MUNICIPAL CONSULTATION FILING

CONCERNING THE CONNECTICUT PORTION

OF THE INTERSTATE RELIABILITY PROJECT

BY

THE CONNECTICUT LIGHT & POWER COMPANY

VOLUME 2 of 5

AUGUST, 2008

VOLUME 2 – ENVIRONMENTAL EXHIBITS

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SUPPLEMENTAL ENVIRONMENTAL INFORMATION

FOR THE

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Connecticut
Light & Power

The Northeast Utilities System

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I. EXISTING ENVIRONMENTAL CONDITIONS

This section describes the general environmental resources along, and in the vicinity of, the Primary Route Under Consideration and the overhead and underground route variations to this primary route (Sections I.A and I.B respectively), and also discusses the environmental conditions in the vicinity of the existing substations and the Loop of the 310 line from Manchester to Millstone into Card Street Substation (310 Line Loop) that would be modified as part of the Project (Section I.C). The environmental features along and in the vicinity of the Primary Route Under Consideration and its route variations have been characterized based on a combination of aerial photography review, field investigations, and available published research, as well as initial consultations with regulatory agencies and the review of municipal and regional land use plans and geographic information system (GIS) data.

The purpose of this discussion is to provide baseline data concerning the Project's environmental setting. Such information is intended to facilitate an understanding of the Project's potential environmental effects (as discussed in Section II) and thereby to promote public participation in the municipal consultation process. The municipal consultation process will serve to identify Project issues of interest to the public, to the affected municipalities, and/or to regulatory agencies, and may result in the performance of additional studies to address such issues.

Volume 5 includes two sets of aerial photography based maps that depict the environmental features near the Primary Route Under Consideration and the route variations. The principal environmental features illustrated on the maps are:

- Location of existing transmission line ROW, substations, structures, and access roads
- Vegetative community types
- Land uses
- Municipal boundaries
- Wetlands
- Water resources, including streams, rivers, lakes, and drainage ditches
- Floodplains
- Public recreational, scenic, open space, and other protected areas, including forests, parks, water supplies, hunting/wildlife management areas
- Schools and community facilities
- Existing infrastructure including roads and railroads

In the summer of 2004, as part of the initial Project planning, CL&P commissioned studies of environmental resources (including wetlands and watercourses, amphibians, birds, and cultural resources) along its existing ROWs between the Card Street Substation and the Connecticut/Rhode Island border

(i.e., the alignment that is now identified as the Primary Route Under Consideration). These initial 2004 studies were reviewed and preliminary additional field investigations were conducted along this route in the fall of 2007. The wetland and watercourse surveys conducted in 2004 are in the process of being updated and will be completed later this year. The results of technical environmental studies that have been conducted to date, including the 2004 studies, are included in Volume 2.

I.A PRIMARY ROUTE UNDER CONSIDERATION

The Primary Route Under Consideration would traverse approximately 37 miles in a general northeasterly direction, extending from CL&P's existing Card Street Substation in Lebanon through portions of the following towns:

- Lebanon (New London County)
- Columbia, Coventry, and Mansfield (Tolland County)
- Chaplin, Hampton, Brooklyn, Pomfret, Killingly, Putnam, and Thompson (Windham County)

A 345-kV line on the Primary Route Under Consideration would connect to the National Grid portion of the proposed 345-kV Project transmission line at the Connecticut-Rhode Island state boundary in the Town of Thompson. This overhead transmission line route would be aligned within an existing CL&P easement, adjacent to other existing overhead transmission lines. This ROW typically varies in width from 300 to 350 feet, except for a small ROW segment near Mansfield Hollow Reservoir and Mansfield Hollow State Park (located in the Towns of Mansfield and Chaplin), where the existing ROW width is only 150 feet. In the Mansfield Hollow/Mansfield State Park area, additional ROW width may have to be acquired to accommodate the new transmission line.

I.A.1 Topography, Geology, and Soils

I.A.1.1 Topography

The Project area lies in the Eastern Highlands physiographic province. Topography in the Project area generally is characterized by hills and valleys. Elevations in the Project area range from approximately 210 feet National Geodetic Vertical Datum (NGVD) to approximately 600 feet NGVD.

I.A.1.2 Geology

Connecticut's bedrock geology has a direct effect on landscape forms because of the rocks' different resistances to weathering and erosion. Within the Project area, bedrock consists mainly of Paleozoic Era igneous granites, gneisses, quartzites, and metamorphic schists folded into north-south belts. Over time, south-flowing streams and rivers incised the softer rock types into valleys, cutting the slopes that now

border the floodplains of rivers in the Project area, such as the Willimantic, Shetucket, Fivemile, and Quinebaug.

Surficial geology within the Project area is varied and consists of different thicknesses of tills, sand, gravel, fines, alluvium, and elongated hills called drumlins. The U.S. Geological Survey (USGS) map contained in Volume 5 depicts the surficial geologic conditions (i.e., depth of till and other deposits overlying bedrock) along the Primary Route Under Consideration. Depth to bedrock along the Primary Route Under Consideration was estimated based on a review of soils data and surficial geology maps, and are noted on Table A-1.

I.A.1.3 Soils

Information regarding the soils in the Project area was obtained from county soil surveys and maps published by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). These surveys and maps provide soil classifications and characteristics, including depth to bedrock, slope, drainage, and erosion potential.

Table A-1 (in Appendix A) summarizes the principal soil associations, as identified by the USDA NRCS[1], in the general vicinity of the Primary Route Under Consideration. This information provides a useful baseline for identifying areas of hydric soils (a soil that formed under conditions of saturation, flooding or ponding, and generally indicates the presence of a wetland); assessing the potential for erosion and sedimentation during construction; and for planning appropriate erosion and sedimentation controls to be implemented during construction (refer to the discussion of potential soils impacts in Section II). Table A-1 also identifies soils classified as Prime Farmland Soils or Farmland of Statewide Importance (FOSI).

The baseline soils information obtained from the NRCS maps and surveys is a supplement to the field investigations that are required to identify Connecticut wetlands, which are defined based on the presence of hydric or floodplain soils. Wetlands along the Primary Route Under Consideration were delineated by registered professional soil and wetland scientists, botanists, and biologists as part of field studies conducted in 2004. An initial field review of the wetlands identified during the 2004 studies was performed in 2007. Additional field investigations to update and verify these wetland/watercourse delineations are in the process of being performed and are scheduled to be completed later this year. A

[1] The NRCS was formerly the Soil Conservation Service (SCS).

report documenting the results of the wetland and watercourse studies conducted to date is included in Volume 2.

I.A.2 Water Resources (Wetlands, Watercourses and Waterbodies)

Water resources include wetlands, watercourses (surface waters – streams and rivers), and waterbodies (surface waters – lakes, ponds, and reservoirs).

I.A.2.1 Wetlands and Watercourses

As described previously, field investigations to identify and delineate wetlands and water resources along the Primary Route Under Consideration were performed in 2004. These water resources were characterized using both Connecticut delineation methodology and the three-parameter method for determining federal jurisdictional wetlands as defined in the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory 1987). Specific descriptions of each of the wetlands and water resources are included in the *Wetlands and Waterways Description Report* in Volume 2. Additional field studies to update the 2004 delineations will be completed in 2008.

Water resources were characterized based on type, extent, and functional quality. Prior to the field surveys, biologists studied the following resources to identify the mapped water resource areas:

- National Wetlands Inventory (NWI) mapping;
- DEP Wetlands mapping;
- USDA NRCS soil surveys for New London, Windham, and Tolland counties; and
- Available aerial mapping.

The *Wetland and Waterways Description Report* (Volume 2) summarizes the characteristics of each of these resources and includes representative photographs and wetland data forms. Table A-2 lists the wetlands that were identified along the Primary Route Under Consideration. Wetland and watercourse locations are depicted on the maps in Volume 5, keyed to the descriptions in Volume 2 *Wetland and Waterways Description Report*.

As indicated by the 2004 field studies, the most common types of wetlands along the Primary Route Under Consideration are emergent, scrub-shrub, and forested. Emergent wetlands are characterized by a dominance of rooted herbaceous hydrophytes, such as cattails, grasses, sedges, and rushes. Scrub shrub wetlands are characterized by a dominance of woody vegetation that is less than 20 feet tall. Forested wetlands are characterized by woody vegetation greater than 20 feet tall (Cowardin et al., 1979). In general, wetlands along the route have been historically affected by the maintenance of the ROW in low-growing vegetation to assure the safe operation of the existing overhead transmission lines.

I.A.2.2 Drainage Basins and Streams

Connecticut is divided geographically into eight major drainage basins. The Primary Route Under Consideration is located within the Thames River drainage basin, which is characterized by watercourses that flow into Long Island Sound in New London and Groton. Regional watersheds along the route include the Natchaug River, Shetucket River, Willimantic River, Quinebaug River, and Fivemile River drainage basins.

The DEP maintains detailed water resources information concerning state drainage basins and promotes watershed management efforts to improve water quality. The DEP also has established Water Quality Standards and Classifications, which identify the water quality management objectives for each stream and are central to the state's clean water program (refer to Table A-3). Overall, the goal of Connecticut's water quality policies are to protect surface and groundwater from degradation, to restore degraded surface waters to conditions suitable for fishing and swimming, to restore degraded surface groundwater to protect existing and designated uses, and to provide a framework for establishing priorities for pollution abatement. Minor perennial named and unnamed waterbodies and intermittent streams were not given water quality classifications.

Table A-4 lists the watercourses and waterbodies located along the Primary Route Under Consideration. Of these, the primary water resources traversed include Hop River, Willimantic River, Mansfield Hollow Lake, Natchaug River, Little River, and the Quinebaug River.

I.A.2.3 Floodplains

The Federal Emergency Management Agency (FEMA) classifies flood zones for insurance and floodplain management purposes and has prepared maps that designate certain areas according to the frequency of flooding. An area within the 100-year flood designation has a 1 percent chance of flooding each year or is expected to flood at least once every 100 years. A review of FEMA maps indicates the following watercourses and waterbodies along the Primary Route Under Consideration have an associated 100-year flood boundary.

- Ten Mile River
- Hop River
- Willimantic River
- Saw Mill Brook
- Mansfield Hollow Lake
- Natchaug River
- Cedar Swamp Brook
- Little River

- Stony Brook
- Blackwell Brook
- White Brook
- Creamery Brook
- Quinebaug River
- Little Dam Tavern Brook
- Munson Brook
- Fivemile River
- Teft Brook

The 100-year flood boundaries associated with these watercourses are depicted on the maps in Volume 5. FEMA 100-year flood boundary data for Buttonball Brook, Humes Brook, and Culver Brook are not available at this time.

Certain areas along the Primary Route Under Consideration have a history of flood management issues. The route physically traverses the Mansfield Hollow Lake Dam Management Property. The Mansfield Hollow Lake Dam, completed in 1952, lies at the confluence of the Natchaug, Fenton, and Mt. Hope rivers, in Mansfield Center. The dam is part of a network of six flood control dams in the Thames River Basin that were constructed and are maintained by the USACE. Water stored during potential flooding conditions is released after water levels downstream recede.

I.A.2.4 Groundwater Resources and Public Water Supplies

Potable water in the vicinity of the Primary Route Under Consideration is derived from groundwater wells and surface water supplies or reservoirs. Drinking water in a number of towns along the route is provided solely by individual groundwater wells, with one well typically sourcing one house or business. Surface water from reservoirs such as the Willimantic Reservoir (which straddles Mansfield and Windham) provides potable water in certain towns, especially in the more densely developed areas. Groundwater wells, often located in stratified drift deposits, also provide public drinking water to portions of certain towns as described below. [2]

- **Lebanon** – Lebanon obtains drinking water primarily from private groundwater wells with the exception of three small community well systems and a small number of households which are served by Norwich Public Utilities. The closest community well is located approximately five miles southeast of the Card Street Substation and the Primary Route Under Consideration in Lebanon. Groundwater in the vicinity of the route is classified as "GA".
- **Columbia** – Columbia's residents rely on private groundwater wells for all their drinking and household water needs. Groundwater in the vicinity of the route is classified as "GA".

[2] Information on municipal water supplies was obtained by personal communication with municipal officials and/or through review of municipal planning documents.

- **Coventry** – Coventry relies on private groundwater wells in the vicinity of the Primary Route Under Consideration. Several water companies provide groundwater to developments near the center of Coventry. Groundwater in the vicinity of the route is classified as "GA".
- **Mansfield** – Water supply in the area of the Primary Route Under Consideration is provided by private groundwater wells. Two public water supply systems (Windham Water Works and the Windham Sewer System) supply water to users in southern Mansfield, just south of the Project area. Several high quality aquifers have been identified in stratified drift deposits in the valleys in Mansfield. The Primary Route Under Consideration would cross two zones of the Stratified Drift Aquifer associated with the Willimantic River Valley aquifer and also a portion of the watershed to the reservoir as it runs through south Mansfield. Groundwater in the vicinity of the route is classified as "GA/GAA/GAAs" and "GA/GAA may not meet current standards".
- **Chaplin** – Chaplin obtains drinking water from private groundwater wells, with the exception of one condominium complex that is supplied by the Windham Water Department, from the Willimantic Reservoir. Groundwater in the vicinity of the route is classified as "GA/GAA/GAAs".
- **Hampton** – Hampton relies solely on private individual groundwater wells. Groundwater in the vicinity of the route is classified as "GA".
- **Pomfret** – Pomfret residents rely on private groundwater wells, with the exception of one factory that relies on a municipal source. Groundwater in the vicinity of the route is classified as "GA".
- **Brooklyn** – Potable water in rural areas of Brooklyn is derived from individual private groundwater wells. The Crystal-Gallup Water Company (part of the private Connecticut Water Company) operates a wellfield of groundwater supply wells near the west side of the Quinebaug River in the vicinity of Quebec Street in east Brooklyn. The Primary Route Under Consideration is more than one mile from this well field at its closest point. Groundwater in the vicinity of the route is classified as "GA".
- **Killingly** – Killingly relies largely on private groundwater wells. The Crystal-Gallup Water Company (alternately the Connecticut Water Company) operates a wellfield of groundwater wells between the east side of the Fivemile River and Main Street (Route 12), in the vicinity of Rock Avenue. This wellfield provides potable water to the more developed areas of Killingly, and is located approximately three miles south of the Primary Route Under Consideration. Groundwater in the vicinity of the route is classified as "GA".
- **Putnam –** There are two primary water supply sources for the Town of Putnam. Surface water from the Little River is diverted via a man-made dam to the Peake Brook Road water treatment plant in Woodstock. This source provides approximately 60 percent of total water demand. The second source is groundwater from a wellfield on the Quinebaug River at Park Street (Park Street Level A Aquifer). Groundwater is diverted to the water system from the two production wells located in the 3-well field. Diverted groundwater provides about 40 percent of total demand, servicing the industrial park and the southern portion of the system. The Primary Route Under Consideration is approximately 3,000 feet east of the wells at its closest point. Groundwater in the vicinity of the route is classified as "GA" and "GB".
- **Thompson** – The Crystal Water Company operates a groundwater supply wellfield east of French River, in the vicinity of Rachel Drive and Route 200 near the center of town. This area is included within a Level B Aquifer Area designated in the Thompson zoning regulations. The wells supply developed areas of Thompson, while more rural areas rely on individual groundwater wells. The Primary Route Under Consideration is located approximately 2.5 miles south of the wellfield at its closest point. The Quaddick Reservoir, just north of the route, is not a drinking water supply, but is a recreational area. The Primary Route Under Consideration would cross an area of glacial outwash designated as a Stratified Drift Protection Area, west of

Quaddick Town Farm Road and south of the Quaddick Reservoir. Groundwater in the vicinity of the route is classified as "GA".

I.A.3 Biological Resources

I.A.3.1 Vegetative Communities and Wildlife Resources

The Primary Route Under Consideration crosses or is located near various types of predominantly upland vegetative communities that provide a variety of wildlife habitat (refer to the Volume 5 maps). Along the existing ROW within which the Primary Route Under Consideration is located, vegetative growth is maintained to assure consistency with transmission line use. As a result, the predominant vegetation types within the existing transmission line corridor consist of dense shrub and herbaceous growth, whereas the primary vegetation types in the vicinity of the existing ROW are deciduous (hardwood) and mixed hardwood forest (in varying successional stages), intermixed with areas of agricultural use, maintained lawn and wetlands.

In general, there are seven habitat types that were characterized and identified along or in the vicinity of the route: old field/shrub land, mature mixed upland forest, forested/wooded wetland, scrub-shrub wetland, emergent wetland, agricultural lands, and urban areas. These vegetative community types can be expected to provide productive habitat for a variety of wildlife species.

Old field/shrub land areas generally support the greatest variety of wildlife because of the interspersion of different habitat types. Mammalian wildlife typical of these habitats include small mammals such as meadow voles, short-tailed shrews, and deer mice; predators such as red fox, coyote, weasel, skunk, and raccoon; woodchuck, rabbit, and white-tailed deer. Various species of birds, as well as reptiles and amphibians (collectively referred to as herptiles) also typically are present.

Species typically common in forested habitats include white-tailed deer, rabbit, coyote, fox, striped skunk, Virginia opossum, chipmunk, squirrel, and numerous small mammals (e.g., deer mouse, red-backed vole, shrews, and bats). Various species of birds and herptiles also are common in wooded areas. Birds typical of wooded areas include raptors (owls, hawks), grouse, wild turkey, woodpeckers, and numerous species of songbirds. Herptiles likely to occur in wooded areas include salamanders, as well as certain species of toads, frogs, turtles, and snakes.

Many of the species that use wooded and shrubland (successional upland) habitats also utilize wooded, scrub-shrub, and emergent wetland communities. In addition, there are species that are adapted primarily to wetland or other aquatic habitat. These include mink, beaver, otter, muskrat and water shrew; as well as birds such as heron, waterfowl, and certain types of raptors and songbirds. Numerous herptiles are

particularly adapted to wetlands and aquatic habitats; typical species include most salamanders at some time in their life cycle, frogs, turtles, and snakes.

Wildlife in agricultural lands can be abundant as animals are attracted to human food sources (e.g., crop fields and orchards). Some of the most recognizable wildlife species can be found in these areas, such as white-tailed deer, raccoons, woodchucks, and birds such as Canada geese, robins, and house sparrows. Other less visible species such as red fox, coyotes, and skunk are also common. Herptiles such as frogs and snakes can also be found in agricultural areas.

Wildlife in urban areas (e.g. industrial/commercial, high density residential, etc.) can also be abundant as animals are attracted to human food sources, but the species inhabiting them must be tolerant to some degree of human disturbance. Species such as crows, rats, and other small rodents are often abundant in these habitats. Some wildlife species are even dependent on human activity to thrive, such as birds that nest almost exclusively in human structures (e.g., chimney swift, barn swallow, purple martin).

The Town of Lebanon has designated existing utility corridors, including those originating from the Card Street Substation, as protected open space in their Plan of Conservation and Development, as these corridors may represent import wildlife corridors. The Town has identified these corridors as important open space because they are largely left "as is" with minimal structures developed.

The Primary Route Under Consideration also traverses the Mansfield Hollow Wildlife Management Area in Mansfield. The area encompasses approximately 2,000 acres and is managed by DEP for regulated hunting activities. The area is open to provide habitat for small game, waterfowl, turkey, and deer hunting. The Wildlife Management Area is expected to provide habitat to species common to forested areas as described above.

I.A.3.2 Summary of Avian Studies

As part of the initial Project planning conducted in 2004, research was performed regarding the bird species that may potentially be found in the region. These studies were designed to identify the bird species that are known or expected to breed in Connecticut and may occur in the Project vicinity; assess the birds' potential use of the ROW and adjacent habitats; and evaluate the potential effects of the construction and operation of the proposed Project on such species. The following summarizes the results of this research; Volume 2 includes more detailed information concerning these avian studies.

Considerable research has been performed regarding both the bird species that occur in Connecticut and that use ROW habitat. The bird study conducted for the Project involved a review of such studies, as well

as analyses based on the habitat types that occur along the Primary Route Under Consideration and its associated variations.

The *Atlas of Breeding Birds of Connecticut* (*Atlas*) was the primary source consulted to determine the bird species likely to occur in the vicinity of the Project. The *Atlas* subdivides the state into 596 "blocks", with each representing approximately 10 square miles of geographic coverage. For this statewide survey, observers recorded observations of bird species and their behavior. The *Atlas* provides a distribution map for each species that indicates in which blocks the species was observed, and whether breeding was confirmed, probable, or possible. During compilation of the Atlas, a total of 173 species were confirmed as breeding in Connecticut.

The distribution maps provided in the *Atlas* were compared to the planned locations of the Project facilities. Any species that the *Atlas* identified as possible, probable, or confirmed for breeding within approximately 10 to 15 miles of the alternative Project routes (including the Primary Route Under Consideration as defined in this document) were included in the analysis. The results of the 2004 agency consultations with the NDDB and USFWS were also incorporated.

Each bird species identified as potentially occurring in the vicinity of the routes was then ranked in terms of likelihood of occurrence (high, moderate, or low), based on the distance from the routes to the blocks where the species was observed; whether breeding was confirmed, probable, or possible; the habitat requirements of the species; and the overall abundance of the species in Connecticut. In addition, using aerial alignment maps; an analysis of the habitat types traversed by the routes was performed in 2004 and correlated to bird species that could occur in each habitat type. Of the 173 bird species identified as breeding in Connecticut (Bevier, 1994), a total of 135 were identified as potentially occurring in the Project area, based on a review of the breeding bird survey data in the *Atlas*. This number includes 81 species that were ranked as having low or moderate potential for occurrence, and 54 species with a high potential to occur in the Project vicinity. A table listing the bird species that could be found along the Primary Route Under Consideration is included as part of the bird study conducted for the Project (Volume 2).

In addition to the 2004 Breeding Bird Survey and *Atlas* review, recent (2007 and 2008) consultations with the DEP NDDB identified three state species of special concern that could occur along the Primary Route Under Consideration. These species are the Whip-poor-will (*Caprimulgus vociferous),* the Savannah Sparrow (*Passerculus sandwichensis*), and the Eastern Meadowlark (*Sturnella magna*).

The Whip-poor-will is a nocturnal bird, which can be found in dry open woodlands usually near fields[3]. This species has been reported to occur within the towns of Chaplin, Hampton, and Putnam. The remaining two state species of special concern have been reported to occur near the Mansfield Hollow area of Mansfield. The Savannah Sparrow nests in open, grassy areas, and the Eastern Meadowlark typically nests in open, grassy fields larger than 15 acres.

In addition, the DEP NDDB identified one threatened species, the American Kestrel (*Falco sparverius*) which is reported to occur near the Mansfield Hollow area of Mansfield. The American Kestrel generally prefer open areas such as woodland edges, parks or open fields and are cavity nesters that seek out abandoned woodpecker or flicker holes in which to nest. Further, the DEP NDDB identified two endangered species, the Grasshopper Sparrow (*Ammodramus savannarum*) and the Horned Lark (*Eremophila alpestris*) reported to occur near Mansfield Hollow. The Grasshopper Sparrow nests in open, grassy areas such as open fields, meadows, and marshes. The Horned Lark prefers large fields, open areas, shoreline beaches, grasslands and agricultural areas.

A Great Blue Heron (*Ardea Herodias*) rookery was identified during the Spring 2008 field surveys. Great Brue Herons nest together in colonies, referred to as rookeries, which often consist of hundreds of breeding pairs. The rookery identified during the field surveys is associated with Wetland D220/300 and is located in the Town of Thompson, west of Quaddick Town Farm Road. The rookery is located within and adjacent to the existing CL&P ROW.

As planning fro the Project continues, CL&P will continue to coordinate with the NDDB regarding these species. Field studies for potential breeding birds along the Primary Route Under Consideration are currently being conducted. An updated Breeding Bird Survey Report, based upon the 2008 studies, will be included in the Application to the Council.

