EXHIBIT

OVERVIEW IN SUPPORT OF THE PETITION TO REOPEN AND MODIFY DOCKET NO. 3

for the

DERBY JUNCTION TO ANSONIA 115-KV TRANSMISSION LINE REBUILD PROJECT

City of Shelton, Fairfield County and Cities of Derby and Ansonia, New Haven County, Connecticut

May 2022

Submitted to:

Connecticut Siting Council

Prepared By:

THE UNITED ILLUMINATING COMPANY

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EXECUTIVE SUMMARY

Proposed Project:

To improve the reliability of the transmission grid in conformance with the National Electrical Safety Code (NESC) and continue to provide reliable service to the lower Naugatuck Valley area, The United Illuminating Company (UI or the Company) proposes to rebuild three existing 115-kilovolt (kV) overhead transmission circuits located within an approximately 4.1-mile existing UI right-of-way (ROW), extending from Derby Junction[1] in the City of Shelton (Fairfield County), across the Housatonic River to Indian Well Substation in the City of Derby (New Haven County), through portions of the City of Derby, to Ansonia Substation in the City of Ansonia (New Haven County). This **Derby Junction to Ansonia 115-kV Transmission Line Rebuild Project** (Project; refer to Figure ES-1) will:

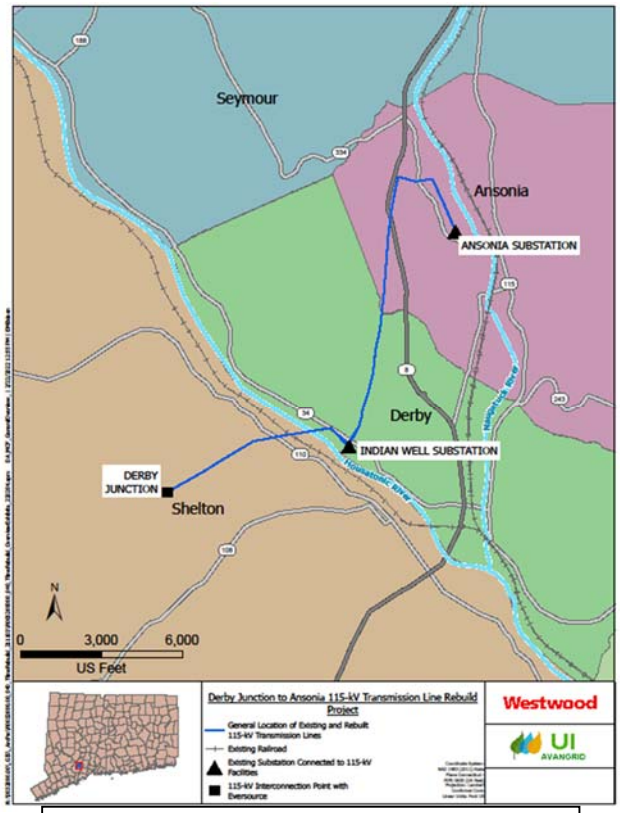

Figure ES-1: General Project Location

- Rebuild the 115-kV lines, installing new monopoles, conductors, insulators and related hardware;
- Interconnect the rebuilt 115-kV circuits at Derby Junction, Indian Well Substation, and Ansonia Substation; and
- Dismantle and remove the existing 115-kV structures, conductors, insulators, hardware and structure foundations.

The Project is subject to the regulations of the Connecticut Siting Council (Council, CSC), as well as other Federal and State regulatory agencies.

Project Background and Need:

UI's existing 115-kV circuits provide critical connections to both Indian Well and Ansonia substations, which are located at the edge of UI's transmission system. These two substations, from which UI serves approximately 26,400 customers in Shelton, Derby, and Ansonia, are not linked to any other transmission lines.

The infrastructure that supports the existing 115-kV lines is almost 100 years old. Currently, the lines are arranged in a double-circuit configuration (that is, with one 115-kV line on either side of each

[1] Derby Junction refers to the location where UI's 115-kV circuits connect to the 115-kV lines owned and operated by The Connecticut Light & Power Company dba Eversource Energy (Eversource). The actual "junction" (also sometimes referred to as a "tap") is an existing Eversource 115-kV structure, located within Eversource's ROW.

structure) and are supported on 40 structures (29 lattice steel towers, four self-supporting steel monopoles, two direct-embed steel monopoles, one wide-flange column pole, and four takeoff structures at the substations[2]). These transmission line structures, which range in height from about 65 to 140 feet, were originally built and owned by the Derby Gas and Electric Company (DG&E).

DG&E installed the lattice steel towers in 1924; at that time, the lines operated at 13.8 kV. The transmission lines were upgraded to 69 kV in the 1930s and then to 115 kV in the late 1960s. UI purchased the structures from DG&E in 1969. The Company has subsequently operated and maintained the 115-kV lines, completing minor repairs to structure foundations in 2008-2009.

The conductors, overhead shieldwire (OHSW), and insulators on the 115-kV lines have been in service for at least 50 years, with some components having been in service for close to 100 years. The conductors and OHSW consist mostly of 7-strand 4/0 copper.

Between Derby Junction and Ansonia Substation, the UI ROW extends for approximately 1.2 miles in Shelton, 1.4 miles in Derby, and 1.5 miles in Ansonia. The existing 115-kV transmission line ROW varies in width but is generally 80 feet wide in Shelton and 50 feet wide in Derby and Ansonia, with some areas of undefined width (dating to DG&E's original establishment of the electric lines), a small section that is 40 feet wide, and a segment that is 100 feet wide approaching Ansonia Substation.

The ROW traverses or is bordered by a variety of land uses, ranging from residential and open space to industrial/commercial areas. Most of these uses were developed after the ROW was established.

The transmission circuits span the Housatonic River, which forms the boundary between Shelton and Derby. In Derby and Ansonia, the ROW extends for approximately 1,465 feet across the northeastern-most, undeveloped portion of Osbornedale State Park. The 350-acre park is managed by the Connecticut Department of Energy and Environmental Protection (CT DEEP) and provides recreational opportunities for hiking, fishing, picnicking, and wildlife viewing as well as for general environmental education (at the Kellogg Environmental Center and Osborne Homestead Museum). None of these recreational areas are located near the ROW. The UI ROW pre-dates the park, which was established in 1956.

As part of asset condition studies, over the past 10 years, UI performed detailed inspections and analyses of the three existing 115-kV circuits connecting Derby Junction, Indian Well Substation, and Ansonia Substation. UI's evaluations found that the copper conductors, which exhibited reductions in tensile strength, are at the end of their useful life, and the insulators demonstrated electrical failures. As a result, UI determined that all three of the circuits would require new conductors, insulators, and OHSW.

After determining that the lines must be reconductored and reinsulated, UI analyzed the integrity of existing transmission line structures to assess whether the structures could support the mechanical loading associated with the new conductors, new OHSW, and added Optical Ground Wire (OPGW), while adhering to applicable electrical standards and conductor clearance requirements. These investigations concluded that a majority of the existing structures could not support the additional structural loads associated with the reconductoring and verified that the current NESC conductor clearance requirements could not be met. UI therefore concluded that the 115-kV circuits must be entirely rebuilt, with new structures, conductors, insulators, OHSW, and OPGW.

[2] The four takeoff structures, two at Indian Well Substation and two at Ansonia Substation) will not be replaced as part of this Project.

Proposed Project Facilities:
The Project will consist of the following:

- Rebuild the 115-kV lines on 41 new self-supporting steel monopoles (25 double-circuit monopoles and 15 single-circuit monopoles, and one single-circuit H-frame structure). The structures will typically range in height from 75 to 135 feet; however, the monopole structures on either side of the Housatonic River will be 170 feet tall.

- Replace the existing 4/0 copper conductors and shield wire with 795 kcmil 26/7 aluminum conductor steel reinforced (ACSR) "DRAKE" conductor, 7 No. 7 Alumoweld Shieldwire, and install OPGW DNO-12503 (96 fiber) between Derby Junction and Indian Well Substation and DNO-11467 OPGW (72 fiber) between Indian Well Substation and Ansonia Substation. For the Housatonic River crossing, UI will use 19 No. 8 Alumoweld Shieldwire.

- Interconnect the rebuilt circuits at Derby Junction and Indian Well and Ansonia substations.

- Remove and recycle or otherwise properly dispose of the existing 115-kV structures, conductors, insulators and associated hardware, and remove the existing structure foundations in accordance with UI specifications.

As part of the Project, UI will also establish a defined ROW width in locations where the permanent easement is presently unspecified and will expand the width of the existing ROW as necessary to align the new transmission line structures such that the distance from the conductors adheres to NESC blowout clearance and UI vegetation management requirements. Typically, UI proposes an approximately 80-foot-wide ROW.

However, in various locations, including at the 1,742-foot-long Housatonic River span and across Osbornedale State Park, the ROW will be wider. Based on the current Project design, an estimated 9.9 acres of additional permanent easement will be required from property owners abutting the existing ROW, including approximately 1.8 acres from CT DEEP to expand the ROW across Osbornedale State Park by 60 feet. To increase the width of the ROW across the Housatonic River from the existing 80 feet to 260 feet, approximately 4.6 acres of permanent easement (over water) will be required. An estimated additional 4.3 acres of the transmission line ROW will coincide with local road ROWs.

Construction Activities:
The construction of the Project will involve a sequence of tasks. Work will be organized to keep one of the 115-kV circuits between Derby Junction and Ansonia Substation energized at all times, as required to maintain service to customers during the construction period.

Temporary access roads and work pads will be required at each rebuilt structure site, as well as at the locations where the existing structures will be removed.

Table ES-1 summarizes the general sequence of anticipated Project construction activities (the actual work sequence may vary).

Table ES-1: General Project Construction Sequence

Typical Pre-Construction Activities
• Survey and stake construction work areas, edge of UI ROW, and proposed structure locations
• Confirm and re-flag environmental resource areas (e.g., wetland and watercourse boundaries) or other sensitive areas to be avoided or where special construction procedures will apply
• Mark vegetation clearing limits along the ROW
• Locate and mark utilities crossed by or along the ROW
Typical Construction Activities*
• Prepare approved laydown/material staging/contractor yard(s) to support the construction effort
• Clear vegetation along the ROW as necessary and install temporary erosion and sedimentation controls around work sites as needed
• Install temporary construction matting as needed for access across wetlands, small watercourses, agricultural areas, or other environmentally-sensitive locations
• Establish or upgrade any required access roads to provide ingress/egress to the new monopole sites and to existing structures to be removed
• Create a level work pad at each structure site, as well as at conductor pulling sites and if necessary, at guard structure sites
• Take outage on the 115-kV circuit located on one side of the existing double-circuit structures; the other 115-kV circuit will remain energized
• Remove the existing de-energized conductor, as well as associated insulators, OHSW, and cross-arm supports (as needed) from the existing double-circuit structures
• Install new structure foundations and assemble/erect new structures; new structure will be offset in transverse direction from the center of existing lattice towers to maintain adequate working clearances from the existing energized conductors
• Install new insulators, conductors, OHSW, and OPGW (for one circuit side of the new structures)
• Install rebuilt 115-kV line connections to Derby Junction and UI substations (for one circuit side)
• Energize the rebuilt 115-kV circuits (on one circuit side of the new structures) to provide service between Derby Junction, Indian Well Substation, and Ansonia Substation
• Take outage on the remaining legacy 115-kVcircuit located on the other side of the existing double-circuit structures
• Remove the remaining legacy 115-kV line wires, conductor, insulators, and OHSW from the existing double-circuit structures
• Dismantle and remove from the ROW the old lattice steel towers and other structures
• Install new insulators, conductors and OHSW/OPGW on the other side of the new structures
• Energize the rebuilt 115-kV circuits on the remaining side of the new structures
• Remove temporary construction access roads and work pads; stabilize permanent access roads / work pads and install/upgrade permanent erosion/sedimentation controls where required
• Perform final clean-up and restore/stabilize areas affected by construction (e.g., by seeding and re-vegetating as needed)
• Maintain erosion and sedimentation controls until areas affected by construction are verified to be restored/stabilized

*Note: This list represents UI's anticipated construction tasks; actual outage and construction sequences may vary in any one location along the ROW. However, continuous 115-kV service between Derby Junction, Indian Well Substation, and Ansonia Substation will be provided throughout construction.

Project construction will be performed in accordance with applicable Federal and State regulatory requirements, as well as UI's Project plans and specifications. For example, UI will prepare a Stormwater Pollution Control Plan and Materials Management Plan, as well as a Development and Management Plan (as required pursuant to CSC regulations).

Schedule, and Work Hours:
UI proposes to commence Project construction in 2023 and to place all three rebuilt 115-kV circuits in service by the end of 2024. Standard construction hours will be 7:00 AM to 7:00 PM, Monday through Saturday. However, certain tasks will require work on Sundays or at night.

Environmental Setting, Impacts, and Mitigation:
To define environmental and cultural features along and in the vicinity of the ROW, UI performed research and conducted studies of topography, geology, soils, ecologic resources, (wetlands, watercourses, floodplains, vegetation, wildlife, Federal and State-listed species), land uses, visual resources, historic/archaeological resources, transportation, air quality, and noise.

In general, the ROW extends across varied topography, ranging from relatively flat areas to steep slopes leading to the Housatonic and Naugatuck river valleys. The ROW spans the Housatonic River but is located west of (and does not cross) the Naugatuck River. In total, the ROW encompasses 10 wetlands and 10 watercourses, including the Housatonic River.

Overall, land uses along and near the ROW consist primarily of suburban/urban areas. The ROW crosses open space and agricultural areas in Shelton and commercial/industrial areas in portions of Derby and Ansonia; residential developments are located near the ROW in all three municipalities. In addition to crossing an undeveloped portion of Osbornedale State Park, the ROW is adjacent to the Paugussett Trail (Shelton) and Nolan Athletic Field (Ansonia). The ROW also spans State Routes 110, 34, 8, and 334, as well as a rail lined owned by The Housatonic Railroad Company.

UI's analyses determined that the Project is consistent with the long-established utility use of the ROW and will have a positive long-term effect on the reliability of the electric system. Most environmental effects are expected to be minor and localized to the Project vicinity. UI will mitigate such impacts to the extent practical by implementing standard construction best management practices and conforming to the conditions of Project permits and approvals.

For example, the construction of the Project will result in temporary disturbance to soils, wetlands, and watercourses; removal of vegetation within the ROW and from off-ROW access roads; increases in noise and air emissions due to work activities such as earth-moving, drilling for structure foundations, and the general operation of construction equipment/vehicles; and traffic congestion due to the movement of construction equipment/vehicles on roads leading to work sites.

Across wetlands, the installation of Project construction access roads and work pads, consisting of timber mat or equivalent matting, will result in approximately 0.14 acre of temporary impacts. However, after the completion of the 115-kV line rebuild work, the temporary mats will be removed and the affected wetlands will be restored.

The Project also will result in long-term impacts. For instance, to allow the safe and reliable operation of the overhead transmission lines, UI will have to acquire and maintain approximately 9.9 acres of new permanent easement, including 1.8 acres in Osbornedale State Park, from the owners of properties adjacent to the existing ROW.[3] In total, approximately 6 acres of trees will be removed for the Project, mostly within the expanded easement area.

Within the ROW (including the expanded permanent easement), certain land uses will be precluded pursuant to standard UI requirements. UI will maintain vegetation on the ROW in low growing shrub-scrub and other species, consistent with the safe operation of the overhead 115-kV lines.

[3] Approximately 4.6 acres of additional easement will be required over the Housatonic River.

In addition, some of the access roads established for Project construction will remain permanently to facilitate UI's operation and maintenance of the rebuilt 115-kV lines. One permanent access road along the ROW in Shelton must cross the same intermittent stream twice, requiring the installation of permanent culverts at each location. The two culverts will result in an estimated 0.03 acre of permanent fill. In addition, three new monopoles near Indian Well Substation will be located in the Housatonic River 100-year floodplain.

The Project also will result in a long-term change to the visual environment within the viewshed of the ROW. The proposed new double- and single-circuit monopoles will be taller than most of the existing 115-kV structures and thus will potentially be more visible from certain locations. The visibility of the rebuilt 115-kV lines will depend on the screening provided by intervening natural (vegetation) and man-made (building) features. In some locations, the replacement of the aging legacy lattice towers with monopoles may be perceived as a visual improvement.

Electric and Magnetic Fields:

UI commissioned a study to measure the electric and magnetic fields (EMF) associated with the existing 115-kV lines and to model the anticipated EMF levels from the rebuilt 115-kV facilities. All calculated EMF levels associated with the Project will be a small fraction of those recommended for the general public by international health-based standards.

The study found that post-Project EMF levels will generally be similar to or lower than existing EMF levels. The Project design that UI proposes reconfigures the transmission lines to minimize magnetic fields and applies siting and design features that are consistent with the CSC's EMF Best Management Practices.

Alternatives:

Before identifying the proposed Project as the preferred solution for maintaining system reliability, UI identified and evaluated the following alternatives:

- ***No Action Alternative***. Under this Alternative, UI would not rebuild the Derby Junction-Ansonia facilities. As a result, transmission system reliability would be at risk because the aging conductors and lattice steel towers would not be improved. This alternative was dismissed due to unacceptable risks to the reliability of the transmission system.

- ***All-Underground Underground Configuration Alternative***. This Alternative would involve rebuilding the existing 115-kV lines in an underground configuration, using a combination of the existing ROW and local roads. However, compared to the Project as proposed, an all-underground configuration would require longer to construct, result in greater environmental impacts, and be significantly more costly.

- ***Rebuild/Upgrade Alternatives***. In addition to the Project, UI identified and analyzed alternatives for modifying the Derby Junction-Ansonia Substation 115-kV circuits. These alternatives, which were evaluated in terms of initial engineering design, cost, schedule, and environmental/real estate factors, involved partial transmission line upgrades (e.g., replacing only some of the existing structures, strengthening the structural supports on others, and installing different types of conductors and OPGW), as well as rebuilding the existing double-circuit lines on pairs of single-circuit monopoles.

As a result of these analyses, UI determined that the proposed Project (combination double0-and single-circuit rebuild) represents the optimal solution for enhancing the long-term reliability and resiliency of the electric system to the benefit of consumers in the Naugatuck Valley area and in Connecticut.

Route and Line Configuration Options:

After selecting the proposed Project, UI performed additional engineering and environmental studies to refine the overhead line design and construction plans. As part of those analyses, UI identified and investigated options to the proposed alignment of the rebuilt lines along the existing ROW in Osbornedale State Park, as well as configuration options to the proposed use of paired single-circuit monopoles (instead of a single double-circuit monopole) in certain locations.

- ***Osbornedale State Park Route Options.*** UI is in the process of coordinating with CT DEEP regarding the proposed ROW expansion in the park. However, in the event that this additional permanent easement cannot be acquired, UI identified and evaluated potential route and 115-kV line rebuild configurations that would avoid the park entirely, minimize the required width of the expanded easement in the park, or avoid the need to acquire additional permanent easement within the park by installing the 115-kV segment across the park in an underground configuration. UI concluded that any of the alternative options would be more costly than the proposed overhead alignment across the park and would result in various impacts to environmental resources and land uses. However, if an expanded easement through the park cannot be acquired from CT DEEP for the proposed overhead line rebuild, UI would be prepared to install the 115-kV lines within the existing 50-foot-wide ROW in an underground configuration (assuming that underground rights can be obtained from CT DEEP); within the existing ROW using substantially taller structures; or along underground alignments along local roads.

- ***Structure Location Configuration Options.*** The proposed Project design will involve replacing five of the existing double-circuit lattice steel towers (Structures 3, 4, 17, 18, and 19) with paired single-circuit monopoles. At these five locations, the ROW is characterized by steep topography, line angles, and/or bordering densely-developed residential/commercial uses. The single-circuit monopoles will facilitate construction by allowing one of the 115-kV circuits to be rebuilt and then placed in service, after which the second circuit will be taken out of service and rebuilt on the second single-circuit monopole. An alternative to rebuilding these five structures on paired single-circuit monopoles while still maintaining one of the 115-kV lines in service during Project construction is to erect structures to temporarily support one of the circuits, while each double-circuit monopole is installed. The temporary structures would be installed within the ROW near each of the five lattice steel towers. The in-service 115-kV line would be transferred to these temporary structures while the new double-circuit monopole is installed. UI is in the process of performing further analyses of this structure configuration option and anticipates that the use of temporary structures may have merit to allow the use of double-circuit monopoles at Structures 4 and 17 in particular.

Estimated Project Costs and Facility Service Life:

The estimated capital cost for the siting, design, and construction of the Project is approximately $57.2 million. The Project transmission facilities are expected to have a service life of approximately 40 years.

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1. PROJECT OVERVIEW AND NEED

1.1 PROJECT BACKGROUND, LOCATION, AND PURPOSE

The United Illuminating Company (UI or the Company) proposes to rebuild three existing 115-kilovolt (kV) overhead transmission circuits located within an approximately 4.1-mile existing UI right-of-way (ROW), extending east from Derby Junction[4] in the City of Shelton (Fairfield County), across the Housatonic River to UI's Indian Well Substation in the City of Derby, through portions of Derby and the City of Ansonia, to UI's Ansonia Substation in Ansonia (New Haven County) in order to improve the reliability of the transmission grid in conformance with the National Electrical Safety Code (NESC) and UI standards. This **Derby Junction to Ansonia 115-kV Transmission Line Rebuild Project** (Project) will rebuild the existing 115-kV lines, which consist of aging legacy lattice steel structures, on new modern steel monopole structures. These new structures will include steel monopoles, with Aluminum Conductor Steel Reinforced (ACSR) conductors, transmission line insulators, optical groundwire (OPGW), overhead shield wire (OHSW), and related hardware. The existing 115-kV transmission line structures, conductors, and related hardware will be disassembled and removed from the ROW.

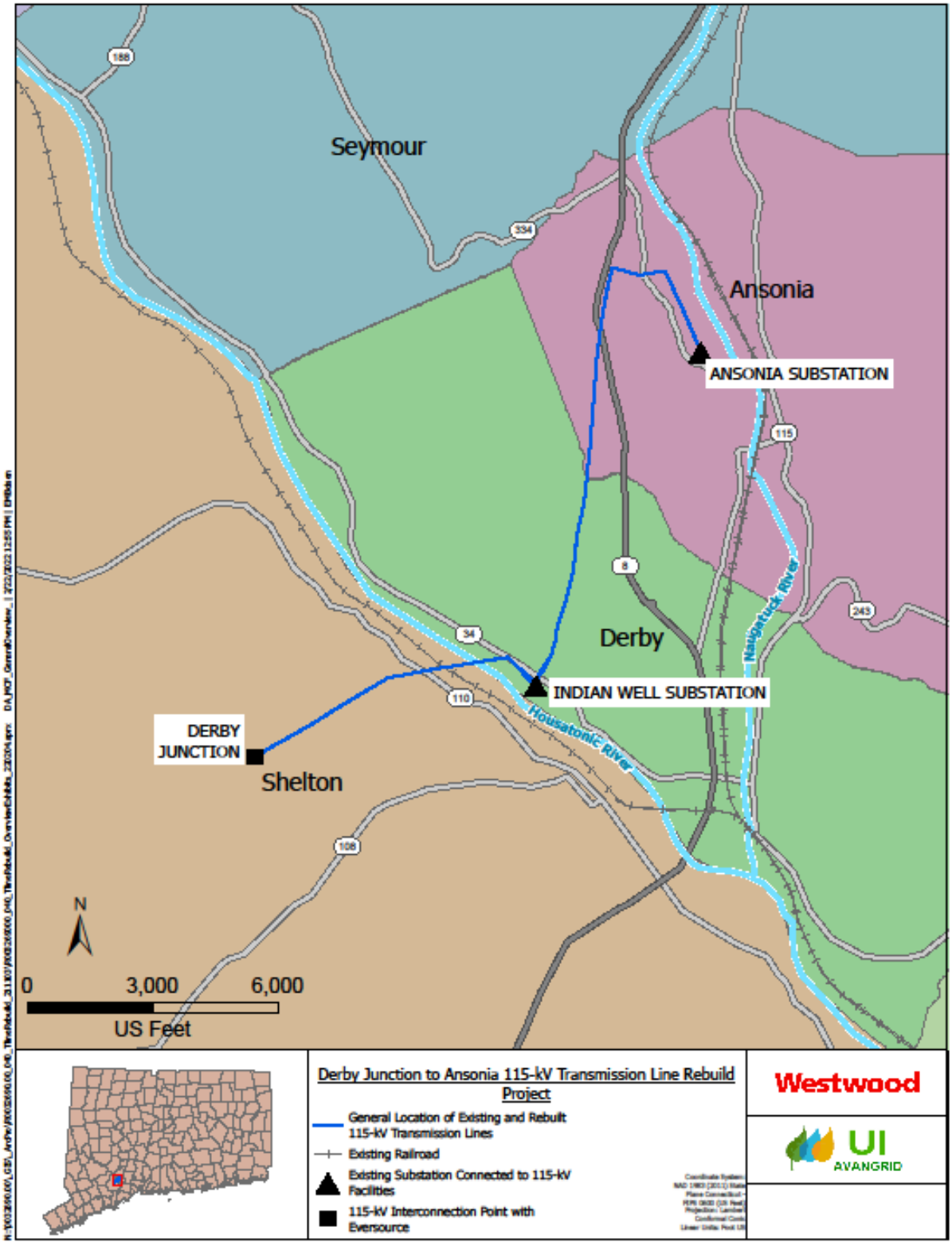
The Project also will interconnect the rebuilt 115-kV lines to Derby Junction, Indian Well Substation, and Ansonia Substation, making minor associated modifications within the substations to accommodate the connections to the rebuilt 115-kV lines. Similarly, the existing 115-kV line connections to Derby Junction, Indian Well Substation, and Ansonia Substation will be removed. Figure 1-1 illustrates the general Project location.

1.1.1 Existing Transmission Facilities: Characteristics, Location, and History

UI's existing 115-kV lines between Derby Junction, Indian Well Substation, and Ansonia Substation provide critical electric service to the Lower Naugatuck Valley area, which consists of the cities of Shelton, Derby, and Ansonia. In total, through Indian Well and Ansonia substations, the transmission lines serve approximately 26,400 UI customers.

[4] A transmission system "junction" (sometimes also referred to as a "tap") is a location where different transmission lines intersect. At Derby Junction, UI's 115-kV lines connect to The Connecticut Light and Power Company dba Eversource Energy (Eversource) transmission system at Eversource Structure 1364.

Figure 1-1: General Project Location



The existing 115-kV lines between Derby Junction and Ansonia Substation are arranged in a double-circuit configuration (for a total of approximately 8.2 circuit miles), as follows:

- 1560-3 Line: extends for approximately 4.1 miles, from Derby Junction to Ansonia Substation.
- 1808-2 Line: co-located with the 1560-3 Line for approximately 1.5 miles, from Derby Junction to Indian Well Substation.
- 1594 Line: co-located with the 1560-3 Line for approximately 2.6 miles, from Indian Well Substation to Ansonia Substation.

In this Exhibit, these transmission lines are typically referred to collectively as "the 115-kV lines".

UI's existing 115-kV lines are supported on 40 structures: 29 lattice steel towers, four self-supporting steel monopoles, two direct-embed steel monopoles, one wide-flange column pole, and four takeoff structures at the substations[5]. The structures along the ROW, which were originally owned and operated by the Derby Gas and Electric Company (DG&E), range in height from 65 to 140 feet. The tallest structures are located on either side of the crossing of the Housatonic River, which forms the boundary between Shelton (Fairfield County) and Derby (New Haven County). The shortest structure is Structure 17 in Ansonia. The 115-kV structures within Indian Well and Ansonia substations are 45-50 feet in height.

DG&E built the lattice steel towers in 1924. At that time, two lines, one on either side of the lattice towers (double circuit configuration), operated at 13.8 kV. The transmission lines were upgraded to 69 kV in the 1930s and then to 115 kV in 1967-1968.

UI purchased the structures from DG&E in 1969. The Company has subsequently operated and maintained the 115-kV lines, completing minor repairs to structure foundations in 2008-2009.

Table 1-1 identifies the existing structures, by municipality as well as by UI structure number, type, and height range.

[5] The four takeoff structures (two each at Indian Well and Ansonia substations) will not be replaced as part of this Project.

Table 1-1: Existing 115-kV Structures, by Municipality, Structure Number, Type, and Height Range

Municipality	Structure Nos.	Structure Types	Structure Height Range (feet)
Shelton	351-358 359 (Housatonic River crossing)	9 Steel Lattice Towers	80 feet; 140 feet at river crossing
Derby	360 (Housatonic River crossing) 361A, 361B H-Frame tubular steel take-offs at Indian Well Substation 1B, 2A, 2-9	8 Steel Lattice Towers 4 Self-Supporting Steel Poles 1 Wide-Flange Section Column 2 Tubular Steel Pole H-Frame Takeoffs	140 feet at river crossing; 45-95 feet
Ansonia	10-20 20A, 20B, 21 Wide-flange A-frame take-off - Ansonia Substation	12 Steel Lattice Towers 2 Direct-Embedded Steel Pole 2 Wide-Flange A-Frame Takeoffs	50-97.5 feet

Except for the span over the Housatonic River (between Structures 359 and 360, where the existing conductor is 336.4 (26/7) aluminum conductor with steel support (ACSS) "Linnet", the 115-kV lines currently use 7-strand 4/0 copper for both conductors and OHSW. The conductors, OHSW, and insulators have been in service for at least 50 years, with some components in service for close to 100 years. Similarly, most of the structures that support the 115-kV lines are almost 100 years old.

The existing 115-kV transmission line ROW varies in width but is generally 80 feet wide in Shelton and 50 feet wide in Derby and Ansonia, with some areas in Derby of undefined width, a small section that is 40 feet wide, and a segment that is 100 feet wide approaching Ansonia Substation. The areas of undefined easement width date to DG&E's original establishment of the electric lines.

The ROW traverses or is bordered by a variety of land uses, ranging from residential and open space to industrial/commercial areas. In Derby and Ansonia, the ROW extends for approximately 1,465 feet across the northeastern-most, undeveloped portion of Osbornedale State Park, which occupies a total of 350 acres. The park is managed by the Connecticut Department of Energy and Environmental Protection (CT DEEP) and provides recreational opportunities for hiking, fishing, picnicking, and wildlife viewing as well as for general environmental education (at the Kellogg Environmental Center and Osborne Homestead Museum). The UI ROW pre-dates the park, which was established in 1956. None of the park's primary recreational areas are located near the ROW.

1.1.2 Project Need

As part of asset condition studies, UI inspected and analyzed the 115-kV lines along the Derby Junction – Ansonia Substation ROW. These studies included evaluations of conductor tensile strength; thermal-mechanical cycling and combined mechanical-electrical test of insulators; and climbing, visual inspections, mechanical loading, and conductor sway simulations of the existing structures. UI's analyses found that the copper conductors, which exhibited reductions in tensile strength, are nearing the end of their useful life, and that the insulators demonstrated electrical failures. As a result, UI determined that all three of the circuits would require new conductors, insulators, and shieldwires.

After determining that the 115-kV circuits must be reconductored and reinsulated, UI evaluated the integrity of the 36 existing transmission structures and four existing substation takeoff structures to assess whether the structures could support the mechanical loading associated with the new conductors, new insulators, new OHSW, and added OPGW, while adhering to applicable electrical standards and conductor clearance requirements. These investigations concluded that a majority of the existing structures could not support the additional structural loads associated with the reconductoring and that the NESC conductor clearance requirements could not be met.

Specifically, UI's detailed engineering studies, which were performed in 2020-2021, concluded that 80% (29) of the 36 transmission structures had deficiencies, such as structure foundation spalling, anchor-bolt/plate galvanic corrosion, failed concrete breakout tests, structural member failures, or inadequate shieldwire support. UI's analyses also verified that current NESC clearance standards are not met.

Therefore, UI determined that a complete rebuild of the Derby Junction – Ansonia Substation 115-kV lines is required.[6]

1.2 SUMMARY OF PROPOSED PROJECT FACILITIES

The Project will consist of the following primary components:

- Rebuild the 115-kV lines on 41 new self-supporting steel poles (25 double-circuit monopoles, 15 single-circuit monopoles, and one single-circuit H-frame structure).

[6] On September 22, 2021, UI provided a presentation regarding the need for the proposed Project to the Independent System Operator – New England's (ISO-NE) Planning Advisory Committee (PAC).

- Replace the existing 4/0 copper conductors and shield wires with 795 kcmil 26/7 ACSR "DRAKE" conductors, 7 No. 7 Alumoweld Shieldwire (Circuit 1560-3), and install OPGW DNO-12503 (96 fiber) between Derby Junction and Indian Well Substation (Circuit 1808-2) and DNO-11467 OPGW (72 fiber) between Indian Well Substation and Ansonia Substation (Circuit 1594). For the Housatonic River crossing (between Structures 359 and 360), UI will use 19 No. 8 Alumoweld Shieldwire instead of 7 No. 7 Alumoweld Shieldwire (Circuit 1560-3).

- Interconnect the rebuilt 115-kV circuits at Derby Junction, as well as to UI's Indian Well and Ansonia substations.

- Remove and recycle or otherwise properly dispose of the existing 115-kV structures, conductors, insulators and associated hardware, and remove the existing structure foundations in accordance with UI specifications.

In conjunction with the rebuild work, UI also will establish a defined ROW width in locations where the permanent easement is presently unspecified and will expand the width of the existing ROW as necessary to align the new transmission line structures such that the distance from conductors adheres to NESC blowout clearance requirements. In most locations, UI proposes an approximately 80-foot-wide ROW; however, in some areas, the ROW will be wider. For example, due to the length of the Housatonic River crossing span, the existing 80-foot-wide ROW over the river will be expanded to a total of 260 feet. Similarly, across Osbornedale State Park, the existing 50-foot-wide ROW must be expanded by 60 feet due to unique topographic conditions.

Based on the current Project design, UI proposes to acquire an estimated 9.9 acres of additional permanent easement adjacent to the existing ROW. An additional 4.6 acres of additional permanent easement will be required to maintain blowout clearance over the water at the Housatonic River; an additional 4.3 acres will be along road corridors.

1.3 ORGANIZATION OF THE EXHIBIT

The Project is subject to the regulations of the Connecticut Siting Council (Council or CSC) and other State and Federal regulatory agencies. This Exhibit, which provides information pursuant to the CSC requirements, specifically:

- Describes the need for the Project, including a summary of the existing 115-kV facilities and the planned 115-kV line rebuilds (Section 1);

- Provides technical specifications and the estimated capital cost and life cycle for the Project (Section 2);

- Describes Project construction and operation / maintenance procedures (Section 3);

- Identifies the Project schedule and anticipated construction work hours (Section 4);

- Discusses existing environmental features in the Project area, including topography, geology, wetlands/watercourses, vegetation, wildlife, fisheries, land uses, recreational and community facilities, cultural resources, visual resources, transportation infrastructure, air quality, and noise (Section 5);

- Describes the Project's potential environmental impacts and reviews measures designed to avoid or mitigate such effects during both the construction and operation / maintenance of the rebuilt 115-kV facilities (Section 6);

- Provides data concerning electric and magnetic fields (EMF) associated with the Project facilities (Section 7);

- Reviews the permits and approvals required for the Project and summarizes the consultations with Federal, State, and local agencies completed to date and expected to be performed in the future (Section 8);

- Discusses the alternatives analyses that led to the selection of the Project (Section 9); and

- Provides a Glossary of Terms and Acronyms used in the document (Section 10).

Appendices to this Exhibit include supporting information regarding the Project, as follows:

- Appendix A: Detailed 11-x17-inch Project maps, plans, and drawings, including:

  - A Project location map and key index to the mapping.

  - Cross-sections depicting the proposed locations of the rebuilt 115-kV structures and proposed UI easement in relation to the existing transmission lines and ROW.

  - Aerial-based maps, at a scale of both 1"=400' and 1"=100' that identify the existing and proposed UI 115-kV transmission facilities in relation to the surrounding topography, land uses, environmental resources, local/State roads, and property boundaries.

  - Plan and profile drawings of the rebuilt 115-kV lines.

- Appendices B-D: Technical reports regarding biological resources, visual resources, and cultural resources;

- Appendix E: EMF Report; and

- Appendix F: The CSC's Formal Requirements and Application Guide, which references the sections of this Exhibit in which each of the CSC's documentation requirements is addressed.

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2. PROJECT TECHNICAL SPECIFICATIONS

The technical information provided for the Project in this section includes:

- The proposed 115-kV rebuilt transmission line facilities (by municipality), including termination and substation connection points;
- Transmission line structure design, appearance, and heights;
- Conductor, OHSW, and OPGW sizes and specifications;
- Proposed modifications at the Project termination points, including within the two substations to which the rebuilt lines will interconnect;
- Land requirements, including proposed permanent and temporary easements; and
- Estimated Project capital (construction) cost and service life.

2.1 PROPOSED 115-KV TRANSMISSION LINE REBUILD FACILITIES AND SPECIFICATIONS

2.1.1 Length of Lines (by Municipality and Terminal Points/Substation Connections)

The three 115-kV lines will be rebuilt along UI's 4.1-mile ROW, extending east from Derby Junction in Shelton, through Indian Well Substation in Derby, to Ansonia Substation in Ansonia. UI's ROW traverses approximately 1.2 miles in Shelton, 1.4 miles in Derby, and 1.5 miles in Ansonia.

The rebuilt 115-kV lines will remain predominantly in a double-circuit configuration (as are the existing lines), with the 1560-3 Line extending the entire length from Derby Junction to Ansonia Substation. The 1808-2 Line will be co-located on new monopoles with the 1560-3 Line between Derby Junction and Indian Well Substation (approximately 1.5 miles), while the 1594 Line will be co-located on new monopoles with the 1560-3 Line from Indian Well Substation to Ansonia Substation (approximately 2.6 miles).

In some locations as required to account for line angles or ROW/constructabilty constraints, the rebuilt lines will be placed on single-circuit monopoles. Specifically, from Derby Junction to Indian Well Substation, the lines will be rebuilt on 10 double circuit structures and four single-circuit structures. Between Indian Well Substation and Ansonia Substation, the rebuilt lines will include 15 double-circuit and 12 single-circuit structures.

Termination points for the lines will be at Derby Junction, as well as UI's 115-/13.8-kV Indian Well and Ansonia substations. Indian Well Substation was constructed in 1995 and is located in a commercial/industrial area of Derby adjacent to the Housatonic River off State Route 34, while Ansonia Substation was constructed in 1968 and is situated in an industrial area of Ansonia, approximately 500 feet west of the Naugatuck River.

