Connecticut Siting Council
Docket No. 272

Development & Management Plan
for the

Middletown-Norwalk 345-kV Transmission Line Project

Crossings of Watercourses and Railroads in Segments 3, 4a and 4b

Volume 1 of 3

April 2007

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Submitted By:
The Connecticut Light and Power Company

April 2007

Prepared by:
Burns & McDonnell Engineering Company, Inc

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APPENDICES

1.0 INTRODUCTION

The Connecticut Light and Power Company (CL&P) hereby submits this Development and Management (D&M) Plan for the watercourse and railroad crossings associated with the underground portion of the Middletown-Norwalk Project (the Project) between the Singer Substation in Bridgeport and Father Conlon Place in Norwalk and between the East Devon Substation in Milford and the first splice vault west of the Housatonic River, in accordance with the Connecticut Siting Council (Council) Decision and Order for Docket No. 272 of April 7, 2005, and pursuant to Sections 16-50j-60 through 16-50j-62 of the Regulations of Connecticut State Agencies, *Requirements for a right-of-way development and management plan*. The Middletown-Norwalk Project consists of approximately 69 miles of 345-kV transmission line from CL&P's existing Scovill Rock Switching Station (located in the City of Middletown in Middlesex County), through New Haven County to CL&P's existing Norwalk Substation (located in the City of Norwalk in Fairfield County). The Project will include approximately 45 miles of overhead transmission line construction and 24 miles of underground transmission line construction. The overhead portion of the Project will extend from the Scovill Rock Switching Station in the City of Middletown to the East Devon Substation in the City of Milford. The underground portion will extend from the East Devon Substation to the Norwalk Substation in Norwalk. The Project will include the construction of two new electric substations (East Devon Substation in Milford and United Illuminating's Singer Substation in the City of Bridgeport) and one new switching station (Beseck Switching Station in Wallingford), as well as modifications to the existing Norwalk Substation and Scovill Rock Switching Station. CL&P will own all overhead portions of the Project, as well as the underground portion from East Devon Substation to the first vault west of the Housatonic River. CL&P ownership continues for the entire underground portion from the Singer Substation to the Norwalk Substation. The United Illuminating Company will build and own the Singer Substation and the underground portion from the Singer Substation to the first splice-vault, inclusive of the splice vault, west of the Housatonic River, a distance of approximately 5.6 miles.

CL&P plans to submit thirteen D&M plans for its portion of the Project. The D&M plans will be developed based on the type of construction and geographic location along the route, as follows:

<u>Switching Stations and Substations</u> (4 D&M plans)

- Scovill Rock (Middletown) – Approved by the Council on August 25, 2005
- Beseck (Wallingford) – Approved by the Council on February 22, 2006
- East Devon (Milford) – Approved by the Council on December 12, 2006
- Norwalk (Norwalk)

<u>Overhead Lines</u> (4 D&M plans)

- Segment 1a: Scovill Rock Switching Station to Chestnut Junction, Oxbow Junction to Beseck Switching Station, and Black Pond Junction to Beseck Switching Station
  (Middletown, Haddam, Durham, Middlefield, Meriden, Wallingford) – Approved by the Council on March 8, 2006
- Segment 1b: Royal Oak By-pass
  (Middletown) – Approved by the Council on March 8, 2006
- Segment 2a: Beseck Switching Station to Cheshire/Hamden Town line
  (Wallingford, Cheshire) – Approved by the Council on June 7, 2006
- Segment 2b: Cheshire/Hamden Town line to East Devon Substation
  (Hamden, Bethany, Woodbridge, West Haven, Orange, Milford) – Approved by the Council on August 31, 2006, with the exception of that portion of Segment 2b

between Rimmon Road and Center Road in the Town of Woodbridge, which was approved October 10, 2006.