The existing maintained ROW along which the Primary Route Under Consideration is proposed for location offers several advantages with respect to birds species diversity. The “edge effect” is a long recognized ecological principle that the edge or border between different habitat types typically produces larger numbers and a greater diversity of wildlife than the adjacent habitats alone, as it is inhabited by species that specialize in utilizing edge habitats, as well as species that primarily utilize the adjacent habitat types. This situation is common on utility ROW in the Northeast, where the maintained old field/shrubland habitat on ROW often borders a different habitat type (e.g., woodlands, agricultural lands,

[3] National Audubon Society, 1994

rural/suburban/urban developments). As a result, ROWs can support a large and diverse population of bird species.

Long-term studies have confirmed that ROWs typically support a greater number and diversity of birds than adjacent forested habitats, because they not only provide food and nesting opportunities for early successional species, but also are important sources of food and cover for family groups of woodland species with their fledglings. ROW corridors maintained as early successional shrub, forb, or grass communities have a positive effect on numerous wildlife species.

In addition, the old field/shrubland habitat typically maintained on ROWs is becoming scarce in both Connecticut and in the Northeast in general, as abandoned farmlands revert to forest and as existing woodlands mature. At its peak around the middle of the 19th century, agriculture resulted in the clearing of nearly 75 percent of the forestland in Connecticut; in comparison, approximately 60 percent of the state is presently forested. The amount of forestland in Connecticut has remained relatively stable since 1972, with losses due to development being approximately offset by the conversion of farmland to forestland; this trend is expected to continue for the foreseeable future. Therefore, ROWs represent an important component of regional habitat diversity, providing a stable, long-term source of shrub land habitat in a region where it is becoming scarce.

The trend toward more forestland in the northeast has raised concerns regarding the potential effect on bird populations. While concerns have also been raised about the decline of forest-nesting birds in the northeast due to deforestation in their wintering grounds or forest fragmentation in their breeding grounds, in general, woodland birds are doing well in the northeastern United States. The Atlas data for 1980 to 2000 shows that 57 percent of all woodland species in the Northeast are increasing.

In contrast, Atlas data show that 66 percent of all Neotropical migrant birds in the northeast with significant population trends for 1980 to 2000 are decreasing. This is at least in part due to a decline in bird species associated with grasslands and shrub lands. Of the declining woodland species, 82 percent use mid-successional forests, open parklands, or dense understory, and 53 percent prefer disturbance conditions. Of the Neotropical migrants from all habitats that show a decline from 1980 to 2000 in the northeast, 90 percent use disturbance-generated habitats such as open fields, shrub lands, mid-successional forests, open parkland, and forest edge, and 72 percent prefer disturbance and non-climax habitats.

I.A.3.3 Summary of Amphibian Studies

Field studies to identify potential amphibian breeding habitat, including vernal pools, must be carefully timed to coincide with the spring amphibian breeding season. In conjunction with 2004 field investigations conducted to identify wetlands and water resources, biologists experienced in the identification of amphibian breeding habitat and vernal pools conducted a preliminary analysis of the potential for wetlands along the route to provide amphibian breeding habitat. Several wetlands were identified as having a "high" potential to provide amphibian breeding habitat with the majority of them located within the eastern portion of the route (i.e., generally between Chaplin and the Rhode Island border). A number of wetlands were identified as potential vernal pools. These areas were identified based upon observations of the physical characteristics of the wetlands, such as pools of water, calls of obligate vernal pool amphibians, direct evidence of obligate amphibian breeding (egg masses, amphibian larvae), distinct depressions in wetlands combined with water stained leaves (if dry), significant water marks on vegetation and/or rocks, as well as marked pit and mound topography.

The areas described above include the "classic vernal pool" generally thought of as a distinct, isolated depression, which is not connected to any other wetland, as well as the "cryptic vernal pool", which is often imbedded in a larger wetland area, associated with additional wetland and/or a watercourse. Additional surveys of the potential vernal pools are currently being conducted; these surveys are being performed during the appropriate amphibian breeding and/or larval development time periods and have been designed to determine whether or not each wetland supports amphibian breeding. An Amphibian Breeding Habitat Report, based on the 2008 field studies, will be included in the Application to the Council.

I.A.3.4 Fisheries

The freshwater watercourses along the Primary Route Under Consideration support either cold- or warm-water fish habitat. Compared to warm-water fisheries, cold-water fisheries are considered more sensitive because the fish species that comprise cold-water fisheries are less tolerant of habitat disturbance and poor water quality. Because the Project area includes only a few small ponds and the Mansfield Hollow Lake Dam, the majority of the fish species likely to be present in the Project area are cold-water species.

Mansfield Hollow Lake Dam, also known as Naubesatuck Lake or Mansfield Hollow Reservoir, is located in Mansfield and Windham. The lake is contained entirely within Mansfield Hollow State Park. The shoreline is predominately forested, with some areas of open land. A public boat launch is provided for lake access. Twenty freshwater fish species have been identified by the DEP Inland Fisheries Division in Mansfield Hollow Lake, including largemouth bass, smallmouth bass, brown trout, rainbow

trout, northern pike, chain pickerel, black crappie, yellow perch, brown bullhead, yellow bullhead, bluegill, pumpkinseed, green sunfish, bluegill/pumpkinseed hybrid, tessellated darter, fallfish, golden shiner, spottail shiner, banded killifish, and white sucker.

Based on a review of data concerning freshwater fisheries maintained by the DEP Inland Fisheries Division, the perennial streams in the Project area support habitat for various types of fish species, ranging from trout to white sucker.

The DEP's inland fisheries management efforts for rivers and streams are directed primarily toward providing trout fishing opportunities, which have traditionally been an important part of Connecticut's angling activity.[4] The implementation of DEP's 1999 Trout Management Plan, which was developed based on the compilation of fish population, physical habitat and water chemistry information for approximately 800 Connecticut streams, is designed to improve fishing quality by diversifying angler opportunities. The Trout Management Plan designates various special management areas for trout. These include: streams where self-sustaining wild trout populations are encouraged through catch-and-release angling; trout management areas; streams where DEP stocks catchable size hatchery trout; trophy trout areas (which are stocked with larger hatchery trout); trout parks (which offer easy access to the public and are stocked more frequently to promote angler success); and streams believed to be able to support sea-run trout (anadromous brown trout).

The DEP typically stocks hatchery-raised adult-sized trout (adult brook, brown, and rainbow trout) for put-and-take purposes in publicly-accessible portions of certain rivers. Stocked streams in the Project area include: Tenmile River, Hop River, Willimantic River, Natchaug River, Merrick Brook, the Little River, Blackwell Brook, White Brook, Quinebaug River, and the Fivemile River. In the fall, the Shetucket River is also stocked with large (2 to 15 pound) Atlantic salmon below the Scotland Dam.

Under the *Trout Management Plan*, several streams and rivers are proposed for further fishery management. Within the Project area, the Little River is proposed for wild trout put-and-grow management, and the Natchaug and Shetucket Rivers are proposed Trophy Trout Waters. The Natchaug River is also proposed for a Trout Park and Intensive/High Yield Areas. Trout Parks are waterbodies in easily accessible areas that the DEP (or others) frequently stocks to enhance trout fishing opportunities for

[4] DEP also has a *Bass Management Plan*, which recognizes the importance of warm water species (e.g., smallmouth and largemouth bass, northern pike, panfish, and catfish) to angling in the state. However, because such warm water fish species in the Project area are found primarily in lakes and ponds (which the proposed project would generally not affect) this discussion focuses on coldwater fisheries (trout).

young and novice anglers, as well as for those with mobility challenges. Intensive/High Yield Areas are waterbodies identified as good trout habitat that are frequently stocked to increase angler success.

Since March 2006, the DEP has implemented an alewife and blueback herring fishery closure throughout the entire state of Connecticut as a result of declining population numbers of these fish. Alewife and blueback herring referred to as river herring, migrate between freshwater and saltwater and utilize freshwater habitats for spawning. Populations of alewives that spend their entire life-spans in freshwater are referred to as "landlocked alewives." The route does not cross any water resources that provide habitat for landlocked alewives.

I.A.3.5 Rare, Threatened and Endangered Species

CL&P has consulted with and requested that the DEP NDDB and USFWS review the Project area to determine whether there is a potential for the Project to affect species identified by federal or state authorities as threatened, endangered or species of concern. In November 2007, the USFWS indicated that the Project area does not encompass any known habitat for any federally-listed threatened or endangered species. However, the USFWS did indicate that the New England cottontail (*Sylvilagus transitionalis*), a candidate species, occurs in the Town of Lebanon.

The NDDB's February 25, 2008 correspondence to CL&P (which is included in Volume 2, Agency Correspondence) regarding the Project stated that there are 23 species listed as endangered, threatened or species of special concern that have been reported to occur in the vicinity of the Primary Route Under Consideration. These species are identified in Appendix A, Table A-5; the bird species identified as of concern are reviewed in Section I.A.3.2. The DEP Wildlife Division has advised that site-specific surveys for some of these species might be required as route selection, design and construction scheduling progress.

Further, the DEP recommends that construction work be conducted during the period of November 1 through April 1 in certain wetland habitats to avoid possible impacts to the two turtle species. In the case of avian species identified as of concern, if surveys find that it is nesting near the ROW, construction would be scheduled so as to avoid the nesting season, generally February through July. CL&P would continue to consult with DEP during the Project planning process to develop appropriate construction scheduling and other mitigation measures.

The NDDB sent additional correspondence to CL&P on March 17, 2008. In this letter the NDDB determined that the Project will not impact any known extant population of state-listed plant species.

I.A.4 Land Use, Land Use Plans, and Recreational/Scenic Resources

CL&P has conducted a review of land use, recreational resources, and Statutory Facilities in the Project area. This review included consultation with the municipalities along the Primary Route Under Consideration to assess the consistency of the proposed Project with local and regional land use plans. This section includes a list of recreational resources as well as Statutory Facilities found along the route.

I.A.4.1 Land Use

The Primary Route Under Consideration is proposed for alignment primarily within CL&P's existing overhead transmission line ROW between the Card Street Substation and the Rhode Island border. This ROW, which was developed for transmission line use more than 30 years ago, traverses or is bordered by a variety of land uses, ranging from public open space to commercial/industrial developments. The aerial-based maps in Volume 5 illustrate the route and identify the principal land uses in the vicinity, as well as immediately along the proposed ROW. The following summarizes some of the predominant land uses along portions of the ROW.

The Primary Route Under Consideration will commence at CL&P's existing Card Street Substation in the Town of Lebanon. From the Card Street Substation, the route extends through the northernmost corner of Lebanon and into the Town of Columbia.

Several recreational, historic, scenic, and open space resources are located near the route in the Town of Columbia. One historic site, the Ten Mile Bridge, as identified in the Town of Lebanon Plan of Conservation and Development is located near the Columbia-Lebanon boundary, close to the route. The Ten Mile Mill historic site, as identified in the Town of Columbia Plan of Conservation and Development, is also located in proximity to the route. Three parcels of private open space lie either adjacent to or intercepting the route. A town-proposed nature trail with scenic vista is planned in the same area. There is one town-identified priority wetland crossed by the Primary Route Under Consideration (Town of Columbia, 2006). This priority wetland is located along the Columbia/Coventry border at the Hop River and is identified as Wetland A10b in the *Wetland and Waterways Description Report* (Volume 2). The town identifies priority wetlands as those that:

- Protect quantity and quality of drinking water supplies
- Protect unique of sensitive environmental resources
- Protect habitat areas for Columbia's game and non-game wildlife, including large unfragmented forest blocks

From Columbia, the route enters Coventry, where it crosses the Hop River State Park Trail. The Hop River State Park trail is an approximately 6-mile linear corridor along the Hop River in the towns of Bolton, Coventry, Andover and Columbia. No other recreation, scenic, or open spaces have been identified along the route within Columbia.

The route enters Mansfield in the southeast corner, and crosses the Highland Ridge Driving Range on Route 32 (Stafford Road), as well as Mansfield Hollow State Park and Wildlife Management Area, which includes Mansfield Hollow Recreational Area, and Mansfield Hollow Lake. The state park and lake are used for recreational boating and picnic activities. According to the Town of Mansfield 1993 Plan of Conservation and Development, four scenic vistas are located at Mansfield Hollow Lake, two looking south along the southeastern portion of Lake, and two located at Basset Bridge (one looking north and one south) which crosses the center of the Lake (Town of Mansfield, 1993). Two scenic vistas with a view north are located to the north of Pleasant Valley Road and one with a view south is located along Stearns Road. There is a scenic vista looking west located at Wolf Rock south of Crane Hill Road and one looking east from Storrs Road between Cemetery Road and Basset Bridge Road (Town of Mansfield, 1993). As identified in Table A-6, the Primary Route Under Consideration also crosses or is in proximity to town open space and parcels owned by Joshua's Trust, a non-profit land trust (Town of Mansfield 2006). The route crosses several areas designated as preserved open space. These areas include private agricultural open space south of Stearns Road, the Nipmuck Trail, and federally-designated open space at Mansfield Hollow State Park (Town of Mansfield, 2006).

Within Chaplin, the route crosses other portions of Mansfield Hollow State Park and the Natchaug State Forest. The Primary Route Under Consideration is located within approximately 200 feet of Airline State Park Trail in this area.

From Chaplin, the route crosses into Hampton, where it crosses Airline State Park Trail and Bigelow Howard Valley Fish and Game Club areas. James L. Goodwin State Forest is located approximately 1,200 feet north of the route. Pine Acres Lake is located over 3,000 feet north of the route in Hampton. A public boat launch is located at the lake and provides recreational boating opportunities. A scenic vista (with views north and southeast) is located south of the existing ROW near Parker Road and Route 97. The route crosses one of the Blue Blazed Hiking Trails (the Natchaug Trail) just west of Route 97 in Hampton. The Blue Blazed Hiking Trails consist of over 700 miles of hiking trails maintained by the Connecticut Forest and Park Association. The trails are typically located on privately owned land with permission of the landowners.

Connecticut State Route 169 has been identified as a National Scenic Byway and is crossed by the route in the Town of Brooklyn. Three scenic vistas are located in proximity to the route in Brooklyn: Tatnic Hill (with views northeast and southeast) and Gray Mare Hill (with a view southeast) located south of the ROW, and one scenic vista off Barrett Hill Road (with a view southeast) located north of the route (Town of Brooklyn, 1992 - Conservation Land Planning Maps). The route also crosses an area designated as open space; this area is located between Laurel Hill Road and Wolf Den Road (Town of Brooklyn, 1992).

No recreational, scenic, or open space resources were identified in proximity to the route in Pomfret or Killingly. However, the route does cross a portion of committed open space owned by the Wyndham Land Trust, Inc. (Town of Pomfret 2004). After Killingly, the Primary Route Under Consideration enters Putnam from the southeast. The route crosses several areas designated for "greenbelt" protection by the Town of Putnam; these areas are characterized by water, wetland, or floodplain elements and are marked for town protection (Town of Putnam). These areas are located along the Putnam/Killingly border along the Quinebaug River, south of Route 12, and east of Liberty Highway. The areas designated for greenbelt protection are currently traversed by existing CL&P transmission line and ROW. There is also a large subdivision (Clover Brook Estates) that is planned, but not yet constructed, along both sides of the ROW in Putnam.

From Putnam, the route enters Thompson. In Thompson, the route crosses protected land owned by the Wyndham Land Trust (in cooperation with The Nature Conservancy). This area consists of 92 acres of wetland and upland buffer at Lower Pond, south of Quaddick Road. Located 0.35 miles northeast of the Primary Route Under Consideration, Lower Pond is recognized by the NDDB as one of the state's best examples of Atlantic white cedar swamp, and contains habitat for several significant animal and plant species, in Connecticut. The site has also been selected as a priority site in the Conservancy's Lower New England Ecoregional Plan. The route is approximately 1,000 feet south of Quaddick State Park in this area.

I.A.4.2 Land Use Plans

CL&P has consulted with the municipalities along the Primary Route Under Consideration and has compiled available information concerning local and regional land use plans. Each of the municipalities along the route has established municipal land-use plans, all of which have goals and objectives that are consistent with those of the Project. In addition, the future land-use and planning objectives of the Windham Regional Council of Governments (WINCOG) and the Northeastern Connecticut Council of Governments (NCCOG), the regional planning agencies that encompass the Project area, are also consistent with the Project.

WINCOG's mission is to plan for the future of the region, both physical and economic; to provide a forum for inter-municipal discussion and decision-making, and to help towns implement their planning goals by providing information and assistance. Based on the information provided in the Windham Region Land Use Plan (2002), the WINCOG seeks, in part; to provide efficient public utilities and development for the region's continued economic growth. NCCOG's mission is to serve as a forum to identify, study, and solve regional issues; develop policies and initiate actions of mutual benefit to member towns; promote cooperative arrangements and coordinated action; coordinate and carry out comprehensive regional planning; and provide technical assistance to members.

CL&P has also reviewed the Conservation and Development Policies Plan for Connecticut 2005 - 2010 (C&D Plan) prepared by the Connecticut Office of Policy and Management for information relating to the State's growth. The objective of the C&D Plan is to guide and balance response to human, environmental, and economic needs in a manner that best suits Connecticut's future. Based upon the general planning information provided in the C&D Plan, the Project is consistent with the overall goals and objectives of the Plan and serves a public need by providing a reliable transmission of electricity. As stated in the C&D Plan, "The ability to redevelop Connecticut's Regional Centers requires that existing infrastructure be maintained and updated to support compact urban development. This holds true and is particularly relevant regarding electric capacity and delivery systems" (p. 22). Regional Centers within the towns of Windham and Killingly are located in the Project area. However neither of these Centers are traversed by the Primary Route Under Consideration.

I.A.4.3 Recreational and Scenic Resources

The Primary Route Under Consideration crosses or is located in proximity to several recreational and scenic areas, as described below and illustrated on the Volume 5 maps:

- **Quinebaug and Shetucket River Valley National Heritage Corridor.** Designated by the National Park Service (NPS), the National Heritage Corridor encompasses approximately 695,000 acres of land in northeastern Connecticut and south-central Massachusetts. Within the Corridor, citizens, businesses, nonprofit cultural and environmental organizations, local and state governments, and the NPS work together to preserve the region's cultural, historical, and natural heritage (NPS, 2006). The National Heritage Corridor includes the entire towns of Lebanon, Coventry, Mansfield, Chaplin, Hampton, Brooklyn, Pomfret, Killingly, Putnam, and Thompson.
- **Airline State Park Trail.** The Airline State Park Trail is a 50-mile multi-use trail that follows the corridor of the former Airline Railroad. It was declared a national recreational trail in 2001 and provides hiking, biking and horseback riding opportunities. The trail stretches from East Hampton to Lebanon and connects to the Hop River Trail in Willimantic. The Primary Route Under Consideration crosses the trail in the towns of Lebanon, and Hampton.
- **Hop River State Park Trail.** The Hop River State Park Trail is approximately 5.4 miles long, extending beginning from the Andover town line to the Willimantic River in the Town of

Windham. The trail, which is aligned along the Hop River through the towns of Coventry and Columbia, provides opportunities for hiking, biking, and skiing. The Primary Route Under Consideration crosses this trail in the Town of Coventry.

- **Joshua Tract Conservation & Historic Land Trust.** Joshua's Trust, a non-profit land trust, owns or protects more than 3,000 acres of land in eastern Connecticut. The Primary Route Under Consideration is located in proximity to land owned and/or protected by the land trust in the towns of Coventry and Mansfield (these lands include railroad ROW, wildlife management land, and the Wolf Rock Nature Preserve).
- **Highland Ridge Driving Range.** The Highland Ridge Driving Range is a golf driving range located on Stafford Road in the Town of Mansfield. The Primary Route Under Consideration crosses the driving range.
- **Nipmuck Trail.** The Nipmuck Trail is a 14-mile hiking trail and is part of the Blue Blazed Hiking Trail, a system of 700 miles of trails. The Primary Route Under Consideration crosses the trail in the Town of Mansfield. The trail is owned by the DEP in this area.
- **Mansfield Hollow State Park & Wildlife Management Area.** Mansfield Hollow State Park and Wildlife Management Area offers fishing and hunting, as well as hiking, biking, and picnicking activities. Mansfield Hollow Lake, located within the Park, is the result of the dam built by the USACE to control flooding in the Thames River Basin. The Lake spans approximately 500 acres and offers public boating and fishing activities. The Primary Route Under Consideration crosses approximately 0.47 miles of the Park, and 0.42 miles of the Management Area within the Town of Mansfield, and approximately 0.56 miles of the Management Area in the Town of Chaplin. Within the Towns of Mansfield and Chaplin portions of the existing ROW may need to be expanded involving an estimated 27 acres.
- **Natchaug State Forest.** The Natchaug State Forest is popular for fishing in the Natchaug River which is designated a "Trout Park" fishing area by the DEP. The State Forest is also popular for its horse riding trails and camping and picnicking areas. The Primary Route Under Consideration crosses the Natchaug State Forest in the Town of Chaplin, and is located within 400 feet of the state forest parcels in the Town of Killingly.
- **Fin, Fur, and Feather Club.** The Fin, Fur, and Feather Club, a privately owned sportsman's area, is located in the Town of Chaplin and provides archery, black powder, hunting, fishing, rifle, pistol, and shotgun sports activities. The Primary Route Under Consideration is located within 400 feet of the Fin, Fur, and Feather Club properties between Willimantic and Chewink Roads in the Town of Chaplin.
- **James L. Goodwin State Forest.** The James L. Goodwin State Forest is located in the Town of Hampton approximately 1,200 feet north of the route. Forest activities include picnicking, bird watching, boating, horseback riding and snowshoeing.
- **Pine Acres Lake.** Pine Acres Lake is located in the Town of Hampton approximately 3,000 feet north of the route. The Lake offers a public boat launch and fishing opportunities.
- **Blue Blazed Hiking Trails (Natchaug Trail).** The Blue Blazed Hiking Trails is a system of nearly 700 miles of hiking trails in Connecticut. The Primary Route Under Consideration crosses the Natchaug Trail (one of the blue blazed hiking trails) in the Town of Hampton.
- **Bigelow-Howard Valley Fish & Game Club.** The Bigelow-Howard Valley Fish and Game Club own land crossed by the Primary Route Under Consideration in the Town of Hampton. These lands are located between Pudding Hill Road and Drain Street.
- **Brooklyn Tennis Club.** The Brooklyn Tennis Club is located off of Church Street in the Town of Brooklyn and offers 5 red clay courts. The Primary Route Under Consideration is located approximately 1,200 feet north of this area.
- **Quaddick State Park & Reservoir.** Quaddick State Park & Reservoir is located in the Town of Thompson. The Park consists of approximately 116 acres and offers picnicking, fishing, boating,

and swimming activities. The Primary Route Under Consideration is located approximately 1,500 feet south of this area.

The Primary Route Under Consideration also crosses or is located in proximity to protected or designated open space/preserved lands within the towns of Mansfield, Lebanon, Columbia, Brooklyn, Pomfret, Putnam and Thompson. The areas are currently traversed by the existing CL&P transmission line and ROW and the proposed project will not change the current land use in these areas. Table A-6 identifies recreational, scenic and open space areas in the vicinity of the route. The Town of Lebanon has designated existing utility corridors, including those originating from the Card Street Substation, as protected open space because of their importance as wildlife corridors. The Primary Route Under Consideration crosses an open space corridor that runs the length of Lebanon's boundary with the Town of Columbia (Town of Lebanon, 2000). Connecticut State Route 169 has been identified as a National Scenic Byway and is crossed by the route in the Town of Brooklyn. In addition, according to the Town of Mansfield 1993 Plan of Conservation and Development, several scenic vistas are also located in the Project area within the Town of Mansfield.

I.A.5 Statutory Facilities

Section 16-50p(i) of the Connecticut General Statutes designates a group of land uses (i.e., "Statutory Facilities") that the Council must consider in its review of new electric transmission lines, in particular:

- Private or public schools
- Licensed child day care facilities
- Licensed youth camps
- Public playgrounds
- Residential areas

Along the Primary Route Under Consideration, the new overhead 345-kV line would be located adjacent to one school, the Mount Hope Montessori School in Mansfield, and one family daycare facility in Brooklyn. These Statutory Facilities are identified on the maps in Volume 5.

