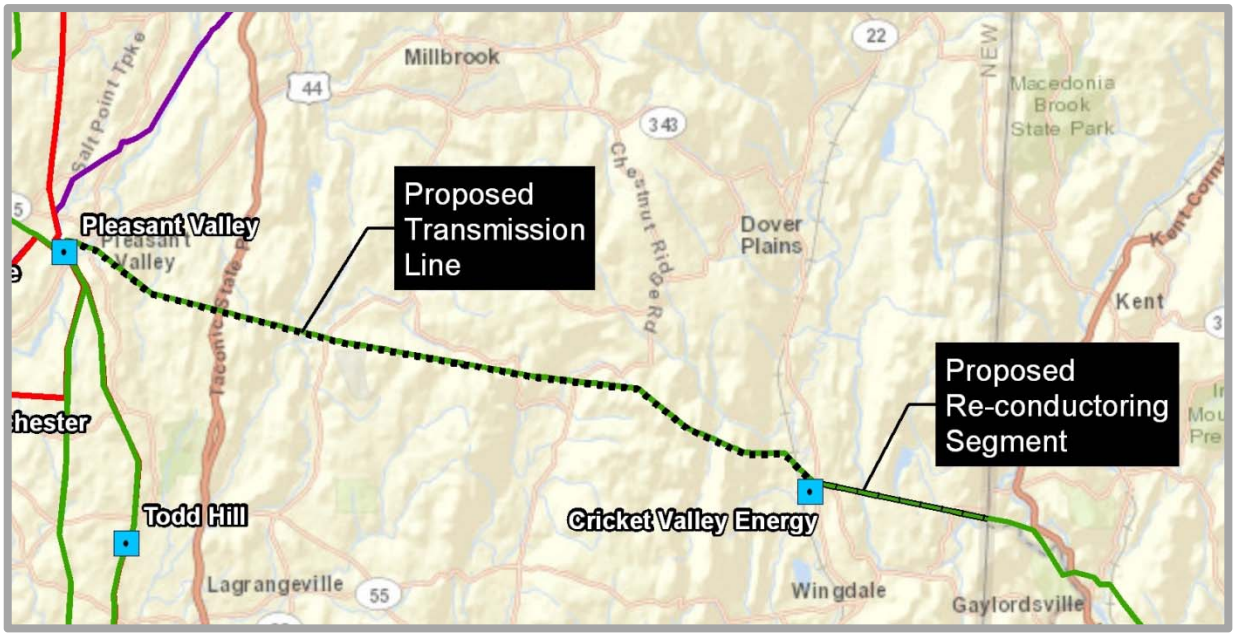
Cricket Valley Energy

Cricket Valley Transmission Line and Re-conductoring Project

Volume 2: Additional Exhibits



New York Public Service Commission - Article VII Application

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EXHIBIT 4 ENVIRONMENTAL IMPACTS

This Exhibit addresses the requirements of 16 NYCRR §86.5.

4.1 Introduction

Cricket Valley Energy Center, LLC ("Cricket Valley") is proposing to: (1) develop a new approximately 14.6-mile 345 kilovolt "(kV") transmission line parallel to the existing Consolidated Edison Company of New York, Inc.'s ("Con Edison") 345 kV Transmission Line 398 ("Line 398") from the planned Cricket Valley switchyard (the "Cricket Valley Switchyard") in the town of Dover, New York to Con Edison's Pleasant Valley Substation in the town of Pleasant Valley, New York (the "Transmission Line"); and (2) re-conductor an approximately 3.4-mile segment of the existing 345 kV Transmission Line 398 in the town of Dover between the Cricket Valley Switchyard and the New York-Connecticut state line (the "Re-conductoring Segment") (collectively the "Project").

The Project will also include improvements to Consolidated Edison's Pleasant Valley Substation. New protection and communication system upgrades will be required within the existing control buildings at the Pleasant Valley Substation.

The Project right-of-way crosses through the towns of Dover, Union Vale, LaGrange, and Pleasant Valley, all located in Dutchess County, New York.

The Project will be designed, constructed and operated in a manner that avoids or minimizes impacts to environmental resources within Dutchess County, New York.

Field investigations, literature reviews, and agency consultations were conducted to identify and assess existing environmental conditions within the Project area. This Exhibit summarizes the results of environmental impact studies prepared by Cricket Valley under the following categories:

- Land Uses;
- Aesthetic, Visual and Recreational Resources;
- Cultural Resources;
- Terrestrial Ecology and Wetlands;
- Topography and Soils;
- Water Resources;
- Noise; and
- Electric and Magnetic Fields ("EMF").

The impact studies describe existing conditions, methodologies used in the investigation, the anticipated environmental effects of the transmission facilities and, where appropriate, recommended mitigation measures to avoid or minimize any adverse impacts.

4.2 Project Description

On September 26, 2012, the New York State Department of Environmental Conservation ("NYSDEC") completed its review for Cricket Valley's proposed combined cycle, natural gas-powered 1,000 megawatt ("MW") electric generating facility in Dover, New York (the "Generation Facility") and the Cricket Valley Switchyard – the Generation Facility's point of interconnection to the New York Independent System Operator ("NYISO")-administered grid.

The NYSDEC approval process included findings under the State Environmental Quality Review Act ("SEQR") (SEQR Findings Statement, dated September 26, 2012) and final Air, Wetland and Water Quality permits. NYSDEC permits required to construct and operate the Facility include a State Air Facility Permit, an New York Environmental Conservation Law ("NYECL") Article 24 Freshwater Wetlands Permit, a 401 Water Quality Certificate, and the SPDES Stormwater General Permit for Construction Activities. The NYSDEC found that the Generation Facility and the Cricket Valley Switchyard avoided, or minimized to the maximum extent practicable, predictable environmental impacts.

On February 14, 2013, the New York State Public Service Commission ("PSC" or "Commission") issued an Order, granting the Generation Facility a Certificate of Public Convenience and Necessity ("CPCN"). The Commission found that the Generation Facility would serve the public interest and that environmental impacts would be avoided, or minimized to the maximum extent practicable, and issued its own SEQR Findings Statement.

As outlined in more detail in Exhibit E-4, during the 2011 Class Year study process for Generation Facility, NYISO determined that the Transmission Line and Re-conductoring Segment are System Upgrade Facilities ("SUFs") required to allow the Generation Facility to interconnect with the grid without adversely impacting the reliability, stability, operability or transfer limits of the system.

4.2.1 New 345 kV Transmission Line Construction

The new 345 kV Transmission Line includes the construction of 14.6 miles of overhead line along an existing electric transmission line corridor. The new circuit will be constructed of steel monopole structures with bundled 795 Aluminum Conductor Steel Supported ("ACSS") Mallard conductors, a single 7 #5 Shield wire and a single AFL AlumaCore Optical Ground Wire ("OPGW") AC-102/691 wire cable with 72 fibers.

Line and structure constructability is significantly affected by both steep terrain and by hard shallow rock. Selective use of air-crane helicopters to erect the steel monopoles will facilitate tower construction in areas with steep terrain and difficult accessibility. Air-crane helicopter usage will be required for approximately 20 structures and may be economically and environmentally beneficial for other structures. Rock anchor foundations or rock micropile foundations are anticipated for the majority of the structures. However, concrete foundations may also be used. Final foundation designs will be presented in the Environmental Management and Construction Plan ("EM&CP").

Construction of the Project will entail several distinct activities that will typically progress in a linear manner from one end of the circuit to the other. These general construction phases consist of:

- Clearing;
- Access Road Construction;
- Laydown and Staging Areas;
- Structure Erection;
- Stringing of Conductors; and
- Clean-up and Restoration.

4.2.1.1 Clearing

As the Project is located within the existing Con Edison Line 398 right-of-way which has been largely cleared of tall woody vegetation in the past, limited tree clearing activities are anticipated. Approximately 53 acres of tree clearing are anticipated to be necessary along the southern edge of the existing right-of-way to support necessary clearance distances from the Transmission Line. Section 4.6.1 of this application provides detail on the nature and extent of vegetation clearing expected to be completed in support of the Project.

Selective vegetation clearing practices will be employed along much of the right-of-way; however, non-selective (general) vegetation clearing practices will be employed in certain areas such as structure erection locations. At ecologically sensitive locations, such as wetlands and stream crossings, natural vegetation buffer strips will be maintained using selective tree cutting and trimming techniques. The amount of vegetation to be maintained within the buffer strip is dependent upon tree species composition and height, the flexibility of adjusting structure locations and the conductor height.

The actual widths of these buffer strips will be described in the EM&CP to be prepared for the Project. This information will be placed on the plan and profile drawings and will be used to locate transmission line support structures. Structures will be placed outside of buffer strips whenever possible.

During the right-of-way clearing, all merchantable wood will be salvaged in the form of logs, pulpwood, and/or wood chips. Non-merchantable wood and brush located in the selective and non-selective cleared areas of the right-of-way will be removed, chipped or piled where permitted by state and local regulations regarding such operations. Disposal of the wood on the right-of-way and management of clearing-related vegetation waste is proposed to be completed in accordance with the North American Electric Reliability Corporation ("NERC") Standard FAC-003-1 and the Overhead Transmission Right-of-Way Land & Vegetation Management Plan ("VMP") prepared by Con Edison, which is designed to comply with FAC-003-1. The Con Edison VMP is updated on a regular basis and submitted to the PSC for approval; right-of-way management will be completed following the Con Edison VMP currently in effect at the time of construction of the Project. Particular consideration will be afforded the handling and disposal of ash trees in accordance with the NYSDEC Emerald Ash Borer Management Response Plan (NYSDEC, January 12, 2011, version 6.0). Ash trees (*Fraxinus* spp.) were observed to be a dominant tree species adjacent to, but not within, the existing Line 398 right-of-way. Should ash trees need to be cut in association with Project construction, woody debris associated with ash tree clearing will be disposed of in the same general vicinity as the tree removal, and not transported off of the right-of-way.

4.2.1.2 Permanent Access Road Construction

Permanent access roads, if required, will be constructed to provide equipment and worker access to the supporting structure locations as well as support of future maintenance activities. Typically, new permanent access roads will extend from the existing permanent right-of-way access roads to new transmission tower locations to support construction and future access. Permanent access roads, as described below, will not be constructed within sensitive areas, such as wetlands or agricultural fields. Existing access roads associated with Con Edison's Line 398, as depicted on plans included in Exhibit 2 (see Figure 2-6), will be employed to the maximum degree practical to facilitate access to the Project right-of-way from local, state and public roadways and avoid unnecessary construction of new access roads. The construction of new permanent access roads would generally consist of the extension of the existing access roads to the new structure locations. Improvements to the existing access roads if required would generally consist of the application of crushed stone to produce stable and level roadway conditions and manage precipitation and runoff without causing erosion or mobilizing sediment that may affect wetlands and waterways.

4.2.1.3 Temporary Construction Access in Sensitive Environmental Areas

In various locations along the Project right-of-way, sensitive features such as wetlands, streams, agricultural fields, and areas of potential archaeological significance exist. In such areas, access to tower structure locations will be temporary, and completed without significantly altering existing topography through the use of construction matting or a suitable equivalent. To the extent practical, access pathways will be routed to avoid

environmentally sensitive features. Unavoidable impacts to wetlands or protected habitat are expected to be temporary, minor, and restored to approximate pre-construction conditions. Where applicable, a permit application to the US Army Corps of Engineers for potential impacts to jurisdictional wetlands will be filed under the applicable regulatory program in 2014, as described in Exhibit 8, Other Pending Filings.

The Project will employ a variety of techniques to reduce unavoidable environmental impacts associated with temporary construction access, described here and further detailed in future regulatory filings, including the EM&CP. Mitigation measures include use of air-crane helicopters during select support structure erection activities to reduce use of access roads through environmentally sensitive areas. Temporary pathways for ground access to transmission structures through sensitive areas will be developed using construction matting, or similar removable ground protection measures. Limited removal of woody vegetation may be required prior to placement of construction mats, however grounds disturbed by temporary access pathway preparation and removal will be restored to approximate pre-construction contours and will be stabilized with a seed mix comprised of quick growing native grasses.

The construction of new permanent access roads and temporary access pathways, the use of existing access roads, and the control of erosion and sedimentation during construction of the Project will be conducted in accordance with the EM&CP to be submitted for the Project. Erosion control guidelines will be designed to improve, maintain and protect the soil and water resources located within the Transmission Line right-of-way during and immediately following the construction activity. These guidelines will include, but not be limited to, consideration of the following: timing of construction; accessibility; movement of construction traffic within the Project right-of-way at stream crossings; and heavy equipment operation.

4.2.1.4 Laydown and Staging Areas

During construction of the Project, it is expected to be necessary to establish and use off-site areas that will serve as locations for construction-related facilities such as:

- Office trailers;
- Personnel parking, portable sanitary facilities, and telephones;
- Material, equipment and vehicle storage;
- Helicopter parking, refueling, and maintenance area at the Sky Acres Airport and other locations as needed;
- Structure storage and assembly; and
- Minor equipment and vehicle maintenance.

These areas, referred to as construction laydown and staging areas, will typically be located along the proposed route. Several construction laydown and staging areas may be required. Although they will not typically be within the Line 398 right-of-way, the laydown and staging areas will generally be located adjacent to an existing road or near the route, and to the extent practical will be located upon previously developed lands. These areas will be located to avoid environmentally sensitive features including wetlands, known archaeological sites, and sensitive habitats.

A single primary laydown and staging area of up to 20 acres will be used for material storage and assembly. Several additional support laydown and staging areas of 2-3 acres will be required and if possible will be located near a paved road. They will serve as storage yards for materials such as poles, hardware and conductors, and support for helicopter operations. Establishment of these areas may require vegetation clearing, removal and stockpiling of topsoil, site grading, spreading of gravel cover, and fencing. Upon completion of construction activities, these areas will be restored to pre-construction conditions.

Use of an air-crane requires that particular features are present in staging areas, including adequate space, appropriate level topography, few structures at working height nearby, and proximity to fueling and maintenance facilities. The Sky Acres airport in Union Vale is proposed as a primary location for staging and operations supporting air-crane use, though additional staging areas suitable for air-crane use will be employed and fully described in the EM&CP for review and approval prior to their establishment.

4.2.1.5 Structure Erection

Construction of new transmission towers in upland areas not designated as sensitive habitats will be completed within an approximately 100' by 100' gravel-surfaced construction pad built to support tower erection activities. In sensitive areas, structures will be assembled in pre-determined assembly areas before being brought to installation locations by air-crane helicopters, thus minimizing land disturbances. Rock anchor foundations or rock micropile foundations will be used when conditions allow; this may minimize environmental impact associated with foundation construction. Construction pads to be created within potentially sensitive habitats will be reduced in size to the minimum area needed to support ground-based construction activities.

Pre-construction planning and work site layout will be conducted to ensure that appropriate environmental standards are met. Activities requiring coordination include designation of vegetation buffer strips, access road location, location of tree and brush disposal sites, location of structure foundations, location of structure assembly sites, location of conductor pulling sites, and layout of the grounding system. Advance planning during this phase will assure that tree cutting and brush disposal are properly conducted, equipment operation

and construction activities are limited to designated areas, the appropriate erosion control measures are applied, and tree marking and clearing or selective cutting precedes structure placement.

Where possible, Transmission Line structures will be located at least 100 feet from road crossings, as well as streams, rivers and other major bodies of water to facilitate the establishment of vegetative buffer strips at these locations. To the extent practical, transmission line structures will not be located within identified archaeological sites or other sites sensitive to disturbance, such as wetlands or locations supporting rare plants or animals.

Structures have been sited to avoid wetland areas wherever possible. Based on the preliminary design, no Transmission Line structures will be located within wetland areas. Upon completion of final detailed engineering design, if it is necessary to place structures within the limits of a wetland or NYSDEC-regulated Adjacent Area, care will be taken to protect the wetland during site preparation. Access through wetlands, when necessary, will be completed using established access roads or through the use of construction matting that will be removed to allow restoration of the disturbed areas following construction. Access to sensitive areas will be completed via existing access roads, with improvements generally limited to placement of gravel to level and stabilize existing access roads. Wood construction matting will be employed at wetland crossings. These temporary features would be removed after construction is complete, minimizing impacts to wetlands. Water from foundation excavations, if any, will be pumped to hay bale settling basins or discharged onto vegetated areas outside of wetlands to remove suspended sediment before being allowed to return to wetlands. Excess concrete from foundation installation will also be disposed of in designated waste concrete collection locations outside of wetland and wetland buffer areas.

4.2.1.6 Stringing of Conductors

After structures are assembled and erected, aerial ground wires and conductors (wires) will be either strung using helicopters, or completed on foot using a lead line that can be walked through wooded areas, wetlands and vegetative buffer strips with minimum disruption. Wire pulling and tensioning equipment will be set up at the start and finish of each wire pull for those areas where stringing will be completed on the ground. Setup locations for wire pulling are chosen for ease of access and to avoid environmentally sensitive locations, where feasible. Conductors will be pulled through stringing blocks using pulling and tensioning equipment. During the stringing operation, temporary guard structures will be placed at all crossings of roads, highways, hiking trails and existing utility lines to ensure public safety and the continued operation of other utility equipment.

4.2.1.7 Clean-up and Restoration

Clean-up activities include removal of all equipment and construction debris from the right-of-way. Restoration activities will vary depending on the environmental resources specific to a particular section of right-of-way and could include removal of access roads at stream or wetland crossings, seeding and mulching, and removal of timber matting used to prevent impacts to agricultural land.

Sites requiring restoration as a result of the construction work will be restored in accordance with the EM&CP prepared for the Project. This work may include re-grading, repair of stream banks, restoration of wetlands, temporary and permanent seeding and mulching for erosion control, and tree and shrub plantings in vegetative buffer strips. All permanent seeding and tree and shrub planting work will be conducted during appropriate seasons based upon species being installed.

4.2.2 Existing 345 kV Transmission Line Re-conductoring

The Re-conductoring Segment of the Project includes constructing a new three phase, single circuit line from the proposed Cricket Valley Switchyard to existing Line 398 structure L-60 (Figure 2-2), and re-conductoring and reinforcing the existing Line 398 from structure L-60 to the Connecticut border (structure L-76). Support structures would include new steel monopoles for the new line from the Cricket Valley Switchyard up to and including structure L-60, a steel lattice structure to be replaced with a steel monopole. The existing single-circuit Line 398 lattice towers from structure L-61 to structure L-76 would be used for the re-conductoring of the existing Line 398. Activities associated with the construction of the new single circuit line from the Cricket Valley Switchyard to structure L-60 will be constructed in the same manner as the remainder of the transmission line. As re-conductoring efforts between structures L-61 and L-76 would occur on existing support structures, only minor ground disturbance will be required and vegetation clearing is not anticipated. Access to these structures would be made from existing access roads improved as needed for use, typically through application of crushed stone, and land impacts associated with construction of new access roads are not anticipated. Structure L-65 is expected to undergo structural reinforcement prior to use and several other structures are under consideration for rock anchor reinforcement, which requires minimal land disturbance.

4.2.3 Pleasant Valley Substation Modification

Proposed modifications to the Pleasant Valley Substation will occur within the existing fence line of the substation. Activities associated with this effort would be limited to previously disturbed or developed areas. Additional ground disturbance activities or vegetation clearing are not anticipated during the completion of this portion of the Transmission Line.

4.3 Land Use

This section examines the existing land uses traversed by, directly affected by, and surrounding the Project based on review of local comprehensive plans, publicly available geospatial data, and in-field observation. The use of an existing electric transmission right-of-way and substation will substantially reduce the Project's impact on land use as compared to development of new facilities that require development of a new right-of-way, and will increase its compatibility with existing land uses in the region.

Local land use planning and policies, including comprehensive plans and zoning districts, help to guide routing, locations, and configuration of the proposed circuits to promote compatibility with existing and future land use.

4.3.1 Existing Land Use and Planning

Land uses adjacent to the proposed new and existing Project facilities were identified from several sources including aerial photography based figures provided in Exhibit 2 of this document, various public mapping resources including U.S Geological Survey ("USGS") 1:24,000 scale quadrangle maps and the Town Comprehensive and Master Plans developed by Dutchess County and the towns of Pleasant Valley, LaGrange, Union Vale, and Dover.

4.3.1.1 Dutchess County

The entirety of the Project will be located in Dutchess County. Dutchess County borders the Hudson River to the west and Connecticut to the east. In general, Dutchess County is characterized by low density residential development and agricultural uses with population centers in the cities of Poughkeepsie and Beacon, both of which are located along the Hudson River.

Dutchess County, together with the City of Poughkeepsie, developed the 2013-2017 Dutchess County and City of Poughkeepsie Consolidated Plan that focuses on promoting a coordinated approach to housing and community needs. The plan recognizes the need for utility infrastructure improvements, which will be supported by the Project (Dutchess County, 2013a).

4.3.1.2 Town of Pleasant Valley

A section of the Transmission Line and modification of the Pleasant Valley Substation are located in the Town of Pleasant Valley. These Project facilities are located within the existing Con Edison Line 398 right-of-way in the southwestern portion of the Town in areas of medium and high density residential and rural agricultural land uses. The Town is generally characterized by hamlets, suburban areas, and rural countryside. Residents value

the rural character of the Town and consider the protection of farmlands, natural areas, scenic vistas, and important wildlife habitats to be top priorities (Town of Pleasant Valley, 2013).

The Town of Pleasant Valley Comprehensive Plan, adopted in 2009, identifies community facilities, public trails, scenic roads, and greenspace. The Hamlet of Pleasant Valley is just north of the Pleasant Valley Substation and contains several community facilities including Town Hall, a library, a fire and EMS station, and the Pleasant Valley Recreation Park. The proposed Transmission Line crosses through the 5.5-acre Pleasant Valley Recreation Park along the existing Line 398 right-of-way (Figure 2-4). The park provides access to Wappinger Creek, a canoe and kayak ramp, a pavilion, picnic tables, grills, a playground, a tennis court, a basketball court, and a lighted softball field. The Public Trails and Scenic Roads chapter of the Comprehensive Plan identifies a proposed public trail that crosses the existing electric transmission right-of-way at the Pleasant Valley Recreational Park as well as a proposed Scenic Road Segment that crosses the electric transmission right-of-way. The Project right-of-way, considered a major greenspace parcel itself, is located adjacent to seven major greenspace parcels of 25 acres or more. The Comprehensive Plan also identifies three agricultural exempt parcels adjacent to the Line 398 right-of-way and areas of state significant soils and prime agricultural soils overlapping with the Line 398 right-of-way. The majority of the agricultural exempt parcels, state significant soils, and prime agricultural soils are located in the northern half of the Town and not impacted by the Transmission Line (Town of Pleasant Valley, 2009).

4.3.1.3 Town of LaGrange

A section of the Transmission Line is proposed to be located within an existing Line 398 right-of-way in the northeastern corner of the Town of LaGrange in residential areas. The Town of LaGrange has a Comprehensive Plan developed in 2005 and designed to balance growth with conservation of natural resources. The existing Line 398 is not mapped as open space or green space in the Plan.

Within the Town of LaGrange, the Transmission Line crosses the Taconic Parkway in one location and is adjacent to parkland in a second location. The existing Line 398 right-of-way crosses the Taconic Parkway, which was designed to be aesthetically pleasing and is listed on the National Register of Historic Places ("NRHP") in recognition of its historic importance in the development of parkways. See Section 4.5, Cultural Resources, for more information on the significance of the Taconic Parkway. The existing right-of-way is adjacent to the 909-acre Taconic-Hereford Multiple Use Area that is located primarily in the Town of Pleasant Valley and a relatively small portion is located in the Town of LaGrange. The Taconic-Hereford Multiple Use Area has trails that are used for hiking, mountain biking, horseback riding, and cross country skiing (NYNJTC, 2013).