2.1.2 Rebuilt Transmission Line Design, Appearance, and Height

UI will rebuild the 115-kV lines on 41 new self-supporting galvanized steel monopoles (25 double-circuit monopoles, 15 single-circuit monopoles and one H-Frame structure).[7] The monopoles will consist of typical double circuit vertical suspension or strain type insulator configurations (refer to the cross-section drawings in Appendix A). Table 2-1 lists the proposed structure types and heights, by municipality. The design and configuration of the new monopoles reflects the accommodation of multiple angles along UI's ROW, clearance considerations, and the requirements for the rebuilt 115-kV line entries to Indian Well and Ansonia substations.

2.1.3 Conductor, OPGW, OHSW, and Insulator Specifications

The Project will involve the installation of 795 kcmil 26/7 ACSR "DRAKE" conductor, 7 No. 7 Alumoweld Shieldwire on Circuit 1560-3 (from Derby Junction to Ansonia Substation), DNO-12503 OPGW (96 fiber) on Circuit 1808-2 (from Derby Junction to Indian Well Substation), and DNO-11467 OPGW (72 fiber) on Circuit 1594 (from Indian Well Substation to Ansonia Substation).

For the Housatonic River crossing, UI will use 19 No. 8 Alumoweld Shieldwire on Circuit 1560-3 and the same DNO-12503 OPGW as the other 96 fiber count OPGW for continuity with the fiber optic system tie in at Derby Junction.

The new 795 ACSR conductor and hardware will significantly increase all line ratings (the Summer Long Term Emergency [LTE] will rating by approximately 85%) and will extend the integrity of the transmission lines between Derby Junction and Ansonia Substation by a minimum of 40 years.

[7] UI proposes to use galvanized steel monopoles, which have a longer lifecycle than weathering steel monopoles. In addition, in the Project's urban/suburban area, the gray color of the galvanized steel poles typically is less visually intrusive than the rusty brown color of weathering steel poles. In addition, galvanized steel poles are cost-effective (approximately 5-10% less expensive than weathering steel poles).

Table 2-1: Existing and Proposed Rebuilt Structures, by Municipality and Structure Characteristics

Structure No.	Existing			Proposed		
	Structure Type	Structure Configuration	Structure Height (Feet)	Structure Type	Structure Configuration	Structure Height (Feet)
Shelton						
350	Part of New Design Only			Single Circuit H-Frame	CUSTOM	80/50
351	Double Circuit Lattice Tower	DCT	78.5	Double Circuit Steel Monopole	DCDE	95
352		DCT	78.5		DCT	100
353		DCT	78.5		DCT	100
354		DCT	78.5		DCT	100
355		DCT	78.5		DCT	100
356		DCT	78.5		DCT	100
357		Running Angle	78.5		DCDE	95
358		DCT	78.5		DCT	125
359 (Housatonic River crossing)		Deadend	140.5		DCDE	170
Derby						
360 (Housatonic River crossing)	Double Circuit Lattice Tower	Deadend	140.5	Double Circuit Steel Monopole	DCDE	170
1B (Indian Well Substation)	Single Circuit Steel Monopole	Deadend	75	Single Circuit Steel Monopole	SCDB	85
361A (Indian Well Substation)		Deadend	75		SCDA	85
361B (Indian Well Substation)		Deadend	65		SCDB	75
2A	Single Circuit Steel Wide Flange	SPCT	92		SPCT	110
2B	Part of New Design Only			Single Circuit Steel Monopole	SPCT	110
2	Single Circuit Steel Monopole	Deadend	90	Double Circuit Steel Monopole	DCDE[8]	100
3	Double Circuit Lattice Tower	Deadend	95	Structures 3A/B Replaces this Structure		
3A	Part of New Design Only			Single Circuit Steel Monopole	SCDA	110
3B					SCDA	110
4	Double Circuit Lattice Tower	Deadend	82.5	Structures 4A/B Replaces this Structure		
4A	Part of New Design Only			Single Circuit Steel Monopole	SPCB	115
4B					SPCB	115
5		Deadend	85		DCDE	115

[8] Additional structure needed to increase clearances to adjacent building facilities on B-Street

Structure No.	Existing			Proposed		
	Structure Type	Structure Configuration	Structure Height (Feet)	Structure Type	Structure Configuration	Structure Height (Feet)
6	Double Circuit, Lattice Tower	Deadend	75	Double Circuit Steel Monopole	DCDE	100
7		Deadend	85		DCT	115
8		Deadend	80		DCT	115
9		Deadend	87.5		DCDE	110
Ansonia						
10	Double Circuit, Lattice Tower	Deadend	85	Double Circuit Steel Monopole	DCT	120
11		Deadend	70		DCT	120
12		Deadend	79		DCT	110
13		Deadend	68		DCT	100
14		Deadend	86.5		DCDE	115
15		Deadend	84.5		DCT	110
16		Deadend	87.5		DCT	125
17		Deadend	78.5	Structures 17A/B Replaces this Structure		
17A	Part of New Design Only			Single Circuit Steel Monopole	SPDE	105
17B					SPDE	105
18	Double Circuit, Lattice Tower	Deadend	82.5	Strictures 18A/B Replaces this Structure		
18A	Part of New Design Only			Single Circuit Steel Monopole	SCDA	115
18B					SCDA	115
19	Double Circuit, Lattice Tower	Deadend	90	Structures 19A/B Replaces this Structure		
19A	Part of New Design Only			Single Circuit Steel Monopole	SCDB	105
19B					SCDB	105
20	Double Circuit, Lattice Tower	Deadend	74	Double Circuit Steel Monopole	DCT	135
20A/B	Single Circuit Steel Monopoles	Braced Post Tangent	90	Not needed per new design		
21 (Ansonia Substation)	Double Circuit, Lattice Tower	Deadend	87	Double Circuit Steel Monopole	DCDE	100

Key to structure configuration abbreviations:

- DCT=Single Pole Double-Circuit Tangent
- DCDE=Single Pole Double-Circuit Deadend
- SCDA=Single Pole Single-Circuit Deadend Type A (0 to 60° Angle)
- SCDB=Single Pole Single-Circuit Deadend Type B (60° and Greater Angle)
- SPCT=Single Pole Single-Circuit Tangent
- SPCB=Single Pole Single-Circuit Running Angle with Brackets
- SPDE=Single Pole Single-Circuit Deadend on Davit Arms

2.1.4 Proposed Rebuilt Structure Locations

The design of the rebuilt 115-kV lines reflects conformance to current NESC standards and consideration of terrain and land uses along and adjacent to the ROW. For the most part, the rebuilt structures will be located as close as practical to the existing structures, taking into account the need to maintain one of the 115-kV lines between Derby Junction and Ansonia Substation in-service at all times during Project construction.

The proposed locations of the new structures are illustrated on the aerial maps and Plan and Profile Drawings in Appendix A. As the Plan and Profile drawings illustrate, span lengths vary along the 4.1-mile route, but typically range from approximately 325 feet to 963 feet, depending on terrain. An exception is the Housatonic River span at 1,742 feet. The shortest spans (approximately 153 feet) are between the new structures near Indian Well Substation.

Potential locations for the rebuilt 115-kV structures were initially established using baseline structure spotting procedures. After conducting this baseline structure spotting, further analyses were performed that resulted in shifts to the initially identified structure sites. In general, proposed structure locations were aligned to:

- Avoid or minimize impacts with the surrounding built environment (i.e., buildings, adjacent electric distribution lines, roads) and to environmental resources (e.g., wetlands, watercourses).
- Avoid underground utilities identified during due diligence subsurface surveys.
- Avoid double-circuit outages by strategically aligning the new structures such that only a single-circuit outage will be required throughout Project construction.[9]
- Eliminate constructability concerns (structures were positioned, where possible, to avoid side-slopes and to accommodate future vehicle access to the monopoles for operation/maintenance purposes).

Structure locations within the ROW may be modified slightly as the Project design process advances. Future changes could occur based on information obtained from more detailed field studies (e.g., subsurface geotechnical investigations, final engineering and environmental surveys, constructability reviews), as well as input from municipalities, regulatory agencies, and the public.

[9] The 115-kV lines to be rebuilt for this Project serve a "load pocket" at the edge of UI's territory. To maintain electric service to customers in this area, one of the 115-kV circuits along the 4.1-mile ROW must remain energized at all times. Accordingly, each new structure has been aligned to avoid the need for double-circuit outages during Project construction.

2.1.5 Re-Connections to Derby Junction and Existing Substations

Like the existing 115-kV lines, the rebuilt 115-kV lines will connect to Derby Junction, as well as to UI's Indian Well and Ansonia substations.

UI does not propose any modifications at Derby Junction, other than to connect the rebuilt 1560-3 and 1808-2 lines to the Eversource transmission system and to remove the existing UI 115-kV lines connections. This work will be performed within the existing UI and Eversource ROWs at the junction.

At both Indian Well and Ansonia substations, UI proposes modifications within the station fence lines to link the rebuilt 115-kV lines to the substations. In addition, single-circuit monopoles will be installed directly outside each substation, as required to correctly align the phases of different circuits to the existing line terminal switches in each substation yard. Further, hardware modifications will be required on existing structures within each substation to accommodate the larger 795 kcmil conductor size, as well as the new OPGW and the associated OPGW fiber splice boxes. New underground fiber optic cable will be installed to connect the fiber at the OPGW splice box (either located within the substation or at a steel monopole outside, but adjacent to, the substation fence) to the control enclosure within each substation.

2.2 ROW AND PERMANENT / TEMPORARY EASEMENT REQUIREMENTS

UI's existing ROW generally is approximately 80 feet wide in Shelton and 50 feet wide in Derby and Ansonia, with some areas of varied width. However, along portions of the transmission line route in Derby, the ROW width is not specifically defined.[10]

2.2.1 Proposed ROW Width and Additional Permanent Easement Acquisition

For the Project, a typical ROW width of approximately 80 feet will be required. However, in various locations, including at the Housatonic River span and across Osbornedale State Park, the ROW will be wider. This ROW width is needed to conform to NESC specifications and Company standards (to accommodate the rebuilt 115-kV lines' wire, blowout, and vegetation removal in accordance with mandated electrical clearance standards).

[10] The areas of undefined ROW are located in the vicinity of Coon Hollow Road in Derby. In this area, DG&E initially owned various properties, including the lands on which the transmission lines are located and the lands that would become Coon Hollow Road. In the mid-1930s, DG&E sold the property to the City of Derby, reserving the rights for the transmission lines but not specifying a ROW width.

As illustrated on the Appendix A aerial maps and cross-section drawings, in certain areas, UI proposes to acquire new permanent easement adjacent to the existing ROW. Based on the current Project design, an estimated 9.9 acres of additional permanent easement will be required from property owners abutting the existing ROW. In addition, to expand the ROW across the Housatonic River from the existing 80-foot-wide area to 260 feet, approximately 4.6 acres of permanent easement (over water) will be required. An estimated 4.3 acres of the ROW will be within local road ROWs.

Table 2-2 summarizes the existing widths along the 4.1-mile ROW, as well as the width of the additional permanent easement that UI proposes to acquire in order to expand the ROW to meet current electrical clearance standards.

Table 2-2: Summary of Existing ROW Widths and Proposed ROW Expansion (Permanent Easement)

Municipality / Structure #s	Existing ROW Width (feet)	Additional Permanent Easement Required (estimated feet)
Shelton		
350-359	80	0 to 30
Shelton-Derby		
359-360 (Housatonic River Crossing)	80	30 to 180
Derby		
360-Indian Well Substation (1B, 361A/B)	80	25
Indian Well Substation to 3AB	Undefined	80
3AB-4AB	50	30
4AB-9	Undefined	80
9-10	50	30 to 70
Ansonia		
10-14	50	30-60
14-16	50	30-50
16-17A/B	40-50	30-40
17A/B-19A/B	50	30
19A/B-21 (Ansonia Substation)	50-100	0 to 50

Along the ROW, UI currently has easement rights from 82 property owners, including the cities of Shelton, Derby, and Ansonia. For example, from Derby Junction east to Meadow Street in Shelton (Structures 350-353), the ROW extends across municipal open space that is maintained in fields and forested vegetation. East of Coon Hollow Road in Derby (near Structure 8), the ROW traverses parcels used by the City's Department of Public Works.

In addition, in Derby and Ansonia, the 50-foot-wide ROW traverses approximately 1,465 feet across the northeastern portion of Osbornedale State Park. To maintain clearances between conductors and vegetation while taking into consideration the steep topography in this area, UI proposes to expand the ROW by approximately 60 feet to the west (acquiring 1.8 acres of additional permanent easement from CT DEEP).

Over the many decades since the ROW was initially established, homes and buildings have been developed near portions of the transmission line route. As a result, in some locations, the proposed permanent easement[11] will encompass portions of residential and commercial properties.[12] The ROW width that UI proposes reflects adherence to existing national and Company standards for safe transmission line operation. To the extent practical, UI has aligned the required ROW expansion to avoid residential and other developed areas; however, the density of development along the ROW in general poses constraints regarding the options for increasing the width of the permanent easement. In areas where permanent easements will be required, UI will coordinate with the affected landowners. Within the expanded easement area, UI will allow existing facilities (sheds, garages, pools, etc.) to remain but also plans to acquire easements, as it has done in the past, that would only allow rebuilding in the ROW within 18 months, if those existing facilities were substantially damaged or destroyed.

2.2.2 Permanent and Temporary Access Road and Work Pad Requirements

Although UI has operated and maintained the 4.1-mile transmission line ROW for decades, few existing permanent on-ROW access roads have been established. The ROW crosses various State and local roads, which UI traditionally has used, as necessary, for ingress/egress to the transmission facilities within the ROW. For the construction and subsequent operation/maintenance of the rebuilt 115-kV lines, UI also expects to use these State and local roads to provide access to the Project area and, where practical, directly to the ROW.

However, to construct the proposed Project, access roads will have to be established along the ROW. Specifically, access will be required to each new and existing structure site (where work pads must be established), as well as to pulling pads and guard structure locations. These access roads are required to allow the safe movement of the heavy construction equipment needed to install the rebuilt transmission lines and remove the existing 115-kV facilities.

[11] Includes areas where the existing ROW will be expanded and where permanent easement rights will be established in locations of presently undefined ROW.

[12] As illustrated on the Appendix A, 100 scale maps, these locations include near Structures 357 and 359 (Shelton), Structures 2A/2B, 3B, 4A/4B, 5, 6, 8 and 9 (Derby), and Structures 14, and 16-19A/19B.

In addition, in certain areas, access directly from the public roads that the ROW crosses will not be practical due to challenging terrain or other factors. Consequently, new temporary or permanent easements will be required to provide off-ROW access to portions of the ROW. Temporary access roads will be required only during Project construction, whereas the permanent access roads will be retained to facilitate the long-term maintenance of the rebuilt 115-kV lines.

The temporary and permanent on-and off-ROW access roads that UI proposes to use for the Project are illustrated on the Appendix A aerial-based maps. Details regarding both temporary and permanent access road construction (width, material) are described in Section 3 of this Exhibit.

2.3 ESTIMATED PROJECT COSTS AND FACILITY SERVICE LIFE

The estimated capital cost for the siting, design, and construction of the Project is approximately $57.2 million. The rebuilt transmission lines are expected to have a service life of approximately 40 years.

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3. PROPOSED CONSTRUCTION AND OPERATION/MAINTENANCE PROCEDURES

3.1 INTRODUCTION AND OVERVIEW

UI will construct, operate, and maintain the rebuilt 115-kV transmission lines in full compliance with NESC standards, the Institute of Electrical and Electronic Engineers (IEEE) and the American National Standards Institute (ANSI); good utility practice; and UI's technical specifications, final engineering plans, and the conditions of regulatory and siting approvals obtained for the Project. This section describes the procedures and methods that UI will use to construct, operate, and maintain the rebuilt Project facilities, as well as to remove the existing 115-kV lines and infrastructure. The section also reviews UI's protocols for the reliability, safety, and security of the transmission system. The Project will consist of the following components:

- Rebuild the 115-kV transmission lines, primarily in a double-circuit configuration[13], on galvanized steel monopoles.
- Interconnect the rebuilt lines to UI's existing Indian Well and Ansonia substations and to Derby Junction.
- Remove the existing 115-kV transmission line facilities (structures, wires, hardware).
- Restore the areas temporarily affected by construction (access roads, work pads) to approximate pre-construction conditions, to the extent practical, by regrading and, as appropriate, by seeding and re-vegetating. Stabilize (regrade, establish permanent erosion and sedimentation controls) any permanent access roads or work pads.

Sections 3.2 through 3.6 describe the construction procedures that will apply to the overall Project, including both standard methods and protocols specifically designed to minimize impacts during work in environmentally sensitive areas such as across wetlands, watercourses, and agricultural fields. Procedures are described for the 115-kV line rebuild work, interconnections of the rebuilt 115-kV lines to Derby Junction, Indian Well Substation, and Ansonia Substation, as well as the removal of the existing 115-kV facilities. Section 3.7 summarizes UI's approach for construction monitoring, while

[13] In some locations, such as at angles, to establish the rebuilt 115-kV line connections to Indian Well and Ansonia substations, and to address constructability constraints, single-circuit monopoles will be installed.

operation and maintenance procedures applicable to the 115-kV facilities are described in Section 3.8. Data regarding the Project's reliability, safety, and security is included in Section 3.9.

This section describes the construction, operation, and maintenance procedures that UI currently proposes. However, as required by the Council's regulations, after Council approval of this Project but prior to the commencement of construction activities, UI will prepare and submit a Project-specific Development and Management (D&M) Plan to the Council for review and approval. Project construction will be performed in accordance with the procedures described in the D&M Plan, which will reflect conformance to the conditions of the Council's approval of the Project, as well as compliance with other regulatory requirements and UI technical specifications. UI will monitor and perform inspections of Project construction activities for conformance to these requirements.

3.2 GENERAL CONSTRUCTION SEQUENCE AND SUPPORT AREAS

3.2.1 Typical Construction Sequence

In general, the transmission line rebuild work will involve standard activities, as summarized generally in Table 3-1 and discussed in Sections 3.3 and 3.4. However, for this Project, construction will be carefully sequenced to keep one of the 115-kV circuits between Derby Junction and Ansonia Substation energized at all times in order to maintain electric service to customers. As a result, UI anticipates that construction will generally be performed in the following sequence[14]:

- De-energize one side of the 115-kV circuits on the existing lattice towers/other structures.
- Remove the existing de-energized conductor, insulators, OHSW, and lattice cross arms from one side of the existing double-circuit structures.
- Install new structures, davit arms, conductor and OHSW/OPGW.
- Energize the rebuilt 115-kV circuit on the new structures.
- De-energize the remaining 115-kV circuit on the existing structures.
- Remove the remaining 115-kV line and associated hardware; dismantle and remove the existing structures from the ROW.
- Install the second set of new conductors, hardware, and OHSW/OPGW on the new double-circuit structures (in locations of paired single-circuit monopoles, install the second new monopole).

[14] Between Structure 360 and Indian Well Substation (in Derby), the existing UI distribution lines located along the west side of State Route 34 (Roosevelt Drive) will be relocated to the west side of the road to avoid construction conflicts and to facilitate the maintenance of the rebuilt 115-kV lines.

Table 3-1: General Project Construction Sequence

Typical Pre-Construction Activities
• Survey and stake construction work areas, edge of UI ROW, and proposed structure locations
• Confirm and re-flag environmental resource areas (e.g., wetland and watercourse boundaries) or other sensitive areas to be avoided or where special construction procedures will apply
• Mark vegetation clearing limits along the ROW
• Locate and mark utilities crossed by or along the ROW
Typical Construction Activities*
• Prepare approved laydown/material staging/contractor yard(s) to support the construction effort
• Clear vegetation along the ROW as necessary and install temporary erosion and sedimentation controls around work sites as needed
• Install temporary construction matting as needed for access across wetlands, small watercourses, agricultural areas, or other environmentally-sensitive locations
• Establish or upgrade any required access roads to provide ingress/egress to the new monopole sites and to existing structures to be removed
• Create a level work pad at each structure site, as well as at conductor pulling sites and if necessary, at guard structure sites
• Take outage on the 115-kV circuit located on one side of the existing double-circuit structures; the other 115-kV circuit will remain energized
• Remove the existing de-energized conductor, as well as associated insulators, OHSW, and cross-arm supports (as needed) from the existing double-circuit structures
• Install new structure foundations and assemble/erect new structures; new structure will be offset in transverse direction from the center of existing lattice towers to maintain adequate working clearances from the existing energized conductors
• Install new insulators, conductors, OHSW, and OPGW (for one circuit side of the new structures)
• Install rebuilt 115-kV line connections to Derby Junction and UI substations (for one circuit side)
• Energize the rebuilt 115-kV circuits (on one circuit side of the new structures) to provide service between Derby Junction, Indian Well Substation, and Ansonia Substation
• Take outage on the remaining legacy 115-kVcircuit located on the other side of the existing double-circuit structures
• Remove the remaining legacy 115-kV line wires, conductor, insulators, and OHSW from the existing double-circuit structures
• Dismantle and remove from the ROW the old lattice steel towers and other structures
• Install new insulators, conductors and OHSW/OPGW on the other side of the new structures
• Energize the rebuilt 115-kV circuits on the remaining side of the new structures
• Remove temporary construction access roads and work pads; stabilize permanent access roads / work pads and install/upgrade permanent erosion/sedimentation controls where required
• Perform final clean-up and restore/stabilize areas affected by construction (e.g., by seeding and re-vegetating as needed)
• Maintain erosion and sedimentation controls until areas affected by construction are verified to be restored/stabilized

*Note: This list represents UI's anticipated construction tasks; actual outage and construction sequences may vary in any one location along the ROW. However, continuous 115-kV service between Derby Junction, Indian Well Substation, and Ansonia Substation will be provided throughout construction.

Temporary poles and other temporary work may be required to assure that a single-circuit remains energized during Project construction. Additional details regarding construction procedures and sequencing, including the need for any temporary poles along the ROW, will be provided in the Project's D&M Plan. During construction, certain work activities and sequences may vary, based on

factors such as final Project design, weather, and the conditions of the Council's or other agencies' regulatory approvals.

3.2.2 Laydown/Material Staging Area/Contractor Yard(s), including Field Office

To support the 115-kV line rebuild work, one or more temporary construction laydown/material staging areas/contractor yards will be required. Typically, such sites are not identified until a few months prior to the start of construction. As a result, the laydown/material staging/contractor yard will either be included in the Project D&M Plan or UI will submit the proposed yard site(s) separately to the Council for review and approval prior to use.

Generally, a primary laydown/material staging area/contractor yard typically requires approximately 2-5 acres to accommodate space for construction field office trailers and parking, as well as for storing Project materials, staging construction equipment and supplies, fractionization tanks (used for temporarily storing water removed from 115-kV structure foundation excavations), and temporarily stockpiling materials removed from the old 115-kV facilities prior to appropriate off-site reuse or disposal. The laydown/material staging area/contractor yard also will provide a site for marshalling construction crews, holding daily safety meetings, and assigning daily work.

The preferred location for Project laydown/material staging areas/contractor yards is within or in the general vicinity of the ROW, on UI property, or at existing nearby vacant or underdeveloped commercial or industrial sites. In addition, UI will use the Indian Well and Ansonia substation properties for staging Project work regarding the 115-kV line connections to the substations.

3.3 STANDARD OVERHEAD TRANSMISSION LINE CONSTRUCTION PROCEDURES

The Appendix A aerial-based maps and cross-section drawings illustrate the proposed Project construction areas. In particular, the maps and drawings identify:

- The width of the existing UI ROW;
- Existing property boundaries and locations where UI proposes to acquire additional permanent easements;
- Locations of the existing 115-kV structures to be removed and the planned placement of the new 115-kV monopoles;
- Areas of planned tree clearing;

- The anticipated alignments of access roads and work pads, both on- and off-ROW; and
- The proposed composition of access road and work pads, including areas where temporary construction matting, in lieu of gravel, will be used to minimize impacts to environmentally sensitive areas, such as wetlands, and agricultural areas.

The following subsections describe UI's standard construction procedures for rebuilding the 115-kV lines and removing the existing transmission facilities. This information is based on UI's current Project plans. More detailed construction information will be provided in the D&M Plan.

3.3.1 Pre-Construction Surveys and Vegetation Removal

Prior to the commencement of construction, UI will perform surveys to mark the ROW boundaries and new structure locations, as well as to clearly flag or otherwise demarcate the boundaries of sensitive environmental resources (e.g., wetlands, watercourses). UI also will survey and appropriately mark the areas of the ROW where vegetation must be removed.

Existing vegetation will be removed from Project construction sites (including access roads and work pads) as required to provide ingress/egress for construction equipment and from areas of the permanent easement as needed to maintain clearance from the rebuilt 115-kV line conductors. The existing vegetation that must be removed for the Project consists of both scrub-shrub species within the portions of the ROW that UI currently maintains (consistent with the Company's transmission line vegetation management procedures), as well as mature trees, most of which are located within UI's proposed additional permanent easement. Overall, UI estimates that approximately 6 acres of trees[15] will be cleared for the Project.

In addition, in certain areas, "danger trees" or "hazard trees", which are trees deemed a potential risk to the overhead 115-kV lines, may need to be trimmed or removed.[16] Such danger or hazard trees, which may be situated on private property outside the UI ROW, would typically be identified after the rebuilt lines are installed. If danger or hazard tree trimming or removal is required outside the ROW, UI will coordinate with the affected property owner.

[15] Mature trees are defined herein to consist of tall-growing vegetation typically greater than 6 inches diameter breast height (dbh). Of the 6 acres of trees to be cleared, an estimated 5.6 acres will be managed in low-growing vegetation, consistent with overhead transmission line operation; 0.4 acre will be allowed to revegetate naturally, including regrowth of trees.

[16] 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 lines. 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 lines.

Vegetation clearing and grubbing will be accomplished by conventional methods, using a combination of chain saws, hand labor, and mechanized equipment. Typically, trees will be directionally felled to minimize impacts. As currently planned, all vegetative materials cut will be removed and disposed of properly, outside of the Project area, unless another disposition method is requested by the property owner. For example, if requested by the landowner, the timber portions of the trees could be left on the landowner's property, in upland areas on the edge of the ROW.

Matting, comprised of timber or composite materials, will be used to cross agricultural land, wetlands, and watercourses, as well as to access wetland areas where vegetation clearing is required. For use at water resource crossings, the mats will be cleaned prior to use to avoid the spread of invasive wetland species. Cut vegetation will not be felled into watercourses or wetlands. In wetlands, trees and brush will be cut flush with the ground surface and the stumps will be left in place unless removal is required for Project construction. All other cut vegetation will be removed from wetland areas.

Typically, temporary erosion and sedimentation controls will be installed after initial vegetation removal and in advance of earth disturbance activities, such as grubbing, stump removal, and the establishment of access roads / work pads. All erosion and sedimentation controls will be installed and maintained in accordance with Project-specific and Connecticut requirements, including the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*; the *2004 Connecticut Stormwater Quality Manual*; the CT DEEP *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities* (General Permit); and the Stormwater Pollution Control Plan (SWPCP) that UI will prepare for the Project, pursuant to the General Permit.[17] (Refer also to the discussion regarding erosion and sediment controls in Section 3.4.)

Erosion and sedimentation controls will be inspected and repaired or replaced as necessary until the areas affected by the Project are stabilized, all conditions of the SWPCP/General Permit are met, and UI submits to CT DEEP a Notice of Termination regarding the General Permit.

[17] Pursuant to Conn. Gen. Stat. Section 22a-430b, construction activities, such as the Project, which will result in the disturbance of 1 or more total acres of land area must comply with the CT DEEP's General Permit. Pursuant to the requirements of the General Permit, prior to the start of construction, UI will submit to CT DEEP a Registration Form and will prepare a SWPCP that details stormwater management and erosion/sedimentation control measures for the Project construction.

3.3.2 Access Roads and Work Pads

The Appendix A maps identify the locations of the access roads and work pads that UI proposes to use for Project construction, as well as the access roads that UI proposes to retain permanently to facilitate the maintenance of the rebuilt 115-kV lines. To further expedite future line maintenance work, at some new structure sites in non-agricultural upland areas, UI proposes to leave portions of the gravel work pads in place. The locations permanent access roads and work pads will be shown in the D&M Plan.

Access Roads

To access Project work sites, UI will use a combination of public roads and proposed or existing access roads within or near the ROW. Access will be required to each new structure site, as well as to reach the existing 115-kV structures to be removed. Because portions of the 115-kV route are characterized by challenging topography (steep terrain, rock outcrops) that make linear construction access within the ROW difficult, UI proposes to use off-ROW access roads, as necessary, to provide safe ingress/egress to Project work sites, while avoiding or minimizing adverse environmental impacts.

Access roads may be permanent or temporary and will consist of materials appropriate to the different characteristics of the Project areas traversed (e.g., upland, wetlands). To minimize or avoid the potential for soil to be tracked from Project work sites onto public roads, rock "aprons", track pads, or equivalent stabilization will be established at the entrances/exits to work sites from public roads.

Access roads across wetlands and watercourses will be temporary and will be comprised of timber mats or equivalent. Access roads in uplands typically will consist of gravel, although construction mats will be used in agricultural lands. Typically, Project construction access roads will be approximately 16-20 feet wide. However, in some areas, roads will be wider to accommodate equipment turning and passing or to account for terrain. UI will also use existing access (e.g., paved or graveled areas), where available. Existing paved access is not expected to require significant upgrades, whereas existing non-paved access may require the addition of gravel or asphalt patch.

UI expects that permanent access roads will be required in certain areas to provide ingress/egress for operation and maintenance work along the rebuilt 115-kV lines.[18] Based on current plans, UI proposes permanent access roads as follows:

[18] UI will obtain appropriate Federal and State regulatory approvals for permanent access roads that affect water resources.

- **Shelton**. Between Structures 355-357: final plans for permanent access will be coordinated with the landowner and predicated on the need to provide access for agricultural use.

- **Ansonia.** Between Structures 12-13 (on UI property) and to reach Structure 19 (due to challenging terrain).

Permanent access roads typically will consist of gravel and will be approximately 12 to 16 feet wide.

Work Pads

Construction work pads will be required both to install the new monopoles and to remove the existing 115-kV structures. Work pads, which also will be required at conductor and OPGW pulling sites, will consist of construction mats (timber or equivalent) or gravel. The following describes the typical sizes of work pads expected to be required for the Project construction. The specific dimensions of each work pad and pull pad will be refined based on final constructability and engineering data; such information will be provided in the D&M Plan.

The size of each work pad will vary based on location. In general, the typical work pad for installing a new monopole and removing the adjacent lattice structure will be approximately 80 feet by 150 feet; however, specific work pad dimensions will vary by location, taking into consideration topography. The work pads will be used to stage structure components for final on-site assembly, to provide a safe, level base for the construction equipment used to install foundations, and to erect the structures. To establish work pads, grading will be performed as needed. Construction matting will be used for work pads that must be installed (in whole or in part) within wetlands and in agricultural areas; matting also may be used in other areas, as appropriate.

Pads for conductor pulling also will be required at certain locations along the ROW. These pull pads are expected to be approximately 80 feet by 400 feet.

Temporary work sites also will be required adjacent to the various roads spanned by the 115-kV lines. During conductor/wire removal and installation across roads, UI will park cranes with elevated booms ("boom trucks") or may install temporary poles (referred to as "guard structures").

The boom trucks/guard structures will be positioned to prevent the conductor/wire from reaching the ground in the event of an issue during the crossing work. Typically, boom trucks will be positioned on road shoulders or – in some cases – within a part of the road (requiring a temporary lane closure).

Guard structures, if required, are generally installed on small work pads that are typically 50 feet by 80 feet, with an associated access road if needed.

UI anticipates that in upland areas, portions of the gravel work pads used during Project construction will be left in place to provide a stable base for the performance of transmission line operation and maintenance activities. Such work pads are estimated to be approximately 30 feet by 60 feet but may vary by location.

3.3.3 Foundation and Structure Installation

Foundation Installation

The new monopoles are expected to be installed primarily on drilled pier foundations[19]. Such foundations will average 15-35 feet in depth, although some foundations may be almost 50 feet deep. The depth of the foundations will depend on subsurface conditions and the type of structure. Spoils generated from the drilling process will be managed pursuant to a Materials Management Plan that UI will prepare for the Project (refer to Section 3.6.1 for additional details regarding this Plan).

Auger drilling will be used to perform the excavations for the drilled pier foundations. The size of each excavation typically will be 6-12 feet in diameter. Casings, or equivalent, may be used to provide soil support as needed to complete the excavation work and place concrete. The casing may be removed from the pier foundations as concrete is placed or soon thereafter.

Once the excavation is complete, steel reinforcing bars and an anchor bolt cage will be placed in the excavation and encased in concrete. The concrete will be conveyed from the mixer to the place of the final deposit by methods that will prevent the separation or loss of material. Any water displaced during the concrete pour will be managed according to standard UI procedures. Field tests of the concrete will be conducted regularly. In general, as an indication of other physical properties, the quality of the concrete being produced will be judged by the compressive strength developed within a given period.

Structure Assembly and Installation

After the structure foundation is in place and the concrete is cured, the steel transmission monopole will be assembled and erected. Structure components will be delivered to work pads and then assembled on site. Structures will not be erected on the concrete piers for a minimum of 14-28 calendar days after

[19] Direct embed structures and structures supported by pile type foundations may be installed in certain locations, pending the results of further engineering analyses.

the concrete has been poured and until the compressive strength of the concrete has reached 4,500 pounds per square inch (psi).

The galvanized steel monopole structures may be assembled on the ground and erected as a complete unit or assembled in pieces with a crane. Once a structure is erected and framed with the support insulators and hardware, it will be ready for the installation of the overhead lines. Conductor pulling blocks, which are a required tool to install the new OPGW, OHSW, and conductor, will also typically be installed at this time.

Structure Grounding

Each transmission line structure will be grounded, prior to energization of the rebuilt 115-kV lines, to provide a path for the energy from lightning discharges to enter the earth and safely dissipate. The foundation of each transmission line structure will provide some natural grounding through contact to the surrounding earth. However, to provide further protection, a minimum of two ground rods, and associated ground conductor, will be buried adjacent to each foundation. Typically, the ground rods will be installed after the completion of the foundation and before the installation of the structure. The need for and location of additional ground rods will be determined by the construction contractor.

3.3.4 Conductor, OHSW, and OPGW Installation

The installation of the overhead line conductors, OHSW and OPGW will require the use of pulling and tensioning equipment, as well as reels of conductor, which will be positioned at temporary pulling work pads along the transmission line route. Helicopters may be used to install pulling ropes at the commencement of the conductor/OPGW pulling process, or to install marker balls on the lines at the Housatonic River crossing. To maintain clearance at road crossings during conductor and OPGW installation, temporary guard structures or boom trucks will be positioned adjacent to the crossings, as described in Section 3.3.2.

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 strain and dead-end structures. Finally, the conductors, OHSW, and OPGW will be pulled to their design tensions and attached to the hardware. Linemen in bucket trucks will perform this operation.

3.3.5 Cleanup and Restoration

Cleanup and restoration activities will include the removal from Project areas of construction debris, signs, flagging, and fencing, as well as temporary (i.e., timber mat or equivalent) work pads and access roads. Areas affected by construction, including contractor laydown/material staging yards, will be restored and stabilized, as appropriate, to approximate pre-construction conditions (e.g., seeded, graveled, repaved as necessary) and in accordance with UI's SWPCP requirements, as applicable. As discussed in Section 3.3.2, some gravel access roads are expected to remain in place permanently to facilitate future UI operations and maintenance activities (refer to the Appendix A maps).

All temporary work pads and access roads will be removed from wetlands. Timber mat bridges (or equivalent) used to provide construction access across small streams will similarly be removed. Wetland areas affected by construction will be either allowed to revegetate naturally, reseeded with a temporary annual seed mix (such as annual rye for inland wetlands) that will promote stabilization, or reseeded with appropriate wetland seed mixes. In areas within the conductor clearance zones, wetland vegetation will be managed to promote low-growing wetland species consistent with the operation of the rebuilt overhead 115-kV lines.

Materials used in work pad construction, as well as other construction debris, will be removed and will either be properly disposed of or otherwise re-purposed. In areas subject to erosion, temporary erosion and sedimentation controls will remain in place until permanent stabilization is achieved, pursuant to the requirements of the CT DEEP General Permit and the Project-specific SWPCP.

The materials from the existing 115-kV facilities that will be dismantled initially may be temporarily stockpiled at Project staging areas. Ultimately, these materials will be recycled or disposed of properly.

3.4 DERBY JUNCTION AND SUBSTATION CONNECTIONS

The rebuilt 115-kV lines will be connected to the Eversource transmission system at Derby Junction, as well as to UI's Indian Well and Ansonia substations. All activities involving the connection of the rebuilt 115-kV lines to the substations will be performed within the existing fenced portion of each station. The Project will include hardware modifications and new OPGW[20] splice boxes at the take-off structures at both substations.

[20] OPGW will be installed on the 1808-2 and 1594 lines; OHSW will be installed on the 1560-3 Line.

UI's work at Derby Junction will consist of removing the existing 115-kV lines and connecting the rebuilt lines to existing Eversource Structure 1364. All work will be performed within the UI or Eversource ROWs. UI has been actively collaborating with Eversource regarding the Project plans for this critical tie-in point.

At Indian Well Substation, hardware modifications will be performed to the H-frame structures on the line termination side, up to the switch attachment location. In addition, two new fiber splice boxes will be installed to terminate the OPGW fibers for the 1594 and 1808-2 lines on two existing H-Frame structures inside the substation fence. From these structures, all dielectric self-supporting (ADSS) fiber (72 fiber for the 1594 Line and 96 fiber for the 1808-2 Line) will be encased inside separate inner ducts, which will extend to the control/switchgear enclosure through the backup cable trench. The ADSS fiber will be terminated into separate fiber patch panels in the control/switchgear enclosure.

At Ansonia Substation, hardware modifications will be performed to the A-frame structure on the line termination side, up to the switch attachment location. In addition, one new fiber splice box will be installed to terminate the OPGW fibers for 1594 Line on an existing A-frame structure inside the substation fence. Underground 72-fiber ADSS for the 1594 Line will be encased inside inner ducts, which will extend to through the existing (secondary) cable trench before terminating at the fiber patch panel inside the control enclosure.

