

APPENDIX C

RIGHT-OF-WAY VEGETATION CLEARING STANDARD TRM
81.021

General

The major factor positively affecting transmission line reliability is a well managed program of vegetation control directed toward tall and fast-growing trees and invasive shrub species in and adjacent to transmission line rights-of-way. Vegetation related outages of high-voltage transmission lines can be minimized by applying this clearing standard to new and replacement lines and post-construction periodic vegetation management. The clearance minimums in this standard will provide safe clearances after re-growth at the end of a typical four (4) year maintenance cycle.

This specification conforms to the scope and intent of the NEPOOL Operating Procedures OP-3 Appendix 3-D1 titled “NEPOOL Right-of-Way Vegetation Management Standard” dated 02/26/99.

Clearance Between Conductors and Woody Vegetation

Transmission lines within the Northeast Utilities’ system present a variety of woody vegetation control situations. Regulatory permit conditions often specify “buffers” or “screenings” at visually sensitive highway and local road crossings and other locations which require special attention to the desired screening and to the necessary clearances. Northeast Utilities’ right-of-way vegetation clearing practices differ in specific areas as defined below:

1. Under and adjacent to the conductors of the transmission line as depicted on Figure C; cut all tall-maturing tree species of any height while retaining existing compatible woody shrub species (see Appendix 1).
2. At structure sites and access roads; clear cut what is required to insuring clear construction and maintenance areas as depicted on Figure C.
3. At road crossings, within 15 feet of the edge of clearing and other sensitive areas that may be specified under the regulatory permit; retain low-maturing tree species such as Flowering Dogwood (see Appendix 2) to the extent that they will not conflict with operation of the transmission line throughout the vegetation maintenance cycle.
4. At ravines, river crossings, and similar locations; allow tree species to remain where the conductors will be significantly higher than normal and where the vegetation at full mature height would not violate Figure A clearances or will not cause construction, or access or problems.

The minimum clearances established in Figures A, B, and C between conductors and woody vegetation includes the allowance for re-growth over the periodic maintenance cycle of 4 years in order to prevent clearance problems to the energized conductors between maintenance cycles. The defined clearances cover all types of vegetation including natural growth, orchards, ornamental plantings, nursery stock, and danger trees.

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

Figure A; Minimum Conductor Clearances

Figure B; Danger Tree Clearance

Figure C; Clear Cut Area for New Construction

Where orchards, ornamental plantings, or nursery stock exist, the maximum tree height is shown in Figure A. Individual easements or other legal instruments may define site specific maximum allowable tree heights.

Original	Right-of-Way Vegetation Clearing Standard for 69-kV through 345-kV Transmission Lines			
02/27/04				
Approved				
DWF	NORTHEAST UTILITIES	DESIGN & APPLICATION STANDARD	TRM 81.021	1

Where rights exist beyond the edge of the right-of-way, any tree designated as a “danger tree”, i.e.; a tree that can fall within the dimensions noted in Figure B, will be removed at the discretion of the arborist. In sensitive areas adjacent to or within the right-of-way or where rights or other permission to remove danger trees cannot be obtained, the solution is to remove those portions of the tree canopy projecting into the right-of-way and those portions of a tree which, if they become detached, may fall within the clearance area.

On sidehill rights-of-way, danger trees can be found significantly further from the conductors on the up-hill side of the right-of-way than they will be on the down-hill side of the right-of way.

Clearing Activities

There are four distinct right-of-way vegetation clearing areas and activities:

1. Preparatory clearing for new transmission line construction.
2. Preparatory clearing for the replacement of an existing line, structure or appurtenance.
3. Clearing for wind-displaced conductor clearances.
4. Maintenance clearing.

Each clearing activity accomplishes a different objective by completing a different level of vegetation removal. New construction, equipment replacement, or repair typically involves activities 1 or 2, and 3.

Preparatory Clearing for New Construction

This clearing consists of clear cutting three distinct areas of the right-of-way and removing other trees which may be a hazard to the line due to their mature height as defined by Figure C. These clearing areas are:

1. At each structure site for a distance of twenty-five (25) feet from all surfaces of the structure, all poles of a multiple pole structure, and all anchor locations.
2. The full length of all access road and spurs to structure sites for a cleared width of fifteen (15) feet.
3. A width along the centerline of construction to a horizontal distance outside the two outermost conductors in accordance with Figure A. Low-maturing woody shrub species are typically not removed, and low maturing tree species such as Flowering Dogwood may be allowed to remain along the outer edges (“B” dimension of Figure A).

For new construction, in addition to the twenty-five (25) foot cleared area around the structure, a lay-down and assembly area may be required that is considerably larger. This area is dependant upon topography, the type of structure to be assembled, and the type of foundation required at the site.

Preparatory Clearing for Structure Maintenance or the Replacement of an Existing Line

This clearing is similar to new construction clearing with the following exceptions:

1. Clearing is dependant on the relative location of the rebuilt line with respect to the existing

cleared area and the proposed construction method for installation of conductors and shield wires. These factors may significantly reduce or eliminate needed clearing.

Original	Right-of-Way Vegetation Clearing Standard for 69-kV through 345-kV Transmission Lines			
02/27/04				
Approved				
DWF	NORTHEAST UTILITIES	DESIGN & APPLICATION STANDARD	TRM 81.021	2

2. The structure site and access clearing will still be required but may also be significantly reduced.
3. When structures from the old line are removed, the clear area at these sites and the access spurs to them will be allowed to naturally re-vegetate with native plant species which may include native grasses, forbs or shrubs.

Clearing for Conductor Clearance

After the conductors are installed a reference is established to determine required conductor clearances. Additional "danger trees" outside of the initial cleared area will be identified and removed in accordance with the clearance envelope lines shown in Figure B.

Maintenance Clearing

This clearing will allow natural re-vegetation across the entire width of the right-of-way to the extent that the mature height of any second growth vegetation remains under the clearance envelope lines shown in Figure A. Normally maintenance in the area under the conductors will result in vegetation heights which do not exceed eight (8) feet. Additionally, at each clearing cycle the right-of-way will be examined to determine if any new danger trees have developed. If so, arrangements for their removal will be negotiated as needed and the trees removed or overhanging portions trimmed.

Decision Responsibility for Clearing Woody Vegetation

For initial clearing, the transmission line Construction Manager, with assistance as necessary from the Project Engineer, will be responsible for obtaining approval from the Transmission Supervisor, Vegetation Management before allowing vegetation to remain which conflicts with the clearances shown in Figures A, B, and C.

