in-service ac line was approximately 2.0 per unit. This value was a conservative estimate of the transient over-voltage that is created at the point of application (e.g. a substation) by switching a capacitor bank without pre-insertion devices (e.g. closing resistors). At voltage levels where capacitor banks are not very common (e.g. Maximum System Voltage of 362 kV), the maximum transient over-voltage of an in-service ac line are created by fault initiation on adjacent ac lines and shunt reactor bank switching. These transient voltages are usually 1.5 per unit or less.

Even though these transient over-voltages will not be experienced at locations remote from the bus at which they are created, in order to be conservative, it is assumed that all nearby ac lines are subjected to this same level of over-voltage. Thus, a maximum transient over-voltage factor of 2.0 per unit for transmission lines operated at 302 kV and below was considered to be a realistic maximum in this application. Likewise, for ac transmission lines operated at Maximum System Voltages of 362 kV and above a transient over-voltage factor of 1.4 per unit was considered a realistic maximum.

The Gallet equations are an accepted method for insulation coordination in tower design. These equations are used for computing the required strike distances for proper transmission line insulation coordination. They were developed for both wet and dry applications and can be used with any value of transient over-voltage factor. The Gallet equation also can take into account various air gap geometries. This approach was used to design the first 500 kV and 765 kV lines in North America.

If one compares the MAID using the IEEE 516-2003 Table 7 (table D.5 for English values) with the critical spark-over distances computed using the Gallet wet equations, for each of the nominal voltage classes and identical transient over-voltage factors, the Gallet equations yield a more conservative (larger) minimum distance value.

Distances calculated from either the IEEE 516 (dry) formulas or the Gallet "wet" formulas are not vastly different when the same transient overvoltage factors are used; the "wet" equations will consistently produce slightly larger distances than the IEEE 516 equations when the same transient overvoltage is used. While the IEEE 516 equations were only developed for dry conditions the Gallet equations have provisions to calculate spark-over distances for both wet and dry conditions.

Since no empirical data for spark over distances to live vegetation existed at the time version 3 was developed, the SDT chose a proven method that has been used in other EHV applications. The Gallet equations relevance to wet conditions and the selection of a Transient Overvoltage Factor that is consistent with the absence of trapped charges on an in-service transmission line make this methodology a better choice.

The following table is an example of the comparison of distances derived from IEEE 516 and the Gallet equations.

**Comparison of spark-over distances computed using Gallet wet equations vs.**

**IEEE 516-2003 MAID distances**

| **( AC ) Nom System Voltage (kV)** | **( AC ) Max System Voltage (kV)** | **Transient Over-voltage Factor (T)** | **Clearance (ft.) Gallet (wet) @ Alt. 3000 feet** | Table 7 (Table D.5 for feet) **IEEE 516-2003 MAID (ft) @ Alt. 3000 feet** |
|---|---|---|---|---|
| | | | | |
| 765 | 800 | 2.0 | 14.36 | 13.95 |
| 500 | 550 | 2.4 | 11.0 | 10.07 |
| 345 | 362 | 3.0 | 8.55 | 7.47 |
| 230 | 242 | 3.0 | 5.28 | 4.2 |
| 115 | 121 | 3.0 | 2.46 | 2.1 |

**Rationale:**
During development of this standard, text boxes were embedded within the standard to explain the rationale for various parts of the standard. Upon BOT approval, the text from the rationale text boxes was moved to this section.

**Rationale for Applicability (section 4.2.4):**
The areas excluded in 4.2.4 were excluded based on comments from industry for reasons summarized as follows:

1) There is a very low risk from vegetation in this area. Based on an informal survey, no TOs reported such an event.
2) Substations, switchyards, and stations have many inspection and maintenance activities that are necessary for reliability. Those existing process manage the threat. As such, the formal steps in this standard are not well suited for this environment.
3) Specifically addressing the areas where the standard does and does not apply makes the standard clearer.

**Rationale for Applicability (section 4.3)**:
Within the text of NERC Reliability Standard FAC-003-3, "transmission line(s)" and "applicable line(s)" can also refer to the generation Facilities as referenced in 4.3 and its subsections.

**Rationale for R1 and R2:**
Lines with the highest significance to reliability are covered in R1; all other lines are covered in R2.

Rationale for the types of failure to manage vegetation which are listed in order of increasing degrees of severity in non-compliant performance as it relates to a failure of an applicable Transmission Owner's or applicable Generator Owner's vegetation maintenance program:

1. This management failure is found by routine inspection or Fault event investigation, and is normally symptomatic of unusual conditions in an otherwise sound program.
2. This management failure occurs when the height and location of a side tree within the ROW is not adequately addressed by the program.
3. This management failure occurs when side growth is not adequately addressed and may be indicative of an unsound program.
4. This management failure is usually indicative of a program that is not addressing the most fundamental dynamic of vegetation management, (i.e. a grow-in under the line). If this type of failure is pervasive on multiple lines, it provides a mechanism for a Cascade.

**Rationale for R3:**
The documentation provides a basis for evaluating the competency of the applicable Transmission Owner's or applicable Generator Owner's vegetation program. There may be many acceptable approaches to maintain clearances. Any approach must demonstrate that the

applicable Transmission Owner or applicable Generator Owner avoids vegetation-to-wire conflicts under all Ratings and all Rated Electrical Operating Conditions.

**Rationale for R4:**

This is to ensure expeditious communication between the applicable Transmission Owner or applicable Generator Owner and the control center when a critical situation is confirmed.

**Rationale for R5:**

Legal actions and other events may occur which result in constraints that prevent the applicable Transmission Owner or applicable Generator Owner from performing planned vegetation maintenance work.

In cases where the transmission line is put at potential risk due to constraints, the intent is for the applicable Transmission Owner and applicable Generator Owner to put interim measures in place, rather than do nothing.

The corrective action process is not intended to address situations where a planned work methodology cannot be performed but an alternate work methodology can be used.

**Rationale for R6:**

Inspections are used by applicable Transmission Owners and applicable Generator Owners to assess the condition of the entire ROW. The information from the assessment can be used to determine risk, determine future work and evaluate recently-completed work. This requirement sets a minimum Vegetation Inspection frequency of once per calendar year but with no more than 18 months between inspections on the same ROW. Based upon average growth rates across North America and on common utility practice, this minimum frequency is reasonable. Transmission Owners should consider local and environmental factors that could warrant more frequent inspections.

**Rationale for R7:**

This requirement sets the expectation that the work identified in the annual work plan will be completed as planned. It allows modifications to the planned work for changing conditions, taking into consideration anticipated growth of vegetation and all other environmental factors, provided that those modifications do not put the transmission system at risk of a vegetation encroachment.

# ATTACHMENT 4
# FERC/NERC REPORT ON TRANSMISSION FACILITY OUTAGES DURING THE NORTHEAST SNOWSTORM OF OCTOBER 29–30, 2011 CAUSES AND RECOMMENDATIONS

REPORT ON

# Transmission Facility Outages During the Northeast Snowstorm of October 29–30, 2011

## Causes and Recommendations



Prepared by the Staffs of the

Federal Energy Regulatory Commission *and the* North American Electric Reliability Corporation

# *Report on Transmission Facility Outages during the Northeast Snowstorm of October 29–30, 2011*

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# I. Introduction

On October 29-30, 2011, an unprecedented fall snowstorm hit the Northeastern United States, blanketing the region with up to two and a half feet of heavy, wet snow. Snowfall amounts broke all previous October records throughout the Mid-Atlantic and New England regions. The snowfall totals were most significant in New England, but parts of New York, New Jersey, and Pennsylvania also received well over a foot of snow. On the morning of October 30, near the end of the storm, more than 3.2 million homes and businesses were without power.[1] Thousands were without power for more than a week, some for as long as eleven days. Estimates put storm costs between approximately $1 billion and $3 billion.

Although the vast majority of these customer outages were caused by damage to electric distribution lines,[2] seventy-four transmission lines[3] and forty-four transmission substations[4] also experienced outages of ten minutes or more. Twenty-four of the transmission facilities (twenty-three lines and one substation) that experienced outages are Bulk-Power System (BPS) elements.[5]

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[1] Over the course of the weekend, more than 4.3 million customers lost power at one point or another. U.S. DEPARTMENT OF ENERGY, ENERGY ASSURANCE DAILY 1 (Oct. 31, 2011), http://www.oe.netl.doe.gov/docs/eads/ead103111b.pdf (showing the non-concurrent, peak reported outages of twenty-two utilities).

[2] Distribution lines, which carry power from the interstate transmission system to retail customers, are typically operated under 100 kilovolts (kV) and are generally regulated by the states.

[3] Transmission lines, which carry power from electric generating facilities to substations connected to the distribution system, are typically operated over 100 kV and generally – but not universally – regulated by the Federal Energy Regulatory Commission (FERC or the Commission) as to rates and terms of transmission service. See Federal Power Act § 201(b)(1), 16 U.S.C. § 824(b)(1). As explained in footnote 5, the Commission also has jurisdiction, pursuant to Section 215 of the Federal Power Act, over the reliability of the bulk-power system. Although some facilities operated under 100 kV are considered to be "transmission facilities" in certain contexts, this report uses that term to refer only to facilities operated at or above 100 kV.

[4] A transmission substation is connected to one or more transmission lines and houses transformers used to step up or step down (increase or decrease) electric energy voltages. Substations also contain, among other equipment, breakers that allow lines to be connected or isolated in order to clear faults or perform maintenance. Transmission substations impacted by the storm are discussed further in Section IV.B.

[5] Section 215(a)(1) of the Federal Power Act defines the bulk-power System as "(A) facilities and control systems necessary for operating an interconnected electric energy transmission network (or any portion thereof); and (B) electric energy from generation facilities needed to maintain transmission system reliability. The term does not include facilities used in the local distribution of electric energy." 16 U.S.C. § 8240(a)(1). With respect to electric reliability, the Commission has jurisdiction over all users, owners, and operators of the BPS. FERC approves mandatory and enforceable Reliability Standards that are developed by the Electric Reliability Organization (ERO), the North American Electric Reliability Corporation (NERC), that apply to those BPS users, owners and operators registered by NERC. The Commission has adopted, at least for an initial period, NERC's definition of the term Bulk

In light of, among other things, the scope and seriousness of the October snowstorm event, the number of customers and states impacted, the duration of some of the outages, the storm's impact on entities subject to the Commission's jurisdiction, and the level of interest of the public and elected officials in the event, the Commission initiated an inquiry in November 2011 focused on the transmission- and BPS-related impacts of the storm. NERC also began an inquiry into the storm's effect on the BPS, and FERC and NERC combined their efforts into one joint inquiry. NPCC, which had been assisting NERC in its assessment of the storm event, also joined the inquiry team.

From the outset, this joint inquiry focused on determining the causes of the transmission facility outages and on the steps utilities could take to improve their performance in maintaining grid reliability during the next large snowstorm or similar weather event. The purpose of the inquiry has not been to investigate whether particular companies violated the Reliability Standards or other applicable statutes and regulations. NPCC, NERC, and FERC will follow their regular processes in identifying and pursuing any potential Reliability Standards violations. Nor has the purpose of this inquiry been to propose new or revised Reliability Standards or other regulations.

During the course of the inquiry, FERC, NERC, and NPCC staff obtained a significant amount of data from a variety of affected entities. Staff issued a first set of seven multi-part data requests to the thirty-six NERC-registered Transmission Owners and Transmission Operators[6] in the NPCC region, and sent a set of twenty-one multi-part data requests to those entities that reported experiencing transmission facility outages during the event. Staff conducted numerous follow-up calls and requested additional information from a number of entities. Staff also interviewed representatives of Northeast Utilities, the parent company of the three utilities that experienced the most

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Electric System (BES) for application of the Reliability Standards. The current definition of the BES is: "as defined by the [Regional Entity,] the electrical generation resources, transmission lines, interconnections with neighboring systems, and associated equipment, generally operated at voltages of 100 kV or higher. Radial transmission facilities serving only load with one transmission source are generally not included in this definition." *Mandatory Reliability Standards for the Bulk-Power System*, Order No. 693, FERC Stats. & Regs. ¶ 31,242, at P 75, *order on reh'g*, Order No. 693-A, 120 FERC ¶ 61,053 (2007). The Northeast Power Coordinating Council (NPCC), the NERC-certified Regional Entity for the states affected by the October snowstorm, uses a performance-based test (rather than a voltage-based bright line) to determine which facilities in its region are subject to the Reliability Standards, and calls those facilities "Bulk Power System elements." *See* NPCC DOCUMENT A-10, CLASSIFICATION OF BULK POWER SYSTEM ELEMENTS (2007). Because the transmission facility outages caused by the October snowstorm occurred only in the NPCC region, this report uses NPCC's term "BPS elements."

[6] A Transmission Owner is an entity "that owns and maintains transmission facilities." A Transmission Operator is an entity that "is responsible for the reliability of its 'local' transmission system, and that operates or directs the operations of the transmission facilities." NERC, *Glossary of Terms Used in Electric Reliability Standards* (Feb. 8, 2012), http://www.nerc.com/files/Glossary_of_Terms.pdf.

transmission facility outages. Staff visited approximately twenty transmission sites on a three-day visit to Connecticut, Massachusetts, and New Hampshire. Staff reviewed relevant reports issued by the affected utilities and independent entities.

A number of agencies in several states affected by transmission and distribution facility outages during the October snowstorm are conducting their own inquiries into utility performance before, during, and after the event. Staff consulted with many of these state agencies, monitored their public proceedings, and discussed with them the report's preliminary findings and recommendations. Staff held outreach meetings with the Edison Electric Institute, the American Public Power Association, the National Rural Electric Cooperative Association, and the North American Transmission Forum, and also shared with them, on a non-public basis, the report's preliminary findings and recommendations. Feedback provided by state agencies and industry associations was considered in preparing this report.

This report: (1) presents staff's assessment of the October snowstorm event, including its impacts on transmission facilities and the BPS, and the causes of transmission facility outages; (2) discusses the applicability of the transmission vegetation management reliability standard to the event; and (3) provides a number of recommendations to industry that, if implemented, could improve utilities' performance and enhance transmission grid reliability during the next large snowstorm or similar event.

# II. Executive Summary

The early autumn snowstorm that hit the Northeast on October 29-30, 2011, was unprecedented in the amount of snowfall it produced and particularly devastating because of the untimely combination of several factors. As much as two and a half feet of heavy, wet snow fell at a time when many trees still had their leaves, following a warm, rainy period that left the ground unfrozen, saturated, and soft. The quantity of snow held by the unusually top-heavy trees, coupled with the soft, wet ground, resulted in a great number of healthy trees, most outside of utility rights-of-way,[7] being uprooted and falling onto distribution and transmission lines.

The storm left a trail of destruction that primarily affected distribution systems. Distribution lines were damaged in an estimated 50,000 locations ("trouble spots") throughout the Northeast.[8] Millions of customers[9] served by more than two dozen utilities lost power. Tens of thousands of customers served by Connecticut Light & Power Company (CL&P) were without electricity for more than a week, and some customers served by CL&P were without service for eleven days.[10]

Most of the damage, and customer outages, was due to impacts to the distribution system, which is generally subject to state or local regulation. The transmission system, which is subject to the Commission's jurisdiction, was impacted as well, but it caused less than 5% of customer outages at the storm's peak. Seventy-four transmission lines and forty-four transmission substations experienced sustained outages.[11] Transmission line outages were responsible for approximately 130,000 customer outages around the storm's peak. Most of these outages lasted for less than two days, and none lasted for more than five days. Nearly three-quarters of all of the transmission outages were

[7] Utilities rarely own the land on which they site transmission lines. Instead, utilities obtain rights, usually in the form of an easement, over portions of property owned by others. The easement allows the utility to construct, maintain, and operate transmission facilities and vegetation over a defined area of land, the "right-of-way."

[8] A "trouble spot" is a location where there is damage to a line requiring crew response to make conditions safe for the public, repair damage, and restore power.

[9] In the utility industry, the term "customer" generally refers to a single meter, whether at a residence, a retail store, or a factory; it does not refer to each person served at that meter.

[10] *See* WITT ASSOCIATES, CONNECTICUT OCTOBER 2011 SNOWSTORM POWER RESTORATION REPORT 11 (Dec. 1, 2011), *available at* http://www.wittassociates.com/assets/860/CTPowerRestorationReport20111201_FINAL_1_.pdf.

[11] For purposes of this report, facility outages lasting ten or more minutes are considered "sustained" outages.

caused when trees weighed down with heavy, wet snow fell onto transmission lines. Although most of the damage and outages were on the distribution system, this report addresses impacts on, and recommendations for, the FERC-jurisdictional transmission system.

Partly as a result of the August 14, 2003 blackout across the Northeast and Canada, which was caused in part by trees growing too close to transmission lines,[12] Congress passed legislation requiring the Commission to enact mandatory and enforceable Reliability Standards. One of those standards, FAC-003-1 (Transmission Vegetation Management Program), requires Transmission Owners to develop transmission vegetation management programs. These programs must include a schedule for vegetation inspections and specific vegetation clearance distances around transmission lines, have annual vegetation management work plans, and report certain vegetation-related outages.

This Standard's applicability to this event is limited in that FAC-003-1 only applies to transmission lines operated at voltages of 200 kV and above, plus any lower voltage lines identified by the applicable Regional Entity as critical to the reliability of the electric system in the region — and NPCC has not designated any lower-voltage facilities as critical for the purpose of applying FAC-003-1. In fact, FAC-003-1 applied to only one transmission facility forced out of service due to vegetation contact — a 345 kV transmission line in Connecticut — and that line outage did not cause any loss of service to customers. To the extent that a state does not have vegetation management standards governing transmission lines operated over 100 kV and the relevant Regional Entity has not designated lines operated under 200 kV as critical to the region's reliability for the purpose of applying FAC-003-1, lines operated between 100 kV and 200 kV in that state would not be covered by any federal or state vegetation management standard.

In addition, the Standard's applicability to the October event is limited because it does not specifically address off-right-of-way vegetation management. Further, although FAC-003-1 requires each Transmission Owner to "prepare and keep current, a formal transmission vegetation management program" that must include the Transmission Owner's objectives, practices, approved procedures, and work specifications,"[13] beyond this, each Transmission Owner has flexibility on the specific content of its vegetation

[12] U.S.-Canada Power System Outage Task Force, Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations 139 (Apr. 2004), *available at* http://www.nerc.com/filez/blackout.html.

[13] Reliability Standard FAC-003-1, at Requirement R-1.

management program, including specific direction on how to address danger trees[14] outside of Clearance 1[15] but within the right-of-way.

This report makes several recommendations to help reduce the adverse impacts of future, similar weather events on the transmission system, including: (1) where appropriate, taking targeted steps to address off-right-of-way danger trees; (2) employing best practices in managing vegetation on full rights-of-way; (3) laying the foundation for effective vegetation management when establishing new rights-of-way; and (4) enhancing storm preparedness and response plans as needed. In addition, staff recommends increasing reporting of vegetation-caused outages and improving the content of required disturbance reports.

[14] A danger tree is any tree that, if it fell, could contact a transmission line. *See*, *e.g.*, Accredited Standards Comm. (ASC) A300, Tree Care Indus. Ass'n, American National Standard for Tree Care Operations — Tree, Shrub, and Other Woody Plant Maintenance — Standard Practices (Integrated Vegetation Management a. Electric Utility Rights-of-Way) 72.5 (2006) [hereinafter ANSI A300].

[15] Clearances are defined and discussed in more detail in Section VII.A.

# III. The October 29–30, 2011 Nor'easter

An unprecedented early fall snowstorm blanketed the upper East Coast with up to two-and-a-half feet of snow in about a twenty-four hour period spanning October 29–30, 2011. Significant October snowstorms are rare, and the 2011 storm broke records throughout the Northeast. While the storm and its impacts on trees and power lines were not unanticipated, the severity of the storm exceeded forecasts, and its repercussions were wide-ranging and severe.

## A. Forecasts and Utility Preparations

By early in the afternoon of Thursday, October 27, 2011, weather agencies had issued forecasts that an unusual October Nor'easter would hit the New England and the Mid-Atlantic states on Saturday, October 29.[16] Several inches of snow were predicted to fall across the Northeast, and that day's forecasts warned that the coming storm would bring down trees and power lines across the region.[17] Predictions of maximum total snowfall amounts increased rapidly from October 27 to October 29. By the morning of October 29, forecasters were predicting up to fifteen inches of snow in some areas.[18] The snow was expected to begin falling in the late afternoon or early evening of October 29.[19]

A number of utilities began preparations for the storm on Friday, October 28. In the lead-up to the storm, they held internal planning meetings, increased staff in

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[16] *See*, *e.g.*, CL&P Resp. to Data Req. PURA-02, Q-EL-014, Conn. Pub. Utils. Regulatory Auth. Docket No. 11-09-09, Nov. 23, 2011 (providing the Telvent weather report from 1:00 p.m. on October 27, 2011, which mentioned a storm arriving on October 29, 2011). A Nor'easter is a severe winter weather event that produces heavy snow or rain, severe winds, and significant waves. A Nor'easter gets its name from the strong northeasterly winds blowing in from the ocean ahead of the storm and over coastal areas. Nat'l Oceanic & Atmospheric Admin., *National Weather Service Glossary*, http://www.weather.gov/glossary/.

[17] *See*, *e.g.*, CL&P Resp. to Data Req. AG-03, Q-AG-117-SP01, Conn. Pub. Utils. Regulatory Auth. Docket No. 11-09-09, Nov. 18, 2011 (providing National Weather Service briefing slides used by CL&P to prepare for the storm).

[18] *See*, *e.g.*, CL&P Resp. to Data Req. PURA-02, Q-EL-014, Conn. Pub. Utils. Regulatory Auth. Docket No. 11-09-09, Nov. 23, 2011 (providing the Telvent weather report from 6:00 a.m. on October 29, 2011, which predicted up to fifteen inches of snow in western Massachusetts).

[19] Nat'l Oceanic & Atmospheric Admin., *Rare October Winter Storm in the Northeast* (Oct. 28, 2011), http://www.nnvl.noaa.gov/MediaDetail2.php?MediaID=874&MediaTypeID=1.

operations centers, and placed in-house and contract field crews on call.[20] Regional mutual aid groups, through which utilities can request line restoration assistance from other utilities, also held conference calls. However, due in part to the moderate snowfall amounts in weather predictions from that morning, few utilities requested assistance on October 28.[21] Nor did many utilities make mutual assistance requests on the morning of Saturday, October 29; at that point, there was a general understanding that utilities would be holding their crews in order to respond to the event in their own service territories.[22] However, snowfall amounts exceeded forecasts, and by Saturday afternoon, utilities began to see that more manpower would be required to address the rapidly increasing outages. Many utilities then began requesting aid from the mutual assistance groups.[23] But because the storm was so widespread — and demand was so great — there were few regional crews immediately available.[24] In addition, there generally was only limited pre-staging of crews (i.e., positioning field workers at locations around a utility's service territory before a weather event so that they will be on the scene to make repairs as soon as the storm is over).

Some utilities — in particular, CL&P — have faced criticism at the state level for inadequate storm preparation, including failing to request mutual assistance earlier or to pre-stage field crews in order to speed response times.[25] Utility emergency preparation and response is almost entirely outside of the Commission's jurisdiction.[26] However, as discussed below, staff's review of the impact of utility preparation and response on transmission restoration found no indication that inadequate preparation materially

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[20] *See*, *e.g.*, Davies Consulting, Final Report: Connecticut Light and Power's Emergency Preparedness and Response to Storm Irene and the October Nor'easter 19 (Feb. 27, 2012), *available at* http://media2.wtnh.com/docs/Storm-Review-Final-Report.pdf

[21] *See*, *e.g.*, Witt Associates, *supra* note 10; Central Hudson gas & Electric Corp., 16 NYCRR — Part105 Compliance Filing: Report and Evaluation of October 2011 Snowstorm, October 29–November 4, 2011, at 22-23 (Jan. 5, 2012), *available at* http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={23000E96-EBCF-45C1-BB29-387EF9943C33}; Davies Consulting, *supra* note 20, at 19.

[22] *See*, *e.g.*, CENTRAL HUDSON GAS & ELECTRIC CORP., *supra* note 21, at 5; WITT ASSOCIATES, *supra* note10, at 21.

[23] *See*, *e.g.*, CENTRAL HUDSON GAS & ELECTRIC CORP., *supra* note 21, at 5; WITT ASSOCIATES, *supra* note 10, at 21.

[24] *See*, *e.g.*, CENTRAL HUDSON GAS & ELECTRIC CORP., *supra* note 21, at 5; WITT ASSOCIATES, *supra* note 10, at 21.

[25] *See, e.g.*, JOE MCGEE ET AL., REPORT OF THE TWO STORM PANEL, PRESENTED TO: GOVERNOR DANNEL P. MALLOY 10–11 (Jan. 9, 2012), *available at* http://www.governor.ct.gov/malloy/lib/malloy/two_storm_panel_final_report.pdf; WITT ASSOCIATES, *supra* note 10, at 2-3.

[26] Although several Emergency Operations Reliability Standards deal with registered entities' responses to emergency situations, those Standards are focused on BPS operation issues, and not more conventional preparation and response issues like employee training, staffing levels, or field crew response.

hindered restoration of transmission facilities, as opposed to the more serious preparation and restoration problems reported on the distribution side.

## B. Storm Produces Record Amounts of October Snowfall

Not long after the storm began, it became clear that snowfall totals would exceed projections. Wet snow began falling in the late morning of October 29.[27] Snowfall was heavy by mid-day, and it fell quickly: up to three inches per hour for sustained periods.[28] Within about twenty-four hours, some areas had received two-and-a-half feet of snow. The highest amounts of total snowfall were in Massachusetts, where Peru recorded 32 inches, and in New Hampshire, where Jaffrey recorded 31.4 inches.[29] The storm set records for October snowfall across the region. On October 29 alone, Hartford, Connecticut, received 12.3 inches of snow, far surpassing the previous October record of 1.7 inches.[30] That same day, Concord, New Hampshire, received a record 13.6 inches of snow, and Worcester, Massachusetts, received a record 11.4 inches.[31] The previous records were 3.0 inches and 7.5 inches, respectively.[32]

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[27] Nat'l Weather Serv., *October 29th Historic Early Season Snowstorm*, http://www.erh.noaa.gov/okx/StormEvents/10292011/index.html; DAVIES CONSULTING, *supra* note 20, at 18.

[28] Nat'l Weather Serv. Forecast Office, Boston, Mass., *Review of Snow-tober 2011*, http://www.erh.noaa.gov/box/sigevents/Snowtober_2011/

[29] Nat'l Weather Serv., *Significant Weather Event: Oct. 29–30, 2011*, http://www.erh.noaa.gov/box/displayEvent.php?event=Oct_29-30_2011&element=snow.

[30] Nat'l Climatic Data Ctr., *CT Daily Snowfall Records Set in October 2011*, http://www.ncdc.noaa.gov/extremes/records/daily/snow/2011/10/00?sts[]=CT#records_look_up.

[31] Nat'l Climatic Data Ctr., *MA Daily Snowfall Records Set on October 29, 2011*, http://www.ncdc.noaa.gov/extremes/records/daily/snow/2011/10/29?sts[]=MA#records_look_up (providing daily snowfall records for cities in Massachusetts on October 29, 2011); Nat'l Climatic Data Ctr., *NH Daily Snowfall Records Set on October 29, 2011*, http://www.ncdc.noaa.gov/extremes/records/daily/snow/2011/10/29?sts[]=NH#records_look_up (providing daily snowfall records for cities in New Hampshire on October 29, 2011).

[32] Nat'l Weather Serv., *Concord Climate Data For the Year 2011* (Jan. 18, 2012), http://www.srh.noaa.gov/data/GYX/CLACON; Nat'l Climatic Data Serv.; *MA Monthly Snowfall Records Set in 2011*, http://ncdc.noaa.gov/extremes/records/monthly/snow/2011/10/00?sts[]=MA#records_look_up.

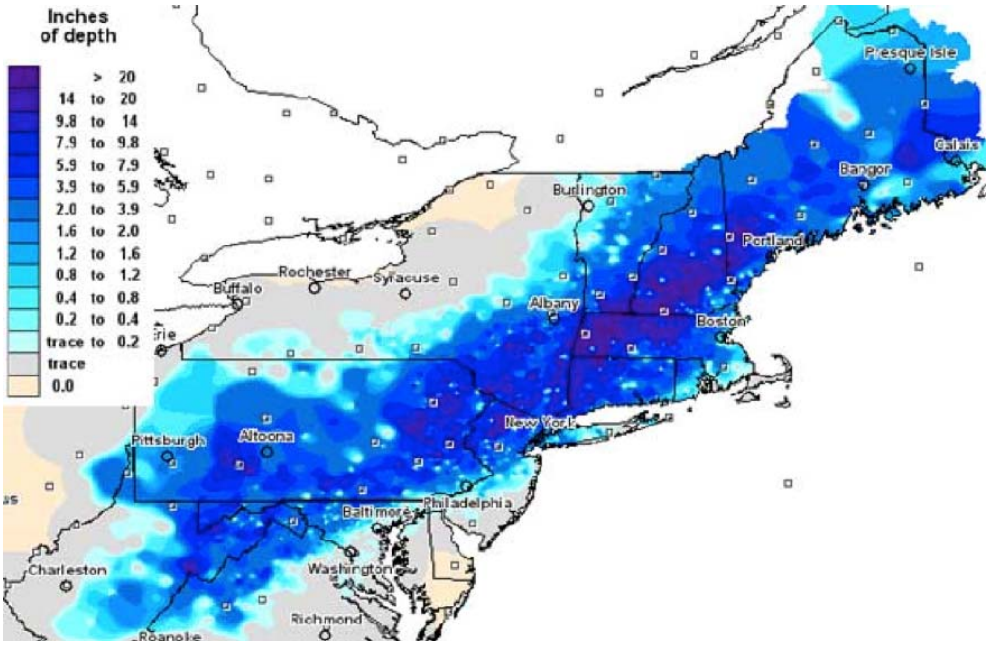



**Figure 1: Snowfall Totals Across the Northeast on October 30, 2011**

*Source: NOAA, nohrsc.noaa.gov/interactive*

The National Weather Service called the October Snowstorm a "rare and historic October Nor'easter"[33] and rated it as the strongest fall storm on record for the Northeast region.[34] Connecticut Governor Dan Malloy said that "a review of state records dating back to 1650 indicates that this storm is the most severe October Nor'easter in Connecticut history."[35] The only other notable October snowstorm in New England in the last one hundred and fifty years, which occurred on October 4, 1987, was far less destructive. That storm produced between six and twenty inches of snowfall from Albany, New York, to the Western Berkshires in Massachusetts, and caused only about 300,000 customer outages,[36] compared to the more than 3 million outages caused by the October 2011 storm.

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[33] Nat'l Weather Serv., *Winter Storm Summary for October 29, 2011 Event*, http://www.erh.noaa.gov/phi/show_wss.php.

[34] Email from NOAA staff to FERC staff (Mar. 15, 2012) (on file with OE staff). The October snowstorm is the only October storm to be ranked by NOAA among the 45 highest-impact snowstorms that have affected the Northeast urban corridor. Nat'l Climatic Data Ctr., *The Northeast Snowfall Impact Scale*, NOAA, http://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis.

[35] Letter from Dannel P. Malloy, Conn. Governor, to Barack Obama, President (Nov. 11, 2011) [hereinafter Malloy Letter].

[36] Robert D. McFadden, *Early Snowstorm Covers Northeast*, N.Y. TIMES (Oct. 5, 1987), http://www.nytimes.com/1987/10/05/us/early-snowstorm-covers-northeast.html?pagewanted=all&src=pm.

## C. Leafy Trees and Prior Rainfall Compound the Impact of the Snowstorm

The effects of record amounts of heavy, wet snow were particularly severe because the snow fell across densely wooded areas where deciduous trees had not yet lost many of their leaves. Due to an unusually warm and wet September and October, leaf drop was significantly lower than normal for late October. For example, before the October storm, most of Massachusetts and Connecticut had only experienced "Moderate" — rather than the typically "High" — leaf drop.[37] The weight of snow on the leaves put significant strain on trees, causing limbs to snap and entire healthy trees to fall.

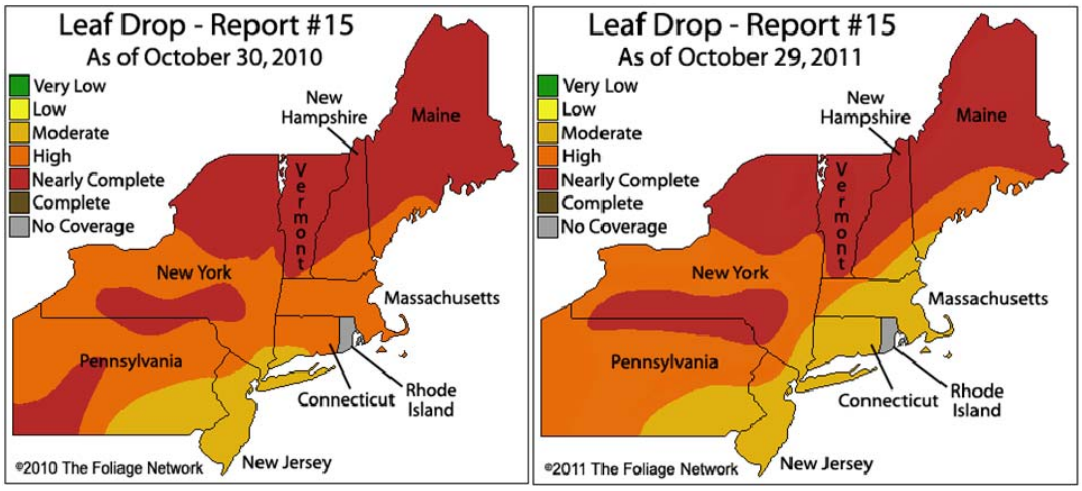



**Figure 2: Leaf Drop Reports, October 2010 vs. October 2011**
*Source: The Foliage Network*

Moreover, the ground throughout much of the Northeast was saturated due to an abnormally wet year — including significant August rainfall from Tropical Storm Irene. In fact, August 2011 was the wettest month on record in the Northeast since recording began in 1895.38 Because the saturated ground had not yet frozen, the weight of the

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[37] *See Report #15 – Oct. 29, 2011*, THE FOLIAGE NETWORK, http://www.foliagenetwork.net/index.php?option=com_content&view=article&id=333:ne-foliage-report-15-2011&catid=34:northeast-us&Itemid=68; *Report #15 – Oct. 30, 2011*, THE FOLIAGE NETWORK, http://www.foliagenetwork.net/index.php?option=com_content&view=article&id=275:ne-foliage-report-10302010&catid=62:northeast-us&Itemid=85.

[38] In August 2011 an average of 8.53 inches of precipitation was recorded in the Northeast, while the 20th century regional average is only 3.85 inches. Nat'l Climatic Data Ctr., *Precipitation Rankings August 2011 Northeast*, NOAA, http://www.ncdc.noaa.gov/temp-and-precip/ranks.php?parameter=pcp&state=101&div=0&periods[]=1&month=8&year=2011. The year 2011 was also the wettest year on record for the Northeast since 1895: an average of 56.04 inches of precipitation was recorded, while the 20th century average is only 41.08 inches. Nat'l Climatic Data Ctr., *Precipitation Rankings December 2011 Northeast*, NOAA, http://www.ncdc.noaa.gov/temp-and-precip/ranks.php?periods%5B%5D=12&parameter=pcp&year=2011&month=12&state=101&div=0.

heavy, wet snow on leafy trees caused many healthy trees across the region to uproot. On November 1, 2011, the Connecticut Department of Transportation estimated there were 24,000 trees downed on Connecticut roads alone. As explained by Governor Malloy: [39]

> *"The combination of heavy wet snow and near freezing air caused adherences of the snow to all objects including trees, which had not yet lost their seasonal foliage. The weight of the snow on trees and power lines, combined with very wet soils as a result of Tropical Storm Irene and the remnants of Tropical Storm Lee, quickly overwhelmed the ability of trees to remain upright under the added weight. This added weight de-limbed hundreds of thousands of trees and uprooted tens of thousands of additional trees in just 12 hours."*

The October snowstorm crippled much of the Northeast. As noted above, more than 3 million customers lost electric power. Activity in the affected states ground to a halt: many roads were impassable and scores of schools and businesses closed.[40] States of emergency were declared in many states, including Connecticut,[41] Massachusetts,[42] New Hampshire,[43] and parts of New York.[44] News reports identified at least twenty-two storm-related deaths.[45] The National Oceanic and Atmospheric Administration estimates the costs of the storm to be between $850 and $900 million, and one unofficial estimate puts the costs at more than $3 billion.[46]

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[39] *See* Malloy Letter, *supra* note 35.

[40] *See* Lauren Keiper, *Millions Without Power After US Northeast Snowstorm*, REUTERS (Oct. 31, 2011), http://www.reuters.com/article/2011/10/31/uk-weather-northeast-idUSLNE79U02Y20111031.

[41] Press Release, Gov. Malloy Declares State of Emergency (Oct. 29, 2011), *available at* http://www.governor.ct.gov/malloy/cwp/view.asp?A=4010&Q=.

[42] Press Release, Governor Lynch Requests FEMA's Reconsideration of Emergency Disaster Declaration (Nov. 2, 2011), *available at* http://www.governor.nh.gov/media/news/2011/110211-emergency.htm.

[43] Press Release, Governor Patrick Meets with Utility Company Officials on Storm and Power Recovery Efforts (Oct. 31, 2011), *available at* http://www.mass.gov/governor/pressoffice/pressreleases/2011/111031-storm-power-recovery.html.

[44] Press Release, Governor Cuomo Declares State of Emergency for Counties Hit Hard by Winter Storm (Oct. 29, 2011), *available at* http://www.governor.ny.gov/press/10292011stateofemergency.

[45] CNN Wire Staff, *Freak Snowstorm Blamed for at Least 22 Deaths*, CNN (Nov. 3, 2011), http://articles.cnn.com/2011-11-03/us/us_east-coast-storm_1_carbon-monoxide-poisoning-cl-p-power-outages?_s=PM:US.

[46] AON BENFIELD, OCTOBER 2011 MONTHLY CAT RECAP – IMPACT FORECASTING 2 (Nov. 3, 2011), *available at* http://thoughtleadership.aonbenfield.com/ThoughtLeadership/Documents/201111_if_monthly_cat_recap_october.pdf; Mary O'Leary, *Gov. Malloy: "What We Need is Action" on Connecticut Power Crisis*, NEW HAVEN REGISTER (Nov. 2, 2011), http://www.governor.ct.gov/malloy/cwp/view.asp?A=11&Q=489996 (quoting Governor Malloy as anticipating

# IV. Significant and Widespread Damage to Electric Delivery Infrastructure

The October storm's historic snowfall and resulting tree damage devastated the system of high and low voltage wires that distribute power across the Northeast, leaving approximately 3.2 million customers from Pennsylvania to Maine without power near the end of the storm. The vast majority of the damage to electric delivery infrastructure was to the distribution system. However, the storm's impact on transmission facilities was also significant. Seventy-four transmission lines in a half-dozen states experienced sustained outages.

## A. Distribution Facility Damage and Customer Impact

Exact measures of the total physical damage to distribution systems are hard to determine, but there were an estimated 50,000 separate locations across the Northeast where utility crews were required to remove trees from or physically repair distribution lines ("trouble spots"). This serious and widespread damage to distribution facilities caused more than 95% of customer outages. The map on the next page overlays a snapshot of several utilities' customer outages on a map showing snowfall totals across the Northeast.

storm costs would exceed $3 billion); Email from NOAA staff to FERC staff (Mar. 29, 2012) (estimating costs at between $850 million and $900 million) (on file with OE Staff).

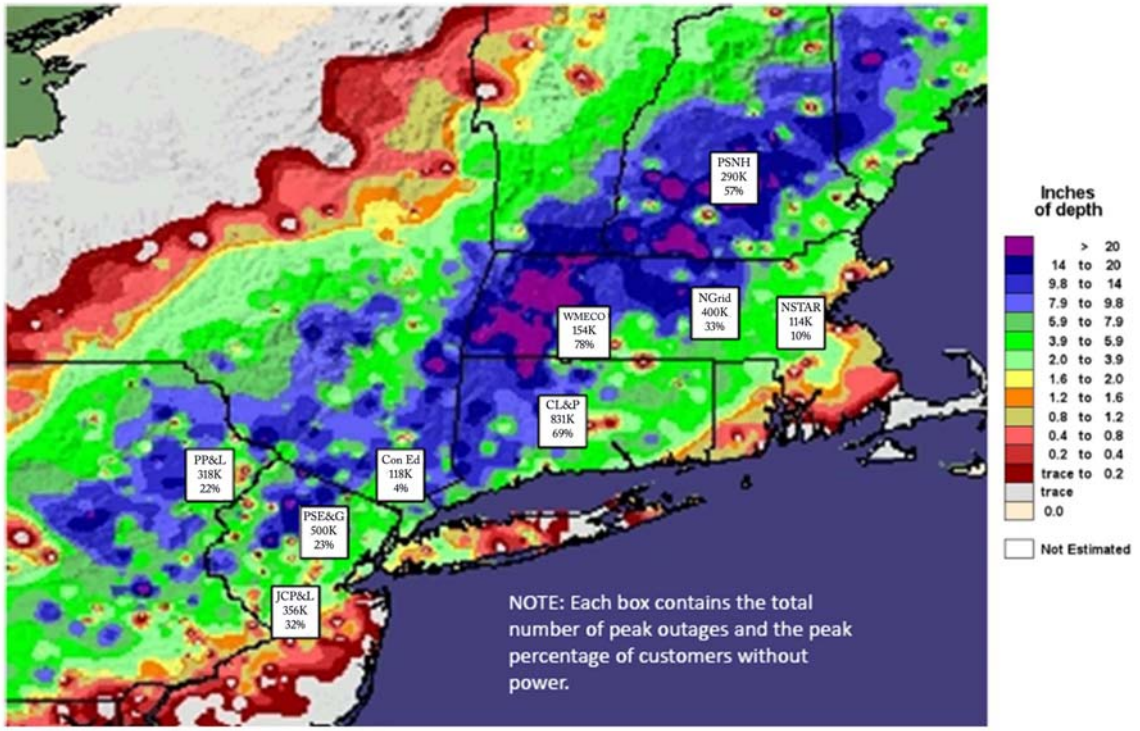



**Figure 3: Snowfall Amounts and Customers That Lost Power**

*Source: NOAA, National Operational Hydrologic Remote Sensing Center, Interactive Snow Information47 and U.S. Department of Energy, Energy Assurance Daily.*[48]

There was significantly more damage to distribution facilities than transmission facilities for a number of reasons, including the fact that in some areas there are approximately twenty times more miles of distribution lines than transmission lines.[49] In addition, under typical industry practices, vegetation is generally allowed to grow much closer to distribution lines than transmission lines because there is less risk of flashover[50] between low-voltage distribution lines and nearby trees.

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[47] *Available at* http://www.nohrsc.nws.gov/interactive/html/map.html?ql=station&zoom=&loc=Latitude%2CLongitude%3B+City%2CST%3B+or+Station+ID&var=snowfall_72_h&dy=2011&dm=10&dd=30&dh=0&incr=+%2B+&snap=1&o9=1&lbl=m&mode=pan&extents=us&min_x=-76.041666666669&min_y=33.741666666667&max_x=-63.450000000002&max_y=43.816666666667&coord_x=-69.745833333336&coord_y=38.779166666667&zbox_n=&zbox_s=&zbox_e=&zbox_w=&metric=0&bgvar=dem&shdvar=shading&palette=1&width=1000&height=800&nw=1000&nh=800&h_o=2&font=0&js=1&uc=0

[48] U.S. Department of Energy, supra note 1.

[49] See About NU, Northeast Utilities, http://www.nu.com/aboutnu/nufacts.asp (listing 4,500 circuit miles of transmission lines and 72,000 pole miles of distribution lines).

[50] Flashover is the spontaneous arcing of electricity from a line to a grounded object like a tree.

A number of state utility commissions and other state government agencies have initiated inquiries into the distribution-level customer outages caused by the storm.[51] In addition, several utilities (and some independent entities) have produced reports on the event that focus on distribution system impacts.[52]

## B. Transmission Facility Damage and Customer Impact

Although its impact was not as extensive as the damage to the distribution system, the October snowstorm impacted many transmission facilities. Near the end of the storm, about 130,000 customers across six states lost power as a result of transmission line outages.

### 1. Transmission Outages

Of the seventy-four transmission lines forced out of service for a sustained period during to the storm, the vast majority (seventy) were 115 kV facilities. One 138 kV and three 345 kV lines also experienced outages.

[51] The Connecticut Public Utilities Regulatory Authority (Docket No. 11-09-09), the Massachusetts Department of Public Utilities (Docket No. 11-119), the New Hampshire Public Utilities Commission, and the New York State Public Service Commission (Case No. 11-M-0595) are all conducting inquiries.

[52] *See*, *e.g.*, Central Hudson Gas & Electric Corp., *supra* note 21; Consolidated Edison Company of New York, Inc., Report on Preparation and System Restoration Performance: Nor'easter October 29 through November 3, 2011 (Jan. 5, 2012), *available at* http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={512EF4A0-EC4C-4204-A527-B047022B6FC3}; Davies Consulting, *supra* note 20; McGee, *supra* note 25; Public Service of New Hampshire, Amp Up and Power On: October Nor'easter 2011 (Nov. 2011), *available at* http://www.hollisnh.org/announce/2011OctoberNor'easterReport.pdf; Western Massachusetts Electric Company's Report to the Department of Public Utilities on Expectations for Electric Distribution Company Performance Regarding Emergency Events (Dec. 20, 2011), *available at* http://www.env.state.ma.us/dpu/docs/electric/11-119/12202011-tech-session.pdf.

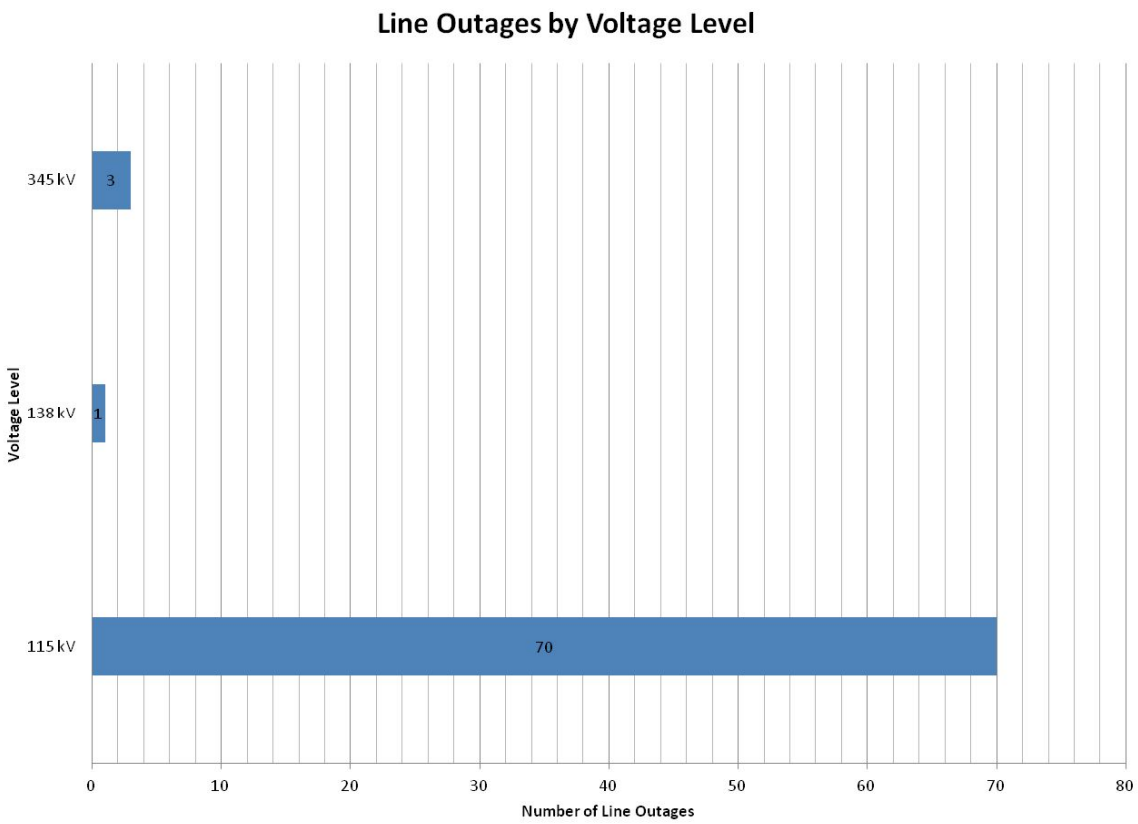



**Figure 4: Transmission Line Outages by Voltage Level**

There were also seven brief — between one and nine minute — line trips, four of which were caused by relay misoperations.[53]

Twenty-three of these seventy-four line outages occurred on NPCC-designated BPS elements. As explained in footnote 5, NPCC uses a performance-based test to designate facilities as BPS elements.[54]

[53] Relay misoperations occur when an automated line monitoring and communications device — a relay — transmits an incorrect signal to a line's breakers, causing the breakers to open when that action is not necessary. Failure of a relay to operate when it should is also considered a misoperation. The one relay misoperation that resulted in a transmission line outage of ten or more minutes is discussed in Section V.C.

[54] NERC has filed, for Commission consideration, a revised definition of BES that would impose a bright-line threshold of 100 kV, such that if approved, all facilities over 100 kV would be part of the Bulk Electric System and subject to most Reliability Standards unless a specific exception was granted or generic inclusion was made. *See N. Am. Elec. Reliability Corp.*, Petition, Docket No. RM 12-06-000 (filed Jan. 25, 2012). This report takes no position on the BES definition filing.

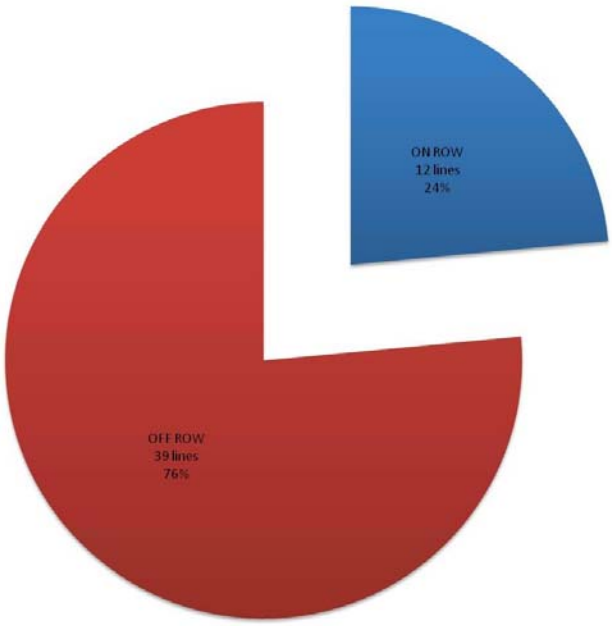



**Figure 5: Total Outages: BPS vs. Non-BPS Elements**

Because transmission lines conduct power from generating facilities to substations, transmission line outages can cause substation outages.[55] During the October snowstorm, transmission line outages forced forty-four transmission substations out of service, including one NPCC designated as a BPS element. Loss of power to transmission substations is significant for two main reasons. First, many transmission substations provide power to distribution systems, so that the loss of power to a transmission substation can result in thousands of customer outages. Second, transmission substations contain relays and breaker controls that operate to protect individual transmission lines and stabilize the power grid as a whole. When a substation's power source is lost, substation battery banks provide backup power to control equipment and breakers, but those batteries only last for a limited period of time, at which point the equipment can no longer perform its functions. These forty-four transmission substation outages, combined with seventy-four transmission line outages, constituted a significant transmission event.

[55] Sometimes only one transmission line feeds power to a substation. If that single source line experiences an outage, the entire substation will be out of service. Generally, multiple transmission lines provide power to a substation; in that case, the substation will go out of service because of transmission line outages only if all of the transmission lines serving that substation are out of service.

## 2. Affected States and Utilities

A half-dozen states — Connecticut, Maine, Massachusetts, New Hampshire, New York, and Rhode Island — and ten utilities experienced transmission outages on lines they own, or co-own and maintain. Half of those outages occurred in just one state, Connecticut.[56] The chart below shows the number of outages by state.

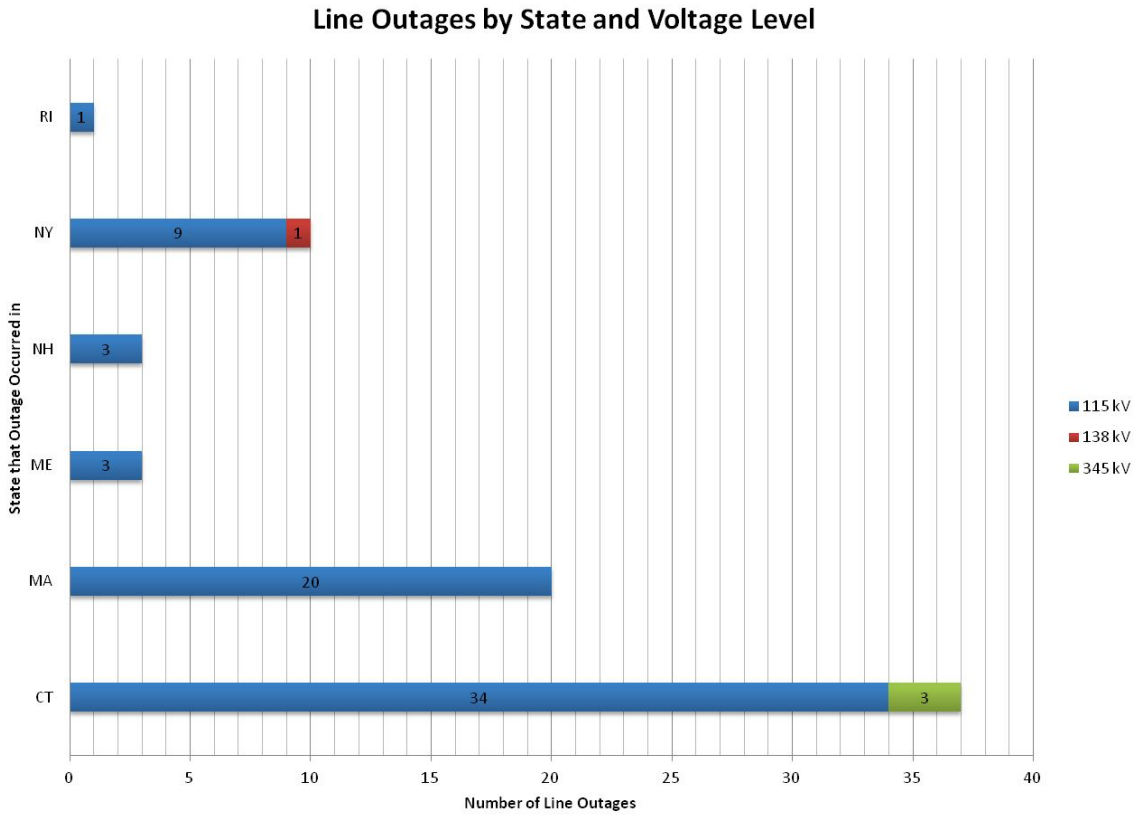



**Figure 6: Transmission Line Outages by State and Voltage Level**

As the following map shows, transmission line outages were concentrated in the Connecticut River Valley area, through Connecticut and into Massachusetts.

[56] Other states, such as Pennsylvania and New Jersey, experienced significant snowfall and distribution facility outages, but no transmission facility outages.

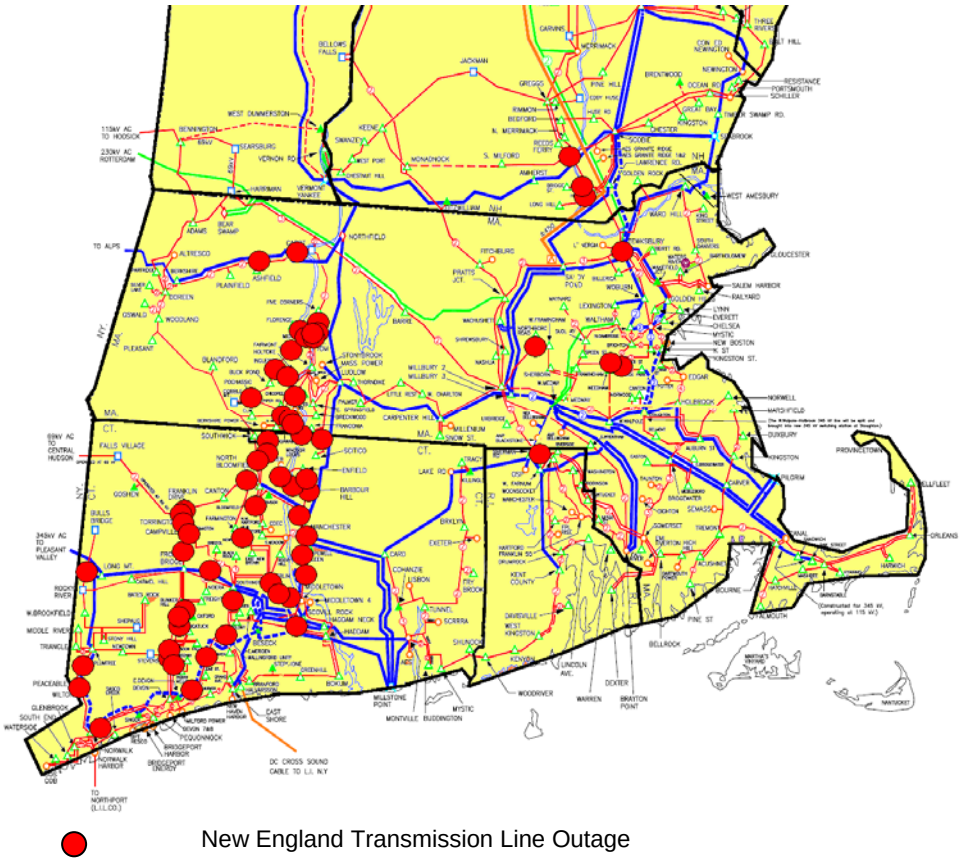



**Figure 7: ISO-NE Transmission Line Outages During the October Snowstorm**

*Source: ISO-New England*

The service territories of CL&P and Western Massachusetts Electric Company (WMECO), two subsidiaries of Northeast Utilities (NU), largely cover this area. As shown in the chart below, these two companies had the most transmission line outages. A third NU subsidiary, Public Service of New Hampshire (PSNH), had an additional three transmission line outages. Overall, outages of facilities owned — or co-owned, operated, and maintained — by NU subsidiaries[57] accounted for fifty-four of the October storm's seventy-four transmission line outages (approximately 74%).

[57] NU and NSTAR merged on April 10, 2012, and NSTAR is now a subsidiary of NU. Because the merger occurred after the October snowstorm, this report does not include NSTAR as an NU subsidiary.

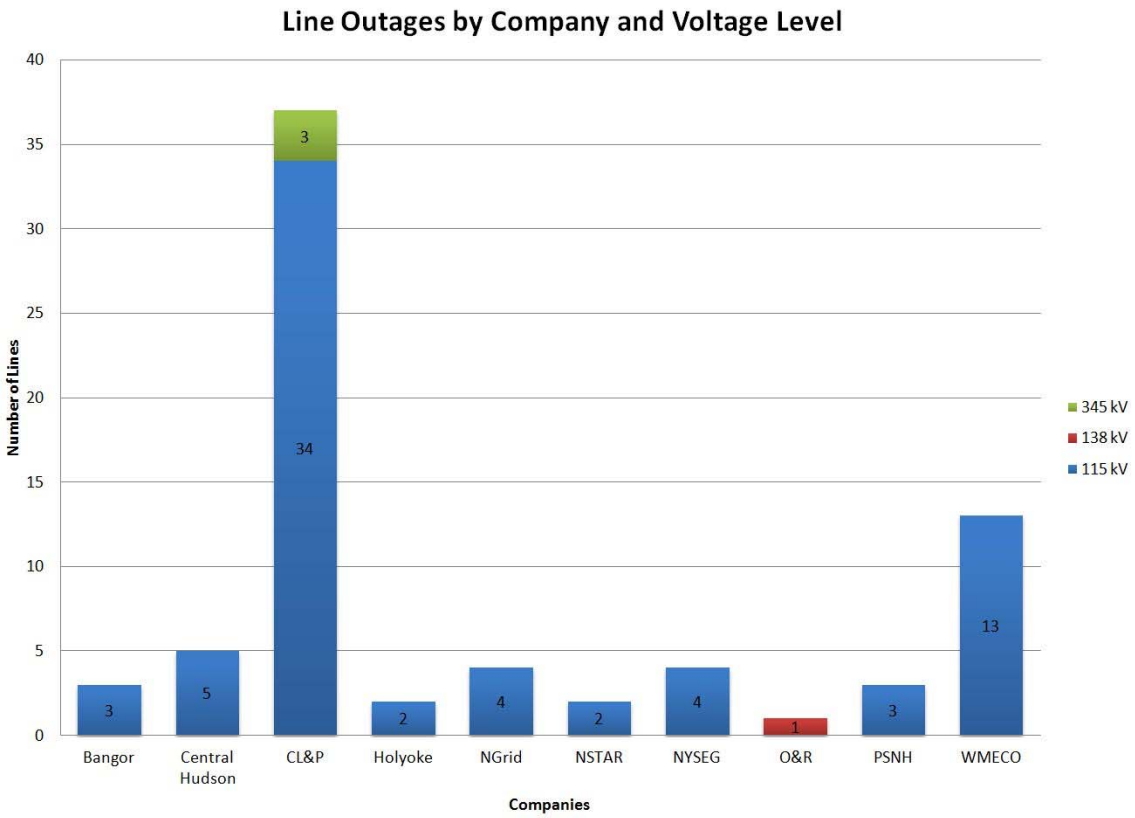



**Figure 8: Line Outages by Company and Voltage Level**[58]

## 3. Transmission Facility Outages Had Relatively Limited Impacts on Customers and Were Restored Quickly

Although seventy-four transmission line outages is a significant transmission event, these outages impacted far fewer customers than the distribution facility outages. At the storm's peak, damage to the transmission system caused approximately 130,000 homes and businesses to lose power, less than 5% of all of the storm-related customer outages. In addition, the peak number of transmission-caused customer outages (which rose above 100,000 customers for only about two hours) was relatively small compared to distribution-caused outages. While many customers impacted by distribution facility outages were without service for more than five days – and some for eleven – service was restored to all customers that lost power due to transmission outages in less than five

[58] The full names of the utility companies included in this chart are: Bangor Hydro Electric Co.; Central Hudson Gas & Electric Corp.; Connecticut Light & Power Co.; Holyoke Gas & Electric Department; National Grid USA; NSTAR Electric & Gas Co.; New York State Electric & Gas Co.; Orange & Rockland Utilities, Inc.; Public Service of New Hampshire; and Western Massachusetts Electric Co. Where a line is co-owned by more than one utility, this report attributes the outage to the company with the responsibility for maintaining the line where the outage occurred.

days. In fact, service was restored to the majority (77% percent) of such customers in less than forty-eight hours.

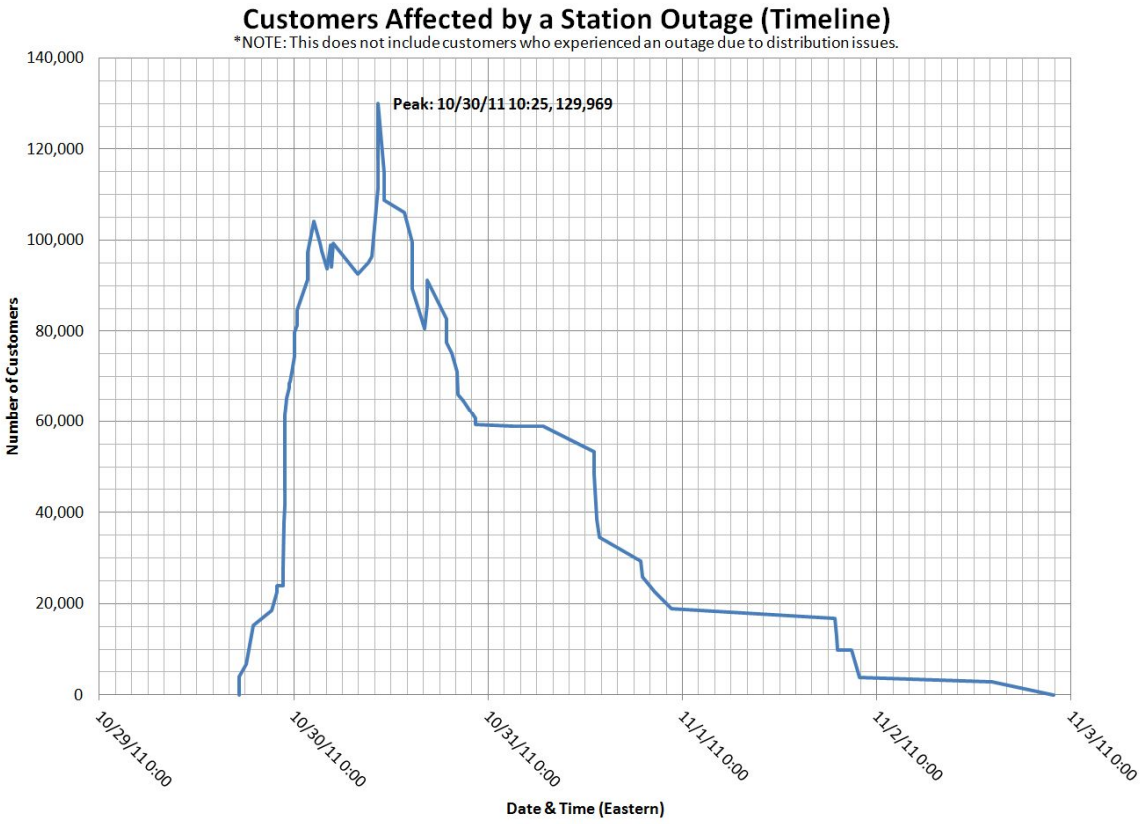



**Figure 9: Timeline of Customers Affected by a Transmission Station Outage**

While most transmission facilities were restored relatively quickly, four were out of service for nearly a week, and an additional three remained out of service between seven and eight days. However, none of these seven transmission line outages resulted in customer outages or were, at that time, necessary for BPS stability. The following chart illustrates the duration of transmission line outages.

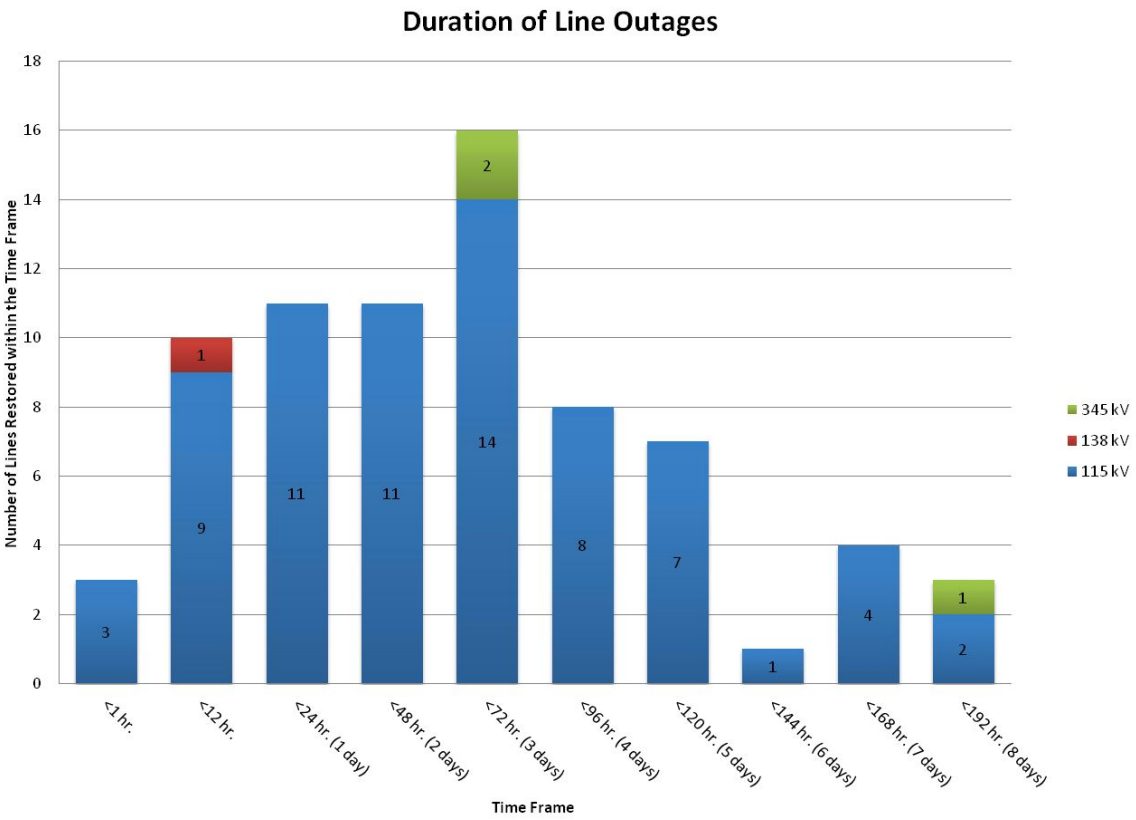



**Figure 10: Duration of Transmission Line Outages**

Utilities faced several physical obstacles in restoring the seven transmission lines that were out of service for six to eight days. Each of these lines or its supporting structures had significant structural damage that required rebuilding. For example, on five of these seven lines, falling trees snapped insulators, cross-arms, and various support structures. In addition, the site of the damage to the 345 kV line that was out of service for nearly eight days was particularly difficult to access. Again, no retail customers were without service due to these seven line outages.

One of the reasons for fast restoration of many transmission lines that caused customer outages is that, in setting priorities for transmission line restoration, utilities focus on restoration of lines that impact customers and are important for grid stability. For example, NU's restoration priorities for the storm event were: (1) transmission lines that would restore more than one substation; (2) transmission lines that impacted one substation; (3) 345 kV lines; (4) lines that served substations with only one live-line feeding them, such that if the live-line went out of service, the substation — and customers served by it — would experience an outage (i.e., single contingency load loss situations); and (5) all other transmission lines.

Staff concludes that restoration of transmission lines was not materially hampered by inadequate utility preparation or response.[59] For example, staff finds that, overall, additional staffing or field crew pre-staging would not have significantly enhanced transmission facility restoration. However, staff — and utilities themselves — recognize that there is room for improvement in storm preparedness. NU informed staff that its restoration of transmission facilities would have happened somewhat faster, albeit minimally, if the company had obtained more outside assistance in advance of the storm, pre-staged some crews, and had access to additional damage assessment equipment (specifically, helicopters and infrared cameras). Therefore, although utility preparation did not pose significant problems for restoration of transmission facilities during this event, staff recommends in Section IX.4 several steps utilities can take to improve preparation for future severe storm events.