"Residential areas" are construed to mean developed "neighborhoods," not residentially zoned land or sparsely settled rural or semi-rural areas. Section 16-50p(i) of the Connecticut General Statutes establishes a rebuttable presumption that electric transmission lines with a voltage of 345-kV or greater, shall be constructed underground if they are "adjacent to" Statutory Facilities. This presumption may be overcome by a demonstration that it is infeasible to bury the lines for technical or economic reasons. The Council may, in such a case, approve overhead construction of a 345-kV line adjacent to Statutory Facilities, provided that they will be contained within a buffer zone adequate to protect public health and

safety. A ROW that provides clearance requirements consistent with generally applicable safety standards may qualify as such a buffer zone. Such standards are presented in the National Electrical Safety code (NECS), published by the Institute of Electrical and Electronic Engineers (IEEE), and the Council EMF Best Management Practice for the Construction of Electric Transmission Lines in Connecticut (December 14, 2007).

I.A.6 Transportation and Access

The road transportation network in the study area is well developed and consists of a variety of federal, state and local roads. Principal roads include Interstate 395; U.S. Routes 6 and 44; State Routes 12, 21 (Liberty Highway) 32, 66, 97, 169 and 195. State Route 169 has been designated a National Scenic Byway. Additionally, two local general aviation airports are located in the area (Windham and Danielson), as well as the New England Central and Providence and Worcester railroads.

Table A-7 lists all roadways crossed by the Primary Route Under Consideration.

I.A.7 Cultural Resources

Cultural resources include buried archaeological sites, standing historic structures, or thematically-related groups of structures. To be considered significant and eligible for listing on the National or State Registers of Historic Places (NRHP/SRHP), a cultural resource must exhibit physical integrity and contribute to American history, architecture, archaeology, technology, or culture; and must possess at least one of the following four criteria:

- Association with important historic events
- Association with important persons
- Distinctive design or physical characteristics
- Potential to provide important new information about prehistory or history

The State Historic Preservation Office (SHPO) is responsible for reviewing projects to assure that significant cultural resources will be protected or otherwise preserved. In Connecticut, the SHPO's office is part of the Connecticut Commission on Arts, Tourism, Culture, History, and Film.

CL&P has consulted with the SHPO regarding the studies required to identify and evaluate the known or potential significant cultural resources along the Primary Route Under Consideration and it's underground and overhead variations, and has conducted a Cultural Resources Assessment. The SHPO has verbally concurred with the scope of work, based on similar studies completed for CL&P's Bethel-Norwalk and Middletown-Norwalk transmission projects. CL&P will provide the report to the SHPO for review.

CL&P is sensitive to Connecticut's cultural heritage and is committed to working with the SHPO in protecting and mitigating potential impacts to these resources.

Raber Associates (Raber), a firm specializing in historical and social sciences, was retained to compile information about the history and prehistory of the Project area; to identify the known cultural resources in the vicinity of the Primary Route Under Consideration; and, based on such information, to make recommendations regarding the potential for locating as yet undiscovered resources during the development of the Project. The cultural resources report, which addresses both archaeological and historic resources, is included in Volume 2.

The cultural resources report is based on information obtained from the Office of State Archaeology, previously published technical studies of cultural resources, reviews of the NRHP and SRHP listings, the Historic American Engineering Record (HAER) Connecticut Inventory, consultations with the SHPO and the Connecticut State Archaeologist, published and unpublished studies of geology, hydrology, local or regional history and geology, and field inspection by walkover, driveover and/or flyover. As is standard procedure, the report does not provide exact locational information about buried archaeological sites in order to protect the integrity of such resources.

The following summarizes the principal findings of the cultural resources report (refer to Volume 2 for a more detailed discussion of cultural resources).

A total of 5 known Native American archaeological sites have been reported within approximately one mile of the Primary Route Under Consideration. One of these sites (State Site No. 112-8 in Pomfret) has been determined not eligible for the National Register. The site is 0.25 mile east of the Primary Route Under Consideration. Four archaeological sites in Mansfield with insufficient reported data to make a determination of eligibility to the National Register are located within approximately 300 feet of the centerline of the Primary Route Under Consideration. Results of the archaeological sensitivity assessment found that approximately 64.2 percent of the Primary Route Under Consideration corridor appears to be sensitive for possible Native American sites (see cultural resource maps Volume 2).

The report found that the Primary Route Under Consideration generally appears to have limited sensitivity for significant belowground Euroamerican archaeological sites. A total of 24 previously reported Euroamerican sites have been identified from 400 to 6,000 feet of the route, none of which were listed or eligible for the State or National Registers. The closest reported site is a partly documented 19th century mill ruin on Stony Brook in Brooklyn, located about 400 feet east of the route.

Two inactive former rail lines cross this route in three places. The Air Line Railroad, completed in 1873, crosses the route as a flat trackbed just west of Card Street Substation in Lebanon. The New York & New England Railroad, opened in 1872, crosses the route as a flat trackbed north of Route 6 in Coventry, and as a cut through rock 25 to 30 feet deep east of South Brook Road in Hampton. The latter site has no well-defined engineering features, and, like the other two former crossings, does not appear to be a potentially significant cultural resource, according to Raber Associates.

Small undocumented possible domestic, commercial or recreational archaeological sites may exist along or near roads crossed by the route, including ruins of small structures probably associated with a former Boy Scout camp (circa 1935 to 1965) south of Route 44 in Putnam.

A total of 12 significant aboveground historic architectural resources were identified within approximately 0.25 mile of the Primary Route Under Consideration. Some of these resources are historic districts that are located at least partially within the 0.25 mile limit; therefore, the total number of individual sites and structures within 0.25 mile is 21. These resources include:

- Flanders Road Bridge in Coventry;
- Three Cemeteries, Mansfield Hollow Historic District, Mansfield Hollow Dam, Mansfield Center Historic District, and Mansfield Center Cemetery in Mansfield;
- The Chewink and Old cemeteries in Chaplin; South Cemetery in Hampton;
- Brooklyn Green Historic District in Brooklyn;
- Rogers Village in Killingly; and
- Munyan Cemetery in Putnam.

Additional information about these and other resources is presented in the report in Volume 2 Exhibit 3. In addition to these resources, the Primary Route Under Consideration crosses Route 169 in Brooklyn, which has been designated a National Scenic Byway.

I.A.8 Noise

Existing noise levels in the vicinity of the Primary Route Under Consideration vary as a function of land use, and can be expected to range from sound levels typical of an urban environment to those typical of quiet, rural areas. Noise levels are also variable throughout the day, and are influenced by diverse factors such as vehicular traffic, commercial and industrial activities and outdoor activities typical of suburban environments. Table A-8 lists typical sound levels associated with different types of environments and activities.

The State of Connecticut has noise regulations (RCSA 22a-69-1 to 22a-69-7.4) that identify the limits of sound that can be emitted within certain types of land uses. The state regulations define daytime vs.

nighttime noise periods; classify noise zones based on land use; and identify noise standards for each zone. Table A-9 summarizes Connecticut's noise zone standards, by emitter (source) and receptor (receiver) noise classification. In general, the regulations specify 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. As illustrated in Table A-9, the allowable noise levels vary by type of noise emitter and type of noise receptor; for example, an industrial noise emitter is allowed a 70 dBA (decibel, on the A-weighted scale) (decibel obtained using weighted filter) level on other industrial receptors, but only a 61 dBA (daytime) level on residential areas.

In accordance with Connecticut Statutes (C.G.S.22a-73), municipalities also may adopt noise control ordinances. Such ordinances must be approved by the Commissioner of DEP and be consistent with the state noise regulations.

I.A.9 Air Quality

Ambient air quality is affected by pollutants emitted from both mobile sources (e.g., automobiles, trucks) and stationary sources (e.g., manufacturing facilities, power plants, and gasoline stations). In addition, naturally occurring pollutants, such as radon gas or emissions from forest fires, affect air quality. In addition to emissions from sources within the state, Connecticut's air quality is significantly affected by pollutants that are emitted in states located to the south and west, and then transported into Connecticut by prevailing winds. Ambient air quality in the state is monitored and evaluated by the DEP. Air quality conditions are assessed in terms of compliance with national standards for selected "criteria" pollutants, as well as conformance with regulations governing the release of toxic or hazardous air pollutants. New London, Tolland and Windham counties are in conformance with all the national ambient air quality standards established by the Federal Clean Air Act Amendment standards except for the 8-hour ozone criterion.

I.B ROUTE VARIATIONS

As described in Volume 1, Section VI, CL&P has identified four route variations, along which the transmission line could be constructed in an overhead configuration, and five route variations which could be constructed in an underground configuration as depicted on the maps in Volume 5. These route variations would replace certain portions of the Primary Route Under Consideration. This section describes the general environmental characteristics along each of these route variations. Because of their general proximity, the nine variations and the Primary Route Under Consideration share certain of the same environmental characteristics. As a result, the following descriptions center only on those

environmental features along the route variations that differ from those along the Primary Route Under Consideration.

It should be noted that route locations for the overhead variations, all of which would require the development of the proposed 345-kV transmission line on new ROWs, generally on private land across which CL&P would have to obtain easements, have been determined based on preliminary desktop analysis and may change based on site specific information. If these routes are to be used, site-specific field environmental and engineering studies would be required to further refine the locations of the variations within these corridors, as well as to perform field investigations to identify and assess specific environmental and cultural resources.

As described in Volume 1, Sections VI and VII, each of the underground route variations would require land for not only the cable system (ducts and splice vaults), but also property for the construction and operation of transition stations on either end of the variation. In general, the underground variations are proposed to be within or adjacent to public roads and/or, for short segments, within or adjacent to CL&P's existing overhead transmission line ROW.

I.B.1 Willimantic South Overhead Variation

As discussed in Volume 1, Section VI.C.1, the Willimantic South Overhead Variation would be approximately 9 miles long and would traverse the towns of Lebanon, Windham, and Chaplin. The route would extend east from the Card Street Substation and would be located within a new ROW (which would have to be acquired from private landowners) from Card Street Substation into the Town of Chaplin, where just south of U.S. Route 6, it would interconnect to the existing CL&P ROW discussed under the Primary Route Under Consideration above (refer to Figure VI-3). This 9-mile variation would replace approximately 12 miles of the Primary Route Under Consideration.

Topography, Geology, Soils

Elevations along the Willimantic South Overhead Variation range from approximately 200 feet NGVD to 587 feet NGVD. Geologic and soil conditions along the variation are generally the same as those described for the Primary Route Under Consideration. Surficial geology along the variation consists predominantly of floodplain alluvium (sand, gravel, silt, and some organic matter of variable thickness) overlying sand and fines. Similar to the Primary Route Under Consideration, the Willimantic South Overhead Variation traverses some soil types classified as Prime Farmland or Farmland of Statewide Importance (FOSI) soils. Soils traversed by the variation are identified in Table A-10.

Water Resources

To identify and assess wetlands and water resources along the Willimantic South Overhead Variation, existing wetlands and soils mapping, as well as GIS data analysis, were used. Based on this analysis, the variation would traverse an estimated 22 wetlands and 16 watercourses as identified on the maps in Volume 5. The watercourses and their associated water quality classifications are listed in Table A-11. The surface waters traversed by this variation are classified as A, B, or AA waters. Groundwater near Willimantic South Overhead Variation has been classified as "GA: within the Town of Lebanon, "GA", "GB", "GC", or "GA/GAA" within the Town of Windham, and "GA/GAA/GAAs" within the Town of Chaplin. In addition, portions of this route are located within the 100-year flood boundary of Jordan Brook and the Shetucket River.

Biological Resources

The vegetative communities along the variation are dominated by forested habitat, which is intermixed with areas of open fields, wooded floodplains along the Shetucket River, and wetlands. The wildlife species that can be expected to inhabit these habitat types, are generally similar to those described for the Primary Route Under Consideration. However, unlike the Primary Route Under Consideration along which CL&P has maintained the existing transmission line ROW, scrub-shrub habitat is not prevalent along the variation.

In Project-related consultations in November 2007, the USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species. However, the USFWS did indicate that the New England cottontail (*Sylvilagus transitionalis*), a candidate species, occurs in the Town of Lebanon.

In February 2008, the DEP NDDB indicated that six species of invertebrates listed as endangered, threatened, or species of special concern may occur in proximity to the Willimantic South Overhead Variation. These species include one endangered species, the Banded Bog Skimmer Dragonfly (*Williamsonia lintneri*), three threatened species, the Frosted elfin (*Callophryus irus*), Harris' checkerspot (*Chlosyne harrisii*), and the Moustached clubtail (*Gomphus adelphus),* and two species of special concern, Horace's duskywing (*Erynnis horatius*) and the Bog Copper butterfly (*Lycaena epixanthe*).

The Willimantic South Overhead Variation traverses rivers and streams where the majority of the fish species likely to be present are cold-water species. In the fall the Shetucket River is stocked with large (2

to 15 pound) Atlantic Salmon below the Scotland Dam. The Shetucket River is also a proposed Trophy Trout Water.

Land Uses

The Willimantic South Overhead Variation traverses land uses that consist of a mix of rural residential areas, agricultural lands, and undeveloped forested tracts. The variation also would traverse Pomeroy State Park and Scenic Reserve and Pomeroy State Forest in the Town of Lebanon, adjacent to the Lebanon/Windham town line. Pomeroy State Park and Scenic Reserve, a state designated area of preserved open space (approximately 90 acres), is primarily undeveloped and contains no public facilities. Development of a new transmission line ROW in this area would be inconsistent with this use. In Windham, the variation borders but does not cross the Willimantic Camp Ground and the Beaver Brook State Park and Scenic Reserve. Beaver Brook State Park and Scenic Reserve is an undeveloped park of approximately 350 acres. The variation crosses the Airline State Park Trail (Northern Section) in the Town of Chaplin, in the same area as Beaver Brook shortly before joining the Primary Route Under Consideration within CL&P's existing ROW.

Statutory Facilities

No Statutory Facilities are located along the Willimantic South Overhead Variation.

Transportation and Access

As listed in Table A-12, the principal transportation routes crossed by the Willimantic South Overhead Variation, among others, U.S. Route 6, as well as State Routes 289, 32, 14, and 203.

Cultural Resources

A total of four reported Native American archaeological sites are located within one mile of this alternate route. None of the sites are adjacent to or within the route corridor itself. Approximately 71.6 percent of this route appears to be sensitive for possible Native American sites.

As with the Primary Route Under Consideration, this route also generally appears to have limited sensitivity for significant belowground Euroamerican archaeological sites. Three previously reported Euroamerican sites were identified within one mile of this route. All but one of the sites is from 400 to 5,100 feet away from the route. One site listed on the National Register in Windham is traversed by the Willimantic South Overhead Variation. This archaeological site is the Fourth Camp of Rochambeau's

Army, a 16-acre Revolutionary War encampment. The location of this archaeological site is restricted from public documents to protect its integrity.

There is one former New York & New England Railroad trackbed crossing in Chaplin along this route, which has not been inspected at this time.

A total of 4 significant historic resources (including 29 individual structures or sites) have been identified within approximately 0.25 mile of the Willimantic South Overhead Variation: the Dr. Chester Hunt Office and the Windham Center Historic District in Windham; and the Chewink and Old cemeteries in Chaplin.

Additional information about these resources is presented in the report in Volume 2. A number of other aboveground properties within 0.25 mile of the Willimantic South Overhead Variation have been inventoried in surveys, but no determinations of eligibility have been made to date.

I.B.2 Willimantic South Underground Variation

The Willimantic South Underground Variation would commence at the Card Street Substation in Lebanon, extending east and then northeast generally along or adjacent to road ROWs and along a portion of the existing overhead transmission line ROW. The variation would be approximately 11 miles in total length and, cross 0.8 miles in Lebanon, 8.2 miles in Windham and 1.7 miles in Chaplin. Along this variation, a new transition station would have to be developed at the intersection of the underground route with the Primary Route Under Consideration (i.e., along the existing overhead transmission line ROW in the Town of Chaplin). This 11-mile variation would replace approximately 11 miles of the Primary Route Under Consideration.

Topography, Geology, Soils

Topography along the Willimantic South Underground Variation is less variable than along the Primary Route Under Consideration, as roadways tend to be in relatively level areas with gradual changes in topography. Soil and geologic types along the Willimantic South Underground Variation are similar to that of the Primary Route Under Consideration. Bedrock geology consists of Canterbury Gneiss, Tantic Hill, Waterford Group, Hebron Gneiss, and Scotland Gneiss formations. Surficial geology along this route variation consists of sand and gravel, sand and gravel overlying sand, till, alluvium overlying sand, gravel, and sand and gravel overlying sand overlying fines. Similar to the Primary Route Under Consideration, the variation traverses some soil types classified as FOSI soils. Soils along the variation are identified in Table A-13.

Water Resources

Based on the analysis of published information regarding wetlands and soils, as well as GIS data, approximately 14 wetlands and 15 watercourses are located along the Willimantic South Underground Variation, as depicted on the maps in Volume 5. Table A-14 lists the watercourses and their associated water quality classification. The surface waters traversed by this variation are classified as A, B, or AA waters. Groundwater near Willimantic South Overhead Variation has been classified as "GA: within the Town of Lebanon, "GA", "GB", "GC", or "GA/GAA" within the Town of Windham, and "GA/GAA/GAAs" within the Town of Chaplin. A portion of the route is located within the 100-year flood boundary of the Shetucket River.

Biological Resources

The vegetative communities adjacent to the roads along which the underground variation would be located consist of riparian wooded floodplains, maintained lawn/road shoulder areas, agricultural areas, scrub-shrub areas, scattered wetlands, and forest land. These communities can be expected to support wildlife species typical of each habitat type. The portion of the variation located within the existing ROW would provide habitat to species that prefer scrub shrub habitat similar to those discussed for the Primary Route Under Consideration.

In Project-related consultations in November 2007, the USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species. However, the USFWS did indicate that the New England cottontail (*Sylvilagus transitionalis*), a candidate species, occurs in the Town of Lebanon.

In February 2008, the DEP NDDB indicated that six species of invertebrates listed as endangered, threatened, or species of special concern in the proximity of the Willimantic South Underground Variation. These species include one endangered species, the Banded Bog Skimmer dragonfly (*Williamsonia lintneri*), three threatened species, the Frosted elfin (*Callophryus irus*), Harris' checkerspot (*Chlosyne harrisii*), and the Moustached clubtail (*Gomphus adelphus)*, and two species of special concern, Horace's duskywing (*Erynnis horatius*) and the Bog Copper butterfly (*Lycaena epixanthe*). With the exception of the Banded Bog Skimmer dragonfly and the Copper butterfly, these species have also been identified along the Primary Route Under Consideration.

The Willimantic South Underground Variation traverses rivers and streams where the majority of the fish species likely to be present are cold-water species. In the fall the Shetucket River is stocked with large (2

to 15 pound) Atlantic Salmon below the Scotland Dam. The Shetucket River is also a proposed Trophy Trout Water.

Land Use

The variation would be aligned beneath or adjacent to various local roads and state highways. The development along these highways varies from residential and commercial (south of Windham) to undeveloped forest land and agricultural uses. Land uses in Lebanon, in the vicinity of the variation, are made up of primarily agricultural areas with a mix of residential uses. In Windham, land uses consist of residential and commercial areas as well as forested areas (deciduous and coniferous) and pasture lands. In Windham, the route runs in proximity to several recreational uses including athletic fields and, the Willimantic Camp Ground along Route 32, Airline State Park Trail (Northern Section) just prior to joining US Route 6 in Windham, and Mansfield Hollow State Park & Wildlife Management Area in proximity to the Windham/Chaplin town boundary. The variation enters Chaplin adjacent to Mansfield Hollow State Park where it rejoins the Primary Route Under Consideration.

Statutory Facilities

The Willimantic South Underground Variation is located within 600 feet of eight Statutory Facilities including: two family daycares, two licensed daycare centers, and the Windham Center School, playground, and North Windham Elementary School and playground.

Transportation and Access

The variation would be located primarily within or adjacent to various public roadway ROWs. Table A-15 lists the roads that the Willimantic South Underground Variation would cross.

Cultural Resources

The Willimantic South Underground Variation would commence at the Card Street Substation in Lebanon, extending east and then northeast generally along or adjacent to road ROWs and along a portion of the existing overhead transmission line ROW. The variation would be approximately 11 miles in total length and, cross 0.8 miles in Lebanon, 8.2 miles in Windham and 1.7 miles in Chaplin. Along this variation, a new transition station would have to be developed at the intersection of the underground route with the Primary Route Under Consideration (i.e., along the existing overhead transmission line ROW in

the Town of Chaplin). On the western end of the variation, transition facilities would be collocated at the existing Card Street Substation.

A total of 16 reported Native American archaeological sites are located within one mile of this route. None of the sites are adjacent or within the route corridor itself.

Underground construction within existing roadways is assumed to have no archaeological sensitivity. However, along these roadways 71.2 percent of adjacent unpaved areas appear sensitive, although undocumented disturbance may have occurred within some of these areas.

Review of historical maps and available secondary sources indicate that the Willimantic South Underground Variation is located in roadways built on previously undeveloped land. Most of the roads traversed by this route were established between the late 17th and late 19th centuries. Episodes of road and utility construction have probably removed or severely damaged remains of original unpaved roads, as well as much of the underlying soils.

There are 16 previously reported Euroamerican archaeological sites within approximately 1 mile from this variation. Two of these sites are Rochambeau Army Revolutionary War encampments in Windham; both are listed on the National Register. The Fourth Camp of Rochambeau's Army is a 16-acre site delineated approximately 850 feet from the route variation. The 47th Camp of Rochambeau's Army is a 16-acre site delineated approximately 2,300 feet from the variation. Locations are restricted to protect the integrity of the archaeological sites.

The former New York & New England Railroad once crossed this variation near the Windham Airport, but recent maps and aerial photographs suggest this crossing has been completely removed.

A total of 7 significant aboveground historic properties (including 32 individual sites or structures) are located within 500 feet of the underground portion of this route alternative. These sites are all located in the Town of Windham and include: Willimantic Armory, Willimantic Elks Club, Willimantic Footbridge, Windham Road Bridge (No. 01850), Dr. Chester Hunt Office, Center Historic District, and North Windham Cemetery. Additional information about these resources is presented in the report in Volume 2.

I.B.3 Mansfield Underground Variation

The Mansfield Underground Variation, which is located within the Town of Mansfield (Tolland County), has been identified as an option to avoid some of the potential perceived effects (such as EMF) to a group of homes near the ROW in the western portion of the Town of Mansfield. The variation would involve

the installation of an approximately 1-mile segment of the 345-kV line underground, within CL&P's existing transmission line easement. This variation would begin at a new transition station located west of Highland Road and adjacent to CL&P's existing ROW; from this station, the underground variation would extend north and then east along the north side of the existing ROW before ending at a new transition station that would have to be located adjacent to the existing CL&P ROW.

Topography, Geology, and Soils

The Mansfield Underground Variation would be aligned along the eastern side of the Willimantic River valley, ascending from elevation 310 feet NGVD to 410 feet NGVD. In the vicinity of the variation, the depth to bedrock varies. Soils types and approximate depth to bedrock along the variation are identified in Table A-16.

Water Resources

Wetlands are located along the Mansfield Underground Variation (refer to Table A-17), as well as one watercourse. These features are also traversed along the Primary Route Under Consideration. The watercourse traversed along the variation is an intermittent tributary to Cedar Mill Brook, with a water quality classification of A. Groundwater in the vicinity of Mansfield Underground Variation is classified as "GA".

Biological Resources

The variation would traverse predominantly upland deciduous forest areas adjacent to the existing CL&P transmission line ROW, a portion of which is maintained as scrub-shrub communities.

The USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species. Correspondence with the DEP NDDB indicated that one species of special concern, Horace's duskywing (*Erynnis horatius*), may be present in the vicinity of the Mansfield Underground Variation, CL&P will consult further with DEP regarding measures to avoid adverse affects to the species.

The intermittent water course traversed by the variation is likely to contain cold-water fish species.