Original	Right-of-Way Vegetation Clearing Standard for 69-kV through 345-kV Transmission Lines			
02/27/04				
Approved				
DWF	NORTHEAST UTILITIES	DESIGN & APPLICATION STANDARD	TRM 81.021	3

APPENDIX 1

SHRUB SPECIES ALLOWED TO REMAIN: (PARTIAL LIST)

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

APPENDIX 2

Original	<p>Right-of-Way Vegetation Clearing Standard for 69-kV through 345-kV Transmission Lines</p>			
02/27/04				
Approved				
DWF	NORTHEAST UTILITIES	DESIGN & APPLICATION STANDARD	TRM 81.021	4

LOW-MATURING TREE SPECIES ALLOWED TO REMAIN ALONG THE SIDES OF CLEARING: (PARTIAL LIST)

All species listed above including:

Alder	<i>Alnus spp.</i>
Dogwood - Alternate-leaved	<i>Cornus alternifolia</i>
Dogwood - Flowering	<i>Cornus florida</i>
Sumac - Shining	<i>Rhus copillina</i>
Sumac - Smooth	<i>Rhus glabra</i>
Sumac - Staghorn	<i>Rhus typhina</i>
Willows (except tree species)	<i>Salix spp.</i>
Witch-Hazel	<i>Hamamelis virginiana</i>

Figure A

Minimum Conductor Clearances

Original	Right-of-Way Vegetation Clearing Standard for 69-kV through 345-kV Transmission Lines			
02/27/04				
Approved				
DWF	NORTHEAST UTILITIES	DESIGN & APPLICATION STANDARD	TRM 81.021	5

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

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

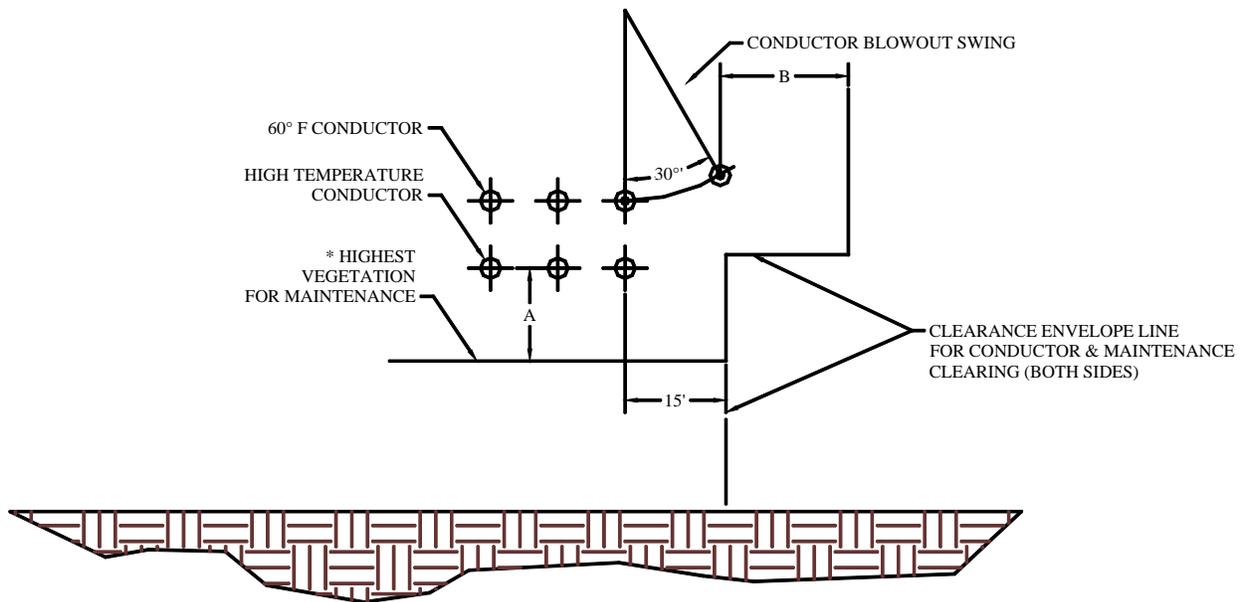


Figure B

Danger Tree Clearances

Original	Right-of-Way Vegetation Clearing Standard for 69-kV through 345-kV Transmission Lines			
02/27/04				
Approved				
DWF	NORTHEAST UTILITIES	DESIGN & APPLICATION STANDARD	TRM 81.021	6