[59] Staff recognizes that a number of states are looking into the impact of utility preparation and response on the distribution system as part of their ongoing proceedings relating to the storm's impacts on customers in their state. This report makes no findings regarding impacts of utility preparation and response on restoration of distribution facilities.

# V. Causes of Transmission Facility Outages

As could be expected from a major snowstorm, the vast majority of transmission line outages during the October event were caused by tree contact or the accumulation of ice and heavy, wet snow on transmission conductors.[60] Other causes included losses of source[61] and relay misoperation.

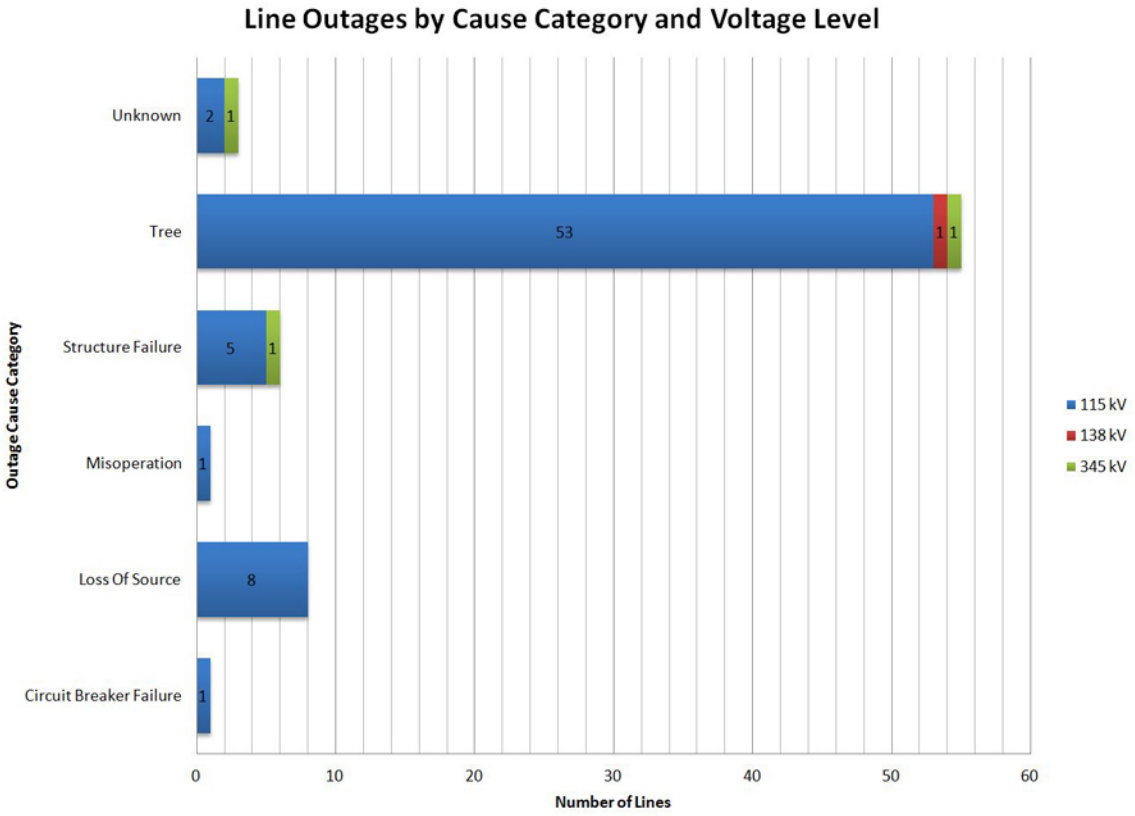



**Figure 11: Line Outages by Cause Category and Voltage Level**

[60] Transmission lines, the wires that carry electricity, are also called conductors.

[61] "Loss of source" outages occur when a connected line, or series of lines, trip and no longer feed an interconnected transmission line, meaning the interconnected line no longer has a source of electrical energy.

## A. Tree Contact

The vast majority of transmission line outages — fifty-five out of seventy-four, or nearly 80% — were caused when snow-weighted leafy trees contacted transmission lines.[62] All but two of these trees were healthy. Twenty-five percent of these trees were located within the utility's right-of-way, and therefore, were likely within the utilities' rights to maintain.

Specifically, thirty-nine transmission line outages resulted from off-right-of-way trees falling onto transmission lines, resulting in loss of power to approximately 84,000 customers. An additional twelve transmission line outages, resulting in 13,000 customer outages, occurred when trees located *inside* a utility's full right-of-way[63] fell into transmission lines. The only tree-caused 345 kV line outage occurred when a sixty-five-foot tall tree located within a full right-of-way (forty-six feet from the nearest transmission line) fell. All of the trees that fell into lines from within the utility's full right-of-way were located outside the area in which the utility performs vegetation management (known as the "maintained right-of-way").[64]

[62] Utilities attributed four of those fifty-five outages to tree contact, but post-storm field inspections by the utilities could not definitively confirm that explanation. Based on review of the data, staff accepts the utilities' attribution of these four outages to tree contact.

[63] For purposes of this report, "full right-of-way" means the portion of land for which a utility has documented legal rights to build and maintain transmission facilities.

[64] As explained in Section VII.B, no Reliability Standard requires that utilities manage vegetation on the entire width of their full rights-of-way. In fact, managing a narrower maintained right-of-way, rather than the full right-of-way, is a relatively common industry practice, though not a best practice.

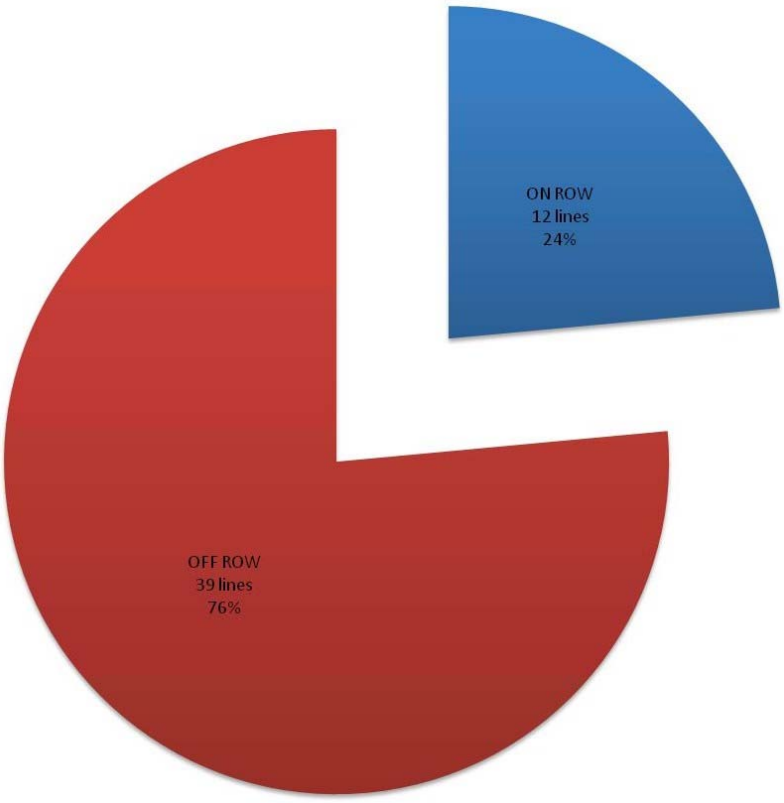



**Figure 12: Fallen Trees Located on Rights-of-Way and Off-Rights-of-Way**

The 115 kV line in the photograph below was forced out of service when several trees, each over sixty feet tall and located twenty to thirty feet outside of the utility's full right-of-way, uprooted and fell onto three separate spans of the line. Transmission lines are not always located in the middle of a right-of-way, but instead often are closer to an edge of the right-of-way. Thus, as is the case here, a tree may be outside the boundaries of a 130 foot wide right-of-way but still less than sixty-five feet from a conductor.



**Figure 13: Trees Fallen on 115kV Line in Connecticut**

*Source: Northeast Utilities*

The line in the photograph below is a 115 kV line in Massachusetts that went out of service when a seventy-five foot tall tree located outside of the 100 foot wide maintained right-of-way, but inside the 200 foot wide full right-of-way, fell onto the line. Because the transmission line was not centered on the right-of-way, the base of the tree, while outside the maintained right-of-way, was only about 30 feet from the nearest conductor.



**Figure 14: Tall Tree Fallen on an 115kV line in Massachusetts**

*Source: Northeast Utilities*

As noted above, data obtained during the inquiry indicates that some of the affected utilities only manage vegetation on narrower maintained rights-of-way rather than their full rights-of-way. For example, one utility's maintained right-of-way widths for 115 kV lines range from 68 feet to 280 feet despite having easements of 88 feet to 325 feet. One 345 kV line is located on a 340-foot wide easement, but only 280 feet of the right-of-way is maintained. Staff finds that the removal of danger trees from full rights-of-way could have prevented the twelve 115 kV transmission line outages (six of which were NPCC-designated BPS elements) that resulted from on-right-of-way tree contact during the October Nor'easter. Preventing those line outages would have avoided approximately 13,000 customer outages.[65] Based on the findings outlined above, staff makes several recommendations regarding right-of-way management in Section IX.

[65] Further complicating right-of-way management is the fact that, for a variety of reasons, some utilities find it difficult to locate the exact edges of many rights-of-way in the field.

## B. Transmission Structure Failures

Extreme weather conditions caused several transmission facilities to break, resulting in transmission line outages. Temperatures during the snowstorm hovered around 32 degrees, which is conducive to the accumulation of ice and snow on transmission lines. The weight of the accumulated ice and snow on conductors, and, in one case, high wind conditions, caused a number of structures — including static wires,[66] conductors, insulators,[67] and cross-arms[68] — to break, resulting in six transmission line outages and approximately 32,000 customer outages. Although a number of the transmission structures that failed were several decades (or even more than fifty years) old, it does not appear, based on data obtained during the inquiry, that these structures were in need of repair before the storm. Data reviewed by staff also indicates that the affected structures had been maintained according to utility plans, which staff finds are consistent with typical utility practice.



**Figure 15: Structure Failure on a 345kV Line in Connecticut**

[66] Static wire (also known as shield wire) is grounded wire that is strung above conductors to protect them from lightning strikes. The static wire is connected to the grounded tower structure and provides a path for lightning to discharge into the earth.

[67] Transmission line insulators are devices used to contain, separate, or support electrical conductors on high-voltage electricity supply networks. Their purpose is to prevent electricity from arcing between conductors or from conductors to the ground.

[68] Cross-arms are the structures located near the top of transmission poles or metal towers that support conductors.

The 345 kV line shown in the photograph above was forced out of service when the weight of ice and heavy, wet snow on conductors damaged a structure and broke a conductor, static wire, cross-arms, guy-wires,[69] and insulators. This photograph shows (in the background) a wood pole where cross-arms and guy-wires have broken and the conductor has fallen to the ground.

## C. Other, or Unknown, Causes

Several transmission line outages were the result of various other, or unknown, causes.

- Eight lines experienced outages as a result of other transmission line failures (i.e., losses of source); these lines were each energized by only one other transmission line, so that when that feeder transmission line failed, the adjacent line also experienced an outage. These loss-of-source transmission line outages caused approximately 16,000 customers to lose power.

- A relay misoperation caused one 115 kV line to be out of service for approximately five hours. As described in footnote 53, a relay misoperation occurs when an automated line monitoring and communications device — a relay — transmits an incorrect signal to a line's breakers, causing the breakers to open when that action is not necessary. In this case, a relay incorrectly detected a problem on the line and forced it out of service. The misoperation did not result in loss of service to any customers.

- One 115 kV line was forced out of service when a circuit breaker component became stuck. The stuck component prevented the breaker from isolating a line that had experienced a fault, resulting in the interconnected 115 kV line losing power. This stuck breaker condition caused about 4,900 customers to lose power for approximately one-and-a-half hours.

- Utility inspections of one 345 kV and two 115 kV transmission lines that experienced outages did not reveal any damage to transmission structures or nearby vegetation, and there is no indication of equipment misoperations. Therefore, the causes of these outages could not be determined by the utility. No customers lost power because of the 345 kV line outage. Approximately 3,800 customers lost service for approximately four to twelve hours as a result of the two 115 kV line outages. Possible causes of those two line outages are undetected tree contacts or arcing across an insulator due to accumulated snow and ice.

[69] A guy-wire is a tensioned cable designed to add stability to structures like utility poles. One end of the cable is attached to the structure and the other is anchored to the ground at a distance from the structure's base.

# VI. Transmission Outages Did Not Destabilize the BPS or Regional Systems

Despite the number — and, in some cases, the duration — of the transmission facility outages caused by the storm, the stability of the BPS and the operations of the transmission systems operated by ISO-New England (ISO-NE) and the New York Independent System Operator (NYISO) were never impaired. This was the result of two main factors: a significant decrease in load resulting from distribution facility damage and, to a lesser extent, preventative measures taken by ISO-NE.

## A. Bulk Power System Impacts

The loss of seventy-four transmission lines — including twenty-three BPS elements — during the October snowstorm did not strain the BPS. There were no Special Protection System[70] operations. System operators were not required to shed load or take other mitigating measures to maintain reliability. All transmission substations that went out of service were restored before their batteries were depleted; thus, the stability and control of the BPS was not threatened due to those substation outages. In short, the transmission system held up well. An important reason for this, however, is that the damaged distribution system significantly reduced the demands placed on the transmission system. The dramatic drop in power usage (also known as "loss of load") that occurred when millions of customers lost power due to distribution facility damage eased the burden on transmission facilities across the Northeast. Under normal load conditions, seventy-four transmission facility outages could have caused swings in voltage and changes in flows requiring system operators to take emergency actions, possibly including load shedding, in order to prevent cascading outages.[71]

Of course, utilities and regulators strive to prevent loss of load, the effects of which can cause significant harm to customers and the economy. Efforts are currently under way in many Northeastern states to prevent significant damage to distribution systems

[70] Special Protection Systems are systems designed to automatically detect abnormal conditions on a transmission system and to take corrective action. *See* NERC, *supra* note 6.

[71] A cascading outage is a sequence of events where an initial event, or set of events, triggers a series of other outages. Cascading outages can result in widespread power outages, such as those that occurred during the 2003 Blackout. However, in some cases, outages can be halted before the sequence results in a major interruption of electricity service.

in future storms in order to minimize customer outages.[72] If these efforts succeed, then load loss resulting from distribution facility damage during severe weather will diminish, which could then increase the demands on transmission lines during and immediately after storm events. Therefore, while it has always been important that utilities take steps to minimize weather-caused transmission line outages, it becomes especially important to do so as efforts are underway to minimize load loss caused by distribution facility damage.[73]

Although the transmission line outages caused by the October snowstorm did not significantly impact the BPS, future storms could cause greater harm to the BPS, and there are valuable lessons that can be learned from this event. Therefore, staff recommends in Section IX that utilities consider targeted actions to better protect transmission facilities. In particular, as discussed below, staff recommends that, where appropriate, utilities take steps to improve maintenance of their rights-of-way and take a targeted approach to enhance management of off-right-of-way danger trees, focusing on protecting lines rated at 200 kV and above, and lower-voltage transmission lines that, if lost, would negatively impact the overall reliability of the Bulk Electric System.

## B. Regional System Impacts

Transmission facility outages during the storm also had no detrimental impact on the ISO-NE or NYISO operations. The ten transmission line outages in the NYISO74 region did not impact the reliability or operation of the NYISO system: no system operating limits were exceeded, no generation was lost, and all applicable reserve margins were maintained. There was no need for NYISO to implement any emergency procedures or alerts.

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[72] For example, the Connecticut legislature recently passed a bill that, among other things, requires the state Public Utilities Regulatory Authority to establish standards for electric utilities in preventing outages, restoring power, trimming trees, and for emergency planning, staffing, mutual aid policies, and power restoration coordination efforts with telecommunication companies. SB 23, Reg. Sess. (Conn. 2012).

[73] As during the October snowstorm, future severe storms events that damage transmission lines will also likely damage distribution lines for the simple reason that large-scale tree failures will not occur only, or even primarily, near transmission lines.

[74] NYISO is the independent, non-profit organization that operates New York State's transmission network, administers its wholesale electricity markets, and serves as the state's NERC-certified Reliability Coordinator. A Reliability Coordinator is "[t]he entity that is the highest level of authority who is responsible for the reliable operation of the Bulk Electric System [in a defined area], has the Wide Area view of the Bulk Electric System, and has the operating tools, processes and procedures, including the authority to prevent or mitigate emergency operating situations in both next-day analysis and real-time operations." NERC, *supra* note 6.

Nearly all transmission facility outages — sixty-four — occurred on the ISO-NE[75] system, but they caused no significant operating impacts. ISO-NE implemented limited procedures to ensure the reliability of the region's transmission system before, during, and after the snowstorm. In anticipation of the snowstorm, ISO-NE implemented an Abnormal Conditions Alert (Master/Local Control Center Procedure 2 (M/LCC-2)) at 1:00 p.m. Eastern Daylight Time (EDT) on Saturday, October 29. This alert protects the stability of the transmission system by requiring market participants to postpone scheduled maintenance, construction, or testing activities in order to maintain reliability in the face of unplanned outages or similar conditions. ISO-NE cancelled the Abnormal Conditions Alert at 11:15 a.m. EDT on Monday, November 7, 2011.

The storm's most significant impact on ISO-NE operations was the significant loss of load caused by the damage to distribution and, to a lesser extent, transmission lines. As a result of the dramatically decreased demand, by Sunday, October 30, ISO-NE had more generation scheduled to run than it needed. In order to reduce the planned power output and keep the system in balance on October 30, ISO-NE twice implemented a Minimum Generation Emergency. This declaration allowed ISO-NE to require generators to operate below the minimum level at which it is economic to run.

Finally, approximately 1,500 MW of generation capacity in ISO-NE went offline during the storm.[76] However, ISO-NE maintained its required reserve margins at all times.[77] All but one of these generation outages were resolved by 9:00 a.m. EDT on October 31. The remaining generator was restored on November 2. The loss of generation capacity had no impact on the stability of the ISO-NE system or the BPS because load levels dropped so significantly during and after the storm that the power the facilities could have produced was not needed.

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[75] ISO-NE is a private, non-profit organization that operates the transmission grid, administers the energy markets, and serves as the NERC-certified Reliability Coordinator for Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.

[76] Twenty-one small units in total were offline; twelve were offline due to loss of transmission lines serving those facilities, seven due to loss of communications for remote start capability, and two due to generator step-up transformer trips.

[77] A generation reserve margin is the amount of generation capacity required to be available at any given time in excess of the amount of generation that is anticipated to be needed to meet actual demand. Reserve margins ensure that there will be enough generation available to meet demand that exceeds projections or to compensate for unanticipated losses of other sources of generation. *See* NERC, *Reliability Indicators: Planning Reserve Margin*, http://www.nerc.com/page.php?cid=4%7C331%7C373.

# VII. Applicability of the Transmission Vegetation Management Reliability Standard

As discussed above, the majority of transmission facility outages and related loss of load that occurred during the October snowstorm were the result of vegetation contact with transmission lines. Therefore, the FERC-approved Reliability Standard most relevant to this event is FAC-003-1 (Transmission Vegetation Management Programs). However, its applicability to the October snowstorm event is limited.

## A. Overview of Reliability Standard FAC-003-1

Reliability Standard FAC-003-178 was developed by the industry with the purpose of preventing outages from vegetation located in transmission rights-of-way and minimizing outages from vegetation adjacent to the right-of-way.[79] The standard requires Transmission Owners to document a transmission vegetation management program (TVMP) that defines a schedule for right-of-way vegetation inspections based on anticipated vegetation growth and other relevant factors.[80] TVMPs must identify two minimum clearances around transmission lines: a "Clearance 2," the minimum distance around transmission lines to be maintained at all times in order to prevent flashover between the lines and vegetation;[81] and a "Clearance 1," the distance around transmission lines utilities will clear to when performing periodic maintenance so as to prevent vegetation from growing into the Clearance 2 space during maintenance intervals.[82] The TVMP also must specify a schedule for, and methods of, vegetation

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[78] Reliability Standard FAC-003-1 was approved by FERC on March 16, 2007, in Order No. 693, FERC Stats. & Regs. ¶ 31,242, and became mandatory and enforceable on June 18, 2007.

[79] Reliability Standard FAC-003-1 (Transmission Vegetation Management Program), at A.3.

[80] *Id*., at Requirement R1.1.

[81] *Id*., at Requirement R1.2.2. Clearance 2 distances must be at least as great as the clearances set forth in IEEE Standard 516-2003, which range from 0.75 to 6.24 meters (2.45 to 22.44 feet) between conductors and grounded objects like vegetation, depending on the conductor's rating. INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS GUIDE FOR MAINTENANCE METHODS ON ENERGIZED POWER LINES 20, 94 (2003).

[82] Reliability Standard FAC-003-1, at Requirement R1.2. As the Commission explained in Order No. 693, FAC-003-1's clearance requirements mandate that Transmission Owners establish "sufficient clearances to prevent outages due to vegetation management practices under all applicable conditions." Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 729. The Commission noted that "all applicable conditions" does not include the extraordinary circumstances specified in Requirement R3.2, which excludes "natural disasters (including wind shears and major storms) that cause vegetation to fall into the transmission lines from outside the [right-of-way]." *Id*.

inspections.[83] In addition, utilities are required to develop annual plans for vegetation management work to ensure reliability, taking into account various factors, such as anticipated vegetation growth.[84] Finally, Transmission Owners must report certain vegetation-related outages to the relevant Regional Entity.[85]

Unlike the vast majority of Reliability Standards, which apply to all BES facilities (i.e., generally, those operated at or above 100 kV, or otherwise as determined by the Regional Entity), FAC-003-1 applies only to BPS "transmission lines operated at 200 kV and above and to any lower voltage lines designated by the [Regional Entity] as critical to the reliability of the electric system."[86] This means that the Standard does not apply to lines operated at voltages under 200 kV in the NPCC region unless NPCC has designated those lines as "critical" under the Standard. NPCC has not designated any transmission lines rated under 200 kV as "critical" for the purposes of applying FAC-003-1.

When approving FAC-003-1, the Commission acknowledged that, although the proposed Standard gave Regional Entities discretion to designate lines under 200 kV to which the Standard would be applicable, no Regional Entity had actually designated any lower-voltage lines as critical for that purpose.[87] The Commission expressed the concern that a bright-line 200 kV threshold for application of the Standard would "exclude a significant number of transmission lines that could impact Bulk Power System reliability."[88] However, in response to industry concerns that, among other things, the costs of expanded applicability to sub-200 kV facilities could outweigh the benefits, the Commission did not require NERC to revise FAC-003-1 immediately. Instead, it directed NERC to "revise it through the Reliability Standards development process, with the expectation that the applicability of this Reliability Standard will expand to include additional facilities that impact reliability that currently are not covered by this Reliability Standard."[89]

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[83] Reliability Standard FAC-003-1, at Requirement R1.

[84] *Id.*, at Requirement R2.

[85] *Id.*, at Requirement R3.

[86] *Id.*, at A.4.

[87] Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 706.

[88] *Id.*

[89] *See id.* P 710.

Because NPCC does not apply FAC-003-1 to any sub-200 kV BPS elements, FAC-003-1 only applied to one line — a 345 kV line in Connecticut — that was forced out of service due to tree contact during the October snowstorm.[90] That line's outage did not result in any customer outages. Thus, although the October snowstorm outages were almost entirely caused by vegetation contact, the Transmission Vegetation Management Reliability Standard applied to only *one* of the fifty-five transmission lines forced out of service by tree contact (and applied to none of the distribution lines damaged in the storm).[91] To the extent that a state does not have vegetation management standards governing transmission lines operated over 100 kV[92] and the relevant Regional Entity has not designated lines operated under 200 kV as critical to the region's reliability for the purpose of applying FAC-003-1, lines operated between 100 kV and 200 kV in that state would not be covered by any federal or state vegetation management standard.

## B. FAC-003-1's Scope

If FAC-003-1 had applied to all of the transmission facilities impacted by tree contact during the October snowstorm, compliance with the Standard with respect to those lines may not have prevented the storm's vegetation-caused transmission line outages. This is because: (a) the majority of outages were caused by trees that fell onto transmission lines from outside the utility's right-of-way, and FAC-003-1 does not specifically address off-right-of-way vegetation management; and (b) FAC-003-1 does not dictate specific right-of-way management practices, including how utilities should manage on-right-of-way danger trees.

First, FAC-003-1 does not specifically address management of vegetation located outside a utility's right-of-way. Thus, even if the Standard had applied to all

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[90] Two other lines that experienced outages during the October snowstorm are operated at over 200 kV, and therefore subject to FAC-003-1, but those outages were not caused by vegetation contact.

[91] On December 21, 2011, NERC filed with FERC a proposal to replace FAC-003-1 with a new standard, FAC-003-2. Among other things, FAC-003-2 would revise the Standard so that it would be applicable to all transmission lines operated at or above 200 kV and any line that is an element of an Interconnection Reliability Operating Limit (IROL) or a Western Electric Coordinating Council (WECC) Transfer Path. N. Am. Elec. Reliability Corp., Petition, Docket No. RM12-4-000 (filed Dec. 21, 2011). However, this expanded applicability would not have significantly increased the Standard's impact on lines forced out of service by tree contact during the October snowstorm because only eight of those 115 kV or 138 kV lines are IROL elements (none are WECC Transfer Paths). Moreover, the proposed FAC-003-2's requirement that no vegetation come into contact with lines governed by the Standard does not apply when the vegetation contact is caused by major storms. This report does not offer any views on proposed FAC-003-2, which is currently under review by the Commission.

[92] *See, e.g.*, N.Y. Comp. Codes R. & Regs. Title. 16 §§ 84.2, 84.3; Cal. Gen. Order 95, Rule 35.

transmission lines impacted by vegetation during the October storm, it would not have addressed the condition — tall trees growing outside of utilities' rights-of-way — that caused over half of all storm-related outages. One reason FAC-003-1 does not explicitly address off-right-of-way vegetation management is that land adjacent to rights-of-way is typically not owned by the utility, and state laws usually limit utilities' ability to prune or remove trees on property they do not own. Although state laws differ, generally speaking, a utility may not remove a tree (including a danger tree) located outside of its right-of-way without the property owner's consent.[93] Moreover, obtaining permission to remove off-right-of-way trees can be complicated and difficult.

When utilities and state agencies set policies and make decisions regarding removal of danger trees outside the right-of-way, they must consider a number of factors. Reliability of the transmission system, and, in particular, preserving the stability of the BPS, is a central concern. However, environmental issues, property rights, viewsheds, and cost also play an important role. In heavily forested regions like New England, even if possible, the reliability benefits of removing all danger trees from outside utilities' rights-of-way often would not outweigh the costs of doing so.[94] For example, Northeast Utilities provided staff with an estimate that there are some 800,000 danger trees along the edges of its rights-of-way, and that removing them would cost approximately $400 million.[95] Notwithstanding competing policy concerns, off-right-of-way tree fall-ins were the leading cause of transmission line outages during the October snowstorm, and, in general, some off-right-of-way danger trees can pose a threat to reliability. Therefore, staff makes a recommendation in Section IX that utilities should re-evaluate, and work to enhance, their off-right-of-way vegetation management.

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[93] *See, e.g.*, N.H. Rev. Stat. Ann. § 231:172(I) (electric utilities must obtain consent of the landowner to prune trees outside of the right-of-way); *see also Tree Trimming FAQs*, PUBLIC SERVICE OF NEW HAMPSHIRE, http://www.psnh.com/CustomerSupport/Home/Tree-Trimming-FAQs.aspx (explaining procedures for obtaining consent of tree owners before performing trimming maintenance). In some circumstances, if a utility provides notice of its intent to remove a tree and the landowner does not object, the utility may proceed without specific permission. *See, e.g.*, N.H. Rev. Stat. Ann. § 231:172(II)(b) (stating that the utility may perform the work without permission if the tree owner does not request personal consultation after receiving notice). In some states, there are expedited procedures for obtaining permission to remove "hazard trees" — trees that present an imminent danger to transmission lines because they are damaged or diseased. *See, e.g.*, Mass. Gen. Laws Ann. ch. 87 § 14(b), (c) (permitting electric utilities to file hazard tree removal plans for approval by the tree warden to avoid otherwise applicable restrictions on tree removal).

[94] As ISO-NE has stated, "[t]he political, social and environmental expectations placed on utilities in New England prevent the clearing required to guarantee total system protection from falling trees. In severe weather events (hurricanes, micro bursts, tornadoes and ice storms) trees may fail and fall into lines." ISO-NE, OPERATING PROCEDURE 3 Appendix C (2005).

[95] Of course, the monetary and non-monetary costs of danger tree removal must be weighed against, among other things, the often high costs of transmission outages.

Second, while FAC-003-1 does require utilities to maintain plans and procedures to address vegetation to meet its Clearance 1 requirements, and utilities have considerable flexibility in designing transmission vegetation management programs as long as utilities are compliant with the FAC-003-1 requirements, the Standard does not specifically dictate how utilities should manage danger trees that are outside of Clearance 1 but within the right-of-way. Thus, utilities may maintain vegetation clearances on less than the full right-of-way, which can increase the number of danger trees within the right-of-way.[96]

FAC-003-1 does recognize that the American National Standard Institute's (ANSI) Standard A300, which provides guidelines for integrated vegetation management on electric utility rights-of-way,[97] is an industry best practice.[98] ANSI A300 does not specifically prohibit growth of danger trees on a right-of-way, but it does explain that the "wire zone-border zone" vegetation management method, where the full right-of-way is managed in order to prevent the growth of danger trees, "is a proven method that ensures the reliability of electric supply lines."[99] The wire zone-border zone method allows very low-growing vegetation such as grasses and other groundcover species in the area under and immediately around transmission structures (the "wire zone") and permits short-growing vegetation like shrubs and short trees from the outer edge of the wire zone to the edge of the utility's full right-of-way (the "border zone").[100] The following drawing illustrates the wire zone-border zone concept.

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[96] Staff notes that no registered entity has been charged with a violation of FAC-003-1 as the result of a healthy tree falling onto (as opposed to growing into) a transmission line.

[97] Integrated vegetation management (IVM) is "[a] system of managing plant communities in which compatible and incompatible vegetation is identified, action thresholds are considered, control methods are evaluated, and selected control(s) are implemented to achieve a specific objective." ANSI A300, *supra* note 14 at 72.

[98] Reliability Standard FAC-003-1, at Requirement R1 n.1.

[99] ANSI A300, *supra* note 14 at 75.2, Annex A.

[100] ANSI A300, *supra* note 14; RANDALL H. MILLER, BEST MANAGEMENT PRACTICES: INTEGRATED VEGETATION MANAGEMENT 17 (2007) (companion publication to ANSI A300).

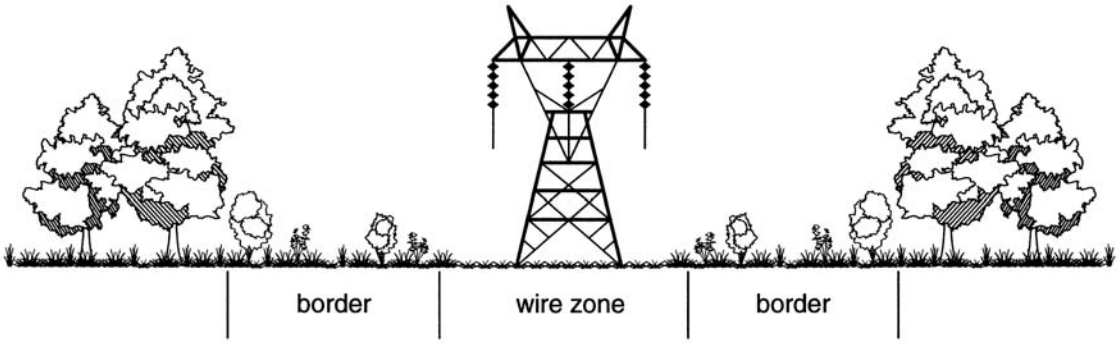



**Figure 16: Wire Zone-Border Zone Illustration**

*Source: UVM Final Report, infra note 109*

FAC-003-1's focus on maintaining clearances through a specific method like the recognized wire zone-border zone best practice reflects an emphasis on preventing vegetation from growing or swaying into conductors (or conductors swaying or sagging into vegetation) rather than vegetation breaking and falling into conductors, especially during severe storms.[101] Thus, to minimize the damage caused by similar events in the future vegetation management requirements would need to include a requirement to address at least those danger trees growing within the right-of-way.

[101] Indeed, the genesis of FAC-003-1 was the major blackout that occurred on August 14, 2003, which was caused in significant part by unmanaged vegetation that, due to growth and line sag, contacted several 345 kV lines and precipitated cascading outages throughout the eastern United States and Canada. *See* U.S.-CANADA POWER SYSTEM OUTAGE TASK FORCE, *supra* note 12. Proposed FAC-003-2 requires that Transmission Owners manage vegetation in order to prevent *any* vegetation from making contact with transmission lines – including fall-ins. *N. Am. Elec. Reliability Corp.*, Petition, Docket No. RM12-4-000, at Proposed Standard FAC-003-2, R1, R2 (filed Dec. 21, 2011). However, as stated in note 91, the proposed standard would *not* apply to vegetation contact in "circumstances that are beyond the control of a Transmission Owner," including natural disasters such as "major storms as defined either by the Transmission Owner or an applicable regulatory body . . . ." *Id.*, at R1 n.2. As previously noted, this report takes no position on proposed FAC-003-2.

# VIII. Outage Reporting Provides Limited Information

During and after the storm, two Reliability Standards – FAC-003-1 and EOP-004-1 – required that entities report some information about their outages to either NERC or NPCC. However, those requirements, and the responses provided by most affected utilities, resulted in FERC and NERC initially receiving limited information about the event. Based on the findings in this Section, staff makes recommendations in Section IX for improved or enhanced reporting of certain outage information.[102]

Standard FAC-003-1 requires Transmission Owners to report on a quarterly basis to Regional Entities such as NPCC sustained vegetation-caused outages on lines subject to that Standard,[103] and NPCC guidance also instructs transmission owners to report vegetation-caused outages on any BPS elements operated under 200 kV.[104] However, outages caused by off-right-of-way tree contacts during natural disasters, including major storms, do not have to be reported under FAC-003-1.[105] While NERC obtains certain data about outages through other reporting mechanisms, there are no data reporting requirements in place that mandate the reporting of all the transmission facility outages that occurred in the October storm. Nor were all such outages, in fact, reported to NERC. Thus, utilities were not required by FAC-003-1 to submit information on the October storm's BPS element outages caused by off-right-of-way tree fall-ins.

Staff gathered substantial information about these outages during the inquiry, but is concerned that information about off-right-of-way tree fall-ins during other weather

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**102** This report's findings and recommendations regarding reporting address only issues related to reporting outage information to FERC, NERC, or the Department of Energy (DOE). We do not address issues related to reporting distribution facility or customer outages to state regulators. However, staff notes that there have been calls to improve the consistency of distribution facility outage reporting. *See* MASSACHUSETTS INSTITUTE OF TECHNOLOGY, *The Future of the Electric Grid*, 9 (2011), *available at* http://web.mit.edu/mitei/research/studies/the-electric-grid-2011.shtml ("Most outages occur within distribution systems, but only 35 U.S. states require utilities to report data on the impact of all outages on consumers, and reporting standards and practices differ. It is accordingly impossible to make comprehensive comparisons across space or over time.").

**103** Reliability Standard FAC-003-1, at Requirement R3.

**104** NPCC, COMPLIANCE GUIDANCE STATEMENT ON REPORTING OF TRANSMISSION OUTAGE RELATED TO VEGETATION CONTACT (rev. Oct. 3, 2008), *available at* https://www.npcc.org/Compliance/Compliance%20Guidance%20Statements/Forms/Public%20List.aspx.

**105** Reliability Standard FAC-003-1, at Requirement R3.2.

events may not be reported. The weather exception prevents regulators from obtaining a key source of information about the extent and severity of these types of outages. Better information would allow policymakers to understand the scope and impacts of weather-caused off-right-of-way tree fall-ins, and to assess whether regulations or guidance should be formulated to address those outages.

Second, staff finds that, during and after the October snowstorm, affected entities did not always provide thorough information in the disturbance reports they were required to file with NERC under Reliability Standard EOP-004-1. That Standard mandates that registered entities submit completed disturbance report forms — either the DOE Electric Emergency Incident and Disturbance Report (Form OE-417) or NERC's Interconnection Reliability Operating Limit and Preliminary Disturbance Report — after certain events, including those where there is significant loss of load.[106] Initial Form OE-417s must be submitted to DOE and NERC within an hour of the disruption, and, at the time of the October storm, final reports providing complete disruption information were required to be filed within 48 hours of the event.[107] However, the majority of the OE-417 forms submitted by utilities during and after the October snowstorm did not provide enough information to allow for a useful initial analysis of the event. For example, many final reports did not include full narrative descriptions of events, or include the voltage of transmission lines that experienced outages. This lack of thoroughness, particularly in the final reports, made it difficult for FERC and NERC staff to ascertain the exact nature of the impact of the storm on the affected systems.[108]

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[106] Reliability Standard EOP-004-1 (Disturbance Reporting), at Requirement R3.

[107] *Id.*, Attachment 2. As of January 1, 2012, the forty-eight-hour reporting requirement for final reports was extended to seventy-two hours.

[108] The inconsistency and incompleteness of information regarding BPS outages was also noted in the MIT report on the future of the electric grid: "At the bulk power level, data on major disturbances and unusual occurrences have been reported to the U.S. Department of Energy (DOE) since the 1970s and to the North American Electric Reliability Corporation (NERC), which has responsibility for the reliability of the bulk power system, since 1984. However, these data are not consistent, complete, or necessarily accurate, and they cannot reliably be used to assess changes in the reliability of the bulk power system over time." *See* MASSACHUSETTS INSTITUTE OF TECHNOLOGY, *supra* note 102, at 9.

# IX. Recommendations

The October 2011 Nor'easter was a rare storm that, due to a number of circumstances — record amounts of heavy wet snow, trees that had not lost most of their leaves, and unusually saturated ground — had severe and widespread impacts on the electricity infrastructure in the Northeast. Staff recognizes the unusual aspects of this weather event. Nonetheless, based on information gathered and findings made during the inquiry, staff concludes there are a number of "lessons learned" that, if implemented, could improve reliability during future storms and similar weather events. Accordingly, staff makes the following recommendations with regard to transmission facilities.

### • *Vegetation Management Recommendations*[109]

By far, the leading cause of transmission line outages during the October snowstorm was trees or tree branches falling onto power lines from outside and inside utilities' rights-of-way.[110] Staff therefore recommends that utilities take the following targeted steps to enhance their management of danger trees both on and off their rights-of-way in order to reduce these types of outages.[111]

#### 1. Where Appropriate, Utilities Should Take Targeted Steps to Address Off-Right-of-Way Danger Trees

As noted above, off-right-of-way tree fall-ins accounted for about half of the storm's transmission line outages, and nearly 75% of all confirmed vegetation-caused outages. Off-right-of-way danger trees are a particular threat to reliability in New England, where there may be hundreds of danger trees along one span of a transmission line. Staff

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[109] In response to the 2003 Blackout, FERC commissioned a separate vegetation management report to support the federal investigation into that event. The result was the Utility Vegetation Management Final Report, completed by CN Utility Consulting, LLC and published in 2004. STEPHEN R. CIESLEWICZ & ROBERT R. NOVEMBRI, UTILITY VEGETATION MANAGEMENT FINAL REPORT (March 2004) [hereinafter "UVM Final Report"], *available at* http://www.ferc.gov/industries/electric/indus-act/reliability/blackout/uvm-final-report.pdf. The recommendations related to vegetation management in this report are similar to several of the vegetation management recommendations made in the UVM Final Report.

[110] In fact, the majority of vegetation-related outages in the United States are caused by trees or portions of trees falling into lines from distances outside of normal clearing zones (i.e., Clearance 1 or Clearance 2 distances). *See* NERC, *Vegetation Management Reports*, http://www.nerc.com/page.php?cid=3|26.

[111] Staff recognizes the sensitivity of vegetation management issues and the difficulty of expanding rights-of-way and more effectively maintaining them. However, these difficulties must be balanced against the reliability and safety benefits of improved right-of-way management.

recognizes that in most cases utilities are not free to unilaterally remove off-right-of-way trees, that the process for obtaining permission to do so is frequently difficult and costly, and that tree removal often faces significant landowner and public opposition. Moreover, the costs of indiscriminate, widespread removal of off-right-of-way danger trees may outweigh the reliability benefits of doing so.

Taking all these factors into consideration, staff recommends that, where appropriate, utilities follow a targeted approach to enhancing their off-right-of-way danger tree management, focusing on protecting lines operated at 200 kV and above, and lower-voltage transmission lines that, if lost, would negatively impact the overall reliability of the Bulk Electric System. Utilities should analyze their transmission systems in order to identify danger trees — particularly those species of trees that have a tendency to fail — that could impact critical transmission lines. After performing this analysis, utilities should work with affected property owners, state regulators, and local communities to develop a strategy for managing those trees that pose the greatest threat to those facilities. In addition, if state laws or policies significantly impact utilities' ability to manage off-right-of-way danger trees that could impact these critical facilities, utilities should work with stakeholders and state and local governments to develop solutions that reduce risk to those lines.

### 2. Utilities Should Employ Recognized Best Practices in Managing Rights-of-Way Where Feasible

Staff found in Section V.A that roughly 25% of the confirmed vegetation-related transmission line outages during the October event were caused by trees that fell into transmission lines from inside a utility's full right-of-way. These on-right-of-way trees were all located outside the utility's maintained right-of-way. Based on this finding, staff recommends that, where possible and practical, utilities implement the industry best practice of ensuring that danger trees are not present within their full rights-of-way.[112] In particular, to the extent a utility manages vegetation only on maintained rights-of-way rather than full rights-of-way, it should work toward reclaiming the full right-of-way width where feasible.[113]

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[112] Staff recognizes that there are a number of ways to achieve this result. The wire zone-border zone right-of-way maintenance method, discussed in Section VI, is recognized as highly effective in protecting against on-right-of-way tree contact and generally maintaining reliability. Selection of the most appropriate maintenance method for any given right-of-way should be made by qualified vegetation management personnel.

[113] Maintaining narrower areas within a full right-of-way is not an uncommon practice in the industry and occurs for a variety of reasons, some of which are outside the control of the utility. However, it is not a best practice.

Two key components of reclaiming and maintaining full rights-of-way are (1) knowing the exact boundaries of that area and (2) being able to identify those boundaries in the field. This is not always easy, given that traditional markers (such as wooden stakes or iron plates) can deteriorate or get lost during four-plus year vegetation management cycles. However, technologies such as Light Detection and Ranging (LiDAR) and Global Positioning Systems (GPS) can help utilities accurately and more permanently identify right-of-way boundaries on the ground. Staff recommends that, over time, utilities work toward employing technologies that will allow them to track the exact boundaries of all of their transmission rights-of-way and locate those boundaries in the field.

Staff recognizes there are a number of circumstances where utilities may be unable to completely prevent the presence of danger trees within full, or even maintained, rights-of-way through implementation of the wire zone-border zone management or other, similar techniques, and that utilities have been, and must continue to be mindful, of these circumstances.[114] For example, utilities may be prohibited by state law from removing certain vegetation on their rights-of-way in environmentally sensitive areas, or may be required to maintain on-right-of-way vegetation in order to partially shield power lines from view.[115] Removal of danger trees also may not be possible where the easement establishing the utility's right-of-way explicitly limits, or does not clearly permit, vegetation management in the full easement area. Even where the easement gives a utility rights to manage vegetation across the entire right-of-way, past practices (for example, years of permitting landowners to grow tall trees inside the right-of-way), landowner objections, or public sentiment opposing the maintenance of wide rights-of-way may make it difficult to employ the wire zone-border zone method or otherwise to remove danger trees. Staff also recognizes that reclaiming rights-of-way that are not currently being fully managed can be expensive, time consuming, and difficult. However, staff finds that consistently maintaining the full right-of-way would reduce the number of danger trees near transmission lines.[116]

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**114** *See, e.g.,* CIESLEWICZ & NOVEMBRI, *supra* note 109, at 21 (recognizing that there are locations where implementing the wire zone-border zone model is not practical); MILLER, *supra* note 100, at 18-19 (same).

**115** *See generally*, CIESLEWICZ & NOVEMBRI, *supra* note 109, at 15-16.

**116** Staff recognizes that, in some instances, removing certain tall-growing trees from the interior edge of the full-right-of-way may expose weaker, top-heavy danger trees on the exterior edge, posing more of a risk of a tree falling into the transmission facilities.

Utilities should, of course, take these circumstances into account when evaluating their right-of-way management policies to specifically address danger trees. Staff recommends that utilities: (a) identify the areas where elimination of danger trees inside the full right-of-way is possible given site-specific circumstances and (b) evaluate whether danger tree removal/right-of-way reclamation would increase reliability and be feasible. Once rights-of-way that are appropriate for removing danger trees are identified, utilities should prioritize their efforts, focusing first on rights-of-way surrounding lines that are rated at or above 200 kV, and lower-voltage transmission lines that, if lost, would negatively impact the overall reliability of the Bulk Electric System.

In sum, in order to improve reliability during future major storms, staff recommends that, where possible, utilities develop and implement plans to ensure that danger trees are not located within their full rights-of-way.[117]

### 3. Utilities Should Lay the Foundation for Effective Vegetation Management When Establishing New Rights-of-Way

Preventing fall-ins from both inside and outside the right-of-way is easier if utilities consider vegetation management needs when siting new transmission lines and acquiring new easements. Therefore, staff recommends that utilities carefully assess vegetation and growth rates in the area of planned lines in order to establish the appropriate right-of-way width. For example, if native trees have a mature height of 100 feet, the easement should cover an area wide enough to ensure that existing and future trees outside of the right-of-way will not fall into the facilities.[118]

In addition, utilities should ensure that easement documents protect the utility's ability to ensure safe and reliable transmission of electricity. New easements should clearly provide the utility with rights to manage the full easement in order to prevent the presence of danger trees inside the right-of-way. In addition and where possible, new easements should give the utility the ability to remove danger trees outside of the right-of-way.

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[117] To be clear, preventing the presence of danger trees within the right-of-way does *not* mean that full rights-of-way need to be (or should be) clear-cut. This recommendation is focused on ensuring that, where feasible, danger trees – those trees that could fall into a transmission line or structure – are not present within rights-of-way because they can threaten reliability. Many types of trees growing within rights-of-way do not constitute danger trees.

[118] *See* CIESLEWICZ & NOVEMBRI, *supra* note 109, at 71.

• ***Other Recommendations***

## 4. Utilities Should Evaluate and, As Needed, Enhance Their Storm Preparedness and Response Plans

As explained in Section III, the October snowstorm exceeded forecasts, and many utilities scrambled — often at the last minute — to assemble adequate response personnel, especially field crews. Although these manpower and related issues did not significantly hinder restoration of transmission line outages or unduly prolong transmission-caused customer outages, the event revealed potential areas of improvement in preparation for future storms. Thus, staff recommends that utilities evaluate their severe storm preparation and response plans to ensure they are flexible and scalable enough to quickly respond to events that are more severe than predicted. For example, utilities should: (a) clearly define how and when they will request outside assistance, through mutual aid or outside contractors; (b) be prepared for regional mutual assistance crews to be unavailable when a weather event is predicted to impact many states, either by requesting mutual aid from other regions early on or retaining additional local contractors to make up for the lack of immediately available mutual assistance; (c) have a policy in place regarding if, when, and where pre-staging will occur; (d) have the ability to, and procedures regarding, reservation of equipment, such as helicopters and infrared cameras, in advance of major storms in order to ensure prompt assessment of transmission system damage; and (e) in regions where extreme weather events occur, and especially where they are becoming more common, retain experienced weather personnel with the responsibility to predict likely impacts of weather events, taking into account service-territory-specific conditions.

## 5. Utilities Should Report All Vegetation-Caused BES Facility Outages to NERC

As discussed in Section VIII, even though off-right-of-way tree contact during severe storms is a frequent cause of transmission line outages, FAC-003-1 does not require utilities to report those outages to Regional Entities or NERC. Moreover, the Standard does not require the reporting of vegetation-caused sustained outages on BES transmission lines not subject to FAC-003-1 (i.e., those operated at voltages below 200 kV or lower-voltage lines not designated as critical by a Regional Entity). To ensure that regulators have sufficient information to allow them to make informed policy decisions about these types of outages, staff recommends that all tree contact-caused BES facility outages be reported to NERC.

## 6. Disturbance Reports Should Be Clear and Complete

Section VIII finds that although a number of entities were required by Reliability Standard EOP-004-1 to file preliminary and final disturbance reports related to the October snowstorm outages, many of the filed forms were not completed thoroughly. This lack of thoroughness made it difficult to quickly ascertain the impact of the storm on the affected systems. Staff recommends that, where possible, all entities required to file disturbance reports under EOP-004-1 promptly provide thorough, descriptive, high-quality information in the initial reports as it becomes available to them. With regard to the final disturbance reports, utilities should ensure their responses are comprehensive, providing all the relevant information in their possession.

# ATTACHMENT 5
# ENVIRONMENTAL JUSTICE OUTREACH

247 Station Drive
Mail Stop NE 390
Westwood, MA 02090

3/31/2022

Dear Stakeholder,

As part of our everyday effort to deliver reliable energy to our customers and communities, we are planning improvements to the electric system in your area. This project will improve the reliability of the electric grid in Massachusetts so that all of our customers have access to dependable power that meet their current and growing energy needs.

## We're Always Working to Serve You Better

We are planning a Transmission Right-of-Way Reliability Project (TRRP) in the right-of-way corridor between Eversource's Northfield substation in Northfield traveling through Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst and Granby to Eversource's Ludlow substation in Ludlow. The Transmission Right of Way Reliability Program is a long-term transmission system reliability and resiliency program that increases the maintained width of the right-of-way to the easement edge. This program improves system reliability by reducing the number of tree fall-in risks and has proven to be an effective way to create a sustainable environment comprised of vegetation that can safely coexist with the transmission lines. Our long-term management objective is to manage these newly cleared areas as early succession habitat and encourage the growth of grasses, forbs and shrubs.

## For More Information

Keeping the lines of communication open is important to us. The attached form includes additional information on the project or you may contact Daniel Burns at daniel.p.burns@eversource.com or 860.728.4630. You can also contact our Project Hotline at 1-800-793-2202 or send an email to ProjectInfo@eversource.com and mention the proposed WMA TRRP WT-11 project in the subject line.

We welcome your feedback and look forward to discussing this project in more detail.

Sincerely,

*Daniel Burns*

Daniel Burns

# ADDENDUM: Environmental Justice Screening Form

| | |
|---|---|
| Project Name | WT-11 Transmission Right-of-way Reliability Program |
| Anticipated Date of MEPA Filing | May 25, 2022 |
| Proponent Name | Eversource Energy |
| Contact Information (e.g., consultant) | Dan Burns<br>Project Manager – Project Services<br>Eversource Energy<br>Daniel.p.burns@eversource.com<br>O: 860-728-4630 |
| Public website for project or other physical location where project materials can be obtained (if available) | N/A |
| Municipality and Zip Code for Project (if known) | Linear Project in existing right-of-way.<br>Towns crossed include: Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, and Ludlow, Massachusetts. |
| Project Type* (list all that apply) | Electric Transmission |
| Is the project site within a mapped 100-year FEMA flood plain? Y/N/yet unknown | Y |
| Estimated GHG emissions of conditioned spaces if known (click **here** for GHG Estimation tool) | N/A |

Project Description

- **Provide a brief project description, including overall size of the project site and square footage ofproposed buildings and structures if known.**

Eversource is responsible for maintaining a safe, reliable electric transmission system and is required to meet federal, regional, and electric industry reliability standards, which includes vegetation management. This requires a balance between the environmental benefits that trees provide with the responsibility to deliver safe and reliable power. Tall-growing trees located in electric transmission rights-of-way (ROW) pose a risk to the safe operation of the system, which can result in widespread electric power outages or other public safety issues. To maintain compliance with industry standards, minimize risk to public safety, enhance reliability, and improve system performance during severe weather events, Eversource has developed a Transmission Right-of-way Reliability Program (TRRP). TRRP consists of tree removal within the ROW along the existing edge of clearing to increase the distance between the overhead transmission lines and the adjacent, unmaintained/forested vegetation.

Eversource is proposing to implement the TRRP on the ROW WT-11, which extends approximately 29.3 miles, from the Northfield Substation in Northfield, Massachusetts to the Ludlow Substation in Ludlow, Massachusetts. The WT-11 contains a 345-kV overhead transmission line, is 300 feet wide and has a maintained width of approximately 125 feet. The proposed TRRP will increase the maintained ROW width to 200 feet by cutting trees from within the currently maintained/forested portions of the ROW, which increases the distance between the overhead transmission lines and the adjacent trees.

In addition, typical maintenance will also occur and include:

- Floor cutting, which is clearing all incompatible woody vegetation to maintained floor/easement ROW width. Woody vegetation is removed around all pole/tower structures, guide wires, gates/barriers and all “off road” access roads. Woody vegetation is removed 30 feet back from primary road crossings and/or ROW wooden barrier.
- Pruning tree limbs and hazard tree removal, which is required to ensure that vegetation does not contact or encroach within minimum distances of the energized transmission system.

**1. List anticipated MEPA review thresholds (301 CMR 11.03) (if known).**

(1) Land

(a) ENF and Mandatory EIR.

1. Direct alteration of 50 or more acres of land.

(2) State-listed Species under M.G.L. c. 131A (Massachusetts Endangered Species Act)

(b) ENF and Other MEPA Review if the Secretary So Requires.

1-2. Alteration of designated significant habitat and greater than two acres of disturbance of designated priority habitat, as defined in 321 CMR 10.02, that results in a take of state-listed endangered or threatened species or species of special concern.

(3) Wetlands, Waterways and Tidelands

(a) ENF and Mandatory EIR.

1. a-b. Alteration of one or more acres of bordering vegetating wetlands or alteration of ten or more acres of any other wetlands.

**2. List all anticipated state, local and federal permits needed for the project (if known).**

- Massachusetts Environmental Policy Act (MEPA) Certificate
- United States Army Corps of Engineers (USACE) Self-Verification Notification
- Massachusetts Department of Environmental Protection (MassDEP) 401 Water Quality Certification
- Massachusetts Historical Commission (MHC) Section 106 Clearance
- MA Natural Heritage and Endangered Species Program (NHESP) MA Endangered Species Act (MESA) project review
- Orders of Condition (OOC) under the Massachusetts Wetlands Protection Act and local wetlands bylaws (if applicable) for each town crossed by the project:
    - Northfield
    - Erving
    - Wendell
    - Montague
    - Leverett
    - Shutesbury
    - Pelham
    - Belchertown
    - Amherst
    - Granby
    - Ludlow

**3. Identify EJ populations and characteristics (Minority, Income, English Isolation) within 5 miles of project site (can attach map from EJ Maps Viewer in lieu of narrative).**

See attached map.

5. **Identify any municipality or census tract meeting the definition of "vulnerable health EJ criteria"in the DPH EJ Tool located in whole or in part within a 1 mile radius of the project site.**

The project area is within a 1-mile radius of EJ community in the following towns:

- Wendell:
    - Childhood blood lead criterion are met for year ranges 2012-2016 and 2015-2019 (most current data range). Due to the low number of cases the rate is considered unstable and therefore unreliable.
- Amherst:
    - Childhood blood lead criterion are met for year range 2015-2019 (most current data range).

**6. Identify potential short-term and long-term environmental and public health impacts that mayaffect EJ Populations and any anticipated mitigation.**

No short-term or long-term environmental or public health impacts are expected to affect EJ populations as a result of the project. Tall growing trees will be cut at the base, but compatible, low-growing vegetation will be allowed to remain resulting in the permanent conversion of forested land into early successional/scrub shrub habitat. The existing ROW passes through largely rural areas occupied by remote forest lands and agricultural areas, and impacts are expected to be limited to the properties crossed by Eversource's ROW.

**7. Identify project benefits, including "Environmental Benefits" as defined in 301 CMR 11.02, thatmay improve environmental conditions or public health of the EJ population.**

This project will provide the following benefits to the environmental conditions and/or public health of the EJ population:

- **Enhanced energy reliability:** This project will strengthen our electric system, by ensuring the continued reliable delivery of energy where and when needed, including EJ populations. Power outages can disrupt communication, water, and transportation services. They can be especially dangerous if they occur during extreme cold or hot temperatures and for those that rely on electricity for medical devices. Decreasing the potential for power outages to occur will have a positive impact on the stability of communities that depend on the electricity distributed by this transmission line, especially those communities that may not have the financial resources to purchase generators, find temporary housing, or replace lost food in the event of a power outage.
- **Improved access to clean renewable energy**: Maintenance of Eversource's transmission lines is necessary to transport clean renewable energy to our customers.
- **Habitat enhancement**: This project will expand and sustainably manage the early successional scrub/shrub habitat of our ROW. These habitats are becoming increasingly rare due to development, but are critical for a variety of wildlife, including numerous pollinators and rare and endangered species.

**8. Describe how the community can request a meeting to discuss the project, and how the community can request oral language interpretation services at the meeting. Specify how to request other accommodations, including meetings after business hours and at locations nearpublic transportation.**

Please make any requests for more information to Dan Burns, Project Manager – Project Services, Eversource Energy at Daniel.p.burns@eversource.com or (860) 728-4630. Please specify any accommodations required, including language interpretation or meeting times/locations, and we will address these needs accordingly.

247 Station Drive
Mail Stop NE 390
Westwood, MA 02090

作為我們向客戶和社區提供可靠能源的日常工作的一部分，我們正在計劃改進您所在地區的電力系統。這一專案將提高麻塞諸塞州電網的可靠性，以便我們所有的客戶都能夠獲得可靠的電力，滿足他們目前和不斷增長的能源需求。

## 我們一直致力為您提供更好的服務

我們正在規劃一個輸電路權可靠性專案(TRRP )，位於諾斯菲爾德的Eversource諾斯菲爾德變電站之間的路權走廊上，穿過歐文、溫德爾、蒙塔古、萊弗里特、舒茨伯里、佩勒姆、貝爾徹敦、阿姆赫斯特和格蘭比，到達位於勒德洛的Eversource勒德洛變電站。
輸電路權可靠性計畫是一項長期的輸電系統可靠性和彈性計畫，它將維護的路權寬度增加到地役權的邊緣。該計畫透過減少樹木倒伏的風險來提高系統的可靠性，並被證明是創造可持續環境的有效方法——由可與輸電線路安全共存的植被組成的環境。
我們的長期管理目標是將這些新開闢的區域作為早期演替棲息地進行管理，並鼓勵草類、雜類植物和灌木的生長。

## 更多資訊

保持溝通渠道暢通對我們來說很重要。所附表格包括關於本專案的更多資訊，您亦可以透過daniel.p.burns@eversource.com或860.728.4630聯繫Daniel Burns。您也可以撥打1-800-793-2202聯繫我們的專案熱線，或傳送電郵至ProjectInfo@eversource.com，並在主旨欄中提及擬議的WMA TRRP專案。

我們歡迎您的回饋，並期待著與您更詳細地討論這個專案。

祝安好，

Daniel Burns

# 附錄：環境正義篩查表

| | |
|---|---|
| 專案名稱 | WT-11輸電路權可靠性計畫 |
| 預計在MEPA備案日期 | 2022年5月25日 |
| 提案者名稱 | Eversource Energy |
| 聯絡方式（如顧問） | Dan Burns<br>專案經理 – 專案服務部<br>Eversource Energy<br>Daniel.p.burns@eversource.com<br>辦公電話：860-728-4630 |
| 專案的公共網站或其他可以獲得專案材料的實際地點（如果有的話） | 不適用 |
| 專案所在的市鎮和郵遞區號（如已知） | 現有路權上的線性專案<br>穿越的城鎮包括：麻塞諸塞州諾斯菲爾德、歐文、溫德爾、蒙塔古、萊弗里特、舒茨伯里、佩勒姆、貝爾徹敦、阿姆赫斯特、格蘭比和勒德洛。 |
| 專案類型*（請列出所有適用的專案類型） | 電力輸送 |
| 專案場地是否在規劃的100年FEMA洪泛區範圍內？是/否/未知 | 是 |
| 空調空間的溫室氣體排放估算（如已知）（點擊**這裡**使用溫室氣體估算工具） | 不適用 |

專案描述

- **提供簡短的專案描述，包括專案場地的總體規模以及擬建建築物和結構的平方英尺（如已知）。**

Eversource負責維護一個安全、可靠的電力輸送系統，並被要求滿足聯邦、地區和電力行業的可靠性標準，其中包括植被管理。這需要在樹木提供的環境效益與提供安全、可靠的電力的責任之間取得平衡。位於輸電路權上的高大樹木對電力系統的安全運行構成風險，這可能導致大範圍的電力中斷或其他公共安全問題。 為了始終符合行業標準，最大限度地減少公共安全風險，提高可靠性，並改善惡劣天氣事件期間的系統效能，Eversource制定了一個輸電路權可靠性計畫（TRRP）。TRRP包括沿現有空地邊緣移除輸電路權內的樹木，以增加架空輸電線路與鄰近的、未經維護的植被/森林植被之間的距離。

Eversource正在提議在輸電路權WT-11上實施TRRP，該輸電路權從麻塞諸塞州諾斯菲爾德變電站到麻塞諸塞州勒德洛變電站，長約29.3英里。WT-11包含一條345千伏的架空輸電線路，寬300英尺，維護寬度約為125英尺。擬議的TRRP將通過砍伐輸電路權上目前得到維護部分/森林部分的樹木，將所維護的輸電路權寬度增加到200英尺，從而增加架空輸電線路與鄰近樹木之間的距離。

此外，還會進行通常的維護，包括：

- 地面砍伐，即清除所有不相容的木質植被，至所維護的地面/地役權的輸電路權寬度。所有電線杆/塔架結構、導引線、閘門/屏障和所有「非公路」通道周圍的木質植被均將被清除。在主要道路交叉口和/或輸電路權木質屏障後30英尺處清除木質植被。

- 修剪樹枝和移除危險樹木，這是為了確保在通電的輸電系統的最小距離內，植被不接觸或侵犯輸電線路所必需做的。

**1. 列出預期的MEPA審查門檻（根據301 CMR 11.03條規）（如已知）**

（1）土地

(a) 環境通知書（ENF）和強制性環境影響報告（EIR）。

1.直接改變50英畝或更多的土地。

（2）根據M.G.L. c.的規定，被列入州名錄的物種131A(《麻塞諸塞州瀕危物種法案》)

(b) 如果秘書要求，ENF和其他MEPA審查。

1-2.改變指定的重要棲息地，以及擾亂超過兩英畝的指定優先棲息地（如321 CMR 10.02中所定義），導致州名錄列出的瀕危或受威脅物種或特別關注物種消失。

(3) 濕地、水道、灘涂

(a) 環境通知書（ENF）和強制性環境影響報告（EIR）。

1. a-b.改變一英畝或更多的接壤的植被濕地或改變十英畝或更多的任何其他濕地。

**2. 列出專案所在州、地方和聯邦預期需要的許可證（如已知）。**

- 麻塞諸塞州環境政策法（MEPA）證書
- 美國陸軍工程兵部隊（USACE）的自我核查通知
- 麻塞諸塞州環境保護部 (MassDEP) 401水質認證
- 麻塞諸塞州歷史委員會(MHC)第106條許可
- 麻塞諸塞州自然遺產和瀕危物種計畫（NHESP）麻塞諸塞州瀕危物種法案（MESA）專案審查
- 根據《麻塞諸塞州濕地保護法》和當地濕地法規（如果適用），專案所經過的每個城鎮的條件令（OOC）：
    - 諾斯菲爾德
    - 歐文
    - 溫德爾
    - 蒙塔古
    - 萊弗里特
    - 舒茨伯里
    - 佩勒姆
    - 貝爾徹敦
    - 阿姆赫斯特
    - 格蘭比
    - 勒德洛

**3. 請指認專案場地5英里內的環境正義人群和特徵（少數族裔、收入、英語隔離）（可從EJ地圖檢視器中附上地圖，以代替敘述）。**

見所附地圖。

5.**確定在專案場地1英里半徑範圍內，全部或部分符合DPH EJ工具中「脆弱健康EJ標準」定義的任何城市或人口普查區。**

專案區域位於下列城鎮EJ社區的1英里半徑範圍內：

- 溫德爾：
    - 2012-2016年和2015-2019年（最新資料範圍）的兒童血鉛標準得到滿足。由於病例數量少，這一比率被認為不穩定，因此不可靠。
- 阿姆赫斯特：
    - 2015-2019年（最新資料範圍）的兒童血鉛標準得到滿足。

**6. 請確定可能影響EJ人群的潛在短期和長期環境和公共衛生影響以及任何預期的緩解措施。**

預計本專案不會對EJ人群產生短期或長期的環境影響或公共健康影響。高大的樹木將從底部砍伐，但相容的、低矮的植被將被允許保留，從而使林地永久轉化為早期演替/灌木棲息地。現有路權主要穿過偏遠林地和農業區佔據的農村地區，預計影響僅限於Eversource路權穿過的地產。

**7. 請指出可能會改善環境條件或EJ人群公共健康的專案效益，包括301 CMR 11.02中定義的「環境效益」。**

本專案將為EJ人群的環境條件及/或公共健康帶來以下效益：

- **加強能源的可靠性：**本專案將加強我們的電力系統，確保在需要的地方和時間持續可靠地提供能源，包括向EJ人群供電。停電會擾亂通信、供水和交通運輸服務。如果停電發生在極冷或極熱的溫度下，以及對於那些依賴電力的醫療器械來說，停電可能會特別危險。減少停電發生的可能性將對依賴本輸電線路配電的社區的穩定性產生積極影響，特別是那些可能沒有財力購買發電機、尋找臨時住房或在停電時補充所損失的食物的社區。
- **改善獲得清潔可再生能源的機會：**對於向我們的客戶輸送清潔的可再生能源而言，維護Eversource的輸電線路是必不可少的。
- **棲息地改善：**本專案將擴大和可持續地管理我們路權中的早期演替灌叢/灌木棲息地。這些棲息地由於開發而變得越來越稀少，但對各種野生動物卻至關重要，包括眾多授粉者和珍稀瀕危物種。

**8. 描述社區如何要求召開會議討論專案，以及社區如何要求在會議上提供口譯服務。具體說明如何要求提供其他便利，包括在工作時間之後和在公共交通站點附近的地點舉行會議。**

如需瞭解更多資訊，請與Eversource Energy公司專案服務部專案經理的Dan Burns聯繫：Daniel.p.burns@eversource.com 或（860）728-4630。請具體說明所需的任何便利條件，包括口譯或會議時間/地點，我們將相應地滿足這些需求。

247 Station Drive
Mail Stop NE 390
Westwood, MA 02090

作为我们向客户和社区提供可靠能源的日常工作的一部分，我们正在计划改进您所在地区的电力系统。这一项目将提高马萨诸塞州电网的可靠性，以便我们所有的客户都能够获得可靠的电力，满足他们目前和不断增长的能源需求。

## 我们一直致力为您提供更好的服务

我们正在规划一个输电路权可靠性项目(TRRP )，位于诺斯菲尔德的Eversource诺斯菲尔德变电站之间的路权走廊上，穿过欧文、温德尔、蒙塔古、莱弗里特、舒茨伯里、佩勒姆、贝尔彻敦、阿姆赫斯特和格兰比，到达位于拉德洛的Eversource拉德洛变电站。
输电路权可靠性计划是一项长期的输电系统可靠性和弹性计划，它将维护的路权宽度增加到地役权的边缘。该计划通过减少树木倒伏的风险来提高系统的可靠性，并被证明是创造可持续环境的有效方法——由可与输电线路安全共存的植被组成的环境。
我们的长期管理目标是将这些新开辟的区域作为早期演替栖息地进行管理，并鼓励草类、杂类植物和灌木的生长。

## 更多信息

保持沟通渠道畅通对我们来说很重要。所附表格包括关于本项目的更多信息，您也可以通过daniel.p.burns@eversource.com或860.728.4630联系Daniel Burns。您也可以拨打1-800-793-2202联系我们的项目热线，或发送电子邮件至ProjectInfo@eversource.com，并在主题行中提及拟议的WMA TRRP项目。

我们欢迎您的反馈，并期待着与您更详细地讨论这一项目。

此致,

Daniel Burns

# 附录：环境正义筛查表

| | |
|---|---|
| 项目名称 | WT-11输电路权可靠性计划 |
| 预计在MEPA备案日期 | 2022年5月25日 |
| 提案者名称 | Eversource Energy |
| 联系方式（如顾问） | Dan Burns<br>项目经理 – 项目服务部<br>Eversource Energy<br>Daniel.p.burns@eversource.com<br>办公电话：860-728-4630 |
| 项目的公共网站或其他可以获得项目材料的实际地点（如果有的话） | 不适用 |
| 项目所在的市镇和邮政编码（如已知） | 现有路权上的线性项目<br>穿越的城镇包括：马萨诸塞州诺斯菲尔德、欧文、温德尔、蒙塔古、莱弗里特、舒茨伯里、佩勒姆、贝尔彻敦、阿姆赫斯特、格兰比和拉德洛。 |
| 项目类型*（请列出所有适用的项目类型） | 电力输送 |
| 项目场地是否在规划的100年FEMA洪泛区范围内？是/否/未知 | 是 |
| 空调空间的温室气体排放估算（如已知）（点击**这里**使用温室气体估算工具） | 不适用 |

项目描述

- **提供简短的项目描述，包括项目场地的总体规模以及拟建建筑物和结构物的平方英尺（如已知）。**

Eversource负责维护一个安全、可靠的电力输送系统，并被要求满足联邦、地区和电力行业的可靠性标准，其中包括植被管理。这需要在树木提供的环境效益与提供安全、可靠的电力的责任之间取得平衡。位于输电路权上的高大树木对电力系统的安全运行构成风险，这可能导致大范围的电力中断或其他公共安全问题。 为了始终符合行业标准，最大限度地减少公共安全风险，提高可靠性，并改善恶劣天气事件期间的系统性能，Eversource制定了一个输电路权可靠性计划（TRRP）。TRRP包括沿现有空地边缘移除输电路权内的树木，以增加架空输电线路与邻近的、未经维护的植被/森林植被之间的距离。

Eversource正在提议在输电路权WT-11上实施TRRP，该输电路权从马萨诸塞州诺斯菲尔德变电站到马萨诸塞州拉德洛变电站，长约29.3英里。WT-11包含一条345千伏的架空输电线路，宽300英尺，维护宽度约为125英尺。拟议的TRRP将通过砍伐输电路权上目前得到维护部分/森林部分的树木，将所维护的输电路权宽度增加到200英尺，从而增加架空输电线路与邻近树木之间的距离。