3.5 REMOVAL OF EXISTING 115-KV FACILITIES

The existing UI structures to be removed from the ROW are listed in Table 2-1 and identified on the Appendix A maps. Access will be required to reach each of the existing 115-kV structures to be removed. Work pads also will be needed at each of these locations.

In general, the conductors and OHSW will be removed - first from one circuit [set of conductors] and then from the other. The existing structures will be dismantled and removed after one of the rebuilt lines is placed in service. As summarized in Section 3.2.1, special construction sequencing will be required for outage logistics. In order to maintain a single circuit outage, initially only one of the circuits (and associated hardware) on the existing structures will be removed to maintain energization to a single circuit. Once the new structures are installed and the lines energized, the existing structures will be completely dismantled and removed from the ROW. Details regarding the removal of the existing 115-kV facilities will be included in the D&M Plan, after construction sequencing plans are finalized.

UI expects to recycle all the steel materials and to properly repurpose, recycle, or dispose of other miscellaneous hardware and materials from the existing 115-kV lines. Removal activities will typically include dismantling the towers and recycling materials to the extent practical. Materials that cannot be recycled or reused will be disposed of properly. (Refer to Section 3.6.6 for additional information.)

3.6 SPECIAL CONSTRUCTION AND BEST MANAGEMENT PROCEDURES

During construction in site-specific locations, UI will implement the procedures described in this section, as required to address constructability issues or to avoid or minimize Project impacts. These procedures may be modified to reflect the conditions of Project-specific approvals that will subsequently be obtained from State and Federal regulators. Final procedures will be included in the Project D&M Plan.

3.6.1 Erosion/Sedimentation Control and Stormwater Management

UI will install and maintain erosion and sedimentation controls to avoid or minimize the potential for surface water runoff, erosion, and sedimentation to occur outside of the work limits. These measures will conform to any Project-specific permit conditions from CT DEEP and the U.S. Army Corps of Engineers (USACE); applicable regulations concerning soil and erosion/sedimentation control and stormwater management, including CT DEEP's General Permit, the *2002 Connecticut Guidelines for Sedimentation and Erosion Control*, and the *2004 Connecticut Stormwater Quality Manual;* and the provisions of the Project SWPCP.

UI also will prepare a Materials Management Plan that will provide specifications, to be followed by the Project construction contractor, for the handling of excess soil, spoil, metals, and groundwater generated during Project construction, such as from grading, excavating for structure foundations, and dismantling/ removing the legacy structures (refer also to Section 3.6.6).

3.6.2 Water Resource Crossings

The Project ROW encompasses 10 watercourses (including the Housatonic River) and 10 wetlands. No new structures will be located in any watercourses or wetlands; however, certain construction activities will unavoidably be required in certain water resources, as described below and illustrated on the Appendix A maps.

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 Project technical plans and specifications. Sections 5.2 and 6.3 provide more specific information regarding the locations and types of water resources in the Project area and the water resources that will be affected by construction activities.

Watercourse Crossings

During Project construction, temporary access, involving the installation of construction mats (timber or equivalent) will be required across three small streams. The Appendix A maps identify the locations of watercourse crossings and indicate where temporary mat bridges or equivalent will be installed along access roads and to allow work pads to span streams, as well as the locations where a permanent access road will cross one intermittent watercourse (WC2 in Shelton) in two locations (requiring two permanent culverts). In total, the permanent culverts will result in an estimated 0.03 acre of permanent impact (fill) in the intermittent stream.

The construction techniques used at each watercourse crossing will be in accordance with Project permits and also will depend on site conditions at the time of construction and whether the crossing is permanent or temporary. Any crossings will be placed or sized to maintain water flows and avoid or minimize the potential for flooding. UI will install the two proposed permanent culverts at the intermittent stream pursuant to the conditions of permits obtained from CT DEEP and/or USACE.

Appropriate erosion control measures will be deployed to avoid and/or minimize impacts at watercourse crossings. The rebuilt 115-kV transmission lines will span all the watercourses along the Project route.

Wetland Crossings

UI has designed the Project to avoid or minimize impacts to wetlands to the extent practical. Of the 10 wetlands within the ROW, only four will be affected by the Project as a result of tree removal, temporary access roads/work pads, and the two permanent culverts.

Tree clearing, totaling 0.01 acre, will be required in only one wetland (W-5 in Shelton). The 0.01 acre of existing forested wetland vegetation will be permanently converted to shrub-scrub wetlands, pursuant to UI's ROW vegetation management procedures. In addition, the installation in wetlands of construction access roads and work pads (consisting of timber mats or equivalent) will result in

approximately 0.14 acre of temporary impacts to wetlands (0.12 acre for temporary access roads and 0.02 acre for work pads). Approximately 0.04 acre of wetland (W4 in Shelton) will be permanently filled as part of the installation of the two permanent culverts across intermittent stream WC2.

3.6.3 Wetland Invasive Species Control Methods

To minimize the potential spread of invasive wetland species, UI will require its contractors to implement standard procedures, such as ensuring that construction mats are cleaned prior to being brought to Project work sites or transferred from one Project wetland to another. Details regarding UI's proposed wetland invasive species control methods will be provided in the Project D&M Plan.

3.6.4 FEMA Flood Zones

Near the Housatonic and Naugatuck rivers, the Project will extend across 100- and 500-year floodplains identified by the Federal Emergency Management Agency (FEMA). Certain new monopoles will be located in these FEMA-designated floodplains. However, no new monopoles are planned for location in FEMA-designated floodways.

One of the four existing lattice tower footings for Structure 360 (Derby) is located in the Housatonic River designated floodway; the other three footings are in the 500-year floodplain. The rebuilt Structure 360 will be located slightly to the east, in the 500-year floodplain. All existing and proposed structures at and directly east of Indian Well Substation are within the river's 100- or 500-year floodplain. In Ansonia, a portion of the ROW between Structures 19A/B and 20 is within the Naugatuck River's 500-year floodplain. Ansonia Substation is west of the Naugatuck River, within an area identified by FEMA as having a reduced risk of flooding due the presence of a levee along the river. Sections 5.2 and 6.3 provide additional information about the Project location in relation to floodplains.

In locations where structures must unavoidably be located in FEMA-designated floodplains, UI will design and install the new monopoles with extended foundation reveals to withstand any foreseeable major flood events.

3.6.5 Rock Removal

In some areas along the ROW (particularly in Derby and Ansonia), bedrock will be encountered at shallow depths. UI currently expects to use mechanical measures (e.g., hoe ramming, chipping) to remove bedrock as necessary to create level work pads or access. However, based on the depth, extent,

and type of bedrock identified during detailed subsurface studies of the Project route, it is possible that controlled blasting could be required in some areas.

If controlled blasting is necessary, UI will retain a licensed blasting contractor to develop a blasting plan for the Project. The resulting plan, which will be provided to the municipal fire marshal and the CSC, will comply with State and local regulations, and will take into consideration geologic conditions, as well as the locations of nearby utilities and land uses. The blasting plan typically will contain information about the work to be performed, schedule, safety, noise and vibration monitoring, pre- and post-blast inspections, and traffic control measures, as warranted. Detailed information regarding the contents of a blasting plan, if required, will be included in the Project's D&M Plan. If the need for controlled blasting is determined after the submission of the D&M Plan, UI will provide the blasting plan separately to the Council for approval.

3.6.6 Soils, Groundwater, and Materials Testing and Management

As part of the Project planning process, UI performed field sampling and analyses programs to characterize soils and groundwater along the Project ROW and to identify the materials in the paints and coatings on the existing transmission line structures that will be dismantled and removed from the ROW. These studies were designed to provide information for use in both the Project design and the management of materials during Project construction.

Soil and Groundwater Management. The objective of the soils and groundwater sampling and analysis program was to assess subsurface conditions, not only for structure foundation design purposes, but also to determine the appropriate methods for managing excavated soils and groundwater encountered during construction. Materials excavated during the Project construction process will be managed in accordance with Connecticut Guidelines for Soil Waste Management and the numeric criteria in the Connecticut Remediation Standard Regulations. Based on the results of the Project-specific studies, UI anticipates that some excavated materials will be loaded directly into dump trucks and then transported for disposal or management at an approved off-site location.

In some locations, topsoil or spoils may be temporarily stockpiled at work sites. Such materials will be contained within appropriate erosion and sediment controls (e.g., straw bales, silt fence) and may be covered with poly/plastic, pending off-site disposal or re-spreading over work sites as part of restoration. Soil and subsoil stockpiles also may be reseeded for temporary stabilization with an annual

seed mix (e.g., annual rye or equivalent), pending final restoration. UI will protect stockpiled soils/subsoil materials in accordance with the procedures in the D&M Plan and Project SWPCP.

Structure Removal Materials Management. The lattice steel towers that will be dismantled and removed as part of the Project are almost 100 years old. As a result, UI conducted an extensive sampling and analysis program designed specifically to characterize the paint and other coating materials, not only on the lattice towers, but also on all other structures to be removed as part of the Project. The purpose of this sampling and analysis program was to provide input to the protocols for safely dis-assembling, removing from the ROW, and recycling or otherwise disposing of the materials that comprise the existing structures.

Samples were taken and analyzed from each of the existing structures. The results of the sampling and analysis revealed that the paint on the structures contains lead and other heavy metals. Paints containing these materials were historically used for various purposes, including electric transmission structure coatings. The sampling and analysis program also identified asbestos coating on one lattice tower (Structure No. 360 near the Housatonic River in Derby).

UI will use the results of the sampling and analysis to develop protocols for structure dismantling, removal from the ROW, and appropriate recycling or disposal. Such protocols will be described in the Project's D&M Plan. In general, however, UI anticipates that each structure will be carefully dismantled into manageable pieces, which then will be lowered to the ground within the ROW adjacent to the structure site. Subsequently, the structure pieces may be further dismantled or cut for removal and transport to an approved recycling or disposal facility. This work will be performed by contractors trained and licensed in the management of materials containing the paints and coatings found on the towers. Any hazardous materials will be handled by appropriately licensed contractors.

During Project construction, UI is committed to maintaining the safety of both the public and its workers and to protecting environmental resources. UI will hire contractors licensed to dismantle and remove facilities with the paints and coatings found on the structures. In addition, UI will retain an independent environmental health and safety contractor to monitor the structure removals. All work will be performed in accordance with strict protocols for maintaining community and worker safety and protecting the environment, including the use of best management practices for controlling potential air emissions and dust. During activities that may disturb the structure coatings, UI will perform air monitoring as necessary to verify the effectiveness of the structure removal procedures.

Further, UI will adhere to standard protocols for properly handling, transporting, and disposing of all materials from the dismantled structures.

3.7 CONSTRUCTION MONITORING

After the Council's certification of the Project, UI will prepare and submit a D&M Plan to the Council for review and approval. The D&M Plan will detail Project construction procedures, incorporating the methods that will be implemented to conform to the specific conditions of the Council's approval and the requirements of other State and Federal permits, as applicable.

During construction, UI will assign field inspectors to verify that the Project is developed in accordance with both regulatory requirements and UI standards. Prior to the start of Project construction, UI also will prepare and submit to CT DEEP a Project SWPCP, which will require monitoring of the work by a qualified inspector. Project areas will be inspected both routinely (on a weekly basis during construction) and after heavy rain events, as defined by the General Permit. Pursuant to the SWPCP, after the installation of the rebuilt 115-kV lines, monitoring will be performed to verify the effectiveness of ROW stabilization measures. Such monitoring is expected to be conducted for one growing season following the completion of stabilization.

3.8 OPERATION AND MAINTENANCE PROCEDURES

UI will operate, monitor, and maintain the rebuilt 115-kV facilities in accordance with standard Company procedures, required industry standards, and good utility practice.

3.9 PROJECT FACILITIES RELIABILITY, SAFETY, AND SECURITY INFORMATION

The Project will be designed in accordance with sound engineering practices, constructed in compliance with UI design standards and that of the NESC and good utility practice. The rebuilt facilities will be maintained pursuant to UI's Operating Procedures, which are in conformance with industry standards, regulations, and best practices.

3.9.1 Protective Equipment

The Project design includes connecting existing protective relaying equipment, which automatically detects abnormal system conditions and isolates the faulted section of the transmission system, to new OPGW fibers which will provide a robust and reliable communications path for the protective relaying systems. The protective relaying and associated equipment, along with a Supervisory Control and Data

Acquisition (SCADA) system for 24/7 remote control and equipment monitoring, will be housed at UI's System Operations Center.

3.9.2 Substation Security, including Fire Suppression Technology

UI's existing substations are already gated and equipped with lighting to facilitate work at night under emergency conditions or during inclement weather. Further, the perimeter of each substation is entirely enclosed with a 14-foot high chain-link fence topped with approximately 1 foot of barbed wire to discourage unauthorized entry and vandalism. The Project will not involve the expansion of the substations; as a result, these security measures will remain fully in place during Project construction and operation/maintenance. The substations also presently have low-level lighting for safety and security purposes.

During Project construction, access to the substations will be controlled, with the substation gates kept closed and locked as needed. In addition, substation gates will be locked at the end of the workday during Project construction and at all times after the Project is completed, unless UI personnel are on site. Appropriate signs are posted at each substation, alerting the general public to the presence of high voltage at the facilities.

Smoke detection systems are already in place in the existing relay and control enclosures at the two UI substations. In the event that smoke is detected, these smoke detection systems will automatically activate an alarm at UI's Energy Control Center (ECC), and the system operators then would take the appropriate action. The relay/control enclosures at each substation are equipped with portable fire extinguishers (20 pound halotron units) that meet or exceed National Fire Protection Association (NPFA) standards. The manual fire extinguishers are electronically monitored by the substation control enclosure fire alarm system, which meets or exceeds NFPA requirements, reports all alarm, trouble, and supervisory conditions to the ECC via SCADA connections, providing constant system monitoring.

3.9.3 System and Physical Security

This section provides a description of security measures for the proposed Project facilities, consistent with the Council's *White Paper on the Security of Siting Energy Facilities* (*White Paper*), as amended[21]. The *White Paper* focuses on the unpredictable, intentional acts of perpetrators who may want to damage the physical structure of the transmission facilities. The proposed Project will be

[21] The CSC's White Paper was initially adopted in the Council's Docket 346.

consistent with the *White Paper* guidelines, which target security issues associated with four primary areas (Planning, Preparedness, Response, and Recovery). For each of these four areas, the following first lists the discussion topic included in the *White Paper* and then provides UI's security approach for the topic, as relevant to the Project.

Planning

Identify the physical vulnerabilities most likely to pose a security threat: The rebuilt 115-kV transmission lines will be constructed along UI's long-established ROW, which is not presently and cannot be, fenced off from the public. Unauthorized personnel could relatively easily identify the transmission lines and then gain access to individual monopoles. However, existing substations typically are points of greater system vulnerability than transmission lines. Because multiple transmission and distribution circuits connect to each of the UI substations, an attack on a substation would be more likely to affect multiple circuits (and therefore more than one source of supply) than would an attack on a portion of the transmission lines. The UI substations are visible and easily accessible via access off public roads. However, the substations already have security measures in place and the Project will not add any new vulnerabilities to the substations.

Identify the type and characteristics of the facility and any ways in which the facility's setting affects security concerns: The Project setting poses no particular security concern because of the location of the lines along the existing ROW, in densely developed urban/suburban areas where hostile activity will be easier to detect in a timely manner than would be the case if the 115-kV facilities were located in isolated rural areas. Moreover, the 115-kV lines on the new monopoles will be less accessible to unauthorized personnel than the existing transmission lines atop the lattice steel towers. Further, the presence and activities of adjacent landowners, businesses, and passers-by all provide deterrents to, and sources of information about, attempted hostile activities.

Examine any pertinent ways in which the facility is linked to other facilities and systems and potential repercussions from a facility or system interruption. Examine whether the proximity of the facility to other electric facilities, either dependent or independent, presents security challenges: The region's electric supply systems are tightly networked, such that a disturbance to one part of the system can cause an overload or voltage violation on other, fairly distant parts of the system. However, in a system that is planned and operated according to applicable reliability standards, the sudden and unexpected loss of even a critical system element when the system is already under stress would not result in cascading outages, or damage to customer or utility equipment. The rebuilt 115-kV transmission lines will help provide such a robust system and will improve reliability overall by replacing aging transmission infrastructure, while maintaining the same substation points of interconnection as the existing 115-kV lines.

Examine if there is an established method to help regional, State and national security officials maintain situational awareness of this facility: UI has decades of experience in successfully operating the 115-kV lines along Derby Junction-Ansonia Substation ROW, as well as established procedures to help regional, State and national security officials maintain situational awareness of its facilities. The Connecticut Valley Exchange (CONVEX) monitors UI's transmission facilities and those of other member utilities in Connecticut in real time and maintains a procedure for identifying and reporting sabotage events to local and Federal officials, neighboring entities, and regulatory authorities. The Independent System Operator – New England (ISO-NE) similarly monitors the security status of the entire New England bulk power system. Causes of outages are investigated promptly and, when appropriate, reported to law enforcement officials.

Preparedness

Examine site security infrastructure, including site monitoring, physical and nonphysical barriers and access controls: Both UI substations are fenced and gated to discourage unauthorized entry and vandalism. Access is limited through locked gates and only authorized personnel are permitted to enter. Physical security measures include electronic access control and Closed Circuit TV. UI complies with NERC guidelines for assessing the degree ofprotection each component of the grid should receive and the recommended types of precautions that these facilities should have in place.

Review any simulated exercises that include local police, fire, and other emergency response teams. Examine whether local law enforcement/emergency response liaison is in place and review mutual aid agreements between affected entities: UI regularly consults with first responders across its service territory. The rebuilt Project facilities will not require any change to established procedures for notification and response. The Company's Public Outreach personnel routinely act as liaisons with municipal officials. The Connecticut Department of Emergency Services and Public Protection (DESPP) Training and Exercise Division sponsors emergency preparedness training, seminars, exercises, and conferences for local first responders, as defined in Homeland Security Presidential Directive 8 (i.e., police, fire, emergency management, emergency medical services, public health, public works, private sector, non-governmental organizations and others). These presentations and seminars are designed to cover Mitigation, Preparedness,Response and Recovery. UI is represented on the Private Sector Council of DESPP, which meets quarterly and more frequently as needed. UI has participated, and will continue to participate, in State and regional emergency exercises.

Response

Examine notification procedures to public and/or local officials, including the types of security issues that would warrant such notification: For the rebuilt 115-kV transmission facilities, UI does not anticipate any change in existing, pre- established public notification procedures, including notifications as required to the NERC and CONVEX.

Examine mitigation measures, including alternate routing of power, strategically located spares and mobile backup generation: By replacing aging electric transmission system infrastructure, the Project will improve the reliability and resiliency of the grid in UI's service territory and in Connecticut overall. UI continually prepares for outage contingencies. The system is planned and operated so that the sudden and unexpected loss of the Project's 115-kV lines would not result in a widespread loss of load or in damage to utility or customer equipment. UI also keeps an inventory of spare equipment in order to quickly restore facilities to service after most failures.

Recovery

Identify measures that will be taken, if necessary, to restore natural resources at the site of the facility: In the event of an incident, the first priority will be to eliminate any threat to public safety and then to repair the transmission facilities. In responding to an incident, natural resources will be protected to the extent practical and, if impacted, subsequently will be restored to pre-incident conditions as appropriate. Mitigation protocols for impacts to wetlands and water resources, if any, will be coordinated as appropriate with resource agencies, such as the USACE and CT DEEP.

Determine whether reporting procedures are established to evaluate and improve the effectiveness of local emergency response teams, methods to limit negative impacts on neighboring electric facilities, and restoration of the natural environment: UI investigates and responds to any incident associated with its infrastructure. Depending on the magnitude and

consequences of the incident, the Company's processes and/or after action reviews evaluate what improvements may be needed to minimize the potential for future adverse effects on its facilities, the environment, and neighboring electric facilities in future incident response, as well as the effectiveness of the interfacewith local emergency response teams.

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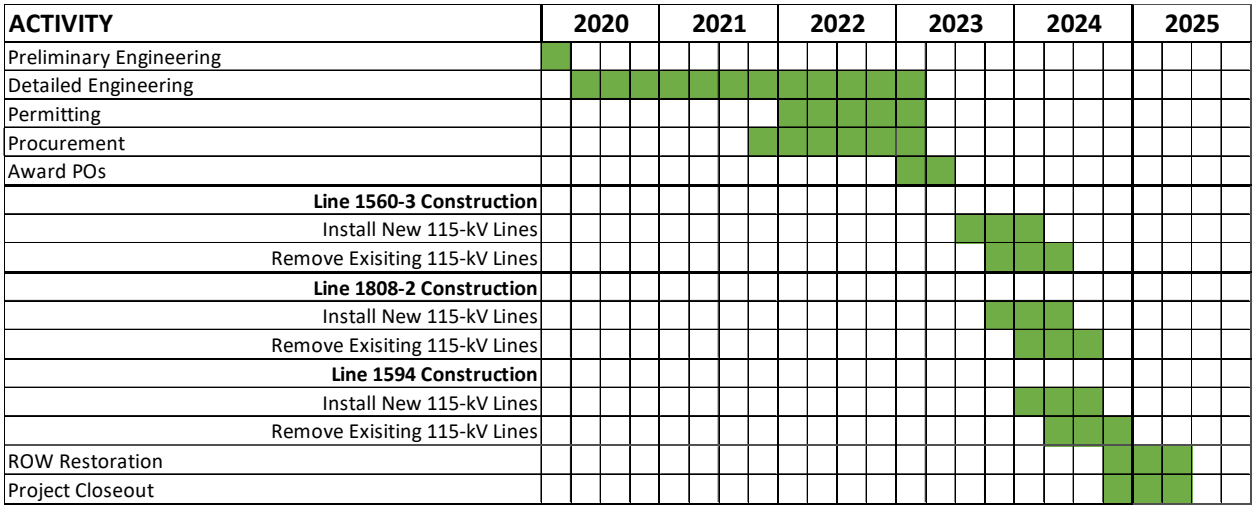
4. CONSTRUCTION SCHEDULE AND WORK HOURS

4.1 SCHEDULE

UI's proposed Project schedule is illustrated in Figure 4-1. As this schedule shows, UI anticipates Project construction will commence in 2023 and that the rebuilt 115-kV lines will be placed in service by the end of 2024. However, full restoration (complete site stabilization and revegetation) of the areas disturbed by construction (including the access roads and work pads along the ROW) may not be completed until early in the 2025 growing season.

Figure 4-1: Project Schedule



**Note: The Project schedule is subject to change based on the receipt of regulatory approvals or other factors.*

4.2 WORK HOURS

Typical work hours for Project construction will be from 7 AM to 7 PM, Monday through Saturday. Construction personnel may arrive for and leave work outside of these times (e.g., marshalling at the laydown/material staging/contractor yard and at the substations for meetings, or at work sites along the ROW for pre-workday tailboards). However, noise-generating construction activities typically will not be performed before 7:00 AM or after 7:00 PM unless prior approval is obtained from the Council.

UI anticipates that some extended hours and Sunday work will be necessary on a limited basis. For example, extended hours will be needed for construction work that must occur on a continuous basis (e.g.,

concrete pours and setting for foundations) or that must be scheduled in accordance with outage requirements.

In addition, work that involves conductor/OPGW installation or removal over State roads (e.g., State Routes 110, 34, 8, 334) will require encroachment permits from the Connecticut Department of Transportation (CT DOT). Such permits may specify that Project activities be performed during non-peak travel times, such as at night or on weekends.

5. EXISTING ENVIRONMENTAL CONDITIONS

This section summarizes the existing environmental conditions along the Project ROW, including at Derby Junction, Indian Well Substation, and Ansonia Substation, as well as in the general vicinity. This information reflects the results of UI's Project-specific environmental field studies and consultations with Federal and State agencies concerning environmental resources in the Project area. In addition, data was compiled from land use plans and environmental reports published by Federal and State agencies, as well as the cities of Shelton, Derby, and Ansonia.

Appendices B through D include reports that provide detailed information regarding the ecological, visual, and cultural resources in the Project area. The ecological report also includes copies of correspondence from Federal and State agencies. The Appendix A aerial-based maps illustrate the existing environmental conditions, land use features, and zoning in the Project area.

5.1 TOPOGRAPHY, GEOLOGY, AND SOILS

The data presented in this section is based on both existing published information and the results of ROW-specific field investigations. As input to the final Project design, UI expects to perform additional investigations in some areas along the ROW to further characterize the physical and structural characteristics of subsurface geologic features.

5.1.1 Topography

The Project is situated within Connecticut's Western Uplands physiographic region, which is characterized by hilly, glacial till dominated landscapes of intermediate elevation with narrow glacial outwash valleys and localized areas of steep and rugged terrain. As such, the Project ROW crosses varied topography. The topographic conditions along the route principally range from rolling hills to rocky slopes. Elevations vary from about 500 feet in North American Vertical Datum of 1988 (NAV88) near Meadow Street (east of Derby Junction) in Shelton to 35 feet (NAVD88) at Ansonia Substation.

The Project area is not near and does not traverse any traprock ridge or amphibolite ridge areas as specified in Conn. Gen. Stat. § 8-1aa(1). Similarly, the ROW does not parallel any major ridgelines.

Along the ROW, the most notable areas of topographic relief are on either side of the Housatonic River in Shelton and Derby, from Coon Hollow Road in Derby to Hull Street in Ansonia, and from North Westwood Road to Ansonia Substation in Ansonia. In Shelton, elevations along the ROW gradually decline from west to east, toward the Housatonic River. At Structure 359, the topography slopes more steeply into the river valley. In Derby, the ROW follows a similarly steep slope between Structures 3 and 4. Between Structures 4 and 15 (Derby-Ansonia), the ROW extends within a valley bordered by steep hillsides, including within Osbornedale State Park. In Ansonia, Structure 19 sits upon an elevated terrace that slopes steeply to the east, into the Naugatuck River valley.

5.1.2 Bedrock and Surficial Geology

Bedrock in the Project area consists predominantly of Ordovician gneiss and schist (formed 445 – 500 million years ago). These bedrock features are largely buried beneath a variable depth of more recently deposited till and eolian material (15,000 – 130,000 years ago).

The principal surficial deposit along the ROW is shallow till in moderate to strongly sloping bedrock-controlled topography. The slopes and outline of the landform generally reflect the form of the underlying bedrock, which is draped by a shallow mantle of till. Till thicknesses overlying the bedrock are generally 20 - 30 feet but in some areas till deposits are less than 15 feet such that bedrock outcrops are evident. The shallowest till deposits are located west of the Housatonic River in Shelton near Structures 355 and 356 and east of the Housatonic River between Coon Hollow Road in Derby and Hull Street in Ansonia.

Deep till deposits occur where glacial ice overriding the land surface pushed up rounded hills oriented along the localized travel direction of the last continental ice sheet. These rounded hills, or drumlins, generally have till depths exceeding 15 feet; however, depths of 100 feet are not uncommon. The ROW traverses deep till deposits west of Meadow Street in Shelton. Glacial outwash deposits, typically characterized by stratified sand and gravel, were derived from meltwater steams flowing from retreating glacial ice. Within the ROW, outwash deposits are associated with the Housatonic River and Naugatuck River valleys in Derby and Ansonia. Bedrock depths generally exceed 30 feet beneath these sand and gravel deposits and are often more than 100 feet below the ground surface. Floodplain deposits are also associated with the Naugatuck River Valley in Ansonia. Bedrock is generally deep (greater than 30 feet) beneath these deposits.

5.1.3 Soils

Information regarding the soils within the ROW was obtained from on-line soil surveys and maps published by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Web

Soil Survey. These surveys and maps provide soil classifications and characteristics, including depth to bedrock, slope, drainage, and erosion potential. Table 5-1 summarizes the principal soil associations, as identified by the NRCS, along the ROW. Appendix B includes a soils report that provides additional information regarding the soils found along the ROW.

Table 5-1: Summary of Soil Types within the Project ROW

Map Unit Symbol	Soil Map Unit	Approximate Percent of ROW
2	Ridgebury fine sandy loam, 0 to3 percent slopes	0.6%
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	5.1%
29A	Agawam fine sandy loam, 0 to 3percent slopes (***Prime Farmland; between Indian Well Substation and Structure 3 in Derby)***	1.5%
38C	Hinckley loamy sand, 3 to 15percent slopes ***(Statewide Important Farmland between Structures 11 and 14 in Ansonia***)	3.5%
38E	Hinckley loamy sand, 15 to 45percent slopes	4.5%
45B	Woodbridge fine sandy loam, 3to 8 percent slopes ***(Prime Farmland between Structures 350 and 352 in Shelton)***	5.3%
45C	Woodbridge fine sandy loam, 8to 15 percent slopes	0.5%
46B	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony	8.5%
46C	Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	0.2%
73C	Charlton-Chatfield complex, 0 to 15 percent slopes, very rocky	1.7%
73E	Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	10.5%
75E	Hollis-Chatfield-Rock outcrop complex, 15 to 45 percent slopes	5.1%
76E	Rock outcrop-Hollis complex, 3to 45 percent slopes	1.9%
84D	Paxton and Montauk fine sandy loams, 15 to 25 percent slopes	3.8%
85C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes, very stony	2.2%
229B	Agawam-Urban land complex, 0to 8 percent slopes	9.1%
238C	Hinckley-Urban land complex, 3to 15 percent slopes	0.7%
260B	Charlton-Urban land complex, 3to 8 percent slopes	1.4%
260C	Charlton-Urban land complex, 8to 15 percent slopes	1.3%
306	Udorthents-Urban land complex, Urban land	13.1%
307	Urban land, Udorthents, smoothed	5.8%
308	Udorthents, smoothed	7.6%
W	Water	6.2%

In addition to the baseline NRCS information, UI obtained soils data from field investigations conducted along the ROW to identify Connecticut wetlands, which are defined based on the presence of poorly drained, very poorly drained, or floodplain soils. Project wetlands were delineated by registered professional soil and wetland scientists, working with biologists, as part of field studies conducted in 2016 and verified in 2020 (refer to the wetlands discussion in Section 5.2).

As summarized in Table 5-1, the ROW crosses a variety of soil types. Approximately 39% (1.6 miles) of the ROW traverses areas classified as Urban Land, Urban Land complexes, or Udorthents. Urban soils are found in built environments that typically have been significantly changed by human activities; this soil classification also includes impervious surfaces, such as pavement. The Udorthents classification is a miscellaneous upland type used to denote moderately well to excessively drained earthen material that has been so disturbed by cutting, filling, or grading that the original soil profile can no longer be discerned.

In all three municipalities along the 4.1-mile transmission line route, the ROW encompasses soils mapped by the NRCS as Prime Farmland or Statewide Important Farmland soils.[22] The Prime Farmland soils located along the ROW in Shelton (Structures 350 to 352) include areas of municipal open space that are hayed. In this area, approximately 0.96 acre of Prime Farmland soils are within the ROW; existing Structure 352 is within this soils area and occupies approximately 350 square feet.

The areas mapped as Prime Farmland in Derby between Indian Well Substation and existing Structure 3 are developed for various residential/commercial/industrial purposes and encompass State Route 34 and B Street. A total of approximately 0.56 acre of Prime Farmland soils are mapped within this area. However, only Structure 3 is located in an area not otherwise developed; this tower, which occupies about 600 square feet, is situated on UI property that is vacant except for the managed transmission line ROW.

The Statewide Important Farmland soils along the ROW in Ansonia (generally between Structures 11 and 14) presently consist of open fields in Osbornedale State Park, forested areas, residential development and State Route 8. The ROW, including the 360-square-foot foundations for lattice Structure 12, encompasses approximately 1.3 acres of Statewide Important Farmland in this area.

Several areas of the ROW include soils and surficial geologic material that are identified as erodible based on the CT DEEP erosion susceptibility mapping, which depicts areas most susceptible to terrace escarpment type erosion. Generally, erosion susceptibility is related to a combination of surficial geology, soils, and slope. Table 5-2 summarizes the materials susceptible to erosion found along the ROW.

[22] Prime Farmland soils are defined as soils that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oil seed crops, and also are available for these uses (e.g., land could be cropland, pasture, etc., but not urban or otherwise developed). Statewide Important Farmland Soils are soils that fail to meet one of the criteria for Prime Farmland, but are important for food, feed, fiber, or forage crop production.
http://cteco.uconn.edu/guides/resource/CT_ECO_Resource_Guide_Soils_Farmland.pdf

Table 5-2: Summary of ROW Soils and Surficial Materials Susceptible to Erosion

Soil Group	Slopes	Surficial Geologic Materials
Rock Outcrop-Hollis	3-45%	Till
Hollis-Chatfield-Rock Outcrop	15-45%	Till
Paxton-Montauk	8-15%, 15-25%	Till
Hinckley	3-15%, 15-45%	Till
Urban Land, Udorthents	--	Sand and Gravel, Artificial Fill
Charlton-Chatfield	3-15%, 15-45%	Till
Agawam-Urban Land	0-8%	Till
Hinckley-Urban Land	0-8%	Till

Source: CT DEEP. 2005. CT Erosion Susceptibility data. Available via Connecticut Environmental Conditions Online (http://www.cteco.uconn.edu/guides/Erosion_Susceptibility.htm)

5.2 WATER RESOURCES AND WATER QUALITY

To define designated water resources in the Project area, UI conducted baseline research (reviewing published data regarding drainage basins, water quality, wetlands and watercourses, FEMA designated floodplains, drinking water supply sources) and performed field investigations to delineate State and Federal jurisdictional water resources (e.g., wetlands and watercourses, lakes and ponds).

5.2.1 Drainage Basins and CT DEEP Water Quality Classifications

The Project area is located within the Housatonic Drainage Basin, one of Connecticut's eight major drainage basins. Within this major drainage basin, the ROW extends through the CT DEEP-mapped Housatonic Sub-Regional Basin, which coincides with the U.S. Geological Survey (USGS)-mapped Halfway River-Housatonic River Basin (HUC12 Basin No. 011000051003) and Bladens River-Naugatuck River Basin (HUC12 Basin No. 011000051207).

The two most prominent water resources in the Project area are the Housatonic River and the Naugatuck River. The Housatonic River, which in the Project area forms the boundary between Shelton and Derby, is impounded by the Ousatonic Dam to form Lake Housatonic. UI's existing 115-kV lines diagonally span Lake Housatonic (referred to herein as the Housatonic River) approximately 425 feet-1,400 feet upstream (north) of the dam. The Ousatonic Dam, which was constructed in 1870, is the last of a series of impoundments on the river. Below the dam, including near Indian Well Substation (which is located between the river and State Route 34 in Derby), the river is tidally influenced, ultimately flowing into Long Island Sound. Remnants of the canal system associated with the dam remain near Indian Well Substation.

Ansonia Substation is located approximately 500 feet west of the Naugatuck River, the largest tributary of the Housatonic River. Following the significant flood of 1955, the USACE installed a series of dams, floodwalls, and dikes along the Naugatuck River. The portion of the river near the substation is contained within this flood control system.

CT DEEP maintains detailed water resources information concerning the drainage basins in Connecticut and promotes watershed management efforts to improve water quality. As a central element of the State's clean water program, the CT DEEP established Water Quality Standards and Classifications, which identify the water quality management objectives for each waterbody.

Overall, Connecticut's water quality policies are established to protect surface and groundwater from degradation; restore degraded surface waters to conditions suitable for fishing and swimming; restore degraded surface and groundwater to protect existing and designated uses; and to provide a framework for establishing priorities for pollution abatement. Table 5-3 summarizes the designated use goals that the State has established for surface waters and groundwater.

Table 5-3: Summary of Connecticut Water Quality Use Goals

Water Resource Class	Classification Use Description
Surface Water	
Class AA	Public water supply, fish and wildlife habitat, recreation
Class A	Potential public water supply, fish and wildlife habitat, recreation, industrial water supply, agricultural water supply
Class B	Fish and wildlife habitat, recreation, industrial water supply, agricultural water supply, discharge of treated wastewaters
Class C, D	Goal is Class B. Impaired water quality affecting one or more Class B uses
Class SA (Marine)	Marine fish, shellfish and wildlife habitat, shellfish harvesting for direct human consumption, recreation and all other legitimate uses including navigation
Class SB (Marine)	Marine fish, shellfish and wildlife habitat, shellfish harvesting for transfer to approved areas for purification prior to human consumption, recreation, industrial and other legitimate uses including navigation
Groundwater	
Class GAA	Public water supply
Class GAAs	Existing or potential public supply, stream base flow industrial and miscellaneous, tributary to a public reservoir. Natural quality, or suitable for drinking
Class GA	Existing private water supply and potential public water supply suitable for drinking without treatment
Class GB	Industrial water supply and miscellaneous non-drinking supply
Class GC	Assimilation of wastes, such as landfill leachate

Note: Class refers to freshwater unless otherwise indicated.
Source: R.C.S.A., Sections 22a-426-4 and 22a-426-7.

In the Project area, only the Housatonic and the Naugatuck rivers have surface water quality designations. Upstream of the Ousatonic Dam, the Housatonic River is designated as Class B; downstream of the dam, the river is tidal and is designated as Class SB. The Naugatuck River is also designated as Class B. In Connecticut, surface waters that are not specifically classified are considered Class A or Class AA; hence, these designations apply to the small watercourses along the ROW.

In the Project area, the CT DEEP classifies most groundwater as Class GA. However, areas of Class GB designated groundwater are found along the ROW in Derby and Ansonia, generally along the Housatonic and Naugatuck rivers. In addition, Class GAA groundwater for a potable water supply well is located within a designated aquifer protection area near the Housatonic River (refer to Section 5.2.2).

5.2.2 Public Water Supplies and Aquifer Protection Areas

In the Project area, the Aquarion Water Company (Aquarion) provides public water supplies to Shelton, whereas the South Central Connecticut Regional Water Authority (RWA) delivers potable water to Derby and Ansonia. Both Aquarion and the RWA serve customers via the management of a system of groundwater wells, surface water reservoirs, and treatment plants.

CT DEEP's Aquifer Protection Area (APA) Program identifies Level A and Level B APAs by municipality. In accordance with Conn. Gen. Stat. § 22a-354c and § 22a-354z, APAs are delineated for active public water supply wells in stratified drift that serve more than 1,000 people. Level A mapping delineates the final APA, which becomes the regulatory boundary for land use controls designated to protect the well from contamination. Level B mapping delineates a preliminary APA, providing an estimate of the land use controls designated to protect the well from contamination.

