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Docket No. 272  
Connecticut Light and Power Company  
Segment 2a  
Beseck Switching Station to Cheshire/Hamden Town line  
Overhead 345-kV Transmission line  
May 17, 2006

On March 31, 2006 Connecticut Light and Power Company (CL&P) submitted a Development and Management (D&M) Plan for overhead transmission lines in Segment 2a - Beseck Switching Station to Cheshire/Hamden Town line that traverses Wallingford and Cheshire.

CL&P consulted with officials and residents of Wallingford and Cheshire. Commonwealth Associates, an independent Technical Advisor selected after consultation with Connecticut's Office of Consumer Counsel, was available to assist residents and municipal officials with their requests.

Pursuant to Connecticut General Statutes §16-243, CL&P must file a *Method and Manner of Construction* with the Connecticut Department of Public Utility Control and associated Department regulations. The Project is also subject to a permit from the U.S. Army Corps of Engineers.

The D&M Plan and alignment maps (at a scale of 1" = 200'), including right-of-way and structure profiles, outlines the route of a new overhead 345-kV transmission line.

From the new Beseck Switching Station south to East Wallingford Jct. (5.8 miles long) there is currently one 345-kV circuit supported on wood-pole H-frame structures within the ROW, each with a typical height of 90 feet. There are no 115-kV line components in this sub-segment. The structures for the new 345-kV line will be a compact delta design with a typical height of 108 feet. The existing 345-kV line would be shifted to the west in three locations: 1) along four spans within the right-of-way in vicinity of Barnes Road; 2) structure 24264 would be a vertical monopole due to a narrowing in ROW; and 3) one span lowered to accommodate clearance to the new 345-kV line crossing. At Traditions Golf Club, CL&P proposes a new 125-foot wide right-of-way beginning at structure 24247 to structure 24242 (approximately 4000 feet). A steel pole delta configuration with a typical height of 108 feet would be installed along this section. The new ROW is on Traditions Golf Club property which was negotiated to avoid construction on the golf course. The existing 115-kV ROW and structures will remain in their present location. In this 5.8 mile segment, construction and installation of the new circuit will require a widening of the existing 275-foot ROW southerly by 75 feet except for the new ROW on Traditions Golf Club.

The Council's Decision and Order Item 14(t) required a reduction of structures in a wetland in vicinity of existing structures 8799 and 8800 located in the Tamarac Swamp in Wallingford. The design of the line in the vicinity of this wetland was adjusted so that no structures will be placed within the mainbody of the wetland. New structure 24252 will be placed just outside of the

northeast edge of the wetland, while new structure 24251 will be placed 150 feet in on the southwest edge of the wetland, resulting in a span of approximately 1,030 feet.

From East Wallingford Junction to Wallingford Junction (1.8 miles) there is currently one 115-kV line within the 200-foot ROW supported on wood-pole H-frame structures with a typical height of 57 feet. For the section from East Wallingford Junction to North Haven Junction (1.2 miles) the 115-kV H-frames will be removed and replaced with double-circuit 345/115-kV monopoles with a typical height of 135 feet. Approximately 25 feet on the south side of the existing 200-foot ROW would be cleared. From North Haven Junction to Pent Road Junction (0.3 miles), the existing 115-kV H-frames will remain with the new 345-kV line located south of the existing structures using a standard delta monopole design with a typical height of 108 feet. This section of the ROW would require clearing of 95 feet of an existing 200-foot ROW.

From Pent Road Junction to Wallingford Junction (0.3 miles), the existing 115-kV H-frames will be removed and replaced with double-circuit 345/115-kV steel monopoles with a typical height of 105 feet. Approximately 25 feet on the south side of the existing 200-foot ROW would be cleared.

