BLOOMFIELD - WINDSOR UPGRADES PROJECT

DEVELOPMENT AND MANAGEMENT PLAN

for

115-kV TRANSMISSION LINE UPGRADES

VOLUME 1

August 2016

Prepared by:

The Connecticut Light and Power Company doing business as Eversource Energy

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1. INTRODUCTION

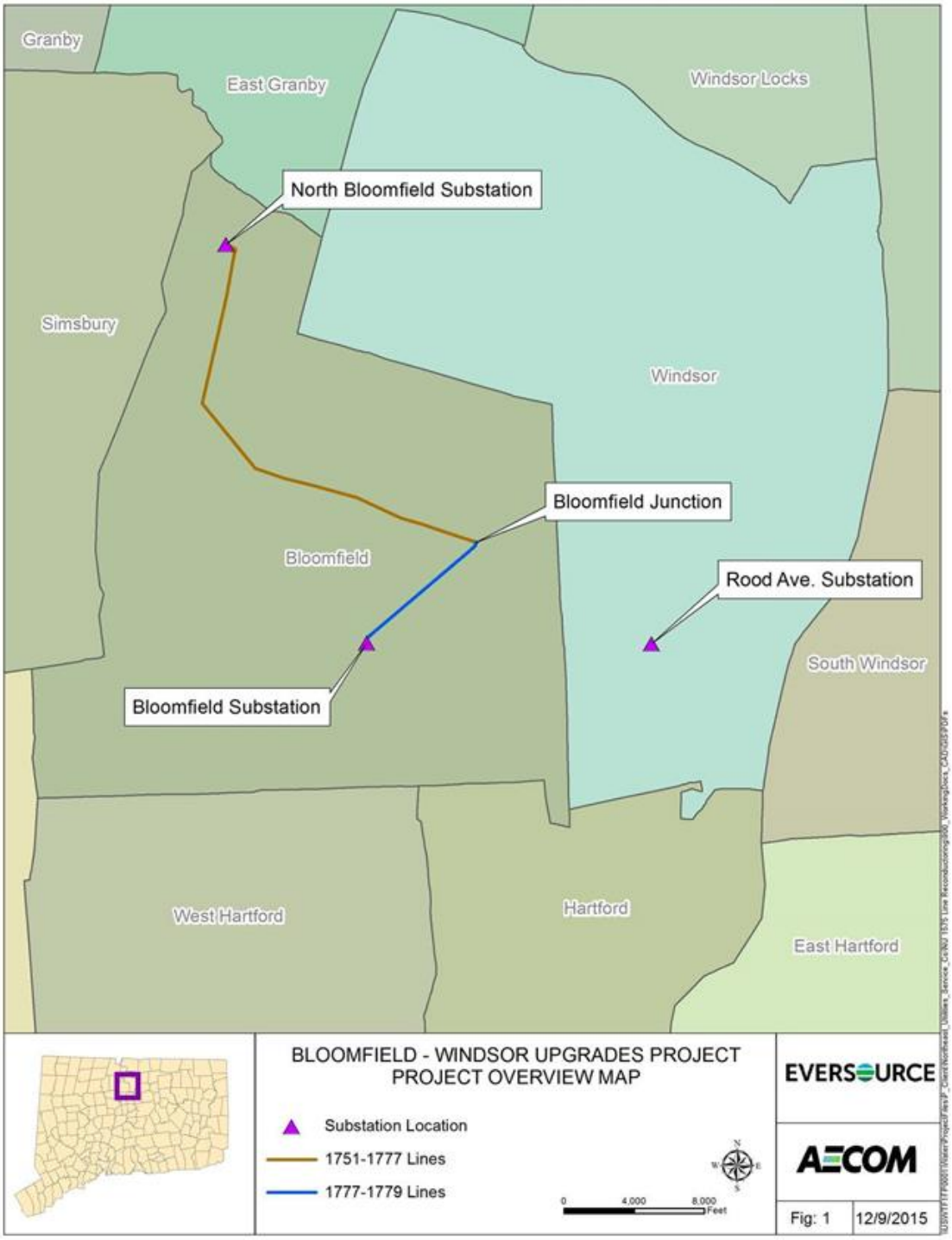
1.1 PROJECT OVERVIEW AND PURPOSE OF THE PLAN

To eliminate potential transmission system thermal and voltage criteria violations in the Greater Hartford and Central Connecticut (GHCC) area, The Connecticut Light and Power Company, doing business as Eversource Energy (Eversource or the Company), will upgrade existing 115-kilovolt (kV) transmission lines and implement associated modifications to its existing Rood Avenue, Bloomfield, and North Bloomfield substations. Referred to as the Bloomfield-Windsor Upgrades Project (Project), these modifications will be located entirely within existing Eversource rights-of-way (ROWs) or on Eversource-owned properties in the towns of Bloomfield and Windsor, Hartford County, Connecticut (refer to Figure 1-1). The Project facilities will consist of the following:

- Separation of approximately 6.9 miles of existing 115-kV lines (all within the Town of Bloomfield) that presently occupy common support structures, referred to as double-circuit tower (DCT) configurations, including:
  - ✓ The existing 1777/1779 lines, which are presently located on DCT lattice structures along a 1.6-mile segment of ROW between Bloomfield Substation and Bloomfield Junction; and
  - ✓ The existing 1751/1777 lines, which are presently located on common monopoles for 5.3 miles between Bloomfield Junction and North Bloomfield Substation.
- Modification to loop the existing 115-kV overhead 1779 Line into and out of Rood Avenue Substation in an underground configuration. The existing 1779 Line, which is in a DCT configuration with Eversource's 345-kV 3642 Line, presently bypasses Rood Avenue Substation. The connections of two other 115-kV lines (the 1448 and 1751 lines) that presently tie into Rood Avenue Substation also will be reconfigured.
- Related improvements to Rood Avenue, Bloomfield, and North Bloomfield substations.

On March 8, 2016 Eversource submitted to the Connecticut Siting Council (Council or CSC) a Petition for Declaratory Ruling, requesting a Council determination that a Certificate of Environmental Compatibility and Public Need (Certificate) was not required for the Project. The Council subsequently reviewed the Petition (CSC Petition No. 1217) and, after consideration, on May 3, 2016 ruled that a Certificate will not be required for the Project. The Council's ruling included seven conditions. Condition No. 1 requires that Eversource prepare a Development and Management (D&M) Plan for the Project in compliance with Sections 16-50j-60 through 16-50j-62 of the Regulations of Connecticut State Agencies (RCSA: *Requirements for a D&M Plan, Elements of a D&M Plan, Reporting Requirements*), and in accordance with seven Project-specific requirements. This D&M Plan addresses all construction activities for the Project's 115-kV transmission line upgrades in the Town of Bloomfield. A separate D&M Plan addresses the modifications to Rood Avenue, Bloomfield, and North Bloomfield substations, as well as the 1779 Line loop and related 115-kV line reconfigurations into the Rood Avenue Substation.

Figure 1-1 Bloomfield to Windsor Upgrades Project: Overview Map



1.2 TRANSMISSION LINE UPGRADES: LOCATION AND GENERAL DESCRIPTIONS

The 115-kV transmission line upgrades will be located within two existing Eversource ROWs in the Town of Bloomfield. The 115-kV lines interconnect at Bloomfield Junction, where several existing structures will be removed and replaced to facilitate the DCT separation and line upgrades. The following summarizes the existing and planned transmission line configurations along each ROW segment.

Bloomfield Substation to Bloomfield Junction: Separation of the 1777/1779 Lines

Eversource's approximately 1.6-mile, 200-foot-wide ROW between Bloomfield Substation and Bloomfield Junction extends through the southeastern portion of the Town of Bloomfield. Within this ROW, the existing 1777/1779 Lines are co-located on lattice steel structures. The 1777/1779 line structures are generally centered within the ROW; the northern portion of the ROW is occupied by the 115-kV 1751 Line, which is supported on wood pole H-frame structures. Along approximately 130 feet of the 200-foot-wide ROW, Eversource presently manages vegetation to promote low-growth species consistent with the safe operation of overhead transmission lines.

As part of the Project, the 1779 Line will be relocated to new structures, which will be installed within the ROW, generally south of the existing lattice steel structures. Along this ROW segment, 16 new monopoles and one three-pole structure will be installed to support the relocated 1779 Line. To accommodate the new 1779 Line structures, an additional 25 feet of vegetation along the southern portion of the ROW will be cleared and subsequently managed for low-growth species.

Bloomfield Junction to North Bloomfield Substation: Separation of the 1751/1777 Lines

Eversource's 5.2-mile, 200-foot-wide ROW between Bloomfield Junction and North Bloomfield Substation traverses the central and northern portions of the Town of Bloomfield. Within this ROW, the 1751/1777 lines are presently supported on DCT steel monopoles, which are located on the eastern portion of the ROW. A 345-kV line (Eversource's 3642 Line), which is supported on a combination of wood pole H-frames and monopoles, also occupies the ROW. To maintain proper clearance between vegetation and these existing overhead transmission lines, approximately 175 feet of the 200-foot-wide ROW is presently managed to promote low-growing species.

Along this segment of ROW, the 1777 Line will be relocated to new vertical steel monopole structures, which will be installed within the ROW, east of the existing 1751/1777 line monopoles. A total of 49 new steel monopoles will be installed for the relocated 1777 Line. The 1751 Line will remain on the existing monopoles, from which the conductor and shield wire arms used to support the 1777 Line will be removed.

1.3 ORGANIZATION OF THE D&M PLAN

This D&M Plan consists of three volumes:

- **Volume 1** includes specific information relevant to the 115-kV transmission line upgrades. The main text of Volume 1 (Sections 1-8) describes information and procedures that are pertinent to the construction of the transmission line upgrades, including regulatory requirements, general Project construction procedures and special plans, overall construction schedule, environmental inspection, public outreach, and processes for reporting to the Council during construction, and for notifying and requesting approval from the Council for changes to the D&M Plan.

  Table 1-1 summarizes each of the Council's D&M Plan requirements, pursuant to RCSA Sections 16-50j-60 through 16-50j-62; Table 1-2 identifies the requirements pertaining to the Project facilities as contained in the Council's May 3, 2016 ruling regarding the Project. For each D&M Plan requirement, Tables 1-1 and 1-2 either identify the location in this D&M Plan where the requirement is addressed or state why the requirement is not relevant to the Project transmission line upgrades.

  Appendices to Volume 1 provide resource- or site-specific construction plans or information regarding the 115-kV transmission line upgrades, as follows:

  - Vegetation Clearing Plan (Appendix A).
  - Vernal Pool Habitat Report (Appendix B)
  - Rare Salamander Habitat Assessment and Field Survey Report (Appendix C)
  - Blue Hills Avenue Laydown Area (Appendix D)

- **Volume 2** includes the approvals, permits, standard practices, and best management practices (BMPs) pertinent to all Project construction activities (both transmission line and substation upgrades). These include:

  - The Council's Declaratory Ruling for the Project (Attachment A).
  - Spill Prevention and Control Plan (Attachment B).
  - Snow Removal and De-Icing Procedures (Attachment C).
  - Eversource's *BMP Manual: Connecticut (Construction and Maintenance Environmental Requirements)* (*BMP Manual*) (Attachment D).
  - Connecticut Department of Energy and Environmental Protection (CT DEEP) General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities (Attachment E).

- **Volume 3** consists of maps, drawings, and other details relevant to the construction of the 115-kV transmission line upgrades, including:

  - Key Map, depicting the route of the 115-kV transmission line upgrades (scale 1"=2,000', U.S. Geological Survey topographic map base);

- Cross-sections depicting the alignment of the 115-kV transmission line upgrades within Eversource's ROWs;

- Mapsheets, at a scale of 1 inch = 100 feet (1"=100') showing the location of the 115-kV transmission line upgrades, on- and off-ROW access roads, and work pads in relation to environmental features and land uses, as well as a summary of the characteristics of each new transmission structure (structure number, type, height, finish, and foundation type);

- Detail sheets that summarize water resource impacts and water resource avoidance and impact minimization measures, provide threatened and endangered species protection measures, wetland invasive species best management practices, vernal pool protection procedures, and select BMPs, including typical erosion and sedimentation controls; and

- Drawings of typical transmission structure configurations, as well as structure foundation and grounding details.

Table 1-1
D&M Plan Directory
Bloomfield to Windsor Upgrades Project
(Compliance with RCSA Sections 16-50j-60, 61 and 62, as amended through September 7, 2012)

R.C.S.A Section	Description	D&M Plan (Section Reference, as Applicable)
16-50j-60	**Requirements for a D&M Plan**	
(a)	**Purpose.** The Council may require the preparation of full or partial D&M Plans for proposed energy facilities, modifications to existing energy facilities, or where the preparation of such a plan would help significantly in balancing the need for adequate and reliable utility services at the lowest reasonable cost to consumers with the need to protect the environment and the ecology of the state.	This D&M Plan applies to the 115-kV line upgrades (DCT separations).
(b)	**When required.** A partial or full D&M plan shall be prepared in accordance with this regulation and shall include the information described in RCSA Sections 16-50j-61 to 16-50j-62, inclusive, for any proposed energy facility for which the Council issues a certificate of environmental compatibility and public need, except where the Council provides otherwise at the time it issues the certificate. Relevant information in the Council's record may be referenced.	This D&M Plan includes all information applicable to the transmission line upgrades.
(c)	**Procedure for preparation**. The D&M plan shall be prepared by the certificate holder or the owner or operator of the proposed facility or modification to an existing facility. The preparer may consult with the staff of the Council to prepare the D&M plan.	This D&M Plan was prepared by Eversource.
(d)	**Timing of plan.** The D&M plan shall be submitted to the Council in one or more sections, and the Council shall approve, modify, or disapprove each section of the plan not later than 60 days after receipt of it. If the Council does not act to approve, modify or disapprove the plan or a section thereof within 60 days after receipt of it, the plan shall be deemed approved. Except as otherwise authorized by the Council, no clearing or construction shall begin prior to approval of applicable sections of the D&M plan by the Council.	This D&M Plan addresses the Council's requirements for the construction of the 115-kV transmission line upgrades except for the list of contractor personnel as specified in Section 16-50j-61(c)(8). Contact information for the prime contractors for the transmission line work will be provided to the Council in a supplemental submission, prior to commencement of construction.
16-50j-61	**Elements of D&M Plan**	
(a)	**Key Map**, 1"=2,000' USGS topographic map	Volume 3

R.C.S.A Section	Description	D&M Plan (Section Reference, as Applicable)
(b)	**Plan Drawings**, 1"=100' or larger, and supporting documents, which shall contain the following information:	Maps and cross-sections are included in Volume 3.
1.	Edges of the proposed site and any existing site contiguous to or crossing the site, portions of the site owned by the company in fee, and the identity of property owners of record of the portions of the site not owned by the company in fee	Volume 3
2.	Public roads and public land crossings or adjoining the site	Volume 3
3.	Approximate location of 50' contours along the site	Volume 3
4.	Probable location, type, and height of the proposed facility and components (including each new transmission structure, position of guys, description of foundations, and locations of any utility or other structures to remain on the site or to be removed)	Volume 3 maps and cross-sections.
5.	Probable points of access to the site, and the route and likely nature of accessways, including alternatives	Volume 3
6.	Edges of existing and proposed clearing areas, the type of proposed clearing along each part of the site, and the location and species identification of vegetation that would remain for aesthetic and wildlife value	Volume 3 maps; Volume 1 Section 3.4 and Appendix A, Vegetation Clearing Plan
7.	Identification of sensitive areas and conditions within and adjoining the site, including but not limited to:	
	A. Wetland and watercourse areas regulated under CGS Chapter 440 and any locations where construction may create drainage problems	Volume 1, Section 5.2; Volume 3
	B. Areas of high erosion potential	Volume 1, Section 5.1; Volume 3
	C. Critical habitats or areas identified as having rare, endangered, or threatened, or special concern plant or animal species listed by the state or federal government	Volume 1,Section 5.4; Volume 3
	D. Location of known underground utilities or resources to be crossed (electric line, fuel line, drainage systems and natural or artificial public or private water resources)	Volume 3
	E. Residences or businesses within or adjoining the site that may be disrupted during construction	Volume 3
	F. Significant environmental, historic and ecological features (significantly large or old trees, buildings, monuments, stone walls or features of local interest)	Volume 1, Sections 5.2, 5.6, 5.10; Volume 3
(c)	**Supplemental Information**	

R.C.S.A Section	Description	D&M Plan (Section Reference, as Applicable)
1.	Plans (if any) to salvage marketable timber, restore habitat and maintain snag trees within or adjoining the site	Volume 1, Section 3.4; Appendix A, Vegetation Clearing Plan
2.	All construction and rehabilitation procedures with reasonable mitigation that shall be taken to protect areas and conditions identified in 7(b), above, including but not limited to:	
	A. Construction techniques at wetland and watercourse crossings	Volume 1, Section 5.2; Volume 2 Attachment D (Eversource *BMP Manual*), Volume 3 maps/detail sheets
	B. S & E control and rehabilitation procedures, consistent with the CT Guideline for Soil Erosion and Sediment Control, as updated and amended for areas of high erosion potential	Volume 1, Section 3, Section 5.1; Volume 2, Attachment D, BMPs; Volume 3
	C. Precautions and all reasonable mitigation measures to be taken in areas within or adjoining the site to minimize any adverse impacts of such actions or modifications to endangered, threatened, or special concern plant or animal species listed by federal or state agencies and critical habitats that are in compliance with federal and state recommended standards and guideline, as amended	Volume 1, Section 5.4, Appendices B and C; Volume 3 maps/detail sheets
	D. Plans for modification and rehabilitation of surface, drainage, and other hydrologic features	Volume 1, Section 5.2; Volume 2, Attachment D, BMPs
	E. Plans for watercourse bank restoration in accordance with Chapter 440 of the C.G.S.	Volume 1, Section 5.2; Volume 2, Attachment D, BMPs; Volume 3 detail sheets
	F. Plans for the protection of historic and archaeological resources with review and comment from a state historic preservation officer of the CT Department of Economic and Community Development (DECD) or its successor agency	Volume 1, Section 5.10 (no cultural resources associated with transmission facility sites)
3.	Plans for the method and type of vegetation clearing and maintenance to be used within or adjacent to the site	Volume 1, Section 3.4 and Appendix A
4.	Location of public recreation areas or activities known to exist or being proposed in or adjacent to the site, together with copies of agreements between the company and public agencies authorizing the public recreation use of the site to the extent of the company's rights thereto.	Volume 1, Section 5.6; Volume 3 maps (Easement copies not included herein)
5.	Plans for ultimate disposal of excess excavated material, stump removal, and periodic maintenance of the site	Volume 1, Section 5.7
6.	Locations of areas where blasting is anticipated	None anticipated; refer to Volume 1, Section 5.15

R.C.S.A Section	Description	D&M Plan (Section Reference, as Applicable)
7.	Rehabilitation plans, including but not limited to reseeding and topsoil restoration	Volume 1, Section 3.4; Volume 2, Attachment D BMPs
8.	Contact information for the personnel of the contractor assigned to the project	To be provided after transmission line contract awards.
9.	Such site-specific information as the CSC may require	Refer to Table 1-2: List of requirements per Petition 1217 Decision and Order and Opinion
(d)	**Notice** A copy, or notice of the filing, of the D&M Plan, or a copy, or notice of the filing of any changes to the D&M Plan, or any section thereof, shall be provided to the service list and the property owner of record, if applicable, at the same time the plan, or any section thereof, is submitted to the CSC	Volume 1, Section 7
(e)	**Changes to the Plan** The CSC may order changes to the D&M plan, including but not limited to vegetative screening, paint color, or fence design at any time during the preparation of the plan	As applicable; refer to Volume 1, Section 7.2 for discussion of Eversource's Change Notice process
16-50j-62	**Supplemental Reporting Requirements**	
(a)	**Site Testing and Staging Areas** The certificate holder, or facility owner or operator, shall provide the CSC with written notice of the location and size of all areas to be accessed or used for site testing or staging areas. If such an area is to be used prior to approval of the D&M plan, the CSC may approve such use on terms as it deems appropriate.	Volume 1, Sections 3.3 and 7.1; Volume 3 identifies work pads for the transmission line construction. No site testing is planned. The locations of additional contractor yards and material staging areas will be identified by the contractor and will be submitted to the Council for review and approval prior to use, pursuant to the Change Notice process described in Section 7.2
(b)	**Notice**	
1.	The certificate holder, or facility owner or operator, shall provide the CSC, in writing with a minimum of two weeks advance notice of the beginning of:	Volume 1, Section 7.1 summarizes notification procedures
	A. Clearing and access work in each successive portion of the site, and	

R.C.S.A Section	Description	D&M Plan (Section Reference, as Applicable)
	B. Facility construction in that same portion	
2.	The certificate holder, or facility owner or operator, shall provide the CSC with advance written notice whenever a significant change of the approved D&M plan is necessary. If advance written notice is impractical, verbal notice shall be provided to the CSC immediately and shall be followed by written notice not later than 48 hours after the verbal notice. Significant changes to the approved D&M plan shall include, but not be limited to, the following:	Volume 1, Section 7.2 includes Eversource's D&M Plan change process
	A. The location of wetland or watercourse crossing	
	B. The location of an accessway or structure in a regulated wetland or watercourse area	
	C. The construction or placement of any temporary structures or equipment	
	D. A change in structure type or location including, but not limited to, towers, guy wires, associated equipment or other facility structures	
	E. Utilization of additional mitigation measure, or elimination of mitigation measures. The CSC or its designee shall promptly review the changes and shall approve, modify, or disapprove the changes in accordance with subsection (d) of Section 16-50j-60 of the RCSA	
3.	The certificate holder, or facility owner or operator, shall provide the CSC with a monthly construction progress report or a construction progress report at intervals determined by the CSC or its designee, indicating changes and deviations from the approved D&M Plan. The CSC may approve changes and deviations, request corrections, or require mitigation measures.	Volume 1, Section 7.3
4.	The certificate holder, or facility owner or operator, shall provide the CSC with written notice of completion of construction and site rehabilitation.	Volume 1, Section 7.1
(c)	**Final Report** The certificate holder, or facility owner or operator, shall provide the CSC with a final report for the facility not later than 180 days after completion of all site construction and site rehabilitation. The report shall identify:	Volume 1, Section 7.3
1.	All agreements with abutters or other property owners regarding special maintenance precautions	
2.	Significant changes of the D&M plan that were required because of property rights of underlying and adjoining owners for other reasons	

R.C.S.A Section	Description	D&M Plan (Section Reference, as Applicable)
3.	The location of construction materials which have been left in place including, but not limited to, culverts, erosion control structures along watercourses and steep slopes, and corduroy roads in regulated wetlands	
4.	The location of areas where special planting and reseeding have been done	
5.	The actual construction cost of the facility, including but not limited to the following costs:	
	A. Clearing and access	
	B. Construction of the facility and associated equipment	
	C. Rehabilitation; and	
	D. Property acquisition for the site or access to the site	
(d)	**Protective Order** The certificate holder, or facility owner or operator, may file a motion for protective order pertaining to commercial or financial information related to the site or access to the site.	N/A

Table 1-2
D&M Plan Directory of Docket No. 1217 Petition Requirements
Bloomfield to Windsor Upgrades Project: Transmission Line and Double Circuit Separation

Condition or Page Number	Description	D&M Plan (Section Reference, as Applicable)
Condition Number	**Decision and Order**	
(1)	The Petitioner shall prepare a Development and Management Plan (D&M Plan) for this Project in compliance with Sections 16-50j-60 through 16-50j-62 of the Regulations of Connecticut State Agencies (RCSA). The D&M Plan shall be served on the Towns of Bloomfield and Windsor for comment and submitted to and approved by the Council prior to the commencement of construction and shall include:	This D&M Plan addresses the transmission line upgrades portion of the Project. A draft of the Plan was provided to and discussed with representatives of the Town of Bloomfield. A final version of the Plan also will be provided to the Town.
	a. Statement that transmission structures located within the 100-year flood zone are designed to withstand inundation	This commitment is included in Section 5.2.3.
	b. Statement that Petitioner shall implement protective measures for Natural Diversity Database wildlife in consultation with the Connecticut Department of Energy and Environmental Protection (CT DEEP)	This commitment is included in Section 5.4.
	c. Any additional staging area locations not identified in the Petition	Volume 1, Appendix D describes the proposed Blue Hills Avenue laydown area, located in the Town of Bloomfield. The Volume 3 maps identify other staging areas identified for the Project to date. Additional staging areas, if any, will be provided to the Council for review in accordance with the D&M Plan Change procedures identified in Section 7.2.
	d. Timing of work in the vicinity of Wintonbury Hills Golf Course	Refer to Volume 1, Section 5.6. Work at the golf course will be conducted between Thanksgiving and April 1.
	e. Consideration of limited landscaping along the north side of the expanded area of the Rood Avenue Substation to improve aesthetics as viewed from Sunnyfield Drive	Refer to the Substations D&M Plan
	f. Vernal pool study consistent with Calhoun and Klemens 2002 Best Development Practices	Volume 1, Appendix B

Condition or Page Number	Description	D&M Plan (Section Reference, as Applicable)
	g. Wildlife analysis for the blue spotted salamander and marbled salamander with protective measures as applicable	Volume 1, Appendix C. (Note: No blue-spotted salamander egg masses were located during surveys of the ROWs in spring 2015 or spring 2016. Larvae surveys for blue-spotted salamanders occurred during June 2016. Marbled salamanders were not identified as being located within the Project area).
(2)	Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed within three years from the date of the mailing of the Council's decision, this decision shall be void, and the facility owner/operator shall dismantle the facility and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The facility owner/operator shall provide written notice to the Executive Director of any schedule changes as soon as practical.	N/A (see Section 4, Schedule, and Section 7, Reporting)
(3)	Any request for extension of the time period to fully construct the facility shall be filed with the Council not later than 60 days prior to the expiration date of this decision and shall be served on all parties and intervenors, if applicable, and the towns of Bloomfield and Windsor.	N/A
(4)	Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed.	See Section 7
(5)	The facility owner/operator shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under CGS §16-50v.	N/A
(6)	This Declaratory Ruling may be transferred, provided facility owner / operator / transferor is current with payments to the Council for annual assessments and invoices under CGS §16-50v, and the transferee provides written confirmation that the transferee agrees to comply with the terms, limitations, and conditions contained in the Declaratory Ruling, including timely payments to the Council for annual assessments and invoices under CGS §16-50v; and	N/A
(7)	If the facility owner/operator is a wholly owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the facility within 30 days of the sale and/or transfer.	N/A

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2. REGULATORY APPROVALS AND CONSULTATIONS

2.1 REGULATORY APPROVALS AND REQUIREMENTS

This D&M Plan conforms to the specifications of RCSA Sections 16-50j-60 through 16-50j-62 (*Requirements for a D&M Plan, Elements of a D&M Plan, Reporting Requirements*); incorporates Eversource's commitments as contained in Petition No. 1217; and reflects adherence to the conditions of the Council's ruling regarding the Project and other relevant regulatory requirements.

To construct the Project transmission line upgrades, various permits and approvals are required (refer to Table 2-1). For activities within regulated water resource areas (wetlands and watercourses), authorizations are required from the U.S. Army Corps of Engineers (USACE) New England District and the Connecticut Department of Energy and Environmental Protection (CT DEEP).

However, for the Project activities that will occur within upland areas, no authorizations pertaining to wetlands or watercourses are required from the USACE or the CT DEEP. Consequently, the controlling regulatory approvals for these upland construction activities are:

- This D&M Plan, as required by the Council pursuant to its ruling regarding Petition No. 1217 for the Project (see Volume 2, Attachment A); and
- The CT DEEP *General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities*, which applies to the management of the discharge of stormwater and dewatering wastewaters from construction sites.

2.2 CONSULTATIONS

During Project planning, Eversource consulted with representatives from the towns of Bloomfield and Windsor, as well as with representatives of various state and federal agencies, including the USACE, New England District; U.S. Fish and Wildlife Service (USFWS); CT DEEP; State Historic Preservation Office (SHPO), and Connecticut Department of Transportation (ConnDOT). In addition, Eversource coordinated with property owners along the transmission line ROWs.

During consultations with municipal representatives, Eversource provided information regarding the D&M Plan process, the planned transmission line upgrades, and Eversource's outreach procedures and points-of-contact prior to and during construction. In accordance with Condition 1 of the Council's Declaratory Ruling, Eversource also issued the draft transmission line D&M Plan to the Town of Bloomfield, and met with town representatives to review the plan and gather comments. Additional information regarding Eversource's public outreach process is included in Section 8.

Eversource consulted with federal and state agencies both as part of permitting efforts and as part of the preparation of resource-specific protection measures included in this D&M Plan. For example, Eversource coordinated with the CT DEEP and the USFWS regarding threatened and endangered species. The results

of Eversource's consultations with CT DEEP are reviewed in Section 5 of this Volume and reflected on the Project Plans included in Volume 3. In addition, as specified in the D&M Plan requirements, RCSA Section 16-50j-61(c)(2)(F), Eversource consulted with representatives of the SHPO regarding the potential effects of the Project on archaeological or historic resources and the measures to mitigate such effects, as necessary.

Table 2-1
Permits, Reviews, and Approvals Required for the Project

Agency	Certificate, Permit, Review, Approval or Confirmation	Activity Regulated
FEDERAL		
USACE, New England District	Section 404 Clean Water Act (CWA) – Category 2 authorization (Permit requires conformance with National Historic Preservation Act (NHPA), Section 106; see SHPO, below)	Discharge of dredge or fill material into waters of the U.S. (wetlands or watercourses)
U.S. Fish and Wildlife Service	Coordinates with USACE regarding endangered or threatened species	Activities that may affect federally-listed endangered or threatened species
U.S. Environmental Protection Agency	Provides input to USACE permit application review	Activities that may affect water, air, or other resources
CONNECTICUT		
Connecticut Siting Council	Declaratory Ruling (Docket 1217, refer to Volume 2, Attachment A) D&M Plan approvals	General transmission line siting, construction, environmental compatibility, safety, and operation / maintenance and ROW management procedures
CT DEEP	401 Water Quality Certification	Conformance to Section 401 of the CWA
	Dam Construction Permit	Construction in proximity to regulated dams
	General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (refer to Volume 2, Attachment E)	Stormwater management during construction
	Threatened, Endangered, and Special Concern Species	Rare species coordination and mitigation
CT DEEP Public Utilities Regulatory Authority	Approval pursuant to CGS Section 16-243	Method & Manner of Construction Approval to Energize Line
SHPO	Approval of proposed Project consistency with the NHPA; comments during Council and USACE processes	Construction and operation activities that may affect archaeological or historic resources (Note: investigations revealed that no cultural sites will be affected by transmission line facilities)
Connecticut Department of Transportation (ConnDOT)	Encroachment permits	Transmission line crossings of state highways

3. GENERAL CONSTRUCTION PROCEDURES

This section describes the typical construction procedures and plans for the Project's transmission line upgrades. These modifications will involve a sequential, phased, construction approach. Section 3.1.1 summarizes the modifications required for the separation of the 1777/1779 and 1751/1777 transmission lines. Sections 3.2, 3.3, 3.4, and 3.5 describe construction activities and vegetation clearing activities that will occur along the transmission ROWs.

Additional special construction procedures, plans, or mitigation measures will be implemented to avoid or minimize impacts to the public, environmental resources (e.g., water resources; vernal pools; threatened, endangered and special concern species), and public recreational areas. Such measures are described in Section 5. The Volume 3 maps and detail sheets includes site-specific information regarding the transmission line structure characteristics (i.e., structure number, type, height, finish, and foundation), environmental features along the ROWs, property owners, construction work areas, and the locations where special resource protection measures will be implemented.

3.1 SUMMARY OF TRANSMISSION FACILITY UPGRADES

Separation of the 1777/1779 Lines between Bloomfield Substation and Bloomfield Junction (1.6 miles)

Project components between Bloomfield Substation and Bloomfield Junction are described below.

a) Install 16 galvanized single-circuit steel monopoles and two three-pole galvanized steel poles as required to separate the existing 1777/1779 Lines that are currently supported on the same structures. The 1779 Line will be relocated to the new structure and the 1777 line will remain on the existing lattice tower structures. The new structures will be installed adjacent to the existing 1777/1779 double-circuit lattice structures within Eversource's existing ROW. The new galvanized steel structures will be placed approximately 35 feet laterally to the east of, and staggered up to 25 feet longitudinally from, the existing structure locations.

   Direct-embedded structures will be utilized for all tangent structures that will not be located within a floodplain. Self-supported structures on drilled shaft foundations will be used for all angle structures and structures located in the floodplain.

   The heights of the existing 1777/1779 lattice steel structures range from approximately 80 to 100 feet above ground level. The new structures will be approximately 5 to 10 feet taller than the existing structures. The tallest new structure will be approximately 105 feet above ground level (refer to the Volume 3 maps for the specific height of each new structure). The increase in height is to comply with the conductor-to-ground clearance requirements and phase-to-phase clearance requirements of the 2012 National Electric Safety Code (NESC), and the Company's Overhead Transmission Line Standards.

b) Install new 1272-kcmil 54/19 aluminum conductor with steel support (ACSS) on the monopoles that will support the 1779 Line.

c) Relocate the optical ground wire (OPGW) from the existing 1779 line (i.e., on the 1777/1779 DCT) to the new 1779 Line monopoles.

d) Remove the 1779 Line 556-kcmil aluminum-conductor steel-reinforced cable (ACSR) and the associated conductor and shield wire arms from the existing double-circuit lattice structure.

Separation of the 1751/1777 Line between Bloomfield Junction and North Bloomfield Substation (5.3 miles)

The Project modifications to the 1751/1777 lines between Bloomfield Junction and North Bloomfield Substation will include the following:

a) Install 49 single-circuit weathering steel monopoles to separate the existing 1751/1777 lines that are currently supported on common DCT structures. The 1777 Line will be relocated to the new structures and the 1751 Line will remain on the existing double-circuit steel structures (with arms removed). The new weathering steel monopoles will be installed approximately 5 feet laterally to the east of, and staggered up to 20 feet longitudinally from, the existing 1751/1777 double-circuit steel poles within the existing Eversource ROW.

   Direct-embedded structures will be utilized for all tangent structures that will not be located within a floodplain. Self-supported structures on drilled shaft foundations will be used for all angle structures and structures located in floodplains.

   Along the existing DCT 1751/1777 line, the existing structures range in height from approximately 75 to 105 feet above ground level. The new structures will be approximately 5 to 20 feet taller than the existing double-circuit steel pole structures; however, the tallest new structure will be approximately 105 feet above ground level. The difference in heights is due to varying ground elevations along the ROW. (Refer to the Volume 3 maps for specific heights of the new structures.)

b) At Bloomfield Junction, replace two 115-kV double-circuit horizontal weathering steel lattice towers (Structures 3115 and 3116 on the 1751/1777 lines) with four three-pole weathering-steel structures on new drilled shaft foundations. These existing structures are 60 feet above ground level; the new structures will be approximately 20 feet taller than the existing structures. The increase in height will provide the necessary NESC safety conductor-to-conductor crossing clearances at Bloomfield Junction.

c) At Bloomfield Junction, replace two existing 115-kV direct-embedded single-circuit guyed wood H-frame structures (Structures 10166 and 10168 on the 1751 Line) with two new direct-embedded single-circuit guyed weathering steel H-frame structures. The new structures will be installed immediately adjacent to the existing structures. These structure replacements are required because the existing structures are not adequate to support the change in line angle resulting from the separation of the 1777/1751 lines at Bloomfield Junction. The existing structure heights are 36 feet and 60 feet above ground level; the new structures will typically be approximately 15 feet taller than the existing structures with the tallest new structure approximately 70 feet above ground level. The increase in height will provide the necessary NESC safety conductor-to-ground clearances.

d) Replace 0.15 mile of the existing 1272-kcmil 45/7 ACSR with 1272-kcmil 54/19 ACSS conductor on the 1751 and 1777 lines (between Structures 3116-1 to 3115-1, 3116 to 3115 and 3116 to 10166) at Bloomfield Junction. This conductor will be required to support the Project modifications at Bloomfield Junction.

e) Remove conductor and shield wire arms from the existing double-circuit steel monopole structures.

f) Relocate 5.3 miles of the existing 1777 Line conductor and OPGW from the existing double-circuit steel poles to the new steel monopoles.

3.2 CONSTRUCTION MANAGEMENT AND CONTACT INFORMATION

Eversource expects to award contracts for the transmission line work in the fall of 2016. After contract awards, but prior to the commencement of the prime contractor's on-site work, Eversource will provide the Council with contact information for the prime construction contractor(s), consisting of the name of the firm, name of primary contact, corporate address, telephone number, and e-mail.

The Project construction will be overseen by Eversource personnel or Eversource representatives. Such personnel will monitor construction activities, including adherence to safety, engineering and permit and approval requirements.

3.3 CONSTRUCTION FIELD OFFICES, CONTRACTOR YARDS, AND STAGING AREAS

To support the transmission line work, Eversource plans to use its fee-owned properties at Bloomfield and North Bloomfield substations as staging area locations. The proposed staging areas will be used to store construction materials, equipment, tools, and supplies (including conductors, insulators, hardware, poles and construction mats) for the Project. Office trailers may be located at the staging areas, which also may be used for parking (both by construction crew members for parking personal vehicles, as well as for parking construction vehicles and equipment) and for performing minor maintenance on construction equipment. In addition, transmission line components removed during the work (conductor, hardware and insulators) may be temporarily accumulated and stored at staging areas prior to off-site removal and/or disposal. The Volume 3 maps identify staging area locations on Eversource's substation properties.

In addition to the planned staging areas at its substation properties and the use of small staging areas within its ROWs for short-term storage of structures and materials (e.g., at work pads; refer to Volume 3, Mapsheet 11), Eversource has entered into a lease agreement to use an 8-acre privately-owned parcel, located at 885 Blue Hills Avenue in the Town of Bloomfield, as a staging area for the Project (Appendix D includes details regarding the location and characteristics of this proposed staging area). This proposed staging area site is presently vacant, but was formerly developed and used as a drive-in movie theater and as a gardening center with green houses. The parcel does not include any cultural resources, wetlands, watercourses, or habitat for federal- or state-listed species. The location and approximate boundaries of the staging area are illustrated on the maps included in Appendix D. Eversource proposes to use this staging area for the same general purposes as described above for the staging areas on the substation sites.

The construction contractor(s) for the transmission line upgrade work will be responsible for establishing the Project staging areas (including setting up temporary field office trailers, designating areas for equipment / vehicle parking, materials, etc.). If a contractor identifies a need for any additional staging area or support sites not identified in this D&M Plan, Eversource will first assess each proposed location and, if acceptable, will submit the proposed construction support area to the Council staff for review and approval prior to use, in accordance with the Change Notice Approval Process described in Section 7.2.

3.4 CONSTRUCTION PROCEDURES: TRANSMISSION LINE UPGRADES

3.4.1 General Construction Sequence

Eversource will complete the transmission line upgrades in several stages, some overlapping in time. Further, the construction approach for the separation of the 1777/1779 and 1751/1777 lines will differ in some respects. Overall, however, the following summarizes the general sequence of construction activities for the DCT separation work:

- Prepare material staging sites (e.g., storage, staging and laydown areas) to support the construction effort.
- Establish construction field office area(s), typically including space for an office trailer, equipment storage and maintenance, sanitary facilities, and parking.
- Survey and stake the ROW boundaries (where necessary), vegetation clearing boundaries, and new structure locations.
- Mark the boundaries of previously delineated wetland and watercourse areas, including vernal pools.
- Mark any other environmentally-sensitive areas to be avoided or otherwise protected (e.g., habitats for threatened, endangered, or special concern species).
- Identify other areas, as appropriate, where special construction considerations will apply (e.g., areas that require particular construction treatment pursuant to landowner agreements).
- Perform vegetation clearing.
- Construct new access roads or improve existing roads. Prepare level work pads as necessary at new structure sites and conductor pulling sites (and, possibly, guard structure sites).
- Install erosion and sedimentation controls.
- Construct foundations and erect/assemble new structures.
- Install shield wires and conductors on the relocated 1779 and 1777 lines.
- Install structure grounding systems, including counterpoise (where needed).
- Remove conductor and shield wire arms from the existing double-circuit structures (1751/1777 lines only). All removed conductor that is not reused will be recycled.
- Remove existing structures to be replaced (e.g., at and in the vicinity of Bloomfield Junction, along the ROW near North Bloomfield Substation).
- Remove temporary roads and construction debris and restore disturbed sites.
- Maintain temporary erosion and sediment controls until vegetation is re-established or disturbed areas are otherwise stabilized.

3.4.2 Clearing and Vegetation Removal

Vegetation removal, the first step in the preparation of the ROWs for construction, will be performed as described in the *Vegetation Clearing Plan* (refer to Appendix A). The Volume 3 maps identify vegetation clearing limits for construction along the ROWs. Within these limits, tall-growing tree species will be removed to meet the established minimum vegetation clearances from the conductors along the relocated 1779 and 1777 lines. A total of approximately 7 acres of upland forest habitat and 1.1 acres of forested wetlands will be cleared, and converted to scrub-shrub within the ROWs. Along presently un-managed portions of the ROWs, the vegetation removal limits represent the "new edge of ROW vegetation management" as illustrated on the cross-sections in Volume 3.

Within the vegetation clearing limits for construction, other types of vegetation (e.g., shrubland) also will be removed as needed for transmission line construction. Some clearing thus will be performed within presently managed portions of the ROWs. Outside of the vegetation clearing limits shown on the Volume 3 maps, trees and herbaceous or low-growing scrub/shrub species will only be cleared as needed to facilitate Project construction activities along on- and off-ROW access roads. Further, after initial vegetation removal (particularly after the new conductors are installed), trees adjacent to cleared areas may need to be selectively removed or pruned to achieve clearances from conductors.

Temporary erosion and sedimentation controls may be installed before, during, or after vegetation removal, depending on site-specific characteristics. (Refer to the typical drawings of erosion and sedimentation control measures in the *BMP Manual* [Volume 2, Attachment D] and in Volume 3.)

3.4.3 Access Roads and Work Pads

3.4.3.1 Access Roads

On-ROW access roads will provide the principal means for equipment and material to reach transmission line structure locations. The locations of existing and planned on-ROW access roads are illustrated on the Volume 3 maps.

In some areas, to avoid traversing along the ROWs over rugged terrain or through sensitive environmental resources, access roads to the ROWs will be developed across private property or across land owned by Eversource ("off-ROW access roads"). The Volume 3 maps illustrate the off-ROW access roads to be used during construction and identify the property owner, parcel (line list) number, and the public road from which the road will provide access to the ROW.

To support the heavy construction equipment required to install the new 115-kV transmission line structures and foundations and to complete the DCT separation work, all access roads (on- or off-ROW) must be sufficiently wide, with a stable base and grades that typically must be 10% or less. Access roads will have a typical 16-to-20-foot-wide travel way and, overall, a 20-to-25-foot-wide footprint (including road shoulders). However, access road widths will vary depending on site-specific conditions (principally slope and presence of wetlands) and on factors such as the amount of grading (cutting and filling) required and on whether a particular section of road must accommodate equipment turning radii and/or equipment passing/turn-out locations.

Eversource's existing access roads for maintaining the lines that presently occupy the ROW will be upgraded and widened, as necessary, for the Project construction. Access road improvements typically will include removing adjacent vegetation and widening roads as needed to provide a minimal travel width (additional width will be necessary as discussed above).

Access roads in upland areas will likely be improved by installing processed rock and/or gravel. In some locations, particularly on steep slopes and at intersections with public roads, asphalt millings may be used to improve road stability and vehicle traction. Eversource also will require the construction contractors to use the BMPs as warranted by site-specific conditions to maintain access road stability and minimize the potential for erosion and sedimentation.

Where access roads traverse streams or wetlands, special construction procedures will include the use of timber mats, or equivalent (refer to Section 5.2 and Volume 3, Detail Sheets). Within and near wetlands and watercourses, erosion and sedimentation controls will be installed as necessary to avoid or minimize impacts during the improvement, development, and subsequent use of access roads. (Refer to the typical drawings of erosion and sedimentation control measures in the *BMP Manual* [Volume 2, Attachment D] and in Volume 3.)