The ROW traverses approximately 0.75 mile across one Level A APA. This APA, which encompasses approximately 0.5 square miles and was designated by CT DEEP in 2010, extends from near Meadow Street in Shelton, northeast across the Housatonic River and into the southern portion of Osbornedale State Park in Derby. The APA is associated with a RWA Wellhead Protection Area around a groundwater well located off State Route 34 in Derby (north of the ROW); the groundwater immediately surrounding this well is designated as Class GAA.

In addition, Shelton's zoning regulations include an APA district that overlaps other zoning districts. The local APA district zoning encompasses all areas that consist of stratified drift aquifers that are existing or

designated as potential and important sources of public water supply, based on USGS information and as approved by the CT DEEP.[23] In the vicinity of the ROW, Shelton's aquifer overlay district and the CT DEEP Level A APA boundaries coincide.

5.2.3 Surface Water Resources: Wetlands and Watercourses

As identified in Table 5-3 and on the Appendix A maps, the Project ROW crosses 10 wetlands and 10 watercourses, including the Housatonic River. UI identified these resources based on the results of desktop research, followed by field surveys (conducted in 2016 and verified in 2020) to delineate water resources that meet Federal and State jurisdictional criteria. The ROW does not cross any ponds or lakes.

The methods used to field-delineate Federal and State jurisdictional water resources are summarized in the Ecological Report (Appendix B). As detailed in this appendix, State jurisdictional wetlands and waterbodies are defined solely on the presence of poorly drained, very poorly drained, alluvial, or floodplain soils and submerged land. Watercourses are defined as rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, vernal or intermittent, public or private, which are contained within, flow through or border upon the State or any portion thereof.

Federal jurisdictional water resources ("Waters of the United States") include lakes, rivers, and streams, as well as vegetated wetlands. In the Project area, Federal jurisdictional waters and wetlands, which are regulated by the USACE, were delineated in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual Northcentral and Northeast Region* (Version 2.0, January 2012).

To qualify as a Federal jurisdictional wetland, three parameters must be present: dominant hydrophytic vegetation, hydric soils, and hydrological conditions. The National Wetlands Inventory (NWI) classifications used in the field studies are listed in Table 5-4 and included in the Appendix A map key.

[23] City of Shelton, Municipal Regulations Aquifer Protection Areas; effective February 19, 2009.

Table 5-4: Summary of Wetlands and Watercourses along the Project ROW

City / Appendix A Map No.		Wetland / Watercourse ID*	Field Delineated Wetland Designation[b]	NWI Classification	Location along ROW (by Structure No.)
100-scale	400-scale				
Shelton					
1, 2	1	W1	Wetland A	PSS1	West of Derby Jct. Str. 1364
1, 2	1	W2	Wetland I-J (w/ stream)	PSS1	Between Str. 351 & 352
2	1	W3, WC1	Wetland K (w/ stream)	PSS1	Between Str. 352 & 353
3, 4	1	W4, WC2	Wetland L-M (w/ stream)	PEM2/SS1	Between Str. 354 & 356
4	1	W5, WC3	Wetland N-O (w/ stream)	PSS1	Between Str.357 & 358
Shelton/Derby					
5, 6	1, 2	WC4	Housatonic River	L1UBHh (upstream of the Ousatonic Dam); RIUBV (downstream of the dam)	Spanned between Str. 359-360
Derby					
6	2, 3	TW1	Wetland G	R1US5	South of Str. 360
6	2, 3	WC5	Canal	R1UBHx	Between Str. 360 & 2/2B
7, 8	2, 3	WC6	Watercourse A	R4SB3	Between Str. 3A/B & 4A/B
8	2, 3	W6, WC7	Wetland Q (w/ stream)	PEM2/UB4	Between Str. 6 & 7
9	2, 3	W7, WC8	Wetland P (w/ stream)	PEM2/SS1	Between Str. 6 & 8
Ansonia					
11	3, 4	WC9	Watercourse B	R4SB3	Between Str. 10 & 11
13	3, 4	W8	Wetland C	PSS1	Between Str. 15 & 16
14, 15	3, 4	W9/W10[a] WC10	Wetland D-E-F	PEM1/SS1	Between Str.19 & 20

[a] W9 is a State-jurisdictional wetland (floodplain soil) only. W10 is a State (poorly drained soil) and Federal (hydric) jurisdictional wetland.
[b] This designation was used to denote the Project's wetlands and watercourses during field delineations (refer to Appendix B).

In accordance with *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al., 1979), wetlands delineated for the Project were classified as palustrine scrub-shrub (PSS), palustrine emergent (PEM), and palustrine unconsolidated bottom (PUB). Waterbodies within the Project Area were classified as lacustrine limnetic (L1), tidal riverine (R1, and intermittent riverine (R4). These wetland and waterbody classifications are characterized as follows:

- Palustrine Scrub-Shrub Wetlands (PSS): Scrub-shrub wetlands are typically dominated by woody vegetation less than 6 meters (approximately 20 feet) tall. Scrub-shrub wetland types may represent a successional stage leading to a forested wetland and include shrubs, saplings, and trees or shrubs that are small and/or stunted due to environmental conditions or human vegetation management practices.

- Palustrine Emergent Wetlands (PEM): Emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes not including mosses and lichens. These wetlands maintain the same appearance year after year, are typically dominated by perennial plants, and the vegetation of these wetlands is present for the majority of the growing season.

- Palustrine Unconsolidated Bottom (PUB): Areas of open water with unconsolidated bottoms that border on palustrine systems are referred to as PUB.

- Lacustrine Limnetic (L1): Deepwater habitats that are situated in a topographic depression or a dammed river channel; lack trees, shrubs, persistent emergents with greater than 30% areal coverage; and are greater than 20 acres in size.

- Tidal Riverine (R1): Wetlands and deepwater habitats where the gradient is low and water velocities fluctuate under tidal influence. Like all Riverine classes, the habitats are contained with a channel that are not dominated by trees, shrubs, persistent emergents; contain freshwater (i.e., ocean-derived salts less than 0.5 ppt).

- Intermittent Riverine (R4): Wetlands and deepwater habitats contained with a channel that are not dominated by trees, shrubs, persistent emergents; contain freshwater (i.e., ocean-derived salts less than 0.5 ppt); and contain flowing water for only part of the year.

Some wetlands along the ROW exhibit more than one wetland classification type (i.e., PSS/PEM) or have inclusions of multiple vegetative cover types. In such situations, transitions between wetland types are categorized by the most dominant classification type.

Many of the wetlands along the ROW have been historically influenced by ROW maintenance activities, which promote low-growing vegetation to insure the safe operation of the existing overhead transmission lines. Thus, most of the wetlands in the ROW are well-vegetated and dominated by PSS and shallow PEM communities; portions of some of these extend off the existing ROW, transitioning to PFO wetlands characterized by mixed hardwood deciduous and coniferous forested vegetation.

5.2.4 Flood Zones

FEMA classifies flood zones for insurance and floodplain management purposes and has prepared maps designating certain areas according to the frequency of flooding (Flood Insurance Rate Maps [FIRM]). An area within the 100-year flood designation has a 1% chance of flooding each year or is expected to flood at least once every 100 years. Areas designated “AE” indicate a base floodplain where base flood elevations have been determined by FEMA. An area within the 500-year FEMA-designated flood zone has a 0.2% chance of flooding each year. Such areas (between the 100-year and 500-year flood zones) are considered to have a moderate flood hazard; a Zone “X” on FEMA mapping refers to these areas.

FEMA defines a “regulatory floodway” as a “channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height”. FEMA defines a “floodplain” as “any land area susceptible to being inundated by floodwaters from any source”. In other words, a floodplain is the area

that includes the floodway, as defined above, and the floodway fringes, which are the remaining areas on either side of the floodway that comprise the floodplain. FEMA and State regulations allow communities to allow the floodway fringes to be modified and developed if certain requirements are met.

The UI ROW extends across floodplains associated with both the Housatonic and Naugatuck rivers. One of the four footings on existing Structure 360 is located in the designated Housatonic River floodway; the remaining three footings are on the adjacent riverbank near State Route 34, in the 500-year floodplain. In addition, Indian Well Substation is situated entirely within the Housatonic River's 100-year floodplain. Although near the Naugatuck River, Ansonia Substation is within an area defined by FEMA as having a reduced risk of flooding due to the extensive flood controls (levee) in place along the river.

5.3 BIOLOGICAL RESOURCES

5.3.1 Vegetation

Vegetative communities found in the Project area and along the ROW are varied, consisting of a mix of cover types. In general, these communities are characteristic of southern New England and range from open fields and forests to urban commercial/industrial developments with minimal vegetation and suburban areas with lawns, trees, and landscaping. Riparian and wetland habitat types also are found along the Housatonic River and the streams and wetlands in the Project area.

Osbornedale State Park, which encompasses 350 acres mostly west of the ROW, is characterized by large tracts of upland forest, interspersed with open fields and several ponds. The ROW extends for approximately 1,465 feet across the northeastern portion of the park. In this area, vegetation communities include shrub-scrub habitat along the UI ROW, open fields, a forested buffer strip and State Route 8 to the east, and forested areas along Silver Hill Road to the west. Residential/commercial uses and the vegetation types associated with them are found to the southeast and north. While the central portion of Osbornedale State Park consists of small core forest (<250 acres), the portion of the park that the ROW crosses is considered perforated and edge forest habitat.

The most diverse vegetative cover types are found along or near the ROW in Shelton, along Coon Hollow Road in Derby, and northeast of Division Street in Ansonia (including the alignment across Osbornedale State Park). In these areas, the predominant vegetative cover types include a mix of old field/shrub land, upland forest, and agricultural lands. Other portions of the ROW extend across commercial/industrial areas or suburban lawn areas.

Pursuant to national and Company required clearance standards, UI presently manages vegetation along its ROW to maintain low-growth species that will not interfere with the overhead transmission lines. Seven habitat types/land uses were documented along or within the ROW:

- *Upland Forest*: This habitat includes mature mixed deciduous/coniferous forests adjacent to the existing ROW in upland areas. Mature mixed forests consist typically of tree species common to the Northeast such as maples, oaks, hickories, spruce, and pine. The ratio of deciduous to coniferous species and age of stands varies. This habitat is found along the edge of the existing ROW (e.g., between Structures 355 and 356 in Shelton and between Structures 10 and 14 near Osbornedale State Park in Derby/Ansonia).

- *Old Field/Shrub Land*: This habitat type includes the existing managed ROW in most areas, as well as adjacent abandoned fields, natural shrub lands, and early successional forests. Examples of these habitats are located in Shelton between Structures 354 and 355. Vegetation in these areas consists of native species (e.g., silky dogwood, mountain laurel, golden rods, bedstraw, orchard grass), as well as invasives (e.g., multiflora rose, mugwort, reed canary grass).

- *Scrub-Shrub Wetland*: Shrub swamp areas, which are found within or adjacent to the existing ROW, typically include components of emergent marsh, where shrub coverage is substantial. An example of this habitat is located between Structures 15 and 16 in Ansonia. Vegetation in these areas includes both native (e.g., alders, sweet pepperbush, grey dogwood) and invasive (e.g., glossy buckthorn, garlic mustard, multiflora rose) species.

- *Emergent Wetland*: Emergent marshes are dominated by herbaceous wetland plant species and can be found along Coon Hollow Road near Structures 6 to 8. These emergent wetlands are vegetated by species such as native sedges, rushes and grasses, sensitive fern, and cattails. Some invasive species within emergent wetlands include common reed and purple loosestrife.

- *Open Water*: This includes the vegetation bordering large open water areas such as the Housatonic River.

- *Agricultural Land*: This includes cultivated fields, croplands, hay fields, and pastures in active agricultural use such as those in Shelton between Structures 350 and 353 and in Ansonia (Osbornedale State Park) between Structures 11 and 12.

- *Urban Areas*: Urban areas refer to suburban and urban residential developments, subdivisions, areas developed for industrial or commercial use, recreational areas such as parks and golf courses, maintained lawns, and roadside vegetation. Such habitats are found along the ROW in all three municipalities.

In accordance with UI's ROW vegetation management program, woody vegetation that could interfere with the operation of the overhead transmission lines is periodically removed from the managed portion of the ROW, and trees located along the edges of the managed ROW are periodically trimmed or removed. The vegetation within the ROW is managed on a rotating basis. As a result of UI's vegetation management program, the predominant vegetation types within the managed portions of the transmission line ROW

consist of dense shrub and herbaceous species (old field/shrubland). In New England, old field/shrubland areas are often disturbance-dependent and ephemeral. Historically, the occurrence and distribution of shrublands and other early successional cover types were largely influenced by humans. The widespread abandonment of farms in the early 20th Century, along with increases in suburban development and fire suppression, has led to a consistent decline in the area of early successional cover types over the last century and the subsequent decline in several wildlife species dependent on this habitat.

5.3.2 Wildlife, Including Breeding Birds, and Fisheries

Wildlife

The wildlife that may be found in the Project area can be expected to be typical of the vegetative communities and water resource habitats identified along and near the ROW. Common wildlife species may vary depending on the habitats available along different portions of the ROW (e.g., agricultural areas bordered by forest land in Shelton vs. urban/suburban development along State Route 34 in Derby). The following summarizes the wildlife habitats and representative species that commonly occur in the vegetative communities found along and in the vicinity of the ROW, as identified based on both research and field investigations:

- *Upland Forest*: Forests in southern New England support a wide array of wildlife and is the dominant cover type in the State. Typically, common mammalian species in forested habitats include a variety of rodents (e.g., mice, voles, moles and shrews), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), grey fox (*Urocyon cinereoargenteus*), white-tailed deer (*Odocoileus virginianus*), striped skunk *(Mephitis mephitis*), Virginia opossum (*Didelphis virginiana*), chipmunk (*Tamias striatus*) and grey squirrel (*Sciurus carolinensis*). Less common forest-dwelling species include black bear (*Ursus americanus*), fisher (*Martes pennanti*) and porcupine (*Erithizon dorsatum*). Birds typical of forested areas include raptors (owls, hawks), wild turkey, woodpeckers and migratory songbirds, including a number of species solely associated with forested habitats (i.e., habitat specialists). Reptiles and amphibians likely to occur include toads and hylid treefrogs.

- *Old Field/Shrublands*: Old field/shrubland habitats are some of the rarest and most critical wildlife habitats in the State. Common mammalian wildlife include small mammals such as meadow voles (*Blarina brevicauda*), shrews, various mice, woodchuck (*Marmota monax*), rabbits, and white-tailed deer. Predatory and scavenging species such as red fox, coyote, weasels, skunk, and raccoon (*Procyon lotor*) often forage or bed in fields. Various species of shrubland-dependent birds including the prairie warbler (*Setophaga discolor*) and blue-winged warbler (*Vermivora cyanoptera*) are common.

- *Wetlands/Open Water*: Freshwater wetlands (i.e., scrub-shrub and emergent wetlands) and other aquatic habitat (e.g., streams, ponds) provide excellent habitat for a wide range of wetland-dependent wildlife. Many of the species using upland forest and shrubland habitats also utilize forested wetland, shrub swamp, shallow marsh, or wet meadow communities. Several common mammalian species are adapted primarily to wetlands or other aquatic habitat including muskrat (*Ondatra zibethicus*). Reptiles and amphibians are particularly adapted to wetlands and aquatic

habitats. Typical species include salamanders, ranid frogs, toads (*Bufo* sp.), hylid treefrogs, turtles and various snakes including the eastern ribbon snake (*Thamnophis sauritus*).

- *Agricultural/Urban Lands*: A variety of wildlife habitats are included in this category. These include hayfields, suburban and urban residential areas, commercial and industrial developments, developed recreational areas (e.g., parks, playgrounds), maintained lawns, and road corridors. Wildlife in these habitats can be abundant, as animals are attracted to human food sources (e.g., crop fields, orchards, bird feeders), but the species inhabiting them must be tolerant to some degree of human disturbance. Some of the most recognizable wildlife species can be found in these areas, such as white-tailed deer, raccoon, woodchuck, and birds such as Canada geese (*Branta canadensis*), robin (*Turdus migratorius*), house sparrow (*Passer domesticus*), and other numerous bird species frequenting feeders. Other common but less visible species, such as red fox, coyote and skunk may also be present. Nuisance wildlife species (e.g., crows, rats, and other small rodents) are often abundant in these habitats. Some wildlife species are dependent on human activity to thrive, such as birds nesting almost exclusively in human structures (e.g., chimney swift, barn swallow). Reptiles and amphibians, which are typically less tolerant of human activity, tend to be scarce in these habitats. Common amphibian and reptile species in suburban habitats include green frog (*Rana clamitans*), bullfrog (*Rana catesbeiana*) and garter snake (*Thamnophis sirtalis*).

Breeding Birds

To identify the birds that may breed in the habitats found in the Project area, UI conducted baseline research using published data regarding breeding birds in Connecticut, supplemented by observations during biological field studies performed for the Project. For this evaluation, potential suitable habitat for breeding birds was assumed to be areas within approximately 100 feet of the ROW.

An initial inventory of birds that could potentially breed in the Project vicinity was generated based on the presence of suitable habitat. That preliminary list was then refined by considering such factors as bio-geographical distribution, the presence or absence of critical habitat features and minimum patch size requirements (i.e., for area-sensitive species). The resulting list of birds that could potentially breed in the Project area, subdivided by habitat type, is presented in Table 5-5.

The list of birds in Table 5-5 was developed utilizing a habitat-based catalog of known breeding birds in Connecticut. The primary source was *The Atlas of Breeding Birds of Connecticut*, which is the result of a five-year study (1982-1986) of all bird species known to breed in the State. This study is the most comprehensive review to date of Connecticut's breeding birds. Additional resources on habitat utilized include *New England Wildlife: Habitat, Natural History and Distribution* (DeGraaf and Yamasaki, 2001).

Table 5-5: List of Birds Potentially Breeding in the General Project Area

Common Species Name	Scientific Name
American Crow	*Corvus brachyrhynchos*
American Goldfinch	*Carduelis tristis*
American Robin	*Turdus migratorius*
Bald Eagle (State-Listed Threatened)	*Haliaeetus leucocephalus*
Baltimore Oriole	*Icterus galbula*
Barn Swallow	*Hirundo rustica*
Barred Owl	*Strix varia*
Belted Kingfisher	*Ceryle alcyon*
Black-capped Chickadee	*Parus atricapillus*
Blue Jay	*Cyanocitta cristata*
Blue-headed vireo	*Vireo solitarius*
Blue-winged warbler	*Vermivora cyanoptera*
Brown-headed Cowbird	*Molothrus ater*
Canada Goose	*Branta canadensis*
Carolina Wren	*Thryothorus ludovicianus*
Cedar Waxwing	*Bombycilla Vieillot*
Chimney Swift	*Chaetura pelagica*
Chipping Sparrow	*Spizella passerina*
Common Grackle	*Quiscalus quiscula*
Common Raven	*Corvus corax*
Common Yellowthroat	*Geothlypis trichas*
Cooper's Hawk	*Accipiter cooperii*
Downy Woodpecker	*Picoides pubescens*
Eastern Kingbird	*Tyrannus*
Eastern Phoebe	*Sayornis phoebe*
Eastern Wood-Pewee	*Contopus virens*
European Starling	*Sturnus vulgaris*
Field Sparrow	*Spizella pusilla*
Fish Crow	*Corvus ossifragus*
Gray Catbird	*Dumetella carolinensis*
Great Crested Flycatcher	*Myiarchus crinitus*
Great Horned Owl	*Bubo virginianus*
Green Heron	*Butorides virescens*
Hairy Woodpecker	*Picoides villosus*
House Finch	*Carpodacus mexicanus*
House Sparrow	*Passer domesticus*
House Wren	*Troglodytes aedon*
Indigo Bunting	*Passerina cyanea*
Killdeer	*Charadrius vociferus*
Mallard	*Anas platyrhynchos*
Mourning Dove	*Zenaida macroura*
Northern Cardinal	*Cardinalis*
Northern Flicker	*Colaptes auratus*
Northern Mockingbird	*Mimus polyglottos*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Osprey	*Pandion haliaetus*
Ovenbird	*Seiurus aurocapillus*
Peregrine Falcon	*Falco peregrinus*
Pileated Woodpecker	*Dryocopus pileatus*
Pine Warbler	*Setophaga pinus*
Prairie Warbler	*Setophaga discolor*
Red-bellied Woodpecker	*Melanerpes carolinus*
Red-eyed Vireo	*Vireo olivaceus*
Red-shouldered Hawk	*Buteo lineatus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Rock Dove	*Columba livia*
Rose-breasted Grosbeak	*Pheucticus ludovicianus*
Ruby-throated Hummingbird	*Archilochus colubris*
Scarlet Tanager	*Piranga olivacea*
Sedge wren (State-Listed Endangered)	*Cisttothorus platensis*
Song Sparrow	*Melospiza melodia*
Tree Swallow	*Tachycineta bicolor*
Tufted Titmouse	*Parus bicolor*
Warbling Vireo	*Vireo gilvus*
White-breasted Nuthatch	*Sitta carolinensis*
Wild Turkey	*Meleagris gallopavo*
Wood Thrush	*Hylocichla mustelina*
Yellow-rumped Warbler	*Dendroica coronata*

References: Ed. Bevier, L. R. 1994. The Atlas of Breeding Birds of Connecticut, CT DEEP. Birds of the World (A. F. Poole and F. B. Gill, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA. DeGraaf, R.M. and Yamasaki, M. 2001. New England Wildlife: Habitat, Natural History and Distribution. University Press of New England.

Fisheries

The ROW spans the Housatonic River, as well as nine small intermittent or perennial un-named streams. The Housatonic River is the only watercourse that supports fisheries. The Ousatonic Dam forms a barrier between the river's intertidal and non-tidal habitats. The intertidal waters have a direct connection to Long Island Sound but the dam is a barrier to upstream migration by most species. Conversely, the non-tidal waters are isolated from Long Island Sound and any viable diadromous migration. Table 5-6 summarizes the most common finfish species that have been inventoried in the Housatonic River, upstream and downstream of the Ousatonic Dam.

Table 5-6: List of Fisheries Identified by CT DEEP in the Housatonic River

Common Name	Scientific Name	Upstream of Dam	Downstream of Dam
Anguilla rostrata	American Eel	X	X
Catostomus commersoni	White Sucker	X	X
Cyprinus carpio	Eurasian Carp	X	
Esox lucius	Tiger musky	X	
Etheostoma olmstedi	Tessellated Darter	X	X
Lipomis auritus	Redbreast Sunfish		X
Lipomis gibbosus	Pumpkinseed		X
Micropterus dolomieui	Smallmouth Bass		X
Micropterus salmoides	Largemouth Bass		X
Morone americanus	White Perch		X
Notemigonus crysoleucas	Golden Shiner		X
Notropis hudsonius	Spotted Shiner		X
Paralabrax clathratus	Calico Bass	X	
Rhinichthys atratulus	Eastern Blacknose Dace	X	
Rhinichthys cataractae	Longnose Dace	X	
Salmo trutta	Brown Trout	X	
Salvenelinus fontinalis	Brook trout	X	
Sander vitreus	Walleye	X	
Trinectes maculatus	Hogchoker		X

References: Hagstrom, N.T., M. Humphreys and W.A. Hyatt. 1992. A Survey of Connecticut Streams and Rivers – Lower Housatonic and Naugatuck River Drainages. CTDEEP, Hartford, CT. CT DEEP. 2021. 2021 Connecticut Fishing Guide: Inland and Marine

5.3.3 Vernal Pools

In conjunction with 2016 and 2020 wetland delineation studies along the Project ROW, UI conducted field surveys of the to determine if vernal pools[24] were present. A follow-up survey for vernal pools also was performed in April 2021. No vernal pools were observed within or directly adjacent to the ROW.

[24] The definition of a vernal pool, as specified in the USACE General Permit for Connecticut, is: "[A]n 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 (obligate species). Such species may include wood frogs, mole salamanders (Ambystoma sp.), fairy shrimp, fingernail clams, and other amphibians, reptiles and invertebrates. Vernal pools lack breeding populations of fish".

5.3.4 Federal and State-Listed Threatened, Endangered, or Special Concern Species

To evaluate the potential for Federal or State-listed species to occur in the Project area, UI conducted research, evaluated potential habitats during field investigations, and consulted with both the U.S. Fish and Wildlife Service (USFWS) and the CT DEEP Natural Diversity Database (NDDB) program.

Federally-Listed Species

UI consulted with the USFWS to determine if the Project area coincides with the known habitat of species identified by the Federal government as threatened, endangered, or species of concern. Specifically, UI consulted with the USFWS's New England Ecological Services Field Office using the online Information for Planning and Consulting (iPaC) tool. The iPaC system identified two species:

- **Northern Long-Eared Bat ([NLEB]:** ***Myotis septentrionalis***. The NLEB, a Federally-listed Threatened species, could potentially use trees in the Project area for summer roosting habitat.[25] No critical habitat has been designated by the USFWS for this species. The Project area is not located within 150 feet of a known occupied maternity roost tree or within 0.25 mile of a known NLEB hibernaculum. There are currently no documented NLEB maternity roost trees in Connecticut. The nearest NLEB habitat resource to the ROW is in North Branford, over 18 miles from the Project area. (Refer to USFWS correspondence in Appendix B).

- **Monarch Butterfly:** ***Danaus plexippus***. The Monarch Butterfly was identified in December 2020 as a candidate species under consideration for listing, but not yet a Federally-listed species. Critical habitat is not listed for the species, which use milkweed as a host plant.

State-Listed Species

The NDDB publishes maps, by municipality, that depict the approximate locations of (i) endangered, threatened and special concern species and (ii) significant natural communities in Connecticut. The locations of species and natural communities depicted on the NDDB maps are based on data collected over the years by CT DEEP staff, scientists, conservation groups, and landowners. In some cases, an occurrence represents a location derived from the literature, museum records, and/or specimens.

Based on review of NDDB mapping (dated December 2021) and correspondence from NDDB (refer to Appendix B), two State-listed species (both birds) are known to inhabit the general Project area:

- **Sedge Wren:** ***Cisttothorus platensis***. A State-listed Endangered species, the sedge wren nests in dense, tall growths of sedges and grasses in wet meadows, hayfields, retired croplands, upland margins of ponds and marshes, coastal marshes, and sphagnum bogs. This species was identified in the vicinity of the Derby Junction. The sedge wren nests between May and August.

[25] On March 24, 2022, the USFWS proposed the NLEB as a candidate for listing as Endangered. The NLEB is also a State-listed Endangered species.

- **Bald Eagle: *Haliaeetus leucocephalus***. Habitat use by bald eagles, a State-listed Threatened species, varies; however, proximity to large bodies of water with suitable foraging opportunities is critical. As such, bald eagles are generally restricted to coastal areas, lakes, and rivers. Preferred breeding sites are in forested areas adjacent to water in areas with minimal human disturbance. Large, tall conifers are often chosen for nesting, perching, and roosting. In some areas, the distance of the nest site to water is not as critical as the quality of available foraging habitat and the amount of human activity. The average distance from a bald eagle nest tree to human development is >1,600 feet, with the minimum distance about 300 feet. Relatively open tree canopies, some type of habitat edge, and the availability of super-story trees that provide good access to nests and stout horizontal perching branches are preferred habitat features for breeding pairs.

5.4 LAND USE, RECREATION, AND COMMUNITY FACILITIES

5.4.1 Existing Land Use and Zoning

UI's ROW (established in 1924) has been continuously occupied by electric transmission facilities for almost 100 years. In that time, the land uses in the Project area have evolved such that the ROW is presently bordered by a mix of agricultural, residential, recreational, commercial, and industrial areas. Most of these land uses developed long after the ROW was established. For example, Osbornedale State Park, through which the ROW extends for approximately 1,465 feet in Derby/Ansonia, was acquired by the State in 1956. Appendix D includes historical aerial photographs showing the ROW and surrounding land uses over time.

Both of UI's existing substations are situated in industrial/commercial areas. Indian Well Substation, which occupies 0.97 acre east of the Housatonic River in Derby, is bordered to the east by State Route 34 and commercial uses in converted industrial buildings, to the north by Gilder Boat House (Yale), and to the south by a recently developed 14-megawatt (MW) fuel cell facility operated by Derby Fuel Cell, LLC. Similarly, Ansonia Substation, which occupies approximately 3.2 acres west of the Naugatuck River in Ansonia, is situated in an industrial area north of State Route 334.

In general, the properties along and abutting the ROW in Shelton include open space/agricultural uses, along with some single-family residential developments, whereas in Derby and Ansonia, the ROW extends near industrial/commercial uses and more densely-developed residential areas. Recreational uses include the Gilder Boat House, as well as an undeveloped portion of Osbornedale State Park. In some areas, private developments (e.g., sheds, swimming pools) have encroached on the existing ROW. The municipal zoning districts along and in the vicinity of the ROW reflect the varied land uses. Table 5-7 summarizes the prominent land use features and zoning designations, by municipality, along the ROW.

Table 5-7: Summary of Predominant Land Uses and Features along or near the ROW, by Municipality

Feature / Municipality	Shelton	Derby	Ansonia
ROW Miles (approx.)	1.25	1.42	1.47
Nearby Environmental & Other Features	• Municipal open space/agricultural areas • Housatonic River • Indian Well State Park (north of ROW) • RiverviewPark (south of ROW) • Duck Island Wildlife Area (in the Housatonic River south of the Ousatonic Dam, generally opposite Riverview Park) • Shelton High School (south of the ROW near Derby Junction) • CFPA Paugussett Trail • Bluff Walk Trail (City of Shelton)	• Housatonic River • Gilder Boat House (Yale University) • Ousatonic Dam and canal • Osbornedale State Park • Derby High School and Middle School • Municipal dog park • Coon Hollow Park (municipal recreational area) • St. Michaels Cemetery (north of ROW)	• Osbornedale State Park • Nolan Field Athletic Complex • Ansonia Middle School • Naugatuck River and levee (east of Ansonia Substation)
Zoning	Conservation Residential Development; Planned Residential Development; Residential Development	Residential; Business; Mill Design District; Public and Semi-Public; Open Space	Residential; Commerce Park District; Heavy Industrial Area
Transportation Network	Local roads = Meadow Street, Howe Avenue State roads = Route 110 (Howe Avenue) Other = Housatonic Railroad Company (Freight railroad, its Maybrook Line is adjacent to the Housatonic River that line connects to Danbury and extends west into New York State)	Local roads = B Street, Park Avenue, Coppola Terrace,, Coon Hollow Road, Chatfield Street, Division Street State roads = Route 34 (Roosevelt Drive)	Local roads = Division Street, Silver Hill Road, Willow Street, Scotland Street, Wakelee Avenue, North Westwood Road, Riverside Drive State roads = Route 8; Route 334 (Franklin Street)

5.4.2 Open Space and Recreational Areas

The UI ROW does not cross and is not located near any national wildlife refuges, parks, forests, or wild and scenic rivers. However, the ROW traverses or is located near State, municipal, and private recreational uses, as listed in Tables 5-7 and 5-8, illustrated on the Appendix A maps, and summarized below, by municipality. In addition, both the Housatonic and Naugatuck rivers provide opportunities for water-based recreation (fishing, kayaking/canoeing, etc.) in the general vicinity of the Project area.

Table 5-8: Recreational Facilities along or near the ROW

Municipality	Recreational Resource	Location in Relation to ROW
Shelton		
	Indian Well State Park (various recreational facilities/opportunities; state boat launch)	Approximately 1 mile northwest of Structure 359
	Shelton Riverview Park & Bluff Walk Trail	Approximately 0.2 mile southeast of Structure 359
	Paugussett Trail (CFPA blue blazed)	Extends along and through Eversource's ROW from Constitution Blvd. and parallels UI ROW, 0.2 mile to the north
Derby		
	Gilder (Yale University) Boat House	Adjacent to ROW and northwest of Structure 360
	Municipal dog park	Within ROW at Structure 8
	Coon Hollow Park (municipal)	Approximately 0.1 mile west of Structure 5
	Recreational fields at Derby High School	Approximately 0.1 mile west of Structure 6
	Osbornedale State Park	West of the ROW
Ansonia		
	Osbornedale State Park	ROW crosses the park between Structures 10-12
	Nolan Field Athletic Complex	Adjacent to and north of the ROW between Structures 17 and 18

Shelton:

- The Connecticut Forest & Park Association's (CFPA's) 13.3-mile Paugussett (Blue-Blazed) Trail extends from Shelton into the Town of Monroe. In the Project area, a portion of the hiking trail is located along and through the Eversource ROW from Constitution Boulevard North to north of Derby Junction before turning west to extend about 0.2 mile north of and parallel the UI ROW.

- The ROW crosses several City open space parcels, including 0.3 mile across an open space parcel (currently an agricultural/open field) between Derby Junction to west of Meadow Street and 0.2 mile across open space parcels north and east of Ten Coat Lane and west of Howe Avenue (State Route 110). (Cumulatively, the City has approximately 2,000 acres of public open space.)

- Riverview Park extends along the Housatonic River approximately 0.2 mile south of the ROW. The City's first park, the area includes a playground, baseball fields, a hiking trail, picnic area, and an overlook of the Ousatonic Dam and river. The overlook includes a 100-year-old fountain.

- Indian Well State Park. The 153-acre park, which borders the Housatonic River, is located about 0.75 mile north of the ROW and includes a beach, boat launch, and picnic facilities. The Paugussett Trail extends through the park, as does Indian Well Road, which Shelton has designated as scenic.

Derby:

- Gilder Boat House (Yale), includes facilities for Yale's rowing program and also offers a summer youth rowing program.

- CT DEEP fishing access to the Housatonic River off Roosevelt Drive (State Route 34) near the Ousatonic Dam.

- Coon Hollow Park (also referred to as the Derby Picnic Grove); includes a field with pavilion and is near tennis and basketball courts. The Leo F. Ryan Athletic Complex is nearby.

- Dog Park (Coon Hollow Road). The fenced dog park is operated jointly by Derby and Ansonia.

Derby/Ansonia:

- The UI ROW (between Structures 10 and 12) crosses the eastern portion of Osbornedale State Park (refer to Figure 5-1). The park dates to 1956, when a private landowner (Mrs. Frances Osborne Kellogg) willed the property (which had been farmed and used for breeding Holstein cows) to the people of Connecticut. The park offers multiple recreational opportunities (e.g., hiking, fishing, picnicking) and includes the Osborne Homestead Museum and the Kellogg Environmental Center. As Figure 5-1 illustrates, the park's principal recreational areas are located west and south of the UI ROW, which is separated from the main park area by Division Street and Silver Hill Road.

Ansonia:

- The ROW borders Ansonia's Nolan Field Athletic Complex, which includes baseball and football fields, as well as a track and tennis courts.

- The Naugatuck River Greenway Trail, a designated Connecticut State Greenway consisting of open and green spaces to be used for non-motorized multi-trail purposes, is planned to extend for 44 miles along the Naugatuck River. The Ansonia portion of the trail is pending construction and is planned for location east of Ansonia Substation.

5.4.3 State, Regional, and Local Land Use Plans

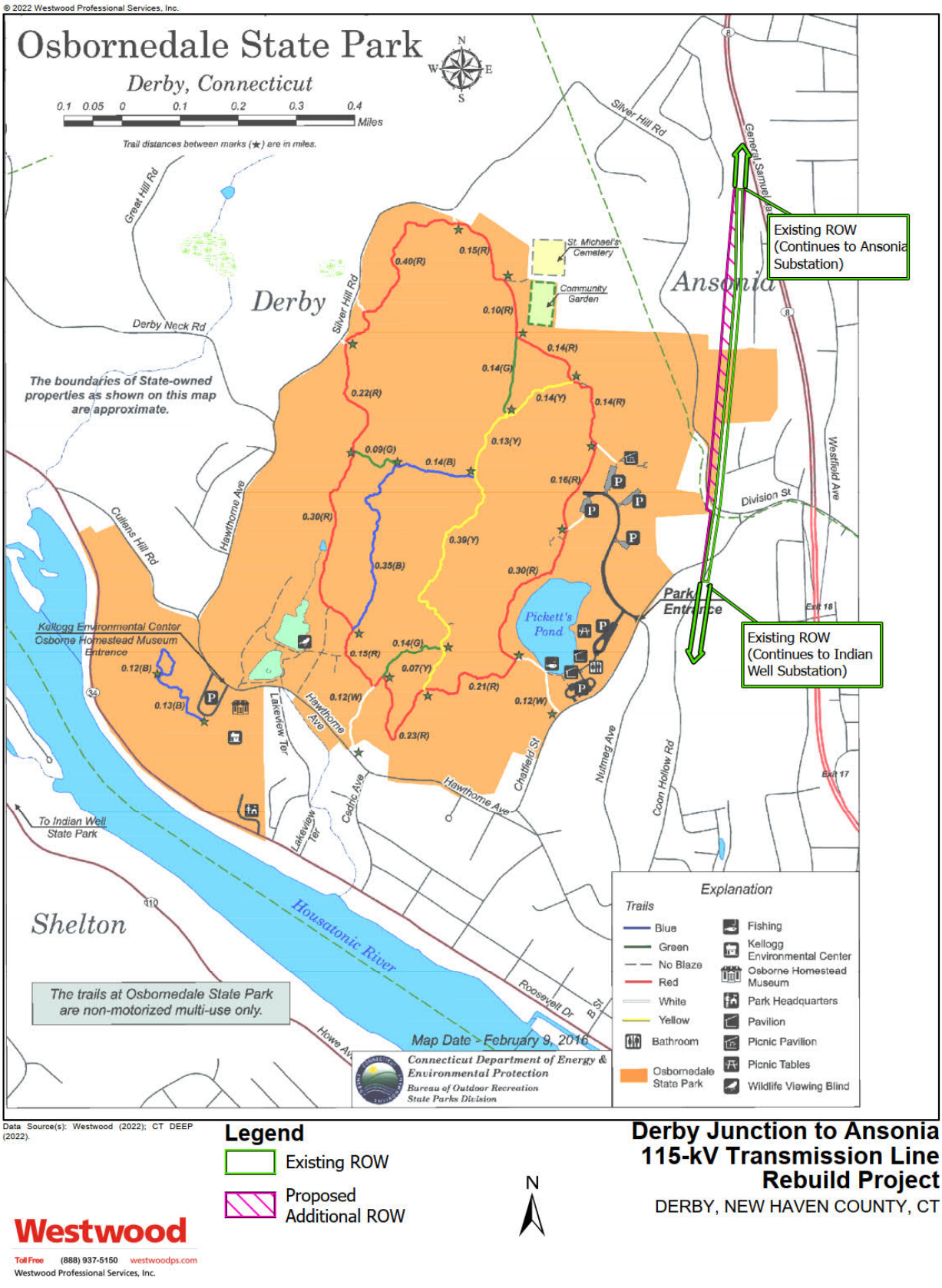
To evaluate the consistency of the proposed Project with State, regional, and local land use plans, UI reviewed published information from each of the cities in the Project area, as well as regional policy documents and the State's *Conservation and Development Policies: The Plan for Connecticut* (C&D Plan).