此外，还会进行通常的维护，包括：

- 地面砍伐，即清除所有不兼容的木质植被，至所维护的地面/地役权的输电路权宽度。所有电线杆/塔架结构、导引线、闸门/屏障和所有□非公路□通道周围的木质植被均将被清除。在主要道路交叉口和/或输电路权木质屏障后30英尺处清除木质植被。
- 修剪树枝和移除危险树木，这是为了确保在通电的输电系统的最小距离内，植被不接触或侵犯输电线路所必需做的。

**1. 列出预期的MEPA审查门槛（根据301 CMR 11.03规定）（如已知）**

（1）土地

(a) 环境通知书（ENF）和强制性环境影响报告（EIR）。

1.直接改变50英亩或更多的土地。

（2）根据M.G.L. c.的规定，被列入州名录的物种131A(《马萨诸塞州濒危物种法案》)

(b) 如果秘书要求，ENF和其他MEPA审查。

1-2.改变指定的重要栖息地，以及扰乱超过两英亩的指定优先栖息地（如321 CMR 10.02中所定义），导致州名录列出的濒危或受威胁物种或特别关注物种消失。

(3) 湿地、水道、滩涂

(a) 环境通知书（ENF）和强制性环境影响报告（EIR）。

1. a-b.改变一英亩或更多的接壤的植被湿地或改变十英亩或更多的任何其他湿地。

**2. 列出项目所在州、地方和联邦预期需要的许可证（如已知）。**

- 马萨诸塞州环境政策法（MEPA）证书
- 美国陆军工程兵部队（USACE）的自我核查通知
- 马萨诸塞州环境保护部 (MassDEP) 401水质认证
- 马萨诸塞州历史委员会(MHC)第106条许可
- 马萨诸塞州自然遗产和濒危物种计划（NHESP）马萨诸塞州濒危物种法案（MESA）项目审查
- 根据《马萨诸塞州湿地保护法》和当地湿地法规（如果适用），项目所经过的每个城镇的条件令（OOC）：
    - 诺斯菲尔德
    - 欧文
    - 温德尔
    - 蒙塔古
    - 莱弗里特
    - 舒茨伯里
    - 佩勒姆
    - 贝尔彻敦
    - 阿姆赫斯特
    - 格兰比
    - 拉德洛

**3. 请指认项目场地5英里内的环境正义人群和特征（少数族裔、收入、英语隔离）（可从EJ地图查看器中附上地图，以代替叙述）。**

见所附地图。

5.**确定在项目场地1英里半径范围内，全部或部分符合DPH EJ工具中"脆弱健康EJ标准"定义的任何城市或人口普查区。**

项目区域位于下列城镇EJ社区的1英里半径范围内：

- 温德尔：
  - 2012-2016年和2015-2019年（最新数据范围）的儿童血铅标准得到满足。由于病例数量少，这一比率被认为不稳定，因此不可靠。
- 阿姆赫斯特：
  - 2015-2019年（最新数据范围）的儿童血铅标准得到满足。

**6. 请确定可能影响EJ人群的潜在短期和长期环境和公共卫生影响以及任何预期的缓解措施。**

预计本项目不会对EJ人群产生短期或长期的环境影响或公共健康影响。高大的树木将从底部砍伐，但兼容的、低矮的植被将被允许保留，从而使林地永久转化为早期演替/灌木栖息地。现有路权主要穿过偏远林地和农业区占据的农村地区，预计影响仅限于Eversource路权穿过的地产。

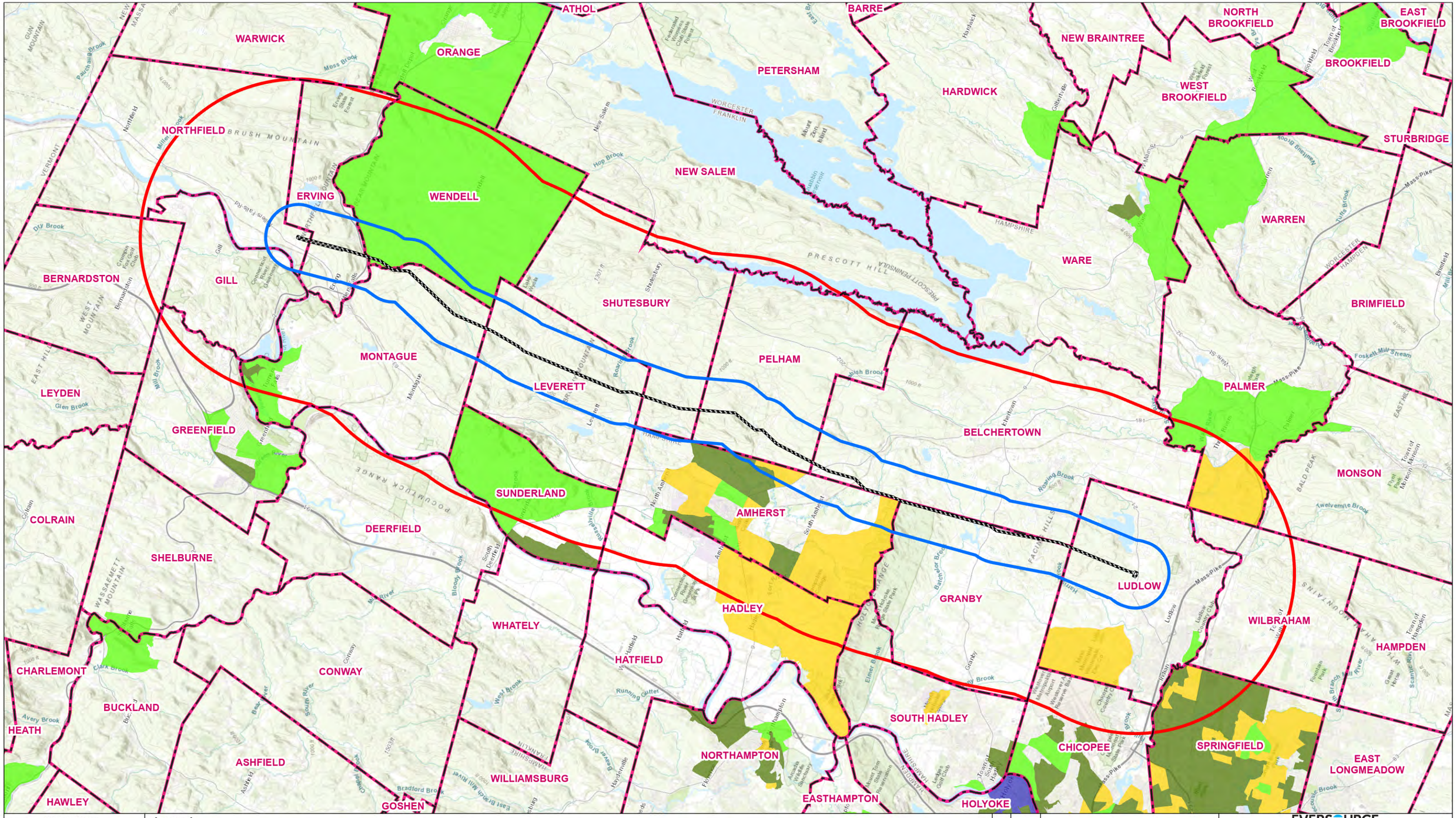
**7. 请指出可能会改善环境条件或EJ人群公共健康的项目效益，包括301 CMR 11.02中定义的"环境效益"。**

本项目将为EJ人群的环境条件及/或公共健康带来以下效益：

- **加强能源的可靠性：**本项目将加强我们的电力系统，确保在需要的地方和时间持续可靠地提供能源，包括向EJ人群供电。停电会扰乱通信、供水和交通运输服务。如果停电发生在极冷或极热的温度下，以及对于那些依赖电力的医疗器械来说，停电可能会特别危险。减少停电发生的可能性将对依赖本输电线路配电的社区的稳定性产生积极影响，特别是那些可能没有财力购买发电机、寻找临时住房或在停电时补充所损失的食物的社区。
- **改善获得清洁可再生能源的机会：**对于向我们的客户输送清洁的可再生能源而言，维护Eversource的输电线路是必不可少的。
- **栖息地改善：**本项目将扩大和可持续地管理我们路权中的早期演替灌丛/灌木栖息地。这些栖息地由于开发而变得越来越稀少，但对各种野生动物却至关重要，包括众多授粉者和珍稀濒危物种。

**8. 描述社区如何请求召开会议讨论项目，以及社区如何请求在会议上提供口译服务。具体说明如何请求提供其他便利，包括在工作时间之后和在公共交通站点附近的地点举行会议。**

如需了解更多信息，请与Eversource Energy公司项目服务部项目经理的Dan Burns联系：Daniel.p.burns@eversource.com 或（860）728-4630。请具体说明所需的任何便利条件，包括口译或会议时间/地点，我们将相应地满足这些需求。




**INDEX MAP**



**Legend**

- Tree Clearing
- 1-Mile Buffer
- 5-Mile Buffer
- Municipal Boundary

MA 2020 Environmental Justice Blockgroups

- Minority
- Income
- Minority and Income
- Minority, Income, and English Isolation

Environmental Justice Blockgroup data source:
MA Executive Office of Energy and Environmental Affairs

1 inch = 15,000 feet

0 1.5 3 Miles

| NO. | DATE | REVISIONS |
|---|---|---|
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EVERSOURCE ENERGY

**WT-11**
**Proximity to Massachusetts Environmental Justice Blockgroups**

NORTHFIELD, ERVING, WENDELL, MONTAGUE, LEVERETT, SHUTESBURY, PELHAM, BELCHERTOWN, AMHERST, GRANBY, AND LUDLOW, MA

Date: March 23, 2022

# ATTACHMENT 6
# RMAT CLIMATE RESILIENCE DESIGN STANDARDS TOOL OUTPUT REPORT

# RMAT Climate Resilience Design Standards Tool Project Report

**Eversource WT-11 TRRP**
Date Created: 5/31/2022 2:05:16 PM Created By: rebecca.weissman [Download]

## Project Summary

Link to Project

Estimated Construction Cost: $4500000.00
End of Life Year: 2062
Project within mapped Environmental Justice neighborhood: Yes

| Ecosystem Benefits | Scores |
|---|---|
| Project Score | Moderate |
| **Exposure** | **Scores** |
| Sea Level Rise/Storm Surge | Not Exposed |
| Extreme Precipitation - Urban Flooding | Moderate Exposure |
| Extreme Precipitation - Riverine Flooding | High Exposure |
| Extreme Heat | High Exposure |




## Asset Summary

Number of Assets: 1

| Asset Risk | Sea Level Rise/Storm Surge | Extreme Precipitation - Urban Flooding | Extreme Precipitation - Riverine Flooding | Extreme Heat |
|---|---|---|---|---|
| Transmission Line 354 | Low Risk | Moderate Risk | High Risk | High Risk |

## Project Outputs

| | Target Planning Horizon | Intermediate Planning Horizon | Percentile | Return Period | Tier |
|---|---|---|---|---|---|
| **Sea Level Rise/Storm Surge** | | | | | |
| Transmission Line 354 | | | | | |
| **Extreme Precipitation** | | | | | |
| Transmission Line 354 | 2070 | | | 25-yr (4%) | Tier 2 |
| **Extreme Heat** | | | | | |
| Transmission Line 354 | 2070 | | 50th | | Tier 2 |

## Scoring Rationale - Exposure

### Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

### Extreme Precipitation - Urban Flooding

This project received a "Moderate Exposure" because of the following:

- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- No historic flooding at project site
- No increase to impervious area

- Existing impervious area of the project site is less than 10%

**Extreme Precipitation - Riverine Flooding**

This project received a "High Exposure" because of the following:

- Part of the project is within a mapped FEMA floodplain, outside of the Massachusetts Coast Flood Risk Model (MC-FRM)
- Part of the project is within 100ft of a waterbody
- No historic riverine flooding at project site
- Project is not likely susceptible to riverine erosion

**Extreme Heat**

This project received a "High Exposure" because of the following:

- 30+ days increase in days over 90 deg. F within project's useful life
- Existing trees are being removed as part of the proposed project
- Existing impervious area of the project site is less than 10%
- Located within 100 ft of existing water body
- No increase to the impervious area of the project site

## Scoring Rationale - Asset Risk Scoring

**Asset - Transmission Line 354**
Primary asset criticality factors influencing risk ratings for this asset:

- Asset may inaccessible/inoperable for more than a day but less than a week after natural hazard event
- Loss/inoperability of the asset would have state-wide or greater impacts
- The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses
- Inoperability is likely to significantly impact other facilities, assets, or buildings and will likely affect their ability to operate
- There are no hazardous materials in the asset

## Project Design Standards Output

Asset: Transmission Line 354 — Infrastructure

**Sea Level Rise/Storm Surge** — Low Risk

**Applicable Design Criteria**

**Projected Tidal Datums:** No
**Projected Water Surface Elevation:** No
**Projected Wave Action Water Elevation:** No
**Projected Wave Heights:** No
**Projected Duration of Flooding:** No
**Projected Design Flood Velocity:** No
**Projected Scour & Erosion:** No

**Extreme Precipitation** — Moderate Risk

Target Planning Horizon: 2070
Return Period: 25-yr (4%)

**Applicable Design Criteria**

**Tiered Methodology:** Tier 2

**Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms:** Yes

| Asset Name | Recommended Planning Horizon | Recommended Return Period (Design Storm) | Projected 24-hr Total Precipitation Depth (inches) | Step-by-Step Methodology for Peak Intensity |
|---|---|---|---|---|
| Transmission Line 354 | 2070 | 25-Year (4%) | 8.2 | Downloadable Methodology PDF |

*Limitations*: While precipitation depth is useful for project planning and design, rainfall distribution and peak intensity of the design storm is recommended to also be considered. Lower-intensity, longer-duration storms allow time for infiltration and reduce the load on the infrastructure system over the duration of the storm. Higher-intensity, shorter-duration storms often have higher runoff volumes because the water does not have enough

time to infiltrate and infrastructure systems (e.g., catch basins) and may overflow or back up during such storms. In the Northeast, short -duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. These events can result in the rapid inundation of the asset project location. Design should consider both short- and long-duration precipitation events and how they may impact the asset.

The precipitation values provided by this Tool (version 1) are recommended to inform planning and design, but they do not guarantee that the asset will be protected from or be able to withstand an extreme precipitation event. The planning, design, and review guidance accompanying these values is general and projects are encouraged to do their own due diligence to understand the vulnerability of their asset.

**Projected Riverine Peak Discharge & Peak Flood Elevation:** Yes

**Extreme Heat** High Risk

Target Planning Horizon: 2070
Percentile: 50th Percentile

**Applicable Design Criteria**

**Tiered Methodology:** Tier 2

**Projected Annual/Summer/Winter Average Temperatures:** Yes
**Projected Heat Index:** Yes
**Projected Growing Degree Days:** No
**Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F:** Yes
**Projected Number of Heat Waves Per Year & Average Heat Wave Duration:** Yes
**Projected Cooling Degree Days & Heating Degree Days (base = 65°F):** No

## Project Inputs

**Core Project Information**

| | |
|---|---|
| Name: | Eversource WT-11 TRRP |
| Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)? | 2062 |
| Location of Project: | Amherst, Belchertown, Erving, Granby, Leverett, Ludlow, Montague, Northfield, Pelham, Shutesbury, Wendell |
| Estimated Capital Cost: | $4,500,000 |
| Who is the Submitting Entity? | Private Other NSTAR Electric Company d/b/a Eversource Energy<br>Rebecca Weissman (rebecca.weissman@swca.com) |
| Is this project being submitted as part of a state grant application? | No |
| Which grant program? | |
| What stage are you in your project lifecycle? | Permitting |
| Is climate resiliency a core objective of this project? | Yes |
| Is this project being submitted as part of the state capital planning process? | No |
| Is this project being submitted as part of a regulatory review process or permitting? | Yes |
| Brief Project Description: | NSTAR Electric Company d/b/a Eversource Energy (Eversource) is proposing the WT-11 Transmission Right-of-way Reliability Program (the Project). The proposed Project will provide enhanced reliability of the electric grid by expanding the existing maintained (cleared) right-of-way (ROW). The transmission line corridor extends approximately 29.3 linear miles from the Northfield substation in Northfield, Massachusetts, crossing through Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, and Granby, to the Ludlow Substation in Ludlow, Massachusetts. The WT-11 ROW contains Line 354, which is a 345-kilovolt (kV) overhead transmission line within an approximate 300-foot-wide ROW. The expansion will consist of the trimming and/or removal of trees such that the ROW, which is currently maintained at an average width of approximately 125 feet, will be maintained at an average width of approximately 200 feet once the Project is complete. The Project will require: an ENF and mandatory EIR from MEPA; an Order of Conditions from each town conservation commission, a 401 Water Quality Certification from MassDEP, and a Conservation & Management Permit from NHESP. |
| Project Submission Comments: | The purpose of the Project is to enhance the reliability and climate resiliency of Eversource's grid by ensuring that tall-growing trees are kept further away from the active 345-kV Line 354. |

**Project Ecosystem Benefits**

**Factors Influencing Output**

✓ Project reduces storm damage
✓ Project promotes decarbonization
✓ Project protects fisheries, wildlife, and plant habitat
✓ Project provides pollinator habitat
✓ Project improves air quality

**Factors to Improve Output**

✓ Incorporate nature-based solutions that may provide flood protection
✓ Protect public water supply by reducing the risk of contamination, pollution, and/or runoff of surface and groundwater sources used for human consumption
✓ Incorporate green infrastructure or nature-based solutions that recharge groundwater
✓ Incorporate green infrastructure to filter stormwater
✓ Incorporate nature-based solutions that improve water quality
✓ Incorporate nature-based solutions that sequester carbon carbon
✓ Preserve, enhance, and/or restore coastal shellfish habitats
✓ Identify opportunities to remediate existing sources of pollution
✓ Provide opportunities for passive and/or active recreation through open space
✓ Increase plants, trees, and/or other vegetation to provide oxygen production
✓ Identify opportunities to prevent pollutants from impacting ecosystems
✓ Incorporate education and/or protect cultural resources as part of your project

**Is the primary purpose of this project ecological restoration?**

No

**Project Benefits**

| | |
|---|---|
| Provides flood protection through nature-based solutions | No |
| Reduces storm damage | Yes |
| Recharges groundwater | No |
| Protects public water supply | No |
| Filters stormwater using green infrastructure | No |
| Improves water quality | No |
| Promotes decarbonization | Yes |
| Enables carbon sequestration | No |
| Provides oxygen production | No |
| Improves air quality | Yes |
| Prevents pollution | No |
| Remediates existing sources of pollution | No |
| Protects fisheries, wildlife, and plant habitat | Yes |
| Protects land containing shellfish | No |
| Provides pollinator habitat | Yes |
| Provides recreation | No |
| Provides cultural resources/education | No |

**Project Climate Exposure**

| | |
|---|---|
| Is the primary purpose of this project ecological restoration? | No |
| Does the project site have a history of coastal flooding? | No |
| Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)? | Unsure |
| Does the project site have a history of riverine flooding? | Unsure |
| Does the project result in a net increase in impervious area of the site? | No |
| Are existing trees being removed as part of the proposed project? | Yes |

**Project Assets**

Asset: Transmission Line 354
Asset Type: Utility Infrastructure
Asset Sub-Type: Energy (electric, gas, petroleum, renewable)
Construction Type: Maintenance (environmental)
Construction Year: 2022
Useful Life: 40

**Identify the length of time the asset can be inaccessible/inoperable without significant consequences.**
Infrastructure may be inaccessible/inoperable for more than a day, but less than a week after natural hazard without consequences.

**Identify the geographic area directly affected by permanent loss or significant inoperability of the infrastructure.**
State-wide or greater impacts

**Identify the population directly served that would be affected by the permanent loss or significant inoperability of the infrastructure.**
Greater than 100,000 people

**Identify if the infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.**
The infrastructure provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

**Will the infrastructure reduce the risk of flooding?**
No

**If the infrastructure became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?**
Inoperability of the infrastructure would result in moderate or severe injuries or moderate or severe impacts to chronic illnesses

**If there are hazardous materials in your infrastructure, what are the extents of impacts related to spills/releases of these materials?**

There are no hazardous materials in the infrastructure

**If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?**

Significant – Inoperability is likely to impact other facilities, assets, or buildings and result in cascading impacts that will likely affect their ability to operate

**If the infrastructure was damaged beyond repair, how much would it approximately cost to replace?**

Less than $10 million

**Does the infrastructure function as an evacuation route during emergencies? This question only applies to roadway projects.**

No

**If the infrastructure became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?**

No impact on surrounding natural resources is expected

**If the infrastructure became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the infrastructure is not able to serve or operate its intended users or function)?**

Loss of infrasturcture may reduce the ability to maintain most government services, while some sevices will still exist

**What are the impacts to loss of confidence in government resulting from loss of infrastructure functionality (i.e. the infrastructure asset is not able to serve or operate its intended users or function)?**

Loss of confidence in Commonwealth

## Report Comments

The purpose of the Project is to enhance the reliability and climate resiliency of Eversource's grid by ensuring that tall-growing trees are kept further away from the active 345-kV Line 354.

# ATTACHMENT 7
# QUANTITATIVE CARBON ANALYSIS

# Quantitative Carbon Analysis

# WT-11 Transmission Right-of-Way Reliability Program (TRRP) Project Carbon Accounting

# Northfield, Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, Granby, Ludlow, Massachusetts

**AUGUST 2025**

PREPARED FOR

**NSTAR Electric Company d/b/a**
**Eversource Energy**
**Westwood, Massachusetts**

PREPARED BY

**SWCA Environmental Consultants**

# EXECUTIVE SUMMARY

The proposed WT-11 Transmission Right-of-Way Reliability Program (TRRP) Project is part of Eversource's effort to provide enhanced reliability of the electric grid by expanding the maintained (cleared) width of the ROW to minimize the potential for outages caused by trees falling onto the 312, 354 and 1604 electric transmission lines.

To accomplish this goal, it will be necessary to remove vegetation capable of growing to a height exceeding 30 feet from 285.6 acres of existing ROW and then manage that acreage such that tall growing tree species are periodically removed while other tree, shrub, and grass species continue to grow.

This analysis was prepared to inform the Massachusetts Environmental Protection Act office of the change in greenhouse gas (GHG) emissions that may be brought about by the Project. Following the Council on Environmental Quality's January 2023 Interim National Environmental Policy Act Guidance on Greenhouse Gas Emissions,[1] this includes an analysis of the net GHG emissions.

From a GHG accounting perspective, the Project could result in the following changes.

1. Approximately 61,062 U.S. tons of $CO_2e$ currently sequestered in live biomass, forest soil, dead wood, and litter may be released due to vegetation clearing and/or soil disturbance.
2. The conversion of wooded habitat to low-growing herbaceous and woody shrub habitat will reduce the rate of future GHG sequestration within the Project footprint, resulting in a potential Project-related increase of approximately 18,735 U.S. tons of CO2e.
3. More than 944 U.S. tons of CO2e will likely not be emitted because of Project-related increases in reliability.
4. An unquantified amount of GHG will not be released each time increased grid resiliency enables peak demand to be met by generation at the Northfield Mountain Pumped Storage Hydropower Facility rather than a fossil fuel fired peaking unit.

Thus, the Project is expected to increase $CO_2e$ emissions by less than 78,853 U.S. tons over its 40-year lifespan, less any GHG not released due to increased grid reliability. This equates to approximately 1,971 U.S. tons CO2e annually which is equivalent to the annual emissions associated with about 75 Massachusetts households.

[1] 88 Federal Register 1196. Available at: https://www.federalregister.gov/documents/2023/01/09/2023-00158/national-environmental-policy-act-guidance-on-consideration-of-greenhouse-gas-emissions-and-climate.

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# 1 PURPOSE AND NEED

The proposed WT-11 Transmission Right-of-Way Reliability Program (TRRP) Project (hereafter the Project) is part of Eversource's effort to enhance electric grid reliability by expanding the maintained (cleared) width of the ROW to minimize the potential for outages caused by trees falling onto the lines. This transmission line corridor extends approximately 29.3 miles from the Northfield Substation in Northfield, Massachusetts, south through the towns of Erving, Wendell, Montague, Leverett, Shutesbury, Pelham, Belchertown, Amherst, and Granby, to the Ludlow Substation in Ludlow, Massachusetts.

Approximately 1.3 miles of the corridor is currently cleared of trees and maintained as low-growing vegetation at a width of approximately 335 feet. The remaining 28 miles is maintained at a width of between 125 and 135 feet. The proposed expansion will consist of the removal of tall-growing trees and shrubs, those that have mature heights greater than 30 feet, such that the ROW will be maintained at an average width of approximately 250-500 feet once the Project is complete. This newly cleared area will become part of the regularly managed portion of the ROW following completion of the Project and will be maintained in the future. Overall, widening the managed portion of the ROW would result in the conversion of 285.6 forested acres to scrub-shrub habitat.

This analysis was prepared to inform the Massachusetts Environmental Protection Act office of the change in greenhouse gas (GHG) emissions that may be brought about by the Project.

# 2 METHODOLOGICAL OVERVIEW

This assessment is designed to provide the best practical estimate of the net change in GHG emissions brought about by the Project. The estimate considers multiple biophysical and behavioral processes that will have a material effect on the actual Project-related change in GHG emissions. In preparing this estimate it is acknowledged that the scientific community has studied some processes extensively and so their effects are characterized with a relatively high degree of precision; other processes have been subject to less study and so are characterized with less precision.

Project-related changes in GHG emissions are estimated as a function of four processes:

1. Some carbon currently sequestered in live biomass, forest soil, dead wood, and litter may be released to the atmosphere due to the tree clearing process.
2. When mature trees are cleared and younger trees and scrub/shrub species are allowed to replace them, there will be a reduction in the rate at which carbon is sequestered in the future.
3. Some GHG will not be emitted because the Project will reduce the probability of future power outages.
4. Some GHG will not be emitted because the Project will reduce the probability that tree fall-in will prevent the Northfield Mountain Pumped Storage Hydropower Facility from supplying power to the grid and so require fossil fuel fired peaking units to be dispatched.

The methods used to quantify the change in GHG emission associated with each process are outlined in Sections 2.1, 2.2, and 2.3, respectively.

## 2.1 Release of Currently Sequestered Carbon

Living trees and plants absorb carbon dioxide ($CO_2$) from the air. As part of the photosynthetic process, the oxygen and carbon molecules are separated; the oxygen is released back into the air while the carbon

becomes part of the tree or plant itself. In a functioning forest, the carbon removed from the air is stored in one of four pools: 1) aboveground live biomass, 2) belowground live biomass (roots), 3) soil organic carbon, or 4) dead wood and forest litter.

When trees are cleared from an area, some of the stored carbon that would otherwise remain sequestered in the four pools may be released back into the atmosphere as carbon dioxide. To determine "how much" extra carbon dioxide is released when forests are disturbed, it is necessary to understand both the biophysical processes that cause carbon dioxide to be released from the various carbon pools as well as the human behaviors that often act to mitigate those tree-clearing-related releases.

For example, if an acre of forest is cut and used as timber, the resulting GHG emission estimate must account for not only the change in the amount of carbon released from the forested footprint, but also the series of market changes that arise because unanticipated logs are introduced into the timber market, which will tend to reduce the amount of acreage cleared for timber at some other location. This "market based" effect is commonly referred to as "leakage."[2] To illustrate the leakage concept, consider the following hypothetical example.

1. Imagine a community that clears 50 acres of forest each summer to produce 500 cords of wood, which they burn for home heating.
2. Now assume that a ROW project that affects 50 acres of forest results in 500 cords of firewood being unexpectedly introduced into the community's firewood supply chain in the fall season.
3. The additional 500 cords of firewood entering the market in the fall will not cause the community to burn 1,000 cords of wood in the winter. Given the increased availability of firewood, they might increase usage to 600 cords and save the remaining 400 cords for the following year.
4. When the following summer arrives, the community will already have 400 cords of firewood available. As such, rather than clearing 50 acres of forest to meet their needs, they will only clear 10 acres to ensure that a total of 500 cords of firewood is available.

In this hypothetical example, absent any ROW management, the community would have cleared 100 acres of forest to create two years' worth of firewood. Because ROW management increased the local firewood supply, the community cleared only 60 acres (50 in the first summer and 10 in the second summer). Along with the 50 acres cleared because of the ROW project, this brings the total amount of forest clearing over the two years to 110 acres. Thus, the ROW project caused total forest clearing to increase from 100 acres to 110 acres and carbon accounting is properly based on the 10-acre net increase in tree clearing brought about by the ROW project. In other words, because logs were placed into the firewood market, economic linkages offset 80 percent of the GHG releases that might otherwise be associated with the ROW management.

To estimate the effect of leakage in the context of this Project, it is noted that the Climate Action Reserve's Climate Forward Reforestation Methodology, Version 2.0 (2022), suggests that, when project logs are placed into markets, and so long as the projects do not occur on existing commercial forest land, leakage is likely to offset 24 to 50 percent of the GHG changes that would otherwise be associated with a project.

[2] The Intergovernmental Panel on Climate Change (IPCC) *Special Report on Land Use, Land Use Change and Forestry* defines leakage as "…the indirect impact that…an activity in a certain place at a certain time has on carbon storage at another place or time" (IPCC 2000, section 2.3.5.2, p. 71). From an economics perspective, leakage occurs when a project causes a shift in market equilibria that results in market participants behaving in a manner that offsets (either partially or in its entirety) a change in GHG emission that would otherwise be brought about by a project. Streck (2022) is an informative primer on leakage.

Herein it is assumed that, when project logs are used as timber, firewood, or other forestry products, leakage reduces the amount of GHG release that would otherwise be associated with that forest clearing by 50 percent (i.e., the upper end of the Climate Action Reserve's range). The upper end of the "leakage range" was selected based on a firewood and heating oil analysis by the Alaska Department of Conservation (2019) and an analysis of general energy use in U.S. buildings by the Energy Information Administration (EIA) (2021). SWCA believes 50 percent is more likely to understate than overstate the true effect of leakage because the wood at issue will either be provided at no cost as part of firewood donation programs or be provided at no cost to either landowners or vegetation management contractors to utilize for a productive use of their choosing. In contrast, the 24 to 50 percent range and the associated literature on leakage is generally based on modest price differentials instead of products being provided at "near-zero costs."

## 2.2 Scrub-Shrub Habitat Replaces Hardwood Habitat

When mature trees are removed and scrub-shrub and younger trees replace them, the rate of carbon sequestration will change.

This assessment conservatively assumes that, outside of ROW maintenance, forest that is cleared for some useful enterprise will rapidly revert to a forested state. Forest cleared as part of ROW maintenance will be maintained as scrub-shrub habitat. Therefore, all acres within the ROW are subject to habitat conversion. In other words, the rate of carbon sequestration is not adjusted for leakage.

## 2.3 Grid Reliability and Resiliency

There are three main steps required to get electricity to a home or business: generation, transmission, and distribution. Generation refers to the process of converting energy including fossil fuels (coal, oil, and natural gas), nuclear reactions (fission), and renewable sources (such as solar, wind, geothermal and hydroelectric power) into electricity. Transmission refers to transporting electricity, typically over long distances, from the place where the electricity is created to the areas where it is needed. Distribution is the process of transferring electricity over the relatively short distance from the end of the transmission cables to an end user (Resources for the Future 2022).

The Project will occur along the existing WT-11 transmission corridor, which contains Line 312, Line 1604, and Line 354. These lines are a regionally important component of the bulk power system (BPS) that transmits electricity throughout New England. As a result, if the ability of these lines to reliably transmit power is interrupted, two GHG emitting events could occur.

1. Power outages could occur throughout Massachusetts and New England. When outages occur, GHG releases increase as back-up generating units are dispatched, food spoilage increases, and adverse impacts to industry[3] are addressed. Therefore, each time the Project prevents an outage that otherwise would occur (i.e., when the reliability of Line 312, Line 1604 and Line 354 are increased), a spike in GHG emissions is avoided. This effect is quantified by reviewing historic data describing the spike in GHG emission that occurs when the power goes out.

2. Fossil fuel fired peaking units that otherwise would not be dispatched may need to be called up to make up for electricity that would otherwise be put onto the grid by the lower-carbon Northfield Mountain Pumped Storage Hydropower Facility. Because the full grid analysis required to

[3] Industry is sensitive to outages as well as short-duration voltage fluctuations (i.e., flickers). The sensitivity arises from, among other reasons, the need to replace damaged manufacturing equipment, remanufacture products that were being produced when an outage or flicker occurred, and/or bring production processes back up to temperature or speed.

estimate the expected GHG reduction associated with the prevention of otherwise unnecessary dispatches is beyond the scope of this assessment, this effect is discussed but not quantified.

# 3 DETAILED CALCULATIONS

## 3.1 Release of Currently Sequestered Carbon

Table 1 illustrates the calculations used to estimate the amount of currently sequestered carbon potentially released because of the Project. The reasoning behind each input and calculation is described in the remainder of this section.

### *3.1.1 Leakage Adjusted Acres*

Eversource is working with landowners, its contractors, local organizations, and the state to ensure, to the maximum extent practical, that the wood felled as a result of the Project will be used in some productive enterprise. These actions not only benefit communities directly, but they also reduce the level of GHG emission that would otherwise be associated with the Project.

To determine the actual change in carbon emission brought about by the Project, it is necessary to consider if and how people will use the trees felled as a result of the Project. This analysis identifies four potential fates for these trees.

1. It is likely that some wood will be retained and used by adjacent landowners. Based on Eversource's recent experience with landowners, it is conservatively assumed that 30 percent of the wood felled as a result of the Project will be retained and used by landowners. This is equivalent to 85.7 of the 285.6 total acres affected by the Project.
2. Wood not retained by landowners may be taken to sawmills (or other commercial wood users) at the discretion of Eversource's vegetation management contractors. However, because Eversource does not *require* its contractors to remove marketable wood to sawmills or other commercial wood users, this assessment conservatively assumes none of the wood felled because of the Project will be taken to sawmills or other commercial wood users.
3. Nine acres (3.2% of the 285.6 total acres) are assigned the fate "donated for use as firewood."[4] As previously noted, so long as felled wood is used for some useful enterprise, market behavior (i.e., reverse market leakage) will offset some of the GHG emissions that would otherwise be associated with the forest disturbance.
4. The remaining 66.8% percent of the Project-related forest disturbance (190.9 acres) is assigned the fate "left in place."

Therefore, 33.2 percent of the 285.6 forested acres cleared as a result of the Project (94.7 acres) will be used in some productive enterprise. As discussed in Section 2.1, a 50 percent forest leakage adjustment implies that, because of Eversource's actions, 47.3 acres of forest at some other location that otherwise would have been cleared, will remain forest. As such, the leakage-adjusted forested acreage reported in Table 1 is 238.3. This is calculated by subtracting 47.3 *Acres of Forest Not Cleared Elsewhere Due to Leakage* from 285.6 *Acres of Project-Related Forest Clearing*.

[4] A previous project saw approximately 0.815 cords of firewood donated per project acre. At this rate, scaled to the Project's 279.5 acres, it is assumed that approximately 228 cords of firewood will be donated to nearby communities. With a yield of 20 to 30 cords of firewood per acre for mature northeast forest, we calculate about 9 acres will be used to generate firewood that will be donated to communities.

**Table 1. Project-Related Release of Currently Sequestered Carbon**

| Carbon Pool | Acres | Leakage Adjusted Acres | Carbon At Risk of Release (U.S. tons per acre) | Proportion of At-Risk Carbon Released to the Air over 100 Years Due to the Project | Project-Related Release of Carbon from the Affected Footprint (U.S. tons) | Project-Related Release of $CO_2e$ from the Affected Footprint (U.S. tons) |
|---|---|---|---|---|---|---|
| Aboveground Live Biomass | 285.6 | 238.3 | 43.9 | 0.9375 | 9,808 | 35,936 |
| Belowground Live Biomass | 285.6 | 238.3 | 8.08 | 0.6800 | 1,309 | 4,797 |
| Soil Organic Carbon | 285.6 | 238.3 | 71.38 | 0.800 | 1.361 | 4,986 |
| Dead Wood and Litter | 285.6 | 238.3 | 18.19 | 0.9660 | 4,187 | 15,343 |
| | | | | **Total** | **16,665** | **61,062** |

### 3.1.2 Carbon At Risk of Release

The amount of carbon currently sequestered in each carbon pool was estimated using the U.S. Forest Service (USFS) EVALIDator application. EVALIDator produces a variety of population estimates based on current data from the Forest Inventory and Analysis Database (FIADB) (USFS 2024).

EVALIDator allows the user to specify circles on a map and then reports carbon values from test plots within the circle. For this analysis, data were obtained from eight adjacent circles each with a 4-mile diameter. The center of the first circle was placed at the Northfield Substation, the center of the next circle was placed approximately 4.2 miles further south along the Right-of-Way. This progression continued until the final circle was centered on the Ludlow Substation.

Because one of the eight circles did not contain any test plots, the amount of carbon in each carbon pool was estimated as the mean of the data associated with 7 circles. These means are reported in Table 1 under "Carbon at Risk of Release (U.S. tons per acre)".

As indicated in the following bullets, the estimates derived from EVALIDator are generally higher than those reported elsewhere. Thus, the use of EVALIDator is considered a conservative[5] approach.

- The U.S. Forest Service (USFS) (2018a)[6] reports the amount of carbon stored as **aboveground live biomass** for three mature (80- to 100-year-old) New England hardwood forest types: 30.9 U.S. tons per acre (reported as 28 metric tons per acre) for northern hardwood, 35.3 U.S. tons per acre (reported as 32 metric tons per acre) for oak-pine, and 36.4 U.S. tons per acre (reported as 33 metric tons per acre) for oak-hickory. These estimates are materially less than the 43.9 U.S. tons per acre estimated using EVALIDator and reported in Table 1.
- The USFS (2018a) reports the amount of carbon stored as **belowground live biomass** for three mature (80- to 100-year-old) New England hardwood forest types: 5.5 U.S. tons per acre (reported as 5 metric tons per acre) for northern hardwood and 7.7 U.S. tons per acre (reported as 7 metric tons per acre) for oak-pine and oak-hickory. These estimates are somewhat less than the 8.08 U.S. tons per acre estimated using EVALIDator and reported in Table 1.
- Catanzaro and D'Amato (2019) cite data from the USFS (2018a) in reporting the amount of carbon stored in **forest soils** for three mature (80- to 100-year-old) New England hardwood forest types: 30.9 U.S. tons per acre (reported as 28 metric tons per acre) for northern hardwood, 29.8 U.S. tons per acre (reported as 27 metric tons per acre) for oak-pine, and 23.1 U.S. tons per acre (reported as 21 metric tons per acre) for oak-hickory. Thompson et al. (2020) reports that an acre of generic forest soil in Massachusetts may contain as much as 124.4 U.S. tons of soil organic carbon; this is considerably more than the USFS (2018a) reports for mature hardwood forests in New England. Indeed, on pages 54 and 55 of their report, Thompson et al. note that the 124.4 estimate "is much higher than most other forest estimates from the region." They go on to site studies at the Harvard Forest in central Massachusetts and at the Hubbard Brook experimental forest in New Hampshire where soil organic content was more in line with USFS reports. The value in Table 1, 71.38 U.S. tons per acre, fall between the two disparate estimates included in the literature.
- Catanzaro and D'Amato (2019) cite data from the USFS (2018a) in reporting the amount of carbon stored as **dead wood and forest litter** for three mature (80- to 100-year-old) New England hardwood forest types: 17.6 U.S. tons per acre (reported as 5 metric tons per acre of dead

[5] As used here, conservative methods are more likely to overstate carbon-at-risk than they are to understate carbon-at-risk.

[6] See instead page 4 of Catanzaro and D'Amato (2019) for a user-friendly summary of the USFS (2018a) data.

wood and 11 metric tons per acre of litter) for northern hardwood, 17.6 U.S. tons per acre (reported as 4 metric tons per acre of dead wood and 12 metric tons per acre of litter) for oak-pine, and 8.8 U.S. tons per acre (reported as 5 metric tons per acre of dead wood and 3 metric tons per acre of litter) for oak-hickory. These estimates are all less than the 18.19 U.S. tons per acre estimated using EVALIDator and reported in Table 1.

### 3.1.3 Proportion of At-Risk Carbon Released to the Air over 40 Years

Existing literature was reviewed to estimate the proportion of carbon currently sequestered in each carbon pool likely to be released to the air over the 40-year Project lifespan. These estimates are reported in Table 1 and the basis of each estimate is described in the following bullets.

- Not all carbon stored as *aboveground live forest biomass* will be released over the 40-year project lifespan. Russell et al. (2014) report that hardwood left to decay has a half-life of 10 years. This implies that, over 40 years, 93.75% of the carbon stored in this pool will be released into the air while 6.25% will remain sequestered. Thus, Table 1 reports that 93.75% of the carbon at-risk at risk of release that is currently stored as ***aboveground live forest biomass*** will be released to the air because of the Project.
- Not all carbon stored as belowground live biomass will be released over the 40-year project lifespan. Lundholm et al. (2020) reported a weighted average half-life of 17.5 years. This implies that, over 40 years, 80% of the carbon stored in this pool will be released while 20% remains sequestered. Additionally, approximately 85% of the carbon released when belowground biomass decays will enter the atmosphere. The remaining 15% is metabolized by heterotrophs in the soil and eventually contributes to soil organic carbon through a biophysical process known as fragmentation (Bond-Lamberty and Gower 2008). Thus, Table 1 reports that 68% of the at-risk carbon currently stored as ***belowground live forest biomass*** will be released to the air because of the project. This is calculated as the product of a 0.80 probability of release and a 0.85 probability that release will be to the air.
- Activities that expose sub-surface soils to the air, such as tree cutting, may result in the release of some carbon that would otherwise remain sequestered in the soil. Thompson et al. (2020), reports that tree cutting associated with commercial forestry is not likely to release carbon from forest soil. Thompson et al. (2020) note that their conclusion is consistent with the observation that, when measured, the carbon content of soils in yards did not differ from the carbon content of soils in forests adjacent to those yards. However, on page 55 of their report, Thompson et al. also note that in assuming commercial tree clearing does not cause any release of carbon stored in forest soils, they may understate the potential for carbon release. This concern was based on a metanalysis by Nave et al. (2010), which studied "harvest impacts on soil carbon in temperate forests worldwide [and] found that, on average, harvesting reduced soil carbon stocks by 8%, though the impacts can be ephemeral." Thus, Table 1 conservatively reports that 8% of the at-risk carbon currently stored in ***forest soils*** will be released to the air because of the Project.
- Carbon stored in the dead wood and forest litter pool is constantly being released into the air or soil and constantly being replenished as trees die and leaves or needles drop. Because Section 3.2 (Habitat Conversion) uses net carbon sequestration rates for each habitat, this assessment appropriately accounts for carbon loss by assigning all carbon stored in the dead wood and forest litter pool the fate of "potentially released to the air because of the project." Russel et al. (2014) report that hardwood left to decay has a half-life of 10 years. This implies that, over 40 years, 93.75% of the carbon stored in dead wood (9.82 U.S. tons per acre) will be released to the air while 6.25% will remain sequestered. This assessment assumes that all the forest litter (8.37 U.S.

tons of carbon per acre) will decay over 40 years. Thus Table 1 reports that 96.6% of at-risk carbon currently stored as ***dead wood or forest litter*** will be released to the air because of the Project.[7]

### 3.1.4 Project-Related Release of Carbon and $CO_2e$ from the Affected Footprint

The Project-related release of carbon from the affected footprint is calculated as the product of three Table 1 inputs: a*) leakage adjusted acres*; b) *carbon at risk of release denominated as U.S. tons per acre*; and c) *the proportion of at-risk carbon released to the air over 40 years due to the Project*.

The Project-related release of $CO_2e$ from the affected footprint is calculated *as the Project-related release of carbon from the affected footprint ÷ 0.27292 tons of carbon per ton of $CO_2$.*

## 3.2 Scrub-Shrub Replaces Hardwood

When mature trees and vegetation are removed and replaced with scrub-shrub and younger trees, the rate of future carbon sequestration is reduced. Herein, the change in annual sequestration rates is based on the following observations.

- Catanzaro and D'Amato (2019) estimate an average annual carbon sequestration rate for Massachusetts forests of 1.66 U.S. tons of carbon dioxide equivalents ($CO_2e$) per acre. Their estimate is based on Smith et al. (2006), who report that the annual rate of carbon sequestration in a typically aged (around 100 years old) New England maple–beech–yellow birch forest is around 0.41 metric tons of carbon per acre-year.[8]
- While the affected acreage will still sequester carbon after the Project, it will likely do so at a rate estimated to be around 0.02 U.S. ton of CO2e per acre.[9]

Considering the preceding bullets, this assessment assumes that the existing trees would sequester 1.66 U.S. tons of CO2e per acre-year if left undisturbed, while the scrub shrub habitat that will replace it will sequester 0.02 U.S. ton of CO2e per acre-year. Therefore, the change in the amount of carbon sequestered is 1.64 U.S. tons of CO2e per acre-year.

Forest covers 285.6 acres of the Project area; therefore, the amount of carbon not sequestered over the 40-year Project lifetime is estimated to be 18,735.4 U.S. tons of CO2e (calculated as 285.6 forest acres × 1.64 tons of $CO_2e$ sequestration lost annually × 40 years).

## 3.3 Reliability and Resiliency

Damage to the Lines in the WT-11 transmission corridor can result in GHG emission increases if the damages result in outages and/or if the damage results in the dispatching of fossil fuel fired peaking units.

[7] The proportion of carbon stored in dead wood and forest litter that will be released to the air is 99.95%. This is calculated as the proportion of carbon stored in dead wood multiplied by the proportion released over 100 years, plus the proportion of carbon stored in litter, or 0.54 x 0.999 + 0.46.

[8] Smith et al. (2006) reports 0.41 metric tons of carbon per acre year. This is equivalent to 0.45 U.S. tons of carbon per acre year which is equivalent to 1.66 U.S. tons of $CO_2e$ per acre.

[9] See Table 3-2 of Gregg et al. (2021) which reports a carbon sequestration rate of 0.054 ton of CO2e per hectare-year for heathland which is used as a proxy for scrub shrub.

### 3.3.1 Outages

From 2014 through 2023 (inclusive) the Lines at issue experienced two outages involving contact with vegetation. An outage in 2016 lasted for approximately 12 hours; an outage in 2020 lasted for approximately 28 hours.

Absent the Project, a combination of encroaching vegetation and an increased frequency and intensity of climate events is expected to increase the rate of incidents with some potentially resulting in customer outages. By reducing the risk of vegetation-related outages along the WT-11 Right-of-Way, the Project will reduce the potential for future outages and flickers.

Kenward and Raja (2014) report that between 2003 and 2014, weather-related power outages[10] affected an average of 15 million U.S. homes or businesses each year. These outages, which result primarily from damages to transmission lines, substations, and lower-level distribution lines, are estimated to cost the economy $18 billion to $33 billion annually (Moore 2021). Kenward and Raja (2014) and the U.S. Government Accountability Office (2021) further report that between 2003 and 2014 the rate of outages more than doubled, and that the increased frequency was driven by a combination of aging infrastructure and an increasing frequency of extreme weather events such as hurricanes, ice storms, floods, heat waves, droughts, and wildfires. Lastly, there is a consensus that extreme weather and climate-related events are expected to become more frequent and intense in the future, which, unless steps are taken to harden the grid, will cause the frequency of weather-related power outages to continue to increase in the future (Kenward and Raja 2014; Moore 2021; U.S. Government Accountability Office 2021).

Efforts similar to the Project have been identified by the President's Council of Economic Advisers, the U.S. Department of Energy's Office of Electricity Delivery and Energy Reliability, the White House Office of Science and Technology and ISO-NE as cost-effective ways to increase grid reliability[11]. This increased reliability will reduce the probability of power outages which, in turn, will not only benefit Eversource's customers and the U.S. economy, but also reduce outage-related spikes in GHG emissions that occur when society reacts to a power outage[12].

5. Moss and Bilich (2022) evaluated the GHG implications of citizens responding to power interruptions by installing and using back-up generation units (BUGs). They report that, in response to recent reductions in the reliability of California's grid, the Bay area and South Coast generating capacity of BUGs increased rapidly such that, when outages occur, BUGs compensate for approximately 20 percent of the lost power. Further, most BUGs are fossil-fuel-fired and release GHG at rates similar to the 1.4 metric tons of $CO_2e$ per megawatt hour (MWh) associated with Massachusetts' local dispatchable generators. To put that in the context of a modest outage, a typical household uses about 1.2 kilowatt hours (KWh) each hour,[13] so an outage that affects only 5,000 customers for 12 hours (the duration of the 2016 Line 312 outage) may result in 14,400 KWh being generated by BUGs, which is equivalent to 14.4 MWh.[14] This, in turn, is

[10] Kenward and Raja define an outage as the loss of power for 4 or more hours.

[11] See President's Council of Economic Advisers, U.S. Department of Energy's Office of Electricity Delivery and Energy Reliability, and the White House Office of Science and Technology 2013.

[12] A 2019 article in the USA Today, titled *The New York City Blackout was Actually Bad for the Environment,* reports that *"*you might think that when the lights go out, the amount of greenhouse gases emitted as people go about their day would go down. But you'd be wrong. The [carbon] footprint grows because whenever you have a power failure you have all kinds of inefficiencies and waste that cascades through the system."

[13] The EIA (2023) reports that an average house uses 893 KWh per month. This equates to approximately 1.2 KWh per hour.

[14] KWh of loss is calculated as 5,000 affected customers × 12-hour blackout duration × 1.2 KWh per hour × 20 percent compensation via BUGs. To convert to MWh, note that 1 MWh = 1,000 KWh.

likely to result in the release of approximately 20.2 metric tons of $CO_2e$. This is equivalent to approximately 22.3 U.S. tons of $CO_2e$.

6. When the power goes out, residences and commercial operations lose refrigeration. Risk of spoilage causes homes and commercial operations to dispose of food that would otherwise be eaten. The U.S. Environmental Protection Agency (EPA) (2021) reports that, for every pound of food wasted in the United States, between 1 and 2 pounds[15] of $CO_2e$ are unnecessarily emitted into the atmosphere as part of the production process needed to replace that food. In addition, when placed into landfills, a pound of food waste will generate about 5 pounds of $CO_2e$ during decomposition (Brown et al. 2007). While approximately half of those GHGs will be captured (Landfill Gas Expert 2019), the remaining 2.5 pounds of $CO_2e$ will be released. Thus, between the two sources of $CO_2e$, each pound of food wasted results in approximately 4 pounds of $CO_2e$ being released unnecessarily into the atmosphere. The July 13, 2019, New York City outage, which lasted only 3 hours and affected 73,000 customers, is estimated to have resulted in the loss of 29 tons of food[16] or about 0.0004 tons[17] of food per customer. Applying that to an outage affecting 5,000 customers for 12 hours implies the loss of 8 U.S. tons of food. Noting that each ton of food lost results in 4 tons of $CO_2e$ release, it is estimated that an outage affecting 5,000 customers for 12 hours would likely result in the release of 32 U.S. tons of $CO_2e$.
7. Hussain (2019) reports that, in industrial and manufacturing operations, even seemingly small power flickers can have a significant impact. This is because manufacturers are especially vulnerable to equipment damage during outages and the electrical surges that may occur when power is restored. Ericson and Lisell (2020) refer to these types of impacts (e.g., damage to machinery and process interruptions resulting in failed output) as "fixed costs" associated with an outage and estimate that, regardless of duration, medium-sized manufacturing operations can incur costs of up to $30,000 with smaller operations incurring losses in the hundreds of dollars. To the extent these losses are driven by the need to replace damaged equipment, remanufacture products that were being manufactured when the power went out, and/or bring production processes back up to temperature, those monetary losses are associated with otherwise unnecessary increases in $CO_2e$ emissions. Even a flicker that affects 0.03 percent of New England[18] is estimated to result in the otherwise unnecessary release of approximately 4.3 metric tons of $CO_2e$.[19] This is equivalent to approximately 4.7 U.S. tons of $CO_2e$.

Each time efforts to harden the grid prevent a power outage, they reduce GHG emissions. While it is currently not possible to account for all factors contributing to outage related GHG emission spikes, back-

[15] EPA (2021) reports that each year, 161 to 335 billion pounds of food is wasted, resulting in approximately 374 billion pounds of $CO_2e$ being unnecessarily emitted.

[16] As reported in USA Today (2019); the unit is assumed to be a U.S. ton.

[17] This is equivalent to only 0.88 pounds per customer.

[18] There are 14.85 million residents of New England. An outage affecting 5,000 customers is affecting 0.03 percent of the New England population.

[19] The estimate was derived using the following set of calculations. First, note that New England will require at least 125,000 gigawatt hours (GWh) annually from 2023 forward and the industrial sector represents about 26 percent of total retail electricity consumption in the United States (EIA 2022) or about 32,500 GWh annually in New England (calculated as 0.26 × 125,000 GWh), which is equivalent to 32,500,000,000 KWh annually. Dividing by 8,760 hours per year, 32,500,000,000 KWh equates to 3,710,000 kilowatts (KW) of demand from New England industries. Next, note that Balducci et al. (2002) used interruption cost data for 32 standard industrial classification groups that were aggregated and weighted based on relative shares of sector GDP and estimated that, for a 1-hour interruption, industry incurs a loss of $26.35/KW in 2022 dollars, or $28.60/KW in 2025 dollars. Thus, a power outage affecting 0.03 percent of New England residents (calculated as 5,000 customers affected ÷ 14.85 million New England residents) would cost approximately $32,000 in GDP (calculated as 3,710,000 KW × 0.03 percent of facilities affected × $28.60 per KW). Finally, note that every million dollars of U.S. GDP is associated with approximately 270 metric tons $CO_2e$ (Climate Watch 2022). Thus, $32,000 of lost GDP is associated with 8.6 metric tons of $CO_2e$. If half of the at-risk $CO_2e$ is associated with damaged equipment, partially completed products that will need to be replaced, and/or extra energy required to restart industrial processes, then each outage prevented also prevents the release of 4.3 metric tons of $CO_2e$.

up generation, food spoilage, and adverse impacts to industrial processes likely result in the release of approximately 59 U.S. tons CO2e[20] each time damage to transmission lines interrupts supply.

The number of interruptions that would occur over the next 40 years absent the WT-11 TRRP program and the resulting reduction in CO2e emissions was estimated as follows.

A. In the 10 years from 2014 through 2023 contact with vegetation caused one outage every 5 years.

B. Massachusetts (2025) reports "Between 1990 and 2019, FEMA recorded 23 weather-related major disaster declarations in Massachusetts (versus 7 between 1960 and 1989). Winter storms have increased in intensity and frequency since 1950, and heavy downpours increased 71% from 1958 to 2010. Climate models predict that continued increases in the intensity and frequency of extreme weather events may damage community infrastructure and threaten populations that are already highly vulnerable to climate hazards and other stressors."

8. Given bullets A and B above, it is clear that the rate at which vegetation falls into lines will increase in the future due to increased intensity and frequency of extreme weather events. This challenge is exacerbated by recent events including the arrival of emerald ash borer (*Agrilus planipennis*) which is generally fatal to all species of ash trees and the spread of beech leaf disease which leaves both American and European beech trees susceptible to toppling in wind and snow events.

   For purposes of this report, it is conservatively (tending to understate impacts) estimated that, absent the WT-11 TRRP program, the rate of vegetation related outages will only double from one every 5 years to 1 every 2.5 years. Therefore, Project-related reliability increases are conservatively estimated to prevent 16 outages and the release of at least 944 tons of $CO_2e$ over the Project's 40-year lifespan.[21]

### 3.3.2 Dispatch of Fossil Fuel Fired Peaking Units

The WT-11 transmission line corridor plays an unusually important role in the current and future plans to reduce the carbon intensity of electricity transmitted along ISO New England grid. This is because the corridor contains both primary transmission lines that connect the Northfield Mountain Pumped Storage Hydropower Facility to the wider ISO New England Grid[22].

The operation of pumped storage hydropower facilities addresses several grid management challenges posed by the simultaneous retirement of nuclear/fossil fuel electricity generation and the integration of utility-scale solar and wind generation onto the grid by a) providing a source of electricity demand when supply would otherwise exceed demand, b) creating electricity when electricity demand would otherwise exceed supply, and c) providing a source of grid inertia and generation redundancy. Each of these benefits is described in the following paragraphs.

One of the challenges associated with the transition from nuclear/fossil fuel generation to lower carbon (i.e., renewable) electricity generation is that renewables often depend on variable natural resources like wind and sun. Thus, many renewable facilities cannot quickly increase or decrease generation in response

[20] Calculated as 22.3 U.S. tons of CO2e from BUGs, plus 32 U.S. tons of CO2e from food spoilage, plus 4.7 U.S. tons of CO2e related to the need for industry to replace damaged equipment, remanufacture products that were damaged, and/or bring production processes back up to temperature.

[21] Calculated as $\frac{1\ Outage}{2.5\ Years} \times 40\ Years \times \frac{59\ US\ Tons\ CO2E}{1\ Outage}$. This estimate is considered a lower bound for two reasons. First, the New England population is increasing. Second, it is expected that climate change will increase the frequency and intensity of extreme weather events which will, in turn, increase the frequency of weather-related flickers and outages all else equal.

[22] The 345-kilovolt (kV) Line 354 runs the entire length of the WT-11 corridor and connects the Northfield Substation to the Ludlow Substation. The 345-kV Line 312 connects the Northfield Substation to Erving Junction. From Ludlow and Erving, electricity can be directed to points throughout western Massachusetts and the ISO New England Grid.

to changes in the demand for electricity. This presents challenges for grid operators who are responsible for balancing electricity supply with electricity demand, thereby avoiding system failure. The primary grid management challenges associated with utility-scale solar generation is encapsulated in the "Duck Curve" (Figure 3.3 1). The curve highlights two challenges.

1. While the sun is shining, solar-generated electricity can flood markets. On some grids at midday, more electricity is generated than can safely be put onto the grid; this is called over-generation. When this occurs, solar generators must curtail production, which reduces the economic viability of utility-scale solar generation.

2. As many residents return home between 5 PM and 7 PM, electricity demand often peaks; this can occur at the same time the sun is dropping, and solar generation decreases. Thus, the grid increasingly requires electricity generators that can quickly ramp up energy production in the evening; these are referred to as dispatchable sources of electricity and many dispatchable sources in New England burn fossil fuel and release GHG gasses when they operate.

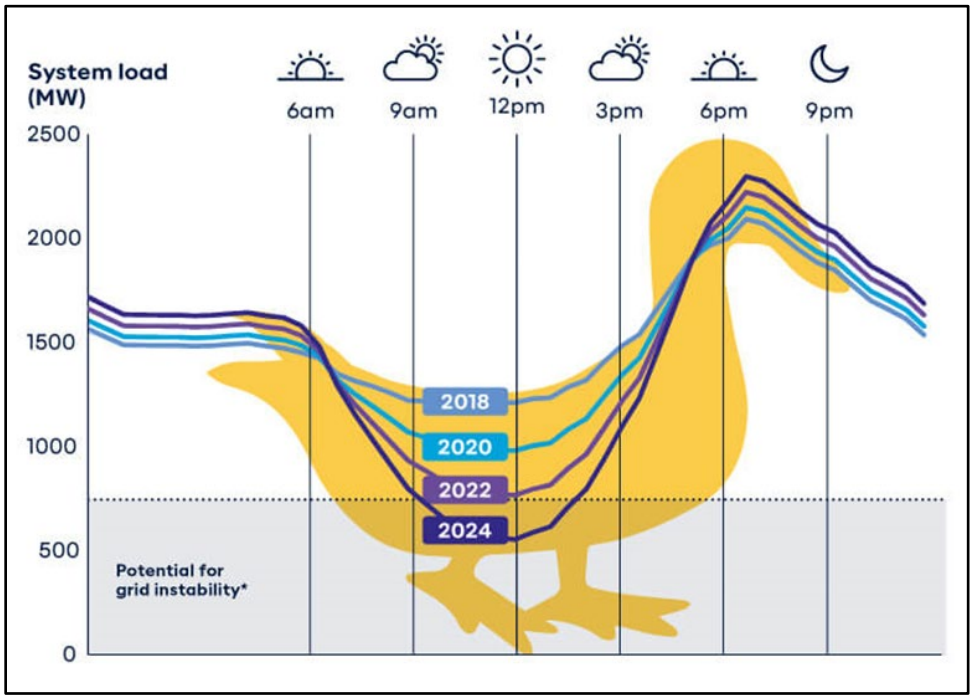



**Figure 3.3-1. A typical Duck Curve as illustrated by Synergy (2024).**

There are two primary grid management challenges associated with utility-scale wind generation: seasonality and intermittency.

1. From a seasonality perspective, the U.S. Energy Information Administration (USEIA) (2022b) reports that the amount of electricity a wind plant generates, relative to its maximum generation potential, depends almost entirely on the availability of wind resources. These resources vary seasonally with the least wind, and so the lowest generating capacity, generally occurring in the summer, which is when electricity demand tends to peak. This mismatch means that generating and/or transmission capacity that would otherwise not be necessary must remain available to cover seasonal variation in wind generation.

2. With respect to intermittency, if the wind does not blow, utility-scale wind projects do not generate electricity. On a day-to-day basis, intermittent wind resources require the maintenance of dispatchable electricity which not only reduces the economic viability of the wind generating resource, it also acts to increase the average carbon intensity of the electricity put onto the grid.

Pumped storage hydropower projects help address these grid management challenges by using excess electricity when it is available to create potential energy by pumping water uphill; the storage system then turns the kinetic energy of released falling water into electricity when the grid needs more electricity. Indeed, the Department of Energy (DOE) wrote that one significant hurdle standing between the United States and a lower carbon economy is a lack of energy storage. The DOE went on to note that solutions are already available—chief among them pumped storage hydropower (DOE 2021). Specific to New England, the Northfield Mountain Pumped Storage Hydropower Facility can ramp from zero to over 1,100 megawatts of generation in less than 15 minutes. In the summer and winter, the facility normally generates in the morning and late afternoon. In spring and fall, the project may generate one or two times a day depending on electricity demand (FERC 2024).

While the full grid analysis required to estimate the expected GHG reduction associated with preventing the dispatch of fossil fuel fired facilities is beyond the scope of this assessment, the following information is illustrative of GHG benefits likely to be associated with the Project as it relates to reducing the probability of dispatching such facilities.

- From 2014 to 2018, approximately 23 oil and gas fired units located in Massachusetts were used to ensure reliable electricity supply during periods of peak electric demand; that is, these units operated as dispatchable units with capacity utilization factors generally under 5%.[16] In Massachusetts, two-thirds of these units burn primarily oil, and more than 90% are over 30 years old, meaning they tend to release more GHG and criteria pollutants for every unit of electricity generated than would be released if newer technology were deployed. Moreover, many of these plants are in low-income and minority communities where vulnerable populations already bear health and environmental burdens (PSE Healthy Energy 2020)[23].
- The USEIA's State Electricity Profile for Massachusetts reports that, in 2020, Massachusetts electric power industry combusted petroleum to generate 36,111 MWh and released 48,502 U.S. short tons of CO2. This equates to 1.34 U.S. short tons of CO2e per MWh of electricity generated[24] by combusting petroleum. An additional 0.14 U.S. tons of CO2e per MWh will have been released in the process of extracting, refining, and transporting that petroleum product to the facility (Gordon and Feldman, 2016) which brings the total GHG emissions per MWh or electricity produced to about 1.5 U.S. tons of CO2e per MWh.
- Assuming a typical capacity of 25 MWh and an average run time of about 13.3 hours (as reported in PSE Healthy Energy 2020), each time one of these local generation resources is dispatched, it results in the release of approximately 500 tons of CO2e that would not be released if the grid had the ability to meet demand with stored energy resources.

Further, operation of the Project may also increase the probability of non-dispatchable, low carbon, generation projects (for example, wind and solar) to be built at locations where they can send electricity to

[23] PSE Healthy Energy (2020) report having "aggregated power plant operational data on a unit basis from EIA and U.S. Environmental Protection Agency (EPA) datasets. We obtained hourly, daily, and annual data on generation (MWh), emissions (CO2, NOx and SO2), and fuel consumption (MMBtu) for the years 2014 to 2018 from the EPA's Air Markets Program Database (AMPD). Although these emissions data are available at greater temporal resolution than from EIA, data are not available for all plants, so we backfilled our emissions data using reported EIA annual data for the years 2014 to 2017. Peaker units were identified as having greater than 5 MW capacity and less than 15% annual utilization." This data assembly was not independently verified.

[24] Calculated as 48,502 U.S. short tons of CO2 ÷ 36,111 MWh of electricity generated by combusting petroleum.

the Project during periods when electricity supply exceeds electricity demand, as doing so would effectively increase the expected profitability of the wind or solar project.

# 4 SUMMARY

The proposed WT-11 TRRP Project is part of Eversource's effort to provide enhanced reliability of the electric grid by expanding the maintained (cleared) width of the ROW to minimize the potential for outages caused by trees falling onto the lines.

To accomplish this goal, it will be necessary to remove vegetation capable of growing to a height exceeding 25 feet from 285.6 acres of existing ROW and then manage that acreage such that tall growing tree species are periodically removed while other tree, shrub, and grass species continue to grow.

From a GHG accounting perspective, the Project is likely to bring about the following changes.

1. Approximately 61,062 U.S. tons of $CO_2e$ currently sequestered in live biomass, forest soil, dead wood, and litter may be released due to vegetation clearing and/or soil disturbance.
2. The conversion of wooded habitat to low-growing herbaceous and woody shrub habitat will reduce the rate of future GHG sequestration within the Project footprint, resulting in the Project-related increase of approximately 18,735 U.S. ton of CO2e.
3. More than 944 U.S. tons of CO2e will likely not be emitted because of Project-related increases in reliability.
4. An unquantified amount of GHG will not be released each time increased grid resiliency enables peak demand to be met by generation at the Northfield Mountain Pumped Storage Hydropower Facility rather than a fossil fuel fired peaking unit.

Thus, the Project is expected to increase $CO_2e$ emissions by less than 78,853 U.S. tons over its 40-year lifespan, less any GHG not released due to increased grid resiliency. This equates to approximately 1,971 U.S. tons CO2e annually which is equivalent to the annual emissions associated with about 75 Massachusetts households[25].

[25] The Executive Office of Energy and Environmental Affairs (EOEEA) report that the total gross emissions in Massachusetts were 73,700,000 U.S. tons CO2e in 2021 (the most recent year for which they have data). The U.S. Census Bureau (2025) reports that Massachusetts has approximately 2.8 million households. Dividing 73,700,000 U.S. tons CO2e gross emissions by 2.8 million households, each Massachusetts household is associated with approximately 26.3 tons of annual CO2e emissions.

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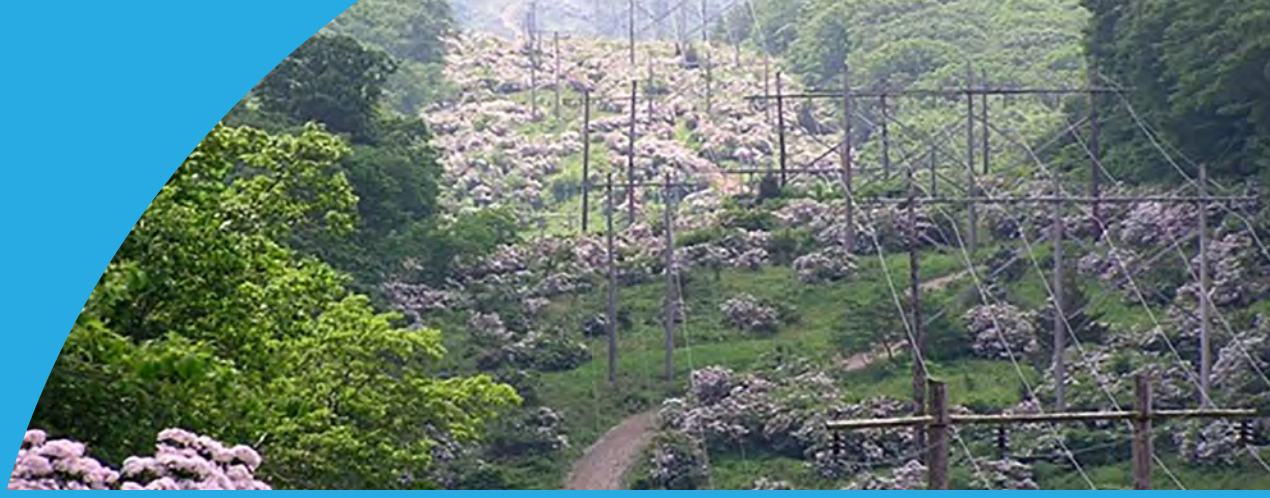
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# ATTACHMENT 8
# EVERSOURCE DOCUMENTS:

# EVERSOURCE BMP MANUAL
# EVERSOURCE INTEGRATED VEGETATION MANAGEMENT PLAN



CONSTRUCTION & MAINTENANCE ENVIRONMENTAL REQUIREMENTS

# Best Management Practices Manual for Massachusetts and Connecticut



APRIL 2022

Prepared for:
Eversource Energy Environmental Licensing and Permitting Group

EVERSOURCE

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# SECTION 1

# Section 1
# Introduction

## 1.1 Purpose

As a matter of Eversource Energy (herein, "Eversource") policy with regard to environmental stewardship and in accordance with local, state, and federal regulations, all construction and maintenance projects shall use environmentally sound best management practices (BMPs) to minimize or eliminate environmental impacts that may result from construction activities. Regardless of whether a specific permit is needed for the work, construction and maintenance projects must follow internal environmental performance standards, which is the purpose of these BMPs.

In many cases, maintenance activities are exempt from regulatory authorization. Permits are usually required for new work. Contractors will be provided with copies of any project-specific permits and will be required to adhere to any and all conditions of the permit(s). Project-specific permit conditions may supersede the BMPs outlined in this manual. However, where certain construction elements are not addressed by permit conditions, or where permitting is not required, or for emergency situations where obtaining a permit before the work occurs may not be feasible, these BMPs shall be considered as Eversource's standards. In some cases, and at the discretion of the Eversource Environmental Licensing and Permitting staff, the BMPs presented herein may be modified to be more appropriate for site-specific conditions.

## 1.2 Scope and Applicability

These BMPs primarily address the disturbance of soil, water, and vegetation incidental to construction within on- and off-road utility corridors, substations, including the establishment of access roads and work areas, within rights of way (ROWs) and on private property, in and near wetlands, watercourses, or other sensitive natural areas (such as protected species), including storm drain systems (e.g., catch basins). Types of construction include, but are not limited to, installation or maintenance of underground and overhead utilities, access road repair/improvement or construction, and upgrades or maintenance of substations and other facilities. Other common construction issues such as noise, air pollution, oil spill procedures, handling of contaminated soils, and work safety rules are addressed in the Eversource Energy Contractor Work Rules and related appendices.