Access roads in uplands will be left in place to facilitate future transmission line maintenance, unless directed to be removed by the landowner. Access roads located in active agricultural lands or within manicured or otherwise improved residential areas will typically be removed unless the landowner requests that they remain in place.

The Project will not require any permanent fill in wetlands or streams as a result of access road construction or improvements. If, during Project construction, Eversource determines that permanent access is needed across water resources, additional approvals from the involved regulatory agencies would be required.

The locations where permanent access roads will remain will be listed in the end-of-Project report to the Council (refer to Section 7).

If not already completed during the vegetation clearing phase, during this phase of construction, flagging, exclusion fencing, or other types of boundary markings will typically be installed, if necessary, to demarcate areas of restricted construction access or environmental resource sensitivity.

It is likely that the width of existing openings (barways) in stone walls will have to be increased when improvements to existing access roads are made for construction; this additional disturbance will be limited to only what is necessary to support construction. Similarly, when new openings in stone walls are required to support the construction of new roads, the width of the opening will be limited to only what is necessary, and to the extent possible a previously disturbed portion of the wall will be chosen for the new opening. As necessary the displaced stones will be stockpiled in close proximity to the wall during construction. If requested by a landowner the disturbed portion of the wall will be rebuilt during the restoration phase of the Project.

During construction, at points where on or off-ROW access roads intersect with public roads, Eversource's construction contractors will install signs as needed along the public roads specifying "construction work zone / entrance ahead" (or equivalent). Signs may also be installed at the access road entrances specifying that the roads are for construction purposes and are restricted from public use. In addition, where on- or off-ROW access roads intersect with public roads, rock aprons or equivalent will be installed to minimize tracking of dirt from the access road onto the public road as a result of construction vehicle movements. Public roads in the vicinity of access roads may also be periodically swept to remove dirt that is tracked from construction activities.

After the completion of Project construction, the ROWs will be monitored, pursuant to Eversource's General Stormwater Permit from CT DEEP (refer to Volume 2, Attachment E), until restoration is deemed to be successful, which typically is defined as suitable revegetation or other stabilization of areas affected by construction.

3.4.3.2 Work Pads

Work pads will be required at each new transmission line structure site, as well as at conductor and OPGW pulling sites and at locations where temporary guard structures may be erected or boom trucks will be positioned during conductor installation. These work pad locations are depicted on the Volume 3 maps.[1]

At the site of each new transmission line structure, a work pad will be required to stage structure components for final on-site assembly and to provide a safe, level base for the construction equipment used to install foundations and erect the structure. Typical work pads will be approximately 100 by 100 feet along the 1777/1779 DCT split and approximately 120 by 80 feet along the 1751/1777 DCT split. At Bloomfield Junction, a work pad with dimensions of approximately 200 by 400 feet will be required to accommodate both the conductor pulling and the structure replacements.

A typical (upland) installation of a work pad at a structure location involves several steps, beginning with the removal of vegetation, if necessary. The work pad site then will be graded to create a level work area and, if necessary, the upper 3 to 6 inches of topsoil (which is typically unsuitable to support the necessary construction activities) will be removed. The topsoil will be temporarily stockpiled within the ROW near the work pad. A rock base, which allows drainage, will be layered on top of filter fabric (if used). Additional layers of rock with dirt/rock fines will typically be placed directly over this rock base. Finally, a roller typically will be used to flatten and compact the pad.

Temporary guard structures or boom trucks with "bat wings" will be placed at road and other crossings during conductor and OPGW installation. These temporary guard structures or boom trucks may require separate work pads of approximately 50 feet by 25 feet[2], with an associated 20-foot-wide access road.

[1] Should Eversource's construction contractor determine that other work pads are required for the Project, Eversource will notify the Council pursuant to the D&M Plan Change Notice process described in Section 7.

[2] Work pads for parking boom trucks used in the conductor/wire stringing process may require less space. Boom trucks also may be parked on paved roads/road shoulders, depending on site-specific conditions.

Potential guard structure work pad locations, where separate from structure work pads, are illustrated on the Volume 3 maps.

In areas where work pads must be located in wetlands, timber mats or equivalent will be used to construct the pads.

Upon completion of the transmission line upgrades, work pads at structure sites in uplands will remain in place, unless directed to be removed by the landowner. Where work pads remain in place, topsoil stripped from beneath the work pad and stockpiled nearby also typically would remain in place or be spread over nearby upland areas of the ROW and re-seeded.

Work pads located in active agricultural lands or within manicured or otherwise improved residential, areas will typically be removed unless the landowner requests that they remain in place. In locations where gravel work pads must be removed, the rock base and fabric materials will be excavated and removed for appropriate off-site disposal or re-use. Stockpiled topsoil would be re-spread within the pad area and re-seeded.

All work pads or portions of work pads in wetlands will be removed and the affected wetlands restored, pursuant to Project permits and approvals. Guard structure pads, if used, also will be removed.

Stone walls will only be disturbed when constructing work pads if it is absolutely necessary. Stones displaced during the construction of work pads will be stockpiled in close proximity to the wall during construction. If requested by a landowner, the disturbed portion of the wall will be rebuilt during the restoration phase of the Project.

3.4.4 Structure Installation

3.4.4.1 Foundation Types and Excavation

The new 115-kV transmission line structures for the DCT separations will be either direct embedded or drilled shaft foundations. The tangent structures will typically be direct embedded. Angle and deadend structures will typically have a drilled shaft foundation. The Volume 3 maps identify the foundation type for each new transmission line structure.

Excavations for structure foundations are expected to be accomplished using mechanical excavators (drill rigs) and pneumatic hammers. During non-working hours, barricades will be placed around and on top of open foundation excavations for structures.

Based on the results of borings taken at the new transmission line structure locations, blasting is not expected to be required for the DCT transmission line upgrades. If blasting is required, a controlled drilling and blasting plan will be developed by a certified blasting contractor in compliance with state and local regulations. Section 5.15 includes the basic elements of such a plan. Nearby residents would be contacted in advance of the blasting, and pre-blast surveys would be performed as appropriate. In the unlikely event that there is damage to a property as a result of blasting, Eversource will compensate the property owner for the damage.

Excavated material will either be reused on-site or disposed of off-site in accordance with standard Eversource specifications and applicable regulatory requirements.

If groundwater is encountered in excavations, the water will be pumped from the excavated area and discharged in accordance with applicable requirements. The water may be discharged on-site into an appropriate sediment control basin or into a dewatering bag; pumped into a temporary fractionization (frac) tank and then discharged into the municipal stormwater system; or pumped into a tanker truck for disposal at appropriate wastewater treatment facilities. Residual silt/sediment collected at the bottom of the frac tanks or other controls will be disposed in appropriate upland areas within the ROWs (i.e., not in protected resource areas) or at an appropriately designated disposal facility. Where the ROWs intersect public roads containing stormwater systems, catch-basin inlet protection will be installed if needed to block sedimentation or construction debris from entering storm sewers.

3.4.4.2 Structure Placement

Structures and associated hardware will be delivered to work pads in sections, then assembled and installed with a crane. Insulators and conductor pulling blocks will be installed on most structures at this time.

3.4.4.3 Structure Grounding

In addition to the natural grounding of the transmission line structures that is provided by their foundation contacts with earth, a ground ring and ground rods will be buried around each foundation (refer to Volume 3, Detail Sheet 10). The ground ring will be installed after the completion of the foundation and the installation of the structure, but before shield wires are installed. The need for and location of counterpoise or additional ground rods (forms of supplemental grounding for transmission line structures) will be determined based on soil resistivity and/or footing resistance testing, which will be performed as part of the construction process.

Where required, counterpoise wires will extend longitudinally from the ground rings around the transmission line structures. Small equipment (e.g., a ditch witch, small excavator, or equivalent) will typically be used to bury the counterpoise wires; the small equipment will excavate a narrow (approximately 12 inches wide) trench, into which the counterpoise wire will be fed. Ground rods, which may be used in conjunction with counterpoise, will typically be buried between or near the ground rings.

3.4.5 Conductor Installation

The installation of the overhead line conductors and shield wires for the separated 1777 and 1779 lines will require the use of pulling and tensioning equipment, and reels of conductor, which will be positioned at pre-determined locations along the ROWs at typical intervals of 1 to 3 miles. It is not anticipated that separate pulling pads will be required for the Project; all pulling activities will occur at the construction pads depicted on the plans in Volume 3. Helicopters may be used to install the initial pulling lines at the commencement of the conductor shield wire pulling process.

The conductors will be pulled under tension to avoid contacting the ground and other objects. The remaining insulators and hardware will then be installed at angle and deadend structures. Finally, in

accordance with industry standards and design specifications, the conductors and shield wires will be pulled to their design tensions and attached to the hardware. Linemen in bucket trucks will perform this operation.

3.4.6 Structure and Conductor/Hardware Removal and Replacement

Along the 5.3-mile ROW segment occupied by the 1751/1777 DCT lines, Eversource will replace four existing structures (Structure Nos. 3115 and 3116 on the 1751/1777 lines and Structures 10166 and 10168 on the 1751 Line). The four new structures will be installed as described in Section 3.4.

Also along the 1751/1777 line ROW, the existing 1777 Line conductor and OPGW will be relocated from the existing DCT structures to the new 1777 Line structures. In addition, approximately 0.15 mile of conductor will be replaced (ACSR to ACSS) on the 1751 and 1777 line span (between Structure Nos. 3116-1 to 3115-1, 3116 to 3115, and 3116 to 10166).

As part of the separation of the 1777/1779 lines along the 1.6-mile ROW segment between Bloomfield Substation and Bloomfield Junction, Eversource will remove the existing 556-kcmil ACSR 1779 Line conductors and associated shield wire and arms from the 1779 Line portion of the existing DCT structures. New 115-kV line conductor (1272-kcmil 54/19 ACSS) will be installed on the new 1779 Line structures; the existing 1779 Line OPGW will be relocated to the new 1779 Line structures.

Eversource will recycle or otherwise properly dispose of the four existing structures and all miscellaneous hardware, components, conductors, and shield wire removed as part of the Project.

3.4.7 Cleanup and Restoration

ROW cleanup and restoration activities will include the removal of construction debris, signs, flagging, fencing, temporary access roads, and temporary work pads. Areas affected by construction will be re-graded as practical and stabilized using revegetation or other measures.

Materials used in temporary access road and work-pad construction, as well as other construction debris, will be removed from the ROW. Such materials will either be properly disposed of or otherwise re-purposed.

In locations where access roads and work pads will not remain in place, areas affected by construction generally will be re-graded (back-bladed) or otherwise restored to approximate preconstruction contours, where practical. However, along portions of the ROWs that traverse steep slopes, some areas affected by construction activities cannot be fully restored to original contours. In such situations, localized topographic contours will be modified and the affected areas will be stabilized as warranted by site-specific conditions.

In wetlands and at watercourses, temporary crossings will be removed and the affected areas re-graded to match the contours of areas outside of the construction work zone, to the extent applicable.

After final grading, upland areas affected by construction will be seeded with appropriate seed mixes and fertilized as appropriate. Seed mix(es) will be selected by Eversource to provide a quick vegetative cover

until vegetation recolonizes the ROWs naturally (refer to Section 5 of Eversource's *BMP Manual* [Volume 2, Attachment D]).

In most locations, native vegetative communities are expected to re-establish dominance along the ROWs. Supplemental erosion and sedimentation controls (e.g., erosion control blankets, mulch) will be used as appropriate based on site-specific conditions and the time-of-year in which final grading is performed. In some areas, permanent erosion and sedimentation controls, such as water diversion bars or crushed stone, may be installed as appropriate.

Wetland areas affected by construction may be stabilized with annual rye grass, a wetland seed mix, or an equivalent mix (40 pounds/acre, unless standing water is present), which will serve to provide a temporary vegetative cover until wetland species become reestablished. No fertilizer, lime, or mulch will be applied in wetlands unless specified by the USACE or CT DEEP regulatory approvals for the Project.

Temporary erosion and sedimentation controls will be left in place and maintained until final stabilization is achieved. Steep areas may be stabilized with bio-degradable, pre-made erosion and sedimentation control fabric containing seed, mulch, and fertilizer, or the equivalent.

Stone walls affected by construction will be rebuilt by Eversource's construction contractors, if required by landowner agreements. Flagging (or equivalent markers) denoting wetlands, streams, and other environmentally sensitive resource avoidance or protection areas will be maintained (and reflagged or marked, as needed) typically until the completion of ROW restoration activities.

Restoration typically will be deemed successful based on the effectiveness of stabilization measures as defined in accordance with Project-specific permit and certificate requirements. Based on the results of post-construction inspections of ROW stabilization, Eversource will determine the appropriate time frame for removing temporary erosion controls.

Within the areas affected by temporary construction activities, vegetative species compatible with the use of the ROWs for transmission line purposes are expected to regenerate naturally over time. Eversource will promote the re-growth of desirable species by continuing to implement its integrated vegetation management program, which involves the use of practices to control tall-growing trees, and where practicable, undesirable invasive species, thereby enabling native plants to dominate the ROWs. Vegetation management practices along the ROWs also will conform to Project-specific conditions regarding habitat restoration and enhancement as may be included in approvals from the CT DEEP and USACE.

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4. CONSTRUCTION SCHEDULE, OUTAGES, AND WORK HOURS

4.1 CONSTRUCTION SCHEDULE, INCLUDING OUTAGES

The 1777/1779 and 1751/1777 transmission line upgrade work is scheduled to commence in the fourth quarter of 2016 and to be completed in the fourth quarter of 2017. Some Project mobilization activities may occur in the third quarter 2016, and some ROW restoration / final stabilization work could extend into 2018.

As currently planned, the general schedule for the construction of the DCT 115-kV transmission line upgrades is as follows:

General Construction Dates*	Transmission Line Upgrades Construction Activity
Quarter 4, 2016	Construction contracts awarded; establish material laydown yards and field offices, begin receiving materials. Contractor mobilization, commence vegetation clearing, access road and work pad installation.
Quarter 4, 2016 – Quarter 4, 2017	Perform construction (vegetation removal, access road/work pad installation, structure foundations, structure installation, conductor installation, ROW clean-up and restoration**, etc.), as summarized in Section 3
Quarter 4, 2017 – Quarter 2, 2018	Line testing, energization, ROW cleanup and restoration. Final ROW revegetation and verification of final stabilization pursuant to regulatory requirements could extend into Quarter 2, 2018)

* Construction schedule is dependent on the receipt of D&M Plan approval from the Council and the issuance of the CT DEEP Section 401 water quality certification and the USACE Section 404 permit. Schedule may change in accordance with receipt of these approvals, as well as on approved outage schedules.

**Where feasible, restoration may begin on some portions of the ROWs when line installation work is completed.

Outages, which will be coordinated with and must be approved by the Connecticut Valley Exchange (CONVEX), will be required for both line upgrades. During the separation of the 1751/1777 line, the 1751 Line will be removed from service during most of the upgrade work (some vegetation clearing may be performed prior to the outage). For the 1777/1779 DCT separation work, outages will be required after the new structures and conductors are installed and the new 1779 Line segment is ready for cut-over. Other outages may be required. All outages will be scheduled and performed in accordance with CONVEX approvals.

4.2 WORK HOURS

Construction work hours will typically be between 7:00 AM and 7:00 PM, six days per week (Monday through Saturday). During these hours, construction will generate noise, which will vary depending on the type of activity performed. Construction workers may arrive for work and leave work outside of these times.

Typical Construction Work Window: Monday-Saturday 7:00 AM-7:00 PM

However, certain activities, such as those that must be performed during CONVEX-approved outages, will involve work during non-typical hours, in some cases on a continuous basis (in excess of 12 hours) and/or on Sundays. The performance of these activities during non-typical work hours can be critical for completing the required tasks within the allowed outage durations and returning equipment to service as expeditiously as possible.

In addition, during winter, snow plowing and de-icing activities (which will be performed pursuant to the plan included in Volume 2, Attachment C) will typically commence, when necessary, prior to 7:00 AM to assure a safe environment for construction personnel prior to the start of the work day.

5. SPECIAL CONSTRUCTION PROTOCOLS AND PROCEDURES

This section provides resource-specific protocols and procedures applicable to the transmission line upgrades, such as measures to protect wetlands, watercourses and waterbodies, vernal pools, and threatened, endangered, or special concern species. Detail sheets regarding these measures are also included in Volume 3. In addition, appendices to this volume present additional information regarding vegetation clearing, rare species, and vernal pools. Volume 2 includes plans and guidance for the protection of environmental resources that will apply to all Project-wide (i.e., transmission line and substation) construction activities. For example, Volume 2 includes the Project's *Spill Prevention and Control Plan*, Attachment B; *Snow Removal and De-Icing Plan*, Attachment C; and BMPs (Attachment D).

5.1 EROSION AND SEDIMENTATION CONTROL PLAN

Eversource will install erosion and sedimentation control measures during transmission line construction to avoid or minimize the potential for surface water runoff, erosion, and sedimentation to occur outside of work limits. These measures will comply with the *2002 Connecticut Guideline for Erosion and Sediment Control*, as well as with Eversource's BMPs (refer to Volume 2, Attachment D) and CT DEEP and USACE permit conditions. Eversource's BMPs incorporate and are consistent with the *2002 Connecticut Guideline for Erosion and Sediment Control* (refer to Volume 2, Attachment D, pp. 1-4 for a list of the guidance documents used in preparing Eversource's BMPs).

Volume 3 includes typical drawings regarding erosion and sedimentation control measures (refer to Detail Sheet 8). The Volume 3 maps also depict general locations for potential erosion and sedimentation control measures. These locations are illustrative; the need for and deployment of actual control measures will be determined based on site-specific field conditions during Project construction. The Volume 3 maps also show areas of high erosion potential. These erosion-prone areas were identified based on soil erodibility factor (K-factor) and slope.

Pursuant to CGS Section 22a-430b, construction activities, such as the Project, that will result in the disturbance of 1 or more total acres of land area must comply with the CT DEEP's *General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities* ([General Permit]; refer to Volume 2, Attachment E). Pursuant to the requirements of this General Permit, prior to the start of construction, Eversource will submit to CT DEEP a Registration Form and will prepare a *Stormwater Pollution Control Plan* that addresses the 115-kV transmission line upgrades.

5.2 WATER RESOURCES

5.2.1 Surface Water Resource Affects Summary

As shown on the Volume 3 maps and summarized below, various water resources (wetlands and watercourses) are located along the Project ROWs or along or near proposed off-ROW access roads.

Potential water resource impacts as a result of Project construction, including off-ROW access roads, are tabulated in Volume 3, Detail Sheets 1-3.

Specifically, the 115-kV transmission upgrades will:

- Span nine perennial streams (refer to Detail Sheet 3). One of the perennial streams (an unnamed tributary to Beaman's Brook) is crossed three times (each crossing is designated separately – as streams PS-2, PS-3, PS-3A). No new transmission line structures will be located in any watercourses or waterbodies.

- Require the following work within wetlands:

  - ✓ Temporary fill (e.g., timber mats for access roads and work pads) will be placed in 25 wetlands. New transmission line structures will unavoidably be located in five of these 25 wetlands, resulting in permanent fill. Of the 25 wetlands impacted by fill, six are located on the 1777/1779 Line between Bloomfield Substation and Bloomfield Junction and 19 are located along the 1751/1777 Line between Bloomfield Junction and North Bloomfield Substation. Impacts to each wetland, by impact type, are included on Detail Sheets 1 and 2 in Volume 3.

  - ✓ Forested vegetation will be removed within 115-kV conductor clearance zones and as otherwise required for the work (refer to the limits of vegetation clearing illustrated on the Volume 3 maps). Danger and hazard trees also will be removed as necessary. Access routes, which will not necessarily be the same as temporary or permanent access roads used for other aspects of construction, will be required for clearing crews to access across and within wetlands. Overall, for the transmission line upgrades, approximately 1.2 acres of forested wetlands will be permanently converted to scrub-shrub wetland habitat (refer to Detail Sheets 1 and 2)

  - ✓ Temporary access roads and work pads, comprised of timber mats or equivalent, will be located in wetlands where no upland alternatives are available. Approximately 6.8 acres of wetlands will be temporarily affected by such construction activities.

  - ✓ Approximately 0.02 acre of wetland will be permanently filled as a result of the unavoidable installation of 12 new structures in five wetlands. Along the 1777/1779 ROW (Bloomfield Substation to Bloomfield Junction), new Structure 3115-1A will be located in Wetland 5. Along the 1751/1777 ROW (Bloomfield Junction to North Bloomfield Substation), Structures 3115, 3115-1B, 3116, and 3116-1 will be located in Wetland 5A; Structures 3151-1, 3152-1, 3153-1, and 3154-1 will be located in Wetlands 22 and 22A; and Structures 3156-1, 3157-1, and 3158-1 will be located in Wetland 23.

5.2.2 Water Resource Crossing Techniques

All crossings of water resources and other construction activities in wetlands and watercourses will be performed in accordance with the Council's requirements, the conditions of USACE and CT DEEP regulatory approvals, and Eversource's BMPs. In addition, to avoid or minimize the potential for impacts from Project construction activities involving water resource crossings or work in areas near water resources, Eversource will require construction contractors to follow the Project's *Wetlands and Waterbodies Avoidance and Minimization Measures.* These measures are included on Detail Sheet 6 in Volume 3.

The Volume 3 maps identify the locations of watercourse crossings and indicate where temporary mat spans or equivalent will be installed.

The construction techniques to be used at each water crossing will depend on site conditions at the time of construction and will be determined by Eversource or its construction management representative. Any temporary crossings will be placed or sized to maintain water flows and avoid flooding. Appropriate erosion control measures will be employed to avoid and/or minimize impacts at watercourse crossings. All temporary crossing materials will be removed following the completion of construction.

5.2.2.1 Watercourse Crossing Methods

The transmission line will span all of the watercourses along the Project ROW. However, access roads will have to traverse smaller watercourses in some locations; and in some locations work pads will need to be installed over some smaller watercourses as well. The following methods will be used when watercourse crossings are necessary.

Access Roads. Where streams must be crossed, bridges consisting of timber mats or equivalent will be used. Temporary metal bridges will typically be installed where culverts or timber mat spans cannot be effectively used.

Work Pads. At some new transmission line structure locations, construction work pads may extend over small watercourses. At these locations, the work pads cannot be moved to avoid the watercourses due to factors such as the location and type of structure (e.g., angle) or terrain. Eversource will use work pad construction techniques designed to maintain flow in these drainages. Options for these techniques, which will be determined on a site-specific basis by Eversource or Eversource's Project manager, may include:

- Spanning the watercourse with timber mats used to create the construction work pad.
- Installing a temporary culvert to carry stream flows beneath the work pad, which will then be constructed over the culvert.

5.2.2.2 Wetland Crossing Methods

"Access routes" across wetlands for vegetation clearing equipment only. Temporary access routes will be created and used only by the vegetation clearing crews and will be removed as clearing activities advance along the ROW. These access routes will not be used during construction or for any other activity other than vegetation clearing. Clearing crews must be able to access areas where vegetation removal is required for construction activities and within the clearance zones of the 115-kV line conductors, as well as to reach on- or off-ROW danger or hazard trees. (Refer to the *Vegetation Clearing Plan* in Appendix A).

The location and type of access routes within each wetland will be determined at the time of construction (based on site-specific conditions) by Eversource, in consultation with the Project clearing contractor. However, timber mats or corduroy roads (logs) are typical options. Vegetation clearing also may be performed when the ground is frozen, when less temporary equipment support is typically needed for work in wetlands.

Improvements to existing access roads. Existing access roads through wetlands will be improved to make the road surface suitable for use during Project construction. This maintenance work would not expand the existing footprint of wetland fill.

New temporary construction access roads through wetlands. New temporary construction access roads across wetlands will be established using timber mats or equivalent. All temporary access roads in wetlands will be removed after the Project facilities are installed.

Transmission Line Structure/Work Pads in Wetlands. In total, 12 new transmission line structures will be constructed in five wetlands. To install the structures in these wetlands, timber mats will be used to create temporary work pads for construction support. In addition, 14 other wetlands will be temporarily affected by work pads required to support the installation of new transmission line structures in adjacent uplands. In these areas, portions of the work pads will extend into the wetlands. Such temporary work pads also will be constructed using timber mats or equivalent.

New Permanent Access Roads or Work Pads in Wetlands. No new permanent access roads will be developed in wetlands. Similarly, no work pads will be left in place in wetlands.

5.2.2.3 Wetland Invasive Species Control Protocols

The construction of the transmission line upgrades will be performed in conformance with state and federal requirements regarding the control of wetland invasive species[3]. Specifically, Eversource's contractors will be required to adhere to Project-specific protocols to avoid or minimize the potential for the spread of wetland invasive species during construction. These protocols are listed on Volume 3, Detail Sheet 6. In general, the protocols include procedures for construction vehicles, equipment, and mats to be cleaned to prevent the transport of invasive wetland species during work on the ROWs. The cleaning protocol will typically involve the use of shovels, brooms, and/or compressed air to remove visible dirt from construction equipment, vehicles, and timber mats. During environmental surveys along the ROW, Wetlands 2, 5/5A, and 22/22A, were noted as containing the invasive species common reed (*Phragmites australis*) and Wetland 17 was observed to contain purple loosestrife (*Lythrum salicaria*). Invasive species were not observed in other wetlands along the ROWs.

5.2.3 Flood Zones

Portions of Eversource's existing 1777/1779 and 1751/1777 line ROWs extend across the 100-year floodplains, as designated by the Federal Emergency Management Agency (FEMA), of Beamans Brook, Wash Brook, Griffin Brook, and their associated unnamed tributaries. In addition, the ROWs traverse undeveloped lands within three sites in the Bloomfield Flood Control Area. These sites, which are

[3] As part of its Project permit applications to CT DEEP and the USACE, Eversource submitted a *Wetlands Invasive Species Control Plan*. This plan, which includes the protocols listed in Volume 3 (Detail Sheet 6), is currently being reviewed by the agencies.

associated with Beamans Brook and Wash Brook, are owned and managed by CT DEEP as part of the North Branch Park River Flood Control System. The Flood Control Areas encompass comparatively large tracts of land, only portions of which are within FEMA-designated 100-year floodplain.

The North Branch Park River watershed covers an area of more than 18,000 acres (about 28 square miles), within multiple central Connecticut municipalities (including Bloomfield[4] and the Town of West Hartford). After the extensive flooding in 1955, the Bloomfield Flood Control Areas, consisting of various dams, were established in the 1960s to control flooding in the tributaries[5] flowing south to the North Branch Park River, and ultimately to alleviate flooding in the Park River through the City of Hartford. Together, these three Flood Control Areas provide more than 3,300 acre-feet of flood storage, as well as public recreational uses (refer to Section 5.6). The Flood Control Areas and dams are presently managed by the CT DEEP.

The Project ROWs cross three Flood Control Areas, including the dams associated with two such areas. Figure 5-1 illustrates the general location of the Project ROWs and the Flood Control Areas, information about which is summarized below:

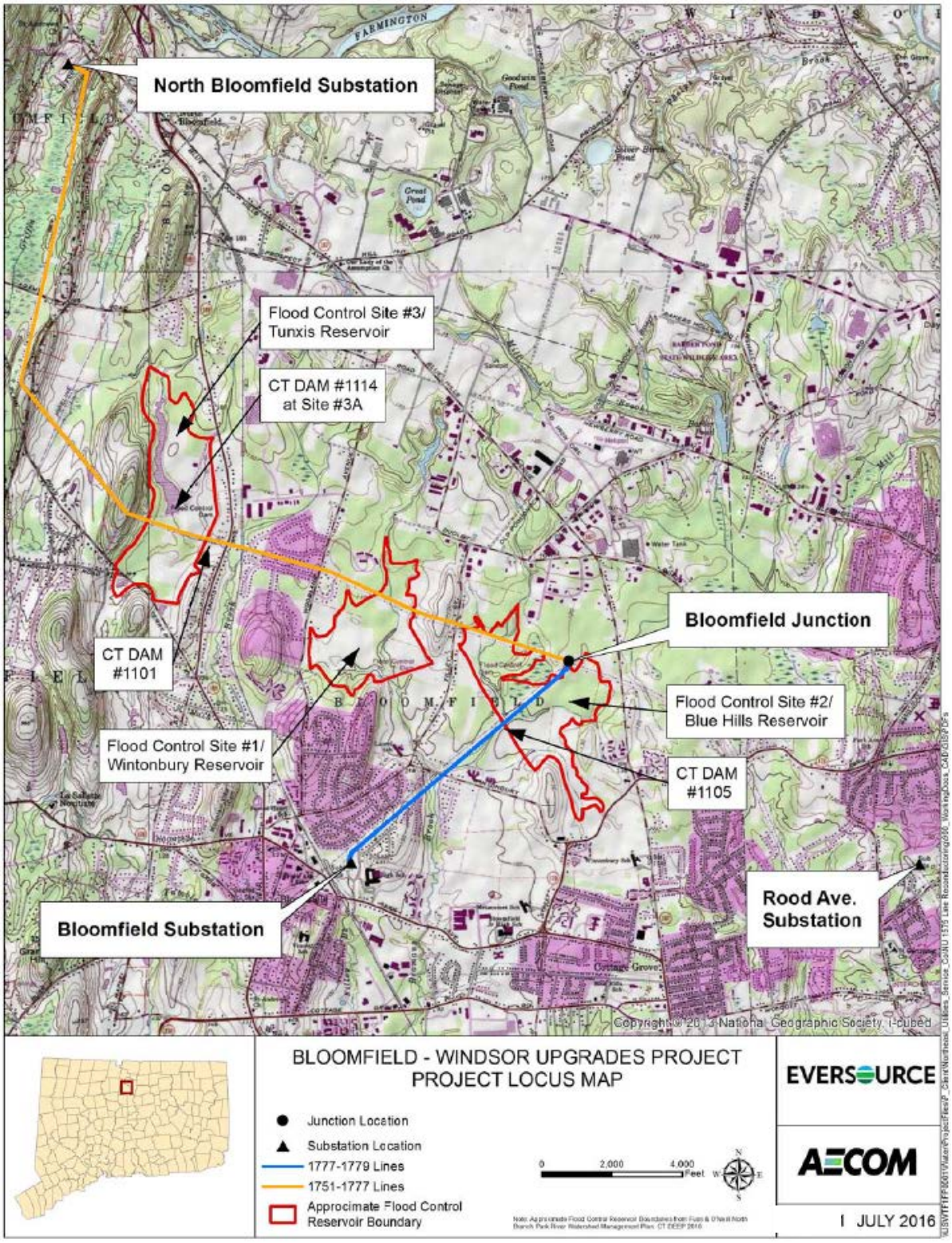
- Flood Control Area: Site 1 Beamans (also known as Wintonbury Reservoir) includes 325 acres and is situated along Beamans Brook, between Filley Street and Woodland Avenue. The Project location in relation to this Flood Control Area is depicted on Mapsheets 9-11 in Volume 3.

- Flood Control Area: Site 2 (also known as Blue Hills Reservoir) encompasses 340 acres and is located along a tributary to Beamans Brook, generally north of Wintonbury Street and west of Blue Hills Avenue. The existing Eversource ROW crosses CT Dam #1105, which is part of this Flood Control Area. The 1777/1779 Line work will traverse this dam. However, the Project will not result in any direct impacts to CT Dam #1105. The nearest proposed new structure is Structure 3-110-1 which will be located up-gradient of the dam and outside of the Flood Control Area. The Project location through this Flood Control Area is depicted on Volume 3, Mapsheets 3-8; Mapsheet 5.depicts the location of CT Dam #1105.

- Flood Control Area: Site 3 (also known as Tunxis Reservoir) is along Wash Brook, which is west of Tunxis Avenue. CT Dam #1114 and CT Dam #1101 are both located within this Flood Control Area, which the 1751/1777 Line ROW crosses. The nearest proposed new structure to CT Dam #1101 is Structure 3135-1; however, this structure is up-gradient of the dam and outside of the Flood Control Area boundaries. For the Project work, CT Dam #1114 will be crossed via an existing access road; for the Project construction, Eversource will improve this existing access road, as needed, by adding clean gravel. In addition, the existing bridge will be spanned from abutment-to-abutment, in order to avoid overloading the rated capacity of the existing bridge with construction vehicles. The Project location through this Flood Control Area is depicted on Mapsheets 13-15 in Volume 3. Mapsheet 13 depicts the location of CT Dam #1101 and the location CT Dam #1114 and the spanned bridge crossing are located on Mapsheet 14.

[4] Approximately 68% of the watershed is within Bloomfield.
[5] The North Branch Park River is formed by four major tributaries: Beamans Brook, Wash Brook, Filley Brook, and Tumbledown Brook.

Figure 5-1: Bloomfield to Windsor Upgrades Project: Flood Control Areas



The Volume 3 maps illustrate the locations of the three Flood Control Area sites and associated dams, as well as the boundaries of the FEMA-designated floodways and 100-year floodplains crossed by the Project ROWs. No new structures will be constructed within FEMA-designated floodways or affected by the operation of the Project. However, as summarized in Table 5-1, 20 new transmission line structures (seven along the relocated 1779 Line and 13 along the relocated 1777 Line) will be located within 100-year floodplains. Of the 20 new structures in floodplains, 12 also will be located within Bloomfield's Flood Control Areas. As listed in Table 5-1, two new structures will be located within Site 1, eight structures will be located in Site 2, and two structures will be located within Site 3. However, the only fill associated with these new structures will be related to the structure foundations. As a result, no significant change in flood storage capacity or associated flood elevations will result.

Overall, the 20 new structures in FEMA-designated areas will amount to less than 200 cubic yards (0.12 acre-feet) of fill (combined for upland and wetland areas). Accordingly, the new structures would have a de minimus effect on the flood storage capacity of the flood control system, amounting to a reduction of only approximately 0.004% of the available flood storage. Additional information regarding proposed structures in floodplains is provided in Table 5-1, as well as on Detail Sheet 5 in Volume 3.

Eversource consulted with the CT DEEP Dam Safety Program and designed the Project to avoid adverse impacts to the Flood Control Area sites, which cannot be avoided given the location of Eversource's existing ROWs and the Project objective of separating the existing DCT lines by installing new structures within the same ROWs. However, all new structures within the 100-year flood zone and the Flood Contingency Area sites will be designed to withstand inundation.

In addition, Eversource designed and planned the Project to reduce permanent fill in floodplains and in the Flood Control Areas to the maximum extent practicable. For example, new structures will be installed using methods to minimize permanent fill and no new permanent access roads or work pads will be placed in floodplains. Further, Eversource submitted to CT DEEP a detailed Application for a 401 Water Quality Certification for the Project; this Application provides extensive analyses regarding the alignment of the Project facilities within the Flood Control Area sites and 100-year FEMA-designated floodplains.

During the construction of the Project facilities, Eversource will require its construction contractors to adhere to any specific CT DEEP regulatory conditions regarding the Flood Control Area sites and floodplains, as well as to implement BMPs to avoid or minimize impacts in these areas. BMPs will include the use of temporary construction mats for access roads and work pads in the CT DEEP Flood Control Areas. All construction mats located within FEMA floodplains or the CT DEEP Flood control areas will be secured together.

Table 5-1: Transmission Line Upgrades: New Structures within ROWs in 100-Year FEMA Floodplains and in Flood Control Areas
(Refer to notes at end of table for abbreviations and definitions)

New Structure Number	Volume 3 Map Sheet No.	Associated Watercourse Floodplain	Structure Located in 100-Year Floodplain	FEMA Designation	Associated Floodplain Elevation (Feet)	Proposed Fill in Floodplain (Sq. Ft)	FEMA 100-Year Floodplain Fill Volume (Cubic Yds.)	CT DEEP Bloomfield Flood Control Area (Site No.)
New 1779 Line Structures (Bloomfield Substation to Bloomfield Junction)								
3-107-1	3	UNT to Beamans Brook	Yes	100 Year (AE)	92	38	5.1	N/A
3-109-1	4	UNT to Beamans Brook	No	500 Year Floodplain	93	50	0.0	N/A
3-111-1	5	UNT to Beamans Brook	Yes	100 Year (A)	110	38	16.2	Blue Hills Reservoir (Flood Control Site #2)
3-112-1	5	UNT to Beamans Brook	Yes	100 Year (A)	110	38	13.1	Blue Hills Reservoir (Flood Control Site #2)
3-113-1	6	UNT to Beamans Brook	Yes	100 Year (A)	110	38	2.1	Blue Hills Reservoir (Flood Control Site #2)
3-114-1	6	UNT to Beamans Brook	Yes	100 Year (A)	110	50	1.6	Blue Hills Reservoir (Flood Control Site #2)
3-115-1A	6	UNT to Beamans Brook	Yes	100 Year (A)	110	150	4.9	Blue Hills Reservoir (Flood Control Site #2)
Total Proposed Fill in 100 Year Floodplain of all New 1779 Structures*:						**402**	**43.0**	
New 1777 Line Structures (Bloomfield Junction to North Bloomfield Substation)								
3115-1B	6	UNT to Beamans Brook	Yes	100 Year (A)	110	150	4.5	Blue Hills Reservoir (Flood Control Site #2)
3119-1	8	UNT to Beamans Brook	Yes	100 Year (A)	110	50	5.9	Blue Hills Reservoir (Flood Control Site #2)

New Structure Number	Volume 3 Map Sheet No.	Associated Watercourse Floodplain	Structure Located in 100-Year Floodplain	FEMA Designation	Associated Floodplain Elevation (Feet)	Proposed Fill in Floodplain (Sq. Ft)	FEMA 100-Year Floodplain Fill Volume (Cubic Yds.)	CT DEEP Bloomfield Flood Control Area (Site No.)
3120-1	8	UNT to Beamans Brook	Yes	100 Year (A)	110	50	6.4	Blue Hills Reservoir (Flood Control Site #2)
3124-1	10	Beamans Brook	Yes	100 Year (A)	110	50	7.2	Wintonbury Reservoir (Flood Control Site #1)
3125-1	10	Beamans Brook	Yes	100 Year (A)	110	50	6.4	Wintonbury Reservoir (Flood Control Site #1)
3133-1	13	UNT to Wash Brook	Yes	100 Year (AE)	129	50	6.0	N/A
3136-1	14	Wash Brook	Yes	100 Year (A)	145	50	17.6	Tunxis Reservoir (Flood Control Site #3)
3137-1	14	Wash Brook	Yes	100 Year (A)	145	50	17.4	Tunxis Reservoir (Flood Control Site #3)
3151-1	19	Griffin Brook	Yes	100 Year (AE)	178	38	1	N/A
3152-1	20	Griffin Brook	Yes	100 Year (AE)	178	38	4.4	N/A
3153-1	20	Griffin Brook	Yes	100 Year (AE)	177	38	1.6	N/A
3154-1	20	Griffin Brook	Yes	100 Year (AE)	177	38	2.5	N/A
3157-1	21	Griffin Brook	Yes	100 Year (AE)	177	38	0.0	N/A
Total Proposed Fill in 100 Year Floodplain of all New 1777 Structures:						**690**	**80.9**	
Project Total - Total Proposed Fill in 100 Year Floodplain						**1092**	**123.9**	

1. UNT = Un-named tributary
2. FEMA designations are as listed on FEMA maps (i.e., "AE" = the base floodplain where based flood elevations are provided; "A" = areas with a 1% annual chance of flooding (because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones)
3. Volumes were calculated based on foundation and structure type and floodplain elevations. Current FEMA elevation compared to the proposed Project elevation at the pole locations were used as an indication of the depth of fill required and the resulting cubic yards of fill for each structure is provided in the table.
4. **Shading** indicates structure also is within a Flood Control Area.

In those areas where access roads and pads are outside of wetlands or the CT DEEP Flood Control Areas, but must be located within FEMA floodplains, Eversource may use a combination of construction mats, gravel and filter fabric to facilitate construction of new access roads and pads without any loss of flood storage capacity. Existing access roads may need to be improved to facilitate travel of construction equipment. In locations where new pads and roads are required, the following may occur:

- Stripping of and removal of approximately 6 inches of topsoil from the floodplain, and replacement with approximately 6 inches of gravel.
- Placement of gravel overtop filter fabric to create temporary access roads and pads.

5.2.4 Aquifer Protection

The Project ROWs do not cross any Aquifer Protection Areas. Neither the construction nor operation of the new 115-kV transmission structures will adversely affect groundwater resources, including public water supplies or private groundwater wells. During construction, Eversource will require its contractors to adhere to the BMPs and any Project-specific regulatory requirements regarding the storage and handling of any hazardous materials used during the work. Proper storage, secondary containment, and handling of potentially hazardous materials such as diesel fuel, motor oil, grease and other lubricants, will be required.

5.2.5 Drainage

To avoid or minimize erosion and sedimentation and to maintain hydrology and drainage patterns, Eversource will require its construction contractors to assess and implement the BMPs as appropriate to site-specific situations. Eversource also will require its contractors to work in accordance with the conditions in the CT DEEP regulatory requirements that pertain to stormwater management and drainage (refer to Volume 2, Attachment E).

5.3 VERNAL POOLS

The CT DEEP defines vernal pools as small bodies of standing fresh water found throughout the spring that typically result from various combinations of snowmelt, precipitation, and high water tables associated with the spring season. These depressions can be natural or man-made. In most years, for at least part of the time, these areas become completely dry, losing water through infiltration and evapotranspiration. Vernal pools vary in many aspects including appearance, water source, hydroperiod, water quality and surrounding habitats. Field investigations must coincide with the amphibian breeding and/or larval development time periods to determine if an area is functioning as a vernal pool. In Connecticut, to meet the definition of a vernal pool, the following four criteria must be met:

- Contains water for approximately two months during the growing season;
- Occurs within a confined depression or basin that lacks a permanent outlet stream;
- Lacks any fish populations; and
- Dries out most years, usually by late summer.

Many organisms critically rely upon vernal pool habitat for reproductive success. These species are referred to as obligate vernal pool species. According to the CT DEEP (2011), obligate vernal pool species that may have ranges within the Project area include the following:

- wood frog (*Lithobates sylvatica*)
- Eastern spadefoot toad (*Scaphiopus holbrookii*)
- spotted salamander (*Ambystoma maculatum*)
- Jefferson salamander (*Ambystoma jeffersonianum*)
- marbled salamander (*Ambystoma opacum*)
- fairy shrimp (*Branchiopoda anostraca*)

Facultative vernal pool species are fauna that utilize, but do not necessarily require, vernal pools for reproductive success. Examples of facultative species include spring peeper (*Pseudacris crucifer*), spotted turtle (*Clemmys guttata*), red-spotted newt (*Notophthalmus viridescens viridescens*), green frog (*Rana clamitans*) and bull frog (*Rana catesbeiana*). Facultative species such as those mentioned above can utilize vernal pool habitats. However, these species can also breed successfully in the margins of permanent water bodies, including streams, rivers, and lakes.

5.3.1 Vernal Pool Survey Methods

Vernal pool surveys along the Project ROWs were conducted in the spring of 2015. The survey periods corresponded to the appropriate times of the year to identify areas that may function as vernal pools based on the presence of egg masses and developing larvae. Supplemental surveys were performed in May and June 2016 to compile additional habitat information at certain vernal pools that could potentially provide habitat for a state-listed species, as well as at three vernal pools that would be directly impacted by Project tree clearing or trimming. The *Vernal Pool Habitat Report* (refer to Appendix B) provides detailed information regarding these surveys.

During the 2015 surveys, all wetlands associated with the Project ROWs were investigated to determine if breeding amphibians, both obligate and facultative, were present in an effort to identify vernal pools. To facilitate the surveys, biologists were provided with Project-specific wetland mapping and dip nets.

The surveys were conducted after the first significant rainfall events in the spring, when evening low temperatures remained in the 40s (degrees Fahrenheit). These weather conditions facilitate inward migration of amphibians to the pools for the purpose of breeding. Biologists conducted visual surveys and used dip nets to sweep the water column to assist in determining the presence or absence of amphibians and other vernal pool species. Choruses of breeding frogs were noted when audible.