State and Regional Plans

The goal of Connecticut's C&D Plan is to guide and balance response to human, environmental, and economic needs in a manner that best suits the State's future, taking into account risks associated with increased coastal erosion due to sea level changes. The current C&D Plan (2013-2018) remains in effect until the updated plan (2018-2023; currently in draft form) is approved by the State legislature; the legislature will consider the updated plan during the 2022 legislative session. The Project is consistent with the current Plan's overall objectives and is particularly relevant to the Plan's Growth Management Principle #1: Redevelop and Revitalize Regional Centers with Existing or Currently Planned Physical Infrastructure[26].

[26] The draft 2018-2023 C&D Plan includes the same principle regarding growth management.

Figure 5-1: Project ROW and Osbornedale State Park



State and Regional Plans

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The Project will serve a public need by ensuring that the existing 115-kV lines are rebuilt to continue to provide reliable electric service to the region. Moreover, the Project will conform to the C&D Plan's recommendation to "ensure the safety and integrity of existing infrastructure over its useful life through the timely planning and budgeting for maintenance, repairs, and upgrades" (C&D Plan, p. 8) and will "minimize the potential risks and impacts from natural hazards, such as flooding, high winds, and wildfires, when siting infrastructure…" and will "consider potential impacts of climate change on existing and future development" (C&D Plan, p. 9).

Shelton, Derby, and Ansonia are among the 19 cities and towns that comprise the Naugatuck Valley Council of Governments (NVCOG) planning region. The NVCOG was created in 2015 as a result of the consolidation of three regional planning agencies: the Valley Council of Governments, the Council of Governments of the Central Naugatuck Valley, and the Central Connecticut Regional Planning Agency. Each of these three regional planning groups previously published regional Plans of Conservation and Development (POCDs). The NVCOG is presently reviewing these POCDs and is in the process of developing a regional POCD as an advisory policy document regarding the future development.

Local Land Use Plans

Shelton, Derby, and Ansonia each have published a POCD, designed to establish and guide a vision for future municipal development. Shelton's POCD (2017 update to the 2006 POCD) focuses on guiding future development and continuing to protect/enhance greenways, ridgelines, watercourses and other important natural features. Derby's 2016 POCD and Ansonia's POCD (2018) encourages the preservation of open

[27] The draft 2018-2023 C&D Plan includes the same principle regarding growth management.

space and natural features while promoting economic development and municipal improvements. The POCDs generally do not address transmission energy infrastructure.

However, Shelton's Open Space Inventory & Trails Map (October 2014) illustrates UI's ROW in relation to other municipal and State conservation and recreational areas, including the City's Riverview Park and Indian Well State Park, while the City's Building Zone Map (as amended July 2017) depicts the locations of the UI and other energy transmission lines. The entire Project area in Shelton is also within a designated coastal management area. However, in Shelton, the ROW extends across predominantly upland areas. Further, UI's existing transmission lines span the Housatonic River, which is not tidal at the crossing.

5.4.4 Community Facilities

The CSC defines community facilities as public and private schools, licensed daycare centers, public playgrounds, group homes, hospitals, recreational areas, and licensed youth camps. The community facilities within 2,000 feet of the Project area are listed in Table 5-9 and shown on the Appendix A maps.

5.5 VISUAL AND AESTHETIC CHARACTERISTICS

UI's ROW was originally established in 1924 and over time the transmission facilities have been modified and upgraded. The establishment of the ROW pre-dates most of the adjacent land uses and thus the overhead transmission lines and associated lattice steel towers and other support infrastructure have been a distinctive landscape element for almost 100 years.

Similarly, Indian Well Substation and Ansonia Substation also were initially developed in 1995 and 1968, respectively, although both substations have been expanded and modernized over the years. Eversource's overhead transmission line ROW, which extends generally north-south through Derby Junction, as well as the Indian Well and Ansonia substations also contribute to the existing visual environment.

The visual environment adjacent to the UI ROW varies, both in terms of land uses and natural features (topography, vegetative screening) that affect views of the transmission infrastructure. The Housatonic River is a primary landscape attribute along the ROW.

In general, areas surrounding the ROW in Shelton are characterized by municipal open space and agricultural lands, bordered by residential development. In Derby and Ansonia, the ROW extends near industrial/commercial uses and more densely-developed residential areas, as well as recreational uses (e.g., Gilder Boat House, Osbornedale State Park).

Table 5-9: List of Community Facilities within 0.5 mile of Project Area

Community Facility Type/Name	Address	City	Distance from Project ROW (miles, direction)
Medical Facilities			
Griffin Hospital	130 Division Street	Derby	0.39, east
Group Homes			
Varca Residence	45 Murray Street	Derby	0.35, east
Senior Centers			
Shelton Senior Center	81 Wheeler Street	Shelton	0.32, southeast
Daycare Facilities			
Jane Mancini	244 Soundview Avenue	Shelton	0.49 miles, west
Marian Moore	25 Geissler Drive	Shelton	0.44, southeast
Eudocia Infantas Ureta	29 Hawthorne Avenue	Derby	0.36, southeast
Saint Mary Saint Michael School	14 Seymour Avenue	Derby	0.47, east
Josefina Rosario	51 10th Street	Derby	0.22, east
Little Raiders University (Preschool)	75 Chatfield Street	Derby	0.05, west
Emanuela Soldra/ABC 123 daycare	55 Francis Street	Derby	0.44, east
Maria Elvia Perez	42 Jackson Street	Derby	0.13, southwest
Abundance of Joy Learning Center	195 N Main Street	Derby	0.37, east
Jeanne Kingsley	25 Roosevelt Drive	Derby	0.35, northeast
Youth Camps			
Naugatuck Valley Boys & Girls Club Summer Camp	1 Positive Place	Shelton	0.35, southeast
The Recreation Camp	550 Roosevelt Drive	Derby	0.31, northwest
Valley YMCA	12 State Street	Derby	0.39, east
Yale Rowing Camp	280 Roosevelt Drive	Derby	0.01, North
Schools			
Shelton High School	120 Meadow Street	Shelton	0.17, southeast
Derby High School	75 Chatfield Street	Derby	0.04, west
Derby Middle School	73 Chatfield Street	Derby	0.11mi, west
Recreational Areas/Parks			
The Shelton Riverview Park	697 Howe Avenue	Shelton	0.17 south
Coon Hollow Park	63 Nutmeg Ave	Derby	0, west
Osbornedale State Park	43 Chatfield Street	Derby	0, west
Nolan Athletic Complex	350 Wakelee Ave	Derby	0.4, north

Throughout the Project area, adjacent land uses include existing overhead utility infrastructure (i.e., poles supporting distribution circuits, terrestrial telephone wires, and cables). Views of the existing 115-kV lines are evident from the Paugussett Trail, which parallels the UI ROW and extends directly along and through a portion of the Eversource ROW in Shelton.

The *Visual Assessment and Photo-Simulations* report provided in Appendix C includes detailed information about the visual analyses conducted of the Project area, including representative views of the existing visual environment in the vicinity of the ROW.

The Project is not near any designated national scenic areas, National Heritage Corridors, or State heritage areas. Federal and State heritage areas are places where historic, recreational, cultural, natural, and scenic resources combine to form landscapes that are recognized as important, either from a national or Connecticut perspective. Similarly, no CT DOT Scenic Land Strips[28] and no locally-designated scenic roads are within or adjacent to the Project area.

5.6 CULTURAL (ARCHAEOLOGICAL AND HISTORIC) RESOURCES

Heritage Consultants, LLC (Heritage) conducted a Phase IA cultural resources assessment survey of the proposed Project area. The Phase IA survey included a review of various data related to the Project ROW and its immediate surroundings, including historical mapping, aerial imagery analysis, and a literature search of previously identified archaeological sites and National Register of Historic Places/State Register of Historic Places (NRHP/SRHP)-listed properties.

The survey revealed that there are no previously identified archaeological sites or NRHP/SRHP properties or districts located within or in close proximity to the Project ROW. However, Heritage's review of current landscape conditions and qualities of the western portion of the ROW between Structures 350 and 356 suggests that this area retains a moderate to high potential to yield intact cultural deposits. As a result, Heritage recommended that UI commission a Phase 1B cultural reconnaissance (field) survey of this area, focusing on locations where it would not be feasible to use best management practices (BMPs), such as the use of timber matting for access roads/work pads and the installation of high visibility fencing along the edges of work areas to keep construction contractors from straying outside the Project limits).

[28] CT DOT Scenic Land Strips are roadside properties, located primarily outside of highway ROWs, that were purchased by CT DOT pursuant to a program under the 1965 Federal Highway Beautification Act. The purpose of this program was to control the proliferation of billboards and other unsightly views along Federally designated highways. In Connecticut, there are 33 such parcels located along seven highways in eight towns; however, none are in the Project area.

5.7 TRANSPORTATION, UTILITIES, AND ENERGY FACILITIES

5.7.1 Transportation Network

The Project area is characterized by a well-developed transportation network, consisting of local roads, State highways (State Routes 110, 34, 8, and 334), and a railroad corridor. Adjacent to the Housatonic River in Shelton, the ROW spans the Housatonic Railroad Company's Maybrook Line, which provides freight service. Adjacent to Indian Well Substation in Derby, the ROW is adjacent to and spans a portion of the canal that formerly provided boat access around the Ousatonic Dam; only a small segment of this canal remains.

No airports are located in the immediate Project area. The nearest airport is Waterbury-Oxford Airport, a publicly-owned general aviation facility located in the Town of Oxford approximately 11 miles north of Ansonia Substation. UI's current electric transmission lines that span the Housatonic River do not include any aviation lighting or marker balls.

5.7.2 Utilities and Energy Facilities

The Project area is served by a full complement of utilities (electric, natural gas, sewers, public water, telephone, cable). Energy facilities within a 5-mile radius of the Project area (excluding the UI Project facilities) that are owned or operated by a public service company are listed in Table 5-9. Energy facilities in the immediate vicinity of the Project area (including Derby Junction and Indian Well and Ansonia substations and the Derby Fuel Cell facility that borders Indian Well Substation to the south) are visible on the Appendix A maps.

Table 5-10: Energy Facilities within 5-Mile Radius of UI Project

Facility Name	Address	Facility Type	Distance & Direction from Project ROW
Eversource Electric Transmission Lines	Linear corridor	115-kV	Interconnection at Derby Junction; North-South
Iroquois Gas Transmission System	Linear corridor	Natural gas transmission system	West of Derby Junction
Kinder-Morgan Gas Transmission System	Linear corridor	Natural gas transmission system	Southeast of Derby Junction
Derby Fuel Cell	200 Roosevelt Drive, Derby	Fuel cell power generating facility	South of and adjacent to Indian Well Substation
FirstLight Power Stevenson Hydroelectric Dam	1 Roosevelt Drive (Route 34), Monroe	Hydroelectric Dam	5 miles Northwest of Derby Junction

5.8 AIR QUALITY, NOISE, AND LIGHTING

Air Quality

Ambient air quality is affected by emissions from mobile sources (e.g., vehicles) and stationary sources (e.g., manufacturing facilities, gasoline stations, power plants). Naturally occurring pollutants, such as radon gas, also affect air quality. Ambient air quality in Connecticut is monitored by CT DEEP and air quality conditions are assessed based on compliance with the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants (sulfur dioxide, carbon monoxide, nitrogen dioxide, particulate matter, lead, and ozone).

Connecticut is in attainment for all criteria pollutants except ozone. CT DEEP data shows that measured ozone levels in southern Connecticut (including Fairfield and New Haven counties) exceed the NAAQS on several days each summer, depending on weather conditions. Ambient air quality in the Project area can generally be expected to mirror these conditions in the State.

The U.S. Environmental Protection Agency (EPA) has determined that carbon dioxide (CO_2) is a pollutant and has included CO_2 in its list of criteria pollutants. Areas of non-attainment have not yet been established for CO_2 or other greenhouse gases.

In an effort to reduce particulate emissions, the CT DEEP has promulgated regulations (RCSA § 22a-174-18) that prohibit unnecessary idling for more than 3 minutes. Exceptions are made for weather extremes and certain service vehicles.

Noise

Existing noise levels in the Project area vary as a function of the different land uses along the ROW. For example, in Shelton, the ROW extends across open space and near single-family residences and town homes before crossing State Route 110 and the Housatonic Railroad Company's Maybrook Line adjacent to the Housatonic River. Ambient sound levels along the Shelton portion of the route thus are characteristic of generally low-density residential uses, interspersed with noise from vehicle movements and intermittent railroad traffic.

In comparison, lands adjacent to the ROW in Derby and Ansonia are characterized by a mix of commercial and industrial uses, along with more densely-developed residential areas. In the vicinity of the ROW in these municipalities, the existing noise environment is influenced by higher traffic volumes on State and

local roads (including State Routes 34 and 8), as well as the operation of various commercial and industrial facilities.

The State noise regulations (RCSA §§ 22a-69-1 to 22a-69-7.4, 2015) prescribe the A-weighted maximum sound pressure levels, based on land use at the noise emitter and receptor. These regulations define daytime vs. nighttime noise periods, classify noise zones based on land uses, and identify noise standards for each zone, specifying that noise emitters must not cause the emission of excessive noise beyond the boundaries of their noise zone so as to exceed the allowable noise levels on a receptor's land. Table 5-11 lists the Connecticut noise zone standards, by emitter (source) and receptor (receiver) noise classification.

Table 5-11: State of Connecticut: Maximum Sound Pressure Level Noise-Control Levels (By Emitter and Receptor Land Use)

Noise Emitter Land Use	Noise Receptor Land Use			
	Industrial	Commercial	Residential (Day)	Residential (Night)
Residential	62 dBA	55 dBA	55 dBA	45 dBA
Commercial	62 dBA	62 dBA	55 dBA	45 dBA
Industrial	70 dBA	66 dBA	61 dBA	51 dBA

Note:
The State of Connecticut defines "day" as the hours from 7:00 AM to 10:00 PM, and night from 10:00 PM to 7:00 AM all days of the week. Bridgeport defines "day" as the hours from 7:00 AM to 6:00 PM, and night from 6:00 PM to 7:00 AM, Monday through Friday. On Saturday and Sunday, the City defines "day" as from 9:00 AM to 6:00 PM, and night from 6:00 PM to 9:00 AM.

In accordance with Conn. Gen. Stat. Section 22a-73, municipalities also may adopt noise control ordinances, which must be approved by the Commissioner of the CT DEEP and be consistent with the State noise regulations. Shelton, Derby, and Ansonia each have municipal noise ordinances that have been approved by CT DEEP.[29]

Shelton's and Ansonia's noise ordinances include the same standards for emitters and receptors as the Connecticut noise regulations. However, Derby's noise ordinance is slightly different than the State and Shelton standards, classifying both emitters and receptors as either residential or non-residential. Noise from residential emitters to both non-residential and residential receptors is limited to 55 dBA during both the daytime and the nighttime. Standards for noise from non-residential emitters is limited to 62 dBA at the property boundary for non-residential receptors (daytime) and 55 dBA for residential receptors (daytime). The Derby ordinance further specifies a nighttime noise limit at the emitter property boundary of 45 dBA.

[29] Shelton's noise ordinance was approved in April 1978, Derby's in May 1999; and Ansonia's in June 2001. The noise ordinances are available on the CT DEEP website at: https://portal.ct.gov/DEEP/Air/Planning/Noise-Control

The State and three municipal ordinances all exempt construction related noise from the regulations during specified hours, defined as follows:

- State of Connecticut (as well as Shelton and Ansonia) daytime hours are 7:00 AM to 9:00 PM Monday through Saturday, and 9:00 AM to 9:00 PM Sunday.
- Derby defines construction hours as between 7:00 AM and one hour after sundown, Monday through Saturday, and between 9:00 AM and one hour after sundown on Sunday.

Lighting

Illumination in the vicinity of the ROW is reflective of the adjacent land uses, including the degree of development. Urban/suburban areas such as those found near portions of the ROW are typically well-lit from a variety of sources, including public streetlights, lighting on individual homes and commercial/industrial facilities, and commercial signs.

6. POTENTIAL ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

The proposed Project will have a positive long-term effect on the reliability of the electric system in Fairfield and New Haven counties and will minimize adverse environmental effects to the extent practical by rebuilding the 115-kV transmission lines along UI's long-established ROW between Derby Junction and Ansonia Substation. Overall, the environmental impacts associated with the Project are expected to be minor, short-term, or highly localized on and in the vicinity of the ROW.

The anticipated impacts and proposed mitigation measures identified in this section are based on UI's historical experience in constructing/rebuilding, operating, and maintaining electric transmission lines in Fairfield and New Haven counties, as well as on the results of the environmental and cultural resource studies; visual impact analyses; engineering, geotechnical, and constructability evaluations; and agency consultations conducted specifically for this Project. Additional measures to avoid or minimize environmental effects may be identified as Project plans are refined based on the input provided during the CSC process, the completion of other Federal and State agency reviews, and further consultations with regulatory agencies, stakeholders, and the general public. The final Project plans (including the D&M Plan) will reflect conformance to the conditions of Project-specific regulatory and siting approvals.

6.1 TOPOGRAPHY, GEOLOGY, AND SOILS

The construction and operation of the Project will have highly localized effects on topography, geology, and soils. These effects will be concentrated in the vicinity of work sites along the ROW, or where earth-moving activities, if any, are required at off-ROW Project support areas (e.g., off-ROW access roads, staging areas).

6.1.1 Topography and Geology

The ROW traverses varied terrain, including areas where grading (cut and fill) will be required to establish safe access roads and level work pads for installing the new monopoles, conductors, OHSW, and OPGW and removing the existing lattice steel towers and other structures. Where grading is required, soils will be managed in accordance with the procedures defined in the SWPCP. Grading typically will not be required where the terrain along the ROW is relatively level, where little or no access road improvements or new access roads are needed, or where the conductors span the underlying terrain.

At structure locations, work pads must be established to accommodate the equipment needed to safely install the structure foundation, structure, and associated conductors / hardware. The size of the work pad needed, as well as the changes in grades (e.g., cut or fill) required, will depend on the type of structure and the nearby terrain, as well as on whether temporary construction mats can be effectively stacked and positioned to create a level work area. Cut and fill activities typically will be localized to the work pad and the immediately adjacent areas.

Based on the results of UI's geotechnical investigations of the ROW, bedrock will be encountered during excavations for certain structure foundations. In some locations, bedrock also will have to be removed to create work pads and access roads.

UI proposes to remove rock using mechanical methods (such as excavators, drilling, or pneumatic hammers). Rock removal activities will generate dust, vibration, and noise in the immediate vicinity of work sites. Blasting is not expected to be necessary to remove rock. However, if blasting is required, UI will develop a Blasting Control Plan in compliance with industry, State, and UI procedures. The plan, which typically will include pre- and post-blast inspections of nearby structures, will be provided to the CSC for approval, as well as to the appropriate fire marshal(s).

Excess soils or rock generated by from grading or structure foundation excavation will be either temporarily stockpiled at construction work sites or loaded directly into dump trucks for off-site management or disposal in accordance with applicable regulations. These materials will be managed in accordance with UI's Project-specific Materials Management Plan and SWPCP; UI's construction contractors will be required to implement these plans.

In the locations where UI proposes to retain access roads or portions of the work pads to facilitate the operation/maintenance of the rebuilt 115-kV lines or in areas where significant bedrock removal is required, the topographic modifications associated with grading and rock removal will be permanent. In other locations, as the final phase of the Project construction, UI will restore, to the extent practical, the ROW (access roads and work pads) to approximate pre-construction contours.

6.1.2 Soils and Stormwater Management

The construction of the Project will result in localized, minor, and typically short-term impacts to soils as a result of grading (as needed to establish work pads and access roads), excavations for new structure

foundations, and the removal of existing structures. In addition, minor impacts to soils could potentially occur at laydown/material staging sites and contractor yards, if these temporary work areas are not located on paved or graveled properties. However, in areas where UI proposes to establish permanent access roads to facilitate operation and maintenance activities, the local topographic modifications (grading, filling) will be long-term.

Portions of the ROW cross soils designated as Prime Farmland (0.2 mile),[30] Statewide Important Farmland (0.4 mile), or susceptible to erosion (2.6 miles). UI recognizes that any soils disturbed by construction activities could be subject to erosion from wind or stormwater, and thus will develop a Project-specific SWPCP, pursuant to the CT DEEP's General Permit. The SWPCP will address the protection of farmland soils, soils susceptible to erosion, as well as general practices for both temporary (during construction) and permanent erosion and sedimentation control.

The SWPCP will be implemented by UI and its construction contractor(s) to avoid, minimize, or eliminate potential adverse environmental effects during transmission line construction, and will identify measures to reduce the likelihood of sediment migration from construction sites. After the completion of the 115-kV line work, the sites affected by Project activities will be restored and permanently stabilized. As a result, the operation of the rebuilt 115-kV lines will not result in long-term adverse effects to soils.

The following summarizes UI's approach for overall soil and stormwater management during Project construction, as well as the techniques anticipated to be used to protect farmland soils. Refer also to Section 3.6.6 for information regarding soils, groundwater, and materials management testing and management.

General Soil Management and Erosion Control

At Project work sites where soils will be disturbed and construction activities could potentially lead to erosion or sedimentation (as a result of mechanized vegetation clearing equipment, grading, excavation for structure foundation, general soil / spoils stockpiling), temporary erosion controls will be installed and maintained as needed. UI will pay particular attention to areas of construction on slopes, where soils are classified as erodible.

Soil erosion/sedimentation controls typically will include hay/straw bales, silt fence, straw wattles, coir logs, diversion swales, track pads, hay bale corrals for management of spoils or concrete washout areas,

[30] In Derby, the soils mapped as Prime Farmland, which are located between Indian Well Substation and Structure 3, are developed for commercial/industrial purposes.

and erosion control blankets. Such controls will be deployed in accordance with the SWPCP, the General Permit, and Project construction plans and specifications. The types of erosion controls used will be appropriate to each ROW area. Pursuant to the General Permit and the Project SWPCP, UI will retain a qualified inspector to perform weekly and post-rain event inspections of construction sites.

The need for and extent of temporary and permanent erosion and sedimentation controls will be a function of site-specific field considerations such as:

- Slope (steepness, potential for erosion, and presence of environmentally sensitive resources, such as wetlands or streams at the bottom of the slope).
- Type of vegetation removal method used and the extent of vegetative cover remaining after removal (e.g., presence/absence of understory or herbaceous vegetation that will minimize the potential for erosion and degree of soil disturbance as a result of clearing equipment movements).
- Type of soil and erodibility potential.
- Soil moisture regimes.
- Proximity to water resources (e.g., wetlands, watercourses), public roads, or other sensitive environmental resources.
- Time of year. The types of erosion and sedimentation control methods used along the ROW will depend on the time of year construction work is initiated and completed. For example, reseeding is typically ineffective during the winter months. In winter, with frozen ground, controls other than re-seeding (such as wood chips, straw, hay, geotextile fabric, erosion control logs, etc.) typically will be deployed or maintained to control erosion and sedimentation and thus to stabilize disturbed areas until reseeding can be performed under optimal seasonal conditions.

Temporary erosion controls will remain in place and will be maintained, as necessary, throughout the period of active Project construction until disturbed sites are appropriately stabilized. SWPCP inspections are expected to continue for at least one full growing season following site stabilization, per the General Permit.

Farmland Soils

In areas where the ROW traverses soils classified as Prime Farmlands or Statewide Important Farmland Soils that are in active agricultural use, UI will implement special procedures to avoid or minimize impacts to the soil structure as a result of Project construction.[31] Typically, UI will use temporary construction mats (timber or equivalent) to install access roads and work pads without disturbing farmland soils. In areas

[31] The Project will replace the existing lattice steel towers with monopoles that have a much smaller foundation (7 to 8-inch diameter. Overall, UI estimates that permanent impacts to farmland soils will be less than 0.07 acre.

where grading is required, UI will require its contractors first to strip and stockpile the topsoil layer, for later use in respreading across the affected area of the ROW. Other mitigation measures that UI will consider to protect farmland soils include:

- No new permanent access roads will be located in active farmlands unless approved by the landowner.
- Temporary access roads and work pads will be sited, to the extent practicable, to avoid or minimize disruptions to active farm uses.
- The boundaries of work areas will be demarcated by flagging or staking. No vehicles or equipment will be allowed outside of these identified work areas except as may be necessary to perform specified construction activities (e.g., cut and remove vegetation to maintain appropriate clearance from transmission line conductors).
- Except for equipment that cannot practically be moved once in place (e.g., cranes), no equipment or vehicle refueling will be performed in active farmlands.
- Existing agricultural drainage and erosion control features (e.g., ditches, swales) will be avoided during construction to the extent practical. If avoidance is not possible, the construction contractor will take appropriate measures to maintain the effectiveness of the existing features. Any drainage features disturbed by construction activities will be repaired.
- Silt fence or equivalent may be installed as appropriate along access roads and around work pads. Hay bales (which may contain seeds inappropriate to farm use) will not be used for temporary erosion and sedimentation control in active farmlands unless specifically approved by the farmer. (Instead, straw bales, weed-free hay, or other types of erosion and sedimentation control measures will be used as appropriate.)

Farmland soil protection measures will be refined in consultation with the affected property owners.

Pro-Active Soil Characterization

In some areas, construction activities will disturb soils in areas that historically were used for industrial and commercial purposes. Soils will be pre-characterized and subsequently managed in accordance with CT DEEP solid waste regulations and UI requirements. Certain soils excavated during construction (including structure removal work) may be removed from the ROW and properly managed or disposed of off-site. UI will adhere to Federal and State requirements, as applicable, for the disposal of contaminated soils, if any are encountered during construction.

Dust Control

Fugitive dust may be generated from Project construction activities such as vegetation removal, construction vehicle and equipment movements on non-paved access roads and work pads, structure

foundation excavation, and structure removal activities. Dirt from unpaved access roads also may be tracked onto adjacent paved surfaces.

Crushed stone (or equivalent) anti-tracking pads also will be installed, as necessary to mitigate fugitive dust and tracking of dirt. To minimize the amount of dust generated by Project construction, standard dust minimization practices will be implemented. For example, access roads may be sprayed with water to minimize dust. Paved road surfaces affected by construction will be regularly inspected and swept as necessary by UI's contractors to remove excess accumulations of dirt.

6.2 WATER RESOURCES, WATER QUALITY, AND WATER SUPPLY

The Project extends primarily through upland areas but will involve certain temporary and permanent impacts to wetlands and watercourses. As described further in the following subsections, the Project will result in approximately 5,300 square feet (0.14 acre) of temporary impacts and 2,500 square feet (0.07 acre) of permanent impacts (fill) to wetlands or watercourses. In addition, the Project will require approximately 350 square feet (0.01 acre) of forested wetland vegetation clearing. No new 115-kV structures will be constructed in wetlands or watercourses, and the Project will not result in any adverse effects to groundwater or to Connecticut's water quality objectives.

6.2.1 Watercourses and Wetlands

The existing ROW extends across 10 watercourses (including the Housatonic River) and 10 wetlands (nine non-tidal and one tidal). The rebuilt 115-kV lines will span the same wetlands and watercourses. None of the rebuilt structures will be located in wetlands or watercourses. Construction equipment will be prohibited from directly fording wetlands or watercourses.

However, certain Project access roads and work pads will unavoidably affect four wetlands and four watercourses, all in Shelton. Temporary wetland and watercourse impacts will be associated with the installation of access roads across wetlands and streams to provide ingress/egress to structure sites along the ROW during construction. In addition, to provide ingress/egress in an area of steep topography for both construction and operation/maintenance purposes, UI proposes to establish a permanent access road from Canterbury Lane to Structures 355, 356 and 357. This permanent access road will require the installation of two permanent culverts to cross a small intermittent stream (WC2) and will affect an adjacent wetland (W4).

For the Project, existing lattice tower (Structure 360, which is located partially in the Housatonic River in Derby) will be dismantled and rebuilt in an adjacent upland area. However, the footings for existing Structure 360 are expected to remain, thereby avoiding disturbance to river sediments.

Table 6-1 summarizes the estimated Project impacts to water resources and wetlands, based on UI's current plans.

Table 6-1: Summary of Estimated Project Impacts to Streams and Wetlands

Appendix A Mapsheet No.		Watercourse/Wetland No.	Estimated Project Impact, by Type (Sq. Ft.)			
			Temporary Impacts[a]		Permanent Impacts (Fill)[b]	Wetland Forest Vegetation Clearing[c]
1:400	1:100		Access Roads	Work Pads		
Shelton						
1	1, 2	W2	2,300	600	0	0
1	2	W3; WC1	2,100	0	0	0
1	3	W4; WC2 (two crossings, permanent culverts)	0	0	2,500	0
1	4	W5; WC3	300	0	0	350
Shelton/Derby						
1, 2	6	Housatonic River (WC6)[d]	0	0	0	0

[a] The placement of temporary construction matting that is not subject to federal regulatory review.
[b] Direct fill placed in wetlands or watercourses that are subject to State and Federal regulatory review.
[c] Refers to long-term change in wetland vegetation type (e.g., forested to shrub-scrub), but not a net reduction in wetland function or size.
[d] No direct fill will be placed in the Housatonic River. However, spanning a navigable waterway is subject to Federal regulatory review as potentially affecting interstate commerce.
Note: Numbers have been rounded up for impact estimation purposes.

As identified in Table 6-1, approximately 350 square feet of forested wetland vegetation along the ROW must be removed to allow Project construction and thereafter to maintain safe distances between vegetation and the transmission line conductor. This wetland forest vegetation removal will not represent a loss of wetland habitat but will constitute a limited long-term effect by converting the wetland habitat type from forested to scrub-shrub and emergent.

UI has designed and will construct the Project, using various best management practices, to avoid or minimize the potential for adverse direct and indirect effects to water resources. Erosion and sedimentation controls will be installed along access roads and around work pads as appropriate to limit the potential for erosion and sedimentation outside designated construction work areas. These measures and controls will be inspected regularly pursuant to the Project SWPCP and the conditions of the General Permit. Anti-tracking pads at the intersections of Project access roads and public roads, as well as the use of dust control

measures (such as applying water to exposed soils/gravel areas) also will serve to minimize the potential for the deposition of soils disturbed by Project activities into wetlands and streams.

To minimize the potential effects of Project construction on water resources, UI anticipates that the following types of measures (or equivalent) will be implemented:

- Watercourse and wetland boundaries will be clearly demarcated (re-flagged by a registered soil or wetland scientist) prior to the commencement of work. Construction personnel will be given D&M Plan and SWPCP maps that depict wetland and watercourse boundaries in relation to work areas.

- Timber construction mats or equivalent will be installed across wetlands and streams; the mats will be positioned to maintain water flows.

- Project construction contractors will be required to conform to the requirements of the USACE and CT DEEP permits and Council conditions concerning work in water resources.

- Concrete (used for structure foundations) will be mixed, placed, and disposed of to avoid or minimize the risk of concrete materials entering a watercourse or wetland.

- Installation of two new culverts for the permanent crossings of an intermittent stream (WC2) will be in accordance with the measures recommended in the CT DEEP *Stream Crossing Guidelines* as appropriate.

- Existing riparian vegetation within 25 feet of watercourse banks will be maintained or cut selectively, to the extent practical.

- Controls will be installed as needed to prevent or minimize the potential for sedimentation into watercourses or wetlands. Near / in wetlands, straw bales will be used instead of hay bales to prevent the spread of non-wetland plant seeds.

- Petroleum product management procedures will be implemented to avoid or minimize the potential for spills into water resources. To the extent possible, petroleum products will be stored in uplands more than 25 feet from wetlands, and construction equipment, except for equipment that cannot be practically moved, will be refueled only in upland areas.

- Forested wetland vegetation will be removed without removing stumps except in areas where the intact stumps pose a concern for the installation of timber mat (or equivalent) access/workspace and the safety of construction personnel.

- Wetland areas temporarily affected by Project construction will be restored and if appropriate reseeded with a wetland seed mix. No woodchip mulch or fertilizer will be applied within wetlands. If mulch is needed, straw will be used.

6.2.2 Groundwater Resources and Public Water Supplies

The construction and operation of the rebuilt 115-kV transmission lines will not adversely affect groundwater resources, including the Level A APA along portions of the ROW in Shelton and Derby, public water supplies, or private groundwater wells.

During construction, UI will implement standard measures to protect the Level A APA aquifer. For example, UI will require its contractors to adhere to the Project SWPCP, Company BMPs, and any State and Federal regulatory requirements regarding the storage and handling of any petroleum products (e.g., diesel fuel, motor oil, grease, lubricants) and hazardous materials that may be used during the work. In addition, UI anticipates that the Project D&M Plan will include a spill prevention and control plan to which all construction contractors must adhere.

Groundwater is expected to be encountered during the excavation of certain structure foundations. UI collected and analyzed groundwater samples at locations where groundwater was encountered during Project geotechnical investigations. Based on the results of this sampling and analysis process, UI characterized the groundwater along the Project route into one of the following two categories: (1) treatment not required; or (2) containment, treatment, and/or disposal required.

Typically, groundwater encountered during the construction of the rebuilt 115-kV lines will be dewatered in accordance with the procedures defined in the SWPCP and Materials Management Plan. Proposed management activities for groundwater dewatered during the Project may include but will not be limited to the use of vacuum trucks and off-site management at an approved facility, temporary storage at Project work sites in fractionization (frac) tanks prior to off-site disposal, and/or discharge to sanitary sewers and/or surface waters, with treatment if required. All dewatering activities will be conducted in accordance with applicable regulatory requirements.

6.2.3 Flood Zones

The rebuilt 115-kV transmission lines will cross FEMA-designated 100- and 500-year flood zones associated with the Housatonic River and a portion of the Naugatuck River flood area, which is protected by a levee and thus has a reduced flood risk. As summarized in Table 6-2, UI proposes to install seven new structures in the Housatonic River floodplain; these structures will replace six existing structures within the floodplain (the additional structure is required for the rebuilt 115-kV line entry to Indian Well Substation). Similarly, UI plans to install two new monopoles in the Naugatuck River flood area, replacing four existing structures. No new permanent access roads will be located in any 100- or 500-year floodplains.

Table 6-2: Proposed Monopoles within FEMA 100- and 500-Year Flood Zones

Appendix A Mapsheet No		Floodplain	Proposed Structure Number	Within 100-year or 500-year Flood Zone	Monopole Foundations: Estimated Impact Area (SF)*	Monopole Foundation Estimated Impact (CF)*
400-scale	100-scale					
3	6-7	Housatonic River	360	500-year	114	114
3	6-7	Housatonic River	361A (Indian Well Substation)	100-year	55	264
3	7	Housatonic River	361B (Indian Well Substation)	100-year	40	203
3	6-7	Housatonic River	1B (Indian Well Substation)	100-year	55	239
3	7	Housatonic River	2	500-year	55	492
3	7	Housatonic River	2A	500-year	10	62
3	7	Housatonic River	2C	500-year	10	62
22	15	Naugatuck River	20	Area of Reduced Risk of Flooding	64	114
22	15	Naugatuck River	21	Area of Reduced Risk of Flooding	64	114

*Impact area (square feet [SF].cubic feet [CF]) estimated based on current engineering design data regarding structure foundations.

The anticipated impact of the installation of the new monopoles in the floodplains was estimated based on the following structure design information. Each monopole in a flood zone is expected to have a foundation base diameter of approximately 7-9 feet, except for Structure 360 which will have foundation diameters of about 12 feet. Based on these dimensions, each monopole foundation will occupy up to approximately 64 square feet, except for the Structure 360 foundation, which will be approximately 114 square feet.

At the Housatonic River, the three monopoles that must unavoidably be placed in 100-year floodplain will displace approximately 706 cubic feet of total flood storage capacity, and the four monopoles installed in 500-year floodplain will displace approximately 730 cubic feet of flood storage capacity. This displacement of floodplain storage capacity will be insignificant compared to the total drainage area and flood storage capacity of the Housatonic River watershed, which encompasses approximately 2,000 square miles.[32]

[32] The structures near the Naugatuck River will be behind the levee, where FEMA determined a reduced risk of flooding.

Therefore, UI does not anticipate that the Project will have any adverse effects on flood dynamics and will not alter the floodplains or chances for flooding. UI will coordinate with CT DEEP regarding any further analyses of the Project's potential effects on floodplains, as well as the need for mitigation (if any) to compensate for the small amount of flood storage capacity impact in each of the affected floodplains.

6.3 BIOLOGICAL RESOURCES

The Project will result in generally minor and highly localized effects on vegetative communities and wildlife. These effects will be concentrated along the existing and expanded ROW.

The Project will not affect any fishery resources. No work is anticipated within the Housatonic River[33] and none of the small streams located along the ROW are capable of supporting support fish populations. Similarly, the Project area does not encompass any vernal pools and therefore no obligate vernal pool species will be affected. The Project will require vegetation removal within the existing ROW and within the areas that UI proposes for new permanent easement. The need to maintain low-growing vegetation near the rebuilt 115-kV lines will, in certain areas, represent a long-term change in vegetative community type.

6.3.1 Vegetation

The Project will result in both short- and long-term impacts to the vegetative communities that presently characterize the existing ROW and the areas where UI proposes to expand the ROW. In general, the Project will require vegetation clearing within the construction footprint (e.g., access roads and work pads), along the areas of expanded easement, and within the 115-kV conductor clearance zones.

Subsequently, the operation of the rebuilt 115-kV lines will require the management of the entire ROW to maintain low-growth vegetative communities, consistent with Company and utility industry standards. Along much of the existing ROW, this will increase the width of the vegetation that UI will manage in herbaceous, shrub-scrub, or other low-growth vegetative types. In currently forested wetlands and uplands, tree removal will result in a permanent cover type change and the conversion to scrub-shrub and/or herbaceous habitats, similar to those found in the uplands and wetlands within the presently managed ROW.