4.3.1.4 Town of Union Vale

A section of the new Transmission Line is located within the existing Line 398 right-of-way in the northern portion of the Town of Union Vale in medium and low density residential and rural areas. The existing Line 398 right-of-way is also adjacent to the Sky Acres Airport. According to the Town, Union Vale is generally characterized by its "sense of place, rural character, and quality of life" that the Town aims to preserve through regulatory controls and growth management (Town of Union Vale, 2013).

The key elements of the residential areas that the right-of-way crosses through, as identified in the Town of Union Vale Master Plan adopted in 2001, are its large lot pattern with sparse and intermittent small lots, viewsheds, varying topography, aquifer, limited wetland areas, some streams, and balance of forested areas and open pasture. The key elements of the rural areas that the right-of-way crosses, as identified in the Master Plan, are its large lot pattern, scattered wetlands, dramatic viewshed, natural features including varying topography, aquifer, wetlands, forested areas, pastures, streams and ponds, and historic residences, agricultural uses, and scattered development. Within these residential and rural areas, the Master Plan aims to preserve open space and viewsheds, adjust zoning to increase minimum lot sizes, promote architectural conformity of new buildings with old buildings, and limit slope cuts, ground disturbance, vegetation removal, and impacts to the aquifer. The Master Plan also states the Town of Union Vale's intent to continue the operation of the Sky Acres Airport (Town of Union Vale, 2001).

4.3.1.5 Town of Dover

A portion of the Transmission Line and Re-conductoring Segment will be located centrally through the Town of Dover. Project facilities will be in areas of low density residential, adjacent to offices and businesses, and will cross surface waters (see Section 4.8). The Town of Dover is characterized by its scenic, rural, and residential community that is attractive to families, businesses, and clean industry.

The Town of Dover Master Plan focuses on preserving open space and the Town's rural character, and restricting mining activities to appropriate locations. In the Master Plan, the Town identifies the scattered mix of land uses with little central focus as a potential problem for preserving its scenic qualities, natural features, and remaining rural character. Because the Master Plan was adopted by the Town of Dover of Planning Board in September 1993 and amended in April 1999, the existing conditions of the built environment and current community goals of the Town may differ from those identified in the Master Plan (Town of Dover 1993 and 2013).

4.3.2 New York State Open Space Conservation Plan

The 2009 New York State Open Space Conservation Plan contains recommendations to help local governments and non-profit organizations undertake open space planning at regional and community levels. The Plan focuses on four goals: responding to climate change, fostering green, healthy communities, connecting New Yorkers with nature and recreation, and safeguarding the state's natural and cultural heritage. New York's formal Open Space Conservation Program began in 1990 and focused on ensuring citizen input into land acquisition decisions made by the State. New York's current open space conservation goals as reflected in the 2009 Plan include protecting habitat for the diversity of plant and animal species, combating climate change by protecting New York's coastlines, riparian corridors, and wetlands, maintaining an interconnected network of protected lands and waters, protecting habitat to sustain the traditional pastimes of hunting, fishing, trapping, and wildlife viewing, and protecting and enhancing scenic, historic, and cultural resources. Committees led by the NYSDEC and involving citizen scientists, non-profit leaders, elected officials and government officials are working with the public to review the 2009 Plan and make new recommendations in a 2013 Open Space Conservation Plan Revision that is not yet available (NYDEC, 2013).

The Plan divides New York State into nine regions. The Project is entirely contained within Region 3/Lower Hudson Valley. Regional Priority Conservation Projects of Region 3 related to the Project are listed below.

- Great Swamp – Located partially in the Town of Dover, the Great Swamp is the largest and highest quality red maple hardwood swamp in southern New York. It contains critical habitat for bird and aquatic species, protects and purifies potable water supply, is an aquifer recharge area, reduces flooding, and provides educational and recreational opportunities. The 2009 Plan identifies the need to protect and conserve the Great Swamp and the surrounding uplands from further development and its associated runoff.
- Hudson River Greenway Trail Links - This project is part of the Hudson River Corridor Estuary / Greenway Trail / Quadricentennial Legacy Trail project. It aims to establish a continuous trail from New York City to Saratoga County with direct or visual access to the Hudson River and regional trails that link to riverside trails, such as the Dutchess County Greenway Trail.
- Taconic Ridge / Harlem Valley – The protection of the Taconic Mountain Ridge and its viewsheds are a high priority due to the region's high biodiversity, scenic views, recreational value, un-fragmented forestland, steep hillsides, unique geologic features, historic architecture, active agriculture, and connection opportunities to State, Federally, County, Town, and privately protected land.

- Turtle Conservation Sites – This project identifies wetlands and associated uplands scattered throughout Dutchess County that provide habitats for a high diversity of turtles.

Statewide Farm Protection – Farmland protection is a critical component to preserving open space and requires state and other funding sources. The Region 9 committee recommended the creation of a "farmland preservation board" in each Region to encourage municipal and regional collaboration on protecting farmland. The New York State Open Space Conservation Plan recognizes that energy production and distribution capacity are important to New York State and the Northeast as a whole (NYSDEC, 2009). Because the future planning for and siting of electrical generation and transmission facilities has the potential to affect open space, the plan supports the use of a statewide planning and siting process that takes into consideration the sustainable development of energy generation and transmission facilities.

4.3.3 Floodplains

Figure 4.3-1 illustrates the one percent annual chance (100-year) floodplains relative to the Project facilities. Floodplain mapping was derived from the Flood Insurance Rate Maps (FIRMs) published by the Federal Emergency Management Agency (FEMA). Flood hazard areas are determined by FEMA using statistical analysis of records reflecting river flow, storm tides, and rainfall as well as information obtained through consultation with the communities including floodplain topographic surveys and hydrological and hydraulic analysis. Typically, only drainage areas that are greater than one square mile are studied.

The Transmission Line traverses approximately 0.87 mile of land that FEMA has determined to be in the 100-year recurrence floodplain (approximately 0.78 miles along the Transmission Line and approximately 0.09 miles along the Re-conductoring Segment). Mapped 100 year floodplain exist within or nearby the Project right-of-way associated with Wappinger Creek, Pond Gut (stream), Willow Brook, Clove Brook, Coopertown Brook, Swamp River, and other unnamed surface water features.

The Project is unlikely to exacerbate flooding because the structure design is low profile and will not significantly increase impervious area within the right-of-way, and the Re-conductoring Segment and modification of the Pleasant Valley Substation will not create any additional impervious surfaces.

4.3.4 Agricultural Districts

Article 25-AA of the Agriculture and Markets Law authorizes the creation of local agricultural districts pursuant to landowner initiative, preliminary county review, state certification, and county adoption. These designations encourage improvements of agricultural land and the continued use of agricultural land for the production of food and other agricultural products. An important benefit of the Agricultural Districts Program is the

opportunity provided to farmland owners to receive real property assessments based on the value of their land for agricultural production rather than on its development value. The program is voluntary and provides benefits to landowners including agricultural tax assessments, special benefit assessment, protections against restrictive local laws, government acquisition or construction projects, and private nuisance suits. Dutchess County has established four Agricultural Districts to encourage the continued use of farmland for agricultural production and discourage the conversion of farmland to nonagricultural uses (Dutchess County, 2013b).

Several agricultural districts are located adjacent to the right-of-way as shown in Figure 4.3-1. One agricultural district, located near Wappinger Creek, is bisected by the proposed Transmission Line. The length of the crossing is approximately 0.07 miles. In addition to the agricultural lands included in mapped districts, other active and former agricultural lands are crossed by the Project, as shown on aerial-photo based plans presented in Figure 4.3-1 and quantified in acres along with other land use cover types in Table 4.6-1. This includes active agricultural lands located between Waterbury Hill Road and Clove Road in Union Vale, and to a lesser extend to the north of South Ave in Pleasant Valley and east of Old State Route 22 in Dover. Permanent alteration to these agricultural lands would be limited to installation of structure foundations.

Access roads through agricultural areas will be temporary and will typically be located on construction mats. In limited areas, crushed stone over geotextile fabric may be employed if required. For temporary stone access pathways, topsoil will be removed and segregated in a windrow to one side of the access road. Geotextile fabric will be placed on the subsoil and then overlain with crushed stone. After construction the stone and geotextile fabric will be removed and the subsoil will be knifed to elevate compaction. After the topsoil has been replaced, the area will be restored with a seed mix approved by the landowner and New York Ag and Markets and stabilized with straw mulch.

4.3.5 Environmental Effects and Mitigation

All construction activities will occur within established roadways, access roads within upland locations, and temporary access pathways within sensitive areas within the Transmission Line right-of-way and the Pleasant Valley Substation. Indirect impacts may occur to land uses surrounding the right-of-way from temporary and short-term roadway lane closures (see Exhibit E-6), noise (see Section 4.9 of this Exhibit), and views of construction activities.

Impacts to land use during operation of the Project are largely avoided because Project facilities will be sited within existing electric transmission facilities including the Pleasant Valley Substation and the existing Line 398 electric transmission right-of-way.

Mitigation associated with land use impacts is limited to the construction phase controls to be described in the EM&CP, such as dust and noise control, construction traffic management, and the restoration of certain lands, such as wetland and agricultural fields, following construction.

4.4 Visual Resources

In accordance with PSL §122(1)(c) and 16 NYCRR §86.5(b)(2)(i)-(ii), and (8), this section includes a study of the visual and aesthetic impacts resulting from the construction and operation of the Project. The study examines the existing visual resources potentially affected within a three mile radius of the Project based. This analysis will determine whether the Project "avoids scenic, recreational and historic areas," and whether the right-of-way has been, "routed to minimize its visibility from areas of public view."

4.4.1 Existing Landscape Quality

The Project facilities are located entirely within Dutchess County in the southeastern portion of New York State. The Project makes use of the existing Line 398 electric transmission right-of-way, which will minimize visual impacts and disturbance to the surrounding built-up and natural environments. The landscape surrounding the Project area predominantly contains rural and suburban development and agricultural land.

The Project is located in the towns of Pleasant Valley, LaGrange, Union Vale, and Dover within the existing Line 398 right-of-way. The western end of the Project right-of-way is located just south of the Hamlet of Pleasant Valley and crosses through the Pleasant Valley Recreation Park. The right-of-way also crosses the Taconic Parkway in the Town of LaGrange. The existing landscape along the remainder of the Project right-of-way is rural and agricultural with interspersed suburban development. As discussed in the following sections, indirect impacts to visual resources will occur during construction and operation of the Project.

Re-conductoring of existing Line 398, as it relates to this Application, will occur entirely within the Town of Dover. Line 398 crosses a small lake named Ellis Pond. Overall, the existing landscape surrounding the existing Line 398 right-of-way is rural with interspersed suburban development and agricultural land. Because Re-conductoring Segment will not require new transmission towers, short-term and temporary impacts to visual resources will occur during construction and no impacts to visual resources will occur during operation of the proposed Project.

Modification of the existing Pleasant Valley Substation will occur entirely within the Town of Pleasant Valley just south of the existing Hamlet of Pleasant Valley in a suburban area of the Town. Because modification of the Pleasant Valley Substation will occur entirely within

Bay 2 of the existing substation, short-term and temporary impacts to visual resources will occur during construction and no impacts to visual resources will occur during operation of the Project.

4.4.1.1 Visual Resource Inventory

Visual resources are landscape areas and features that are significant because of their inherent visual quality or cultural significance, including:

- Natural features which create a landscape of high visual/aesthetic quality;
- Manmade features which create a landscape of high visual/aesthetic quality;
- Designated recreational and scenic areas; and
- Landscapes that demonstrate a historic significance.

An initial inventory of aesthetic resources of statewide significance was conducted for the Project area studied (a three-mile radius surrounding the Project) to identify resources that would warrant specific consideration in terms of potential visual impacts. The specific categories of aesthetic resources of statewide significance pursuant to the NYSDEC Policy on Assessing and Mitigating Visual Impacts are shown on Figure 2-5. These figures identify the locations of known historic or scenic areas and parks within three miles of the Project. These resources are also listed in Table 4.4-1. Thirty-three (33) visual, recreational and historic resources were identified within the Project area. These included 12 County, Municipal and Local Parks, Trails and Recreation Areas; 4 State Lands; 1 National Recreational Trail, and 16 Historic Resources. It should be noted that two of the State lands (James Baird State Park and Taconic State Pkwy) are also listed as Historic Resources.

Table 4.4-1 Visual, Recreational and Historical Resources within 3 Miles of the Project

Name	Location	Category
County, Municipal and Local Parks, Trails and Recreation Areas		
Fallkill Park	Town of Hyde Park	Municipal Park
Beck Park	Town of Hyde Park	Local Park
Greenfields Park	Town of Hyde Park	Local Park
Peach Hill Park	Town of Poughkeepsie	Local Park
Pleasant Valley Recreation	Town of Pleasant Valley	Local Recreation Area
Cady Recreation Park	Town of Pleasant Valley	Local Recreation Area
Bower Park	Town of Pleasant Valley	Local Park
Freedom Park	Town of LaGrange	Local Park
The Links At Union Vale	Town of Union Vale	County Park or Recreation Area
Godfrey Park	Town of Union Vale	Local Park
Harlem Valley Golf Club	Town of Dover	County Park or Recreation Area
Thomas J Boyce Park	Town of Dover	Local Park

Table 4.4-1 Visual, Recreational and Historical Resources within 3 Miles of the Project (Continued)

Name	Location	Category
State Lands		
James Baird State Park	Town of LaGrange	State Recreation Area
Taconic State Pkwy	Towns of Pleasant Valley; LaGrange	State Scenic Byway
Taconic Hereford Multiple Use Area	Town of Pleasant Valley; LaGrange	State Recreation Area
Swamp River Waterway Access	Town of Dover	State Recreation Area
National Parks and Wildlife Refuges		
Appalachian National Scenic Trail	Town of Dover	National Recreation Trail
Historic Resources, Including National Register of Historic Places (NRHP)		
Abraham Kip House	Town of Hyde Park	NRHP Eligible
1.5 Story Frame Dwelling; vernacular Italianate	Town of LaGrange	NRHP Eligible
Old Stone Mill (Pleasant Valley Finishing Company)	Town of Pleasant Valley	NRHP Eligible
Newcomb–Brown Estate	Town of Pleasant Valley	NRHP
James Baird State Park	Town of LaGrange	NRHP
NYS Taconic Pkwy	Towns of LaGrange; Pleasant Valley	NRHP
Oswego Meeting House and Friends' Cemetery	Town of Union Vale	NRHP
Wilkinson Farmstead	Town of Union Vale	NRHP Eligible
Clove Mountain Fire Tower	Town of Union Vale	NRHP Eligible
Clove Mountain Fire Observers Cabin	Town of Union Vale	NRHP Eligible
Chapel of the Child	Town of Union Vale	NRHP Eligible
Vincent Farmhouse	Town of Dover	NRHP Eligible
Vincent Barns	Town of Dover	NRHP Eligible
Pratt-truss bridge BIN 3702-70; D-70R	Town of Dover	NRHP Eligible
Greek Revival House	Town of Dover	NRHP Eligible
Harlem Valley Psychiatric Center	Town of Dover	NRHP

Saratoga Associates, Inc. ("Saratoga Associates") is in the process of conducting a viewshed modeling analysis to determine if the Transmission Line may be visible from aesthetic resources within three miles of the Transmission Line. As part of that process Saratoga Associates will be conducting an independent evaluation and subsequent inventory of aesthetic resources within the Project area (within three miles). Furthermore, John Milner Associates, Inc. ("JMA"), is conducting a Phase 1A Cultural Resources survey of the Project area and will be updating the inventory of historic resources. An updated list of aesthetic resources will be prepared and submitted once these studies are completed. A detailed review of the aesthetic resources identified above in Table 4.4 -1 is provided below, followed by a description in Section 4.4.2 of the planned visual assessment, and potential mitigation in Section 4.4.3 for those aesthetic resources that may be affected by the Transmission Line.

4.4.1.2 NYSDEC Policy Inventory

This section addresses specific visual resource categories outlined in the NYSDEC's Program Policy, Assessing and Mitigating Visual Impacts (NYSDEC 2003). With this policy, NYSDEC asserts that the State's interest with respect to aesthetic resources is to protect those resources whose scenic character has been recognized through national or state designations. This section addresses the 11 categories of aesthetic resources of statewide significance that are applicable to the Project. The other four categories pertain to the Palisades, Adirondack and Catskill Parks, which are far removed from the Project. The NYDEC has also designated Scenic Areas of Statewide Significance, one of which, the Estates District of the Hudson River Valley, is located in Dutchess County outside of the Project area (DOS, 1993).

1) Historic Resources. A property on or eligible for inclusion in the National or State Register of Historic Places [16 U.S.C. § 470a et seq., Parks, Recreation and Historic Preservation Law Section 14.07]

A review of the files maintained by the New York State Office of Parks, Recreation and Historic Preservation ("OPRHP") and other appropriate databases identified 7 individual properties, complexes, and historic districts listed in the National Register of Historic Places ("NRHP") and no properties on the State Register of Historic Places within three miles of the proposed facilities. Additionally there are 11 properties eligible to be listed on the NHRP.

2) State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]

The James Baird State Park, Taconic State Parkway, Taconic-Hereford Multiple Use Area, and Swamp River Waterway Access are located in the Project area. The James Baird State Park is a recreation area located approximately 2 miles south of the Project right-of-way and adjacent to the Taconic State Parkway in the Town of LaGrange. The Taconic State Parkway is a scenic byway that runs north/south through the Project area in the towns of Pleasant Valley and LaGrange and is crossed by the Project right-of-way in one location. Both of these state parks are also listed on the NRHP. The Taconic-Hereford Multiple Use Area is located primarily in the Town of Pleasant Valley. This area supports trails that are used for hiking, mountain biking, horseback riding, and cross country skiing. The Swamp River access is a State recreation area located in the Town of Dover.

3) Urban Cultural Parks [Parks, Recreation and Historic Preservation Law Section 35.15]

In 1982 the New York State Legislature created the Urban Cultural Parks Program under the jurisdiction of the OPRHP. This Program, which aimed to develop, interpret, identify and preserve the natural and cultural resources of the State, has grown beyond the original concept and was amended in 1994 to become the State Heritage Areas program. The

Project area falls within the Hudson River Valley National Heritage Area, which encompasses the 150-mile and 4-million acre valley from Troy to Yonkers, NY (Hudson River Valley, 2013).

4) National wildlife refuges [16 U.S.C. 668dd], and State Game Refuges and State Wildlife Management Areas [New York State Environmental Conservation Law (ECL) 11-2105]

No national wildlife refuges, State Game Refuges, or State Wildlife Management Areas are located within the Project area.

5) National Natural Landmarks [36 CFR Part 62]

No National Natural Landmarks are located within the Project area.

6) The National Park System [16 U.S.C. 1c]

The Appalachian National Scenic Trail is within the Project area but is not crossed by the right-of-way. The Appalachian National Scenic Trail is a 2,184 mile long public footpath that extends from Georgia to Maine. The trail is managed by the National Park Service, U.S. Forest Service, Appalachian Trail Conservancy, state agencies and volunteers (NPS, 2013).

Additionally, the Project falls within the Hudson River Valley National Heritage Area. This heritage area was established by Congress in 1966 to recognize, preserve, protect, and interpret the nationally significant history and resources of the Hudson River Valley. The Hudson River Valley National Heritage Area encompasses the 150-mile and 4-million acre valley from Troy to Yonkers, NY (Hudson River Valley, 2013). No National Forests or National Seashores were identified within the Project area.

7) Rivers designated as National or State Wild, Scenic or Recreational [16 U.S.C. Chapter 28, ECL 15-2701 et seq.]

No National or State Wild and Scenic Rivers have been designated within the Project area.

8) A site, area, lake, reservoir or highway designated or eligible for designation as scenic [ECL Article 49]

Areas subject to Article 49 designation include Scenic Byways, parkways designated by the OPRHP, and other areas designated by NYSDEC. The Project right-of-way crosses the Taconic State Parkway, which is designated as a State Scenic Byway and is listed on the NRHP. The Taconic State Parkway was built between the 1920s and 1960 to provide access to parks in New York State.

9) A state or federally designated trail, or one proposed for designation [16 U.S.C. Chapter 27 or equivalent]

The Appalachian National Scenic Trail is within the Project area, but is not crossed by the Project.

10) State Nature and Historic Preserve Areas [Section 4 of Article XIV of the State Constitution]

There are no Wildlife Management Areas or National Wildlife Refuge within three miles of the Project.

11) Bond Act Properties purchased under Exceptional Scenic Beauty category

Information regarding properties purchased under the Bond Act was not readily available.

4.4.1.3 Local Recreation Sites

The Project area includes 2 county parks, 1 municipal park and 9 local parks or recreation areas. These local recreation areas include municipal parks, playgrounds, recreation centers, and golf courses. Generally, these local recreation areas include active recreation facilities (i.e., ball fields, courts and playgrounds), which tend to minimize their sensitivity to potential visual impacts.

4.4.2 Viewshed Assessment and Visual Simulation of Tower Structures

To supplement the analysis provided herein, a viewshed modeling assessment of the Transmission Line area is being prepared by Saratoga Associates to assess the potential impacts to the aesthetic resources described in Section 4.4.1. The viewshed modeling will consider the effects of intervening terrain and vegetation on potential visibility of the Transmission Line from those aesthetic resources identified by Saratoga Associates in the updated inventory. In addition, Saratoga Associates will prepare before and after photo-simulations of the Transmission Line from select, sensitive resources including Cady Recreation Park in Pleasant Valley and the Taconic State Parkway in LaGrange. A report describing the Visual Assessment will be prepared by Saratoga Associates and submitted early in 2014.

4.4.3 Environmental Effects and Mitigation

Potential visual impacts are greatest when incompatible landscape features or elements are added in a way that detracts from the overall setting or the enjoyment of historic, scenic and recreational resources. Potential visual impacts from the Transmission Line, Re-conductoring Segment, and modifications of the Pleasant Valley Substation are minimized through the use of existing electrical facilities and transmission right-of-way.

By co-locating the Transmission Line structures along the existing Con Edison Line 398 Line right-of-way, visual impacts are limited to incremental cumulative impacts to sensitive receptors already affected by the inclusion of an electric transmission line within their viewshed. This incremental increase in visibility of transmission infrastructure is applicable to those locations which already experience viewshed impacts; the new circuit is not expected to present an impact to areas and receptors not already affected.

Further, only that portion of the Transmission Line (14.6 miles), including installation of new tower structures, is expected to have any long term visual impact, since visual impacts associated with the Re-conductoring Segment would only be applicable to the construction phase, which would be limited in both duration and extent. Use of helicopters would necessarily reduce the length of construction for both the new Transmission Line structures and Re-conductoring Segment, providing mitigation by shortening the timeframe that construction-related visual impacts occur.

Mitigation associated with the co-location of new structures alongside Line 398 will include preservation of trees and screening vegetation between the line and adjacent homes and sensitive receptors, use of a non-specular wire to prevent glare effects from the new circuit, and location of tower structures where practical to avoid visual impacts to the most sensitive receptors, such as historic structures protected under Section 106 of the National Historic Preservation Act.

4.5 Cultural Resources

In accordance with PSL §122(1) (c) and 16 NYCRR §§86.3(a)(1)(iii) and 86.5(b)(2)(i), this section provides a discussion of potential impacts to cultural resources resulting from the construction and operation of the Transmission Line. As used here, the term cultural resources includes archeological sites, objects, and places, as well as historic buildings, structures, districts, and objects. This section tabulates previously-inventoried cultural resources in the area affected by the Project and discusses the Project's potential direct impacts on these resources. The Project's potential visual impacts on historic structures are addressed in Section 4.4 of this exhibit and will also be considered in the supplemental viewshed modeling analysis described in Section 4.4.