Evidence of amphibian breeding, including but not limited to wood frog chorusing, egg masses and amphibian larvae, was recorded. Additional data recorded included the approximate size and depth of the observed breeding pool(s), substrate type and general comments, if any.

Lastly, biologists sketched the extent of the documented vernal pool habitat onto field mapping and/or used a global positioning system (GPS) data collection device to locate the boundaries or center of pool where possible. Field sketches and GPS data were then digitized onto Project mapping. Identified vernal pools within and near the ROWs are listed in Table 5-2 and illustrated on the Volume 3 maps.

5.3.2 Vernal Pool Survey Results

As summarized in Table 5-2, based on the 2015 breeding season field surveys, eight wetland complexes located along the Project ROWs were determined to contain 15 vernal pools that provide habitat for obligate species. Portions of these eight wetland complexes extend off the Project ROWs; of the 15 identified vernal pools, six are located in such off-ROW areas. Of the 15 vernal pools, two are situated along or near the 1777/1779 line ROW and 13 are located along or near the 1751/1777 line ROW. The location of each vernal pool is illustrated on the Volume 3 maps, while the *Vernal Pool Habitat Report* (Appendix B) describes each vernal pool.

Of the 15 identified vernal pools:

- Two are located entirely within currently maintained portions of the ROWs;
- One is located entirely within the currently forested portion of the ROW;
- One is located partially within the maintained portion of the ROW, partially within the forested portion of the ROW and partially outside of the existing ROW;
- Two are located partially within the currently maintained portion and partially within the currently forested portion of the ROW;
- Three are located partially within the currently forested portion of the ROWs and partially outside of the existing ROWs; and
- Six are located outside of the existing ROWs.

For wetlands that encompass vernal pools, the vernal pools depicted represent the areas that could be successfully utilized by obligate vernal pool species. Distinct areas within the overall vernal pool where specific data was collected are known as the data collection areas. The size of the data collection areas, as well as the overall vernal pool dimensions, reflect the results of data collected during the survey and can be expected to vary from year-to-year based upon seasonal fluctuations in the water table caused by annual variations in the amount and timing of precipitation. These hydrologic variations could in turn affect where exactly amphibians would deposit egg masses in a given year.

Vernal Pool Assessment sheets from the *Best Development Practices, Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern U. S.* (*Best Development Practices*; Calhoun and Klemens 2002), were used to rate the variable value of each vernal pool.

Table 5-2: Vernal Pool Habitat Identified on the Project ROWs

Vernal Pool Number[1]	Associated Wetland[2]	Nearest Transmission Line Structure[3]	Volume 3 Mapsheet Number[4]	Species Observed and/or Heard	Existing Cover Type	Substrate	Tier Rating[5]	Position in Project ROW
VP-1779-2	Wetland 3/3A	3-111	5 of 25	Numerous wood frog tadpoles, 1 spotted salamander egg mass	PFO	Muck	I	Partially In ROW
VP-1779-1	Wetland 5	3-115	6 of 25	Numerous wood frog tadpoles, 2 spotted salamander egg mass	PSS/PFO	Leaf litter	I	Within ROW
VP-1751-1	Wetland 5A	3-116	6 of 25	Numerous wood frog tadpoles, 1 wood frog egg mass, 2 spotted salamander egg masses	PFO	Muck	I	Outside of ROW
VP-1751-3	Wetland 7A	3118	7 of 25	Numerous wood frog tadpoles	PFO	Leaf litter	III	Outside of ROW
VP-1751-4	Wetland 7A	3118	7 of 25	Numerous wood frog tadpoles	PFO	Leaf litter	III	Outside of ROW
VP-1751-5	Wetland 8	3119	8 of 25	Numerous wood frog tadpoles	PSS/PFO	Leaf litter	III	Partially In ROW
VP-1751-6	Wetland 8	3119	8 of 25	Numerous wood frog tadpoles	PSS/PEM	Leaf litter	III	Within ROW
VP-1751-7	Wetland 23	3157	22 of 25	Numerous wood frog tadpoles	PFO	Leaf litter, muck	III	Outside of ROW
VP-1751-9	Wetland 23	3156	21 of 25	Numerous wood frog tadpoles	PFO	Leaf litter	III	Outside of ROW

Vernal Pool Number[1]	Associated Wetland[2]	Nearest Transmission Line Structure[3]	Volume 3 Mapsheet Number[4]	Species Observed and/or Heard	Existing Cover Type	Substrate	Tier Rating[5]	Position in Project ROW
VP-1751-10 (Cryptic VP)	Wetland 23	3156	21 of 25	Numerous wood frog tadpoles, 1 spotted salamander egg masses	PSS/PFO	Muck	III	Partially In ROW
VP-1751-11	Wetland 22/22A	3154	20 of 25	Numerous wood frog tadpoles	PFO	Muck	III	Outside of ROW
VP-1751-12	Wetland 22/22A	3154	20 of 25	Numerous wood frog tadpoles	PFO	Muck	III	Partially In ROW
VP-1751-13 (Cryptic VP)	Wetland 22/22A	3154	20 of 25	Numerous wood frog tadpoles	PSS/PFO	Leaf litter	I	Partially In ROW
VP-1751-14	Wetland 6	3-116	6 of 25	Numerous wood frog tadpoles, caddisfly larva	PFO	Leaf litter	I	Outside of ROW
VP-1751-15	Wetland 12A	3124	10 of 25	Numerous wood frog tadpoles, 2 spotted salamander egg masses	PFO	Leaf litter, muck	I	Outside of ROW

Notes:

1. Vernal pool habitat number is Project-specific, for identification purposes.
2. Associated wetland number corresponds to the Project Wetland Identification number.
3. Refers to existing transmission line structure.
4. Refer to the Volume 3 maps.
5. Tier rating system based on biological value of the pool and condition of terrestrial habitat (refer to Assessment Sheets in the *Vernal Pool Habitat Report*).

These Vernal Pool Assessment sheets, which are provided as part of the *Vernal Pool Habitat Report* in Appendix B, are typically used to rate each pool for local planning and management purposes. The tier rating system (which includes Tiers I-III) is designed to identify the relative ecological value of each vernal pool.

This rating system is based on two parameters: (1) biological value; and (2) condition of the terrestrial habitat. The assessment of the pools' biological value, factors in species abundance, species diversity, and pool vulnerability. Assessment of the terrestrial habitat includes the integrity of the vernal pools' envelope (i.e., land within 100 feet from the pool's edge) and critical terrestrial habitat (i.e., land from 100 to 750 feet from the pool's edge). The rating system assesses the relative ecological value of pools within the community or area. Accordingly, vernal pools with 25% or less developed area in the critical terrestrial habitat are defined as meeting Tier I criteria, warranting highest priority for protection. A Tier I rating denotes exemplary pools and generally applies to only a minority of sites. Tier II ratings may constitute the majority of vernal pool resources typically found in suburban areas. The *Best Development Practices* report indicates Tier II pools are likely good candidates for restoration. Tier III pools provide less than optimum conditions to sustain breeding and non-breeding habitat for vernal pool species.

Two of the vernal pools identified during the surveys are "cryptic vernal pools". Cryptic vernal pools are large wetland systems exhibiting expansive areas of flooding where obligate vernal pool species are documented as breeding. The cryptic vernal pools are those areas within the large wetland complex where obligate vernal pool species are observed breeding, but the areas do not meet the traditional definition of a vernal pool.

Of the 15 vernal pools identified within or near the Project ROWs, six are classified as Tier I (including both vernal pools along the 1777/1779 line ROW), while nine meet the criteria for Tier III. No Tier II vernal pools were identified. Table 5-2 identifies the classification of each of the vernal pools along the Project ROWs.

5.3.3 Vernal Pool Impacts

The transmission line upgrade work will not result in any permanent fill or direct, temporary impacts to vernal pools. No new transmission line structures, work pads, or access roads will be placed within any vernal pools. However, to maintain mandated clearances between vegetation and the relocated 115-kV transmission line conductors, tree clearing and tree trimming activities will be required within three vernal pools (VP-1779-1; VP-1751-5; and VP-1751-13). As a result of this required tree clearing, approximately 1,936 square feet (0.04 acre) of currently forested habitat within these three vernal pools will be converted to scrub-shrub habitat.

Secondary impacts to vernal pools also will result from vegetation clearing and subsequent conversion of habitat (e.g., forest to scrub-shrub vegetation) in the vernal pools envelope (land within 100 feet of a pool's depression edge) and critical terrestrial habitat (land from 100 to 750 feet from a pool's depression edge). Within the Project ROWs, vegetation clearing will be required within these envelopes adjacent to the vernal pools. Table 5-3 summarizes the direct and secondary impacts for each of the 15 vernal pools along the Project ROWs.

During construction, Eversource will require its construction contractor to implement protective measures to avoid or minimize impacts to vernal pools. These measures are described below and reproduced in the *Vernal Pool Avoidance and Minimization Protocols* (refer to Detail Sheet 6 in Volume 3).

Vernal Pool Impact Avoidance and Minimization Measures:

- The use of construction matting over identified vernal pool depressions is not authorized.
- Gravel work pads are not permitted within 100 feet of identified vernal pools.
- Except in areas where access roads and work pads must be installed, existing scrub-shrub vegetation within 25 feet of vernal pools will be maintained, consistent with ROW vegetation management requirements.
- Removal of low growing (scrub-shrub) vegetation surrounding vernal pools shall be minimized by utilizing construction matting where access is needed. In locations where vegetation must be cut adjacent to vernal pools, some of the cut vegetation (slash) will be left in place along the edges of the pools to serve as recruitment for leaf litter and coarse woody debris.
- Erosion and sedimentation control measures will be installed and maintained along construction access roads and around work pads, as necessary, to protect water quality and to limit the potential for sediment transport to vernal pools.
- Where existing on-ROW access roads adjacent to vernal pools must be improved, swamp mats or corduroy road will be used if practicable; otherwise, clean materials will be used (e.g., clean riprap, gravel, stone or equivalent and rock fords).
- To the extent that circuit outage and other construction timing constraints allow, Eversource will attempt to schedule the installation of access roads and work pads near vernal pool habitats so as not to interfere with amphibian breeding and migration seasons.
- For project activities that must occur adjacent to vernal pools during amphibian migration periods, measures will be implemented on a site-specific basis, as necessary, to facilitate unencumbered amphibian access to and from vernal pools. Mitigation measures will be identified after taking into consideration site-specific conditions, including the type of construction activity in proximity to a vernal pool, the amphibian species known to occur in the vernal pool, and seasonal conditions. Options to be evaluated to allow amphibian access to vernal pools may include, but are not 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.
- Erosion and sedimentation control devices will be removed upon final revegetation and stabilization of the ROWs.
- In the three vernal pools where tree clearing is required, tree trimming and clearing activities will be completed by hand (no construction mats will be used in vernal pools). Trees will be felled away from, and outside of, vernal pools to the extent practicable.

Table 5-3: Summary of Vernal Pool Impacts

Vernal Pool Identification No.	Existing Cover Type	Calhoun and Klemens Vernal Pool Tier Rating	Vernal Pool Size (square feet)	Location of Anticipated Impact															
				Planned Construction Work within Vernal Pool Boundaries (square feet)					"Vernal Pool Envelope"** (Extending to 100' from Vernal Pool Edge) (square feet)					"Critical Terrestrial Habitat"*** (Extending from 100' to 750' from Vernal Pool Edge.) (square feet)				
				Nature of Anticipated Impacts (Square Feet)														
				Tree Clearing (Manual)	Temporary Access Road	Temporary Construction Pads (Timber mats)	Permanent Road	Permanent Pad	Tree Clearing*	Temporary Access Road	Temporary Construction Pads (Timber mats)	Permanent Road****	Permanent Pad****	Tree Clearing*	Temporary Access Road	Temporary Construction Pads (Timber mats)	Permanent Road****	Permanent Pad****
Bloomfield Substation to Bloomfield Junction																		
VP-1779-1	PFO	I	2350	770	0	0	0	0	6392	0	9687	0	0					
VP-1779-2	PFO	I	1387	0	0	0	0	0	5741	0	1139	0	0					
Bloomfield Junction to North Bloomfield Substation																		
VP-1751-1	PFO	I	1938	0	0	0	0	0	2241	0	15249	343	0	81103	32733	174746	3577	25459
VP-1751-14	PFO	I	223	0	0	0	0	0										
VP-1751-3	PFO	III	78	0	0	0	0	0	1535	0	0	0	7453					
VP-1751-4	PFO	III	393	0	0	0	0	0										
VP-1751-5	PSS/PFO	III	1400	110	0	0	0	0	1240	6398	0	0	0					
VP-1751-6	PSS/PEM	III	507	0	0	0	0	0	747	2535	0	0	6749					
VP-1751-7	PFO	III	204	0	0	0	0	0	547	0	0	0	0					
VP-1751-9	PFO	III	1095	0	0	0	0	0	1053	2688	0	0	0					
VP-1751-10 (Cryptic VP)	PSS/PFO	III	7322	0	0	0	0	0	1769	2373	9854	0	0					
VP-1751-11	PFO	III	702	0	0	0	0	0	2842	6354	9897	0	0					
VP-1751-12	PFO	III	1036	0	0	0	0	0										
VP-1751-13 (Cryptic VP)	PSS/PFO	I	10944	1056	0	0	0	0										
VP-1751-15	PFO	I	1904	0	0	0	0	0	1303	0	0	0	0					
Total (SF)		Varies	31484	1936	0	0	0	0	25410	20248	45826	343	14202	81103	32733	174746	3577	25459
Total (Acres)		Varies	0.72	0.04	0	0	0	0	0.58	0.46	1.05	0.01	0.33	1.86	0.75	4.01	0.08	0.58

* Tree Clearing will be completed using timber mats in wetland areas. Clearing work will be performed by hand in vernal pool areas.

** Due to size of overlapping vernal pool envelopes, select impacts have been aggregated, as noted in the table.

*** Due to size of overlapping Critical Terrestrial Habitat, impacts have been aggregated on a Project-wide basis. Critical Terrestrial Habitat areas drawn as a perimeter offset and not biased towards suitable upland habitat.

**** "Permanent" gravel road and pad impacts represent maximum anticipated disturbance and impact. Permanent roads and pads will only be in uplands. Existing roads may need to be top dressed to accommodate construction equipment. Based on landowner requests, "permanent" gravel roads and pads may be removed subsequent to construction activities.

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5.4 PROTECTION MEASURES FOR LISTED SPECIES

Based on a review of CT DEEP Natural Diversity Database (NDDB) information and Project field studies, eight state-listed species and one federally-listed species potentially occur within the Project area.

During construction, Eversource will implement protection strategies for these species as described on Detail Sheet 7 in Volume 3. These protection strategies include, among other measures, a construction contractor awareness program and species-specific protection measures, which will depend on the season in which construction occurs in a particular species' habitat.

Exact location information regarding federal- and state-listed species habitat along the Project ROWs is not provided for public review, pursuant to Eversource's Data Sharing Agreement with CT DEEP NDDB. Eversource will implement all mitigation measures included in Project authorizations and permits from the CT DEEP and USACE.

A review of the USFWS's list of Federally Listed Endangered and Threatened Species in Connecticut (USFWS 2014) identified the Northern Long-eared Bat (NLEB) as having a statewide pattern of distribution. Eversource has coordinated with the USFWS on the NLEB and consultation with USFWS indicated that no known records occur within 1 mile of the Project. In accordance with the USFWS Final 4d Rule for NLEB, no time-of-year restrictions are anticipated. Eversource continues to coordinate with USFWS on the NLEB.

Vernal pool surveys were performed in May 2015 and May and June 2016, as described in Section 5.3 and in the *Vernal Pool Habitat Report* (Appendix B). No state-listed species were observed during the 2015 vernal pool surveys and no eggs masses were located. Additional field surveys for state-listed species associated with vernal pools were conducted in May and June 2016 along portions of the ROWs. No state-listed species were identified during these 2016 surveys. The 2016 surveys were conducted pursuant to Condition 1(g) of the Council's Declaratory Ruling. The results of these surveys are presented in the *Rare Salamander Habitat Assessment and Field Survey Report* (Appendix C): this report is not provided for public dissemination in order to protect species habitats).

Surveys for two bird species were conducted in June 2016 within and in proximity to identified NDDB habitat areas. However, neither of these bird species was observed within the Project ROWs. Further, no suitable nesting trees or nesting habitat for these species exists within the ROWs.

5.5 AIR QUALITY PROTECTION (MINIMIZATION OF DUST AND VEHICLE IDLING PROTOCOL)

Dust Suppression and Anti-Tracking Pads

To minimize short-term adverse effects to air quality during construction, access roads and staging areas will typically be graveled[6] and may be watered, as necessary, to suppress fugitive dust emissions. Additionally, crushed stone aprons will be installed at all gravel or dirt access road entrances to public roadways, with the objective of minimizing tracking of soil onto the roadway. Paved roads at the intersection with Project access roads will be periodically swept, as necessary to remove excess dirt tracked onto the pavement from the ROWs.

Construction Equipment: Idling vs. Warm-up during Cold Weather

Unnecessary construction equipment and vehicle idling expends fuel, increases costs, and causes air pollution. Vehicle emissions will be limited by requiring contractors to properly maintain construction equipment and vehicles, and by minimizing the idling time of equipment and vehicles, including diesel construction equipment, in accordance with regulatory standards. Idling requirements for the Project are as follows:

Pursuant to Connecticut requirements (RCSA 22a-174-18), the allowable idling time for vehicles of all kinds, including diesel construction equipment, is 3 minutes. However, under winter work conditions (when the ambient temperature is below 20 degrees Fahrenheit) the following apply:

- Construction equipment may require longer periods to warm up after overnight shut down or other extended periods of inactivity. Such "warm up" periods, as required to bring the equipment up to a safe operating temperature (as defined by the equipment manufacturer), are exempt from the idling time limit.

- Construction equipment may have to idle for longer periods to operate defrosting or heating equipment to ensure the safety or health of the driver.

Note: "Idling" is defined as the period when mobile construction equipment is not in motion or is not otherwise actively performing its designated function. Thus, "idling" does not apply to the use of certain types of mobile construction equipment (e.g., cranes, cement mixers) that may be stationary, but is actively operating, at a work site.

[6] Except where timber mats are used (e.g., at wetland crossings).

5.6 PROCEDURES FOR CROSSING PUBLIC TRAILS, PROTECTED OPEN SPACE, AND RECREATIONAL AREAS

Within Eversource's existing ROWs, the 115-kV transmission line upgrades will require work in the recreational areas listed in Table 5-4 and illustrated on the Volume 3 maps.

Eversource has consulted or will consult with the owners or managers of each of the recreational and open space properties to discuss the Project, review the types of construction activities that will be performed on each property, and solicit input regarding the appropriate methods (if any) to be used during construction to minimize disruptions to the public while maintaining public safety. These consultations generally have addressed or will address the following topics, as may be applicable to each property:

- Use and placement of construction warning signs.
- Bike and pedestrian offset gates.
- Public safety (flagmen).
- Temporary trail re-routing or closure during certain construction activities.
- Trail and/or pavement protection from heavy construction equipment.
- Construction schedule.
- Schedule constraints, if any, for construction activities due to peak recreational use periods or site-specific activities (e.g., hunting season in the state forest).
- Regular correspondence and updates, including the use of the Project website to provide construction status and schedule information.
- Restoration of areas affected by construction.

Based on the consultations, Eversource will implement appropriate site-specific mitigation measures for use during construction across the publicly-accessible recreational areas. Such measures will typically consist of signs identifying construction work zones, flagmen, and/or temporary trail closures during periods of active construction.

The Town of Bloomfield is planning the construction of the Bloomfield Greenway Multi-Use Trail (Section 1), an approximately 1.8-mile, paved 10-to 12-foot-wde recreational trail that will begin south of State Route 189 approximately 0.4 mile southeast of the Simsbury town line and end on Day Hill Road in the Town of Windsor. Most of this trail extends within Eversource property over a former railroad bed. The planned trail extends north of the North Bloomfield Substation and crosses the 1751/1777 line ROW southeast of the substation. Eversource consulted with the Town of Bloomfield regarding this trail project and will continue to coordinate with the town concerning construction scheduling, access, and staging to avoid or minimize conflicts between the Project and the planned trail.

Table 5-4: Public Trails, Recreational Areas, and Designated Open Space Crossed by the 115-kV Transmission Line Upgrades

Volume 3 (Map No.)	Parcel No. (Line List)	Description (Owner)
Bloomfield Substation to Bloomfield Junction		
Sheet 3	862	Tobacco Valley Open Space Area (Town of Bloomfield)
Sheets 3-8	900 and 909	North Branch Park River Flood Control Site #2 – Blue Hills Reservoir (CT DEEP). CT Dam #1105 located on this parcel. Seabury walking trails located on this parcel.
Bloomfield Junction to North Bloomfield Substation		
Sheets 9-11	920.01	North Branch Park River Flood Control Site #1 – Wintonbury Reservoir (CT DEEP)
Sheets 3-8	900 and 909	North Branch Park River Flood Control Site #2 – Blue Hills Reservoir (CT DEEP). CT Dam #1105 located on this parcel. Seabury walking trails located on this parcel.
Sheets 13-15	991	North Branch Park River Flood Control Site #3 – Tunxis Reservoir (CT DEEP). CT Dams #1101/1004 located on this parcel. Town of Bloomfield Recreation area, including public fishing and open space.
Sheets 15-18	1002	Wintonbury Hills Golf Course (18-hole municipal golf course managed by Billy Caspar Golf and certified as a Cooperative Sanctuary by Audubon International; Town of Bloomfield)
Sheet 24, 24A	Various	Proposed Bloomfield Greenway Multi-Use Trail – Section 1. This Town of Bloomfield greenway, which will be located in a former rail corridor, is scheduled for construction in 2016 / 2017. The trail will link the Farmington Canal Heritage Trail to the Charter Oak Greenway.

Eversource met with CT DEEP personnel (Dam Safety and Land Acquisition and Management) to discuss the Project and to review specific construction activities proposed in the North Branch Park River Flood Control sites. Eversource will continue to consult with the CT DEEP regarding these locations and the measures to be implemented to limit any impact to active recreation at the sites during construction.

Eversource has consulted with the owners of the Wintonbury Hills Golf Course and is planning to limit construction at this location to winter months to minimize the impact at this location. Eversource has met with the Town of Bloomfield who owns the golf course and the Town of Bloomfield has requested that work at the Wintonbury Hills Golf Course occur between Thanksgiving and April 1st. Eversource is currently negotiating the details of this arrangement with the Town of Bloomfield.

5.7 SOILS AND MATERIALS HANDLING AND DISPOSITION

Eversource's construction contractors will be responsible for the proper handling and disposal of all excess soils, groundwater, recyclable materials, and other wastes generated during the construction process.

Excess excavated soil and groundwater (if encountered in structure foundation excavations) will be handled and disposed of in accordance with regulatory requirements (depending on the type of material) and Eversource's BMP procedures.

Excess soil will typically be reused on-site. Excess excavated soils will typically be spread along the ROW in upland locations, away from water resources, state-listed species habitats, agricultural areas, and residential or commercial land uses.

If groundwater is encountered in excavations, the water will be pumped from the excavated area and discharged to an upland area in a location that does not result in a discharge to wetlands or watercourses. The water may be discharged on-site into an appropriate sediment control basin, filter bag, pumped into a temporary fractionization (frac) tank and then discharged into an appropriate upland area, or pumped into a tanker truck for disposal at appropriate upland sites or wastewater treatment facilities.

If obvious polluted or contaminated soil is encountered, it must be reported to Eversource and handled in accordance with the appropriate regulatory requirements. If encountered, contaminated soils will be stockpiled on and covered by polyethylene sheeting. Sheeting used to cover the stockpile will be weighted to prevent the wind migration of contaminated dust. The materials will be tested to determine appropriate handling and disposition.

Recyclable materials will be removed from the ROWs and transported off-site for appropriate re-use or salvage, pursuant to Eversource policies. General waste materials and debris other than soil and groundwater will be collected in receptacles at the work sites or in secured containers, either at designated locations along the ROW or at contractor staging areas or yards. Containers that are not removed or emptied at the end of the work day will be inspected regularly until removed for off-site disposal at approved, regulated waste disposal sites.

In no case will solid or liquid wastes (except for excess soil or groundwater, if appropriate) be buried or otherwise disposed of on the ROWs or at contractor staging areas or yards.

5.8 LIGHTING AND NOISE MITIGATION

The 115-kV transmission line upgrade construction activities will result in localized and short-term increases in ambient noise levels in the vicinity of work sites. Construction-related noise will occur as a result of the operation of equipment and vehicles, including vegetation removal equipment, jackhammers, drilling rigs and cranes. Helicopters may also be used to install transmission line components.

Other potential noise-generating activities may include blasting and the use of implosive connectors (for conductor installation). At this time, Eversource does not anticipate that blasting will be required or that implosive connectors will be used on the Project. Should one or both of these techniques be needed, the procedures presented in Section 5.15 will apply to the preparation of appropriate site-specific plans.

Because noise attenuates with distance, the effects of construction-generated noise will depend on the noise source location in relation to noise receptors.

Temporary noise impacts associated with construction will be minimized because the ROW extends across relatively remote areas and because noise from construction will be relatively short-term and limited primarily to daylight hours (i.e., between 7 AM and 7 PM). In addition, Eversource will require its contractors to properly maintain and muffle equipment and vehicles to minimize noise emissions.

Because the 115-kV transmission line construction work will be performed principally during daylight hours, temporary lighting is not expected to be required on a routine basis. If needed to accomplish specific tasks that cannot otherwise be suspended at nightfall, construction lighting will be focused on the targeted work areas and will have only a short-term and localized effect.

5.9 SITE ACCESS, TRAFFIC CONTROL, AND CONSTRUCTION SIGNS

During construction, the access to the Project ROWs will be via the public road network. On- and off-ROW access roads will provide direct ingress/egress to construction work sites, as illustrated on the Volume 3 maps.

To minimize the potential for traffic issues during construction, Eversource's construction contractors will implement access and traffic control measures, working with representatives of the affected municipalities as necessary. Such measures will include procedures for safe ingress and egress to the ROW for construction equipment and other vehicles and for informing the public of construction work zones. For example, at construction work sites along public roads, signs will be erected to indicate the presence of construction work zones and flaggers or police personnel will be used to direct traffic, as needed.

The construction contractors will be responsible for posting and maintaining construction warning signs, in accordance with state and local requirements, along public roads in the vicinity of the work areas along the ROW. Signs will be consistent with the federal *Manual of Uniform Traffic Control Devices* ([MUTCD],

2009 edition, as revised May 2012, or the latest version)[7]. Flagmen and other traffic control measures may also be used as necessary.

5.10 CULTURAL RESOURCES

5.10.1 Survey Results

Eversource and its cultural resource consultant (Heritage Consultants, LLC [Heritage]) coordinated with the Connecticut State Historic Preservation Office (SHPO) and the Tribal Historic Preservation Officers (THPOs) of involved Native American tribes (e.g., Mashantucket Pequot Tribe, Mohegan Tribe, and Wampanoag Tribe) regarding the review of the Project for compliance with Section 106 of the National Historic Preservation Act. Heritage also completed a Phase 1 cultural resources reconnaissance survey of the Project ROWs.

The Phase 1 desktop review and a supplemental document, including findings from the reconnaissance survey, were submitted to the SHPO and THPOs for review. Subsequently, Heritage performed Phase 1B shovel testing in areas of moderate to high sensitivity to further investigate the potential presence of cultural resources. After completion of this work, a final Phase 1B report was prepared; this report was provided to the SHPO and THPOs for review.

The results of the Phase 1B cultural resources reconnaissance survey revealed that no historic or prehistoric sites that may be potentially eligible for listing on the National Register of Historic Places are situated within the Project ROWs. Moreover, many of the excavated shovel tests showed signs of the areas having been disturbed by previous construction and maintenance of the existing transmission line. As a result, Heritage concluded that "…no additional testing is needed and that construction of the transmission line upgrades will not have any effect on cultural resources." Both the SHPO and THPOs have concurred with Heritage's findings.

5.10.2 Unanticipated Cultural Resources Discovery Procedures

The Project training for construction contractor managers will review the procedures to be followed, should unanticipated potential cultural materials be discovered during construction. Specifically, construction personnel will be instructed to stop the task that resulted in the potential discovery and inform Eversource.

Eversource will have a professional archaeological consulting firm available to respond to potential unanticipated cultural resource discoveries. Construction work at the potential cultural resource discovery site will not resume until authorized by the professional archaeologist and Eversource.

5.11 CONSTRUCTION EQUIPMENT/VEHICLE WASHING AND CLEANING

With the exception of concrete trucks, no construction equipment or vehicle washing will be allowed on the ROW. Concrete truck wash-out will be allowed only in designated locations, which will be selected to

[7] Connecticut has adopted the federal MUTCDs.

minimize the potential for off-site environmental impacts. All wash-out areas will include measures to control and contain wash-water and to collect the cement wash-off for off-site disposal.

Erosion and sedimentation controls deployed at wash-out areas will conform to the relevant provisions of the *2002 Connecticut Guideline for Soil Erosion and Sediment Control* (as amended), Eversource's *BMP Manual,* and the CT DEEP's *General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities* (refer to Volume 2, Attachments D and E).

5.12 UTILITY CROSSINGS

Above-ground utilities and marked underground utilities are identified on the Volume 3 maps. Eversource's contractors will use "Call Before You Dig" to identify the locations of buried utilities in relation to any sub-surface work. The known buried utilities traversed by the ROW are located primarily within public roads. A natural gas transmission line and Metropolitan District Commission line also traverse the ROW (refer to the Volume 3 maps). Project construction will not involve any excavation in the vicinity of underground utilities.

5.13 METHODS TO PREVENT OR DISCOURAGE UNAUTHORIZED USE OF THE ROW, INCLUDING ATVS

Eversource's existing transmission line easements restrict the types of activities that can be conducted within the ROWs, and typically prohibit the on-ROW construction of buildings, pools, and other structures. Eversource also has policies for addressing requests from property owners and other parties external to Eversource. These policies outline an evaluation process and provide guidelines for allowing certain uses (e.g., driveways or parking lots) where appropriate. Requests for uses that are prohibited by the easement agreements, or otherwise pose safety, engineering, environmental, or other concerns, are rejected.

Connecticut law prohibits the operation of ATVs on private land without the written permission of the landowner (CGS Section 14-387). Eversource does not grant permission to use ATVs on its properties or properties subject to its easements.[8]

- **Prior to the start of construction, Eversource will send a letter to the police department in each of the two Project towns, reaffirming its policy on ATV use of its transmission line ROWs and requesting that the police give particular consideration to enforcing the prohibition on ATV use of the ROW.**

Where Eversource holds an easement as opposed to land ownership in fee, Eversource must receive landowner approval prior to installing fences, gates, etc. along the ROWs. Eversource will coordinate with landowners and agencies, as appropriate, to discourage unwarranted access onto and use of its ROWs. Accordingly, Eversource will:

[8] Eversource contractors and employees may use ATVs for construction and maintenance activities.

- Install signs warning the general public of the hazards posed by contact with the high voltage transmission line and indicating that it is unlawful to operate ATVs on private land without the written permission of the landowner; and

- Consider, based on consultation with and approval of the landowner, the installation of fences, gates, barricades, berms, or vegetative screens to discourage access onto the ROWs. The type of measure considered for a particular area will depend on site-specific conditions and landowner preferences.

Eversource will report unlawful ATV use on the Project ROWs to the local police.

5.14 WINTER WORK, ROW STABILIZATION, AND ROW MONITORING PROTOCOL

Because the 115-kV transmission line construction will require approximately 12-16 months to complete, work activities will be conducted during the winter months. Winter work activities will be conducted to minimize or avoid adverse environmental impacts. Snow removal and the use of de-icing procedures at construction sites will be in accordance with the *Snow Removal and De-Icing Plan* (Volume 2, Attachment C).

If, after Project construction, some ROW clean-up or restoration work is completed too late in the season to initiate or complete permanent stabilization of disturbed areas (e.g., temporary staging areas that may require reseeding), temporary erosion and sedimentation controls will be left in place and augmented if necessary. These measures will be periodically inspected and maintained until permanent site stabilization can be completed, likely during the following spring.

All erosion and sedimentation control practices and over-winter monitoring will be in accordance with Eversource's *BMP Manual*, the CT DEEP's *General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities*, the Project's 401 Water Quality Certification, and any relevant conditions of the USACE Section 404 permit.

5.15 BLASTING PROCEDURES

Eversource does not anticipate that blasting or implosive connector work will be used to install the transmission line facilities. However, if blasting is subsequently determined to be required to facilitate line construction, Eversource will retain a certified blasting specialist (blasting contractor licensed by the Connecticut Department of Emergency Services and Public Protection) to develop a site-specific blasting plan, in compliance with state and local regulations and Eversource guidelines. The plan will take into consideration local geologic conditions and the locations of nearby transmission line structures and other developments. Pre- and post-blast surveys of nearby properties would be conducted, as necessary. The blasting plan will typically address the following:

- Location(s) along the ROWs where blasting would be performed and general summary of work to be performed.

- List of permits required (e.g., from local Fire Marshals).

- Blasting schedule (days and hours per day).

- Safety meetings to be held prior to the performance of the blasting.
- Noise monitoring.
- Traffic control measures, as warranted.
- The blasting plan would be provided to the local Fire Marshals and to the Council for review and approval.

Prior to either blasting or implosive connector work, Eversource would conduct community outreach to inform local officials and the public about the planned work and about any pre- and post-work inspections, as necessary, of properties abutting the work sites. Typically, the construction contractor would arrange for pre- and post-work inspections of abutters' properties. Eversource would coordinate directly with town officials, including notifications to the local police and fire departments regarding the schedule for the work.

Eversource would submit any site-specific blasting plan(s) to the Council pursuant to the "Project Change Approval Process" included in Volume 1, Section 7 of this D&M Plan.

6. ENVIRONMENTAL INSPECTION

The Project construction contractors will be required to comply with all applicable environmental regulatory requirements, as well as with the Council-approved D&M Plan. Eversource will require construction contractors' personnel to attend training regarding Project-specific requirements, including the specifications of this D&M Plan.

To verify the contractors' environmental compliance, Eversource personnel (or Eversource's representative) will routinely monitor Project construction activities for conformance to the D&M Plan and to other Project-specific permits and approvals. Eversource also will provide environmental monitoring, as applicable, pursuant to the requirements of CT DEEP and USACE permit approvals for the Project.

Contractors will be responsible for ensuring that all of their employees attend the Project specific training. Contractor employees will be responsible for implementing and following the conditions of all permits and approvals and implementing the appropriate protective measures outlined in this D&M Plan.

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7. NOTICES AND REPORTS

7.1 NOTICES TO THE COUNCIL: START AND COMPLETION OF CONSTRUCTION (INCLUDING ACCESS AND VEGETATION CLEARING)

Pursuant to RCSA Section 16-50j-62(b)(1), Eversource will provide written notification to the Council **a minimum of two weeks in advance** of the commencement of the following types of work:

a. Vegetation clearing or access work; and

b. Transmission line construction.

Pursuant to RCSA Section 16-50j-62(b)(4), Eversource also will provide written notification to the Council of the completion of construction (including site restoration / rehabilitation) and the commencement of site operation.

Pursuant to RCSA Section 16-50j-62(a)(1), Eversource also will provide written notification to and seek approval (as necessary) from the Council regarding the location and size of all areas to be accessed or used for site testing or staging and not otherwise included in this D&M Plan.

7.2 NOTICE OF CHANGES TO D&M PLAN

Pursuant to RCSA Section 16-50j-61(d), notice of a filing of changes to the D&M Plan that require Council approval will be provided to the service list and the property owner of record, if applicable, at the time that the filing is made with the Council.

7.2.1 D&M Plan Changes Requiring Notice to the Council

Pursuant to RCSA Section 16-50j-62(b)(2), the Council must pre-approve any significant changes to this D&M Plan. Eversource (or its agent) will identify, track, and approve all changes, whether significant or insignificant. *No changes to the D&M Plan will be implemented without such documented approvals.*

Eversource will provide the Council with advance written notice whenever a significant change of the approved D&M Plan is necessary. If advance written notice is impractical, Eversource will provide immediate verbal notice to the Council, followed by written notice no later than 48 hours after the verbal notice.

RCSA Section 16-50j-62(b)(2) defines a "significant" change to the approved D&M Plan as including, but not limited to, Project modifications that entail a change in:

- The location of a wetland or watercourse crossing.
- The location of an accessway or structure in a regulated wetland or watercourse area.

- The construction or placement of any temporary structures or equipment.
- Transmission line structure type or location including, but not limited to, towers, guy wires, associated equipment, or other structures.
- Use of additional mitigation measures or elimination of mitigation measures.

In addition to the above criteria, Eversource proposes to define a "significant" Project change as one that would substantially reduce the amount of protection to the environment, substantially increase potential public concern, or would otherwise potentially result in a meaningful effect on the environment, the public, or other Project permits and approvals.

7.2.2 D&M Plan Change Approval Process

A request for a change to the D&M Plan may originate from the Project team, construction contractors, or others, or be driven by regulatory agency approvals issued after the Council's approval of the D&M Plan, with which the D&M Plan must be consistent. The following procedures will be used to identify, track, and obtain the approval of the Council, if required, for changes to this D&M Plan.

1. **Identify Proposed Project Change**. A proposed change is identified and described by the change originator and provided to Eversource. Data to be provided to Eversource by the change originator may include, for example:

   - Description of the change (location, type);
   - Reason/need for the change;
   - Date by which the change is required (timing);
   - Project schedule and cost implications (if applicable); and
   - Identification of effects (if any) on the environment, cultural resources, and the public.

   The Project change request will be supported by maps and drawings, as appropriate.

2. **Assess Significance of Proposed Change**. Eversource will evaluate each proposed change to determine whether it either:

   - Qualifies as a significant change to the approved D&M Plan and thus requires advance notification to and approval by the Council; or
   - Constitutes a minor change requiring only Eversource approval.

3. **Significant Changes Requiring Notice to and Prior Approval by the Council.** After Eversource determines that a proposed change represents a significant change to the D&M Plan requiring notification to the Council and the Council's pre-approval, Eversource will categorize each proposed change as either "urgent" or "non-urgent", based on the following:

   - ***Urgent.*** A Project change will be considered "urgent" if waiting until the next regularly-scheduled Council meeting to obtain approval of the change would have a negative impact on

Project construction costs or scheduling, or if the provision of written notice is impractical for other reasons. For "urgent" changes, Eversource will provide verbal notification of the change to Council staff and will request that the Council approve the change expeditiously. Eversource will promptly implement the D&M Plan change in accordance with the Council's expedited approval (verbal or written). Not later than 48 hours after the provision of verbal notice of the D&M Plan change request to the Council, Eversource will submit written notice to the Council. If the Council elects not to act on the proposed D&M Plan change request pursuant to the urgent (verbal) notice, Eversource will provide the Council with written notice of the proposed Project Change within 48 hours and will defer any construction activities related to the change request pending the Council's determination.

- ***Non-Urgent.*** If Eversource determines that a D&M Plan change request is "non-urgent", Eversource will provide written notice to the Council, seeking the Council's consideration of the proposed D&M Plan change at the next regularly-scheduled Council meeting.

4. **Non-Significant D&M Plan Change: No Council Pre-Approval Required.** Minor changes to the approved D&M Plan will require Eversource approval prior to implementation, as well as Project documentation. Documentation of minor changes will be provided in the monthly construction progress reports that will be submitted to the Council.

Figure 7-1 provides a flow chart illustrating this change approval process.

7.2.3 D&M Plan Change Documentation and Reporting

Although only significant D&M Plan changes will require the Council's pre-approval, Eversource will document all D&M Plan changes and provide such documentation to the Council in its monthly construction progress reports.

7.3 REPORTS

Table 7-1 identifies the written reports that will be provided to the Council regarding the Project. Eversource will provide general updates regarding the status of the Project in the Monthly Construction Progress Reports.

Figure 7-1
D&M Plan Change Process

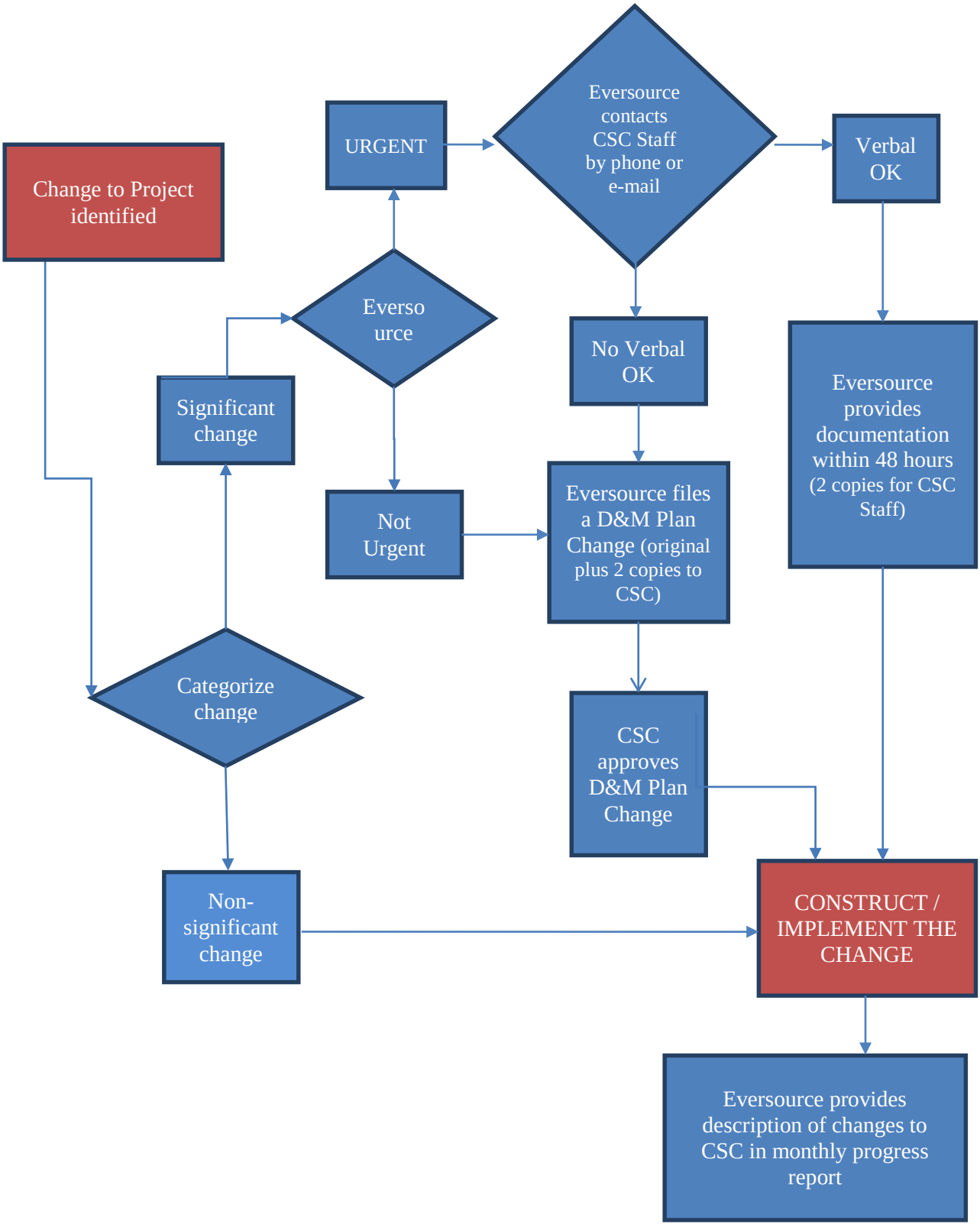

Table 7-1
Reports to be Provided to the Council

Report Type (Regulatory Requirement)	Content
Monthly Construction Progress Report (RCSA Section 16-50j-62(b)(3))	Monthly construction progress report will summarize the status of the Project construction (by location, percent complete) and will identify modifications to the approved D&M Plan, including both significant changes involving Council pre-approval and minor changes that did not require Council action.
Final Report (RCSA Section 16-50j-62(c))	Eversource will provide to the Council a final report no later than 180 days after the completion of all site construction and rehabilitation. The report will identify the following: 1 All agreements with abutters or other property owners regarding special maintenance precautions 2 Significant changes to the D&M Plan that were required because of property rights or underlying and adjoining owners or for other reasons 3 The location of construction materials that have been left in place, including but not limited to, culverts, erosion control structures along watercourses and steep slopes, and corduroy roads in regulated wetlands 4 The location of areas where special plantings and reseeding have been performed 5 The actual construction cost of the facility, including but not limited to the following costs: a. Clearing and access; b. Construction of the facility and associated equipment; c. Rehabilitation; and d. Property acquisition for the site or access to the site.