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

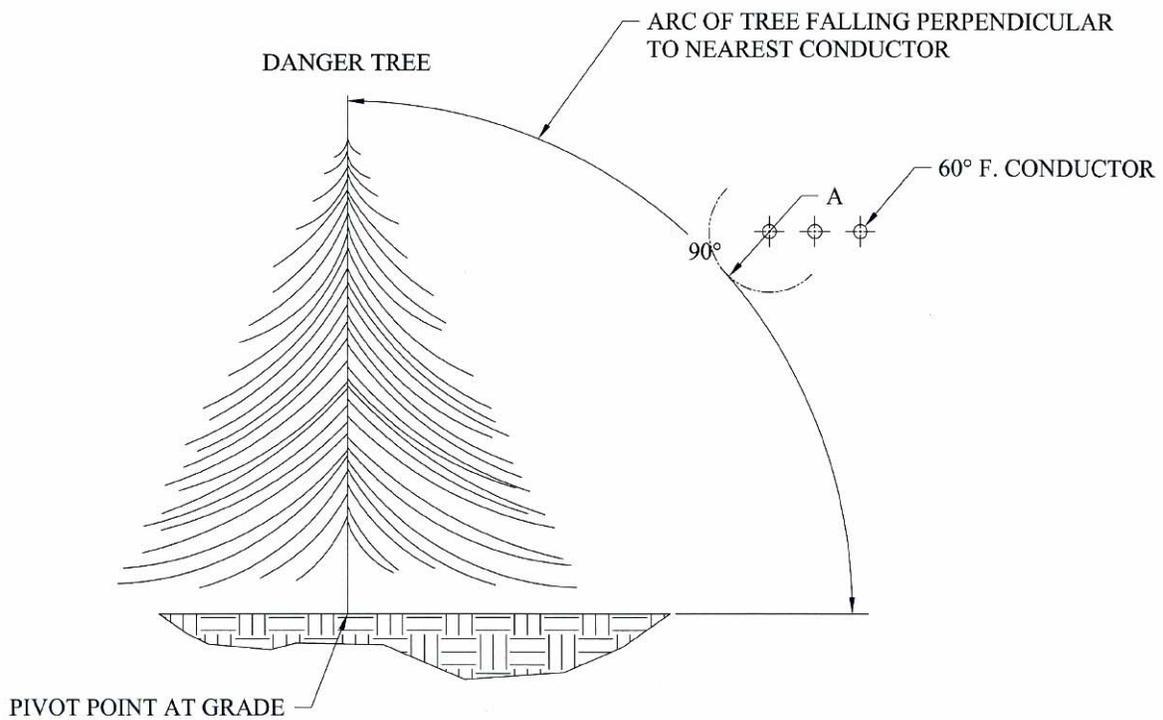
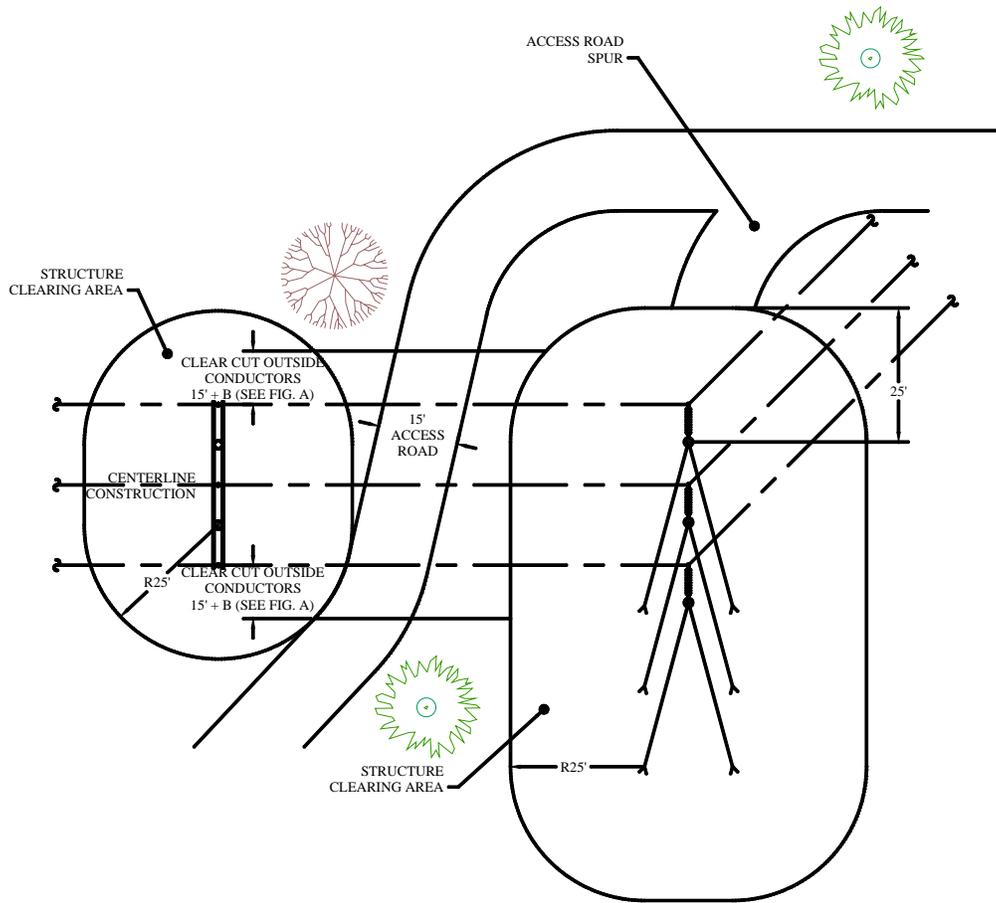


Figure C

Clear Cut Area for New Construction

Original	Right-of-Way Vegetation Clearing Standard for 69-kV through 345-kV Transmission Lines			
02/27/04				
Approved				
DWF	NORTHEAST UTILITIES	DESIGN & APPLICATION STANDARD	TRM 81.021	7



Original	Right-of-Way Vegetation Clearing Standard for 69-kV through 345-kV Transmission Lines			
02/27/04				
Approved				
DWF	NORTHEAST UTILITIES	DESIGN & APPLICATION STANDARD	TRM 81.021	8

APPENDIX D

CONDITIONS FOR CONSTRUCTING PROJECT ON MIDDLETOWN WATER DEPARTMENT PROPERTY

SCHEDULE I – DURING CONSTRUCTION

1. Prior to the commencement of construction on Middletown Water Company property, a spill prevention plan and an emergency spill response plan shall be made available to the Northeast Utilities (NU) project engineers and job site supervisors, after review and approval by the Connecticut Siting Council. These plans shall include measures to prevent contaminant releases, 24/7 emergency response protocols, and containment procedures in the event of an emergency during the project or post construction. Job site personnel shall be adequately trained to respond to protect the drinking water sources, tributaries and watershed land. A representative of NU shall immediately notify the City of Middletown Water Department (CM) if any potentially hazardous materials are improperly introduced or spilled upon the watershed land during the project. Upon completion of spill cleanup but no later than forty-eight hours after the cleanup, NU shall submit a comprehensive written report to the CM with copies to the State of Connecticut Department of Environmental Protection and the State of Connecticut Department of Public Health. NU shall immediately shut down the project to protect drinking water sources, tributaries and watershed land, if determined to be necessary by the Connecticut Siting Council (“CSC”) based on recommendations by the CSC’s independent environmental inspector. The CSC shall retain the right to temporarily shut down the project to protect drinking water sources, tributaries and watershed land if NU fails to protect the drinking water sources, tributaries and watershed land. Spill response equipment and containment materials, adequate in type and number, shall be available on-site at all times along with personnel trained in the proper use of such equipment. A person or persons shall be designated by NU or its contractor for emergency response coordination on a 24/7 basis. Contact information of the designated emergency spill responder shall be submitted prior to the start of construction. No equipment, machinery, or vehicles shall be cleaned, repaired, fueled or stored on the project site. Oil, solvents, or hazardous substances shall be disposed of off the project site. Disposal shall be conducted in an environmentally safe manner.
2. No construction shall take place until all necessary water pollution controls, and erosion and sedimentation controls, are in place. These controls shall be installed, functioning properly, inspected regularly, and remains in place throughout the duration of the project. Both hay bales and silt fence erosion controls shall be used on or adjacent to CM owned land. Proper erosion and sedimentation control measures must be established in accordance with the Soil Conservation Service’s Erosion and Sediment Control Handbook.
3. All debris from clearing and grubbing and other excavated materials shall be disposed of off the project site. Disposal shall be conducted in an environmentally safe manner. Any soil to be placed on site as fill shall be inspected and approved as clean by NU. All fill shall be stabilized during use to prevent erosion and contained to prevent runoff. Extent of fill or excavation shall be minimized. All fill areas shall be restored and revegetated. Stockpiling of