Research to date has consisted of a review of archeological site and historic property records available through the online State Preservation Historical Information Network Exchange (SPHINX) database of the New York Office of Parks, Recreation and Historic Preservation (OPRHP, the State Historic Preservation Office [SHPO]), as well as that agency's separate Geographic Information System for Archeology and National Register online tool (OPRHP GIS). Desktop background research has also been performed on websites maintained by the National Park Service (NPS), historical organizations, and commercial content providers. A review of OPRHP files was completed on December 16, 2013 by JMA. The results of the file review will be incorporated in the Phase 1A cultural report which will be prepared by JMA and filed in early 2014.

In addition to background research, a cultural resources specialist conducted a field reconnaissance and systematic walkover of the Project right-of-way in late September and early October 2013.

The primary purpose of the initial field review was to evaluate the sensitivity of the right-of-way to contain previously undocumented archeological resources. Archeological sensitivity is the potential for various landforms within a study area to contain cultural deposits, based upon associated environmental factors and proximity to key natural resources. Some of the environmental factors contributing to archeological sensitivity for prehistoric-period resources include distance to water, well-drained soils, level terrain, and south-facing aspect. Proximity to water is generally considered the most important factor in the location of prehistoric archeological sites. Areas sensitive for the presence of historic-period archeological sites are often located along transportation routes such as rivers and roads, or along stream drainages that powered water mills.

4.5.1 Existing Conditions

The lower Hudson Valley is comparatively well known from the point of view of both archeology and historic architecture. Research in the region has documented that the oldest traces of Native American occupancy date to 10,000 to 12,000 years ago and that Native American peoples were frequently present or settled in the area during the succeeding millennia of the prehistoric (or pre-contact) period. The lower Hudson was also among the earliest sections of New York occupied by Euroamericans in the post-contact period, first as part of the early to mid-seventeenth century Dutch colony based at Manhattan and subsequently as part of the English colony. Following independence from Great Britain, the region remained a vital part of the expanding State of New York and was characterized by a mix of extractive industries, agriculture, and manufacturing. Manufacturing and agriculture remain important in the region today, complemented by other economic and social developments, such as tourism and the growth of residential communities for urban workers in New York, Albany, and other cities of the lower Hudson Valley.

Although the region's archeology and history are rich and well documented, the main stem of the Hudson River and its major tributaries have been the focus of the majority of the research. Largely situated on the eastern edge of the Hudson region in the Taconic Highlands, the Project crosses several towns that have been less thoroughly inventoried than areas closer to the river. Previous cultural resources studies in the immediate vicinity of the Project Area are limited to those related to construction of the Generation Facility near the eastern end of the Project, and to the historical documentation of the Taconic State Parkway, which is crossed by the west-central portion of the Project.

As shown in Table 4.4-1 and Figure 2-5 in Exhibit 2, there are three properties listed on the NRHP wholly or partially within the 3-mile buffer around the Project right-of-way and 12 properties wholly or partially within the buffer that have been determined NRHP-eligible.

Most of these properties are situated at least 1 mile from the right-of-way. However, the Project will cross the NRHP-listed Taconic State Parkway approximately 0.2 mile south of the LaGrange-Pleasant Valley town line and will cross approximately 350 feet southwest of the NRHP-eligible Pratt Truss Bridge BIN 3702-70 in Dover Other properties that are relatively close to the Project include the NRHP-eligible Vincent Farmhouse and Barns (inventoried as two properties), approximately 0.1 mile north of the Project right-of-way in Dover; the NRHP-eligible Old Stone Mill (Pleasant Valley Finishing Company), approximately 0.37 mile north of the right-of-way in Pleasant Valley; and the Oswego Meeting House and Friends' Cemetery, approximately 0.8 mile south of the right-of-way in Union Vale.

Figure 4.5-1 shows that the Project crosses several areas designated in the online OPRHP GIS as sensitive for archeological resources. These designations are based upon the occurrence of one or more recorded archeological sites within the sensitivity area. (All sites generate sensitivity buffers, not just those that have been listed on or determined eligible for the NRHP). No information on the sites is presently available from the OPRHP GIS or OPRHP file review.

In the OPRHP GIS system, precontact Native American archeological sites typically receive approximately 0.5-mile buffers, while historic period Euroamerican sites receive approximately 0.1-mile buffers. The size of the buffers therefore indicates that all but one are associated with precontact archeological sites. The sites appear typically to be located along streams or adjacent to wetlands, including: Wappinger Creek, Sprout Creek, Willow Brook, Seeley Creek, Mill River, and Swamp River. The probable historic period archeological site, possibly the ruins of a mill or mill dam, occurs on Coopertown Brook.

While broadly useful, the archeological sensitivity buffers from the OPRHP GIS are relatively non-specific for assessing the potential impacts of a specific project on a specific landform. More specific information was provided by a systematic walkover of the right-of-way in September-October 2013. During this reconnaissance, a qualified and experienced archeologist identified localities that have moderate to high sensitivity for containing archeological sites based on terrain and other environmental factors. No building foundations or other ruins were noted during the reconnaissance, so the designated localities are judged to be sensitive primarily for the presence of precontact Native American archeological sites. In all, 24 such localities were identified, of which five were designated as having a high archeological sensitivity (Table 4.5-1 and Figure 4.5-1).

It should be noted that disclosure of the nature, extent of location of archaeological resources is subject to redaction from publicly-available documents and redacted versions of this and other Project documents will be provided to regulatory agencies as required by applicable law and policy.

Table 4.5-1 Areas of Archeological Sensitivity within Project Area

Sensitivity Area	Sensitivity Level	Description
1	Medium	Flat terrace; 300 ft south of Wappinger Creek
2	High	Broad rise; 200 ft to 500 ft south of Wappinger Creek
3	Medium	Narrow rise; adjacent to wetlands
4	High	Broad rise; adjacent to wetlands
5	Medium	Low rise; 200 ft east of stream and wetlands
6	Medium	Low rise between wetlands
7	Medium	Level ground adjacent to small wetland
8	Medium	Narrow terrace; 50 ft west of Sprout Creek
9	Medium	Narrow terrace; 75 ft west of stream
10	Medium	Narrow terrace; 50 ft east of stream
11	Medium	Narrow terraces on both banks of stream
12	High	Broad flat; 250 ft to 800 ft west of stream and wetlands
13	Medium	Narrow flat, 500 ft east of stream and wetlands
14	Medium	Terrace 100 ft east of Coopertown Brook
15	Medium	Broad flat; 250 ft east of wetland
16	Medium	Broad flat; 300 ft northwest of stream/wetland
17	High	Broad terraces; 50 ft to 600 ft northwest of Swamp River
18	Medium	Narrow rise; 350 ft southeast of Swamp River wetlands
19	Medium	Rise; 100 ft east of wetland and 1000 ft west of Tenmile River
20	Medium	Narrow terrace; west bank of Tenmile River
21	High	Terrace; 250 ft east of Tenmile River; *private property—not visited*
22	Medium	Broad flat; 100 ft west of stream
23	Medium	Narrow rise; 50 ft west of wetland, 800 ft east of stream
24	Medium	Flat; 100 ft east of stream

4.5.2 Potential Project Effects and Mitigation

Construction of the proposed Project has the potential to affect as-yet unidentified archeological resources within the Transmission Line placement. Although the Project will be constructed within an existing transmission right-of-way, clearing of vegetation and installation of poles could result in ground disturbance of sufficient magnitude to affect archeological sites if present at certain locations along the alignment. The OPRHP has established a policy regarding the area of potential effect (APE) for utility corridors and the requirements for assessing potential impacts to archeological resources. The OPRHP expects documentation of previous disturbance and requires testing to be conducted within a construction work zone (i.e., the area within which work can proceed without the potential to impact resources) where the least disturbance has occurred. Accordingly, the

APE would also include construction access roads where grading is required, transmission structure sites, laydown areas and storage yards. These areas will be identified as part of the final design and presented in the EM&CP. A Phase IB archeological survey will be conducted where the anticipated ground disturbance will occur within potential areas of sensitivity designated in Table 4.5-1. A Phase IB work plan will be developed in accordance with applicable guidelines and provided to OPRHP for review in 2014.

Since the Transmission Line will be constructed within an existing right-of-way, no direct impacts are anticipated to above-ground historic resources that are listed in or eligible for the NRHP. As discussed in Section 4.4.2 above, potential visual impacts from the Transmission Line, Re-conductoring Segment, and modifications of the Pleasant Valley Substation are minimized through the use of existing electrical facilities and transmission right-of-way. A supplemental viewshed analysis is being completed and will be submitted in early 2014, as described in Section 4.4. Lastly, a comprehensive historic architectural survey will be conducted after consultation with the OPRHP, and in accordance with applicable guidelines.

4.6 Terrestrial Ecology and Wetlands

In accordance with PSL §122(1)(c) and 16 NYCRR §86. 5(a) and (b), this section provides a summary of the potential effects to biological and natural resources associated with construction and operation of the Project. Each section discusses methods used in determining impacts and efforts undertaken to avoid and minimize potential impacts. A desktop analysis was conducted based on an overlay of Project facilities using existing information from federal and state agency database searches, literature review of published data, and state agency correspondence to ascertain the presence of biological and natural resources likely to occur, and to determine the extent to which they occur within the Project vicinity.

Vegetation communities were analyzed using vegetation cover types as defined by USGS Gap Analysis Program ("GAP") Level 3 New York land cover data (USGS, 2010a). GAP land cover data is developed using a combination of 2001 Landsat imagery from the Multi-Resolution Land Characteristics ("MRLC") Consortium land cover data available in the National Land Cover Database ("NLCD") which is then field verified. GAP integrates a variety of other datasets to help with the land cover classification process including Digital elevation model-derived data sets; digital data on soils, geology, stream, and wetlands; point locations for rare plant communities; and fire and tree harvest information. A review of current aerial photography in comparison to GAP data was conducted to detect large changes over time, especially in respect to vegetation structure and density associated with forest clearing, development, and changing cultivation strategies. Predominant vegetation communities have been characterized according to the classification scheme presented in the NatureServe ecological dataset (NatureServe, 2013).

The presence of jurisdictional waters of the U.S., including wetlands, and waters of the state were determined based upon desktop assessment and in-field delineation and survey. Initial wetland and waterway identification was completed based on a review of existing information from New York's Department of Environmental Conservation Freshwater Wetland maps (CUGIR, 2002) and the United States Fish and Wildlife Service ("USFWS") National Wetlands Inventory ("NWI") wetland maps (USFWS, 2013). The NWI database indicates potential wetland areas based on interpretation of remotely sensed imagery with limited ground verification and often coincide with state-regulated wetlands and surface water features. Current aerial imagery, the USGS National Hydrography Dataset (NHD) (USGS, 2010b), and the Natural Resources Conservation Service (NRCS) soil survey (USDA-NRCS, 2011) supplemented review of freshwater wetland maps to determine wetland areas.

Delineation along the right of way and Project access roads was completed in October and November, 2013. This effort resulted in the delineation and mapping of 107 wetland areas totaling 49.8 acres, and 13 stream segments totaling 2,795 linear feet within the Transmission Line and Re-conductoring Segment right-of-way. Wetland types mapped included palustrine scrub-shrub, palustrine emergent, palustrine open water, and palustrine forested. Additional details on wetlands existing within the right-of-way will be included in the EM&CP in the design of proposed mitigation measures, where specific impacts are identified, for approval by the Commission.

A literature review was conducted to identify the known status and distribution of resident and transient wildlife species potentially occurring within the Project right-of-way and adjacent lands. Information resources included published literature, previously recorded survey data, and NYSDEC database searches. The USFWS Federally-listed Threatened and Endangered Species and Candidate Species County Lists for the Project were evaluated and coordination with the New York Natural Heritage Program ("NYNHP") to assess potential effects to documented species or sensitive habitats is ongoing and expected to be completed in 2014. Additional evaluation of threatened and endangered species habitat will be completed in 2014 in coordination with NYNHP and USFWS and will be presented in the EM&CP where necessary to propose specific mitigation plans.

4.6.1 Vegetation

Vegetation along the right-of-way is comprised of a mix of ecological associations and cover types. The dispersion and density of land cover documented throughout the Project area correlates with adjacent land use, development, and existing natural resources. Terrestrial woodland and forested communities composed of semi-mature to mature stands of deciduous and coniferous species dominate land cover within the Project followed by agricultural lands of pasture and hay. Shrubland and herbaceous communities within the Project are largely confined to the right-of-way as a result of past vegetation management practices within the right-of-way. Wetland communities and open water systems occurring within the Project are typically associated with floodplain areas along streams and rivers. Tables 4.6-1 and 4.6-2 provide a cumulative summary of vegetation communities identified

within the Project right-of-way based on use GAP land cover data. Table 4.6-1 similarly provides the acres of vegetation communities identified within the Transmission Line construction right-of-way based on a 125 foot wide corridor. As the re-conductoring of Line 398 is limited to work on existing poles, Table 4.6-2 presents the quantity of vegetation communities along the existing Re-conductoring Segment right-of-way in miles.

Table 4.6-1 Vegetation Communities Intersecting Transmission Line Construction Right-of-Way

Vegetation Community Classification	Acres	Percent
Terrestrial Communities		
Central Appalachian Pine-Oak Rocky Woodland	74.9	33.5
Central Appalachian Oak and Pine Forest	35.6	15.9
Northeastern Interior Dry-Mesic Oak Forest	25.4	11.4
Appalachian Hemlock-Hardwood Forest	14.7	6.6
Laurentian-Acadian Northern Hardwoods Forest	13.0	5.8
Introduced Upland Vegetation – Treed	4.3	1.9
Palustrine Communities		
North-Central Interior and Appalachian Rich Swamp	8.4	3.7
Laurentian-Acadian Floodplain Systems	2.8	1.3
North-Central Interior Wet Flatwoods	1.8	0.8
Central Interior and Appalachian Floodplain Systems	0.9	0.4
Introduced Riparian and Wetland Vegetation	0.2	0.1
Cultural Communities		
Pasture/Hay	33.5	15
Developed, Open Space	7.3	3.3
Developed, Medium Intensity	0.5	0.2
Developed, Low Intensity	0.3	0.1
Developed, High Intensity	0.1	0.04
TOTAL	223.7	100%

Table 4.6-2 Vegetation Communities Intersecting the Re-conductoring Segment

Vegetation Classifications	Acres	Percent
Terrestrial Communities		
Central Appalachian Oak and Pine Forest	13.9	28.9
Northeastern Interior Dry-Mesic Oak Forest	11.4	23.7
Appalachian Hemlock-Hardwood Forest	6.5	13.5
Central Appalachian Pine-Oak Rocky Woodland	2.1	4.3
Introduced Upland Vegetation – Treed	1.3	2.7
Introduced Riparian and Wetland Vegetation	0.01	0.02
Laurentian-Acadian Northern Hardwoods Forest	1.6	3.3
Laurentian-Acadian Floodplain Systems	0.2	0.4
Ruderal Forest	0.3	0.7
Palustrine Communities		
North-Central Interior and Appalachian Rich Swamp	3.8	7.9
North-Central Interior Wet Flatwoods	0.7	1.5
Central Interior and Appalachian Floodplain Systems	0.4	0.8
Cultural Communities		
Pasture/Hay	3.5	7.4
Developed, Open Space	1.9	3.9
Developed, Low Intensity	0.5	1.0
TOTAL	**48.1**	**100%**

Effects on vegetation from right-of-way development were evaluated using the above-referenced spatial data in conjunction with the preliminary transmission line design. The Project is proposed entirely within an existing Line 398 right-of-way owned by Con Edison. These areas currently undergo routine vegetation maintenance as part of a long-term management plan to ensure adequate clearance requirements. An analysis of tree clearing needed to construct and operate the Project based upon small-scale aerial photo analysis and ground-truthing on the right-of-way is estimated at approximately 53 acres (see Figure 4.6-1).

The proposed Project centerline and preliminary structure locations for new pole locations associated with the Transmission Line and Re-conductoring Segment were designed in PLS-CADD and geo-referenced to the GIS database described above. The Project is proposed entirely within an existing electric transmission right-of-way. The extent of new vegetation clearing was determined using the typical cross section provided in Exhibit 5 (Design Drawings) of this application. The extent of the new Project right-of-way was determined by establishing a centerline along proposed pole locations and setting the southern edge of the right-of-way 75 feet to the south. This area encompasses approximately 223.7 acres, which defines the area that will be maintained as active right-of-way.

Based on GAP land cover data, approximately 169.6 acres of terrestrial forested communities including a mix of deciduous and coniferous mature and semi-mature stands are intersected by the Transmission Line. Remaining lands intersected by the Project include 33.5 acres of agricultural land, approximately 4.5 acres of forested floodplain and introduced herbaceous emergent wetland systems, and approximately 8.3 acres of developed lands. The Re-conductoring Segment comprises approximately 36.8 acres of forested upland communities, approximately 5.1 acres of wetland systems, 3.6 acres of pasture/hay lands and 2.4 acres of developed lands. A brief description of the vegetation communities including common plant species anticipated within the communities are provided below.

4.6.1.1 Terrestrial Communities

Central Appalachian Pine-Oak Rocky Woodland - This system encompasses open or sparsely wooded hilltops and outcrops or rocky slopes. The substrate rock is generally granitic or of other acidic lithology, although near the northern limit of its range, examples can also occur on intermediate, base-rich, or mafic bedrock including traprock. The vegetation is patchy, with woodland as well as open portions. Pitch pine (*Pinus rigida*) and Virginia pine (*Pinus virginiana*) is diagnostic and often mixed with xerophytic Oak (*Quercus* spp.). Some examples lack pine and feature Eastern red-cedar (*Juniperus virginiana*) or American hophornbeam (*Ostrya virginiana*) as important co-dominants with oak. Some areas have a fairly well-developed heath shrub layer, others a graminoid layer, the latter particularly common under oaks or other deciduous trees. Conditions are dry and for the most part nutrient-poor, and at many, if not most, sites, a history of fire is evident.

Central Appalachian Oak and Pine Forest - The topography and landscape position range from rolling hills to steep slopes, with occasional occurrences on more level, ancient alluvial fans. The forest is mostly closed-canopy but can include patches of more open woodlands. It is dominated by a variable mixture of dry-site oak and pine species, most typically chestnut oak (*Quercus prinus*), Virginia pine, and white pine (*Pinus strobus*), but sometimes white oak (*Quercus alba*) and/or scarlet oak (*Quercus coccinea*). Heath shrubs such as blueberry (*Vaccinium* spp.) and mountain-laurel (*Kalmia latifolia*) are common in the understory and often form a dense layer.

Northeastern Interior Dry-Mesic Oak Forest - These oak-dominated forests are typically closed-canopy forests that cover large expanses at low to mid elevations, where the topography is flat to gently rolling, occasionally steep. Soils are mostly acidic and relatively infertile but not strongly xeric. Local areas of calcareous bedrock, or colluvial pockets, may support forests typical of richer soils. Oak species characteristic of dry-mesic conditions include red oak (*Quercus rubra*), white oak, Eastern black oak (*Quercus velutina*), scarlet oak, and hickory (*Carya* spp.). Red maple (*Acer rubrum*), black birch (*Betula lenta*), and yellow birch (*Betula allegheniensis*) may be common associates; sugar maple (*Acer saccharum*) is occasional. Within these forests, hill slope pockets with impeded drainage may support small isolated wetlands, including non-forested seeps or forested wetlands.

Appalachian Hemlock-Hardwood Forest - Northern hardwoods such as sugar maple, yellow birch, and American beech (*Fagus grandifolia*) are characteristic, either forming a deciduous canopy or mixed with Eastern hemlock (*Tsuga canadensis*) and occasionally white pine. Other common and sometimes dominant trees include oak, tulip tree (*Liriodendron tulipifera*), black cherry (*Prunus serotina*), and black birch.

Laurentian-Acadian Northern Hardwoods Forest - These northern hardwood forests occur in various dry-mesic to wet-mesic settings. Sugar maple, yellow birch, and American beech are the dominant trees. Eastern hemlock and red spruce are common minor canopy associates. Successional stands may be dominated by quaking aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), red maple, American beech, black cherry, sometimes with scattered white pine. Soils range from moderately nutrient-poor to quite enriched, with associated shifts in the herb flora.

Introduced Upland Vegetation – Treed - Land cover is significantly altered/disturbed by introduced, non-native perennial grasses and forbs. Natural vegetation types are no longer recognizable.

Ruderal Forest - Vegetation resulting from succession following significant anthropogenic disturbance of an area. It is generally characterized by unnatural combinations of species (primarily native species, though they often contain slight or substantial numbers and amounts of species alien to the region as well).

4.6.1.2 Palustrine Communities

North-Central Interior and Appalachian Rich Swamp - These forested wetlands are found in basins where higher pH and/or nutrient levels are associated with a rich flora. Species include red maple, black ash (*Fraxinus nigra*), as well as tamarack (*Larix laricina*) and calciphilic herbs. There may be shrubby or herbaceous openings within the primarily wooded cover. The substrate is primarily mineral soil, but there may be some peat development.

Laurentian-Acadian Floodplain Systems - This system occurs along medium to large rivers where topography and process have resulted in the development of a complex of upland and wetland temperate alluvial vegetation on generally flat topography. This complex includes floodplain forests, with sugar maple, as well as herbaceous sloughs and shrub wetlands. In areas subject to more scour, sparse non-wetland vegetation may develop on sandbars or exposed rock. Most areas are underwater each spring; microtopography determines how long the various habitats are inundated. Associated trees include red maple and American hornbeam, the latter frequent but never abundant. Common shrubs include silky dogwood (*Cornus amomum*) and Viburnum (*Viburnum* spp.). The herb layer in the forested portions often features abundant spring ephemerals, giving way to a fern-dominated understory in many areas by mid-summer. Non-forested wetlands associated with these systems include shrub-dominated and graminoid-herbaceous vegetation.

North-Central Interior Wet Flatwoods - This small-patch system usually occurs on somewhat poorly drained uplands or in depressions associated with glacial features such as till plains, lake plains or outwash plains. Soils often have an impermeable or nearly impermeable clay layer that can create a shallow, perched water table. Saturation can vary, with ponding common during wetter seasons, and drought possible during the summer and autumn months. Microtopography and fluctuating moisture levels can lead to complexes of forest upland and wetland species occurring within this system. Pin oak (*Quercus palustris*) and swamp white oak (*Quercus bicolor*) typically dominate the wetter portions and are often associated with red maple. White oak, red oak, and American beech are common in the better-drained areas. Shagbark hickory (*Carya ovata*), tulip tree, white ash (*Fraxinus americana*), and green ash (*Fraxinus pennsylvanica*) are also common associates, although their presence varies by region. Understory herbaceous and shrub species present in examples of this system can vary. Stands with denser tree cover have less shrub and herbaceous cover, while those with moderate tree canopy cover tend to have a dense understory. Some common species in the wetter portions include sedge (*Carex* spp.), cinnamon fern (*Osmunda cinnamomea*), buttonbush (*Cephalanthus occidentalis*), alder (*Alnus* spp.), and holly (*Ilex* spp.).

Central Interior and Appalachian Floodplain Systems - This system occurs from river's edge across the floodplain or to where it meets a wet meadow system. It can have a variety of soil types found within the floodplain from very well-drained sandy substrates to very dense clays. It is this variety of substrates and flooding that creates the mix of vegetation that includes sugar maple, large tooth aspen (*Populus deltoids*), and willow (*Salix* spp.) in wetter areas; and green ash, American elm (*Ulmus Americana*), and bur oak (*Quercus macrocarpa*) in more well-drained areas.

Introduced Riparian and Wetland Vegetation - Vegetation dominated (typically >60% canopy cover) by introduced species. These are spontaneous, self-perpetuating, and not (immediately) the result of planting, cultivation, or human maintenance. Land occupied by

introduced vegetation is generally permanently altered (converted) unless restoration efforts are undertaken. Specifically, land cover is significantly altered/disturbed by introduced riparian and wetland vegetation.

4.6.1.3 Cultural Communities

Pasture/Hay - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.

Developed, Open Space - Includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.