## 1.3 Definitions

The following definitions are provided to clarify use of common terms throughout this document.

**Best Management Practice (BMP):** A means to reduce and minimize impact to natural resources.

**Casing:** A galvanized steel corrugated pipe that serves as the form for a utility structure foundation.

**Emergency Projects:** Actions needed to maintain the operational integrity of the system or activities necessary to restore the system and affected facilities in response to a sudden and unexpected loss of electric or gas service or events that affect public health and safety.

**Embedded Culvert:** A culvert that is installed in such a way that the bottom of the structure is below the stream bed and there is substrate in the culvert.

**Environmentally Sensitive Areas:** An area containing natural features, cultural resources, or ecological functions of such significance to warrant protection. Some examples are rivers, streams, ponds, lakes, wetlands, rare species habitat, water supply protection areas, archaeological sites, parks, and agricultural land.

**Erosion Control:** A measure to prevent soil from detachment and transportation by water, wind, or gravity.

**Existing Access Roads:** Previously permitted or grandfathered access roads that are used to access structures that are clearly visible or can be found by mowing or by the presence of road materials in soil cores.

**Grubbing:** A site preparation method that is used to clear the ground of roots and stumps.

**Intermittent Watercourse:** An intermittent watercourse, or stream, is broadly defined as a channel that a flowing body of water follows at irregular intervals and does not have continuous or steady flow. Regulatory definitions for intermittent watercourses are:

- **Connecticut** – Per the Connecticut Inland Wetland and Watercourses Act, intermittent watercourses are delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation.
- **Massachusetts** – Under the Massachusetts Wetlands Protection Act (MAWPA), a jurisdictional intermittent watercourse is defined as a body of running water which moves in a definite channel in the ground due to a hydraulic gradient, does not flow throughout the year, and which flows within, into or out of an area subject to protection under the MAWPA. Intermittent watercourses upgradient of any Bordering Vegetated Wetlands or Ponds are not jurisdictional under the MAWPA. A watercourse can be determined to be intermittent if it meets MAWPA criteria with regard to its depiction on the most current USGS topographic map of the area (i.e., shown as intermittent or not shown), and watershed size and predicted flow rates as determined by the USGS StreamStats method or documented observations of no flow at least once per day over the course of four days in any consecutive 12-month period barring drought conditions, withdrawals, or other human-made flow reductions or diversions (subject to conservation commission and/or MassDEP review and approval).

**Limit of Work/Disturbance:** The boundaries of the approved project within regulated areas. All project related activities in regulated areas must be conducted within the approved limit of work/disturbance. The limit of work/disturbance should be depicted on the approved permit site plans, which may require the limits to be survey located and identified in the field by flagging, construction fencing, and/or perimeter erosion controls.

**Low Ground Pressure Vehicle:** Vehicles that have a lesser impact on an environmentally sensitive area due to the vehicle being smaller, lighter, or different in another way than a vehicle which would have a greater impact. Low ground pressure is

measured in pounds per square inch (psi) when loaded and as defined by the US Army Corps of Engineers (ACOE).

CT = < 3 psi

MA = < 3 psi

Low impact vehicles could include off-road vehicles (ORVs) or all-terrain vehicles/ utility vehicles (ATVs/UTVs), tracked vehicles with low ground pressure, or vehicles with oversized balloon-type tires.

**Maintenance Projects:** Typically consist of activities limited to the repair and/or replacement of existing and lawfully located utility structures and/or facilities where no substantial change in the original structure or footprint is proposed. Maintenance activities also include vegetation management.

**Minimization:** Causing as little disturbance to an area as practicable during construction.

**New Construction:** Construction of new transmission or distribution facilities that previously did not exist or construction that substantially modifies existing facilities. All new (and existing) construction projects are required to go through a full permit review by Eversource Environmental Licensing and Permitting.

**Pre-Construction Notification (PCN):** Project activities that do not qualify for Self-Verification (SV) or where otherwise required by the terms of the Massachusetts (MA) and Connecticut (CT) General Permits (GPs) must submit a PCN and obtain written verification before starting work in ACOE jurisdiction. Refer to MA and CT GPs for PCN thresholds. Projects that cannot be completed under a PCN must file for an Individual Permit with the ACOE. In CT, for coastal projects, notification is provided to ACOE by the CT Department of Energy and Environmental Protection (CT DEEP), Office of Long Island Sound Programs (OLISP) or by applicants as necessary. Written approval from ACOE is required.

**Protected Species:** Species named and protected under the Massachusetts Endangered Species Act (MESA) regulations and/or the Connecticut Endangered Species Act (C.G.S. §§ 26-303 through 26-315).

**Rare Species:** *See Protected Species.*

**Restoration:** To return a disturbed area to its former, original or unimpaired condition. A site is considered fully restored when it has returned (as closely as practicable) to its original state. Restoration of disturbed areas should occur as soon as practicable following the completion of activities at that location.

**Revegetation:** Establishment of plant material for temporary or permanent soil stabilization.

**Right of Way (ROW):** A pathway, road, or corridor of land where Eversource has legal rights (either fee ownership, lease, or easement) to construct, operate, and maintain an electric power line and/or natural gas pipeline.

**Sediment Control:** The practice of managing the erosion of soil materials mobilized by water, typically stormwater runoff, on-site for the purpose of protecting nearby wetland and water resources.

**Self-Verification (SV):** Activities that are eligible for SV are authorized under the MA and CT GPs and may commence without written verification from the ACOE provided the prospective permittee has:

i. Confirmed that the activity will meet the terms and conditions of applicable MA and CT GPs.

ii. Submitted the Self-Verification Notification Form (SVNF) to the ACOE.

In CT, coastal projects do not require filing of a SVNF. ACOE relies on CT DEEP submittals.

**Sensitive Environmental Area:** For the purposes of this BMP Manual, this term shall be inclusive of all wetlands, streams, waterways, waterbodies, buffer zones, rare species habitat, and historical/cultural resources.

**Stabilization:** A system of permanent or temporary measures used alone or in combination to minimize erosion from disturbed areas.

**Work:** For the purposes of this BMP Manual, any form of temporary or permanent draining, dumping, damming, discharging, excavating, filling or grading; the erection, reconstruction, replacement or expansion of any buildings or structures; the driving of piles; the construction or improvement of roads and other ways; the changing of run-off characteristics; the intercepting or diverging of ground or surface water; the installation of storm drain systems (e.g., catch basins); the discharging of pollutants; the destruction of plant life; and any other changing of the physical characteristics of land including, but not limited to: on- and off-road utility corridors and substations. Types of work include but are not limited to the installation or maintenance of underground and overhead utilities, substations and other facilities.

## 1.4 Acronyms and Abbreviations

The following acronyms and abbreviated are provided to clarify use of common terms throughout this document.

| | |
|---|---|
| All-terrain Vehicle | ATV |
| Best Management Practice | BMP |
| Certified Vernal Pool | CVP |
| Connecticut | CT |
| Connecticut Department of Energy & Environmental Protection | CT DEEP |
| Connecticut Department of Transportation | ConnDOT |
| Connecticut General Statute | Conn. Gen. Stat. |
| Cross-Linked Polyethylene | XLPE |
| Eastern Box Turtle | EBT |
| Environmental Affairs Department | EAD |
| Eversource Energy | Eversource |
| General Permits | GPs |
| Geographic Information System | GIS |
| High-Pressure Fluid-Filled | HPFF |
| Horizontal Directional Drilling | HDD |
| Kilovolt | kV |
| Massachusetts | MA |
| Massachusetts Department of Agriculture | MA DAR |
| Massachusetts Department of Conservation and Recreation | MA DCR |

| | |
|---|---|
| Massachusetts Department of Environmental Protection | MassDEP |
| Massachusetts Endangered Species Act | MESA |
| Massachusetts Wetlands Protection Act | MAWPA |
| Massachusetts General Law | M.G.L. |
| Natural Diversity Database | NDDB |
| Natural Heritage and Endangered Species Program | NHESP |
| New England Cottontail | NEC |
| Off-Road Vehicle | ORV |
| Outstanding Resource Water | ORW |
| Pounds per Square Inch | psi |
| Pre-Construction Notification | PCN |
| Right of Way | ROW |
| Self-Verification | SV |
| Self-Verification Notification Form | SVNF |
| Species | spp. |
| Time of Year | TOY |
| United States | U.S. |
| United States Army Corps of Engineers | ACOE |
| United States Department of Agriculture | USDA |
| United States Geologic Survey | USGS |
| Utility Vehicle | UTV |
| Vegetation Management Plan | VMP |

## 1.5 BMP References

The following table lists the public guidance documents utilized during the preparation of this BMP manual. Refer to these documents for additional information.

**BMP References**

| **General** |
|---|
| Best Management Practices (BMPs) Manual for Access Road Crossings of Wetlands and Waterbodies, EPRI, Palo Alto, CA (2002) 1005188. |
| Gas Research Institute. Horizontal Directional Drilling Best Management Practices Manual (2002) ENSR Corporation, Westford, MA and Trenchless Engineering Corp., Houston, TX. |
| **Connecticut** |
| Connecticut Department of Transportation (ConnDOT). ConnDOT Drainage Manual (October 2000) http://www.ct.gov/dot/cwp/view.asp?a=1385&Q=260116 |

**BMP References**

Connecticut Standard Specifications for Roads, Bridges and Incidental Construction, FORM 816 (2004) http://www.ct.gov/dot/cwp/view.asp?a=3609&q=430362

Connecticut Department of Energy & Environmental Protection. Connecticut Guidelines for Erosion and Sediment Control. (2002) http://www.ct.gov/deep/cwp/view.asp?a=2720&q=325660&deepNav_GID=1654%20

Connecticut Department of Energy & Environmental Protection, Bureau of Natural Resources, Division of Forestry. Best Management Practices for Water Quality While Harvesting Forest Products (2012) https://portal.ct.gov/-/media/DEEP/forestry/best_management_practices/BestPracticesManualpdf.pdf

Regulations of Connecticut State Agencies (RCSA). Control of Particulate Matter and Visible Emissions. Section 22a-174-18. https://eregulations.ct.gov/eRegsPortal/Browse/RCSA/Title_22aSubtitle_22a-174Section_22a-174-18/

**Massachusetts**

Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges (2020) https://www.mass.gov/doc/2020-standard-specifications-for-highways-and-bridges/download

Massachusetts River and Stream Crossing Standards (Revised March 1, 2011) https://www.nae.usace.army.mil/Portals/74/docs/regulatory/StreamRiverContinuity/MA_RiverStreamCrossingStandards.pdf

Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas. Original Print: March 1997. *Reprint: May 2003*. https://www.mass.gov/doc/complete-erosion-and-sedimentation-control-guidelines-a-guide-for-planners-designers-and/download

The Massachusetts Unpaved Roads BMP Manual (Winter 2001) https://www.mass.gov/doc/unpaved-roads-bmp-manual/download

The Massachusetts Anti-Idling Law. M.G.L. Chapter 90, Section 16A and 310 CMR 7.11. https://www.mass.gov/doc/massdep-faq-the-massachusetts-anti-idling-law/download

# SECTION 2

# Section 2
# Project Planning

After undergoing an initial screening review by the department conducting the proposed project, if sensitive environmental areas are identified, the project is required to go through a permit review by Eversource Environmental Licensing and Permitting. The permit review process is supported by Geographic Information Systems (GIS) or a similar program that references the most current spatial data for the project areas in question. Through the GIS review process various geo-processing tools are used to compose maps and provide a spatial reference to environmentally sensitive areas. In consultation with Eversource Environmental Licensing and Permitting, the Project Engineer, permitting specialist, or other project planner should determine regulatory jurisdiction and which (if any) environmental permits or approvals are required before starting any project. Questions regarding which activities may be conducted in regulated areas or within environmentally sensitive areas should be referred to Eversource Environmental Licensing and Permitting. Summaries of potentially applicable laws and regulations are provided in Appendices B and C of this document.

Eversource employs a best practice mitigation hierarchy to 1) avoid environmental impacts wherever possible, followed by 2) minimization of environmental impacts where they cannot be avoided, and 3) mitigating and restoring any environmental impacts where necessary.

## 2.1 Regulated Areas

### 2.1.1 Types of Wetlands

Wetland areas common to New England and common to both Connecticut and Massachusetts include, but are not limited to, the following:

Forested Wetlands

Forested wetlands are wetlands that are dominated by trees that are 20 feet or taller. These wetlands are typically drier with standing water typically occurring during periods of high precipitation, seasonally high groundwater, snowmelt, and runoff (e.g., early spring through mid-summer). Tree species typical of this type of wetland include red maple (*Acer rubrum*) and eastern hemlock (*Tsuga canadensis*). "Pit and mound" topography is common in forested wetlands, where mature trees grow on the higher and drier mounds and obligate wetland species are found in the lower pits.

Scrub-Shrub Wetlands

Scrub-shrub wetlands are dominated by woody vegetation less than 20 feet tall and may include peat bogs. Typical bog species include leatherleaf (*Chamaedaphne calyculata*), cotton grasses (*Eriophorum* sp.), cranberry (*Vaccinium macrocarpon, V. oxycoccus*), and black spruce (*Picea mariana*). Other non-bog scrub-shrub wetlands are characterized by buttonbush (*Cephalanthus occidentalis*), alders (*Alnus* spp.), dogwoods (*Swida* spp.), and arrowwoods (*Viburnum* spp.).

Marshes

Marshes are dominated by erect, herbaceous vegetation and appear as grasslands or stands of reedy growth. These wetlands are commonly referred to by a host of terms, including marsh, wet meadow, or fen. These areas are flooded all or most of the year and, in New England, tend to be dominated by cattails (*Typha* spp.).

Wet Meadows

Typical wet meadow species include grasses such as bluejoint (*Calamagrostis canadensis*) and reed canary grass (*Phalaris arundinacea*), sedges (*Carex* spp.) and rushes (*Juncus* spp.), and various other forbs such as Joe-Pye-weeds (*Eutrochium* spp.) and asters (*Aster* spp.).

Floodplains

A floodplain is generally defined as an area of low-lying ground adjacent to a stream or river that is formed mainly of river sediments and is subject to inundation from floodwaters. State-specific regulatory definitions vary and are described as follows:

- In Connecticut, areas that contain alluvial or floodplain soils are regulated as wetlands. These areas may flood so infrequently or be so freely drained that hydrophytic vegetation and hydric soils are not present. Soils in these areas must be examined carefully to determine whether well drained alluvial or floodplain soils are present.
- In Massachusetts, a floodplain is a type of wetland resource area that floods following storms, prolonged rainfall, or snowmelt. There are three types of floodplain areas protected under the MAWPA: coastal areas, areas bordering rivers and streams, and isolated depressions that flood at least once a year.

Streams

A stream is any natural flowing body of water that empties to any ocean, lake, pond or other river. Perennial streams, or rivers, have flows throughout the year. Intermittent streams do not have surface flows throughout the year, though surface water may remain in isolated pockets.

Vernal Pools

Vernal pools are typically contained basin depressions lacking permanent aboveground outlets. These areas fill with water with the rising water table of fall and winter and/or with the meltwater and runoff of winter and spring snow and rain. The pools contain water for a few months in the spring and early summer. Due to periodic drying cycles, vernal pools do not support breeding fish populations and can thus serve as breeding grounds for a variety of organisms, including some rare and/or protected species of frogs and salamanders.

### 2.1.2 Rare Species

Utility ROWs within Connecticut and Massachusetts overlap with, and in some circumstances create or enhance, habitat of rare/protected species of plants, vertebrate and invertebrate animals. Special requirements may need to be evaluated as part of new construction and/or some maintenance activities.

### 2.1.3 Historical/Cultural

Other regulated factors taken into consideration during the project planning process include the presence of protected (i.e., threatened or endangered) species, non- native, invasive plant species and/or historical/cultural resources. Special requirements may need to be evaluated as part of new construction and/or some maintenance activities.

## 2.2 Meetings

**A pre-construction meeting** is typically held prior to the commencement of all work with the purpose to appoint responsible parties, discuss timing of work, and further consider options to avoid and/or minimize disturbance to sensitive areas. The meeting confirms that there is consensus on work methods and responsibilities and ensures that tasks will be fulfilled with as little disturbance to the environment as practicable. These meetings can occur on or off-site and should include all the applicable stakeholders (i.e., Eversource, contractors, consultants, inspectors and/or monitors, and regulatory agency personnel). A short and less formal briefing should suffice for smaller maintenance projects.

## 2.3 Site Staging and Parking

During the project planning and permitting process, locations should be identified for designated crew parking areas, material storage, and staging areas. Where possible, these areas should be located outside of buffer zones, watershed protection areas, and other environmentally sensitive areas. Any proposed locations should be evaluated for all sensitive receptors and for new projects requiring permitting, should be incorporated onto permitting and access plans.

## 2.4 Construction Monitoring

Construction projects require environmental monitoring, which can be conducted either internally or by consultants. Some permitted projects require oversight by designated and pre-approved compliance monitors. Environmental monitoring is a way to keep a chronological record of pre-construction site conditions, progress, and changes that are made, as well as to document issues and authorized solutions.

If work will occur in a sensitive environmental area, permit conditions may dictate that construction be monitored by a qualified and pre-approved wetland or wildlife specialist.

## 2.5 Signage/Limit of Boundaries

Where appropriate, wetland delineation flagging or signage shall be installed that makes clear where critical boundaries (i.e., the limits of jurisdictional wetland resource areas, rare species habitat, and/or historical/cultural resources) and setbacks occur. Appropriate signage shall also be installed to indicate regulatory authorization by agencies and to prohibit certain uses on ROWs, such as ORV traffic.

Where appropriate, signage shall be installed along sediment and erosion control barriers at appropriate intervals, heights, and sizes to ensure that the presence and location of said barriers is clear to construction personnel during deep snow or other low visibility conditions. Inspection and maintenance of this signage shall be conducted on a regular basis to ensure effectiveness.







Examples of signage at wetlands

# SECTION 3

# Section 3
# Construction Considerations

This section addresses BMPs specific to construction of new access roads, repair of existing access roads, the installation of work pads, structure-related work, and soil stockpile management. Information regarding recommended erosion and sedimentation controls or stormwater controls is also discussed. Please refer to Appendix A for typical details and representative photographs of BMPs used for erosion and sedimentation control and water diversion during construction.

During all project activities (e.g., maintenance, new construction), federal, state, and local regulatory authorities require steps be taken to avoid, minimize, and/or mitigate disturbance to the environment. Sensitive environmental areas should be avoided whenever practicable. However, some projects may require entrance into these areas in order to perform work. This section discusses measures that should be taken to minimize disturbance to if work must occur within sensitive environmental areas.

BMPs were developed to aid in this process and should be carefully selected and implemented based on the proposed activities and the nature of sensitive area(s) encountered at each site. Proper selection of BMPs should take into consideration the project goals, permit requirements, and site-specific information. Once an assessment of the area is made and requirements of the project are established, all BMPs should be considered and implemented as appropriate.

## 3.1 Avoidance and Minimization

Avoidance and minimization should always be considered before beginning any construction or maintenance project. Eversource and their contractors should utilize appropriate measures to avoid construction impacts to sensitive environmental areas including, but not limited to: wetlands, waterways, rare species habitats, known below and above ground historical/archeological resources, and other environmentally sensitive areas. Use existing ROW access whenever practicable. Keep to approved routes and roads and do not widen or deviate from them. Consult with the Eversource Environmental Licensing and Permitting Group, when avoidance is not practicable, to determine measures to minimize the extent of construction impacts. Alternate access routes and/or staging areas that will minimize construction impacts to the natural environment may be considered.

## 3.2 Rare Species Habitat

Eversource Environmental Licensing and Permitting coordinates with state and local agencies when work is within areas designated as rare and/or sensitive species habitat.

In order to protect these resources in Connecticut, the following must be reviewed:

- Natural Diversity Database (NDDB) area mapping.
- Critical Habitat mapping.
- Eversource's New England Cottontail (NEC) BMP map.
- Prior NDDB Determinations.

The NDDB mapping is updated approximately every six months and is posted on the State's GIS data download webpage. The Critical Habitat mapping is less frequently updated and also on the State's GIS data download page. Eversource's NEC BMP map and mapping which depicts prior NDDB Determinations shall be provided through Eversource Environmental Licensing and Permitting.

In Massachusetts, Eversource has an annual Operations and Management Plan (OMP) which is updated and renewed at the start of each calendar year with the Natural Heritage Endangered Species Program (NHESP) which designates Priority Habitat (PH) in the State. All work in PH requires review of and compliance with the OMP which may include consultation with NHESP. The OMP establishes guidelines for work within known rare species habitat based on the type of species presence. These guidelines may include time of year (TOY) restrictions or similar measures to avoid impacts to rare species.

Regardless of the State in which construction is taking place, the following shall be employed in all mapped, State-listed species and designated Critical Habitat areas:

- Make every effort to avoid impacts to known populations of State-listed plants and other stationary resources.
- Limit permanent impact through the use of temporary construction matting as opposed to gravel for access road and work pad construction.
- If State-listed resources cannot be avoided, mitigation planning shall be discussed with Environmental Licensing and Permitting.
- Consider time-of-year (TOY) restrictions to avoid impact to sensitive resources during critical life stages including but not limited to nesting season for ground and shrub nesting birds, pup rearing season for bats (if tree removal is necessary), flowering and seeding times for State-listed plants.

Certain species, including the timber rattlesnake (*Crotalus horridus*), are one of the few venomous species in New England which can be a threat to worker safety. Protection measures provided by the respective State agency shall be followed and may require snake sweeps by a qualified herpetologist, contractor education, and field demarcation of hibernacula/known rattlesnake dens.

## 3.3 Hiking Trails

The following practices shall be implemented in the event project areas intersect or overlap with recreational hiking trails.

- Avoid using hiking trails as access roads or access routes for vehicles and equipment.
- If a hiking trail must be used for vehicle or equipment access coordination with Eversource Vegetation Management Compliance or Oversight staff and/or Eversource Environmental Licensing and Permitting staff is required prior to use.
- Utilize existing access roads to cross hiking trails to the maximum extent practicable.
- If no existing access roads exist and a hiking trail must be crossed, minimize trail crossings by designating one location for use by equipment.
- Signs, barriers, spotters or other means to alert the public to the work shall be

implemented.

- Stockpiling logs and other cut material within 25 feet of hiking trails is not allowed unless approved by Eversource Vegetation Management Compliance or Oversight staff.
- Spreading wood chips on hiking trails is not allowed unless approved by Eversource Vegetation Management Compliance or Oversight staff.
- At the end of each workday all cut material must be removed from hiking trails.
- As soon as possible after work is complete disturbed portions of hiking trails shall be returned as close to pre-construction condition as possible. This may include hand raking, hand cutting of stumps and/or hand removal of cut vegetation.
- If any trees that are marked for trail navigation must be cut, the property manager or trail maintainer must be notified.
- Posts or other markers that are used for trail navigation shall be protected at all times. Replacement in kind shall be completed by the contractor if disturbed or damaged during completion of the work.

## 3.4 Work on State-owned land in Connecticut

For all work on State of Connecticut-owned land as depicted on the "DEEP Property" data layer available through the State's GIS data download page, matting shall be employed to the greatest extent possible. Gravel access roads and work pads shall only be installed when terrain prohibits the installation of matting. All work must be coordinated through Eversource Environmental Licensing and Permitting for acquisition of necessary authorization prior to the start of construction on State-owned properties.

## 3.5 Historic/Cultural Resources

Historic and cultural resources are diverse and include, but are not limited to, archaeological sites, historic structures, historic districts, stone walls, and ceremonial stone landscapes. Construction activities near or within significant resources are subject to restrictions outlined in any site or project-specific avoidance/protection plans. The locations of archaeological sites and other sensitive resources such as ceremonial stone landscapes and burials are considered confidential and may only be disclosed on a need-to-know basis.

### 3.5.1 Stone Walls

Stone walls can be considered significant resources for a number of reasons including unique construction methods, their function as a property boundary, their association with other historic resources such as archaeological sites or farmsteads, and/or their importance to the underlying landowner(s). Non-impact methods of managing work and access near stone walls should always be prioritized and removal, dismantlement, or other alterations to stone walls should be avoided, when possible. Non-impact methods of managing work near stone walls include:

- Avoiding the stone wall altogether - This may involve re-routing an access road or selecting a new access point. Care should be taken not to incur additional impacts to other sensitive environmental areas (e.g., wetlands or rare species habitat).
- Traversing the wall through an existing breach - In this scenario, the breach is

used as-is and the breach is not widened or expanded in any way.

- Traversing the wall using timber matting to temporarily bridge over the wall (e.g., "air bridge") - Although the construction of individual air bridges will vary depending on the surrounding topography, the height of the wall, and the individual operator, the timber mats should not touch the stone wall on any side, and a sufficient air gap between the top of the stone wall and the timber matting directly above should be left to ensure the stone wall is not damaged during the passage of heavy machinery. Before and after photographs of the portion of the stone wall to be crossed should be taken and provided to Eversource Environmental Licensing and Permitting.
- Elevating work pads near stone walls using timber matting - If work pads cannot be reduced in size to avoid stone walls, timber matting may be used to elevate the work pad, or portions thereof, above the stone wall to avoid impacts. None of the timber mats should be in contact with the stone wall and before and after photographs of the stone wall should be taken.

If implementation of the four non-impact measures noted above is not feasible and either temporary or permanent alterations to a stone wall are necessary, Eversource Environmental Licensing and Permitting must be contacted prior to any alterations occurring to secure the appropriate permissions. These permissions may take several weeks to secure and may require input from the cultural resources consultant or Eversource Real Estate and/or Legal Departments.

Prior to alteration, proper documentation of the wall should be obtained and provided to Eversource Environmental Licensing and Permitting. At a minimum, this effort should include recording the following:

- Wall dimensions (total length, width, average height)
- Any existing breaches
- Wall location and general orientation on project maps

Photographs (including a scale, if possible) should also be taken of the entire wall clearly showing all sides, with increased attention on any areas of the wall that will be modified (e.g., expanded breaches) or will need to be rebuilt. The removal of dense vegetation along the stone wall prior to photography is highly recommended.

Once permissions to alter a stone wall and appropriate documentation have been secured, the following BMPs should be followed during alteration and rebuilding:

- While it is preferred that alterations be conducted by hand following traditional dry stone construction methods, construction machinery may be used when appropriate to the level of effort required and taking care not to unreasonably scratch or mar the stones or to begin excavating into soils underneath the wall.
- Any removed stones should be stockpiled nearby, outside any identified sensitive environmental areas such as wetlands or rare species habitat.
- When rebuilding, the wall should be reconstructed in the same location as the original and should match the original wall as closely as possible; if present, it is preferred that weathered/moss-covered surfaces are exposed.
- When alterations/rebuilding is complete, additional photographs from all sides should be taken and provided to Eversource Environmental Licensing and

Permitting.

### 3.5.2 Unanticipated Discoveries

During construction activities, most notably ground disturbing activities such as excavation, trenching, or grading, it is possible to discover previously unknown archaeological resources. Any specific procedures outlined in project-specific documents such as Post-Review Discoveries or Unanticipated Discoveries Plans should be followed. If such documents do not exist and a contractor encounters an unanticipated discovery, the contractor shall immediately notify the Eversource Construction Representative/Supervisor, secure the site, and not restart work in the area of the discovery until after the Eversource Senior Cultural Resources Program Administrator has granted clearance.

## 3.6 Human Remains

In the event human remains are encountered, the contractor must immediately stop work and notify the Eversource Construction Representative/Supervisor, secure the site, and ensure that the remains are treated with the utmost dignity and respect. The remains should be covered and left undisturbed along with any associated artifacts. No photography of the remains is allowed and work will not resume in the area of the discovery until after the Eversource Senior Cultural Resources Program Administrator has granted clearance. In addition to these preliminary guidelines, all relevant state laws and guidelines, including, but not limited to, the Massachusetts Unmarked Burial Law (M.G.L. Chapter 38, Section 6) and the Connecticut Human Burials Law (Conn. Gen. State. Sec 10-388) must be adhered to.

## 3.7 Vernal Pools

Construction within and across wetlands and in proximity to vernal pools should be limited to the extent practicable to avoid working in the periods between April 1st and June 1st. This will allow for obligate vernal pool species to emigrate to the breeding areas, deposit egg masses, and allow for hatching and development of juveniles. Silt fence should be installed at the limits of the construction to prevent individual reptiles and amphibians from entering the workspace, but in a manner that does not impede movement to and from pools from adjacent forested uplands. Consider installing syncopated silt fencing.

Protection Measures

When performing construction activities in proximity to vernal pools, a number of protection measures should be implemented.

Vegetation Removal

- Maintain existing scrub-shrub vegetation (consistent with ROW vegetation management requirements) within 25 feet of vernal pools, except in areas where access roads and work pads must be installed.
- Minimize removal of low growing (scrub-shrub) vegetation surrounding vernal pools by utilizing construction matting where access is needed. If vegetation must be cut adjacent to vernal pools, the cut vegetation (slash) should be left in place to serve as recruitment for leaf litter and coarse woody debris.

Erosion and Sedimentation Control

- Where the potential for sediment intrusion and runoff into a vernal pool exists, sedimentation and erosion controls shall be installed.
- Promptly remove erosion and sedimentation control devices upon final revegetation and stabilization of the ROW.

Access Roads

- Use construction mats, corduroy roads, or clean materials (i.e., clean riprap, gravel, stone or equivalent and rock fords) in locations where existing on-ROW access roads must be improved and are adjacent to vernal pools.
- Man-made depressions along existing on-ROW access roads provide low-quality vernal pool breeding habitat (due to an insufficient hydroperiod). Access roads must be graded and/or improved to accommodate project construction vehicles which may eliminate these depressions and the associated potential for amphibian breeding habitat. Perform improvements to on-ROW access roads outside of the breeding and migration seasons of vernal pool species to avoid direct impacts to amphibians that may breed in the man-made depressions along existing on-ROW access roads.

Scheduling and Site-Specific Considerations

- To the extent practicable (and in consideration of circuit outages and other construction timing constraints), schedule access road and work pad installation in and around vernal pool habitats to minimize interference with amphibian breeding and migration seasons.
- For project activities that must occur adjacent to vernal pools during amphibian migration periods, implement measures on a site-specific basis to facilitate unencumbered amphibian access to and from vernal pools. Consider the site-specific conditions including the type of construction activity that will occur in proximity to a vernal pool, the amphibian species known to occur in the vernal pool, and seasonal conditions. Identify appropriate mitigation measures. Options to be evaluated to allow amphibian access to vernal pools may include, but not be limited to: syncopated silt fencing in the immediate vicinity of vernal pools; elevated construction matting; and aligning erosion and sedimentation controls to avoid bifurcating vernal pool habitat.

### 3.7.1 Certified Vernal Pools (MA)

Encroachment upon Certified Vernal Pools (CVP) in Massachusetts should be avoided to the maximum extent practicable. CVPs are considered Outstanding Resource Waters (ORWs) in Massachusetts and are regulated under the 401 Water Quality Certification program. Consult with Eversource Environmental Licensing and Permitting.

## 3.8 Access Roads

Existing construction access roads are unpaved roadways that work crews use to access a site within a ROW. These access roads were generally either permitted previously or

constructed prior to the promulgation of regulations and are previously authorized under past general permits.

### 3.8.1 New Access Roads

New access roads are generally associated with new or large-scale projects that have separate permitting requirements. Construction of new access roads will be based on plans that are reviewed and approved by applicable federal, state, and local agencies. If a new access road is needed and not associated with a large project, notify Eversource Environmental Licensing and Permitting to make a decision on best access routes and identification of the necessary permits and approvals required to construct the new road. **Permit requirements must be followed**.

### 3.8.2 Existing Access Roads

The travel surface width of access roads in upland areas is not to exceed 16 feet. This does not include side slopes. Maintenance of existing access roads includes mowing of vegetation, grading, placement/replacement of stone, and the installation/maintenance of erosion control features (e.g., water bars, swales, sedimentation basins).

When access roads are in wetlands, measures should be taken to avoid disturbance to wetlands, waterways, and other sensitive environmental areas. If avoidance is not practicable, then measures should be taken to minimize the extent of disturbance. Alternate access routes should always be considered. Below is a list of methods that should be considered where disturbance is necessary:

- Minimize the width of typical access roads through wetlands. If an existing access road is evident in the wetland based on the presence of previously imported road-building materials (e.g., crushed stone), the existing width of the access road must be maintained. If unable to ascertain the original width of the access, then do not make the road wider than 16 feet (including side slopes).
- To the extent practicable, use low-impact vehicles and/or vehicles with low ground pressure when driving through wetlands.
- Coordinate the timing of work to minimize impacts during the regulatory low-flow period under normal conditions, when water/ground is frozen, after the spring songbird nesting season, and outside of the anticipated amphibian migration window (mid- February to mid-June). The ACOE defines the low-flow periods for streams as follows:
    - Connecticut streams—July 1 through September 30
    - Massachusetts non-tidal streams—July 1 through February 28
    - Massachusetts tidal streams—November 16 to February 15
- Use construction mats in wetlands to minimize soil disturbance and rutting when work needs to occur during non-frozen ground conditions.
- If practicable, conduct work manually if warranted (decision to be made by the Eversource Project Team).

Existing access roads are characterized by a clear dominance of imported fill material to a depth of at least three inches. When determining the presence and extent of an existing access road, soil probes shall be advanced as necessary to establish the boundary between fill and native soil. In some cases, hydrophytic vegetation may have become established or ponding may occur within the limits of imported fill. In these cases, the clear and

consistent presence of fill along a distinguished route is considered a previously authorized fill. Where the existing access road is not evident, Eversource Environmental Licensing and Permitting must be consulted to make a determination whether stone can be placed in the wetland. If stone is not evident, through soil cores, hand digging or other methods, construction mats must be used. If permanent access is warranted through the wetland, the new access road will need to have a permitting review and will likely require permits.

The access road in the wetland should not exceed 16 feet in width (unless there is evidence that the road was originally wider than 16 feet).

Over time, existing access roads require maintenance and repair. Travel by construction equipment and general traffic to reach a particular portion of the ROW must be via the designated access road and route. Changes in the location of the access road or the use of alternate roads must be reviewed and approved by the Eversource Project Team prior to their construction or use. Access road routes were selected to prevent degradation of the utility corridor, and must be constructed, used, and maintained in accordance with this BMP Manual, as well as federal, state, and local requirements, and other project plans.

In some situations, it may be necessary to construct redundant access roads, this practice should be avoided to the extent practicable. Some appropriate reasons for suggesting alternate routes are:

- Poor site conditions along preferred route because of weather or season.
- Property rights constraints, or property owner's preference.
- Equipment requirements.
- Unanticipated off-site access limitations along existing roads.

Unanticipated access opportunities (e.g., ice, snow, other developments) which may avoid environmental disturbance and/or reduce cost.

General Design: New and Existing Access Roads

Construction access roads that require new grading and/or filling or are to be heavily used require the creation of a stable, load-bearing surface resistant to erosion. If the existing soil and subsoil are not well drained, it may be necessary to import an aggregate road base (i.e., gravel borrow) such as that meeting the requirements of aggregate found in the:

- *Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges*, Section 400
- Connecticut *Standard Specifications for Roads, Bridges and Incidental Construction*, Section M1.02

When the construction access road follows the same route as the permanent design road, establishing the grades and subgrade for the permanent roadway early in the construction sequence is recommended.

The travel surface of construction access roads shall typically not exceed 16 feet in width except for passing points, where necessary. Subgrading shall not extend beyond the space required for the finished road and normal side slopes.

Where practicable, construction access roads should conform to the contours of the land,

avoiding grades steeper than 10 percent and creating side slopes no steeper than a ratio of 2:1. If the side slopes are steeper than 2:1, then use of engineered slope stabilization methods may be necessary. Consider the volume and type of construction traffic as well as the extent that natural ground must be altered to accommodate the traffic. If no grading is required and traffic is sporadic (i.e., access roads used to maintain utility lines) the measures used may be limited to water bars, or some top dressing with gravel or stone in areas where the vegetation over soft soil is destroyed by traffic.

During wet weather, these roadways can generate significant quantities of sediment if not constructed with adequate stormwater management and erosion control measures. During active construction or maintenance activities, inspection of the construction access road and associated erosion and sedimentation measures should be conducted by the person(s) designated at the pre-construction meeting, should occur regularly while the activity is occurring, and repairs to controls should be made in a timely matter. Repairs may include re-grading and/or top dressing the traveled surface with additional aggregate to eliminate ruts, as well as those repairs required by each erosion and sedimentation measure used. When the roadway is no longer needed on a regular basis, the access road should be reviewed to ensure that the road is left in a condition that prevents future erosion and sedimentation (e.g., installation of water bars, gravel). In some cases, permit conditions may require that the access road be removed and that the disturbed area be restored (e.g., seeded and mulched) in accordance with applicable permits as required to match the pre-construction conditions.

Erosion and Sedimentation Controls

Construction personnel are reminded to control erosion and flow conditions during access road construction or maintenance activities by utilizing the following erosion and sedimentation measures which are described and illustrated further in Appendix A:

- **Outlet protection**, a **level spreader**, a **trench breaker**, a **sediment trap or basin**, or a **stone check dam** may be used to de-energize concentrated flows from diversions and in temporary channels.
- **Geotextile silt fencing**, **compost filter berms**, **straw wattles** and **straw bale barriers** may be utilized to provide protection at the toe of fill slopes and discharges from water bars.
- Side slopes can be protected by installing **erosion control blankets** and **seeding** the area with a fast-growing native or annual grass mix.
- **Dust control** should be employed when construction access road conditions create airborne dust.
- **Geotextile fabric** shall be used beneath all new fill and construction entrances, where needed.

**The use of hay and/or hay products is strictly prohibited.**

**The use of nylon and/or plastic netting is strictly prohibited.**

### 3.8.3 Best Management Practices – New Access Roads

The following are BMPs that are applicable to new access roads in uplands and are described at the following tabs:

Construction Entrance Track Pad (see Figure A01 in Appendix A)

Stormwater Management BMPs (includes Water Bars [Figure A02], Drainage Swales [Figure A03], and Sedimentation Basins [Figures A38-A41] in Appendix A)

**Construction Entrance Track Pad**

Applications: Erosion and sedimentation control, roadway protection

Limitations:

- Maintenance is required if the pad becomes clogged with soil.
- Muddy conditions may warrant the use of a tire wash station.

Overview:

Where access roads or construction areas connect to paved roads, a stone track pad must be installed at the construction entrance to prevent construction machinery from tracking soil onto paved roadways. Materials appropriate to construction site soil conditions should be employed and/or replenished, as necessary.

Installation:

- Use 3- to 6-inch washed stone to install stone tracking pads at a minimum length of 50 feet and a minimum depth of 12 inches.
- On sites with clayey soils, underlay stone tracking pads with a geotextile liner to prevent the stone from sinking into the soil.

Maintenance:

- Periodically inspect the stone in the entrance track pad. If the pad becomes clogged with soil, remove and refresh and/or clean stone.

Additional Comments:

If muddy conditions warrant the use of a tire wash station, procedures should be established to ensure soils are not tracked off site.

Where appropriate and when safety and environmental conditions are considered, vehicle tires or tracks may be spun quickly ("burn out") on the track pad to further facilitate the removal of soil.

## Water Bar

Applications: Erosion and sedimentation control

Limitations:

- Should never be used to direct a watercourse into another waterbody or to divert unfiltered runoff to a wetland.
- Can impede vehicular movement.
- Damage from vehicle traffic and stormwater flow may require water bars to be reinstalled/reworked at the beginning and end of each construction season.

Overview:

Water bars are linear features built diagonally across access roads or ROWs to redirect stormwater runoff away from the road surface at non-erosive intervals. In general, they consist of a trench dug at least 6 inches below grade followed by an earthen mound at least 6 inches above grade. Use water bars to prevent erosion on sloping roadways less than 100 feet wide. Water bars must be designed to be stable throughout their useful life and meet the criteria in the table below. The maximum capacity should be the peak runoff from a 10-year storm.

Installation:

- Set water bar direction to utilize stable outlets and do not allow upslope water bar runoff to converge with down slope water bars. Water bars should be directed into well vegetated upland areas, sediment basins, or other erosion and sedimentation controls (e.g., straw bales, silt fence) as needed.
- Construct the bar immediately after vegetation has been cleared on constant or slightly increasing grades, not exceeding 2%. Avoid reverse grades.
- Mark the location and width of the ridge and disk the entire length.
- Fill ridge to above the design height and compact with wheeled equipment to the design cross section.
- Construct sediment traps or outlet stabilization measures, as needed.
- After the area has been permanently stabilized, remove the ridge and channel to blend with the natural ground level.
- Seed and mulch diversions that are intended for use for more than 30 days.

**Minimum Cross Section**

| Top Width (ft) | Height (ft) | Side Slopes |
|---|---|---|
| 0 | 1.5 | 4:1 |
| 4 | 1.5 | 2:1 |

| Maximum Recommended Spacing[1] | |
|---|---|
| **Land Slope (%)** | **Diversion Spacing (ft)** |
| < 5 | 125 |
| 5 to 10 | 100 |
| 10 to 20 | 75 |
| 20 to 30 | 50 |
| > 35 | 25 |

[1] Recommendations for ROW widths less than 100 feet as per the Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas (MassDEP, March 1997).

Maintenance:

- Inspect each week and after rain events of 0.25 inches (MA) or 0.50 inches (CT) or greater, or more frequently per permit conditions or Eversource Environmental Licensing and Permitting. Repair damage caused by construction traffic or erosion.
- Remove accumulated sediment and debris from the trench and stabilize outlets.
- If necessary, repair ridge to a positive grade and cross section, and add gravel at crossing areas.
- Use routine inspections to determine if the original spacing is adequate or if additional water bars need to be constructed.

## Drainage Swales

Applications: Convey stormwater away from work area and/or improve water quality and reduce peak runoff.

Limitations:

- Vegetated swales need to have adequately established vegetation before flow is diverted to them.
- Need to have adequate bottom stabilization to prevent scouring.

Overview:

Drainage swales usually consist of a ditch that is either vegetated or lined with riprap, erosion control blankets, or other materials. They are natural or constructed waterways/outlets that intercept, redirect, and convey stormwater away from the work area to a stable location and are used in areas where concentrated runoff would otherwise cause erosion/flooding. Swales can be used to reduce erosion in uplands and/or prior to discharge of stormwater flows to natural receiving waters (e.g., wetlands or streams). They also help to reduce surface flow velocity and turbidity.

*Grass Lined Channels (Stabilized with vegetation)*

- Use where vegetative lining will provide sufficient stability, slopes are less than 5%, and space is available for a wide cross section.

Installation:

- Remove trees, brush, and stumps.

- Excavate and shape channel to dimensions on plans. Overcut 0.2 ft for vegetative growth.
- Install temporary liner or riprap at inflows and stabilize outlets.
- Vegetate immediately after construction and divert water until grass establishes. Install matting if flow cannot be diverted.
- Install sod rather than seeding where slopes approach 5%.
- Spread topsoil to a minimum of 4 inches where soil conditions are unfavorable. Seeded channels should be mulched.

*Vegetated Swales (Stabilized with dense vegetation)*

- Use for water quality improvement and peak runoff reduction. Applicable for small drainage areas with relatively small amount of impervious cover. The grassed waterway is used to convey runoff at a non-erosive velocity. Dense vegetation can be established and a stable outlet constructed.

Installation:

- General design parameters are as follows: minimum capacity 10-year, 24-hour storm; design slopes to prevent erosion during the 2-year storm event; maximum side slopes 3:1; bottom width 2 to 8 feet.
- Vegetate with a native erosion control seed mix for use at moist sites and divert flow until established.

*Riprap Lined Channels (Contains lining of riprap or stone)*

- Use on sites where channel flow velocities exceed those acceptable for grass lined swales. Applicable where vegetative establishment is not possible or there are steep grades, wetness, highly erodible soils, seepage or prolonged base flow.

Installation:

- Remove trees, brush, and vegetation from channel area.
- Stabilize inlets and install outlet protection.
- Construct channel and install filter and lining as shown on plan.
- Use the maximum stone size for riprap plus thickness of filter.

Maintenance:

- Swales need to be routinely maintained to prevent brush/sediment buildup. Inspect swale regularly and after every rain event (0.25 inches (MA) or 0.50 inches (CT), or greater). Repair and/or re-seed rill or gully erosion. Remove accumulated sediments and brush before it reaches a depth of 6 inches.

Additional Comments:

- Depth and spacing of swales should be dependent on runoff conditions of the specific site.
- If required, install check dams constructed of riprap or other materials to slow flows along certain reaches of a swale.

- Remove temporary swales once construction is complete or areas are stabilized. If leaving swales in place will provide long-term benefits and be compatible with the ultimate use of the site, then they may remain in place.

**Sedimentation Basins**

Applications: Erosion and sedimentation control

Limitations:

- Traps and basins need to be adequately sized based on expected rain events and the contributing drainage area.

Overview:

Sediment traps and basins are used to filter and settle out suspended solids in stormwater runoff before water is released into a wetland or other unprotected and/or sensitive environmental area. A sediment trap is a temporary measure installed during construction to detain runoff, while a basin is a more permanent measure. Basins are also used where other erosion control measures are not adequate to prevent off-site sedimentation.

Sediment traps and basins should have three components: a forebay, a check dam, and a basin. Debris and some sediments begin to settle out of the water in the forebay. The stone or straw bale check dam filters more suspended solids as water flows through. The actual basin is a low-velocity pool where suspended solids settle out of the water column before the water is released at the outlet.

Based on the size of the project area, a qualified engineer may be required to calculate the appropriate size of the basin. State-specific guidance for basin sizing can be found in the following locations:

- Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas (Page 140); http://www.mass.gov/eea/docs/dep/water/esfull.pdf
- 2002 Connecticut Guidelines for Soil Erosion and Sediment Control (Section 5-11-1); http://www.ct.gov/dep/cwp/view.asp?A=2720&Q=325660.

Installation:

*Drainage area of 5 acres or less:*

- Install to direct stormwater runoff to the sedimentation trap or basin. Form basin by excavating a depression similar to a small pond or by placing an earthen embankment across an existing drainage swale or naturally low area.
- The ratio between the basin length and width should be greater than 3:1 (L:W). A ratio of 9:1 is recommended.
- Clear, grub, and strip all vegetation and root material from area of embankment and place embankment fill in lifts (<9”/lift, max). Compact fill and construct side slopes 2:1 or flatter. Excavate rectangular outlet section from compacted embankment.
- Filter fabric may be installed on bottom and sides of basin and covered by riprap.
- Extend outlet apron/spillway below toe of dam on level grade until stable conditions are reached (5 feet minimum). Cover inside face of stone outlet section with a 1-

foot layer of ½- to ¼-inch washed stone.

- Use permanent or temporary seeding to vegetate embankments, spillways, and disturbed areas downgradient of the basin.

*Drainage area of 10 acres or less:*

- Locate the basin in an easily accessible upland area, not a wetland area.
- Install the basin so that it intercepts the largest possible amount of runoff from the disturbed area.
- Divert sediment-laden water to the upper end of the sediment pool to improve trapping effectiveness.
- Basin should have a minimum volume based on ½-inch of storage for each acre of drainage area.
- Size basin to provide a minimum detention of 12 to 24 hours at the maximum runoff quantity expected for the duration of the basin's use.

Maintenance:

- Monitor the amount of sedimentation in the trap/basin. Install a stake with a marking at half the design depth. Remove sediment when it reaches this mark.
- Inspect after every rain event.
- Clean or replace the spillway gravel and re-seed/plant vegetation, as needed.
- Monitor embankment, spillway, and outlet for erosion. Repair erosion problems immediately.

Additional Comments:

Construction of sediment traps and/or basins should occur before primary construction on a project begins. They are often a critical stormwater management component for larger construction sites and/or those with poorly drained upland soils. If compatible with the post-construction site use, it may be appropriate to leave sediment basins in place indefinitely.

### 3.8.4 Construction in Wetlands

Access roads that are constructed in or across wetlands require the following considerations in addition to the considerations for access roads in uplands:

- Construction of new access roads in wetlands, whether temporary or permanent, that do not utilize construction mats (e.g., earthen and/or rock fill roads, corduroy roads) requires considerable project specific permitting and design. These types of projects should comply with project specific permits and plans, while only using this BMP manual as a general reference source. Permits often also require wetlands replication when permanent new access roads are constructed in wetlands.
- Avoid putting the construction access road in a wetland whenever practicable. Explore all feasible and prudent alternatives before determining that a wetland crossing is necessary. When avoidance is not practicable, consider crossings that will result in the least amount of disturbance. This may involve locating the construction access road so that it crosses the wetland at its narrowest width or uses areas previously disturbed for access or other purposes.

- Minimize the width of the temporary construction access road through the wetlands (generally no wider than 16 feet when using construction mats). It is preferable to have a passing point created before and after the wetland crossing, but internal passing points may be needed if the crossing is long or critical sight line restrictions exist.
- Construct access roads so that wildlife is able to pass under or go through the road. In areas where the road is only one construction mat thick, allow for passageways or "gaps" between construction mats. In locations where the access road is greater than one mat thick, install elevated construction mat road crossings or "bridges." Gaps and/or bridges are to be placed along the access road at intervals no less than 50 feet.
- Consider the soil conditions. Expect deep organic wetland soils to require geotextiles, construction mats, or other materials during use to keep imported road materials separated from wetland soils. In shallow organic or saturated soils, thick plywood sheets or AlturnaMATS® may be sufficient to support a stable travel surface for small, lightweight vehicles. In addition, in areas which are inundated or have deep organic wetland soils, it may be necessary to use more than one layer of construction mats.
- Prevent obstructions to surface and subsurface flow across and through the construction access road. Provide adequate drainage. This may require the use of crushed stone, a layer of log corduroy, construction mat bridges, or multiple cross culverts, particularly if the wetland does not contain a well-defined watercourse channel and/or the wetland crossing is long. If the wetland soils are susceptible to seasonal high groundwater tables or flooding, then give additional consideration for maintaining flows across and/or over the construction access road without causing erosion or siltation during such times.
- Plan in advance how the construction access road will be removed and the wetland restored. A road stabilization geotextile can facilitate the segregation of imported soils and crushed stone and/or log corduroy from the native wetland soils and make wetland restoration easier. However, after the end of an extensive project and a highly traveled crossing, stone removal from the wetland surface will still usually have to occur, even when placed in conjunction with geotextile.

In some cases, access roads may not need to be constructed in a wetland to gain access into or through a wetland if the work can be designed such that disturbances to the wetland are avoided or negligible. Options to be considered are presented below.

Equipment Selection and Usage:

- **Low ground pressure equipment -** Using equipment that reduces the pressure it exerts on the ground can minimize disturbance to sensitive areas. Employing the use of equipment with wide tires, rubberized tracks, and low ground pressure (<3 psi when loaded) can help minimize soil compaction.
- **Wide tires -** Increasing the width of tires will increase traveling surface area and therefore reduce the amount of ground compaction that the equipment will cause. Ultimately, this will reduce rutting, and allow for easier maneuvering of the vehicle. However, wide tires may be costly and will require a wider travel area.
- **Rubberized tracks -** Equipment with rubberized tracks spreads the weight of the vehicle over a much larger surface, reducing ground pressure and enabling the vehicle to move more freely through wet substrates. Each track can be between

1.5 and 3 feet wide, length depending on the width of the vehicle. This can greatly reduce rutting and allow the vehicle to move with less difficulty through wet substrates.

- **Lightweight equipment -** Disturbance in a wetland area can be lessened by reducing the size of equipment (e.g., ORVs, Gator™) used in sensitive environmental areas. This reduces the amount of pressure to the travel surface as well as the necessary width of access ways.

Timing of Work:

- **Work during frozen conditions**. Activities conducted once wetland areas are frozen can minimize rutting and other disturbance to the surrounding environment. Work during this time also generally reduces disturbance of aquatic and terrestrial wildlife movement by avoiding sensitive breeding and nesting seasons.
- **Work during the "low flow" period**. Conducting work during the low flow period can reduce disturbance to surface water and generally avoids spawning and breeding seasons of aquatic organisms. The ACOE defines the low-flow periods for streams as follows:
    - Connecticut streams—July 1 through September 30
    - Massachusetts non-tidal streams— July 1 through September 30
    - Massachusetts tidal streams—November 16 through February 15

Alternate Access:

- **Manual access** – Consider accessing work areas on foot through terrestrial areas and/or by boat through open water or ponded areas. Smaller projects (e.g., repairs to individual structures or parts of structures) do not categorically require the use of heavy machinery and should be accessed manually to the extent practicable.
- **Limit trips** – Multiple trips through a wetland have shown to increase the potential for damage and requirement for matting. Try to limit trip to one in and one out.

Use of overhead/aerial access (e.g., helicopters):

- Using overhead or aerial equipment can be expensive and is not always feasible, but it may be appropriate in some situations to get vehicles and other equipment to a site that may be otherwise very difficult to access. The use of overhead and/or aerial equipment may be beneficial for work in areas where large water bodies, deep crevices, or mountainous areas hinder ground access.

Erosion and Sedimentation Controls:

Construction personnel are reminded to control erosion and flow conditions during new access road construction by utilizing the following erosion and sedimentation measures which are described and illustrated further in Appendix A:

- **Straw wattles** [Figure A26 in Appendix A]**, geotextile silt fencing** [Figure A22 in Appendix A]**,** and **straw bale barriers** [Figure A21 in Appendix A] may be installed at the edges of earthen roads or construction mat roads to prevent erosion of soil into wetlands from the road fill or tracked soil on construction mats.
- In areas where silt fencing is required for more than one activity season, **syncopated silt fencing** [Figure A23 in Appendix A] may be installed to permit animal crossings.

- Side slopes of earthen roads can be protected by installing **erosion control blankets** [Figure A25 in Appendix A] and **seeding** [Figure A32 in Appendix A] the area with a fast-growing native or annual grass mix.
- **Dust control** should be employed as necessary when construction access road conditions create airborne dust when necessary. Refer to Section 3.16 of this BMP Manual.

### Best Management Practices – Construction in Wetlands

The following are BMPs that are applicable to new access roads in wetlands and are described at the following tab:

Construction Mats (includes Elevated Construction Mats and AlturnaMATs®; see Figures A04 – A06 in Appendix A)

Permeable Road (see Figure A08 in Appendix A)

Dewatering (see Figures A39 – A41 in Appendix A)

### Construction Mats (i.e., timber or swamp mats)

Applications: Wetland crossings, rut minimization

- Used for access where the ground surface is unstable due to shallow, standing water, saturated soils, or other substrates not suitable for heavy vehicles.

Limitations:

- Only for temporary use. Generally, mats should be removed upon construction completion.
- May float away in high water conditions.
- Need to be installed with heavy machinery.
- AlturnaMATs® limited to smaller vehicles and equipment.
- Equipment operators should remain cautious so as not to drive off or slip off the side of the mats.
- In winter, mats must be plowed and sanded or heated to prevent equipment from sliding off mats. Use of a deicing agent requires approval by Eversource Environmental Licensing and Permitting. Snow removal must be conducted in accordance with the Eversource Snow Removal BMP (refer to Section 3.15).

Installation:

- Place mats along the travel area without any gaps and so that each board is positioned perpendicular to the direction of traffic. Position mats so that they are offset far enough from the resource area so that ruts are not created when equipment enters and exits a sensitive area.
- Remove mats by "backing" out of the site and removing mats one at a time. Regrade soils to pre-existing contours while taking care not to compact soils.
- Clean mats after use to remove any invasive plant species seed stock. Cleaning methods may include, but are not limited to, shaking or dropping mats in a controlled manner with a piece of machinery to knock off attached soil and debris,

spraying with water or air, sweeping, or exposing the mats to high temperatures.

- Clean mats that were used in wetlands dominated by invasive species using brooms, shovels, and compressed air, if needed.

Additional Comments:

Construction mats installed in wetlands categorized as ORWs in Massachusetts must be underlain by non-woven geotextile, which can be placed directly on the ground surface beneath the first layer of matting or atop the first layer of matting if additional layers of mats are to be installed.

Lightweight, easy to maneuver alternatives to traditional mats are available. For example, AlturnaMATS® are half-inch thick polyethylene slip-resistant ground protection mats available in dimensions up to 4 feet by 8 feet and weigh between 21.5 and 86 pounds.

Mat anchoring may be required for matting installed in areas prone to flooding, such as stream crossings, shorelines of lakes and ponds, floodplains where known base flood elevations are 2 feet or greater above the ground surface, and tidal areas, and when mats will be in place in these areas for more than two weeks during hurricane season. The need for, and type of, anchoring should be coordinated with Eversource Environmental Licensing and Permitting. Examples of mat anchoring include:

- Linear ropes anchored using helical screws, manta ray anchors, or posts.
- Cable or report in chain pockets and run linearly.

Construction mat anchoring methods are illustrated in Figure A07 in Appendix A of this BMP Manual. Additional methods may be necessary depending on site and/or weather conditions.

**Permeable Road** (i.e., rock sandwich, French Mattress, or road with continuous cross-drainage)

Applications: Temporary wetland crossings, rut minimization

Limitations:

- Must be removed entirely at the end of construction unless project-specific permits have been obtained to allow for permanent wetland fill.
- Not appropriate for areas where concentrated, high volume and/or velocity water flow will intersect the road (i.e., stream crossings).
- Need to be installed with heavy machinery.
- Equipment operators should remain cautious so as not to drive or slip off the side of the road.

Overview:

Permeable roads are used for access in situations not suitable for heavy vehicle use often due to unstable ground surfaces with shallow standing water, saturated soils, or other unstable substrate. Installation of a permeable road can also help reduce the potential for frost action and pothole creation by preventing groundwater from wicking up into the road fill material.

Installation:

- Cover existing soil with a geotextile fabric prior to road construction. Excavation of existing soil is generally not recommended in order to minimize impacts to the resource area. Construct road on top of the soil surface, as shown on the typical on the next page. Drainage layer materials include 3- to 6-inch rock (12-inch minimum depth) or log corduroy (2-inch minimum diameter).
- Install the road so that it is offset far enough from the resource area so that ruts are not created when equipment enters and exits a sensitive area.
- Remove road by "backing" out of the site and removing road one section at a time. Regrade soils to pre-existing contours while taking care not to compact soils.

Maintenance:

- Regularly inspect and clean edges of cross-drainage layer along the sides of the road to prevent clogging by debris, leaf litter, sediment, etc.

### 3.8.5 Watercourse Crossings

There are a number of BMPs that can be used to minimize disturbance to streams. For each application, consider the site and project needs to select a method that is cost effective and will incur the fewest secondary disturbances. Additional erosion and sedimentation controls (e.g., straw bales) may be required in conjunction with the stream crossing BMPs to protect sensitive areas. The stream crossing methodology chosen will depend largely on the equipment required for a particular task, the existing environmental conditions, and the duration of the crossing. In constructing any stream crossing, care should be taken to limit disturbance to the extent practicable within 100 to 200 feet of the stream banks (the riparian area). The riparian area provides habitat to a number of species and provides protection and shading to the stream.

Erosion and Sedimentation Controls

Construction personnel are reminded to control erosion and flow conditions during new watercourse crossings by utilizing the following erosion and sedimentation measures which are described and illustrated further in Appendix A:

- **Straw wattles** [see Figure A26 in Appendix A]**, geotextile silt fencing** [see Figure A22 in Appendix A] and/or **straw bale barriers** [see Figure A21 in Appendix A] may be installed at the edges of earthen roads or construction mat roads to prevent erosion of soil into watercourses from the road fill or tracked soil on construction mats. These controls however should generally not be placed within a watercourse.
- Side slopes of earthen roads can be protected by installing **erosion control blankets** [see Figure A25 in Appendix A] and **seeding** [see Figure A32 in Appendix A] the area with a fast-growing native or annual grass mix.

#### Best Management Practices – Watercourse Crossings

The following are BMPs that are applicable to new access roads watercourse crossings and are described at the following tabs:

Stream Crossings without Bridges (includes limiting turbidity and stone crossing; see Figures A05, A06, and A12 in Appendix A)

Bridged Crossings (includes construction mat bridges and rail car frame bridges; see Appendix A)

Dewatering (see Figures A39 – A41 in Appendix A)

**Stream Crossings Without Bridges: Limiting Turbidity**

Applications: Stream crossing, turbidity control

Limitations:

- Limited to areas where stream banks and bottoms will not be significantly damaged by the crossing.

Overview/Use:

- In some situations, such as routine or emergency maintenance with small ORVs, pickup trucks or tracked equipment, it may be acceptable for equipment to simply travel (perpendicularly) through a stream.
- Crossings are generally considered acceptable in situations where there is an existing or historic access road, a stable rock or sand/gravel stream bottom, and/or the crossing is at a relatively narrow reach of the stream and any adjacent wetlands.
- Cross streams slowly to minimize in-stream turbidity.

**Stream Crossings Without Bridges: Stone Crossings**

Applications: Stream crossing, turbidity control

Limitations:

- Only use in small (less than 2 feet wide or braided) intermittent streams which do not appear on USGS topographic maps and have a downstream section with a gradient greater than 20%.
- Not suitable in areas where there could be a potential for fish passage.
- Stone size should be sufficient to allow for macroinvertebrate passage.
- Not preferred for new access road crossings; generally more suitable for existing access road crossings.
- Project-specific permitting may be required to allow for installation of stone within a stream bed. Consult with Eversource Environmental Licensing and Permitting prior to using this crossing method.

Overview/Use:

- Use to cross small streams with stable stream bottoms.
- Carefully place 6-inch to 8-inch clean angular stone within stream at crossing. Limit width of stone to that needed for widest vehicle/equipment to crossing the stream.
- Drive over stone slowly.
- Leave riprap in intermittent streams for future use. More damage will occur by removing stone.

**Bridged Crossings: Construction Mats as Temporary Bridge**

Applications: Watercourse crossings

Limitations:

- Installation requires machinery.
- May become unstable under high flows.

Overview/Use:

- Untreated wooden construction mats may be used as a temporary bridge over a stream to allow construction vehicles access to the work site. Construction mat bridging is suitable for crossing intermittent and perennial streams. Before constructing a stream crossing, confirm that the construction mats are capable of supporting the equipment to be used.
- Place small sections of matting on either side of the stream parallel to the flow of water at top of banks to act as supports. Then place mats perpendicular to the stream and resting on top of the initial construction mat supports.
- Install non-woven geotextile between the first and second layers of matting; install erosion control barriers (e.g., straw bales, straw wattles, silt socks) along edges of timber matting to minimize potential for soil to discharge to the stream.
- Use of non-woven geotextile fabric at ORW crossings (MA) is required.

**Bridged Crossings: Rail Car Frame as Temporary Bridge**

Applications: Watercourse crossings

Limitations:

- Requires heavy equipment for transport and installation.
- Expensive.
- Banks must be stable to support heavy loads.

Overview/Use:

- Used rail car frames can be used for crossing larger and deeply incised streams where construction mats are unsuitable.
- Place the rail car frame perpendicular to the stream flow and between opposing banks. Use timber frame footings, if necessary. Next, place construction matting
- Install non-woven geotextile between the first and second layers of matting; install erosion control barriers (e.g., straw bales, straw wattles, silt socks) along edges of timber matting to minimize potential for soil to discharge to the stream. Use of non-woven geotextile fabric at ORW crossings (MA) is required.

**Culvert Installation / Repair / Replacement**

**Contact Eversource Environmental Licensing and Permitting prior to performing any culvert installations, repairs and/or replacements**

Applications: Stream and wetland crossings

Limitations:

- Permitting and design are required for new culvert installation or expansion of existing culverts over streams and wetlands. Significant regulatory requirements must be followed. Permitting restrictions on time of year use.
- Installation may require in-stream work; dewatering and sedimentation concerns.
- Culverts are susceptible to washouts, sedimentation, erosion, and failure during heavy wet-weather events and flooding.
- Culverts require routine and long-term maintenance because they often become clogged with debris or other obstructions.

Overview:

Culverts are installed to maintain wetlands or streams at road crossings. Hydraulic calculations are required at all crossings to determine the area that will drain to the culvert.

General Design Guidelines:

- Size culverts to handle the maximum expected flow of the wetland or watercourse. It is preferable to have one large culvert rather than multiple culverts. Corrugated culverts are favored because they slow the water velocity. HDPE corrugated pipes are preferred to metal.
- Design culverts to withstand and accommodate high flows while maintaining existing low flows and not impeding on the movement of indigenous aquatic life. Culverts must be sized to accommodate flows from at least the 100-year storm and preferably 500-year storm.
- The maximum velocity at the culvert outlet should be consistent with the velocity of the natural channel. To mitigate higher velocities, use outlet protection measures, energy dissipation, and channel stabilization, if necessary.
- Refer to state specific stream crossing guidance documents for additional design requirements:
    - Connecticut: Stream Crossing Guidelines, CT DEEP, Inland Fisheries Division Habitat Conservation and Enhancement Program, February 26, 2008 (www.ct.gov/deep/lib/deep/fishing/restoration/streamcrossingguidelines.pdf)
    - Massachusetts: Massachusetts River and Stream Crossing Standards, River and Stream Continuity Partnership, March 1, 2006, Revised March 1, 2011 (https://www.nae.usace.army.mil/Portals/74/docs/regulatory/StreamRiverContinuity/MA_RiverStreamCrossingStandards.pdf)

Installation:

- Construction mats may be placed over culverts to provide structural protection from heavy loads.

- Backfill culverts with natural substrate matching the upstream and downstream streambed substrate, even when fish passage is not a concern. Other aquatic organisms rely on natural streambed sediment to aid their movement.
- Strive to install culverts with minimal disruption to the watercourse and riparian buffer zone.
- Culvert length should be as short in length as practicable. Cut culverts to size if they are protruding into the natural streambed.

Maintenance:

- Remove debris and sediment from culverts to maintain an open channel for flow. A clogged culvert could result in flooding and washout.

**Pole Fords**

Applications: Stream Crossings

Limitations:

- Limited to streams with gently sloping adjacent land.

Overview/Use:

- Poled fords are used in remote locations where a stream crossing requires a functional BMP, but it is impractical to bring in larger materials. Sufficiently sized wood poles or saw logs of may be laid in the streambed parallel to the flow.
- Gently slope the road to and from the streambed at a maximum ratio of 1:5 (V:H). To limit disturbance to the riparian area, install engineering fabric and cover with an aggregate bed at the approach and exit.
- Use poles with a minimum length of ten feet.
- Remove poles immediately after use.

## 3.9 Slope Excavation

Engineering designs may be required for any changes in upland areas that could potentially direct or channel water across the face of slopes, particularly terrace escarpments or other highly erodible soils. No snow or soil piles, construction materials, or equipment should be stored in the immediate vicinity at the top of the terrace escarpment or other highly erodible soils.

## 3.10 Vegetation Removal and Preservation

Care should be taken to limit disturbance to the extent practicable when removing vegetation. Grubbing is not preferred as it results in considerable ground disturbance that could result in erosion and should be avoided to the extent feasible. Utilize grubbing only when all other methods cannot be used to prepare stable and safe work areas. If grubbing is necessary, the area must be seeded and mulched to protect it prior to the end of the workday. During mowing and trimming, woody debris greater than two (2) inches in diameter should not be placed in wetlands, and no woody debris should be placed in standing water. Permit conditions may mandate all woody debris to be removed from sensitive environmental areas. Mowing must be kept to a minimum, particularly at road crossings.

### 3.10.1 ROW Vegetation and Eastern Box Turtle (EBT) – MA only

Eastern box turtles (EBT) are often found near small streams and ponds and inhabit old fields, deciduous forests, and logged woodlands. Adults are completely terrestrial, while the young may be semiaquatic. EBTs hibernate on land by digging down in the soil between October and April. They have an extremely small home range and can usually be found in the same area year after year. EBT populations have been negatively impacted by the loss of suitable habitat. Some turtles may be killed directly by construction activities, but many more are lost when important habitat areas for shelter, feeding, hibernation, or nesting are destroyed. As remaining habitat is fragmented into smaller pieces, turtle populations can become small and isolated. Turtles are long-lived and the loss of even a single adult turtle can negatively impact the persistence of a local population. Therefore, vegetation removal in ROWs should be performed in a manner that minimizes impacts to turtle populations.

**Cleared and Maintained ROW**—EBTs have been found to use existing ROWs for foraging and nesting. Whenever feasible, perform maintenance mowing in identified habitat during inactive periods (November 1st to March 31st). Turtle BMPs are not required for work performed during the inactive period.

If mowing during the active turtle season (April 1st to October 31st) is required, turtle sweeps should be conducted by trained personnel prior to mowing activities; mow vegetation to no lower than seven (7) inches. Use Brontosaurus or Fecon mower heads to minimize the impact to identified habitat areas. Do not used Flail-type mowers during the active season. Additionally:

- **Avoid direct harm to turtles**. Visual inspections ("turtle sweeps") of the work area must be conducted by trained personnel prior to the commencement of work. If turtles are encountered, they should be removed from the work area and reported to NHESP.

Use extra care when using heavy machinery or traveling in vehicles through areas mapped as turtle habitat.

Any silt fencing used in these areas should be removed as soon as site stabilization has occurred; fencing can be a barrier to turtle movements. Alternatively, install silt fencing in accordance with the Syncopated Silt Fence detail (see Appendix A).

If required, excavation should be completed within one (1) day and/or open excavations should be backfilled daily to prevent turtles from becoming trapped.

*Uncleared ROW*—When project work requires vegetation removal in an uncleared ROW, cut and mow uncleared portions of EBT habitat during the active season (April 1st to November 1st). If clearing must be conducted during hibernation periods, pre-planning will involve conducting a turtle survey and the possible use of telemetry. Consult Eversource Environmental Licensing and Permitting before performing work because this activity may not be covered under the OMP and may require a permit.

### 3.10.2 ROW Vegetation and Other Protected Turtles

In addition to EBTs, some ROWs overlap with known habitat of other protected species of turtles. In Massachusetts, these species include Blanding's Turtle, Bog Turtle and Northern Red-bellied Cooter. If any work, including but not limited to vegetation

management, is scheduled to occur in the habitats of these turtles at any time of the year, **avoid wetland work**.