topsoil on site is prohibited. Disturbed areas must be seeded or sodded as soon as possible to provide a vegetative cover to protect against erosion. Seed mixtures, hydro-seeding, and erosion control fabric shall be free from any herbicide or pesticide additive or treatment. Any storage or use of pesticides, herbicides, de-icers or fertilizers on the project site is prohibited.

4. Any malfunction or breakdown of water pollution control or erosion and/or sedimentation control devices, shall be repaired immediately. At the direction of the CSC, construction activities shall be discontinued until repairs have been completed. Per Public Health Code Section 19-13-B32(i), any water discharge, including dewatering and stormwater drainage, shall be discharged at least one hundred feet away from a watercourse within the watershed. Any dewatering basin shall be sized to handle the maximum volume of water being pumped at any time to ensure satisfactory removal. The basin shall be inspected twice a week and immediately after precipitation. If the present design of any environmental control is found during the course of the project to be inadequate for preventing water quality problems, it shall be modified by NU to perform in a manner acceptable to the CSC.
5. NU shall provide onsite inspection to assure that the water company land conditions contained in the Segment 1b D&M Plan are satisfied. As the CSC requires, the project area will be inspected by the CSC's independent environmental inspector. The environmental inspector will file written reports weekly with the CSC. These reports will be provided to the City of Middletown.

SCHEDULE II – POST CONSTRUCTION

1. NU shall provide Long Term Protection Management Practices for all activities that may affect water quality.
2. NU shall prohibit the use or storage of any chemical that has a water quality health based standard or maximum contaminant level. Non-chemical means shall be utilized in the vegetation management of transmission right of ways because chemical pesticide use is prohibited unless specifically approved by the City of Middletown
3. NU is the responsible party for the development, implementation, and maintenance of these water company land conditions.
4. NU is responsible to annually report the implementation of the water company land conditions to the CSC for three years.

APPENDIX E

SEDIMENT AND EROSION CONTROL PLAN

APPENDIX E

SEDIMENT AND EROSION CONTROL PLAN

The objective of this Plan is to minimize the potential for erosion and sedimentation impact during construction and to effectively restore the work areas and other disturbed areas. This objective will be met by implementing the erosion and sediment control measures contained in this section. These erosion and sediment control measures will serve as minimum erosion sedimentation by:

- Minimizing the quantity and duration of soil exposure
- Protecting areas of critical concern during construction by redirecting and reducing the velocity of runoff
- Installing and maintaining erosion and sediment control measures during construction
- Establishing vegetation where required as soon as possible following final grading
- Inspecting the work areas and maintaining erosion and sediment control as necessary until final stabilization and inspection are achieved.

It is Connecticut Light and Power Company (CL&P) responsibility for ensuring that all contracts implement and maintain erosion and sediment control measures during construction. This plan includes erosion and sediment control techniques that apply to all areas of construction, expands on the impact minimization associated with clearing, grading, installation, and restoration phases and discusses the use of construction safety precautions.

1.0 Standard Construction Methods

Construction of an aboveground electric transmission line consists of several distinct phases: clearing, grading, drilling of foundations, installation of new structures and restoration.

1.1 CLEARING

All clearing activities will conform to the methods dictated in this section.

- Transmission line right-of-way boundaries will be clearly delineated in the field before commencement of clearing activities. The Owner's Representative (OR) will ensure that no clearing occurs beyond these boundaries.
- Trees to be saved shall be clearly marked (flagging, snow fencing, etc.) before commencement of clearing operations. As part of the pre-construction planning and vegetation inventory, efforts have been, and will continue to be, made to identify unique or specimen trees that are located within or near the construction workspace. Landowners will be consulted concerning their desire to protect such trees. The specified trees will be flagged and, to the extent practical, attempts will be made to preserve the identified trees during the construction process.
- Stemmed vegetation such as brush, shrubs and trees shall be removed at or near the ground surface to allow the root system to remain intact.
- All existing fences and walls shall be maintained by the use of temporary fences section (gap). Prior to removal, the fence or wall will be properly braced and similar material used to construct the gap. At no time will an opening be left unattended. The gap will be replaced after cleanup with a permanent fence or wall of the same or similar material and condition.
- When pruning is necessary, it shall be conducted as follows:
 - a. Cuts shall be smooth
 - b. Branch collars shall not be cut (i.e., cuts should be made immediately in front of the branch collar)

- c. Large, heavy branches shall be precut on the underside to prevent splitting or peeling
- d. Climbing spurs shall not be used
- Trees shall be cut to grade within the non-paved work area
- Trees and limbs will not be permitted to fall into wetlands or watercourses, where possible.
- Construction activity with the potential for generating high-decibel noise levels will be restricted to the period between 7am and 7pm or in accordance with local regulations.
- Brush will be piled at the edge of the work area to provide additional runoff protection or additional wildlife habitat.
- All brush will be removed from wetland areas.
- Chips may be left on the workspace with OR approval if placement does not inhibit revegetation.
- Chips will not be left in wetlands or agricultural lands or stockpiled in such a location that they may be transported into wetland or agricultural lands.

1.2 GRADING

When existing topography and/or terrain does not permit crews and equipment to operate safely and does not provide access or an effective work area, grading may be required. The following general construction methods will be employed by CL&P during grading.

1.2.1 Removal of Tree Stumps

In upland areas, stumps can be removed across the entire width of the construction workspace; however, in wetlands, stumps will be removed only if they are in a structure foundation location. Stumps that create construction constraints or safety concerns may require removal from under a work pad or on a side slope. Stumps may be chipped in upland areas. Grindings will be removed from the wetlands to the maximum extent practicable.