Underground Lines (4 D&M plans)

- Segment 3: East Devon Substation to the Housatonic River Crossing (Milford) – Approved by the Council on March 22, 2006
- Segment 4a: Singer Substation to Fairfield/Westport Town line (Bridgeport, Fairfield) – Approved by the Council on February 22, 2006
- Segment 4b: Sasco Creek to Father Conlon Place in Norwalk (Westport, Norwalk) – Approved by the Council on June 27, 2006
- Segment 4c: Father Conlon Place in Norwalk to Norwalk Substation (Norwalk)

Crossings of Watercourses and Railroads in Underground Segments (1 D&M plan)
(Milford, Stratford, Bridgeport, Fairfield, Westport, Norwalk)

1.1 PROJECT DESCRIPTION

This D&M Plan covers the work associated with the installation of five water crossings and two railroad crossings in the underground segments as noted below by installation method:

- Housatonic River (Milford and Stratford) – Horizontal Directional Drill (HDD)
- Ash Creek (Bridgeport and Fairfield) –HDD
- Southport Harbor/Mill River (Fairfield) – Attachment to ConnDOT Bridge
- Sasco Creek (Fairfield and Westport) – Attachment to ConnDOT Bridge
- Saugatuck River (Westport) – HDD
- Metro North main line crossing near the intersection of I-95 and Naugatuck Avenue (Milford) – Jack and Bore (J&B)
- Metro North Waterbury spur line crossing near the intersection of Naugatuck Avenue and Kent Street (Milford) – Independent utility bridge.

The four installation methods used to install the crossings of watercourses and railroads are discussed below.

1.1.1 Horizontal Directional Drill Installation Method

Installation of a duct bank by horizontal directional drilling (HDD) is generally accomplished in three stages. The first stage consists of directionally drilling a small diameter pilot hole along a designated path. The second stage involves enlarging this pilot hole to a diameter sufficient to accommodate the duct bank. The final stage consists of pulling the duct bank into the enlarged hole. All stages of HDD involve circulating drilling fluid, typically a mixture of fresh water and bentonite clay, from equipment on the surface, through a drill pipe, and back to the surface through the drilled annulus.

1.1.1.1 Pilot Hole

Directional control of the pilot hole is achieved using a non-rotating drill string with an angular offset at the leading edge, typically created by a bent sub or a bent motor housing. The asymmetry of the leading edge creates a steering bias while the non-rotating aspect of the drill string allows the steering bias to be held in a specific position while drilling. If a change in direction is required, the drill string is rolled so that the direction of bias is the same as the desired change in direction. Where directional control is not required, the drill string may be rotated continually. In soft soils, drilling progress is typically achieved by erosion as a result of drilling fluid being discharged at high velocity through a jet nozzle on the bit. In hard soils or bedrock, drilling progress is achieved by mechanical cutting using a downhole hydraulic motor, commonly referred to as a mud motor, which allows for bit rotation without drill string rotation. The path of the pilot hole is monitored during drilling using a steering tool inserted in the drill string several feet behind the drill bit. Transmission of survey readings from the steering tool to the surface is generally accomplished through a wire running inside the drill string. These downhole survey readings, in conjunction with measurements of the distance drilled, are used to calculate the horizontal and vertical position of the pilot hole relative to the initial entry point on the surface. The path of the pilot hole may also be tracked using a surface monitoring system which determines the location of the steering tool using measurements from a coil placed on the surface. In short, the steering tool senses its location relative to the coil and communicates this information to the surface.

1.1.1.2 Prereaming

After the pilot hole is completed, one or more prereaming passes are employed to enlarge the pilot hole to a diameter suitable for installation of the duct bank. Reaming tools typically consist of a circular array of cutters and drilling fluid jets and are often custom made by contractors for a particular hole size or type of soil. For a typical prereaming pass, a reamer attached to the drill string at the pilot hole's exit point is rotated and drawn to the drilling rig, thus enlarging the hole. Drill pipe is added behind the reamer as it progresses toward the drilling rig insuring that a string of pipe is always maintained in the drilled hole. It is also possible to ream away from the drill rig, in which case a reaming tool fitted into the drill string at the rig is rotated and advanced away from it.