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8. PUBLIC REVIEW AND OUTREACH

8.1 PROJECT PLANNING AND D&M PLAN

As part of the Project planning process, Eversource consulted with municipal officials in the towns of Bloomfield and Windsor and conducted Project outreach with abutting property owners. Prior to submitting this D&M Plan to the Council, Eversource provided copies of the draft D&M Plan to representatives of the Town of Bloomfield and then met with Town representatives to discuss the Plan.

In addition, Eversource posted the filed D&M Plan on the Project web site. This website is accessible from the Eversource homepage (www.Eversource.com). From this homepage, Project information can be accessed by clicking the "About" tab and then the "Major Projects and Infrastructure" tab to view a list of the Company's ongoing and proposed projects, including this Project. Included on the website is an e-mail address (transmissioninfo@eversource.com) and a telephone number (800-793-2202) to contact Eversource for more Project information or to provide comments about the Project.

8.2 PUBLIC OUTREACH DURING CONSTRUCTION

Throughout the Project planning and the Council's siting processes, Eversource conducted extensive community outreach, including direct coordination with landowners, and municipal officials. Eversource will continue its outreach efforts through the Project's construction phase.

Specific to the Council's condition of approval, regarding the timing of work in the vicinity of the Wintonbury Hills Golf Course, the Project is consulting with the Town of Bloomfield on this matter, as well as securing a modification to Eversource's existing easement to accommodate the new structure configuration within the existing ROW.

Eversource's Project information and email address are currently available, via the website noted in Section 8.1. This website provides an overview of the Project, a map of the Project facilities, and Eversource contact information. Residents, businesses, and other stakeholders can use the website information to contact Project representatives.

In addition, Eversource representatives will contact adjacent and nearby residents and businesses, via mail, to notify them of the start of construction activities. Project field representatives also will be available throughout the construction process to address any specific questions or concerns regarding the transmission line upgrades.

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9. GLOSSARY OF TERMS

Access Road:	A road that provides access into and out of the stations, staging areas, or ROW.
BMP:	Best Management Practice
CGS:	Connecticut General Statutes
Conductor:	A metallic wire, busbar, rod, tube or cable that serves as a path for electric current flow
ConnDOT:	Connecticut Department of Transportation
Conduit:	Pipes, usually PVC plastic, typically encased in concrete, for housing underground power and control cables.
Council or CSC:	Connecticut Siting Council
CWA:	Clean Water Act
CT DEEP:	Connecticut Department of Energy and Environmental Protection
Counterpoise:	Part of grounding system.
D&M Plan:	Development and Management Plan (required by the Connecticut Siting Council)
dBA:	Decibel, on the A-weighted scale.
Deadend Structure:	A line structure that is designed to have the capacity to hold the lateral strain of the conductor in one direction.
DECD:	Connecticut Department of Economic and Community Development
Declaratory Ruling:	Connecticut Siting Council ruling regarding the Project
Direct Embed:	Structure installation type in which the bottom section of each pole is placed in an excavated hole. Does not require the use of foundations or concrete. H-frame and guyed pole structures are typically direct embedded.
Drilled Shaft Foundation:	Structure foundation type involving the use of drilling rigs and pneumatic hammers to excavate an area for the structure foundation. Concrete is used for the foundation.
During Construction:	Construction refers to Project activities commencing with work site / staging area preparation through final restoration and site stabilization.

Electric Field:	Produced by voltage applied to conductors and equipment. The electric field is expressed in measurement units of volts per meter (V/m) or kilovolts per meter (kV/m); 1 kV/m is equal to 1,000 V/m.
Electric Transmission:	The facilities (69 kV+) that transport electrical energy from generating plants to distribution substations.
EMF:	Electric and magnetic fields.
Environmental Inspector:	Environmental scientist employed by Eversource to monitor the conformance of Project construction to the environmental requirements
EPA:	United States Environmental Protection Agency
Eversource:	Also "the **Company**": The Connecticut Light and Power Company doing business as Eversource Energy.
Fault:	A failure (short circuit) or interruption in an electrical circuit.
FEMA:	Federal Emergency Management Agency
Frac Tank:	Fractionization tank, used to temporarily hold water pumped from Project excavations or otherwise used during Project construction activities
Grounding System:	Consists of ground rings, placed around transmission line poles and counterpoise as required.
Ground Wire:	Cable/wire used to connect wires and metallic structure parts to the earth. Sometimes used to describe the lightning shield wire.
H-Frame Structure:	A wood or steel structure constructed of two upright poles with a horizontal cross-arm and bracings.
Idling:	The period when mobile construction equipment is not in motion or is not otherwise actively performing its designated function.
kV:	Kilovolt, equals 1,000 volts
kW:	Kilowatt, equals 1,000 watts
Lightning Shield Wire:	Electric cable located to prevent lightning from striking transmission circuit conductors.
Line:	A series of overhead transmission structures supporting one or more circuits; or in the case of underground construction, a duct bank housing one or more cable circuits.
Magnetic Field:	Produced by the flow of electric currents; however, unlike electric fields, most materials do not readily block magnetic fields. The level of a magnetic field is commonly expressed as magnetic flux density in units called gauss (G), or in milligauss (mG), where 1 G = 1,000 mG.
MF:	Magnetic Field
MUTCD:	Manual of Uniform Traffic Control Devices

NAAQS:	National Ambient Air Quality Standards
NDDB:	Connecticut Natural Diversity Data Base (CT DEEP)
NRCS:	National Resources Conservation Service (U.S. Department of Agriculture)
NRHP:	National Register of Historic Places
NWI:	National Wetlands Inventory
OPGW:	Optical groundwire (a shield wire containing optical glass fibers for communication purposes)
PEM:	Palustrine emergent marsh (wetlands)
Petition:	Petition No. 1217 (CSC Petition Number for the Project)
PFO:	Palustrine forested (wetlands)
Phases:	Transmission (and some distribution) AC circuits are comprised of three phases that have a voltage differential between them.
Project:	Bloomfield – Windsor Upgrades Project
PSS:	Palustrine scrub-shrub (wetlands)
PUB:	Palustrine unconsolidated bottom (wetlands)
PURA:	Public Utilities Regulatory Authority (part of CT DEEP)
RCSA:	Regulations of Connecticut State Agencies
Reconductor:	Replacement of existing conductors with new conductors, but with little if any replacement or modification of existing structures.
ROW:	Right-of-Way
Shield Wire:	See Lightning Shield Wire
SHPO:	State Historic Preservation Office (Connecticut)
SPCP:	Spill Prevention and Control Plan
SRHP:	State Register of Historic Places
Stormwater Pollution Control Plan:	A sediment and erosion control plan that also describes all the construction site operator's activities to prevent stormwater contamination, control sedimentation and erosion, and comply with the requirements of the Clean Water Act.
Substation:	Part of the electric transmission system, a high-voltage electrical facility with a fenced-in yard containing switches, transformers, line-terminal structures, and other equipment enclosures and structures to regulate and distribute electrical energy, such as receiving power from a generating facility, changing voltage levels, limiting power surges, etc. Adjustments of voltage, monitoring of circuits and other service functions take place in this installation.

Terminal Structure:	Structure typically within a substation that ends a section of transmission line.
Transmission Line:	Any line operating at 69,000 or more volts.
USACE:	United States Army Corps of Engineers
USDA:	United States Department of Agriculture
USFWS:	United States Fish and Wildlife Service
USGS:	United States Geological Survey (U.S. Department of the Interior).
Vegetation Clearing:	Removal of forest vegetation. May also refer to mowing or cutting of scrub-shrub vegetation.
Watercourse:	Rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, public or private.
Wetland:	An area of land consisting of soil that is saturated with moisture, such as a swamp, marsh, or bog. CT DEEP and the USACE have formal definitions of state and federal jurisdictional wetlands, respectively.
XS:	Cross section (drawing)

APPENDICES

Appendix A: Vegetation Clearing Plan

- Attachment 1: Northeast Utilities' Vegetation Clearing Specifications: *Right-of-way Vegetation Initial Clearing for 115- and 345-kV Transmission Line* (OTRM 030.001)
- Attachment 2: *Vegetation Clearing Procedures and Practices for Transmission Line Sections* (OTRM 230)
- Attachment 3: Eversource's brochure regarding procedures for landowners to request timber cleared from the ROW on their property ("Making Requests for Wood" www.Eversourcerightsofway.com)

Appendix B: Vernal Pool Habitat Report

Appendix C: Rare Salamander Habitat Assessment and Field Survey Report

Appendix D: Blue Hills Avenue Laydown Area

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Appendix A
Vegetation Clearing Plan

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BLOOMFIELD - WINDSOR UPGRADES PROJECT

DEVELOPMENT AND MANAGEMENT PLAN

for

115-kV TRANSMISSION LINE UPGRADES

APPENDIX A - VEGETATION CLEARING PLAN

August 2016

Prepared by:

The Connecticut Light and Power Company doing business as Eversource Energy

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1 Eversource *Right-of-way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines* (OTRM 030.001)

2 Eversource *Vegetation Clearing Procedures and Practices for Transmission Line Sections* (OTRM 230)

3 Eversource brochure regarding procedures for landowners to request timber cleared from the ROW on their property ("Making Requests for Wood" www.NUrightsofway.com)

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1. INTRODUCTION

Within portions of the rights-of-way (ROWs) associated with the Bloomfield to Windsor Upgrades Project (Project), Eversource routinely manages vegetation pursuant to requirements for the reliable operation of the overhead transmission lines. Since April 7, 2006, Eversource's ROW vegetation management practices have been required to comply with mandatory standards adopted by the North American Electric Reliability Corporation following the August 14, 2003 Northeast blackout.[1] These vegetation management practices are designed to allow the reliable operation of the transmission facilities by preventing the growth of trees or invasive vegetation that will otherwise interfere with the transmission facilities or hinder access along the ROWs.

As a result, the vegetation within the managed portions of the Project ROW typically consists of shrubs and small trees (generally maturing at less than 20 feet in height) and herbaceous species. The vegetation outside the currently managed portions of the ROW consists predominantly of mixed deciduous forest of various ages and sizes[2], but also includes areas of farmlands, open fields, and similar low-growing vegetative communities.

Low growing, herbaceous, scrub/shrub and forest vegetation along the ROW will be removed where necessary to construct the new 115-kV line, to provide and maintain access to transmission line structures, and to provide safe distances between the conductors and woody vegetation at all times. However, the amount of and type of vegetation clearing required will vary, depending on factors such as the existing width of the managed ROW, vegetation communities present (e.g., forested, herbaceous, scrub-shrub, open field, lawn), the type of the new 115-kV transmission line structures, configuration of the transmission line conductors, transmission line span lengths, and terrain.

This *Vegetation Clearing Plan (Plan)* describes the vegetation clearing that will be performed as part of Project construction, including the limits of clearing for construction and the vegetation disturbance (primarily removal of tall-growing tree species) along each ROW segment, as required to meet the established minimum vegetation clearances when operating the new transmission line. These vegetation removal limits are illustrated on the Volume 3 maps.

It also is likely that as part of vegetation removal during construction or after the conductors have been installed, additional trees, located outside of the initially cleared area, may need to be selectively removed or pruned to achieve the required clearances. Vegetation (trees and herbaceous or low growing scrub/shrub) removal outside of the vegetation clearing limits shown on the Volume 3 maps will also be required, particularly along off-ROW access roads and on-ROW access roads that extend beyond these clearing limits.

[1] Transmission line outages triggered by conductors sagging into overgrown vegetation in Ohio were substantial factors in causing the blackout.

[2] A "tree" is defined as a woody plant maturing at 20 feet or more in height, usually with a single trunk, un-branched for several feet about the ground, with a definite crown. (Refer to Attachments 1 and 2 to this *Plan*)

The *Plan* also addresses the typical methods to be used for forested and low growing herbaceous and scrub/shrub vegetation removal, along with measures for salvaging merchantable timber.

Vegetation clearing methods will be in accordance with Eversource specifications (refer to Attachments 1, 2, and 3 to this *Plan*), the conditions of Project regulatory approvals received from the Connecticut Siting Council (Council), U.S. Army Corps of Engineers (USACE), and Connecticut Department of Energy and Environmental Protection (CT DEEP). In addition, Eversource's Best Management Practices (BMPs) will be implemented, as appropriate to the clearing activities (refer to Volume 2, Attachment D).

2. LIMITS OF CLEARING

Along the Project ROW, the width of the vegetation that Eversource currently manages differs, depending on the number and configuration of the existing transmission lines that occupy the ROW (refer to the cross-sections in Volume 3). As a result, the amount of new vegetation clearing for the Project, particularly additional forest removal, will vary by ROW segment. Table 2-1 summarizes the widths of the Project ROW segments, the typical widths of the presently managed portions of the ROW, and the anticipated additional widths of vegetation removal for the Project.

Table 2-1: Summary of Project ROW Widths, by ROW Segment and Existing and Planned Vegetation Management

Line #	Existing Eversource ROW or Property			
	Cross-Section Reference (refer to Vol. 3)	Total ROW Width (feet)	Width of Current Vegetation Management Area along ROW (feet, typical)	Estimated Width of New Vegetation Clearing* Required for Proposed 115-kV Transmission Line (feet)
1777/1779	XS-1	200	130	25
1751/1777	XS-2	200	175	5

*Note: The estimated width of new vegetation clearing refers to the additional areas of the ROW, outside of the portions of the ROW that Eversource presently manages, where vegetation (typically forest) would have to be removed for the 115-kV transmission line. To accommodate the construction of the Project, vegetation (mostly shrub-scrub) would also have to be removed along portions of the existing managed ROW.

The Volume 3 maps illustrate the edge of new vegetation removal that is required to meet the established minimum vegetation clearances for operating the new transmission lines and – within the presently managed portions of the ROW - the general limits of vegetation clearing that will be required to construct the new line.

Outside of the limits of vegetation removal shown on the Volume 3 maps, most of the vegetation within the remaining width of the ROW will not be affected by construction activities. However, some additional vegetation removal will be required to establish on- or off-ROW access roads and certain work pads that must be located beyond the standard vegetation removal limits.

Also, as part of vegetation removal during construction or after the conductors have been installed, additional trees, located outside of the initially cleared areas, may need to be selectively removed or pruned to achieve the required clearances.

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3. VEGETATION CLEARING METHODS

3.1 General Approach

Vegetation clearing for the new 115-kV transmission line will be performed in accordance with Eversource's *Right-of-way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines* (OTRM 030.001) and *Vegetation Clearing Procedures and Practices for Transmission Line Sections* (OTRM 230). (Refer to Attachments 1 and 2, respectively, to this *Plan*).

Vegetation will be removed along those portions of the ROW to be used for the construction of the new transmission lines, as well as in areas that contain undesirable, tall-growing, woody species that could grow to interfere with the operation of the proposed transmission lines should they not be removed. For example, as part of construction, all tall growing vegetation will be removed within the identified "proposed vegetation removal limits" shown on the Volume 3 maps.

Vegetation (all types) also will be cleared, as required, at work pads, as well as along existing or new access roads. In addition, vegetation will be removed, as necessary, along existing or new access roads that may be on the ROW (but outside the designated vegetation removal limits) or off the ROW (but required to reach the ROW). In addition, danger or hazard trees outside the limits of clearing (on or off the ROW) will be removed as necessary to protect the integrity of the new transmission lines.

Clearing will typically be accomplished using mechanical methods, although manual methods (e.g., chain saws) may be used in wetlands and near residential areas. Vegetation removal activities typically require flatbed trucks, brush hogs or other types of mowing equipment, bucket trucks for canopy trimming, feller bunchers for mechanical tree cutting, skidders, forwarders, and wood chippers, log trucks, and chip vans for removal of wood products from the ROW.

3.2 Access for Vegetation Clearing

Clearing crews must be able to access areas where vegetation removal is required for construction and within the clearance zones of the new 115-kV conductors, as well as to reach on-ROW or off-ROW danger and hazard trees (refer to Section 3.4). Thus, vegetation clearing crews will use both on- and off-ROW access roads, which also will be used for general Project construction, as well as on-ROW "access routes" that will be required only to reach areas where vegetation must be removed.

Access roads are illustrated on the Volume 3 maps. Temporary "access routes" for vegetation clearing and removal crews are also identified on the Volume 3 maps. However, actual clearing crew routes may vary slightly from those illustrated on the maps because the Project clearing contractor will locate such temporary routes in the field at the time of construction, based on site-specific conditions. Such

"access routes" will be restored to pre-construction conditions, as clearing activities proceed along the ROW.[3]

During vegetation removal, timber mats, timber corduroy road, or equivalent may be used to provide a stable base for clearing equipment across watercourses or within wetlands. Such temporary support will minimize rutting in wetlands and will be removed after the clearing activities are completed. Within wetlands and across streams, vegetation clearing crew "access routes" will be in accordance with all Project regulatory requirements, including permits from the CT DEEP and the USACE.

3.3 Vegetation Removal: Low-Impact Tree Clearing

Eversource will implement various measures to minimize the environmental effects of vegetation removal. For example, Eversource will incorporate into the vegetation clearing contract relevant specifications for access, wetland/stream crossings, vegetation removal methods, vernal pool protection, state-listed species protection, and maintenance of site quality.

In addition, Eversource will require the vegetation clearing contractor to use low-impact tree clearing means and methods to remove forested vegetation. Low-impact tree clearing incorporates a variety of approaches, techniques, and equipment to minimize site disturbance and to protect wetlands, watercourses, soils, threatened and endangered species and their habitats, and cultural resources. Eversource will require the clearing contractor to use some or all of the following low-impact tree clearing methods, depending on site-specific considerations:

- Consider soil and weather conditions when scheduling vegetation removal activities.
- Maximize the use of uplands for clearing access routes.
- Fell trees directionally (parallel to and within the ROW) to minimize impacts to residual vegetation, where practical.
- Adhere to BMPs, as described in the *Best Management Practices for Water Quality while Harvesting Forest Products*, 2007 Connecticut Field Guide (also referenced in the Eversource BMPs, Volume 2, Attachment D) (http://www.ct.gov/deep/cwp/view.asp?a=2697&q=379248&deepNav_GID=1631).
- Use a variety of tree clearing equipment, as appropriate to minimize impacts to the extent practicable.
- Cut trees close to the ground, leaving root systems and stumps, where practical, to provide additional soil stability.
- Stockpile cut timber and brush only in uplands.

[3] Clearing access routes also will be used to reach danger and hazard trees, located either on-or off the ROW that, in the opinion of Eversource foresters, must be removed to protect the integrity of the transmission line. Such danger and hazard trees cannot be identified until the construction phase.

Where removal of woody vegetation is required, vegetation will be cut so that stumps are generally 6 inches or less above the ground surface.

Desirable species will be preserved to the extent practical. For example, certain desirable, low-growing trees may be kept on the ROW in specific locations, pursuant to Eversource's *Right-of-Way Vegetation Initial Clearance Standard for 115-kV and 345-kV Transmission Lines* (refer to Attachment 1 of this *Plan*). Generally, all tall-growing tree species will be removed from the managed portion of the ROW and low-growing tree species and taller shrub species will be retained in the areas outside of the conductor zones. The conductor zone is the area directly beneath the conductors extending outward a distance of 15 feet from the outermost conductors.

3.4 Vegetation Removal: Environmentally Sensitive and Other Special Areas

In environmentally sensitive and other special use areas, Eversource will conduct vegetation removal activities in accordance with applicable federal and state permit requirements, and site-specific conditions that may apply to special land uses (e.g., public recreational areas).

Wetlands and Waterbodies. Along stream banks and within wetlands, Eversource will attempt to retain low-growing vegetation to the extent practicable. For example, vegetation removal near streams will be performed selectively, preserving desirable streamside vegetation within a 25-foot-wide riparian zone adjacent to either side of the stream bank in order to maintain habitat, shading, and bank stability and to minimize the potential for sedimentation.

In wetlands, vegetation clearing will be conducted to minimize rutting; in addition, stumps will not be removed from forested wetlands unless it is determined that intact stumps will pose a safety concern for the construction personnel during the establishment/use of access roads and work areas, or installation of transmission line structures. (For additional information regarding vegetation removal in and near water resources, refer to the *Wetlands and Waterbodies Impact Avoidance and Minimization Measures* included on Detail Sheet 6 in Volume 3).

Vernal Pools. A limited amount of vegetation removal within vernal pools will be required. However, such clearing will be performed manually; no equipment will be allowed within the identified limits of the vernal pools. Vegetation removal near vernal pool habitats will be necessary, but will be limited to the extent practicable, as will equipment access to complete the vegetation removal. Where access near (i.e., within 100 feet of) vernal pools is unavoidable, lower impact clearing techniques and/or temporary timber mats, corduroy roads, or equivalent may be used to support vehicles and equipment. (Refer to Detail Sheet 4 in Volume 3 for additional information regarding vernal pool impacts.) To the extent that circuit outage and other construction timing constraints allow, Eversource will attempt to schedule these activities so as not to interfere with amphibian breeding and migration seasons. Work during frozen ground conditions also will be considered, if construction and/or transmission line outage schedules allow. (For additional details, refer to the *Avoidance and Minimization Measures for Vernal Pools* included on Detail Sheet 6 in Volume 3).

Other. Eversource may alter vegetation removal activities in the following areas, provided that the vegetation clearing is consistent with the requirements for construction and for the operation of the facilities pursuant to national transmission line vegetation management standards:

a. Agricultural lands (where vegetation removal is required, such as within hedgerows).

b. Near homes where owner-maintained ornamental vegetation does not interfere with the construction, maintenance, or operation of the transmission line.

c. In areas documented to contain state-listed species or those that provide state-listed species habitat, Eversource will minimize mowing and ground disturbance outside of the areas required to safely complete the necessary vegetation clearing for construction activities. (Refer to Detail Sheet 7 in Volume 3 for additional information regarding rare species avoidance and impact minimization measures.)

3.5 Timber and Brush Disposition

The clearing contractor will be responsible for using or properly disposing of any vegetative materials cut along the ROW that are not otherwise planned for use by the landowner (e.g., as firewood) per easement agreements (refer to Section 5 and Attachment 3 of this *Plan*). Other than when wood is to be left for the landowner, Eversource will not dictate to the clearing contractor the means and methods for wood disposition.

The value of timber resources removed from the ROW for such uses as lumber, firewood, mulch, or biomass chips is a function of the species, location, size, and quality, as well as the market for such products. Typically, a clearing contractor can be expected to reduce waste, minimize clean-up costs, and maximize the value of the wood resources. The following methods may be used for timber disposition:

1. **Wood Requested by Landowners.** For landowners who request to retain wood that is cleared from an easement area on their property, tree tops will be cut, chipped and removed or spread in upland areas, but the timber/firewood will be piled on the edge of the ROW (on the landowner's property), outside of any environmentally sensitive areas and away from construction activities.

2. **Drop and Lop.** This method involves cutting a tree, lopping off the branches (as appropriate), and then leaving the wood materials where felled. The "drop and lop" method is typically used in areas that are inaccessible to clearing equipment; when cutting sapling-size trees (generally less than 2 inches dbh) on the managed portions of the ROWs; or when impacts to nearby compatible vegetation need to be avoided.

3. **Chipped on ROW.** Brush, tree tops, limbs, and other non-marketable timber and marginally marketable trees typically will be disposed of by chipping. Chips must not be left in piles, but may be spread on the ROW at a depth not to exceed 3 inches.

4. **Used for Log Riprap.** Some timber may be requested by the construction contractor involved in access road construction for use when developing temporary access roads (corduroy) across wetlands. The use of corduroy must be in accordance with regulatory requirements.

5. **Removed for Forest Product Use.** The harvested trees or other wood materials (e.g., wood chips) are transported off-site for productive use. Market demand, transportation costs, and quality of the wood materials will factor into the viability of this option.

3.6 Danger and Hazard Trees

A danger tree is a tree that, due to its location and height, could cause a flashover or damage to the structures or conductors, or violate the conductor zones, if it were to fall toward the transmission line. A hazard tree is a tree that exhibits some type of defect or damage (e.g., weakness, broken limbs, decay, infestation) that increases the risk of it falling into the transmission line.

During and after the 115-kV transmission line construction, on- and off-ROW danger and hazard trees that threaten the transmission line will be identified. Such trees will be removed or pruned as necessary. To the extent that un-managed portions of the existing Eversource ROW border the new 115-kV line, there is a lower potential for the occurrence of off-ROW danger or hazard trees. However, on-ROW danger or hazard trees, located in un-managed areas outside the limits of the Project clearing, may be identified and then would be removed.

Prior to the removal of any off-ROW danger or hazard trees, Eversource will inform and seek permission from the affected landowner.

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4. VEGETATION MANAGEMENT AND PRESERVATION GOALS AND METHODS

The objective of Eversource's well-established vegetation management program is to maintain safe access to its transmission facilities and promote the growth of vegetative communities along its ROWs that are compatible with transmission line operation and in accordance with federal and state standards. The vegetation along the new transmission lines will be managed in accordance with these standards.

Eversource's vegetation management practices are designed to allow the reliable operation of transmission lines by preventing the establishment and growth of trees or invasive vegetation that could interfere with the transmission facilities or access along the ROWs. As a result, the vegetation within the managed portions of Eversource's ROWs typically consists of shrubs, herbaceous species, and other low-growing species. Unused or un-managed portions of Eversource's ROWs not proximate to the existing line may be characterized by forest vegetation, which is allowable as long as it does not conflict with the operation of overhead transmission lines.

Undesirable tall-growing woody species within the ROWs and proximate to the new 115-kV transmission lines will be removed during construction. These species will be cut to ensure adequate clearance from wires and structures, pursuant to Eversource's *Right-of-Way Vegetation Initial Clearance Standard for 115-kV and 345-kV Transmission Lines* (refer to Attachment 1 to this *Plan*). Desirable species will be preserved to the extent practicable. In selected locations, certain desirable low-growing trees or tall growing shrubs, due to their growth characteristics and locations relative to the new line, may be allowed to remain on the ROWs.

Vegetative species compatible with the use of the ROW for transmission line purposes are also expected to regenerate naturally over time. Eversource will promote the re-growth of desirable species by implementing ROW vegetative management practices to control tall-growing trees and promote native plant colonization.

Vegetation preserved during Project construction activities may be removed in the future in accordance with Eversource's *Vegetation Clearing Procedures and Practices for Transmission Lines, OTRM 230* (refer to Attachment 2 to this *Plan*).

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5. LANDOWNER OUTREACH AND BENEFICIAL USE OF FOREST PRODUCTS

The timber and firewood resources along the 115-kV transmission line route belong to the landowners across whose properties the ROW is aligned. Eversource's policy is to proactively coordinate with landowners regarding the disposition and use of the trees to be removed along the ROWs.[4]

If requested by the landowner, the firewood and timber portions of the trees will be left on the landowner's property on the edge of the managed portion of the ROW, in upland areas that are not otherwise designated as environmentally sensitive,. After limbs are removed, the boles of the trees would be piled in tree-length logs for landowners to cut and remove at their convenience.

Timber and firewood removed along the ROWs on Eversource-owned properties or on parcels where the landowners are not interested in retaining the wood will become the property of the Project's land clearing contractor.

[4] Information for landowners regarding vegetation clearing and timber also is described in Eversource's brochure "Making Requests for Wood", which can be found at www.NUrightsofway.com. A copy of this brochure is included in Attachment 3 of this *Plan*.

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ATTACHMENT 1

Right-of-way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines (OTRM 030.001)

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1. Scope

This standard describes the vegetation clearing along rights-of-way (ROW) of the NU operating companies in Connecticut and Massachusetts where overhead transmission lines are to be constructed. The practices described here apply to the construction requirements for all 115kV and 345kV [1] electric transmission lines, and are consistent with the North American Electric Reliability Council (NERC) Vegetation Management Standard FAC-003-1 dated 2/16/2006, The New England Independent System Operator's (ISO-NE) vegetation clearing standard OP-3 dated 2/1/2005, and the National Electrical Safety Code (NESC) Rule 218 as adopted by the Connecticut Department of Public Utility Control (Regulation Sec. 16-11-134).

This standard applies to new construction clearing requirements and practices and not to on-going future vegetation maintenance of the ROW's. The initial clearance requirements outlined in this standard are intended to provide adequate clearances for a period of four (4) years at which time scheduled maintenance will be performed to reestablish or preserve the initial clearances. The maintenance of the vegetation following construction is addressed under the Northeast Utilities Specification for Rights-of-Way Vegetation Management. Low-maturing trees, which are allowed to remain after completion of vegetation clearing, are still subject to future trimming and removals, depending upon their growth and health, as well as the future needs of NU to operate, maintain, and add or replace electric facilities on the ROW.

NU operating companies typically obtain permanent easement rights for the placement of overhead transmission lines, including the right to clear vegetation within the fully defined limits of a ROW. In most locations the right to remove any tree or portion of tree outside the easemented limits of the ROW ("danger tree") that by falling could endanger the transmission line facilities is also obtained. These rights are necessary to provide for the safe and reliable operation and maintenance of any overhead transmission line that is built on a ROW.

Notwithstanding these rights, the standard practice of the NU operation companies is to minimize tree and other vegetation removal that is required for new transmission line construction by:

A. Designing new lines to keep the positions of new conductors as much as possible within any existing cleared ROW corridor, thus minimizing additional clearing

B. Remove non-compatible vegetation (trees and tall growing shrub species) within the conductor clearance zone (area directly under the conductors extending 15 feet horizontally outward from the outermost line conductors)

[1] Except for possible modifications to existing 69kV lines, it is unlikely that NU will construct any new 69kV lines. Therefore, this standard covers 115 and 345kV lines only, and 115kV line clearances would apply to any new 69kV lines.

C. Allowing low-maturing tree species such as dogwoods to remain within the side zones (area outside of the conductor clearance zone extending to the edge of the ROW clearing limits) where these low-maturing species exist

D. Re-establishing pre-existing access roads for construction vehicles to minimize the clearing of low growth within the existing corridor for access

E. Locating new line structures close to old structures and overlapping the work areas of old structures to reduce to the amount of clearing for the new structure work areas

F. Where feasible, using existing conductors to pull in new conductors, thus reducing damage to low growth vegetation along the cleared corridor

G. Engaging an arborist to determine individual "danger trees" for removal considering
   1) Species
   2) Soil conditions
      a) including wetland vs. upland
      b) susceptibility to flooding
      c) depth to rock (and adaptability of the species to those conditions)
   3) Health of the tree
   4) Inclination of trunk
   5) shape of crown

Refer to figures V-1 through V-6 for diagrams of the conductor clearance zone and side zones associated with various line structure types.

2. Clearance between Conductors and Woody Vegetation

Transmission lines within the Northeast Utilities System present a variety of woody vegetation control situations. Regulatory authorities may require "buffers" or "screening" at visually sensitive highway and local road crossings or other locations, and such locations require special attention to achieve and maintain the necessary clearances. At all other locations, standard ROW vegetation clearing practices for new line construction are as follows:

A. Within the ROW limits, as depicted on Figures A, B, and C, cut all tall-maturing tree species of any height while retaining existing compatible woody shrub species (see Appendix 1).

B. Clear-cut construction areas at structure locations and access roads as depicted on Figure C.

C. At road crossings, within side zones and other sensitive areas, as specified by ROW development and management plans, retain existing low-maturing tree species such as Flowering Dogwood (see Appendix 2) to the extent that these trees will not conflict with operation of the transmission line prior to the next scheduled vegetation maintenance.

D. At ravines, river crossings, and similar locations: retain tree species on the ROW where the conductors will be significantly higher than normal and where the

vegetation at full mature height would not violate Figure A clearances and will not cause construction or access problems.

The minimum clearances established in Figures A, B, and C between conductors and woody vegetation includes allowances for re-growth over the periodic maintenance cycle of four (4) years for vegetation within the cleared limits of the ROW, and ten (10) years for vegetation beyond the cleared limits of the ROW. The defined clearances cover all vegetation including natural growth, screens or buffers, orchards, ornamental plantings, nursery stock, and danger trees.

The minimum clearances applicable to woody vegetation are shown in the included figures.

1) Figure A; Minimum Conductor Clearances
2) Figure B; Danger Tree Clearance
3) Figure C; Conductor Clearance Zone, Side Zones and Structure Clearing Areas for New Construction

Where Orchards, ornamental plantings, or nursery stock is permitted by easement or license to exist, the maximum tree heights allowed within the conductor and side zones are shown in Figure A. Agreements with individual property owners may define site-specific maximum allowable tree heights and should be checked prior to scheduled maintenance activities.

Where rights exist beyond the edge of the ROW, any tree designated as a "danger tree," i.e. a tree that can fall within the dimensions noted in Figure B that is determined to be an imminent hazard will be removed at the discretion of the arborist. In sensitive areas adjacent to or within the ROW or where rights or other permission to remove danger trees cannot be obtained, arborists will direct the removal of those portions of the tree canopy projecting into the ROW, and those portions of a tree which, if they become detached, may fall within the minimum clearance distances as shown on Figure B. On side-hill ROW's, danger trees can be found significantly further from the conductors on the uphill side of the ROW.

3. Clearing for New Construction

This clearing consists of clear cutting four distinct areas of the ROW as defined by Figure C. These clearing areas are:

A. Basic clearing of the ROW width, which consists of a conductor clearance zone and side zones. Low-maturing woody shrub species are typically not removed from the side zones, and low maturing tree species such as Flowering Dogwood will be preserved where they do not conflict with construction needs.

B. Clearing at each structure location as required for construction equipment

C. Clearing the full length of all access road and spurs to structure sites for a cleared width of fifteen (15) feet

D. Removal of danger trees that pose an imminent risk to the new line along the new or existing clearing edge

For new line construction, in addition to the cleared area around each structure, a lay-down and assembly area may be required that is considerably larger. The size of this area depends upon topography, the type of structure to be assembled, and the type of foundation required at the site. Also at selected locations spaced several miles apart, setup sites for conductor-pulling equipment are required within the conductor zone and may require some removal of shrub growth.

The process to accomplish the clearing for new construction involves:

A. Field survey and stake the edge of the clearing limits and conductor zone

B. The NU "Owner's Representative" further reviews the survey staking before clearing begins

C. Where specified in an existing agreement with individual landowners, the Owner's Representative or his designee marks acceptable low growing trees they will attempt to retain within a side zone

D. The Owner's Representative contacts landowners before the clearing begins if they wish to discuss the clearing as marked out, and to ask if the property owner wishes to take ownership of the cut wood

E. Where the landowner will take the cut wood, an agreement will specify the contractor's placement of cut wood outside the ROW, or the landowner's schedule for removal if at a location within the ROW

F. Carry out the clearing operation

G. Cut using chain saws within wetland areas, and minimize the use of mechanized equipment for removal (note: mechanized equipment may be used to remove the logs and tree tops from a wetland by positioning equipment outside wetlands to drag out logs and tops using cables)

H. During or shortly after the initial clearing operation, an arborist will evaluate trees beyond the edge of the clearing limits to identify and mark danger trees that pose an imminent risk to the new line

I. The landowner will then be given an opportunity to discuss the danger trees marked for removal with the Owner's Representative who will then give instructions to the contractor

Contracts for clearing will be structured to effectively implement the above process and this standard. Despite efforts to minimize tree and other vegetation removal, there may still be locations where the transmission facility requirements and/or the existing vegetation conditions are such that no substantial vegetation may remain within the ROW limits.

4. <u>Clearing for Structure Maintenance or the Replacement of an Existing Line</u>

Clearing for structure maintenance or replacement of an existing line is similar to that for new line construction with the following exceptions:

A. Clearing needs depend on the relative location of the rebuilt line with respect to the existing maintained area of the ROW and the proposed construction method for installation of conductors and shield wires. These factors may reduce the needed clearing.

B. Structure site and access road clearing will still be required but may also be significantly reduced.

C. When structures from the old line are removed, the cleared area at these sites and the access spurs to them will be allowed to naturally re-vegetate with native plant species, which may include native grasses, forbs or shrubs.

5. Decision Responsibility for Retention of Non-standard Woody Vegetation

The transmission line Construction Manager and Contractor Arborist will be responsible for obtaining approval from the Transmission Supervisor, Vegetation Management before allowing vegetation to remain which conflicts with the clearances shown in Figures A, B, and C.

6. Approving Managers and SME

Dorian Hill
Manager Transmission Line and Civil Engineering
Northeast Utilities

Peter Avery
Manager Transmission Line Construction and MTCE
Northeast Utilities

SME

Anthony Johnson III
Supervisor Transmission Vegetation Management
Northeast Utilities

7. Deviations

This standard sets forth the current NU 'best practices' for most applications of this subject matter. Therefore, deviation from this standard is generally not permitted. However, in unique instances a user may submit a written deviation request including justification to the listed Subject Matter Expert (SME). The SME must approve or deny the request in writing prior to the user commencing any non-standard activities. The SME may consult with his/her supervisor, co-SME if any and co-SME supervisor, and subsequently must copy any approval to them.

Revision History
Rev.0 – original issue
Rev. 1 – Clarified conductor zone and side zone definitions, and clearing practices to address NERC reliability requirements through strict conformance to the ISO-NE OP-3.