Land Uses

The Mansfield Underground Variation would traverse undeveloped forest lands, as well as an agricultural field. The only development near the variation is the residential subdivision along Highland Road, which both the underground variation and the existing overhead transmission line would traverse. A portion of the variation is designated as town open space along Highland Road. The Mansfield Underground Variation would not interfere with this use as it is located within CL&P's existing ROW. Two new transition stations, which would be required on either end of the line, would be located on property presently devoted to forested uses.

Statutory Facilities

No Statutory Facilities were identified within 600 feet of Mansfield Underground Variation.

Transportation and Access

Highland Road, a town roadway, is the only transportation route crossed along the underground variation.

Cultural Resources

The archaeological sensitivity of the Mansfield Underground Variation is the same as for the comparable section of the Primary Route Under Consideration. The percentage of area considered sensitive for possible Native American archaeological sites for this variation is 73.5 percent. Two reported sites are located within one mile of the variation; both of which are at least 2,000 feet away. There are no significant historic resources reported within 500 feet of the Mansfield Underground Variation.

I.B.4 Mount Hope Overhead Variation

As discussed in Volume 1, Section VI.C.4, the Mount Hope Overhead Variation, located in the Town of Mansfield, would extend approximately 0.5 miles. The purpose of this short route variation would be to place the new transmission line farther away from a designated Statutory Facility. This variation would be located within a new ROW (which would have to be acquired from private landowners).

Topography, Geology, Soils

The elevation along the variation is approximately 250 feet NGVD. Bedrock geology in the area includes the Hope Valley Alaskite Gneiss and Waterford Group formations. Surficial geology along the variation consists primarily of sand and gravel, and sand and gravel overlying sand and fines. Similar to the

Primary Route Under Consideration, the variation traverses some soil types classified as Prime Farmland or FOSI soils. Soils traversed by the Mount Hope Overhead Variation are identified in Table A-18.

Water Resources

Based on a review of published wetland and soils maps, and on a review of the state GIS data, the variation would traverse five wetlands and one unnamed watercourse as depicted on the maps in Volume 5. The unnamed watercourse has a water quality classification of AA. Groundwater is classified as "GA/GAAs" and "GA/GAA may not meet current standards". A portion of this variation is located within the 100-year flood boundary of the Natchaug River.

Biological Resources

The variation traverses predominantly agricultural/open field areas bordered by pockets of woodlands and maintained lawn areas associated with rural residential uses. The wildlife resources associated with these habitats are expected to be typical of these found along the Primary Route Under Consideration.

The USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species. The NDDB's February 25, 2008 correspondence to CL&P regarding the Project stated that there are eighteen species listed as endangered, threatened or species of special concern that have been reported to occur in the vicinity of the Mount Hope Overhead Variation. These species are identified in Table A-19. The DEP Wildlife Division has advised that site-specific surveys for some of these species might be required as route selection, design and construction scheduling progress.

The unnamed water course traversed by the Mount Hope Overhead Variation is likely to contain cold-water fish species.

Land Use

The variation would be aligned primarily across privately-owned farmland and is adjacent to wooded areas and scattered residences. No public parks, forests, or other recreational or scenic areas are located in the vicinity of the variation.

Statutory Facilities

The Mount Hope Montessori School is located within 600 feet of the variation. The objective of the variation is to provide an option for aligning the new 345-kV transmission line approximately 250 feet farther away from this facility. The Mount Hope Overhead Variation is located to the east of the existing CL&P ROW which would be relocated east to provide additional buffer between the line and the school.

Transportation and Access

The Mount Hope Overhead Variation crosses Bassetts Bridge Road (a local roadway) in the Town of Mansfield.

Cultural Resources

Nine reported Native American archaeological sites are located within one mile of this variation, none of which are adjacent to or within the approximate variation corridor. Approximately 80 percent of this corridor appears to be sensitive for possible Native American sites.

As with the Primary Route Under Consideration, this route also generally appears to have limited sensitivity for significant belowground Euroamerican archaeological sites. Five previously reported Euroamerican sites were identified within one mile of this route, none of which are listed on the National Register.

Two significant historic resources (including nine individual structures or sites) have been identified within approximately 0.25 mile of the variation corridor: Mansfield Hollow Historic District, and Mansfield Center Historic District. Additional information about these resources is presented in the report in Volume 2.

I.B.5 Mount Hope Underground Variation

The Mount Hope Underground Variation would be approximately 1.1 miles long and would begin in the Town of Mansfield at a new transition station located west of State Road 195 and adjacent to CL&P's existing overhead transmission line. This variation would be located entirely within the existing CL&P ROW. This variation would leave the transition station to the east along the existing ROW, cross State Road 195, turn north, cross Bassetts Bridge Road, and turn east before ending at a new transition station to be located on existing CL&P owned property. Although this route is feasible, it poses multiple physical constraints and additional logistics in regards to constructability.

Topography, Geology, Soils

The Mount Hope Underground Variation would descend at a slope of 10 percent from 490 feet NGVD near Sawmill Brook and west of Mansfield Hollow to 220 feet NGVD just west of Route 195. In the vicinity of the variation, the depth to bedrock varies. Soil types and approximate depth to bedrock along the variation are identified in Table A-20. Some of the soils along this underground variation have been mapped as Prime Farmland soils.

Water Resources

The water resources encountered along the variation are the same as those described for the comparable section of the Primary Route Under Consideration. Four wetlands are traversed by the Mount Hope Underground Variation as identified in Table A-21. An intermittent tributary to the Willimantic Reservoir is crossed several times by the variation and has a water quality classification of AA. Groundwater is classified as "GA/GAAs" and "GA/GAA may not meet current standards".

Biological Resources

The vegetative communities along and in the vicinity of the underground variation consist of scrub-shrub habitat along the maintained overhead transmission line ROW, as well as tracts of upland deciduous forest and agricultural/open fields. Scattered ornamental vegetation and lawn areas are associated with the residential development along State Route 195 and other local roads.

The USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species. The NDDB's February 25, 2008 correspondence to CL&P regarding the Project stated that there are eighteen species listed as endangered, threatened or species of special concern that have been reported to occur in the vicinity of the Mount Hope Underground Variation. These species are the same as those listed for the Mount Hope Overhead Variation and are identified in Table A-19. The DEP Wildlife Division has advised that site-specific surveys for some of these species might be required as route selection, design and construction scheduling progress.

The intermittent tributary traversed by the Mount Hope Underground Variation is likely to contain cold-water fish species.

Land Uses

Land uses along the variation include residential development along State Route 195 and town roads, agricultural areas, and undeveloped forest. The Mount Hope Montessori School is located immediately northwest of the route. The variation does not cross any recreational, scenic, or open space uses. However, the eastern end of the route variation runs adjacent to designated town open space along Storrs and Bassetts Bridge Road, and is approximately 800 feet west of Mansfield Hollow State Park. The Mount Hope Underground Variation is located entirely within the existing CL&P ROW; therefore Project related impacts to the designated town open space will be minimal.

Statutory Facilities

The Mount Hope Underground Variation is located adjacent to one Statutory Facility, the Mount Hope Montessori School.

Transportation and Access

The Mount Hope Underground Variation crosses Storrs Road (State Route 195), as well as Bassetts Bridge Road (a local roadway).

Cultural Resources

The archaeological sensitivity of the Mount Hope Underground Variation is the same as for the comparable section of the Primary Route Under Consideration. Nine Native American archaeological sites, including 2 located within 300 feet of the variation, are reported within 1 mile of this variation. The percentage of area considered sensitive for possible Native American archaeological sites for this variation is 68.9 percent.

Four Euroamerican archaeological sites are reported within 1 mile of the variation, none of which have been determined eligible for the NRHP. The edge of the Mansfield Hollow Historic District is approximately 500 feet east of the Mount Hope Underground Variation, although the nearest historic structures within the district are approximately 1,000 feet from this route variation.

I.B.6 Brooklyn Overhead Variation

The Brooklyn Overhead Variation would be located within the towns of Brooklyn and Pomfret, (Windham County) and would extend approximately 3.3 miles located within a new ROW (which would have to be acquired from private landowners). The variation is located less than a mile west of the

Primary Route Under Consideration, and provides an alternative to the alignment of the new transmission line near residential areas in Brooklyn, along Church Street, Darby Road, and Meadowbrook Lane. The Brooklyn Overhead Variation also avoids siting a new transmission line in proximity to a Statutory Facility located along Church Street in the Town of Brooklyn.

Topography, Geology, Soils

Elevations along the variation range from approximately 300 feet NGVD to 500 feet NGVD. Bedrock geology in the area includes the Quinebaug and Tatnic Hill formations. Surficial geology along the variation consists primarily of sand and gravel, and sand and gravel overlying sand and fines. Similar to the Primary Route Under Consideration, the variation traverses some soil types classified as Prime Farmland or FOSI soils. Soils traversed by the Brooklyn Overhead Variation are identified in Table A-22.

Water Resources

To identify and assess wetlands and watercourses along this variation, existing wetlands and soils mapping, as well as GIS data analysis, were used. Based on this analysis, the variation would traverse seven wetlands and three watercourses. The surface watercourses have water quality classifications of A and B/A. The watercourses and associated water quality classifications are listed in Table A-23. Groundwater in the vicinity of Brooklyn Overhead Variation is classified as "GA".

Biological Resources

The Brooklyn Overhead Variation would traverse along a new ROW that would extend primarily through forested habitat, intermixed with isolated areas of rural residential development (lawn areas) and agricultural fields. The wildlife resources associated with these habitat types can be expected to be similar to those identified for the Primary Route Under Consideration. However, unlike the Primary Route Under Consideration along which CL&P has maintained the existing transmission line ROW, scrub-shrub habitat is not prevalent along the variation.

The USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species. The DEP NDDB has indicated that this area does not contain any areas of known habitat for state-listed endangered, threatened, or species of special concern.

The Brooklyn Overhead Variation traverses rivers and streams where the majority of the fish species likely to be present are cold-water species. White Brook which is crossed by this route variation is stocked.

Land Use

The variation would traverse primarily areas of undeveloped forest. However, where the variation follows Barrett Hill Road in the Town of Brooklyn and along Searles Road in the Town of Pomfret, scattered residential development is found. Agricultural land uses are located in Pomfret just before the route rejoins the Primary Route Under Consideration.

Statutory Facilities

No Statutory Facilities were identified along the Brooklyn Overhead Variation.

Transportation and Access

The variation would cross three local roadways: Barrett Hill Road in the Town of Brooklyn, and Spaulding Road and Searles Road in the Town of Pomfret.

Cultural Resources

There are no reported archaeological sites within one mile of the Brooklyn Overhead Variation. Approximately 80 percent of this variation appears sensitive for possible Native American Archaeological Resources. This variation appears to have limited sensitivity for possible Euroamerican archaeological resources (see Volume 2). No significant aboveground historic sites or structures were identified within approximately 0.25 mile of the variation.

I.B.7 Brooklyn Underground Variation

The Brooklyn Underground Variation would be approximately 1 mile long and would be located within CL&P's existing overhead transmission line easement. The variation would begin in the Town of Brooklyn at a new transition station located west of Church Street and adjacent to CL&P's existing ROW. From the new transition station, the underground route would proceed east along the existing transmission line ROW, cross Church Street, and then turn north at Day Street Junction before ending at a new transition station to be located entirely within CL&P's property. The purpose of this variation is to provide an alternative route for avoiding a cluster of homes and a day care center within 400 feet of the overhead transmission line ROW.

Topography, Geology, and Soils

Elevations along the Brooklyn Underground Variation range from approximately 350 feet NGVD to approximately 200 feet NGVD. In the vicinity of the variation, the depth to bedrock varies. Soils types and approximate depth to bedrock along the variation are identified in Table A-24. Some of the soils along this underground variation have been mapped as Prime Farmland or FOSI soils.

Water Resources

The variation would traverse four wetlands and two watercourses as identified in Tables A-25 and A-26. These resources also would be traversed along the Primary Route Under Consideration. Both watercourses have a surface water quality classification of A. Groundwater quality is classified as "GA" in this area.

Biological Resources

Vegetative community types along the variation consist of the scrub-shrub habitat maintained on the existing CL&P ROW, as well as scattered areas of old field, forests, wetlands, and maintained lawn/ornamental vegetation.

The USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species. The DEP NDDB indicated that the Project area does not encompass any known habitat for state-listed endangered, threatened, or species of special concern.

Water resources traversed by the Brooklyn Underground Variation are likely to contain cold-water fish species.

Land Uses

The variation would be located predominantly within the existing CL&P transmission line easement, where land is presently dedicated to utility use. Nearby land uses include a mix of residential areas (primarily along Church Street), agricultural uses, and undeveloped forest land. The Brooklyn Underground Variation does not cross any recreational, scenic, or open space uses.

Statutory Facilities

The Brooklyn Underground Variation is adjacent to one family daycare facility located along Church Street.

Transportation and Access

The variation crosses Church Street, a local roadway, in the Town of Brooklyn.

Cultural Resources

The archaeological sensitivity of the variation is the same as for the comparable section of the Primary Route Under Consideration. There are no reported archaeological sites within 1 mile of Brooklyn Underground Variation. The percentage of area considered sensitive for possible Native American archaeological sites for this variation is 77.2 percent.

I.B.8 Putnam North Overhead Variation

The Putnam North Overhead Variation, located in the Town of Putnam, would extend for approximately 1.2 miles north of the Primary Route Under Consideration. This variation would be located within a new ROW (which would have to be acquired from private landowners).

Topography, Geology, Soils

Elevations along the variation range from approximately 400 feet NGVD to 500 feet NGVD. Bedrock geology in the area consists of the Quinebaug formation. Surficial geology along the variation consists primarily of sand and gravel overlying fines, thick till, and till. Similar to the Primary Route Under Consideration, the Putnam North Overhead Variation traverses some soil types classified FOSI soils. Soils traversed by the variation are identified in Table A-27.

Water Resources

Based on the review of published wetland and soils maps and the evaluation of existing GIS data, the variation would traverse seven wetlands and three watercourses (an intermittent tributary to Munson Brook, Munson Brook, and the Fivemile River all of which have a water quality classification of A). These resources are shown on the maps in Volume 5. Groundwater is classified as “GA/GB” in this area. Portions of this variation are located within the 100-year flood boundary of the Fivemile River and Munson Brook.

Biological Resources

The Putnam North Overhead Variation would be aligned through largely unbroken tracts of deciduous forest habitat, as well as forested riparian habitat along Munson Brook. These vegetative communities can be expected to support wildlife common to such areas.

The USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species. The NDDB's February 25, 2008 correspondence to CL&P regarding the Project stated that the Eastern Ribbon Snake (*Thamnophis sauritus*), a species of special concern may occur in the vicinity of the Putnam North Overhead Variation.

Water resources traversed by the variation are likely to contain cold-water fish species. The Fivemile River which is crossed by this route variation is stocked.

Land Uses

With the exception of rural residential areas that front on U.S. Route 44, the variation traverses undeveloped woodland.

Statutory Facilities

No Statutory Facilities were identified along the Putnam North Overhead Variation.

Transportation and Access

The variation crosses only one road – U.S. Route 44 (Providence Pike).

Cultural Resources

Four reported Native American archaeological sites are located within one mile of this variation, none of which are adjacent to or within the approximate variation corridor. Approximately 50.8 percent of this corridor appears to be sensitive for possible Native American sites.

There are no reported Euroamerican archaeological sites within one mile of this variation, and no significant historic resources reported within 0.25 mile.

I.B.9 Putnam North Underground Variation

The Putnam North Underground Variation, which is located in the towns of Putnam and Thompson, would extend for approximately 3.4 miles, commencing at a new transition station south of State Route

44 and adjacent to the existing CL&P ROW in the Town of Putnam. It would exit the transition station to the south following State Route 44, turn northeast on Munyan Road, turn north along East Putnam Road/Quaddick Town Farm Road, and then turn east along the existing CL&P ROW before ending at a new transition station located adjacent to the ROW and north of Elmwood Hill Road in the Town of Thompson.

Topography, Geology, and Soils

The variation would traverse a short, relatively flat segment of the existing CL&P ROW before extending within or adjacent to local roads. The local roads along which the variation would be aligned are characterized by relatively level topography, skirting low hills. Some of the soils adjacent to the roads along this variation have been mapped as Prime Farmland or FOSI soils. In the vicinity of the variation, the depth to bedrock varies. Soil types and approximate depth to bedrock along the Putnam North Underground Variation are identified in Table A-28.

Water Resources

To identify and assess wetlands and watercourses along this variation, existing wetlands and soils mapping, as well as GIS analysis, were used. Based on this analysis, the variation is located along six wetlands and seven watercourses as identified in the maps in Volume 5. All of the watercourses have a surface water classification of A. Table A-29 identifies the watercourses and their water quality classifications. Groundwater is classified as "GA/GB" in this area. Portions of this variation are located within the 100-year flood boundary of Munson Brook, Fivemile River, and Teft Brook.

Biological Resources

The variation would be aligned along portions of the existing CL&P ROW that are presently forested or are maintained as scrub-shrub habitats. In addition, the variation would be aligned generally along roads where the adjacent vegetation is predominantly forested or maintained lawn.

The USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species. The NDDB's February 25, 2008 correspondence to CL&P regarding the Project stated that the Eastern Ribbon Snake (*Thamnophis sauritus*), a species of special concern may occur in the vicinity of the Putnam North Underground Variation.

Water resources traversed by the variation are likely to contain cold-water fish species. The Fivemile River, which is crossed by this route variation, is stocked.

Land Uses

The Putnam North Underground Variation is characterized by woodland and residential areas along Elvira Heights and Munyan Road. The variation passes Munyan Cemetery along Munyan and East Putnam roads.

Statutory Facilities

No Statutory Facilities are located within 600 feet of the Putnam North Underground Variation.

Transportation and Access

The variation is located underground partially within the CL&P ROW and within existing road ROW within U.S. Route 44, Munyan Road, and East Putnam/Quaddick Town Farm Road. Putnam North Underground Variation crosses on local roadway (Elmwood Hill Road) in the Town of Thompson.

Cultural Resources

The Putnam North Underground Variation would be constructed largely within existing roadways. Five Native American archaeological sites are reported within 1 mile. Approximately 79 percent of adjacent unpaved areas appear sensitive for possible Native American archaeological sites.

I.C SUBSTATIONS AND OTHER TRANSMISSION FACILITIES

I.C.1 Loop of the Manchester to Millstone Line into Card Street Substation

As described in Volume 1, Section VI.B.1 and depicted on the maps in Volume 5, the 310 Line Loop would extend 1.7 miles west from the Card Street Substation to the Village Hill Road Junction and would be located within the existing CL&P 345-kV ROW in the Town of Lebanon.

Topography, Geology, Soils

The 310 Line Loop traverses relatively level topography leaving the Card Street Substation and then proceeds to climb a small hill to the Village Hill Road Junction. Elevations along the route range from approximately 350 feet NGVD at the Card Street Substation to approximately 450 feet NGVD at Village Hill Road. Surficial geology types along the 310 Loop consist of sand and gravel, and till.

Table A-30 describes the soil types found along the 310 Line Loop.

Water Resources

In 2008, CL&P commissioned field investigations to identify and delineate wetlands and watercourses along CL&P's existing Manchester to Millstone ROW which contains the 310 Line Loop component of the Project. The 310 Line Loop crosses two perennial watercourses both with a surface water quality classification of A/SA south of the Card Street Substation. Five intermittent stream channels were identified during the field investigations (two associated with Wetland W21-9, one associated with wetland W21-8, one associated with wetland W21-7, and one associated with wetland W21-5). Sixteen wetland resource areas were identified during field surveys conducted in 2008. These wetland resources areas are identified in Table A-31 and shown on the maps in Volume 5. The *Wetlands and Watercourse Report* for the 310 Line Loop component of the Project is contained in Volume 2.

Biological Resources

In general, most of the 310 Line Loop route traverses upland areas. The predominant vegetation types within the existing transmission line corridor consist of dense shrub and herbaceous growth, whereas the primary vegetation types surrounding the existing ROW are deciduous (hardwood) and mixed hardwood forest (in varying successional stages), intermixed with areas of agricultural use, maintained lawn and wetlands.

Two of the wetlands were identified as potential vernal pools/amphibian breeding habitat. Additional surveys of the potential vernal pools are currently being conducted to determine whether or not each wetland supports amphibian breeding.

The 310 Line Loop crosses 11 habitat and land use types that include commercial/industrial and pavement, coniferous forest, deciduous forest, non-forested wetland, pasture hay and grass, residential and commercial, rural residential, scrub-shrub, shallow water and mud flats, turf and grass, and turf and tree. These vegetative community types can be expected to provide productive habitat for a variety of wildlife species.

In Project-related consultations in November 2007, the USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species. However, the USFWS did indicate that the New England cottontail (*Sylvilagus transitionalis*), a candidate species, occurs in the Town of Lebanon.

DEP NDDB has indicated that no known habitat for state-listed endangered, threatened, or species of special concern exists within this area.

Land Use

The 310 Line Loop is planned for location primarily within an existing overhead transmission line ROW, where land is predominantly maintained in scrub-shrub cover, consistent with utility use. As illustrated on the Volume 5 maps, the primary land uses adjacent to the existing ROW includes forested/undeveloped, agricultural, and low density suburban residential. As discussed previously, the Town of Lebanon has designated utility corridors, including those originating from the Card Street Substation, as existing protected open space as they represent important wildlife corridors.

No federal, state, or municipal lands are crossed by the proposed 310 Line Loop.

Additional ROW would need to be acquired on the west side of the ROW, just south of Card Street where the transmission lines enter into the substation. The extent of impact on adjacent land uses at this location is still uncertain and additional studies in this area will be required to quantify impacts.

Statutory Facilities

No Statutory Facilities were identified within 600 feet of the 310 Line Loop.

Transportation and Access

The 310 Line Loop would cross two local roadways, Village Hill Road and Card Street.

Cultural Resources

One reported Native American archaeological site is located within one mile of the 310 Line Loop, approximately 83 percent of which appears to be sensitive for possible Native American sites.

There are no reported Euroamerican archaeological sites within one mile of this corridor, and no significant historic resources reported within 0.25 mile.

I.C.2 Card Street Substation

The Card Street Substation is located in the Town of Lebanon (New London County). The developed portion of the substation occupies approximately 8.4 acres of a 125-acre site owned by CL&P.

As discussed in Volume 1, Section VI.B.3, for the proposed 345-kV Project, the substation will have to be expanded. This expansion can be accommodated within CL&P's existing property; however, the existing fence will be extended approximately 145 feet to the south (in the direction of Card Street). Clearing and grading at Card Street Substation will be required to allow for this expansion.

Geology, Topography, and Soils

Elevation at the Card Street Substation is approximately 350 NGVD. Surficial geology at the substation site consists of till. Bedrock geology consists of gray to dark-gray, medium-grained gneiss or schist associated with the Tatnic Hill Formation. Table A-30 identifies the soil types found at the Card Street Substation.[5]

Water Resources

Three wetland resource areas were identified during field surveys conducted in 2008 (Loop of the Manchester to Millstone Line into the Card Street Substation). These wetland resources areas are identified in Table A-33 and shown on the maps in Volume 5. The *Wetlands and Watercourse Report* is included in Volume 2. An intermittent tributary (with a water quality classification of A) to the Tenmile River is located along the west side of the substation site[6].

Biological Resources

The predominant terrain surrounding the substation site consists of shallow water and mudflats, deciduous (hardwood) forest, pasture hay and grass, open field-shrub land and forested and scrub shrub wetlands. These types of vegetative communities can be expected to provide productive habitat for a variety of wildlife species.

In Project-related consultations in November 2007, the USFWS indicated that the Project area does not encompass any areas of known habitat for any federally-listed threatened or endangered species.

However, the USFWS did indicate that the New England cottontail (*Sylvilagus transitionalis*), a candidate species, occurs in the Town of Lebanon.

[5] A 500 foot radius was applied around the center point of each substation to analyze existing environmental conditions unless otherwise noted.

DEP NDDB has indicated that no known habitat for state-listed endangered, threatened, or species of special concern exists within the vicinity of the substation site.