1.1.1.3 Pullback

Upon completion of prereaming, duct bank installation is accomplished by attaching the prefabricated bundle of ducts, commonly referred to as the "pull section", behind a reaming assembly at the exit point, then pulling the reaming assembly and pull section through the reamed hole to the drilling rig. Prior to being pulled into the hole, the pull section is supported on the ground surface using some combination of roller stands and pipe handling equipment to minimize tension and prevent damage to the ducts. A swivel assembly is placed between the reaming assembly and the pull section in order to prevent the pull section from rotating as the reaming assembly is rotated and pulled by the rig.

1.1.2 Jack and Bore Installation Method

The term jack and bore (J&B) encompasses several trenchless construction methods for installing a casing from a launching shaft to a receiving shaft beneath obstacles such as a roads and railroads. These methods include, but are not necessarily limited to, auger boring and pipe ramming. On the Project, the specific horizontal boring method to be employed for the Metro North main line crossing near the intersection of I-95 and Naugatuck Avenue in Milford will be determined by the contractor, taking into account factors such as the length and required accuracy of the bore, workspace availability, anticipated subsurface conditions, depth to groundwater, and environmental impact. J&B methods may utilize water or slurry for lubrication of the casing being installed, stabilization of the borehole, or to facilitate removal of spoil. Details relative to auger boring and pipe ramming are provided below.

1.1.2.1 Auger Boring

The auger boring process involves simultaneously pushing a casing through the earth while removing soil within the casing using a rotating helically wound auger. The rotating action of the auger serves the dual purpose of transferring spoil back to the launching shaft and transmitting torque to a cutting head. Power to drive the auger and cutting head is provided from the surface through utility lines. Auger boring systems use an open-faced cutting head allowing groundwater and spoil to flow freely into the casing. Auger boring is typically utilized to advance casing pipe along a straight line between a launching shaft and a receiving shaft. In general, auger boring systems are non-steerable. However, guided boring systems have been developed and have been used on a limited basis. Steering is achieved through articulation of the casing near the cutting head, which can be controlled from the launching shaft.

1.1.2.2 Pipe Ramming

Pipe ramming is a non-steerable installation technique in which a pneumatic hammer is used to advance a steel casing through the earth using repeated percussive blows. The pipe being installed will typically be open-ended allowing the soil to enter the pipe during installation. Spoil inside the pipe can be removed either during the installation or after the installation is complete using an auger, compressed air, or water jetting. Like auger boring, pipe ramming is typically utilized to advance casing pipe along a straight line between a launching shaft and a receiving shaft.

1.1.2.3 Duct Installation In Jack and Bore Casing

Once the casing is installed by one of the J&B methods discussed above, conduits are assembled into wheeled spacers and passed through the casing. The spacers, placed at approximate 5-foot intervals, serve to maintain the specified separation of conduits as required due to mutual heating and subsequent cable ampacity derating concerns. The casing is backfilled with a thermally engineered grout mixture and tied into the normal duct bank construction on each end. One spare conduit per circuit will be installed with the J&B installations.

1.1.3 Independent Utility Bridge Installation Method

The Utility Bridge crossing of the Metro North spurline tracks near Naugatuck Avenue and Kent Street will be installed outside the public road rights-of-way.

Installation of the Utility Bridge consists of the following activities provided in sequential order:

- Clearing and grubbing
- Sheet pile construction
- Substructure construction
- Superstructure placement
- Cable and utility support placement
- Architectural cladding and roofing system installation
- Restoration and fencing.

1.1.3.1 Clearing and Grubbing

Prior to the start of construction at each crossing, clearing of the site will be performed to accommodate the equipment and materials necessary to start construction. This work will take place on previously acquired parcels of property to provide adequate temporary and permanent work space.