In total, the Project will require the removal of approximately 6[34] acres of trees for construction. Of these 6 acres, an estimated 5.6 acres will remain in shrub-scrub vegetation within the ROW, whereas about 0.4

[33] UI currently plans to dismantle existing Structure 360, which is currently partially in the river, from a staging area in adjacent uplands.
[34] Includes about 0.01 acre of tree removal in wetlands.

acre will be allowed to revegetate fully after the completion of Project construction. In some areas, such as in Shelton where the rebuilt lines will be significantly above the Housatonic River and forested riverbank, tree clearing will not be required because the rebuilt conductors will be above the existing tree canopy. In the areas where tall growing trees must be removed during construction, the modified ROW will subsequently be managed as shrubland or old field habitat. Converting forest to shrubland, open field, or old field vegetation along the ROW will modify habitat, representing a long-term, but not a necessarily adverse, impact. In fact, the creation of additional shrubland and early successional habitat (and the preservation of such existing habitat) along the ROW will represent a long-term benefit for many species because shrubland habitat is otherwise declining in New England. This decline is a result of various factors (e.g., conversion of farms, suburban / urban development, ecological succession, absence of fires).

Other vegetative cover types within the ROW that will be affected by the construction of the Project include existing open field / shrubland, agricultural land, and lawn / landscaped areas associated with developed areas. However, the effects on these cover types will be mostly short-term. After the completion of Project construction, these vegetative communities, which are compatible with overhead transmission line operation, are expected to recolonize the ROW.

After the installation of the rebuilt 115-kV lines, UI will continue to manage the ROW in accordance with the procedures of its established vegetation management program. The objective of this program is to maintain safe access to the transmission facilities and promote the growth of vegetative communities along ROWs that are compatible with transmission line operation and in accordance with applicable Company and utility industry standards. Overall, UI promotes the re-growth of desirable species by implementing ROW vegetation management practices to control tall-growing trees and promote native plant colonization. When performing ROW management, UI preserves vegetation along watercourses and within wetlands to the extent possible. In general, UI may alter, to some degree, its vegetation management activities in the following areas:

- Areas of visual sensitivity where vegetation removal may be limited for aesthetic purposes;
- Steep slopes and valleys spanned by transmission lines;
- Agricultural lands;
- Near homes where owner-maintained ornamental vegetation does not interfere with the construction or operation of the facilities;
- Within wetlands or along streams to preserve shrub cover;

- Within a 25-foot vegetated riparian zone adjacent to watercourses and waterbodies; or
- In areas documented to support rare animal species or host plants (e.g., milkweed) that support rare invertebrates.

6.3.2 Wildlife, Birds, and Fisheries

The Project will result in both temporary and permanent alterations to wildlife habitat along the ROW, as well as direct effects on wildlife such as disturbance, displacement, or mortality. However, these effects will not be significant because they will be localized to and in the vicinity of the ROW and will be generally short-term (i.e., during Project construction) and minor due to the availability nearby of adjacent, undisturbed habitats similar to those found on the ROW. Further, the Project will have a long-term beneficial effect on certain wildlife species that use shrubland habitat such as is found on the existing ROW and will be established on the expanded ROW.

During construction, the removal of vegetation within the construction footprint will displace wildlife and will reduce cover, nesting, and foraging habitat for some species. Other construction activities (e.g., the development of access roads and work pads; general construction equipment movements; and construction-related noise) will similarly temporarily disturb or displace mobile wildlife species, such as large mammals and birds. These species will likely move to comparable nearby habitats.

Within the ROW, the removal of existing forest vegetation and the conversion to low-growing vegetative communities will have a long-term beneficial effect on early-successional wildlife by providing additional habitat for species that utilize shrubland, old field and other non-forested habitats. The wildlife species that will benefit from the additional shrubland habitat include various bird species (e.g., prairie warbler, brown thrasher, field sparrow, eastern towhee and indigo bunting), as well as other taxa and species that favor this habitat. While early-successional habitat specialists will benefit from the creation of additional habitat resulting from the Project, total habitat for forest-dwelling species will be reduced slightly as a result of the tree clearing. Overall, although the wildlife species utilizing the ROW will be expected to change slightly, the ROW can be expected to continue to provide diverse wildlife habitat.

Fisheries

The construction and operation of the Project is not anticipated to affect fishery resources. The proposed 115-kV transmission lines will span the Housatonic River, the only waterbody containing fisheries. Because of the height of the new conductors above the river, no vegetation removal or tree-trimming will be required in the riparian areas adjacent to the river.

Access roads across the small streams along the ROW will be designed to avoid or minimize direct disturbance to stream banks and substrates to the extent practical and will conform to USACE and CT DEEP permit requirements. UI recognizes that streambank vegetation provides important aquatic resource cover and shading. Within a 25-foot-wide area adjacent to watercourses, lower-growing riparian vegetation along the ROW will be maintained, where possible. Vegetation will be cut only if required to maintain safe clearances from conductors and access to and from the transmission facilities.

Temporary soil erosion and sedimentation controls will be installed around areas of disturbed soils at work sites up-gradient from streams. These temporary erosion controls will remain in place until the disturbed areas are revegetated or otherwise stabilized.

Birds

The Project will result in both long-term benefits and short-term, but minor, effects on bird species that inhabit the ROW and nearby areas. Project construction will cause temporary effects due to direct disturbance and noise. Operation and maintenance activities on the rebuilt 115-kV lines similarly could temporarily displace birds from portions of the ROW. These disturbances may drive birds from the work areas or generally disrupt nesting, feeding, or other activities. If conducted during the breeding season, such activities may result in inadvertent takings of nests and young. Once construction is complete, avian utilization of the Project area is anticipated to resume to pre-construction levels.

Within the expanded ROW, the Project will permanently convert forested habitat to shrubland or scrub-shrub wetland. However, because the forested habitat that will be converted is adjacent to UI's long-established ROW, the Project will not fragment forest interior habitat. Specifically, because the ROW has been managed in low-growth species for decades, the forest areas that presently border portions of the ROW are categorized as edge forest (as opposed to interior forest). Edge forest is favored by ecotone specialists or forest generalists and is not optimal breeding habitat for forest-interior birds. As a result, forest interior bird species are not expected to be negatively affected by the Project. Moreover, the additional shrubland that will be created on the expanded ROW will benefit the bird species that use such habitat.

6.3.3 Federal and State-Listed Threatened, Endangered, or Special Concern Species

UI is coordinating with both the USFWS and CT DEEP to identify general measures to avoid or minimize adverse effects on Federal and State-listed species that may inhabit the ROW. As a result of the implementation of the measures discussed below, or similar or additional measures that may be identified

during future agency consultations, UI anticipates that no significant adverse effects will occur to any known listed species.

Screening using the USFWS IPaC indicated that the NLEB, a Federally-Threatened and State-Endangered species, may be present near the Project area. The USFWS recommended that consultations regarding this species be coordinated through CT DEEP. Although there are no known records of this species or hibernacula in the vicinity of the Project ROW, potential suitable NLEB summer roosting habitat was documented along portions of the ROW during field investigations conducted in the fall of 2020. This assessment concluded that portions of the ROW where tree clearing will be required may provide suitable NLEB summer roosting habitat. As a result, UI anticipates that Project tree clearing in these areas will be performed outside of the summer roosting period.

In addition, based consultations with the CT NDDB, UI has identified the following potential mitigation measures to avoid or minimize the potential for impacts to the two State-listed species (both birds) that may potentially occur in the vicinity of the Project:

- **Sedge Wren (State Endangered)**. Potential habitat for the sedge was identified in the vicinity of the Derby Junction. The sedge wren nests in dense, tall growths of sedges and grasses in wet meadows, hayfields, retired croplands, upland margins of ponds and marshes, coastal marshes, and sphagnum bogs. The species breeds between May-August. CT DEEP recommends reducing disturbance to any of these habitats in the Project area by avoiding construction during the breeding period or by conducting a species survey to determine if they are nesting in the area. Accordingly, UI proposes to conduct an avian survey to determine if the sedge wren in fact utilizes the area in the vicinity of Derby Junction.

- **Bald Eagle (State Threatened)**. Habitat for the bald eagle was identified in the vicinity of the Naugatuck River. Natural year-round habitat of bald eagles includes lakes, marshes, rivers, or seacoasts, where there are tall trees nearby for nesting and roosting and plenty of fish for eating. Although bald eagles feed primarily on fish, they also are opportunistic predators and scavengers that will eat anything that can be caught easily or scavenged, such as waterfowl, small and large mammals, and livestock carrion. In addition, they have a reputation of being thieves, robbing other raptors or gulls of their catch.

  Pursuant to Con. Gen Stat. § 26-93, it is illegal to disturb bald eagles during roosting, feeding, or nesting. The critical time for nesting eagles is February 1- August 1. CT DEEP recommends a 660-foot setback with no public access from a bald eagle nest or critical roosting site. Therefore, UI will conduct an avian survey to determine if any bald eagles use areas within 660 feet of the ROW. Should the avian survey determine that bald eagles are located within 660 feet of the ROW, UI anticipates the following measures may be used to avoid or minimize potential Project-related impacts to bald eagles:

- During the species' critical nesting period (February 1 – August 1), Project work activities will not be performed within 330 feet of active nests/roosts, in the line of sight of an active nest or roost, or otherwise within 660 feet from nests/roosts that are in the line of sight during periods of eagle use, unless surveys demonstrate that the nest or roost is not being used.

- Minimize cutting of large trees to the extent practical. No known bald eagle nest trees, perch trees, or roost trees will be felled or modified unless they present a danger or hazard to the operation and maintenance of the transmission lines. UI will coordinate with CT DEEP to ensure the Project does not disturb bald eagle nesting or roosting trees, or that suitable mitigation is provided.

As planning for the Project proceeds, UI will continue to consult with CT DEEP regarding species-appropriate mitigation strategies, which will be incorporated into the D&M Plan and other Project specifications.

6.4 LAND USE, RECREATION, AND COMMUNITY FACILITIES

The rebuilt 115-kV lines will continue to be located along UI's ROW, which has served as a linear electric transmission corridor for almost 100 years. By upgrading these 115-kV facilities, the Project will improve the reliability of the transmission grid and will be consistent with various State and local land use plans. As a result, except for the areas where UI must acquire additional easement to expand the ROW to conform to current electrical clearance standards, the Project will result in generally limited and temporary impacts on land uses, mostly during the construction phase.

To achieve the required clearance between the rebuilt 115-kV line conductors and the edge of the ROW, UI proposes to acquire approximately 9.9 acres of new permanent easements from the owners of certain properties that abut the ROW. The expanded ROW is required to accommodate the rebuilt 115-kV wires, blowout, and vegetation removal in accordance with electric transmission clearances.

In some of the areas where UI proposes to acquire new easement, existing sheds and debris may have to be removed prior to Project construction. Future land uses within the expanded ROW will be restricted to those compatible with overhead transmission line operation. In general, UI's easement will prohibit the construction of buildings, pools, and structures. UI will coordinate with affected landowners on a case-by-case basis.

The Project is consistent with overall State and local objectives for continuing to provide a reliable resilient electrical transmission system to assist in serving existing customers and promoting economic growth. Shelton, Derby, and Ansonia each have published POCDs. None of the plans identify local land use policies

that are inconsistent with the Project. Although the ROW extends across a portion of Shelton's designated coastal area, the Project will not affect any coastal resources or uses; the rebuilt structure (Structure No. 359) near the Housatonic River in Shelton will be located in an upland area, west of The Housatonic Railroad Company tracks. The Project also is consistent with federal guidelines regarding the preference for the use of existing ROWs when modifying transmission facilities.[35]

The Project area extends through a well-developed urban/suburban area that includes a variety of community facilities, such as daycare centers, schools, group homes, and youth camps, as well as recreational areas (refer to Table 5-9). The Project will temporarily affect the parking lot for the Derby/Ansonia Dog Park and will traverse Osbornedale State Park and adjacent to the Nolan Athletic fields. In addition, in Shelton, a proposed off-ROW access road crosses the CFPA's Paugussett Trail and the ROW traverses designated municipal open space.

To avoid potential impacts to users of the Paugusett Trail and municipal recreational/open space areas, UI will coordinate with the CFPA, as well as the cities of Shelton, Derby, and Ansonia to develop appropriate mitigation measures. Such measures may include the use of temporary construction fencing (i.e., snow fence or equivalent) to demarcate construction work areas, as well as signs warning of the presence of construction work zones. During periods of active construction in or near recreational areas, UI also anticipates that flaggers will be on-site to direct the public away from work zones.

UI's existing ROW traverses an undeveloped portion of Osbornedale State Park; as a result, UI's proposed ROW expansion and subsequent Project construction will not directly affect any of the park's designated recreational use areas. The Project will result in the removal of two of the three existing 115-kV lattice steel towers (Structures 10 and 12) that presently occupy the ROW within the park; the third existing structure (Structure 11) will be replaced with a monopole. However, UI's planned expansion of the ROW across the park will require additional permanent easement from CT DEEP. UI is in the process of discussing the proposed expanded easement with CT DEEP.[36]

6.5 VISUAL AND AESTHETIC CHARACTERISTICS

To evaluate views of the rebuilt transmission lines from nearby locations, UI completed a *Visual Assessment and Photo-Simulations* report, which is provided in Appendix C. This analysis incorporated a combination

[35] Federal Power Commission (now Federal Energy Regulatory Commission) *Guidelines for the Protection of Natural, Historic, Scenic and Recreational Values in the Design and Location of Rights-of-Way and Transmission Facilities.*

[36] UI conducted an extensive analysis of alternatives to the proposed expansion of the portion of the ROW in Osbornedale State Park. Section 9 presents a summary of the alternatives considered.

of three-dimensional computer modeling and field evaluations to predict the extent of visibility and to provide representative simulations of the appearance of the rebuilt lines. The report includes viewshed analysis mapping, as well as representative photographs of existing conditions and corresponding photo-simulations that portray scaled renderings of the proposed rebuilt 115-kV structures.

The rebuilt 115-kV transmission line structures will be aligned within UI's long-established ROW between Derby Junction and Ansonia Substation, replacing a combination of lattice steel towers and other structures. The heights of the proposed monopoles on which the 115-kV lines will be rebuilt will vary along the ROW but will generally be taller than the existing structures. The new 115-kV structures will typically range in height from 75 feet 135 feet above ground level, whereas the existing structures generally vary from about 65 feet to 95 feet in height. Exceptions are the structures on either side of the Housatonic River, at approximately 140 feet for the existing lines and 170 feet for the rebuilt lines (the tallest on the ROW).

As depicted in the photo-simulations and on the viewshed mapping in Appendix C, the general zone of visibility associated with the 115-kV lines will not change substantially as a result of the Project. What will change are the characteristics of several views, a result of the modified structure types and heights. Views of the transmission lines will continue to generally extend over distances of 0.25 mile or less in most areas. This is due primarily to a combination of topography and mature vegetation. In non-residentially developed areas and over open water, the viewshed extends to approximately 0.5 to 0.75 mile, due to the sparseness of vegetation.

The almost 100-year-old electric transmission line infrastructure pre-dates most of the residences and other development adjacent to or crossed by the ROW. The majority of the current transmission line structures, with the exception of those adjacent to the two substations, are four-legged lattice towers. The proposed replacement structures will be steel monopoles. Some locations will experience changes from existing conditions due to the placements and modified heights of the new structures. In areas where residences are located in near the ROW and direct lines of sight exist, the new structures may represent more or less prominent features on the landscape, depending on their specific locations.

6.6 CULTURAL (ARCHAEOLOGICAL AND HISTORIC) RESOURCES

The Project is not expected to result in any adverse effects to known cultural (archaeological or historic) resources. As documented in Heritage's *Phase 1A Cultural Resources Assessment Survey* (refer to Appendix D), the Project ROW (and areas in the immediate vicinity) does not encompass and is not located

in close proximity to any documented archaeological sites or standing historic structures listed on the NRHP/SRHP.

Further, because of both past land use developments and unfavorable topography (e.g., steep slopes, wetlands), Heritage determined that most of the existing ROW has little or no potential for yielding as yet undiscovered cultural deposits. In contrast, Heritage found that the landscape conditions along the western portion of the ROW (between Structures 350 and 356 in Shelton) suggest that the area has a moderate/high potential for yielding intact cultural materials. In this area, Heritage recommended that UI plan construction either to avoid ground disturbance or, if avoidance is not practical, to require best management practices, such as the use of timber (or equivalent) mats to construct access roads/work pads and the installation of high visibility fencing or flagging along the edges of construction areas (thereby minimizing the potential for ground disturbance outside of matted work zones). Alternatively, Heritage recommended that a Phase 1B cultural reconnaissance (field) survey be performed of the Project area between Structures 350 and 356.

Heritage submitted the Phase 1A assessment survey report to the SHPO on March 17, 2022. UI has commissioned Heritage to perform the Phase 1B survey of the Project area between Structures 350 and 356; this field survey is expected to be completed in the first half of 2022. The results of the Phase 1B survey will be provided to the SHPO. Further, UI will retain Heritage to conduct supplemental cultural resource analyses, as needed, of the areas in which UI proposes to acquire additional permanent easement, as well as of proposed permanent or temporary off-ROW access roads. UI's Project D&M Plan will incorporate Heritage's recommendations as well as any input from the SHPO.

Despite Heritage's analyses, it is possible that buried cultural deposits could be encountered during Project construction activities, such as access road grading or excavations for structure foundations. However, given the long-term use of the ROW for electric transmission purposes, combined with the varied topography and the urban/suburban land use development in the Project area, the potential for discovering such undocumented buried archaeological materials during construction is considered to be low. However, to address this contingency, UI will include in the Project D&M Plan protocols for implementation if unanticipated cultural materials are unearthed during construction. UI's construction contractors will be briefed on such protocols.

6.7 TRANSPORTATION, UTILITIES, AND ENERGY FACILITIES

The construction and operation of the Project will not result in any significant adverse effects on transportation, municipal utility systems, or energy facilities.

6.7.1 Transportation

The Project is not located near any airports or flight paths, and the proposed new monopole heights were reviewed by the FAA, which issued Determinations of No Hazard, indicating that no special lighting or markers will be required on the rebuilt 115-kV lines to maintain aviation safety.[37] Moreover, the Project will have a positive effect on the reliability of the State and regional electric systems, particularly UI's distribution system served by the Indian Well and Ansonia substations.

The Project area is readily accessible from the local and regional highway network. During construction, equipment and vehicles will use this road network, as well as temporary and permanent access roads established for the Project, to reach work sites. At locations where construction access along public roads could interfere with traffic flow patterns, UI will coordinate with municipal police departments and CT DOT (for State roads) to assure that appropriate construction warning zone signs are erected and that flaggers and/or police are on site to direct traffic. In certain locations (e.g., B Street and Coon Hollow Road in Derby), temporary lane/road closures and detours will likely be required.

Some construction activities could result in minor and short-term effects to vehicular traffic on the local roads leading to Project work sites. For example, localized traffic congestion may occur when heavy construction equipment or large components are transported to the work sites, as well as when construction personnel travel to and from the Project contractor/staging yards and work sites along the ROW. However, these effects will be minor and short-term. To the extent practical, UI will coordinate work to minimize potential impacts to traffic patterns.

In addition, UI will obtain encroachment permits from CT DOT for the proposed transmission line spans across State roads, including State Route 110 in Shelton, State Route 34 in Derby, and State Routes 8 and 334 in Ansonia. UI also will obtain a right-of-entry/crossing permit from The Housatonic Railroad Company. However, no construction access will be required near the railroad tracks; in this area, both the existing and new conductors are significantly above both the railroad and the Housatonic River.

UI's construction contractors also will be required to obtain appropriate permits related to the transport of oversized loads and equipment to and from Project sites.

[37] Although not required by the FAA, UI proposes to install marker balls on the lines across the Housatonic River; this approach is consistent with UI's use of marker balls on its other transmission line spans of the Housatonic River (Stratford-Milford). Prior to the start of construction, UI will require its Project contractor to consult with the FAA regarding notice for the use of cranes, as will be required to install the new structures and dismantle the existing structures.

6.7.2 Utilities

The Project area is served by public water, sewer, and storm sewer systems, as well as other utilities. Neither the construction nor the operation of the Project will affect any existing municipal utilities. UI will coordinate with the relevant stakeholders regarding utility crossings and will design the Project to avoid impacts to existing utility systems. As necessary, UI will temporarily or permanently relocate existing infrastructure outside of construction zones. In addition to Call Before You Dig procedures, UI utilizes a comprehensive program of advanced due diligence, including archival research, ground penetrating radar, and the use of soft dig to minimize any potential for interruption of existing utility systems.

6.7.3 Energy Facilities

The proposed Project will not result in any adverse impacts to existing energy facilities and will significantly benefit the Connecticut energy system by maintaining the reliability and resiliency of UI's facilities, in accordance with applicable national and regional electric standards and criteria. These upgrades will maintain and improve system reliability, preserve safety within and adjacent to the transmission line facilities, and provide technological enhancements to legacy system equipment.

6.8 AIR QUALITY, NOISE, AND LIGHTING

The Project will have minimal and highly localized temporary effects on air quality, noise, and lighting.

Air Quality

The development of the Project will result in short-term and localized effects on air quality as a result of emissions from construction equipment and vehicles, as well as from fugitive dust emissions generated during earth-moving and drilling activities, as well as dismantling of the existing steel lattice and other structures. The operation of the rebuilt 115-kV lines will not result in any adverse impacts to air quality.

To minimize emissions from construction equipment and vehicles, UI will require Project contractors to properly maintain equipment and to adhere to Connecticut's anti-idling requirements (RCSA § 22a-174-18). In addition, UI will require its contractors to control dust emissions by applying water or equivalent substances to exposed soils on work sites, as necessary, per guidance provided in the SWPCP. To minimize tracking of dirt from Project construction areas onto paved roads at construction access points, UI will install crushed stone (or equivalent0 anti-tracking pads. At ingress/egress points to the ROW, dirt that is unavoidably tracked onto paved roads will be swept and removed by UI's construction contractor.

Noise

The construction of the Project will result in short-term increases in noise associated with various construction activities, such as the movement and operation of heavy equipment (such as earth movers, jackhammers, drilling rigs, cranes) and the work to excavate areas for new structure foundations. These activities will temporarily raise ambient sound levels near work sites. The noise impacts will vary based on the work being performed and will last only for the duration of Project activities in a particular location.

In general, the extent of a noise effect to humans is dependent upon a number of factors, including the change in noise level from ambient, the duration and nature of the noise, the presence of other noise sources, the number of people exposed to the noise, and the type of activity affected by the noise (e.g., sleep, recreation, conversation). Project work hours are typically expected to be from 7:00 AM to 7:00 PM, Monday to Saturday. Thus, construction will be performed principally in the daytime when human sensitivity to noise is generally less than during the nighttime. However, along the ROW, construction noise is expected to be comparatively more evident in nearby residential areas (where background noise levels are lower) than in adjacent commercial and industrial zones (where the sound environment is influenced by traffic, manufacturing activities, etc.).

Although construction noise is exempt under the Connecticut regulations for the control of noise, (RCSA § 22a-69-1.8(h)), UI is aware that Shelton, Derby, and Ansonia have adopted noise control ordinances, which identify typical hours for construction activities. To assure that the public is aware of the Project work activities, UI will inform the involved municipalities and stakeholders of the Project schedule (refer to Section 8 for a discussion of UI's outreach efforts).

The operation of the rebuilt 115-kV lines will not cause any long-term changes to ambient noise. Further, the Project will not involve the addition of any noise-producing equipment to Indian Well or Ansonia substations.

Lighting

Project construction is expected to be performed during the daytime, when temporary lighting will not be required. In the event that nighttime work is required to perform select construction tasks (such as those that require 24/7 work), UI will require its contractors to install temporary lights such that the illumination is focused on work sites. As a result, lighting-caused glare outside of the approved construction work zones is not anticipated. The Project will not result in any long-term changes to ambient lighting along the ROW, or to the existing lighting at Indian Well and Ansonia substations.

7. ELECTRIC AND MAGNETIC FIELD CONSIDERATIONS

To assess the alternating current (AC) electric and magnetic fields (EMF) associated with the Project, UI retained Exponent, Inc. (Exponent), a company with specialized expertise in such evaluations.

To perform the EMF analyses, Exponent measured EMF levels associated with the operation of existing 115-kV transmission lines on the existing structures between Derby Junction and Ansonia Substation. Exponent also modeled the EMF levels that will be associated with the operation of the proposed rebuilt 115-kV lines on structures consisting mainly of double-circuit monopoles. These new monopoles will be installed near, but offset (i.e., realigned) from the centerline of existing structures.[38]

The EMF from the proposed transmission lines are calculated to be similar to or lower than existing levels. However, the realignment of the rebuilt monopoles in relation to the existing structures will cause a corresponding shift in the location of maximum EMF levels compared to existing levels, resulting in an increase in the EMF levels on one side of the existing structure centerline and a corresponding similar decrease in EMF levels on the other side. Overall, EMF levels as a result of the Project are calculated either not to change significantly (between Indian Well and Ansonia substations) or to decrease compared to existing levels (between Derby Junction and Indian Well Substation).

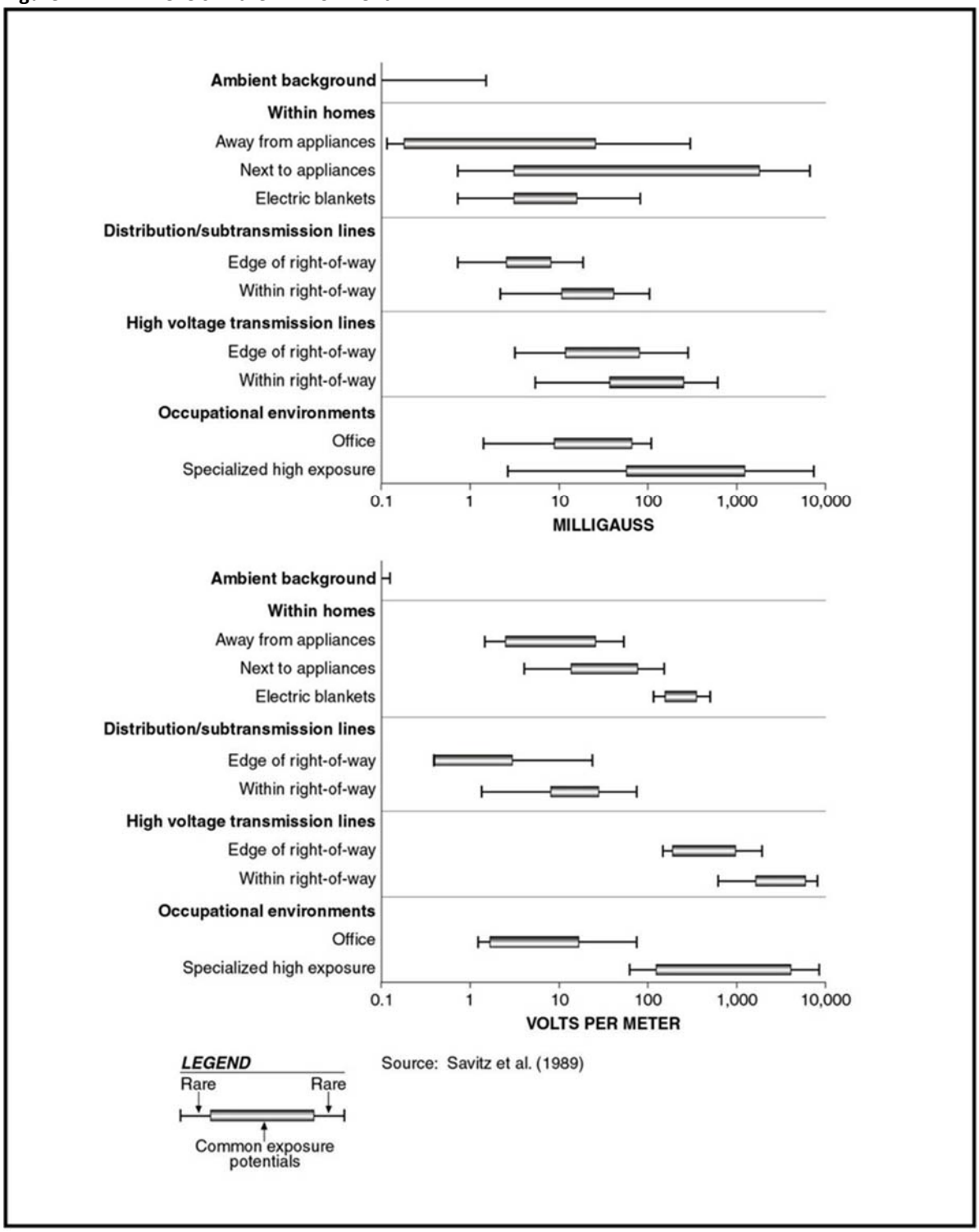
The largest Project-related change is the *location* of the maximum EMF levels, which will be shifted on the ROW by the offset in the proposed structure centerline. This offset will result in an increase in the EMF on one side of the existing structure centerline and a corresponding decrease in EMF on the other side. Detailed results of the EMF analysis are included in Appendix E.

7.1 OVERVIEW

EMF surrounds anything that generates, transmits, or uses electricity. As a result, people living in modern communities are surrounded by various sources of EMF on a daily basis. Figure 7-1 depicts typical EMF levels in residential and occupational environments, as well as on or at the edges of transmission and distribution line ROWs.

[38] There will be no changes to Indian Well and Ansonia Substations that will affect EMF levels from these facilities. Therefore EMF from the substations is not discussed further.

Figure 7-1: EMF Levels in the Environment



Magnetic fields and electric fields are described as follows:

- ***Magnetic Fields:*** The current flowing on the electrical conductors generates a magnetic field near the conductor. The strength of Project-related magnetic fields is expressed as magnetic flux density in units of milligauss (mG) where 1 Gauss (G) = 1,000 mG. The AC electricity carried by transmission lines (and thus magnetic fields) varies in direction and magnitude in a continuous cycle that repeats 60 times per second (i.e., at a frequency of 60 Hertz [Hz]). The level of the magnetic field around conductors varies with the circuit loading, which are expressed in units of amperes (A). Because of variations in circuit loadings, measurements or calculations of the magnetic field present a snapshot of the magnetic field at one moment in time. On a given day, throughout a week, or over the course of months and years, the magnetic-field level can change depending upon the patterns of power demand on the transmission system; therefore, magnetic-field values are calculated at average and peak loading.

- ***Electric Fields:*** The voltage on the conductors of transmission lines generates an electric field in the space between the conductors and the ground. Electric-field levels are expressed in units of kilovolts per meter (kV/m), where 1 kV/m = 1,000 volts per meter (V/m). In contrast to magnetic fields, the electric field from Project-related sources will not change significantly over time or with changes in power demand on the transmission system. In addition, many objects including fences, shrubbery, and buildings block or attenuate electric field strength.

7.2 EMF MEASUREMENTS AND MODELING

To assess EMF from existing sources under pre-Project conditions, Exponent took measurements of the EMF associated with the existing UI transmission lines along the ROW between Derby Junction and Ansonia Substation. The purpose of these measurements was to characterize existing EMF levels along the existing transmission line ROW.

Field levels were measured at a height of approximately 3.3 feet (ft) (1 meter [m]) above ground using instruments meeting IEEE Standard 1308-1994[39] for obtaining accurate field measurements at power line frequencies and calibrated by EMDEX, LLC, using methods like those described in IEEE Standard 644-2019.[40] The measurements were taken and reported as the root mean square value of the field in accordance with IEEE Standard C95.3.1-2021[41] and IEEE Standard 644-2019. EMF measurements were obtained as close to the edges of the existing ROW as possible.

[39] Institute of Electrical and Electronics Engineers (IEEE). IEEE Recommended Practice for Instrumentation: Specifications for Magnetic Flux Density and Electric Field Strength Meters - 10 Hz to 3 kHz. (IEEE Std. 1308-1994, Reaffirmed 2010). New York: IEEE, 1994.

[40] Institute of Electrical and Electronics Engineers (IEEE). IEEE Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines (IEEE Std. P644). New York: IEEE, 2019.

[41] Institute of Electrical and Electronics Engineers (IEEE). IEEE Recommended Practice for Measurements and Computations of Electric, Magnetic, and Electromagnetic Fields with Respect to Human Exposure to Such Fields, 0 Hz to 300 GHz (IEEE Std. C95.3-2021). New York: IEEE, 2021.

Measured magnetic-field levels within UI's existing ROW averaged 4.5 mG with a maximum value of 12 mG. Magnetic-field measurements in other areas within approximately 300 ft (91 m) of the ROW were generally lower, consistent with the rapid decrease in EMF levels with distance. The average measured magnetic field in these areas (outside the UI ROW) varied from approximately 0.2 mG to 6.1 mG. Electric-field levels measurements on the ROW were measured to be 0.5 kV/m or less and at the ROW edges and beyond were 0.1 kV/m or less, decreasing to background levels rapidly with distance from overhead transmission or distribution sources.

Exponent also calculated the EMF levels (using both 2-dimensional and 3-dimensional models where appropriate) for the existing and proposed configurations of the 115-kV lines, assuming peak and peak daily average loading in 2022 and projected peak and peak daily average loading within 5 years after the line is placed in service (i.e., in 2029). The calculations were made using the optimal phasing configuration of the rebuilt lines, selected by UI, to minimize the magnetic-field levels at the edges of the ROW.

The design of the proposed transmission lines is generally the same throughout the entire route from Derby Junction to Ansonia Substation; in contrast, the existing structures between Derby Junction and Indian Well Substation differ from the typical existing structures between Indian Well and Ansonia substations. Exponent's assessment therefore concluded that rebuilding the transmission circuits will affect the EMF levels on the route segment from Derby Junction to Indian Well Substation differently than the EMF levels on the route segment between Indian Well and Ansonia substations.

- ***Between Derby Junction and Indian Well Substation***, the existing transmission line structures have greater phase-phase spacing, lower conductor heights and suboptimal phasing compared to the proposed configuration. Therefore the new structures will generally reduce EMF levels below existing levels. The current on the circuit 1808-2 (between Derby Junction and Indian Well) is higher than the current on the circuit 1594 (between Indian Well and Ansonia substations), leading to higher magnetic fields between Derby Junction and Indian Well Substation than between the Indian Well and Ansonia Substations.
- ***Between Indian Well and Ansonia substations*** the existing transmission line structures have smaller phase-phase spacings than the proposed structures; however the proposed structures have greater conductor heights and optimal phasing compared to existing structures. The net result of these design features is that there are similar EMF levels for the existing and proposed transmission line configurations.

Because of the unique construction constraints associated with this Project, the new monopoles will be offset from the existing structures at various locations along the ROW.[42] Between Derby Junction and

[42] Maintaining the existing structure centerline for the new structures would require an extended electrical outage during construction. Therefore, the new structures must be offset from existing structures to maintain electrical service for customers throughout the construction of the Project.

Indian Well Substation, this offset is approximately 10 feet or less with a somewhat larger offset near the Housatonic River crossing. Between Indian Well and Ansonia substations, the offset between existing and proposed structures is typically about 15 feet or less but extends to approximately about 40 feet in a few limited locations. UI proposes to acquire additional permanent easements (as necessary) to ensure the new transmission line conductors maintain necessary horizontal clearances to adjacent property as mandated by the NESC as well as UI's standard design criteria.[43]

At average loading, magnetic-field levels at the existing ROW edge will increase or decrease by similar amounts (maximum increase or decrease of about 15 to 16 milligauss [mG]) as a result of this realignment. Electric-field levels at the existing ROW edge will increase (1.3 kilovolts per meter [kV/m]) or decrease (0.5 kV/m) by small amounts. EMF levels at the edge of the proposed ROW generally decrease compared to those at the edge of the existing ROW after construction of the Project due to generally greater ROW widths after the Project. While there are some small increases (2.7 mG and 0.4 kV/m or less) along short segments of the route, there are much larger decreases (up to 23 mG and 1.2 kV/m) in other portions. Overall, the average proposed ROW edge EMF decreases by 7.8 mG and 0.2 kV/m compared to the average EMF level at the existing ROW edge.

Regardless of the offset of the proposed line from the existing centerline, magnetic-field levels decrease rapidly with distance for both the existing and proposed configurations. Magnetic-field levels between Derby Junction and the Indian Well Substation will decrease as a result of the Project. Between the Indian Well and Ansonia Substations, magnetic-field levels for both existing and proposed configurations decrease to 1 mG or less within approximately 100 feet (30 m) of the proposed ROW edge. At this distance, all existing and proposed electric-field levels will be 0.1 kV/m or less.

For most of the route between the Derby Junction and the Ansonia Substation, 2-dimensional modeling was used to calculate magnetic-field levels accurately and conservatively. For the remainder of the route, Exponent used 3-dimensional modeling because the proposed transmission line structure configuration and conductor orientation change from span to span; this type of modeling accounts both for the change in conductor configuration between structures and for potential changes in the geographic routing direction of the transmission lines. The areas where 3-dimensional modeling was employed included:

- Two spans in Shelton (Structures 356 to 358);

[43] Both before and after the proposed Project, there are adjacent buildings (including some residential buildings) that are or will be inside the existing or proposed ROW edge.

- Several spans near Indian Well Substation (Structures 2 to 4) in Derby; and
- Several spans north of Ansonia Substation (Structures 15 to 21) in Ansonia.

The EMF levels calculated by 3-dimensional modeling were quite similar to the EMF levels obtained by 2-dimensional modeling described above but show that ground-level magnetic-field levels decrease dramatically near structures (where conductors are higher above ground) compared to the midspan (where conductors are closer to ground).

7.3 ASSESSMENT CRITERIA

Neither the Federal government nor Connecticut have enacted standards for EMF from power lines or other sources at power frequencies; however, the CSC has developed best management practices (BMP) for siting new transmission lines,[44] as summarized in Section 7.4.

Several states have statutes or guidelines that apply to fields produced by new transmission lines, but these guidelines are not health-based. For example, New York and Florida have limits on EMF that were designed to limit fields from new transmission lines to levels associated with existing transmission lines.

EMF assessment criteria include the exposure limits recommended by health and scientific organizations. These exposure limits are included in guidelines developed to protect health and safety and are based on reviews and evaluations of relevant health research.