Developed, Low Intensity - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20 to 49 percent of total cover. These areas most commonly include single-family housing units.

Developed, Medium Intensity - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50 to 79 percent of the total cover. These areas most commonly include single-family housing units.

Developed, High Intensity – Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to100 percent of the total cover.

4.6.1.4 Invasive Species

The occurrence of invasive plant species is common along transmission line right-of-ways. These corridors provide opportunities for the movement of invasive species through the landscape. Equipment, vehicles, clothing, boots, and materials can act as vectors for the inadvertent spread of invasive species as plant material, seeds, and roots are transferred from site to site during initial construction and subsequent operations. In recent years, the state agencies have expressed an increasing interest in reducing the spread of invasive species in New York through identification and mitigation within Project area. Invasive species that occur on the Revised Interim List of Invasive Plant Species in New York State (NYSDEC, 2012) were observed in the right-of-way during environmental assessment. These species include reed canary grass (*Phalaris arundinacea*), Japanese stilt grass (*Microstegium vimineum*), mugwort (*Artemisia vulgaris*), spotted knapweed (*Centaurea maculosa*), brown knapweed (*Centaurea jacea*), Oriental bittersweet (*Celastrius orbiculatus*), Morrow's honeysuckle (*Lonicera morrowii*), Japanese virgin's bower (*Clematis terniflora*),

Japanese barberry (*Berberis thunbergii*), Autumn olive (*Elaeagnus umbellate*), black locust (*Robinia pseudoacacia*), common reed (*Phragmites australis*), multiflora rose (*Rosa multiflora*), and purple loosestrife (*Lythrum salicaria*).

Cricket Valley has consulted with the NYSDEC to determine which invasive species are of regional concern, and fall 2013 field work focused on identification of concentrations of invasives with the potential to impact the function of wetland systems, potential rare species habitat, and other sensitive receptors. This pre-construction baseline survey will be used during the post-construction phase to evaluate invasive species populations. Areas containing an infestation will be clearly identified on construction plans and in the EM&CP. Prior to construction activities Cricket Valley will develop and propose Best Management Practices ("BMPs")in the EM&CP based upon applicable precedent adopted by the Commission in other Article VII proceedings which will include a plan for invasive species management to facilitate the identification, control, and monitoring of invasive vegetation with the objective of preventing their spread.

4.6.1.5 Environmental Effects

The most significant effect to vegetation is the long-term conversion of existing forested communities to managed grassland or shrubland within areas of the right-of-way proposed to be cleared. The total area of tree clearing associated with the Project is estimated to be approximately 53 acres. While the quality of the existing habitat is a factor in quantifying effects, in general the conversion of forest cover is considered more significant than the conversion of shrub or grassland because of the structural changes to habitat that occur when forest cover is removed. Permanent removal of forest cover is needed in areas that require widening of the existing right-of-way to accommodate the new circuit, and selective clearing of woody species or saplings associated with access road construction.

Vegetation clearing and management techniques will include mechanical clearing and application of herbicides, or a combination of the two. Site-specific selection of vegetation management practices will be based on the community type, and vegetation structure and density. Implementation of an invasive species management plan including NYSDEC guidelines will mitigate the potential spread of invasive plant and insect species. Details regarding vegetation clearing methods, herbicide application and disposal as well as techniques employed to limit the spread of invasive species will be included in the EM&CP to be prepared as part of the final design.

Construction and operation of the Project would affect vegetative communities adjacent to the right-of-way; however, measures have been implemented to minimize significant adverse effects to the existing environment during early planning phases. The Project is designed to locate new transmission structures between approximately 80 and 100 feet from the existing structures, which utilizes the existing right-of-way and reduces the need for clearing of a new right-of-way. Vegetation clearing will be required within the existing right-of-way to support construction of new structures and to ensure proper clearances from

the new circuit once installed. Subsequently, operation of the Project would require long-term vegetation management within the right-of-way to maintain low growing and small-diameter woody species and open vegetative communities, which are compatible with the restrictions necessary for safe and reliable use of the right-of-way. Long-term vegetation management of the new and existing transmission lines will be conducted in accordance with Con Edison's PSC-approved long-range vegetation management plan.

Re-conductoring of Line 398 utility poles will result in temporary, short-term affects to existing vegetative communities associated with construction activities. Based on the current understanding of Con Edison right-of-way vegetation management practices, along with analysis of aerial photography and field inspection, the existing right-of-way is managed as a shrub community, reducing the need for trees removal.

4.6.2 Wetlands

Wetlands provide many ecological functions and values not provided by upland habitats that are beneficial to the natural and human environments. Wetlands often provide important habitat for plants and animals, and typically provide an interspersion of water, vegetation, and substrates that offer foraging opportunity, nesting habitat, and essential cover for numerous species during breeding seasons, migration, and winter months. In addition to wildlife habitat values, wetlands offer hydrologic functions such as water quality improvement, floodwater retention and desynchronization, and erosion control. Water quality is improved through the uptake and retention of nutrients, natural attenuation of organic and chemical wastes, and the retention of suspended sediment. During flood periods, wetlands act to alleviate rising storm waters by serving as temporary storage areas and protecting downstream areas from flood damage. Alteration or removal of wetlands may result in a decline in water quality downstream or in nearby waterbodies. In addition, wetlands have recreational significance as they contribute to the aesthetic value of the landscape as well as providing habitat for numerous game species of fish and wildlife.

Mapped wetlands boundaries were identified along the 14.6 miles of proposed Transmission Line right-of-way to assess the extent of jurisdictional resources potentially affected by right-of-way clearing and new structure installation. For the Re-conductoring Segment, potential crossings of mapped wetland areas were identified with the assumption that all work will be completed using existing access roads.

A site reconnaissance of the Project right-of way was performed in September-November, 2013. During this effort, the presence of USFWS and NYSDEC mapped wetlands were confirmed and refined via mapping of delineated boundaries in and adjacent to the right-of-way. Formal wetland delineations of the right–of-way were completed in November, 2013. Detailed assessments of Project-related wetland impacts are being completed to support preparation of an application to the U.S. Army Corps of Engineers ("USACE") for impacts to federally-jurisdictional wetlands to be submitted in early 2014. Theses analyses will also support the preparation of specific mitigation measures to be proposed in the EM&CP to

mitigate impacts to state and federal jurisdictional wetlands where disturbance is expected to take place from construction of the Transmission Line. Initial analyses indicate that the Project will not include permanent impacts to state or federally-jurisdictional wetland or stream resources, and will affect only approximately 0.2 acre of wetlands temporarily associated placement of construction timber mats within wetlands located upon existing access roads.

4.6.2.1 NYSDEC-Regulated Wetlands

New York State's freshwater wetlands are protected under Article 24 of the Environmental Conservation Law, commonly referred to as the Freshwater Wetlands Act. Pursuant to Article 24, New York regulates wetlands greater than 12.4 acres or wetlands of any size that possess unique qualities. In addition, to protect and preserve state-mapped wetlands, New York regulates Adjacent Area, defined as those areas of land or water that are outside a wetland and within 100 feet of the wetland boundary.

Four NYSDEC-regulated wetlands (DP-22, PV-4, PV-12, and PV-66) totaling approximately 1.17 acres are located within or nearby the right-of-way (see Appendix A). Wetland DP-22 is a Class I wetland and the remaining wetlands are Class II wetlands. One additional NYSDEC wetland (DP-24) lies within the Re-conductoring segment. Wetland DP-24 is a Class II wetland. Approximately 0.14 miles of the wetland were identified within the existing Line 398 right-of-way based upon a desktop mapping assessment, however several wetland series mapped during the 2013 delineation effort are presumed to be associated with NYSDEC regulated wetlands, and will be described as such in the EM&CP for the purposes of proposing specific mitigation measures where necessary. Wetlands identified within the Project right-of-way coincide with forested communities adjacent to agricultural land and along riparian and floodplain areas of rivers or streams.

Figure 4.6-2 shows the location of NYSDEC- regulated mapped wetlands in relation to the Project. Based on the preliminary design, no structures will be placed in wetland areas; however, one or more structures may be placed in wetland Adjacent Areas. Cumulative impacts resulting from permanent structure placement in Adjacent Area are estimated to be less than 0.15 acre. No permanent impact to wetlands is expected as a result of Project construction and operation Table 4.6-3 provides a summary of NYSDEC-regulated mapped wetlands and adjacent areas associated with the Project.

Table 4.6-3 NYSDEC-Regulated Mapped Wetlands within the Right-of-Way

NYSDEC Wetland	Cowardin Classification[1]	Wetland Classification	Wetlands Within Right-of-Way	Wetland Adjacent Area Within Right-of-Way
Transmission Line Right-of-Way				
DP-22	PSS/PEM	I	0.03 acres	0.95 acres
PV-4	PSS	II	0.10 acres	0.70 acres
PV-12	PEM	II	0.23 acres	0.49 acres
PV-66	PSS/PEM	II	0.81 acres	0.64 acres
Transmission Line Project Total			**1.17 acres**	**2.78 acres**
Re-conductoring Segment of Right-of-Way				
DP-24	PEM	II	0.25 acres	1.15 acres
Re-conductoring Total			**0.25 acres**	**1.15 acres**

[1] PSS = Palustrine Scrub-Shrub, PEM = Palustrine Emergent

4.6.2.2 USACE-Regulated Wetlands

The U. S. Army Corps of Engineers has regulatory jurisdiction over waters of the United States including wetlands pursuant to Section 404 of the Clean Water Act, and jurisdiction over Navigable Waters of the United States pursuant to Section 10 of the Rivers and Harbors Act of 1899.

USFWS NWI maps were used to identify wetlands existing along the Transmission Line route and Re-conductoring Segment. Approximately 2.78 acres of NWI wetland crossings are located within the right-of-way of the Transmission Line and 0.25 acres of NWI wetland crossings are located within the Re-conductoring Segment. Wetlands identified as palustrine emergent wetland (PEM) and palustrine forested/shrub (PFO/PSS) and PEM wetlands occurred most frequently within the Transmission Line and Re-conductoring Segment portions of the Project, respectively. Wappingers Creek, Ten Mile River, Coopertown Brook, Swamp River, Clove Brook, Sprout Creek, and two unnamed open water bodies are located in or near the right-of-way associated with the Transmission Line. One unnamed lake and one unnamed river occur within the Re-conductoring Segment of the Project.

NYSDEC-regulated wetlands that coincide with NWI mapped wetlands occur throughout the Project right-of-way. Table 4.6-4 provides a summary of NWI mapped wetlands within the right-of-way and Figure 4.6-2 shows the NWI mapped wetlands within the Project area.

Table 4.6-4 USFWS NWI Mapped Wetlands within the Project Right-of-Way

USFWS Classification Code	Description	Number of Crossings	Wetlands within Right-of-Way
Transmission Line Right-of-Way			
RUBH	Riverine	2	0.36 acres
PUBH	Freshwater pond	3	0.26 acres
PFO/PSS	Freshwater forested/shrub	10	2.29 acres
PEM	Freshwater emergent	7	2.27 acres
	Transmission Line Right-of-Way Total	**22**	**5.17 acres**
Re-conductoring Segment Right-of-Way			
RUBH	Riverine	1	0.01 miles
LUBH	Lacustrine	1	0.03 miles
PFO/PSS	Freshwater forested/shrub	4	0.18 miles
PEM	Freshwater emergent	4	0.09 miles
	Re-conductoring Right-of-Way Total	**10**	**0.30 miles**

4.6.2.3 Locally Regulated Wetlands and Buffers

In addition to State and Federal wetland regulations, the towns of Pleasant Valley and LaGrange have instituted ordinances providing for wetland regulatory permit programs, whose procedural provisions are preempted under Section 130 of the Public Service Law. Pleasant Valley defers to the NWI wetland mapping and LaGrange, Union Vale and Dover defer to the NYSDEC mapped wetlands. In addition to wetland areas, both Pleasant Valley and LaGrange also regulate wetland adjacent areas. Details regarding these regulated areas are presented in the following Table by town.

Table 4.6-5 Local Regulated Wetland Buffers

Pleasant Valley	
Wetland Size/Waterbody	**Regulated Adjacent Area**
0.5 to 1.0 acre	25 foot width
1.0 to 2.0 acres	50 foot width
2.0 to 3.0 acres	75 foot width
3.0 + acres	100 foot width
Wappinger's Creek, Little Wappinger's Creek, Great Spring Creek	100 foot width
Perennial tributaries to the referenced streams	25 foot width

Table 4.6-5 Local Regulated Wetland Buffers (Continued)

Pleasant Valley	
LaGrange	
Wetland Size/Waterbody	Regulated Adjacent Area
1.0 to 2.0 acres	50 foot width
2.0 to 3.0 acres	75 foot width
3.0 + acres	100 foot width
Wappinger's Creek, Sprout Creek, Jackson Creek	200 foot width either side of centerline
All other watercourse	20 foot width from either side of banks

The need for local wetland permits and other local procedural requirements are preempted by Public Service Law Section 130, as explained in Exhibit 7 of this Application. However, the Project complies with the substantive provisions of the Pleasant Valley and LaGrange regulatory programs by avoiding, to the extent practicable, the placement of structures and direct impacts associated with structure access within regulated Adjacent Areas.

4.6.2.4 Environmental Effects and Mitigation

Impacts to wetland areas may occur directly or indirectly during construction and operation. Every practical attempt will be made to avoid wetlands and minimize the nature, extent, and duration of disturbances. Based on the preliminary design, permanent impacts to wetlands due to structure placement are not anticipated. However, several structures will be sited in NYSDEC and/or Pleasant Valley and LaGrange regulated wetland Adjacent Areas.

Protective measures will be implemented to avoid unnecessary impacts to wetlands as well as to offset short-term and temporary impacts during construction. In addition, a Project wetlands permit expected to be issued by the U.S. Army Corps of Engineers and the EM&CP to be submitted in this Article VII proceeding will contain specific wetland protection and mitigation measures to offset wetland impacts. Protective measures to be proposed depending upon the specific expected impact will include erosion control measures such as installation of silt fencing and/or straw bales, and stabilization of exposed soils via establishment of vegetation to prevent soil from entering wetlands and surface waters due to runoff. Access roads will be predominantly constructed for temporary use, and removed and the affected area restored to approximate pre-construction conditions. As required by the SPDES Construction General Permit, no more than 5 acres of soil will be disturbed at any one time during Project construction. Restoration of wetlands and riparian buffer areas affected temporarily by construction will be restored using appropriate native species and invasives in the area will be removed and controlled to the extent practical, providing an overall improvement to the restored wetland and riparian systems in the post-construction condition, offsetting temporal losses of function and value during the Transmission Line's construction phase.

Cricket Valley will also request from the Commission, at an appropriate time in 2014, that the Commission or its designated representative, issue the certification required by Section 401 of the Clean Water Act, as part of the Article VII certification of the Transmission Line.

4.6.3 Wildlife

A desktop review of publicly-available data sources was conducted to identify the status and distribution of resident and transient species of mammals, birds, reptiles, and amphibians potentially occurring within the Project area. Information resources included published literature, previously recorded survey data, and state and federal database searches. Distribution maps from the Amphibian & Reptile Atlas maintained by the NYSDEC were reviewed to assess the presence of reptile and amphibian species potentially occurring in the Project area (NYSDEC, 2013). Avian species, including migratory and breeding populations potentially occurring in the Project area, were evaluated based on records of visual observations from the Hawkcount database developed for the Mohonk Preserve located in New Paltz, New York, approximately 40 miles west of the Project area as well as data presented in The Second Atlas of the Breeding Birds in New York State (McGowan and Corwin, 2008). A review of the *Checklist of Amphibians, Reptiles, Birds and Mammals of New York State, Including Their Legal Status* (NYSDEC, 2010) was conducted to identify fauna that may be common in the area.

In addition, the USFWS Federally-listed Threatened and Endangered Species and Candidate Species County Lists for the Project were evaluated, and data request letters previously submitted to the New York Natural Heritage Program ("NYNHP") were reviewed to assess potential effects to documented species as well as sensitive habitats potentially occurring within the Project vicinity. Incidental wildlife observations were documented during the September-November 2013 site reconnaissance, and correspondence will be submitted to the USFWS and NYNHP in early 2014 for the right-of-way and lands supporting the Project to confirm the preliminary results collected for the purpose of preparing the EM&CP.

The Project area generally occupies a rural landscape, which is bordered by terrestrial forested communities and to a lesser extent, agricultural land. Wildlife habitats within the Project area include meadow, old field, shrubland, and forested, emergent, and shrub wetlands. The potential occurrence for wildlife species was based on examination of habitat suitability and known occurrences within the Project area. A list of wildlife species expected to occur within the Project area is provided in Table 4.6-6.

Wildlife species composition and abundance within the right-of way is influenced by habitat type, foraging availability, and adjacent land use. Many species favor more than one habitat type, whereas other species remain dependent upon specific vegetative structure or ecological community. White-tailed deer (*Odocoileus virginianus*), grey squirrel (*Sciurus carolinensis*), American black bear (*Ursus americanus*), red fox (*Vulpes vulpes*), skunk (*Mephitis mephitis*), Eastern cottontail (*Sylvilagus floridanus*), and raccoon

(*Procyon lotor*) are common in terrestrial forested communities. These species may exhibit seasonal habitat preferences and migrate to shrub, or agriculture areas during various times of the year for mating, foraging, and shelter opportunities.

Freshwater wetlands and other aquatic systems provide optimal habitat for a variety of amphibians, herpetofauna, birds, and reptiles. Many species migrate between aquatic and terrestrial systems for breeding, foraging, mating, and hibernating while other species are adapted primarily to aquatic systems. These species include mink (*Mustela vison*) and beaver (*Castor canadensis*) as well as waterfowl, salamanders, frogs, turtles, and snakes.

Agricultural land including cultivated crops, hay, and pasture attract many species of wildlife that frequent natural communities due to abundant food sources. Species typically observed in these areas are more tolerant of human activity and disturbances. White-tailed deer, red fox, Eastern coyote (*Canis latrans*), Canada goose (*Branta canadensis*), birds, and small rodents are commonly found in this habitat.

Table 4.6-6 Summary of Wildlife Expected to Occur in the Project Area

Common Name	*Scientific Name*	Common Name	*Scientific Name*
Reptiles and Amphibians			
Black Rat Snake	*Elaphe o. obsoleta*	Northern Dusky Salamander	*Desmognathus fuscus*
Blanding's Turtle[1]	*Emydoidea blandingii*	Northern Redback Salamander	*Plethodon c. cinereus*
Bog Turtle[1]	*Clemmys [=Glyptemys] muhlenbergii*	Northern Ringneck Snake	*Diadophis punctatusedwardsi*
Bullfrog	*Rana catesbeiana*	Northern Slimy Salamander	*Plethodon glutinosus*
Common Garter Snake	*Thamnophis sirtalis*	Northern Spring Peeper	*Pseudacris crucifer*
Common Snapping Turtle	*Chelydra serpentina*	Northern Two-lined Salamander	*Euryceabis lineata*
Eastern American Toad	*Bufo americanus*	Northern Water Snake	*Nerodia sipedon*
Eastern Box Turtle	*Terrapene carolina*	Painted Turtle	*Chrysemys picta*
Eastern Milk Snake	*Lampropeltis triangulum*	Pickerel Frog	*Rana palustris*
Gray Treefrog	*Hyla versicolor*	Red-spotted Newt	*Notophthalmus viridescens*
Green Frog	*Rana clamitansmelanota*	Southern Leopard Frog	*Rana sphenocephalautricularius*
Jefferson Salamander	*Ambystoma jeffersonianum*	Spotted Salamander	*Ambystoma maculatum*
Marbled Salamander	*Ambystoma opacum*	Spotted Turtle	*Clemmys guttata*
Timber Rattlesnake[1]	*Crotalus horridus*	Wood Frog	*Rana sylvatica*
Northern Black Racer	*Coluber constrictor*	Wood Turtle	*Clemmys insculpta*
Birds			
Acadian Flycatcher	*Empidonax virescens*	Hooded Warbler	*Wilsonia citrina*
Alder Flycatcher	*Empidonax alnorum*	House Finch	*Carpodacus mexicanus*
American Black Duck [3]	*Anas rubripes*	House Sparrow	*Passer domesticus*
American Crow	*Corvusbrachy rhynchos*	House Wren	*Troglodytes aedon*
American Goldfinch	*Carduelis tristis*	Indigo Bunting	*Passerina cyanea*
American Kestrel	*Falco sparverius*	Killdeer	*Charadrius vociferus*
American Redstart	*Setophaga ruticilla*	Least Flycatcher	*Empidonax minimus*
American Robin	*Turdus migratorius*	Long-eared Owl	*Asio otus*
American Woodcock	*Scolopax minor*	Louisiana Waterthrush	*Seiurus motacilla*
Bald Eagle[1]	*Haliaeetus leucocephalus*	Mallard[3]	*Anas platyrhynchos*
Baltimore Oriole	*Icterus galbula*	Merlin	*Falco columbarius*
Barn Swallow	*Hirundo rustica*	Mourning Dove	*Zenaida macroura*
Barred Owl	*Strix varia*	Mute Swan[3]	*Cygnus olor*

Table 4.6-6 Summary of Wildlife Expected to Occur in the Project Area (Continued)

Common Name	*Scientific Name*	Common Name	*Scientific Name*
Birds			
Belted Kingfisher	*Megaceryl ealcyon*	Northern Cardinal	*Cardinalis cardinalis*
Black Vulture	*Coragypsa tratus*	Northern Flicker	*Colaptes auratus*
Black-and-white Warbler	*Mniotilt avaria*	Northern Goshawk	*Accipiter gentilis*
Black-billed Cuckoo	*Coccyzusery thropthalmus*	Northern Harrier[1]	*Circus cyaneus*
Blackburnian Warbler	*Dendroica fusca*	Northern Mockingbird	*Mimus polyglottos*
Black-capped Chickadee	*Poecilea tricapilla*	Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Black-throated Blue Warbler	*Dendroica caerulescens*	Orchard Oriole	*Icterus spurius*
Black-throated Green Warbler	*Dendroica virens*	Northern Waterthrush	*Seiurus noveboracensis*
Blue Jay	*Cyanocitta cristata*	Osprey	*Pandion haliaetus*
Blue-gray Gnatcatcher	*Polioptila caerulea*	Ovenbird	*Seiurus aurocapilla*
Blue-headed Vireo	*Vireo solitarius*	Peregrine Falcon[1]	*Falco peregrinus*
Blue-winged Warbler	*Vermi vorapinus*	Pileated Woodpecker	*Dryocopus pileatus*
Bobolink	*Dolichonyx oryzivorus*	Pine Warbler	*Dendroica pinus*
Broad-winged Hawk	*Buteo platypterus*	Prairie Warbler	*Dendroica discolor*
Brown Creeper	*Certhianamericana*	Purple Finch	*Carpodacus purpureus*
Brown Thrasher	*Toxo stomarufum*	Purple Martin	*Prognes ubis*
Brown-headed Cowbird	*Molo thrusater*	Red-bellied Woodpecker	*Melaner pescarolinus*
Canada Goose[3]	*Branta canadensis*	Red-breasted Nuthatch	*Sitta canadensis*
Canada Warbler	*Wilsonia canadensis*	Red-eyed Vireo	*Vireo olivaceus*
Carolina Wren	*Thryothorus ludovicianus*	Red-shouldered Hawk	*Buteo lineatus*
Cedar Waxwing	*Bombycilla cedrorum*	Red-tailed Hawk	*Buteo jamaicensis*
Chestnut-sided Warbler	*Dendroica pensylvanica*	Red-winged Blackbird	*Agelaius phoeniceus*
Chimney Swift	*Chaetura pelagica*	Ring-necked Pheasant[3]	*Phasianus colchicus*
Chipping Sparrow	*Spizella passerina*	Rock Pigeon	*Columba livia*
Common Grackle	*Quiscalus quiscula*	Rose-breasted Grosbeak	*Pheucticusl udovicianus*
Common Merganser[3]	*Mergus merganser*	Ruby-throated Hummingbird	*Archilochus colubris*
Common Nighthawk	*Chordeiles minor*	Savannah Sparrow	*Passerculus sandwichensis*
Common Raven	*Corvus corax*	Scarlet Tanager	*Pirangao livacea*
Common Yellowthroat	*Geothly pistrichas*	Sharp-shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperii*	Song Sparrow	*Melos pizamelodia*