Land Use

The Card Street Substation is classified as commercial/industrial land use. Land uses surrounding the Card Street Substation include undeveloped forest, transmission line ROW (scrub-shrub), pasture hay and grass, and scattered residential uses.

Statutory Facilities

No Statutory Facilities were located in proximity to the Card Street Substation.

Transportation and Access

Access to the substation is via Card Street on the south side of the site.

Cultural Resources

One reported Native American archaeological site is located within one mile of this substation. Most or all of the area presently intended for substation expansion appears to be sensitive for possible Native American sites.

There are no reported Euroamerican archaeological sites within one mile of this corridor, and no significant historic resources reported within 0.25 mile.

Noise

The Card Street Substation is located in a rural area within the Town of Lebanon. Noise sensitive sites in proximity to the Substation include scattered residences south and east of the Substation. The nearest residence is located within 400 feet of the substation site.

II. OVERVIEW OF POTENTIAL ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

This section provides a summary discussion of the types of direct and indirect effects that the Project may potentially have on environmental, cultural, and aesthetic resources. Potential effects and mitigation measures are described generically for the Primary Route Under Consideration, as well as for overhead and underground route variations and for the 310 Line Loop. Potential effects and mitigation measures also are discussed for the Card Street Substation expansion.

These analyses are based on the currently available information concerning these routes and CL&P's past experience with the installation of overhead and underground transmission facilities and substations throughout Connecticut. The analysis will be refined, on a route-specific basis, after CL&P incorporates the results of the municipal consultation process.

To date, CL&P has evaluated the effects of the Project, as currently proposed, on scenic and recreational resources; local, state, and federal land use plans; existing and future development; railroad and waterway crossings; water resources; public health and safety; vegetation and wildlife resources; water supply areas; and archaeological and historic resources. Short-term (due to construction) and long-term (due to the operation and maintenance of the transmission facilities) environmental effects, both positive and negative, will occur. However, by following existing ROWs, the Project will minimize adverse environmental effects, at reasonable cost to Connecticut customers.

Overall, as the following sections demonstrate, the Project design and route options are intended to reflect currently available data concerning natural and cultural resources and general public concerns about the siting and construction of transmission facilities. The currently proposed Project incorporates various measures to mitigate adverse environmental and cultural resource effects. Additional mitigation measures typically are identified during the Council process, as well as during the process of applying for other permits and approvals that may be required from other federal, state, or local agencies.

The potential environmental effects and mitigation measures along the 310 Line Loop component of the Project are expected to be the same as those presented for the Primary Route Under Consideration. The only exception is the additional ROW that would be required at the northwest corner of the existing CL&P ROW at Card Street Substation for the overhead line entry. However, the extent of impact at this location is still uncertain. Additional engineering is being conducted to further quantify the potential impacts in this area.

II.A PROJECT ROUTE

II.A.1 Topography, Geology, Soils

The Project would have negligible, if any, effects on topography. Grading would only be performed along the overhead portion of the transmission line, if required, to create a level workspace in the immediate area around structure footings or to level access roads to provide safe passage for construction vehicles/equipment. Grading would not be required where the terrain is flat and open (e.g., in agricultural areas). However, in areas of rock outcrops or irregular terrain, grading may be required, both to improve existing access ways and for new structure locations. Where grading is required, temporary erosion control measures would be applied as necessary to stabilize disturbed soils.

All activities involving soil disturbance and soil movement would be performed in accordance with CL&P's best management practices to minimize the potential for soil erosion and sedimentation into nearby watercourses and/or wetlands. Suitable erosion and sedimentation control measures would be installed, consistent with the CL&P's plans and with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*.

Blasting-Rock Removal

The preferred methods for excavation of rock are mechanical ripping, the use of expansive chemicals, or the application of cryogenic materials (e.g., liquid nitrogen). The selection of a particular method will depend on site-specific factors, such as proximity to structures (e.g., buildings and existing transmission structures) and the characteristics of the rock to be removed. The handling, storage, and application of expansive chemicals and/or cryogenic materials, if used, will be in accordance with manufacturer's specifications and federal and/or state requirements. If the preferred rock excavation methods are not viable blasting may be required. Blasting to remove rock would be performed on a site-specific basis, such as where rock outcrops are encountered (grade blasting), or where bedrock is close to the surface and structure foundations must be excavated. All blasting will be performed by licensed blasting contractor(s), pursuant to the regulations of State and Local Fire Marshals.

II.A.2 Water Resources

Potential water resource/water quality effects associated with construction of the Project would be minor, short-term, highly localized and are not expected to result in significant adverse effects. Similarly, operation of the Project would not cause long-term negative effects on water resources.

II.A.2.1 Watercourses

The Primary Route Under Consideration would span watercourses and, as a result, potential effects on streams and water quality would be limited and short-term. CL&P proposes to align the overhead transmission line across watercourses adjacent to the existing overhead transmission line. In addition, CL&P would avoid direct construction work in watercourses (i.e., disturbance to banks and sediments) to the extent practical and would use best management practices to limit the potential for indirect effects associated with erosion/sedimentation or spills into watercourses or lakes from nearby upland construction activities.

Appropriate temporary bridges may be installed to allow equipment crossings of watercourses along the ROW. Where possible, vegetation removal would be minimized within a 25-foot-wide buffer around streams, except in the vicinity of the temporary equipment crossings. Within this buffer, the minimum amount of vegetation necessary for the construction and safe operation of the transmission facilities would be removed. Vegetation removal near streams would preserve desirable streamside vegetation for habitat enhancement, shading, bank stabilization, and erosion/sedimentation control.

CL&P will implement the following constraints for construction activities in or near watercourses:

- If in-water work is required, the installation of the transmission facilities across streams will conform to regulatory timing requirements to protect important fisheries resources, specifically spawning and primary migration periods, and will avoid or minimize the potential for sedimentation.
- Where existing access roads across streams must be improved, clean materials will be used (e.g., clean riprap or equivalent, rock fords). To the extent possible, the improvement of existing access roads across streams that support fishery resources would be scheduled to avoid conflicts with fish spawning/migration.
- Water flows (if water is present at the time of construction) will not be constrained at any time at existing equipment crossings.
- Concrete (used for structure foundations) will not be mixed or placed so as to enter a watercourse.
- Permit conditions imposed on construction by regulatory agencies will be followed.

II.A.2.2 Groundwater Resources and Public Water Supplies

Neither the construction nor the operation of the Primary Route Under Consideration will result in effects on groundwater resources or public water supplies. The construction of the Project is not expected to affect water supply areas or private groundwater wells.

The excavations required for the installation of the overhead transmission line facilities (i.e., structure foundations) are expected to be above the aquifers located in the Project area. Groundwater may be encountered in low areas where excavation for some structure foundations may be necessary. However, it is unlikely that the excavation or limited blasting (if any) associated with the installation of certain

structure foundations will affect groundwater used for water supply. In the event that groundwater is encountered during excavation for overhead structure foundations, dewatering will be performed in accordance with the procedures listed in Volume 1, Section VII.A.2.2.

II.A.2.3 Wetlands

Adverse effects on wetlands will be minimized by implementing the following procedures:

- Avoiding the placement of new structures in wetlands, where possible.
- Installing, inspecting, and maintaining erosion and sediment controls and other applicable construction best management practices.
- Limiting grading for access roads and structure foundations in wetlands to the amount necessary to provide a safe workspace.
- Installing temporary timber matting, swamp mats, or geotextile and stone pads for access roads across wetlands or to establish safe and stable construction work areas/crane pads within wetlands, where necessary.
- Restoring wetlands, after transmission facility construction, to their pre-construction configurations and contours to the extent practicable.
- Adhering to water resource permit conditions.

II.A.3 Biological Resources

The following sections summarize the general environmental effects and mitigation measures that would be implemented during construction to minimize long-term adverse effects on vegetative communities and wildlife resources, including habitat types, avian and amphibian communities, fisheries, and threatened and endangered species in the vicinity of the Project area.

II.A.3.1 Vegetation Resources

Because the Project would be aligned along existing ROWs, adverse impacts to vegetation and wildlife resources would generally be short-term, minor, and highly localized. The Project will require the conversion of forested habitat to shrub/herbaceous community types to construct and operate the transmission line. This will represent a long-term, but minor, effect.

The vegetation types found along the route are common in the region and vegetation removal would represent a negligible overall effect on wildlife habitats and populations. Transmission line ROW can create new early successional habitat which is characterized by a mixture of grasses, flowering plants, shrubs, and saplings. In fact, the creation of additional low-growing, shrub land habitat along the maintained ROW would represent a long-term positive effect on vegetation and wildlife as shrub land habitat (like any other early successional habitats) is otherwise declining in New England as a result of

various factors (e.g., development, ecological succession, absence of fire). In Connecticut, transmission line ROWs are considered a major source of shrub land habitat[7].

This type of habitat supports vegetation and wildlife communities very different from older, mature habitat. Creation of new ROW benefits populations of animals including birds, butterflies, rare plants, and amphibians. Creation of new ROW would also increase edge habitat in the Project area. As a result species that prefer forest-interior habitat would retreat to contiguous forest and become absent from the habitat directly bordering the ROW.

The construction of the 345-kV line along the Primary Route Under Consideration would result in the removal of some forested vegetation. The operation of the new transmission facilities would require the maintenance of the 345-kV ROW in shrub land habitat. In areas where forest lands presently exist, the conversion to shrub land would represent a long-term, but not an adverse, habitat effect.

Vegetation on the existing CL&P ROW is managed in accordance with CL&P's vegetation management program, which means that trees that could interfere with the operation of the existing lines are eliminated from within the cleared portions of the ROW and trees along the edges periodically trimmed or removed.

The proposed vegetation removal would modify, but would not eliminate, vegetation and wildlife habitat. In general, the principal effect of the proposed clearing would be the removal of existing mature mixed forest areas – moving the current forested edge habitat, and replacing the existing edge with old field and shrub land habitat. In wooded wetlands that contain trees that would interfere with the operation of the transmission line, the removal of woody vegetation would create shrub swamp wetlands, such as are present along the existing ROW.

Vegetation removal to widen the ROW and provide equipment access would be performed using mechanical methods. Appropriate erosion and sediment controls would be implemented as necessary.

After the completion of construction, desirable native vegetative species would regenerate naturally and the new transmission facilities would be as compatible with natural systems within the Project area as the existing transmission facilities. CL&P would promote the establishment of desirable low-growing vegetation species by selective applications of herbicide to control tree saplings and undesirable invasive species, thereby enabling native plants to dominate within the ROW. Invasive or potentially invasive shrub species in Connecticut that are controlled under CL&P's current vegetation management program

[7] Shrubland habitat information from "Wildlife Habitat in Connecticut: Shrubland", Laura Saucier, Habitat Management Program, in *Connecticut Wildlife*, July/August 2003.

include, among others, multiflora rose, autumn olive, black locust, buckthorn, tree-of-heaven and honeysuckle.

II.A.3.2 Wildlife

The construction of the Project would have minor, short-term effects on wildlife habitat, associated with vegetation removal and with the potential disturbance to wildlife due to general construction activities. During construction, the wildlife species that presently use the existing corridors and the additional areas that would be required for the project facilities would be temporarily displaced or disturbed. Mobile wildlife species can be expected to leave the Project area during periods of construction, but to return quickly thereafter.

The operation and maintenance of the Project would involve a localized, but increasing shift in wildlife populations using the ROW from those favoring forested habitats to those utilizing shrub land, old field habitats, or habitat edges. This shift would have a localized positive effect on wildlife species that utilize shrub land habitat, including mammals (e.g., New England cottontail, white-tailed deer, eastern mole, bats) and various bird species (e.g., American woodcock, prairie warbler, brown thrasher, field sparrow, eastern towhee, red-tailed hawk, indigo bunting, gray catbird). Because shrub land and old field habitat are becoming less common in Connecticut, this increase in shrub land and old field habitat would have a positive effect on habitat diversity and would benefit species that use such habitat.

CL&P is proposing an expansion of its existing maintained ROW within Mansfield Hollow State Park and Wildlife Management Area in the Towns of Mansfield and Chaplin. Up to 150 feet of additional ROW may be required at this location to install the proposed 345-kV transmission line, since the existing cleared ROW in this vicinity is only approximately 150 feet in width. In the Town of Mansfield, approximately 0.42-mile of the Wildlife Management Area and 0.46-mile of the State Park will be traversed by the Primary Route Under Consideration. Within the Town of Chaplin, approximately 0.56-mile of the Wildlife Management Area is traversed by the Primary Route Under Consideration. In total, approximately 25 acres of clearing may be required in these areas. Clearing of this additional ROW may result in interior forest species retreating further into the Wildlife Management Area and an increase in species preferring edge or scrub shrub habitat on and adjacent to the ROW.

II.A.3.3 Birds

The Project would have highly localized, minor effects on bird species that utilize woodland habitats (mature mixed forest, wooded wetland) as a result of vegetation removed and maintenance during the construction and operation of the proposed facilities. However, the amount of woodland habitat affected

would be negligible compared to the amount of similar habitat available in the surrounding region. In contrast, the proposed Project would benefit shrub-land bird species by permanently increasing the amount of suitable habitat. Minor, temporary effects would be experienced by all species inhabiting the ROW during periods of active construction and vegetation removal, but these effects would be of short duration and limited to the individuals in the vicinity of work sites.

II.A.3.4 Amphibians

Preliminary amphibian field investigations indicated that certain wetlands along the route have the potential to function as vernal pools that provide amphibian breeding habitat. Additional field studies to verify amphibian breeding habitat are currently being performed along the Primary Route Under Consideration.

Potential adverse effects to amphibian breeding habitat will be mitigated on a site-specific basis. However, in general, new structures would be located outside of wetlands that provide high or moderate potential for productive amphibian breeding. However, several of the potential breeding areas may be located within large wetlands, where structure placement could be unavoidable.

To minimize adverse effects on amphibians, CL&P would attempt to schedule construction activities in and near the amphibian breeding areas to avoid impacts during critical periods in these species' life cycles. CL&P will continue its consultations with the CT DEP to identify appropriate time periods during which construction can be performed, or identify construction best management measures that can be implemented so as to minimize effects on amphibians.

II.A.3.5 Fisheries

Along the Primary Route Under Consideration, watercourses are expected to be spanned, thereby avoiding direct disturbance to stream sediments and stream banks. Riparian vegetation along the ROW would be maintained in order to provide shade, and vegetation would be cut only if required to maintain safe clearances from the transmission facilities. Measures also would be taken to minimize the potential for sedimentation into watercourses resulting from construction activities in nearby upland areas. In particular, temporary soil erosion and sedimentation controls would be installed around areas of disturbed soils at work sites up gradient from streams. These temporary erosion controls would remain in place until the disturbed areas are re-vegetated or otherwise stabilized.

II.A.3.6 Rare, Threatened and Endangered Species

The NDDB mapping reviewed by CL&P indicates the presence of several threatened, endangered, or species of special concern reported to occur in the Project vicinity. The NDDB's February 25, 2008

correspondence to CL&P (which is included in Volume 2, Agency Correspondence) regarding the Project stated that there are twenty-three species listed as endangered, threatened or species of special concern that have been reported to occur in the vicinity of the Primary Route Under Consideration. These species are identified in Table A-5. The DEP Wildlife Division has advised that site-specific surveys for some of these species might be required as route selection, design and construction scheduling progress.

Further, the DEP recommends that construction work be conducted during the period of November 1 through April 1 in certain wetland habitats to avoid possible impacts to the two turtle species. In the case of avian species identified as of concern, if surveys find that they are nesting near the ROW, construction would be scheduled so as to avoid the nesting season, generally February through July. CL&P would continue to consult with DEP during the Project planning process to develop appropriate construction scheduling and other mitigation measures to ensure that adverse impacts to state-listed rare and/or threatened species would be avoided or minimized to the maximum extent practicable.

The NDDB sent additional correspondence to CL&P on March 17, 2008. In this letter the NDDB determined that the Project will not impact any known extant population of state-listed plant species.

The USFWS has indicated that no federally-listed, or proposed threatened, or endangered species or critical habitat under the jurisdiction of the USFWS are known to occur in the Project area, and that further consultation with the USFWS and/or the Preparation of a Biological Assessment under Section 7 of the Endangered Species Act is not required. The USFWS did indicate that the New England cottontail (*Sylvilagus transitionalis*), a federal candidate species, occurs in the Town of Lebanon. This species prefers thickets of tangled vegetation (early successional forests). No adverse impacts to the New England cottontail will occur as the additional shrublands created by the Project will enhance their preferred habitat.

II.A.4 Land Use, Land Use Plans and Recreational/Scenic Resources

Municipal consultations and document reviews conducted to date indicate that the Primary Route Under Consideration generally will not conflict with local land use plans, primarily because the proposed transmission facilities will be located principally within existing, well-established ROWs. Similarly, the Project is anticipated to have minimal effects on existing and future land uses within and adjacent to the ROW. Along the route, the easement for the existing transmission facilities already precludes permanent structures.

The Project may temporarily affect certain recreational resources, particularly those that are crossed by the transmission facilities. CL&P expects to consult with representatives of these affected recreational

areas in order to identify site-specific mitigation measures. In particular, CL&P is proposing an expansion of its existing maintained ROW in the towns of Mansfield and Chaplin, within Mansfield Hollow Reservoir, Mansfield Hollow State Park and Wildlife Management Area. Up to an additional 150 feet may be required at this location to install the proposed 345-kV transmission line, since the existing ROW in this vicinity is only approximately 150 feet in width. This proposed ROW expansion would encroach onto property owned and managed by the USACE and state. CL&P will consult with the affected property owners to assess the effects of this proposed ROW expansion and to identify appropriate mitigation measures.

II.A.5 Statutory Facilities

There are several Statutory Facilities located directly adjacent to the Primary Route Under Consideration. During the siting process, the Council may determine that a variation should be constructed in lieu of the proposed overhead line within CL&P's existing ROW because of it is proximity to a Statutory Facility. These include the Mount Hope Montessori School in Mansfield, and a residential daycare center Brooklyn. In making this determination, the Council will consider whether costs of the variations would impose an unreasonable burden on ratepayers.

II.A.6 Transportation and Access

The Primary Route Under Consideration crosses various highways. All such crossings will be overhead and will not affect the normal use of the transportation facilities. The well-established public road network in the Project area will afford ready access for construction vehicles and equipment to most work sites. Further, the ROW will be used to provide access to construction sites; where possible, existing access roads that exist within the existing transmission ROW will be improved for this purpose.

II.A.7 Cultural Resources

The cultural resources assessment (Volume 2) identifies the cultural resources that could potentially be affected by the Project, including the identification of known or potential archaeological resources within Project area and the evaluation of the potential visual effects of the Project on historic properties listed or eligible for listing on the State and National registers of historic places. The archaeological portion of the assessment was conducted in accordance with the standards of the SHPO's *Environmental Primer for Connecticut's Archaeological Resources*. The assessment of potential visual effects on historic structures was performed in accordance with guidelines in Section 16-50p(a)(4)(C) of Connecticut's Public Utilities Environmental Standards Act (PUESA) and in the regulations of the federal Advisory Council on Historic Preservation (36 CFR 800.5).

For archaeological evaluations, an assessment analyzes background data as a prerequisite to a reconnaissance survey, which involves more detailed surface inspection and subsurface testing. The cultural resource assessment for the Project involved visual inspection of the existing transmission line ROWs and an analysis of the characteristics (i.e., slope, drainage, ledge, ground disturbance, land fill) that affect the sensitivity of areas for locating as yet undiscovered Native American or Euroamerican archaeological resources. The assessment also involved an extensive review of documentary sources, as well as personal consultations with the SHPO and the Connecticut State Archaeologist. The results of this process provide the basis for recommendations for future reconnaissance investigations when the final project configuration is determined.

The cultural resources study determined that no documented archaeological sites exist within the Primary Route Under Consideration along the existing transmission line ROW.

At the locations of future structures including off-road underground facilities, and in areas requiring vegetation clearing or access road construction, additional assessment of Native American archaeological sensitivity may be required to make a final determination of locations where reconnaissance testing will be necessary to locate sites.

To evaluate potential visual effects of the new overhead transmission structures on historic structures, the cultural resource assessment evaluated all significant surveyed historic properties within 0.25 miles of the transmission line ROWs. SHPO and Council guidelines were used as the basis for the visual assessment.

Digitally profiled topographic transects (i.e. cross sections) between specific aboveground historic properties and their closest associated existing transmission tower were prepared, and digital photographs were taken as appropriate to simulate views of the new transmission structures. The assessment results indicate that for ten of the twelve historic properties at issue, terrain and forest cover will preclude any visibility of new structures. Of the two remaining properties, the Mansfield Center Cemetery, located 0.32 miles from the center of the existing CL&P ROW, has partial views screened by trees along the edge of the cemetery, and the Mansfield Hollow Dam has open views of existing and proposed transmission structures. Visual simulations of proposed transmission structures from these two historic resources, presented in Appendix 3 of Volume 2, suggest visibility with non-adverse effect. Similarly, visual simulations of proposed transmission structures which would be visible from Route 169, a National Scenic Byway, in Brooklyn suggest visibility with non-adverse effect because of structure design, terrain, and distances. In most cases, adverse visual effects on historic resources potentially associated with the new overhead structures under consideration are unlikely at distances over 500 feet.

CL&P will continue to coordinate with the SHPO regarding cultural resources and will perform further archaeological and visual effect studies as necessary.

II.A.8 Noise

Construction-related noise will be short-term (lasting only for the duration of the construction period) and will generally stem from the operation of construction equipment, truck traffic, earth moving, vehicles and equipment, jackhammers and structure erection equipment (cranes) etc. The operation of the transmission line will not affect the ambient sound environment.

Noise sensitive sites (receptors) include residences, schools, and designated passive recreational areas. The extent of a noise impact to humans at a sensitive receptor is dependent upon a number of factors, including the change in noise level from the ambient; the duration and character of the noise; the presence of other, non-project sources of noise; people's attitudes concerning the project; the number of people exposed to the noise; and the type of activity affected by the noise (e.g., sleep, conversation).

Standard types of construction equipment are expected to be used for the Project. In general, the highest noise levels from this type of equipment is approximately 92 dB(A) at the source. The following procedures may be applied during construction to minimize noise effects at sensitive receptors:

- Engine-powered construction equipment will be properly muffled and maintained to minimize excessive noise. Such equipment will not be permitted to operate or idle unnecessarily near noise-sensitive receptors. If necessary, efforts may be made to modify construction schedules to mitigate noise impact on sensitive receptors.
- In areas where blasting or rock hammering is required (e.g., to install foundations for overhead structures), efforts will be made to schedule or muffle blasts to minimize noise and vibration disturbances.

Overall, the development of the transmission facilities will result in sound levels that are typical of construction projects.

II.A.9 Air Quality

The Project will result in highly localized and short-term impacts on air quality during the construction phase, primarily from fugitive dust. Several measures will be implemented to minimize the amount of dust generated by construction activities. The extent of exposed/disturbed areas at any one time will be minimized to the extent possible. Water may be used to wet down disturbed soils as needed during construction activities. The operation of the Project will not adversely affect air quality.

II.B OVERHEAD ROUTE VARIATIONS

The development of the Project along any of the overhead route variations will require the creation of a new 150-foot-wide utility corridor across mostly privately-owned properties that are currently used for other purposes.

II.B.1 Topography, Geology, Soils

Whereas along the Primary Route Under Consideration the new 345-kV line would be located predominantly within CL&P's existing ROW, the overhead route variations would create new corridors through the landscape. Along these variations, forested upland and wetlands would have to be cleared, and in order to facilitate construction, shrub vegetation also would likely be removed from the ROW. Additionally, new access roads along these new overhead route variations would have to be constructed grading would be required to create these new access roads, as well as to install structures.