1.1.3.2 Substructure Construction

The substructure components, i.e. abutments and temporary support pier bents, will be installed at the various locations utilizing temporary and permanent sheet piling to form the reinforced concrete abutments and drive piles where necessary for permanent and temporary structural measures. U-shaped wingwalls are used to confine the limits required to protect the buried portion of the duct bank as it approaches the bridge.

1.1.3.3 Superstructure Placement

The superstructure, which consists of the beam and bracing system that will support the transmission lines, will be placed in stages, depending on the length of the beams. The beams will be placed on the newly constructed substructure components. The placement of these beams will be performed using cranes located on either previously acquired properties or on municipal roadways during off-peak hours.

Once the superstructure system is set in place, heat shielding will be placed under the superstructure to protect the cables from diesel train exhaust. The utility supports will be connected to the system and the cable ducts will be placed across the structure.

1.1.3.4 Cable and Utility Support Placement

Once the superstructure system is set in place, the utility supports can be connected to the system and then the cable ducts can be placed across the structure. Fiberglass conduits to house the XLPE cables, grounding cables and signal and control fibers will be supported on the utility diaphragms in a predefined arrangement. Six 8-inch conduits will house each of the three cables of each circuit. Two 4-inch conduits will house signal and control fiber optic cables and two 2-inch conduits will contain the coated copper grounding cables. The fiberglass conduits will also be transitioned to PVC for the approach duct banks.

1.1.3.5 Architectural Cladding and Roofing System Installation

Upon completion of the sub and superstructure construction, the utility bridge superstructure is aesthetically enhanced with architectural cladding and roofing, somewhat resembling a covered bridge. The primary function of the roofing and cladding system is to protect the conduits from ultra-violet light and subsequent solar heating that degrade the ampacity of the transmission cables. A ridge vent will be provided to allow heat emitted by the cables to escape, while the underside of the bridge (except where the heat shielding is directly over the railroad tracks) will remain open to provide continuous airflow. Although the underside of the bridge adjacent to the railroad tracks is virtually open, a protective bird netting will be installed to discourage the nesting of birds and other animals.

1.1.3.6 Restoration and Fencing

The site will be graded, seeded and planted to restore the surroundings as closely as possible to the pre-construction state. Protective fencing is used to enclose the elevated approach areas and restrict access to the bridge.

1.1.4 Transmission Line Supported on ConnDOT Structures

Attachment of the transmission line to Bridge No.00320 and Bridge No.05858; U.S. Route 1 over Sasco Creek and Route 130 over Mill River (Southport Harbor) in the Towns of Westport and Fairfield, respectively, will be installed in empty bays (between beams) under the bridge.

Installation of the transmission line on ConnDOT bridges consists of the following activities provided in sequential order:

- Install Temporary Work-Platforms and Debris Shield
- Modifications to existing steel framing system
- Modifications to existing substructure
- Removal of approach slab/roadway
- Cable and utility support placement
- Reconstruction of approach slab and roadway.

1.1.4.1 Install Temporary Work-Platforms and Debris Shields

Prior to the start of construction at each crossing, the Contractor shall determine the type and location, and install temporary work-platforms to perform the under bridgework. Additionally, the Contractor shall install temporary debris shield underneath the bridge deck to prevent deleterious material from entering the watercourses.

1.1.4.2 Modifications to Existing Steel Framing System

The Contractor will remove the existing end and intermediate diaphragms within the specified utility bay. The existing connection plates will be modified to conform to the new diaphragm configurations and the geometric requirements of the utility ducts.

1.1.4.3 Modifications to Existing Substructure

The abutment backwalls shall be removed to the specified limits within the specified utility bay. The bridge seat and backwall will be reconstructed utilizing fiberglass reinforcement and the utility duct sleeves will be cast into the newly constructed backwall.

1.1.4.4 Removal of Approach Slab/Roadway

The existing concrete approach slab and roadway structure will be removed at Bridge No.00320 and Bridge No.05858, respectively. The limits are specified on the plans in Volume 2 and will accommodate the approach duct bank trenching.