APPENDIX 1

SHRUB SPECIES ALLOWED TO REMAIN: (PARTIAL LIST)

COMMON NAME	GENUS/SPECIES
Arrowwood Viburnum	*Viburnum dentatum*
Bayberry	*Myrica pennsylvanica*
Blueberry - Highbush	*Vaccinium corymbosum*
Blueberry - Lowbush	*Vaccinium angustifolium & V. vacillans*
Brambles	*Rubus spp.*
Buttonbush	*Cephalanthus occidentalis*
Dogwood - Gray	*Cornus racemosa*
Dogwood - Redosier	*Cornus stolonifera*
Dogwood - Silky	*Cornus amomum*
Elderberry	*Sambucus spp.*
Hazelnut	*Corylus americana & C. cornuta*
Honeysuckle - Bush	*Diervilla lonicera*
Honeysuckle - Fly	*Lonicera canadensis*
Honeysuckle - Tartarian	*Lonicera tatarica*
Huckleberry	*Gaylussacia spp*.
Maple-leaf Viburnum	*Viburnum acerifolium*
Meadowsweet - Broad-leaved	*Spirea latifolia*
Meadowsweet - Narrow-leaved	*Spirea alba*
Mountain Laurel	*Kalmia spp*.
Oblong Fruited Juneberry	*Amelanchier bartramiana*
Oldfield Common Juniper	*Juniperus depressa*
Pasture Juniper	*Juniperis communis*
Running Shadbush	*Amelanchier stolonifera*
Sheeplaurel	*Kalamia augustifolia*
Spicebush	*Lindera benzoin*
Steeplebush	*Spirea tomentosa*
Sumac - Smooth	*Rhus glabra*
Sweetfern	*Comptonia peregrina*
Sweetpepperbush	*Clethra alnifolia*
Winterberry	*Ilex verticillata*
Witch Hobble	*Vburnum alnifolium*
Witherod	*Viburnum cassinoides*

APPENDIX 2

LOW-MATURING TREE AND SHRUB SPECIES ALLOWED TO REMAIN ALONG THE SIDE ZONES: (PARTIAL LIST)

All species listed above including:

Alder	*Almus spp*.
Dogwood - Alternate-leaved	*Cornus alternifolia*
Dogwood - Flowering	*Cornus florida*
Sumac - Shining	*Rhus copillina*
Sumac - Staghorn	*Rhus typhina*
Willows (except tree species)	*Salix spp.*
Witch-Hazel	*Hamamelis virginiana*

Figure A

Minimum Conductor Clearances

* All Other Woody Species		
Line Voltage	A (ft.)	B (ft.)
69 & 115 kV	12	11
230 & 345 kV	16	15

* Orchards		
Line Voltage	A (ft.)	B (ft.)
69 & 115 kV	14	11
230 & 345 kV	18	15

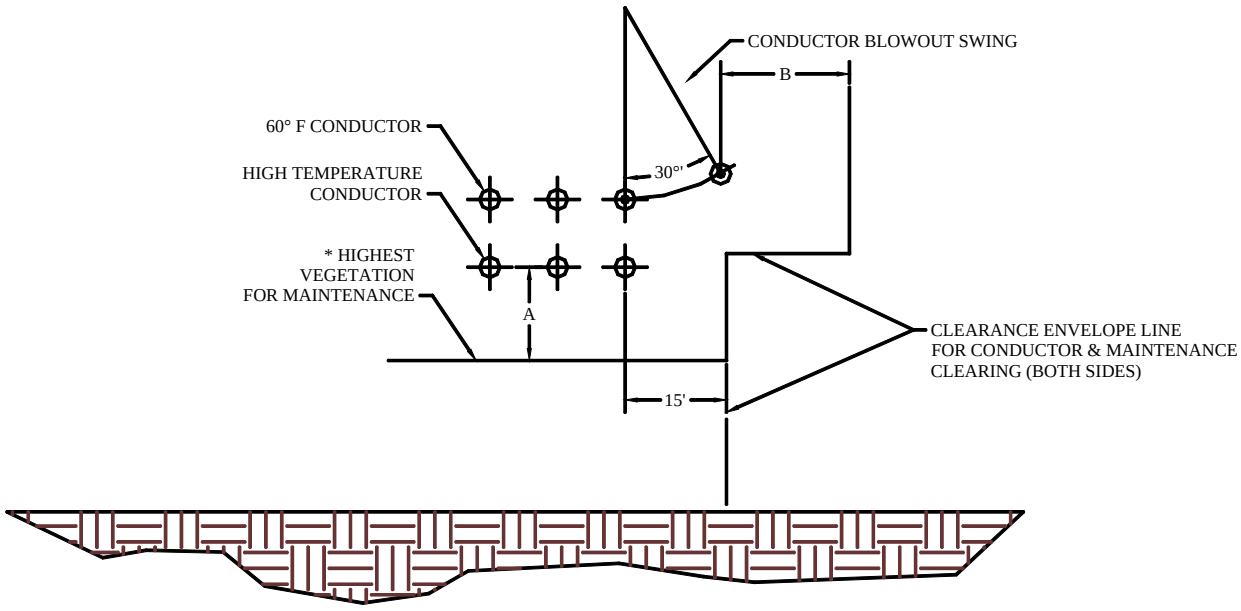


Figure A Right-of-Way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines			
Northeast Utilities **Approved by: DEH, PJA**	**Design and Application**	**OTRM** **030.008**	**Rev. 1** **05/16/2008**

Figure B

Danger Tree Clearances

Line Voltage	A (ft.)
69 & 115 kV	6
230 & 345 kV	10

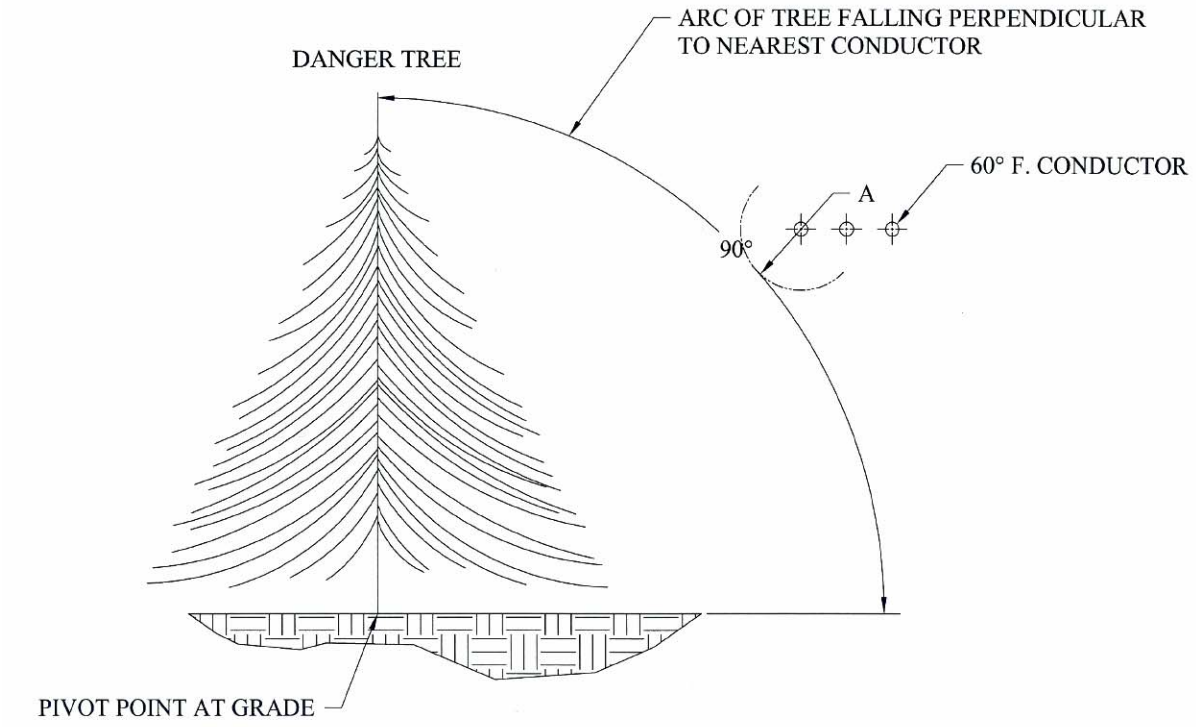


Figure B Right-of-Way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines			
Northeast Utilities **Approved by: DEH, PJA**	**Design and Application**	**OTRM** **030.009**	**Rev. 1** **05/16/2008**

Figure C

Conductor Clearance Zone, Side Zones
and Structure Clearing Areas for New Construction

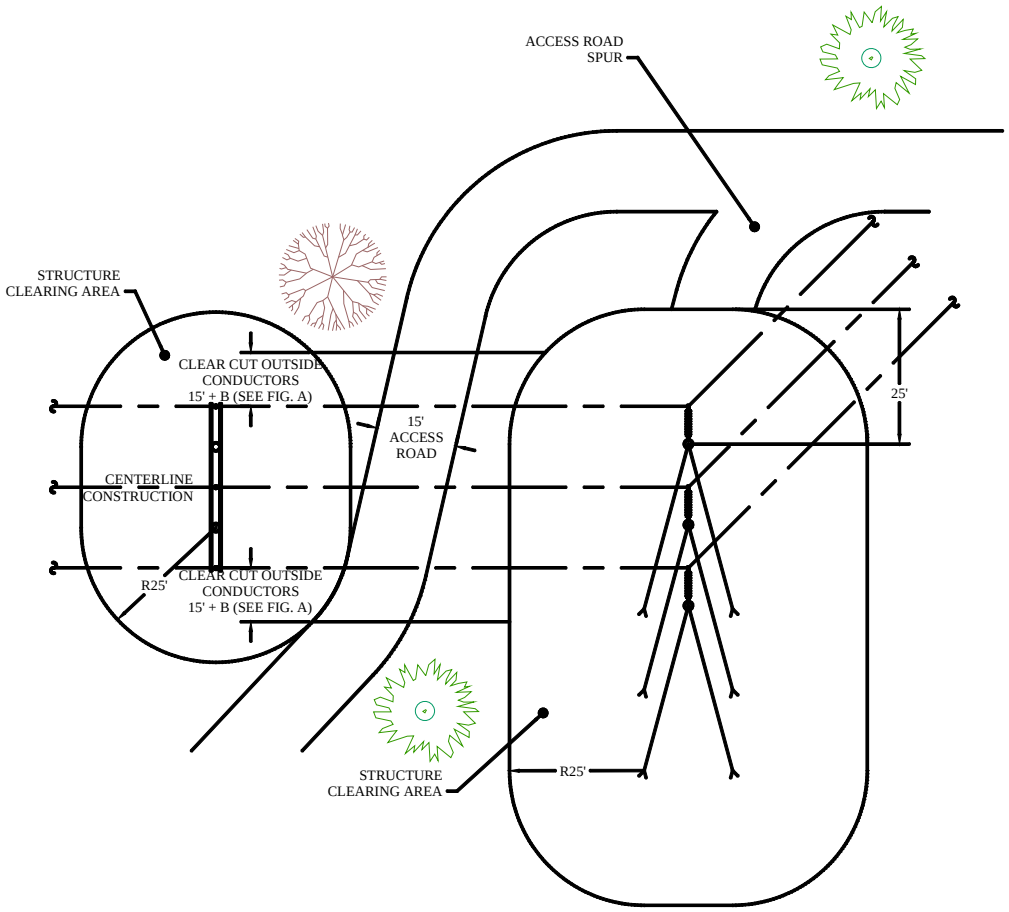
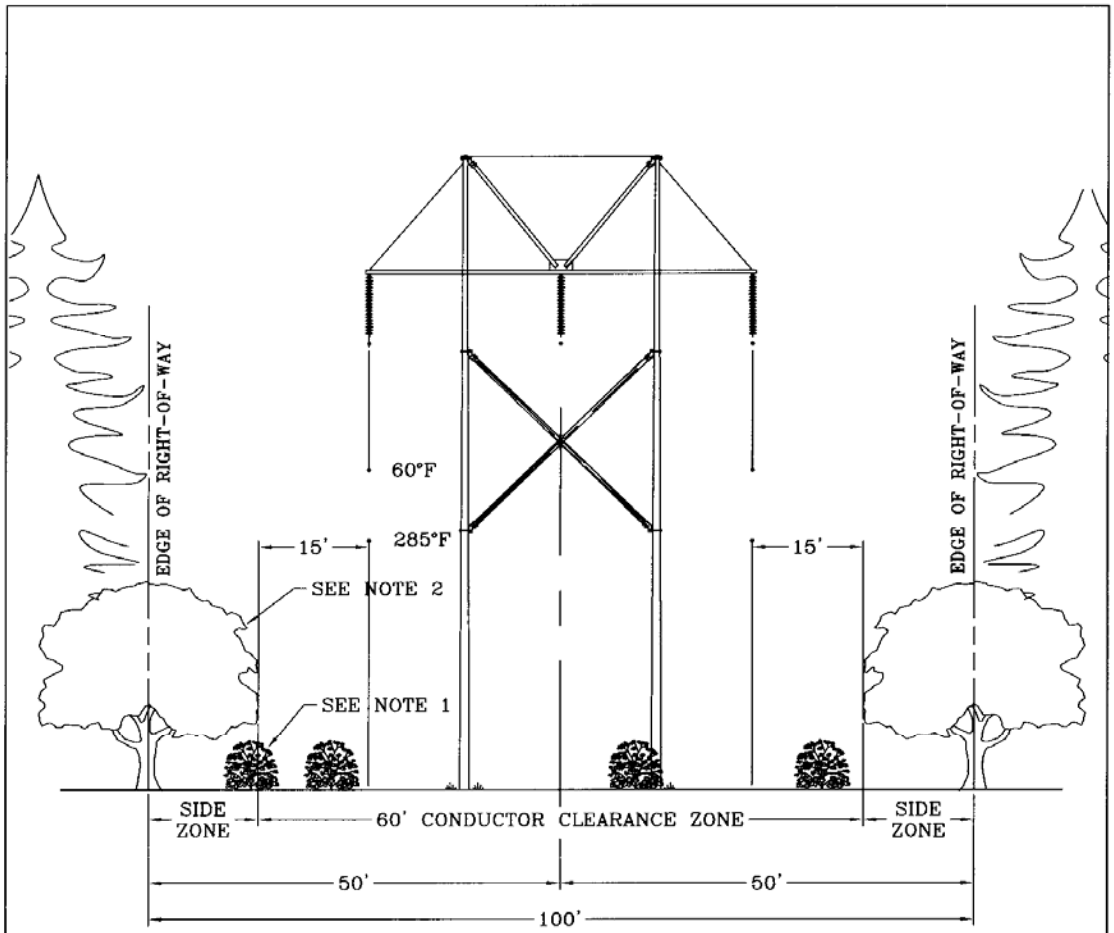


Figure C Right-of-Way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines			
Northeast Utilities **Approved by: DEH, PJA**	**Design and Application**	**OTRM** **030.0010**	**Rev. 1** **05/16/2008**



NOTES:
1) WOODY SHRUB SPECIES
2) LOW MATURING TREE SPECIES SUCH AS DOGWOODS ALLOWED OUTSIDE CONDUCTOR CLEARANCE ZONES.
3) ACTUAL DIMENSION TO R.O.W. EDGE VARIES. ADD UP TO 25' TO SIDE ZONE WHERE EXTRA RIGHT-OF-WAY EXISTS.

NORTHEAST UTILITIES SERVICE CO.

TITLE
TYPICAL VEGETATION CLEARING FOR A 115-kV H-FRAME STRUCTURE LINE

BY RDG	REV A	APP DEH	APP
DATE 04/13/04	DATE 05/13/08	DATE 12/23/04	DATE
SCALE NONE	MICROFILM DATE	DWG. NO. FIGURE V-1	
P.A. #			

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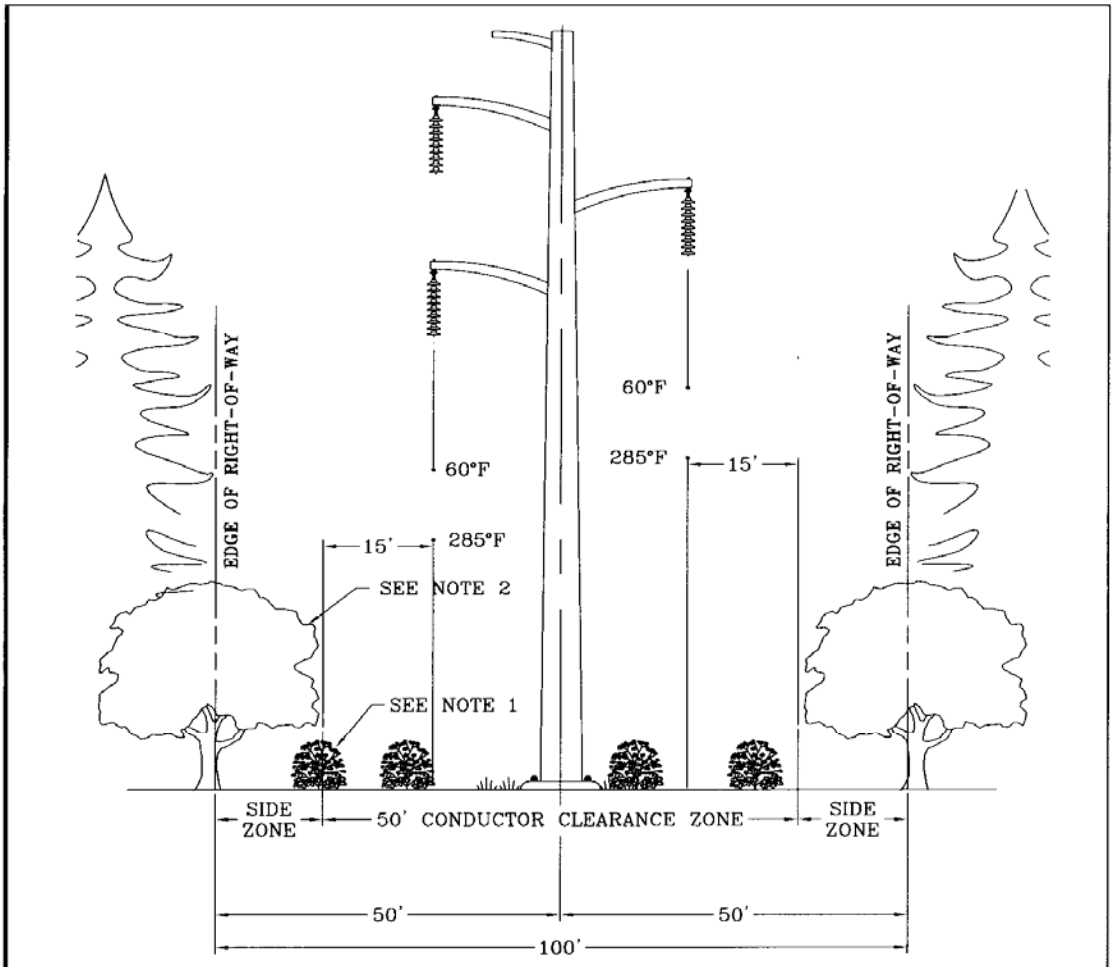
Figure V-1
Right-of-Way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines

Northeast Utilities **Approved by: DEH, PJA**	**Design and Application**	**OTRM 030.0011**	**Rev. 1 05/16/2008**



NOTES:
1) WOODY SHRUB SPECIES
2) LOW MATURING TREE SPECIES SUCH AS DOGWOODS ALLOWED OUTSIDE CONDUCTOR CLEARANCE ZONES.
3) ACTUAL DIMENSION TO R.O.W. EDGE VARIES. ADD UP TO 25' TO SIDE ZONE WHERE EXTRA RIGHT-OF-WAY EXISTS.

NORTHEAST UTILITIES SERVICE CO.

TITLE
TYPICAL VEGETATION CLEARANCE
FOR A 115-kV DELTA POLE STRUCTURE LINE

BY RDG	REV RDG	APP DEH	APP
DATE 04/13/04	DATE 05/13/08	DATE 12/23/04	DATE
SCALE none	MICROFILM DATE	DWG. NO. FIGURE V-2	
P.A. #			

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Figure V-2
Right-of-Way Vegetation Initial Clearance Standard
for 115- and 345-kV Transmission Lines

Northeast Utilities **Approved by: DEH, PJA**	**Design and Application**	**OTRM** **030.0012**	**Rev. 1** **05/16/2008**

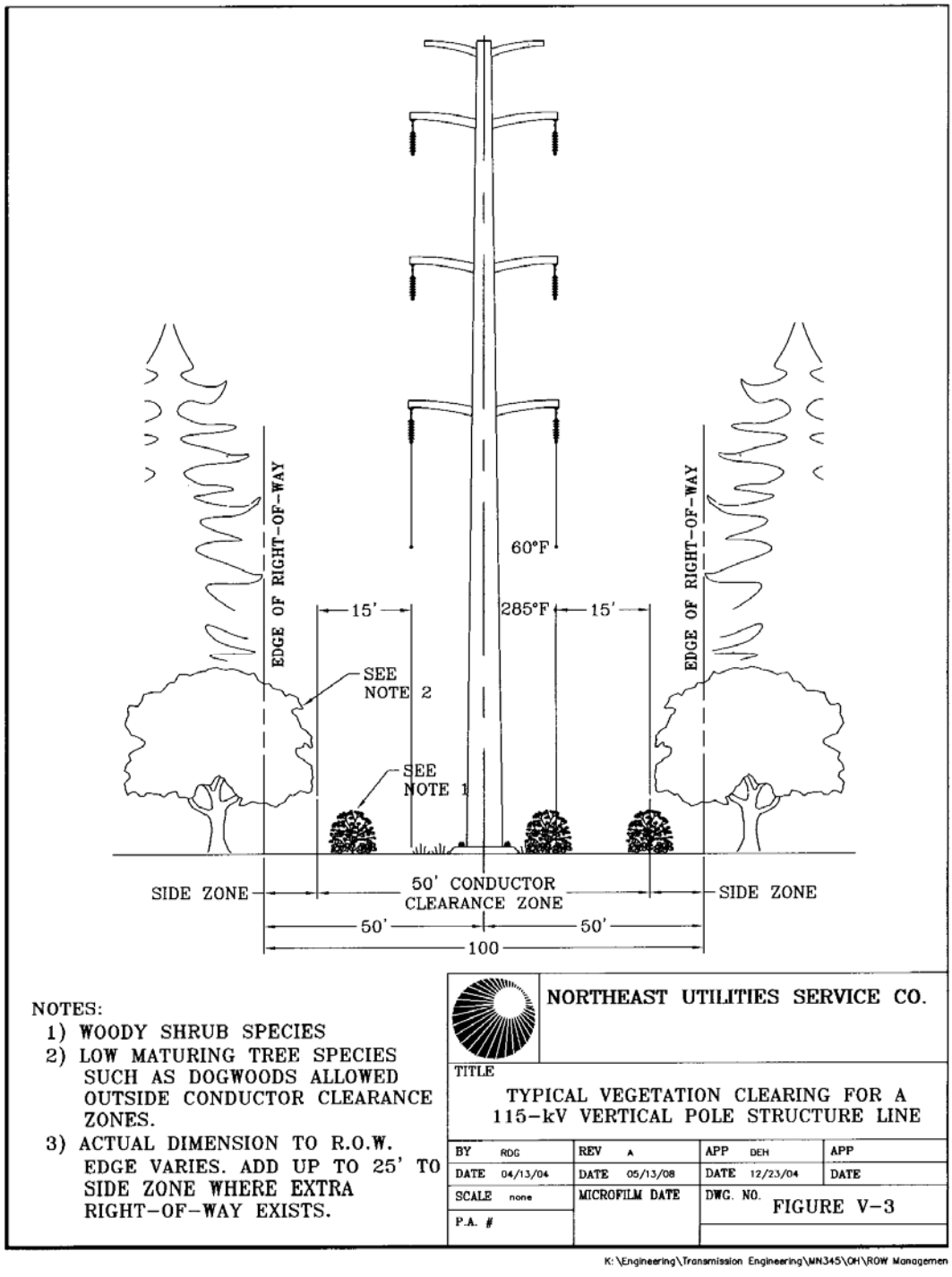


Figure V-3
Right-of-Way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines

Northeast Utilities **Approved by: DEH, PJA**	**Design and Application**	**OTRM 030.0013**	**Rev. 1 05/16/2008**

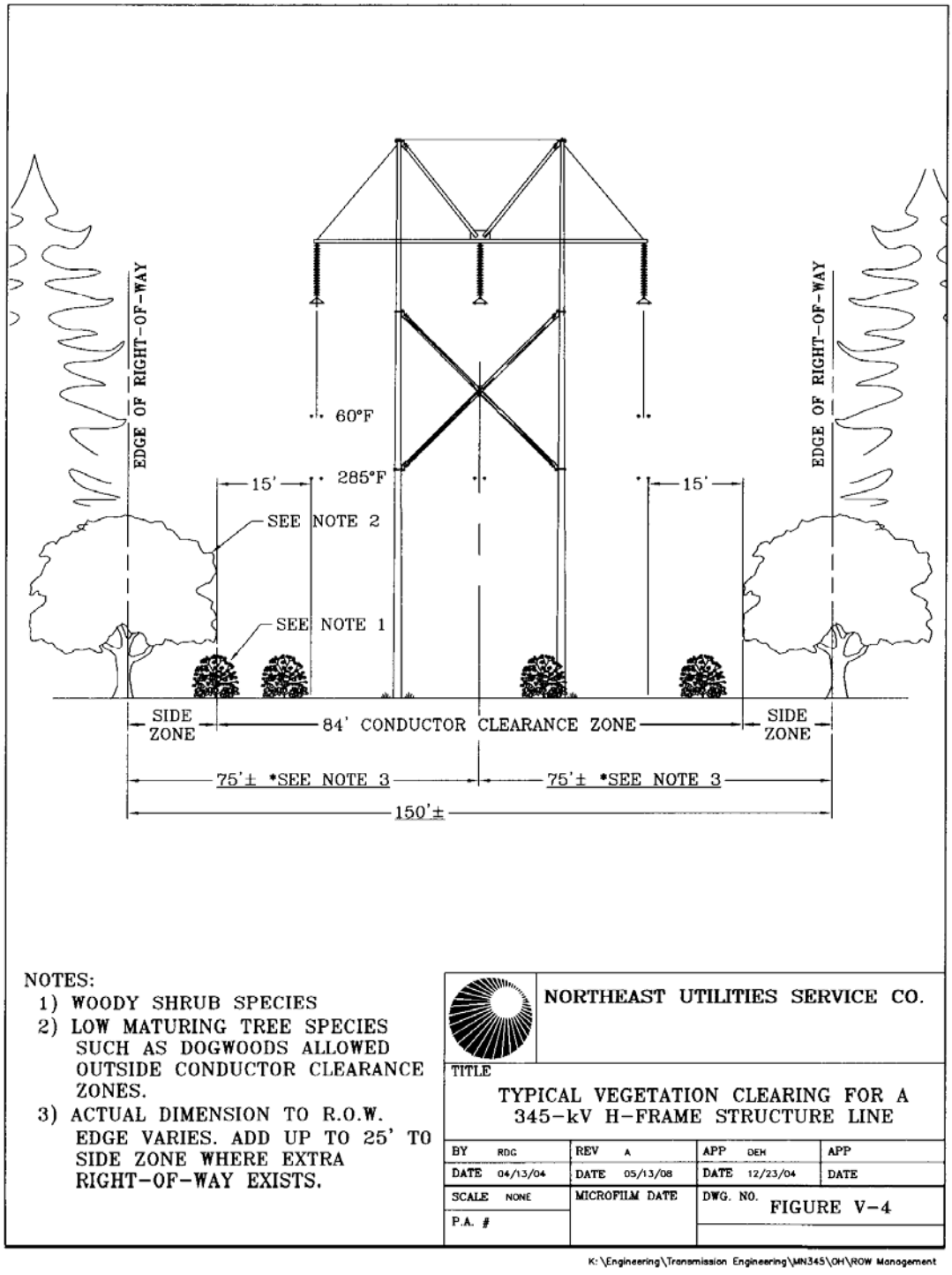


Figure V-4
Right-of-Way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines

Northeast Utilities **Approved by: DEH, PJA**	**Design and Application**	**OTRM 030.0014**	**Rev. 1 05/16/2008**

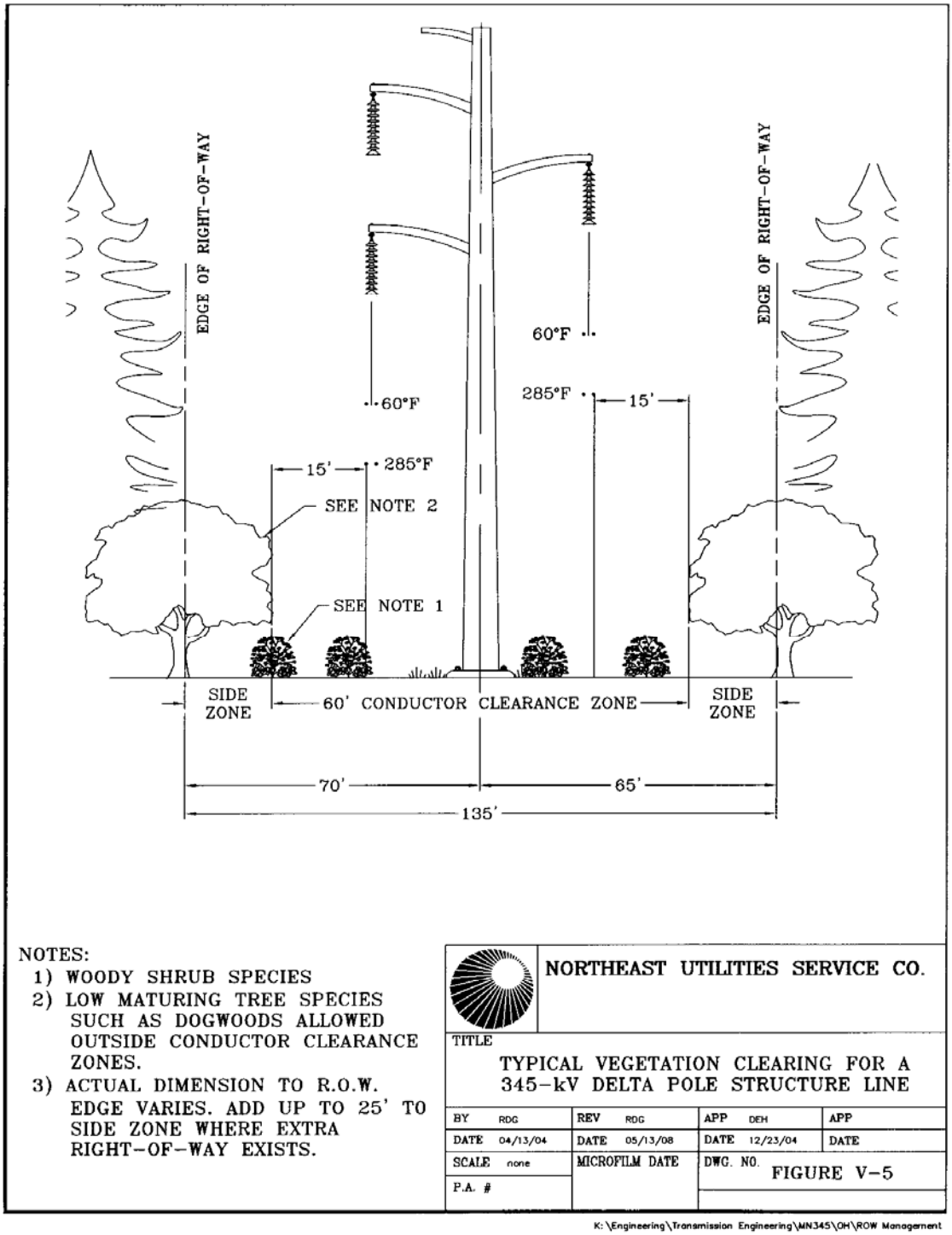
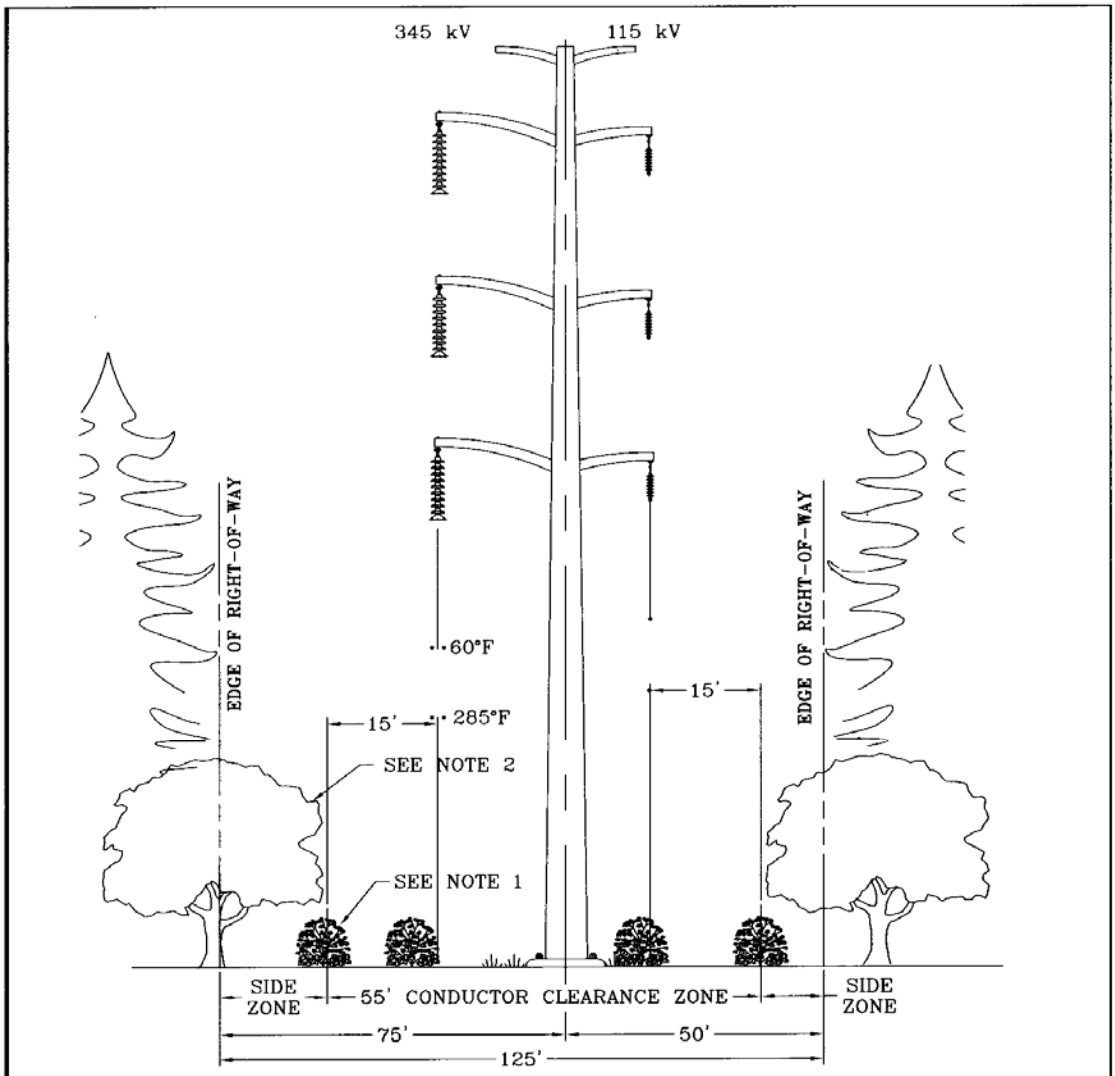


Figure V-5
Right-of-Way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines



NOTES:
1) WOODY SHRUB SPECIES
2) LOW MATURING TREE SPECIES SUCH AS DOGWOODS ALLOWED OUTSIDE CONDUCTOR CLEARANCE ZONES.
3) ACTUAL DIMENSION TO R.O.W. EDGE VARIES. ADD UP TO 25' TO SIDE ZONE WHERE EXTRA RIGHT-OF-WAY EXISTS.

NORTHEAST UTILITIES SERVICE CO.

TITLE
TYPICAL VEGETATION CLEARING FOR A 345/115-kV VERTICAL POLE STRUCTURE LINE

BY RDG	CHKD A	APP DEH	APP
DATE 04/13/04	DATE 05/13/08	DATE 12/23/04	DATE
SCALE none	MICROFILM DATE	DWG. NO. FIGURE V-6	
P.A. #			

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Figure V-6
Right-of-Way Vegetation Initial Clearance Standard for 115- and 345-kV Transmission Lines

Northeast Utilities **Approved by: DEH, PJA**	**Design and Application**	**OTRM 030.0016**	**Rev. 1 05/16/2008**

ATTACHMENT 2

Vegetation Clearing Procedures and Practices for Transmission Line Sections (OTRM 230)

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1. Scope

   This standard details the procedures for:

   1. Cutting, pruning, and disposal of trees, tree parts and other woody vegetation within Right-of-Way ("ROW") areas requiring clearing; the Conductor Clearance Zone and Side Zones.
   2. Structure Clearing Areas and access routes on or to the ROW.
   3. Cutting, trimming and disposal of danger trees located outside the construction clearing limits.

   Contract clearing scopes vary depending upon the classification of the area to be cleared. Contract drawings will designate two categories of Clearing Areas; the Conductor Clearance Zone and Side Zones.

2. Related NU and National Standards

   A. OTRM 030 Right-of-Way Vegetation Initial Clearance Standard for 115kV and 345-kV Transmission Lines

   B. Occupational Health and Safety Regulations (29 CFR 1910.269 and ANSI Z-133)

   C. OTRM 222 Operation of Equipment on NU Rights-of-Way

3. Definitions

   For further illustration of definitions, 2.1 through 1.12 see OTRM 030 Figures A through C and V-1 through V-6

   A. Clearing Area – The work area, which includes a central Conductor Clearance Zone flanked by two Side Zones.

   B. Conductor Clearance Zone – Areas normally located along the center portion of the width to be cleared that includes the structures and areas beneath the conductors. The width varies with the type of structure to be installed. Contract drawings provide details of the locations of t he conductor clearance zones.

   C. Side Zones – Areas adjoining the Conductor Clearance Zone to the edge of the cleared limits of the right-of-way to provide for clearances between conductors and vegetation. Contract drawings provide details of the locations of side zones.

   D. Water Supply Area – Areas owned or controlled by a public or private water supply agency for water supply purposes.

   E. Tree – A woody plant normally maturing at 20 feet or more in height, usually with a single trunk un-branched for several feet above the ground, with a definite crown.

   F. Danger Tree – Any tree located outside the limits of clearing shown on the drawing identified by the owner's representative, which could endanger the transmission line by falling closer than 6 feet to the normal 60°F sag position of a conductor.

   G. ROW Access Route – Routes within the limits of the right-of-way generally but not necessarily within the area to be cleared, to which construction traffic is to be

confined. This route shall be cleared for a width of 15 feet in the manner specified within the project documents.

H. Off-ROW Access Route – Routes outside of the limits of the ROW on private property for which rights have been or will be obtained. Such routes provide shortened access from public highways or circumvent obstacles on the ROW. This route shall be cleared for a width of 15 feet in a manner specified elsewhere.

I. Structure Clearing Area – Area that is required for the installation, equipment set up or removal work, within the conductor clearing area as shown in OTRM 030 Figure C.

J. 60° Sag Position – Conductor design elevation at any given point at 60°F – no wind.

K. Maximum Hot Sag Position – Conductor elevation at any given point under emergency high temperature operation 285°F unless otherwise noted on project profile drawings.

4. General Requirements

A. Access to and along the ROW

The owner has acquired entry and access rights to the ROW covering the project as stated elsewhere in the contract documents. The contractor shall obtain the approval of the owner's representative prior to the clearing and use of each section of access routes.

The normal access to any job site is along the owner's ROW from the intersection with the nearest public way. The ROW Development and Management (D & M) Plan for the project, which is a part of the contract drawings, establishes the location of access roads along the ROW. The contractor shall confine all travel within the ROW to the routes designated on the D & M plan. Alternative access routes shall not be used without the approval of the owner's representative who will ascertain if any additional regulatory approval is required before use. Use of alternative access will typically result in owner's re-designation of identified access routes.

Temporary rights of access over adjacent land may also be indicated on the drawings or subsequently be available via the owner's representative or construction manager. The contractor shall strictly observe established conditions attendant to the use of any temporary rights.

Continuing negotiations with property owners and regulatory authorities may result in access roads being located other than shown on the contract drawings. The owner's representative or construction manager shall instruct the contractor regarding such changes. The contractor shall make no access route changes except on the instruction of the owner's representative.

B. Site Location

The owner will flag the limits of clearing work to be done by the contractor; this shall include the limits of the clearing areas on the ROW and the location of all access routes, structures, Conductor Clearing Areas and Side Zones. The owner will identify individual trees that have been approved by the owner's representative to remain and mark them for preservation. The contractor shall confirm the location of all access

routes both on and off the ROW with the owner's representative before commencing work or making entry into a new work area.

The contractor shall preserve these field markings established by the owner for the duration of the project. The contractor is further responsible to preserve and leave undisturbed all permanent property monuments.

C. Contact with Property Owners and the Public

Property owners along the ROW will be advised by the owner's representative or construction manager of the nature of the work to be conducted on the ROW in advance of any contractor entry. All subsequent contacts with property owners on or adjacent to the ROW and access routes will be established by or with the prior specific permission of the owner's representative. The contractor shall immediately advise the owner's representative of any inquires or complaints made by property owners during the progress of the work.

The owner reserves unto itself the responsibility for public relations. The contractor shall make no statements regarding the work in progress. The contractor shall refer to the owner's representative any interest in the work expressed by individuals or groups for the general public.

D. Regulatory Aspects

The owner has general environmental obligations as well as specific development and management (D & M) plan obligations relative to the overall construction of the transmission line. As applied to the work under this specification, these obligations bear on the elimination or reduction of adverse environmental effects on desirable vegetation, fish, wildlife, forests, water purity, and water resources.

Stream crossings with equipment shall only be performed in a manner consistent with the D & M plan to avoid disturbance of stream banks and stream bottoms, which would result in siltation.

Where a wet area must be traversed by an access road or other construction, careful provision must be made to assure that surface and subsurface drainage is not impaired. The contractor shall repair any disturbance to natural drainage caused by the contractor's operation to the equivalent of the original condition.

The contractor shall take special care when moving equipment to prevent erosion on slopes leading to wetland areas. Disturbed surfaces caused by the contractor's operation which may lead to erosion or siltation shall be quickly repaired to the equivalent original condition by the contractor.

Any storage yards for trucks, equipment, etc, shall be located as far as practical away from stream and wetland buffer zones to minimize the potential adverse effects on these resources. The recommended distance for storage of equipment is 100 feet from the edge of any stream or wetland.

The statements above shall serve to advise the contractor of the scope and character of any Environmental Protections for which he shall be responsible.

The conduct of the work may be monitored by representatives of appropriate regulatory agencies. All contacts with such agencies and their representatives will be initiated by or referred to the owner's representative.

E. Contractor's Field Headquarters

The owner has made no provision for a contractor's field headquarters near the right-or-way. The contractor shall make their own provisions for a field reporting headquarters off the ROW and the cost thereof shall be included as part of their operating overhead. The cost of the contractor's field reporting headquarters shall not be separately billed to the owner. The contractor shall obtain the approval of the owner's representative as to the location of any field reporting headquarters.

F. Fences

No fence on the ROW or crossing access routes may be cut without permission of the owner's representative. Fences cut for any temporary purpose shall be repaired immediately upon completion of that purpose.

Gates may exist or be required along the ROW. The contractor shall furnish and install such gates as the owner's representative may direct as an extra cost to the owner.

The contractor shall keep closed except when moving personnel and equipment, all fence openings or gates. Particular care shall be taken to see that livestock are not allowed out of their intended bounds. The contractor is responsible for all consequential damages arising out of livestock being allowed out of their intended bounds or unauthorized access and damage from the general public as a result of their activities.

G. Overhead Electric Lines

Overhead lines energized at various voltages may be located within the ROW, cross the ROW and/or be parallel to the ROW at various locations. Such lines shall be considered energized <u>at all times.</u>

When in proximity to any overhead line:

1) The contractor is responsible to alert their people to the energized potential electrical hazard
2) The contractor is independently responsible to train maintain working clearance required b Occupational Health and Safety Regulations (29 CFR 1910.269 and ANSI Z-133)
3) The contractor shall further respond to applicable requirements of the owner's safety manual as the owner's representative may direct.

Should conditions develop where the performance of the work and overhead lines on the ROW are in conflict, the contractor shall not proceed with the work until after the situation has been reviewed with the owner's representative and all appropriate arrangements to address safety concerns or corrective actions made by the contractor.

During ROW clearing operations, including travel to and from worksites, the contractor shall set up equipment and arrange procedures to maintain safe vertical and horizontal clearances in accordance with OTRM 222.001. Elevating equipment shall be positioned in a manner and location so that the operation of this equipment would not violate owner requirements or safety regulations.

In any case, where equipment must be positioned so that it is capable of contacting any conductors, the owner's representative may require that the work proceed under the owner's protective tagging system. In such cases, the owner's representative shall define to the contractor whether the application of the protective tagging system provides an energized or de-energized line, and if energized, the limits of the protection provided.

H. Water Supply Areas

The owner will show on the project drawings where any portion of the work falls within a public water supply watershed or well field. It is the contractor's responsibility in a water supply area to:

1) Immediately remove any litter originating with his operations
2) Provide commercial toilet service for the control and removal of wastes
3) Ensure proper storage and containment of all chemicals and petroleum products. Prevent the spillage of any chemical or petroleum products. In the event of a spill, the contractor shall immediately report the spill to the owner's representative to initiate the necessary regulatory notifications and corrective action. Payment under the contract documents shall not be made for the work and materials expended to accomplish the required spill cleanup and rehabilitation.

I. Wetlands

Wetland areas designated on the plans or drawings shall be avoided to the extent practical and all activities within or adjacent to wetland areas shall follow the prescribed procedures or practices to be followed when working within or in close proximity to these areas.

1) Heavy machinery or equipment shall not be used in wetland areas
2) All vegetative debris must be removed immediately from wetland areas.
3) Storing of equipment and refueling shall not be allowed within 100 feet of any designated wetland boundary.
4) Prevent the spillage of any chemical or petroleum products. In the event of a spill, the contractor shall immediately report the spill to the owner's representative to initiate the necessary regulatory notifications and corrective action. Payment under the contract documents shall not be made for the work and materials expended to accomplish the required spill cleanup and rehabilitation.

J. Herbicide Treatments

Herbicides are not usually applied within the scope or during the schedule of work under a ROW clearing specifications. Any unusual case, which is an exception to this generality, shall be specified elsewhere in the contract documents.

5. <u>Cutting</u>

A. General Requirements

1) Stump Height - All stumps except those within access route areas shall be cut to a height above ground of not more than one-half the stump diameter. However, in no case shall stumps be left higher than 10" on the uphill side unless used as a

support for a fence or for removal in areas where stumps will be removed. Within the Conductor Clearance Zone, all access routes and at all Structure Clearing Areas stumps shall be cut to within 3" of the ground. Stumps in developed lawn areas shall be ground to 6" below the surface, covered with 6" of soil, seeded, and mulched.

2) Cordwood – Where specifically designated on the drawings or in the Special Conditions, cordwood shall be cut in four (4) foot lengths and piled in accordance with the Disposal section.
3) Tree-length Logs – All logs not designated for use as cordwood shall be limbed-out into tree-length logs and disposed of as indicated in the Disposal section. The contractor may elect to cut the logs into shorter lengths.
4) Brush – The remaining limbed-out branches and small stems measuring less than 3" in diameter on the large end are designated "brush" and shall be disposed of as indicated in the Disposal section.
5) Danger Trees – The owner's representative shall designate removal of certain danger trees situated outside the limits of clearing shown on the drawings for which rights of removal have been obtained. These trees shall be removed and disposed of under the same provisions of the contract documents applying to these activities on the adjacent cleared ROW. Re-inspection of the ROW after the initial removal of marked danger trees may result in the owner's representative marking additional danger trees for removal.
6) Prohibitive Cutting – The contractor shall not remove trees outside the limits of clearing shown on the drawings unless marked by the owner's representative as a danger tree to be removed or in an Off-ROW Access Route marked by the owner's representative.

B. Cutting Areas
   1) Conductor Clearance Zone – Within these areas all tall-maturing tree species as well as low growing shrub species shall be cut in order to provide a clear and accessible area for the construction of the new facilities.
   2) Side Zones – Within these areas all tall-maturing tree species shall be removed. Where the density of trees to be removed in a given area will allow practical preservation of specimens in good condition, the owner's representative will preserve low-growing desirable species listed under OTRM 030 Appendix 1 and Appendix 2 to the extent practical. This will be allowed where vegetation to be preserved will not impinge upon the clearance envelope nor with construction, maintenance or operation of the proposed transmission line.

C. Pruning Practices – Trimming shall be accomplished in accordance with proper arboricultural practices and follow the guidelines established under ANSI Z-133;
   1) When cutting back or topping trees, drop crotch trimming shall be used as much as possible and avoid cutting back to small suckers.
   2) In general reduction of size (cut back or topping) not more than 1/3 of the total area should be reduced at a single operation.
   3) All cuts shall be made sufficiently close to the parent stem so that healing can readily start under normal conditions.

4) All limbs 1 inch in diameter (size of a quarter) or over must be pre-cut to prevent splitting.
5) Trees showing visible signs of disease or damage shall be reported to the owner who will decide whether they will be trimmed or removed.

6. Disposal

A. General

1) Techniques – Disposal techniques will be as hereinafter specified or as may be more explicitly called for on the drawings or plans at a specific location.
2) Fallen Trees and Limbs – All trees and limbs in the proposed clearing area, which have fallen or were cut prior to the clearing of the ROW shall be considered part of the contract and disposed of accordingly. This does not apply to cuttings that were stacked to decay and provide wildlife habitat.
3) Danger Trees – Danger trees shall be disposed of under the same provisions of the contract documents that apply to disposal on the adjacent cleared ROW.
4) Cherry Tree Disposal Precaution – Wilted cherry leaves are poisonous to livestock, therefore, in areas frequented by livestock any cherry cuttings shall be disposed of immediately out of reach of livestock.