1.2.2 Rock Disposal

Excess rock, including drilled rock, shall be used or disposed of by one or more of the following methods:

- Windrowed in uplands per landowner agreement and applicable permits, or removed if it exceeds that of surrounding terrain.
- Hauled to disturbed property per landowner agreement. As part of the agreement, the landowner will accept responsibility for the rock and not place it in a wetland area.
- Removed and disposed at an approved site that is traditionally used for rock debris disposal.
- Used to construct stone walls or fences, if approved by CL&P per landowner agreement.
- Used to improve designated construction access roads per appropriate approval.

1.2.3 Water Bars/Terraces (Slope breakers where necessary)

- Water bars/terraces shall be installed diagonally across the work area when needed.
- A temporary channel will be excavated and a compacted berm created adjacent to the channel or ridge of compacted soil.
- The type of soil, degree of slope, runoff area and location of suitable outlets determines the number and shape of water bars required. The minimum guidelines for water bar spacing per the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control are:

<u>Percent (%) Slope</u>	<u>Spacing (feet)</u>
1	400
2	245
5	125
10	78
15	58

- The bar/terrace will be created in such a way as not to prohibit safe passage.
- Water bars/terraces will be maintained and repaired at the end of each day.
- Water bars/terraces will divert water to a well vegetated area. If a vegetated area is unavailable, erosion control barriers shall be installed at the limit of the construction workspace at the outlet of the water bar.
- Silt fence, straw/hay bales or sandbags may be used in place of water bars/terraces per the OR.

1.2.4 Temporary Erosion Control Barriers

Straw/hay bales and silt fences are interchangeable, except where noted below. Temporary erosion control barriers shall be installed prior to initial disturbance of soil and maintained as described below.

- At the outlet of a water bar when existing vegetation is not adequate to control erosion.
- Along banks of waterbodies between the workspace and waterbody after clearing.
- Downslope of any stock piled soil in the vicinity of waterbodies and vegetated wetlands.
- At sideslope and downslope boundaries of the construction area where runoff is not otherwise directed by a water bar/terrace.
- Maintain throughout construction and remain in place until permanent soil stabilization has been judged successful, at which time they will be removed (straw/hay bales may be left in place).
- Between wetlands and adjacent disturbed upland areas and as necessary to prevent siltation of ponds, wetlands, or other waterbodies adjacent to /downslope of the work areas.
- At the edge of the construction workspace as needed to contain soil and sediment.
- To be inspected on a daily basis in areas of active construction or equipment operation, on a weekly basis in areas with no construction or equipment operation and within 24 hours of a storm event that is 0.5 inches or greater.

1.2.4.1 Silt Fence Installation and Maintenance

- All silt fences shall be installed as directed by manufacturer and applicable permit conditions.
- A sufficient supply of silt fence shall be stockpiled onsite for emergency use and maintenance.

1.2.4.2 Straw/Hay Bale Installation and Maintenance

Straw/hay bales may be used in place of, or in addition to, silt fence. If straw/hay bales are to be used it must be installed and maintained as described below.

- It shall be anchored in place with at least two 2-inch diameter stakes.
- Bindings on bales shall be horizontal, in compliance with 2002 CT Guidelines for soil Erosion and Sediment Control.
- Bales shall be replaced if damaged or allowing water flow underneath.
- Damaged bales shall be replaced with new bales as deemed necessary by the OR.

- A sufficient supply of bales shall be maintained onsite for emergency use.
- Bales bound with wire or plastic shall not be used.

1.3 DRILLING OF FOUNDATIONS

To prepare for the installation of the concrete foundations, holes must be drilled into the ground. Since many of the proposed foundation locations are located on rock, rock drilling is likely to be required. Excess rock shall be disposed of as described in Section 1.2.2 of this Plan. Excess soil generated by the preparation for the foundation will be disposed of by:

- Spreading in uplands or removed if it exceeds that of surrounding terrain.
- Hauled to disturbed property per landowner request. As part of the agreement, the landowner will accept responsibility for the spoil. It cannot be placed in a wetland area.
- Removed and disposed at an approved site that is traditionally used for soil disposal.
- Used to improve designated construction access roads per appropriate approval.

Temporary erosion control barriers must also be installed around spoil piles as described in Section 1.2.4 of this Plan. Spoil will be stored at least 50 feet from waterbodies, where possible.

Underground utilities shall be located and carefully exposed, by hand digging if necessary. Appropriate authorities, such as "Call Before You Dig", will be notified 72 hours in advance of conducting any drilling.

1.4 INSTALLATION

Transmission line structures will be transported and unloaded in the general vicinity of their location. The structures will not be stored in wetlands or other waterbodies. Once the foundation holes are drilled, the foundations will be constructed. The foundations consist of re-inforced concrete with an above-grade bolting system. Excavations may require dewatering as a result of storm water or groundwater. Dewatering shall be conducted as described below.

- The dewatering location shall be a fairly level upland that is well vegetated, as to allow for the water to drain to the ground. Water will not be discharged to a wetland or waterbody.
- The dewatering area shall consist of a 10 ft by 10 ft straw/hay bale perimeter (size adjusted per water volume). Straw/hay bales shall be installed and maintained per Section 1.2.4.2 of this Plan.
- The pump hose shall be connected to a filter bag that is placed within the straw/hay bale barrier. The pump hose shall contain a diffuser nozzle or be installed to allow for a low discharge rate to prevent scouring.
- Additional straw/hay bales can be used to increase detention and filtering.

Once the foundations are cured (approximately 7 to 28 days) the steel transmission line structures will be erected and bolted securely to the foundation.

After all the structures are erected, the electric cables will be strung via pulley system from designated pulling areas. These areas will not be located within 50 feet of the edge of a wetland or waterbody.

1.5 RESTORATION AND REVEGETATION

Restoration and revegetation of the work areas incorporates permanent erosion and sediment control measures. However, in the event that final restoration cannot occur in a timely manner due to weather or soil conditions, temporary erosion and sediment control measures will be maintained until weather is suitable for final cleanup and revegetation. In no case shall final cleanup be delayed beyond the end of the next growing season.