II.B.2 Water Resources

Wetlands and watercourses along the new ROWs associated with the overhead variations would be spanned to the extent possible. However, the location of some structures and associated foundations, and guy lines and anchors may need to be located in wetlands due to design and safety codes, taking into consideration the local terrain. Further, creation of new ROWs would affect previously undisturbed wetland systems through changes in vegetative communities. Clearing of vegetation for construction along these variations would convert primarily forested cover to primarily shrub scrub and emergent cover types. There could also be a greater potential for erosion and sedimentation with construction in new ROW. Line safety and reliability requirements would determine the extent of vegetative buffers retained along stream and riverbanks. New access roads and routes would be required, and would likely result in some level of permanent wetland impacts.

II.B.3 Biological Resources

II.B.3.1 Vegetation Resources

For the overhead variations, new ROW would need to be acquired and cleared of forest vegetation. In general, any of the overhead variations would require comparatively more vegetation clearing than the Primary Route Under Consideration as they are not aligned within an existing, maintained ROW. In areas where forest lands presently exist, a conversion to shrub land would represent a long-term localized effect.

II.B.3.2 Fisheries

Along the overhead variations, all watercourses would be spanned, thereby avoiding direct disturbance to stream sediments and stream banks. Riparian vegetation along the ROW would be maintained, to the maximum extent possible, in order to provide shade, and vegetation would be cut only if required to maintain safe clearances from the transmission facilities. Riparian vegetation removal could have effects on streamside shading increasing disturbance to fish habitat.

Riparian forests minimize disruption of aquatic communities by maintaining stream flow during droughts and reducing stream bank erosion of flood events. Streamside forest areas serve as biological buffers to absorb excessive levels of sediment, nutrients and other pollutants and also serve to minimize erosion and/or sedimentation into the stream.

The removal of streamside vegetation can result in stream temperature change due to loss of shading. In some cases this can adversely affect fish habitat resulting in a shift in aquatic community populations from more desirable "cold-water" species such as trout to less desirable and more tolerant "warm-water" species.

Removal of vegetative cover within riparian areas adjacent to smaller brooks and streams also may increase the potential for erosion and sedimentation into the waterbody.

Measures would be taken to minimize the potential for sedimentation into watercourses resulting from construction activities in nearby upland areas. In particular, temporary soil erosion and sedimentation controls would be installed around areas of disturbed soils at work sites up gradient from streams. These temporary erosion controls would remain in place until the disturbed areas are re-vegetated or otherwise stabilized.

II.B.4 Land Use, Land Use Plans and Recreational/Scenic Resources

The development of the new 345-kV transmission line along the overhead variations would create new utility corridors and would generally not be consistent with federal land policies for co-locating linear utility corridors where practical. The use of the variations also would require the conversion of various existing land uses to utility line development. CL&P would have to acquire easement rights from the affected property owners. In such areas, future land uses along the ROW will be restricted to those that are compatible with utility use.

As discussed in Volume 1, Section VI.C.1, the Willimantic South Overhead Variation traverses or is adjacent to certain recreational, open space, or otherwise protected land uses (Pomeroy State Park &

Scenic Reserve, Airline State Park Trail, and Beaver Brook State Park and Scenic Reserve). While these resources are also traversed by, or adjacent to, the Primary Route Under Consideration, construction of the Willimantic South Overhead Variation would represent a new utility line crossing of these facilities. Construction of the overhead variations may temporarily affect recreational and scenic resources, particularly those that are crossed by the transmission facilities. CL&P expects to consult with representatives of these affected recreational areas in order to identify site-specific mitigation measures. Construction of new utility ROWs and transmission structures would also have a permanent effect on viewsheds within the Project area.

II.B.5 Cultural Resources

Because the overhead variations generally traverse undeveloped areas where soils may not previously have been disturbed, the potential for locating intact buried archaeological sites can be expected to be higher than along the Primary Route Under Consideration. Further assessments of the archaeological sensitivity along the route variations would be required to evaluate the need for field cultural resources testing.

II.C UNDERGROUND TRANSMISSION CABLES

The development of underground 345-kV transmission cable facilities along any of the underground route variations would involve similar types of construction procedures and associated impacts. These underground variations would be located within or adjacent to public road ROWs or within CL&P's existing overhead transmission line ROW. In addition, for any of these underground variations, transition stations (up to 10 acre sites) would be required to interconnect the underground and overhead transmission facilities. These stations would represent long-term land use conversions and would cause localized adverse effects on the visual environment. The operation of underground transmission cable systems typically will not result in adverse environmental effects, except to the extent those maintenance activities require re-excavations or work within the existing splice vaults (which could cause traffic congestion).

Because of many of the impacts common to underground construction would be common to all of the underground route variations, the following subsections describe these effects generically. Any specific effects associated with a particular route variation are noted.

II.C.1 Topography, Geology, Soils

Underground cable installation would involve the excavation of a continuous trench, as well as excavation for concrete splice vaults which must be buried at intervals of approximately 1,600 feet along

each route. During construction, suitable temporary erosion and sedimentation control measures would be installed, consistent with CL&P's established plans and with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*. Rock removal along the trench and at splice vault locations would be performed as detailed in Volume 1, Section VII.B. The extent of rock encountered can have a significant effect on the time required to complete construction in any one area.

In addition, relatively large volumes of excavated soil can be expected to be generated as a result of the underground cable construction. The soils excavated from the trench or vault areas may not be suitable for backfill and may need to be hauled off-site for disposal or alternative use.

Pre-construction soil (and groundwater) characterization is a critical element of the underground cable system planning. This is because of the potential for encountering contaminated soils or groundwater, which must be clearly identified and then classified for proper off-site disposal. Typically, soil and groundwater samples are collected and analyzed along an entire underground route. The resulting information is used to develop a project-specific materials handling guide (or equivalent), which is used to specify the appropriate locations for disposing of the soil (and/or groundwater) from the underground cable system excavations.

After the completion of conduit and splice-vault installation, disturbed roadways, CL&P's ROWs, and adjacent disturbed soils, would be restored to the appropriate grade. Excess soils typically would be trucked off-site and disposed of in accordance with applicable regulations.

II.C.2 Water Resources

Along the underground route variations, various methods may be used to install the cable beneath watercourses and wetlands. For example, the transmission cable could be installed beneath watercourses using in-road construction above the elevation of existing culverted sections of watercourses, conventional "open cut" methods (e.g., trenching through the watercourse, typically using cofferdams or pump arounds), or beneath watercourses via trenchless technologies such as HDD or jacking and boring. These techniques would involve the use of temporary construction staging areas on each side of watercourses and may affect any wetlands directly bordering the watercourses.

CL&P would perform site-specific studies of subsurface conditions to further define the type of water crossing method. Such data would be provided as part of CL&P's permit applications to the USACE and DEP, and would be submitted to the Council in the D&M Plan.

Along the underground route variations, it is possible that groundwater may be encountered in the cable trench or splice vaults excavations. If groundwater is encountered, the same general mitigation procedures described for the overhead portion of the Project would be applied – that is, the water would be pumped from the excavated areas into municipal catch basins or sanitary sewers, into holding tanks and then to sewers, into a tank truck for off-site disposal, or into dewatering basins, and then discharged to well-vegetated areas. During construction, care would be taken to avoid impacts to municipal water lines that may be located in proximity to the proposed underground cable route.

II.C.3 Biological Resources

II.C.3.1 Wildlife and Vegetation

Where the underground transmission cables would be aligned within or adjacent to existing paved roads, no significant adverse effects on vegetation and wildlife resources would occur.

However, when the underground cables are installed along CL&P's overhead ROW or where the splice vaults must be located outside of paved roads ROWs, existing lawns, trees, ornamental vegetation and other vegetation would have to be removed. The amount of vegetation affected would depend on the actual locations of splice vaults and routes. In addition, where the underground cable system is located within the existing CL&P ROWs, only low vegetation (e.g. grasses) would be allowed over the trench area.

II.C.3.2 Fisheries

The installation of the underground cables along the route variations may affect stream banks or stream beds, if conventional open cut technology is used. Other construction methods for installing the cables across watercourses would not affect the streams and thus would not result in any adverse effects on water quality, fisheries, or other aquatic organisms. CL&P would minimize the potential for indirect effects (e.g., sedimentation into watercourses) by installing temporary soil erosion and sedimentation controls around areas of disturbed soils at work sites located upgradient from streams. These temporary erosion controls would remain in place until the disturbed areas are stabilized.

II.C.3.3 Amphibians

The construction of the cable system along the underground variations may affect wetland resources and could potentially affect amphibian habitat or amphibians. Construction best management practices will be employed to contain the construction sites and control soil erosion and the discharge of sediment-laden water to wetlands and watercourses located along the existing roadways.

II.C.3.4 Birds

The construction of the underground cables within or adjacent to road and CL&P's ROWs would result in temporary disturbance and displacement of species that may utilize vegetation along the ROW. No long-term adverse effect on bird habitat or bird migratory patterns is anticipated.

II.C.4 Land Uses

The underground cable system construction work within existing CL&P's transmission line and/or road ROWs would not directly affect land use or recreational activities, but could cause temporary, highly localized effects (e.g., noise, dust, and traffic congestion). These effects would occur throughout the period of active construction, and would depend on the type of construction work at each location, as well as the schedule for such activities. Depending on the difficulty of construction (e.g., presence of underground utilities, rock), work at any one location could extend for months and will involve several different tasks.

The Project would have temporary visual effects during the construction period. The only anticipated permanent effect on visibility and potential viewsheds would be related to vegetation clearing along the ROW, and the construction of aboveground facilities, such as transition stations.

The transition stations that would be required on either end of the underground variations would require the permanent conversion of 2 to 10 acres of land to utility uses for the life of the Project. This would represent a long-term land use and visual effect. In addition, some property for the transition stations would have to be acquired from private landowners.

II.C.5 Transportation and Access

Underground cable construction activities along or within road ROWs would require temporary road lane closures and could potentially result in traffic disruption, delays, detours, and/or congestion. Construction workers traveling to work sites, as well as the movement of construction equipment, also could temporarily cause localized increases in traffic volumes. The operation of the Project would not affect transportation patterns, except when cable system maintenance or repairs require access to the splice vaults or other portions of the buried cable.

To mitigate potential interference with traffic flow along public roads during construction, certain areas of work within road ROWs may be performed on weekends, during non-peak travel times, or at night. Measures would be taken to maintain vehicular access to adjacent businesses and nearby residential areas during the construction period. In addition, CL&P would:

- Coordinate with municipal officials and involved highway authorities (including ConnDOT) to schedule construction activities in order to minimize traffic-related effects, such as detours, peak travel time disruptions, and congestion, as well as to assure that access is maintained for emergency vehicles.
- Develop a Traffic Control Plan, for inclusion in the D&M Plan, which would address the specific concerns of each affected municipality.
- Coordinate construction activities with state and municipal officials so that construction activities do not interfere with special events such as parades and fairs.
- Employ police personnel, where required, to direct traffic at construction work sites along roads.
- Erect appropriate traffic signs and work area protection measures to indicate the presence of construction work zones.

In addition, the underground cable systems would be designed so as not to interfere with existing utilities or other infrastructure facilities (e.g., railroads, transmission pipelines) that occupy the road ROW along which the transmission line would be located, or that the line would cross.

II.C.6 Cultural Resources

The cultural resources assessment (Volume 2) has determined that all potential transition stations are sensitive for potential (as yet undocumented) Native American sites. In areas where the underground cable routes deviate from paved road ROWs, there is potential for Native American and/or EuroAmerican archaeological resources associated with historic agricultural communities. None of these areas are within 0.25 mile of significant aboveground historic resources, precluding any potential for adverse visual effects.

II.D SUBSTATIONS

The project will require modifications to two existing substations: Card Street Substation in Lebanon, and Lake Road Substation in Killingly. The modifications to Lake Road Substation will all occur within the fence line of the existing station. In contrast, the modifications to the Card Street Substation will require expansion of the substation on land owned by CL&P. As a result, the following impacts summary focuses primarily on the Card Street Substation.

II.D.1 Topography, Geology, Soils

The Card Street Substation expansion will require moderate earth work for the substation expansion work. In the event that blasting is required, CL&P would develop a blasting control plan in compliance with industry and CL&P standards. All disturbed areas outside of the substation footprint would be stabilized, restored and revegetated.

II.D.2 Water Resources

The Card Street Substation expansion will affect two wetland resource areas and an intermittent tributary to the Ten Mile River. Approximately 7,800 square feet of palustrine forested wetland and 2,000 square feet of scrub shrub wetland will be affected by expansion as well as associated clearing and grading activities. CL&P would implement Construction Best Management Practices to minimize or eliminate potential adverse environmental effects during the construction phase of the Project.

II.D.3 Biological Resources

Certain upland and wetland habitats will be displaced by the expansion of the Card Street Substation. In particular expansion will cause the conversion of upland forest, forested wetland, and scrub shrub wetland cover types to substation use. Approximately 59,000 square feet of forest clearing will occur as a result of the substation expansion, including approximately 7,800 square feet of palustrine forested wetland and 2,000 square feet of scrub shrub wetland.

II.D.4 Land Uses

No adverse effects to current land uses are expected from the proposed substation expansion because the entire proposed Project related development will be located on the existing CL&P property.

II.D.5 Transportation and Access

The Card Street Substation is readily accessible via the public road network and established access of such public roads. These roads are expected to be used during the proposed construction activities. These existing access roads are depicted in the maps in Volume 5. The operation of the expanded substation will not affect the local transportation network. CL&P does not plan to permanently staff the substation; instead only periodic trips (estimated at two trips per month) to the site are anticipated for monitoring and maintenance purposes.

II.D.6 Cultural Resources

The cultural resources assessment (Volume 2) determined that one reported Native American archaeological site is located within one mile of the substation. Most or all of the area presently intended for substation expansion appears to be sensitive for possible Native American sites.

II.D.7 Noise

Construction-related Project noise, which will be short term and highly localized in the vicinity of the substations, will result from the operation of construction equipment, truck traffic, earth moving vehicles and equipment, and jackhammers. The operation of the Project will not result in any permanent significant adverse noise impacts.

Engine-powered construction equipment will be properly muffled and maintained to minimize excessive noise. In areas where rock removal is required, efforts will be made to schedule work to minimize the annoyance to the public associated with the additional noise and vibration disturbance.

Elevated noise levels generated during construction will be temporary. Where feasible, construction work will be scheduled to minimize disruptions to traffic flow patterns and to residential and business uses.

Appendix A

Tables for Primary Route Under Consideration

Table A-1: General Characteristics of Soil Associations Along the Primary Route Under Consideration

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
2* Ridgebury fine sandy loam	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	Yes	20-30	0.0-0.5
3 Ridgebury, Leicester, Whitman	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	Yes	12-30	0.0-1.5
13* Walpole sandy loam	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
15 Scarboro muck	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
17 Timakwa and Natchaug	woody organic material over sandy and gravelly glaciofluvial deposits, and woody organic material over loamy alluvium and/or loamy glaciofluvial deposits and/or loamy till	Yes	--	0.0-1.0
21A** Ninigret and Tisbury, 0 to 5 percent slopes	coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
23A** Sudbury sandy loam, 0 to 5 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss, and coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	1.5-3.0
29A** Agawam fine sandy loam, 0 to 3 percent slopes	coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
29B** Agawam fine sandy loam, 3 to 8 percent slopes	coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
32A** Haven and Enfield soils, 0 to 3 percent slopes	coarse-loamy and coarse-silty eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss,	No	--	--
34A** Merrimac sandy loam, 0 to 3 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
34B** Merrimac sandy loam, 3 to 8 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
38A* Hinckley gravelly sandy loam, 0 to 3 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
38C* Hinckley gravelly sandy loam, 3 to 15 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
38E Hinckley gravelly sandy loam, 15 to 45 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
45A** Woodbridge fine sandy loam, 0 to 3 percent slopes	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
45B** Woodbridge fine sandy loam, 3 to 8 percent slopes	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
46B Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
46C Woodbridge fine sandy loam, 8 to 15 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
47C Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
50A** Sutton fine sandy loam, 0 to 3 percent slopes	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
50B** Sutton fine sandy loam, 3 to 8 percent slopes	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
51B Sutton sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
52C Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
58B Gloucester gravelly sandy loam, 3 to 8 percent, very stony	sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
58C Gloucester gravelly sandy loam, 8 to 15 percent, very stony	sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
59C Gloucester gravelly sandy loam, 3 to 15 percent, extremely stony	sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
60B** Canton and Charlton, 3 to 8 percent slopes	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
60C* Canton and Charlton, 8 to 15 percent slopes	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
61B Canton and Charlton, 3 to 8 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
61C Canton and Charlton, 8 to 15 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
62C Canton and Charlton, 3 to 15 percent slopes, extremely stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
62D Canton and Charlton, 15 to 35 percent slopes, extremely stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
73C Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	20-40	--
73E Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	20-40	--
75C Hollis-Chatfield-rock outcrop complex, 3 to 15 percent slopes	loamy melt-out till derived from granite and/or schist and/or gneiss	No	0-40	--
75E Hollis-Chatfield-rock outcrop complex, 15 to 45 percent slopes	loamy melt-out till derived from granite and/or schist and/or gneiss	No	0-40	--
76E Rock outcrop-Hollis complex, 3 to 45 percent slopes	loamy melt-out till derived from granite and/or schist and/or gneiss	No	0-20	--
84B** Paxton and Montauk fine sandy loam, 3 to 8 percent slopes	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
85B Paxton and Montauk fine sandy loam, 3 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
85C Paxton and Montauk fine sandy loam, 8 to 15 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
86C Paxton and Montauk fine sandy loam, 3 to 15 percent slopes, extremely stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
86D Paxton and Montauk fine sandy loam, 15 to 35 percent slopes, extremely stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
100* Suncook loamy fine sand	sandy alluvium	No	--	5.0->6.0
101** Occum fine sandy loam	coarse-loamy alluvium	No	--	5-6
102** Pootatuck fine sandy loam	coarse-loamy alluvium	No	--	1.5-2.5
103* Rippowam fine sandy loam	coarse-loamy alluvium	Yes	--	0.0-1.5
108 Saco silt loam	coarse-silty alluvium	Yes	--	0.0-0.5
109 Fluvaquents-Udifluvents complex, frequently flooded	alluvium	Fluvaquents are Hydric	--	0.0->6.0
305 Udorthents-pits complex, gravelly	gravelly outwash	No	--	2.0-4.5
306 Udorthents-Urban land complex	drift	No	--	4.5->6.0
307 Urban land	This is a miscellaneous area			
W Water	This is a miscellaneous area			

Source: USDA Natural Resources Conservation Service, Online Soil Surveys and Geographic Data of New London, Tolland counties, and Windham Counties, accessed April 2008.
* Soils classified as Farmland Soils of Statewide Importance
** Soils classified as Prime Farmland Soils
-- No Data Given. No bedrock or water encountered to survey depth.

Table A-2: Delineated Wetlands Along the Primary Route Under Consideration

Wetland No[8].	Municipality	Wetland Class[9]	Comments
A1	Lebanon	PEME/PSS1E	
A2	Lebanon	PSS1E/PEME	May function as amphibian breeding habitat
A3	Lebanon	PSS1E/PEME	
A22	Lebanon	PEME/PSS1E	Borders Ten Mile River. Potential amphibian breeding habitat
A23	Columbia	PSS/PFO	Potential vernal pool
A24	Columbia	PSS/PEM	
A21	Columbia	PEM/PSS	Intermittent tributary to Ten Mile River
A4	Columbia	PSS1E/PEME	
A5	Columbia	PEME/PSS1E	Potential amphibian breeding habitat is present
A6	Columbia	PSS1E	
A7	Columbia	PSS1E	
A8	Columbia	PEME/PSS1E	
A9	Columbia	PSS1E	May provide potential amphibian breeding habitat
A10a	Columbia	PEME/PSS1E	Potential amphibian breeding habitat
A10b	Columbia	PSS1E	Borders Hop River
A11	Coventry	PFO1E	
A12	Coventry	PEME	
A13	Coventry	PEME/PSS1E	Potential amphibian breeding habitat
A14	Coventry	PSS1E/PEME	
A15	Coventry	PEME/PSS1E	Potential amphibian breeding habitat
A16	Coventry	PEME/PSS1E	
A17	Mansfield	PSS1E	Potential amphibian breeding habitat
A18/82	Mansfield	PSS1E	Potential amphibian breeding habitat
A19	Mansfield	PFO1E	Associated with Cider Mill Brook wetland complex. Potential amphibian breeding habitat.
A83	Mansfield	PSS1E	Intermittent tributary to Cider Mill Brook
A84	Mansfield	PSS1E	Potential amphibian breeding habitat
A85	Mansfield	PSS1E/PFO1E	Potential amphibian breeding habitat
A86	Mansfield	PSS1E/PEME	Borders an Intermittent tributary to Conantville Brook. Potential amphibian breeding habitat
A87	Mansfield	PSS1E/POWH	Borders Conantville Brook. Potential amphibian breeding habitat
A88	Mansfield	PSS1E/PFO1E	Borders an Intermittent tributary to Eatons Pond. Potential amphibian breeding habitat may occur in wooded portion.
A89	Mansfield	PSS1E/PFO1E	
A90	Mansfield	PFO1E	
A90a	Mansfield	PSS1E/PEME	
A91	Mansfield	PSS1E	Potential amphibian breeding habitat
A92	Mansfield	PEME/PSS1E	
A93	Mansfield	PEME	

[8] Wetland No. refers to the number generated during the 2004 field surveys to identify wetlands in and adjacent to the Project corridor. This Wetland No. is keyed to those displayed on the Volume 5 maps.

[9] Wetlands classified according to Cowardin et al 1979; PEM = Palustrine Emergent Wetland; PFO = Palustrine Forested Wetland; PSS = Palustrine Scrub-Shrub Wetland.