From Wallingford Junction to the new transition structure west of the Wallingford/Cheshire Town Line in Cheshire (2.5 miles), there are currently two 115-kV circuits within the existing 200-foot ROW, both of which are supported on the same double-circuit lattice towers with a typical height of 90 feet. The structures for the new 345-kV line will be standard delta steel pole with a typical height of 108 feet. The existing 115-kV lines will remain, but will require modifications only at the west end of this section since one of the two circuits will terminate on a new overhead-to-underground transition structure near the Wallingford/Cheshire Town Line in Cheshire. No additional ROW will be required however; about 80 feet on the south side of the existing 200-foot right-of-way would be cleared.

From the transition structure west of the Wallingford/Cheshire Town Line to Cook Hill Junction in Cheshire (approximately 0.4 miles), there are currently two 115-kV circuits within the existing 200-foot ROW, both of which are supported on the same double-circuit lattice towers with a typical height of 90 feet. These lattice towers will be removed. The new 345-kV line and one of the existing 115-kV lines will be supported on a 345/115-kV standard composite monopole with a typical height of 108 feet. No additional ROW will be required however; about 80 feet on the south side of the ROW would be cleared. A new 115-kV underground line will be constructed in Cheshire and Hamden within Old Farms Road and Old Lane Road (approximately 0.9 miles). The existing overhead easement will be used to gain access to these roads from the overhead transition structures. The width of the existing ROW will not have to be expanded; however, CL&P will have to acquire rights to install underground facilities along this portion of the ROW.

In this section structure numbers 24209, 4663 and 4663A support the transition of the 115-kV overhead to underground and the combining of the 115 and 345-kV lines onto a single composite structure. The structure locations are 50 feet east of Old Farms Road, Cheshire in an open view of the neighborhood. The proposed heights would be 170, 165, and 145 feet. If these structures were relocated 300 feet east of Tuttle Avenue the structures would be in a wooded area compared to an open area with residences. Also, the structure heights would be reduced 10 to 15 feet in height.

Thus a single 165-foot structure would be required adjacent to Old Farms Road. The construction of the three transition structures would be in uplands 100 feet from a wetland (CL&P proposes a buffer of 50 feet) and require about 800 feet of additional cable and trenching. This trenching would be within an access road which crosses 100 feet of a wetland east of Tuttle Avenue and cross Tuttle Road continuing west across CL&P property. This section of trenching would cross another wetland for about 100 feet. These wetlands were qualified as low functioning and no plant or animal species of concern were identified in these two wetlands. CL&P contends that it endeavors to minimize disturbance to wetlands and claims construction of the structure foundations would be within a wetland, construction restraints to bending a cable around Tuttle Avenue and Old Farms Road, an additional 800 feet of cable, an additional vault would be necessary and placing the transition structures in another town (Wallingford). Council staff recommends that CL&P provide a redesigned plan identifying structure locations in upland areas and the location of a linear trench reducing a bending radius of the cable and use construction mats to facilitate construction and minimize impacts to wetlands.

From Cook Hill Junction in Cheshire to the new transition structure south of the Cheshire/Hamden Town Line in Hamden (approximately 0.5 miles), there are currently three sets of 115-kV lines. Two of these 115-kV lines are supported on separate H-frames with a typical height of 57 feet and the other 115-kV line is supported on double-circuit steel lattice towers with a typical height of 80 feet. These existing structures will be removed. The new structure will be a 345/115-kV compact composite steel monopole with a typical height of 120 feet. The 115-kV Line 1690 south of Cook Hill Junction will be removed. A guyed wood pole will be installed just north of Cook Hill Junction to terminate the remaining Line 1690 conductors and shield wires. At the south end of this sub-segment there will be the transition of the new 115-kV underground line to overhead on a transition structure near the Cheshire/Hamden Town Line in Hamden. No additional ROW will be required; however 20 feet on the south side of the ROW would be cleared. Structure numbers 24203 and 24204 in this section are proposed at 120 feet but a resident that crosses under this span requests that the structures be 135 feet in height. CL&P contend that conductor clearances to ground and topography affect structure design, increasing the height 15 feet would increase visibility, larger diameter poles and foundations and slight decrease in EMF levels. Heights of adjacent structures (135 and 145 feet) would not be changed. Visibility and construction of the structures would be consistent with adjacent structures and would not change the view-scape or increase cost substantially. At this specific location, Council staff recommends that structure number 24203 and 24204 be 135 feet in height.