1.5.1 Temporary Erosion Control

- Stabilization measures shall be initiated as soon as practical on portions of the workspace where activities have temporary or permanently ceased except:
 - a. When the initiation of stabilization measures are precluded by weather. Stabilization measures shall be initiated as soon as machinery is able to obtain access to the work areas.
 - b. When activities will resume within 21 days, stabilization measures do not have to be initiated by the fourteenth day following the cessation of activities.
- If construction is completed more than 30 days before the perennial vegetation seeding season, wetland areas and adjacent to waterbodies shall be mulched with straw or equivalent for a minimum of 100 feet on either side of the waterbody.
- Temporary plantings will be fertilized in accordance with the recommendations of the local NRCS office or other soil conservation authority.
- Temporary sediment barriers will be removed when an area is successfully revegetated in compliance with applicable regulatory approvals.

1.5.2 Permanent Restoration Measures

- Final grading around structure foundations shall be completed after installing foundation and pole structure, weather permitting.
- For wetland and/or stream impacted areas, re-contouring will be completed as soon as the foundation and pole structures are installed and temporary wetland stream access location structures such culverts, pipe flume, or matting have been removed. These erosion and sediment control structures shall be removed upon completion of that portion of the project and when they are no longer needed for construction purposes/access. Permanent structures within streams or wetlands may require federal, state, or local permitting.
- Construction debris shall be removed from the workspace, and the area shall be graded so that the soil is left in the proper condition for mulching, seeding or natural revegetation.
- Permanent water bars/terraces shall be constructed in association with final grading and prior to seeding.
- Permanent water bars will be constructed to replace temporary erosion control barriers at road and waterbody crossings.
- Permanent water bars/terraces will be constructed to the same specifications as temporary water bars.

1.5.3 Revegetation and Seeding

- The workspace will be seeded within 7 working days of final grading, weather and soil conditions permitting and planted in accordance with recommended seeding dates.
- Where broadcast or hydro-seeding occurs the seedbed will be scarified to ensure sites for seed to lodge and germinate.
- The seedbed will be prepared to an average depth of 3-4 inches using appropriate equipment to provide a firm, smooth seedbed, free of debris.

- Slopes steeper than 3:1 shall be seeded immediately after final grading in accordance with recommended seeding dates, weather permitting.
- The seed shall be applied and covered uniformly in accordance with the 2002 Connecticut Guidelines for Erosion and Sedimentation Control Guidelines. Broadcast or hydro-seeding can be used at double the recommended seeding rates. Where broadcast seeding is used, the seedbed shall be firmed after seeding.
- Areas seeded will be mulched with straw to prevent erosion.

1.5.4 Mulching

- After seeding, mulch will be applied at a rate of approximately 2 tons per acre on the disturbed areas, except wetlands, lawns, agriculture areas and areas where hydro-mulch is used.
- If construction or restoration activity is interrupted for extended periods (greater than 21 days), mulch will be applied.
- If mulching before seeding, mulch application will be increased on all slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre at a 4 inch depth.
- Mulch shall be anchored immediately after placement on steep slopes and stream banks.
- When mechanically anchoring mulch, mulch anchoring tool or tracked equipment will be used to crimp the mulch to a depth of 2-3 inches.
- When anchoring with liquid mulch binders, application rates will be as recommended by the manufacturer. Liquid mulch binders will not be used within 100 feet of wetlands or waterbodies.

1.5.5 Matting/Netting

- Matting or netting will be applied to sensitive areas (i.e., steep slopes, banks of waterbodies, bar ditches, etc.), in accordance with permit requirements.
- Matting or netting will be anchored with pegs or staples.

1.5.6 Monitoring/Reporting

- CL&P will conduct follow-up inspections after the first and second growing seasons after seeding to monitor the success of revegetation. In upland areas, revegetation will be considered successful if vegetation cover is sufficient to prevent erosion of soils disturbed in the workspace. Sufficient vegetation coverage is defined as a uniform 70%. If sufficient vegetative cover has not been achieved after two full growing seasons, additional restoration measures will be implemented. Erosion control devices shall be removed upon successful stabilization and revegetation of disturbed areas.
- CL&P will implement one or more of the following measures in cooperation with the landowner, if warranted or required, to control off-road vehicles:
 - Post and maintain, as necessary, appropriate signage
 - Installing a locking gate with fencing to prevent bypassing
 - In extremely sensitive areas, planting conifers or other appropriate shallow-rooted trees and shrubs in underground areas and overhead line areas across the workspace except where access is required for periodic inspection and maintenance use by CL&P. The spacing of trees and shrubs and length of workspace plantings shall comply with CL&P and national codes. This method will be used only when reflected on site specific plans or required by a regulatory agency
 - Installing a slash and timber barrier or boulders across the ROW.

2.0 Safety

- Temporary safety fences shall be erected at ROW crossings (e.g., residential areas, sensitive environmental areas, road crossings, etc.) where necessary.
- The length of time that the foundation pit/hole is left open shall be minimized through coordination by the construction inspector and the construction contractor.
- Soil tracked onto roads by construction equipment shall be minimized and will be cleaned in a manner consistent with all applicable permits. If stone access pads are used in residential or active agricultural areas, synthetic fabric will be used to facilitate removal.
- CL&P may employ flagmen and/or police detail for traffic control, temporary traffic detours and/or off-site parking facilities and busing for work crews.
- An electric utility surveyor/inspectors will be on-site at all times while construction activities occur near electric utilities.
- Overhead spotters will be on-site during construction activities.

3.0 Access Roads

- The contractor will not make any arrangements with landowners to use, change, or improve private access roads or property beyond those specified on the drawings or designated in the landowner agreement.
- Water bars will be necessary on steep slopes if the road will require grading or regrading as described in Section 1.2.3.
- If side ditches are required to provide drainage, they shall be excavated parallel to the road to carry runoff away from the road.
- Where an access road crosses an intermittent drain, culverts or pipe flumes will be installed as necessary to maintain existing drainage patterns, and clean stone/rock will be used to improve the surface of access roads for stabilization and/or rutting protection.
- If open water crossings are required, an equipment bridge will be used.
- Access roads will be restored to pre-construction condition unless specified otherwise by the landowner and approved by applicable permits.
- If subsoils are unstable, the use of timber mats may be required. These materials will be removed during clean up.
- Erosion control barriers will be installed, inspected and maintained as required at the edge of access roads where necessary to prevent siltation of ponds, wetlands of other adjacent/downslope waterbodies.