1.1.4.5 Cable and Utility Support Placement

Once the utility support hangers are set in place, the cable ducts can be placed across the structure. Fiberglass conduits to house the XLPE cables, grounding cables and signal and control fibers will be supported on the utility diaphragms in the specified utility bay. Six 8-inch conduits will house each of the three cables of each circuit, which are in two separate utility bays. Two 4-inch conduits will house signal and control fiber optic cables and two 2-inch conduits will contain the coated copper grounding cables. The fiberglass conduits will also be used within the approach duct banks and terminated at the first adjacent splicing vault.

1.1.4.6 Reconstruction of Approach Slab and Roadway

The approach slab at Bridge No.00320 will be reconstructed with steel reinforced concrete and the approach roadway at Bridge No.05858 will consist of full depth pavement reconstruction.

1.1.5 Duct-Bank Installation

Duct-bank installation, common to all four trenchless crossing methods, occurs at approaches to the specific crossings. The work zone for duct-bank construction will measure approximately 400 feet in length. The following activities will occur in the work zone:

- saw cutting pavement
- trench excavation
- duct placement
- backfilling
- temporary pavement restoration
- permanent pavement restoration

1.1.5.1 Saw Cutting Pavement

Roadway pavement will be saw cut on both sides of the planned excavation to a width slightly greater than that for the standard duct-bank configuration (See Volume 2). Alternate duct-bank configurations to avoid existing utilities will require slight variations in the width of pavement requiring saw cutting.

1.1.5.2 Trench Excavation

The standard duct-bank configuration requires excavation of a 4-foot wide trench to a minimum depth of 5 feet. This depth provides a minimum cover of 2.5 feet, as will be set forth in the General Encroachment Agreement between CL&P and ConnDOT. As previously mentioned, at certain locations alternative duct-bank configurations will be required to avoid existing utilities, and these locations will typically require greater trench depths. Typical cross sections are provided in Volume 2. Trenching is anticipated to proceed at a rate of 50 to 200 linear feet per day. Steel plating of the open trench will be utilized as allowed by ConnDOT, the City of Milford, City of Bridgeport, Town of Fairfield, and Town of Westport to facilitate the construction process and open up travel lanes during restricted construction periods. A soil management plan for handling spoil material removed during excavation will be issued.

Subsurface utility engineering (SUE), including the locating of potential conflicts with existing utilities, has been performed. Results of this study are incorporated on the Plan Drawings in Volume 2. Excavations for relocations of existing utilities will be necessary at certain locations, and this work will be performed prior to trenching for duct-bank installation. The size of the work area necessary for excavations will vary by utility site-specific requirements. Steel plating will be used when necessary to maintain road availability. Site specific traffic plans will be developed for excavations and included in the MTP. Utilities scheduled for relocation are noted in the profile view of the Plan and Profile drawings of Volume 2. Specific measures for the relocation of existing utilities will be determined by the Owner of the existing utilities.

1.1.5.3 Duct Placement

Schedule 40 Polyvinyl Chloride (PVC) conduits to house the XLPE cables, grounding cables and signal and control fibers will be placed into the excavated trench in a predefined arrangement. Six eight-inch conduits will house each of the three cables of each circuit. Two 4-inch conduits will house signal and control fiber-optic cables and two 2-inch conduits will contain the coated copper grounding cables. The ducts will be supported by incrementally spaced duct spacers and, in certain locations, these ducts will be strapped together to prevent movement during backfilling operations. Spacing of the ducts is critical and is dictated by system ampacity requirements which are negatively affected by mutual heating of the cables. Detailed information regarding spacing is provided in the duct-bank cross-section drawings noted as construction details in Volume 2.

1.1.5.4 Trench Backfilling

Backfilling will be performed incrementally with various materials. The ducts will be encased in 3000-psi concrete (earthen formed), and then the trench will be backfilled with fluidized thermal backfill, ranging from 100-psi to 300-psi, to a depth below the existing unbound layers or as specified by ConnDOT and/or the municipality. Aggregate material will then be installed in multiple lifts with alternating compaction techniques.