The typical duct bank configuration includes three 3500-kcmil copper XLPE 115-kV transmission cables and grounding wire. The work zone for duct bank construction will measure approximately 400 feet in length. The following activities will occur in Old Farms Road and Old Lane Road:

- saw cutting pavement
- trench excavation that includes a typical 3-foot wide by 5.5-foot deep trench which would allow for a 30 inch minimum cover of the duct bank. Steel plating of the open trench will be used to facilitate the construction process and open up travel lanes.
- duct placement includes three six-inch and one 2-inch Polyvinyl Chloride (PVC) ducts supported by incrementally spaced duct spacers Spacing of the ducts is critical and is

dictated by system ampacity requirements, which are negatively affected by mutual heating of the cables. CL&P proposes various configurations for duct installation which would address specific conditions such as avoiding other underground utilities.

- backfilling the ducts will be encased concrete (earthen formed), and then the trench will be backfilled with a 100-psi fluidized thermal backfill.
- temporary pavement restoration and in the end permanent pavement restoration.

Two splice vaults are proposed for the 115-kV underground line. Vaults serve as the location where a successive length of cable is connected and corresponds to a single three phase circuit. Pre-cast concrete splice vaults with outside dimensions of 24 feet in length, 7 feet in width and 8 feet in height with an approximate 1 foot wall thickness will be installed at approximate intervals of 1600 feet along the underground route and be located with. The distance between vaults is determined by the cable length that can be reasonably shipped and transported over roadways. CL&P determined 1,800 feet of cable would be the optimum distance minimizing splices and condemnation of property. Vault excavations require up to 15-foot by 30 foot area around the excavation for workspace. The vault would be installed to a minimal depth of 15 feet, providing a minimum cover of 2.5 feet, with over excavations of 2 feet on each side for workspace. Each vault will have two 36-inch entry manholes. CL&P has made extensive efforts to locate vaults so as to minimize impacts to traffic.

Site specific traffic plans will be developed for excavations and included in the Maintenance and Protection of Traffic (MPT) Plans. MPT Plans will be submitted to the towns. The Council has exclusive jurisdiction of the project and would resolve any disagreement.

Residents in Cheshire and Wallingford raised concerns and requests to move structures within the ROW, structure heights, and landscaping. The D&M Plan reflects many iterations maximizing location and height of structures to reduce electric and magnetic fields consistent with the Council's Decision and Order. Wetlands, roadways, railroad ROW, golf course restrictions, and attempts to reduce view scape affected how the structures were located. Furthermore, when dealing with conflicting requests of structure heights CL&P defaulted to the low-EMF design. CL&P does not landscape around or in vicinity of the transmission line structures, CL&P does not object to property owners to landscape as long as the plantings are not within 25 feet of a structure or five feet of a guy and said plantings would not mature above a particular height.

Project administration is overseen by CL&P. CL&P's construction contractor will establish a contractor's yard for office trailers, staging of equipment, materials and supplies, and a parking area for construction workers. This contractor's yard will be about two to five acres in size and located proximal to the project. Where possible, material storage, staging and lay down areas will be set up on property already owned by NU. If NU property is not available, areas such as parking lots or land that is not in use would be used. Council staff recommends that the contractor's yard and staging areas be identified and provided to the Council prior to use.

The D&M Plan specifically outlines the methods of construction and guidelines for clearing, (permanent and temporary) access roads, foundation excavation, soil erosion and sedimentation control, dewatering, spoil placement, and restoration of disturbed areas to pre-construction conditions. Blasting is not expected however if blasting is necessary CL&P would submit a Blasting plan to the Council for review and approval.

A soil management plan will be issued for handling spoil material removed during excavation. Council staff recommends a soil management plan be provided prior to commencement of construction.