Wetland No[8].	Municipality	Wetland Class[9]	Comments
A96	Mansfield	PSS1E	Small pocket of potential amphibian breeding habitat Potential vernal pool
A97	Mansfield	PSS1E/PEME	Associated with Saw Mill Brook. May provide amphibian breeding habitat
A99	Mansfield	PSS1E/PFO1E	May provide amphibian breeding habitat
A98	Mansfield	PEME/POWH	Potential amphibian breeding habitat
A95	Mansfield	POWH	
A94	Mansfield	PEME/PSS1E	Associated with Echo Lake wetlands complex. Potential amphibian breeding habitat present.
A200	Mansfield	PSS1E/PFO1E	Borders Mansfield Hollow Lake. Potential amphibian breeding habitat
B100	Mansfield	PEM/PSS	Potential amphibian breeding habitat Potential vernal pool
B200	Mansfield	PFO4	
B300/400	Mansfield	PSS	Associated with an intermittent tributary to the Natchaug River. Potential amphibian breeding habitat
B500/600	Chaplin	R	
B700	Chaplin	PSS/PFO/R	Potential amphibian breeding habitat
B800	Chaplin	PEM/PSS	Potential amphibian breeding habitat
B900	Chaplin	PEM	Potential amphibian habitat. Potential vernal pool
B1	Chaplin	PSS1/PFO1	Potential habitat for amphibians and reptiles
B2	Chaplin	PSS1/PFO1	Potential amphibian breeding habitat
B3	Chaplin	PEM1/PFO1	Potential amphibian breeding habitat
B4	Chaplin	PSS1	
B5	Chaplin	PSS1/PFO1	May provide amphibian breeding habitat. Potential vernal pool
B6	Chaplin	PSS1/PFO1	Potential amphibian breeding habitat
B7	Chaplin	POW	Potential amphibian breeding habitat
B8	Chaplin	POW1/PFO1	Potential amphibian breeding habitat
B9	Chaplin	PSS1/PFO1	
B10	Chaplin	PSS1/PFO1	
B11	Chaplin	POW/PSS/PFO	May provide amphibian breeding habitat
B12	Chaplin	POW1/PEM1/PFO1	Potential amphibian breeding habitat
B13	Chaplin	PSS1/PFO1	
B14	Hampton	PFO1	
B15	Hampton	PSS1/PFO1	Potential amphibian breeding habitat
B16	Hampton	PSS1	
B17	Hampton	PSS1/PFO1	
B18	Hampton	PSS1/PFO1	
B19	Hampton	PSS1/PFO1	May provide amphibian breeding habitat Potential vernal pool
B20	Hampton	PSS1/PFO1	
B21	Hampton	POW	Likely to provide amphibian breeding habitat. Potential vernal pool
B22	Hampton	PFO1	Potential amphibian breeding habitat. Potential vernal pool
B23	Hampton	PSS1	
B24	Hampton	PSS1	
B25	Hampton	PSS1/PFO1	

Wetland No[8].	Municipality	Wetland Class[9]	Comments
B26	Hampton	PFO1	
B27	Hampton	RSS1	
B28	Hampton	PSS	
B29	Hampton	RSS1	Potential amphibian breeding habitat. Potential amphibian breeding habitat
B30	Hampton	PSS1/PEM1	May provide amphibian breeding habitat
B31	Hampton	PEM/PSS	Provides amphibian breeding habitat. Potential vernal pool
B32	Hampton	PEM1/PSS1	
B33	Hampton	PFO1/PSS1/PEM1	
B34	Hampton	PFO1/PSS1/PEM1	
B35	Hampton	PFO1/PSS1	Potential amphibian breeding habitat. Potential vernal pool
B36	Hampton	PFO1/PSS1/PEM2/PEM1	Potential amphibian breeding habitat. Potential vernal pool
B37	Hampton	PSS1/PFO1/PEM1	Potential amphibian breeding habitat. Potential vernal pool
B38	Brooklyn	PSS/PEM/PFO	Very productive amphibian breeding habitat. Potential vernal pool
B39	Brooklyn	PSS/PFO	Amphibian habitat. Potential vernal pool
B40	Brooklyn	PSS	Potential amphibian breeding habitat
B87	Brooklyn	PEME/PSS1E	Potential amphibian breeding habitat
B88	Brooklyn	PSS1E/PEME	Likely to provide amphibian breeding habitat
B89	Brooklyn	PSS1E/PEME	
B90	Brooklyn	PSS1E/PEME	
B91	Brooklyn	PEME/PSS1E	Potential amphibian breeding habitat
B91A	Brooklyn	PUB	
B92	Brooklyn	PFO1	Potential amphibian breeding habitat
B93	Brooklyn	PSS1E/PFO1	
B94	Brooklyn	PSS1E/PFO1	
B95	Brooklyn	PSS1E/PEME	
B96	Brooklyn	PEME/PSS1E	Potential amphibian breeding habitat
B97	Brooklyn	PSS1E	Potential amphibian breeding habitat
B98	Brooklyn	PEME/PSS1E	Potential amphibian breeding habitat
B99	Brooklyn	PSS1E	
C1	Brooklyn	PFO/PSS	Potential amphibian breeding habitat
C2	Brooklyn	PFO4/PSS	Potential amphibian breeding habitat
C3	Brooklyn	PUB/PSS	Limited amphibian breeding habitat. Potential vernal pool
C4	Brooklyn	PUB/PSS	Potential amphibian breeding habitat. Potential vernal pool
C5	Brooklyn	PSS/PFO	Potential amphibian breeding habitat. Potential vernal pool
C6	Brooklyn	PSS	
C7	Brooklyn	PUB/PEM/R	Potential amphibian breeding habitat. Potential vernal pool
C8	Brooklyn	PEM/PSS1	Potential amphibian breeding habitat
C9	Brooklyn	PEM/PSS1	Potential amphibian breeding habitat
C10	Brooklyn	PFO4	
C11	Brooklyn	PEM/PSS	Potential amphibian breeding habitat
C12	Brooklyn	PEM/PUB	Potential amphibian breeding habitat.

Wetland No[8].	Municipality	Wetland Class[9]	Comments
			Potential vernal pool
C13	Brooklyn	PFO	Potential amphibian breeding habitat
C14	Brooklyn	PEM/PSS	Potential amphibian breeding habitat
C15	Brooklyn	PUB	
C16	Brooklyn	PEM	Potential amphibian breeding habitat
C101	Brooklyn	PEM1/PSS2	
C102	Brooklyn	PFO1	
C103	Pomfret	RSB4	
C104	Pomfret	RSB4	
C105	Pomfret	PEM1E	
C106	Pomfret	PEM2/PSS1/PFO1/PEM2/PSS2	Potential amphibian breeding habitat
C107	Killingly	PSS1E/PEM	
C109	Killingly		
C110	Killingly	PSS1/PEM1/PFO1E	
C111	Killingly	PFO1E/PSS1E	
C112	Killingly	PFO1E/PSS1E	
C113	Killingly	PEM/PFO1E	
C114	Killingly	PSS	Potential amphibian breeding habitat
C500	Putnam	R	
C501	Putnam	PSS	Potential amphibian breeding habitat
C502	Putnam	PSS	
C503	Putnam	PEM	Potential amphibian breeding habitat. Potential vernal pool
C504	Putnam	PSS1	Potential amphibian breeding habitat. Potential vernal pool
C505	Putnam	PEM/POW	Potential amphibian breeding habitat. Potential vernal pool
C506	Putnam	PFO4/PSS	Potential amphibian breeding habitat. Potential vernal pool
C507/C508	Putnam	R	
C509	Putnam	PEM	
C510	Killingly	PSS	
C511	Killingly	PEM/R4	
C17	Putnam	PSS	
C18	Putnam	PSS	
C19	Putnam	PSS	
C20	Putnam	PSS	
C21	Putnam	PSS	Potential amphibian breeding habitat
D1	Putnam	PEM1	
D2	Putnam	PEM1	
D3	Putnam	PEM1/PSS1	
D4	Putnam	PEM1/PSS1	
D5	Putnam	PSS1/PFO1	
D6	Putnam	POW/PAB/PSS1/PEM2/PEM1/PFO1	
D7	Putnam	PFO1/PEM1/PSS1/PFO1	
D8	Putnam	PSS	Potential amphibian breeding habitat
D9	Putnam	PSS	Potential amphibian breeding habitat
D10	Putnam	PUB	High probability of amphibian breeding habitat. Potential vernal pool

Wetland No[8].	Municipality	Wetland Class[9]	Comments
D105/106	Putnam	PSS/PFO	Potential amphibian breeding habitat
D103/104	Putnam	PEM/PSS/PFO	Potential amphibian breeding habitat
D101/102	Putnam	PEM/PSS/PFO	Potential amphibian breeding habitat
D100	Putnam	PEM/PSS	Potential amphibian breeding habitat
D200	Putnam	PEM/PSS	Potential amphibian breeding habitat
D201	Putnam	PEM	Potential amphibian breeding habitat Potential vernal pool
D219	Putnam		
D220	Putnam	PEM/PSS	Potential amphibian breeding habitat
D300	Thompson	PEM/PSS/PFO5	Potential amphibian breeding habitat Great Blue Heron rookery associated with this wetland.
D301	Thompson	PSS	Potential amphibian breeding habitat
D302	Thompson	PEM	Potential amphibian breeding habitat
D303	Thompson	PSS	Potential amphibian breeding habitat
D304	Thompson	PEM/R4SB	
D504	Thompson	PSS	
D505	Thompson	PSS/R4SB	
D506	Thompson	PSS/PFO	

Source: Wetland and Waterways Description Report, ESS December 2004.

Table A-3: Summary of Connecticut Water Use Classifications

Water Resource Class	Classification Use Description
Surface Waters	
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	Impaired water quality affecting one or more Class B uses. Indicates unacceptable quality. Goal is obtain Class B uses.
Ground Waters	
Class GAA	Public water supply
Class GAAs	Groundwater that is tributary to a public water supply reservoir
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

Source: CT DEP December 2002. Connecticut Water Quality Standards.

Table A-4: Watercourses and Waterbodies Along the Primary Route Under Consideration

Stream Name	Municipality	Water Quality Classification
Intermittant Tenmile River (crossed 3 times)	Lebanon	A
Tenmile River	Lebanon/Columbia	B/A, B/AA, C/A
Intermittant Tributary to Tenmile River (crossed 2 times)	Columbia	A
Perennial Tributary to Tenmile River	Columbia	A
Hop River	Columbia/Coventry	B/A, B/AA, C/A
Willimantic River	Coventry/Mansfield	B
Intermittent Tributary to Cider Mill Brook (crossed 2 times)	Mansfield	A
Conantville Brook	Mansfield	A
Intermittent Tributary to Eatons Brook (crossed 2 times)	Mansfield	A
Intermittent Tributary to Sawmill Brook	Mansfield	A
Sawmill Brook	Mansfield	A
Intermittent tributary to Willimantic Reservoir (crossed 6 times)	Mansfield	AA, A/AA
Mansfield Hollow Lake Dam	Mansfield	B/A, B/AA, C/A
Intermittent tributary to Natchaug River	Mansfield	B/AA
Natchaug River	Mansfield	B/AA
Perennial Tributary to Natchaug River (crossed 3 times)	Chaplin	AA, A/AA
Unnamed Pond	Chaplin	AA, A/AA
Intermittent Tributary and unnamed pond drains to Ames Brook	Chaplin	AA, A/AA
Intermittent Tributary to Tucker Pond (crossed 2 times)	Chaplin	
Intermittent Tributary to Cavanaugh's Pond (crossed 2 times)	Chaplin	AA, A/AA
Buttonball Brook and unnamed ponds	Chaplin	AA, A/AA
Buttonball Brook	Chaplin	AA, A/AA
Intermittent Tributary to Buttonball Brook	Chaplin	AA, A/AA
Intermittent Tributary to Buttonball Brook	Hampton	AA, A/AA
Merrick Brook	Hampton	A
Intermittent Tributary to Merrick Brook (crossed 2 times)	Hampton	A
Intermittent Tributary to Cedar Swamp Brook (crossed 6 times)	Hampton	A
Cedar Swamp Brook (crossed 2 times)	Hampton	A
Intermittent Tributary to Cedar Swamp Brook	Hampton	A
Little River	Hampton	A
Intermittent Tributary to Little River (crossed 3 times)	Hampton	A
Unnamed Pond and Intermittent Tributary to Little River	Hampton	A
Humes Brook	Hampton	A
Intermittent Tributary to Coffey Brook	Hampton	A
Unnamed Intermittent Watercourse	Hampton	A
Intermittent Tributary to Stony Brook (crossed 2 times)	Brooklyn	A

Stream Name	Municipality	Water Quality Classification
Stony Brook	Brooklyn	A
Intermittent Tributary to Blackwell Brook (crossed 3 times)	Brooklyn	A
Blackwell Brook	Brooklyn	A
Intermittent Tributary to Blackwell Brook (crossed 2 times)	Brooklyn	A
Tanner Brook	Brooklyn	A
Unnamed Pond	Brooklyn	A
Intermittent to White Brook (crossed 4 times)	Brooklyn	A
White Brook (crossed 4 times)	Brooklyn	A
Creamery Brook	Brooklyn	A
Intermittent Tributary to Quinebaug River (crossed 6 times)	Brooklyn	A
Quinebaug River (crossed 3 times)	Pomfret/Killingly	C/B, D/B
Intermittent Tributary to Quinebaug River (crossed 2 times)	Killingly	A
Unnamed Pond	Putnam	A
Unnamed Pond	Putnam	A
Unnamed Pond	Putnam	A
Quinebaug River	Putnam/Killingly	C/B, D/B
Intermittent Tributary to Wheatons Pond (crossed 2 times)	Putnam	A
Culver Brook	Putnam	A
Intermittent Tributary to Culver Brook (crossed 2 times)	Putnam	A
Unnamed Intermittent Stream	Putnam	A
Perennial Tributary to Tavern Pond Brook	Putnam	A
Intermittent Tributary to Lippitts Brook (crossed 2 times)	Putnam	A
Intermittent Tributary to Munson Brook	Putnam	A
Munson Brook	Putnam	A
Fivemile River	Putnam	A
Teft Brook (crossed 2 times)	Thompson	A
Intermittent Tributary to Teft Brook	Thompson	A
Intermittent Tributary to Peck Pond	Thompson	A

Source: CT DEP, Bureau of Water Management, Surface Water Quality Classifications GIS Datalayer, May 2002

Table A-5: Summary of Rare, Threatened and Endangered Species Along the Primary Route Under Consideration

Species (Scientific Name)	Species (Common Name)	Status*	General Location Reported in NDDB and Habitat Type
Erynnis horatius	Horace's duskywing	SCC	Mansfield and Chaplin, Open woodlands and edges
Eremophila alpestris	Horned lark	SE	Mansfield, Open areas with little cover
Ammodramus savannarum	Grasshopper sparrow	SE	Mansfield, Grasslands, pastures and old fields
Callophryus irus	Frosted elfin	ST	Mansfield, Chaplin and Brooklyn, xeric and open disturbance-dependent habitats on sandy soil
Erynnis brizo	Sleepy duskywind	ST	Mansfield, Barrens and areas with poor, thin or well drained (often sandy) soils

Species (Scientific Name)	Species (Common Name)	Status*	General Location Reported in NDDB and Habitat Type
Falco sparverius	American kestrel	ST	Mansfield, Grassland or shrubland at the edge of forest; requires cavities for nesting
Zale oblique	Noctuid moth	SCC	Mansfield, pitch pine-scrub oak barrans
Zanclognatha martha	Pine Barrens Noctuid moth	SCC	Mansfield, pitch pine-scrub oak barrans
Heterodon platirhinos	Eastern hognose snake	SCC	Mansfield, Sandy, wooded areas
Gyraulus circumstriatus	Aquatic snail	SCC	Mansfield, Fresh, clear water
Lepipolys perscripta	Scribbled sallow	SCC	Mansfield, disturbed areas with sandy soil
Apamea burgessi	Noctuid moth	SCC	Mansfield, Hampton, xeric, sandy areas
Chaetaglaea cerata	Noctuid moth	SCC	Mansfield, pitch pine-scrub oak barrens on heathlands and sand plains
Eucoptocnemis fimbriaris	Noctuid moth	SCC	Mansfield, dry grassy or sandy fields with remnant pine barrens and scrub oak barrens
Shinia spinosae	Noctuid moth	SCC	Mansfield, associated with jointweed
Euchlaena madusaria	Shrub euchlaena	SCC	Mansfield, scrub oak shrubland
Passerculus sandwichensis	Savannah sparrow	SCC	Mansfield, Grassy fields with damp soils
Sturnella magna	Eastern Meadowlark	SCC	Mansfield, Large, grassy fields
Chlosyne harrisii	Harris' checkerspot	ST	Mansfield and Chaplin, Windham, Moist areas such as bogs, meadows and marshes
Gomphus adelphus	Moustached clubtail	ST	Mansfield and Chaplin, Clean gravelly or rocky rivers
Glyptemys insculpta	Wood Turtle	SCC	Pomfret, Riparian areas with large floodplains, forests, fields
Caprimulgus vociferus	Whip-poor-will	SCC	Putnam, Scrubby immature woods, wooded areas following a disturbance
Thamnophis sauritus	Eastern Ribbon snake	SCC	Putnam, Wetlands, edges of ponds and streams
Hetaerina americana	American Rubyspot damselfly	SCC	Chaplin, River banks

Source: CT DEP, February 25, 2008 correspondence to Donald Biondi, Northeast Utilities
*Key: SSC=State Species of Special Concern, ST=State Threatened, SE=State Endangered

Table A-6: Recreational, Scenic, and Open Space Uses Along the Primary Route Under Consideration

Municipality	Proximity to Route	Recreational/Scenic/Open Space Feature
Lebanon	Crosses	Airline State Park Trail (Southern Section)
Coventry	Crosses	Hop River State Park Trail
Coventry	800 feet	Joshua's Tract Cons.&Historic Trust
Coventry	Crosses	Town Open Space (Flanders River Road)
Mansfield	Crosses	Highland Ridge Driving Range
Mansfield	300 feet	Town Open Space (Stafford Road)
Mansfield	Crosses	Town Open Space (Highland Road)
Mansfield	350 feet	Town Open Space (Saw Mill Brook Lane)
Mansfield	1020	Joshuas Tract and Historic Trust (Wolf Rock Nature Preserve)
Mansfield	150 feet	Town Open Space Storrs and Bassetts Bridge Road)
Mansfield	800	Joshua's Tract Wildlife Area

Municipality	Proximity to Route	Recreational/Scenic/Open Space Feature
Mansfield	Crosses	Mansfield Hollow State Park & Wildlife Management Area
Mansfield	600 feet	Mansfield Hollow Lake (picnic area and boat ramp)
Mansfield		Scenic Vistas
Mansfield	Crosses	Nipmuck Trail
Chaplin	Crosses	Mansfield Hollow State Park/Wildlife Management Area
Chaplin	200 feet	Fin, Fur and Feather Club
Chaplin	Crosses	Natchaug State Forest
Chaplin	200 feet	Airline State Park Trail
Hampton	Crosses	Airline State Park Trail (Northern Section)
Hampton	Crosses	Bigelow Howard Valley Fish & Game Club
Hampton	550	South Cemetery
Hampton	1,200 feet	James L. Goodwin State Forest
Hampton	1100 feet	Little River Wildlife Area
Hampton		Scenic Vista
Hampton	Crosses	Blue Blazed Hiking Trail (Natchaug Trail)
Brooklyn	Crosses	State Route 169
Brooklyn	Crosses	Protected Private Property
Brooklyn		Scenic Vistas
Brooklyn	1100 feet	Brooklyn Tennis Club
Killingly	200 feet	Natchaug State Forest
Putnam	400 feet	Windham Land Trust (Route 44)
Thompson	1000 feet	Quaddick State Park/Reservoir

Source: CT DEP, Office of Information Management, GIS Data Guide DEP Property, November 2002. Connecticut Office of Policy and Management, and CT DEP Office of Information Management, GIS Data Guide Municipal and Private Open Space, 1997.

Table A-7: Road Crossings Along the Primary Route Under Consideration

Milepost	Road Name	Town	Road Type
0.96	Cards Mill Road	Columbia	Local Road
1.78	Old Willimantic Road	Columbia	Local Road
2.12	Willimantic Road	Columbia	Highway
2.46	US Highway 6	Coventry	Major Highway
3.04	Babcock Road	Coventry	Local Road
3.33	Flanders River Road	Coventry	Local Road
3.71	Unnamed Road	Mansfield	Local Road
3.76	Stafford Road	Mansfield	Highway
4.54	Highland Road	Mansfield	Local Road
5.80	Mansfield City Road	Mansfield	Local Road
7.53	Storrs Road	Mansfield	Highway
7.95	Bassetts Bridge Road	Mansfield	Local Road
8.61	Bassetts Bridge Road	Mansfield	Local Road
8.66	Unnamed Road	Mansfield	Local Road
9.48	Bassetts Bridge Road	Mansfield	Local Road
9.75	South Bedlam Road	Mansfield	Local Road
10.84	Willimantic Road	Chaplin	Highway
11.84	Chewink Road	Chaplin	Local Road
13.35	Brook Road	Hampton	Local Road

Milepost	Road Name	Town	Road Type
15.15	Pudding Hill Road	Hampton	Highway
15.30	Cemetery Road	Hampton	Local Road
15.42	Bigelow Road	Hampton	Local Road
16.59	Drain Street	Hampton	Local Road
18.01	Stetson Road	Brooklyn	Local Road
19.53	Windham Road	Brooklyn	Local Road
19.79	Hartford Road	Brooklyn	Highway
19.88	Appell Road	Brooklyn	Local Road
20.33	Laurel Hill Road	Brooklyn	Local Road
20.87	Wolf Den Road	Brooklyn	Local Road
21.05	Costello Road	Brooklyn	Local Road
21.81	Pomfret Road	Brooklyn	Highway
23.88	Church Street	Brooklyn	Local Road
26.28	Killingly Road	Pomfret	Highway
26.83	Lake Road	Killingly	Local Road
27.44	Lake Road	Killingly	Local Road
28.59	Unnamed Road	Putnam	Local Road
29.47	Interstate 395	Killingly	Major Highway
30.05	Park Road	Putnam	Local Road
30.93	Killingly Avenue	Putnam	Highway
31.72	Heritage Road	Putnam	Local Road
31.94	Toutellotte Road	Putnam	Local Road
32.39	Liberty Highway	Putnam	Highway
32.53	Aldrich Road	Putnam	Local Road
33.00	Fox Road	Putnam	Local Road
33.82	Providence Pike	Putnam	Highway
34.18	Elvira Court	Putnam	Local Road
35.42	Quaddick Town Farm	Thompson	Highway
35.63	Elmwood Hill Road	Thompson	Local Road

Source: US Dept of Commerce, US Census Bureau, and UCONN Center for Geographic Information and Analysis. Connecticut Street Network State Plane/TIGER Line 2000. 2002.

Table A-8: Typical Noise Levels Associated with Different Indoor and Outdoor Activities

Outdoor Noise Levels	A-Weighted Sound Level (dBA)	Indoor Noise Levels
Jet aircraft take-off at 100 feet	+120	
Riveting machine at operator's position	+110	
Cut-off saw at operator's position	+100	
Elevated subway at 50 feet		
		Newspaper press
Automobile horn at 10 feet		
	+90	Industrial boiler room
Diesel truck at 50 feet		Food blender at 3 feet

Outdoor Noise Levels	A-Weighted Sound Level (dBA)	Indoor Noise Levels
Noisy urban daytime	+80	Garbage disposal at 3 feet
Diesel bus at 50 feet		
		Shouting at 3 feet
	+70	
Gas lawn mower at 100 feet		Vacuum cleaner at 10 feet
Quiet urban daytime	+60	Normal conversation at 5 - 10 feet
		Large business office
Quiet urban nighttime	+50	Open office area background level
Substation (transformer)	+43	
Quiet suburban nighttime		
	+40	Large conference room
		Small theater (background)
Quiet rural nighttime	+30	Soft whisper at 2 feet
		Bedroom at nighttime
	+20	Concert hall

Table A-9: State of Connecticut Noise Control Regulations by Emitter and Receptor Land Use Classification

Noise Emitter Class	Noise Receptor Class			
	C: Industrial	**B: Generally Commercial**	**A: Residential Day**	**A: Residential Night**
C: Industrial	70 dBA	66 dBA	61 dBA	51 dBA
B: Generally Commercial	62 dBA	62 dBA	55 dBA	45 dBA
A: Residential	62 dBA	55 dBA	55 dBA	45 dBA

Source: RCSA § 22a-69-1 et seq., Control of Noise (1978).

Definitions:

Day = 7:00 AM to 9:00 PM Monday – Saturday; 9:00 AM to 9:00 PM Sunday

Night = 9:00 PM to 7:00 AM Monday – Saturday; 9:00 PM to 9:00 AM Sunday

Tables for the Willimantic South Overhead Variation

Table A-10: General Soil Characteristics Along the Willimantic South Overhead Variation

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
3 Ridgebury, Leicester, Whitman	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	Yes	12-30	0.0-1.5
13* Walpole sandy loam	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
17 Timakwa and Natchaug	woody organic material over sandy and gravelly glaciofluvial deposits, and woody organic material over loamy alluvium and/or loamy glaciofluvial deposits and/or loamy till	Yes	--	0.0-1.0
21A** Ninigret and Tisbury, 0 to 5 percent slopes	coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
23A** Sudbury sandy loam, 0 to 5 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss, and coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	1.5-3.0
29A** Agawam fine sandy loam, 0 to 3 percent slopes	coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
29B** Agawam fine sandy loam, 3 to 8 percent slopes	coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
34A** Merrimac sandy loam, 0 to 3 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
34B** Merrimac sandy loam, 3 to 8 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
36B* Windsor loamy sand, 3 to 8 percent slopes	Eolian sands over sandy glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
38C* Hinckley gravelly sandy loam, 3 to 15 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
38E Hinckley gravelly sandy loam, 15 to 45 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
46B Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
47C Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
50B** Sutton fine sandy loam, 3 to 8 percent slopes	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
51B Sutton sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
52C Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
60B** Canton and Charlton, 3 to 8 percent slopes	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
61B Canton and Charlton, 3 to 8 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
61C Canton and Charlton, 8 to 15 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
62C Canton and Charlton, 3 to 15 percent slopes, extremely stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
62D Canton and Charlton, 15 to 35 percent slopes, extremely stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
73C Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	20-40	--

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
73E Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	20-40	--
84B** Paxton and Montauk fine sandy loam, 3 to 8 percent slopes	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
85B Paxton and Montauk fine sandy loam, 3 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
86C Paxton and Montauk fine sandy loam, 3 to 15 percent slopes, extremely stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
86D Paxton and Montauk fine sandy loam, 15 to 35 percent slopes, extremely stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
102** Pootatuck fine sandy loam	coarse-loamy alluvium	No	--	1.5-2.5
103* Rippowam fine sandy loam	coarse-loamy alluvium	Yes	--	0.0-1.5
307 Urban land	This is a miscellaneous area			

Source USDA Natural Resources Conservation Service, Online Soil Surveys and Geographic Data of New London, Tolland counties, and Windham Counties, 2007.
* Soils classified as Farmland Soils of Statewide Importance
** Soils classified as Prime Farmland Soils
-- No Data Given. No bedrock or water encountered to survey depth.