1.1.5.5 Temporary Pavement Restoration

Pavement restoration using hot patch will be temporarily used until final pavement restoration occurs. The temporary hot patch will be installed in the width of the saw-cut trench and will match the existing roadway grade.

1.1.5.6 Permanent Pavement Restoration

Permanent pavement restoration will be performed to standards outlined by ConnDOT and/or the municipality for locations within public roadway right-of-way (ROW). Restoration plans for vault locations located outside of the public ROW will be specific to each location. Restoration of Connecticut Department of Environmental Protection (DEP) property at the Housatonic River boat launch will be discussed with, and approved by, the DEP. For cases involving restoration other than pavement (i.e., landscaping), final restoration cannot occur until after the pulling and splicing operations have been completed.

1.2 CONDITIONS

In addition to the *Requirements for a right*-of-*way development and management plan,* found in Sections 16-5-j-60 et seq. of the Regulations of Connecticut State Agencies, the Council stipulated certain requirements for the D&M plans in its Decision and Order for the Project, in conditions 14-21. A copy of this portion of the Decision and Order is provided in Appendix A. Those requirements have been incorporated in this D&M Plan either directly or by reference. Construction procedures will also be described in the *Method and Manner to Construct* filing that will be submitted to the Connecticut Department of Public Utility Control pursuant to Connecticut General Statutes §16-243. Permits from the U.S. Army Corps of Engineers and the Connecticut Department of Environmental Protection are required for the work proposed in this D&M Plan.

1.3 CONSULTATIONS

CL&P consulted with municipal officials from the City of Milford, the City of Bridgeport, the Town of Fairfield and the Town of Westport and ConnDOT about watercourse and railroad crossings. Additionally, a copy of the draft Watercourse and Railroad Crossing D&M Plan was submitted to the municipalities and ConnDOT on June 12, 2006. The Director of Conservation for the Town of Fairfield, Mr. Thomas Steinke, provided written concerns in a letter dated August 13, 2006 to First Selectman Ken Flatto. pertaining to three of the seven crossings contained in this D&M Plan. A copy of this letter was provided to CL&P and is located in Appendix B.

1.3.1 Milford

No comments were received from Milford pertaining to watercourse or railroad crossings.

1.3.2 Bridgeport

Bridgeport submitted a letter, provided in Appendix B, on June 28, 2006 stating that they had no comments. However, pursuant to the DEP OLISP notice of tentative determination on CL&P/UI's permit application for Structures, Dredging and Fill of Tidal Wetlands multiple meetings were held with representatives from the City of Bridgeport, Ash Creek Conservation Association and other interested members of the public present. The City of Bridgeport requested intervenor status in the permit and subsequently the permit application was subject to a DEP adjudication hearing that resulted in a Stipulation Agreement being signed by all concerned parties including the City of Bridgeport. The Stipulation Agreement revised the crossing methods of Ash Creek, Mill River (Southport Harbor) and Sasco Creek. The executed Stipulation Agreement is included in Appendix B.

A memorandum of understanding (MOU) is being drafted between the City of Bridgeport, the Town of Fairfield and the Connecticut Department of Transportation regarding impacts to traffic and business interruptions due to the HDD at Ash Creek and will be submitted to the Council when executed.

1.3.3 Fairfield

CL&P submitted a letter to William Hurley, engineer for the Town of Fairfield, on August 2, 2006 that presented a history of the engineering design changes for the three watercourse crossings in Fairfield as well as a review of the OLISP and U.S. Army Corps of Engineers permit processes. A copy of this letter is provided in Appendix B. A meeting was held on August 9, 2006 with officials from the Town of Fairfield and the City of Bridgeport to discuss the contents of the August 2, 2006 letter to William Hurley and to address concerns of municipal officials. The reasons why an Independent Utility Bridge (IUB) was chosen and why it was infeasible to use HDD for installation were discussed in detail.