Construction of the overhead transmission lines requires use of existing access roads and construction of (permanent and temporary) access roads both to widths of 15 feet. CL&P would install crushed stone, gravel and or timber mat as a base for access roads. Steel poles ranging in height from 50 feet to 165 feet would require reinforced concrete foundations ranging from 6 feet to 8 feet in diameter. Structure and foundation construction would require a 25-foot cleared area to drill foundation holes in to the ground or into rock. . Excavated material would be used to improve grade around the structures in upland areas; to improve designated construction access roads; and/or deposited as directed by the landowner but not in a wetland. Soil excavated in wetlands would be stored in upland areas reserved for wetlands restoration. Other excess material would be removed and disposed in accordance with state and/or federal regulations. Excavations may require dewatering as a result of storm water or groundwater. Dewatering shall consist of a 10 ft by 10 ft straw bale perimeter (size adjusted per water volume; be located on a fairly level upland that is well vegetated, to allow water to drain and not to discharge into a wetland or water body. No lay down or pulling station sites have been identified and Council staff would recommend such locations not be located within 50 feet of the edge of a wetland or water body and be provided prior to commencement of construction.

Clearing will occur along the majority of Segment 2a. Vegetation clearing practices to be used are consistent with NU's Design and Application Standard titled "Right-of-Way Vegetation Clearing Standard for 69-kV through 345-kV Transmission Lines" (TRM 81.021), the New England Independent System Operator's Vegetation Clearing Standard OP-4, and the National Electrical Safety Code Rule 218 as adopted by the Connecticut Department of Public Utility Control (Regulation Section 16-11-134). The construction clearing practices include retention of a 50-foot buffer near intermittent streams and wetlands and a 100 foot buffer near perennial streams.

A professional forester will oversee tree inventory and clearing activities. Low-impact tree clearing is the preferred method for clearing which incorporates a variety of approaches, techniques and equipment to minimize site disturbance and to protect residual forests, wetlands, watercourses, soils and cultural resources, including stone walls, old cemeteries and old foundations that are commonly found in wooded areas in Connecticut. Primarily, CL&P would follow the Best Management Practices (BMP) for harvesting as outlined in *Logging and Water Quality in Connecticut* – developed by the Connecticut 208 Forestry Advisory Committee, 1982. Council staff recommends CL&P utilize a professional forester to oversee clearing activities consistent with BMP.

A potential vernal pool is located in Wallingford in vicinity of proposed structure 24261. This area will be fenced with orange safety fence and will be noted as restricted access for construction purposes. CL&P proposes to cross the area near the vernal pool from the south. Access to structure 24261 could be accomplished from the north and avoid crossing the wetland area. This may require removing fencing within the ROW; however, CL&P contends it is not responsible for privately owned fencing erected within the ROW. If gates are installed CL&P would use these open access points. Staff recommends approaching structure no. 24261 from the north and place construction fencing no less than 25 feet to the vernal pool and placement of erosion and sediment controls be placed down slope of construction fencing.

McKenzie Watershed Protection District is in the Town of Wallingford and a portion of this district is located from existing pole #8798 to the Beseck Switching Station. The Town of Wallingford owns a dedicated Open Space within the watershed protection district. There will be no expansion of the ROW within this watershed. Council staff recommends that best management practices for fueling, operation, and maintenance of vehicles in aquifer zones and inland wetland and watercourses be employed.

Special procedures have been developed for stream and inland wetland crossings, electric utility crossings, noise sensitive receptors, fugitive particulate emissions, dust and mud control, management of solid and/or hazardous substances, protection of cultural and historic resources including an unanticipated discoveries plan, visual impact and residential mitigation plan, and worksite safety plan.

Segment 2a crosses three sets of rails two owned and operated by Tilcon Connecticut and the other owned by Amtrak. The crossings are 1) between existing structures 8776 and 8777, 2) near the intersection of the ROW and Powers Road and 3) near the intersection of the ROW and South Colony Road. Council staff recommends CL&P notify and coordinate with Tilcon and Amtrak for rail crossings 30 days prior to construction activity.