B. Logs

1) Tree-Length Logs – Removal of tree length logs in all areas shall be the primary method of disposal. Tree length logs including shorter lengths and limbs measuring at least three (3) inches in diameter on the small end shall be temporarily piled neatly within the cleared portions of the ROW outside the conductor clearance zone and as near the ROW boundaries as possible. However, none shall be piled within roads, paths, cleared areas for access roads, within 100 feet of a wetland boundary or within 100 feet longitudinally on either side of an angle point.

   Each pile shall be no higher than then (10) feet and no wider on the ground than sixteen (16) feet. Each pile shall be spaced at least six (6) feet from adjacent log piles or brush piles.
2) Cordwood – Where specified on the drawings cordwood in four (4) foot lengths shall be piled in four (4) foot high piles parallel to the sides of the ROW along the edges of the cleared areas. Single piles of cordwood shall not exceed sixteen (16) feet in length.
3) Salvageable Wood Products – For those forest products owned by the NU Operating Subsidiary and for which there is marketable value, NU will estimate the value of the timber and it shall be the contractor's responsibility to validate the value of the timber, to perform the cutting, salvage, and marketing operation at his sole discretion, and shall be conducted subject to the constraints expressed below.
   a) All forest products cut by the contractor for market become the property of the contractor and shall be removed from the ROW. Cutting remnants shall be disposed by either the manner specified for brush disposal at the cutting location, or when larger than brush size, shall be combined with the disposal of unmarketable logs in the manner specified for logs at the cutting location.

b) The contractor shall state the scope of their marketing intentions in their proposal, and shall quote a unit price or prices, which apply to material actually removed for market. The contractor shall report, subject to confirmation by the owner's representative, the materials actually removed from the ROW.

c) The contractor shall complete his removals for market within 90 days after cutting. With the expiry of the stated time, all materials then remaining on the ROW reverts to being the property of the owner.

d) The contractor may not conduct sales to the general public at or on the ROW locations

e) Sawlog measurement shall be based on the international (1/4" kerf) log scale. Trees cut for sawlogs shall be to a minimum of:

i) 10" tip DIB for hardwoods (deciduous)

ii) 6" tip DIB for softwoods (coniferous, including cedar)

Other measurements shall be as follows:

i) Posts – linear foot, 10"DIB maximum

ii) Cordwood – Standard Cord, 4X4X8

iii) Wood Chips – cubic yard

C. Brush

1) Chipping – shall be the primary method of disposal. The chips shall not be left in piles but shall be spread on the ROW. The maximum depth of fresh chips shall be no greater than three (3) inches. Avoid burying desirable low-growing shrubs such as lowbush blueberries as practicable. Chips shall not be placed within access roads, structure-clearing areas, or within defined wetlands.

2) Piling – to the extent, may be allowed as method of disposal in some areas if noted on the Development and Management Plan. Brush shall be piled within the same cleared areas as the log piles. Each brush pile shall be no higher than four (4) feet and no longer than sixteen (16) feet on its maximum horizontal dimension. Each brush pile shall be separated from any other brush or log pile by at least six (6) feet. Care shall be taken not to pile within the Conductor Clearance zone or within 100 feet longitudinally in both directions from an angle point.

D. Burying

Burying of vegetative debris is not permitted as a means of disposal

E. Burning

Burning is not permitted as a method of disposal.

7. Deviations

This standard sets forth the current NU 'best practices' for most applications of this subject matter. Therefore, deviation from this standard is generally not permitted. However, in unique instances a user may submit a written deviation request including justification to the listed Subject Matter Expert (SME). The SME must approve or deny the request in writing prior to the user commencing any non-standard activities. The

SME may consult with his/her supervisor, co-SME if any and co-SME supervisor, and subsequently must copy any approval to them.

8. Approving Managers and SME's

   Manager-Transmission Line Construction & Maintenance; NU

   Manager of Transmission Engineering; PSNH

   SME

   Supervisor Transmission Vegetation Management NU

Revision History
Rev.0 – original issue 8/22/2006
Rev 1- Complete rewrite to comply with new national standards 7/29/2008

ATTACHMENT 3

Making Requests for Wood
(www.NUrightsofway.com)

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Making Requests for Wood

Property owners whose land falls within the right-of-way to be cleared may retain all or a portion of the wood cleared on the property.

As part of any new transmission line construction project, Eversource must remove vegetation from the transmission line rights-of-way. This vegetation removal facilitates the use of line construction equipment and better ensures the safety of construction crews. Eversource is also required to comply with mandatory federal standards which dictate specific distances that vegetation must be kept from energized conductors for transmission system reliability.

The vegetation clearing process is typically a very noticeable activity associated with the construction of new transmission lines. Clearing in some areas may seem especially significant to public observers either because electric facilities presently may not be using the full width of a right-of-way, or because additional right-of-way widths may have been acquired.

During the vegetation removal process, property owners whose land includes the right-of-way being cleared are offered the opportunity to retain the cut wood for their personal use. Unless otherwise specified in the easement granting the transmission rights-of-way, this document outlines the process by which property owners can request the wood.

Property owners whose land is crossed by a transmission line right-of-way being cleared are eligible to retain all or a portion of the wood from the trees cleared from their property. Wood is provided only for the property owner. It will not be provided for renters, neighbors, friends, family or others who are not the property owner of record.

How to Retain Wood

Eversource compiles a list of property owners whose trees will need to be removed. Prior to the start of clearing, project representatives will inform each property owner of the amount of clearing necessary and the potential for keeping wood. A Wood Information Form must be signed by the property owner at this point.

Before the actual clearing begins, Eversource will review the requests of property owners interested in keeping wood. Agreement will be reached with each owner on the quantity of wood to be left, and the location for that wood. Wood will be left in a mutually agreeable location on the parcel of land from which the trees were removed, within an agreed-upon time period. Please be aware that the wood will be in log lengths, typically 18-22 feet long, and can be placed only in areas not considered wetlands or near rare, threatened, and/or endangered species habitats. The quantity and location of wood cannot be guaranteed and is subject to change based on accessibility, permit requirements, project constructability and maintenance requirements.

If you are a property owner and interested in keeping the wood of the trees cleared from your property, please advise the Eversource project representatives during the initial briefing.

For More Information

TransmissionInfo@eversource.com
800-793-2202
Eversource.com

EVERSOURCE

Appendix B
Vernal Pool Habitat Report

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VERNAL POOL HABITAT REPORT

BLOOMFIELD - WINDSOR UPGRADES PROJECT

Proposed Modifications To:
1777/1779 Transmission Line Upgrades between Bloomfield Substation and Bloomfield Junction and 1751/1777 Transmission Line upgrades between Bloomfield Junction and North Bloomfield Substation

Prepared for:

The Connecticut Light and Power Company doing business as Eversource Energy

107 Selden Street

Hartford, CT 06141

Prepared by:

AECOM

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Rocky Hill, CT 06067

August 2016

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1.0 Introduction

The Connecticut Light and Power Company, doing business as Eversource Energy (Eversource), proposes the Bloomfield-Windsor Upgrades Project (the Project) to bring the electric supply system in northcentral Connecticut into compliance with applicable national and regional reliability standards and criteria.

The Project is located in the towns of Bloomfield and Windsor Connecticut and consists of six components: (1) The separation of the 1777/1779 115-kV transmission lines occupying shared double circuit towers (DCT) between Bloomfield Substation and Bloomfield Junction (1.60 miles); (2) the separation of the 1751/1777 115-kV transmission lines sharing DCT between Bloomfield Junction and North Bloomfield Substation (5.30 miles); (3) modifications to the 1779 line loop into Rood Avenue Substation; (4) modifications to Rood Avenue Substation, at 275 Rood Avenue, in Windsor; (5) modifications to Bloomfield Substation at 40 Crestview Drive, in Bloomfield; and (6) modifications to North Bloomfield Substation at 2 Hoskins Road, in Bloomfield.

On behalf of Eversource, AECOM conducted vernal pool habitat surveys on the Project rights-of-way (ROWs) in the spring of 2015. As part of the surveys, AECOM investigated the entire width of the ROWs, including the areas proposed for the location of new structure facilities and the areas in the vicinity of the existing overhead lines, where Eversource performs routine vegetation management to promote herbaceous and scrub/shrub/sapling habitats consistent with utility operation. In addition, in accordance with Connecticut Siting Council's Declaratory Ruling concerning the Project (Conditions 1.f and 1.g of Petition No. 1217), additional surveys were completed in the spring of 2016 to augment the previously collected vernal pool habitat information, as well as to investigate the presence/absence of the blue-spotted salamander (*Ambystoma laterale*) and marbled salamander (*Ambystoma opacum*).

This report discusses the field methods used to identify vernal pool habitats along the Project ROWs and summarizes the findings of the surveys. Vernal Pool Assessment Forms for all pools, documenting the biological evidence which supports these determinations, are included in Attachment A, and maps showing the locations of confirmed vernal pool habitats are included in Volume 3 of the Development and Management (D&M) Plan for the Project transmission line upgrades. Wetland and vernal pool habitat descriptions are provided in Section 4.0.

2.0 Vernal Pool Habitat Definitions

State and federal agencies apply slightly different definitions to describe vernal pools. The following summarizes the definitions used by the Connecticut Department of Energy and Environmental Protection (CT DEEP) and the U.S. Army Corps of Engineers (USACE).

The CT DEEP defines vernal pools as small bodies of standing fresh water found throughout the spring that typically result from various combinations of snowmelt, precipitation, and high water tables associated with the spring season. These depressions can be natural or man-made (CT DEEP, 2011). In most years, for at least part of the time, these areas become completely dry, losing water through infiltration and evapotranspiration. Vernal pools vary in many aspects including appearance, water

source, hydroperiod, water quality and surrounding habitats. Field investigations must coincide with the amphibian breeding and/or larval development time periods to determine if an area is functioning as a vernal pool.

In Connecticut, to meet the definition of a vernal pool, the following four criteria must be met:

- Contains water for approximately two months during the growing season;
- Occurs within a confined depression or basin that lacks a permanent outlet stream;
- Lacks any fish populations; and
- Dries out most years, usually by late summer.

The USACE's Programmatic General Permit (PGP) for the State of Connecticut defines vernal pools as: an often temporary body of water occurring in a shallow depression of natural or human origin that fills during spring rains and snow melt and typically dries up during summer months. Vernal pools support populations of species specially adapted to reproducing in these habitats. Such species may include wood frogs, mole salamanders (*Ambystoma* spp.), fairy shrimp, fingernail clams (*Sphaeriidae*), and other amphibians, reptiles and invertebrates. Vernal pools lack breeding populations of fish. It is noted in the PGP that the USACE will determine on a case-by-case basis which vernal pools are within their jurisdiction and that all vernal pools are subject to the jurisdiction of the CT DEEP under Connecticut Water Quality Standards.

Many organisms critically rely upon vernal pool habitat for reproductive success. These species are referred to as obligate vernal pool species. According to the CT DEEP (2011), obligate vernal pool species that may have ranges within the Project area include the following:

- wood frog *(Lithobates sylvatica)*
- Eastern spadefoot toad *(Scaphiopus holbrookii)* – State Endangered
- spotted salamander *(Ambystoma maculatum)*
- Jefferson salamander *(Ambystoma jeffersonianum)* – State Species of Special Concern
- marbled salamander *(Ambystoma opacum)*
- fairy shrimp *(Branchiopoda anostraca)*

Facultative vernal pool species are fauna that utilize, but do not necessarily require, vernal pools for reproductive success. Examples of facultative species include spring peeper (*Pseudacris crucifer*), spotted turtle (*Clemmys guttata*), red-spotted newt (*Notophthalmus viridescens viridescens*), green frog (*Rana clamitans*) and bull frog (*Rana catesbeiana*). Facultative species such as those mentioned above can utilize vernal pool habitats. However, these species can also breed successfully in the margins of permanent water bodies including streams, rivers, and lakes.

For the purposes of the ROW investigations and this report, a vernal pool was defined as an area that held obligate species in the 2015 breeding season and that met the majority of the state and federal vernal pool criteria discussed above. Given access constraints to off ROW areas and the temporally limited nature of the observations, it was not possible to be sure that every aspect of the criteria was being met in all cases.

In locations along and adjacent to the ROWs where large wetland systems exhibited expansive flooded areas within which obligate vernal pool species were documented as breeding, the breeding evidence was recorded and, if appropriate based upon the observed vernal pool criteria, the areas were identified as vernal pools. These types of areas are typically referred to as "cryptic vernal pools" and, as their name suggests, may be easily overlooked. Such determinations were made by field biologists during the 2015 surveys. Determinations made by field biologists during the 2015 survey identified two such pools, VP-1751-10 and VP-1751-13. The limits of these two large pools may extend east beyond the ROW survey limits.

3.0 Field Investigations

3.1 **Field Methods**

All wetland areas on the Project ROWs were investigated to determine if breeding amphibians, both obligate and facultative, were present in an effort to identify vernal pools. To facilitate the surveys, biologists were provided with Project specific wetland mapping.

AECOM conducted the vernal pool surveys along all of the Project ROWs in May of 2015, with four follow-up surveys of specific locations along the ROWs performed in 2016; one survey was conducted in May 2016 and three surveys were conducted in June 2016. The 2016 surveys were conducted in proximity to the potential blue-spotted salamander habitat identified by the NDDB and also included additional habitat investigations at the three vernal pools where direct Project impacts are anticipated (i.e. tree clearing and tree trimming by hand in vernal pools 1779-1, 1751-5 and 1751-13).

Both the 2015 and 2016 survey periods corresponded to the appropriate times of the year to identify areas that may function as vernal pools based on the presence of egg masses and/or developing larvae. The 2015 surveys occurred after significant rainfall events in the spring, when evening low temperatures remained in the 40s (Fahrenheit). These weather conditions facilitate inward migration of amphibians to the pools for the purpose of breeding. Biologists conducted visual surveys and used dip nets to sweep the water column to assist in determining the presence or absence of amphibians and other vernal pool species.

Evidence of amphibian breeding, including wood frog chorusing, egg masses and amphibian larvae, was recorded during the surveys. Additional data recorded included the approximate size and depth of the observed breeding pool(s), substrate type and general comments, if any.

Lastly, biologists sketched the extent of the documented vernal pool habitat onto field mapping and/or used a global positioning system (GPS) data collection device to locate the boundaries or center of pool

where possible. Field sketches and GPS data were then digitized onto Project mapping. Identified vernal pools are presented on Project mapping in Volume 3 of the D&M Plan.

During the vernal pool surveys in 2015 and 2016, only the wood frog and spotted salamander were observed on the Project ROWs. No evidence of the state-listed species (blue-spotted salamander) was observed along the ROWs. However, Project-specific consultations with the CT NDDB determined that there is a record of the blue-spotted salamander, a State-listed Endangered, obligate vernal pool species, occurring in the Project vicinity. However, no evidence of blue-spotted salamanders was found during the vernal pool surveys completed of the ROWs in 2015 or 2016.

During the 2015 investigations, wetland areas associated with the Project ROWs were surveyed to identify the presence or absence of obligate vernal pool species (presence/absence surveys). Where obligate species were observed, the area was further investigated to identify whether the state and federal vernal pool criteria had been satisfied. Observed facultative species were also noted.

Whereas the surveys focused on the Project ROWs, in some locations, wetlands extend both within and adjacent to the ROWs. To the extent that wetlands, or portions of wetlands located outside of the Project ROWs could be observed from the ROWs or public roads, such areas were also assessed for the presence/absence of vernal pools.

Vernal Pool Assessment Sheets, using the forms from the *Best Development Practices, Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern U. S.* (*Best Development Practices*; Calhoun and Klemens 2002), were completed to rate the variable value of each vernal pool. These Vernal Pool Assessment Sheets, which are provided in Attachment A, are typically used to rate each pool for local planning and management purposes. The tier rating system (which includes Tiers I-III) is designed to identify the relative ecological value of each vernal pool.

This rating system is based on two parameters: (1) biological value; and (2) condition of the terrestrial habitat. The assessment of the pools' biological value, factors in species abundance, species diversity, and pool vulnerability. Assessment of the terrestrial habitat includes the integrity of the vernal pools' envelope (i.e., land within 100 feet from the pool's edge) and critical terrestrial habitat (i.e., land from 100 to 750 feet from the pool's edge). The rating system assesses the relative ecological value of pools within the community or area. Accordingly, vernal pools with 25% or less developed area in the critical terrestrial habitat are defined as meeting Tier I criteria, warranting highest priority for protection. A Tier I rating denotes exemplary pools and generally applies to only a minority of sites. Tier II ratings may constitute the majority of vernal pool resources typically found in suburban areas. The *Best Development Practices* report indicates Tier II pools are likely good candidates for restoration. Tier III pools provide less than optimum conditions to sustain breeding and non-breeding habitat for vernal pool species.

3.2 **Life History Summary for Obligate Vernal Pool Species found on the Project ROWs**

Life history information for the amphibian species observed (wood frogs, spotted salamanders and spring peepers) during the course of the Project surveys is presented below.

3.2.1 Wood Frog

In New England, the wood frog is among the first amphibian species to arrive at the breeding pools and begin their loud, duck like mating call. Wood frogs have been documented as breeding in open and closed canopy wetlands (Werner and Glennemeier, 1999). The timing of their movement varies annually, depending on climatic conditions but in general terms they immigrate to breeding sites in most years during late February to early April. The large scale migration to the breeding pools generally occurs at night during the first few heavy downpours which are accompanied by warmer air temperatures.

Except for the brief period spent at breeding habitats, wood frogs are mainly terrestrial. They utilize all types of forests and woodlands, including maritime, deciduous, and coniferous (Klemens, 1993); as well as a variety of other types of habitats. During the coldest months wood frogs hibernate under leaf litter, rotting logs, stumps, rocks, and moss. Wood frogs have perfected the cryogenic freezing process. In the winter, as much as 35-45% of the frog's body may freeze, and turn to ice. Ice crystals form beneath the skin and become interspersed among the body's skeletal muscles. During the freeze the frog's breathing, blood flow, and heartbeat cease. Freezing is made possible by specialized proteins and glucose, which prevent intracellular freezing and dehydration.

Compared to other amphibian species that utilize vernal pools for breeding in southern New England, the wood frog is one of the only species that truly can be considered obligate to vernal pools. Wood frogs successfully breed in pools with shorter hydroperiods than any other amphibian in this region, with tadpole metamorphosis often complete by mid-July. Therefore, ponds that dry by August still provide perfectly suitable breeding habitat, whereas it takes much longer for the young of most other species to complete metamorphosis.

Wood frog egg masses are often deposited near the edge of a breeding pool on the water's surface where water temperatures are typically highest. They are usually attached to submerged woody debris and/or herbaceous vegetation. Wood frog egg masses can easily be distinguished from those of the spotted salamander by the lack of an outer gelatinous sheath.

Newly hatched larvae feed on their egg masses and associated algae, as wood frog tadpoles are microphagous filter-feeders with a largely herbivorous diet. Larger tadpoles use their specialized mouth parts to feed on algae and various microorganisms scraped from aquatic vegetation, decaying plants and some animal matter. Adult wood frogs feed on a variety of invertebrates including flies, beetles, spiders, earthworms, moth larva, slugs, snails, and annelids (Klemens, 1993).

3.2.2 Spotted Salamander

In New England, the spotted salamander is a very common and widespread mole salamander. Collectively, the mole salamanders are a secretive group of salamanders that are primarily active at night. These animals are rarely seen except during their nocturnal migrations to and from their breeding pools during their brief early spring breeding season. Often, spotted salamanders can be observed migrating to vernal pools in conjunction with wood frogs. Within a few days after mating, eggs are deposited in firm

spherical or kidney-shaped masses and in most cases are attached to submerged objects such as woody debris or other organic material.

Once hatched, larvae feed predominantly on very small aquatic invertebrates. Larger individuals feed on snails, clams, oligochaete worms, small aquatic insects and their larvae and other invertebrates (Kenny and Burne, 2001). In general, zooplankton is the dietary staple of larvae of all size classes. As adults, spotted salamanders are generalized carnivores that forage in upland habitats for a variety of invertebrates including earthworms, snails, slugs, insects and larvae, spiders, and beetles (DeGraaf and Yamasaki, 2001).

While breeding and larval development takes place in aquatic habitats, during most of the year, spotted salamanders reside in upland forests away from breeding pools. Adults typically reside up to 200 meters from breeding pools but have been documented moving greater distances. Spotted salamanders typically live in burrows created by small mammals such as the short-tail shrew (*Blarina brevicauda*). They appear to be habitat generalists, and have been documented in forest habitats including deciduous, coniferous and mixed forest. However, they are most abundant in mature deciduous or mixed deciduous woodlands.

3.2.3 Spring Peeper

Spring peepers are among the most common frog species in southern New England. However, their diminutive size and cryptic coloration prevent most people from ever noticing them. Ironically, almost everyone has heard their springtime mating calls but fail to recognize the source. When not at breeding pools/ponds, peepers are habitat generalists and utilize habitats which range from mature forests to old field habitats. Although they are most commonly found in or near moist deciduous woodlands they also can be found in coniferous forests, grassy meadows, shrubby fields, gardens, sandy coastal dune habitats, as well as pine barrens (Klemens, 1993).

In southern New England, spring peepers are found at breeding pools/ponds from mid-March through May (Paton et al., 2000). Once there, males establish territories from which they actively call to attract females. After pairing up, females deposit eggs on the pool/pond bottom under organic debris such as dead leaves. Upon hatching, larvae tend to congregate in the warm shallows of ponds, in areas with dense vegetation where they are usually "inactive and benthic" - a strategy used as an anti-predator defense (Lawler, 1989).

Spring peeper larvae feed on small aquatic organisms such as diatoms and algae found on submerged organic debris. Adult peepers feed on a variety of small invertebrates, and thus, are beneficial to the environment by acting as natural pest control agents. Spiders account for the bulk of their diet (48%), although they also gorge themselves on mites, sowbugs, leafhoppers, ants, harvestmen, nematode worms, and lepidoptera (moth and butterfly) larvae (Gilhen, 1984).

4.0 Survey Results

4.1 Summary of Vernal Pool Investigations

Based on the 2015 and 2016 breeding season field surveys, eight wetlands located along the Project ROWs were determined to contain vernal pools that provide habitat for obligate vernal pool amphibian species. Within these eight wetland complexes, 15 vernal pool areas were identified during the 2015 surveys. Of the 15 vernal pools, two are situated along the 1777/1779 line ROW and 13 are located along the 1751/1777 line ROW.

Of the 15 identified vernal pools:

- Eleven are located entirely within forested areas, either within the ROWs, outside the ROWs or both, as follows:
    - VP-1779-2, which is partially within the ROW and partially outside the ROW
    - VP-1751-1, which is entirely outside the ROW
    - VP-1751-3, which is entirely outside the ROW
    - VP-1751-4, which is entirely outside the ROW
    - VP-1751-7, which is entirely outside the ROW
    - VP-1751-9, which is entirely outside the ROW
    - VP-1751-10, which is partially within the ROW and partially outside the ROW
    - VP-1751-11, which is entirely outside the ROW
    - VP-1751-12, which is partially within the ROW and partially outside the ROW
    - VP-1751-14, which is entirely outside the ROW
    - VP-1751-15, which is entirely outside the ROW
- Three are located partially within maintained portions of the ROWs and partially within unmaintained portions (i.e. forested areas), as follows:
    - VP-1779-1, which is partially within the ROW and partially outside the ROW
    - VP-1751-5, which is partially within the ROW and partially outside the ROW
    - VP-1751-13, which is partially within the ROW and partially outside the ROW
- One, VP-1751-6, is located entirely within the currently maintained portion of the ROW.

Table 1 (found at the end of Section 4) provides information on species observations, dominant cover type, pool substrate, Tier Rating (Calhoun and Klemens, 2002; as described below) and pool location. Additional habitat characteristics of each wetland/pool system are also described in greater detail in Section 4.2 and Section 4.3.

Project mapping included in Volume 3 of the D&M Plan identifies the delineated wetlands and vernal pools along the Project ROWs. For wetlands that encompass vernal pools, the vernal pools depicted represent the areas that could be successfully utilized by obligate vernal pool species. Distinct areas within the overall vernal pool where specific data was collected are referred to as the data collection areas. The size of the data collection areas, as well as the overall vernal pool dimensions, reflect the results of data collected during the survey and can be expected to vary from year-to-year based upon seasonal fluctuations in the water table caused by annual variations in the amount and timing of precipitation. These hydrologic variations could in turn affect where exactly amphibians would deposit egg masses in a given year.

Two of the vernal pools identified during the 2015 surveys are "cryptic vernal pools". Cryptic vernal pools are found in large wetland systems exhibiting expansive areas of flooding where obligate vernal pool species are documented as breeding. These areas often lack a clearly defined vernal pool depression, and often do not meet the traditional definition of a vernal pool.

Of the 15 vernal pools identified within the Project ROWs, six are classified as Tier I (including both vernal pools along the 1777/1779 line ROW), while nine meet the criteria for Tier III. No Tier II vernal pools were identified. Table 1 identifies the classification of each of the vernal pools along the Project ROWs, as well as the vernal pool's position relative to the ROW boundaries.

Only three of the 15 vernal pools will be directly affected by the Project construction. Section 4.2 describes these three vernal pools, at which additional surveys were conducted in 2016. Section 4.3 discusses the 12 vernal pools that will not be impacted directly by the Project.

4.2 Wetland and Vernal Pool Habitat Descriptions: Vernal Pools Directly Affected by the Project

The Project will result in direct impacts to only three of the 15 vernal pools identified during the surveys. While no new transmission line structures, access roads, or work pads will be located within these vernal pools, tree clearing within the vernal pools will be required to maintain clearance from the new transmission line conductors along the ROW (resulting in total anticipated impacts of 0.04 acre). To further assess potential impacts at these three vernal pools, in addition to the 2015 surveys, supplemental data on the existing habitat was collected in 2016. Each of the vernal pools in which tree clearing is unavoidable is situated within a wetland complex that also contains other vernal pools. However, the t additional details are only provided for the vernal pools that will be directly affected by Project construction.

4.2.1 Wetland 5/5A (Vernal Pool VP-1779-1)

Wetland 5/5A is located at and adjacent to Bloomfield Junction. This wetland complex is interconnected via culvert pipes that extend underneath an existing on-ROW gravel access road.

Water within Wetland 5, which is located slightly southwest of Bloomfield Junction along the 1777/1779 line ROW, was observed to drain from the northwest into the southeastern portion of the wetland and ultimately continue outside of the ROW. This PSS/PFO wetland is vegetated with common reed

(*Phragmites australis*), silver maple (*Acer saccharinum*), silky dogwood (*Cornus amomum*), and cat-tails (*Typha* sp.). Hydric soil indicators are as follows: hydrogen sulfide, stratified layers, depleted below dark surface, loamy gleyed matrix and depleted matrix. Indicators of wetland hydrology include: surface water, high water table, and saturation.

Wetland 5A is situated immediately north of Wetland 5 and is directly connected to it via a short rip-rap outfall, which crosses the existing access road.

Vernal Pool 1779-1 is a small, shallow depression (approximately 40 feet x 100 feet) located within the ROW southwest of Structure 3115-1 in Wetland W5. Standing water was not present in the shallow depression during the June 16, 2016 site investigation. The limits of the seasonal pool of water confined within the shallow depression were defined by the presence of water-stained leaves. Red maple and American elm (*Ulmus americana*) are the dominant canopy species in the forest community. Common winterberry was a dominant shrub in the understory, with multiflora rose (*Rosa multiflora*) and ironwood (*Carpinus caroliniana*) as associate species. Common vines were poison ivy (*Toxicodendron radicans*) and Virginia creeper (*Parthenocissus quinquefolia*). Sensitive fern (*Onoclea sensibilis*), awned-sedge (*Carex crinita*), and jewelweed (*Impatiens capensis*) were the common to dominant species in the herbaceous layer, with bladder sedge (*Carex intumescens*) and manna-grass (*Glyceria* sp.) present to a lesser extent.

Vernal Pool 1779-1 was classified as Tier I due to breeding evidence of two or more vernal pool indicator species (wood frog and spotted salamander) and the relative large undeveloped portions of the vernal pool envelope and critical terrestrial habitat areas.

4.2.2 Wetland 8 (Vernal Pool VP-1751-5)

Wetland 8 is located along the 1751/1777 line ROW northwest of Structure 3119, and also extends beyond the ROW limits to the north and south. This PSS/PFO wetland is vegetated with silky dogwood and skunk cabbage. Soils were observed to be an organic silt to a depth of 4 inches in the A horizon and a low chroma color with a stratified layer in the B horizon. Hydric soil indicators are as follows: stratified layers, depleted below dark surface, sandy mucky mineral and depleted matrix. Indicators of wetland hydrology include: saturation, water marks, sediment deposits and water-stained leaves.

Vernal Pool 1751-5 is located in the ROW in the northwestern section of Wetland W8 approximately 400 feet west of proposed Structure 3119-1. Standing water was approximately 10-14 inches deep during the June 16, 2016 site investigation. A floating mat of vegetation limited the extent of the open water within the vernal pool. Herbaceous species recorded along the margin of the pool included tussock-sedge, sallow sedge (*Carex lurida*), woolgrass (*Scirpus cyperinus*), spreading bulrush (*Scirpus expansus*), manna-grass, purple loosestrife (*Lythrum salicaria*), skunk cabbage, and common arrowhead (*Sagittaria latifolia*). Shrub species observed bordering the pool included swamp azalea (*Rhododendron viscosum*), common winterberry, maleberry (*Lyonia ligustrina*), and speckled alder (*Alnus incana* ssp. *rugosa*). Wild grape (*Vitis labrusca*) was present in the shrub border, and the pool substrate was mucky with limited coarse woody debris.

Dip nets of the vernal pool habitat performed on June 16, 2016 resulted in the collection of wood frog and American toad (*Anaxyrus americanus*) tadpoles. Invertebrate species collected during the dip net surveys included dragonfly nymphs, scavenger beetles, pill clams, and freshwater snails.

Vernal Pool 1751-5 was classified as Tier III based on dip net survey results and the nature of the vernal pool envelope and critical terrestrial habitat areas.

A second vernal pool (VP-1751-6) also is located in Wetland 8, but will not be affected by the Project (refer to Section 4.3 for a description of this vernal pool. .

4.2.3 Wetland 22/22A (Vernal Pool 1751-13)

Wetland 22/22A, a PSS/PFO wetland, is a large wetland complex that extends across the 1751/1777 line ROW and parallels Duncaster Road in the vicinity of Adams Road. Wetland 22 is located south of the ROW crossing of Adams Road, while Wetland 22A is located north of this road. In Wetland 22/22A, hydric soils were an organic silt in the A horizon to a depth of 6 inches and a silty clay loam in the B horizon. Primary vegetation at the data plot was cat-tail, lurid sedge, common reed, skunk cabbage and sensitive fern. Hydrology included surface water to a depth of 2 inches. Three vernal pools (VPs 1751-11 through -13) are located east of the existing cleared ROW in forested portions of Wetland 22A.

Vernal Pool 1751-13 is a large shallow depression (approximately 60 feet x 210 feet) located in the northern part of Wetland 22A near existing Structure 3154 and proposed Structure 3154-1. Habitat is a mixed PEM/PSS community. The dominant herbaceous species recorded in the wetland plant community was common reed. Common herbaceous associate species include water-plantain (*Alisma subcordatum*), reed canary-grass (*Phalaris arundinacea*), duckweed (*Lemna* sp.), bristly sedge (*Carex comosa*), tussock-sedge (*Carex stricta*), and Pennsylvania Smartweed (*Persicaria pensylvanica*). Common woody associate species include silky dogwood, buttonbush (*Cephalanthus occidentalis*), winterberry (*Ilex verticillata*), and young white ash (*Fraxinus americana*) saplings.

The water depth ranged from 0-14 inches over the course of the surveys completed in June 2016. Substrate consisted of muck overlain with fine organic debris. Amphibian breeding habitat was confirmed in Vernal Pool 1751-13 in June 2016, as wood frog tadpoles and spring peeper tadpoles were recorded in the dip net sweets performed on June 13 and 16, 2016, but the pool was dry by June 30, 2016. Adult green frogs were also observed in the pool of standing water on both site visits. Invertebrate species collected in the dip net sweeps included dragonfly nymphs, caddisfly larvae, pill clams, freshwater snails, and isopods. Standing water in Vernal Pool 1751-13 extended into the forested wetland bordering the eastern edge of the ROW and outside the survey corridor. This section of the vernal pool shows little evidence of disturbance. Canopy species observed in the forested wetland outside the ROW include red maple (*Acer rubrum*) and white ash with common winterberry in the shrub understory layer. Royal fern (*Osmunda regalis*) and tussock-sedge were common herbaceous species in the pool of standing water below the mature canopy species. Coarse woody debris was observed in the standing pool of water in the forested wetland outside the ROW.

Vernal Pool 1751-13 was classified as Tier I due to breeding evidence of two or more vernal pool indicator species (wood frog and spotted salamander) and the relative large undeveloped portions of the vernal pool envelope and critical terrestrial habitat areas.

4.3 Wetland and Vernal Pool Habitat Descriptions: Vernal Pools Not Directly Affected by the Project

Project construction activities will not affect 12 of the 15 vernal pools identified along or near the ROWs. These 12 identified vernal pools are located partially or entirely outside of the existing Project ROWs, or within portions of the ROWs that will not be affected by construction activities. Information for each of these 12 vernal pools is provided below.

4.3.1 Wetland 3/3A (Vernal Pool VP-1779-2)

Wetland 3 is located west of a flood control berm near proposed Structure 3-110-1, and connects to Wetland 2, outside of the southeastern boundary of the ROW. This PEM/PSS wetland was observed to be vegetated with cat-tails (*Typha* sp.), moneywort (*Lysimachia nummularia*), and sensitive fern (*Onoclea sensibilis*). Soils were observed to be an organic silt with low chroma colors in the A horizon and a silty clay in the B horizon. Hydric soil indicators are as follows: stratified layers and depleted below dark surface. Indicators of wetland hydrology include: surface water, high water table, saturation and water marks. Wetland 3 was observed to drain directly into an unnamed tributary of Beamans Brook (PS3). PS3 was also observed to continue through a culvert pipe beneath the flood control berm. PS3 (Unnamed Tributary to Beamans Brook) flows within Wetland 3 and continues outside of the ROW.

Wetland 3A was observed to be located just east of the flood berm. This PEM/PSS wetland was observed to be vegetated with skunk cabbage (*Symplocarpus foetidus*), cattails (*Typha* sp.), and sensitive fern (*Onoclea sensibilis*). Soils were observed to be an organic silt with low chroma colors in the A horizon and a silty clay with a depleted matrix in the B horizon. Hydric soil indicators are as follows: depleted below dark surface and depleted Matrix. Indicators of wetland hydrology include: saturation, water marks and sediment deposits. Wetland 3A was observed to drain directly into PS3A, an unnamed tributary to Beamans Brook. PS3A is connected to PS3 via a culvert beneath the flood control berm.

Vernal pool 1779-2 is a muck bottom area, approximately 1,400 square feet in size, and located within a forested portion of Wetland 3A outside of the existing cleared ROW. Vernal Pool 1779-2 was classified as Tier I due to breeding evidence of two or more vernal pool indicator species and the relative large undeveloped portions of the vernal pool envelope and critical terrestrial habitat areas.

4.3.2 Wetland 5/5A (Vernal Pool VP-1751-1)

As described in Section 4.2.1, Wetland 5/5A is located adjacent to Bloomfield Junction.

Vernal pool VP-1751-1 is located outside of the ROW and within the forested areas adjacent to the existing cleared ROW. This pool contained a muck bottom and is approximately 1,900 square feet in size. Vernal Pool 1751-1 was classified as Tier I due to breeding evidence of two or more vernal pool

indicator species and the relative large undeveloped portions of the vernal pool envelope and critical terrestrial habitat areas.

4.3.3 Wetland 6 (Vernal Pool VP-1751-14)

Wetland 6 is located northwest of Wetland 5A along the 1751/1777 line ROW. Although Wetland 6 is in close proximity, it was not observed to be hydrologically connected to Wetland 5A. This PSS/PFO wetland was observed to be predominantly vegetated with similar species to Wetland 5A. Soils were also observed to be similar to Wetland 5A. Hydric soil indicators are as follows: black histic, depleted below dark surface and depleted matrix. Indicators of wetland hydrology include: surface water, saturation and water marks. Wetland 6 was not observed to drain into any nearby wetlands and other waters of the U.S.

Vernal pool VP-1751-14 is located outside of the existing ROW, and is approximately 225 square feet in size with leaf litter as the dominant substrate. Vernal Pool 1751-14 was classified as Tier I due to breeding evidence of two or more vernal pool indicator species and the relative large undeveloped portions of the vernal pool envelope and critical terrestrial habitat areas.

4.3.4 Wetland 7/7A (Vernal Pools VP-1751-3, VP-1751-4)

Wetland 7/7A is located along both the north and south sides of an existing gravel access road along the 1751/1777 line ROW. Both of these wetlands were observed to extend beyond the limits of the ROW. These PSS/PFO wetlands are vegetated with silver maple and silky dogwood. Soils were observed to be an organic silt to a depth of 4 inches in the A horizon and a low chroma color with a depleted matrix in the B horizon. Hydric soil indicators are as follows: stratified layers, depleted below dark surface and depleted matrix. Indicators of wetland hydrology include: saturation, water marks, sediment deposits and drainage patterns.

Two vernal pool areas, VP-1751-3 and VP-1751-4, were identified within Wetland 7/7A. The two vernal pools are small flooded areas located within forested and scrub-shrub portions of Wetland 7A, outside and north of the existing managed ROW. VP-1751-3 and VP-1751-4 both contained leaf litter as the dominant substrate and are relatively small in size, approximately 100 square feet and 400 square feet, respectively. Both vernal pools were classified as Tier III based on breeding evidence of indicator species and the nature of the vernal pool envelope and critical terrestrial habitat areas.

4.3.5 Wetland 8 (Vernal Pool VP-1751-6)

The primary characteristics of Wetland 8 are described in Section 4.2.2. In addition to VP-1751-5, Wetland 8 includes VP-1751-6, which is situated along the southwestern portion of the ROW, near Structure 3119. Vernal pool VP-1751-6 is the only vernal pool identified during the vernal pool survey that is located entirely within the maintained portion of the ROW. VP-1751-6 is approximately 500 square feet in size and the substrate consisted primarily of leaf litter. VP-1751-6 was classified as Tier III based on breeding evidence of indicator species and the nature of the vernal pool envelope and critical terrestrial habitat areas.

4.3.6 Wetland 12/12A (Vernal Pool VP-1751-15)

Wetland 12/12A was observed to be interconnected via a culvert underneath the existing gravel access road. These PSS/PFO wetlands were observed to extend both north and south beyond the limits of the ROW. The wetlands are vegetated with red-osier dogwood (*Cornus stolonifera*) and sensitive fern. Soils were observed to be an organic silt/black histic to a depth of 7 inches in the A horizon and a low chroma color with a stratified layer (A5) in the B horizon. Indicators of wetland hydrology include: surface water, high water table, saturation, water marks and sediment deposits. Both wetlands were observed to drain directly into PS4 (Beamans Brook). This stream was also observed to drain southward outside of the survey corridor. This wetland is located within Wintonbury Reservoir flood control system.

Vernal pool VP-1751-15 is located completely outside and north of the existing ROW, within forested portions of Wetland 12A. VP-1751-15 is approximately 1900 square feet in size and contained a mixed substrate of muck and leaf litter. Vernal Pool 1751-15 was classified as Tier I due to breeding evidence of two or more vernal pool indicator species and the relative large undeveloped portions of the vernal pool envelope and critical terrestrial habitat areas.

4.3.7 Wetland 22/22A (Vernal Pool VP-1751-11, VP-1751-12)

Wetland 22/22A, as described in Section 4.2.3, is a large wetland complex that extends along the 1751/1777 line ROW and parallels Duncaster Road in the vicinity of Adams Road. Hydric soils were an organic silt in the A horizon to a depth of 6 inches and a silty clay loam in the B horizon. Primary vegetation at the data plot was observed to be cat-tail, lurid sedge, common reed, skunk cabbage and sensitive fern. Hydrology included surface water to a depth of 2 inches.

VP-1751-11 and VP 1751-12 are both located east of the existing cleared ROW within forested portions of Wetland 22A. VP-1751-11 is approximately 700 square feet in size and is located entirely outside of the existing ROW, while VP-1751-12 is approximately 100 square feet in size and is located partially within the existing ROW and partially outside of the existing ROW. The substrate of both vernal pools consisted primarily of muck. Both vernal pools were classified as Tier III based on breeding evidence of indicator species and the nature of the vernal pool envelope and critical terrestrial habitat areas.

4.3.8 Wetland 23 (Vernal Pools VP-1751-7, VP-1751-9, VP-1751-10)

Wetland 23 extends along the 1751/1777 line ROW generally between and near Structures 3156 to 3159; the wetland also extends west and east beyond the ROW and passes underneath Adams Road via three culverts. This PEM/POW/PSS/PFO wetland showed areas in which every type of wetland cover type was observed as the majority vegetative cover. This wetland was observed to be vegetated with silver maple, silky dogwood, cat-tail, sensitive fern, and moneywort. Wetland 23 was observed to have similar hydric soils and hydrology to Wetland 22/22A. Griffen Brook, which flows north in this portion of the ROW, runs parallel to, and disperses through portions of, Wetland 23.

Three vernal pools are located east of the existing cleared ROW within forested portions of Wetland 23. VP-1751-7 and VP 1751-9 are located entirely outside of the ROW. VP-1751-10 is located directly east of proposed Structure 3156-1; the western boundary of this vernal pool extends into the ROW, but the majority is located outside of the ROW in a forested area.

These three vernal pools differ in size; VP-1751-7 is approximately 200 square feet, VP-1751-9 is approximately 1100 square feet, and VP-1751-10 is approximately 7,300 square feet. VP-1751-10 is a cryptic vernal pool, indicating that it is a large area of suitable habitat within a large wetland complex. Substrate in VP-1751-7 consisted of a combination of leaf litter and muck, while VP-1751-9 consisted of only leaf litter, and VP-1751-10 was primarily muck. All three vernal pools were classified as Tier III based on breeding evidence of indicator species and the nature of the vernal pool envelope and critical terrestrial habitat areas.

Table 1: Vernal Pool Habitats Identified on the Project ROWs

Vernal Pool Number[1]	Associated Wetland[2]	Nearest Structure[3]	Mapsheet Number[4]	Species Observed and/or Heard	Existing Cover Type	Substrate	Tier Rating[5]	Position in Project ROW
VP-1779-2	Wetland 3/3A	3-111	5 of 25	Numerous wood frog tadpoles, 1 spotted salamander egg mass	PFO	Muck	I	Partially In ROW
VP-1779-1	Wetland 5	3-115	6 of 25	Numerous wood frog tadpoles, 2 spotted salamander egg mass	PSS/PFO	Leaf litter	I	Within ROW
VP-1751-1	Wetland 5A	3-116	6 of 25	Numerous wood frog tadpoles, 1 wood frog egg mass, 2 spotted salamander egg masses	PFO	Muck	I	Outside of ROW
VP-1751-3	Wetland 7A	3118	7 of 25	Numerous wood frog tadpoles	PFO	Leaf litter	III	Outside of ROW
VP-1751-4	Wetland 7A	3118	7 of 25	Numerous wood frog tadpoles	PFO	Leaf litter	III	Outside of ROW
VP-1751-5	Wetland 8	3119	8 of 25	Numerous wood frog tadpoles	PSS/PFO	Leaf litter	III	Partially In ROW
VP-1751-6	Wetland 8	3119	8 of 25	Numerous wood frog tadpoles	PSS/PEM	Leaf litter	III	Within ROW
VP-1751-7	Wetland 23	3157	22 of 25	Numerous wood frog tadpoles	PFO	Leaf litter, muck	III	Outside of ROW
VP-1751-9	Wetland 23	3156	21 of 25	Numerous wood frog tadpoles	PFO	Leaf litter	III	Outside of ROW

Table 1: Vernal Pool Habitats Identified on the Project ROWs

Vernal Pool Number[1]	Associated Wetland[2]	Nearest Structure[3]	Mapsheet Number[4]	Species Observed and/or Heard	Existing Cover Type	Substrate	Tier Rating[5]	Position in Project ROW
VP-1751-10 (Cryptic VP)	Wetland 23	3156	21 of 25	Numerous wood frog tadpoles, 1 spotted salamander egg masses	PSS/PFO	Muck	III	Partially In ROW
VP-1751-11	Wetland 22/22A	3154	20 of 25	Numerous wood frog tadpoles	PFO	Muck	III	Outside of ROW
VP-1751-12	Wetland 22/22A	3154	20 of 25	Numerous wood frog tadpoles	PFO	Muck	III	Partially In ROW
VP-1751-13 (Cryptic VP)	Wetland 22/22A	3154	20 of 25	Numerous wood frog tadpoles	PSS/PFO	Leaf litter	I	Partially In ROW
VP-1751-14	Wetland 6	3-116	6 of 25	Numerous wood frog tadpoles, caddisfly larva	PFO	Leaf litter	I	Outside of ROW
VP-1751-15	Wetland 12A	3124	10 of 25	Numerous wood frog tadpoles, 2 spotted salamander egg masses	PFO	Leaf litter, muck	I	Outside of ROW

5.0 Anticipated Vernal Pool Impacts and Mitigation Measures

The transmission line upgrades will not result in any permanent fill or direct temporary impacts to the 15 vernal pools located within or near the Project ROWs. No new transmission line structures, work pads, or access roads will be placed within any vernal pools.