If unavoidable, operation and maintenance work in wetlands should be minimized to the greatest extent practicable. If work must occur in wetlands, the following guidelines apply:

- Any work should be reported to NHESP
- Work within wetlands mapped as habitat for the Bog Turtle or Northern Red-bellied Cooter must be reviewed on an individual basis by NHESP.

| | | Recommended Maintenance Activity if the Existing ROW is: | |
|---|---|---|---|
| Time Period | Turtle Status | Cleared and Maintained | Uncleared |
| April 1 to November 1 | Active | *Perform only if required*—Mow vegetation no lower than seven (7) inches and use recommended mower heads | *Recommended*—Cut and mow uncleared areas |
| November 1 to April 1 | Inactive | *Recommended*—Perform maintenance mowing | *Not recommended*—Requires turtle survey at minimum before removing vegetation |

*General Construction Recommendations* –The following are general construction guidelines for protecting turtles:

- Install silt fencing around the work area prior to construction activity. Consider using syncopated silt fencing (see Figure A23 in Appendix A).
- Turtle training is required for all contractors. Apprise workers of the possible presence of turtles and provided a description of the species. Include a turtle sweep reminder on the Daily Tailboard.
- Conduct a turtle sweep after installing silt fencing and before conducting work.
- Perform daily turtle sweeps in work areas before performing any work.
- Carefully move any turtles that are discovered to an area immediately outside of the fenced area. Position turtle in the same direction that it was walking.
- Perform work with caution during early morning and evening hours. Take special care not to harm basking or foraging individuals.
- Remove silt fencing after work is completed and soils are stable so that reptile and amphibian movement between uplands and wetlands is not restricted.
- Return temporary cross-country access routes to pre-construction grade, seed if adequate root and seed stock are absent, and mulch. Do not seed pre-existing sandy soils that are within mapped rare turtle habitats unless directed by Eversource Environmental Licensing and Permitting in order to avoid altering nesting habitat.

### 3.10.3 Preservation of Existing Vegetation

Preserve the existing vegetation (i.e., groundcovers, vines, shrubs, trees) when practicable to improve soil stability and decrease the runoff volume and velocity. Identify and protect specified trees for erosion and sediment control benefits and/or aesthetic purposes. Consider saving trees that provide shading or screening benefits, particularly in residential areas. Preserve existing vegetation by reducing the width of a cleared ROW at stream crossings.

### 3.10.4 Invasive Plant Species

Invasive plant species are non-native species that invade natural communities and develop self-sustaining populations. The start of many infestations is often tied to a disturbance, and once established, the invasive species spread into undisturbed landscapes. They out-compete native species, disrupting ecological processes, and cause a loss of economic value or output. **It is illegal to transport, to introduce, and/or propagate state-listed invasive species**. Cleaning, draining and drying equipment between sites is mandated for aquatic invasives, and recommended for terrestrial equipment. Power washing of equipment and gear between sites is recommended, where feasible. At a minimum, visual inspection and hand removal of any plants, seeds, propagules, insects, mud, etc. is encouraged to maintain compliance with state laws and rules.

The linear nature of utility maintenance activities in vegetated corridors entails that a range of vegetative communities may be encountered by equipment, vehicles and personnel during the course of a single maintenance project or when mobilizing from one project site to another. It is especially important to follow best management practices when mobilizing equipment, vehicles and personnel from an area infested with invasive species to an un-infested area.

#### 3.10.4.1 Project Planning – Invasive Plant Species

Prior to starting utility maintenance work, the project area should be evaluated to determine:

- Do invasive plant species exist in the project area?
- Do project activities have the potential to contact invasive plants or disturb soils in a manner that could potentially spread live plant parts or viable seeds?
- If invasive species are not present, or if it is not possible or not feasible to identify invasive plant species within the project area, follow best management practices to minimize the disturbance and spread of soil and/or plant matter.

#### 3.10.4.2 Species Identification

It is imperative that workers who will be working or operating equipment in areas that may contain invasive plant species be trained in the identification and modes of dispersal of common, highly-prolific aquatic and terrestrial invasive plant species commonly found along road sides and in utility ROWs. See tables below for identification of the common invasive plants in Connecticut and Massachusetts.

Invasive Species in Massachusetts[1]

| Botanical Name | Common name |
|---|---|
| *Aegopodium podagraria* | Bishop's goutweed; bishop's weed |
| *Acer platanoides* | Norway maple |
| *Acer pseudoplatanus* | Sycamore maple |
| *Ailanthus altissima* | Tree of heaven |
| *Alliaria petiolata* | Garlic mustard |
| *Berberis thunbergii* | Japanese barberry |
| *Cabomba caroliniana* | Carolina fanwort; fanwort |
| *Celastrus orbiculatus* | Oriental bittersweet; Asian or Asiatic bittersweet |
| *Cynanchum louiseae* | Black swallow-wort; Louise's swallow-wort |
| *Cynanchum nigrum – see Cynanchum louiseae* | Black swallow-wort; Louise's swallow-wort |
| *Elaeagnus umbellata* | Autumn olive |
| *Euonymus alatus* | Winged euonymus; burning bush |
| *Euphorbia esula* | Leafy spurge; wolf's milk |
| *Fallopia japonica - see Polygonum cuspidatum* | Japanese knotweed; Japanese or Mexican bamboo |
| *Ficaria verna - see Ranunculus ficaria* | Lesser celandine; fig buttercup |
| *Frangula alnus* | European buckthorn; glossy buckthorn |
| *Glaucium flavum* | Sea or horned poppy; yellow hornpoppy |
| *Hesperis matronalis* | Dame's rocket |
| *Iris pseudacorus* | Yellow iris |
| *Lepidium latifolium* | Broad-leaved pepperweed; tall pepperweed |
| *Lonicera japonica* | Japanese honeysuckle |
| *Lonicera morrowii* | Morrow's honeysuckle |
| *Lonicera x bella [morrowii x tatarica]* | Bell's honeysuckle |
| *Lysimachia nummularia* | Creeping jenny; moneywort |
| *Lythrum salicaria* | Purple loosestrife |
| *Myriophyllum heterophyllum* | Variable water-milfoil; two-leaved water-milfoil |
| *Myriophyllum spicatum* | Eurasian or European water-milfoil; spike water-milfoil |
| *Nasturtium amphibium - see Rorripa amphibia* | Water yellowcress; great yellowcress |
| *Nasturtium officinale - see Rorripa nasturtium-aquaticum* | |
| *Phalaris arundinacea* | Reed canary-grass |
| *Phragmites australis* | Common reed |

Invasive Species in Massachusetts[1]

| Botanical Name | Common name |
|---|---|
| *Polygonum cuspidatum* | Japanese knotweed; Japanese or Mexican bamboo |
| *Polygonum perfoliatum* | Mile-a-minute vine or weed; Asiatic tearthumb |
| *Potamogeton crispus* | Crisped pondweed; curly pondweed |
| *Ranunculus ficaria* | Lesser celandine; fig buttercup |
| *Reynoutria japonica – see Polygonum cuspidatum* | Japanese knotweed; Japanese or Mexican bamboo |
| *Rhamnus cathartica* | Common buckthorn |
| *Rhamnus frangula – see Frangula alnus* | European buckthorn; glossy buckthorn |
| *Robinia pseudoacacia* | Black locust |
| *Rorippa amphibia* | Water yellowcress; great yellowcress |
| *Rosa multiflora* | Multiflora rose |
| *Salix atrocinerea/Salix cinerea* | Rusty Willow/Large Gray Willow complex |
| *Sisymbrium amphibium - see Rorripa amphibia* | Water yellowcress; great yellowcress |
| *Trapa natans* | Water-chestnut |
| *Vincetoxicum nigrum – see Cynanchum nigrum* | Black swallow-wort; Louise's swallow-wort |

[1] Based on the Massachusetts Invasive Plants Advisory Group (MIPAG); Last Updated 6/2021

Invasive Species in Connecticut[1]

| Botanical Name | Common name |
|---|---|
| *Acer platanoides* | Norway maple |
| *Aegopodium podagraria* | Goutweed/Bishops Weed |
| *Ailanthus altissima* | Tree of heaven |
| *Alliaria petiolata* | Garlic mustard |
| *Ampelopsis brevipedunculata* | Porcelainberry |
| *Artemisia vulgaris* | Mugwort |
| *Berberis thunbergii* | Japanese barberry |
| *Berberis vulgaris* | Common barberry |
| *Cabomba caroliniana* | Fanwort |
| *Cardamine impatiens* | Narrowleaf bittercress |
| *Celastrus orbiculatus* | Asiatic bittersweet |
| *Centaurea stoebe* | Spotted knapweed |
| *Cynanchum louiseae* | Black swallow-wort |

Invasive Species in Connecticut[1]

| Botanical Name | Common name |
|---|---|
| *Cynanchum rossicum* | Pale swallow-wort |
| *Elaeagnus umbellata* | Autumn olive |
| *Euonymus alatus* | Winged euonymus |
| *Euphorbia esula* | Leafy spurge |
| *Frangula alnus* | Glossy Buckthorn |
| *Froelichia gracilis* | Slender snake cotton |
| *Hesperis matronalis* | Dame's rocket |
| *Hydrilla verticillata* | Hydrilla |
| *Iris pseudacorus* | Yellow iris |
| *Lepidium latifolium* | Perennial pepperweed |
| *Lonicera japonica* | Japanese honeysuckle |
| *Lonicera maackii* | Amur honeysuckle |
| *Lonicera morrowii* | Morrow's honeysuckle |
| *Lonicera x bella* | Belle honeysuckle |
| *Lythrum salicaria* | Purple loosestrife |
| *Microstegium vimineum* | Japanese stiltgrass |
| *Myosotis scorpioides* | Forget-me-not |
| *Myriophyllum heterophyllum* | Variable-leaf watermilfoil |
| *Myriophyllum spicatum* | Eurasian watermilfoil |
| *Phalaris arundinacea* | Reed canary grass |
| *Phragmites australis* | Common reed |
| *Polygonum caespitosum* | Bristled knotweed |
| *Polygonum perfoliatum* | Mile-a-minute vine |
| *Potamogeton crispus* | Curly-leafed pondweed |
| *Ranunculus ficaria* | Fig buttercup |
| *Rhamnus cathartica* | Common buckthorn |
| *Robinia pseudoacacia* | Black locust |
| *Rosa multiflora* | Multiflora rose |
| *Rubus phoenicolasius* | Wineberry |
| *Trapa natans* | Water chestnut |
| *Tussilago farfara* | Coltsfoot |

[1] Based on the Connecticut Invasive Plants Council in accordance with Connecticut General Statutes §22a-381a through §22a-381d. The list was most recently re-printed in October 2018.

### Avoidance and Minimization

- If possible, avoid or minimize contact with invasive species by physically avoiding locations with invasive plant infestations.
- In locations where invasive infestations exist, design the project to minimize contact with invasive species by choosing access routes and staging areas that are outside areas of infestation.
- Sequence work to the extent possible such that work using clean equipment and materials proceeds in un-infested areas prior to moving into infested areas and not vice versa.
- If it is unknown whether invasive species exist, design the project to limit travel across vegetated areas to the extent possible.
- When possible, time work under conditions that minimize the risk of spread, (frozen ground, snow cover, absence of seeds or propagules).

### Vegetation Management

- Control of invasive plants by chemical means should be performed by a licensed applicator in accordance with the requirements of the CT DEEP Pesticide Management Program, the Massachusetts Pesticide Control Act (MPCA; M.G.L. Chapter 132B) and 333 CMR 2.00, ROW Vegetation Management regulations (333 CMR 11.00), and the MAWPA.
- Mechanical mowing of vegetation should adhere to principals of avoidance and minimization. Where possible avoid mowing invasive plants, especially plants that have the ability to sprout from stem and root fragments. For other invasive species, mowing should occur prior to seed set if possible.
- If woody vegetation is removed from a project site, transport it in compliance with invasive pest or disease quarantine zones established by the United States Department of Agriculture (USDA), the Connecticut Agricultural Experiment Station, MA DCR, and MA DAR.
- Any restoration seed mixes used should be free of any species identified as invasive by the Connecticut Invasive Plants Council in accordance with Connecticut General Statutes §22a-381a through §22a-381d (in Connecticut) or the Massachusetts Invasive Plants Advisory Group (in Massachusetts).

### Soil Disturbance and Management

- Where possible, avoid soil disturbance as it may increase the chances of colonization by invasive seeds or propagules.
- Stabilize disturbed soils as soon as possible by seeding and/or using mulch, straw or gravel that is free of invasive plant material.
- Where possible, when excavating soils, top layers of soil containing plant material and roots should be segregated from sub soils and left on site.
- Cover soil and other material containing invasive plant material during transport.
- Do not transport fill and material containing invasive plant material onto a project site.
- If fill and materials containing invasive species must be transported off site, do not reuse, stockpile or dispose of these materials in such a manner that could promote

the spread of invasive plants.

**Decontamination Procedures**

- When utility maintenance activities require work in areas infested with invasive species, implement decontamination procedures per NHDOT's Best Management Practices for Roadside Invasive Plants manual.
- In order to minimize the spread of invasive plant seeds and material:
    - Clean vehicles, equipment, materials, gear, footwear or clothing of all visible soil and plant material on site in the infested area, or as near as practical to the infested area, prior to leaving the project site.
    - Do not decontaminate equipment next to streams or water bodies that could potentially transport seeds or propagules.
    - Decontaminate equipment and materials that may be contaminated by aquatic plant materials adjacent to the surface water they were exposed to prior to use in another surface water body.
    - Do not transport water withdrawn from a surface water body and discharge it to another water body.

**Methods of Cleaning**

- Use a brush, broom or hand tools to manually clean.
- Clean debris off equipment such as construction matting by shaking or dropping mats in a controlled manner to dislodge attached soil and debris.
- Compressed air.
- Containment must be in compliance with wastewater discharge regulations when using low-or high-pressure wash stations.

## 3.11 Work Pads

### 3.11.1 De-Energized and Energized

Applications: Work in wetlands

- Reconnaissance of each work pad area in or adjacent to wetlands should be performed to determine if the construction mat work pad areas could be located outside of wetland resource areas. Wetland disturbances should be avoided or minimized where practicable. Coordinate work pad locations and/or configurations with Eversource Environmental Licensing and Permitting.

Limitations:

- Requires heavy machinery for installation.
- Significant amount of time required for installation and removal.
- Pads for live line work require a considerably larger footprint.
- Several layers of matting may be needed in deep, construction areas.
- Animals may be injured or killed when attempting to cross work pads.

- May not be suitable in deep/open water wetlands.
- Must be underlain with non-woven geotextile if within an ORW (MA only).

How to Use:

- Work at structures may require placement of construction mats to provide safe and stable work pad areas for employees and contractors.
- Live line work, which is work that is done while the line is energized, requires a much larger work pad area. Efforts should be avoid or minimize impacts to wetlands to the extent practicable.
- Sizes of work pads vary based on the type of work being proposed.
- Work pad areas may extend into wetlands where structures that require maintenance either fall within or are in proximity to wetlands. In these cases, untreated wooden construction mats shall be used to limit disturbance.
- Install silt fencing around work pads in identified amphibian and reptile priority habitat and where matting is greater than one mat thick. The exclusionary silt fencing will deter animals from moving across work pads and reduce the likelihood of being crushed by heavy equipment.
- Following construction activities all mats at each work pad and vehicle access locations must be removed.
- Remove mats by "backing" out of the site and removing mats one at a time. Regrade soils to pre-existing contours while taking care not to compact soils, if necessary.
- In areas with invasive species, plant material should be removed from mats following removal from the infested area to prevent the spread of invasive species. Refer to the tables in this section for additional details regarding invasive plant species.

#### 3.11.1.1 Best Management Practices – Work Pads

De-energized work requires smaller work pad areas, while live line work (i.e., work that is done while the line is energized) requires a much larger work pad areas.

De-energized construction mat work pads (see Figure A14 Appendix A)

## 3.12 Structure-Related Work

### 3.12.1 Wetland

Structure-related activities that may occur in wetlands include structure replacement/ installation (including casing installation), guy wire anchor installation, counterpoise installation, and pole butt removal. Access to these areas and completion of the activities can cause disturbance to wetland vegetation and soils. Therefore, structure-related activities in wetlands should entail use of adequately sized work pads and proper dewatering methods if/as needed. Inspection of the construction access and associated dewatering measures should occur daily during construction to ensure that controls are in working order and repairs to damaged/deteriorating controls are made in a timely matter. Repairs may include re-grading the traveled surface to eliminate ruts as well as those repairs required by each erosion and sedimentation measure used.

### Structure Replacement / Installation

Replacement structures will often be replaced within a few feet of the original structure to maintain the required distances and line sags between other existing structures. Therefore, options for relocating proposed replacement structures are limited. Pole replacement will also require placement of construction mats in wetlands to provide a safe work pad for the required structure replacement activities. Usually, there are no alternatives that allow for this work to be conducted from nearby upland areas or to install the replacement structures in upland areas. Each structure replacement area should be assessed to determine the required footprint needed for construction mat work pads. Typical installation is as follows:

- At each pole location, remove wetland topsoil with an excavator and stockpile. Segregate wetland soils as necessary.
- If a borehole is drilled, collect and dispose of drilling spoils in an upland area.
- A galvanized steel casing is then driven into place at least 12 inches below the ground surface. The new pole is installed within the casing with a crane. The casing is then backfilled with crushed rock and compacted.
- Stockpiled wetland topsoil is placed above the casing to the ground surface. No net fill in wetlands occur, as the original poles are removed.
- Following installation of the new structures, the old structures are removed. Each pole is cut with a chainsaw and allowed to fall to the ground, which in wetland areas is protected by construction mats. If the pole is to be bucked into sections, conduct sawing activities in uplands when feasible. Pole butts will remain in place; if removing the pole butt will cause more damage than if left in place.
- Remove the pole and all appurtenant accessories (e.g., cross-arms, insulators) and properly dispose off-site. Remove each pole butt by pulling with an excavator positioned on a construction mat. If it is apparent that pole removal will compromise the integrity of the new pole installation, or that removal will result in additional disturbance to wetland areas, cut off the old pole at least 12 inches below ground level and backfill to match adjacent grades.

### Guy Wire Anchor Installation

Guy wire anchors supporting the structures may also require replacing. There are two types of anchors: 1) helical and 2) plate type. Helical anchors are preferred over plate anchor because the installation of the helical anchor results in less disturbance to the wetland.

- Load test the existing anchor to determine whether it will support the pole structure. Consult with Eversource Engineering to determine load testing requirements. In the event the existing anchor cannot be re-used, remove it and install a new anchor.
- Screw in place a special triple helix ("screw type") anchor with an anchor installation rig operated from the matting area. Add rod sections as needed until proper holding capacity of the anchor is achieved. Consult with Eversource Engineering to determine anchor installation requirements.
    - Helical anchors are turned into the ground with only the rods protruding. Disturbance to the wetland from the helical anchor is minimal.

- Plate anchors are used in wetlands when proper holding cannot be achieved with screw anchors. To install a plate anchor, a pit is excavated to a sufficient depth and if necessary, a concrete footing would be installed several feet below surface grade. Consult with Eversource Engineering to determine plate anchor installation requirements.
    - When excavating to install plate anchors, segregate the top 12 inches of wetland topsoil from the underlying material. When the plate anchor has been set, backfill the excavation with underlying material. Utilize segregated wetland topsoil to restore pre-construction grades.

### Counterpoise Installation/Grounding

To install grounding equipment in wetlands, use hand digging or minimally invasive methods to dig around the structure and restore soil to previous grades. In some cases, grounding rods can be driven directly into the ground with hand tools. Where work is occurring in the vicinity of wetland areas, sedimentation and erosion controls will be used to limit disturbance to wetlands.

### Underground Facility Repair/Replacement

Underground facilities such as cables and conduits may be present beneath wetland areas. In the event underground facilities require repair, BMPs are required for both access and construction. Construction mats are used for access where warranted, and sedimentation and erosion controls are used to isolate the work area. During excavation activities, excavate wetland topsoil and stockpile separately from subsurface soils. Dewatering is often required during excavation and repair activities.

An alternative to repairing a subsurface line by excavation is to install a new line via trenching or horizontal directional drilling (HDD). The decision to use one of these alternatives is made on a case by case basis. Consult with Eversource Environmental Licensing and Permitting to determine if any permits will be needed.

### Pole Butt Removal

When transmission poles are decommissioned or otherwise taken out of service, in most cases the entire pole shall be removed. Treated wood pole butts shall be removed completely from the ground and properly disposed at an off-site location. Locations where the removal of pole butts may cause significant disturbance to wetlands or other sensitive environmental areas will be considered for exception to this practice on a site-by-site basis. The Transmission Line Construction and Maintenance Manager, in consultation with Eversource Environmental Licensing and Permitting, will be responsible for determining if a pole butt can be removed if located in a sensitive environmental area.

All pole butt holes must be backfilled and compacted (every 3 feet) with appropriate fill material. Existing material on-site can be reused if it does not include materials that can rot (e.g., vegetation) and cause settling.

### Disposal

Treated and non-treated wood products owned by the Transmission Group shall be stored in an area(s) designated by the Transmission Line Construction/Contract Field Services Supervisor until collected by an approved disposal vendor.

### Concrete Wash Outs

Concrete wash outs shall be used for the management of concrete waste. Concrete and concrete wash out water shall not be deposited or discharged directly on the ground, in sensitive environmental areas, or in catch basins or other drainage structures. Where possible, concrete wash outs shall be located away from sensitive environmental areas, including buffer zones. Consult with Eversource Environmental Licensing and Permitting to determine concrete wash out locations prior to their use. Following the completion of concrete pouring operations, the wash outs shall be properly disposed of off-site with other construction debris.

## 3.13 Underground Cable and Gas Piping-Related Work

Gas piping-related activities will typically occur within roadways or along roadway shoulders. There may be some instances where wetland permitting is required when wetlands are located adjacent to or in the vicinity of roadways. However, when work is performed within the roadway/shoulder, permitting is typically not required. Verify permitting requirements with Eversource Environmental Licensing and Permitting. In all cases, BMPs should be followed to ensure environmental compliance.

Typical examples of underground cable and conduits include:

**High-Pressure, Fluid-Filled Pipe-Type Cable:** A high-pressure, fluid-filled (**HPFF**) pipe-type of underground transmission line, consists of a steel pipe that contains three high-voltage conductors. The fluid also transfers heat away from the conductors. The fluid is usually static and removes heat by conduction.

**XLPE Cable (cross-linked polyethylene):** Hydronic tubing that is manufactured from polyethylene plastic with a three-dimensional molecular bond that is created within the structure of the plastic. The cross-linked polyethylene (XLPE) underground transmission line is often called solid dielectic cable. The solid dielectric material replaces the pressurized liquid or gas of the pipe-type cables. XLPE cable has become the national standard for underground electric transmission lines less than 200 kV.

### Roadways and Shoulders

When working in roadways, particularly in residential areas, the following activities should be performed in addition to standard construction BMPs:

- Repave disturbed paved areas and return to original elevations on the same day that construction is performed.
- Restore all non-paved areas to pre-existing (or improved) conditions. Replace any sod or other plantings in kind or with an acceptable alternative.
- Employ dust control as necessary to minimize airborne dust.
- Streets should be swept daily or as necessary to remove dirt and debris from resulting from construction from the roadway surface. Dirt and debris swept from the roadway surface should be collected and properly disposed of as construction waste. Under no circumstances should dirt and debris be swept off of the roadway surface to the road shoulder or deposited in any catch basins.
- Discharge trench dewatering volumes to an appropriate dewatering structure setup on adjacent undeveloped, unimproved uplands away from wetlands (refer to Appendix A). Consult with Eversource Environmental Licensing and Permitting staff

to determine appropriate locations for placement of dewatering structures.

- Trench dewatering may also be discharged to areas of open trench to allow for infiltration.
- For minor volumes or short-term duration dewatering needs, trench dewatering may be pumped to frac tanks for transport off-site and discharge to an appropriate dewatering structure located at a contractor yard or similar location.
- Trench dewatering may only be discharged to stormwater catch basins after all necessary federal, state and local permits have been obtained to do so (this typically requires design and implementation of an effective treatment system to remove all potential contaminants, such as suspended solids or other chemical contaminants). Consult with Eversource Environmental Licensing and Permitting if discharge to catch basins is required.

Under certain circumstances, gas piping must be installed beneath existing culverts within roadways. Take care to ensure that any saturated material excavated from the trench be properly stored and disposed as to not cause sedimentation issues. Implement dewatering methodologies, as required.

There may be cases where a drainage ditch or swale must be crossed to gain construction access from paved roads onto ROWs along the roadway shoulder. Install construction mats, mat bridges, or temporary culverts, as necessary, to facilitate access. Culverts should be for temporary use, sized for peak flow, and removed after construction is complete. Consult with Eversource Environmental Licensing and Permitting prior to installation.

### Bridges and Culverts

Attachment of gas piping to bridges or culverts is the environmentally preferable method for crossing a wetland or watercourse. Consult with the appropriate people (engineers, the Department of Transportation (DOT), etc.) to determine if attachment to a bridge or culvert is a technically feasible option at the desired crossing location. Eversource Environmental Licensing and Permitting should also evaluate the impacts to FEMA flood storage quantities and potential Coast Guard permitting requirements. Ensure that proper erosion and sedimentation controls are in place on either side of the bridge or culvert throughout construction.

### Rivers and Streams

There are two primary approaches for crossing a river or stream with a gas pipeline: direct bury (open trenching) and trenchless methods (e.g., HDD, standard bore/pipe jacking).

**Direct bury methods** involve erecting a coffer dam to isolate the work area and redirecting water flow using gravity or pumping to move water from one side of the work area to the other. Direct bury methods have larger direct environmental impacts than trenchless methods. Typical coffer dam examples are included in Figures A42 and A43 in Appendix A.

**Trenchless methods** use specialized equipment to install piping beneath a waterbody (or a major roadway, railroad, etc.). The most common method used for gas piping is HDD which uses remote controlled, steerable drilling equipment to install pipe along a long arc alignment. The drilling process can be divided into three steps: pilot, reaming, and pull-in. The first step is to drill a pilot bore-hole. Next, a larger diameter fly cutter is used to

enlarge the opening. A specialized bentonite slurry drilling fluid is injected into the bore-hole to stabilize the surrounding soil and to lubricate and cool the drill bit. For the final step, a barrel reamer is used to further enlarge the bore-hole and to pull the pipe into place.

A notable environmental concern with HDD is called "frac-out." This occurs when drilling fluid breaks through the soil surface and into the waterbody. Regulatory agencies may require a "frac-out plan" which details preventative controls and response measures should frac-out occur. A typical frac out plan is included in Appendix D; however, HDD contractors should be required to provide a detailed frac-out plan specific to the project and their practices. These plans may be subject to environmental regulatory agency review. Consult with Eversource Environmental Licensing and Permitting for permit requirements.

## 3.14 Construction Material along the ROW

Once a site is prepared by clearing and/or installing erosion and sediment controls, materials may be stored along the ROW prior to the start of construction. Such materials may include the following: piping, poles, cross-arms, cable, insulators, stone, and other engineered backfill materials. In general, the stockpiling of stone and other unconsolidated material on construction mats should be avoided. If it is determined necessary due to access and work pad constraints, the material should be placed on a geotextile fabric and be properly contained with a sedimentation barrier such as straw wattle or bales. No construction materials should be placed in wetlands or other sensitive resource areas.

## 3.15 Winter Construction

### 3.15.1 Snow Management

Snow should not be stockpiled or disposed in any waterbody or near water supply sources. These include wetlands, rivers/streams, the ocean, reservoirs, ponds, stormwater catch basins, wellhead protection area, in high or medium yield aquifer, or within 200 feet of a private well. In addition to water quality impacts and flooding, snow disposed in surface water can cause navigational hazards when it freezes into ice blocks. Maintain a minimum buffer of 25 feet between any snow disposal area and the high water mark of any surface water. A silt fence or equivalent barrier should be installed between the snow storage area and the high water mark of rivers, streams, ponds, or the ocean. Consult with Eversource Environmental Licensing and Permitting regarding any specific state and local snow management requirements.

Avoid disposing of snow on top of storm drain catch basins or in storm water drainage swales or ditches. Snow combined with sand and debris may block a storm drainage system and cause localized flooding. A high volume of sand, sediment, and litter released from melting snow also may be quickly transported through the system into surface water and could also result in fines or a violation.

All debris in a snow storage area should be cleared from the site and properly disposed of no later than May 15 of each year. Care shall be taken not to plow road materials away when removing snow.

### 3.15.2 De-Icing

Where permitted, calcium chloride is the preferred de-icing agent when applied according to manufacturer's guidelines in upland areas. Sand should be used on construction mats through wetland areas. Consult with Eversource Environmental Licensing and Permitting on de-icing agents when working in a facility or substation near resource areas. Many municipalities have specific de-icing agent requirements for work within 100 feet of wetlands and other sensitive environmental areas.

### 3.15.3 Snow and Ice Management on Construction Mats

Promptly and properly remove snow from construction mats to avoid ice formation. Remove snow from construction mats before applying sand to avoid forming ice. A round street sweeping brush mounted on the front of a truck may be an effective way to remove snow from construction mats. Propane heaters may also be suitable solutions for snow removal and/or de-icing of construction mats. Sand should be collected from the construction mats and disposed of in an upland area prior to removing construction mats from wetlands. Once construction mats are removed, wetlands shall be inspected for sand buildup that may have fallen through construction mats. Sand deposited in wetlands or other sensitive environmental areas shall be completely removed by the contractor. Consult with Eversource Environmental Licensing and Permitting prior to commencing work in wetlands or other sensitive environmental areas.

## 3.16 Dust Control

Dust control measures are used to reduce surface and air movement of dust from exposed soil surfaces during land disturbance, demolition, and construction activities. These practices reduce the amount of dust in the air and decrease the potential for accidents, respiratory problems, and airborne sedimentation. Construction activities should be scheduled appropriately to minimize the amount of site surface exposed at one time in order to reduce the amount of areas requiring dust control. Use dust control measures on disturbed soil surfaces and exposed soil surfaces, especially during hot or dry weather periods and in areas with excessively well-drained soils. Repetitive treatments should be used as needed, or required by permits, and until the surface is permanently stabilized.

| Type | Description / Use |
|---|---|
| Vegetative Cover | • Most effective and practical method.<br>• Use in disturbed areas not subject to traffic.<br>• Follow seeding requirements as directed by local guidelines or permit requirements. |
| Stone | • Cover soil surface with crushed stone/coarse gravel. |
| Water/Sprinkling | • Sprinkle exposed soils until wet (Water trucks may be used depending on size of the site).<br>• Do not excessively wet the soil as this causes run-off and also wastes water. |

| | |
|---|---|
| Barriers | • Board fences, wind fences, and sediment fences control air currents and blowing soil.<br>• Wind barriers protect soil downgradient for a distance of ten times the barrier height.<br>• Perennial grasses and stands of existing trees also serve as wind barriers, stressing the importance of planning work phasing properly and minimizing the amount of exposed soil. |
| Plastic Covering | • Cover soil piles with sheets of plastic/tarp to minimize dust. |
| Calcium Chloride | • Loose, dry granules of calcium chloride may be applied with a mechanical spreader.<br>• Apply at a rate that keeps the surface moist but not high enough to cause water pollution or plant damage. This method should be done under consultation with an expert in order to maintain this balance and to determine if the site is applicable. |

### 3.16.1 Soil Stockpile Management

Some projects may involve excavation and stockpiling of soil. Stockpiles should be located outside sensitive areas to the extent practicable and managed to prevent erosion and sedimentation of adjacent areas. Typical measures include the installation of protective measures (e.g., siltation fence and/or straw bales) around the perimeter of the stockpile. The stockpile must be seeded if left in place for more than 30 days. No snow or soil piles, construction materials, or equipment should be stored in the immediate vicinity at the top of a terrace escarpment slope.

### 3.16.2 Stockpiles on Construction Mats

When soil (or gravel) stockpiles must be staged on construction mat work pads in wetlands, stockpiles should be placed atop areas of matting underlain with non-woven geotextile (either directly atop the mats or between layers of matting) to minimize the potential for material to filter through gaps in matting and deposit in wetlands. Use of construction mat stringers as physical barriers at the edge of the work pad should also be considered. These barriers are recommended to minimize the potential for stockpiled material to get pushed off the work pad into wetlands. Consult with Eversource Environmental Licensing and Permitting for site-specific guidance.

### 3.16.3 Regulated Soils Management

When polluted/contaminated soil is encountered, it must be handled in accordance with the appropriate regulatory requirements. In addition to the measures discussed above, contaminated soils should be stockpiled on and covered by polyethylene sheeting. Sheeting used to cover the stockpile should be weighted down to prevent the wind migration of contaminated dust.

For soil stockpiles in substations, contact Eversource Environmental Licensing and Permitting. If soil/water must be stored and/or disposed, comply with existing soil and groundwater management guidelines. Coordinate with the Environmental Affairs Department (EAD) to ensure appropriate procedures are followed.

### 3.16.4 Best Management Practices – Soil Stockpile Management

The following BMP is applicable to soil stockpile management and is described at:

Soil Stockpile Management (see Figure A19 in Appendix A)

## 3.17 Anti-Idling Laws

Connecticut and Massachusetts have promulgated anti-idling laws for the purpose of improving air quality by reducing unnecessary air pollution from idling vehicles.

| State | Idling Time Limit (in minutes) |
|---|---|
| Connecticut | 3 |
| Massachusetts | 5 |

Details of these laws and the statutory exceptions to the limits noted above are presented in the following sections.

### 3.17.1 Connecticut

The Regulations of Connecticut State Agencies (RCSA) section 22a-174-18(b)(3) states: a mobile source shall not operate for more than three (3) consecutive minutes when such mobile source is not in motion except if the vehicle is operating for one of the conditions exempted in the regulation.

These exemptions for mobile sources not in motion include:

- When a mobile source is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control.
- When it is necessary to operate defrosting, heating or cooling equipment to ensure the safety or health of the driver or passengers.
- When it is necessary to operate auxiliary equipment that is located in or on the mobile source to accomplish the intended use of the mobile source.
- To bring the mobile source to the manufacturer's recommended operating temperature.
- When the outdoor temperature is below 20 degrees Fahrenheit.
- When the mobile source is undergoing maintenance that requires such mobile source be operated for more than three (3) consecutive minutes.
- When a mobile source is in queue to be inspected by U.S. military personnel prior to gaining access to a U.S. military installation.

### 3.17.2 Massachusetts

The Massachusetts Anti-Idling Law (M.G.L. Chapter 90, Section 16A and its implementing regulations set forth at 310 CMR 7.11 applies to all vehicles and limits unnecessary engine idling of stopped vehicles to five (5) minutes.

This law shall not apply to:

- Vehicles being serviced, provided that operation of the engine is essential to the proper repair thereof.

- Vehicles engaged in the delivery or acceptance of goods, wares, or merchandise for which engine assisted power is necessary and substitute alternate means cannot be made available.
- Vehicles engaged in an operation for which the engine power is necessary for an associate power need other than movement, and substitute alternate power means cannot be made available provided that such operation does not cause or contribute to a condition of air pollution.

# SECTION 4

# Section 4
# Inspection and Maintenance

A pre-construction meeting will be held to discuss how often and who is responsible for monitoring erosion and sediment controls to document their condition and recommend maintenance or other corrective actions, as necessary. All BMPs will be inspected at least once per week during active construction and until disturbed areas have stabilized following post-construction site restoration. Construction sites will be inspected after major storm events (rainfall events greater than 0.25 inches (MA) or 0.50 inches (CT)), or as directed by Eversource Environmental Licensing and Permitting.

## 4.1 During Construction

Construction sites, construction access roads, and the associated erosion and sediment controls should be inspected by the person(s) designated at the pre-construction meeting, as required by permit conditions. Any damage observed must be repaired in a timely manner, at least within 48 hours of observation. Repairs may include re-grading and/or top dressing the surface with additional aggregate to eliminate ruts as well as those repairs required by each erosion and sediment measure used.

All inspections will be documented in a written report submitted to Eversource Environmental Licensing and Permitting and saved to the project folder. Copies will be distributed to the relevant contractors if/as directed by Eversource Environmental Licensing and Permitting.

### 4.1.1 Maintenance of Erosion and Sedimentation Controls

Spare erosion and sedimentation control materials such as straw wattles, straw bales and silt fencing should be kept on site or be readily available so they may be replaced if they become non-functional due to deterioration or damaged during a storm, extreme water or wind, or other unexpected events.

### 4.1.2 Rapid Wetland Response Restoration

In the event of unintended discharges of sediment into wetlands, Eversource Environmental Licensing and Permitting will direct the contractor(s) to quickly control, contain and remove sediment using non- or marginally invasive methods. Responding quickly to unintended discharges minimizes the difficulty and cost of restoration if the sediment is left in place for an extended period of time. Eversource Environmental Licensing and Permitting will direct sediment removal activities at the time of discharge and will notify the appropriate regulators of the discharge and the recommended corrective actions.

### 4.1.3 Vehicle Storage and Refueling

All storage and refueling of vehicles and other equipment must occur outside of and as far away as practical from sensitive environmental areas such as wetlands, unless specifically authorized by Eversource Environmental Licensing and Permitting and an alternate protocol is developed and approved internally.

The recommended minimum distance from wetlands for storage of fuel and refueling is 100 feet. Additionally, equipment should be checked regularly for evidence of leaks. Construction material storage should also be located at least 100 feet from wetlands.

Storage of larger, less mobile equipment such as drill rigs or large cranes, may be permitting within wetlands subject to prior approval from Eversource Environmental Licensing and Permitting. Secondary containment shall be in place at each piece of equipment during non-working hours.

Refueling of larger, less mobile equipment such as drill rigs or large cranes, may be allowed within wetlands only with prior approval from Eversource Environmental Licensing and Permitting and if specified precautions and protocols are followed. A proper location for refueling should be identified and designated before site work begins. At a minimum, if refueling must be conducted in wetlands, the contractor shall provide adequate secondary containment during refueling operations and shall maintain a spill kit on-site at all times.

### 4.1.4 Spills

Spill kits consist of emergency cleanup and spill containment materials that can be used in the event of a fuel or other chemical spill. Spill kits must be kept on site and accessible at all times in case of an emergency spill. Such kits should generally contain multiple absorbent socks and/or pillows and wipes and temporary disposal bags. Follow the applicable Eversource Contractor Work Rules.

### 4.1.5 Post-Construction

Post-construction inspections of restored areas will be conducted at regular intervals throughout the growing season, as required by any applicable permits, and/or after major storm events. Sites should be inspected for success or failure of revegetation, invasive species colonization, and erosion and sedimentation. In the event additional measures are required to achieve site restoration and stabilization, corrective actions shall be identified and implemented.

All information collected during inspections, regular maintenance, and repair procedures should be documented in project folders. In addition, photographic or diagrammatic logs may be kept to record certain events and for documentation of project progress and any noteworthy observations.

The construction work is not complete until all areas are restored.

# SECTION 5

# Section 5
# Rehabilitation and Restoration

## 5.1 Restoration

All areas disturbed by construction, repair, and maintenance activities shall be substantially restored to pre-construction conditions. Please refer to Appendix A for photos and typical details for loaming, seeding, and mulching. Prompt restoration minimizes the extent and duration of soil exposure and protects disturbed areas from erosion due to stormwater runoff, ice, wind and gravity. Stabilization should be conducted as soon as practicable. Where appropriate, it is preferable to allow sensitive environmental areas, such as wetlands and rare species habitat to revegetate naturally.

Consult Eversource Environmental Licensing and Permitting for project-specific restoration requirements.

### 5.1.1 Seed Mixes

Several different seed mixes are available for upland and wetland restoration. State-specific comprehensive summaries of seed mixes for both temporary and permanent seeding of disturbed sites can be found within the following documents:

- Massachusetts: Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas, page 157: https://www.mass.gov/doc/complete-erosion-and-sedimentation-control-guidelines-a-guide-for-planners-designers-and/download
- Connecticut: 2002 Connecticut Guidelines for Soil and Erosion Sediment Control, page 5-3-8: https://portal.ct.gov/DEEP/Water/Soil-Erosion-and-Sediment-Control-Guidelines/Guidelines-for-Soil-Erosion-and-Sediment-Control

**Upland Seed Mix:** If significant grading or upland alteration has occurred, annual rye grass seed shall be placed for temporary stabilization following manufacturer's recommendations after re-grading activities.

**Wetland Seed Mix:** If significant grading or wetland alteration has occurred, a wetland seed mix shall be placed following manufacture's recommendations after re-grading activities.

### 5.1.2 Upland

The following restoration techniques apply to restoration projects in upland areas.

- Soil excavated during construction and not used as backfill must be evenly spread across disturbed areas to restore grades. Topsoil shall be stripped and separated to the extent practicable for re-use. Permanent soil protection shall be provided for all areas disturbed by construction activities. All areas will be seeded either by hydroseeding or broadcast seeding. Interim stabilization measures are required if areas cannot be seeded due to the time of year. Interim measures may include the application of mulch.
- Topsoil removed during construction activities will be replaced, seeded, and mulched.
- All areas that are broadcast seeded shall be treated with a layer of mulch, such as

straw, up to one (1) inch thick to enhance moisture retention, dissipate disturbance from precipitation, and detract birds foraging on broadcast seed.

- Rehabilitation of access routes and other areas must be performed as soon as practicable after construction is completed, including reestablishment of water bars or other BMPs to control erosion of the access road, and the removal and restoration of temporary wetland or waterway crossings.
    - Temporary breaks in construction activities may warrant seeding and mulching of disturbed areas as interim erosion control measures. Consult with Eversource Environmental Licensing and Permitting to determine project-specific requirements.
- Erosion control measures shall remain in place until soils are adequately stabilized, as confirmed by Eversource Environmental Licensing and Permitting. Once soils are stable, erosion controls – especially silt fence, which presents an obstacle to movement of small animals, shall be removed and properly disposed off-site. Stakes should be removed from straw bales and spread as mulch to remove barriers to wildlife movement.
- The use of hay and/or hay products is strictly prohibited to prevent the spread of invasive plant species seed stock.
- If a grading operation at a site is suspended for a period of more than twenty-nine (29) consecutive days, the disturbed area shall be stabilized by seeding, mulching, and/or other appropriate means within the first seven (7) days of the suspension of grading.
- Within seven (7) days after a final grade is established in any grading operation, the disturbed area shall be stabilized by seeding, loaming, and/or other appropriate means.

### 5.1.3 Wetland / Watercourses

**Re-grading of Ruts**: Upon removal of construction mats, or other BMPs, the wetland/watercourse should be inspected for rutting or disturbance from eroded upland soils. Any rutting should be re-graded to pre-existing contours and upland soils removed from wetland areas while taking care not to compact soils.

The following restoration techniques apply to restoration projects in wetlands:

**Maintenance, Repair, and Emergency Projects (When No Permit is Required)**

- Remove mats by "backing" out of the site and removing mats one at a time. Re-grade soils to pre-existing contours while taking care not to compact soils.
- Soils excavated from wetland areas shall be segregated and stockpiled separately (i.e., topsoil/muck apart from mineral subsoil) in a dry/upland area at least 100 feet from wetland boundaries unless other provisions have been made to facilitate restoration activities.
- Excavated wetland soils that have been stockpiled during underground utility installations within wetlands shall be replaced in the same order (i.e., mineral subsoil beneath organic topsoil/muck) to the extent practicable and restored to pre-disturbance grades.
    - Grading activities should include the elimination of ruts within the

area to be restored.

- If replacement of soil associated with temporary wetland or watercourse crossings for access roads is necessary, disturbed areas must be restored to pre-disturbance grades, either seeded and mulched, or allowed to revegetate from the natural seed bank.
- Disturbed wetland areas shall generally be allowed to revegetate from the natural seed bank. Measures to discourage the establishment or spread of plant species identified as non-native, invasive species by federal or state agencies shall be utilized. Consult with Eversource Environmental Licensing and Permitting to evaluate means and methods of wetland vegetate re-establishment.
- Any restoration plantings or seed mixes used in restoration shall consist of species native to the project area and, if feasible, from local nursery stock.
- Any stream banks and beds damaged shall be restored through use of 100 percent natural fiber geotextile erosion control blankets and/or coir logs. The use of erosion control products containing plastic and/or nylon is strictly prohibited.
- All seeded areas shall be treated with a layer of mulch (i.e., straw; the use of hay and/or hay products is strictly prohibited) up to one (1) inch thick to enhance moisture retention, dissipate disturbance from precipitation, and detract songbirds foraging on broadcast seed.

## 5.2 Private Property

### 5.2.1 Improved Areas

If access is over an off-ROW property, then it is the responsibility of a construction representative to determine if legal access rights are available to cross the property.

Access to and along the ROW over private property must be improved to the extent necessary to ensure suitable passage for construction equipment, provide erosion control, and maintain proper drainage. Upon completion of construction activities, altered yards, lawns, agricultural areas, and other improved areas must be restored to a condition equal to or better than before their use for the construction project.

### 5.2.2 Overall Work Site

Construction personnel should remove all work-related trailers, buildings, rubbish, waste soil, temporary structures, and unused materials upon satisfactory completion of work. All areas should be left clean, without any litter or equipment (e.g., wire, pole butts, anchors, insulators, cross-arms, cardboard, coffee cups, water bottles) and stabilized to match pre-construction conditions to the maximum extent practicable. Debris and spent equipment should be returned to the operating facility or contractor staging area for disposal or recycling as appropriate.

### 5.2.3 Material Storage/Staging and Parking Areas

Upon completion of all work, all material storage yards, staging areas, and parking areas shall be completely cleared of all waste and debris. Unless otherwise directed or unless other arrangements have been made with an off-ROW or off-property owner, material storage yards and staging areas shall be returned to the condition that existed prior to the installation of the material storage yard or staging area. Regardless of arrangements

made with a landowner, all areas shall be restored to their pre-construction condition or better. Any temporary structures erected by the contractor, including fences, shall be removed by the contractor and the area restored as near as possible to its original condition, including seeding and mulching as needed.

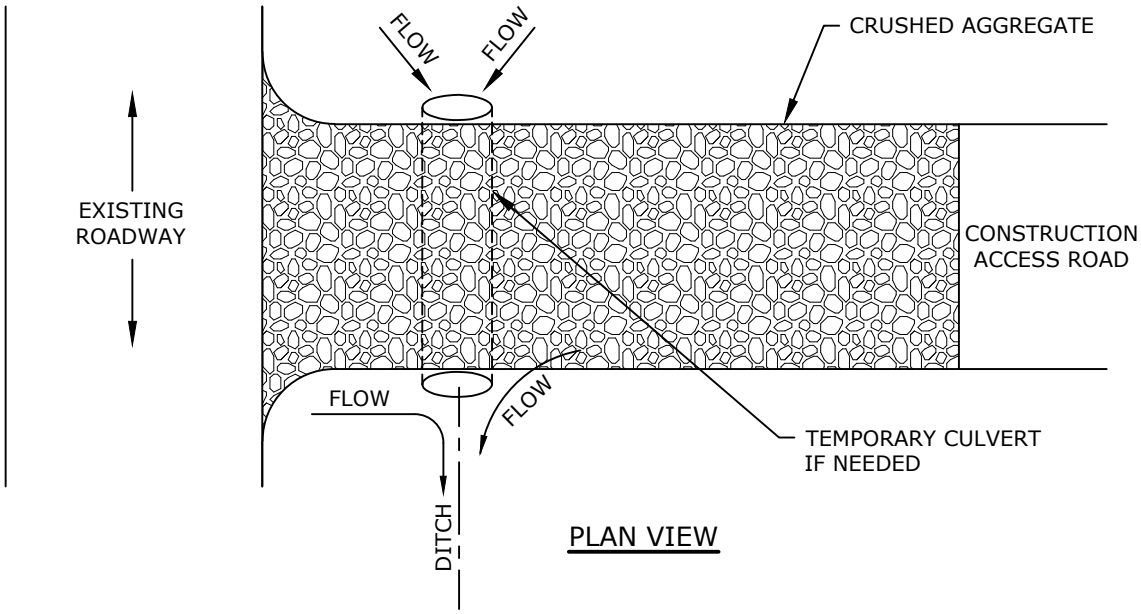
## 5.3 Work in Agricultural Lands

Transmission lines often cross agricultural lands. In some instances, this may affect ongoing agricultural activities in and around the ROWs. If a construction or maintenance project occurs within agricultural lands, Eversource will work closely with landowners, licensees and stakeholders to minimize agricultural impacts. Whenever practical, Eversource will make reasonable efforts to coordinate the schedule of construction-related activities around the growing and harvest seasons to minimize the impacts on agricultural operations. When this is not practical, Eversource will pursue reasonable measures to mitigate any impacts.

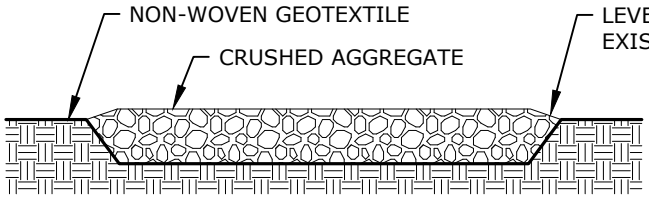
Eversource recognizes that disturbed soils, or soils compacted by heavy construction equipment, may affect the soil's ability to support certain agricultural activities. Eversource will take reasonable steps to avoid or minimize soil compaction and will restore soils that are compacted by construction equipment. Typical measures to avoid or minimize soil compaction include the use of construction mats for access to, and work pads at, structures within the project scope.

Eversource will also work with affected landowners to determine the appropriate method for restoring the soils and is open to discussing and implementing the landowners' alternative restoration suggestions. After the transmission improvement is complete, Eversource will remove all construction-related equipment and debris from the ROW.

# APPENDIX A




PLAN VIEW




ELEVATION VIEW

NOTES:

1. CRUSHED AGGREGATE TO CONSIST OF 3-INCH TO 6-INCH STONE.
2. AGGREGATE TO BE UNDERLAIN WITH NON-WOVEN GEOTEXTILE FABRIC.



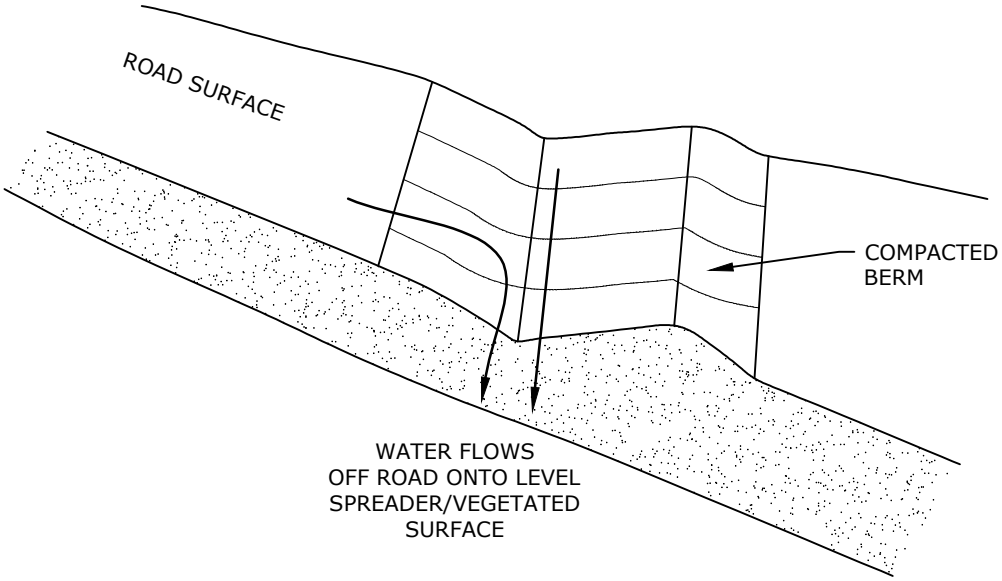

CONSTRUCTION ENTRANCE TRACK PAD

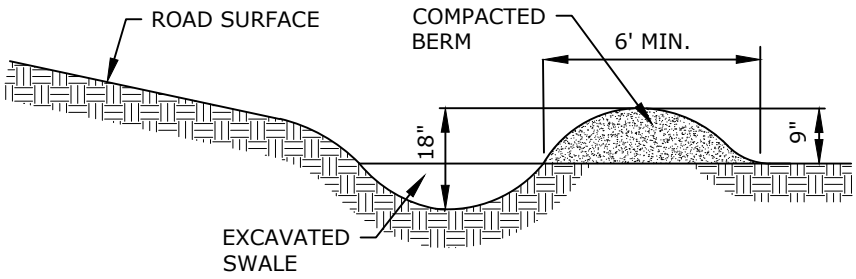
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NOTE:
FILL FOR BERMS SHALL BE A COMBINATION OF GRAVEL, SAND AND SILT TO ENSURE WATER TIGHTNESS AND STABILITY.




ELEVATION VIEW

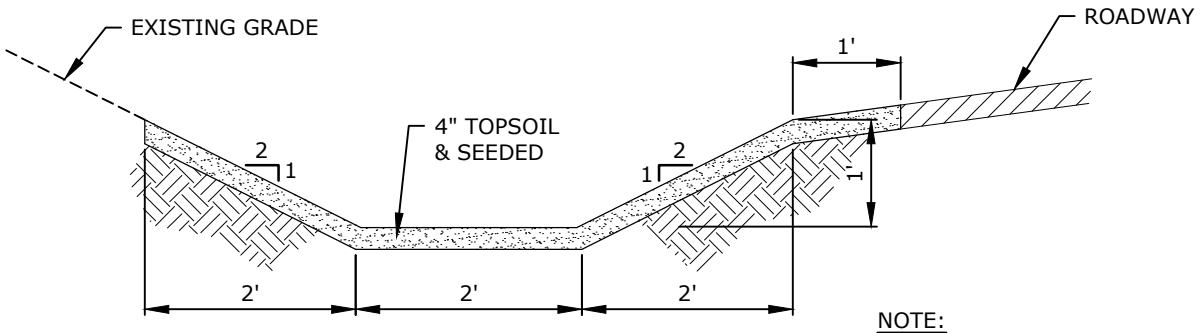


WATER BARS

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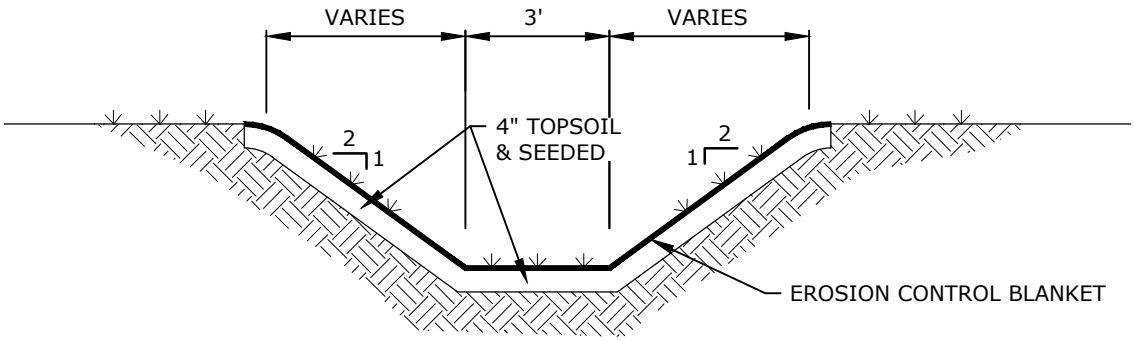
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DRAINAGE SWALE AT ROADWAY

NOTE:

1. USE OF PRODUCTS WITH PLASTIC AND/OR NYLON NETTING IS PROHIBITED.




GRASS-LINED CHANNEL

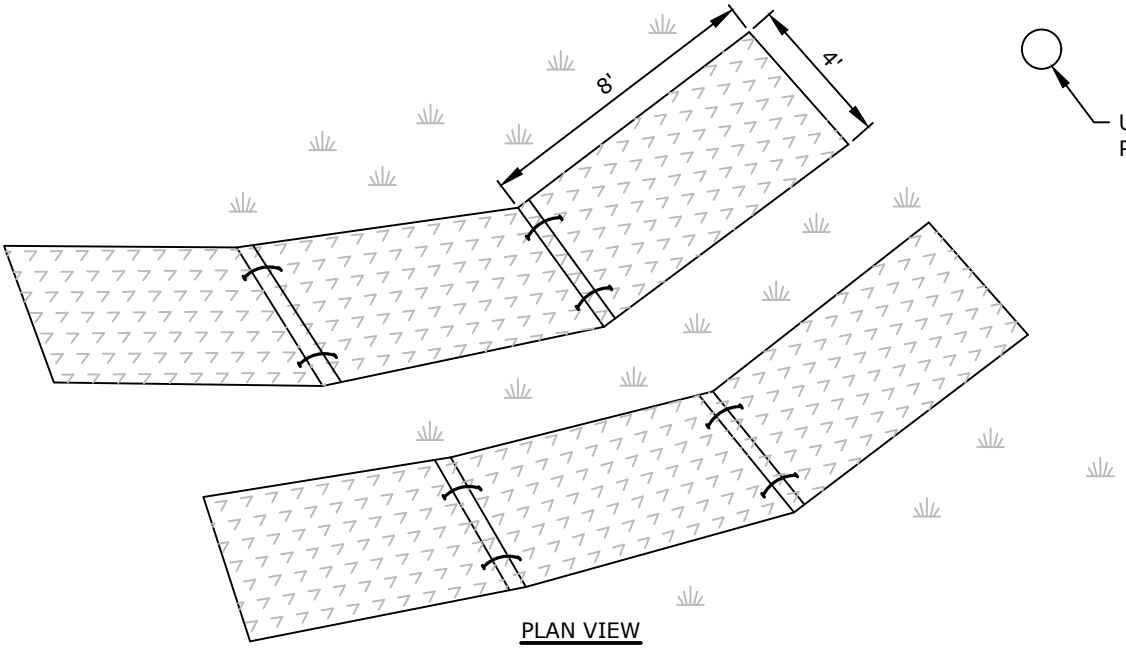


VEGETATED SWALES

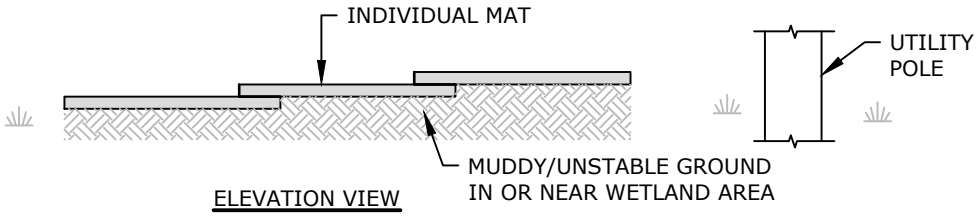
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PLAN VIEW




ELEVATION VIEW

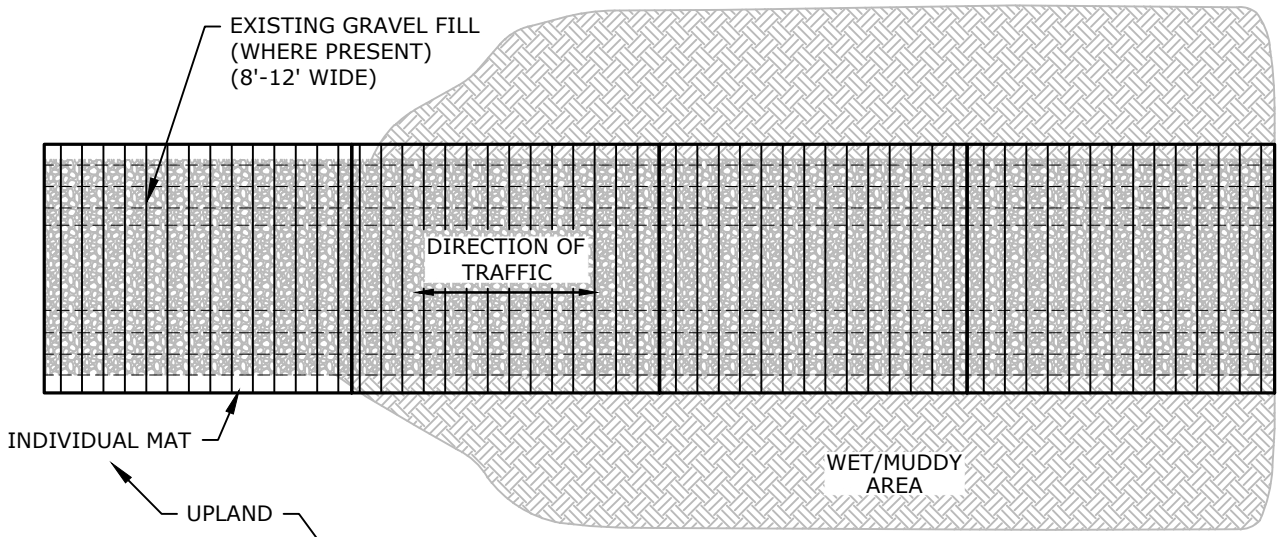


ALTURNAMAT®

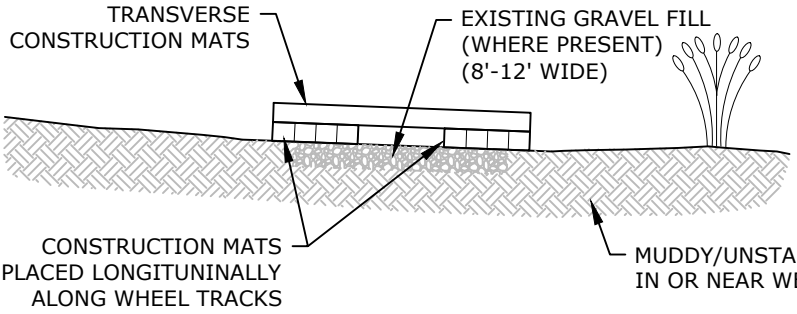
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PLAN VIEW




ELEVATION VIEW

NOTES:

1. CONSTRUCTION MAT DIMENSIONS OF 12'x4'x8", 16'x4'x8" OR OTHER TO BE USED.

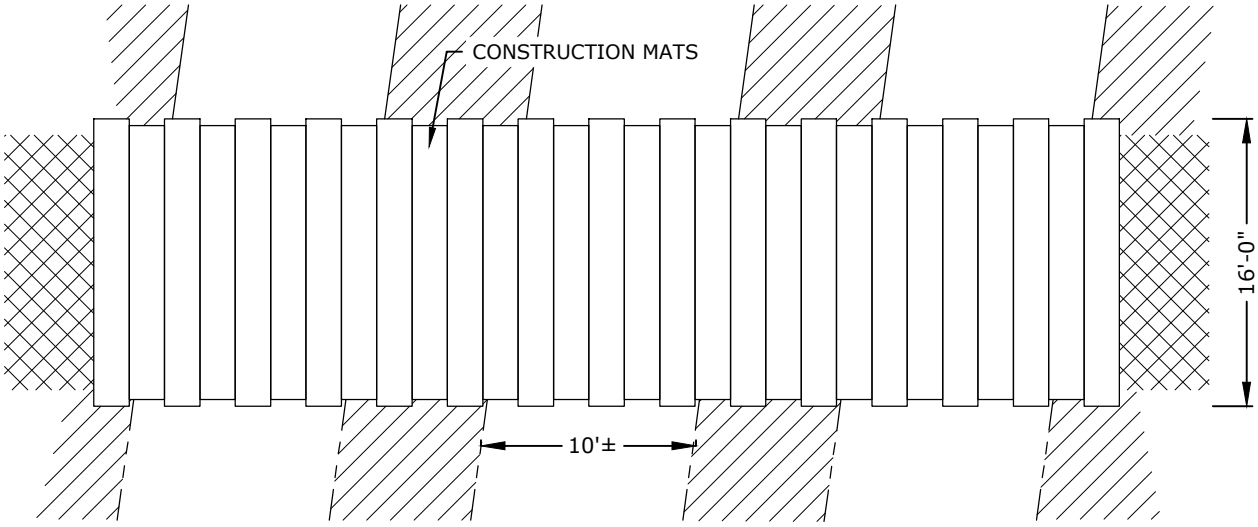


CONSTRUCTION MAT
(WETLAND CROSSING)

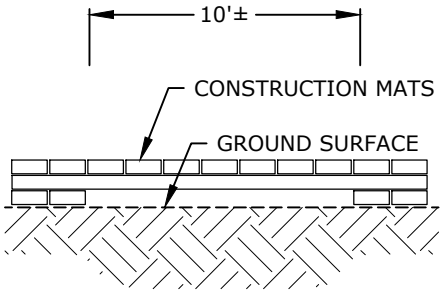
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PLAN VIEW




ELEVATION VIEW

NOTES

1. CONSTRUCTION MATS SHOULD BE PLACED CLOSELY TOGETHER SO THERE ARE NO GAPS BETWEEN EACH MAT SECTION.
2. CONSTRUCTION MAT DIMENSIONS OF 12'x4'x8", 16'x4'x8" OR OTHER TO BE USED.
3. AIR BRIDGING MAY ALSO BE USED TO AVOID IMPACTS TO UNDERGROUND UTILITIES, STONE WALLS, RARE PLANTS OR OTHER SENSITIVE FEATURES. CONSULT WITH EVERSOURCE ENVIRONMENTAL.
4. ADDITIONAL MEASURES MAY BE REQUIRED.

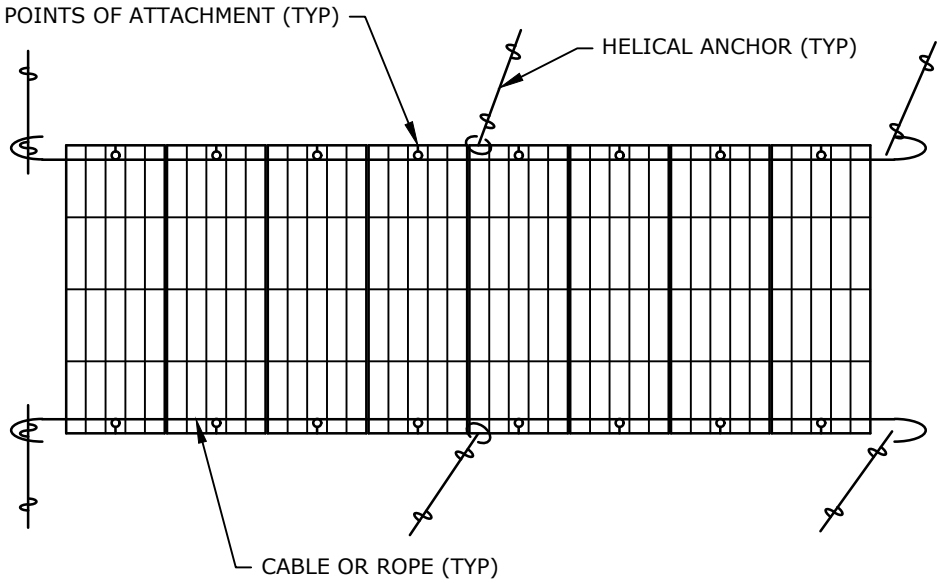



CONSTRUCTION MAT
(AIR BRIDGE)

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A06 |

EVERSOURCE

Nov 22, 2021-2:28pm Plotted By: TMP
Tighe & Bond, Inc. J:\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Elevated Animal Crossing.dwg




PLAN VIEW

NOTES:

1. TYPICAL HELICAL ANCHOR AND CABLE CONFIGURATION FOR MAT CONTAINMENT IN FLOODPLAINS/LAND SUBJECT TO FLOODING.

2. TYPICAL POINT OF ATTACHMENT HEAVY STAPLES, EYEBOLTS OR OTHER SUITABLE HARDWARE TO SECURE ATTACHMENT OF MAT TO LINEAR CABLE. IF CHAIN POCKETS ARE PRESENT IN THE MATS CABLE OR ROPE CAN BE LOOPED THROUGH RODS.

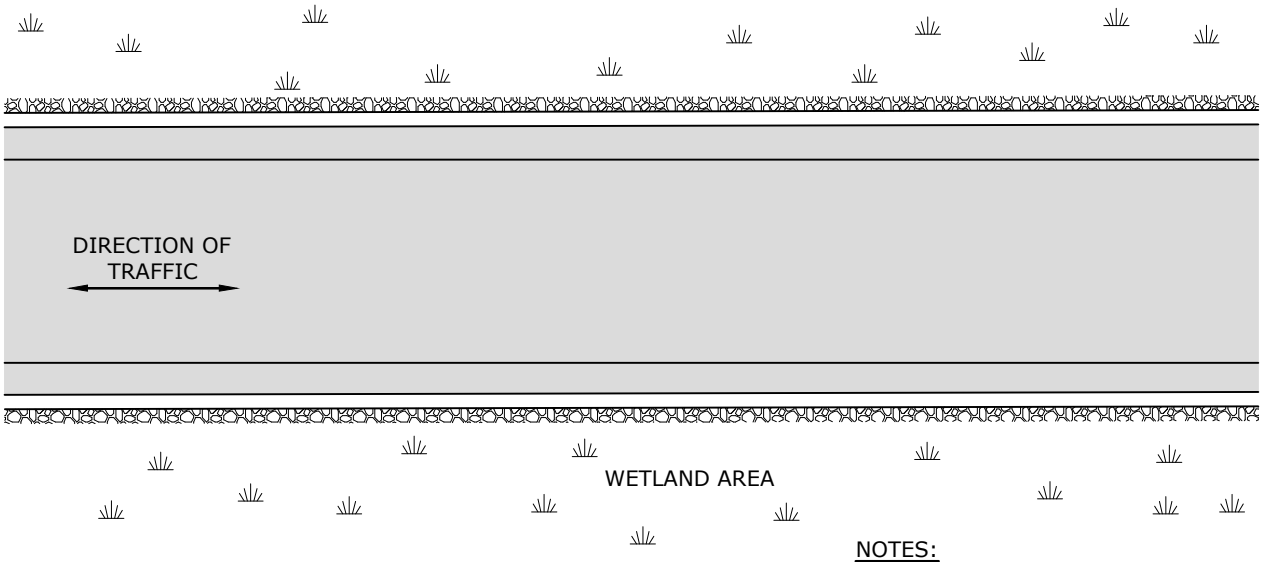


CONSTRUCTION MAT ANCHORING

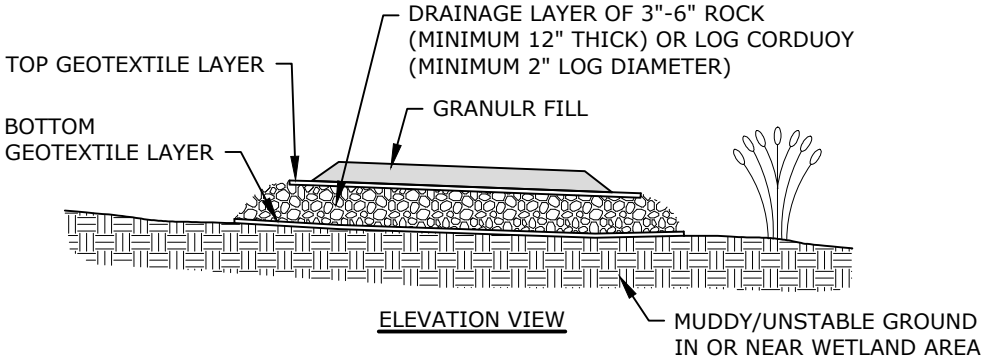
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A07 |

EVERSOURCE

Feb 04, 2022-10:09am Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Construction Mat Anchor.dwg




PLAN VIEW




ELEVATION VIEW

NOTES:

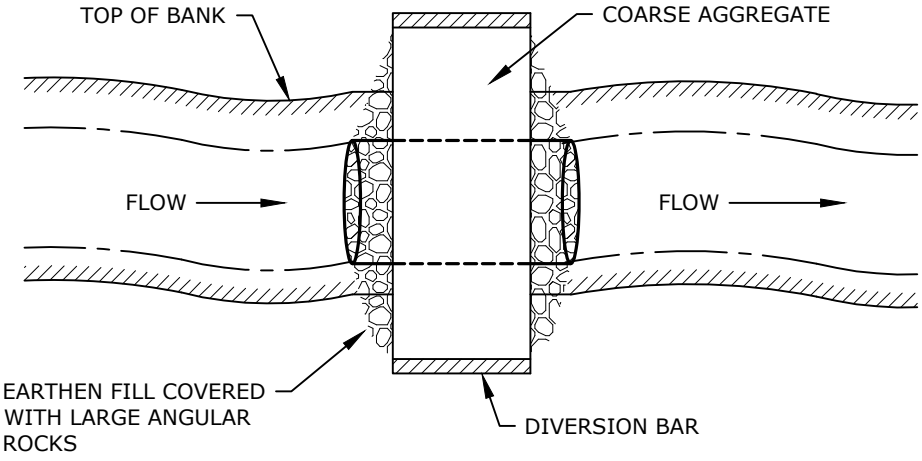
1. DRAINAGE LAYERS MAY BE USED AS AN ALTERNATIVE TO CULVERTS, OR IN COMBINATION WITH CULVERTS, TO PROVIDE ADEQUATE CROSS-DRAINAGE.
2. FILTER FABRIC "JOINTS" SHOULD OVERLAP AT LEAST 18" (WHERE ONE PIECE OF FILTER FABRIC ENDS AND A NEW PIECE OF FABRIC IS ADDED TO CONTINUE THE ROAD).
3. EROSION AND SEDIMENTATION CONTROLS MAY BE INSTALLED ADJACENT TO THE SIDES OF THE ROAD WHEN CONDITIONS WARRANT.