Water crossing methods that may be used during construction include flume pipe with crushed rock ramp, temporary bridge, wooden construction mats and stone fords. Typically work in these resource areas are done during periods of low flow which occur in the summer months of June through September and the winter months of January through March. Also, gaps have been designed into the access roads to provide additional protection to water and/or wetland crossings. These gaps are identified on the drawings as "Restricted Access."

One location (Wetland #71) is a shallow marsh and shrub swamp. The area is a depression with drainage from all sides. CL&P proposes to construct a new access road through the adjacent upland area to the south and east of the wetland to gain access to new structures #8803 and #24248 through #24249. This new access road will continue along the east edge of the ROW to gain access to new structures #24250 and #24251. Construction mats will be used for the portions of the access road in the wetland. Construction mats will also be used to provide a work platform at these structure installation sites.

Also, a private bridge at the end of Malchoidi Drive identified as an access is not structurally capable of supporting construction vehicles, concrete trucks and cranes. An alternative access would be a new access road from structure 24274 to structures 24272 and 24273. Council staff recommends that the alternative routes to existing bridges insufficient to support construction vehicles be provided to the Council for review and approval and construction mats and associated material used throughout Segment 2a be removed upon completion of construction.

Numerous rock walls exist along the ROW and have been identified by the State Historic Preservation Officer (SHPO) as having significance, as defined in the National Historic Preservation Act of 1966. These rock walls and other cultural resources will require that protective measures be employed during clearing and construction activities. Such measures will be developed in consultation with the SHPO, cultural resource contractor and CL&P prior to construction. No specific recommendations have been documented since an archeological

reconnaissance Phase II survey is still being conducted. Council staff recommends that such surveys be submitted for review and approval.

CL&P developed a soil erosion/sedimentation control and revegetation plan and procedures regarding access road development, erosion control and minimization of effects on natural systems incidental to construction. Council staff recommends that the erosion and sediment controls comply with the 2002 Connecticut Guidelines for Erosion and Sediment Control.

Also, CL&P developed a wetland vegetation monitoring and maintenance plan and invasive species control and management plan. Council staff recommends an annual report for three years following ROW construction on the reestablishment of native vegetation to inland wetland and the control and management of invasive plant species.

One recreational resource (Sleeping Giant State Park) is located south of Wallingford/Cheshire/Hamden Town lines. Construction is not anticipated to cause adverse impacts this resource.

A Spill Prevention and Response Plan address actions used to prevent spills in addition to actions that shall be taken should any spills occur including emergency notification procedures. The on-site Environmental Inspectors are responsible for ensuring that contractors implement and maintain spill control measures. All fuel, oil, and hazardous materials management will be in accordance with local, state and federal guidelines. Council staff recommends CL&P attach copies of spill reports with its construction progress report.

CL&P will notify municipalities and landowners adjacent to the rights-of way not less than two weeks hours prior to the initiation of construction. A toll-free number, staffed during working hours and voicemail other hours, will be available specific to the project. All calls will be documented which will initiate a protocol of response. Council staff recommends CL&P provide two weeks advance notice prior to commencement of construction.

CL&P provided a copy of the Project Safety and Health Program. Prior to commencement of construction CL&P requires that all personnel (CL&P and Contractor) involved in construction activities attend a project-specific safety and environmental training session. These training sessions summarize the D&M Plan and other permit/certificate requirements governing the project. The training will emphasize the importance of workplace safety and environmental compliance including disciplinary action. Furthermore, an environmental inspector, the BSC Group previously recognized by the Council will be responsible for inspections and weekly reporting to verify that the construction is performed in accordance with environmental requirements.

The construction and installation of Segment 2a, from survey to energizing, will take approximately 18 months. The schedule is currently under review and subject to modifications. Construction activities are expected to take place during daylight hours (7:00 am to 7:00 pm) six days per week, with additional overtime if necessary. Extensions of the workday and hours may occur on a temporary and case-by-case basis. Council staff recommends that CL&P notify the Council of workday and/or work hour extensions verbally and documented within 24 hours of a business day.