To maintain mandated clearances between vegetation and the relocated 115-kV transmission line conductors, secondary impacts associated with tree clearing activities will occur only within three vernal pools (VP-1779-1; VP-1751-5; and VP-1751-13; refer to Table 2). A total of approximately 1,936 square feet (0.04 acre) of currently forested habitat within the limits of these three vernal pools will be converted to scrub-shrub habitat. In each case, no changes to the functionality of these vernal pools are anticipated based on the limited amount of tree clearing that will be required within each pool (refer to Table 2). The remaining and converted habitat would still provide habitat value to breeding amphibian species within the vernal pools.

Additional secondary impacts to all the vernal pools are anticipated from vegetation clearing and subsequent conversion of habitat (e.g., forest to scrub-shrub vegetation) and the construction of temporary and permanent access roads and work areas in the vernal pools' envelopes (land within 100 feet of a pool's depression edge) and critical terrestrial habitat (land from 100 to 750 feet from a pool's depression edge). Within the Project ROWs, some vegetation clearing will be required within the envelopes adjacent to each vernal pool. Table 2 summarizes the secondary impacts for each of the 15 vernal pools. Due to proximity of some vernal pools, impacts for several vernal pool envelopes had to be aggregated together, as noted in Table 2.

To provide a comparative assessment of the potential effects of Project vegetation removal within the vernal pool envelopes, analyses were conducted of overall land use/land cover types within the envelopes. For the 15 vernal pools located in the vicinity of the Project ROWs, lands within the 100-foot wide vernal pool envelopes were comprised of 9.4 acres of forested lands and 6.5 acres of managed ROW. No other cover types are present within the vernal pool envelopes. Within the vernal pool envelopes, the Project will result in 0.58 acre of tree clearing and associated habitat conversion, as well as 1.5 acres of temporary and 0.3 acre of permanent pad and road construction, as detailed in Table 2.

Across the Project, lands occurring within the "Critical Terrestrial Habitat" (i.e., extending from 100 to 750 feet from the vernal pool depression), are comprised of forested lands, managed ROW, and otherwise developed lands. Within the "Critical Terrestrial Habitat", the Project will result in 1.86 acres of tree clearing and associated habitat conversion, as well as 4.76 acres of temporary and 0.66 acres of permanent pad and road construction, as detailed in Table 2.

The Project is not anticipated to have any major or long-term effects on vernal pool habitat availability or functions. Direct impacts will only occur in three locations and will consist of minimal hand clearing of trees. No access roads, work pads or structures will be located within identified vernal pool habitats. The vernal pool areas impacted by tree clearing will not be filled; these areas represent a conversion from trees to scrub-shrub habitats and will still provide valuable vernal pool habitat for obligate vernal pool

species. In addition, the overall project impacts to forested land within the 100-foot-wide vernal pool envelope will total 0.58 acre, or 6.2% of the total available forested habitat within the envelope.

Further, Eversource has designed the Project to limit impacts to vernal pools to the extent practicable. As a result, no vernal pool habitat will be permanently impacted from Project construction or operation. During construction, Eversource will require its contractors to implement vernal pool protection measures as described in the D&M Plan (refer to Volume 1, Section 5.3, the Volume 3 maps, and Volume 3 Detail Sheet 6).

Table 2 – Vernal Pool Impacts

Vernal Pool Identification No.	Existing Cover Type	Calhoun and Klemens Vernal Pool Tier Rating	Vernal Pool Size (square feet)	Location of Anticipated Impact															
				Planned Construction Work within Vernal Pool Boundaries (square feet)					"Vernal Pool Envelope"** (Extending to 100' from Vernal Pool Edge) (square feet)					"Critical Terrestrial Habitat"*** (Extending from 100' to 750' from Vernal Pool Edge.) (square feet)				
				Nature of Anticipated Impacts (Square Feet)														
				Tree Clearing (Manual)	Temporary Access Road	Temporary Construction Pads (Timber mats)	Permanent Road	Permanent Pad	Tree Clearing*	Temporary Access Road	Temporary Construction Pads (Timber mats)	Permanent Road****	Permanent Pad****	Tree Clearing*	Temporary Access Road	Temporary Construction Pads (Timber mats)	Permanent Road****	Permanent Pad****
Bloomfield Substation to Bloomfield Junction																		
VP-1779-1	PFO	I	2350	770	0	0	0	0	6392	0	9687	0	0					
VP-1779-2	PFO	I	1387	0	0	0	0	0	5741	0	1139	0	0					
Bloomfield Junction to North Bloomfield Substation																		
VP-1751-1	PFO	I	1938	0	0	0	0	0	2241	0	15249	343	0	81103	32733	174746	3577	25459
VP-1751-14	PFO	I	223	0	0	0	0	0										
VP-1751-3	PFO	III	78	0	0	0	0	0	1535	0	0	0	7453					
VP-1751-4	PFO	III	393	0	0	0	0	0										
VP-1751-5	PSS/PFO	III	1400	110	0	0	0	0	1240	6398	0	0	0					
VP-1751-6	PSS/PEM	III	507	0	0	0	0	0	747	2535	0	0	6749					
VP-1751-7	PFO	III	204	0	0	0	0	0	547	0	0	0	0					
VP-1751-9	PFO	III	1095	0	0	0	0	0	1053	2688	0	0	0					
VP-1751-10 (Cryptic VP)	PSS/PFO	III	7322	0	0	0	0	0	1769	2373	9854	0	0					
VP-1751-11	PFO	III	702	0	0	0	0	0	2842	6354	9897	0	0					
VP-1751-12	PFO	III	1036	0	0	0	0	0										
VP-1751-13 (Cryptic VP)	PSS/PFO	I	10944	1056	0	0	0	0										
VP-1751-15	PFO	I	1904	0	0	0	0	0	1303	0	0	0	0					
Total (SF)		Varies	31484	1936	0	0	0	0	25410	20248	45826	343	14202	81103	32733	174746	3577	25459
Total (Acres)		Varies	0.72	0.04	0	0	0	0	0.58	0.46	1.05	0.01	0.33	1.86	0.75	4.01	0.08	0.58

* Tree Clearing will be completed using timber mats in wetland areas. Clearing work will be performed by hand in vernal pool areas. .

** Due to size of overlapping vernal pool envelopes, select impacts have been aggregated, as noted in the table.

*** Due to size of overlapping Critical Terrestrial Habitat, impacts have been aggregated on a Project-wide basis. Critical Terrestrial Habitat areas drawn as a perimeter offset and not biased towards suitable upland habitat.

**** “Permanent gravel road and pad impacts represent maximum anticipated disturbance and impact. Permanent roads and pads will only be in uplands. Existing roads may need to be top dressed to accommodate construction equipment. Based on landowner requests, “permanent” gravel roads and pads may be removed subsequent to construction activities.

6.0 References

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Attachment A

2015/2016 Vernal Pool Habitat Data Forms

VP-1729-1

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No_✓_____

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_✓_____ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No_✓_____

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes_✓_____ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes_✓_____ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
(1-3)	(2)	(Tier I)
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool VP-1779-2

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No✓

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes✓ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No✓

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes✓ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes✓ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
(1-3)	(2)	Tier I
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1751-1

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No✓_____

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes✓_____ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No✓_____

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes✓_____ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes✓_____ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
(1-3)	(2)	(Tier I)
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1751-3 **VERNAL POOL ASSESSMENT SHEET**

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__✓__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No__✓__

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__✓__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__✓__ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__✓__ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1751-4 **VERNAL POOL ASSESSMENT SHEET**

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No_____✓

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No_____✓

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No_____✓

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes_____✓ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes_____✓ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1751-5

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No ✓

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No ✓

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No ✓

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes ✓ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes ✓ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1757-6 **VERNAL POOL ASSESSMENT SHEET**

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No ✓

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No ✓

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No ✓

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes ✓ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes ✓ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1751-7

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No✓

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No✓

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No✓

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes✓ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes✓ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP - 1751-9 **VERNAL POOL ASSESSMENT SHEET**

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No ✓

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No ✓

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No ✓

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes ✓ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes ✓ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1751-10 **VERNAL POOL ASSESSMENT SHEET**

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No ✓

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No ✓

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No ✓

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes X No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes X No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1751-11 **VERNAL POOL ASSESSMENT SHEET**

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No ✓

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No ✓

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No ✓

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes ✓ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes ✓ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
(0)	(1-2)	(Tier III)
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP - 1751 -12 **VERNAL POOL ASSESSMENT SHEET**

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No_✓_____

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes_____ No_✓_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No_✓_____

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes_✓_____ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes_✓_____ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1751-13 **VERNAL POOL ASSESSMENT SHEET**

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No__✓__

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes__✓__ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No__✓__

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes__✓__ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes__✓__ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
1-3	2	Tier I
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1751-14 **VERNAL POOL ASSESSMENT SHEET**

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No ✓

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes ✓ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No ✓

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes ✓ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes ✓ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
(1-3)	(2)	(Tier I)
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

VP-1751-15

VERNAL POOL ASSESSMENT SHEET

A. Biological Value of the Vernal Pool

(1) Are there *any* state-listed species (Endangered, Threatened, or Special Concern) present or breeding in the pool?
Yes_____ No ✓

(2) Are there two or more vernal pool indicator species breeding (i.e., evidence of egg masses, spermatophores [sperm packets], mating, larvae) in the pool?
Yes ✓ No_____

(3) Are there 25 or more egg masses (regardless of species) present in the pool by the conclusion of the breeding season?
Yes_____ No ✓

B. Condition of the Critical Terrestrial Habitat

(1) Is at least 75% of the vernal pool envelope (100 feet from pool) undeveloped?
Yes ✓ No_____

(2) Is at least 50% of the critical terrestrial habitat (100-750 feet) undeveloped?
Yes ✓ No_____

NOTE: For these purposes, "undeveloped" means open land largely free of roads, structures, and other infrastructure. It can be forested, partially forested, or open agricultural land.

Cumulative Assessment

Number of questions answered YES in category A	Number of questions answered YES in category B	Tier Rating
(1-3)	(2)	(Tier I)
1-3	1	Tier II
0	1-2	Tier III
1-3	0	Tier III

CAUTION! *This rating system is designed strictly as a planning tool, not as an official assessment tool.* It will enable you to determine the relative ecological value of pools within your community. A Tier I rating—which will most likely apply to only a minority of sites—denotes exemplary pools; Management Recommendations should be applied at these sites. For pools rated as Tier II, proceed with care; you need more information! Tier II pools will probably constitute the majority of your vernal pool resources; Management Recommendations should be applied at these sites to the maximum extent practicable. Tier II pools might also be likely candidates for restoration efforts (e.g., reforestation of the critical terrestrial habitat).

Appendix C
Rare Salamander Habitat Assessment and Field Survey Report

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Blue-spotted Salamander and Marbled Salamander: Habitat Assessment and Field Survey Report

Bloomfield - Windsor Upgrades Project

Proposed Modifications To:
1777/1779 Transmission Line Upgrades Between Bloomfield Substation and Bloomfield Junction; and,
1751/1777 Transmission Line upgrades between Bloomfield Junction and North Bloomfield Substation

Prepared for:
The Connecticut Light and Power Company doing business as Eversource Energy
107 Selden Street
Berlin, CT 06037

Prepared by:
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Prepared In Support of:
Connecticut Siting Council (CSC) Declaratory Ruling on
Petition No. 1217: Condition 1.G

Contents

List of Appendices

1.0 Introduction

The Connecticut Light and Power Company, doing business as Eversource Energy (Eversource), proposes to upgrade the following 115-kilovolt (kV) transmission lines in the Town of Bloomfield: the 1777/1779 lines between Bloomfield Substation and Bloomfield Junction and the 1751/1777 lines between Bloomfield Junction and North Bloomfield Substation. These transmission line modifications, along with upgrades to certain substations located in Bloomfield and the Town of Windsor, are referred to as the Bloomfield-Windsor Upgrades Project (Project).[1]

On March 8, 2016, Eversource submitted to the Connecticut Siting Council (CSC) a Petition for a Declaratory Ruling, requesting that the CSC determine that a Certificate of Environmental Compatibility and Public Need (Certificate) was not required for the Project. The CSC reviewed the Petition (No. 1217) and, on May 3, 2016, ruled that while a Certificate would not be required, Eversource would have to comply with seven Project-specific conditions, including the preparation of a Development and Management (D&M) Plan for Project construction. Condition 1.g of the CSC's ruling requires that Eversource perform a wildlife analysis for the blue-spotted salamander and marbled salamander, identifying protective measures as applicable.

On behalf of Eversource and in accordance with Condition 1.g, AECOM conducted habitat assessments and biological surveys for the two salamander species: blue-spotted salamander (*Ambystoma laterale*) and marbled salamander (*Ambystoma opacum*), along the Project rights-of-way (ROWs). The blue-spotted salamander is listed by the Connecticut Department of Energy and Environmental Protection (CT DEEP) Bureau of Natural Resources as endangered; the marbled salamander is not listed by CT DEEP[2].

The Project consists of overhead electric utility transmission system improvements proposed to bring the electric supply system in northcentral Connecticut into compliance with applicable national and regional reliability standards and criteria. The Project D&M Plans provide additional details regarding the planned 115-kV upgrades.[3]

This report includes a habitat assessment for each of the above-noted salamander species and summarizes the results of field surveys conducted in May and June 2016. The 2016 field surveys were designed and performed to identify potential blue-spotted and marbled salamander habitat, occurrences, and breeding in the Project ROWs and, as appropriate, to

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[1] All proposed Project modifications are located in the Town of Bloomfield, Hartford County, Connecticut, with the exception of proposed upgrades to and 115-kV line interconnection modifications at Rood Avenue Substation, which is located in the Town of Windsor.

[2] State of Connecticut, Department of Energy and Environmental Protection; Bureau of Natural Resources, 2015. *Connecticut's Endangered, Threatened and Special Concern Species, 2015*. .

[3] Two D&M Plans were prepared for the Project: one for the transmission line upgrade work and one for the substation and related line modifications. Habitat for the two salamander species is not present at the substations where Project modifications will be performed. Potential habitat is present along the transmission line ROWs; thus, in this report, references to "the D&M Plan" pertain to the Plan for the transmission line work for the Project, all of which is within Eversource's existing ROWs in the Town of Bloomfield.

define measures to be implemented during Project construction to avoid or minimize impacts to these species.

The 2016 salamander surveys complement the vernal pool investigations that were completed along the Project ROWs during the spring 2015 and 2016 seasons. Additional details concerning the vernal pool investigations are included the *Vernal Pool Habitat Report* (provided as Appendix B to Volume 1 of the D&M Plan). Appendices A-C to this report provide supporting information concerning the salamander surveys.

During the surveys of the Project ROWs, no blue-spotted or marbled salamander egg masses, larvae, or adults were observed. However, as described in this report, because blue-spotted salamander is known to have historically occurred near a portion of the Project area, it is assumed that this (and other amphibian species) could be present. Accordingly, to protect the blue-spotted salamander and other species that inhabit vernal pools, Eversource has identified impact avoidance and minimization measures to be implemented during Project construction. Details regarding these protection measures are included in the D&M Plan and reproduced as Appendix D to this report.

2.0 Habitat Assessment

To identify the potential for state-listed rare species to occur in the vicinity of the Project, Eversource coordinated with the CT DEEP Natural Diversity Data Base (NDDB) Program via both informal and formal consultation processes. As a result of the initial NDDB map review, followed by consultations with CT DEEP, one CT NDDB polygon[4] associated with the blue-spotted salamander was identified in the Town of Bloomfield. The CT NDDB polygon is located in palustrine emergent marsh / palustrine scrub-shrub (PEM/PSS) vegetated wetland habitat within the 1751/1777 transmission line ROW. The 2016 investigations for this species focused on suitable habitat proximate to the identified historic occurrence, as noted by the NDDB polygon.

Because the marbled salamander is not a state-listed rare species, the CT NDDB does not maintain polygon data regarding known occurrences or potential habitat of this species. However, CT DEEP does maintain habitat information about this species. CT DEEP fact sheets regarding both the marbled salamander and blue-spotted salamander are reproduced in Appendix A and can be found at:

- Blue-spotted salamander: http://www.ct.gov/deep/cwp/view.asp?A=2723&Q=568028
- Marbled salamander: http://www.ct.gov/deep/cwp/view.asp?a=2723&q=567724&deepNav_GID=1655

[4] The NDDB polygons (or shaded "blobs") symbolize the general locations of federal- and state-listed rare species locations and communities based on data collected over the years by CT DEEP and others. The polygon mapping is intended as a pre-screening tool. Eversource consulted further with the NDDB to identify the polygon area as potential habitat for the blue-spotted salamander.

Sections 2.1 and 2.2 provide descriptions of the characteristics and habitat of each of these salamander species.

In addition to the CT DEEP NDDB review and consultations, AECOM reviewed published data regarding the natural history and regional distribution of blue-spotted and marbled salamanders in Connecticut. As part of this research, AECOM reviewed information in *Amphibians and Reptiles of Connecticut and Adjacent Regions* by Klemens (1993) and the original record for blue-spotted salamander in Connecticut as reported by Klemens and Dubos (1978) in *SSAR Herpetological Review, Volume 9(2): 61*. The blue-spotted salamander reported by Klemens and Dubos was collected in 1973 north of Adams Road along Griffin Brook in the Town of Bloomfield. Although the 1751/1777 line ROW extends near and crosses Griffin Brook and crosses Adams Road, the exact location of the 1973 collection site is unknown. The published description for the collection site is described as being 500 meters north of Adams Road, along Griffin Brook, and thus was not investigated during the 2016 surveys. However, seasonal pools of standing water were observed in the forested wetland along and at the ROW crossing of Adams Road (refer to D&M Plan mapsheet 20). As a result, AECOM biologists concluded that potentially suitable breeding habitat for the salamander species was present outside of the ROW within the forested portion of Wetland 22A.

2.1 Blue-spotted Salamander

The blue-spotted salamander is a small to medium-sized salamander averaging 4 to 5½ inches in length when mature. Field identification of adult individuals is based on the narrow, rounded snout, slender body, dark blue to black or grayish-black coloration, and bright blue spots or specks on the body and tail. Migration to breeding areas, including woodland ponds, vernal pools, lake margins, swamps and marshes with weak water flows connected to nearby waterbodies, and ditches typically occurs in the early spring (DeGraaf and Rudis 1983, DeGraaf and Yamasaki 2001; and Klemens 1993). The mid-March to late April migration occurs during warm spring rain events, according to Klemens (1993) and DeGraaf and Rudis (1983). Shallow, temporary pools in red maple swamps and marshes connected to nearby waterbodies offer preferred breeding habitat (Klemens 1993; DeGraaf and Rudis 1983).

Eggs are laid singly or in small clusters of 6 to 10 eggs. Eggs are typically attached to aquatic vegetation, twigs and branches under the water, or under the leaf litter on the bottom of the pond. Hatching occurs in 3 to 4 weeks. The larvae typically metamorphose into air-breathing adults in 2 to 3 months and disperse into the surrounding upland forests. Young larvae are brownish in color with yellowish bars of color. Older larvae are brownish with a yellowish strip along the side that may fade with age.

The terrestrial habitat preferred by blue-spotted salamanders is reported to be a northern hardwood/hemlock forest with fallen logs, decaying woody debris on the forest floor, and a deep layer of leaf litter (Klemens 1993; NHESP 2015).

2.2 Marbled Salamander

The marbled salamander is a stout, medium sized mole salamander averaging 3½ to 4½ inches in length. Adult coloration presents a black body with white or light gray banding across the head, back and tail. Adults migrate from mixed deciduous woodlands to suitable breeding areas in the late summer (late August into September-October).

Breeding areas include dry, seasonal vernal ponds in swamps and the dry beds of temporary ponds and streams. Females lay 50-200 small transparent eggs in protected depressions. Eggs are deposited singly in the surface material under moss or leaves in dry, shallow depressions that fill with water in the fall or early winter. Females typically remain curled around the eggs to protect them. Eggs usually hatch in the fall or early winter if submerged. On occasion, hatching occurs in the spring if the depressions are not flooded by rain. Young larvae are blackish, while older larvae exhibit a brown or blackish coloration and a line of light flecks along the sides of the body. Larvae overwinter in the temporary pools and metamorphose into land-dwelling adults in late May and June (DeGraaf and Rudis 1983). The distinctive marbled pattern develops 1 to 2 months after metamorphosis.

3.0 Field Survey Methods

To identify vernal pools, wetland areas along the ROWs were investigated in May of 2015 by AECOM biologists to determine if breeding amphibians, both obligate and facultative, were present. The surveys, which were performed along all Project ROWs, occurred after significant rainfall events in the spring, when evening low temperatures remained in the 40s (Fahrenheit). These weather conditions facilitate inward migration of amphibians to the pools for the purpose of breeding. Biologists conducted visual surveys and used dip nets to sweep the water column to assist in determining the presence or absence of amphibians and other vernal pool species. Based on the 2015 surveys, 15 vernal pools were identified in eight wetland complexes located along the Project ROWs; of the 15 vernal pools two are situated along or near the 1777/1779 line ROW and 13 are located along or near the 1751/1777 line ROW. Project construction will affect only three of these vernal pools directly; specifically, tree clearing and/or tree trimming will be required in vernal pools (VPs) 1779-1, 1751-5 and 1751-13.

Additional surveys to identify salamander egg masses were completed by AECOM biologists on May 4, 2016 along the 1751/1777 line ROW in the vicinity of Adams Road, where the CT DEEP NDDB data indicated blue-spotted salamander habitat. Specifically, dip net sweeps were performed in the seasonal pools of water within the emergent marsh and scrub-shrub portions of Wetlands 22 and 22A within and in the vicinity of the CT NNDB blue-spotted salamander polygon identified at Adams Road.

Additional surveys for blue-spotted salamander larvae were performed on June 13, June 16, and June 30, 2016. The surveys were completed in areas that offered potentially suitable breeding habitat for the blue-spotted salamander larvae within and in proximity to the mapped CT NDDB species polygon. Within the areas surveyed, the field investigations focused on seasonal pools in

the PEM/PSS habitat complexes. Photographs of the wetland community established in the ROW are presented in Appendix B.

AECOM biologists utilized measured sweeps and incidental dip net sweeps in the standing pools of water present at, and/or near four sampling stations established for these surveys. Based on AECOM's review of the historical data, on-site conditions, and previous species observation, three sampling stations were located in the Adams Road vicinity, and one sampling station was located in VP 1751-13, which is located along the ROW approximately 600 feet north of Adams Road. (Refer to Appendix C for a map of the sampling locations.) The survey protocol was adapted from *Protocols for Sampling Aquatic Macroinvertebrates in Freshwater Wetlands* published by the Maine Department of Environmental Protection (DiFranco 2014). The search pattern for the meander transects followed general guidelines in Olson (1997).

Each sampling station was marked with a wooden survey stake and pink flagging tape to aid in future location identification. At each station, a set of measured dip net sweeps were performed along 1 meter transects. Along with the measured sweeps at each station, a dozen or more incidental dip net sweeps were performed in the vicinity of the wooden stake when standing water was present surrounding the stake. In addition to the measured and incidental dip net sweeps, random dip net sweeps in the pools of water in the vicinity of each station were also performed when standing water was present in the vicinity of the stakes.

In addition to the locations within the NDDB polygon, in June 2016, supplemental surveys were performed of the three vernal pool habitat areas that be directly affected by Project construction (i.e., impacts from tree clearing and trimming activities). These areas are VP-1779-1 in Wetland 5, VP-1751-5 in Wetland 8 and VP-1751-13 in Wetland 22/22A. The purpose of these surveys was to compile additional habitat information, and data regarding species using the pools. Dip-net surveys were performed to locate and identify blue-spotted salamander or marbled salamander larvae.

4.0 Field Results

The results of the 2016 blue-spotted salamander and marbled salamander surveys are presented in Sections 4.1 through 4.7, by sampling station and wetland area.

During the 2015 and 2016 surveys, no blue-spotted or marbled salamander egg masses, larvae, or adults were found along the Project ROWs. Additionally, with respect to the known occurrence of the blue-spotted salamander as identified by the NDDB polygon, AECOM biologists determined that potentially suitable breeding pools for this species are absent in the PEM/PSS habitat located along the 1751/1777 line ROW north of Adams Road. In particular, the blue-spotted salamander does not prefer the dense shrub and herbaceous wetland vegetation that characterizes the ROW in this area. Further, only a short hydroperiod (duration of standing water) was documented during field surveys at and in the surrounding PEM/PSS habitat.

The PEM/PSS habitat in the investigation area south of Adams Road is subject to long-term flooding due to the accumulation of debris at the iron grates covering the culverts under Adams Road at Griffin Brook. The restricted flow at the culverts backs up flood waters in the forested portion of Wetland 22 south of Adams Road and into the PEM/PSS habitat in the ROW. Based on site conditions at the time of the surveys, these areas may contain water year-round, and also contained adult green frogs (*Rana clamitans*) and bull frogs (*Rana catesbeiana*), which may predate larval salamanders. The flooded site conditions recorded in the forested wetland community south of Adams Road during the field surveys was photo-documented (refer to Appendix B) to identify potential breeding habitat located outside of the Eversource ROW and the 2016 survey area.

Additional details regarding the composition of the wetland community and duration of the seasonal pools of water at each sampling location is presented in Sections 4.1 to 4.6. Section 4.7 summarizes the characteristics of the off-ROW wetlands near the Adams Road Project area; these observations were made in an attempt to identify potential off-ROW salamander breeding habitat, given that salamanders could potentially migrate to such areas along or across the ROW.

4.1 Station 1 South at Adams Road

Survey Dates: June 13, 16, and 30, 2016

Station 1 South is located approximately 60 feet south of Adams Road, in a PEM/PSS habitat. No amphibian larvae were recorded in the seasonal pool of standing water at or near the sampling station.

Common woody species recorded at the sampling station included white ash (*Fraxinus americana*), silky dogwood (*Cornus amomum*), and swamp rose (*Rosa palustris*). Dominant herbaceous species recorded were common cat-tail (*Typha latifolia*), common reed (*Phragmites australis*), and reed canary-grass (*Phalaris arundinacea*). Associate herbaceous species included tussock sedge (*Carex stricta*), purple loosestrife (*Lythrum salicaria*), bristly sedge (*Carex comosa*), skunk cabbage (*Symplocarpus foetidus*), and manna-grass (*Glyceria* sp.).

Although a diverse invertebrate community was present in the pool of standing water, no amphibian larvae were collected in the measured and incidental dip net sweeps during the sampling surveys. Mature green frogs (*Lithobates clamitans*) were observed in the PEM/PSS wetland; and invertebrate species collected in the dip net sweeps included freshwater snails, pill clams, isopods, backswimmers, dragonfly nymphs, and diving beetles. Although a longer hydroperiod was recorded at Station 1 South, the absence of salamander larvae is likely due to the relatively dense cover of emergent and scrub-shrub wetland vegetation and areas of heavy shading in this area.

During the June 16 survey, a Virginia rail (*Rallus limicola*) was disturbed from her nest at the base of the sampling station wooden stake. The nest was not present in the herbaceous vegetation when the wooden stake was established on June 13. The nest held 9 eggs and was constructed of common cat-tail leaves, wetland grasses, and sedges. After completing the June 16, 2016 dip net sweeps at the sampling station, AECOM biologists left the PEM/PSS habitat, assuring that the

rail nest was not disturbed. However, the rail nest and eggs were not present on June 30 and it appeared the nest and eggs were destroyed by a predator.

Site conditions at the sampling station were photo-documented during the field surveys. Representative site photographs are presented in Appendix B; a map illustrating the sampling sites is included in Appendix C.

4.2 Station 1 North at Adams Road

Survey Dates: June 13, 16, and 30, 2016

Station 1 North is located approximately 60 feet north of Adams Road in a PEM/PSS habitat present within the ROW. Young white ash and speckled alder (*Alnus incana* spp. *rugosa*) specimens are present in the vegetative community, along with common cat-tail, tussock sedge, woolgrass (*Scirpus cyperinus*), purple loosestrife, and marsh fern (*Thelypteris palustris*).

No amphibian larvae were collected in the measured and incidental dip net sweeps performed at the sampling station on June 13, 2016. Standing water 2 to 3 inches deep was present on June 13 and was absent around the sampling station on June 16 and June 30. However, on June 16, incidental dip net sweeps were performed in a nearby shallow pool of water (8-12 inches deep), which was confined to a vehicle rut. A young wood frog tadpole was collected from the shallow pool of water in the vehicle rut. No salamander larvae were collected in either the measured or incidental dip nets sweeps performed on June 13 and June 16 at this station. Invertebrate species collected in the series of dip net sweeps on June 13 and June 16 included freshwater snails, pill clams, scavenger beetles, and a dragon fly nymph.

Based on the dense emergent and scrub-shrub wetland vegetation and short hydroperiod recorded at Station 1 North this season, AECOM biologists concluded that limited suitable amphibian breeding habitat is present in the shallow, seasonal pool of water found in this location. Site conditions at the sampling station were photo-documented during the field surveys.

4.3 Station 2 North at Adams Road

Survey Dates: June 13, 16, and 30, 2016

Station 2 North is located within the Project ROW approximately 175 feet north of Adams Road near structure Structure 3153 (and proposed Structure 3153-1). The vegetative community at this station is comprised of a PEM community with occasional PSS clusters located near the sampling station. Shrubs present at the station include silky dogwood and young white ash specimens. The dominant herbaceous species is tussock sedge, with common cat-tail, sensitive fern, purple loosestrife and marsh fern as associate species. The shallow pool of standing water present at the station during the June 13 sampling event was approximately 3 to 4 inches deep.

No amphibian species were collected in either the measured or the incidental dip nets sweeps conducted on June 13. Invertebrate species collected in the dip net sweeps on June 13, 2016 included freshwater snails, pill clams, and mosquito larvae. No standing water was present at or

near the sampling station during the June 16 or June 30 surveys; therefore, measured and incidental dip net sweeps were not performed.

Based on the dense cover of wetland vegetation and short hydroperiod recorded at the sampling station this season, AECOM biologists concluded that limited suitable amphibian breeding habitat is present in the shallow, seasonal pool of water found in this location. Site conditions at the sampling station were photo-documented during the field surveys.

4.4 Station 3 North at Adams Road / Vernal Pool 1751-13

Survey Dates: June 13, 16, and 30, 2016

Station 3 North is located in Vernal Pool 1751-13 approximately 650 feet north of Adams Road, and is located near existing Structure 1354 and proposed Structure 3154-1. The vegetative community at this station is a mixed PEM/PSS. Sampling Station 3 North is located within the larger PEM/PSS habitat identified as Wetland 22A and is also l within Vernal Pool 1751-13.

The wetland community supports a dense cover of common reed, with common cat-tail, tussock sedge, water-plantain (*Alisma subcordatum*), purple loosestrife, Pennsylvania smartweed (*Persicaria pensylvanica*), and duckweed (*Lemna* sp.) occurring as common herbaceous associate species. Woody shrubs observed included common winterberry (*Ilex verticillata*), buttonbush (*Cephalanthus occidentalis*), and white ash saplings. Standing water was present at the sampling station during the June 13 and June 16 surveys. No standing water was present in the shallow depression at the sampling station on June 30.

Water depth ranged from 8 to 14 inches during the first two sampling events. Water temperature was 56 degrees on June 13 and 60 degrees on June 16. The substrate at the sampling location consists of muck, with limited coarse organic debris noted on the floor of the vernal pool.

Amphibian breeding activity was confirmed in Vernal Pool 1751-13 during the early June visits. Amphibian species observed included wood frog tadpoles, spring peeper tadpoles, and adult green frogs. Invertebrate species collected in the dip net sweeps were tabulated and a general abundance figure was assigned to each invertebrate species. Common invertebrate species collected in the measured and incidental dip net sweeps included freshwater snails, pill clams, and caddisfly larvae.

No salamander larvae were collected in the measured and incidental dip nets sweeps performed on June 13 and June 16. Based on the presence of a dense vegetative cover in the seasonal pool and the shorter hydroperiod, the preferred breeding habitat for the blue-spotted salamander is absent in this location. No marbled salamander larvae were collected in the dip net sweeps and the field surveys did not identify preferred breeding habitat for the marbled salamander at this location.

Potentially higher quality amphibian breeding habitat was observed in the forested wetland located to the east of the ROW; in this location, standing water in Vernal Pool 1751-13 extends

outside the Eversource ROW onto private property. As a result this area was not investigated further.

Canopy species observed in the adjacent forested wetland included red maple (*Acer rubrum*) and white ash, with common winterberry as a common understory shrub. Herbaceous associates included tussock sedge, royal fern (*Osmunda regalis*), and sensitive fern (*Onoclea sensibilis*). Fallen branches and limbs contributed to the presence of coarse organic debris that could be seen in the pool from the edge of the ROW. No standing water was present in the adjacent forested wetland on June 30.

Site conditions at the sampling station were photo-documented during the field surveys. Representative site photographs are presented in Appendix B.

4.5 Vernal Pool VP-1779-1

Vernal Pool 1779-1 is a small, shallow depression (approximately 40 x 100 feet) located southwest of Structure 3115-1 in Wetland W5 at Bloomfield Junction. Standing water was not present in the shallow depression during the June 16, 2016 site investigation, but the limits of the seasonal pool of water confined within the shallow depression were defined by the presence of water-stained leaves. Given the lack of standing water, it is unlikely that this area would be used by blue-spotted salamanders for successful breeding.

Red maple and American elm (*Ulmus americana*) are the dominant canopy species in the forest community. Common winterberry was a dominant shrub in the understory, with multiflora rose (*Rosa multiflora*) and ironwood (*Carpinus caroliniana*) as associate species. Common vines were poison ivy (*Toxicodendron radicans*) and Virginia creeper (*Parthenocissus quinquefolia*). Sensitive fern (*Onoclea sensibilis*), awned-sedge (*Carex crinita*), and jewelweed (*Impatiens capensis*) were the common to dominant species in the herbaceous layer, with bladder sedge (*Carex intumescens*) and manna-grass (*Glyceria* sp.) present to a lesser extent. Coarse woody debris was present along the edge of the maintained portion of the ROW.

4.6 Vernal Pool 1751-5

Vernal Pool 1751-5 is located in the ROW in the northwestern section of Wetland W8 approximately 400 feet west of Structure 3119-1. Standing water was approximately 10-14 inches deep during the June 16, 2016 site investigation. A floating mat of vegetation limited the extent of the open water within the vernal pool. Herbaceous species recorded along the margin of the pool included tussock-sedge, sallow sedge (*Carex lurida*), woolgrass (*Scirpus cyperinus*), spreading bulrush (*Scirpus expansus*), manna-grass, purple loosestrife (*Lythrum salicaria*), skunk cabbage, and common arrowhead (*Sagittaria latifolia*). Shrub species observed bordering the pool included swamp azalea (*Rhododendron viscosum*), common winterberry, maleberry (*Lyonia ligustrina*), and speckled alder (*Alnus incana* ssp*. rugosa*). Wild grape (*Vitis labrusca*) was present in the shrub border, and the pool substrate was mucky with limited coarse woody debris.

Dip nets of the vernal pool habitat performed on June 16, 2016 resulted in the collection of wood frog and American toad tadpoles. Invertebrate species collected during the dip net surveys included dragonfly nymphs, scavenger beetles, pill clams, and freshwater snails.

4.7 Investigation of PFO Wetland near Adams Road (Outside of ROW)

Photographs of the site conditions in the PFO habitat located south of Adams Road, within Wetland 22 but outside the 1751/1777 line ROW, were taken from Adams Road during the spring 2016 surveys. The flooded conditions recorded in the PFO habitat (and PEM/PSS habitat in the ROW) in this area are likely due to the obstruction of the iron grates/trash racks located at the Griffin Brook, which has very poorly defined upstream banks in this area, but generally flows south through culverts beneath Adams Road. AECOM anticipates that the high water level observed in the PFO habitat will drop once vegetative debris is removed from the iron grates and the natural stream flow is restored through the culverts.

The PFO wetland north of Adams Road and west of the ROW was also photo-documented and assessed based on observations from Adams Road. . Representative photographs of this wetland are included in Appendix B.

Dip net surveys of this habitat were not performed during the 2016 surveys due to the habitat being located outside of the existing Eversource ROW. Based on the conditions observed in this location during the 2016 surveys, it is possible that this off-ROW area would provide suitable breeding habitat for blue-spotted salamanders.

5.0 Summary

As described below, no evidence of blue-spotted salamanders or marbled salamanders was found during field investigations conducted along the Project ROWs in 2015 or 2016. The vernal pools located on the ROWs do not appear to provide suitable habitat for salamander breeding. However, it is possible that habitat may exist in nearby off-ROW areas and that migrating salamanders could potentially be found on the ROWs. Eversource's vernal pool and rare species impact minimization and protection strategies, as well as best management practices, will serve to avoid potential adverse effects to salamanders, in the event that these species are encountered during construction. Appendix D includes details regarding these protocols, which are included in Volume 3 of the D&M Plan.

5.1 Blue-spotted Salamander

Based on the results of the 2016 surveys performed for blue-spotted salamander, AECOM biologists have concluded that preferred blue-spotted salamander breeding habitat is not present in the seasonal pools of water confined in the PEM/PSS habitat along the 1751/1777 line ROW within Wetlands 22 and 22A, which contains VP-1751-13, near the previously mapped CT NDDB polygon; or likely within the two additional vernal pools (VP-1779-1 and VP-1751-5) investigated in mid-June. The dense cover of emergent and scrub-shrub wetland vegetation in the ROW and short hydroperiod observed during the field surveys appears to limit the suitability of the seasonal

pools as breeding habitat for blue-spotted salamanders. In addition, the terrestrial forest habitat preferred by mature blue-spotted salamanders is not present in the transmission line corridor, although suitable forested habitat may be located outside of the existing ROW.

Similarly, the seasonal pools of water located along the 1751/1777 line ROW north of Adams Road provide limited suitable breeding habitat for blue-spotted salamanders due to the dense vegetative cover and short hydroperiod recorded in the pools during the June surveys. Although the seasonal pool of water investigated in the vegetated wetland south of Adams Road had standing water that could be used for egg deposition and development of blue-spotted salamander larvae, no blue-spotted salamander eggs or larvae were collected during the series of dip net sweeps performed in the seasonal pools.

AECOM biologists did not encounter any blue-spotted salamander adults, larvae, or eggs during vernal pool surveys performed along the ROWs in 2015 or in the 2016 surveys, which targeted areas identified by the CT DEEP NDDB. In general, vernal pools identified along the Project ROWs appear to have hydrologic conditions that are not preferred by blue-spotted salamanders (too shallow and too short of a hydroperiod). Within the existing ROWs, the physical characteristics of the existing PEM/PSS wetlands and the short hydroperiod observed in 2016 are not likely conducive to successful breeding of blue-spotted salamanders.

5.2 Marbled Salamander

Suitable breeding habitat for marbled salamander was not found in the vegetated wetlands investigated in the transmission line ROW near Adams Road or in VP-1779-1 and VP-1751-5. The lack of suitable habitat may be attributable to the short hydroperiod and the moderately dense cover of emergent and scrub-shrub vegetation in the seasonal pools within Wetlands 22 and 22A. The deciduous woodland habitat (oak-maple and oak-hickory forest) preferred by the terrestrial form of the marbled salamanders also appeared to be absent within the existing ROW surveyed in 2016, but may exist outside of the ROW.

5.3 Impact Avoidance / Minimization: Best Management Practices

Although no suitable salamander breeding habitat was found along the Project ROWs, seasonal pools offering potentially suitable breeding habitat may be present in the forested and wooded swamp habitat located within Wetlands 22 and 22A west of the 1751/1777 line ROW in the Adams Road vicinity. As such, installation of soil erosion and sedimentation (E&S) controls following Eversource's Best Management Practices (BMPs) is recommended to avoid or minimize sediment deposition into seasonal pools located outside the construction area. In addition, for construction activities near vernal pools along the Project ROWs, Eversource will require its contractors to implement vernal pool protection measures, including the use of BMPs designed to isolate migrating vernal pool species from active work zones. Syncopated silt fencing and other protection measures will also be installed as indicated on the Volume 3 D&M Plan maps. A summary of avoidance and protection measures is also provided in Appendix D of this report.

During construction, the E&S controls, vernal pool protection measures, and other BMPs will be monitored. These measures will be maintained and will remain in place until construction is completed in the vicinity of vernal pools. .

In addition, Eversource plans to conduct tree clearing/trimming and to install access roads and construction pads outside of the March – April breeding season for most vernal pool species, including blue-spotted salamanders. As presently scheduled, tree clearing, access road, and work pad construction near the vernal pools described in this report will be performed during the fall of 2016 and winter of 2016/2017. Tree clearing and constriction activities between Bloomfield Substation and Bloomfield Junction are proposed in the fall 2016. Tree clearing and constriction activities between North Bloomfield Substation and Duncaster Road, which includes the Project ROW near VP-1751-13 and the nearby NDDB blue-spotted salamander polygon area, are proposed in the Winter 2016/2017.

All tree clearing/trimming activities within the three vernal pools that will be directly impacted by Project construction will be completed by hand to minimize impacts. No access roads or work pads will be installed in vernal pools.

Access roads and work pads will be required near vernal pools. However, after access roads and construction pads are installed, all construction vehicles and activities will occur within the defined roads or work pad surfaces and BMPs will be installed as appropriate to site-specific conditions to minimize the potential for impacts to vernal pool species, including salamanders that could potentially migrate near construction sites.

Overall, given the current Project schedule and proposed BMPs and impact avoidance/minimization protocols, Project impacts to vernal pools and salamander habitat are likely to be minimal.

6.0 References

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Appendix A

CT DEEP Fact Sheets for Blue-Spotted and Marbled Salamanders

WILDLIFE IN CONNECTICUT

STATE-LISTED SPECIES

Blue-Spotted Salamander

Ambystoma laterale

Background

The blue-spotted salamander is a striking member of the "mole" salamander family (Ambystomatidae). Connecticut is home to the pure diploid and hybridized complex blue-spotted salamander. The pure, naturally diploid blue-spotted salamander is an endangered species in Connecticut. It occurs in isolated areas where individuals do not have the chance to mate with the Jefferson salamander – a similar-looking member of the mole salamander family.

The "complex" blue-spotted salamander is hybridized with the Jefferson salamander, resulting in an array of genetically variable individuals. It is a Connecticut species of special concern. Strict habitat management is needed to sustain both pure and complex blue-spotted salamander populations.

Range

Blue-spotted salamanders occur in the Canadian Maritime Provinces to northern New Jersey and from southeastern Quebec to northern Illinois and Indiana. Disjunct populations have been found on Long Island, New York.