Table 4.6-6 Summary of Wildlife Expected to Occur in the Project Area (Continued)

Common Name	*Scientific Name*	Common Name	*Scientific Name*
Birds			
Double-crested Cormorant	*Phalacrocorax auritus*	Spotted Sandpiper	*Actitis macularius*
Downy Woodpecker	*Picoides pubescens*	Swamp Sparrow	*Melos pizageorgiana*
Eastern Bluebird	*Sialia sialis*	Tree Swallow	*Tachycineta bicolor*
Eastern Kingbird	*Tyrannus tyrannus*	Tufted Titmouse	*Baeolophus bicolor*
Eastern Meadowlark	*Sturnella magna*	Turkey Vulture	*Cathartes aura*
Eastern Phoebe	*Sayornis phoebe*	Veery	*Catharus fuscescens*
Eastern Screech-Owl	*Otus asio*	Virginia Rail	*Rallus limicola*
Eastern Towhee	*Pipiloerythroph thalamus*	Warbling Vireo	*Vireo gilvus*
Eastern Wood-Pewee	*Contopus virens*	Whip-poor-will	*Caprimulgus vociferus*
European Starling	*Sturnus vulgaris*	White-breasted Nuthatch	*Sitta carolinensis*
Field Sparrow	*Spizella pusilla*	White-eyed Vireo	*Vireo griseus*
Golden Eagle	*Aquila chrysaetos*	Wild Turkey[3]	*Meleagris gallopavo*
Gray Catbird	*Dumetella carolinensis*	Willow Flycatcher	*Empidonax traillii*
Great Blue Heron[3]	*Ardea herodias*	Winter Wren	*Troglodytes troglodytes*
Great Crested Flycatcher	*Myiar chuscrinitus*	Wood Duck[3]	*Aix sponsa*
Great Horned Owl	*Bubo virginianus*	Wood Thrush	*Hylocichla mustelina*
Green Heron[3]	*Butorides virescens*	Worm-eating Warbler	*Helmitheros vermivorum*
Hairy Woodpecker	*Piciodes villosus*	Yellow Warbler	*Dendroica petechia*
Hermit Thrush	*Catharus nguttatus*	Yellow-billed Cuckoo	*Coccyzus americanus*
Hooded Merganser	*Lophodyte scucullatus*	Yellow-throated Vireo	*Vireo flavifrons*
Mammals			
American Black Bear	*Ursus americanus*	North American Opossum	*Didelphis virginiana*
Beaver	*Castor Canadensis*	Northern Flying Squirrel	*Glaucomys sabrinus*
Big Brown Bat	*Eptisicus fuscus*	Northern Short-tailed Shrew	*Blarina brevicauda*
Black Rat	*Rattus rattus*	Norway Rat	*Rattus norvegicus*
Deer Mouse	*Peromyscus maniculatus*	Porcupine	*Erethizon dorsatum*
Eastern Chipmunk	*Tamia striatus*	Raccoon	*Procyon lotor*
Eastern Cottontail	*Sylvilagus floridanus*	Red Bat	*Lasiurus borealis*
Eastern Pipistrelle	*Pipistrellus subflavus*	Red Fox	*Vulpes vulpes*

Table 4.6-6 Summary of Wildlife Expected to Occur in the Project Area (Continued)

Common Name	*Scientific Name*	Common Name	*Scientific Name*
Mammals			
Eastern Woodrat	*Neotoma floridana*	Red Squirrel	*Tamiasciurus hudsonicus*
Ermine	*Mustela ermina*	Silver-haired Bat	*Lasionycteris noctivagans*
Gray Fox	*Urocyoncinereo argenteus*	Small-footed Bat	*Myotis leibii*
Gray Squirrel	*Sciurus carolinensis*	Snowshoe Hare	*Lepus americanus*
Hairy-tailed Mole	*Parascalops breweri*	Southern Bog Lemming	*Synaptomys cooperi*
Hoary Bat	*Lasiurus cinereus*	Southern Red-backed Vole	*Clethrionomys gapperi*
House Mouse	*Mus musculus*	Southern Flying Squirrel	*Glaucomys volans*
Indiana Bat[1]	*Myotis sodalis*	Star-nosed Mole	*Condylura cristata*
Keen's Bat	*Myotis kenii*	Striped Skunk	*Mephitis mephitis*
Little Brown Bat	*Myotis lucifugus*	Water Shrew	*Sorex palustris*
Long-tailed Weasel	*Mustela frenata*	White-footed Mouse	*Peromyscus leucopus*
Masked Shrew	*Sorex cinereus*	White-tailed Deer	*Odocoileus virginianus*
Meadow Jumping Mouse	*Zapus hudsonius*	Woodchuck	*Marmota monax*
Meadow Vole	*Microtus pennsylvanicus*	Woodland Jumping Mouse	*Napaeozapus insignis*
Mink	*Mustela vison*	Woodland Vole	*Microtus pinetorum*
Muskrat	*Ondatra zibethicus*		

[1] New York State and/or U. S. Fish and Wildlife Listed Threatened or Endangered Species.

Sources: HMANA 2010, NYNHP 2011, NYSDEC 2005, NYSDEC 2010, Sauer *et al.* 2009, USFWS, 1997.

Incidental wildlife species observed during the initial field investigation are common occurrences in Dutchess County. Turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), and American crow (*Corvus brachyrhynchos*) were observed flying over the right-of-way, while blue jay (*Cyano cittacristata*), gray catbird (*Dumetella carolinensis*), and American robin (*Turdus migratorius*) were observed perched in shrub thickets within the right-of-way. Wood frog (*Rana sylvatica*) and green frog (*Rana clamitansmelanota*) were abundant in aquatic habitats and a great blue heron (*Ardea Herodias*) was flushed from NYSDEC wetland VB-12, associated with an unnamed tributary of Clove Brook. Common garter snake (*Thamnophis sirtalis*) was observed basking on rocks and Eastern coyote scat was observed throughout portions of the entire right-of-way, which indicate that the right-of-way is used by these animals for hunting and feeding opportunities.

Wildlife species and habitat occurring within the Project area are common throughout Dutchess County. While the Project is located within an existing transmission right-of-way, construction of the 345 kV transmission line, would result in minor temporary and permanent alteration of wildlife habitat and may have an effect on local wildlife species. Expanding the existing right-of way where forested cover will be cleared will alter existing habitat and may affect the types of wildlife that use the right-of-way and how wildlife use the right-of-way for foraging, breeding, and migration.

During construction, wildlife species may experience temporary displacement during vegetation clearing and as a result of noise from construction activities. These effects will be short-term in duration and limited within and adjacent to the existing right-of-way. Wildlife species will likely seek temporary shelter in suitable habitat in adjacent areas and are expected to return once construction is complete. Generally, land cover adjacent to the Project area consists of the same community type that will be disturbed during construction; therefore, significant loss of forage, shelter, and nesting habitat on a local or regional basis is not anticipated. In general, adverse effects to wildlife would be localized to the immediate construction site and are expected to be insignificant in magnitude and duration.

While the long-term control of vegetation development will influence the habitat suitability for specific species, other species may benefit from maintaining stable vegetation communities. In general, the Project will increase the amount of shrubland and herbaceous vegetation communities within the right-of-way resulting from conversion of forested and mixed cover land uses in current existence. Small mammals and grazing species utilize meadow and shrub habitat for forage, cover, and reproduction. Meadows may also provide value to grassland breeding birds by increasing suitable habitat where the right-of-way is contiguous to a larger area of actively utilized grassland bird habitat. Certain rare species, such as the New England cottontail (*Sylvilagus transitionalis*), would possibly benefit from an increase in suitable habitat within the right-of-way.

Open and intermixed vegetation structure characterized by old fields of flowering plants and forbs contributes to species diversity and provides value to wildlife and pollinator species. Shrub communities provide habitat for migrating birds, cover for nesting birds, and forage and cover for reptiles and amphibians.

Avian collisions and electrocution of large birds could potentially occur following construction in areas where the corridor is situated between foraging or breeding areas such as agricultural fields, wetlands, and riparian areas, or when avian species nest on transmission line structures. Effects to avian species will be minimized during the planning phase by designing transmission lines to include adequate spacing and integrating grounding devices (APLIC, 2006).

4.6.4 Threatened and Endangered Species and Significant Natural Communities

Federal and State-level protection for threatened and endangered species, as well as their habitat require certain procedures be followed during project planning. Letters were submitted to the New York Natural Heritage program (NYNHP) by GEI Consultants, Inc. on October 15, 2012 and April 22, 2013 requesting information regarding the presence of threatened or endangered species and unique or significant natural communities for the approximately 14.6 miles of new Transmission Line construction and for the approximately 3.4 miles of Re-conductoring Segment construction, respectively.

Response letters from NYNHP, dated November 5, 2012 and May 2, 2013, to GEI Consultants, Inc. identify four listed wildlife species and one listed vascular plant as potentially occurring on or within the vicinity of the Project (NYNHP 2012 and NYNHP 2013). Listed wildlife species identified on or within the vicinity of the Project included bog turtle (*Glyptemys muhlenbergii*), Indiana bat (*Myotis sodalis*), Blanding's turtle (*Emydoidea blandingii*) and timber rattlesnake (*Crotalus horridus*). The listed vascular plant consisted of Side-oats Grama (*Bouteloua curtipendula var. curtipendula*).

Four unique vegetation communities, three wetland/aquatic communities and one upland community were also identified by the NYNHP as occurring on or proximal to the Project. These communities included Floodplain Forest, Red Maple-Hardwood Swamp, Rich Sloping Fen, and Pitch Pine-Oak-Heath Rocky Summit. Copies of NYNHP correspondences are provided in Appendix A of this application.

Section 7(a) of the Endangered Species Act (ESA) establishes a national program, administered by USFWS for the conservation of threatened and endangered species of fish, wildlife, and for terrestrial species and the ecosystems on which they depend. The USFWS New York field office publishes Federally-listed Threatened and Endangered Species and Candidate Species County Lists regarding the occurrence of federally protected species. The referenced USFWS website was reviewed to identify any potential federally listed Significant Habitats documented as occurring with the right-of-way. Based on review of the "Significant Habitats and Habitat Complexes of the New York Bight Watershed," a portion

of the Dutchess County Wetlands Complex (Complex #27) appears to be located on or proximal to the Project right-of-way. This wetland complex has been identified to include rare turtle habitats (USFWS, 1997)

Careful access planning and construction best management practices (BMPs), based upon applicable Commission precedent in other Article VII proceedings, will be proposed in the EM&CP to be implemented during construction to avoid potential impacts to State and federally listed species and unique or significant natural communities. A summary describing the occurrence and distribution of the above listed species and communities is provided below.

4.6.4.1 Bog Turtle (Clemmys [Glyptemys] muhlenbergii)

The bog turtle is a federally listed threatened and a state listed endangered species. It is a semi-aquatic species that inhabits shallow, spring-fed fens, sphagnum bogs, swamps, marshy meadows, and pastures with soft, muddy bottoms; slow flowing water; and open canopies (USFWS, 2011). In New York, bog turtles prefer saturated soils fed by seeps or springs of cold groundwater that has been in contact with calcium-rich soils or bedrock. Several plant species commonly associated with bog turtle habitats include alders (*Alnus* sp.), willows (*Salix* sp.), sedges (*Carex* sp.), sphagnum moss (*Sphagnum* sp.), jewelweed (*Impatiens capensis*), rice cut-grass (*Leersia oryzoides*), tearthumb (*Polygonum sagittatum*), arrow arum (*Peltandra virginica*), red maple (*Acer rubrum*), skunk cabbage (*Symplocarpus foetidus*), and bulrushes (*Juncus* sp. and *Scirpus* sp.) (Bury, 1979).

Bog turtle and associated habitat has been documented by the NYNHP as occurring within 0.25 mile of the Project right-of-way. In addition, a portion of Dutchess County Wetlands Complex #27, identified as supporting rare turtles, bisects the Project just east of Traver Road (USFWS, 1997). Several wetland areas along the Project right-of-way were tentatively identified as being potential suitable bog turtle habitat during the September-November 2013 site reconnaissance, and will be further evaluated in 2014. Mapping of habitat within or nearby the right-of-way considered suitable for bog turtle is included in Figure 4.6-4. Cricket Valley will correspond with the NYSDEC and USFWS to confirm any known bog turtle sites within the Project right-of-way, and expects to enter into consultation with USFWS under Section 7(a) of the ESA in 2014. NYSDEC is expected to be a party to the Section 7 consultation. Cricket Valley will conduct Phase I bog turtle habitat surveys of all wetlands that include potential bog turtle habitat in or adjacent to the Project area in 2014. Regardless of the results of the survey, the presence of bog turtles will be assumed at any identified potential bog turtle site, and measures will be taken to avoid impacts to suitable habitat. Cricket Valley will develop a threatened and endangered species management plan as part of the EM&CP that includes protective measures for the bog turtle that will be employed prior to and during construction activities. Protective measures will include installation of exclusion fencing and daily clearance surveys and construction monitoring by qualified biologists, and any measures identified in permit conditions.

4.6.4.2 Indiana Bat (Myotis sodalis)

The Indiana bat is a federally and state listed endangered species. They overwinter in caves and mines before emerging and migrating to summer roosting and foraging habitat. Female Indiana bats have been documented moving between 12 and 40 miles from their winter hibernaculum to forage and roosting locations. Indiana bats typically forage in semi-open to closed (open understory) forested habitats, forest edges, and riparian areas and roost under slabs of exfoliating bark and occasionally narrow cracks within trees. Most trees occupied by Indiana bats in summer are dead or nearly so, but they occasionally roost under the naturally peeling bark of mature living trees, including shagbark hickory (*Carya ovata*), shellbark hickory (*Carya lacinosa*), and white oak (*Quercus alba*) located in both rural and suburban landscapes (USFWS, 2007)

The NYNHP documents the occurrence of Indian bat within 2.5 miles of the Project. Indiana bat hibernacula are known to occur in neighboring Ulster County. One of these sites is among the 10 largest hibernacula for the species in the country. Maternity and bachelor colonies have been identified through radio-telemetry studies and mist-net captures in Dutchess County. Cricket Valley will correspond with the NYSDEC and USFWS to confirm if there are any known Indiana bat summer roosting sites within the Project right-of-way.

In October – November 2013 field evaluations of the Project right-of-way included habitat analysis in accordance with the Phase I evaluation method of the Rangewide Indiana Bat Summer Survey Guidelines (USFWS, 2013). This evaluation confirmed that potential roosting habitat may exist in association with forest cover observed along the margins of the existing cleared area of the Project right-of-way. As part of the Section 7 consultation, Cricket Valley will work with USFWS to determine appropriate habitat evaluation actions, such as further habitat evaluations and survey, and/or appropriate restrictions on the Project to avoid impacts to the Indiana bat. At a minimum, protection measures to avoid impacts to Indiana bat will include no tree clearing activities outside of the March 31 to October 1 tree clearing moratorium.

As part of the EM&CP to be developed in 2014, Cricket Valley will develop a threatened and endangered species management plan that includes protective measures for the Indiana bat that will be employed prior to and during construction activities.

4.6.4.3 Blanding's Turtle (Emydoidea blandingii)

Blanding's turtle, a state-listed threatened species, prefers a range of wetland and upland habitats to meet individual needs. Blanding's turtles travel between wetland and upland communities to forage, bask, nest, seek climatic refuge, and overwinter. Wetlands may be isolated or exist as larger assemblages. In general, Blanding's turtle prefer shallow wetlands including shrub swamps, marshes, and shallow ponds.

In Dutchess County, Blanding's turtle were found to occupy kettle shrub pools characterized by seasonally or permanently flooded shrub-dominated depressions formed in a glacial outwash. Hoosic gravelly loam soils, derived from glacial outwash, are typically adjacent to or near pools. Buttonbush (*Cephalanthus occidentalis*) is a common dominant species; however, swamp azalea (*Rhododendron viscosum*) and highbush blueberry (*Vaccinium corymbosum*) may also be abundant or replace buttonbush. A shrub thicket is often encompassed by an open water moat and mature hardwood species including red maple (*Acer rubrum*) and green ash (*Fraxinus pennsylvanica*) are established around the perimeter of the pool. Hydrology within kettle pools is primarily fed by groundwater and may include small, intermittent inlets or outlets (Hartwig et al., 2009).

Blanding's turtle and associated habitat has been documented by the NYNHP as occurring within 0.25 mile of the Project. In addition, a portion of Dutchess County Wetlands Complex #27, identified as supporting rare turtles, bisects the Project right-of-way just east of Traver Road (USFWS, 1997). Blanding's turtle habitats have also been identified in southern Dutchess County, specifically in LaGrange and Union Vale (Hartwig et al., 2009). Four wetlands complexes in and proximal to the Project were identified as suitable Blanding's turtle habitat. These wetlands all occur in the western end of the Transmission Line right-of-way within Pleasant Valley and LaGrange. Several wetlands along the Project right-of-way were tentatively identified as being potential suitable Blanding's turtle habitat, characterized, and noted for future detailed survey during the September-November 2013 site reconnaissance. Mapping of habitat within or nearby the right-of-way considered suitable for Blanding's turtle is included in Figure 4.6-4.

Cricket Valley will coordinate with the USFWS and NYSDEC to confirm if there are any known Blanding's turtle sites within the Project right-of-way, and as part of the Section 7 consultation, determine appropriate habitat evaluation actions, such as further habitat evaluations and survey, and/or appropriate restrictions on the Project to avoid impacts to Blanding's turtle.

The presence of Blanding's turtles will be assumed at all known and potential sites (based on the results of the habitat survey) and measures will be taken to avoid impacts to the species. Cricket Valley will develop a threatened and endangered species management plan that includes protective measures for the Blanding's turtle that will be employed prior to and during construction activities. As identified for the bog turtle above, protective measures to be proposed in the EM&CP will include installation of exclusion fencing and daily clearance surveys and construction monitoring by qualified biologists.

4.6.4.4 Timber Rattlesnake (Crotalus horridus)

Timber rattlesnake, a state-listed threatened species, inhabits mountainous or hilly deciduous or mixed deciduous-coniferous forests characterized by rocky outcroppings, steep ledges, and rock slides. Hibernacula are positioned along talus ledges or rock outcrops and in fractures or accumulations of rock. Terrestrial forested communities, including pitch pine-oak-heath rocky summit, are associated with timber rattlesnake habitat.

The NYNHP identifies timber rattlesnake and associated habitat within 0.25 mile of the Project right-of-way. Potential timber rattlesnake habitat was identified in the western portion of the Transmission Line, west of Route 22, during the September-November 2013 site reconnaissance, characterized, and marked for further evaluation in 2014 following initiation of the Project's Section 7 consultation. This area coincides with the pitch pine-oak-heath rocky summit, a significant natural community identified by the NYNHP. Mapping of habitat within or nearby the right-of-way considered suitable for timber rattlesnakes is included in Figure 4.6-4.

Prior to construction, Cricket Valley will coordinate with the USFWS and NYSDEC to confirm if there are any known timber rattlesnake sites within the Transmission Line right-of-way. The presence of timber rattlesnake will be assumed at all known and potential sites and measures will be taken to avoid impacts to the species. Supporting structure erection in this area will be performed by helicopter, reducing permanent disturbance to this habitat.

As part of the EM&CP, Cricket Valley will develop a threatened and endangered species management plan that includes protective measures for the timber rattlesnake that will be employed prior to and during construction activities. Additional protective measures will include daily clearance surveys and construction monitoring by qualified biologists during vegetation clearing and construction activities, and use of exclusion fencing in select areas.

4.6.4.5 Side-Oats Grama (Bouteloua curtipendula var. curtipendula)

This state-listed endangered grass is widespread and common in parts of New York but occurs very sporadically. This grass is easily recognized due to the attractive display of 10 to 30 spikes during the flowering and fruiting period. This grass species is strongly associated with dry limestone-derived soils and can be found in a wide range of landscapes including open habitats, riverside bluffs, and areas where natural and artificial disturbances have occurred such as in pastures, railroads, and along transmission corridors.

This species was documented by the NYNHP as historically occurring in the vicinity of the Project. This species was not observed during the initial site reconnaissance or during the formal wetland delineation effort completed in October-November, 2013. Any populations observed during 2014 field efforts will be clearly identified on construction plans and in the EM&CP.

4.6.4.6 Floodplain Forest

This rare community type historically covered wide areas along rivers in New York. Their mineral rich soils were deposited along adjacent forests following flood events and were among the first areas to be cleared for farming due to their productivity. Floodplain forests serve as important wildlife corridors and reduce flooding and excessive siltation to downstream areas.

The NYNHP documents the floodplain forest as a Rare Community Type occurring at or in the vicinity of the Project. This community is identified as the Great Swamp North Flow, a relatively young large floodplain forest with good diversity. It includes some highly disturbed areas and some invasive vegetation species along the edges and within the complex. The immediate landscape is described as somewhat fragmented and minimal buffering was identified between the community and Route 22 to the east (NYNHP, 2012 and 2013). This ecological community was determined to be located outside of the Project area to the south (USFWS, 1997). Therefore, adverse effects to this community are not anticipated as a result of the Project.

4.6.4.7 Red Maple-Hardwood Swamp

The NYNHP has identified a high quality occurrence of a red maple-hardwood swamp located in the Great Swamp North Flow. This community is characterized as a large, somewhat fragmented swamp with good diversity. Vegetation cover is comprised of a mix of mature and early successional areas with invasive species established along the perimeter and encroaching into the interior areas with minimal buffering between the community and Route 22 to the east (NYNHP, 2012 and 2013). This ecological community has been documented as occurring outside of the Project area to the south (USFWS, 1997), and was not observed on or adjacent to the right-of-way during field investigations in 2013.

4.6.4.8 Rich Sloping Fen

Rich sloping fens are headwater wetlands with cold water constantly moving through them. Small springs or groundwater seepage attribute to the hydrology and often have water flowing at the surface in small channels or rivulets. Rich sloping fens are often surrounded by upland forest and grade into other palustrine communities such as hemlock-hardwood swamp, shrub swamp, or shallow emergent marsh down slope. The structure of rich sloping fens is variable; usually there are scattered trees and shrubs and a nearly continuous ground layer of herbs and bryophytes. They may be shrub-dominated or herb-dominated. Species diversity is usually very high and may include species from the surrounding forest (NYNHP, 2013). This ecological community was identified by NYNHP as occurring within 0.5 miles of the Project area; therefore, adverse effects are not anticipated. This community was not observed within the Project area during the formal wetland delineation effort.

4.6.4.9 Pitch Pine-Oak-Heath Rocky Summit

This ecological community is considered a high quality occurrence of uncommon community type, and is a broadly defined community that occurs on warm, dry, rocky ridgetops and summits. Vegetation may be sparse or patchy with numerous rocky outcrops where pines are replaced with scrub oak (*Quercus berberidifolia*) or heath (*Erica* spp.) shrubs and are often surrounded by chestnut oak (*Quercus prinus*). This community was documented by the NYNHP as intersecting the right-of-way and coincides with suitable timber rattlesnake habitat. The extent of the community was verified during the 2013 site reconnaissance. Due to the steep slopes along this portion of the Project, supporting structures in this area will be erected via helicopter, and any necessary access spur road and construction pad sited to avoid this habitat type to the extent practical. This technique will minimize potential effects to this community from the Project.