PERMEABLE ROAD

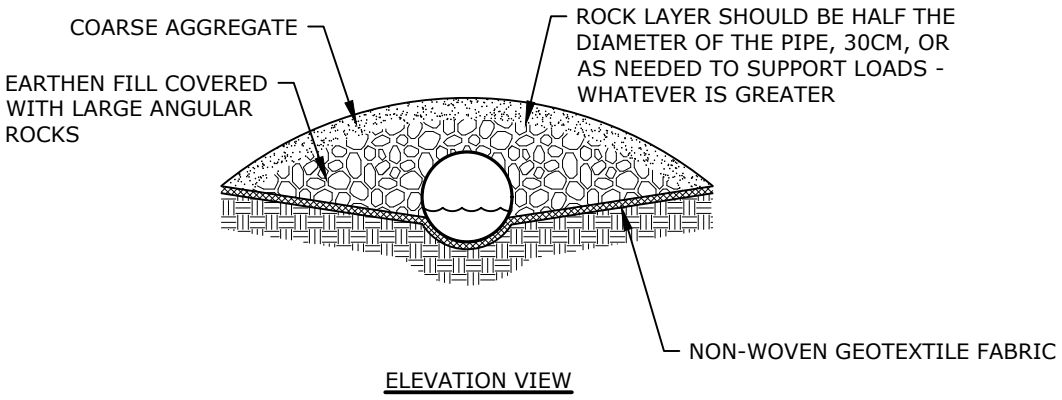
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A08 |

EVERSOURCE

Dec 15, 2021-3:26pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Permeable Road.dwg




PLAN VIEW




ELEVATION VIEW

NOTES:

1. CAPACITY OF PIPES COMBINED SHOULD ACCOUNT FOR SIGNIFICANT STORM EVENTS.
2. INSTALLATION OF NEW CULVERTS MAY REQUIRE PERMITS. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING PRIOR TO CONSTRUCTION.

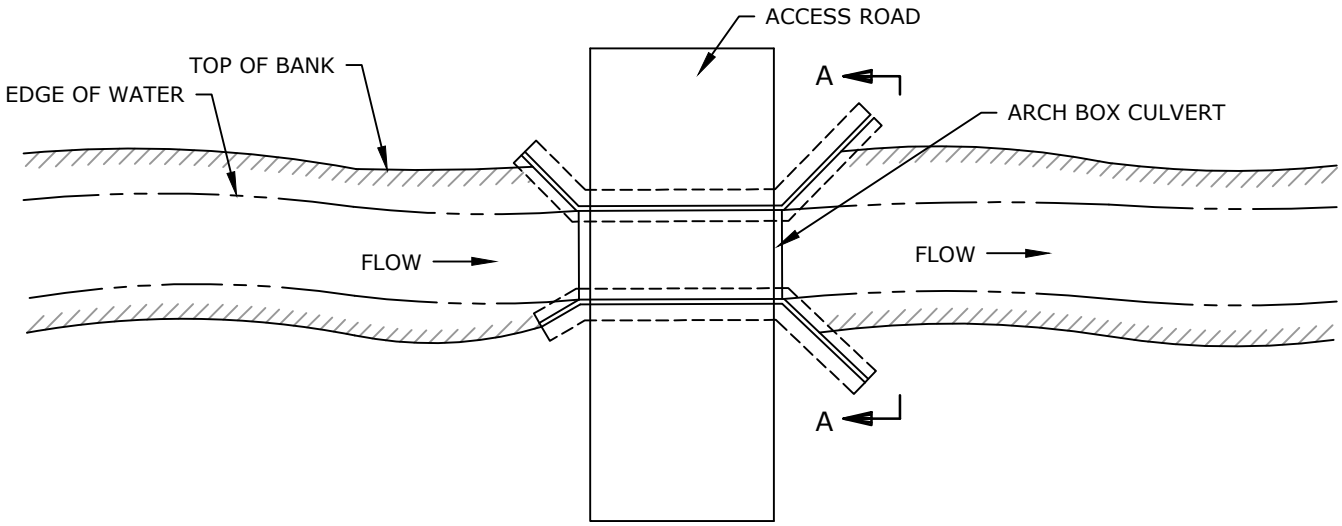


TEMPORARY CONSTRUCTION CULVERT

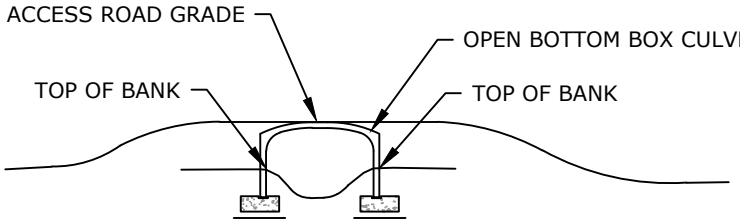
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A09 |

EVERSOURCE

Dec 15, 2021-3:24pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Culv_Cros_Temp.dwg




PLAN VIEW




SECTION A-A

NOTE:

1. INSTALLATION OF NEW OR REPLACEMENT STREAM CROSSINGS, INCLUDING BOX CULVERTS, IS SUBJECT TO ENVIRONMENTAL PERMITTING. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING.

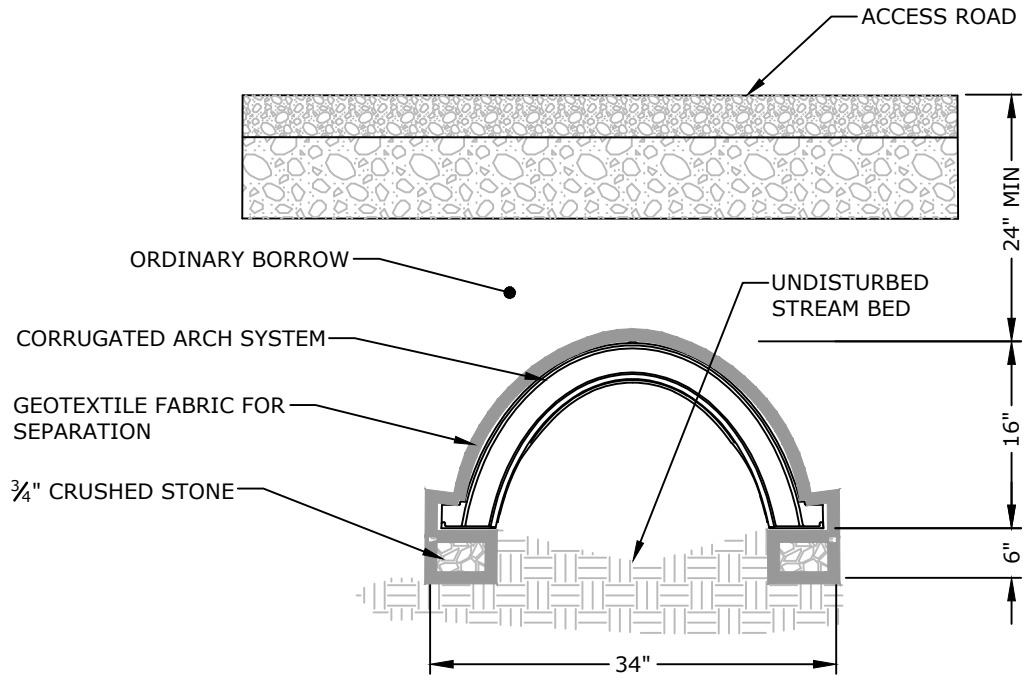



PERMANENT OPEN BOTTOM
BOX CULVERT

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A10 |

EVERSOURCE

Dec 15, 2021-3:21pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Box Culvert _Permanent.dwg




NOTES:

1. CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".

2. CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".

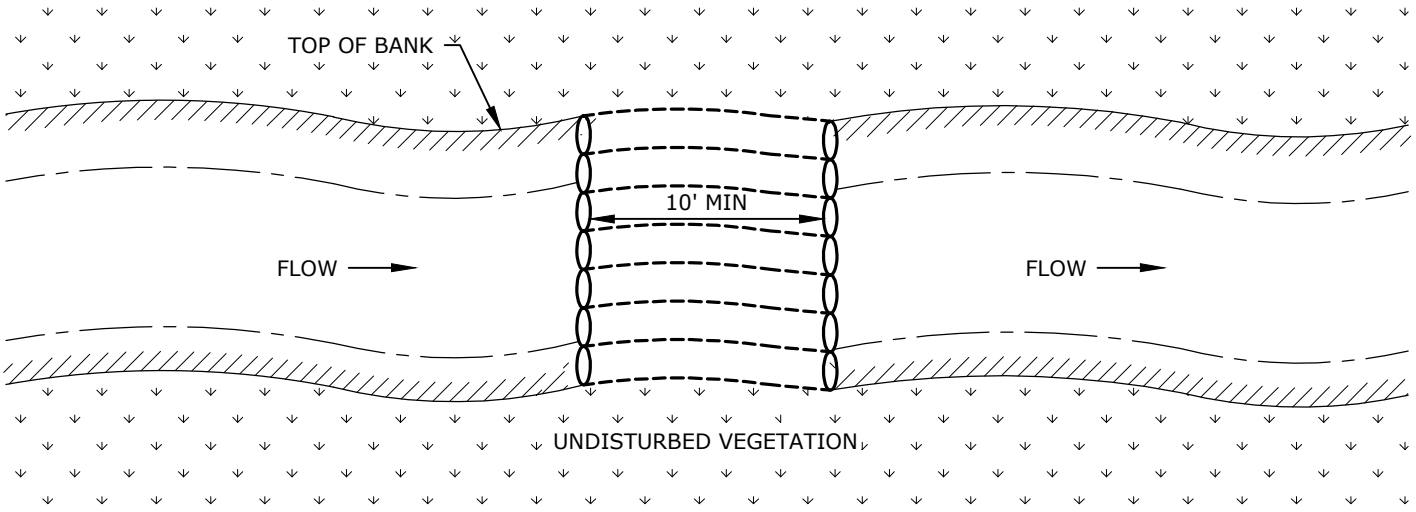


ARCH CULVERT

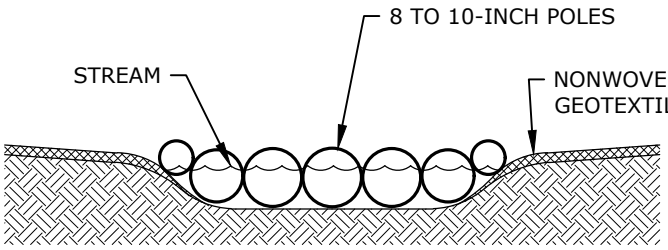
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A11 |

EVERSOURCE

Dec 15, 2021-3:21pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Arch Culvert.dwg




PLAN VIEW




ELEVATION VIEW

NOTES:

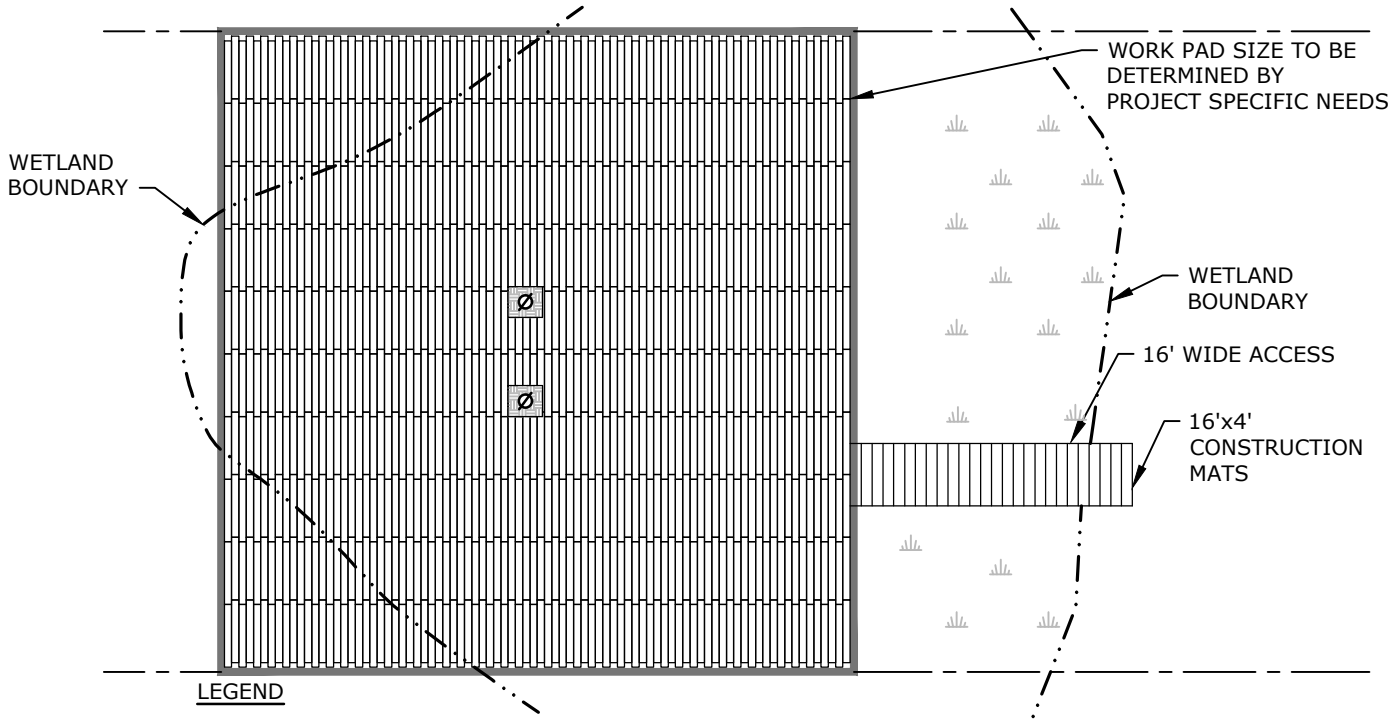
1. POLES AND NONWOVEN GEOTEXTILE MUST BE REMOVED IMMEDIATELY AFTER USE.
2. LENGTH OF POLES SHALL BE AT LEAST 10 FEET.
3. USE OF HARDWOODS PROHIBITED.
4. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING PRIOR TO INSTALLATION OF POLED FORDS.

POLE FORD

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A12 |

EVERSOURCE

Dec 15, 2021-3:26pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Pole Ford.dwg




LEGEND

| | |
|---|---|
| ø | REPLACEMENT POLE LOCATION |
| ▭ | CONSTRUCTION MAT - 16'x4'x 8" TYPICAL SIZE. 12'x4'x8" OR OTHER SIZE ACCEPTABLE. |
| ▬ | WORK SPACE REQUIREMENTS - LIVE LINE WORK (DETERMINED BASED ON PROJECT SPECIFIC NEEDS) |
| — – — | LIMIT OF RIGHT-OF-WAY |
| ılı | WETLAND AREA |

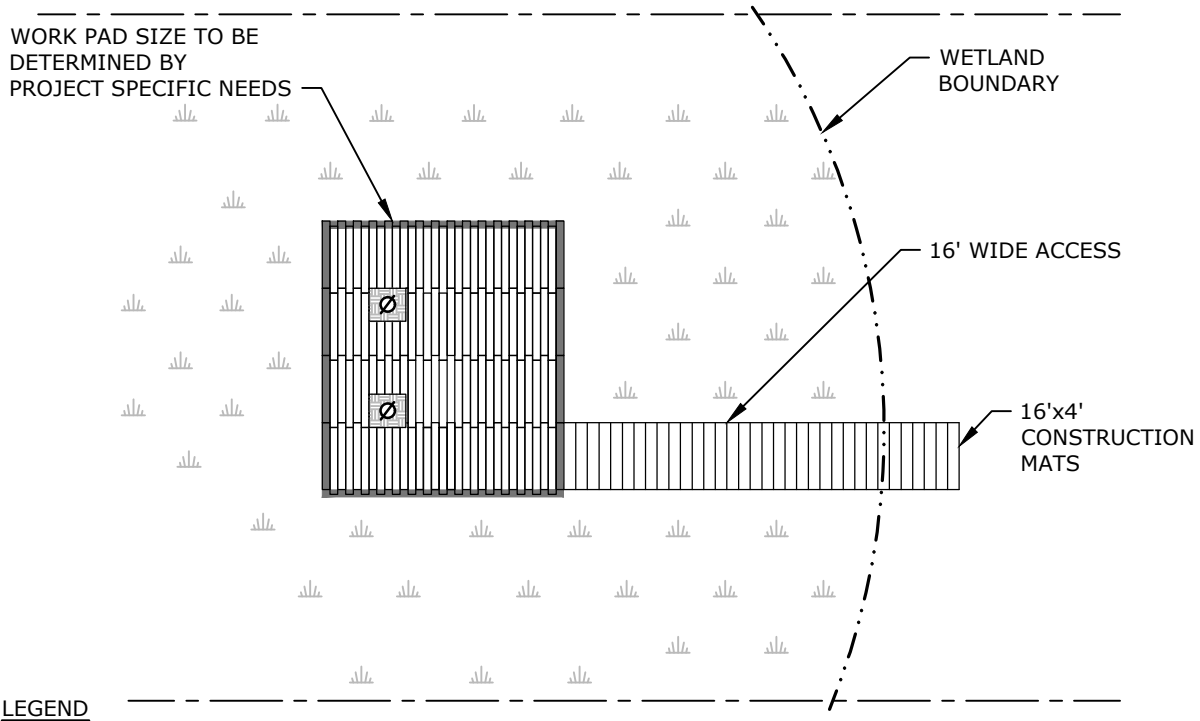



CONSTRUCTION MAT LAYOUT
(LIVE LINE WORK)

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A13 |

EVERSOURCE

Dec 15, 2021-3:24pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Construction Mat-Live Line Work.dwg




LEGEND

| | |
|---|---|
| Ø | REPLACEMENT POLE LOCATION |
| ▭ | CONSTRUCTION MAT - 16'x4'x 8" TYPICAL SIZE. 12'x4'x8" OR OTHER SIZE ACCEPTABLE. |
| ▬ | WORK SPACE REQUIREMENTS - DE-ENERGIZED WORK (DETERMINED BASED ON PROJECT SPECIFIC NEEDS) |
| — – — | LIMIT OF RIGHT-OF-WAY |
| ılı | WETLAND AREA |

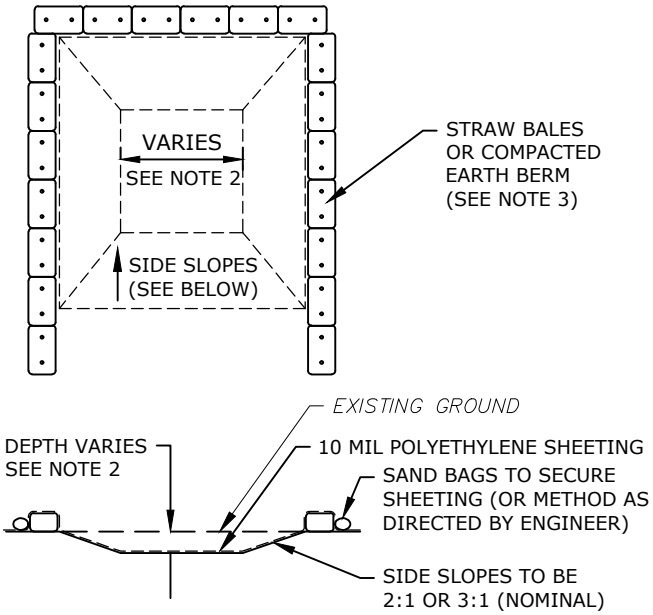


CONSTRUCTION MAT LAYOUT
(DE-ENERGIZED LINE WORK)

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A14 |

EVERSOURCE

Dec 15, 2021-3:28pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Swamp Mat -Deenergized Work.dwg




NOTES:

1. CONCRETE WASHOUT AREA(S) SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE. THE CONCRETE WASHOUT AREA SHALL BE ENTIRELY SELF-CONTAINED.

2. THE CONTRACTOR SHALL SUBMIT THE DESIGN, LOCATION AND SIZING OF THE CONCRETE WASHOUT AREA(S) WITH THE PROJECTS'S EROSION AND SEDIMENTATION CONTROL PLAN.

3. LOCATION: WASHOUT AREA(S) ARE TO BE LOCATED AT LEAST 50 FEET FROM ANY STREAM, WETLAND, STORM DRAINS, OR OTHER SENSITIVE RESOURCE. THE FLOOD CONTINGENCY PLAN MUST ADDRESS THE CONCRETE WASHOUT IF THE WASHOUT IS TO BE LOCATED WITHIN THE FLOODPLAIN.
   SIZE: THE WASHOUT MUST HAVE SUFFICIENT VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS INCLUDING, BUT NOT LIMITED TO, OPERATIONS ASSOCIATED WITH GROUT AND MORTAR.

4. SURFACE DISCHARGE IS UNACCEPTABLE. THEREFORE, STRAW BALES OR OTHER CONTROL MEASURES, SHOULD BE USED AROUND THE PERIMETER OF THE CONCRETE WASHOUT AREA FOR CONTAINMENT.

5. SIGNS SHOULD BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CONCRETE AREA(S) AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS. WASHOUT AREA(S) SHOULD BE FLAGGED WITH SAFETY FENCING OR OTHER APPROVED METHOD.

6. WASHOUT AREA(S) ARE TO BE INSPECTED AT LEAST ONCE A WEEK FOR STRUCTURAL INTEGRITY, ADEQUATE HOLDING CAPACITY AND CHECKED FOR LEAKS, TEARS OR OVERFLOWS. (AS REQUIRED BY THE CONSTRUCTION SITE ENVIRONMENTAL INSPECTION REPORT) WASHOUT AREA(S) SHOULD BE CHECKED AFTER HEAVY RAINS.

7. HARDENED CONCRETE WASTE SHOULD BE REMOVED AND DISPOSED OF WHEN THE WASTE HAS ACCUMULATED TO HALF OF THE CONCRETE WASHOUT'S HEIGHT. THE WASTE CAN BE STORED AT AN UPLAND LOCATION. ALL CONCRETE WASTE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH ALL APPLICABLE LAWS, REGULATIONS, AND GUIDELINES.

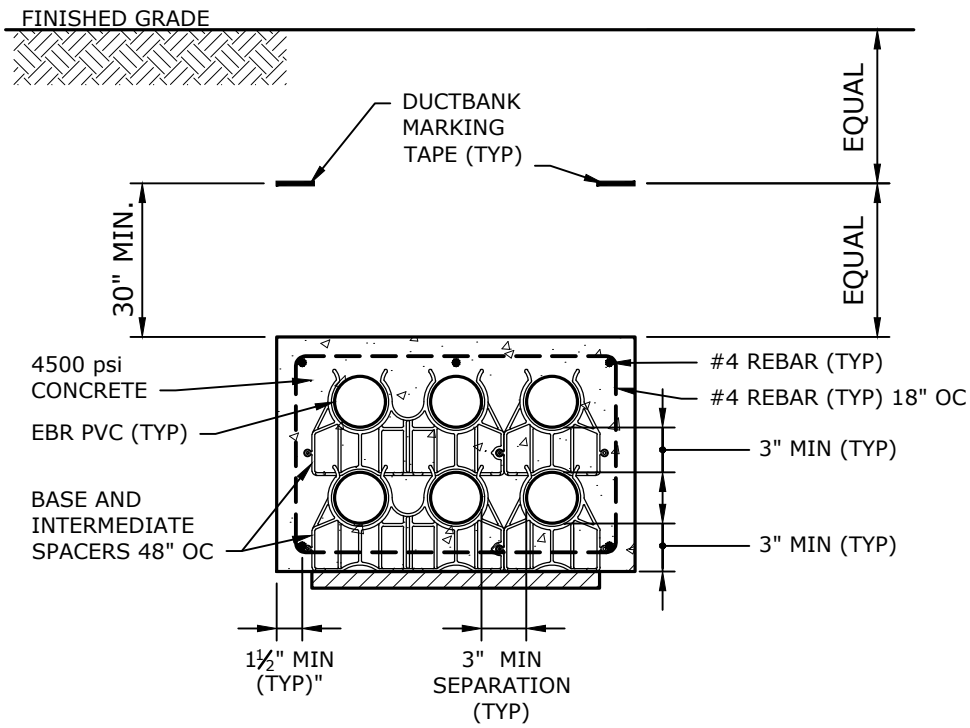


CONCRETE WASH OUT

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A15 |

EVERSOURCE

Dec 15, 2021-3:23pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Concrete Washout.dwg




NOTES:

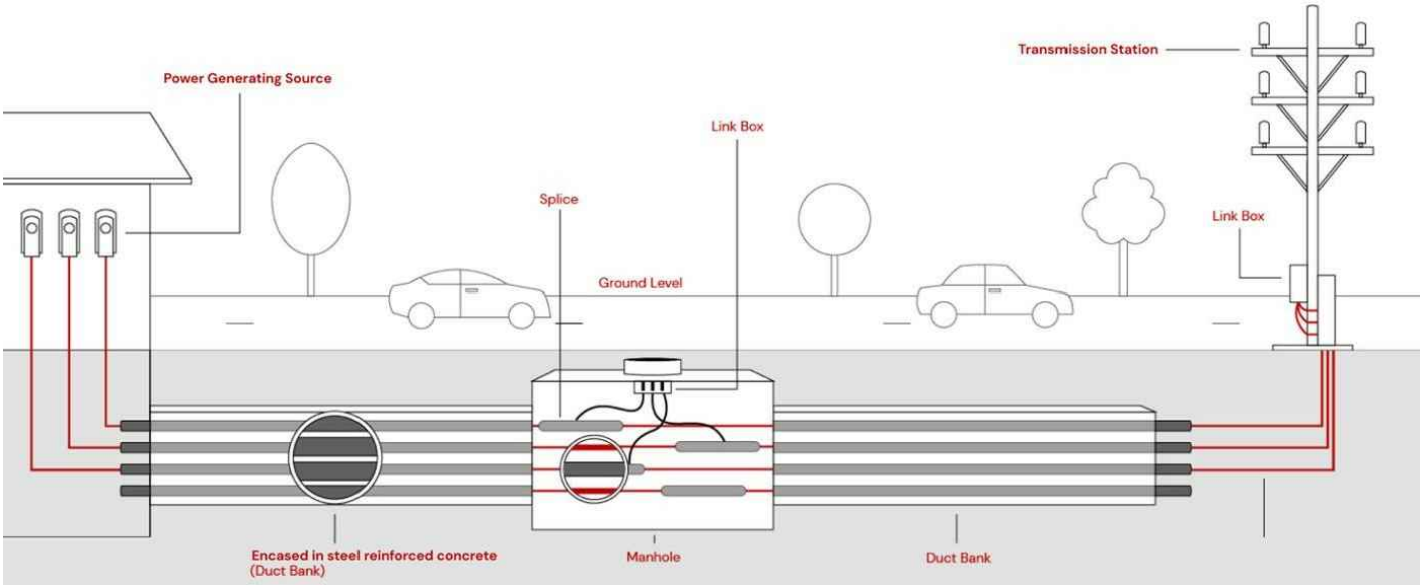
1. GEOTECH TEST, IN ACCORD WITH ASTM D608, THE BOTTOM OF EXCAVATION TO ACHIEVE 85% OF MAXIMUM DRY DENSITY, PRIOR TO CONCRETE PLACEMENT.

ROAD TRENCH
(DUCT BANK)

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A16 |

EVERSOURCE

Dec 15, 2021-3:26pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Road Treanch - 6-Way Ductbank.dwg



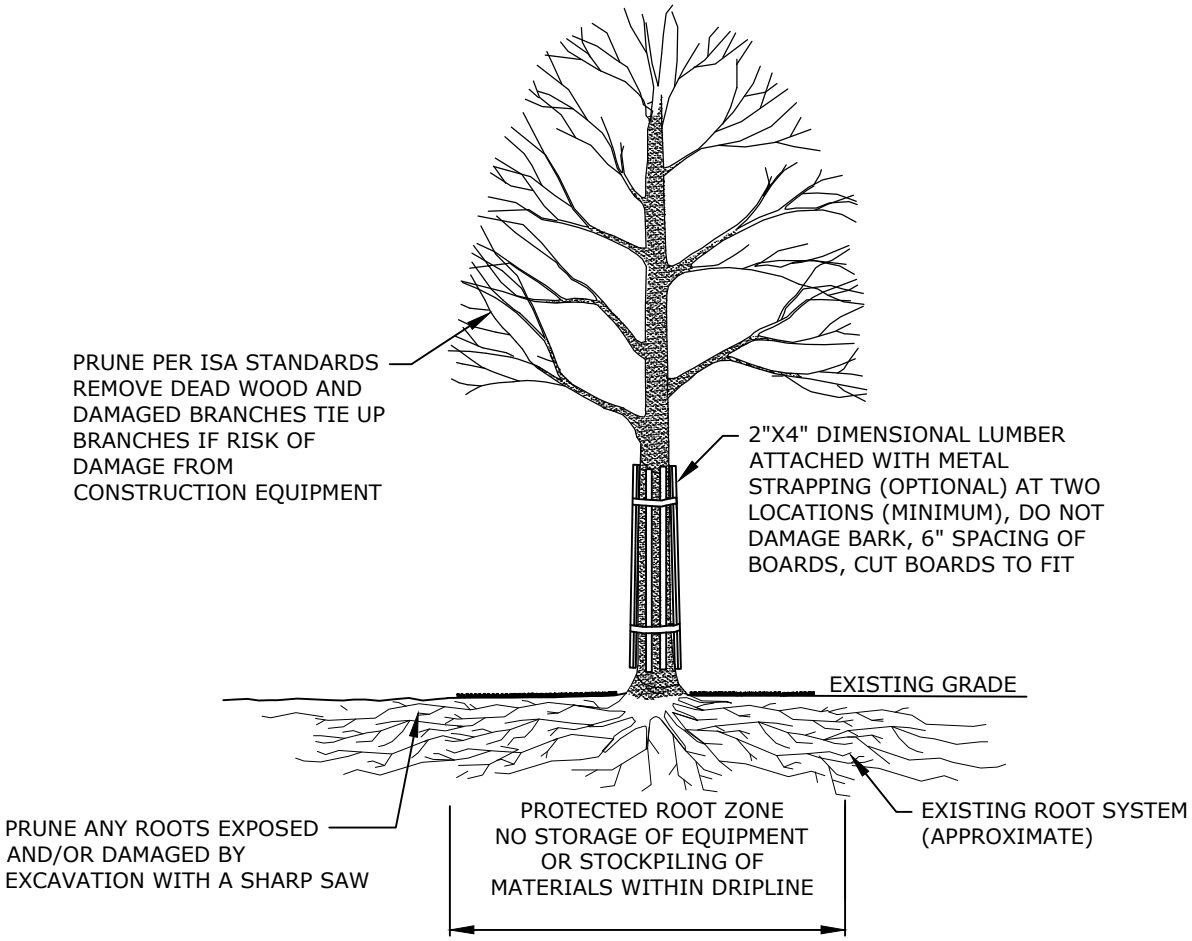

ROAD TRENCH
(6-WAY DUCT BANK)

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A17 |

EVERSOURCE



Dec 15, 2021-3:27pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Road Treanch - Duct Bank.dwg



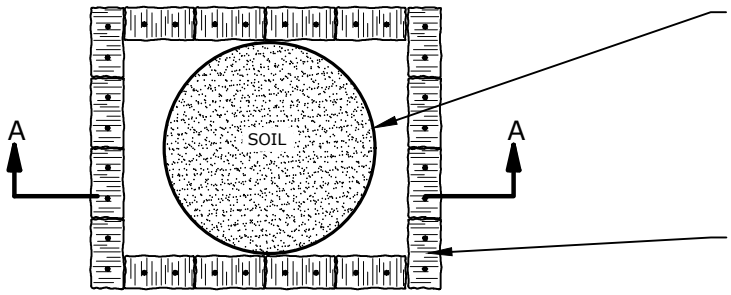



TREE PROTECTION

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A18 |

EVERSOURCE

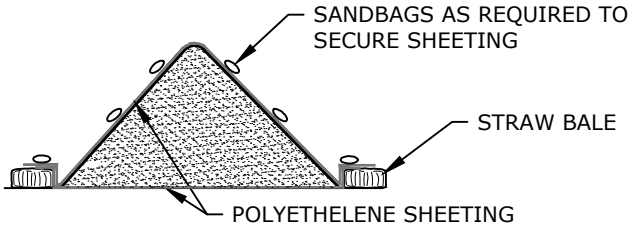
Dec 15, 2021-3:29pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Tree Prot.dwg



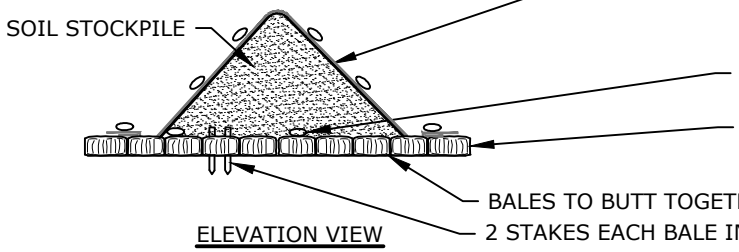

CONTAMINATED SOILS MUST BE ON AND COVERED WITH POLYETHYLENE SHEETING TO LIMIT EROSION. SHEETING NOT REQUIRED FOR NON-CONTAMINATED SOILS IF SEDIMENTATION AND EROSION CONTROLS COMPLETELY ENCLOSE STOCKPILE.

STRAW BALES AND/OR SILT FENCE

PLAN VIEW




SECTION A-A




ELEVATION VIEW

NOTE:

1. SANDBAGS (OR SIMILAR) MAY BE USED TO SECURE POLYETHYLENE SHEETING ON TOP OF THE STOCKPILE.
2. STRAW PRODUCTS ONLY; THE USE OF HAY OR HAY PRODUCTS IS STRICTLY PROHIBITED.



SOIL STOCKPILE MANAGEMENT

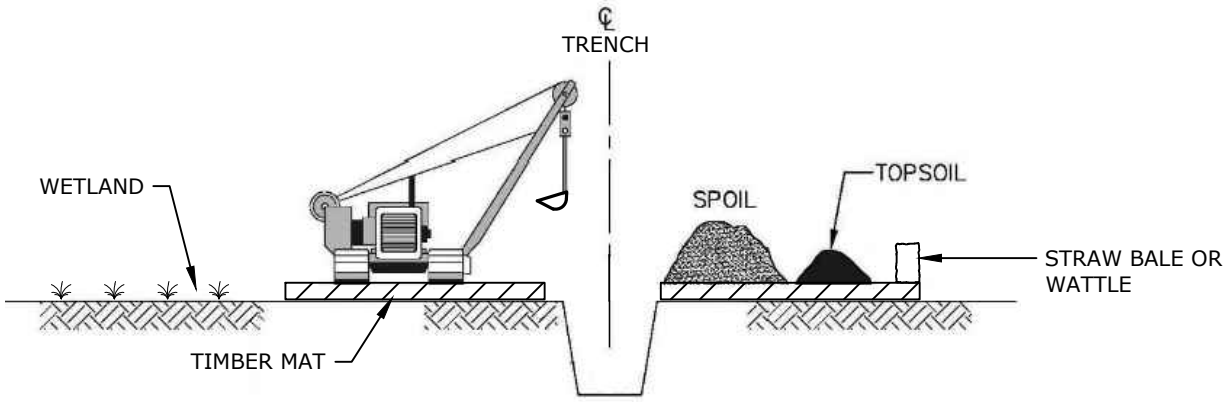
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A19 |

EVERSOURCE

Dec 15, 2021-3:27pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Soil_Stpl_Mgmt.dwg

NOTES:

1. TOPSOIL SEGREGATION TO BE USED IN WETLANDS AND AGRICULTURAL LAND.
2. IF WORKING WITHIN WETLANDS, MATTING BENEATH STOCKPILES MUST BE LINED OR UNDERLAIN BY GEOTEXTILE FABRIC.
3. STOCKPILES SHOULD BE ENCLOSED BY STRAW BALES OR WATTLES.

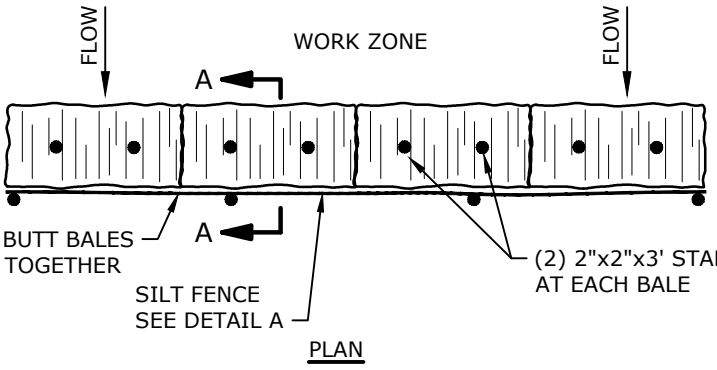



TOPSOIL SEGREGATION

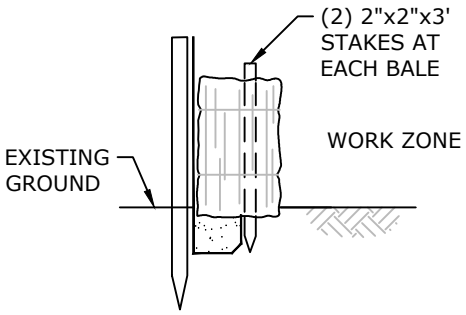
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A20 |

EVERSOURCE

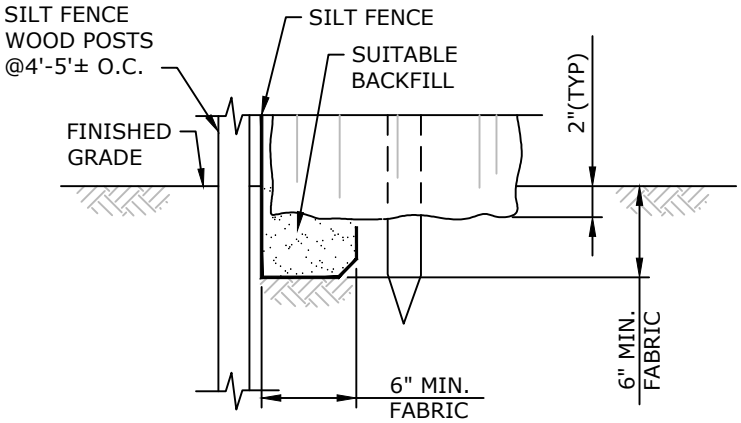
Dec 15, 2021-3:29pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Topsoil.dwg



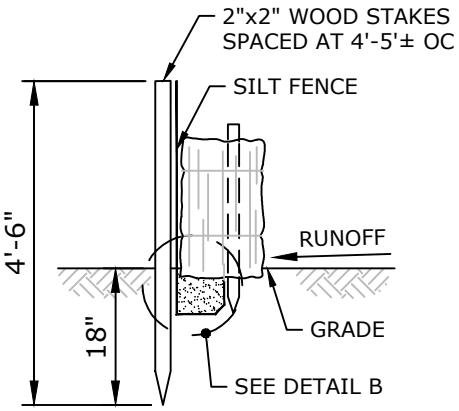

PLAN




SECTION A-A




DETAIL B




DETAIL A

NOTE:
USE OF HAY AND/OR PRODUCTS CONTAINING WEED SEED IS PROHIBITED.

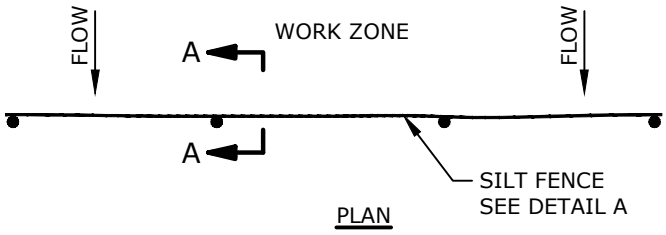



STRAW BALE BARRIER

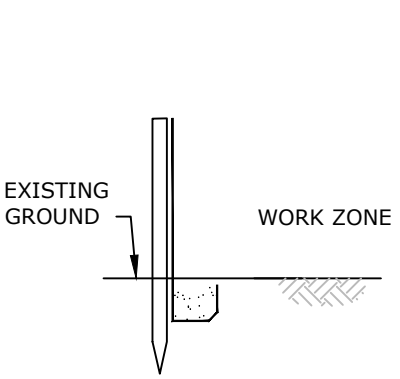
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A21 |

EVERSOURCE

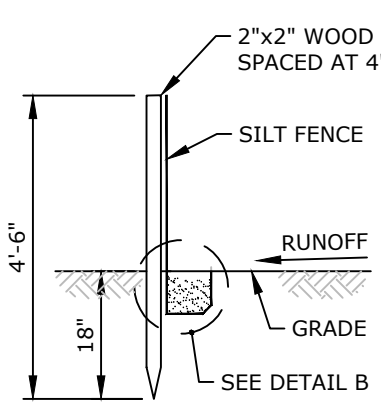
Dec 15, 2021-3:28pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Straw Bales.dwg



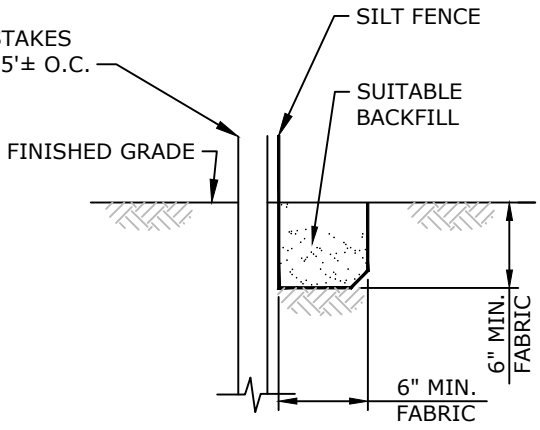

PLAN




SECTION A-A




DETAIL A

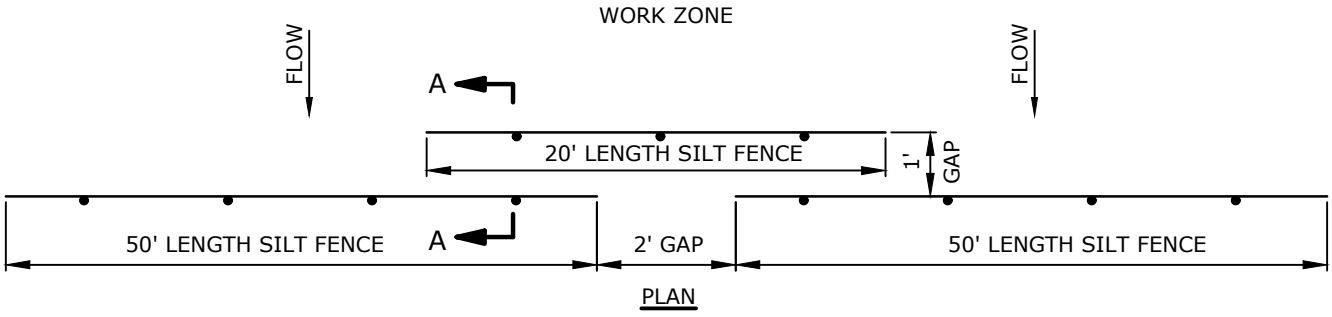



DETAIL B

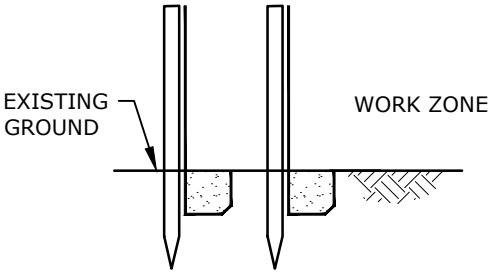


| SILT FENCE | | |
|---|---|---|
| DATE: | 12/2021 | EVERSOURCE |
| SCALE: | NO SCALE | |
| FIGURE: | A22 | |

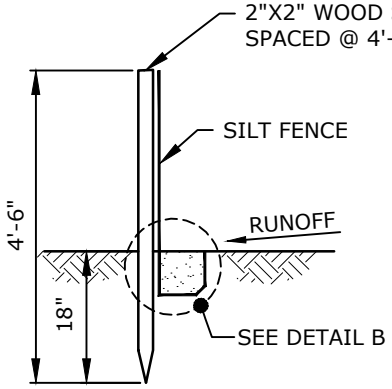
Dec 15, 2021-3:27pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Silt Fence.dwg



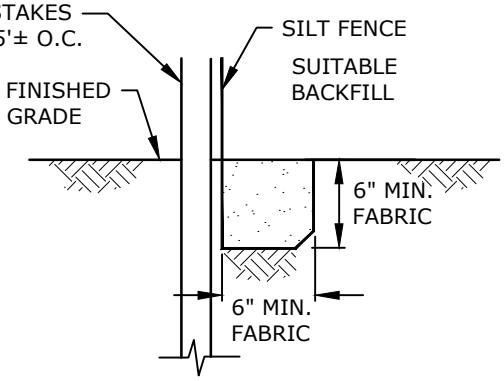

PLAN




SECTION A-A



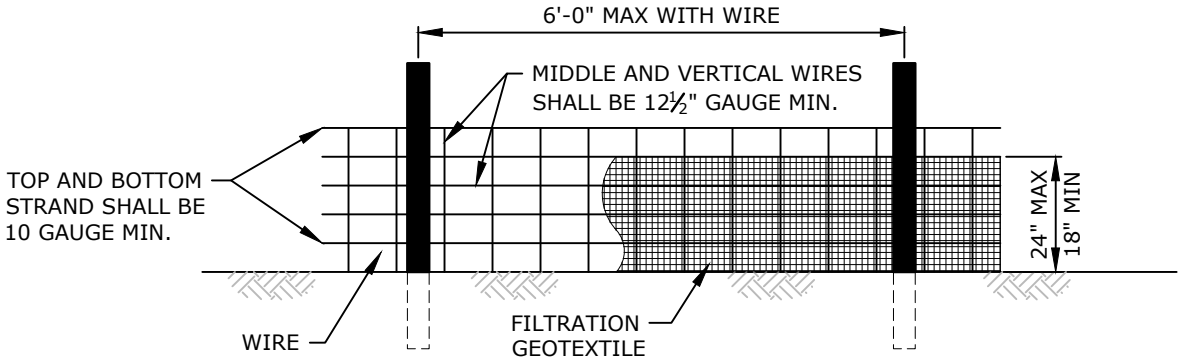

DETAIL A



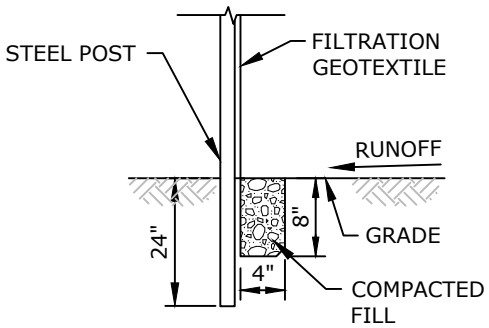

DETAIL B

| | |
|---|---|
| SYNCOPATED SILT FENCE | |
| DATE: 12/2021 | EVERSOURCE |
| SCALE: NO SCALE | |
| FIGURE: A23 | |

Dec 15, 2021-3:29pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Syncopated Silt Fence.dwg




ELEVATION




SECTION

NOTES:

1. USE FILTRATION GEOTEXTILE A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE POSTS AND WIRES AS DIRECTED.
2. USE A WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
3. PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.
4. FOR MECHANICAL SLICING METHOD INSTALLATION, GEOTEXTILE SHALL BE A MAXIMUM OF 18" ABOVE GROUND SURFACE.
5. EXTEND GEOTEXTILE AND WIRE INTO TRENCH.

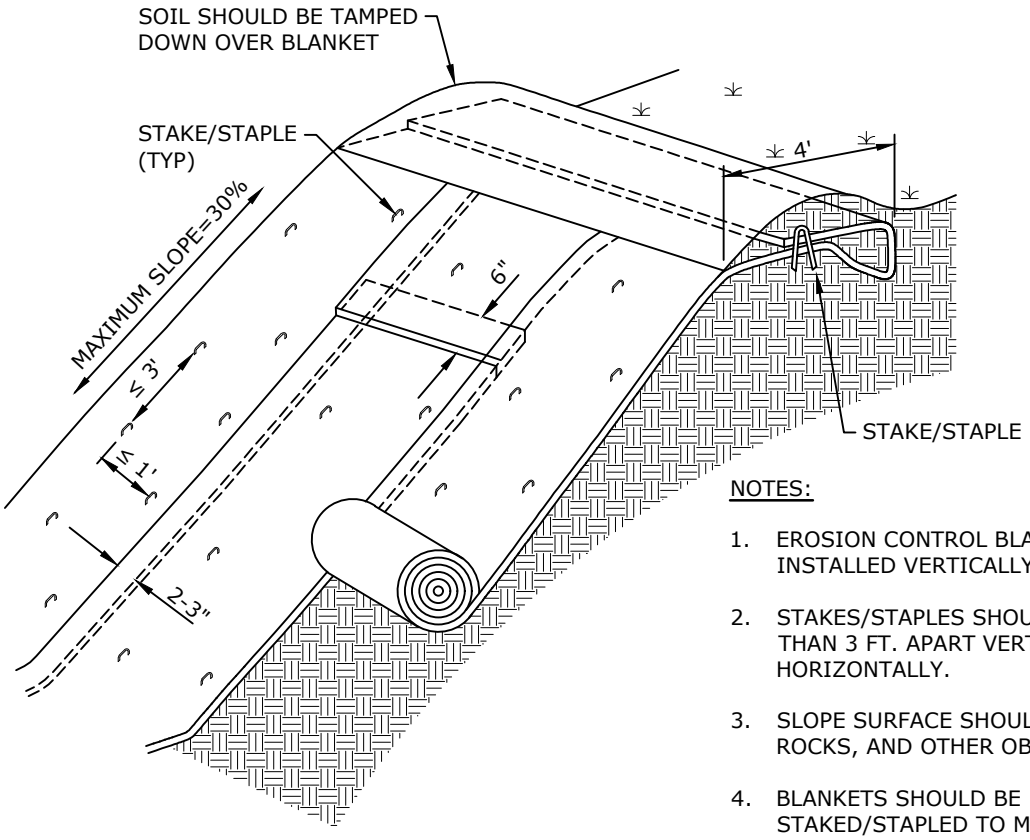


REINFORCED SILT FENCE

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A24 |

EVERSOURCE

Dec 15, 2021-3:27pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Silt Fence-Wire.dwg




NOTES:

1. EROSION CONTROL BLANKET SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.
2. STAKES/STAPLES SHOULD BE PLACED NO MORE THAN 3 FT. APART VERTICALLY, AND 1 FT. APART HORIZONTALLY.
3. SLOPE SURFACE SHOULD BE FREE OF STICKS, ROCKS, AND OTHER OBSTRUCTIONS.
4. BLANKETS SHOULD BE ROLLED OUT LOOSELY AND STAKED/STAPLED TO MAINTAIN DIRECT SOIL CONTACT. DO NOT STRETCH THE BLANKETS.
5. USE OF PRODUCTS WITH PLASTIC AND/OR NYLON NETTING IS PROHIBITED.

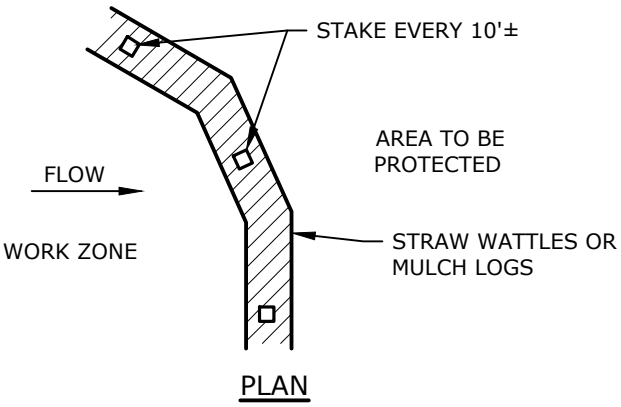


EROSION CONTROL BLANKETS

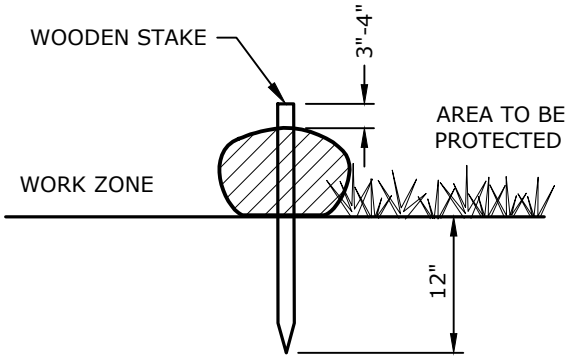
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|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A25 |

EVERSOURCE

Dec 15, 2021-3:25pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\E-Blanket.dwg




PLAN




SECTION

NOTE:

1. USE OF PRODUCTS WITH PLASTIC AND/OR NYLON NETTING IS PROHIBITED.

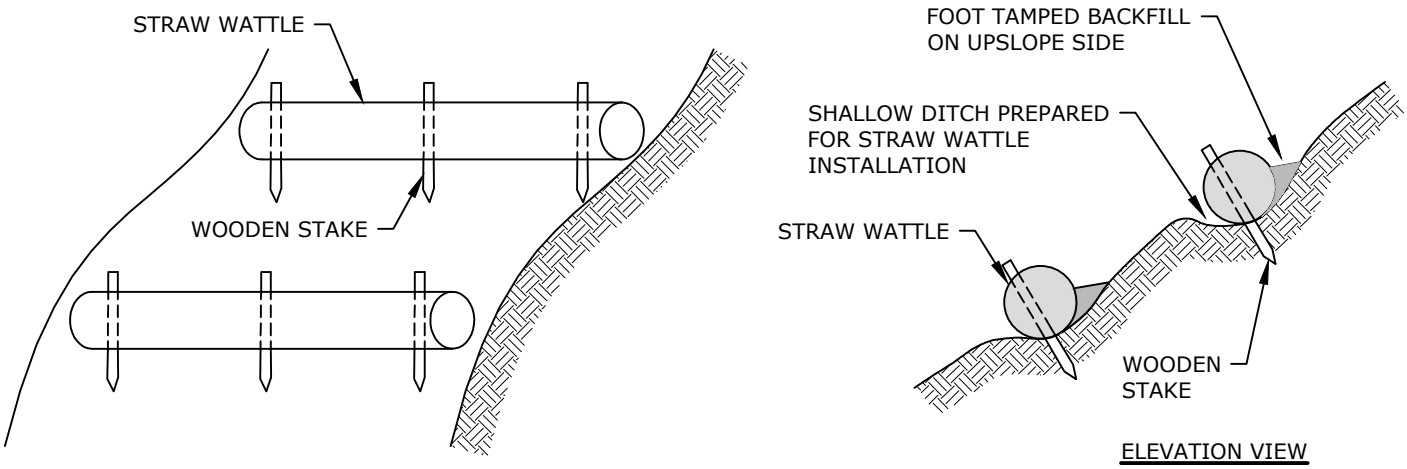


STRAW WATTLE/MULCH LOG

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A26 |

EVERSOURCE

Dec 15, 2021-3:28pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Straw Wattle2.dwg




NOTES:

1. USE OF PRODUCTS WITH PLASTIC AND/OR NYLON NETTING IS PROHIBITED.

2. VERTICAL SPACING FOR SLOPE INSTALLATIONS TO BE DETERMINED BY SITE CONDITIONS: SLOPE GRADIENT AND SOIL TYPE. CONFIRM SPACING PER MANUFACTURER'S SPECIFICATIONS. SEE BELOW FOR TYPICAL REQUIREMENTS. COORDINATE SPACING AND LOCATION WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING.

    - 1:1 SLOPES = 10 FEET APART
    - 2:1 SLOPES = 20 FEET APART
    - 3:1 SLOPES = 30 FEET APART

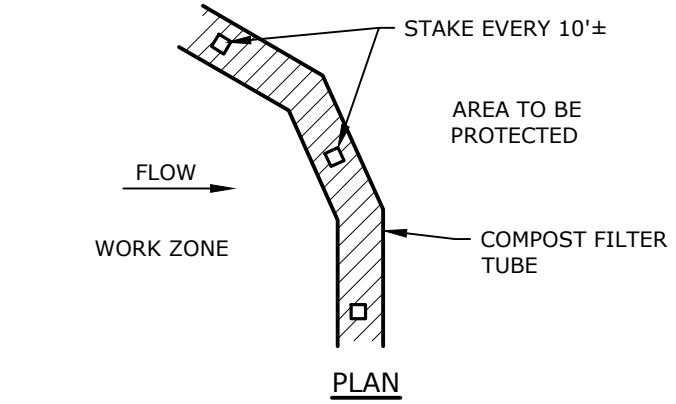
3. MINIMUM 12" DIAMETER WATTLES SHOULD BE USED FOR HIGHLY DISTURBED AREAS (E.G. HEAVILY USED ACCESS ROADS WITH ADJACENT WETLANDS). MINIMUM 8" DIAMETER WATTLES SHOULD BE USED FOR LESS DISTURBED SOILS.

STRAW WATTLE
(ON SLOPE)

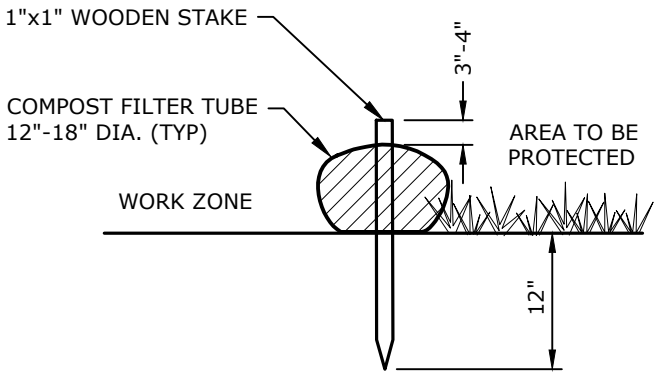
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A27 |

EVERSOURCE

Dec 15, 2021-3:28pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Straw Wattle.dwg



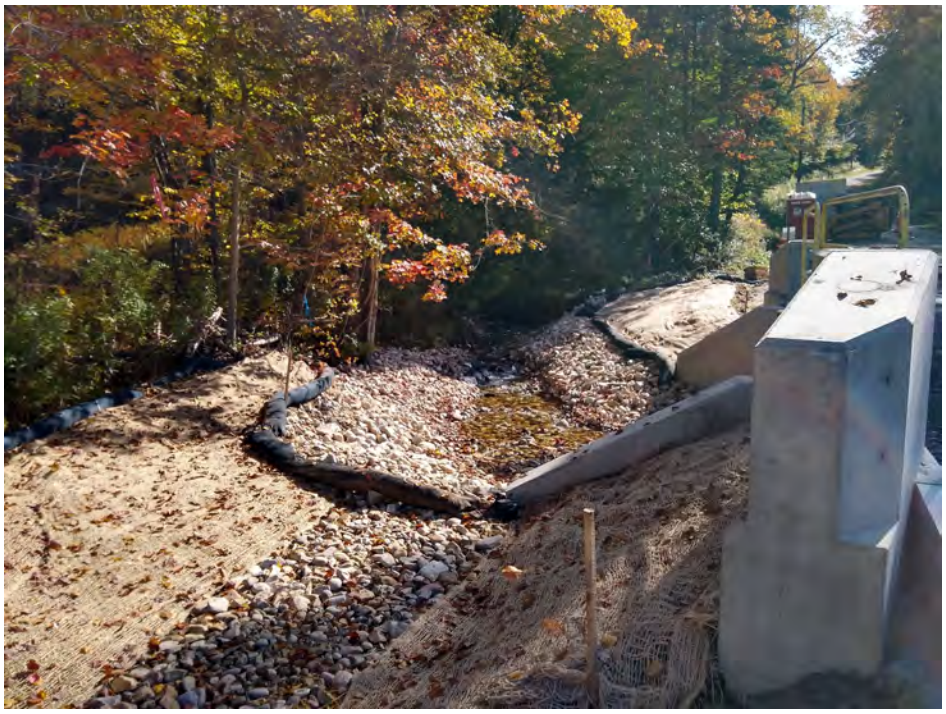

PLAN




SECTION

NOTES:

1. TUBES FOR COMPOST FILTERS SHALL BE JUTE MESH OR APPROVED BIODEGRADABLE MATERIAL.
2. TAMP TUBES IN PLACE TO ENSURE GOOD CONTACT WITH SOIL SURFACE.
3. PROVIDE 3' MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW.
4. COMPOST MATERIAL SHALL BE DISPERSED ON SITE WITHIN LIMITS OF WORK, AS DIRECTED.
5. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
6. DO NOT INSTALL IN PERENNIAL, EPHEMERAL, OR INTERMITTENT STREAMS.
7. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.

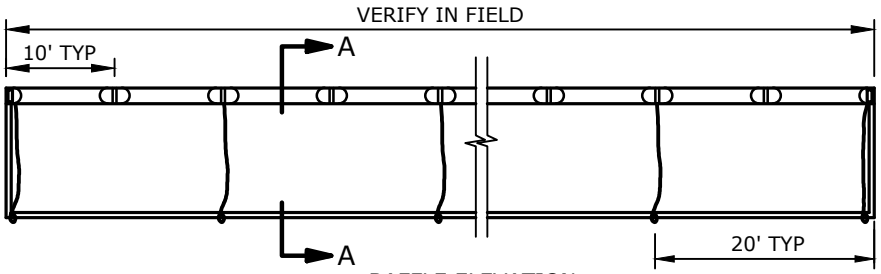


COMPOST FILTER TUBE

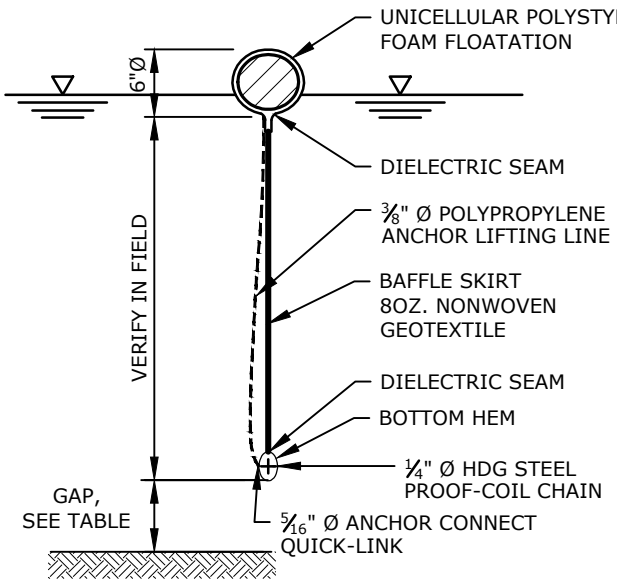
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A28 |

EVERSOURCE

Dec 15, 2021-3:22pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Compost Filter Tube.dwg




BAFFLE ELEVATION




SECTION A-A

NOTES:

1. TURBIDITY CURTAIN BY ENVIRONETICS, INC. OR APPROVED EQUAL.
2. TURBIDITY CURTAIN SHALL NOT BE EXTENDED ACROSS CHANNEL FLOWS.
3. TURBIDITY CURTAIN MATERIAL SHALL BE ULTRAVIOLET LIGHT RESISTANT.

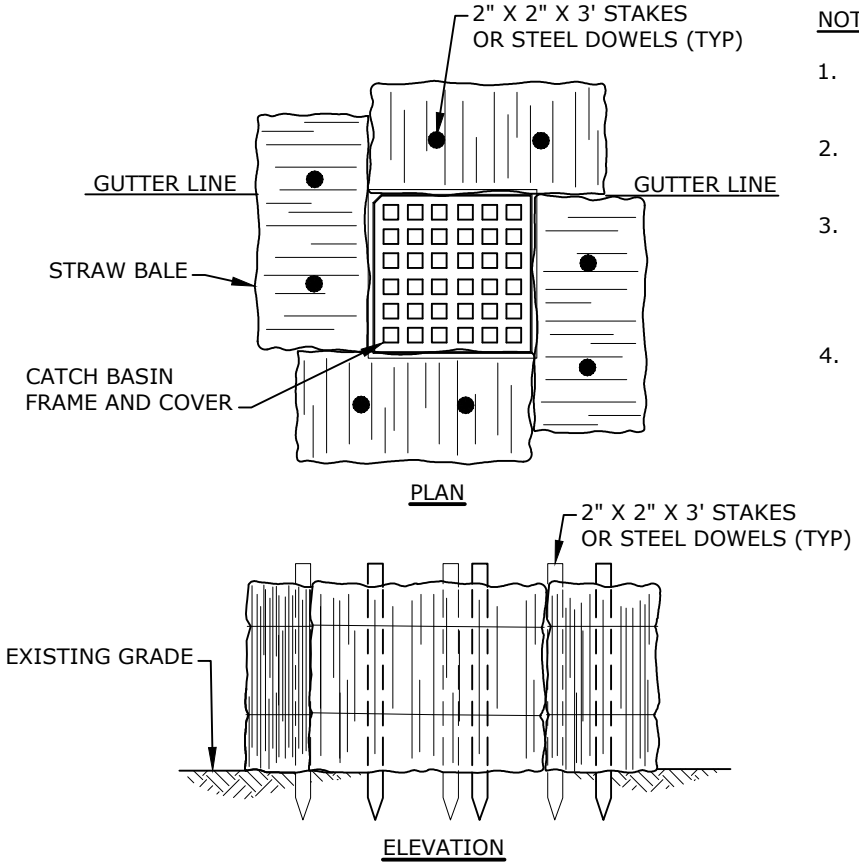
| TYPE | DESCRIPTION | CONDITIONS | GAP (IN.) |
|---|---|---|---|
| I | FLATWATER | CALM AND PROTECTED | 0 |
| II | LIGHTWEIGHT | SEMI-PROTECTED AREA, CURRENTS UP TO 2 FT/S | 12 |
| III | MIDDLEWEIGHT | EXPOSED AREA, CURRENTS UP TO 5 FT/S | 12 |
| IV | HEAVYWEIGHT | EXPOSED TO WIND, CURRENT, AND TIDES | 0 |

TURBIDITY CURTAIN

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A29 |

EVERSOURCE

Dec 15, 2021-3:29pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Turbidity Curtain.dwg




NOTES:

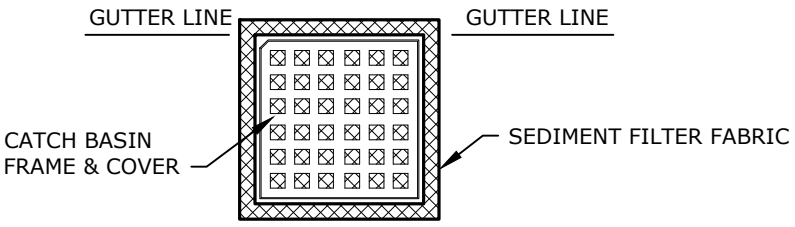
1. A MINIMUM OF TWO WOOD STAKES ARE REQUIRED PER STRAW BALE.
2. STEEL DOWELS MAY BE USED WHERE WOOD STAKES CANNOT BE DRIVEN INTO THE GROUND.
3. "SILT SACKS", "DANDY BAG II" OR OTHER SIMILAR SILT RETENTION DEVICES SHALL BE INSTALLED IN LIEU OF STRAW BALES FOR CATCH BASINS LOCATED IN EXISTING PAVED AREAS.
4. STRAW PRODUCTS ONLY; THE USE OF HAY OR HAY PRODUCTS IS STRICTLY PROHIBITED.

CATCH BASIN INLET PROTECTION
(STRAW BALES)

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A30 |

EVERSOURCE

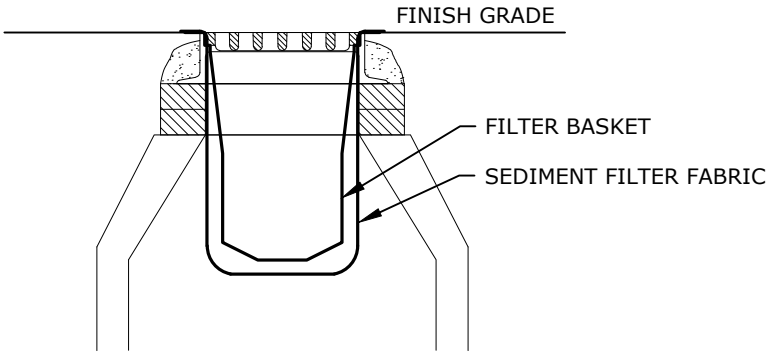
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Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\CB Inlet Prot.dwg




PLAN VIEW

NOTES:

1. FILTER BASKET SHALL BE "SILT SAK" BY JENNIAN, MELROSE, MA; "DANDY BAG" BY DANDY PRODUCTS (1-800-591-2284); DRAIN PAC (91-800-272-2832); OR APPROVED EQUIVALENT SUBJECT TO CONSULTATION WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING.
2. FILTER BASKETS SHOULD BE USED IN COMBINATION WITH ANOTHER INLET PROTECTION MEASURE SUCH AS SEDIMENT FILTER FABRIC IF DRAINAGE AREA IS SMALL WITH SHALLOW FLOWS.