4.0 Inadvertent Disturbance Off Right-Of-Way

CL&P will restrict all activities to the permitted construction work areas. However, under extreme circumstances, such as while working on steep slopes in slippery conditions, and while grading on steep side hills, some inadvertent disturbance may occur outside of these areas. In the event that inadvertent disturbances occur, the following procedures will be implemented:

- The operator or foreman will immediately report the occurrence to a CL&P Inspector, who will notify the construction inspector and environmental inspector. The environmental inspector will then notify the appropriate CL&P personnel.
- The conditions that caused the disturbance will be evaluated, and the construction inspector and environmental inspector will determine whether work at the site can continue under those conditions.

- The nature of the disturbance will be evaluated and corrective actions taken as deemed necessary by the construction inspector and environmental inspector. Such measures may include immediate re-contouring and seeding of the disturbed site, and/or installation of erosion control devices to contain the disturbance.
- CL&P will notify the landowner and appropriate agencies of the disturbance

5.0 Waterbodies and Wetlands

5.1 WETLANDS

CL&P will protect and minimize potential adverse impacts to wetlands by:

- Expediting construction in and around wetlands and limiting the amount of equipment and mainline construction activities within wetlands to reduce disturbances of wetland soils
- Limiting grading to the amount necessary to provide a safe workspace
- Segregating disturbed topsoil from subsoil, as practical, depending on soil saturation at the time of construction
- Restoring wetlands to their original configurations and contours
- Permanently stabilizing upland areas near wetlands as soon as practical after transmission line structure installation
- Inspecting the ROW periodically during and after construction and repairing any erosion control or restoration features until permanent revegetation is successful

Additional workspace at wetland crossings will be minimized and located at least 50 feet from the edge of the wetland where topographic conditions permit. No refueling of construction vehicles will occur within 100 feet of any wetland resource area. The setbacks from watercourses and wetlands will be clearly marked in the field before the start of construction. Hazardous materials, chemicals, fuels or lubricating oils will not be stored nor will concrete coating activities be conducted within 100 feet of a wetland or waterbody boundary.

5.1.1 Clearing

- Equipment will not be allowed to work in wetlands unless it will not damage the existing root systems and as approved by the OR. Bulldozers will not be used for clearing. Trees and brush will be cut at ground level by hydro axes, tree shears, grinders or chainsaws.
- Stumps will be left in place, except at foundation locations or unless the removal is necessary to ensure worker safety. Stumps may be ground to a suitable height for safety reasons.

5.1.2 Grading

- Grading will be limited to the immediate work area of the foundation location, except where topography requires additional grading for safety reasons. Where grading is required, topsoil will be segregated and returned as an even layer to all graded areas.
- Prior to grading along or within wetlands, temporary erosion control barriers shall be installed on the down slope side of the area to be graded.

5.1.3 Drilling/Stock Piling

Since the drilled hole/pit will be filled with concrete to form the foundation, the spoil will be removed from the wetland by side-casting in adjacent uplands or by hauling it out of the wetland by vehicle, to be disposed of as described below.

- Spread in uplands or removed if it exceeds that of surrounding terrain.
- Hauled to disturbed property per landowner agreement. As part of the agreement, the landowner will accept responsibility for the spoil. It cannot be placed in a wetland area.
- Removed and disposed at an approved site that is traditionally used for soil disposal.
- Used to improve designated construction access roads per appropriate approval.

Spoil will be stored at least 100 feet from wetlands. Spoil placed up gradient of wetlands will be contained with sediment control.

Excess rock shall be disposed of as described in Section 1.2.2 of this Plan.

5.1.4 Cleanup/Restoration

- All construction debris shall be removed following foundation completion and transmission line structure erection.
- Once the structures are erected, CL&P will restore the original contours (within 6 inches) and flow regimes to the extent practical with the exceptions of unnatural features and unstable grades.
- The disturbed areas will be seeded with annual rye grass (40 pounds/acre, unless standing water is present) to stabilize the area until indigenous hydrophilic vegetation can become reestablished. If the wetland is within an active agricultural parcel, reseeded will be performed according to appropriate land management or state agency permits and/or landowner agreements.
- If weather limits the effectiveness of reseeded efforts, non-paved work areas may be mulched to minimize erosion until conditions are suitable for reseeded at the discretion of the OR and as allowed by all applicable permits.
- No fertilizer or lime shall be used in wetlands unless specified by the NRCS.

5.1.5 Monitoring

CL&P or its designated OR will monitor wetland revegetation efforts annually for a period of two years. Revegetation will be considered successful if at least 70% of the total cover is native species and the level of diversity of the native species present after construction is at least 50 % of the level originally found in the wetland. If the area is not showing signs of re-establishing native wetland vegetation during the first growing season following construction, CL&P will develop and implement (in consultation with a professional wetland scientist) a plan to revegetate the wetland with native wetland species.

5.2 WATERBODIES

CL&P will ensure that construction across or within waterbodies is completed in the shortest amount of time possible to minimize the duration of potential adverse impacts.

5.2.1 Additional Work Space Areas

Cable pulling locations, additional temporary workspaces, or staging areas will be located 50 feet beyond the edge of an intermittent waterbody and 100 feet from perennial streams.

5.2.2 Spoil Pile Placement/Control

Spoil will be stored at least 50 feet from stream banks and waterbody crossings, where possible. Spoil placed up gradient of stream banks will be contained with sediment control.

5.2.3 Equipment Crossings

Measures will include the use of timber mats laid adjacent to and across streambeds, flume pipes covered by fill material (clean gravel or crushed stone) or portable bridges as approved by the OR. Flume pipes will conform to waterbody crossing dimensions and alignments. Stream channels will not be permanently straightened or realigned for any reason, unless a permit has been acquired to do so. The size and number of the flumes will be sufficient for maximum anticipated flows.

If fill for an equipment crossing includes log riprap or other erodible materials sandbags will be placed in the waterbody at the upstream and downstream ends of the crossing to stabilize and seal the flume pipes. To prevent erosion, sandbags will be placed high enough along both sides of the equipment crossing to contain the fill material (straw/hay bales may also be used for this purpose).

5.2.4 Clearing/Grading

- The construction of the equipment crossing will use one of the following:
 - a. Timber mats with or without flumes
 - b. Clean rock fill and flumes
- Equipment bridges will be maintained to prevent soil from entering the waterbody.
- If more than one-week will pass between the time when the area is cleared and when the pipe is installed, the clearing crew may:
 - a. Leave a 10 foot vegetative strip on either side of the waterbody (excluding the equipment crossing). Trees greater than 4 inches in diameter may be removed from the vegetative strip at the time of initial clearing
 - b. Install sediment barriers at the top of the stream bank if no vegetation strip is left.