4.6.5 Environmental Effects and Mitigation

Based on the preliminary design, structures will not be located within wetland areas; however one or more towers may be located nearby or within NYSDEC and locally regulated wetland Adjacent Areas. Permanent alterations to these areas are anticipated to be minimal and would be limited to tower foundations. Improvements to existing access roads and installation of new temporary access pathways with construction matting will occur within wetland and wetland Adjacent Areas. Proposed mitigation measures to offset affects to these resources will be detailed in the application to USACE and in the EM&CP. Based on initial estimations, temporary impacts may alter approximately 0.2 acre of wetlands primarily associated with use of existing access roads crossing wetlands.

Improvements to existing access roads would be limited to application of crushed stone to level and make stable existing roadways. New temporary access pathways would be advanced on construction mats which would be removed following completion of construction. Following removal, the area will be reseeded with a fast growing wetland seed mix. All temporary impacts to wetlands would be restored in place and in kind. Permanent conversion of forested wetlands to other covertypes will also be quantified in the proposed Project permit applications, but initial estimations indicate up to 5.31 acres of permanent conversion from forested (PFO) wetland to scrub-shrub (PSS) and emergent (PEM) wetlands.

Mitigation for wetland impacts will be detailed in the application made to the USACE and in the EM&CP, but is expected to be limited to restoration of temporarily impacted wetlands to approximate pre-construction conditions. Temporal loss of wetland function associated with permanent conversion is expected to be mitigated for by removal and control of invasive and non-native species during restoration of altered wetland areas.

Temporary displacement of wildlife species is anticipated during clearing and construction activities. It is anticipated that these species will relocate to similar adjacent habitat and return once construction has been completed. A threatened and endangered management plan will be developed that includes protective measures for the bog turtle, Indiana bat, Blanding's turtle and timber rattlesnake. If suitable habitat for these species is identified, their presence will be assumed and protective measures will be employed, such as installation of barrier fences and beginning and end of day inspections by qualified biologists as well as hand clearing and use of barrier fencing as appropriate. Consultation with the NYSDEC, and where applicable the USFWS, will be initiated regarding these species. Selective use of air-crane helicopters for structure erection will be employed in sensitive areas, further reducing potential impacts to listed species or their habitats. Implementation of the threatened and endangered species management plan and use of air-crane helicopters in sensitive areas are expected to produce no significant effect on protected species and their habitat.

4.7 Topography and Soils

4.7.1 Topography

The majority of Dutchess County lies within the Mid-Hudson Valley, which is characterized by relatively low elevations. The Hudson Highlands and the Taconic Mountains are located along the southern and eastern edges of the county, respectively. Hilltop elevations in the lowlands are generally below 500 feet above sea level; however, elevations in the highlands can exceed 1,500 feet. The topography of Dutchess County is dominated by northeast-southwest trending ridges of bedrock covered by a thin veneer of glacial till. These ridges are separated by deep valleys filled with thick fluvial and lacustrine sediments, many of glacial origin. Slopes that do not have bedrock exposures are covered by thin glacial till deposits. The slope steepness determines the nature of soils formed on them. Steeper slopes have thinner, less well developed soils because the parent material is transported downhill by gravity before soil can develop. Soils at the toe of a slope, where material moving downslope collects, tend to be thicker (Budnik et al., 2010).

4.7.2 Geology

Much of the Mid-Hudson Valley is underlain by soft shale or carbonate bedrock. The Hudson Highlands and the Taconic Hills are underlain by much harder granites, gneisses, schists, and other hard rocks. Carbonate rocks often form localized valleys in the eastern part of Dutchess County and ridges in the western part of the county. Major streams commonly occur over soft carbonate rocks in Dutchess County (Budnik et al., 2010).

Sand and gravel are mined for construction aggregate throughout New York and are an important economic resource in Dutchess County. Significant sand and gravel reserves are found primarily along stream valleys, where glacial outwash is located. These relatively level gravel terraces have historically been extensively developed because they are also valuable as farmland and suitable for easy residential development (Budnik et al., 2010).

Economic geologic resources are presented on Figure 2-5. Based on a review of data available from the USGS and NYSDEC, one quarry, 30 stone or sand and gravel companies, and one peat facility have been identified within three miles of the Project (USGS 2009; NYSDEC Division of Mineral Resources 2009a). These facilities are listed in Table 4.7-1; the identification number corresponds to the labels on Figure 2-5.

Table 4.7-1 Geologic Resources

Map Reference	Figure	Name	Location	Category
Geologic Resources				
G01	2-1a	A Colarusso & Son Inc.	Town of LaGrange	Sand and Gravel
G02	2-1a	Lansing, Elizabeth King	Town of Pleasant Valley	Sand and Gravel
G03	2-1a	Dutchess Quarry & Supply Co Inc.	Town of Pleasant Valley	Dolostone
G04	2-1a	Pond Hills Development Corp	Town of LaGrange	Sand and Gravel
G05	2-1a	Cedar Meadow Co Inc.	Town of LaGrange	Sand and Gravel
G06	2-1a	Domin, Jay & Stanley	Town of LaGrange	Sand and Gravel
G07	2-1b	Red Wing Properties Inc.	Town of LaGrange	Sand and Gravel
G08	2-1b	Red Wing Properties Inc.	Town of LaGrange	Sand and Gravel
G09	2-1b	Richard Ryan Excavating, Inc.	Town of LaGrange	Sand and Gravel
G10	2-1b	Ryan, Francis	Town of Union Vale	Sand and Gravel
G11	2-1b	Detraglia, Marilyn	Town of Union Vale	Sand and Gravel
G12	2-1b	Aakjar, Frederick H	Town of Union Vale	Sand and Gravel
G13	2-1b	Verbank Hunting And Fishing Club Inc.	Town of Union Vale	Sand and Gravel
G14	2-1b	Emmadine Land Associates	Town of Union Vale	Sand and Gravel
G15	2-1b; 2-1c	Kiniry, Scott	Town of Union Vale	Sand and Gravel
G16	2-1b; 2-1c	Clove Valley Rod & Gun Club	Town of Union Vale	Sand and Gravel
G17	2-1b; 2-1c	Tusker Construction Corp	Town of Union Vale	Stone
G18	2-1c	Judson, Thomas E	Town of Dover	Sand and Gravel
G19	2-1c	Best Sand & Gravel Inc.	Town of Dover	Sand and Gravel
G20	2-1c	Slocom, Egbert J	Town of Dover	Sand and Gravel
G21	2-1c	Deluca, Anthony	Town of Dover	Sand and Gravel
G22	2-1c	Anderson Peat-Organic Compost Corp	Town of Dover	Peat

Table 4.7-1 Geologic Resources (Continued)

Map Reference	Figure	Name	Location	Category
Geologic Resources				
G23	2-1c; 2-1d	Holback, Ian	Town of Dover	Sand and Gravel
G23	2-1c	Vincent Sand & Gravel Company LLC	Town of Dover	Sand and Gravel
G24	2-1c	R & J Materials	Town of Dover	Sand and Gravel
G25	2-1c	R & J Materials	Town of Dover	Sand and Gravel
G26	2-1c	Dover Stone & Sand Corp	Town of Dover	Sand and Gravel
G27	2-1c	O & G ColproviaInc	Town of Dover	Sand and Gravel
G28	2-1c	Danny Fortune & Co Inc.	Town of Dover	Sand and Gravel
G29	2-1c	Palumbo Sand & Gravel Inc.	Town of Dover	Sand and Gravel
G29	2-1c	Nicholas F Domain Sand & Gravel	Town of Dover	Sand and Gravel
G30	2-1c; 2-1d	Ten Mile River Holding Ltd	Town of Dover	Sand and Gravel

No productive oil or gas wells registered with the NYSDEC were identified within the three mile Project area (NYSDEC Division of Mineral Resources 2009).

4.7.3 Soils

The soils in Dutchess County vary greatly. Silty loam is the dominant texture, but textures can vary greatly from gravelly, sandy loam to fine, silty clay. Most of the cultivated soils are moderately eroded, except in certain nearly level areas. More than 70 percent of county soils are well drained, but small areas of poorly- and very poorly-drained soils can be found (Budnik et al., 2010).

A review of county-level soil survey information from the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database has been reviewed to assess the soil types located along the right-of-way. The SSURGO data categorizes soils based on associations. Associated soils share characteristics such as local relief, drainage capability, and a unique natural landscape.

Analysis of SSURGO data indicates 46 soil associations occur within the right-of-way, as shown in Table 4.7-2. Generally, soils identified along the right-of way are moderately well drained, somewhat excessively drained or well drained upland loamy soils. Evaluation of soil characteristics indicates the presence of soils that may make them either particularly sensitive to disturbance or unsuitable for construction. These units include hydric soils; poorly drained soils; prime farmland soils and soils of statewide importance; soils with shallow bedrock; soils with shallow ground water; soils with limitations for shallow excavations; and soils with high risk of corrosion of concrete. A geotechnical program has not been undertaken for the Project; however, soil borings will be obtained at selected structure locations as necessary to support foundation design.

4.7.4 Environmental Effects and Mitigation

Ground disturbance associated with construction of the Project is characterized by shallow grading for access roads and localized work areas at structure locations. Substantial alterations of slope and gradient is not anticipated; however minor changes to topography will occur from grading of work areas and installation of temporary access pathways with construction matting. Although minor topographic changes are not expected to be significant, mitigation measures will be implemented to address soil erosion, compaction, and sedimentation during construction. Following construction, the disturbed area will be restored to pre-construction contours to reduce the effects of grading. Of the 46 soil units encountered along the Project route, 3 are classified as Prime Farmland if drained, 8 are classified as Prime Farmland, and 9 are classified as Farmland of Statewide Importance as defined by the U.S. Department of Agriculture. These soils do not necessarily correspond to active agricultural areas; rather, they simply meet certain physical and chemical parameters that indicate they are of very high quality and can economically sustain high yields of crops when treated and managed according to acceptable farming methods.

Construction in active agricultural areas is expected to be minimal. However, if construction occurs in farmed areas, soils will be managed to minimize erosion, compaction and soil mixing. Best Management Practices (BMPs), adopted by the Commission in other applicable Article VII certificates, will be proposed in the EM&CP and typically will include timber mats to minimize topsoil disturbance. Detailed restoration procedures will also be included in the EM&CP.

The construction of the Project will not result in cumulative effects relative to topographic and soil conditions along the right-of-way. There are no geologic concerns that would have a long-term effect on the integrity of structures, as demonstrated by the long-standing presence of an existing transmission line along the Project route.

Table 4.7-2 Soil Characteristics – Construction Suitability

Soil Series		Parent Material	Depth to Bed Rock (ft)	Depth to Water Table (ft)	Hydric Rating	Drainage Class	Farmland Class	Shallow Excavations	Risk of Corrosion for Concrete
Bernardston silt loam, 3 to 8 percent slopes	BeB	Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist	6.6	1.8	Not Hydric	Well drained	All areas are prime farmland	Very limited	High
Bernardston silt loam, 8 to 15 percent slopes	BeC	Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist	6.6	1.8	Not Hydric	Well drained	Farmland of statewide importance	Very limited	High
Bernardston silt loam, 15 to 25 percent slopes	BeD	Loamy, acid, dense till derived mainly from phyllite, shale, slate, and schist	6.6	1.8	Not Hydric	Well drained	Not prime farmland	Very limited	High
Carlisle muck	Cc	Deep organic material	6.6	0.0	Hydric	Very poorly drained	Not prime farmland	Very limited	Low
Charlton loam, 8 to 15 percent slopes, very stony	ClC	Acid loamy till derived mainly from schist, gneiss, or granite	6.6	6.6	Not Hydric	Well drained	Not prime farmland	Very limited	High
Chatfield-Hollis complex, rolling, very rocky	CtC	A thin mantle of loamy till derived mainly from schist, granite, and gneiss	1.2	6.6	Not Hydric	Well drained	Not prime farmland	Very limited	High
Chatfield-Hollis complex, hilly, very rocky	CtD	A thin mantle of loamy till derived mainly from schist, granite, and gneiss	1.2	6.6	Not Hydric	Well drained	Not prime farmland	Very limited	High

Table 4.7-2 Soil Characteristics – Construction Suitability (Continued)

Soil Series		Parent Material	Depth to Bed Rock (ft)	Depth to Water Table (ft)	Hydric Rating	Drainage Class	Farmland Class	Shallow Excavations	Risk of Corrosion for Concrete
Copake gravelly silt loam, nearly level	CuA	Loamy over calcareous sandy and gravelly glaciofluvial deposits	6.6	6.6	Not Hydric	Well drained	All areas are prime farmland	Very limited	Moderate
Copake gravelly silt loam, undulating	CuB	Loamy over calcareous sandy and gravelly glaciofluvial deposits	6.6	6.6	Not Hydric	Well drained	All areas are prime farmland	Very limited	Moderate
Copake gravelly silt loam, rolling	CuC	Loamy over calcareous sandy and gravelly glaciofluvial deposits	6.6	6.6	Not Hydric	Well drained	Farmland of statewide importance	Very limited	Moderate
Copake gravelly silt loam, hilly	CuD	Loamy over calcareous sandy and gravelly glaciofluvial deposits	6.6	6.6	Not Hydric	Well drained	Not prime farmland	Very limited	Moderate
Dutchess silt loam, 3 to 8 percent slopes	DuB	Loamy till derived mainly from phyllite, slate, schist, and shale	6.6	6.6	Not Hydric	Well drained	All areas are prime farmland	Somewhat limited	Moderate
Dutchess silt loam, 8 to 15 percent slopes	DuC	Loamy till derived mainly from phyllite, slate, schist, and shale	6.6	6.6	Not Hydric	Well drained	Farmland of statewide importance	Somewhat limited	Moderate
Dutchess silt loam, 15 to 25 percent slopes	DuD	Loamy till derived mainly from phyllite, slate, schist, and shale	6.6	6.6	Not Hydric	Well drained	Not prime farmland	Very limited	Moderate
Dutchess-Cardigan complex, undulating, rocky	DwB	Loamy till derived mainly from phyllite, slate, schist, and shale	6.6	6.6	Not Hydric	Well drained	All areas are prime farmland	Somewhat limited	Moderate
Dutchess-Cardigan complex, rolling, rocky	DwC	Loamy till derived mainly from phyllite, slate, schist, and shale	6.6	6.6	Not Hydric	Well drained	Farmland of statewide importance	Somewhat limited	Moderate

Table 4.7-2 Soil Characteristics – Construction Suitability (Continued)

Soil Series		Parent Material	Depth to Bed Rock (ft)	Depth to Water Table (ft)	Hydric Rating	Drainage Class	Farmland Class	Shallow Excavations	Risk of Corrosion for Concrete
Dutchess-Cardigan complex, hilly, rocky	DwD	Loamy till derived mainly from phyllite, slate, schist, and shale	6.6	6.6	Not Hydric	Well drained	Not prime farmland	Very limited	Moderate
Farmington-Galway complex, undulating, very rocky	FcB	Loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits	1.2	6.6	Not Hydric	Somewhat excessively drained	Not prime farmland	Very limited	Moderate
Farmington-Galway complex, rolling, very rocky	FcC	Loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits	1.2	6.6	Not Hydric	Somewhat excessively drained	Not prime farmland	Very limited	Moderate
Farmington-Galway complex, hilly, very rocky	FcD	Loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits	1.2	6.6	Not Hydric	Somewhat excessively drained	Not prime farmland	Very limited	Moderate
Farmington-Rock outcrop complex, steep	FeE	Loamy till or congeliturbate derived from limestone, dolomite, shale, and sandstone, and in many places mixed with wind and water deposits	1.2	6.6	Not Hydric	Somewhat excessively drained	Not prime farmland	Very limited	Moderate
Fluvaquents-Udifluvents complex, frequently flooded	Ff	Alluvium with highly variable Texture	6.6	0.0	Hydric	Poorly drained	Not prime farmland	Very limited	High
Georgia silt loam, 3 to 8 percent slopes	GsB	Loamy till derived mainly from limestone, shale, or slate	6.6	2.3	Not Rated	Moderately well drained	All areas are prime farmland	Very limited	Moderate

Table 4.7-2 Soil Characteristics – Construction Suitability (Continued)

Soil Series		Parent Material	Depth to Bed Rock (ft)	Depth to Water Table (ft)	Hydric Rating	Drainage Class	Farmland Class	Shallow Excavations	Risk of Corrosion for Concrete
Hollis-Chatfield-Rock outcrop complex, rolling	HoC	A thin mantle of loamy till derived mainly from schist, granite, and gneiss	1.2	6.6	Not Hydric	Somewhat excessively drained	Not prime farmland	Very limited	High
Hollis-Chatfield-Rock outcrop complex, hilly	HoD	A thin mantle of loamy till derived mainly from schist, granite, and gneiss	1.2	6.6	Not Hydric	Somewhat excessively drained	Not prime farmland	Very limited	High
Hollis-Chatfield-Rock outcrop complex, steep	HoE	A thin mantle of loamy till derived mainly from schist, granite, and gneiss	1.2	6.6	Not Hydric	Somewhat excessively drained	Not prime farmland	Very limited	High
Hollis-Chatfield-Rock outcrop complex, very steep	HoF	A thin mantle of loamy till derived mainly from schist, granite, and gneiss	1.2	6.6	Not Hydric	Somewhat excessively drained	Not prime farmland	Very limited	High
Hoosic gravelly loam, undulating	HsB	Sandy and gravelly glaciofluvial deposits	6.6	6.6	Not Hydric	Somewhat excessively drained	Farmland of statewide importance	Very limited	High
Hoosic channery loam, fan, 3 to 8 percent slopes	HtB	Sandy and gravelly glaciofluvial deposits	6.6	4.5	Not Hydric	Somewhat excessively drained	Farmland of statewide importance	Very limited	High
Linlithgo silt loam	Ln	Loamy alluvium over sandy and gravelly water-sorted deposits	6.6	1.0	Not Hydric	Somewhat poorly drained	Prime farmland if drained	Very limited	Moderate

Table 4.7-2 Soil Characteristics – Construction Suitability (Continued)

Soil Series		Parent Material	Depth to Bed Rock (ft)	Depth to Water Table (ft)	Hydric Rating	Drainage Class	Farmland Class	Shallow Excavations	Risk of Corrosion for Concrete
Massena silt loam, 0 to 3 percent slopes	MnA	Loamy till dominated by siliceous rocks with varying proportions of limestone	6.6	1.2	Not Hydric	Somewhat poorly drained	Prime farmland if drained	Very limited	Moderate
Massena silt loam, 3 to 8 percent slopes	MnB	Loamy till dominated by siliceous rocks with varying proportions of limestone	6.6	1.2	Not Hydric	Somewhat poorly drained	Prime farmland if drained	Very limited	Moderate
Nassau-Cardigan complex, undulating, very rocky	NwB	Channery loamy till derived mainly from local slate or shale	1.3	6.6	Not Hydric	Well drained	Not prime farmland	Very limited	High
Nassau-Cardigan complex, rolling, very rocky	NwC	Channery loamy till derived mainly from local slate or shale	1.3	6.6	Not Hydric	Well drained	Not prime farmland	Very limited	High
Nassau-Cardigan complex, hilly, very rocky	NwD	Channery loamy till derived mainly from local slate or shale	1.3	6.6	Not Hydric	Somewhat excessively drained	Not prime farmland	Very limited	High
Nassau-Rock outcrop complex, steep	NxE		1.3	6.6	Not Hydric		Not prime farmland	Not rated	
Pawling silt loam	Pg	Loamy over sandy and gravelly alluvium	6.6	1.8	Not Hydric	Moderately well drained	All areas are prime farmland	Very limited	Low
Pits, gravel	Ps		6.6	6.6	Not Hydric		Not prime farmland	Very limited	

Table 4.7-2 Soil Characteristics – Construction Suitability (Continued)

Soil Series		Parent Material	Depth to Bed Rock (ft)	Depth to Water Table (ft)	Hydric Rating	Drainage Class	Farmland Class	Shallow Excavations	Risk of Corrosion for Concrete
Pittstown silt loam, 8 to 15 percent slopes	PwC	Loamy till	6.6	2.3	Not Hydric	Moderately well drained	Farmland of statewide importance	Very limited	High
Stockbridge silt loam, 3 to 8 percent slopes	SkB	Calcareous loamy till	6.6	6.6	Not Hydric	Well drained	All areas are prime farmland	Somewhat limited	Low
Stockbridge silt loam, 8 to 15 percent slopes	SkC	Calcareous loamy till	6.6	6.6	Not Hydric	Well drained	Farmland of statewide importance	Somewhat limited	Low
Stockbridge silt loam, 15 to 25 percent slopes	SkD	Calcareous loamy till	6.6	6.6	Not Hydric	Well drained	Not prime farmland	Very limited	Low
Sun silt loam	Su	Loamy till derived primarily from limestone and sandstone, with a component of schist, shale, or granitic rocks in some areas	6.6	0.0	Hydric	Poorly drained	Farmland of statewide importance	Very limited	Moderate
Udorthents, smoothed	Ud		6.6	4.5	Not Rated	Well drained	Not prime farmland	Very limited	Moderate
Water	W		6.6	6.6	Not Rated		Not prime farmland	Not rated	
Wayland silt loam	Wy	Silty and clayey alluvium washed from uplands that contain some calcareous drift	6.6	0.0	Hydric	Poorly drained	Not prime farmland	Very limited	Low

Source:U.S. Department of Agriculture-Natural Resource Conservation Service, 2011. Soil Survey Geographic (SSURGO) Data Base for Dutchess County, New York.

Project components will be designed, constructed, operated, and maintained to be compatible with on-site geologic conditions. There are no known geologic or environmental issues expected to affect the integrity of the structures. To mitigate disturbances, soils will be re-graded to reflect pre-construction contours, compacted soils will be restored to their native state, and soil erosion and sediment control techniques will be implemented during construction.

4.8 Water Resources

In accordance with PSL §122(1)(c) and 16 NYCRR §86.5(a) and (b), this section provides an assessment of the potential effects to local water resources resulting from construction and operation of the Project. It identifies efforts undertaken to avoid or minimize these potential impacts, as well as mitigation measures to address unavoidable impacts. These mitigation measures will be reflected in the Project design and incorporated into the EM&CP. To complete this assessment, a desktop geospatial analysis was conducted using the project layout, existing information from federal and state agency data sources, and a literature review of published data to determine likely presence and extent of water resources in the Project right-of-way. Floodplains and wetlands are discussed separately in Section 4.3 and Section 4.6, respectively.

Since construction of the Project will disturb more than one acre of soil, the Project will apply for coverage under the State Pollutant Discharge Elimination System ("SPDES"), General Permit ("GP") for Stormwater Discharges from Construction Activities (GP-0-10-001). A Storm Water Pollution Prevention Plan ("SWPPP") specific to the Project will be developed to prevent discharges of construction-related pollutants to surface waters. Cricket Valley will provide the NYSDEC with a Notice of Intent ("NOI") for the Project prior to construction.

As noted above, in conjunction with the issuance of a CECPN pursuant to Article VII , the Applicant will request the issuance of a Water Quality Certificate pursuant to Section 401 of the Clean Water Act, 33 U.S.C. § 1341(a) (1), and 6 NYCRR Subpart 608.9 from the Commission or its designated representative at the appropriate time.

4.8.1 Affected Environment

Information regarding water resources was obtained from topographical maps, the U.S. National Hydrography Dataset (NHD) (USGS 2010b), NYSDEC and Federal database searches, and other existing GIS data available for Dutchess County. The NYSDEC database indicates classifications, and standards of quality and purity to the various surface waters identified within the Project right-of-way.