The guidelines include exposure limits for the general public recommended by the International Committee on Electromagnetic Safety (ICES) and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) to address health and safety issues.[45] In a June 2007 Factsheet, the World Health Organization recommended that policy makers adopt international exposure limit guidelines, such as those from ICNIRP or ICES (refer to Table 7-1), for occupational and public exposure to EMF.[46]

[44] Connecticut Siting Council (CSC). Electric and Magnetic Fields Best Management Practices for the Construction of Transmission Lines in Connecticut (Revised February 20, 2014). New Britain, CT: CSC, 2014.

[45] International Committee on Electromagnetic Safety (ICES). IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz, Standard IEEE C95.1-2019, Oct. 2019; International Commission on Non-ionizing Radiation Protection (ICNIRP). Guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz to 100 kHz). Health Phys 99: 818-836, 2010.

[46] World Health Organization (WHO). Fact Sheet No. 322: Electromagnetic Fields and Public Health – Exposure to Extremely Low Frequency Fields. Geneva, Switzerland: WHO, 2007.

Table 7-1: ICNIRP and ICES guidelines for EMF exposure at 60 Hz

	Exposure (60 Hz)	
	Electric Field	Magnetic Field
ICNIRP		
Occupational	8.3 kV/m	10 G (10,000 mG)
General Public	4.2 kV/m	2 G (2,000 mG)
ICES		
Occupational	20 kV/m	27.1 G (27,100 mG)
General Public	5 kV/m*	9.040 G (9,040 mG)

*Within power line ROWs, the guideline is 10 kV/m.

7.4 CONSISTENCY WITH CSC BEST MANAGEMENT PRACTICES

The CSC adopted *EMF Best Management Practices for the Construction of Electric Transmission Lines in Connecticut* (EMF BMP) based upon a consensus of health and scientific agencies that the scientific evidence "reflects the lack of credible scientific evidence for a causal relationship between MF [magnetic field] exposure and adverse health effects." Nevertheless, the CSC concluded that precautionary measures for the siting of new transmission lines in Connecticut are appropriate and advocated that "the use of effective no-cost and low-cost technologies and management techniques on a project-specific basis to reduce MF [magnetic field] exposure to the public while allowing for the development of efficient and cost-effective electrical transmission projects."[47]

The Project does not involve the development of new transmission lines, but rather rebuilding the existing 115-kV transmission lines, which will be slightly offset from the current structures, within the existing and expanded UI ROW. The project includes "no cost/low-cost" design recommendations consistent with the CSC's EMF BMPs, such as:

- **Height of Support Structures**: The taller monopole structures will raise the heights of the conductors of all the rebuilt 115-kV transmission lines compared to existing structures and will be higher than minimum clearances required by the NESC.

- **Structure Design and Optimum Phasing**: The proposed transmission line structures, similar to the existing structures, are dual-circuit vertical structures, with conductors arranged vertically, which reduces the average distance between line conductors and ground. The proposed rebuilt line configuration with two circuits on opposite sides of the same vertical monopoles, combined with

[47] CSC. Electric and Magnetic Fields Best Management Practices for the Construction of Transmission Lines in Connecticut (Revised February 20, 2014). New Britain, CT: CSC, 2014, pp. 3-4.

the optimum phasing that UI selected, will result in substantial mutual-cancellation of EMF from the two transmission lines, resulting in lower overall EMF levels compared to other structure designs or phasing alternatives.[48]

7.5 CONCLUSIONS

The EMF levels associated with the operation of the existing and rebuilt transmission lines were calculated using methods that are accepted within the scientific and engineering community and that have been found to match well with measured values.

The EMF from the proposed transmission lines are calculated to be similar to or lower than existing levels. However, the realignment of the rebuilt monopoles in relation to the existing structures will cause a corresponding shift in the location of maximum EMF levels compared to existing levels, resulting in an increase in the EMF levels on one side of the existing structure centerline and a corresponding similar decrease in EMF levels on the other side. Overall, EMF levels as a result of the Project are calculated either not to change significantly (between Indian Well and Ansonia substations) or to decrease compared to existing levels (between Derby Junction and Indian Well Substation).

Regardless of the alignment of the rebuilt monopoles in relation to the existing structures, EMF levels decrease rapidly with distance for both the existing and proposed (rebuilt) configurations. After the Project in all portions of the route, the magnetic-field at approximately 100 feet from the edge of the proposed ROW will either decrease compared to existing levels (between Derby Junction and Indian Well Substation) or will be less than 1 mG (between Indian Well and Ansonia substations). At this distance, all existing and proposed electric-field levels will be 0.1 kV/m or less.

In summary, the calculated EMF levels resulting from the Project will be a small fraction of those recommended for the general public by international health-based standards (i.e., ICES and ICNIRP). The engineering design and other activities initiated by UI include design elements consistent with the CSC's EMF BMP.

[48] Where constructed on two separate vertical monopoles (e.g., Str. 2-4 and Str. 17-19), UI has proposed maintaining the optimal phasing of the two transmission lines. Additionally, the horizontal conductor-conductor separation is similar to that of the double-circuit monopoles, resulting in similar EMF levels for the structures with two monopoles compared those with double-circuit monopoles.

8. PROJECT PERMITS, APPROVALS AND CONSULTATIONS

During the Project planning process, UI consulted with representatives of various Federal and State agencies (including the USACE, USFWS, FAA, CT DEEP, and the SHPO) and briefed representatives of the cities of Shelton, Derby, and Ansonia regarding the Project. UI will continue to consult with the involved regulatory authorities and municipalities as the planning for and development of the Project continues, including via the CSC and other regulatory review processes. This section identifies the permits and approvals required for the construction and operation of the Project and summarizes the agency and municipal consultations that UI has conducted thus far.

8.1 FEDERAL AND STATE AGENCY APPROVALS REQUIRED AND CONSULTATIONS

In addition to the authorization from the Council, the Project will require certain approvals from other Federal and State regulatory agencies.

At the Federal level, the Project must comply with the Clean Water Act (CWA), the Endangered Species Act, the National Historic Preservation Act, and FAA regulations. At the State level, along with compliance with the Council's requirements, UI must obtain Project-specific permits or approvals pertaining to water quality (pursuant to Section 401 of the CWA), stormwater management, flood management, threatened and endangered species, and cultural resources. UI will coordinate with CT DEEP regarding the proposed expansion of the existing ROW across Osbornedale State Park. Approval of the Method and Manner of construction also will be required from the Connecticut Public Utilities Regulatory Authority (PURA), and approvals from CT DOT will be required for the Project work over State roads.

Approvals from the USACE will be required for activities that result in temporary or permanent dredge or fill of Federal jurisdictional waters or wetlands (Section 404 of the CWA), as well as the for the transmission line span over the Housatonic River (crossing of Federal navigable waters pursuant to Section 10 of the Rivers and Harbors Act). The proposed activities qualify under USACE General Permits for the State of Connecticut GP-6 (Utilities Including Lines, Outfall and Intake Structures and Appurtenant Features) and GP-17 (New and Expansion of Recreational, Residential, Institutional and Commercial Developments).

Table 8-1 summarizes the permits and approvals expected to be required for the Project, along with the status of UI's consultations to date with the involved Federal and State agencies.

8.2 MUNICIPAL CONSULTATIONS AND PUBLIC OUTREACH

As part of the Project planning process, UI met with officials from Shelton, Derby, and Ansonia. The purpose of these meetings was to brief the municipal representatives about the Project, including the Project need, construction process, and schedule, as well as to solicit information for UI's use in developing Project plans. UI also distributed Project "fact sheets" to municipal officials. The following summarizes UI's outreach with municipal officials:

- **Shelton.** UI met with Mayor Lauretti and staff on August 12, 2021 to discuss the Project and provide an overview of the proposed Project activities. Email correspondence with Shelton Conservation staff, as well as the Shelton Trails Chair, continued from August 16, 2021 through August 18, 2021 regarding the potential impacts of the proposed Project with respect to Shelton's trails system. UI also met with the Shelton's various departments in person on September 22, 2021 to discuss the Project, ROW, construction, and potential wetlands impacts. UI later provided a copy of the presentation to the municipality.

- **Derby.** UI met with the City of Derby via Teams on September 14, 2021 to discuss the Project in general.

- **Ansonia**. UI met with representatives of the City of Ansonia via Teams on August 19, 2021 to discuss the Project in general.

In addition to the meetings with the municipal officials, UI pro-actively implemented a comprehensive outreach program to provide information about the Project to owners of land along and abutting the Project ROW, as well as to the general public. The following outreach methods have been and will continue to be used, as appropriate, until Project construction is completed:

- **Mailings to Abutters**. In October of 2021, UI sent a mailing to all abutters. The mailing included a letter describing the proposed Project activities and the Project Fact Sheet. The letter also included the Outreach email and Project Hotline telephone number. Further, in March 2022, UI sent a mailing to all abutters informing them of the Project website and inviting them to view the Project Open House area and to attend the Open House Zoom sessions scheduled in April 2022.

Table 8-1: Permits and Approvals Expected to be Applicable to the Project

Agency	Potential Permit/Approval Required / Activity Regulated	Application Submitted or Consultation (Date)	Status
FEDERAL			
USACE	Clean Water Act Section 404 (inland and tidal water resource crossings)	Consultation with USACE in progress	
USFWS	Consultation per Section 7 of the Endangered Species Act	iPAC consultation submitted 2/16/2020	iPAC correspondence included in Appendix B
FAA	Form 7460-1: Notice of Proposed Construction or Alteration	Consultation submitted on 02/07/2022; FAA issued Determinations of No Hazard	Consultation complete. No lighting or marking; however, FAA stated that marker balls/lighting can be provided on a voluntary basis. FAA coordination may be required for contractor cranes.
STATE			
CSC	Approval of Motion to Reopen Docket 3 and modification of Certificate of Environmental Compatibility and Public Need under Conn. Gen. .Stat.,. § 16-50*l*(a)(1) Development and Management Plan (after issuance of certificate and prior to Council's approval to start construction)	May 2022	CSC review Prepared after CSC approval of Motion to Reopen and CSC approval of Project
CT DEEP • Land and Water Resources Division (LWRD)	Water quality certification per Section 401 of the Clean Water Act; pertains to water resource crossings; SDF for conductors over Housatonic River	Filing anticipated September 2022	
• NDDB	State threatened and endangered species; special concern species and significant natural communities' consultation, survey, and review	NDDB consultations submitted January 6, 2022	Determination response correspondence received from CT DEEP on January 18, 2022
• Stormwater & Dewatering	General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (DEEP-WPED-GP-015) and SWPCP	To be submitted after CSC approval.	General Permit / SWPCP submittal date anticipated May 2023,
• Bureau of Natural Resources and Outdoor Recreation / Office of Land Acquisition and Management	Expanded easement for ROW across Osbornedale State Park (Derby and Ansonia)	Consultations initiated in late 2021	Consultations in progress
CT DEEP, PURA	Approval of method and manner of transmission line construction and energization per Conn. Gen. Stat. Section 16-243	To be submitted after CSC approval of the Motion to Reopen	Anticipated late 2023-early 2024
CT DOT	Encroachment permits for state highway crossings (State Routes 110, 34, 8, and 334)	Expected to be submitted in 2023	Anticipated late 2023 – early 2024
CT SHPO	Cultural Resource Consultation under Conn. Gen. Stat. § 16-50*l*(e)	Phase 1A report submitted March 2022	SHPO correspondence pending

- **Project Website**. UI created a website – derbyjunctionansoniatransmissionlinerebuild.com- to provide information to the public about the Project. The website provides a map of the Project location, along with an "Address Lookup" feature. In addition, the website includes a video that describes the Project, as well as a video and instructions regarding how to navigate the Project's Virtual Open House, described below.

- **Virtual Open House.** UI created a Virtual Open House site specifically for the Project. This Open House, which is accessed via the Project website, went live in March 2022. Recognizing potential concerns about holding public gatherings during COVID, the Virtual Open House mirrors the format of an in-person public informational session that UI typically holds for its proposed transmission projects. For example, the Virtual Open House includes a graphic of the typical open house set up and a video to guide participants through the Open House exhibits, which include information regarding the Project (overview video), CSC process, Frequently Asked Questions (FAQs) and responses, Engineering, and Routing and Environmental. The Virtual Open House also features a registration option that allows readers to post comments or questions regarding the Project. In April 2022, UI offered two Zoom appointment sessions to allow the interested public to provide comments about the Project or to ask UI representatives Project-specific questions .

- **Project Information Cards**. UI created and distributed Project information cards to all Project field personnel, who are instructed to provide the cards to members of the public encountered during the field surveys who had questions about the Project. The cards direct the interested public to the UI Outreach hotline for additional information as well as the to the Project website.

- **Facebook and Twitter**. In addition to the mailing to abutters, UI used its Facebook and Twitter accounts to notify customers about the Project and the Virtual Open House.[49]

- **Municipal Websites.** The website, open house, Fact Sheet, and FAQ were provided to the municipalities for posting on their various social media platforms.

- **Notices in Local Newspapers**. During the weeks of March 13 and March 20, 2022, UI placed ads, inviting the public to the Virtual Open House and Project website in local newspapers – specifically, in the *Connecticut Post* and the *Valley Register*.

Tables 8-2 and 8-3 summarize UI's overall public outreach efforts to date. As the Project moves forward (including during the construction process), UI expects to continue to pro-actively coordinate with the municipalities, stakeholders, and affected property owners.

[49] UI publicized the Virtual Open House for two weeks (April 1-15, 2022); however, the site will remain during the entire time that the UI Project-specific website is active.

Table 8-2: Summary of Municipal Outreach Regarding the Project

Municipality – Department(s)	Date of Meeting or Event	Purpose of Meeting or Event
City of Shelton	August 12, 2021 September 22, 2021	Provide Project Overview, discussed CSC process.
City of Derby	September 14, 2021	Provide Project Overview, discussed CSC process.
City of Ansonia	August 19, 2021	Provide Project Overview, discussed CSC process.

Table 8-3: Summary of Public Outreach Regarding the Project

Stakeholder Group	Date of Communication	Type and Purpose of Outreach
Abutters to the Project area in Shelton, Derby, and Ansonia.	October 1, 2021	First class mailing included a letter describing activities in the ROW and Fact sheet detailing the Project overview, scope, and need.
All UI customers	March 4, 2022	A website (Derby Junction to Ansonia 115kV Transmission Line Rebuild Project site) was developed to provide information on all UI's Transmission Line Upgrade Projects with a focus on the project activity. The website includes videos, timelines, construction information and ways to contact UI Outreach.
Virtual Public Open House	April 1 – 15, 2022	A virtual public open house was created on the UI Derby Junction to Ansonia 115kV Transmission Line Rebuild Project site. This site includes information about the Project, the CSC process, and ways to contact the UI Outreach team, as well as an area for viewers to input an address to determine if their property is near the Project area.
UI Customers in Project Municipalities	March 2022	Invitation to the Virtual Open House was placed in the CT Post and Valley Register.
All UI Customers	March 9, 2022	Posts were made about the Virtual Open House and Project information on UIs Facebook and Twitter site.
Customers in Project areas	Q3 2021 – ongoing	Field cards, Project information sheets, and FAQs, notifications, etc.

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9. ALTERNATIVES CONSIDERED

UI selected the proposed Project as the preferred alternative for maintaining the reliability of the 115-kV lines between Derby Junction, Indian Well Substation, and Ansonia Substation, while minimizing environmental and social impacts. In planning the Project, UI initially identified and eliminated various transmission line configurations and engineering design options, including upgrading only portions of the 115-kV line structures, before identifying the proposed Project as the preferred solution for both maintaining the resiliency of the regional electric transmission system and continuing to provide reliable service to its customers in Derby and Ansonia.

After identifying the proposed Project location and double-circuit configuration, UI conducted additional detailed engineering studies to refine the design (e.g., structure heights and locations) and proposed construction methods (e.g., anticipated access road and work pad locations) for rebuilding the double-circuit transmission lines. In addition, because the proposed Project includes an expansion of UI's existing ROW in Osbornedale State Park, which requires approval from the CT DEEP, UI identified and investigated multiple potential route and line configuration options to avoid the park entirely or to minimize the need to acquire additional permanent easement within the park.

Section 9.1 discusses the "No Action" alternative, while Sections 9.2 and 9.3 review the transmission line upgrade and rebuild alternatives that UI identified and evaluated before selecting the proposed Project. Section 9.4 describes the transmission line configuration and route options considered to minimize or avoid an expansion of UI's permanent easement in Osbornedale State Park. Section 9.5 describes structure location/configuration options, while Section 9.6 summarizes the rationale for the selection of the Project.

9.1 NO ACTION ALTERNATIVE

As the first step in the alternatives evaluation process, UI examined the consequences of the No Action Alternative - that is, "doing nothing" to upgrade or rebuild the existing transmission facilities between Derby Junction-Ansonia Substation. Under this alternative, no improvements would be made to correct existing lattice tower structural deficiencies or to replace the existing deteriorated conductors and hardware with new assets.

This alternative was rejected because it would not resolve the known asset condition issues with the existing conductor, hardware, and 100+-year old lattice steel towers. Transmission system reliability would be at risk because of the aging hardware and conductors, and the aged condition of the steel lattice towers, which could lead to structural failures that would result in extended duration power outages. Such outages would adversely affect service to UI's electrical customers and the integrity of the regional electrical transmission system. Overall, the No Action Alternative was dismissed due to unacceptable risks to UI customers, as well as the lost opportunity for the Company to improve the resiliency and increase the reliability of its transmission system.

9.2 UNDERGROUND 115-kV TRANSMISSION LINE CONFIGURATION

UI assessed the economic and environmental viability of placing the Derby Junction to Ansonia Substation 115-kV circuits underground, in a double-circuit configuration, using cross-linked polyethylene cable (XLPE). Typically, underground transmission cable systems are aligned within or adjacent to road ROWs because of the relatively level terrain and available workspace provided by travel lanes and road shoulders.

However, the Project area's characteristics (including segments of rugged topography, Housatonic River crossing, suburban residential development, lack of roads that provide relatively direct connections between Derby Junction, Indian Well Substation, and Ansonia Substation) limit the potential for aligning an underground cable system entirely within roads. As a result, this alternative would involve rebuilding the 115-kV lines below ground, using a route that would be aligned along portions the existing ROW and beneath local roads.

For any underground cable system, UI would also need to perform work within the existing ROW to remove the overhead transmission line structures and associated conductors and hardware. This work would require the installation of access roads and work pads, similar to that for the proposed Project.

Although an underground cable system could potentially be located along portions of the existing ROW, in many locations, the cable system would have to deviate from the ROW (e.g., to avoid rugged terrain and to obtain optimal locations to stage the Housatonic Railroad, Housatonic River, and State Route 8 crossings). To install an underground cable system within its existing ROW, UI would have to obtain underground easement rights from the landowners along the route. To install the transmission cables within road ROWs, UI would need to verify the locations of all underground utilities (sewer, water, communications cables, storm sewers) and then design and plan the construction the cable system to minimize impacts to those utilities and to any underground utility connections to adjacent homes and businesses.

For the purposes of this analysis, UI assumed that an underground 115-kV cable route, using any combination of the existing transmission line ROW and roads, would be similar in length to the existing overhead transmission line route.

Using an underground configuration, UI estimated that the cable system would consist of two XLPE cable circuits, contained within several polyvinyl chloride (PVC) conduits placed in a concrete-encased duct bank. Underground cable installation typically requires the excavation of a trench, approximately 8-10 feet deep and 5 feet wide. This generally requires a minimum 30-foot-wide work area for the cable duct bank construction. For each 115-kV circuit, the system also would require buried concrete splice chambers, where the underground cable sections would be spliced together. The splice chambers (each of which requires a typical excavation of approximately 12 feet wide by 12 feet deep and 28 feet long) would be spaced at intervals of approximately 1,800 to 2,500 feet along the transmission line route. Thus, for an approximately 4.1-mile double-circuit underground cable system between Derby Junction and Ansonia Substation, an estimated 9-12 pairs (18-24) of splice vaults would be required.

To assess the viability of undergrounding the existing 115-kV lines, UI considered the Project area's environmental resources and land use characteristics. For example, in the Project area, topographic variations (particularly near the Housatonic River) and shallow soil depth to bedrock pose particular challenges for the excavation of a continuous trench for the cable system. Due to topographic variations, substantial earth disturbance, including across wetlands and streams, would be required. There also may be a need for blasting, which the proposed Project currently does not require.

In addition, to install the cable system beneath the Housatonic River/Housatonic Railroad and State Route 8, trenchless construction techniques (such as horizontal directional drilling or jack and bore)[50] would be required. These techniques require staging areas of about 1 acre on either side of each crossing. An underground crossing of the Housatonic Railroad/Housatonic River poses particularly significant technical and environmental challenges, given the steep topography and residential areas on the west side of the river, the density of existing development on the east side of the river, and the general lack of available open land for staging areas.

[50] Both of these techniques would install the cable system far below the road/railroad/river crossings, thereby avoiding the significant environmental and social impacts that would otherwise result from trenching across the railroad and roads and within the bed of the Housatonic River.

Further, underground transmission line construction proceeds slowly and must avoid impacts to nearby structures, underground utilities, and soil formations; in urban locales such as the Project area, trenching for the cable duct bank and splice chambers typically proceeds at less than 200 feet per day and may only achieve 50 to 70 linear feet per day. As a result, an underground cable system would take longer to construct than the overhead transmission line rebuild and would involve more short-term nuisance effects to nearby landowners (e.g., due to noise, dust, vibration and traffic disruptions) as construction activities in any one location would require more time.

As part of the analysis of undergrounding the 115-kV lines between Derby Junction and Ansonia Substation, UI also reviewed the CSC's life cycle studies[51] of overhead and underground electric transmission lines. The CSC studies include comparative information on overhead and underground transmission lines, not only regarding costs, but also general environmental impacts and permit requirements.

The most recent CSC study (*Life-Cycle 2017*, issued October 11, 2018), includes information comparing single-circuit 115-kV overhead lines (supported on steel delta monopoles) and underground single-circuit 115-kV XLPE cables. The CSC study found the underground single-circuit line to be significantly more costly to design, build, and permit than an overhead 115-kV line. The average annual costs to operate and maintain underground lines was also found to be greater than similar costs for an overhead circuit. Although the Project involves primarily double-circuit instead of single-circuit transmission lines, the cost differential between overhead and underground line construction (in either double- or single-circuit configurations) is expected to be similar.

Given the significantly higher costs of underground transmission line construction and operation, as well as the significantly greater impacts to environmental features (e.g., Housatonic River crossing, ledge rock, wetlands), this alternative was eliminated from consideration as a viable option for the Derby Junction-Ansonia Substation 115-kV transmission lines.

9.3 OVERHEAD TRANSMISSION LINE UPGRADE/REBUILD ALTERNATIVES

After determining that the existing double-circuit 115-kV transmission lines between Derby Junction and Ansonia Substation must be upgraded or rebuilt in an overhead configuration, UI conducted comprehensive

[51] Pursuant to Conn. Gen. Stat. § 16-50r(b), the CSC is required to prepare and publish information on transmission line life cycle costs every five years. Life cycle cost reflects the estimated capital cost and maintenance cost of a project over its estimated useful life.

analyses to identify and select a Project design that would best achieve the Company's objectives for maintaining the resiliency of the regional electric transmission system and continuing to provide reliable service to its customers, while minimizing costs and environmental and social impacts. These analyses assessed both transmission line upgrades (retain some of the existing structures, reinforce others, and/or install some new structures along with new conductors and OPGW) and full line rebuilds (remove all existing structures and replace with new monopoles, conductors, OPGW, and hardware). UI also considered single- versus double-circuit rebuild configurations for new structures.

All of the overhead transmission line upgrade/rebuild alternatives involved alignments along UI's existing ROW. Because any transmission line upgrade or rebuild must necessarily connect Derby Junction, Indian Well Substation, and Ansonia Substation, no alternatives involving the installation of the 115-kV lines on an entirely new ROW were considered.

Given the dense urban/suburban development in the Project area (and the lack of any other linear corridors that connect Derby Junction to the two UI substations), the acquisition of land for such a new ROW would involve far greater land use, environmental, and social impacts than using UI's existing, long-established ROW. To create a new transmission line corridor between Derby Junction, Indian Well Substation, and Ansonia Substation, UI would have to acquire approximately 40 acres of new easement (assuming a 4.1-mile transmission line route and 80-foot-wide ROW). Because of the density of land use development in Shelton, Derby, and Ansonia, such a new corridor could only be established by removing existing homes and businesses and using existing open space and park areas.

UI's analyses of alternatives considered engineering design factors, cost, schedule, and potential environmental/ real estate impacts. Four alternatives, including the proposed Project (Alternative 1) were identified and evaluated. These alternatives are summarized in Table 9-1.

UI's initial analyses (conducted pre-2019) anticipated that a partial upgrade (i.e., Alternative 3) would be sufficient to cost-effectively maintain the reliability of the 115-kV transmission lines. However, more comprehensive engineering and field investigations, conducted in 2020-early 2021 to refine the planned line upgrades, found additional issues with the existing 115-kV structures. Approximately 80% of the existing structure foundations were determined to have concrete breakout and pull-out failures, as well as spalling and anchor-bolt/plate galvanic corrosion. In addition, UI identified both structural member failures and NESC clearance violations.

Table 9-1: Comparison of 115-kV Transmission Line Upgrade/Rebuild Alternatives*

	Alternative #1**	Alternative #2	Alternative #3	Alternative #4
Structures	Combination Double-and Single-Circuit Rebuild (41 new monopoles)	Partial Upgrade 30 Existing Structures	Partial Upgrade Existing Structures + 8 New Monopoles	Single Circuit Tower Rebuild
Conductor	795 kcmil 26/7 "Drake" ACSR + 96 or 72-fiber OPGW; No.7 Alumoweld Shieldwire	300 kcmil ACSR + OPGW	300 kcmil ACSR GA5 E3X[52] + OPGW	795 kcmil ACSS + OPGW
+50% / -25% Estimated Cost (Million$)	$36.0M	$33.7M	$22.3M	$44.2M

*Costs in Table 9-1 reflect estimates developed during the 10% Project design phase.
Alternative 1 = Preferred; at the Housatonic River crossing, 19 No.8 Alumoweld Shieldwire would be used, along with DNO-11469 OPGW (72 fiber).
**Note: 477 kcmil 30/7 ACSR "HEN" conductor also was considered for Alternative 1; this conductor Alternative would be at an estimated cost of $34.9 million.

Based on the results of the 2020-early 2021 engineering evaluations, UI performed additional analyses, focusing on a more robust partial rebuild (Alternative 2) or full rebuild options (Alternatives 1 and 4). Alternative 4 would be more costly than either Alternatives 1 or 2. Alternative 2, which would replace 30 structures, would be slightly less costly than the proposed Project, but would require a complex engineering design process/construction sequence and would pose a higher reliability risk, due to uncertainties associated with leaving some existing lattice steel towers in place. Further, Alternative 2 would only marginally increase the existing line ratings; the Summer LTE would increase by approximately 8%.

In comparison, the proposed Project (Alternative 1) will address all known structural deficiencies, will include new standard 795 ACSR conductor and hardware, which significantly increases all line ratings (e.g., increases the Summer LTE rating by approximately 85%), and will extend the integrity of the transmission lines between Derby Junction and Ansonia Substation by a minimum of 40 years. The new transmission line will also be designed and constructed to UI's current engineering standards and specifications, which increases resiliency by accommodating the ability to withstand increased wind load (i.e., Hurricane Category 3), additional ice loads, and broken conductor loads.

9.4 OSBORNEDALE STATE PARK ROUTE/CONFIGURATION OPTIONS

9.4.1 Background

UI's existing 50-foot-wide ROW traverses approximately 1,465 feet south-north across an undeveloped portion of the eastern part of Osbornedale State Park. Three lattice steel towers (Structures 10, 11, and 12),

[52] Refers to galvanized steel (G) with class A zinc coating thickness (A), ultra-high strength (5) steel, with E3X (heat-dissipating) technology that is designed to increase ampacity rating and reduce operating temperature for a given conductor size.

all of which date to the initial construction of the transmission lines in 1924, are presently located along the ROW in the park. The park was created in 1956, more than 30 years after UI's ROW was established.

For the Project, UI proposes to align new Structures 10 and 12 on properties outside the park (removing the existing lattice tower Structures 10 and 12 from the park) and to rebuild Structure 11, which will remain within the park, as a double-circuit monopole.[53] In addition, UI proposes to expand the existing 50-foot-wide ROW by approximately 60 feet to the west,[54] requiring the acquisition of approximately 1.82 acres of additional permanent easement in Osbornedale State Park (and the removal of trees within that easement) to conform to current national and UI clearance requirements.

UI is in the process of coordinating with CT DEEP regarding the proposed ROW expansion in the park. However, in the event that the proposed additional permanent easement cannot be acquired, UI identified and evaluated potential route and 115-kV line rebuild configurations that would avoid the need to acquire additional permanent easement for an overhead transmission line alignment within the park, minimize the required width of the expanded easement in the park, or avoid the park entirely the park entirely.

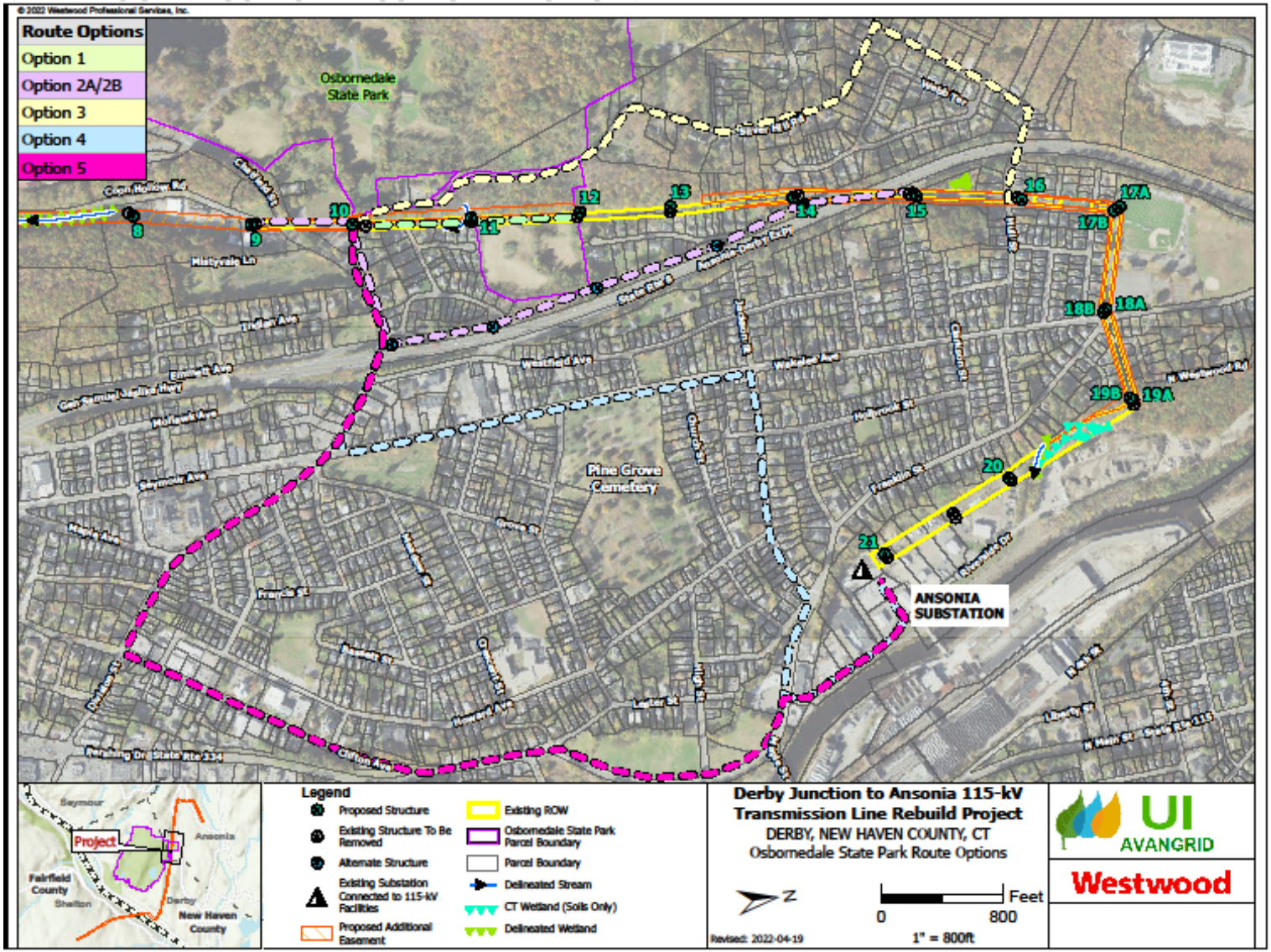
UI's identification of options was constrained due to the topography and land use development in the vicinity of Osbornedale State Park. For example, both north and south of the park (between Structures 10 and 11 and also north of Structure 12), residential developments directly abut the ROW and extend to the east, toward State Route 8. Silver Hill Road bisects a portion of the park, traversing south-north, west of and upslope from the UI ROW, while State Route 8 extends south-north farther east of the UI ROW.

In total, UI identified and evaluated nine route/configuration options to rebuilding the 115-kV lines, as proposed, across Osbornedale State Park. These options included four different transmission line configurations using or expanding the existing ROW within the park; two 115-kV line routes (one overhead and one underground) using, in part, the State Route 8 corridor; and three underground routes along local road ROWs. Figure 9-1 illustrates the general locations of these options, each of which is discussed further in Sections 9.4.2 through 9.4.4.

[53] As listed in Table 2-1, the proposed Structure 11 monopole will be 120 feet tall, whereas rebuilt Structures 10 and 12, both of which will be located outside the State park, will be 120 and 110 feet in height, respectively. In comparison, the existing 100-year-old lattice steel towers at Structures 10, 11, and 12 (all presently located in the park) are 85, 70 , and 79 feet tall, respectively.

[54] The proposed expanded easement width in the State park is required because of the steep, forested terrain to the west of the existing ROW. Without the expanded easement and the removal of trees within that easement, the proposed rebuilt lines will be at risk from falling trees and also non-conformance to horizontal blowout clearance requirements. The ROW cannot be expanded to the east because of residential developments that border the ROW and the State park property (refer to the discussion of Option 1D in Section 9.4.2).

Figure 9-1: Osbornedale State Park Route Options within and Outside the Park



For any of the alternatives that would route the rebuilt transmission lines along a new corridor to avoid the State park, UI would need to not only rebuild the 115-kV lines along the new route, but also would have to dismantle and remove the existing structures and associated transmission infrastructure from the portion of the existing ROW that each route option would replace. Specifically, UI would have to install access roads along the ROW and work pads at each structure removal location, as generally depicted for the proposed Project on the Appendix A maps.

9.4.2 Alternative Configurations within Osbornedale State Park (Options 1A-1D)

As Figure 9-2 illustrates, UI evaluated four alternatives (three overhead and one underground) for aligning the rebuilt 115-kV lines across Osbornedale State Park, including within the existing UI ROW (Options 1A and 1B), by expanding the existing 50-foot-wide ROW to the west by less than the proposed 60 feet (Option 1C), or by expanding the existing ROW to the east (Option 1D).

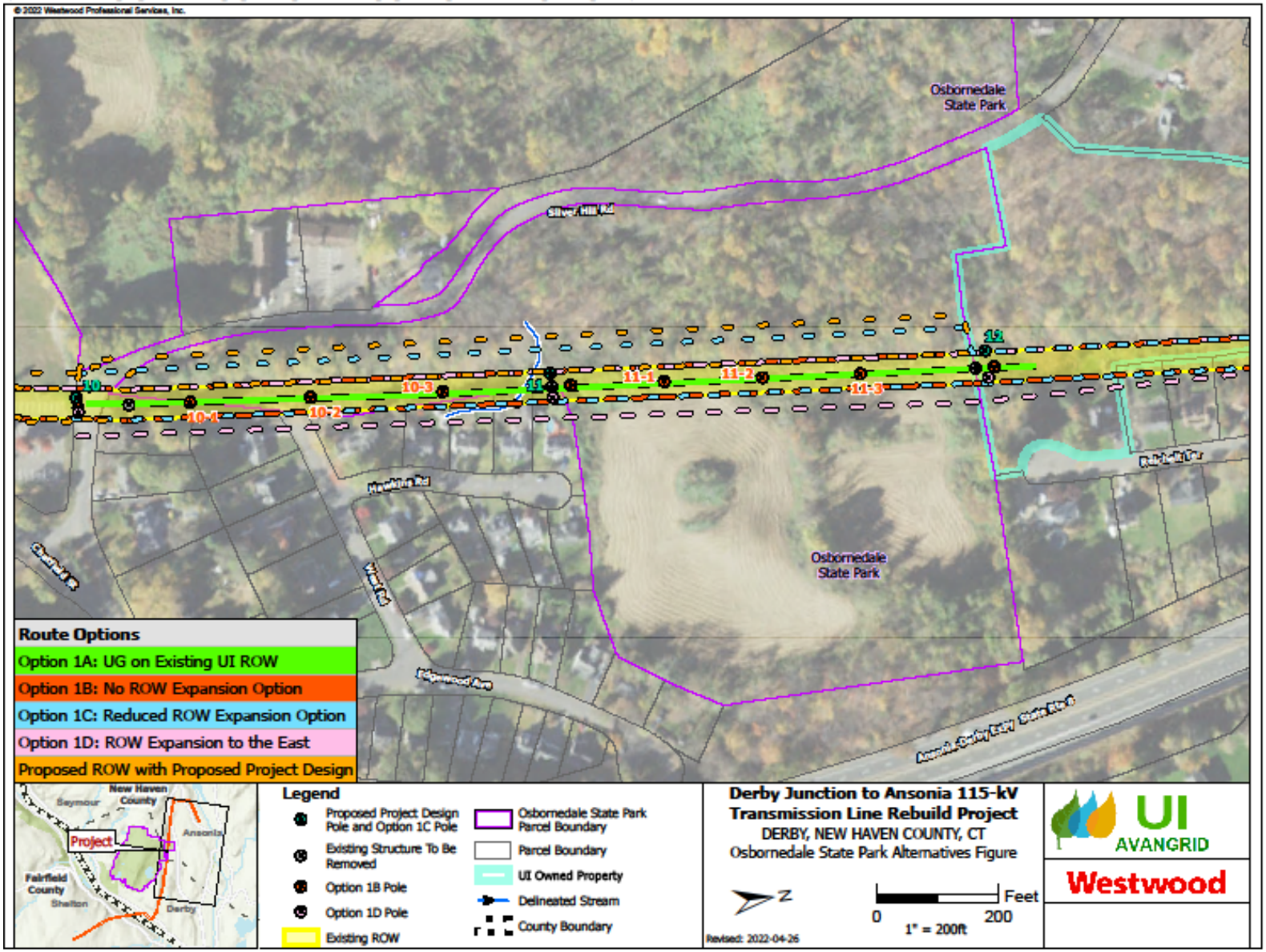
Option 1A: Underground 115-kV Cable Configuration along the Existing UI ROW

Under this option, between Structures 10 and 12, UI would install the rebuilt 115-kV double circuit lines underground using XLPE cable.[55] The underground cable segment would extend for approximately 1,700 feet, from an overhead-to-underground transition structure at/near rebuilt Structure 10, across the State park, to an underground-to-overhead transition at rebuilt Structure 12. UI anticipates that the underground cable segment could be constructed within the existing 50-foot-wide ROW. However, to install the underground cable segment, UI would have to acquire permanent underground easement rights from CT DEEP because UI's current rights cover only the overhead transmission facilities.