5.2.5 Drilling/Stock Piling

Procedures for drilling and stock piling shall be consistent with Section 5.1.3 of this Plan.

5.2.6 Cleanup/Restoration

- During restoration, flume pipes, sand bags and other materials will be removed and the stream will be restored to preconstruction contours or better.
- Stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing the crossing.
- Equipment crossing will be left in place if needed for access during seeding. They will be removed if 1) more than one month will pass between final cleanup/grading and the beginning of initial permanent seeding and 2) appropriate alternative access is available.
- Jute thatching or other erosion control material will be used to stabilize stream banks as necessary.
- Banks of waterbodies disturbed during construction shall be restored in accordance with the 2002 CT Guidelines for Soil Erosion and Sediment Control as well as applicable approvals from the Department of Environmental Protection and the U.S. Army Corps of Engineers. Trees and/or shrub species selected for use in restoration shall be native and provide habitat components for existing fisheries as well as resident migratory wildlife.

5.2.7 Temporary Erosion and Sediment Control

- Install sediment barriers immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction

and reinstalled as necessary, until replacement by permanent erosion controls or restoration of adjacent upland areas are complete.

- Install sediment barriers across the entire construction access road or disturbed area at all waterbody crossings. Temporary interceptor dikes may be used in lieu of sediment barriers in front of equipment bridges or timber mats across the travel lane.
- Install sediment barriers as necessary along the edge of the access road or construction area to contain spoil and sediment within them where waterbodies are adjacent or parallel to the access road or construction area.

5.2.8 Restoration

- Return waterbody banks to preconstruction contours.
- Limit the placement of riprap to the slopes along the disturbed waterbody crossing.
- Install seeded erosion control fabric along waterbodies with flow conditions.
- Revegetate disturbed riparian areas with conservation grasses and legumes. In the event that final cleanup is deferred more than 20 days after the structure is installed, all slopes adjacent to waterbodies shall be mulched with 3 tons/acre of straw for a minimum of 100 feet on each side of the waterbody crossing.
- Remove all temporary sediment barriers when restoration of adjacent upland areas is successful as specified in Section 1.5.2 of this Plan.
- Install a permanent interceptor dike at the base of slopes near each waterbody crossed. Permanent interceptor dikes may not be installed in agricultural areas.

6.0 Stabilization of Disturbed Areas Over Winter

If portions of the Project are constructed in the late fall or early winter (due, for example, to timing restrictions), revegetation and permanent site stabilization immediately after the completion of construction will be impractical. In addition, inclement weather late in the construction season also could delay final restoration on transmission line segments.

When such circumstances delay final restoration and permanent site stabilization, temporary erosion control measures will be used to minimize the potential for erosion until clean-up and permanent revegetation can proceed. These measures may include the following:

- Maintain or install hay or straw/hay bales as silt barriers in swales, at the base of slopes, adjacent to streams and wetlands at access road crossings, and in other areas subject to sedimentation from low velocity runoff.
- Use straw or hay mulch stabilized with a binder or equivalent on disturbed slopes greater than 5%.
- Temporarily seed critical areas (e.g., stream banks on access roads) with a fast-germinating grass such as winter rye.
- Conduct periodic inspections of the construction ROW over the winter and early spring to ensure that the temporary measures are maintained and are effective.

In the event of such inclement weather conditions late in the construction season, final ROW restoration will be deferred until the following spring or early summer, after the ground has thawed, and soil conditions are suitable.

APPENDIX F
D&M PLAN CHANGE APPROVAL PROCESS

APPENDIX F

D&M PLAN CHANGE APPROVAL PROCESS

Identification of Significant Changes:

Once CL&P identifies a required change to the D&M Plan, it must determine whether it is a “significant change,” because such changes require advance Council approval. CL&P proposes the following criteria for identifying significant changes: a “significant change” is a change to the Project that significantly reduces the amount of protection to the environment or significantly increases potential public concerns. To be “significant”, the change must have a meaningful impact to the environment, public, or other permits.

For the underground portion of the Project, once CL&P identifies a potential change, it will consult with a Connecticut Department of Transportation (CDOT) representative to reach an agreement as to whether the change is “significant.” Any changes to existing CDOT facilities or affecting planned projects of CDOT will be considered “significant.”

Procedure for Council Review of “Significant Changes” to D&M Plan:

“Urgent” Case: If the change is “urgent” (i.e., if having to wait until the next regularly scheduled meeting of the Council to obtain approval of the change would have a material impact on construction cost or scheduling), then CL&P will contact Council staff to determine if the Council chairman will grant oral permission for the change so as to allow construction to continue in accordance with the proposed change. If oral permission is granted, CL&P will continue construction in accordance with the change and will file documentation regarding the change within 24 hours. If oral permission is denied, CL&P will file the proposed D&M Plan Change with the Council for review and will hold construction impacted by the change pending the Council’s determination.

“Non-Urgent” Case: If the change is not “urgent,” then CL&P will file the proposed D&M Plan Change with the Council for review at its next meeting and will delay the construction impacted by the change pending the Council’s determination.

Procedure for Council Review of Other Types of Changes to the D&M Plan:

For purposes of reviewing and processing changes to an approved D&M Plan that are not deemed to be “significant”, CL&P will categorize the change as one of the following:

Non-significant change: a change to the Project that may reduce the amount of protection to the environment or may increase potential public concerns, but only in a minor or trivial manner.

Positive Change: A change to the Project that increases the amount of protection to the environment or decreases public concerns, having no negative aspects in this regard (that is, positive impacts may not be considered to offset any negative impacts).

Minor Change: A change to a design aspect of a drawing, where the design has no bearing on the environment or potential public concerns.

For “non-significant” and “positive” changes, CL&P will inform Council staff of the change by phone (or telephone message) and will file appropriate documentation with the Council within 24 hours. There will be no “hold” on construction for such non-significant and positive changes.

For “minor changes”, there will be no formal notification process prior to proceeding with construction incorporating the change, and the reporting of such changes will occur weekly, as described below.

Weekly Reporting of All Changes to D&M Plans

CL&P will document all D&M Plan changes - significant, non-significant, positive, and minor – in an attachment to the environmental inspector’s weekly report.

**Middletown-Norwalk Transmission Project
D&M Plan Change Approval Process**