In Connecticut, hybrids typically occur west of the Connecticut River due to overlapping populations with the Jefferson salamander. Pure diploid populations are isolated to a few locations near the Quinebaug Valley.

Description

This small to medium-sized salamander has a narrow head and dark black body with bright blue flecks. The long, laterally compressed tail makes up nearly half of the total body length, which ranges between to 5 inches. Hybrids, however, may reach longer lengths.

The blue-spotted salamander can be distinguished from the similar-looking young Jefferson salamander by its more narrow head and larger spots. At the larval stage, blue-spotteds appear nearly identical to Jeffersons. Complex hybrids can have a wider range of marks, including more gray coloration, paler blue flecks, and a wider snout, which is associated more with the Jefferson salamander.

Habitat and Diet

Typical habitat consists of red maple swamps with nearby woodlands. The soil types hosting these amphibians vary from water-saturated loam to damp sand. Breeding areas include swamps and marshes with weak water flow that are often connected to other waterbodies. Temporary pools (also known as vernal pools) and floodplains with plentiful organic debris also comprise the breeding grounds for blue-spotted salamanders.

This salamander feeds on insects, slugs, worms, and other small invertebrates.

Life History

Breeding occurs in early spring. When the first warm rains arrive on a spring night, blue-spotted salamanders migrate in large numbers to temporary woodland breeding pools. Eggs are deposited singly or sometimes in clusters underneath leaves or at the base of tussocks, usually in a scattered pattern. After the eggs hatch, the larvae remain in the pool until metamorphosis occurs. Newly transformed salamanders will emerge from the wetland and disperse into the surrounding forest.

Pure diploid populations occur in an even male-female ratio. However, complex populations are female dominated.

Interesting Facts

Blue-spotted salamanders spend most of the year underground, usually beneath leaf litter.

Courtship behaviors included rubbing, nudging, and an impressive "tail-fanning" procedure.

In predatory defense, adults will curl and "lash out" with their tail, which is covered in granular glands that secrete a noxious substance.

Conservation Concerns

Blue-spotted salamanders are protected by the Connecticut Threatened and Endangered Species Act, and may not be collected or removed from the wild.

Populations are threatened by habitat loss and fragmentation, and increased urbanization. Certain populations of this salamander are being impacted by a high number of roadkills during the spring breeding season when these animals migrate in large numbers to their temporary breeding pools. Where appropriate, measures to minimize roadkills should be taken, especially where new development is planned near breeding pools. Such measures may include enlarging buffer zones around breeding pools, providing tunnels or culverts for salamanders to cross under roads, and locating new roads away from salamander migration routes.

Change in the salinity content of breeding pools, through acid rain or runoff from road salts, can affect larvae and newly transformed salamanders.

What You Can Do

Aquatic breeding pools are crucial to many amphibians, including salamanders. Managing temporary pools, as well as buffer zones in the surrounding forest, is extremely important for conserving the amphibians dependent on these habitats.

Avoid the use of fertilizers, herbicides, and insecticides in your yard. If you need to use these products, purchase ones that are natural and organic.

Salamanders should never be collected from the wild. Awareness and education of the blue-spotted salamander's life history and habitats are invaluable tools for conserving this animal. Additional information about salamanders is available on the DEEP website at www.ct.gov/deep/salamanders. If you locate a blue-spotted salamander population or temporary breeding pool, please contact the DEEP Wildlife Division at 860-424-3011 or deep.ctwildlife@ct.gov.

State of Connecticut
Department of Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division
www.ct.gov/deep/wildlife

Amphibians and Reptiles of Connecticut and Adjacent Regions, by Michael W. Klemens (1993), was used as reference for this fact sheet.

6/2015

Connecticut Department of Energy & Environmental Protection

MARBLED SALAMANDER

Ambystoma opacum

Background and Range: The marbled salamander is in the family Abystomatidae, which includes the large, stout-bodied mole salamanders. These salamanders are widely distributed in Connecticut but absent from high elevations (above 1,100 feet). They are locally common on the trap rock ridges of the Central Connecticut Lowland. This southern species reaches its northeastern range limit in Massachusetts and the mid-Hudson Valley of New York. It ranges over much of the eastern United States, but is absent from many areas.

Description: This chunky and compact salamander ranges in length from approximately 3 to 4.75 inches (70-120mm). The tail is stubby, and not as well developed as the other mole salamanders. The marbled salamander is one of Connecticut's more distinctively marked salamanders: males have bright white bands on a black body, while females have grayish-white bands on black. The underside is black. Females are larger than males. Newly transformed young have purplish-gray marbling, which will transform with age. Larvae range from dark gray or black and have light spots of bands on the sides. Larvae have external gills which help distinguish them from frog tadpoles.

Habitat and Diet: Marbled salamanders are found in or around deciduous woodlands. However, water or moist areas are usually close by. These salamanders prefer dry, sandy-soiled habitats and even rocky slopes, but they also may be found in wet, swampy soils. They usually hide under rocks and logs on wooded slopes.

Marbled salamanders feed on worms, slugs, snails, spiders, millipedes, crickets, beetles, ants, and other invertebrates. The larger larval marbled salamanders feed on spotted salamander larvae and wood frog tadpoles, as well as zooplankton.

Life History: Marbled salamanders emerge from their underground homes in early fall to migrate to their breeding grounds. This is opposite from other mole salamanders that breed during early spring. The marbled salamander is the only member of the Ambystomatidae family to breed on land and not in the water. Males typically precede females to a dried-up site that will fill with water after a big rain. Once there, they deposit packets of sperm (technically known as spermatophores). When the females arrive to the breeding grounds, they deposit between 30 to

over 200 eggs underneath moist vegetation or debris. The duration of the larval cycle is dependent on weather and habitat type; it often is timed with the autumn filling of dried temporary pools. Females may remain with the eggs, brooding them until the pools fill with water. Typically, marbled salamander larvae have transformed and are ready to emerge from the wetlands by the time spotted salamanders begin their reproductive cycles in the spring.

Adults hibernate underground during winter in areas not too far from breeding sites. Adults will also avoid high summer heat by aestivating.

Interesting Facts: These salamanders move primarily at night to decrease competition with other species and avoid predation risks. Recently transformed young will wait for a rainy night before migrating away from the breeding site.

A noxious substance that deters many would-be predators is secreted from the skin of the marbled salamander.

Conservation Concerns: Marbled salamanders prefer undisturbed habitats and are less tolerant of areas with human presence and development. Often, buffered protection of seasonal, temporary pools will provide refuge for marbled salamanders and other species that rely on these pools. This protection is important because terrestrial ranges are usually close to breeding sites.

What You Can Do: If you find a marbled salamander in the wild, leave it where you found it and only take photographs. Every individual is vitally important to its local population.
Consider proper habitat management practices if your property contains successful vernal pools where marbled salamanders breed. The Vernal Pool Association website, at www.vernalpool.org, is a good place to start your research.

Urge your town to install amphibian tunnels at migration hotspots that overlap roads. If you are fortunate enough to witness a mass spring migration, you can help move salamanders from one side of the road to the other, as long as it is completely safe to do so. This can be done with gloves and small buckets as to not stress the salamanders or be exposed to any secretions. Spread the word about salamanders! Knowledge is often the best tool for conserving these important amphibians.

Additional information about salamanders is available on the Salamanders of Connecticut webpage.

Content last updated on July 2, 2015.

Appendix B

Photographic Log

PHOTOGRAPHIC LOG

Client: Eversource Energy	**Location:** Town of Bloomfield, Connecticut	**Project No.** 60427611

Photo No.	**Date:**
1	6-13-16

Direction Photo Taken:

View Northeast at Station 1-South in Wetland 22 near Adams Road

Description:

View to the northeast in the PEM/PSS at Station 1 South at Adams Road.

Preferred breeding habitat for blue-spotted salamanders does not appear to occur in the dense PEM/PSS in this section of the ROW.

PHOTOGRAPHIC LOG

Client: Eversource Energy	**Location:** Town of Bloomfield, Connecticut	**Project No**. 60427611

Photo No.	**Date:**
2	6-16-16

Direction Photo Taken:

View west near Station 1 South in Wetland 22 in the ROW near Adams Road

Description:

View of the PEM/PSS habitat south of Adams Road.

Preferred breeding habitat for blue-spotted salamanders does not appear to occur in the PEM/PSS in this section of the ROW.

PHOTOGRAPHIC LOG

Client: Eversource Energy	**Location:** Town of Bloomfield, Connecticut	**Project No**. 60427611

Photo No. 3	**Date:** 6-13-16

Direction Photo Taken:

View north at Station 1 North in Wetland 22A near Adams Road

Description:

View of the PEM/PSS at Station 1 North.

Preferred breeding habitat for blue-spotted salamanders does not appear to occur in the dense PEM/PSS in this section of the ROW.

PHOTOGRAPHIC LOG

Client: Eversource Energy	**Location:** Town of Bloomfield, Connecticut	**Project No.** 60427611

Photo No. 4	**Date:** 6-13-16

Direction Photo Taken:

View north at Station 2 North in Wetland 22A near STR 3153

Description:

View of the PEM/PSS at Station 2 North near STR 3153.

Amphibian breeding habitat is absent in the PEM/PSS in this area of the ROW due to the short hydroperiod.

PHOTOGRAPHIC LOG

Client: Eversource Energy	**Location:** Town of Bloomfield, Connecticut	**Project No**. 60427611

Photo No.	**Date:**
5	6-13-16

Direction Photo Taken:

View north from the service road near STR 3153 in Wetland 22A

Description:

General view of the vegetative cover in the ROW near STR 3153 in the vicinity of Station 2 North.

Preferred breeding habitat for blue-spotted salamanders does not occur in the PEM/PSS habitat at STR 3153.

PHOTOGRAPHIC LOG

Client: Eversource Energy	**Location:** Town of Bloomfield, Connecticut	**Project No**. 60427611

Photo No.	**Date:**
6	6-16-16

Direction Photo Taken:

View East from the ROW at Station 3 North in Wetland 22A

Description:

General view of the PEM/PSS in the ROW at Station 3 North.

Preferred breeding habitat for blue-spotted salamanders does not occur in the PEM/PSS habitat at the station.

PHOTOGRAPHIC LOG

Client: Eversource Energy	**Location:** Town of Bloomfield, Connecticut	**Project No.** 60427611

Photo No.	**Date:**
7	6-16-16

Direction Photo Taken:

View south from Adams Road in Wetland 22

Description:

General view of the forested wetland south of Adams Road and west of the ROW.

Preferred breeding habitat for blue-spotted salamanders may occur in the forested wetland if isolated pools occur. Surveys were not performed outside the ROW corridor.

PHOTOGRAPHIC LOG

Client: Eversource Energy	**Location:** Town of Bloomfield, Connecticut	**Project No.** 60427611

Photo No.	**Date:**
8	6-16-16

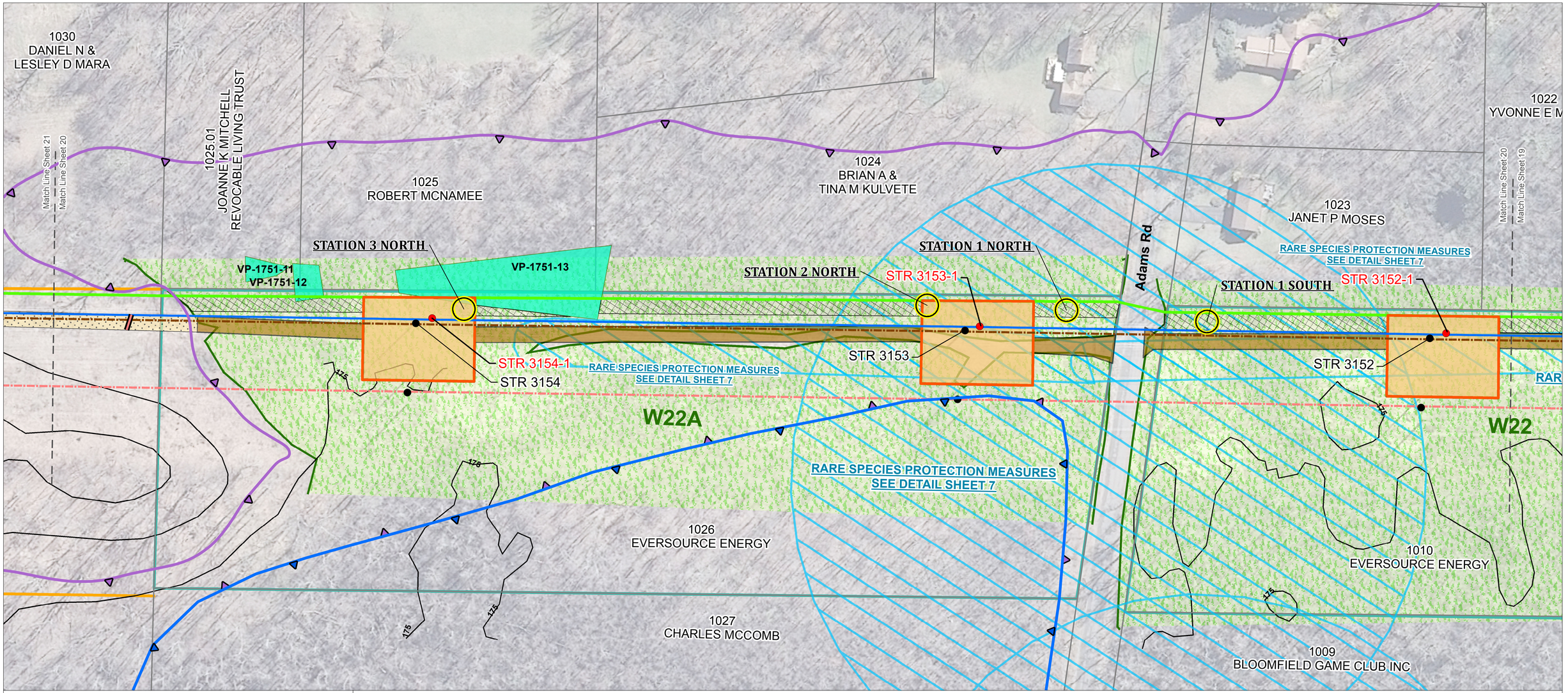
Direction Photo Taken:

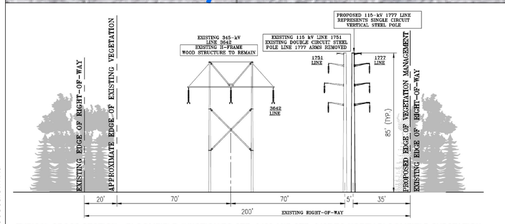
View north from Adams Road in Wetland 22A

Description:

View of PFO wetland community located near Griffin Brook, north of Adams Road.

Appendix C
Map of Sampling Locations in Proximity to NDDB Polygon





TYPICAL CROSS SECTION – BLOOMFIELD JUNCTION TO STR. 3126 AND STR. 3137 TO NORTH BLOOMFIELD SUBSTATION
SEE ACCOMPANYING CROSS SECTION XS-2 FOR DETAILED TYPICAL VIEW (EXISTING AND PROPOSED)

Notes: Wetlands and Watercourses identified in Spring 2015. Work in and adjacent to wetlands, watercourses and vernal pools to be conducted in accordance with Eversource Best Management Practices (BMPs) and CT DEEP 2002 CT Guidelines for Soil Erosion and Sediment Control. See the accompanying Detail Sheets.

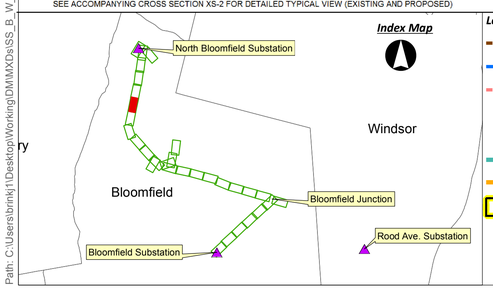
CT Natural Diversity Data Base (NDDB) Area species data provided through Eversource/CT NDDB data sharing agreement. Work will be conducted in accordance with Eversource BMPs and will account for NDDB species considerations. Construction activities will be monitored in accordance with NDDB BMPs, as per the accompanying Detail Sheets.

Stumps of cleared trees will be ground down or removed from yards. Yard and wetland areas will be restored at project completion. Timber mats will be used in wetland areas and in CT deep flood storage areas, as depicted herein. Timber mat use may be field adjusted to overlap with wetland boundaries. Proposed roads and construction pads in FEMA flood zones (outside of wetlands) to be gravel or timber mats. If gravel is used in these areas, approximately 6 inches of topsoil will be removed and temporarily stockpiled outside of flood control areas to avoid flood storage capacity decreases. Existing gravel roadways improvements may be required.

See Detail Sheets and accompanying materials for additional information regarding BMPs, resource areas, constructability considerations, and enlarged cross sectional views. Proposed access to be reviewed with property owners.

Limits of disturbance may extend beyond depicted work areas in upland locations. Sedimentation and erosion (S&E) controls, BMPs and exclusionary fencing to be field verified and installed as necessary. Depicted locations are approximate and may vary based on need and in-field conditions.

STR #	DESCRIPTION	HEIGHT (FT)	FINISH	FOUNDATION
3152-1	Single Circuit Steel Monopole	84	Weathering Steel	Direct Embed
3153-1	Single Circuit Steel Monopole	88.5	Weathering Steel	Direct Embed
3154-1	Single Circuit Steel Monopole	79	Weathering Steel	Direct Embed



Legend:

- 1751/1777 Line - Existing
- 1777 Line - Proposed
- 3642 Line - Existing
- Existing Structure
- Proposed Structure
- Eversource Property
- Eversource Right of Way
- Salamander Station Location
- Parcel Boundary (with ID and owner name ex. 909 Jon Kush)
- Perennial Stream (e.g. PS-1, PS-2)
- Perennial Stream
- Wetland Delineation
- Wetland (e.g. W1, W2)
- Vernal Pool (VP)
- CT NDDB Area
- Proposed Vegetation Removal Limits
- Highly Erodible Soils (SSURGO USDA)
- Existing Access Road
- Proposed Access Road-Gravel
- Proposed Temporary Access Road Construction Mats
- Proposed Gravel Pad
- Proposed Timber Mat Pad
- Proposed Timber Mat Pad- Install As necessary for tree trimming/clearing
- FEMA 100-Year Flood Zone
- FEMA Floodway
- Exclusion Fencing (See Detail Sheet BMPs)
- Silt Fence
- Water Bars
- Vehicle Tracking Pad Location
- Existing Culvert
- Stream Flow Direction

BLOOMFIELD-WINDSOR UPGRADES PROJECT

1751/1777 TRANSMISSION LINE UPGRADES BETWEEN BLOOMFIELD JUNCTION AND NORTH BLOOMFIELD SUBSTATION BLOOMFIELD, CT

Linear Units: Foot US
Datum: North American 1983
Projection: Lambert Conformal Conic
Coordinate System: NAD 1983 StatePlane
Connecticut FIPS 0600 Feet
Datalayers and Imagery: USGS Earth Explorer, CT DEEP GIS, UCONN MAGIC, UCONN CLEAR, Google Earth Imagery, Eversource. NRCS Soils

Scale in Feet
0 50 100

Revised: 8/12/2016

EVERSOURCE

AECOM

Path: C:\Users\brinkj1\Desktop\Working\DM\MXDs\SS_B_W_100scale.mxd

Appendix D

Impact Avoidance and Minimization Measures: D&M Plan Detail Sheet

WETLANDS AVOIDANCE AND MINIMIZATION MEASURES

A. COMPLY WITH RELEVANT PORTIONS OF EVERSOURCE'S BEST MANAGEMENT PRACTICES MANUAL: CONNECTICUT CONSTRUCTION AND MAINTENANCE ENVIRONMENTAL REQUIREMENTS (12/2011). MANUAL CAN BE FOUND IN ATTACHMENT Q.

B. COMPLY WITH THE INVASIVE SPECIES CONTROL MEASURES DURING CONSTRUCTION (REFER TO INVASIVE SPECIES CONTROL PLAN IN ATTACHMENT L).

C. INSTALL EROSION AND SEDIMENTATION CONTROLS AROUND DISTURBED EARTH NEAR WETLANDS TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENTATION. NO CONSTRUCTION ACTIVITIES WILL BE ALLOWED IN WETLANDS OUTSIDE OF THE WORK LIMITS DEFINED IN THE PLAN DRAWINGS.

D. INSPECT AND MAINTAIN EROSION AND SEDIMENTATION CONTROLS THROUGHOUT CONSTRUCTION. SEDIMENT THAT ACCUMULATES BEHIND THESE CONTROLS WILL PERIODICALLY BE REMOVED AND PLACED IN UPLAND AREAS, IN A MANNER THAT WILL PRECLUDE THE POTENTIAL FOR SUBSEQUENT DEPOSITION INTO WATERCOURSES OR OTHER WATERS OF THE U.S., OR WILL OTHERWISE BE DISPOSED OF OFF-SITE.

E. INSTALL TEMPORARY CONSTRUCTION MATTING FOR ACCESS ROADS ACROSS WETLANDS OR TO ESTABLISH SAFE AND STABLE CONSTRUCTION WORK PADS WITHIN WETLANDS.

F. TIMBER MAT COMPLEX AT THE BLOOMFIELD JUNCTION SHALL BE UNDERLAIN WITH FILTER FABRIC.

G. AVOID OR MINIMIZE ACCESS THROUGH WETLANDS, WHERE POSSIBLE. WHERE EXISTING ACCESS ROADS MUST BE IMPROVED OR NEW ROADS DEVELOPED, THE ROADS WILL BE DESIGNED, WHERE PRACTICAL, SO AS NOT TO INTERFERE WITH SURFACE WATER FLOW OR THE WETLAND FUNCTIONS.

H. IMPLEMENT PROCEDURES TO AVOID OR MINIMIZE THE POTENTIAL FOR SPILLS INTO WETLANDS (REFER TO BMPS INCLUDED IN ATTACHMENT Q AND TO THE MATERIALS SUBMITTED TO CT DEEP UNDER SEPARATE COVER: DISCHARGE OF STORMWATER AND DEWATERING WASTEWATERS FROM CONSTRUCTION ACTIVITIES). NO FUEL WILL BE STORED OR EQUIPMENT REFUELED WITHIN 25 FEET OF ANY WETLAND, EXCEPT UNDER THE FOLLOWING CIRCUMSTANCE: EQUIPMENT THAT IS NOT READILY MOBILE OR MUST REMAIN ON-SITE FOR PROLONGED PERIODS TO SAFELY COMPLETE A CONSTRUCTION TASK MAY BE REFUELED IN WETLANDS, PROVIDING PROPER TEMPORARY SPILL PREVENTION, CONTROL, AND CONTAINMENT PROCEDURES ARE FOLLOWED.

I. PROHIBIT VEHICLES OR EQUIPMENT FROM BEING PARKED OVERNIGHT ON ACCESS ROADS OR WORK PADS IN WETLANDS, EXCEPT FOR EQUIPMENT THAT CANNOT BE PRACTICALLY MOVED.

J. REMOVE, FOLLOWING THE COMPLETION OF TRANSMISSION LINE WORK, TIMBER MATS USED FOR WORK PADS AND TEMPORARY ACCESS ROADS IN WETLANDS.

K. RESTORE WETLANDS, AFTER TRANSMISSION LINE WORK IS COMPLETE, TO PRE-CONSTRUCTION CONFIGURATIONS AND CONTOURS TO THE EXTENT PRACTICABLE. REVEGETATE WITH APPROPRIATE WETLAND SEED MIX (WHEN NOT IN CONFLICT WITH RARE SPECIES PROTECTION REQUIREMENTS).

L. INSPECT AND MAINTAIN TEMPORARY EROSION AND SEDIMENTATION CONTROLS UNTIL RESTORATION HAS BEEN DETERMINED TO BE EFFECTIVE.

WETLAND INVASIVE SPECIES BEST MANAGEMENT PRACTICES

TO CONTROL THE SPREAD OF WETLAND INVASIVE PLANT SPECIES, EVERSOURCE WILL REQUIRE CONSTRUCTION CONTRACTORS TO IMPLEMENT THE PROCEDURES DESCRIBED BELOW, AS APPROPRIATE TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED.

A. ALL CONSTRUCTION EQUIPMENT, VEHICLES, AND MATERIALS (E.G., EQUIPMENT MATS) MUST BE CLEANED AND FREE OF EXCESS SOIL, DEBRIS, AND VEGETATION BEFORE BEING MOBILIZED TO THE PROJECT ROW.

B. TO MINIMIZE THE POTENTIAL FOR SPREADING INVASIVE PLANT SPECIES FROM WETLAND TO WETLAND ALONG THE ROW, ANY EQUIPMENT WORKING IN OR TRAVERSING A WETLAND CONTAINING INVASIVE PLANT SPECIES WILL BE CLEANED PRIOR TO RELOCATING TO ANOTHER WORK SITE. CLEANING OF VEHICLES AND OTHER EQUIPMENT (INCLUDING TRACKS AND TIRES) WILL INVOLVE REMOVAL OF VISIBLE DIRT, DEBRIS, AND VEGETATION USING BROOMS, SHOVELS, AND COMPRESSED AIR.

C. SWAMP MATS OR EQUIVALENT WILL BE USED AT WETLAND CROSSINGS SO CONSTRUCTION VEHICLES THAT FREQUENTLY TRAVEL ALONG ON-ROW ACCESS ROADS, SUCH AS PICKUPS CARRYING PERSONNEL OR MATERIAL DELIVERY TRUCKS, CAN AVOID DIRECT WETLAND INTERACTION.

D. MATS USED IN WETLANDS CONTAINING INVASIVE SPECIES WILL BE CLEANED PRIOR TO RELOCATING TO OTHER WORK AREAS OR WETLANDS. CLEANING OF MATS WILL INVOLVE DROPPING MATS ONE ON TOP OF THE ANOTHER TO SHAKE LOOSE ANY SEDIMENT AND DEBRIS. THE MATTING WILL THEN BE SWEPT TO REMOVE LOOSE SOIL AND PLANT MATERIAL.

E. CONSTRUCTION EQUIPMENT WILL REMAIN WITHIN THE APPROVED WORK AREA LIMITS AS DEFINED ON THE PROJECT PLANS.

F. FINAL RESTORATION OF THE ROW WILL BE PERFORMED IN ACCORDANCE WITH THE BMP MANUAL.

WATERBODIES AVOIDANCE AND MINIMIZATION MEASURES

A. COMPLY WITH RELEVANT PORTIONS OF EVERSOURCE'S BEST MANAGEMENT PRACTICES MANUAL: CONNECTICUT CONSTRUCTION AND MAINTENANCE ENVIRONMENTAL REQUIREMENTS (REFER TO ATTACHMENT Q).

B. INSTALL AND MAINTAIN TEMPORARY EROSION AND SEDIMENTATION CONTROLS ALONG THE ROW WHERE CONSTRUCTION ACTIVITIES DISTURB SOILS NEAR WATERCOURSES. THESE CONTROLS WILL BE INSTALLED AND MAINTAINED TO PREVENT SEDIMENTATION INTO WATER RESOURCES. SEDIMENT THAT ACCUMULATES BEHIND THESE CONTROLS WILL PERIODICALLY BE REMOVED AND PLACED IN UPLAND AREAS, IN A MANNER THAT WILL PRECLUDE THE POTENTIAL FOR SUBSEQUENT DEPOSITION INTO WATERCOURSES OR OTHER WATERS OF THE U.S., OR WILL OTHERWISE BE DISPOSED OF OFF-SITE.

C. NO UNCONFINED IN-STREAM ACTIVITIES ARE PROPOSED OR AUTHORIZED. EXISTING ACCESS ROAD CROSSINGS OF WATERCOURSES, WHICH MAY BE RE-ESTABLISHED DURING THE PROJECT, WILL NOT BE CONSTRUCTED DURING CONDITIONS OF PEAK FLOWS OR BANK-FULL CONDITIONS. ONLY CLEAN MATERIALS WILL BE USED (E.G., CLEAN RIPRAP, GRAVEL, STONE OR EQUIVALENT).

D. MAJOR CONSTRUCTION EQUIPMENT WILL BE PROHIBITED FROM FORDING STREAMS.

E. ACCESS ROADS ACROSS WATERCOURSES WILL BE INSTALLED, WHERE PRACTICABLE, SO AS TO AVOID OR MINIMIZE DIRECT ADVERSE IMPACTS TO STREAM BANKS AND STREAM BOTTOM SEDI- MENTS, AND TO PROVIDE UNOBSTRUCTED AMBIENT FLOW IN PERENNIAL STREAMS (E.G., SPAN CROSSINGS WILL PROVIDE ADEQUATE CLEARANCE ABOVE WATERCOURSES TO CONVEY FLOWS).

F. WHERE TEMPORARY CONSTRUCTION WORK PADS MUST BE CONSTRUCTED OVER WATERCOURSES, WORK PAD DESIGN WILL INCORPORATE MEASURES DESIGNED TO MAINTAIN FLOWS AND MINIMIZE AQUATIC HABITAT DISTURBANCE DURING THE CONSTRUCTION PERIOD.

G. MAT SPANS OR EQUIVALENT ACCESS ACROSS WATERCOURSES WILL BE PERIODICALLY SWEPT, AS APPROPRIATE, TO MINIMIZE THE POTENTIAL FOR SOIL DEPOSITION INTO WATERCOURSES AS A RESULT OF VEHICLE/EQUIPMENT MOVEMENTS.

H. TIMBER MAT COMPLEX AT BLOOMFIELD JUNCTION TO BE UNDERLAIN WITH FILTER FABRIC.

I. EXISTING RIPARIAN VEGETATION ALONG THE ROW WITHIN 25 FEET OF WATERCOURSE BANKS WILL BE MAINTAINED, TO THE EXTENT PRACTICABLE AND CONSISTENT WITH ROW VEGETATION MANAGEMENT REQUIREMENTS.

J. EXCEPT FOR EQUIPMENT THAT IS NOT READILY MOBILE OR MUST REMAIN ON-SITE FOR PROLONGED PERIODS TO SAFELY COMPLETE A CONSTRUCTION TASK, CONSTRUCTION VEHICLES AND EQUIPMENT WILL NOT BE REFUELED WITHIN 25 FEET OF A WATERCOURSE. FOR REFUELING THAT MUST BE PERFORMED LESS THAN 25FEET FROM A WATERCOURSE, APPROPRIATE SPILL PREVENTION MEASURES. (REFER TO BMPS INCLUDED IN ATTACHMENT Q AND TO THE MATERIALS SUBMITTED TO CT DEEP UNDER SEPARATE COVER: DISCHARGE OF STORMWATER AND DEWATERING WASTEWATERS FROM CONSTRUCTION ACTIVITIES).

K. NO BULK PETROLEUM PRODUCTS WILL BE STORED WITHIN 25 FEET OF WATERCOURSE.

L. TEMPORARY MAT SPANS WILL BE REMOVED AND WATERCOURSES WILL BE RESTORED AS DETAILED IN ATTACHMENT L. BANKS WILL BE RESEEDED WITH APPROPRIATE UPLAND (ANNUAL RYE) OR WETLAND SEEDMIX. NO GRUBBING WILL BE PERFORMED ON STREAMBANKS SO THAT WOODY ROOT SYSTEMS MAY REMAIN IN PLACE AND NATURALLY REVEGETATE UPON MATTING REMOVAL. TEMPORARY EROSION AND SEDIMENTATION CONTROLS WILL BE REMOVED UPON THE STABILIZATION OF EXPOSED SOILS NEAR WATERCOURSES.

ROADWAY AND WORK PAD CONSTRUCTION PRACTICES

EXISTING ROADWAYS TO BE DRESSED WITH GRAVEL OR CRUSHED STONE AS REQUIRED. PROPOSED ROADS AND CONSTRUCTION PADS TO BE CONSTRUCTED AS DEPICTED HEREIN, AND AS FOLLOWS:

A. TIMBER MATS WILL BE USED IN WETLAND AREAS AND IN CT DEEP FLOOD STORAGE AREAS. TIMBER MAT USAGE MAY BE FIELD ADJUSTED TO OVERLAP WITH WETLAND BOUNDARIES.

B. PROPOSED ROADS AND CONSTRUCTION PADS IN FEMA FLOOD ZONES (OUTSIDE OF WETLANDS) TO BE CONSTRUCTED OF GRAVEL OR TIMBER MATS. IF GRAVEL IS USED IN THESE AREAS, APPROXIMATELY 6 INCHES OF TOPSOIL WILL BE REMOVED AND TEMPORARILY STOCKPILED OUTSIDE OF FLOOD CONTROL AREAS TO RESULT IN NO NET DECREASE OF FLOOD STORAGE AREAS.

C. PROPOSED ROADS AND CONSTRUCTION PADS IN UPLAND AREAS WILL BE CONSTRUCTED OF GRAVEL AND WILL BE LEFT IN PLACE TO FACILITATE FUTURE MAINTENANCE ACTIVITIES UNLESS REMOVAL IS REQUESTED BY THE LANDOWNER.

VERNAL POOL AVOIDANCE AND MINIMIZATION MEASURES

A. THE USE OF CONSTRUCTION MATTING OVER IDENTIFIED VERNAL POOL DEPRESSIONS IS NOT AUTHORIZED.

B. GRAVEL WORK PADS ARE NOT PERMITTED WITHIN 100 FEET OF IDENTIFIED VERNAL POOLS.

C. EXCEPT IN AREAS WHERE ACCESS ROADS AND WORK PADS MUST BE INSTALLED, EXISTING SCRUB-SHRUB VEGETATION WITHIN 25 FEET OF VERNAL POOLS WILL BE MAINTAINED, CONSISTENT WITH ROW VEGETATION MANAGEMENT REQUIREMENTS.

D. REMOVAL OF LOW GROWING (SCRUB-SHRUB) VEGETATION SURROUNDING VERNAL POOLS SHALL BE MINIMIZED BY UTILIZING CONSTRUCTION MATTING WHERE ACCESS IS NEEDED. IN LOCATIONS WHERE VEGETATION MUST BE CUT ADJACENT TO VERNAL POOLS, SOME OF THE CUT VEGETATION (SLASH) WILL BE LEFT IN PLACE ALONG THE EDGES OF THE POOLS TO SERVE AS RECRUITMENT FOR LEAF LITTER AND COARSE WOODY DEBRIS.

E. EROSION AND SEDIMENTATION CONTROL MEASURES WILL BE INSTALLED AND MAINTAINED ALONG CONSTRUCTION ACCESS ROADS AND AROUND WORK PADS AS NECESSARY TO PROTECT WATER QUALITY AND TO LIMIT THE POTENTIAL FOR SEDIMENT TRANSPORT TO VERNAL POOLS.

F. WHERE EXISTING ON-ROW ACCESS ROADS ADJACENT TO VERNAL POOLS MUST BE IMPROVED, SWAMP MATS OR CORDUROY ROAD WILL BE USED IF PRACTICABLE; OTHERWISE, CLEAN MATERIALS WILL BE USED (E.G., CLEAN RIPRAP, GRAVEL, STONE OR EQUIVALENT AND ROCK FORDS).

G. TO THE EXTENT THAT CIRCUIT OUTAGE AND OTHER CONSTRUCTION TIMING CONSTRAINTS ALLOW, EVERSOURCE WILL ATTEMPT TO SCHEDULE THE INSTALLATION OF ACCESS ROADS AND WORK PADS NEAR VERNAL POOL HABITATS SO AS NOT TO INTERFERE WITH AMPHIBIAN BREEDING AND MIGRATION SEASONS.

H. FOR PROJECT ACTIVITIES THAT MUST OCCUR ADJACENT TO VERNAL POOLS DURING AMPHIBIAN MIGRATION PERIODS, MEASURES WILL BE IMPLEMENTED ON A SITE-SPECIFIC BASIS AS NECESSARY TO FACILITATE UNENCUMBERED AMPHIBIAN ACCESS TO AND FROM VERNAL POOLS. MITIGATION MEASURES WILL BE IDENTIFIED AFTER TAKING INTO CONSIDERATION SITE-SPECIFIC CONDITIONS, INCLUDING THE TYPE OF CONSTRUCTION ACTIVITY IN PROXIMITY TO A VERNAL POOL, THE AMPHIBIAN SPECIES KNOWN TO OCCUR IN THE VERNAL POOL, AND SEASONAL CONDITIONS. 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.

I. EROSION AND SEDIMENTATION CONTROL DEVICES WILL BE PROMPTLY REMOVED UPON FINAL REVEGETATION AND STABILIZATION OF THE ROW.

J. IN THE THREE VERNAL POOLS WHERE TREE CLEARING IS REQUIRED, TREE TRIMMING AND CLEARING ACTIVITIES WILL BE COMPLETED BY HAND (NO CONSTRUCTION MATS WILL BE USED IN VERNAL POOLS). TREES WILL BE FELLED AWAY FROM, AND OUTSIDE OF, VERNAL POOLS TO THE EXTENT PRACTICABLE.

Bloomfield-Windsor Upgrades Project

1777/1779 TRANSMISSION LINE UPGRADES BETWEEN BLOOMFIELD SUBSTATION AND BLOOMFIELD JUNCTION

1751/1777 TRANSMISSION LINE UPGRADES BETWEEN BLOOMFIELD JUNCTION AND NORTH BLOOMFIELD SUBSTATION

Select Best Management Practices (BMPs)

No Scale

EVERSOURCE

AECOM

Detail Sheet 6

Appendix D
Blue Hills Avenue Laydown Area

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BLUE HILLS AVENUE LAYDOWN AREA
TOWN OF BLOOMFIELD

To support the construction of the Bloomfield – Windsor Upgrades Project (Project), The Connecticut Light and Power Company doing business as Eversource Energy (Eversource) proposes to use a previously-developed site, located at 885 Blue Hills Avenue in the southeastern portion of the Town of Bloomfield, as a laydown and staging yard. The proposed yard site consists of approximately 6 acres of an 8.39-acre upland property that is situated on the west side of Blue Hills Avenue, approximately 2 miles southeast of Bloomfield Substation.

Figures 1 and 2 illustrate the general location of the proposed laydown yard site. Figure 3 provides an aerial photograph of the site, illustrating existing land uses.

The laydown yard will include construction trailers and portable bathroom facilities, as well as areas for equipment and vehicle parking. Electric service will be established to the site, which is expected to be used principally for the following types of construction support activities:

- Storing transmission facility construction materials, equipment, tools, fuel, and supplies;
- Parking construction vehicles, equipment, and the personal vehicles of construction personnel;
- Performing minor maintenance of construction equipment;
- Refueling construction equipment and vehicles;
- Storing and assembling transmission line structure components; and
- Storing materials temporarily prior to appropriate disposition from the Project.

The 6-acre property proposed for the laydown / staging area was used for many decades as a 500-car drive-in movie theater. The topography of the site is flat, with elevations of approximately 100-150 feet. The site is presently characterized by herbaceous vegetation, growing through areas that were formerly asphalted.

The proposed yard site is bordered by the remainder of the 8.39-acre property, which fronts on Blue Hills Avenue and is used for a farm stand and associated gardens. These uses will not be affected by the proposed use of the yard. Some trees also are located along the site boundaries, principally to the south and west. No trees will be removed in conjunction with the use of the laydown/staging area.

The entire yard site was extensively disturbed, over decades, as a result of past land uses, including the drive-in theater. The site also was previously used as a staging area for other construction projects in the Bloomfield area.

The proposed yard site is not located within a floodplain; does not contain any wetlands or watercourses; has no potential to contain intact cultural resources (due to extensive past earth disturbance); and is not directly proximate to any residential uses. A review of the Connecticut

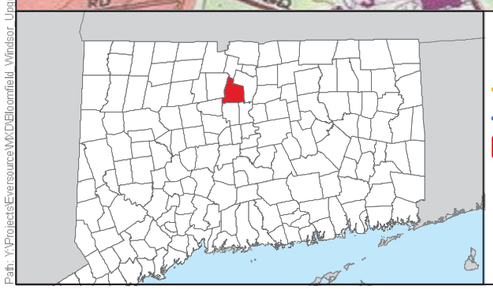
Department of Energy and Environmental Protection (CT DEEP) Natural Diversity Data Base (NDDB) publicly-available maps (June 2016) demonstrates that there are no state-or federally-listed species or significant natural communities near the yard site.

Some site preparation work, consisting of mowing herbaceous vegetation and possibly adding gravel, will be performed, if required, to supplement the existing pavement base on the site. Appropriate erosion and sedimentation controls will be installed and maintained at the site, if necessary, to minimize the potential for erosion. Such controls will be installed and maintained in accordance with the Best Management Practices presented in the approved D&M Plan.

After the completion of Project activities, the yard site will be restored pursuant to Eversource's lease agreement with the landowner.

Bloomfield Substation

Blue Hills Avenue Laydown Yard



Legend

- Substation Location
- 1751-1777 Lines
- 1777-1779 Lines
- Blue Hills Laydown Yard

Bloomfield Windsor Upgrades Project - Proposed Laydown Yard
885 Blue Hills Avenue, Bloomfield, CT

Coordinate System:
Linear Units: Foot US
Datum: North American 1983
Projection: Lambert Conformal Conic
Coordinate System: NAD 1983 StatePlane
Connecticut FIPS 0600 Feet

Scale in Feet
0 375 750

Revised: 6/8/2016

EVERSOURCE

AECOM

Figure 1 - Locus Map

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Blue Hills Avenue Laydown Yard

Bloomfield

Windsor

Blue Hills Sch

Drive-In Theater

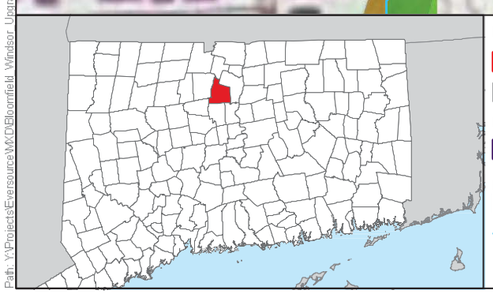
MOUNT ST BENEDICT CEMETERY

Radio Towers (WDRC)

ELIZABETH AVE

HUBBARD ST

WOLCOTT



Legend

- Blue Hills Laydown Yard
- Municipal Boundary

NDDB Area
- State and Federal Listed Species & Significant Natural Communities

NHD Waterbody
- Swamp/Marsh
- Stream/River

NRCS Soils
- Alluvial and Floodplain Soils
- Poorly Drained and Very Poorly Drained Soils

NWI Wetlands
- NWI Wetlands

Bloomfield Windsor Upgrades Project - Proposed Laydown Yard
885 Blue Hills Avenue, Bloomfield, CT

Rare Species and Wetland/Water Resources Soils

Scale in Feet
0 125 250

N W E S

Coordinate System:
Linear Units: Foot US
Datum: North American 1983
Projection: Lambert Conformal Conic
Coordinate System: NAD 1983 StatePlane Connecticut FIPS 0600 Feet

Revised: 6/8/2016

EVERSOURCE

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Figure 2 - Site Map

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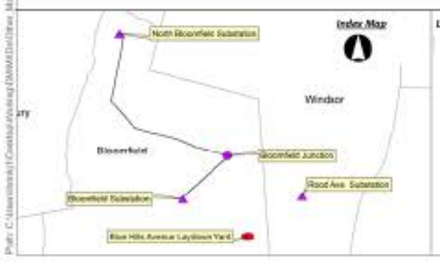

Legend:

Blue Hill Ave Laydown Area

Access Road

BLOOMFIELD-WINDSOR UPGRADES PROJECT

BLUE HILLS AVENUE LAYDOWN YARD
885 BLUE HILLS AVENUE
BLOOMFIELD, CT

Linear Units: Foot US
Datum: North American 1983
Projection: Lambert Conformal Conic
Coordinate System: NAD 1983 StatePlane
Connecticut FIPS 0600 Feet
Datalayers and Imagery: USGS Earth Explorer, CT DEEP GIS, UCONN MAGIC, UCONN CLEAR, Google Earth Imagery, Eversource.

Scale in Feet
0 50 100

Revised: 6/23/2016

EVERSOURCE

Figure 3

Lay Down Yard