ELEVATION VIEW



CATCH BASIN INLET PROTECTION
(SILT SACK)

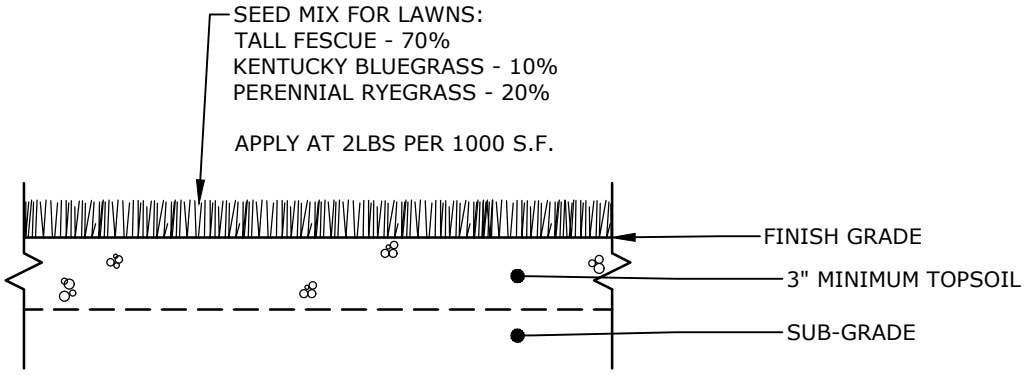
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|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A31 |

EVERSOURCE

Dec 15, 2021-3:27pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Silt Sack.dwg

NOTE:

THE SEED MIX UTILIZED SHALL CONSIST OF QUICK GROWING, DROUGHT TOLERANT, NATIVE GRASSES, SUCH AS RYES. THE SEED MIX UTILIZED WITHIN THE BUFFER ZONE TO WETLAND RESOURCE AREAS MAY CONSIST OF QUICK GROWING, DROUGHT TOLERANT, NATIVE GRASSES BUT MUST CONTAIN AT LEAST 50% OF A NATIVE SEED MIX WITH HIGH HABITAT VALUE, SUCH AS ONES WHICH CONTAIN PERENNIAL SHRUBS, WILDFLOWERS. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING FOR PROJECT SPECIFIC REQUIREMENTS.






LOAM AND SEED

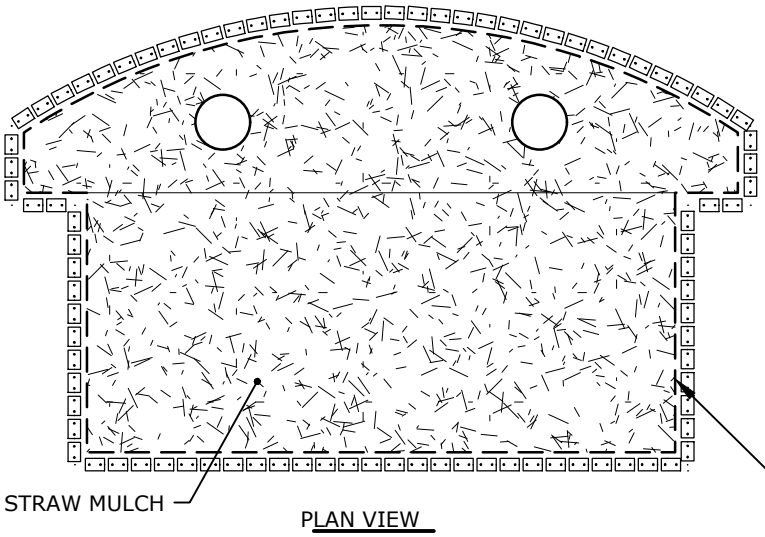
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|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A32 |

EVERSOURCE

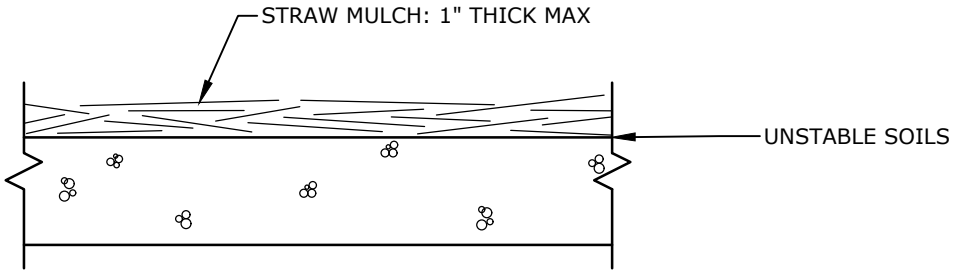
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Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Loam and Seed.dwg

NOTES:

1. STRAW PRODUCTS ONLY; THE USE OF HAY OR HAY PRODUCTS IS STRICTLY PROHIBITED.
2. MULCH APPLICATION SHALL NOT EXCEED 1" IN THICKNESS.
3. WOOD CHIPS MAY BE SUBSTITUTED FOR STRAW MULCH SUBJECT TO EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING APPROVAL.
4. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING FOR PROJECT SPECIFIC REQUIREMENTS.




PLAN VIEW




ELEVATION VIEW

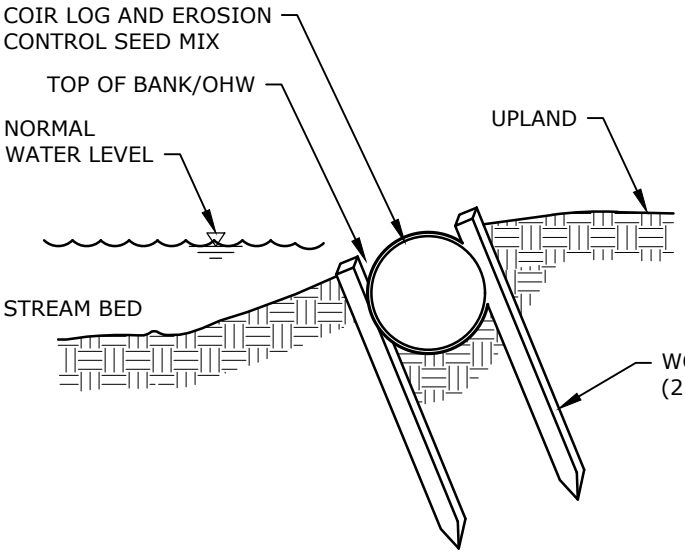


STRAW MULCH

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A33 |

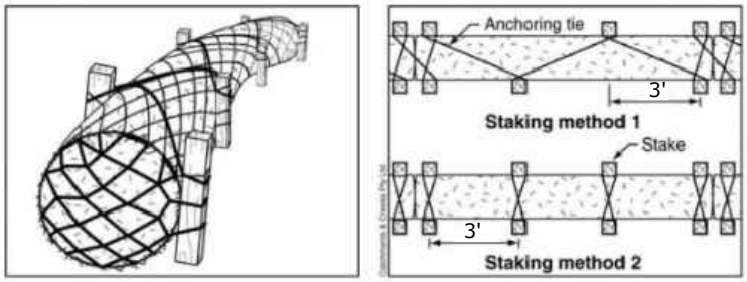
EVERSOURCE

Dec 15, 2021-3:28pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Straw Mulch.dwg




NOTES:

1. USE OF PRODUCTS WITH PLASTIC AND/OR NYLON NETTING IS PROHIBITED.
2. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
3. INSTALLATION MAY INCLUDE SEEDING AND/OR OTHER NATIVE PLANT INSTALLATION. CONSULT EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING.




TYPICAL STAKING

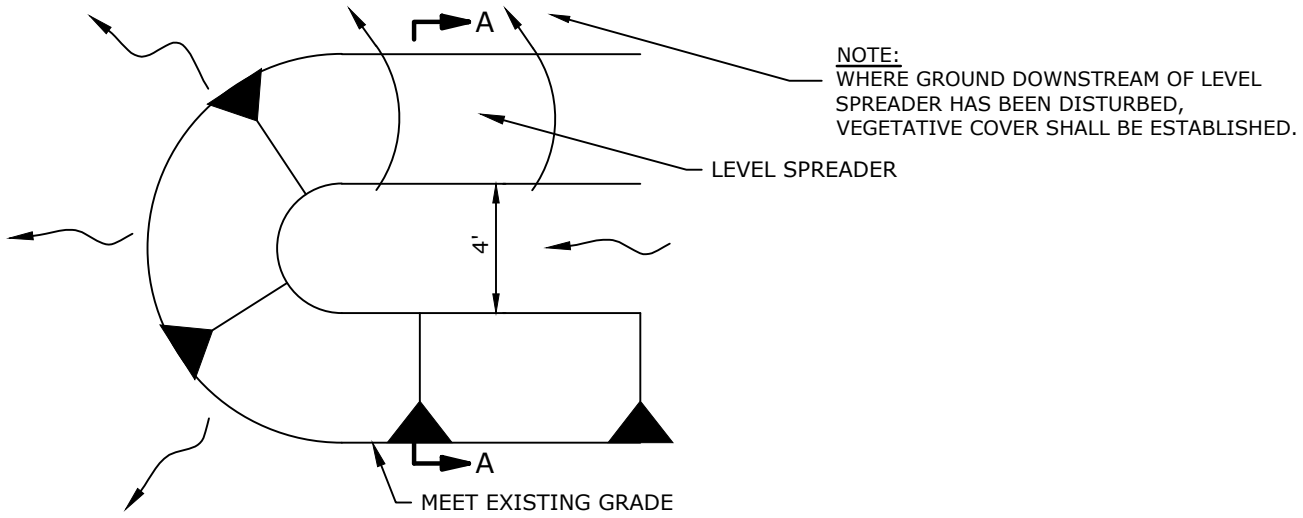


COIR LOG

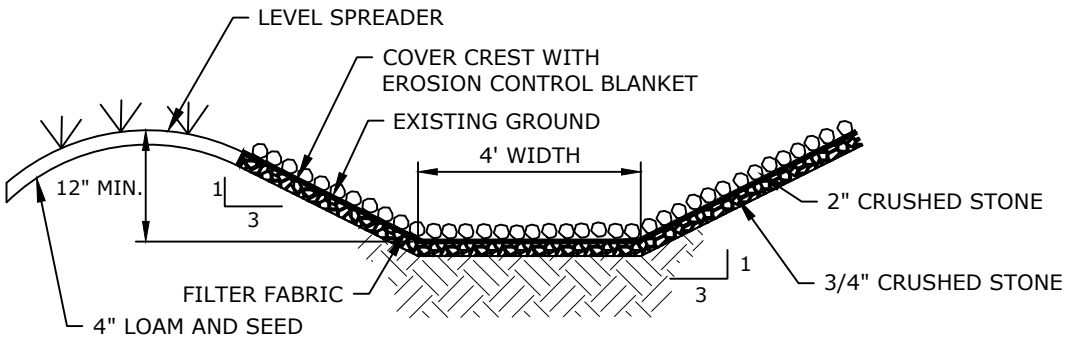
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A34 |

EVERSOURCE

Dec 15, 2021-3:22pm Plotted By: ASapelli
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PLAN VIEW



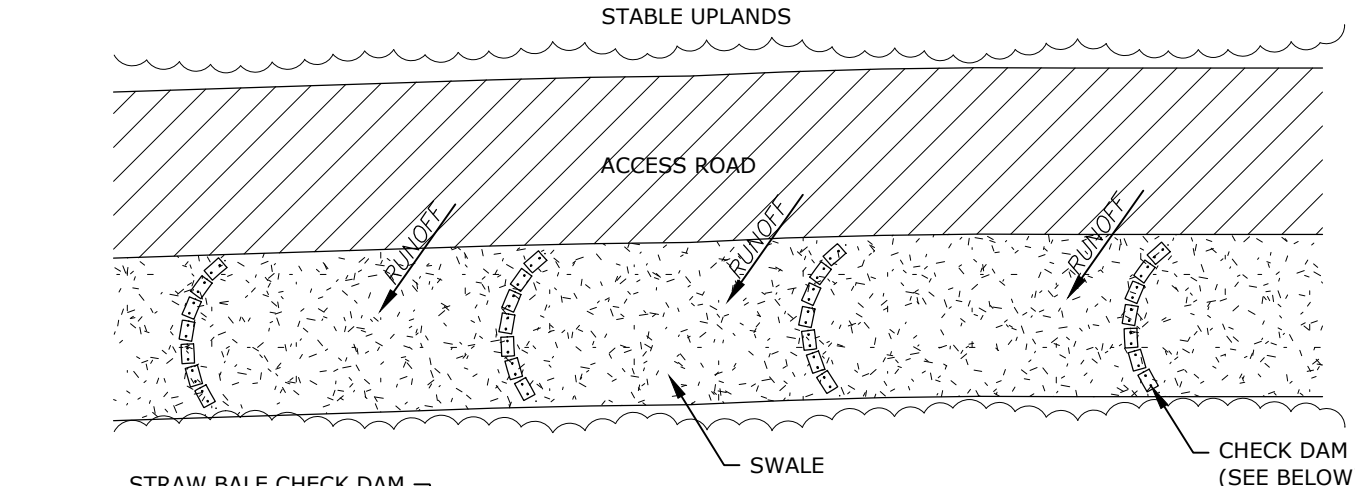

SECTION A-A

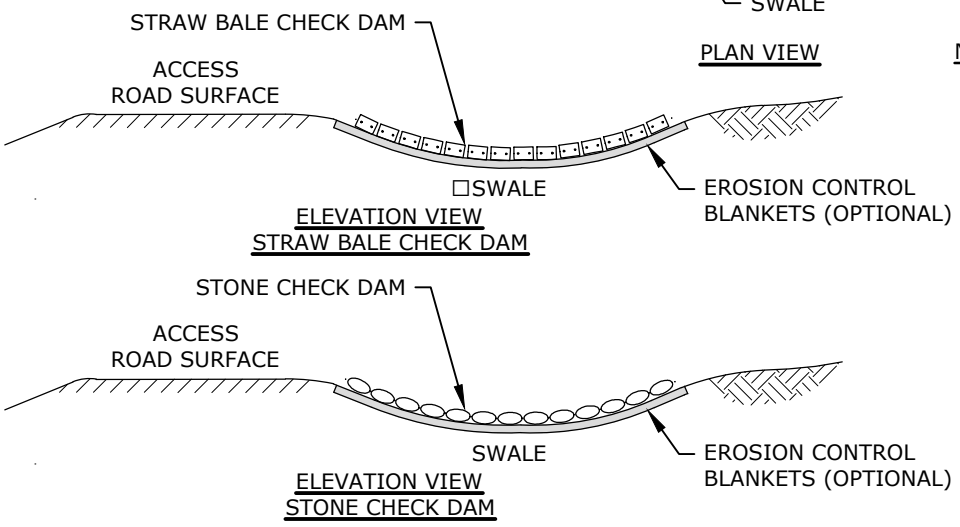
LEVEL SPREADER

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A35 |

EVERSOURCE

Dec 15, 2021-3:26pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Level Spreader.dwg




PLAN VIEW

ELEVATION VIEW
STRAW BALE CHECK DAM




ELEVATION VIEW
STONE CHECK DAM

NOTES:

1. CHECK DAMS SHALL BE CONSTRUCTED OF STONE OR STRAW PRODUCTS ONLY; THE USE OF HAY OR HAY PRODUCTS IS STRICTLY PROHIBITED.
2. HEIGHT AND SPACING OF CHECK DAMS IS DEPENDENT ON SLOPES AND RUNOFF CONDITIONS. CONSULT WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING PRIOR TO INSTALLATION FOR PROJECT SPECIFIC REQUIREMENTS.
3. REMOVE TEMPORARY CHECK DAMS UPON SWALE STABILIZATION AND/OR COMPLETION OF CONSTRUCTION.

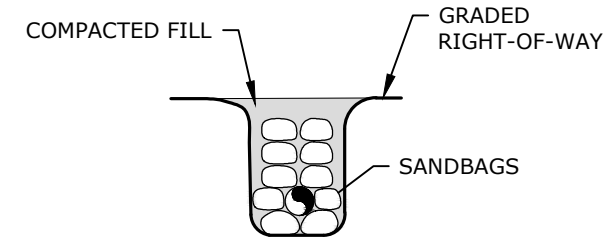


CHECK DAMS

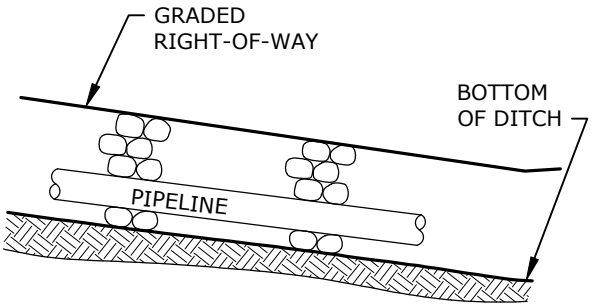
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A36 |

EVERSOURCE

Dec 15, 2021-3:22pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Check Dams.dwg

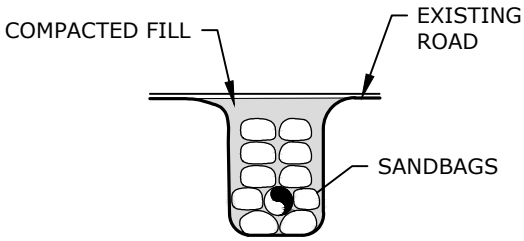



SECTION

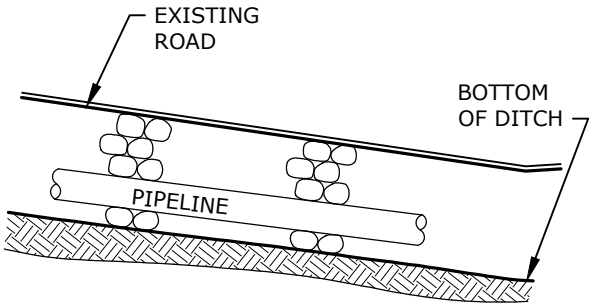



ELEVATION

## CROSS-COUNTRY BURIED PIPELINE




SECTION




ELEVATION

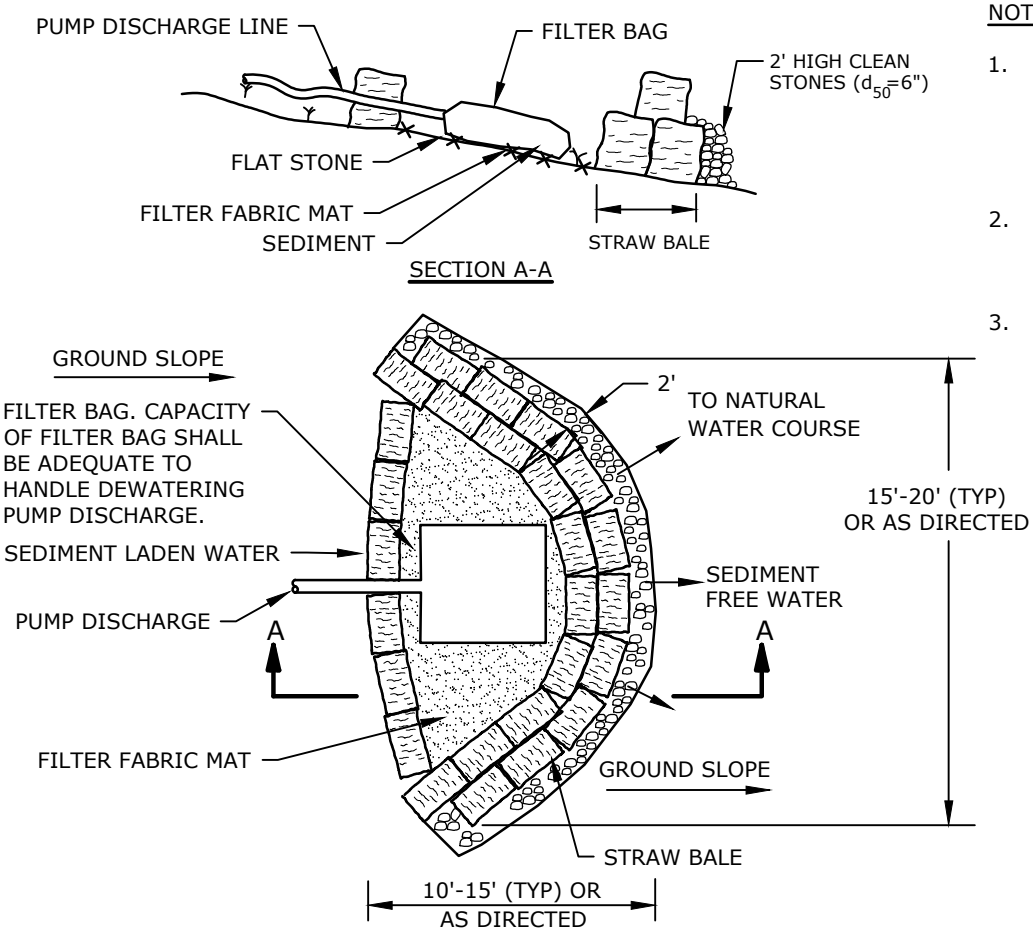
## IN-ROAD BURIED PIPELINE

TRENCH BREAKER

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A37 |

EVERSOURCE

Dec 15, 2021-3:29pm Plotted By: ASapelli
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NOTES:

1. LOCATION OF SEDIMENT TRAP SUBJECT TO CONSULTATION WITH EVERSOURCE ENVIRONMENTAL LICENSING AND PERMITTING.
2. SEDIMENT TRAPS OR SETTLING BASINS SHALL BE USED FOR CONSTRUCTION DEWATERING.
3. DISCHARGE AWAY FROM WORK AREA/DEWATERING AREA.

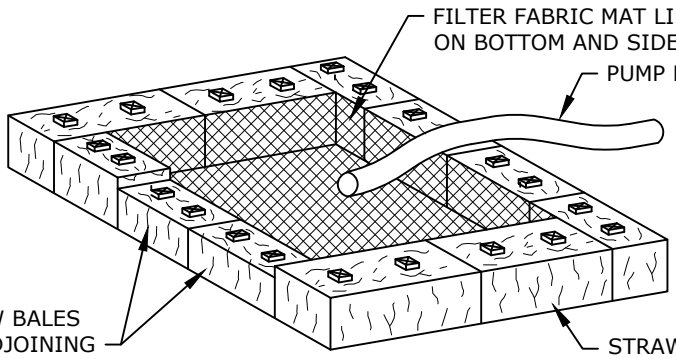


SEDIMENT TRAP

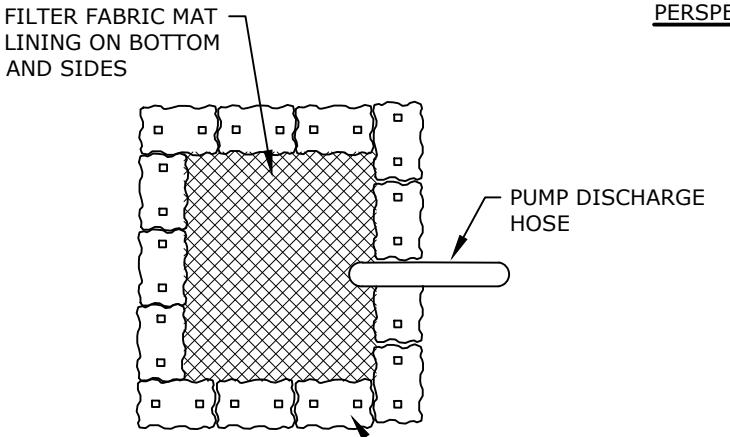
| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A38 |

EVERSOURCE

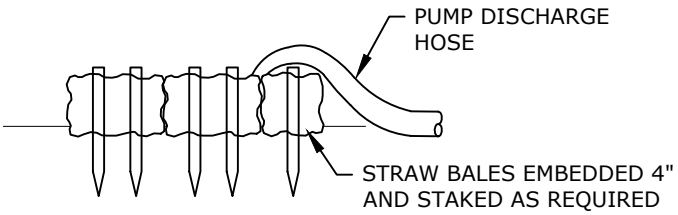
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PERSPECTIVE




PLAN VIEW




SECTION

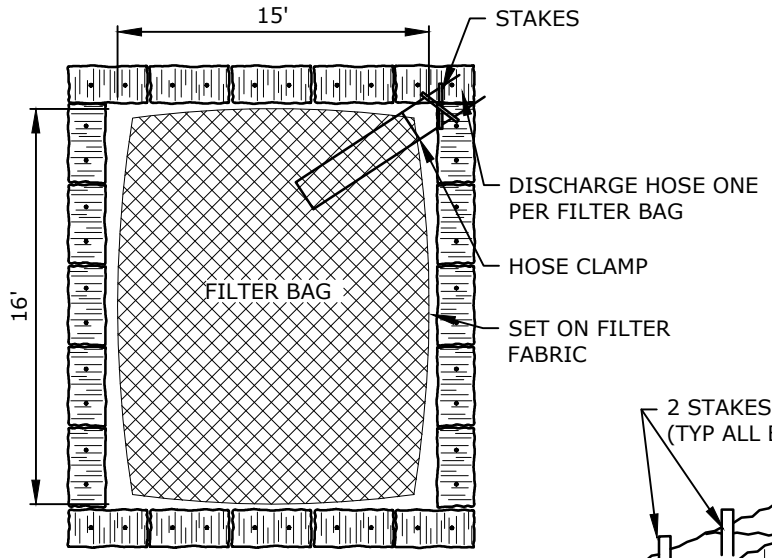
NOTE:
PLACE DEWATERING/PUMPING SETTLING BASINS IN A WELL-VEGETATED AREA, OUTSIDE OF WETLANDS WHENEVER PRACTICABLE.

DEWATERING BASIN

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A39 |

EVERSOURCE

Dec 15, 2021-3:24pm Plotted By: ASapelli
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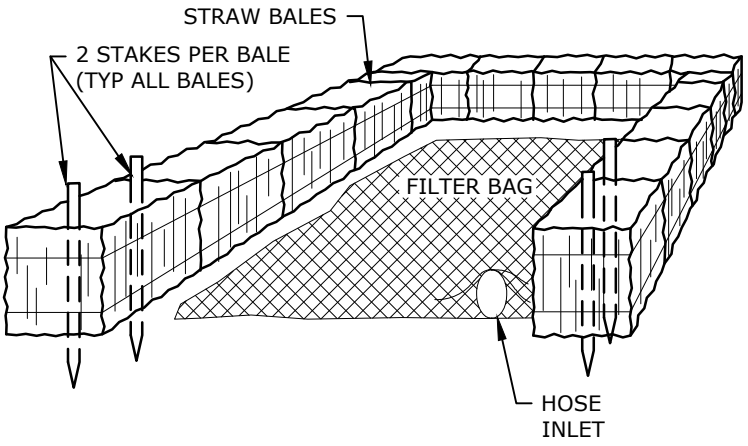

PLAN




SECTION

NOTE:

PLACE FILTER BASINS IN A WELL-VEGETATED AREA, OUTSIDE OF WETLANDS WHENEVER PRACTICABLE.




PERSPECTIVE

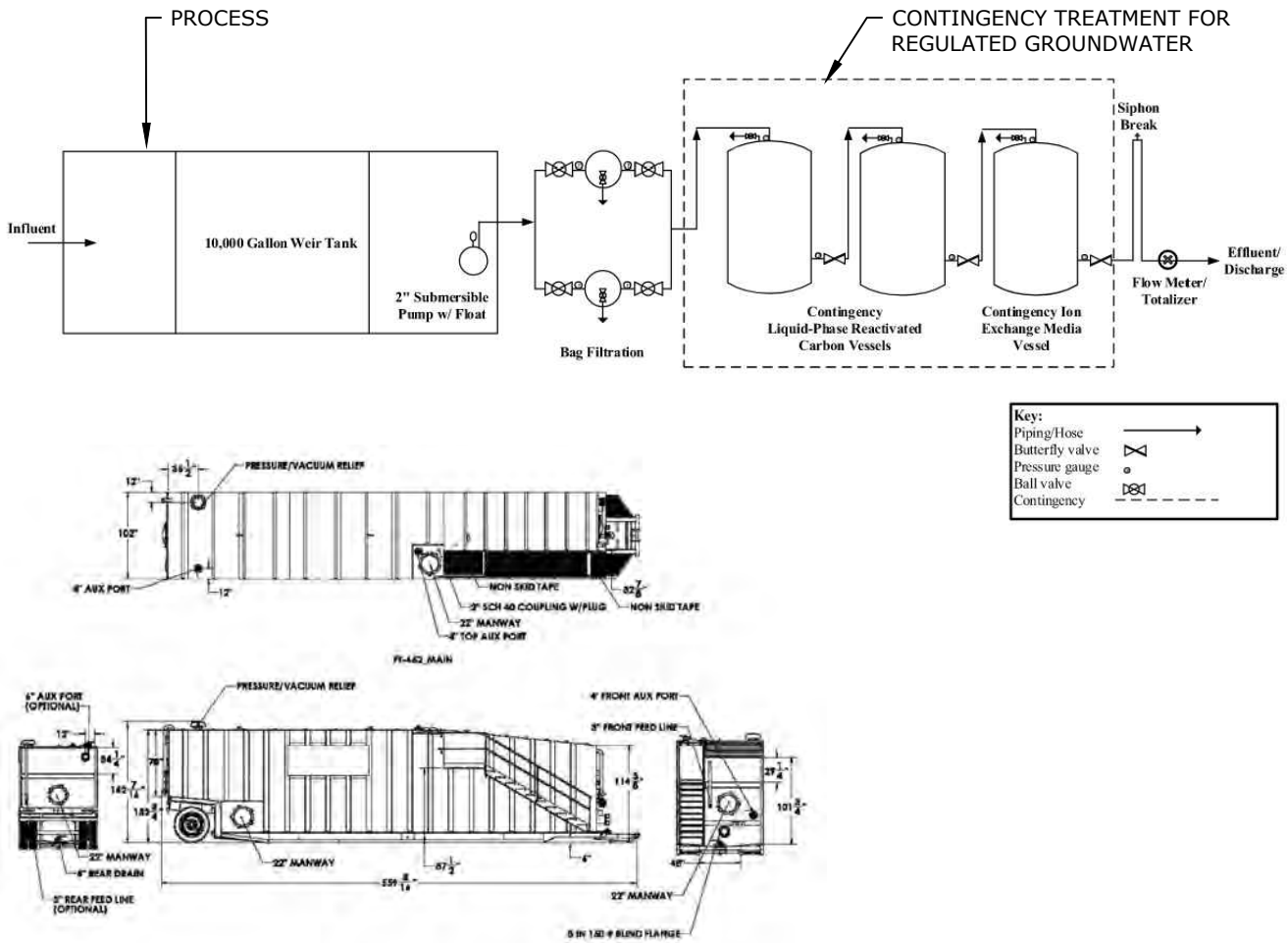


DEWATERING BASIN
(FILTER BAG)

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A40 |

EVERSOURCE

Dec 15, 2021-3:24pm Plotted By: ASapelli
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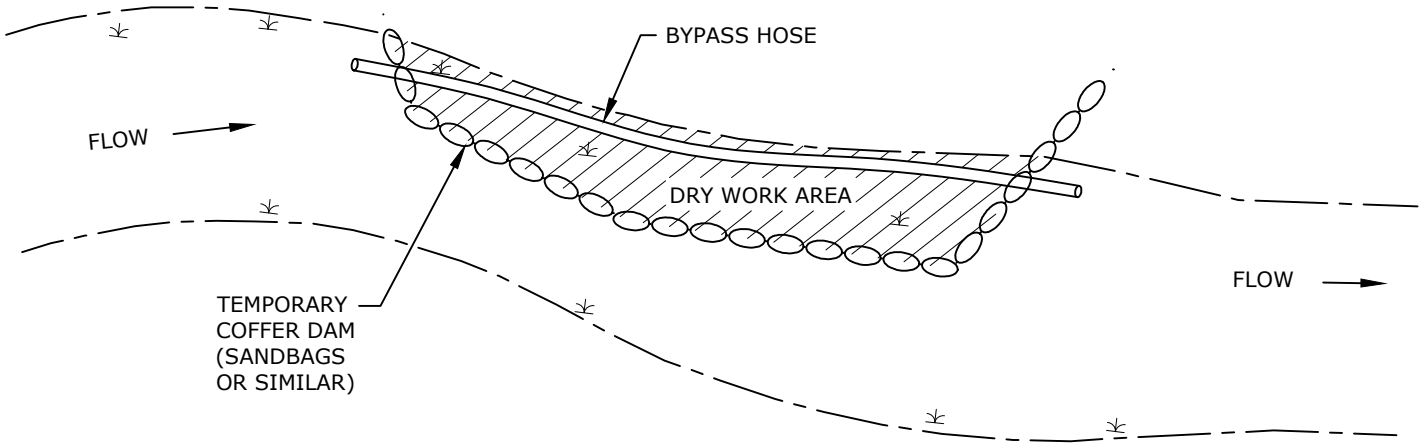



DEWATERING BASIN
(FRAC TANK)

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A41 |

EVERSOURCE

Dec 15, 2021-3:25pm Plotted By: ASapelli
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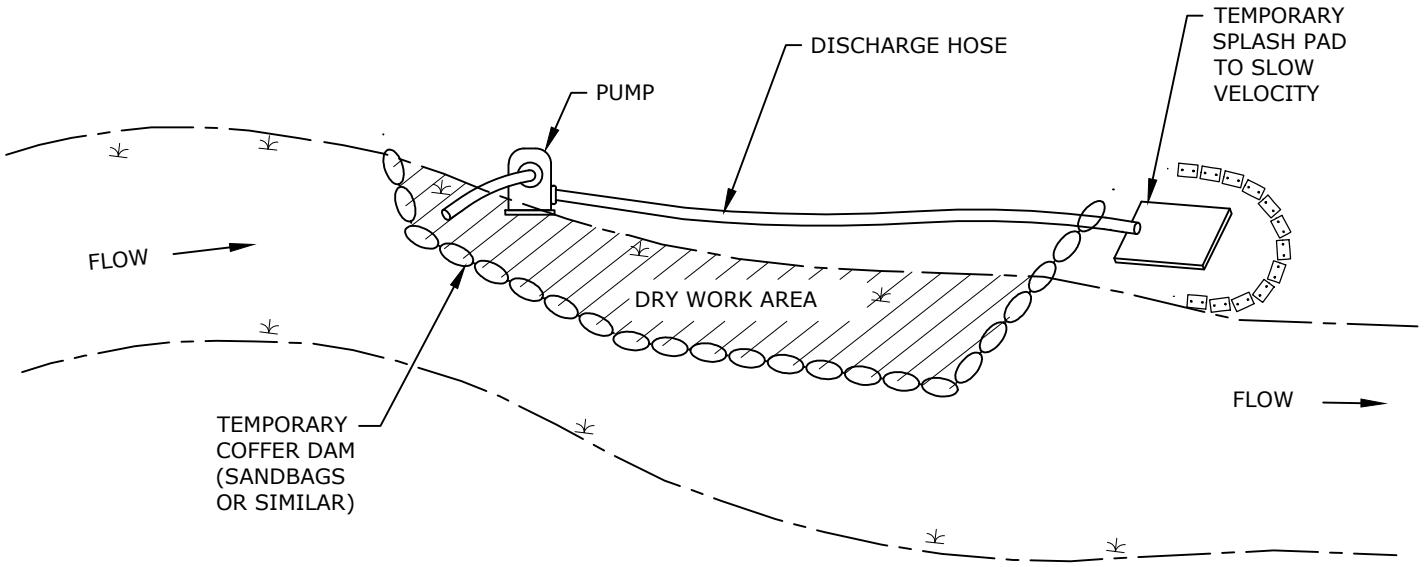

PLAN VIEW - GRAVITY COFFER DAM

COFFER DAM AND STREAM
FLOW BYPASS (GRAVITY)

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A42 |

EVERSOURCE

Dec 15, 2021-3:22pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Coffer Dam Gravity.dwg




PLAN VIEW - PUMP COFFER DAM



COFFER DAM AND STREAM
FLOW BYPASS (PUMPING)

| | |
|---|---|
| DATE: | 12/2021 |
| SCALE: | NO SCALE |
| FIGURE: | A43 |

EVERSOURCE

Dec 15, 2021-3:22pm Plotted By: ASapelli
Tighe & Bond, Inc. F:\Projects\E\E5034 Eversource L&P 2019\088 - CT-MA BMP Manual\Drawings_Figures\AutoCAD\Sheet\Coffer Dam.dwg

# APPENDIX B

## Appendix B

B.1 Applicable Laws/Regulations ..... B-1
B.2 Geographic Areas Subject to Jurisdiction ..... B-1
B.3 Applicable Regulatory Agencies ..... B-2
B.4 Maintenance, Repair, or Emergency Projects ..... B-3
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# Appendix B

## B.1 Applicable Laws / Regulations

In Connecticut, there are no fewer than eight potentially pertinent regulatory programs associated with activities proposed in environmentally sensitive areas. The following list of laws and regulations are most likely to apply to electrical utility projects in the State.

- Connecticut Inland Wetlands and Watercourses Act (C.G.S. §§ 22a-36 through 22a-45a)
- Municipal inland wetland and zoning regulations
- Connecticut General Permit for Water Resource Construction Activities (C.G.S. §§ 22a-6, 22a-45a and 22a-378a)
- Connecticut Environmental Policy Act (C.G.S. §§ 22a-1a through 22a-1h)
- Connecticut Coastal Management Act (C.G.S. §§ 22a-359 through 22a-363; 22a-28 through 22a-35; 22a-90 through 22a-112; 33 U.S.C. § 1314)
- Connecticut Water Diversion Policy Act (C.G.S. §§ 22a-365 through 22a-379)
- Connecticut Endangered Species Act (C.G.S. §§ 26-303 through 26-315)
- Section 10 of the Rivers and Harbors Act of 1899 (C.G.S. §§ 22a-426; 33 U.S.C. § 403)
- Section 401 of the Clean Water Act (33 U.S.C. § 1251)
- Section 404 of the Clean Water Act (33 U.S.C. § 1344)

## B.2 Geographic Areas Subject to Jurisdiction

The following areas are subject to regulatory jurisdiction by at least one of the regulatory programs discussed in this section: It is important to note that more than one jurisdictional resource type may be present at any given location.

- Inland wetlands, watercourses (rivers, streams, lakes, ponds), and floodplains
- Areas subject to municipal wetlands bylaws or ordinances (these vary by town)
- Coastal Resource Areas (beaches, dunes, bluffs, escarpments, coastal hazard areas, coastal waters, nearshore waters, offshore waters, estuarine embayments, developed shorefront, intertidal flats, islands, rocky shorefronts, shellfish concentration areas, shorelands, and tidal wetlands)
- Navigable waters
- Essential Fish Habitat (EFH)
- Rare species habitat as mapped by the Connecticut Natural Diversity Database (NDDB)
- Historic/cultural Resources including archaeological resources and above-ground historic resources

## B.3 Applicable Regulatory Agencies

Activities subject to jurisdiction under the above-referenced programs will generally be subject to review by one or more regulatory agencies (refer to list below). Most stream and wetland crossings will require notification or consultation with municipal Inland Wetland and Watercourses Agencies, and may require permitting with the U.S. Army Corps of Engineers (ACOE) and Connecticut Department of Energy & Environmental Protection (CT DEEP) under Sections 404 and 401 of the Clean Water Act. Coordination with CT DEEP may also be required for projects located within areas mapped by the Connecticut Natural Diversity Database.

- Municipal Conservation Commissions
- Connecticut Department of Energy & Environmental Protection (CT DEEP) Land and Water Resources Division (LWRD)
- CT DEEP Wildlife Division
- CT DEEP Office of Environmental Review
- United States Army Corps of Engineers (ACOE) New England District
- CT State Historic Preservation Office (CT SHPO)

The State of Connecticut and the Federal Government define wetlands differently. According to the Inland Wetlands and Watercourses Act, inland wetlands are defined as "land, including submerged land, not regulated pursuant to Sections 22a-28 through 22a-35 of the Connecticut General Statutes, as amended, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soil Survey, as it may be amended from time to time by the United States Department of Agriculture Natural Resource Conservation Service. Such areas may include filled, graded, or excavated sites which possess an aquic (saturated) soil moisture regime as defined by the National Cooperative Soil Survey." State wetland identification is based solely on the presence of these soil types.

"Watercourses" means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon this state or any portion thereof. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation.

The Federal Government defines wetlands as "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Federal wetland identification is based on a three-parameter approach, where a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology is used to make a wetland determination.

## B.4 Maintenance, Repair, or Emergency Projects

Most regulatory programs contain provisions that allow normal maintenance of existing structures and/or response to emergency situations that require immediate attention.

Prior to commencement of new construction, all jurisdictional wetland areas within the work corridor should be delineated by a qualified wetland and soil scientist. The specialist shall delineate areas in accordance with the General Statutes of Connecticut (revised January 1, 2007) as set forth at Title 22a Chapter 440 "Inland Wetlands and Watercourses Act", the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual, and any local inland wetland regulations, ordinances or bylaws that may exist. Refer to each set of regulations regarding applicable wetland definitions. Wetland areas shall be clearly demarcated using appropriate flagging tape or similar means. It is important to note that certain jurisdictional wetland areas in Connecticut can actually occur in uplands, such as floodplains. In addition, Upland Review Areas generally apply to work activities and vary in each community. This makes consultation with a wetland specialist particularly important.

### B.4.1 Maintain, Repair and/or Replace

Exemptions or considerations for maintenance, repair, and/or replacement of existing electrical utility structures exist in some environmental regulations, but not all. The exemptions are limited to work related to existing and lawfully located structures where no change in the original structure or footprint is proposed. It is not for the selected contractor of a particular project to make a determination as to whether an activity is exempt. This determination will be made prior to work by the Eversource project manager, in consultation with Eversource environmental staff.

These exemptions/considerations are afforded at:

- CT Inland Wetlands & Watercourses Act (RCSA § 22a-39-4)
- CT General Permit (Section 3)
- CT Coastal Management Act (RCSA § 22a-363b)
- CT GP [33 CFR 323.4(a)(2)]
- CT Water Diversion Policy Act (RCSA § 22a-377(b)1)

### B.4.2 Emergency Projects

Emergency provisions are generally afforded to activities that need to abate conditions that pose a threat to public health or safety. These provisions generally do not allow work beyond what is necessary to abate the emergency condition and will generally require an after-the-fact permit. It is not for the selected contractor of a particular project to make a determination as to whether an activity is an emergency. This determination will be made prior to work by the Eversource project manager, in consultation with Eversource Environmental Licensing and Permitting.

It is important to note that invocation of an emergency provision does not release the project proponent from reporting requirements.

Emergency provisions are afforded at:

- CEPA (RCSA § 22a-1a-3)
- CT Coastal Management Act (RCSA § 22a-29)
- CT GP [33 CFR Part 323.4(a)(2)]

## B.5 Municipal Permitting

Work within wetlands, watercourses and designated Upland Review Areas typically requires notification to municipal staff, (Department of Public Works and/or the Inland Wetland and Watercourse Agency staff). In October 1996 the Connecticut Department of Public Utility Control opened a docket (Docket Number 95-08-34) to conduct a generic investigation on the allocation of siting jurisdiction over utility plant facilities. This included an investigation as to whether local authorities (including local Inland Wetlands and Watercourses Agencies) have jurisdiction over public utility projects.

The investigation resulted in several orders which provide guidance on how public utility companies should coordinate with municipalities on the construction of new facilities, upgrades, significant maintenance activities, and routine maintenance activities.

- For the construction of new facilities, alterations to existing facilities (including upgrades) or significant maintenance involving substantial disturbance of soil, water or vegetation which would regularly fall under the review requirements of certain local authorities (ie. Planning and Zoning Authority; Inland Wetlands Commission; Public Works Department; Historic District Commission), the utility shall at least notify and consult with such local authority, or its designated agent or staff, toward the development of mutually agreeable schedules and procedures for the proposed activity.
- For routine maintenance activities or alterations to existing facilities (including upgrades) involving minor disturbance of soil, water or vegetation which would regularly fall under the review and approval requirements of certain local authorities, the utility shall make local authorities or their designated agent or staff aware of such ongoing activities.

## B.6 CT Department of Energy & Environmental Protection

If the project requires formal permitting with the ACOE (Pre-Construction Notification (PCN) or Individual Permit), copies of the application should be forwarded to CT DEEP for review under Section 401 of the Clean Water Act. The CT DEEP requires that a GP Addendum form be completed and submitted along with the ACOE application. If the project qualifies for Self-Verification Notification (SVNF) under the ACOE GP, the project also is granted authorization (Water Quality Certification, WQC) with no formal application under Section 401 of the Clean Water Act, provided the project meets the additional WQC general conditions. The general conditions commonly applicable to utility projects include:

- Prohibiting dumping of any quantity of oil, chemicals, or other deleterious material on the ground;
- Immediately informing the CT DEEP Oil and Chemical Spill Response Division at (860) 424-3338 (24 hours) of any adverse impact or hazard to the environment including any discharge or spillage of oil or chemical liquids or solids;
- Separating staging areas at the site from the regulated areas by silt fences or stray/hay bales at all times;
- Prohibiting storage of any fuel and refueling of equipment within 25 feet from any wetland or watercourse;
- Following the document "Connecticut Guidelines for Soil and Erosion Control," inspecting employed controls at least once per week, after each rainfall, and at least daily during prolonged rainfall, and correcting any deficiencies within 48 hours of being found.

- Prohibiting the storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the
- 500 year flood. Any other material or equipment stored at the site below this elevation must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel for equipment at the site stored below such elevation shall not exceed the quantity of fuel that is expected to be used by such equipment in one day.
- Immediately informing CT DEEP at (860) 424-3019 and the ACOE at (617) 647-8674 of the occurrence of pollution or other environmental damage in violation of the WQC, and within 48 hours support a written report including information specified in the general conditions.

If the project falls within areas mapped by the Connecticut Natural Diversity Database, or is less than 0.50 miles upstream or downstream of a mapped area, a data request and possible coordination will be required with the Natural Diversity Database.

If a project is located within tidal, coastal or navigable waters of the state or in tidal wetlands, permitting may be required with the CT DEEP LWRD. For the routine maintenance of previously permitted structures or structures that were in place prior to June 24, 1939, no permitting is required. For significant maintenance of previously permitted structures or structures that were in place prior to June 24, 1939, a Certificate of Permission is required. For new projects a Structures, Dredging and Fill Permit and/or a Tidal Wetlands Permit may be required. The CT DEEP LWRD should be consulted prior to preparing permits to conduct a pre-application meeting and determine the appropriate permitting route.

## B.7 U.S. Army Corps of Engineers

Work within wetlands and waters of the United States is subject to jurisdiction under Section 404 of the Clean Water Act, which is administered by the ACOE. Work within navigable waters is also administered by the ACOE under Section 10 of the Rivers and Harbors Act of 1899. The ACOE has issued Department of the Army General Permits for the State of Connecticut and Land Located within the Boundaries of an Indian Reservation (CT GPs) which establishes categories for projects based on their nature of impacts. The current permit was issued on December 15, 2021, and expires on December 15, 2026.

Applications are not required for Self-Verification (SV) projects, but submittal of a Self-Verification Notification Form (SVNF) before the work occurs and submittal of a Compliance Certification Form within one month after the work is completed is required. The SVNF and Compliance Certification Form entail self-certification by applicants that their project complies with the terms and conditions of SV under the CT GPs. Pre-Construction Notification (PCN) projects require the submittal of an application to the ACOE, followed by a screening of the application by the ACOE, the U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (US EPA), National Marine Fisheries Service (NMFS) and CT DEEP, and consultation with the Connecticut Commission on Culture and Tourism and Tribal Historic Preservation Officers (THPOs). PCN projects may not proceed until written approval from the ACOE is received. Written approval is generally provided within 45 days of the multi-agency screening. After written approval is received, a Work-Start Notification Form must be submitted before the work occurs, and a Compliance Certification Form must be submitted within one month after the work is completed.

For work proposed within a FEMA floodway or floodplain, the ACOE recommends that the applicant apply for and receive a Flood Management Certification (if required), prior to applying to the ACOE. Additionally, applications for PCN inland projects that propose fill in ACOE jurisdiction must include an Invasive Species Control Plan (ISCP), unless otherwise directed by the ACOE.

An Individual Permit (IP) requires a formal permit application to be submitted to the ACOE. The application is reviewed in detail by both state and federal agencies, and a Public Notice is released for public comment. Projects which trigger an IP generally result in significant impacts to wetlands and/or watercourses.

Stream and wetland crossings are only subject to jurisdiction under the ACOE if there is **a discharge of dredge or fill material into wetlands or waters of the United States**. Equipment access through a stream or wetland with no structural BMP is not regulated by the ACOE if there is no discharge of dredge or fill material (note that equipment rutting as a result of not using an appropriate BMP can be considered a "discharge of dredge material"). Similarly, the use of a timber or rail car bridge that extends from bank to bank with no stream impacts is not regulated by the ACOE. Additionally, the use of timber mats and stone is considered "fill material" by the ACOE, and must be calculated to determine overall impacts. Temporary mats are not counted towards the 1-acre PCN threshold if they are adequately cleaned after previous use, removed immediately after completion of construction and disposed of at an upland site.

Maintenance, including emergency reconstruction of currently serviceable structures, is exempt from ACOE jurisdiction and does not require formal permitting. Maintenance does not include any modification that changes the character, scope, or size of the original fill design. Emergency reconstruction must occur within a reasonable period of time after damage occurs to qualify for this exemption.

Stream and wetland crossings that involve the discharge of dredge and fill material may be conducted under SV if the work complies with the general conditions and SV criteria of the CT GPs. The following are SV criteria that are commonly applicable to stream and wetland crossings in utility rights of way. See Section 1.8 for additional criteria for culvert crossings:

- The work results in less than 5,000 square feet of impacts to wetlands or Waters of the United States. Replacement of utility line projects with impacts solely within wetlands greater than 5,000 square feet may be eligible for SV Authorization after consultation with the ACOE about the specific project;
- Temporary fill, with the exceptions of swamp and timber mats, discharged to wetlands shall be placed on geotextile fabric laid on the pre-construction wetland grade. Unconfined temporary fill discharged into flowing water (rivers and streams) shall consist only of clean stone. All temporary fill shall be removed as soon as it is no longer needed, and disposed of at an appropriate upland site.
- Any unconfined in-stream work, including construction, installation or removal of sheet pile cofferdam structures, is conducted during the low-flow period between July 1 and September 30. However, installation of coffer dams, other than sheet pile cofferdams, is not restricted to the low-flow period and must be installed between July 1 and March 31 and must not encroach > 25% of the stream width measured from OHW during the prohibited work window;
- No work will occur in the main stem or tributary streams of the Connecticut River watershed that are being managed for Atlantic salmon (*Salmo salar*). (Work of this

nature requires screening for potential impacts to designated Essential Fish Habitat.);

- The work does not result in direct or secondary impacts to Special Wetlands, Threatened, Endangered or Special Concern Species, or Significant Natural Communities identified by the Connecticut Natural Diversity Database. Work within 750 feet of vernal pools shall be minimized;
- The project does not require an ACOE permit with associated construction activities within 100 feet of Special Wetlands;
- The project does not result in fill placed within a FEMA established floodway, unless the applicant has a State of Connecticut Flood Management Certification pursuant to Section 25-68d of the Connecticut General Statutes;
- The project does not result in fill placed within a FEMA established floodplain that would adversely affect the hydraulic characteristics of the floodplain;
- The project does not entail stormwater detention or retention in inland waters or wetlands;
- The project is not located in a segment of a National Wild and Scenic River System (includes rivers officially designated by Congress as active study status rivers for possible inclusion) or within 0.25 miles upstream or downstream of the main stem or tributaries to such a system;
- The project has no potential for an effect on a historic property which is listed or eligible for listing in the National Register of Historic Places;
- The project does not impinge upon the value of any National Wildlife Refuge, National Forest, or any other area administered by the U.S. Fish and Wildlife Service, U.S. Forest Service or National Park Service;
- Section 106 needs to be taken into account for all work that requires federal permitting – including SV;
- The project does not use slip lining, plastic pipes, or High Density Polyethylene Pipes (HDPP).
- Appropriate BMPs are employed in regard to heavy equipment in wetlands (General Condition 16) and sedimentation and erosion controls (General Condition 20).
- Disturbed inland wetland areas are restored in accordance with General Condition 18.

Stream and wetland crossings that involve the discharge of dredge and fill material may be conducted under PCN if the work complies with the general conditions and PCN criteria of the CT GPs. The following are PCN criteria that are commonly applicable to stream and wetland crossings in utility ROWs. See Section 1.8 for additional criteria for culvert crossings:

- The work results in less than one acre of impacts to wetlands or Waters of the United States;
- The project does not result in fill placed within a FEMA established floodplain that would adversely affect the hydraulic characteristics of the floodplain;
- The project does not entail stormwater detention or retention in inland waters or wetlands.
- Temporary fill, with the exceptions of swamp and timber mats, discharged to

wetlands shall be placed on geotextile fabric laid on the pre-construction wetland grade. Unconfined temporary fill discharged into flowing water (rivers and streams) shall consist only of clean stone. All temporary fill shall be removed as soon as it is no longer needed, and disposed of at an appropriate upland site.

- Appropriate BMPs are employed in regard to heavy equipment in wetlands (General Condition 16) and sedimentation and erosion controls (General Condition 20).
- Disturbed inland wetland areas are restored in accordance with General Condition 18.

Stream and wetland crossings that cannot meet SV or PCN criteria may require review under an IP. The ACOE should be consulted before assuming an IP will be required, as exceptions can be made under certain circumstances.

GP1. Aids to navigation & temporary recreational structures (Coastal only)
*GP2. Repair or maintenance of existing currently serviceable, authorized or grandfathered structures/fills and removal of structures (Coastal and Inland)*
GP3. Moorings *(Coastal only)*
GP4. Pile-supported structures & floats, including boat lifts/hoists & other miscellaneous structures & work *(Coastal only)*
GP5. Boat ramps and marine railways *(Coastal and Inland)*
*GP6. Utilities including lines, outfall and intake structures and appurtenant structures (Coastal and Inland)*
GP7. Dredging, transport & disposal of dredged material, beach nourishment & rock removal and rock relocation *(Coastal only)*
GP8. Discharges of dredged or fill material incidental to the construction of bridges *(Coastal only)*
GP9. New shoreline and bank stabilization projects and Living Shorelines *(Coastal and Inland)*
GP10. Aquatic habitat restoration, establishment and enhancement activities *(Coastal and Inland)*
GP11. Fish and wildlife harvesting activities *(Coastal and Inland)*
GP12. Oil spill and hazardous material response operations *(Coastal and Inland)*
GP13. Cleanup of hazardous and toxic waste and removal of contaminated soil *(Coastal and Inland)*
GP14. Scientific measurement and monitoring devices *(Coastal and Inland)*
GP15. Survey and exploratory survey activities *(Coastal and Inland)*
GP16. Aquaculture & Mariculture Activities *(Coastal only)*
GP17. New and expansion of recreational, residential, institutional, and commercial developments *(Inland only)*
*GP18. Wetland crossings for linear transportation projects (Inland only)*
*GP19. Stream, river and brook crossings (not including wetland crossings) (Coastal and Inland)*
GP20. Energy generation and renewable energy generation facilities and hydropower projects *(Coastal and Inland)*
GP21. Temporary fill not associated with a regulated General Permit activity *(Inland only)*

GP22. Modification and Improvement of Existing Minor drainage features and Mosquito Control *(Coastal only)*

GP23. Agricultural Activities *(Inland only*)

## B.8 Culvert Installation

New culvert installation or existing culvert replacements will require notification or consultation with municipal staffers which might include the Department of Public Works and/or the inland wetlands officer, and may require permitting with the ACOE under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899, and the CT DEEP under Section 401 of the Clean Water Act. Coordination with CT DEEP may also be required for projects located within areas mapped by the Connecticut Natural Diversity Database. For work within tidal, coastal or navigable waters or in tidal wetlands, permitting will be required with the CT DEEP LWRD.

### B.8.1 Municipal Permitting

See Section 1.5 for general local permitting guidance.

- For the installation of new culverts and the replacement of culverts that involve substantial disturbance of soil, water or vegetation which would regularly fall under the review and approval requirements of certain local authorities (i.e., Planning and Zoning Authority; Inland Wetlands Commission; Public Works Department; Historic District Commission), the utility shall at least notify and consult with such local authority, or its designated agent or staff, toward the development of mutually agreeable schedules and procedures for the proposed activity.
- For the replacement of culverts involving only minor disturbance of soil, water or vegetation which would regularly fall under the review and approval requirements of certain local authorities, the utility shall make local authorities or their designated agent or staff aware of such ongoing activities.

### B.8.2 CT Department of Energy & Environmental Protection

If the project requires formal permitting with the ACOE, copies of the application should be forwarded to CT DEEP for review under Section 401 of the Clean Water Act. CT DEEP requires that a PGP Addendum form be completed and submitted along with the ACOE application.

If a culvert project falls within areas mapped by the Connecticut Natural Diversity Database or falls within 0.50 miles upstream or downstream of a mapped area, a data request and possible coordination will be required with the Natural Diversity Database.

If a culvert project is located within tidal, coastal or navigable waters of the state or in tidal wetlands, permitting will be required with the CT DEEP LWRD. For new projects a Structures, Dredging and Fill Permit and/or a Tidal Wetlands Permit will be required. For replacement structures which were previously permitted, or which were in place prior to June 24, 1939, a Certificate of Permission may only be required, which entails a shorter permitting process.

### B.8.3 U.S. Army Corps of Engineers

See Section 1.7 for general ACOE permitting requirements. Open bottom arches, bridge spans or embedded culverts are preferred over traditional culverts and are required for SV projects. However, where site constraints make these approaches impractical, the ACOE should be consulted.

New bridge or open-bottom structure crossings may be conducted under SV or PCN if the following criteria are met in addition to meeting any applicable general criteria listed in section 1.7 of this manual:

- The work spans at least 1.2 times the watercourse bank full width;

- The structure has an openness ratio equal to or greater than 0.25 meters;
- The structure allows for continuous flow of the 50-year frequency storm flows.

New culvert installations may be conducted under SV if the work complies with the general conditions and SV criteria of the CT GPs. The following are SV criteria that are commonly applicable to new culvert installations in utility right of ways:

- Work is conducted in accordance with the design requirements listed in Section 3.1.3 of the BMP Manual; Plastic and High Density Polyethylene Pipes (HDPE) are not used;
- The work results in less than 5,000 square feet of impacts to wetlands or Waters of the United States;
- Any unconfined in-stream work, including construction, installation or removal of sheet pile coffer dam structures, is conducted during the low-flow period between July 1 and September 30, except in instances where a specific written exception has been issued by the Connecticut Department of Energy & Environmental Protection. However, installation of coffer dams, other than sheet pile coffer dams, is not restricted to the low-flow period;
- No open trench excavation is conducted within flowing waters. Work within flowing waters can be avoided by using temporary flume pipes, culverts, coffer dams, etc. to isolate work areas and maintain normal flows;
- The tributary watershed to the culvert does not exceed 1.0 square mile (640 acres);
- The culvert gradient (slope) is not steeper than the streambed gradient immediately upstream or downstream of the culvert;
- For a single box or pipe arch culvert crossing, the inverts are set not less than 12 inches below the streambed elevation;
- For a multiple box or pipe arch culvert crossing, the inverts of one of the boxes or pipe arch culverts are set not less than 12 inches below the elevation of the streambed;
- For a pipe culvert crossing, the inverts are set such that not less than 25% of the pipe diameter or 12 inches, whichever is less, is set below the streambed elevation;
- The culvert is backfilled with natural substrate material matching upstream and downstream streambed substrate;
- The structure does not otherwise impede the passage of fish and other aquatic organisms;
- The structure allows for continuous flow of the 50-year frequency storm flows;
- The work does not result in direct or secondary impacts to Special Wetlands, Threatened, Endangered or Special Concern Species, or Significant Natural Communities identified by the Connecticut Natural Diversity Database. Work within 750 feet of vernal pools shall be minimized;
- The project does not require an ACOE permit with associated construction activities within 100 feet of Special Wetlands;
- The project does not result in fill placed within a FEMA established floodway, unless the applicant has a State of Connecticut Flood Management Certification pursuant to section 25-68d of the Connecticut General Statutes;

- The project does not result in fill placed within a FEMA established floodplain that would adversely affect the hydraulic characteristics of the floodplain;
- The project does not entail stormwater detention or retention in inland waters or wetlands;
- The project is not located in a segment of a National Wild and Scenic River System (includes rivers officially designated by Congress as active study status rivers for possible inclusion) or within 0.25 miles upstream or downstream of the main stem or tributaries to such a system;
- The project has no potential for an effect on a historic property which is listed or eligible for listing in the National Register of Historic Places;
- The project does not impinge upon the value of any National Wildlife Refuge, National Forest, or any other area administered by the U.S. Fish and Wildlife Service, U.S. Forest Service or National Park Service.
- Appropriate BMPs are employed with regard to sedimentation and erosion controls (General Condition 20).

New culvert installations may be conducted under PCN if the work complies with the general conditions and PCN criteria of the GP. The following are PCN criteria that are commonly applicable to new culvert installations in utility right of ways:

- Work is conducted in accordance with the design requirements listed in Section 3.1.3 of the BMP Manual;
- The work results in less than one acre of impacts to wetlands or Waters of the United States;
- The project does not result in fill placed within a FEMA established floodplain that would adversely affect the hydraulic characteristics of the floodplain;
- There is no practicable alternative location for the crossing that would have less environmental impacts;
- The use of a bridge or open-bottom structure is determined to be not practicable;
- For a single box or pipe arch culvert crossing, the inverts are set not less than 12 inches below the streambed elevation;
- For a multiple box or pipe arch culvert crossing, the inverts of one of the boxes or pipe arch culverts are set not less than 12 inches below the elevation of the streambed;
- For a pipe culvert crossing, the inverts are set such that not less than the pipe diameter or 12 inches, whichever is less, is set below the streambed elevation;
- The culvert is backfilled with natural substrate material matching upstream and downstream streambed substrate;
- The culvert has an openness ratio equal to or greater than 0.25 meters;
- The structure does not result in a change in the normal water surface elevation of the upstream waters or wetlands;
- The structure allows for continuous flow of the 50-year frequency storm flows;
- Appropriate BMPs are employed with regard to sedimentation and erosion controls (General Condition 20).

New culvert installations that cannot meet SV or PCN criteria may require review under an IP. The ACOE should be consulted before assuming an IP will be required, as exceptions can be made under certain circumstances.

In-kind replacement of culverts using the same materials is exempt from Section 404 of the Clean Water Act, and does not require permitting with the ACOE. The ACOE, however, should be consulted before assuming an activity is exempt from their jurisdiction. Consult with Eversource Environmental Licensing and Permitting.

Bridge or open-bottom structure replacements may be conducted under SV if the conditions for a new bridge or open-bottom structure replacement have been met. In addition, bridge or open-bottom structure replacements should not result in a change in the normal surface elevation of the upstream waters or wetland, and the replacement structure should have a riparian bank on one or both sides for wildlife passage. Culvert replacements may be conducted under SV if the conditions for new culvert installation are met.

Bridge or open-bottom structure replacements may be conducted under PCN if the conditions for a new bridge or open-bottom structure replacement have been met. Culvert replacements may be conducted under PCN if the following conditions are met:

- The work results in 5,000 square feet to less than one acre of impacts to wetlands or Waters of the United States;
- The use of a bridge or open-bottom structure is determined to be not practicable;
- For a single box or pipe arch culvert crossing, the inverts are set not less than 12 inches below the streambed elevation;
- For a multiple box or pipe arch culvert crossing, the inverts of one of the boxes or pipe arch culverts are set not less than 12 inches below the elevation of the streambed;
- For a pipe culvert crossing, the inverts are set such that not less than the pipe diameter or 12 inches, whichever is less, is set below the streambed elevation;
- The culvert is backfilled with natural substrate material matching upstream and downstream streambed substrate;
- The culvert has an openness ratio equal to or greater than 0.25 meters;
- The structure does not result in a change in the normal water surface elevation of the upstream waters or wetlands;
- The structure allows for continuous flow of the 50-year frequency storm flows;
- Appropriate BMPs are employed with regard to sedimentation and erosion controls (General Condition 20).

# APPENDIX C

## Appendix C

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# Appendix C – Massachusetts Environmental Regulations

## C.1 Applicable Laws/Regulations

In Massachusetts, there are no fewer than nine potentially pertinent regulatory programs associated with activities proposed in environmentally sensitive areas. The following list of laws and regulations are most likely to apply to electrical utility projects in the Commonwealth.

- Massachusetts Wetlands Protection Act (M.G.L. 131 § 40) (MA WPA)
- Municipal wetland bylaws/ordinances (varies by municipality)
- Massachusetts Endangered Species Act (M.G.L. 131A) (MESA)
- "Chapter 91" Public Waterfront Act (M.G.L. c. 91 §§ 1 through 63)
- Massachusetts Environmental Policy Act (M.G.L. c. 30 §§ 61 through 62H) (MEPA)
- Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. § 403)
- Section 401 of the Clean Water Act (33 U.S.C. § 1251; 314 CMR 9.00)
    - Administrative Consent Order (ACO)
- Section 404 of the Clean Water Act (33 U.S.C. § 1344)
- Massachusetts Watershed Protection Act (M.G.L. 92A §1/2) (MA WsPA)

## C.2 Geographic Areas Subject to Jurisdiction

The following areas are subject to regulatory jurisdiction by at least one of the regulatory programs discussed in this section: It is important to note that more than one jurisdictional resource area type may be present at any given location.

- Massachusetts Wetlands Protection Act Resource Areas:
    - (Coastal) Land Under the Ocean; Designated Port Areas; Coastal Beaches; Coastal Dunes; Barrier Beaches; Coastal Banks; Rocky Intertidal Shores; Salt Marshes; Land Under Salt Ponds; Land Containing Shellfish; Banks of or Land Under the Ocean, Ponds, Streams, Rivers, Lakes or Creeks that Underlie Anadromous/Catadromous ("Fish Run"); Land Subject to Coastal Storm Flowage
    - (Inland). Bank; Bordering Vegetated Wetland; Land Under Water Bodies and Waterways; Land Subject to Flooding; 200-foot Riverfront Area; and the 100-foot Buffer Zone to Bank and BVW
- Areas subject to municipal wetlands bylaws or ordinances (note: varies by community)
- Estimated and/or Priority Habitat of State-listed Rare Species
- Outstanding Resource Waters (ORWs; include Certified Vernal Pools, public surface water drinking supplies, tributaries to drinking water supplies and vegetated wetlands adjacent thereto)
- Essential Fish Habitat (EFH)
- Areas of Critical Environmental Concern (ACECs)
- Great Ponds

- Navigable waterways
- Wild and Scenic Rivers
- Quabbin Reservoir, Ware River and Wachusett Reservoir watersheds

### C.2.1 Endangered Species

The Massachusetts Natural Heritage and Endangered Species Program (NHESP), a department of the Massachusetts Division of Fisheries and Wildlife (MassWidlife) maintains the current list of rare and endangered species and species of special concern in Massachusetts. Publicly available data only allows for identification of designated Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife, not specific species information. Priority and Estimated Habitat locations are available online via the Massachusetts Geographic Information System (MassGIS) viewer.

Species specific information is provided for planned linear transmission maintenance activities which are reviewed by NHESP as part of Eversource's annual Operation and Maintenance (O&M) Plan. Projects/ activities which are not covered in the O&M Plan must file an independent request for information or initiate coordination with NHESP through Eversource Environmental Licensing and Permitting.

Applicable regulations and agency are listed below:

- Massachusetts Endangered Species Act: 321 CMR 10.00 – Division of Fisheries and Wildlife – NHESP

### C.2.2 Vernal Pools

NHESP maintains a database of certified and potential vernal pools in Massachusetts. These data are available on the NHESP website and MassGIS. Certified Vernal Pools (CVP) are considered Outstanding Resource Waters (ORWs).

The current version of the Department of the Army General Permits for the Commonwealth of Massachusetts (MA GPs), effective date April 16, 2018 (expiration date: April 5, 2023) includes General Conditions for protection of vernal pools, regardless of whether or not the vernal pool is certified by NHESP, and including the vernal pool depression, the vernal pool envelope (area within 100 feet of the vernal pool depression's edge), and the critical terrestrial habitat (area within 100-750 feet of the vernal pool depression's edge). Temporary impacts associated with construction mats in previously disturbed areas of existing utility projects rights-of-way are exempt from GP requirements regarding work in the vernal pool envelope or critical terrestrial habitat, provided that a Vegetation Management Plan (VMP) exists that avoids, minimizes and mitigates impacts to aquatic resources. Applicable regulations and agencies for Certified Vernal Pools (CVPs) are listed below:

- Wetlands Protection Act: 310 CMR 10.00 – Municipal Conservation Commissions (and MassDEP)
- 401 Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Material Disposal in Waters of the U.S. within the Commonwealth: 314 CMR 9.00 – MassDEP
- Department of the Army General Permits for the Commonwealth of Massachusetts – ACOE

### C.2.3 Essential Fish Habitat and Wild & Scenic River Designation

Essential Fish Habitat (EFH) is a habitat essential for spawning, breeding, feeding, or growth to maturity of federally managed species. This website provides more information: https://www.fisheries.noaa.gov/region/new-england-mid-atlantic#habitat. Consultation

with the ACO is recommended to confirm the location of Essential Fish Habitat with respect to a proposed project.

Massachusetts has approximately 8,229 miles of river, of which 147.1 miles are designated as wild & scenic, as summarized below:

- Nashua River (Main Stem from the confluence of the North and South Rivers in Lancaster, and extending north to the MA-NH border; some geographic exclusions)
- Squannacook River (from headwaters in Ash Swamp/Townsend, extending downstream to the confluence with the Nashua River in Shirley/Ayer; some geographic exclusions)
- Nissitissit River (from headwaters in Brookline (NH) to confluence with the Nashua River in Pepperell)
- Sudbury River (14.9-mile segment from Danforth Street Bridge/Framingham downstream to the Route 2 Bridge/Concord; 1.7-mile segment
- Assabet River
- Concord River
- Westfield River (Main Stem, East Branch, Middle Branch, West Branch, and named tributaries
- Taunton River (main stem from headwaters at the confluence of the Town and Matfield Rivers (Bridgewater) downstream 40 miles to confluence with the Quequechan River at the Route 195 Bridge (Fall River)

Currently, there are no river segments under study in Massachusetts for National Wild and Scenic designation (https://www.rivers.gov/study.php).

Wild and Scenic designations should be verified via the National Wild and Scenic Rivers System website (https://www.rivers.gov/massachusetts.php) during project planning and permitting. The ACOE reviews projects for impacts to both EFH and National Wild and Scenic Rivers.