4.8.1.1 Surface Waterbodies

The Project is located within the Hudson-Wappinger Creek Watershed (Hydrologic Unit Code 02020008) and the Housatonic Watershed (HUC 0110005). The Hudson-Wappinger Watershed occupies 604,602 acres in the south-eastern portion of New York State straddling the Hudson River just north of the New York City metropolitan area. The watershed occupies portions of two major physiographic provinces. The Hudson Lowlands is an area of rolling landscapes, underlain predominantly by sedimentary rock such as shale and sandstone. In the eastern and southern parts of the watershed are several mountain ranges and highlands. Bedrock in these areas is mostly metamorphic, including schist, phyllite, and gneiss. All of this region has been glaciated and consists mainly of till plains and elongate ridges dissected by narrow valleys. River valleys are filled with silty and clayey glacial lake sediments and sandy and gravelly glacial outwash. Loamy till deposits are on uplands.

The Housatonic Watershed, located on the eastern edge of New York, occupies 1,247,585 acres, most of which is situated within western Massachusetts and Connecticut. The watershed is within the Taconic and Upland sections of the New England physiographic province. Bedrock occurs in a complex pattern of metamorphic rocks, including gneiss, schist, marble, and phyllite. This region was covered by ice during the advance of the last continental glacier. Most of the area consists of uplands blanketed by loamy till deposits. In many places on ridges and high elevations, the till is only a thin layer over bedrock. Sandy and gravelly glaciofluvial deposits and silty and clayey glaciolacustrine deposits are in valleys. Recent alluvial deposits are on narrow floodplains along rivers and streams.

Major streams and rivers within the Project area include the Tenmile River, Coopertown Brook, Swamp River, Wappinger Creek, Sprout Creek, Clove Brook and their associated tributaries. Figure 4.8-1 illustrates the locations of water resources identified within the Project right-of-way. A total of 17 crossings of NYSDEC-regulated streams and their associated tributaries occur within the Project right-of-way. Wetland and stream delineation was completed in October and November of 2014, and Figure 4.6-3 presents the results of that investigation. In addition, all delineated streams and wetlands will be shown on the plan and profile drawings included in the EM&CP and the USACE permit application.

Streams and their associated water quality classifications are identified in Table 4.8-1. These surface waters are classified as either Class B or C Fresh Surface Waters according to the NYSDEC Standards (New York Code of Rules and Regulations [NYCRR] 1999). Classification B indicates a best usage for primary and secondary contact recreation and fishing, but not for drinking water. These waters are suitable for fish, shellfish, and wildlife propagation and survival. Classification C is for waters supporting fisheries and suitable for non-contact activities. These waters are suitable for fish, shellfish, and wildlife propagation and survival. The water quality is suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes. Classified waters may also have

a standard of (T), indicating that it may support a trout population, or (TS), indicating that it may support trout spawning. Special requirements apply to sustain these waters that support these valuable and sensitive fisheries resources.

Table 4.8-1 NYSDEC-Mapped Waterbodies Located within the Project Right-of-Way

Town	Surface Waterbody Name	NYSDEC Classification and Standard
Dover	Unnamed tributary to Tenmile River	C
Dover	Tenmile River	C(T)
Dover	Unnamed tributary to Tenmile River	C(T)
Dover	Unnamed tributary to Swamp River	C(T)
Dover	Coopertown Brook	C(T)
Dover	Swamp River	C(T)
Pleasant Valley	Wappinger Creek	B(T)
LaGrange	Sprout Creek	C(T)
Pleasant Valley	Unnamed tributary to Wappinger Creek	B
Union Vale	Unnamed tributary to Clove Brook	C(TS)
Union Vale	Clove Brook	C(T)
LaGrange	Unnamed tributary to Sprout Creek	C(TS)
Union Vale	Unnamed tributary to Clove Brook	C
Union Vale	Unnamed tributary to Willow Brook	C
Union Vale	Unnamed tributary to Willow Brook	C
Union Vale	Unnamed tributary to Willow Brook	C
Pleasant Valley	Unnamed tributary	B

Source: NYSDEC Data Mapper; 2013.

4.8.1.2 Stormwater Management

The majority of the Project will be located on an existing right-of-way that is well established and maintained in accordance with an approved vegetation management plan. Generally, stormwater runoff from electric transmission rights-of-way is via overland flow, and few structural measures are needed to control stormwater discharges.

4.8.2 Environmental Effects and Mitigation

Potential Project-related impacts to surface waters will be associated with clearing and grading for construction access, installation and operation of the transmission line, and danger tree removal within the Project right-of-way. Operation of construction equipment and vehicles that require the use of diesel and gasoline fuels, lubricating oils, and cooling fluids may pose a small risk for spills. Spills associated with these sources, should they occur, will likely be small and confined to work sites, thus limiting the potential flow into

surface waters. The SWPPP and EM&CP will include detail on prevention of pollution and the use of appropriate BMPs to be protective of sensitive resources on and adjacent to the right-of-way.

To the extent possible, vehicular access across streams and other watercourses will be avoided by interrupting access along the right-of-way and precluding construction traffic through these areas. These areas will be designated "No Vehicular Access" on plan and profile drawings. If necessary, stream crossing will be done in the dry season to the extent possible or where existing stream crossings are available, access roads will be aligned to make use of these crossings. In certain instances, stream crossings will be installed to accommodate construction vehicles while minimizing disturbance and water quality impacts. Bridges with swamp mats or other minimally-intrusive bridge materials will be used for locations where crossing devices are not in place. Information used to determine the crossing type that will be installed at a particular location includes channel characteristics, stream gradient and flow, channel bottom material, stream bank vegetation, resource value, assessment of erosion potential, and an estimate of potential stream flow during construction. The type of stream crossing for each crossing location will be identified on the plan and profile drawings to be provided as part of the EM&CP. Care will be taken to ensure that stream banks are undamaged during the installation and removal of crossing materials, and that stream flow remains unrestricted.

To further reduce impacts to surface waters, transmission line structures have been sited outside of streams, rivers and other major bodies of water to facilitate the preservation of vegetative buffer strips at these locations. Potential construction impacts, such as minor increases in turbidity, will be short-term and have no long-term effect on the bodies of water. With implementation of the Best Management Practices ("BMPs") to be presented in the EM&CP, the Project will have no significant effect on the NYSDEC stream crossings identified in Table 4.8-1. All proposed BMPs will be designed and maintained in accordance with state guidelines.

During construction, dewatering may be required due to the shallow groundwater table along certain portions of the rights-of-way. Should dewatering be necessary, a temporary sedimentation basin will be established to which filtered dewatering effluent would be pumped. Once filtered and/or settled, clear water will be pumped or allowed to flow onto a vegetated upland area. Retention structures and basins will be constructed using materials such as straw bales, filter fabric, or other materials to be detailed within the EM&CP.

Operation of the Project and associated routine maintenance of the rights-of-way will not result in discharges to surface waters and; therefore, will not jeopardize water quality through thermal or chemical contamination. The Project will not result in an increase in stormwater runoff volumes nor erosion or flooding potential along the existing rights-of-way or surrounding lands. Existing and proposed management practices effectively minimize

and control stormwater runoff from these rights-of-way. No perceptible increase in stormwater runoff volume is anticipated as a result of the Re-conductoring Segment, installation of the new Transmission Line structure, or Project-related substation work.

4.9 Noise

A screening level acoustic assessment was completed to determine the potential for adverse noise impacts associated with the construction and operation of the Project, in accordance with PSL §122(1)(C) and 16 NYCRR §§86.5(a), and 86.5(b)(8). The permanent noise sources associated with the Project include corona effect of the transmission line under atmospheric conditions including rain, fog, and high humidity, transformer components associated with new and expanded substations, and the comparatively minor source of routine inspection and maintenance of the transmission line. Noise generated during Project construction is also addressed.

The overall study objectives were to: 1) identify Project sound sources and estimate sound propagation; 2) conduct computer simulations of sound levels using internationally accepted calculation standards; and 3) determine the feasibility of the Project to operate consistent with the substantive provisions of the NYSDEC Program Policy for noise and any applicable local noise ordinances.

4.9.1 Acoustic Terminology

Sound is described as a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure creating a sound wave. Sound energy is characterized by the properties of sound waves, which include frequency, wave length, period, amplitude, and velocity. A sound source is defined by a sound power level (L_W), which is independent of any external factors. By definition, sound power is the rate at which acoustical energy is radiated outward and is expressed in units of watts (W). Sound energy propagates through a medium where it is sensed and then interpreted by a receiver. A sound pressure level (L_P) is a measure of this fluctuation at a given receiver location and can be obtained through the use of a microphone or calculated from information about the source sound power level and the surrounding environment. Sound power, however, cannot be measured directly. It is calculated from measurements of sound intensity or sound pressure at a given distance from the source.

While the concept of sound is defined by the laws of physics, the term 'noise' has further qualities of being excessive or loud. The perception of sound as noise is influenced by several technical factors as intensity, sound quality, tonality, duration, and the existing background levels. Sound levels are presented on a logarithmic scale to account for the large range of acoustic pressures that the human ear is exposed to and is expressed in units of decibels (dB). A decibel is defined as the ratio between a measured value and a reference value usually corresponding to the lower threshold of human hearing defined as 20 micropascals (μPa). Conversely, sound power is referenced to 1 picowatt (pW).

Broadband sound includes sound energy summed across the frequency spectrum. In addition to broadband sound pressure levels, analysis of the various frequency components of the sound spectrum is completed to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves, and typically the frequency analysis examines 11 octave (or 33 1/3 octave) bands ranging from 16 Hz (low) to 16,000 Hz (high), encompassing the entire human audible frequency range. Since the human ear does not perceive every frequency with equal loudness, spectrally varying sounds are often adjusted with a weighting filter. The A-weighted filter is applied to compensate for the frequency response of the human auditory system and sound exposure in acoustic assessments is designated in A-weighted decibels (dBA). Unweighted sound levels are referred to as linear. Linear decibels are used to determine a sound's tonality and to engineer solutions to reduce or control noise as techniques are different for low and high frequency noise. Sound levels that are linear are presented as dBL.

To take into account sound fluctuations, environmental noise is commonly described in terms of equivalent sound level (L_{eq}). The L_{eq} value, conventionally expressed in dBA, is the energy-averaged, A-weighted sound level for the complete time period. It is defined as the steady, continuous sound level, over a specified time, which has the same acoustic energy as the actual varying sound levels over that same time period. Another common noise descriptor used when assessing environmental noise is the day-night sound level (L_{dn}), which is calculated by averaging the 24-hour hourly L_{eq} levels at a given location and adding 10 dB to noise emitted during the nighttime period (10:00 p.m. to 7:00 a.m.) to account for the increased sensitivity of people to noises that occur at night. The L_{max} is the maximum instantaneous sound level as measured during a specified time period. It can also be used to quantify the time-varying maximum instantaneous sound pressure level (as generated by equipment or an activity) or a manufacturer maximum source emission level.

Estimates of common noise sources and outdoor acoustic environments, and the comparison of relative loudness are presented in Table 4.9-1.

Table 4.9-1 Sound Pressure Levels (L_P) and Relative Loudness of Common Noise Sources and Soundscapes

Noise Source or Activity	Sound Level (dBA)	Subjective Impression	Relative Loudness (perception of different sound levels)
Jet aircraft takeoff from carrier (50 ft)	140	Threshold of pain	64 times as loud
50-hp siren (100 ft)	130		32 times as loud
Loud rock concert near stage Jet takeoff (200 ft)	120	Uncomfortably loud	16 times as loud
Float plane takeoff (100 ft)	110		8 times as loud
Jet takeoff (2,000 ft)	100	Very loud	4 times as loud
Heavy truck or motorcycle (25 ft)	90		2 times as loud
Garbage disposal Food blender (2 ft) Pneumatic drill (50 ft)	80	Loud	Reference loudness

Table 4.9-1 Sound Pressure Levels (L_P) and Relative Loudness of Common Noise Sources and Soundscapes

Noise Source or Activity	Sound Level (dBA)	Subjective Impression	Relative Loudness (perception of different sound levels)
Vacuum cleaner (10 ft)	70	Moderate	1/2 as loud
Passenger car at 65 mph (25 ft)	65		
Large store air-conditioning unit (20 ft)	60		1/4 as loud
Light auto traffic (100 ft)	50	Quiet	1/8 as loud
Quiet rural residential area with no activity	45		
Bedroom or quiet living room Bird calls	40	Faint	1/16 as loud
Typical wilderness area	35		
Quiet library, soft whisper (15 ft)	30	Very quiet	1/32 as loud
Wilderness with no wind or animal activity	25	Extremely quiet	
High-quality recording studio	20		1/64 as loud
Acoustic test chamber	10	Just audible	
	0	Threshold of hearing	

Adapted from: Beranek (1988) and USEPA (1971a)

4.9.2 Applicable Noise Standards

A review of noise regulations at the federal, state, and municipal levels was conducted. There are no federal requirements in the United States that specifically refer to transmission lines as noise sources. The NYSDEC has issued guidelines, "Assessing and Mitigation Noise Impacts, Document DEP-00-1" (DEC, 2001) under the State Environmental Quality Review Act (SEQRA), defining an allowable incremental noise increase, relative to existing acoustic conditions. The NYSDEC criterion is a suggested guideline for determining the threshold for the onset of potential of adverse noise impacts. There are also local noise ordinances that were considered for the purposes of assessing compliance with their respective substantive provisions, if applicable to the Project. The compliance of the Project with the noise provisions of the codes of the affected four towns is discussed in Exhibit 7 of the Application based upon the noise impact analysis presented below.

4.9.2.1 NYSDEC Noise Guidelines

The NYSDEC noise guidance (DEC, 2001) is intended to describe an approach for the evaluation of potential community impacts from a new sound source. The NYSDEC method is based on the perceptibility of a new sound source and identifies limits relative to the existing conditions at the nearest residences, or other potentially sensitive receptors (i.e., schools, churches, etc.). In areas that are clearly not sensitive to noise, i.e. undeveloped areas, the application of the NYSDEC criteria may not be appropriate. The NYSDEC program policy (Section V B(7)(c)) states the following:

Increases ranging from 0-3 dB should have no appreciable effect on receptors. Increases from 3-6 dB may have potential for adverse noise impact only in cases where the most sensitive receptors are present. Sound pressure increases of more than 6 dB may require closer analysis of impact potential depending on existing sound pressure levels and the character of surrounding land use and receptors.

Based on the NYSDEC guidance, an incremental increase of more than 6 dBA over the existing L_{eq}, is identified as the threshold when adverse noise impacts may begin to occur, with receptors below the 6 dBA L_{eq} cumulative increase threshold, having a lower likelihood of disturbance, dependent in part on individual sensitivities. For potential exceedances of the 6 dBA threshold, the program policy suggests a Second Level Noise Impact Evaluation be completed, towards evaluating the potential exceedance conditions. However, further information or guidance on what a second level evaluation may consist of is not explicitly stated.

The NYSDEC program policy further defines a typical background sound level at 45 dBA. If a background sound level of 45 dBA were to be assumed, the total cumulative sound level of 51 dBA or 6 dBA above the NYSDEC typical background sound level would be the threshold of the onset of the potential for an adverse noise impact.

4.9.3 Existing Conditions

The degree of audibility of a new or modified sound source is dependent in large part upon the relative level of the ambient noise. A wide range of noise settings occurs within the Project area. Variations in acoustic environment are due in part to existing land uses, population density, and proximity to transportation corridors. Elevated existing ambient sound levels in the region occur near major transportation corridors such as interstate highways and in areas with higher population densities. The Sky Acres Airport is located within ½-mile of the Project and contributes to ambient noise levels in the Project area. In general the area is moderately developed with approximately 2,000 noise sensitive receptors located within ½-mile of the Project. Some of the area traversed by the Project is open land or rural in nature, and will have comparatively lower ambient sound levels, possibly 30 dBA or less during nighttime. Principal contributors to the existing acoustic environment likely include motor vehicle traffic, mobile farming equipment, the existing Line 398, farming activities such as plowing and irrigation, all-terrain vehicles, local roadways, rail movements, periodic aircraft flyovers, and natural sounds such as birds, insects, and leaf or vegetation rustle during elevated wind conditions. Diurnal effects result in sound levels that are typically quieter during the night than during the daytime, except during periods when evening and nighttime insect noise dominates in warmer seasons.

The analysis area is inclusive of all areas that could be potentially affected by construction or operational noise resulting from the Project. The analysis area for noise around the Project was defined as the area bounded by a perimeter extending approximately ½-mile

from the substation fence line and Project. In the absence of ambient measurement data, the existing sound level environment was estimated with a method published by the Federal Transit Administration (FTA) in its Transit Noise and Vibration Impact Assessment (Federal Transit Administration, 2006). This document presents the general assessment of existing noise exposure based on the population density per square mile and proximity to area sound sources such as roadways and rail lines. Population densities according to 2007 US Census block group data within ½-mile of the Project ranges from 1,017 people/square mile in the most populated areas to 82 people/square mile in the most rural areas. Table 4.9-2 indicates the estimated baseline sound levels.

Table 4.9-2 Estimated Baseline Sound Levels in Proximity to the Project

Average Sound Level (dBA)	L_{eq}[1] Day	L_{eq}[1] Evening	L_{eq}[1] Night	L_{dn}[2]
	35 – 50	30-45	25-35	35-50

[1] L_{eq} – equivalent sound level

[2] L_{dn} – Day-Night Average Noise Level

Source: FTA, 2006

4.9.4 Environmental Effects and Mitigation

4.9.4.1 Construction

Transmission Line

Overhead transmission line construction will generate noise levels that are periodically audible. Noise would be generated along the Project route, access roads, structure sites, conductor pulling sites, and staging and maintenance areas. Additional noise sources may include commuting workers and trucks moving material to and from the work sites. The construction equipment to be used is similar to that used during typical public works projects and tree service operations (e.g., road resurfacing, storm sewer installation, natural gas line installation, tree removal, etc.). Overhead line construction is typically completed in the following stages, but various construction activities may overlap and with multiple construction crews operating simultaneously:

Site access and preparation;
Installation of structure foundations;
Erecting of support structures;
Stringing of conductors, shield wire and fiber optic ground wire; and
Cleanup and site restoration.

Noise levels from overhead transmission line construction were evaluated using a screening level analysis approach. The calculation methodology requires the input of the number and type of construction equipment by phase as well as a typical noise source levels associated

with that equipment to determine the composite sound levels for a standard distance of 50 feet and 1,000 feet. Table 4.9-3 summarizes results for the four conceptual construction phases.

Table 4.9-3 Construction Phase Noise Levels for Overhead Line Construction

Phase No.	Construction Phase	Example Construction Equipment	Equipment Noise Level at 15 m (50 ft), dBA	Composite Noise Level at 15 m (50 ft), dBA	Composite L_{eq} Noise Level at 1000 feet, dBA
1	Site Access and Preparation	Bulldozer Grader Roller – Compactor Loader Water Truck Dump Truck	82 85 83 79 76 76	85	51
2	Installation of Structure Foundations	Bulldozer Loader Backhoe-Loader Fork Lift Mobile Crane (2) Auger Rig Drill Rig Compressor Pump Portable Mixer Jackhammer Cement Mixer Dump Truck Slurry Truck Specialty Truck Water Truck Helicopter*	82 79 78 80 81 84 79 78 81 82 89 79 76 78 76 76 99	94	60
3	Erecting of Support Structures	Forklift (2) Mobile Crane (2) Compressor (2) Flatbed Truck (2) Water Truck Helicopter*	80 81 78 74 76 99	93	58
4	Stringing of Conductors, Shield Wire and Fiber Optic Ground Wire	Tracked Dozer Backhoe-Loader (2) Compressor (2) Line Puller Mixed Trucks Specialty Truck (2) Water Truck Helicopter*	82 78 78 81 80 76 76 99	93	58

*In flight at 200 feet

Data compiled in part from the following sources: Federal Highway Administration. 2006.

As demonstrated in the tabulated results, construction sound will be attenuated with increased distance from the source. Other factors, such as vegetation, terrain and obstacles such as buildings will act to further limit the impact of construction noise levels, but were not considered in the analysis. Actual received sound levels would fluctuate, depending on the construction activity, equipment type, and separation distances between source and receiver. The variation in power and usage imposes additional complexity in characterizing construction noise levels and the analysis conservatively assumes all phased construction equipment operating simultaneously; however, equipment is generally not operated continuously. Furthermore, functional mufflers will be maintained on all equipment to minimize noise levels to the maximum extent practicable.

While line construction noise levels are expected to be greater than ambient conditions for some receivers, a significant reduction in the potential impact of construction noise associated with the line construction will result from construction occurring over relatively short 50-400 foot stretches. Work in the proximity of any single general location along the transmission lines will likely last no more than a few days to one week, as construction activities move along the right-of-way. Therefore, no single receptor will be exposed to significant noise levels for an extended period. Accordingly, this construction technique will also be employed to minimize sound levels to the maximum extent practicable. It is expected that the Project will comply with the NYSDEC standards presented in Document DEP-00-1. See Exhibit 7 for the Project's compliance with the substantive noise provisions of the affected four towns.

Helicopter Operations

Access roads to each tower site are generally required for construction, operation, and maintenance activities but there may be areas where access roads are limited in width, grade, or availability and require assistance by helicopters during construction. Project construction activities that could be facilitated by helicopters may include the delivery of construction laborers, equipment, and materials to structure sites; structure placement; hardware installation; and wire-stringing operations. Helicopters generally fly at low altitudes; therefore, potential temporary increases to ambient sound levels will occur in the area where helicopters are operating as well as along their flight path. Depending on the helicopter and its gross weight, noise levels of 89 dBA to 99 dBA may be generated at ground level receptors, when in flight at 200 feet. Helicopter operations would occur for short periods of time during daytime hours, and local residents will be contacted and notified in advance of helicopter operations as they progress along the Project right-of-way. The potential contribution of helicopter operation to noise levels produced during transmission line construction is accounted for in Table 4.9-3.

Blasting

The need for blasting is not anticipated, however a discussion of potential impacts is included in the chance than limited blasting for structure foundations is determined to be necessary. Transmission tower foundations will normally be installed using drilled shafts or piers; however, if hard rock is encountered within the planned drilling depth, blasting may be required to loosen or fracture the rock in order to reach the required depth to install the structure foundations. Locations where blasting may be required will be identified during the geotechnical engineering study. Blasting creates a sudden and intense airborne noise potential as well as local ground vibration. The ground vibration and airblast overpressures that cause concern or annoyance to residents are generally lower than relevant building damage threshold limits. Modern blasting techniques include electronically controlled ignition of multiple small explosive charges in an area of rock. The detonations are timed so that the energy from individual detonations destructively interferes with each other, which is called wave canceling. Impulse (instantaneous) noise from blasts could reach up to 140 dBA at the blast location attenuating to approximately 90 dBA at a distance of 500 feet from the blast.

Blasting is a short duration event as compared to rock removal methods such as using track rig drills, rock breakers, jack hammers, rotary percussion drills, core barrels, and/or rotary rock drills. Blasting plans will be required of all contracted blasting specialists, demonstrating compliance with all applicable substantive provisions of state and local blasting regulations, including the use of properly licensed personnel.

Substation

Modifications to the Pleasant Valley substation will include equipment modification and installation of new equipment and is not anticipated to be a significant source of construction noise. Construction sound levels would be similar to those resulting from maintenance activities at the substation.

4.9.4.2 Operations

Transmission Line

Noise generated by transmission lines typically contribute little to area noise levels when compared to other common sources such as that from vehicles, aircraft and industrial sources; however, with increasing transmission line voltages audible noise produced by corona on the transmission line conductors increases as well. The corona effect is initiated where the conductor's electric field is concentrated by imperfections in the conductor surface such as nicks or scratches, or by substances on the lines such as water droplets, dirt or dust, and/or bird droppings. Foul weather (rain, snow, sleet, or even high relative humidity levels) can lead to conditions favorable for a large number of corona sounds and subsequently noise. In contrast, corona noise generated during fair weather

conditions (i.e., low humidity or no precipitation) is substantially lower, most often diminishing to ambient levels at nominal distances from the transmission line right-of-way.