The following items summarize the projected schedule:

**Overhead Transmission**

Survey	September	2005 – March 2006
Geotech testing	January	2006 – June 2006
Right-of-way clearing		August 2006 – January 2007
Mobilization		April 2007
Structure Removal		September 2007 – May 2008
Structures/Cable installation		April 2007 – June 2008
Cut-overs		April 2008 – July 2008
Site Restoration		September 2007 – July 2008

**Underground Transmission**

Survey		May 2005 – October 2005
Procurement		April 2006 – September 2007
Fabrication/Delivery		March 2007 – January 2008
Civil Work		March 2007 – July 2007
Cable Installation		September 2007 – January 2008
Testing		February 2008- March 2008
Pavement Restoration		March 2008 – May 2008
Landscaping		April 2008 – June 2008

CL&P proposes the following procedures to address deviations of the D&M Plan:

- For proposed deviations prior to the start of construction or well in advance of commencement of specified activity, CL&P will submit a request in writing for review and approval by the Council;
- For proposed deviations during construction based upon field conditions, CL&P will conduct a telephone conference with Council staff to present the proposed modification and receive verbal approval from the Council Chairman with written specification of the deviation to be submitted within 24 hours after the request; and
- Implementation of deviations to the D&M Plan that are approved by the Council will be documented within the monthly monitoring reports to be submitted by the independent environmental inspector.

Council staff recommends that proposed deviations be authorized by the Chairman with written specification of the deviation submitted within 24 hours of a business day after the request and all other changes require advance notification and Council approval or be subject to enforcement by the Attorney General.

CL&P proposed to provide monthly construction reports however the Environmental Inspector for the Council would provide weekly reports. Council staff recommends that CL&P provide quarterly construction reports noting milestones of construction activity.

To summarize, the Council staff recommends approval of the Section 2a D&M Plan as follows:

That CL&P provide two weeks advance notice prior to commencement of construction

That CL&P provide quarterly construction reports noting milestones of construction activity, including spill reports.

That CL&P provide a weekly Environmental Inspector's report.

That the location of the contractor's yard and staging areas be identified and provided to the Council prior to use.

That a redesigned plan identifying structure locations in upland areas and the location of a linear trench reducing a bending radius of the cable and use construction mats to facilitate construction and minimize impacts to wetlands for the transition of the 115-kv line to underground and the 115kV and-345-kV transition to a single pole structure at the Wallingford/Cheshire town line.

That lay down or pulling station sites be provided prior to commencement of construction and such locations not be located within 50 feet of the edge of a wetland or water body.

That CL&P utilize a professional forester to oversee clearing activities consistent with forestry BMP.

That the placement of construction fencing be no less than 25 feet to the vernal pool and placement of erosion and sediment controls be placed down slope of construction fencing in vicinity to structure #3565.

That best management practices for fueling, operation, and maintenance of vehicles in aquifer zones and inland wetland and watercourses be employed.

That CL&P notify and coordinate with Tilcon and Amtrak for rail crossings 30 days prior to construction activity.

That if existing bridges insufficient to support construction vehicles, alternative routes shall be provided to the Council for review and approval and construction mats and associated material used throughout Segment 2a be removed upon completion of construction.

That CL&P provide an annual report for three years following ROW construction on the reestablishment of native vegetation to inland wetland and the control and management of invasive plant species.

That CL&P notify the Council of workday and/or work hour extensions verbally and documented within 24 hours of a business day.

That CL&P notify landowners adjacent to the right-of way not less than two weeks prior to the initiation of construction.

That CL&P provide a blasting plan, if necessary, for review and approval prior to blasting.

That the D&M plans for erosion and sediment controls comply with the 2002 Connecticut Guidelines for Erosion and Sediment Control.

That a soil management plan be provided prior to commencement of construction.

That CL&P provide archeological reconnaissance surveys for review and approval.

That proposed deviations are authorized by the Chairman with written specification of the deviation submitted within 24 hours of a business day and all other changes require advance notification and Council approval or be subject to enforcement by the Attorney General.