In addition, because one of the existing 115-kV lines must remain energized during Project construction to provide service to UI's customers, temporary easements (outside the 50-foot-wide ROW and amounting to an estimated 5,000 square feet) may be required within the park to provide workspace for trenching and cable duct bank installation while Structure 11 remains in place. Alternatively, UI may be able to relocate the 115-kV circuit that must remain energized to a temporary pole. However, to install such a pole, temporary workspace (easements), east of the existing ROW would have to be acquired from CT DEEP and/or private landowners. The temporary workspace would be restored after the cable installation.

[55] For the purpose of this evaluation, UI assumed that no splice chambers would be required along the 1,700-foot cable segment. However, detailed engineering analyses would be required to verify whether or not splice chambers would be needed.

Figure 9-2: Route Options (1A-1D) along ROW in Osbornedale State Park

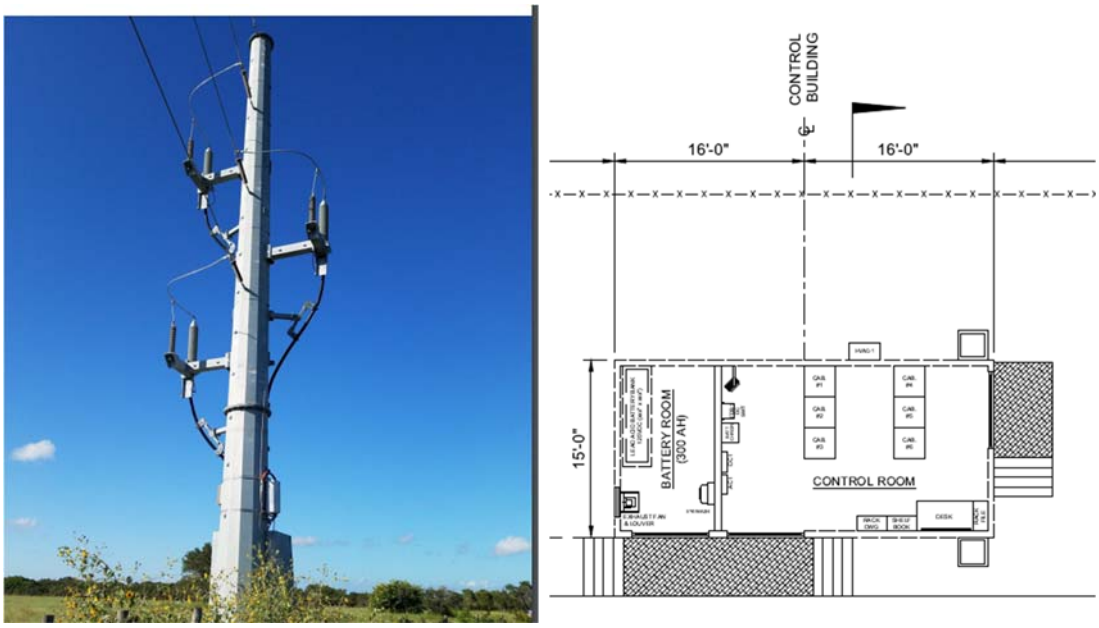


The installation of the cable segment between Structures 10 and 12 poses construction challenges due to the varying terrain and shallow depth to bedrock. Construction would require trenching across Division Street/Silver Hill Road, as well as the removal of all vegetation within the existing 50-foot-wide ROW and any temporary work areas.

Grading (cut and fill) would be required along the full width of the 50-foot-wide ROW in the park to create a safe, level workspace for the trenching and duct bank installation. Because of the potential for bedrock to be encountered during trenching, rock hammering or blasting would be required to achieve the required depth for the cable duct bank. One small intermittent watercourse would be traversed.

Transition structures, with associated control equipment enclosed in a fenced area, would have to be installed on either end of the underground segment (at Structures 10 and 12). These transition structures (refer to Figure 9-3) would be the points at which the overhead and underground 115-kV line segments would connect. At each transition structure, a small control enclosure would be located within a fenced area.

Figure 9-3: Example of Transition Structure and Control Enclosure



In addition, a permanent access road along the length of the underground cable segment in the State park (within UI's ROW) would be required to provide vehicular access to the cable system for operation/maintenance purposes.

Overall, the underground cable segment would be more costly and would require more time to construct than the comparable overhead transmission line rebuild. The estimated cost for the underground segment between Structures 10 and 12 is estimated at $35 million, compared to the approximately $3.6 million for rebuilding the overhead 115-kV lines across Osbornedale State Park, as proposed.

Option 1B: No ROW Expansion Option

Using the No ROW Expansion Option, UI would configure the rebuilt overhead 115-kV lines to avoid the need for any additional permanent easement from CT DEEP, while still adhering to national and Company standards for clearances between the transmission line conductors and vegetation. However, to adhere to these requirements, very short spans between structures would be required.

As a result, compared to the single 120-foot-tall monopole at Structure 11 that will be installed in the park for the proposed Project, a total of seven new monopoles would have to be installed along the 1,465-foot segment of the ROW in the park. Structures 10 and 12 would be rebuilt outside the park, as described for the proposed Project. Each of the seven monopoles between Structures 10 and 12 would be 110-to-130 feet tall and would be spaced approximately 150 to 200 feet apart. (Refer to Figure 9-2.) No tree removal in the park outside of the existing 50-foot-wide ROW would be required, except to selectively remove trees outside the ROW that could pose a hazard to the conductors.

UI could rebuild the 115-kV lines within Osborndale State Park using this configuration. Outside of the existing UI ROW, temporary easements may be required in the park to provide workspace for the construction of the seven monopoles, including (if necessary) for temporary poles that may have to be installed to assure that one of the 115-kV circuits remains in service during Project construction. Such temporary easements would be restored after the installation of the new transmission line structures.

However, the seven new monopoles would alter views of the park and would represent a potential viewshed intrusion to residents of nearby areas. The estimated cost of this option is $4.6 million - $1 million more than the cost of the proposed Project configuration across the State park property ($3.6 million).

Option 1C: Reduced ROW Expansion Option

The Reduced ROW Expansion Option would be similar to the proposed Project, except that UI would install a substantially taller monopole at Structure 11 (in the park) to limit the additional permanent easement required from CT DEEP. Using this option, the rebuilt Structure 11 would be 185 feet tall, compared to the 120-foot-tall Structure 11 proposed for the Project. The taller monopole would increase the heights of

the 115-kV conductors such that UI would have to expand the existing 50-foot-wide ROW by 40 feet to the west, instead of 60 feet in the proposed Project. This would require approximately 1.35 acres of additional permanent easement within the park. Trees would be removed from the entire additional 40-foot-wide permanent easement area.

However, in order to mitigate conductor uplift,[56] the use of the 185-foot-tall monopole at Structure 11 would also require an increase in the heights of the proposed monopoles at Structures 10, 12, and 13. Specifically, using Option 1C, these structures would range in height from 150 to 190 feet, compared to the proposed Project structure heights of 100 to 120 feet.

UI could rebuild the 115-kV lines between Structures 10 and 13 using this Option 1C configuration. However, the significantly taller new monopoles would alter views along the segment of the ROW within the park and in the immediate vicinity. The taller structures also would be a prominent aspect of views to the east from areas within Osbornedale State Park. Figures 9-4 and 9-5 illustrate the heights of the monopoles that would be required under this option.

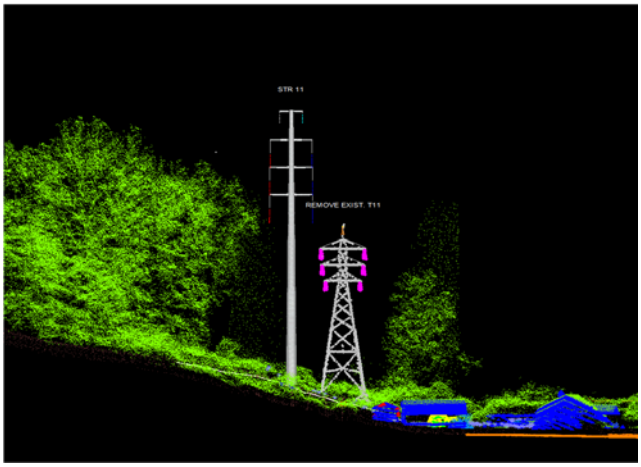
The estimated cost of this option is $6.4 million, compared to $3.6 million for the proposed Project configuration across Osbornedale State Park.

Figure 9-4: Photo-Simulation of Taller Structure 11, View to East from Osbornedale State Park

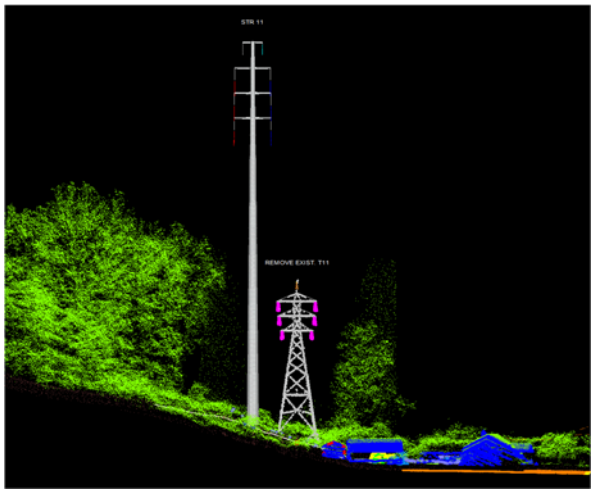
[56] Uplift refers to changes in conductor tension due to temperature-related contraction that can cause stress on the conductor arms, potentially lifting up the structure, and also can result in conductor clearance violations.

Figure 9-5: Engineering Depictions of Proposed Structure 11 and Option 1C (Tall) Structure 11
(View along UI ROW to the north)

Proposed Structure 11: 120 feet tall



Option 1C Structure 11: 185 feet tall



Option 1D: ROW Expansion to the East

Using Option 1D, UI would expand the existing 50-foot-wide ROW by approximately 30 feet[57] to the east between Structures 10, 11, and 12, including across the State park. Under this option, the heights of the new monopoles at Structures 10, 11, and 12 would generally be comparable to the proposed Project (i.e., Structures 10 and 11 would be 120 feet tall; Structure 12 would be 110 feet tall). Figure 9-2 illustrates this option.

Generally, because the topography east of the existing UI ROW is not as steep as to the west (the topography generally slopes to the east), UI would only have to expand the permanent easement to achieve a total of ROW width of 80 feet to adhere to national and Company conductor clearance standards. Using Option 1D, an estimated 1.02 acres of additional total permanent easement would be required. Approximately 0.48 acre of the permanent easement would be within the State park; the remainder (0.54 acre) would be on private residential properties located both north and south of the State land.

[57] For the purposes of this analysis, it was assumed that the permanent ROW expansion to the east would be a uniform 30 feet (including within Osbornedale State Park), increasing the total ROW width to 80 feet. However, it is possible that up to 40 feet of additional ROW to the east could be required in some areas, based on topography.

Option 1D would avoid tree clearing on the State park's wooded slope to the west of the existing UI ROW. Instead, the expanded permanent easement area to the east within the park would encompass mostly a field and hedgerow north of Structure 11.

However, between Division Street/Silver Hill Road and existing Structure 11, the eastern boundary of UI's ROW currently extends across the back or side yards of seven residential properties located along Division Street/Silver Hill Road, West Road, and Hawkins Road. The expansion of the ROW to the east by 30 feet would place the ROW over portions of all seven homes. The expanded ROW also would extend into the backyards of three residential properties along Reichelt Terrace.

Although Option 1D would avoid tree clearing on the wooded slope west of the ROW and limit the additional permanent easement required from CT DEEP within Osbornedale State Park, the expansion of the ROW to the east would result in significant adverse effects to all seven of the abutting residences, potentially requiring UI to purchase the properties. As a result of the unacceptable and overriding potential impacts to residential properties, UI eliminated this option from consideration.

9.4.3 Alternative Route/Configurations along State Route 8: Options 2A and 2B

As an alternative to rebuilding the 115-kV lines along its existing ROW in Osbornedale State Park, UI investigated both an overhead and an underground 115-kV configuration that would be aligned, in part, along the west side of the State Route 8 corridor (Options 2A and 2B, respectively). Options 2A/2B would replace the entire segment of the existing UI ROW from Structure 10 to Structure 14, including the portion within Osbornedale State Park. (Refer to Figure 9-1.)

Using this alignment in either the overhead (Option 2A) or underground (Option 2B) configuration, the transmission line route would diverge from the existing UI ROW at Structure 10, extending east along Division Street and then turning north along Spruce Lane. At the end of Spruce Lane, the route would continue north along the west side of the State Route 8 corridor, in part within CT DOT property, to Structure 14. The Option 2A/2B alternative route would be approximately 0.83 mile in length and would replace an approximately 0.53-mile segment of the existing UI ROW between Structures 10 and 14.

State Route 8 was considered as a potential transmission line route because, compared to most local roads, limited access state highways typically have wider ROWs, including undeveloped areas outside of paved travel lanes where land may be available to accommodate transmission lines. Under this option, UI anticipated that an 80-foot-wide permanent easement would be required for the overhead 115-kV lines

(using double-circuit monopoles) and a 30-to-50-foot-wide easement would be required for a 115-kV double-circuit XLPE underground cable, depending on whether the line is beneath roads or within undeveloped land west of State Route 8. For Option 2B, transition structures would be needed at both Structures 10 and 14 (refer to Figure 9-3); one or two pairs of splice chambers also would be required.

However, as detailed in CT DOT's *Utility Accommodation Manual* (2009), longitudinal co-location of transmission lines in CT DOT limited access highway corridors is not permitted except in special circumstances. CT DOT opposes the co-location of transmission lines in state road ROWs, particularly if other routing alternatives, such as the use of existing utility ROWs, are available.

In addition to CT DOT's policy against the co-location of transmission lines within its highway ROWs, the State Route 8 corridor would pose particular construction challenges for the development of UI's rebuilt 115-kV transmission lines. For example, residential developments are located directly west of the highway corridor, along Spruce Lane, Reichelt Terrace, and Edgehill Road. The existing trees along the western side of the CT DOT corridor, which currently provide a vegetative screen between the highway and residences, would also have to be entirely removed.

Further, the width of CT DOT's corridor on the west side of State Route 8 road shoulder varies in width from approximately 35 to 80 feet. As a result, even if CT DOT did allow co-location of the rebuilt 115-kV transmission lines, the highway corridor is too narrow to accommodate the entire ROW that UI would need for either an overhead or an underground configuration. Some of the ROW would encroach on the easternmost portion of Osbornedale State Park, thereby requiring new ROW from CT DEEP in that area.

Further, easements would also have to be acquired, for either an overhead or an underground configuration, from various private landowners along Division Street, Spruce Lane, Reichelt Terrace, and Edgehill Road. The underground configuration would require potentially four splice chambers, as well as transition facilities at both Structures 10 and 14.

UI eliminated Options 2A and 2B from consideration due to these various overriding constraints.

9.4.4 Alternative Underground Routes along Local Roads: Options 3, 4, and 5

UI investigated options for avoiding Osbornedale State Park by aligning a segment of the rebuilt 115-kV lines underground, using XLPE cable, along local roads in Ansonia. Three alternatives (Options 3, 4, and

5) were identified, as shown on Figure 9-1. For the analysis of these options, UI assumed that a minimum 30-foot-wide work area would be required.

Silver Hill Road to Hull Street (Structure 10 to Structure 16 (Option 3)

Using Option 3, UI would rebuild the two 115-kV transmission lines underground (using XLPE cable) within or adjacent to local roads, replacing the segment of the existing ROW between Structures 10 and 16.

Specifically, the rebuilt 115-kV lines would transition from overhead to underground double-circuit 115-kV cable in the parking lot just south of Silver Hill Road/Division Street, at Structure 10. The cables then would be aligned north within Silver Hill Road before turning east onto Hull Street, crossing beneath State Route 8, reconnecting to UI's existing ROW, and transitioning back to an overhead configuration at Structure 16.

The Option 3 underground cable segment would be approximately 1.1 miles long, replacing an approximately 0.75-mile portion of the overhead line route along UI's existing ROW. Along the cable route, an estimated two-three pairs of splice chambers (depending on spacing and turn radius) would be required.

However, Silver Hill Road and Hull Street are narrow, two-lane roads bordered mostly by residences, with areas of mature trees directly adjacent to and in some cases overhanging the roads. Along the southern portion of Option 3, wooded areas of Osbornedale State Park border both sides of Silver Hill Road. Various utilities are buried beneath both Silver Hill Road and Hull Street.

UI determined that the Option 3 underground cable alignment would result in substantial environmental and land use impacts (e.g., removal of trees, including within the State park lands bordering Silver Hill Road, full road closures, acquisition of land from private property owners for the installation of splice chambers and the alignment of the cable in locations where underground utilities prevent the cable installation within the roads).

Moreover, compared to the proposed overhead transmission line rebuild along UI's existing ROW, the use of an underground cable segment would be significantly more costly and would require longer to construct.

As a result, Option 3 was eliminated from consideration.

Underground Cable Segment Options: Structure 10 to Ansonia Substation

UI investigated two alternatives – Options 4 and 5 – that would replace the portion of the proposed Project from Structure 10 to Ansonia Substation. Figure 9-6 illustrates these two route options which are discussed as follows:

Structure 10 to Ansonia Substation - Northern Route (Option 4)

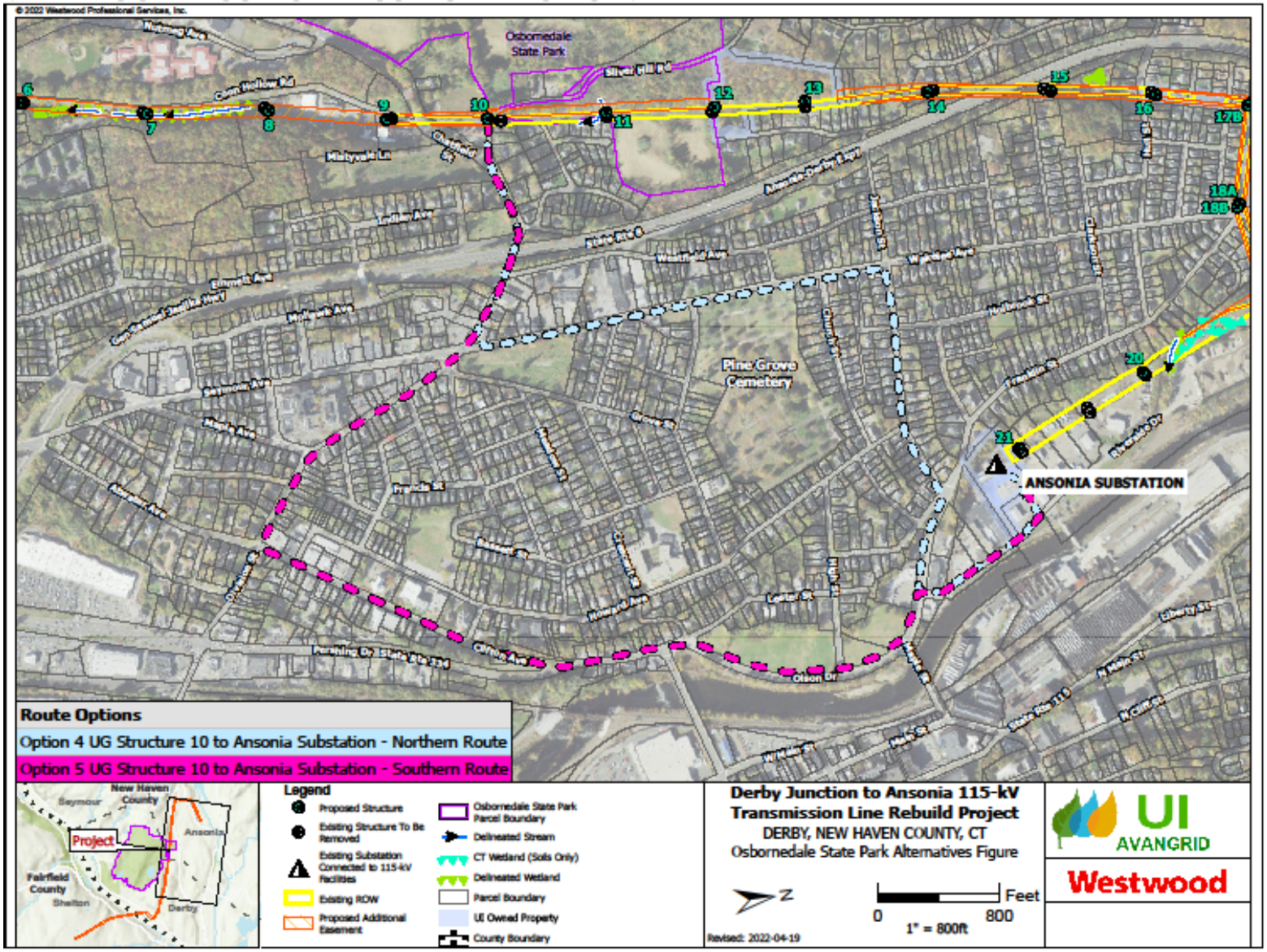
This 1.48-mile underground cable option would replace an approximately 1.59-mile segment of the proposed overhead 115-kV lines on UI's existing ROW, from Structure 10 to Ansonia Substation (refer to Figure 9-6). Using Option 4, the rebuilt 115-kV lines would transition to underground XLPE double-circuit 115-kV cable at Structure 10. From this structure, the underground cable would extend east along Division Street, crossing underneath State Route 8 and then turning north onto Wakelee Avenue. The cable system would continue north along Wakelee Avenue until diverging to the east and extending along Jackson Street, crossing Maple Street (State Route 334) and entering Ansonia Substation from the south.

The local roads along which the Option 4 cable route would be aligned are bordered principally by residential properties. Because of the number of underground utilities (water, sewer, gas, storm drainage and communications) known to be co-located within these roads, UI anticipates that the cable system (trench and the associated three-to-four pairs of splice chambers) could not be aligned entirely beneath the local roads and would have to be aligned beneath sidewalks or on private property in many locations. Figures 9-7 and 9-8 provide a photograph and schematic of a splice chamber, respectively.

In some areas, existing utilities may have to be relocated to accommodate the cable trench and splice chambers. In addition, the cable trench would have to cross the underground connections that extend from the utilities in the roads to each home or other adjacent development. As a result, the underground cable system installation process would be time-consuming, with trenching likely to proceed at only 50-75 linear feet per day.

Further, the 115-kV connections to Ansonia Substation would have to be modified, because the underground cables would extend into the substation from the south, while the existing and proposed rebuilt lines connect to the substation from the north. UI anticipates that Ansonia Substation would have to be expanded to accommodate the new 115-kV underground line entries.

Figure 9-6: Underground Route Options 4 and 5: Structure 10 to Ansonia Substation

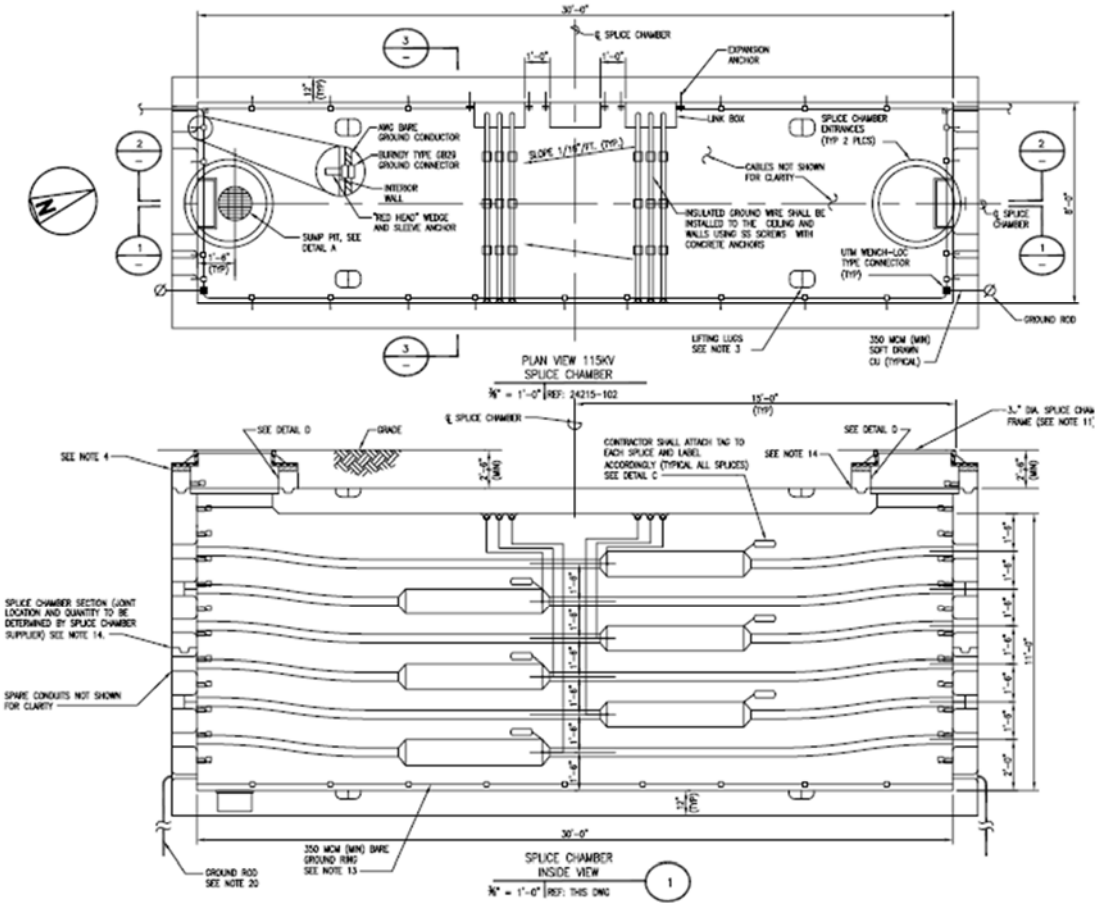


The estimated cost of Option 4 is $170 million. In comparison, rebuilding the existing 115-kV lines overhead between Structure 10 and Ansonia Substation, as UI proposes for the Project, is about $22 million.

Figure 9-7: Photograph of Representative Splice Chamber prior to Installation

Approximate size: 31feet long x 9 feet wide x 12 feet high

Figure 9-8: Schematic of Representative Splice Chamber



Structure 10 to Ansonia Substation –Southern Route (Option 5)

Under this option, a 1.82-mile double-circuit 115-kV underground cable system would replace an approximately 1.59-mile segment of the 115-kV overhead lines along existing UI ROW, from Structure 10 to Ansonia Substation (refer to Figure 9-6). Specifically, using Option 5, the underground cable would extend east from Structure 10 along Division Street, crossing underneath State Route 8, before turning north along Clifton Avenue. The cable route would continue north, first along Clifton Avenue and then would follow short segments of Pershing Drive (State Route 727), Olson Drive, Maple Street (State Route 334), and Riverside Drive before entering Ansonia Substation from the south. An overhead-to-underground transition structure would be required at Structure 10. As described for Option 4, the termination of the cable segment in Ansonia Substation would require modifications to the substation to accommodate the 115-kV underground line entries.

Compared to Option 4, Option 5 would be aligned along roads that are bordered by commercial and industrial uses, as well as residential development. Various underground utilities are located within the roads and, as a result, in some locations, the cable system (splice chambers as illustrated in Figures 9-7 and 9-8 and potentially some areas of the cable trench) may have to be located on private properties outside of the road ROWs. Four to five pairs of splice chambers would be required along the cable system route. As described for Option 4, the underground cable system installation process would be lengthy, with trenching estimated to proceed at only 50-75 linear feet per day.

The estimated cost of Option 5 is $207 million. Rebuilding the existing 115-kV lines overhead along UI's ROW between Structure 10 and Ansonia Substation (as proposed for the Project) is about $22 million.

9.4.5 Summary

Within Osbornedale State Park, the proposed Project - rebuilding the 115-kV lines overhead along UI's long-established ROW with an expansion of the existing 50-foot-wide ROW by approximately 60 feet to the west – is the preferred, least-cost option for maintaining the reliability of the transmission system. Nonetheless, if the additional 60-foot-wide permanent easement from CT DEEP cannot be obtained across Osbornedale State Park, as is necessary to safely construct, operate, and maintain the rebuilt lines as proposed, then UI would be prepared to rebuild a portion of the 115-kV lines using Option 1A[58], 1B, 1C, 4, or 5. However, compared to the proposed Project, each option would be more costly and would result in greater environmental, social, and/or land use disruptions.

[58] Option 1A assumes that UI could obtain underground easement rights from CT DEEP for the existing 50-foot-wide ROW through Osbornedale State Park, as well as a temporary easement for construction workspace in the park.

9.5 STRUCTURE LOCATION AND CONFIGURATION ALTERNATIVES

Because the Project's transmission lines provide critical electric service to customers in the Shelton-Ansonia area, one of the existing 115-kV lines between Derby Junction, Indian Well Substation, and Ansonia Substation must remain in service at all times during Project construction. The inability to take a dual-circuit outage on the lines during construction poses significant constraints, was a key factor in the proposed Project design, and is a significant consideration in construction planning.

Currently, UI proposes to replace five of the existing double-circuit lattice steel towers (Structures 3 and 4 in Derby and Structures 17, 18, and 19 in Ansonia) with paired single-circuit monopoles. At these five locations, the ROW is characterized by steep topography, line angles, and/or directly bordering densely-developed residential/commercial uses – all factors that complicate the installation of the rebuilt 115-kV structures while keeping one line in service. The use of the single-circuit monopoles will facilitate construction by allowing one of the 115-kV circuits to be rebuilt on a new single-circuit structure and then placed in service, after which the second circuit will be taken out of service and rebuilt on the second single-circuit monopole.

An alternative to rebuilding Structure Nos. 3, 4, 17, 18, and 19 on paired single-circuit monopoles while still maintaining one of the 115-kV lines in service during Project construction is to erect structures to temporarily support one of the circuits. Under this alternative, temporary structures would be installed within the ROW near each of the five lattice steel towers. The in-service 115-kV line would be transferred to these temporary structures during the rebuild work.

Using the temporary structures to avoid a dual-circuit outage, the existing double-circuit lattice towers could be rebuilt as double-circuit monopoles. The temporary structures would be removed after one of the 115-kV lines is rebuilt and energized.

UI is in the process of performing further analyses of this structure configuration alternative and anticipates that the use of temporary structures may have merit to allow the use of double-circuit monopoles at Structures 4 and 17 in particular.

9.6. SUMMARY JUSTIFICATION FOR THE SELECTION OF THE PROPOSED PROJECT

After considering various options for upgrading or rebuilding the 115-kV lines between Derby Junction, Indian Well Substation, and Ansonia Substation, UI concluded that the proposed double-circuit overhead configuration on new monopoles, aligned along UI's ROW, will provide a cost-effective solution for maintaining the reliability and resiliency of the transmission grid, while avoiding or minimizing impacts to environmental resources, cultural resources, social impacts and land uses. In particular, the proposed Project:

- **Maximizes the use of UI's long-established ROW in Shelton, Derby, and Ansonia and minimizes the need for additional permanent easement.** The continued location of the 115-kV lines along the existing ROW also will be consistent with Federal policy regarding linear energy facility siting, as set forth in the Federal Energy Regulatory Commission's *Guidelines for the Protection of Natural, Historic, Scenic, and Recreational Values in the Design and Location of Rights-of-Way and Transmission Facilities*.[59]

- **Minimizes environmental and land use impacts.** Although unavoidable temporary effects and minor long-term impacts to site-specific environmental resources and land uses will occur as a result of the construction and operation of the rebuilt 115-kV transmission lines, the development of the Project along the existing ROW will be consistent with State and local land use policies and long-term goals for upgrading the electric transmission grid and will minimize long-term adverse environmental impacts to the maximum extent practical.

- **Achieves a Cost-Effective Solution.** The proposed Project represents a cost-effective solution for accomplishing the required 115-kV transmission line rebuilds in the densely developed Shelton, Derby, and Ansonia areas.

[59] Federal Power Commission, Order No. 414, Appendix A, Docket No. R-365 (November 27, 1970).

10. ACRONYMS AND GLOSSARY OF TERMS

Acronym	Description
115-kV:	115-kilovolts or 115,000 volts
ACSR:	Aluminum conductors with steel reinforcement, a common type of overhead conductor
ACSS:	Aluminum Conductor with Steel Support, a common type of overhead conductor
AGH:	Above Ground Height
AGL:	Above Ground Level
ANSI:	American National Standards Institute
APA:	Aquifer Protection Area
Aquarion:	Aquarion Water Company
ASCE:	American Society of Civil Engineers
BMP:	Best Management Practices
BPA	Bonneville Power Administration (BPA), a division of the U.S. Department of Energy
CCMA:	Connecticut Coastal Management Act
CEII:	Critical Energy/Electric Infrastructure Information
CELT:	Capacity, Energy, Loads, and Transmission Report (ISO-NE)
Certificate:	Certificate of Environmental Compatibility and Public Need (from the Connecticut Siting Council)
CFPA:	Connecticut Forest & Park Association
CIRCA:	Connecticut Institute for Resiliency and Climate Adaptation
Conn. Gen. Stat.:	Connecticut General Statutes
CONVEX:	Connecticut Valley Exchange
Council (CSC):	Connecticut Siting Council
CT DEEP:	Connecticut Department of Energy and Environmental Protection
CT DESPP:	Connecticut Department of Emergency Services and Public Protection
CT DOT:	Connecticut Department of Transportation
CYD:	Cubic yard
D&M Plan:	Development and Management Plan (required by the Connecticut Siting Council)
dBA:	Decibel, on the A-weighted scale
dbh:	Diameter breast height (tree trunk measurement)
DCDE:	Single pole double-circuit deadend (structure)
DCT:	Single-pole double-circuit tangent (structure)
DG&E:	Derby Gas and Electric Company
ECC:	Energy Control Center (UI)
EMF:	Electric and magnetic field
EMF BMP Document:	Electric and Magnetic Fields Best Management Practices for the Construction of Electric Transmission Lines in Connecticut prescribed by the Connecticut Siting Council
EPA:	Environmental Protection Agency (United States)
EPRI:	Electric Power Research Institute

Acronym	Description
Eversource:	The Connecticut Light and Power Company dba Eversource Energy
FAA:	Federal Aviation Administration
FEMA:	Federal Emergency Management Agency
FIRM:	Flood Insurance Rate Map
ICES:	International Committee on Electromagnetic Safety
ICNIRP:	International Commission on Non-Ionizing Radiation Protection
IEEE:	Institute of Electrical and Electronics Engineers
iPac:	Information for Planning and Consulting (online USFWS review tool)
ISO-NE:	Independent System Operator – New England
Hz:	Hertz (frequency)
kV:	Kilovolt; equals 1,000 volts
kV/m:	Kilovolts per meter
LE:	Linear foot (feet)
LiDAR:	Light detection and ranging (remote sensing technology)
LTE:	Long-term emergency (rating)
mG:	Milligaus (measurement of magnetic flux density)
Motion:	Motion to Reopen / Modify Docket No. 3 (CSC)
NAAQS:	National Ambient Air Quality Standards
NAVD88:	North American Vertical Datum 1988
NDDB:	Connecticut Natural Diversity Data Base (CT DEEP)
NERC:	North American Electric Reliability Council, Inc. (initially, the National Electric Reliability Council)
NESC:	National Electrical Safety Code
NFPA:	National Fire Protection Association
NRCS:	Natural Resources Conservation Service (United States Department of Agriculture)
NRHP:	National Register of Historic Places
NLEB:	Northern Long-Eared Bat
NVCOG:	Naugatuck Valley Council of Governments
OPGW:	Optical groundwire (a shieldwire containing optical glass fibers for communication purposes)
OSHW:	Overhead shieldwire
Permanent Easement:	Pertains to the transmission line structures, wire clearances, access, vegetation management, limitations on structures that can be placed on the easement (e.g., buildings, pools,), and protection from excavation, all as needed for UI's installation, maintenance, operation, and repair of the utility infrastructure
POCD:	Plans of Conservation and Development
Project:	Derby Junction to Ansonia Substation 115-kV Transmission Line Rebuild Project
PVC:	Polyvinyl chloride
RCSA:	Regulations of Connecticut State Agencies
ROW:	Right-of-way
RWA:	South Central Connecticut Regional Water Authority
SCADA:	Supervisory Control and Data Acquisition System
SCDA:	Single pole single-circuit deadend type a (0 to 60° angle)
SCDB:	Single pole single-circuit deadend type b (60° and greater angle)

Acronym	Description
SCENIHR:	Scientific Committee on Emerging and Newly Identified Health Risks
SF:	Square Feet
SHPO:	State Historic Preservation Office
SMD:	Standard Market Design (ISO-NE)
SPCB:	Single pole single-circuit running angle with brackets
SPCT:	Single pole single-circuit tangent
SPDE:	Single pole single-circuit deadend on davit arms
SRHP:	State Register of Historic Places
SWPCP:	Stormwater Pollution Control Plan
Tap:	Interconnection point between transmission lines, also referred to as a junction
UI, Company:	The United Illuminating Company
USACE:	United States Army Corps of Engineers
USDA:	United States Department of Agriculture
USGS:	United States Geological Survey (U.S. Department of the Interior)
WHO:	World Health Organization
XLPE:	Cross-linked polyethylene (cable)
XS:	Cross-section (drawing)