- Department of the Army General Permits for the Commonwealth of Massachusetts – ACOE

### C.2.4 Cold-water Fishery Resources

The Massachusetts Division of Fisheries and Wildlife (MassWildlife) maintains a list of waters that are known to have cold-water fishery resources (CFRs) which are waters in which the mean of the maximum daily temperature over a seven day period generally does not exceed 68°F (20°C) and, when other ecological factors are favorable (such as habitat), are capable of supporting a year round population of cold-water stenothermal aquatic life. CFRs are not currently regulated in and of themselves in Massachusetts. However, MassDEP is particularly concerned with water quality impacts to CFRs due to erosion and sedimentation as a result of construction projects.

### C.2.5 Outstanding Resource Waters

Outstanding Resource Waters (ORWs) include Certified Vernal Pools (CVPs), surface drinking water supplies, tributaries to surface drinking water supplies and vegetated wetlands adjacent thereto.

CVPs are designated by NHESP and locations are available through MassGIS. Locations of surface drinking water supplies and other ORWs, typically identified as Zone A, are also available through MassGIS. The applicable regulations and agency are listed below:

- 401 Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Material Disposal in Waters of the U.S. within the Commonwealth: 314 CMR 9.00 – MassDEP

### C.2.6 Historic/Cultural Resources

The Massachusetts Historical Commission (MHC) is the State Historical Preservation Office (SHPO) and, along with the Board of Underwater Archaeological Resources (BUAR), are the state agencies responsible for protecting the Commonwealth's historic and cultural resources. Additional stakeholders for cultural resources include the Massachusetts Commission on Indian Affairs, Native American tribes with interests in the state, and local historical commissions.

## C.3 Applicable Regulatory Agencies

Activities subject to jurisdiction under the above-referenced programs will generally be subject to review by one or more regulatory agencies (refer to list below). New stream and wetland crossings not related to maintenance will require permitting with municipal Conservation Commissions, and may require permitting with the U.S. Army Corps of Engineers (ACOE) and Massachusetts Department of Environmental Protection (MassDEP) under Sections 404 and 401 of the Clean Water Act. Any non-maintenance work within Land Under Water will require permitting with the MassDEP Division of Wetlands and Waterways. Coordination with NHESP may also be required for projects located within areas mapped as Priority and/or Estimated Habitat for state-listed rare species. For work within navigable waters, consultation may be required with the Massachusetts Office of Coastal Zone Management (MA CZM).

- Municipal Conservation Commissions
- Massachusetts Department of Environmental Protection (MassDEP) Division of Wetlands and Waterways
- Massachusetts Division of Fisheries and Wildlife: Natural Heritage and Endangered Species Program (NHESP)
- Massachusetts Executive Office of Energy and Environmental Affairs (EEA)
- United States Army Corps of Engineers (ACOE) New England District
- Massachusetts Office of Coastal Zone Management (MA CZM)
- Massachusetts Division of Conservation and Recreation (MA DCR)

## C.4 Maintenance, Repair, or Emergency Projects

Most regulatory programs contain provisions that allow normal maintenance of existing structures and/or response to emergency situations that require immediate attention.

### C.4.1 Maintain, Repair and/or Replace

Exemptions or considerations for maintenance, repair, and/or replacement of existing electrical utility structures exist in some environmental regulations, but not all. The exemptions are limited to work related to existing and lawfully located structures where

no change in the original structure or footprint is proposed. It is not for the selected contractor of a particular project to make a determination as to whether an activity is exempt. This determination will be made prior to the commencement of work by the Eversource project manager in consultation with Eversource Environmental Licensing and Permitting.

These exemptions/considerations are afforded at:

- MAWPA (M.G.L Chapter 131, § 40, paragraph 1)
- MAWPA regulations for Riverfront Area (310 CMR 10.58(6))
- MEPA regulations (301 CMR 11.01(2)(b)(3))
- 33 CFR Part 323.4(a)(2)
- MESA (M.G.L. Chapter 131A, § 3; 321 CMR 10.14(5-7) and (12)
- MAWPA (350 CMR 11.05(11) and (12))
- National Pollutant Discharge Elimination System (NPDES), Construction General Permit (as modified effective February 16, 2012)

Certain operation and maintenance activities that will directly impact Waters of the United States through the discharge of fill (e.g., construction mats) are subject to Sections 401 and 404 of the Clean Water Act.

### C.4.2 Emergency Projects

Emergency provisions are generally afforded to activities that need to abate conditions that pose a threat to public health or safety. These provisions generally do not allow work beyond what is necessary to abate the emergency condition and will generally require an after-the-fact permit. It is not for the selected contractor of a particular project to make a determination as to whether an activity is an emergency. This determination will be made prior to work by the Eversource project manager, in consultation with Eversource environmental staff.

It is important to note that invocation of an emergency provision does not release the project proponent from reporting requirements.

Emergency provisions are afforded at:

- MAWPA regulations (310 CMR 10.06)
- MEPA (301 CMR 11.00)
- MA 401 WQC (314 CMR 9.12)
- Chapter 91 (310 CMR 9.20)
- MESA (321 CMR 10.15)

## C.5 Municipal Permitting

Work within wetlands, watercourses and Buffer Zones typically requires permitting with municipal Conservation Commissions. Work that entails "maintaining, repairing or replacing, but not substantially changing or enlarging, an existing and lawfully located structure or facility used in the service of the public and used to provide electric service" is exempt under the Massachusetts Wetlands Protection Act (MAWPA) per MGL Chapter 131 Section 40. However, individual municipalities may establish their own wetlands bylaws under Home Rule authority which could require permitting for operation and maintenance activities. The following table lists communities in which Eversource operates and maintains infrastructure and which have a wetland bylaw. Appropriate municipal

permitting or notification should be completed in these towns as required prior to conducting operation and maintenance activities. Bylaws may be revised, or new bylaws enacted, at any time. Consult with Eversource Environmental Licensing and Permitting prior to the commencement of work.

**TABLE C-1**
Eversource Energy Communities with Municipal Wetland Bylaws[1]

| Community | Date of Bylaw | Utility Maintenance Exemption | Notification Required |
|---|---|---|---|
| Acton | 7/8/2003 | Yes | No |
| Amherst | 2/12/2014 | Yes | Yes |
| Andover | 5/11/1999 | Yes | Yes |
| Aquinnah | 6/23/2020 | Yes | Yes |
| Arlington | 5/15/2000 | No | Yes |
| Ashland | 5/6/2009 | Yes | Yes |
| Attleboro | 12/12/2007 | No | No |
| Auburn | 5/1/2012 | Yes | Yes |
| Avon | 5/7/2019 | Yes | Yes |
| Barnstable | 11/7/1987/rev. 7/7/2003 | Yes | Yes |
| Bedford | 1987/rev. 2016 | Yes | Yes |
| Belchertown | 6/7/2020 | Yes | Yes |
| Bellingham | 12/2015 | No | Yes |
| Berlin | 2/15/2021 | Yes | Yes |
| Bolton | 5/7/2012 | Yes | No |
| Boston | 12/11/2019 | Yes | Yes |
| Bourne | 10/26/2009 | No | Yes |
| Brewster | 1/1/2013 | Yes | Yes |
| Bridgewater | 11/13/1990 | Yes | Yes |
| Brookline | 5/28/2013 | Yes | Yes |
| Burlington | 5/2021 | Yes | Yes |
| Canton | 5/10/2017 | Yes | Yes |
| Carlisle | 2002 | Yes | No |
| Carver | 1998 | Yes | Yes |
| Chatham | 5/10/2004 | Yes | Yes |
| Chicopee | 4/3/2002 | Yes | Yes |
| Chilmark | 10/12/1993 | No | Yes |
| Dartmouth | 1990/rev. 8/25/2015 | Yes | Yes |
| Dedham | 11/182013 | Yes | Yes |
| Deerfield | 11/6/1989 | Yes | Yes |
| Dennis | 5/5/1989 | Yes | Yes |
| Dover | 5/2/1994 | Yes | Yes |
| Duxbury | | Yes | No |
| East Longmeadow | 10/1992 | Yes | Yes |
| Eastham | 1980/rev. 1999 | Yes | Yes |
| Edgartown | 1985/rev. 6/25/1991 | No | Yes |
| Fairhaven | 5/10/1988 | Yes | No |
| Falmouth | 4/2/1979/rev. 7/16/1993 | Yes | Yes |

**TABLE C-1**
Eversource Energy Communities with Municipal Wetland Bylaws[1]

| Community | Date of Bylaw | Utility Maintenance Exemption | Notification Required |
|---|---|---|---|
| Framingham | 4/26/2005 | Yes | Yes |
| Grafton | 5/11/1987 | Yes | Yes |
| Greenfield | 11/23/2001 | Yes | No |
| Hadley | 5/1/2008 | No | Yes |
| Hampden | 8/5/1992 | Yes | Yes |
| Harwich | 7/1/2003/rev. 11/25/2020 | No | Yes |
| Holden | 2011 | Yes | Yes |
| Holliston | 5/2021 | Yes | Yes |
| Hopkinton | 5/2/1995/rev. 5/7/2012 | Yes | Yes |
| Holyoke | 11/2005 | Yes | Yes |
| Kingston | 2004 | No | Yes |
| Leicester | 11/2015 | Yes | Yes |
| Lenox[3] | 12/18/1985 | Yes | No |
| Lexington | 5/3/1982 | No | Yes |
| Lincoln | 3/24/2007 | No | Yes |
| Longmeadow | 10/2000 | Yes | No |
| Ludlow | 5/1/2002 | Yes | No |
| Marshfield | 1988/rev. 4/23/2018 | Yes | Yes |
| Mashpee | 2/1/1988 | Yes | Yes |
| Maynard | 12/3/2005 | Yes | Yes |
| Medfield | 1926 | Yes | No |
| Medway | 7/2014 | Yes | Yes |
| Milford | 5/2010 | Yes | No |
| Millis | 5/13/1191 | Yes | No |
| Millville | 5/13/2013 | Yes | Yes |
| Natick | 4/27/2000 | Yes | No |
| Needham | 9/1/1988 | Yes | Yes |
| New Bedford | 2017 | Yes | Yes |
| Norfolk | 11/9/2010 | Yes | Yes |
| Northampton | 8/17/1989 | Yes | Yes |
| Northborough | 5/21/1990 | Yes | Yes |
| Northbridge | 5/6/2008 | Yes | Yes |
| Oak Bluffs | 4/1983 | No | Yes |
| Orleans | 5/5/1987 | Yes | Yes |
| Palmer | 8/12/2013 | Yes | Yes |
| Pelham | 5/2/1987 | Yes | Yes |
| Pembroke | 4/22/2008 | Yes | No |
| Plymouth | 4/5/1989 | Yes | Yes |
| Plympton | 5/16/2012 | Yes | Yes |
| Provincetown | 5/2019 | Yes | Yes |
| Richmond | 5/2015 | Yes | Yes |
| Rochester | As of 12/2015 | Yes | Yes |

**TABLE C-1**
Eversource Energy Communities with Municipal Wetland Bylaws[1]

| Community | Date of Bylaw | Utility Maintenance Exemption | Notification Required |
|---|---|---|---|
| Sandwich | 5/4/1992 | Yes | Yes |
| Sharon | As of 12/2015 | Yes | No |
| Sherborn | 2013 | Yes | No |
| Shutesbury | 5/2/1987 | Yes | Yes |
| Southampton | 9/21/2021 | Yes | Yes |
| Southborough | 4/10/1995 | Yes | Yes |
| South Hadley | 12/27/2005 | No | Yes |
| Southwick | 6/6/1989 | Yes | Yes |
| Springfield | 5/5/1993 | Yes | Yes |
| Stoneham | 4/2013 | Yes | Yes |
| Stow | 5/21/2003 | No | Yes |
| Sudbury | | Yes | Yes |
| Sunderland | 4/27/1990 | Yes | Yes |
| Sutton | 5/11/2015 | Yes | Yes |
| Tisbury | 1/1/1983 | Yes | No |
| Truro | 9/30/2010 | No | Yes |
| Upton | 2009 | Yes | Yes |
| Walpole | 2002 | Yes | Yes |
| Wareham | 4/25/2016 | Yes | Yes |
| Watertown | 10/2010 | Yes | Yes |
| Wayland | 5/1/2002 | Yes | No |
| Wellfleet | 4/20/1986/rev. 10/6/2021 | Yes | Yes |
| Wendell | 3/10/1988 | Yes | Yes |
| West Tisbury | 6/3/2004 | Yes | Yes |
| Westborough | 10/20/2008 | Yes | Yes |
| Westfield | 5/20/2003 | Yes | Yes |
| Westport[4] | 4/11/1995 | No | Yes |
| Westwood | 1989 | Yes | Yes |
| Wilbraham | 5/27/1997 | Yes | Yes |
| Winchester | | No | Yes |
| Woburn | 6/24/1987 | Yes | Yes |
| Worcester | 7/1/2007 | Partial | Yes |
| Yarmouth | 12/1/2016 | No | Yes |

[1] Information based on the Massachusetts Association of Conservation Commissions website as of 2019 and municipal websites.

[2] Refer to municipal bylaws prior to conducting work in the community.

[3] Berkshire Scenic Mountain Act, as adopted by the Town of Lenox and administered by the Lenox Conservation Commission.

[4] Town of Westport Soil Conservation Bylaw, as administered by the Westport Conservation Commission.

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## C.6 MA Department of Environmental Protection

Review and approval under the Commonwealth's Water Quality Certification Regulations

is required for "*discharge of dredged or fill materials, dredging, and dredged material disposal activities in waters of the United States within the Commonwealth which require federal licenses or permits and which are subject to state water quality certification under 33 U.S.C. 1251, et seq. The federal agency issuing a permit initially determines the scope of geographic and activity jurisdiction*" (314 CMR 9.01(2)). An individual Water Quality Certification is required from the Massachusetts Department of Environmental Protection (MassDEP) for any activity identified at 314 CMR 9.04. In accordance with 314 9.04 (4) activities which are exempt from MGL Chapter 131 Section 40 but are subject to 33 U.S.C. 1251, *et seq*., and will result in any discharge of dredge or fill material to bordering vegetated wetlands or land under water require an individual 401 Water Quality Certification.

Eversource entered into an Administrative Consent Order (ACO) with MassDEP in 2017. This ACO serves as a general permit under the 401 Water Quality regulations (314 CMR 9.00) and establishes general conditions for routine operation and maintenance activities within existing ROWs.

## C.7 U.S. Army Corps of Engineers

Work within wetlands and waters of the United States is subject to jurisdiction under Section 404 of the Clean Water Act, which is administered by the ACOE. The General Permits for the Commonwealth of Massachusetts (MA GPs) establish categories for projects based on their nature of impacts. The MA GPs were most recently issued on April 16, 2018, and expire on April 5, 2023.

Certain minor activities are eligible for Self-Verification (SV), which requires submittal of a Self-Verification Notification Form (SVNF) prior to the commencement of work. Activities eligible for Self-Verification are authorized under the MA GPs and may proceed without written verification from the ACOE as long as the SVNF has been submitted and the activity meets the terms and conditions of the applicable MA GPs.

Activities requiring Pre-Construction Notification (PCN) require the submittal of an application to the ACOE, followed by a screening of the application by the ACOE, the U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, National Marine Fisheries Service, MassDEP, and consultation with the Massachusetts Historical Commission, Tribal Historic Preservation Officers (THPOs) and the Massachusetts Board of Underwater Archaeological Resources (BUAR). PCN projects may not proceed until written verification from the ACOE is received.

An Individual Permit (IP) requires a formal permit application to be submitted to the ACOE. The application is reviewed in detail by both state and federal agencies, and a public notice is released for public comment. Projects which trigger an Individual Permit generally result in significant impacts to wetlands and/or watercourses outside the limits of the MA GPs.

Work within, or above, Navigable Waters is also administered by the ACOE under Section 10 of the Rivers and Harbors Act of 1899.

ACOE permitting does not apply to activities that fall under the maintenance exemption set forth at 33 CFR 323.4(a)(2) – Discharges Not Requiring Permits:

*"Maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, bridge abutments or approaches, and transportation structures. Maintenance does not include any modification that changes the character, scope, or size of the original fill design. Emergency reconstruction must occur within a reasonable period of time after damage occurs in order to qualify for this exemption."*

Maintenance projects that occurred prior to the ACOE jurisdiction over fill activities, or that were properly permitted, can proceed under the maintenance exemption noted above, provided that the same temporary fill areas are used. However, it is recommended that a formal determination be requested from the ACOE to confirm these activities are exempt. The repair, rehabilitation or replacement of a previously authorized, currently serviceable structure or fill (with some minor deviations in the structure's configuration or filled area) are regulated under MA GP1 and subject to SV or PCN.

Also, operation and maintenance related activities that do not meet the above exemption may qualify for SV. In that case, it is recommended that a copy of the SVNF be submitted to MassDEP.

The MA GPs are listed below. MA GPs specifically, and typically, applicable to utility projects are emphasized by bold italic font:

*GP1. Repair, Replacement and Maintenance of Authorized Structures and Fills*
GP2. Moorings
GP3. Pile-Supported Structures, Floats and Lifts
GP4. Aids to Navigation, and Temporary Recreational Structures
GP5. Dredging, Disposal of Dredged Material, Beach Nourishment, and Rock Removal and Relocation
GP6. Discharges of Dredged or Fill Material Incidental to the Construction of Bridges
GP7. Bank and Shoreline Stabilization
GP8. Residential, Commercial and Institutional Developments, and Recreational Facilities
*GP9. Utility Line Activities*
*GP10. Linear Transportation Projects Including Stream Crossings*
GP11. Mining Activities
GP12. Boat Ramps and Marine Railways
GP13. Land and Water-Based Renewable Energy Generation Facilities and Hydropower Projects
*GP14. Temporary Construction, Access, and Dewatering*
GP15. Reshaping Existing Drainage Ditches, New Ditches, and Mosquito Management
*GP16. Response Operations for Oil and Hazardous Substances*
GP17. Cleanup of Hazardous and Toxic Waste
GP18. Scientific Measurement Devices
GP19. Survey Activities
GP20. Agricultural Activities
GP21. Fish and Wildlife Harvesting and Attraction Devices and Activities
GP22. Habitat Restoration, Establishment and Enhancement Activities
GP23. Previously Authorized Activities

In general, the following cumulative thresholds apply for determining the level of ACOE permitting required:

**Table C-2**
**MA GPs Permits Limits**

| Resources | SV Limits (SV Eligible) | PCN Limits (PCN Eligible) | IP Limits (IP Required) |
|---|---|---|---|
| Non-tidal waters of the US | 0 to 5,000 sf | 5,000 sf to 1 acre | >1 acre |
| Tidal waters of the US | Not eligible | All discharges ≤1/2 acre | >1/2 acre |
| SAS in tidal waters of the US excluding vegetated shallows | Not eligible | All discharges ≤1,000 sf | >1,000 sf |

| | | | |
|---|---|---|---|
| SAS in tidal waters of the US consisting of vegetated shallows only | Not eligible | All discharges ≤100 sf (compensatory mitigation is required | >100 sf |

*Special Aquatic Sites (SAS) consist of wetlands, mud flats, vegetated shallows, sanctuaries and refuges, coral reefs, and riffle and pool complexes. These are defined at 40 CFR 230 Subpart E.

Stream and wetland crossings are only subject to jurisdiction under the ACOE if there is **a discharge of dredge or fill material into wetlands or waters of the United States**. Equipment access through a stream or wetland with no structural BMP is not regulated by the ACOE if there is no discharge of dredge or fill material (note that equipment rutting as a result of not using an appropriate BMP can be considered a "discharge of dredge material"). Similarly, the use of a timber or rail car bridge that extends from bank to bank with no stream impacts is not regulated by the ACOE. The use of timber mats, stone, and log corduroy is considered "fill material" by the ACOE under the MA GPs, and must be calculated to determine overall impacts.

Maintenance, including emergency reconstruction of currently serviceable structures, is exempt from ACOE jurisdiction and does not require formal permitting. Maintenance does not include any modification that changes the character, scope, or size of the original fill design. Emergency reconstruction must occur within a reasonable period of time after damage occurs to qualify for this exemption.

New culvert installation or existing culvert replacements may require permitting with local Conservation Commissions under the MAWPA, and may also require permitting with the ACOE under Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899, and the MassDEP under Section 401 of the Clean Water Act.

Stream and wetland crossings (including culvert installations) that involve the discharge of dredge and fill material may be conducted under SV if the following criteria are met.

- The use of construction mats of any area can be used to conduct activities that were previously authorized, authorized under Self-Verification, or not subject to regulation. Other temporary or permanent fill and associated secondary impacts must meet the SV limits.
- Authorized construction mats must be removed immediately upon work completion, and the wetlands must be restored per the General Conditions.

The project has no potential for an effect on a historic property within the permit area or any known historic property that may occur outside the permit area.

- Any in-water work controls that encroach upon more than 25 percent of the stream width are limited to a Time of Year (TOY) restriction in consideration of spawning, breeding and migration to maintain upstream fish passage. Activities within streams proposed during the TOY restrictions are generally ineligible for SV authorization.
- The work does not result in direct or secondary impacts to Special Aquatic Sites.
- No work occurs in Navigable Waters (waters subject to the ebb and flow of the tide and, in Massachusetts, the non-tidal consist of the Merrimack River, Connecticut River, and Charles River to the Watertown Dam).
- Span streams or size culverts or pipe arches such that they are at least 1.2 times the bankfull width. Spans are strongly preferred as they avoid or minimize disruption to the streambed and avoid entire streambed reconstruction and maintenance inside the culvert or pipe arch, which may be difficult in smaller structures. Footings and abutments for spans and scour protection should be landward of 1.2 times bankfull width.
- Embed culverts or pipe arches below the grade of the streambed. This is not required when ledge/bedrock prevents embedment, in which case spans are required. The following depths are recommended to prevent streambed washout, and ensure compliance and long-term success:
    - ≥ 2 feet for box culverts and pipe arches, or
    - ≥ 2 feet and at least 25% for round pipe culverts.
- Match the culvert gradient (slope) with the stream channel profile.
- Construct crossings with a natural bottom substrate within the structure matching the characteristics of the substrate in the natural stream channel and the banks (mobility, slope, stability, confinement, grain and rock size) at the time of construction and over time as the structure has had the opportunity to pass substantial high flow events.
- Construct crossings with appropriate bed forms and streambed characteristics so that water depths and velocities are comparable to those found in the natural channel at a variety of flows at the time of construction and over time. In order to provide appropriate water depths and velocities at a variety of flows and especially low flows, it is usually necessary to reconstruct the streambed (sometimes including a low flow channel) or replicate or preserve the natural channel within the structure. Otherwise, the width of the structure needed to accommodate higher flows will create conditions that are too shallow at low flows. Flows could go subsurface within the structure if only large material is used without smaller material filling the voids.
- Openness, which is the is the cross-sectional area of a structure opening divided by its crossing length when measured in consistent units, is > 0.82 feet (0.25 meters).

Banks on each side of the stream inside the crossing matching the horizontal profile of the existing stream and banks outside the crossing are recommended. To prevent failure, all constructed banks should have a height to width ratio of no greater than 1:1.5 (vertical:horizontal) unless the stream is naturally incised. Tie these banks into the up and downstream banks and configure them to be stable during expected high flows.

- The project is not located within a vernal pool depression, or vernal pool envelope, and does not individually or cumulatively impact greater than 25% of the vernal pool critical terrestrial habitat. It is feasible for some temporary impacts associated with the use of construction mats in previously disturbed ROWs to occur within the vernal pool envelope or critical terrestrial habitat if a Vegetation Management Plan demonstrates avoidance, minimization and mitigation impacts to aquatic resources.
- Culvert extensions do not qualify for SV.
- Culvert projects using slip lining do not qualify for SV, either as new work or maintenance activities.
- No open trench excavation in flowing waters. No work in riffles and pools.
- The project does not entail stream relocation.
- Work is not conducted within riffles or pools.
- Normal flows within the stream boundary's confines must be maintained, i.e., temporary flume pipes, culverts, cofferdams, etc.
- Water diversions (i.e., bypass pumping or water withdrawals) may be used immediately up and downstream of the work footprint.
- The project is (a) not located in the designated main stem of, or within 0.25 miles up or downstream of the designated main stem of, or in tributaries within 0.25 miles of the designated main stem of a National Wild and Scenic River System; (b) not in "bordering or contiguous wetlands" that are adjacent to the designated main stem of a National Wild and Scenic River; or (c) does not have the potential to alter flows within a river within the National Wild and Scenic River System.
- The project is not located within areas containing USFWS or National Marine Fisheries Service (NMFS)-listed species or critical habitat. The project is not "likely to adversely affect" listed species or habitat per the federal Endangered Species Act (ESA) or result in a "take" of any federally-listed threatened or endangered species of fish or wildlife.
- The project does not impinge upon the value of any National Wildlife Refuge, National Forest, National Marine Sanctuary, or any other area administered by the U.S. Fish and Wildlife Service, U.S. Forest Service or National Park Service.
- The project is not located on ACOE properties and ACOE-controlled easements.
- The project does not propose temporary or permanent modification or use of a federal project beyond minor modifications required for normal operation and maintenance.
- The project minimizes use of heavy construction equipment, and, where required, either has low ground pressure (typically less than 3 psi) or it must be placed on construction mats.
- Construction mats must be placed in the wetland from the upland or from equipment positioned on swamp mats if working within a wetland.
- Temporary fill must be stabilized. Unconfined, authorized temporary fill must consist of clean material that minimizes impacts to water quality. Temporary fill placed during the growing season must be removed before the beginning of the next growing season. If temporary fill is placed during the non-growing season, it may remain throughout the following growing season but must be removed before the beginning of the next growing season.

- Appropriate erosion, sedimentation and turbidity controls are used and maintained during construction.
- Appropriate measures must be taken to minimize flooding to the maximum extent practicable.

Wetland and stream crossings may be authorized under PCN if the following criteria are met:

- The work results in less than one acre of impacts to inland, non-tidal, wetlands or waters of the United States.

Stream and wetland crossings that cannot meet SV or PCN criteria may require review under an IP. The ACOE should be consulted before assuming an IP will be required, as exceptions can be made under certain circumstances.

## C.8 Temporary Stream Crossings

### C.8.1 U.S. Army Corps of Engineers

See Section C.7 for general ACOE permitting requirements for stream crossings. To qualify for SV, temporary stream crossings (typically culverts) that are not spans must be designed in accordance with below.

1) Installed outside of the TOY restrictions and must be removed before the beginning of the TOY restriction of that same season. Temporary crossings that must remain into the TOY restriction will require PCN review.
2) Impacts to the streambed or banks require restoration to their original condition (see "Stream Simulation: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings," for stream simulation restoration methods). Use geotextile fabric or other appropriate bedding for stream beds and approaches where practicable to ensure restoration to the original grade. The requirements in GCs 17, 18 and 19 are particularly relevant.
3) Avoid excavating the stream or embedding crossings.
4) For Culverts:
    a. The water height should be no higher than the top of the culvert's inlet and the culvert is large enough to pass debris.
    b. Install energy dissipating devices downstream if necessary to prevent scour.
    c. The TOY restrictions in GC 18 and the restrictions in GC 17(f) are particularly relevant.
5) Removed upon the completion of work. Impacts to the streambed or banks requires restoration to their original condition using stream simulation methods.

In-kind repair, replacement and maintenance of currently serviceable, authorized fills are eligible for SV. However, the conditions of the original authorization apply, and minor deviations in fill design are allowed. In-kind repair and maintenance of culverts that includes an expansion or change in use requires PCN. Replacement of non-serviceable fills, including an expansion or change in use, also requires PCN. In-kind replacement using the same materials is exempt from Section 404 of the Clean Water Act, and does not require permitting with the ACOE. The ACOE, however, should be consulted before assuming an activity is exempt from their jurisdiction.

# APPENDIX D

Horizontal directional drilling (HDD) for subsurface utility installations is considered to be the most effective and least environmentally damaging technique when compared to traditional mechanical dredging and trenching. This method ensures the placement of the pipeline at the target burial depth with no wetland or water body disturbance. HDD installation is the preferred method for crossing sensitive resources–the alternative is open cut trenching.

The HDD procedure uses bentonite slurry, a fine clay material as a drilling lubricant. Directional drilling has the small potential to release bentonite slurry into the surface environment through frac-outs. This term describes the situation caused when the drilling head and its accompanying inert clay lubricant slurry, hits a subterranean fractured substrate. When the pressurized lubricant slurry reaches the fracture it can follow the fracture up or otherwise force itself to the surface or into the water if drilling is occurring under a waterbody. If a "frac-out" occurs under these water features, the potential exists for the inert clay (a non-toxic bentonite-based substance) to be released into the water column. In large quantities, the release of drilling mud into a waterbody could affect fisheries or other aquatic organisms by settling and temporarily inundating the habitats used by these species. Properly monitoring the slurry pressures and amounts significantly decreases risk of significant quantities of drilling fluid being released into the environment.

Frac-out is most likely to occur near the bore entry and exit points where the drill head is shallow. Should a frac-out occur during HDD operations, the following measures will be taken.

- Temporarily suspend forward drilling progress.
- Monitor frac-out for 4 hours to determine if the drilling mud congeals. (Bentonite will usually harden, effectively sealing the frac-out location.)
- If drilling mud congeals, take no other action that would potentially suspend sediments in the water column.
- If drilling mud does not congeal, erect appropriate isolation/containment measures (i.e. turbidity curtains and/or underwater boom and curtain).
- If the fracture becomes excessively large, a spill response team would be called in to contain and clean up excess drilling mud in the water. Phone numbers of spill response teams in the area will be on site.
- Following containment, evaluate the current drilling profile (i.e. drill pressures, pump volume rates, drilling mud consistency) to identify means to prevent further frac-out events.
- If the fracture is mitigated and controlled, forward progress of the drilling may resume.

# EVERSOURCE ENERGY, WESTERN, MA

# 2023 YEARLY OPERATIONAL PLAN

# MASSACHUSETTS DEPARTMENT OF AGRICULTURAL RESOURCES

# INTEGRATED VEGETATION MANAGEMENT PROGRAM



Submitted by:
Eversource Vegetation Management

**Submitted:**
**MARCH 20, 2023**

## SUMMARY

In compliance with the Massachusetts Department of Agricultural Resources' Rights-of-Way Regulations (333 CMR 11.00), this Yearly Operational Plan (YOP) informs municipalities of Eversource Energy, Western MA's intent to utilize an integrated vegetation management plan that includes the use of herbicides on electric rights-of-way (ROW) in 2023. Our Integrated Vegetation Management program is outlined in our five-year Vegetation Management Plan.

This YOP identifies target vegetation; the affected rights-of-way and towns; the herbicides, rates and methods of application; alternative control methods; the individual responsible for supervising the OP, and the qualified contractors that will perform the application. It explains how sensitive areas; buffer zones and sites where herbicides are either restricted or not permitted are identified, appropriately marked, treated and protected. It addresses procedures for the mixing, handling and loading of herbicide concentrates. Finally, it includes Herbicide Fact Sheets and Labels, a list of emergency resources and telephone numbers, and maps marked with known Sensitive Areas.

The YOP process provides for a forty-five-day public review and comment period, in conjunction with the twenty-one-day municipal rights-of-way notification period. These review periods give communities an opportunity to provide information that will help identify additional areas that may require specific precautions or protection. Finally, notice will be published in general circulation newspapers at least 48 hours before the scheduled application.

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# I. INTRODUCTION

In compliance with Commonwealth of Massachusetts' Rights-of-Way Vegetation Management Regulations (333 CMR 11.00) Eversource Energy, Western MA's Yearly Operational Plan (YOP) details our vegetation management program for 2023. This YOP is consistent with the terms and procedures set forth in the Eversource Energy, Vegetation Management Plan's (VMP's) per 333 CMR 11.05; with the Massachusetts Pesticide Control Act (Chapter 132B); with all pertinent clauses in Chapter 85 of the Acts of 2000; with the Massachusetts Endangered Species Act (MESA; MGL c. 131 A) and regulations (321 CMR 10.00), and with all Federal and State acts and regulations that apply to right-of-way vegetation management.

Eversource delivers electricity to 1.3 million customers in 136 municipalities. Electricity is transmitted over hundreds of miles of distribution and transmission rights-of-way (ROW) throughout the western, eastern, southeastern, and cape and islands regions of Massachusetts. To ensure safe reliable electric service, Eversource must keep these ROWs free from hazards and encroachments. In this effort, the vegetation on the ROW corridors must be maintained at an early stage of plant succession (herbaceous plants and shrubs).

Using the Integrated Vegetation Management Program (IVM) described in the VMP's, Eversource's program is based on a 4-year selective herbicide application and where appropriate mechanical treatment cycle. This program allows for the safe delivery of reliable electric service and supports a healthier more diverse habitat for wildlife that depends upon early successional landscapes (See VMP's for further description of Eversource's IVM program). The VMP's can be viewed at:

https://www.eversource.com/content/residential/about/reliability/vegetation-management/transmission-system-vegetation-management/transmission-vegetation-management-projects

## II. CHAPTER 132B AND 333 CMR 11.00

> The purpose of this chapter is to conform the laws of the commonwealth to the Federal Insecticide, Fungicide, and Rodenticide Act, Public Law 92-516, as amended, and the regulations promulgated there under and to establish a regulatory process in the commonwealth. The exclusive authority in regulating the labeling, distribution, sale, storage, transportation, use and application, and disposal of pesticides in the commonwealth shall be determined by this chapter. *(MGL 132B, Section 1)*

Chapter 132b (Massachusetts Pesticide Control Act) was created to ensures a clear and uniform set of standards for the entire Commonwealth of Massachusetts ***in order to protect the public from the negative impacts that arise from fragmented, decentralized, sets of standards***. In this effort, the Commonwealth, through the Department of Agricultural Resources (MDAR) retains the sole right to regulate the use of pesticides, including herbicides, throughout Massachusetts. MDAR takes this responsibility extremely seriously and the regulations promulgated under Chapter 132b are stricter than Federal standards.

> The purpose of 333 CMR 11.00 is to establish a statewide and uniform regulatory process which will minimize the uses of, and potential impacts from herbicides in right of way on human health and the environment while allowing for the benefits to public safety provided by the selective use of herbicides *(333 CMR 11.01)*.

333 CMR 11.00 is the most comprehensive rights of way regulation in New England. It requires an Integrated Pest Management (in this case IVM) approach to right of way vegetation management; the establishment of standards and procedures to prevent unreasonable risks to humans or the environment, and a multi-layered system of public and municipal notification that requests input about environmentally and culturally sensitive areas. All of this is outlined in the Eversource VMPs, annual YOPs, *The Environmental Monitor* Notice, 21-day notification, Public Water Supplier notification and 48- hour newspaper notice which serve as guides for the public, state and municipal officials, vegetation management contractors and Eversource personnel.

To ensure compliance with Chapter 132b and 333 CMR 11.00, MDAR performs routine inspections of rights-of-way treatment crews, retains chemists, and perform further tests before approving a limited list of herbicides approved for use in Sensitive Areas (pursuant to 333 CMR 11.04 (1)(d)).

As detailed in the VMP's and YOP, Eversource Energy, Western MA's IVM program strictly adheres to all the requirements of Chapter 132b and 333 CMR 11.00. Eversource only retains herbicide application treatment contractors that hold Massachusetts' certifications and licenses to apply pesticides, which require ongoing training to maintain. All Sensitive Areas (see section V) are treated appropriately using either mechanical treatment methods or Commonwealth of Massachusetts recommended herbicides for use in Sensitive Areas. In fact, Eversource only uses these recommended herbicides on the entire length and cleared width of its ROW corridors.

Beyond the requirements of 333 CMR 11.00 and in compliance with Chapter 216 of the Acts of 2012, Eversource also notifies "abutters" (houses and businesses that abut the rights-of-way being treated in that year) within view of the ROWs before treatments begin. Treatment contractors are required to leave door hangers or talk personally with abutters which allow the contractor to answer site specific questions, identify private wells and help explain the program.

## III. LOCATION OF INTENDED TREATMENTS

In 2023 Eversource plans on completing vegetation maintenance on 4 transmission and 8 distribution line ROWs as listed in Table I. Table II is a list of municipalities where a herbicide treatment will be applied as part of IVM.

### Table I. 2023 Rights-of-Way:

| Massachusetts West (WMA) | |
|---|---|
| **ROW** | **Segment Name** |
| **Electric Transmission Rights of Way** | |
| WT-01 | Berkshire S/S (18C) - Plainfield S/S (18K) - Ashfield S/S (38A) plus Line 312 around Plainfield S/S (18K) |
| WT-03 | Ashfield S/S (38A) - Arthur's Seat Jct. - WT-03/WT-12 Jct. - Erving Jct. - Northfield S/S (16R) plus Arthur's Seat Jct. - Cumberland S/S (22B) |
| WT-04 | Doreen S/S (19A) - Hubbard Jct. – NEP Co TAP - plus Partridge S/S (15E) TAP |
| WT-05 | Doreen S/S (19A) - Berkshire S/S (18C) |
| **Electric Distribution Rights of Way** | |
| D42 | Clark Rd-North St. (15E2) |
| D40 | Crane tap-Dalton Sub (15E3/19A3) |
| D35 | Doreen-Dalton Sub* (19A6) |
| D12 | Cumber - Gardnerfls (22B5/6) |
| D16 | Cumber - Greenfield (22B5/6) |
| D25 | Plainfield-Cummington-Chesterfield (18K2) |
| D24 | Deerfield - Conway (22B1) |
| D68 | Greenfield - Main St. (28W4) |

### Table II: List of 2023 IVM (herbicide treatment) Municipalities:

| **Western MA (WMA) municipalities:** | | | | |
|---|---|---|---|---|
| Ashfield | Dalton | Hinsdale | Peru | Windsor |
| Chesterfield | Deerfield | Lanesborough | Pittsfield | |
| Conway | Erving | Montague | Plainfield | |
| Cummington | Greenfield | Northfield | Shelburne | |

## IV. IDENTIFICATION OF TARGET VEGETATION FOR HERBICIDE APPLICATIONS

Pursuant to the policy and intent set forth in the Eversource VMPs, all vegetation must be removed that obscures the ROW corridors and grows tall enough to interfere with the safe, efficient and legal operation of an electrical power line. In the wire zone, trees and brush are targeted, and native, low growing plant communities that have a mature height less than three feet are established. In the border zone, incompatible trees and brush are targeted, and the growth of native trees and shrubs that have a mature height less than 15 feet is encouraged.

The primary target is all trees species within the cleared width of the ROW; except in Priority Habitats that are under the purview of the Natural Heritage and Endangered Species Program of the Department of Fish and Game (NHESP), which will be treated on a case by case basis.

Examples of targets include, but are not limited to:

| | | |
|---|---|---|
| Alder | Cherry | Pine |
| Aspen | Hemlock | Maple |
| Beech | Hickory | Oak |
| Birch | Locust | Sassafras |

There are more non-target vegetation species on an electric or gas ROW than targets. In fact, ROW's are one of the primary early successional plant communities remaining in New England. As a result, many plant and animal species use ROWs as their homes, feeding grounds or nurseries. Certain plant species, therefore, are generally encouraged on the ROW through the use of an IVM program (excluding invasive plant species):

- Most herbaceous growth is acceptable and encouraged
- Shrubs that mature less than 15 feet in height are only targets where due to their location or attributes they interfere with the function of the ROW.

Certain categories of non-tree species are targets under some circumstances, because of their location and/or their nature. Dense woody vegetation, shrubs and vines are targets where they are capable of interfering with the inspection and maintenance of the poles, wires, and along access roads, paths and gates which need to be kept clear, especially for emergencies.

Eversource intends to control plant species including invasive, poisonous plants and vines at their facilities. Invasive plant species have become an increasing concern throughout Massachusetts in areas that include ROW corridors where they can spread rapidly and move into the adjacent landscape. Eversource plans to use herbicides to spot treat poisonous plants at sites under its ROWs identified as having a high risk of posing a health hazard. This vegetation, likewise, poses a risk to the safety and health of all individuals working on or traversing a ROW and it can impede a rapid response in an emergency.

Examples of non-tree species generally considered targets, include, but are not limited to:

| | | |
|---|---|---|
| Autumn Olive | Japanese Knot-Weed | Greenbriar |
| Buckthorn | Multiflora Rose | Poison Ivy |
| Buckthorn | Oriental Bittersweet | |
| Hawthorne | Staghorn Sumac | |
| Honeysuckle | Poison Sumac | |

## V. DEFINITION, IDENTIFICATION AND TREATMENT OF SENSITIVE AREAS

Sensitive Areas are those areas within a ROW in which public health, environmental concerns or agricultural interests warrant special protection to minimize the risk of unreasonable adverse effects.

The map(s) in Appendix I are a resource and a tool for both the public and the vegetation management crews. They contain the data necessary to identify, mark and treat Sensitive Areas appropriately.

The map(s) include known Sensitive Areas available at the printing of this YOP. Some Sensitive Areas are included in the base USGS topographic maps. The most current data available through Mass GIS such as public water suppliers, certified vernal pools, etc. and any data that Eversource has collected to date on areas such as private wells are added on top of the USGS data. At the time of treatment, any additional Sensitive Areas collected will be added to the maps utilized by our vegetation management contractors. Please note that Zone II's and limited spray areas are not mapped since Eversource Energy, will only use herbicides approved for use within this type of Sensitive Area in their 2023 IVM program.

There is one type of Sensitive Area not included on the maps that we are not authorized to publish: the locations of the Priority Habitats of state listed species as regulated by the Natural Heritage and Endangered Species Program (NHESP) of the Division of Fisheries & Wildlife. A map layer of Priority Habitats is available to the general public at https://www.mass.gov/orgs/massgis-bureau-of-geographic-information , but it is neither specific to areas of concern for herbicide applications nor does it include data on the individual species since the exact location and details of their habitat is protected. Please be assured that we follow all necessary precautions to stay in compliance with 321 CMR 10.00 and this YYOP was approved by NHESP.

Prior to any herbicide application, Sensitive Areas will be identified and when necessary marked in the field by an experienced vegetation management treatment crew point person, by individuals trained in the identification of Sensitive Areas that require the use of GIS (geographic information systems) and GPS equipment, and/or by a NHESP approved botanist trained in the delineation of state-listed species.

Two simple descriptions guide the complex identification of the Sensitive Areas listed in 333 CMR 11.02: *Readily identifiable in the field* and *Not readily identifiable in the field*:

A. *Readily identifiable in the field areas* will be treated and marked according to all applicable restrictions listed in 333 CMR 11.00 and the Eversource Energy, 5-year VMP's.

B. *Not readily identifiable in the field areas* are identified by the use of the data marked on our maps and additional data collected in the YYOP and notification processes before the time of treatment.

Eversource and contractor personnel assigned the task of identifying Sensitive Areas in the field will use the following sources and methods:

A. Massachusetts Department of Environmental Protection (DEP) water supply maps/GIS mapping layers available through Mass GIS
B. Massachusetts Department of Agricultural Resources (MDAR) records of identified private wells along the ROW

C. Correspondence and input from municipalities within the consecutive forty-five day YYOP and twenty-one day municipal ROW notification review and comment periods and the 48 hour newspaper notification
D. Correspondence and input from Eversource's abutter notification procedure
E. A point person who precedes the treatment crew verifying identified Sensitive Areas and any additional areas that may require special precautions.

The following section details some of the Sensitive Areas that require special attention, particularly those that are classified as either no spray or *not readily identifiable in the field:*

A. *Limited Spray Areas*:

Per 333 CMR 11.02, the following need to be identified in the field, require the use of herbicides on the *MDAR Rights-of-Way Sensitive Area Materials List*, and time restrictions between herbicide applications (see Appendix II, Sensitive Area Table). Please note that for 2023 IVM herbicide applications, Eversource is only using Sensitive Area approved herbicides on our entire ROW system:

(a) any Zone II or IWPA
(b) a distance of between 100 feet and 400 feet of any Class A Surface Water Source
(c) a distance of between 10 and 200 feet of any tributary or associated surface water body where the tributary or associated surface water body runs outside the Zone A for the Class A surface water source
(d) a lateral distance of between 100 and 200 feet for 400 feet upstream, on both sides of the river, of a Class B Drinking Water Intake
(e) a distance of between 50 and 100 feet of any identified Private Well
(f) a distance of between 10 and 100 feet of any Wetlands or Water Over Wetlands
(g) a distance of between 10 feet from the mean annual high water line of any river and the outer boundary of the Riverfront Area
(h) a distance of between ten feet from any Certified Vernal Pool and the outer boundary of any Certified Vernal Pool Habitat
(i) a distance of 100 feet of any Agricultural or Inhabited Area.

Please Note that "(f)" is modified by the MDAR (formerly Department of Food and Agriculture) *Decision*, dated October 12, 1995, concerning the wetland impact study conducted pursuant to 333 CMR 11.04(4)(c)(2). According to the *Decision*, Eversource may use herbicides within wetlands except on or within 10 feet of standing or flowing water (item "g" in the *no-spray areas* below was removed from the no spray list for utilities because it does not apply for the same reason).

B. *No-Spray Areas*:

Again, quoting from 333 CMR 11.02 the following no-spray areas need to be identified:

No-Spray Area, any area that is both within a Right-of-Way and within:

(a) any Zone I
(b) 100 feet of any Class A Surface Water Source
(c) 100 feet of any tributary or associated surface water body where the

tributary or associated surface water body runs within 400 feet of a Class A surface water source
(d) 10 feet of any tributary or associated surface water body where the tributary or associated surface water body is at a distance greater than 400 feet from a Class A surface water source
(e) a lateral distance of 100 feet for 400 feet upstream, on both sides of the river, of a Class B Drinking Water Intake
(f) 50 feet of any identified Private Well [within 100 feet of the ROW]
…
(h) 10 feet of the mean annual high-water line of any river
(i) 10 feet of any Certified Vernal Pool.

### *C. Identification and Treatment of Private Drinking Water Supplies*

No herbicide treatments will take place within fifty feet of any identified private wells located within one hundred (100) feet of a ROW. Eversource updates its private well records based on available data.

Municipalities should assist in the identification process and the MDAR will be consulted again prior to the treatment in an attempt to keep the private drinking water supply information up-to-date.

Identified private drinking supplies within one hundred (100) feet of a ROW will be permanently recorded on appropriate maps.

### *D. State-Listed Species Habitat*

Eversource recognizes the importance of the Massachusetts Endangered Species Act, M.G.L.C. 131 A, and its significance to ROW vegetation management. Eversource will comply with all applicable portions of this Act and the regulations promulgated thereunder. Eversource will also follow the rules and prohibitions directed at human activities which Take Species or alter their Significant Habitat (as of this printing there are no designated Significant Habitat in Massachusetts).

321 CMR 10.14, Massachusetts Endangered Species Act Regulations, Part II Exemptions and 333 CMR 11.04(3)(a-c) exempts utility ROW vegetation management from the permit process under the following conditions:

> (12) The management of vegetation within existing utility rights-of-way provided that the management is carried out in accordance with a vegetation management plan approved in writing by the Division prior to the commencement of work for which a review fee shall be charged, the amount of which shall be determined by the commissioner of administration under the provisions of M.G.L. c.7, § 3B…

To comply with exemption 10.14(12), Eversource submits this YYOP to the NHESP for review.

The NHESP has delineated areas as Priority Habitat based on the "Best Scientific Evidence Available" to protect State-listed species from a "take." Under the approval process, details about the Priority Habitat of state-listed species that might be affected by our activities and management recommendations are shared with Eversource under strict confidentiality agreements. Using this data and best management practices, Eversource and contract personnel will follow the appropriate vegetation management treatment methods within these sensitive areas taking all

practical means and measures to modify ROW vegetation management procedures to avoid damage to state-listed species and their habitat.

To identify Priority Habitats, Eversource personnel, NHESP approved review botanists and vegetation management crews must use proper identification procedures. Contractors are, therefore, required to train their personnel to recognize the location of Priority Habitats using one of the following tools: paper maps, GPS coordinates and/or GIS systems.

## VI. PROPOSED HERBICIDE TREATMENT METHODS

Under Eversource's IVM program, combined with mechanical "prep-cutting," mowing and side-trimming activities, herbicide applications will be applied on foot using selective low pressure foliage treatments with backpack sprayers and cut stump or basal treatments. Experienced, Massachusetts licensed applicators will perform the selective herbicide treatments under the direct on site supervision of a certified applicator as required by Chapter 132B.

Eversource's herbicide program is a selective program scheduled to sustain acceptable vegetation control at minimal application rates. Using backpack sprayers, small amounts of herbicide are applied directly to the leaves, stumps or bark of the target vegetation. The average per acre rate of herbicide mix for Eversource's foliar program is under 5 gallons per acre and the actual amount of applied active ingredient is in the pints per acre range.

Eversource also chooses herbicide formulations that are low in acute toxicity, do not bio-accumulate and, as applied, have a short half-life with low soil mobility (see VMP's, Bibliography). Above and beyond the review by the Federal EPA, these herbicides are all carefully reviewed jointly by MDAR and the Massachusetts Department of Environmental Protect for use in "limited spray" sensitive areas (including Zone IIs). Eversource takes this one step further and only uses sensitive area approved herbicides on their entire right-of-way system.

### *A. Methods:*

Eversource and contract personnel will utilize the most appropriate technique for the vegetation species, height, density, site and mandated restrictions. These methods as described in detail in the Eversource 5-year VMP's are briefly reviewed below:

**Low Volume Foliage Techniques** utilize hand-operated pumps or motorized, backpack sprayers. The motorized, backpack sprayer produces an air current that delivers small amounts of herbicide mixture from a portable spray tank to the target vegetation. The low-pressure hand-pump sprayer uses a column of water. In both cases, the amount of herbicide solution applied only dampens or lightly wets the target vegetation.

**Low-Volume Stem Basal:** the selective application of herbicides to the lower 6"-8" of the plant stem. The herbicide concentration is applied with low-pressure, backpack sprayers with special wand attachments and positive shut-off nozzle tips with small orifices.

**Cut Stump Surface Treatment (CST):** the application of an herbicide mixture to the cut surface of a stump immediately following or during a cutting operation. Application equipment includes low-volume, backpack, hand-pump sprayers; hand held squirt bottles; paintbrushes, or sponge applicators.

### *B. Guidelines:*

1. All Sensitive Area restrictions will be followed.

2. Foliar and Basal treatments are used within the cleared width of the ROW for tree and shrub target species below 12 feet in height.

3. CST treatments are used in conjunction with hand-cutting and in situations including but not limited to: trees and shrubs that cannot be foliar treated, at road buffers, and around structures such as poles and gates.

4. Only mechanical treatment methods will be used in *no spray* Sensitive Areas, including but not limited to hand cutting, trimming and mowing.

### *C. Treatment of Wetlands*

Herbicide applications in wetlands will be performed in accordance with 333 CMR 11.04 (4)(c)(2) relative to ROW management. Targets will be selectively treated with herbicides on the MDAR's *Sensitive Area Material List* and will not be applied within ten (10) feet of standing or flowing water.

### *D. Treatment of State-Listed Priority Habitats*

All vegetation management activities will be completed in compliance with the Massachusetts Endangered Species Act (MESA; MGL c. 131 A) and its regulations, 321 CMR 10.00.

## VII. PROPOSED HERBICIDES, CARRIERS, ADJUVANTS AND RATES

In 2023 only the Commonwealth of Massachusetts recommended herbicides listed below for use in Sensitive Areas—pursuant to 333 CMR 11.04 (1)(d)—will be used on the entire length and cleared width of Eversource Energy ROW corridors, in compliance with all labeled directions.

### Table III. Tank Mixes for Low Volume Foliage Applications:

**Tank Mix #1 for Low Volume Foliar (LVF) Treatment Applications**

| Herbicides & Adjuvants | Active Ingredient | EPA Registration Number(s) | Mix Concentration (per 100 gals. water) | Estimated Application Rate Per Acre |
|---|---|---|---|---|
| Krenite S | Fosamine Ammonium | 42750-247 | 6-10% | 32-128 oz. |
| Escort XP or Patriot | Metsulfuron-Methyl | 432-1549 or 228-391 | 2-4 oz. | 0.125-0.8 oz. |
| Arsenal Powerline or Polaris[1] | Imazapyr | 241-431 or 228-534 | 0.125%-0.5% | 2-8 oz. |
| Induce, Clean Cut, Methylated Seed Oil (MSO)[3], or Aqua Fac or equivalent surfactant[2] | n.a. | n.a. | 0.125%-1% | 1-16 oz. |
| Point Blank, Clasp, or equivalent drift retardant | n.a. | n.a. | 0.125%-0.5% | 1-2 oz. |
| Carrier: Water | n.a. | n.a. | n.a. | n.a. |
| | | | | Gallons per acre – 3 to 15 |

**Tank Mix #2 for Low Volume Foliar (LVF) Treatment Applications**

| Herbicides & Adjuvants | Active Ingredient | EPA Registration Number(s) | Mix Concentration (per 100 gals. water) | Estimated Application Rate Per Acre |
|---|---|---|---|---|
| Rodeo, Aquaneat, Roundup Pro, or Roundup Custom[4,5] | Glyphosate | 62719-324, 228-365, 524-475, 524-343 | 3-5% | 16-128 oz. |
| Escort XP or Patriot | Metsulfuron-Methyl | 432-1549 or 228-391 | 2-4 oz. | 0.125-0.8 oz. |
| Arsenal Powerline or Polaris[1] | Imazapyr | 241-431 or 228-534 | 0.125%-0.5% | 2-8 oz. |
| Induce, Clean Cut, MSO[3], or Aqua Fac or equivalent surfactant[2] | n.a. | n.a. | 0.125%-1% | 1-16 oz. |
| Point Blank, Clasp, or equivalent drift retardant[2] | n.a. | n.a. | 0.125%-0.5% | 1-2 oz. |
| Carrier: Water | n.a. | n.a. | n.a. | n.a. |
| | | | | Gallons per acre – 3 to 15 |

## Tank Mix #3 for Low Volume Foliar (LVF) Treatment Applications

**(can be used in MA only if MDAR approved Sensitive Materials List)**

| Herbicides & Adjuvants | Active Ingredient | EPA Registration Number(s) | Mix Concentration (per 100 gals. water) | Estimated Application Rate Per Acre |
|---|---|---|---|---|
| Vastlan | Triclopyr choline | 62719-687 | 2-3% | 12-64 oz. |
| Escort XP or Patriot | Metsulfuron-Methyl | 432-1549 or 228-391 | 2-4 oz. | 0.125-0.8 oz. |
| Arsenal Powerline or Polaris[1] | Imazapyr | 241-431 or 228-534 | 0.125%-0.5% | 2-8 oz. |
| Induce, Clean Cut, MSO[3], or Aqua Fac or equivalent surfactant[2] | n.a. | n.a. | 0.125%-1% | 1-16 oz. |
| Point Blank, Clasp or equivalent drift retardant[2] | n.a. | n.a. | 0.125%-0.5% | 1-2 oz. |
| Carrier: Water | n.a. | n.a. | n.a. | n.a. |
| | | | | Gallons per acre – 3 to 15 |

## Tank Mix #4 for Low Volume Foliar (LVF) Treatment Applications

| Herbicides & Adjuvants | Active Ingredient | EPA Registration Number(s) | Mix Concentration (per 100 gals. water) | Estimated Application Rate Per Acre |
|---|---|---|---|---|
| Escort XP or Patriot | Metsulfuron-Methyl | 432-1549 or 228-391 | 2-4 oz. | 0.125-0.8 oz. |
| Arsenal Powerline or Polaris[1] | Imazapyr | 241-431 or 228-534 | 0.125%-0.5% | 2-8 oz. |
| Induce, Clean Cut, MSO[3], or Aqua Fac or equivalent surfactant[2] | n.a. | n.a. | 0.125%-1% | 1-16 oz. |
| Point Blank, Clasp or equivalent drift retardant[2] | n.a. | n.a. | 0.125%-0.5% | 1-2 oz. |
| Carrier: Water | n.a. | n.a. | n.a. | n.a. |
| | | | | Gallons per acre – 3 to 15 |

## Tank Mix #5 for Low Volume Foliar (LVF) Treatment Applications

| Herbicides & Adjuvants | Active Ingredient | EPA Registration Number(s) | Mix Concentration (per 100 gals. water) | Estimated Application Rate Per Acre |
|---|---|---|---|---|
| Escort XP or Patriot | Metsulfuro n- Methyl | 432-1549 or 228-391 | 2-4 oz. | 0.125-0.8 oz. |
| Arsenal Powerline or Polaris[1] | Imazapyr | 241-431 or 228-534 | 0.125%-0.5% | 2-8 oz. |
| Induce, Clean Cut, MSO[3], or Aqua Fac or equivalent surfactant[2] | n.a. | n.a. | 0.125%-1% | 1-16 oz. |
| Point Blank, Clasp, or equivalent drift retardant[2] | n.a. | n.a. | 0.125%-0.5% | 1-2 oz. |
| Carrier: Water | n.a. | n.a. | n.a. | n.a. |
| | | | | Gallons per acre – 3 to 15 |

**Tank Mix # 6 for Low Volume Foliar (LVF) Treatment Applications**

| Herbicides & Adjuvants | Active Ingredient | EPA Registration Number(s) | Mix Concentration (per 100 gals. water) | Estimated Application Rate Per Acre |
|---|---|---|---|---|
| Garlon 4 Ultra | Triclopyr | 62719-527 | 2-4% | 12-64oz |
| Escort XP or Patriot | Metsulfuron-Methyl | 432-1549 or 228-391 | 2-4 oz. | 0.125-0.8 oz. |
| Arsenal Powerline or Polaris[1] | Imazapyr | 241-431 or 228-534 | 0.125%-0.5% | 2-8 oz. |
| Induce, Clean Cut, MSO[3], or Aqua Fac or equivalent surfactant[2] | n.a. | n.a. | 0.125%-1% | 1-16 oz. |
| Point Blank, Clasp, or equivalent drift retardant[2] | n.a. | n.a. | 0.125%-0.5% | 1-2 oz. |
| Carrier: Water | n.a. | n.a. | n.a. | n.a. |
| | | | | Gallons per acre – 3 to 15 |

## Table IV: Tank Mix for Poison Ivy, Vines, and Invasive Species

| Herbicides & Adjuvants | Active Ingredient | EPA Registration Number(s) | Mix Concentration (per 100 gals. water) |
|---|---|---|---|
| Rodeo, Aquaneat, Roundup Pro, or Roundup Custom[4,5] | Glyphosate | 62719-324, 228-365, 524-475, 524-343 | 2-5% |
| Garlon 4 Ultra | Triclopyr | 62719-527 | 2-4% |
| Escort XP or Patriot | Metsulfuron-Methyl | 432-1549 or 228-391 | 1.25-4 oz. |
| Induce, Clean Cut, MSO[3], or Aqua Fac or equivalent surfactant[2] | n.a. | n.a. | 0.125%-1% |
| Point Blank, Clasp or equivalent drift retardant[2] | n.a. | n.a. | 4-16 oz. |
| Carrier: Water | n.a. | n.a. | n.a. |
| | | | Gallons per acre – 3 to 15 |

## Table V. Tank Mixes for Cut Surface Treatment (CST) Applications:

| Herbicides & Adjuvants | Active Ingredient | EPA Registration Number(s) | Mix Concentration (per 100 gals. water) | Estimated Application Rate Per Acre |
|---|---|---|---|---|
| Rodeo, Aquaneat, Roundup Pro, or Roundup Custom[4,5] | Glyphosate | 62719-324, 228-365, 524-475, 524-343 | 40% to 50% | Per density of target stems |
| Arsenal Powerline or Polaris[1] | Imazapyr | 241-431 or 228-534 | 3%-5% (mixed with Glyphosate) | Per density of target stems |
| Carrier: Water or Windshield Washing Fluid | n.a. | n.a. | n.a. | n.a. |

**Table VI. Tank Mixes for Low-Volume Basal or Cut Surface Treatment (CST) Applications:**

**Tank Mix #1 Low Volume Basal or Cut Surface Treatments (CST) Applications**

| Herbicides & Adjuvants | Active Ingredient | EPA Registration Number(s) | Mix Concentration (per 100 gals.) | Estimated Application Rate Per Acre |
|---|---|---|---|---|
| Garlon 4 Ultra | Triclopyr | 62719-527 | 20%-30% | Per density of target stems |
| Polaris | Imazapyr | 228-534 | 3%-5% (mixed with Garlon 4 Ultra) | Per density of target stems |
| Carrier: Arborchem's low odor basal oil or Aqumix Plus basal oil with dye or equivalent[2] | n.a. | n.a. | n.a. | n.a. |
| | | | | Maximum of 8 gals. Per acre |

**Tank Mix #2 Low Volume Basal or Cut Surface Treatments (CST) Applications**

| Herbicides & Adjuvants | Active Ingredient | EPA Registration Number(s) | Mix Concentration (per 100 gals.) | Estimated Application Rate Per Acre |
|---|---|---|---|---|
| Garlon 4 Ultra | Triclopyr | 62719-527 | 20%-30% | Per density of target stems |
| Carrier: Arborchem's low odor basal oil or Aqumix Plus basal oil with dye or equivalent[2] | n.a. | n.a. | n.a. | n.a. |
| | | | | Maximum of 8 gals. Per acre |

1 – Imazapyr will not be applied on the same right-of-way in two consecutive years
2 – Equivalent surfactants, drift retardants, and basal oils will be used if those listed are no longer available or more effective alternatives become available
3 -Methylated Seed Oil (MSO) will be labeled for wetland uses
4- Roundup Custom ATU will only be used if added to the Massachusetts Sensitive Materials List
5- Additional Glyphosate products may be substituted depending on the availability of products or if additional products become available

## VIII. ALTERNATIVE MECHANICAL CONTROL TECHNIQUES

Areas not treated or prohibited from herbicide use, such as protective buffers for Sensitive Areas, will be maintained mechanically according to the specifications in the VMP's. The following is a brief review of these methods:

**Hand Cutting:** the use of chain and brush saws to remove the stem and/or branches from the plant's root system; can be combined with CST except in no-chemical restricted areas.

**Mowing:** the cutting, severing or shattering of vegetation by large rotary or flail mowers.

**Side Pruning:** side pruning or removal of encroaching tops and/or branches of trees growing on or near the ROW's and access roads.

## IX. COMPANIES THAT MAY PERFORM THE HERBICIDE TREATMENT

x

Vegetation Control Service, Inc.
2342 Main Street
Athol, MA 01331
(978) 249-5348

Lewis Tree Service, Inc
300 Lucius Gordon Drive
West Henrietta, NY 14586
(585) 436-3208

## X. INDIVIDUAL RESPONSIBLE FOR SUPERVISING THE OPERATION PLAN

William Hayes
Senior Supervisor
Eversource Energy
Transmission Vegetation Management
247 Station Drive, SW-1036
Westwood, MA 02090-9230
781-441-3932 (office)

## XI. HERBICIDE FACT SHEETS

Herbicide Fact Sheets prepared and provided by the MDAR, explain technical information relative to the herbicide concentrates proposed for use during the 2023 treatment cycle. These are included in Appendix III, along with the manufacturer's labels in Appendix IV.

## XII. PROCEDURES FOR HANDLING, MIXING AND LOADING HERBICIDE CONCENTRATES

All herbicides will be handled, mixed and applied strictly according to *Label Instructions* and in compliance with all applicable federal and state laws and regulations. If possible, herbicide mixing should be done at the contractor's facilities and extreme care shall be exercised during all mixing, handling and loading in order to prevent careless spills or splashes. No herbicide concentrates will be mixed, handled or loaded on a ROW within one hundred (100) feet of a Sensitive Area.

## XIII. EMERGENCY RESOURCES

Eversource contracts with independent, professional, certified herbicide applicators that are responsible for the containment, clean up and reporting of chemical spills or accidents. The following is a guide to the information sources that, according to various regulations, must be available to the treatment crew in the event of a chemical spill or emergency situation:

A. Technical Reference Materials:
   a. Product Label
   b. Product Material Safety Data Sheet (SDS)
   c. Product Fact Sheet, if available

B. **Table VII. Herbicide Manufacturers:**

| MANUFACTURER | TELEPHONE NUMBER | SPECIAL INSTRUCTIONS |
|---|---|---|
| Albaugh Inc. | 800-247-8013 | |
| BASF Corporation | 800-832-4357 | |
| ENVU and Bayer Environmental Science | 800-334-7577 | |
| Corteva AgriScience | 800-992-5994 | |
| Nufarm | 877-325-1840 | Medical Emergencies |

C. **Table VIII. State Agencies:**

| STATE AGENCY | TELEPHONE NUMBER | SPECIAL INSTRUCTIONS |
|---|---|---|
| Massachusetts Pesticide Bureau | (617) 626-1700 | A.S.A.P. (within 48 hours) |
| Massachusetts Department of Environmental Protection, Emergency Response Section | DEP 24 Hour Contact: (888) 304-1133<br>Southeast Region: (508) 946-2700<br>Northeast Region: (978) 694-3200<br>Western Region: (413) 784-1100<br>Central Region: (508) 792-7650 | For emergencies involving reportable quantities of hazardous materials; required info: City/town, street address, site name (if applicable), material |
| Massachusetts Dept. of Public Health, Bureau of Env. Health Assessment Toxicology Program | (617) 624-5757 | |
| Massachusetts Poison Information Centers | (800) 682-9211 | For medical emergencies involving suspected or known pesticide poisoning symptoms |

D. **Table IX. Emergency Services:**

| EMERGENCY SERVICE | TELEPHONE NUMBER | SPECIAL INSTRUCTIONS |
|---|---|---|
| Massachusetts State Police, Central Office | 617-566-4500 or 911 | |
| Local Fire / Police Dept. | 911 | |
| Chem Trec | 800-424-9300 | |
| Clean Harbors | 800-OIL-TANK | |
| Pesticide Hotline | 800-858-7378 | PST: 8:00 am to 12:00 pm, Web: www.NPIC.orst.edu |

E. Eversource contact in the case of a spill or accident is:

System Control
Eversource
247 Station Drive
Westwood, MA 02090-9230
(617)-541-7858

F. **Table X. Local Emergency Numbers:**

**Non-911 Emergencies Services for Eversource Electric Municipalities**

| Town | Board of Health | Town/City Hall | Town | Board of Health | Town/City Hall |
|---|---|---|---|---|---|
| Ashfield | (413) 628-4441 | (413) 628-4441 x5 | Lanesborough | (413) 442-1167 x28 | (413) 442-1351 |
| Chesterfield | (413) 296-4771 | (413) 296-4741 | Montague | (413) 863-3200 x205 | (413) 863-3200 x104 |
| Conway | (413) 369-4235 x8 | (413) 369-4235 x4 | Northfield | (413) 498-2901 | (413) 498-2901 x112 |
| Cummington | (413) 634-5757 | (413) 634-5560 | Peru | (413) 655-8312 | (413) 655-8312 |
| Dalton | (413) 684-6111 x20 | (413) 684-6111 x14 | Pittsfield | (413) 499-9411 | (413) 499-9361 |
| Deerfield | (413) 665-1400 x109 | (413) 665-1400 x100 | Plainfield | (413) 634-5343 | (413) 634-5420 |
| Erving | (413) 422 2800 x101 | (413) 422-2800 x101 | Shelburne | (413) 625-0300 | (413) 625-0300 |
| Greenfield | (413) 772-1404 | (413) 772-1555 | Windsor | (413) 684-3811 x7 | (910) 620-0162 |
| Hinsdale | (413) 655-2300 x311 | (413) 655-2300 x301 | | | |

**APPENDIX I:**
**Maps**

https://www.eversource.com/content/residential/about/reliability/vegetation-management/transmission-system-vegetation-management/transmission-vegetation-management-projects

# APPENDIX II:
# Sensitive Area Table

**CONTROL STRATEGIES FOR SENSITIVE AREAS[#]**

| Sensitive Area | No-Spray and Limited Spray Areas (feet) | Control Method | Restriction Code |
|---|---|---|---|
| Public Ground Water Supplies | 400' | Mechanical Only | None |
| Primary Recharge Area | Designated buffer zone or ½ mile radius | Mechanical, Recommended Herbicides* | 24 months |
| Public Surface Water Supplies (Class A & Class B) | 100' | Mechanical Only | None |
| | 100'-400' | Recommended Herbicides | 24 months |
| Tributary to Class A Water Source, within 400' upstream of water source | 100' | Mechanical Only | None |
| | 100'-400' | Recommended Herbicides | 24 months |
| Tributary to Class A Water Source, greater than 400' upstream of water source | 10' | Mechanical Only | None |
| | 10'-200' | Recommended Herbicides | 24 months |
| Class B Drinking Water Intake, within 400' upstream of intake | 100' | Mechanical Only | None |
| | 100'-200' | Recommended Herbicides | 24 months |
| Private Drinking Water Supplies | 50' | Mechanical Only | None |
| | 50'-100' | Recommended Herbicides | 24 months |
| Surface Waters | 10' | Mechanical Only | None |
| | 10'-100' | Recommended Herbicides | 12 months |
| Rivers | 10' from mean annual high water line | Mechanical Only | None |
| | 10'-200' | Recommended Herbicides | 12 months |
| Wetlands | 100' (treatment in wetlands permitted up to 10' of standing water)*[+] | Low-pressure Foliar, CST, Basal Recommended Herbicides | 24 months |
| Inhabited Areas | 100' (for high-pressure foliar only) | Recommended Herbicides | 12 months |
| Agricultural Area (Crops, Fruits, Pastures) | 100' (for high-pressure foliar only) | Recommended Herbicides | 12 months |
| Certified Vernal Pools | 10' | Mechanical Only when water is present | None |
| Certified Vernal Pool Habitat | 10'-outer boundary of habitat | No treatment without written approval per 321 CMR 10.14(12) | |
| Priority Habitat | No treatment without written approval per 321 CMR 10.14(12) | | |

Restrictions "24 Months": A minimum of twenty-four months shall elapse between applications
"12 Months": A minimum of twelve months shall elapse between applications

*Massachusetts recommended herbicides for sensitive sites

[+]Per "Decision Concerning the Wetlands Impact Study"

[#]Table Compiled by Jeffrey M. Taylor, Vegetation Control Service, Inc.

# APPENDIX III:
# Herbicide Fact Sheets

HTTPS://WWW.MASS.GOV/SERVICE-DETAILS/RIGHTS-OF-WAY-SENSITIVE-AREA-MATERIALS-LIST

## APPENDIX IV:
## Herbicide Labels

AQUANEAT
AQUANEAT HERBICIDE LABEL

ARSENAL POWERLINE
ARSENAL POWERLINE LABEL

ESCORT XP:
ESCORT XP LABEL

GARLON 4 ULTRA:
GARLON 4 ULTRA LABEL

KRENITE S:
KRENITE S LABEL

MILESTONE:
MILESTONE LABEL

PATRIOT:
PATRIOT LABEL

POLARIS:
POLARIS LABEL

RODEO:
RODEO LABEL

ROUNDUP CUSTOM ATU:
ROUNDUP CUSTOM ATU LABEL

ROUNDUP PRO:
ROUNDUP PRO LABEL

VASTLAN:
VASTLAN LABEL

# ATTACHMENT 9
# COMMENT LETTERS ON THE EENF

# (PROVIDED UNDER SEPARATE COVER)