Audible noise generated by corona on power transmission lines is composed of two major components. The broadband component has a higher-frequency component that distinguishes it from more common outdoor environmental noise. The random phase relationship of the pressure waves generated by each corona source along a line combined with the significant high-frequency content results in the crackling, frying, or hissing characteristic of transmission line noise. The second component is a low-frequency pure tone that is superimposed over the broadband noise. The corona discharges produce positive and negative ions that, under the influence of the alternating electric field around AC conductors, are alternately attracted to and repelled from the conductors. This motion establishes a sound-pressure wave having a frequency twice that of the voltage, namely, 120 Hz for a 60-Hz system. Higher harmonics, 240 Hz, may also be present, but they are of generally less significance. In different weather conditions the relative magnitudes of random noise and hum may be different. Noise levels in fog and snow usually do not attain the elevated level as compared to rain, and when attained, are usually for a shorter duration in proportion to the event.

In conditions of foul weather, there exists the potential for a large concentration of corona sources in the form of water drops or snowflakes that stick to the conductor surface. Noise levels in rain may vary over a wide range. In the initial stages of a rain, when the conductors are not thoroughly wet, there may be a considerable fluctuation in the noise level as the rain intensity varies. When the conductors are thoroughly wet, the noise fluctuations will often be less significant because, even as the rain intensity lessens, the conductors will still be saturated with water drops that act as corona sources. The variation in noise levels during rain depends greatly on the surface condition, size, and type of conductor as well as on the voltage gradient at which the conductors are operating. At high operating gradients, the audible noise is less sensitive to rain rate than at low gradients. Consequently, the dispersion of noise levels is less for the higher gradients. The Project line will parallel an existing Con Edison 345-kV line.

During meteorological conditions conducive to corona noise generation (i.e., foul weather), very quiet background ambient sound conditions, and meteorological conditions favorable to sound propagation, corona noise may be periodically audible at more distant locations. Conversely, corona noise may be partially or fully masked by elevated ambient sound levels generated by rain and/or wind, which may occur during foul weather events. When audible, corona sound from overhead lines will likely not be deemed excessive or unusually loud and will be consistent with sound generated from existing transmission lines successfully sited and operating throughout the state of New York employing similar overhead transmission line separation distances.

Substations

Substations have switching, protection and control equipment and typically one or more transformers, which generate the sound generally described as a low humming. There are three main sound sources associated with a transformer: core noise, load noise and noise generated by the operation of the cooling equipment. The core vibrational noise is the principal noise source and does not vary significantly with electrical load. Transformers are designed and catalogued by megavolt ampere (MVA) ratings. Just as horsepower ratings designate the power capacity of an electric motor, a transformer's MVA rating indicates its maximum power output capacity. The National Electrical Manufacturers Association (NEMA) published NEMA Standards TR1-1993 (R2000), which establish the maximum noise level allowed for transformers, voltage regulators, and shunt reactors based on the equipment's method of cooling its dielectric fluid (air-cooled vs. oil-cooled) and the electric power rating.

The proposed changes to the substation to accommodate electricity from the new Transmission Line would be limited to Bay 2 of the existing substation and primarily comprise the installation of a circuit breaker, disconnect switch, aluminum bus, and a new set of capacitance coupled voltage transformers (CCVTs). The equipment modifications all comprise low MVA ratings and subsequently result in low operational noise levels. Therefore, the modifications would result in minimal changes in noise levels at the substation and at the nearest noise sensitive receptors. Additionally, when audible, sounds from the substation modifications would not be deemed excessive or unusually loud and will be consistent with sound generated from the existing substation.

Maintenance Activities

Routine right-of-way inspections and maintenance will occur annually, but are not expected to result in significant noise generation. Traffic noise generated during maintenance and inspection activities will be of short duration and is not expected to result in adverse noise impacts. General maintenance would include on-site component repair or replacement.

Right-of-way vegetation maintenance may require the use of chain saws. The amount of sound energy generated by a chainsaw depends on several factors including size rating, manufacturer, and equipment condition. Typically, a larger chainsaw necessitates a larger engine due to stronger friction force and this effect may result in a somewhat higher sound source level. Chain sawing activities would occur in many different locations within the right-of-way but all of these locations would not be known until site clearance and maintenance activities begin. Assuming a 110 dBA sound power level for a typical chainsaw, at a linear distance of 50 feet from the source, sound would attenuate to approximately 78 dBA. A short term event, chainsaw activities would be limited to daytime periods only. In addition, the use of chainsaws is not an out of place activity in the woods.

4.10 Electric and Magnetic Fields

Electric and magnetic field (EMF) studies were performed for the Transmission Line and the Re-conductoring Segment. Detailed summaries of the studies and their results are included as Appendix B of this Application.

EMF calculations were performed using the PLS-CADD EMF Calculator, based on the Electric Power Research Institute (EPRI) Red Book methods (2ndEdition, 1982)[1]. The calculations were made in accordance with the guidelines stipulated in the NYSPSC Intern Policy Statement on magnetic fields, issued September 11, 1990[2].

According to the NYSPSC Interim Policy Statement on Magnetic Fields, the peak field at the edge of the right-of-way corresponding to the Winter Normal conductor rating shall not exceed 200 mG. According to the NYSPSC and standards set forth in Opinion No. 78-13, the maximum electric field at the edge of the right-of-way shall not exceed 1.6 kV/m[3].

The maximum calculated EMF for 10 cross sections investigated are shown in Table C-3, below. The results of the studies demonstrate that both the electric and magnetic field levels of the Project are below the maximum levels at the edge of the right-of-way as recommended by Commission guidelines for electric transmission lines.

The maximum magnetic field adjacent to a residence is 71 mG at the Smith Road property between structures CV-26 and CV-27. The maximum electric field adjacent to a residence is 0.52 kV/m for the residence off State Route 6 between structure L64 and L65. In both cases the values for magnetic and electric fields are below the NYSPSC criteria for edge of ROW and the IRPA Interim Guidelines on limits of Exposure to 50/60 Hz. Electric and Magnetic Fields.

Table 4.10-1 Calculated Maximum Electric & Magnetic Fields at Edge of Right-of-Way

Phasing L-line (north to south)	Phasing CV-Line (top to bottom)	Electric Field (kV/m) @ north edge of ROW	Electric Field (kV/m) @ south edge of ROW	Magnetic Field (mG) @ north edge of ROW	Magnetic Field (mG) @ south edge of ROW
A-B-C	B-C-A	1.48	1.0	136	125

[1] Ibid

[2] State of New York Public Service Commission "Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities", Issued September 11, 1990

[3] State of New York Public Service Commission – Transmission Lines, Opinion No 78-13, Issued June 19, 1978

4.11 Summary of Environmental Impacts

The Project's anticipated environmental impacts are summarized as follows:

Land Use: All construction activities will occur within the Pleasant Valley Substation and the existing electric transmission right-of-way which will reduce to a minimum level impacts to previously undeveloped lands, and neither displace any current land uses or propose incompatible uses as related to applicable land use plans and growth policies. The proposed Project is consistent with the goals of the 2009 New York State Open Space Conservation Plan in that the plan recognizes that energy production and distribution capacity are important to New York State and the Northeast as a whole.

Visual Resources: Potential visual impacts to sensitive resources from the Transmission Line and Re-conductoring Segment, and modifications of the Pleasant Valley Substation will be minimized through the use of existing electrical facilities and transmission right-of-way. Analysis of sensitive resources identified thirty-three (33) visual, recreational and historic resources within the Project area. These included 12 County, Municipal and Local Parks, Trails and Recreation Areas; 4 State Lands; 1 National Recreational Trail, and 16 Historic Resources. Two of the State lands (James Baird State Park and Taconic State Pkwy) are also listed as Historic Resources. Cricket Valley is in the process of conducting a viewshed modeling analysis to determine if the Transmission Line may be visible from aesthetic resources within three miles of the Transmission Line. As part of that process Saratoga Associates will be conducting an independent evaluation and subsequent inventory of aesthetic resources within the Project area (within three miles). Furthermore, a Phase 1A Cultural Resources survey of the Project area will be used to update the inventory of historic resources. An updated list of aesthetic resources will be prepared and submitted once these studies are completed, expected in early 2014.

Cultural Resources: As identified above, 16 historic resources were identified within a 3-mile radius of the Project. Since the Project will be constructed within an existing right-of-way, no direct impacts are anticipated to above-ground historic resources that are listed in or eligible for the NRHP. Potential visual impacts from the Project and modifications of the Pleasant Valley Substation will be minimized through the use of existing electrical facilities and transmission right-of-way.

Twenty-four localities that have moderate to high sensitivity for containing archeological sites based on terrain and other environmental factors were identified within the Project area during an initial site reconnaissance. Construction of the Project has the potential to affect as-yet unidentified archeological resources within the planned transmission line alignment. Further investigation of these resources will be conducted prior to construction in the form of a Phase I B investigation to be completed in 2014.

Terrestrial Ecology and Wetlands: The dispersion and density of vegetation land cover throughout the Project right-of-way includes cultivated cropland, wetland communities, intermixed forested upland communities, and invasive plant species. None of these land cover types would be disproportionally affected by the Project insofar as the degree of impact to these community types would be insignificant on a regional level. The most significant effect to vegetation would be the long-term conversion of existing forested communities to managed grassland or shrubland within cleared areas of the right-of-way, estimated at approximately 53 acres.

Approximately 15 wetland complexes are crossed by the Transmission Line and approximately 9 wetland complexes are crossed by the Re-conductoring Segment. Four of the wetland crossings associated with the Project and one of the wetlands associated with the Re-conductoring Segment were identified as being regulated by the NYSDEC. Based on the preliminary design, no structures will be placed within wetland areas. One or more structures may be placed within NYSDEC regulated wetland adjacent areas. Temporary impacts to wetlands are anticipated to be less than 0.2 acre associated with the use of construction matting along temporary access pathways. Reasonable attempts will be made to avoid wetlands and minimize the area of disturbance, and restoration of affected areas offset impacts to wetland resources.

Wildlife species and habitat occurring within the Project area are common throughout Dutchess County. The greatest impact to wildlife will result from expanding the existing right-of way where forested cover will be cleared. Land cover adjacent to the Project area, however, consists of the same community type that will be disturbed during construction; therefore, significant loss of forage, shelter, and nesting habitat is not anticipated.

The New York Natural Heritage Program identified several Federal and State-level protected threatened and endangered species in the vicinity of the Project, including the bog turtle (*Glyptemys muhlenbergii*), Indiana bat (*Myotis sodalist*), Blanding's turtle (*Emydoidea blandingii*), timber rattlesnake (*Crotalus horridus*), and side-oats grama (*Bouteloua curtipendula var. curtipendula*). Four unique vegetation communities were also identified by the NYNHP as occurring on or proximal to the Project. These communities included Floodplain Forrest, Red Maple-Hardwood Swamp, Rich Sloping Fen, and Pitch Pine-Oak-Heath Rocky Summit.

A threatened and endangered management plan will be developed that includes protective measures for the bog turtle, Indiana bat, Blanding's turtle and timber rattlesnake. Suitable habitat for these species was identified during 2013 field surveys and additional survey work will be completed in 2014 to make a determination of the likely presence of the species on or near the right-of-way. Consultation with the NYSDEC, and where applicable the USFWS, will be initiated regarding these species. Selective use of air-crane helicopters for structure erection will be employed in sensitive areas, further reducing potential impacts to listed species or their habitat. With implementation of the threatened and endangered species management plan and the use of air-crane helicopters in sensitive areas, the Project

should have no significant effect on the identified listed species. Should a potential impact to threatened and endangered species be identified, mitigation measures to offset unavoidable impacts will be employed. Such measures may include demarcation and avoidance of sensitive habitat types, construction monitoring efforts as applicable to clear work areas of species that may be present, and specific provisions in the right-of-way maintenance program to protect specific habitat types.

Based on the initial site reconnaissance, the Pitch Pine-Oak-Heath Rocky Summit was the only unique community identified within the Project right-of-way. This area coincides with potential rattlesnake habitat. Due to the steep slopes along this portion of the Project, supporting structures in this area will be erected via helicopter. This technique will minimize any potential preeminent effects to this community from the Project.

Topography and Soils: Analysis of SSURGO data indicates 46 soil associations occur within the Project right-of-way. Substantial alterations of slope and gradient are not anticipated along the alignment and mitigation measures will be implemented to address any soil erosion, compaction, and sedimentation during construction. The Project will be designed, constructed, operated, and maintained to be compatible with on-site geologic conditions and there are no geologic concerns that would have a long-term effect on the integrity of structures, as demonstrated by the long-standing presence of existing transmission lines along the Project right-of-way.

Water Quality: The Project is located within the Hudson-Wappinger Creek Watershed and the Housatonic Watershed. Major streams and rivers within the Project area include the Tenmile River, Coopertown Brook, Swamp River, Wappinger Creek, Sprout Creek, Clove Brook and their associated tributaries. Project-related impacts to surface waters will be associated with clearing and grading for construction access, installation and operation of the transmission line within and downstream of the Project right-of-way, and danger tree removal in areas adjacent to and within the Project right-of-way. These impacts will be reduced and mitigated through compliance with the protective measures detailed in the EM&CP, the SPDES construction general permit guidance, the SWPPP, and conditions of USACE permit for the Project. Operation of the Project and routine maintenance of the rights-of-way will not result in discharges to surface waters, increases in stormwater runoff volumes nor erosion or flooding potential along the existing rights-of-way or surrounding lands.

Noise: Construction of the overhead transmission line will generate noise levels that are occasionally audible along the Project route, access roads, structure sites, conductor pulling sites, and staging and maintenance areas. With the exception of helicopters, construction equipment will be similar to that used during typical public works projects and tree service operations. Construction activities that could be facilitated by helicopters, thereby minimizing any potential noise impacts, may include the delivery of construction laborers, equipment, and materials to structure sites; structure placement; hardware installation; and wire-stringing operations. Helicopter operations would occur for short periods of time

during daytime hours. Construction at substations will include equipment modification and installation of new equipment and is not anticipated to be a significant source of construction noise. All construction activities will occur during daytime hours.

Noise generated by operation of transmission lines typically contribute little to area noise levels when compared to other common sources such as that from vehicles, aircraft and industrial sources; although the noise is greater with increasing transmission line voltages. The operation of substations have switching, protection and control equipment and typically one or more transformers, which generate the sound generally described as a low humming, which will attenuate with distance at different rates depending on the transformer dimensions, voltage rating, and design. Substation maintenance will generate short-term, day time traffic noise during Project maintenance and inspection that are not expected to result in adverse noise impacts.

Electric and Magnetic Fields: The results of the EMF studies demonstrate that both the electric and magnetic field levels of the Project are below the maximum levels at the edge of the right-of-way as recommended by Commission guidelines for electric transmission lines.

Conclusion

The Project is expected to produce minimal adverse environmental impact, particularly because it proposes to utilize an existing transmission right-of-way, overhead configurations, BMP and protection measures that will avoid or minimize environmental impacts. These protection measures will be specified for the particular affected resource in the EM&CP to be prepared for the Project.

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Cricket Valley Energy Center LLC

Cricket Valley Transmission Line and Re-conductoring Project

Exhibit 4 – Figures

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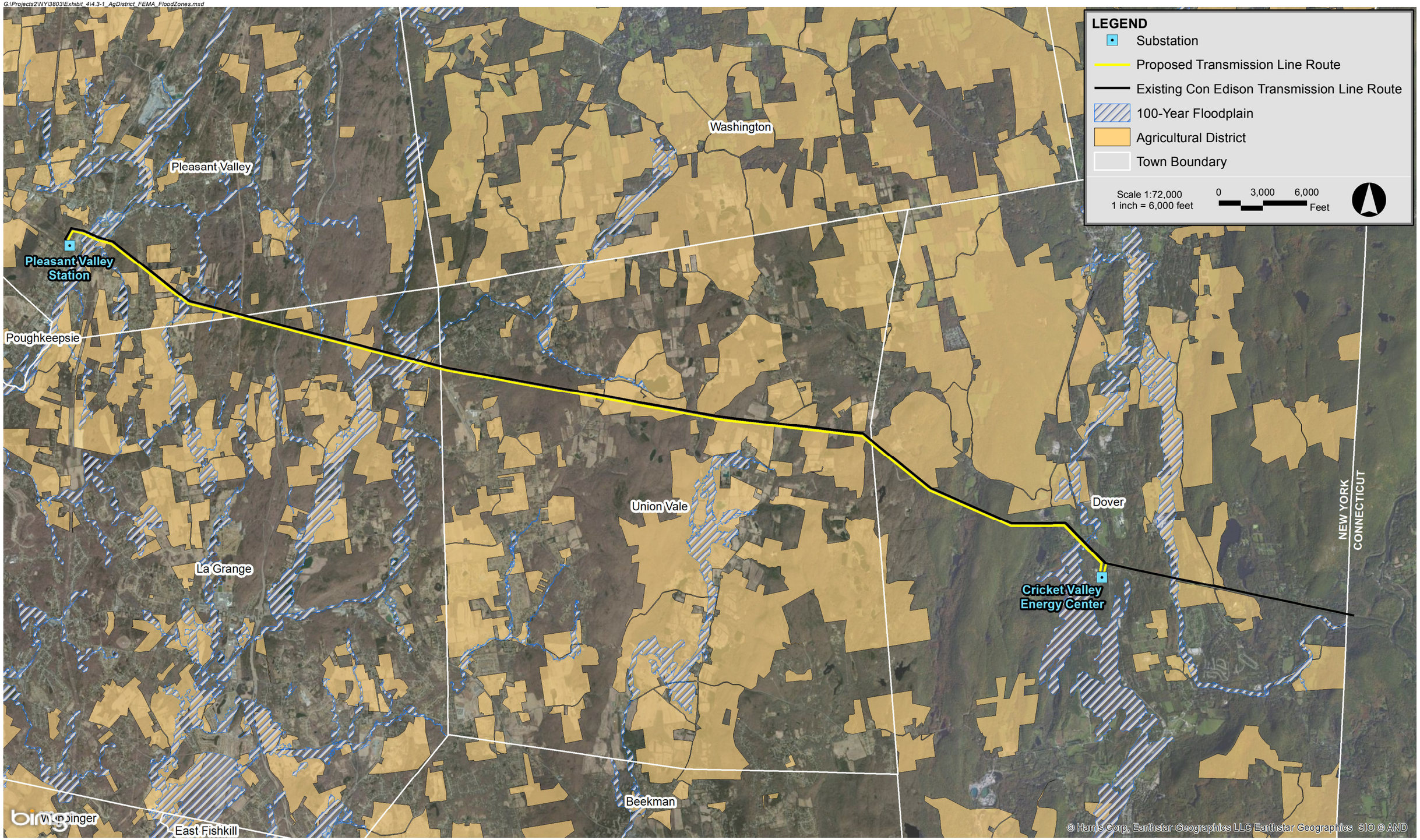
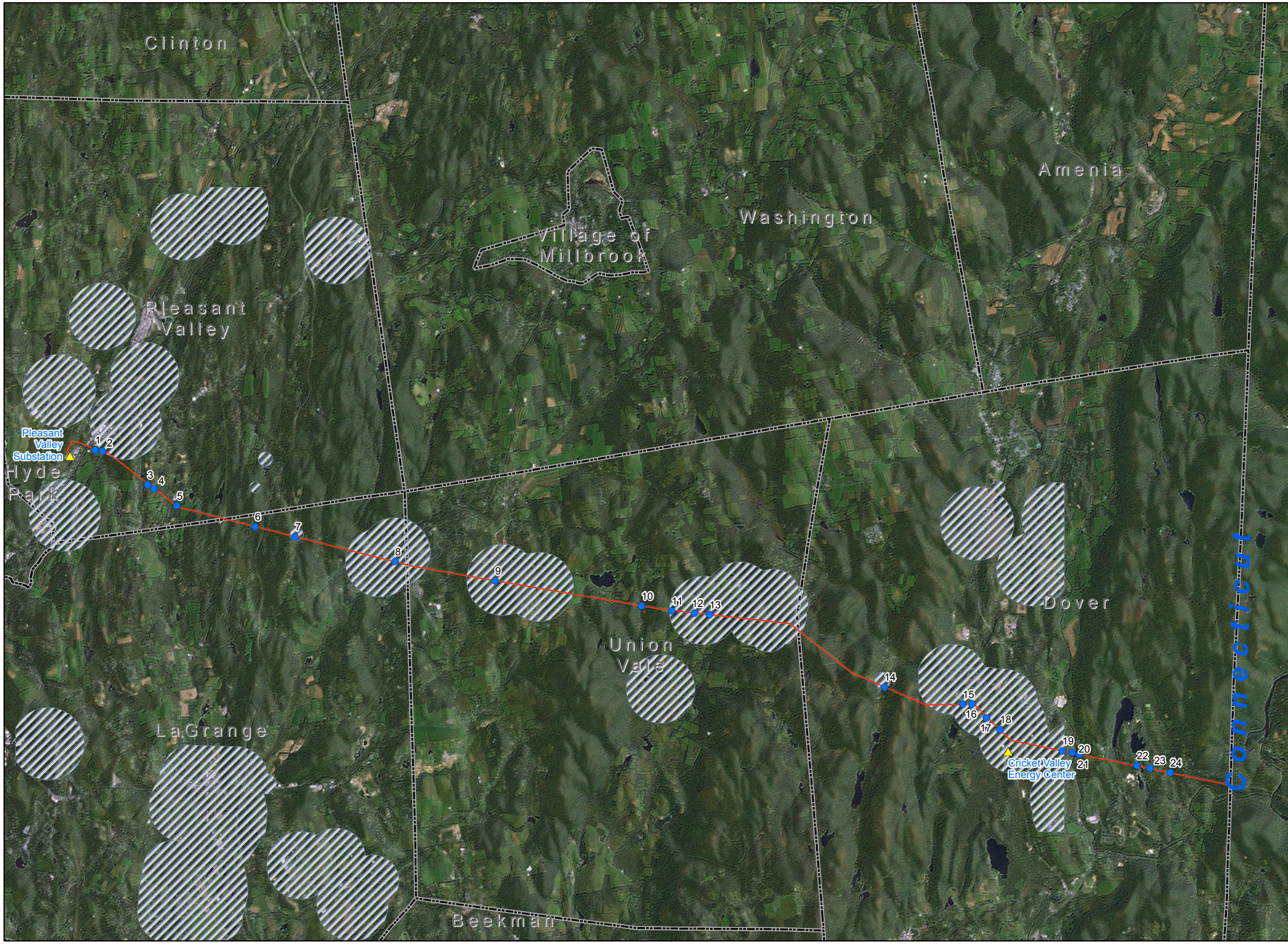
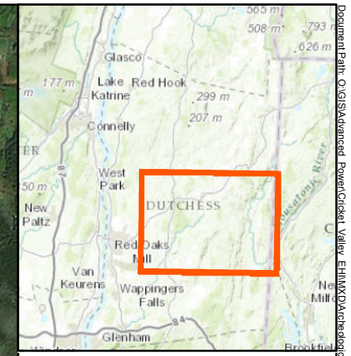


Cricket Valley Transmission Project **Dutchess County, New York**

Epsilon ASSOCIATES INC.

Figure 4.3-1
Agricultural Districts and FEMA Designated Floodplains





Legend

- Sensitive for Archeological Resources (Field Identification)
- Substations
- Proposed Route
- Sensitive for Archeological Resources (OPRHP GIS)
- Town Boundary

Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

Sources:

- Proposed Route: Advanced Power, 2013
- Archeological Resources: Tetra Tech, OPRHP
- Towns: NYSGIS Clearinghouse, 2013
- US Topo: USGS, 2013

Miles
0 0.5 1 2

Kilometers
0 0.5 1 2

Epsilon Associates Inc. | Tetra Tech

Figure 4.5-1
Archeological Sensitivity Data

Cricket Valley Energy Center
Towns of Pleasant Valley, La Grange
Union Vale and Dover
Dutchess County, New York

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