Table A-11: Watercourses Along the Willimantic South Overhead Variation

Name	Water Quality	Town
Jordan Brook	A	Lebanon
Intermittent Watercourse	A	Windham
Unnamed Watercourse	A	Windham
Intermittent Watercourse	A	Windham
Intermittent Watercourse	A	Windham
Intermittent Watercourse	A	Windham
Shetucket River	B	Windham
Shetucket River	B	Windham
Intermittent Watercourse	A	Windham
Unnamed Watercourse	A	Windham
Unnamed Watercourse	A	Windham
Chestnut Hill Brook	A	Windham
Ballymahack Brook	A	Windham
Intermittent Watercourse	A	Windham
Intermittent Watercourse	A	Windham
Ames Brook	AA	Chaplin
Intermittent Watercourse	A	Chaplin

Source: CT DEP, Bureau of Water Management, Surface Water Quality Classifications GIS Datalayer, May 2002

Table A-10: Road Crossings: Willimantic South Overhead Variation

Variation Milepost	Road Name	Town	Road Type
0.18	Card Street	Lebanon	Local Road
0.79	Beaumont Highway	Lebanon	Highway
0.92	Unnamed	Lebanon	Thoroughfare
1.46	South Street	Windham	Local Road
2.11	Jordan Street	Windham	Local Road
2.92	Windham Road	Windham	Local Road
3.00	Windham Road	Windham	Highway
4.22	Plains Road	Windham	Local Road
4.55	North Road	Windham	Highway
5.24	Ballamahack Road	Windham	Local Road
6.63	Beaver Hill Road	Windham	Local Road
8.66	Lynch Road	Chaplin	Local Road
9.22	Unnamed	Chaplin	Thoroughfare
9.30	Chewink Road	Chaplin	Local Road

Source: US Dept of Commerce, US Census Bureau, and UCONN Center for Geographic Information and Analysis. Connecticut Street Network State Plane/TIGER Line 2000. 2002.

Tables for the Willimantic South Underground Variation

Table A-13: General Soil Characteristics Along the Willimantic South Underground Variation

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
3 Ridgebury, Leicester, Whitman	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	Yes	12-30	0.0-1.5
13* Walpole sandy loam	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
15 Scarboro muck	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
17 Timakwa and Natchaug	woody organic material over sandy and gravelly glaciofluvial deposits, and woody organic material over loamy alluvium and/or loamy glaciofluvial deposits and/or loamy till	Yes	--	0.0-1.0
18 Catden and Freetown soils	woody organic material	Yes	--	0.0-1.0
21A** Ninigret and Tisbury, 0 to 5 percent slopes	coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
23A** Sudbury sandy loam, 0 to 5 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss, and coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	1.5-3.0
29A** Agawam fine sandy loam, 0 to 3 percent slopes	coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
29B** Agawam fine sandy loam, 3 to 8 percent slopes	coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
34A** Merrimac sandy loam, 0 to 3 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
34B** Merrimac sandy loam, 3 to 8 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
36B* Windsor loamy sand, 3 to 8 percent slopes	Eolian sands over sandy glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
38A* Hinckley gravelly sandy loam, 0 to 3 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
38C* Hinckley gravelly sandy loam, 3 to 15 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
38E Hinckley gravelly sandy loam, 15 to 45 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
47C Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
50B** Sutton fine sandy loam, 3 to 8 percent slopes	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
51B Sutton sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
52C Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
58B Gloucester gravelly sandy loam, 3 to 8 percent, very stony	sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
60B** Canton and Charlton, 3 to 8 percent slopes	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
61B Canton and Charlton, 3 to 8 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
62D Canton and Charlton, 15 to 35 percent slopes, extremely stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
73C Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	20-40	--
84B** Paxton and Montauk fine sandy loam, 3 to 8 percent slopes	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
84C* Paxton and Montauk fine sandy loam, 8 to 15 percent slopes	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
85B Paxton and Montauk fine sandy loam, 3 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
306 Udorthents-Urban land complex	drift	No	--	4.5->6.0
307 Urban land	This is a miscellaneous area			

Source: USDA Natural Resources Conservation Service, Online Soil Surveys and Geographic Data of New London, Tolland counties, and Windham Counties, 2007
* Soils classified as Farmland Soils of Statewide Importance
** Soils classified as Prime Farmland Soils
-- No Data Given. No bedrock or water encountered to survey depth

Table A-14: Watercourses Along the Willimantic South Underground Variation

Name	Water Quality	Town
Intermittent Watercourse	Lebanon	A
Intermittent Watercourse	Windham	A
Intermittent Watercourse	Windham	A
Shetucket River	Windham	B
Shetucket River	Windham	B
Intermittent Watercourse	Windham	A
Intermittent Watercourse	Windham	A
Intermittent Watercourse	Windham	A
Intermittent Watercourse	Windham	A
Intermittent Watercourse	Windham	A
Unnamed	Windham	AA
Unnamed	Windham	AA
Intermittent Watercourse	Windham	AA
Intermittent Watercourse	Windham	AA
Intermittent Watercourse	Windham	AA
Unnamed	AA	Chaplin

Source: CT DEP, Bureau of Water Management, Surface Water Quality Classifications GIS Datalayer, May 2002

Table A-15: Road Crossings: Willimantic South Underground Variation

Milepost	Road Name	Town	Road Type
1.56	Mountain Street	Windham	Highway
2.00	South Street	Windham	Local Road
4.93	Weir Court	Windham	Local Road
8.88	Station Road	Windham	Local Road

Source: US Dept of Commerce, US Census Bureau, and UCONN Center for Geographic Information and Analysis. Connecticut Street Network State Plane/TIGER Line 2000. 2002.

Tables for the Mansfield Underground Variation

Table A-16: General Soil Characteristics Along the Mansfield Underground Variation

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
3 Ridgebury, Leicester, Whitman	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	Yes	12-30	0.0-1.5
46B Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
58C Gloucester gravelly sandy loam, 8 to 15 percent, very stony	sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
61C Canton and Charlton, 8 to 15 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
62C Canton and Charlton, 3 to 15 percent slopes, extremely stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
85B Paxton and Montauk fine sandy loam, 3 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
85C Paxton and Montauk fine sandy loam, 8 to 15 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
86D Paxton and Montauk fine sandy loam, 15 to 35 percent slopes, extremely stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5

Source: USDA Natural Resources Conservation Service, Online Soil Surveys and Geographic Data of New London, Tolland counties, and Windham Counties, 2007
-- No Data Given. No bedrock or water encountered to survey depth.

Table A-17: Wetlands Along the Mansfield Underground Variation

Wetland No[10].	Municipality	Wetland Class[11]	Comments
A83	Mansfield	PSS1E	Intermittent tributary to Cider Mill Brook
A84	Mansfield	PSS1E	Potential amphibian breeding habitat
A85	Mansfield	PSS1E/PFO1E	Potential amphibian breeding habitat
A86	Mansfield	PSS1E/PEME	Borders an Intermittent tributary to Conantville Brook Potential amphibian breeding habitat

Tables for the Mount Hope Overhead Variation

Table A-18: General Soil Characteristics Along the Mount Hope Overhead Variation

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
13* Walpole sandy loam	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
15 Scarboro muck	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0

[10] Wetland No. refers to the number generated during the 2004 field surveys to identify wetlands in and adjacent to the Project corridor. This Wetland No. is keyed to those displayed on the Volume 5 maps.
[11] Wetlands classified according to Cowardin et al 1979; PEM = Palustrine Emergent Wetland; PFO = Palustrine Forested Wetland; PSS = Palustrine Scrub-Shrub Wetland.

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
32A** Haven and Enfield soils, 0 to 3 percent slopes	coarse-loamy and coarse-silty eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss,	No	--	--
38E Hinckley gravelly sandy loam, 15 to 45 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--

Source: USDA Natural Resources Conservation Service, Online Soil Surveys and Geographic Data of New London, Tolland counties, and Windham Counties, 2007
* Soils classified as Farmland Soils of Statewide Importance
** Soils classified as Prime Farmland Soils
-- No Data Given. No bedrock or water encountered to survey depth.

Table A-19: Summary of Rare, Threatened and Endangered Species Along Mount Hope Overhead Variation

Species (Scientific Name)	Species (Common Name)	Status*	General Location Reported in NDDB and Habitat Type
Erynnis horatius	Horace's duskywing	SCC	Mansfield and Chaplin, Open woodlands and edges
Eremophila alpestris	Horned lark	SE	Mansfield, Open areas with little cover
Ammodramus savannarum	Grasshopper sparrow	SE	Mansfield, Grasslands, pastures and old fields
Callophryus irus	Frosted elfin	ST	Mansfield, Chaplin and Brooklyn, xeric and open disturbance-dependent habitats on sandy soil
Erynnis brizo	Sleepy duskywind	ST	Mansfield, Barrens and areas with poor, thin or well drained (often sandy) soils
Falco sparverius	American kestrel	ST	Mansfield, Grassland or shrubland at the edge of forest; requires cavities for nesting
Zale oblique	Noctuid moth	SCC	Mansfield, pitch pine-scrub oak barrans
Zanclognatha martha	Pine Barrens Noctuid moth	SCC	Mansfield, pitch pine-scrub oak barrans
Heterodon platirhinos	Eastern hognose snake	SCC	Mansfield, Sandy, wooded areas
Gyraulus circumstriatus	Aquatic snail	SCC	Mansfield, Fresh, clear water
Lepipolys perscripta	Scribbled sallow	SCC	Mansfield, disturbed areas with sandy soil
Apamea burgessi	Noctuid moth	SCC	Mansfield, Hampton, xeric, sandy areas
Chaetaglaea cerata	Noctuid moth	SCC	Mansfield, pitch pine-scrub oak barrens on heathlands and sand plains
Eucoptocnemis fimbriaris	Noctuid moth	SCC	Mansfield, dry grassy or sandy fields with remnant pine barrens and scrub oak barrens
Shinia spinosae	Noctuid moth	SCC	Mansfield, associated with jointweed
Euchlaena madusaria	Shrub euchlaena	SCC	Mansfield, scrub oak shrubland
Passerculus sandwichensis	Savannah sparrow	SCC	Mansfield, Grassy fields with damp soils
Sturnella magna	Eastern Meadowlark	SCC	Mansfield, Large, grassy fields

Source: CT DEP, February 25, 2008 correspondence to Donald Biondi, Northeast Utilities.
*Key: SSC=State Species of Special Concern, ST=State Threatened, SE=State Endangered

Tables for the Mount Hope Underground Variation

Table A-20: General Soil Characteristics Along the Mount Hope Underground Variation

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
3 Ridgebury, Leicester, Whitman	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	Yes	12-30	0.0-1.5
13* Walpole sandy loam	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
15 Scarboro muck	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
32A** Haven and Enfield soils, 0 to 3 percent slopes	coarse-loamy and coarse-silty eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss,	No	--	--
34B** Merrimac sandy loam, 3 to 8 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
38C* Hinckley gravelly sandy loam, 3 to 15 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
38E Hinckley gravelly sandy loam, 15 to 45 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
46B Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
62D Canton and Charlton, 15 to 35 percent slopes, extremely stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
85C Paxton and Montauk fine sandy loam, 8 to 15 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5

Source: USDA Natural Resources Conservation Service, Online Soil Surveys and Geographic Data of New London, Tolland counties, and Windham Counties, 2007
* Soils classified as Farmland Soils of Statewide Importance
** Soils classified as Prime Farmland Soils
-- No Data Given. No bedrock or water encountered to survey depth

Table A-21: Wetlands in Proximity to the Mount Hope Underground Variation

Wetland No[12].	Municipality	Wetland Class[13]	Comments
A99	Mansfield	PSS1E/PFO1E	May provide amphibian breeding habitat
A98	Mansfield	PEME/POWH	Potential amphibian breeding habitat
A95	Mansfield	POWH	
A94	Mansfield	PEME/PSS1E	Associated with Echo Lake wetlands complex. Potential amphibian breeding habitat present.

Tables for the Brooklyn Overhead Variation

Table A-22: Soil Characteristics Along the Brooklyn Overhead Variation

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
13* Walpole sandy loam	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
15 Scarboro muck	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
32A** Haven and Enfield soils, 0 to 3 percent slopes	coarse-loamy and coarse-silty eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss,	No	--	--
38E Hinckley gravelly sandy loam, 15 to 45 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--

Source USDA Natural Resources Conservation Service, Online Soil Surveys and Geographic Data of New London, Tolland counties, and Windham Counties, 2007
* Soils classified as Farmland Soils of Statewide Importance
** Soils classified as Prime Farmland Soils
-- No Data Given. No bedrock or water encountered to survey depth.

[12] Wetland No. refers to the number generated during the 2004 field surveys to identify wetlands in and adjacent to the Project corridor. This Wetland No. is keyed to those displayed on the Volume 5 maps.
[13] Wetlands classified according to Cowardin et al 1979; PEM = Palustrine Emergent Wetland; PFO = Palustrine Forested Wetland; PSS = Palustrine Scrub-Shrub Wetland.

Table A-23: Watercourses Along the Brooklyn Overhead Variation

Name	Water Quality	Town
White Brook	A	Brooklyn
Barrett Ledge Brook	A	Promfret
White Brook	B/A	Pomfret

Source: CT DEP, Bureau of Water Management, Surface Water Quality Classifications GIS Datalayer, May 2002

Tables for the Brooklyn Underground Variation

Table A-24: General Soil Characteristics Along the Brooklyn Underground Variation

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
13* Walpole sandy loam	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
15 Scarboro muck	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	Yes	--	0.0-1.0
23A** Sudbury sandy loam, 0 to 5 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss, and coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	1.5-3.0
38C* Hinckley gravelly sandy loam, 3 to 15 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
50A** Sutton fine sandy loam, 0 to 3 percent slopes	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
50B** Sutton fine sandy loam, 3 to 8 percent slopes	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
61B Canton and Charlton, 3 to 8 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
62C Canton and Charlton, 3 to 15 percent slopes, extremely stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
73C Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	20-40	--

Source: USDA Natural Resources Conservation Service, Online Soil Surveys and Geographic Data of New London, Tolland counties, and Windham Counties, 2007
* Soils classified as Farmland Soils of Statewide Importance
** Soils classified as Prime Farmland Soils
-- No Data Given. No bedrock or water encountered to survey depth.

Table A-25: Wetlands in Proximity to the Brooklyn Underground Variation

Wetland No[14].	Municipality	Wetland Class[15]	Comments
C12	Brooklyn	PEM/PUB	Potential amphibian breeding habitat Potential vernal pool
C13	Brooklyn	PFO	Potential amphibian breeding habitat
C101	Brooklyn	PEM1/PSS2	
C102	Brooklyn	PFO1	

Table A-26: Watercourses in Proximity to Brooklyn Underground Variation

Stream Name	Municipality	Water Quality Classification
Creamery Brook	Brooklyn	A
Intermittent Tributary to Quinebaug River	Brooklyn	A

Source: CT DEP, Bureau of Water Management, Surface Water Quality Classifications GIS Datalayer, May 2002

Tables for the Putnam North Overhead Variation

Table A-27: General Soil Characteristics Along the Putnam North Overhead Variation

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
3 Ridgebury, Leicester, Whitman	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	Yes	12-30	0.0-1.5
18 Catden and Freetown soils	woody organic material	Yes	--	0.0-1.0
38C* Hinckley gravelly sandy loam, 3 to 15 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
51B Sutton sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
52C Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5

[14] Wetland No. refers to the number generated during the 2004 field surveys to identify wetlands in and adjacent to the Project corridor. This Wetland No. is keyed to those displayed on the Volume 5 maps.

[15] Wetlands classified according to Cowardin et al 1979; PEM = Palustrine Emergent Wetland; PFO = Palustrine Forested Wetland; PSS = Palustrine Scrub-Shrub Wetland.

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
61B Canton and Charlton, 3 to 8 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
61C Canton and Charlton, 8 to 15 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
73C Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	20-40	--
73E Charlton-Chatfield complex, 15 to 45 percent slopes, very rocky	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	20-40	--

Source: USDA Natural Resources Conservation Service, Online Soil Surveys and Geographic Data of New London, Tolland counties, and Windham Counties, 2007
* Soils classified as Farmland Soils of Statewide Importance
-- No Data Given. No bedrock or water encountered to survey depth.

Tables for the Putnam North Underground Variation

Table A-28: Soil Characteristics Along the Putnam North Underground Variation

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
17 Timakwa and Natchaug	woody organic material over sandy and gravelly glaciofluvial deposits, and woody organic material over loamy alluvium and/or loamy glaciofluvial deposits and/or loamy till	Yes	--	0.0-1.0
23A** Sudbury sandy loam, 0 to 5 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss, and coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	1.5-3.0
34A** Merrimac sandy loam, 0 to 3 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
34B** Merrimac sandy loam, 3 to 8 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--

Soil Map Unit Name and Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to Water Table (feet)
38C* Hinckley gravelly sandy loam, 3 to 15 percent slopes	sandy and gravelly glaciofluvial deposits derived from granite and/or schist and/or gneiss	No	--	--
46B Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
47C Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
51B Sutton sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
52C Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
61B Canton and Charlton, 3 to 8 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
61C Canton and Charlton, 8 to 15 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
62C Canton and Charlton, 3 to 15 percent slopes, extremely stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
73C Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	20-40	--
108 Saco silt loam	coarse-silty alluvium	Yes	--	0.0-0.5
305 Udorthents-pits complex, gravelly	gravelly outwash	No	--	2.0-4.5
306 Udorthents-Urban land complex	drift	No	--	4.5->6.0

Source: USDA Natural Resources Conservation Service, Online Soil Survey and Geographic Data of New London, Tolland countries, and Windham Counties, 2007
* Soils classified as Farmland Soils of Statewide Importance
** Soils classified as Prime Farmland Soils
-- No Data Given. No bedrock or water encountered to survey depth.

Table A-29: Watercourses Along the Putnam North Underground Variation

Name	Water Quality	Town
Tributary to Munson Brook	A	Putnam
Munson Brook	A	Putnam
Fivemile River	A	Putnam
Tributary to Fivemile River	A	Putnam
Teft Brook (crossed 3 times)	A	Putnam

Source: CT DEP, Bureau of Water Management, Surface Water Quality Classification GIS Datalayer, May 2002

Tables for 310 Line Loop

Table A-30: General Soil Characteristics Along the 310 Line Loop

Map Unit Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to water Table (feet)
3 Ridgebury, Leicester, Whitman	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	Yes	12-30	0.0-1.5
17 Timakwa and Natchaug	woody organic material over sandy and gravelly glaciofluvial deposits, and woody organic material over loamy alluvium and/or loamy glaciofluvial deposits and/or loamy till	Yes	--	0.0-1.0
46B Woodbridge fine sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
47C Woodbridge fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy lodgment till derived from granite and/or schist and/or gneiss	No	20-40	1.5-2.5
52C Sutton fine sandy loam, 2 to 15 percent slopes, extremely stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	--	1.5-2.5
61B Canton and Charlton, 3 to 8 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
61C Canton and Charlton, 8 to 15 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
62D Canton and Charlton, 15 to 35 percent slopes, extremely stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	--	--
84D Paxton and Montauk fine sandy loam, 15 to 25 percent slopes	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
85B Paxton and Montauk fine sandy loam, 3 to 8 percent slopes, very stony	coarse-loamy lodgment till derived from granite and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from gneiss and/or coarse-loamy lodgment till derived from granite	No	20-40	1.5-2.5
307	This is a miscellaneous area			

USDA Natural Resources Conservation Service, Online Soil Survey and Geographic Data of New London, Tolland countries, and Windham Counties, 2007
-- No Data Given. No bedrock or water encountered to survey depth.

Table A-31: Delineated Wetlands Along the 310 Line Loop

Wetland No[16]	Municipality	Wetland Class[17]	Comments
W21-13	Lebanon	PSS/PFO	Continues off ROW Potential vernal pool/amphibian breeding habitat
W21-12	Lebanon	PEM	Continues off ROW
W21-11	Lebanon	PSS	Continues off ROW Potential vernal pool/amphibian breeding habitat
W21-10	Lebanon	PEM	Isolated
W21-9	Lebanon	PFO	Continues off ROW
W21-8	Lebanon	PFO/PSS	Continues off ROW
W21-7	Lebanon	PFO	Continues off ROW
W21-6	Lebanon	PSS	Isolated
W21-5	Lebanon	PSS/PFO	Continues off ROW
W21-4	Lebanon	PEM/PSS	Isolated
W21-3	Lebanon	PEM/PSS	Continues off ROW
W21-2	Lebanon	PSS	Continues off ROW
W21-1	Lebanon	PEM/PFO	Continues off ROW
W21-14	Lebanon	PFO	Continues off ROW
W21-16	Lebanon	PFO	Continues off ROW
W21-15	Lebanon	PFO	Continues off ROW

Source: Wetland and Watercourse Report, Loop of the Manchester to Millstone Line into Card Street Substation. ENSR 2008.

Table A-32: Soil Types: Card Street Substation

Map Unit Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to water Table (feet)
17 Timakwa and Natchaug	woody organic material over sandy and gravelly glaciofluvial deposits, and woody organic material over loamy alluvium and/or loamy glaciofluvial deposits and/or loamy till	Yes	--	0.0-1.0
51B Sutton sandy loam, 2 to 8 percent slopes, very stony	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	No	1.5-2.5
61B Canton and Charlton, 3 to 8 percent slopes, very stony	coarse-loamy over sandy and gravelly melt-out till derived from granite and/or schist and/or gneiss	No	No	--

[16] Wetland No. refers to the number generated during 2008 field surveys to identify wetlands in and adjacent to the Project corridor. This Wetland No. is keyed to those displayed on the Volume 5 maps.

[17] Wetlands classified according to Cowardin et al 1979; PEM = Palustrine Emergent Wetland; PFO = Palustrine Forested Wetland; PSS = Palustrine Scrub-Shrub Wetland.

Map Unit Symbol	Parent Material	Hydric Soil	Depth to Bedrock (inches)	Depth to water Table (feet)
73C Charlton-Chatfield complex, 3 to 15 percent slopes, very rocky	coarse-loamy melt-out till derived from granite and/or schist and/or gneiss	No	20-40	--
307 Urban Land	This is a miscellaneous area			

USDA Natural Resources Conservation Service, Online Soil Survey and Geographic Data of New London, Tolland countries, and Windham Counties, 2007
-- No Data Given. No bedrock or water encountered to survey depth.

Table A-33: Delineated Wetlands within 200 Feet of the Card Street Substation

Wetland No[18].	Municipality	Wetland Class[19]	Comment
W21-15	Lebanon	PSS	Continues off ROW
W21-16	Lebanon	PFO	Continues off ROW
W21-14	Lebanon	PFO	Continues off ROW

Source: Wetland and Watercource Report, Loop of the Manchester to Millstone Line into Card Street Substation. ENSR 2008.

[18] Wetland No. refers to the number generated during 2008 field surveys to identify wetlands in and adjacent to the Project corridor. This Wetland No. is keyed to those displayed on the Volume 5 maps.
[19] Wetlands classified according to Cowardin et al 1979; PEM = Palustrine Emergent Wetland; PFO = Palustrine Forested Wetland; PSS = Palustrine Scrub-Shrub Wetland.