A second meeting was held with the representatives of the Town of Fairfield and the City of Bridgeport on August 16, 2006 to specifically address the written concerns expressed by Mr. Steinke in his August 13, 2006 letter to First Selectman Ken Flatto referenced above. Each of the issues raised in Mr. Steinke's letter were discussed at the meeting. CL&P subsequently sent a letter (see Appendix B) dated August 23, 2006 to Mr. Flatto regarding its response to the various requests made with regard to modifications of the crossings at Ash Creek, Mill River, and Sasco Creek. CL&P was not able to accommodate the request for installation of a pedestrian bridge or to raise the IUB to allow pedestrian traffic under the structure due to concerns pertaining to:

- Cable safety
- CSC required best management practices for low Magnetic and Electric Field (EMF) design
- Indemnification/liability issues from CL&P and Bridgeport.

Similar to the City of Bridgeport, the Town of Fairfield requested intervenor status for CL&P/UI's permit application for Structures, Dredging and Fill of Tidal Wetlands which resulted in multiple meetings attended by both municipal officials and other interested civic groups prior to the onset of the DEP OLISP adjudication hearings. As a result of the hearings a stipulation agreement revising the crossing methods of Ash Creek, Mill River (Southport Harbor), and Sasco Creek was signed by all concerned parties including the Town of Fairfield and is provided in Appendix B.

A memorandum of understanding (MOU) is being drafted between the City of Bridgeport, the Town of Fairfield and the Connecticut Department of Transportation regarding impacts to traffic and business interruptions due to the HDD at Ash Creek and will be submitted to the Council when executed.

1.3.4 Westport

No comments were received from Westport pertaining to watercourse or railroad crossings.

1.3.5 ConnDOT

ConnDOT submitted comments on the watercourse and railroad crossing plans in a letter dated July 13, 2006. These have been addressed in the Volume II drawings.

A memorandum of understanding (MOU) is being drafted between the City of Bridgeport, the Town of Fairfield and the Connecticut Department of Transportation regarding impacts to traffic and business interruptions due to the HDD at Ash Creek and will be submitted to the Council when executed.

1.3.6 Stratford

Consultations with the Town of Stratford were conducted by the United Illuminating Company. No work contained within this D&M Plan is within municipal ROW within the Town of Stratford.

2.0 DRAWINGS AND SITE INFORMATION

The seven crossings of watercourses and railroads included in this D&M Plan are located in the portion of the Project from the East Devon Substation in Milford to Father Conlon Place in Norwalk, exclusive of the UI portion of the Project. The total distance of these crossings is approximately 1.2 miles. The route in this portion of the Project is located primarily within existing municipal road and ConnDOT rights-of-way. CL&P performed and reported on extensive research on environmental conditions and cultural resources as part of the Docket No. 272 Application to the Council (the Application). Descriptive information regarding the existing conditions at the site and the modifications that will take place along this portion of the Project follows. This information is shown graphically on the drawings described below.

2.1 KEY MAP

The locations of the crossings of watercourses and railroads are shown on the Key Maps on Figures 2.1(a) thru 2.1(c).

2.2 PLAN DRAWINGS

In addition to the Key Map, this D&M Plan contains drawings showing the Plan and Profile for the transmission line construction using a scale of 1”=30’. The Plan and Profile drawings, located under separate cover in Volume 2, are organized by municipal name and stationing. Construction drawings specific to the trenchless method at each crossing are also provided in Volume 2 of this D&M Plan. The drawings in Volume 2 depict the engineering design for installation of the duct bank, location of existing underground utilities, ROW boundary, adjacent property owners and access points other than municipal roadways.

2.3 LAND OWNERSHIP

A listing of landowners affected by installation of the trenchless methods at the seven crossings contained in this D&M Plan is provided in Table 2-1.

2.4 PUBLIC ROADS AND LANDS

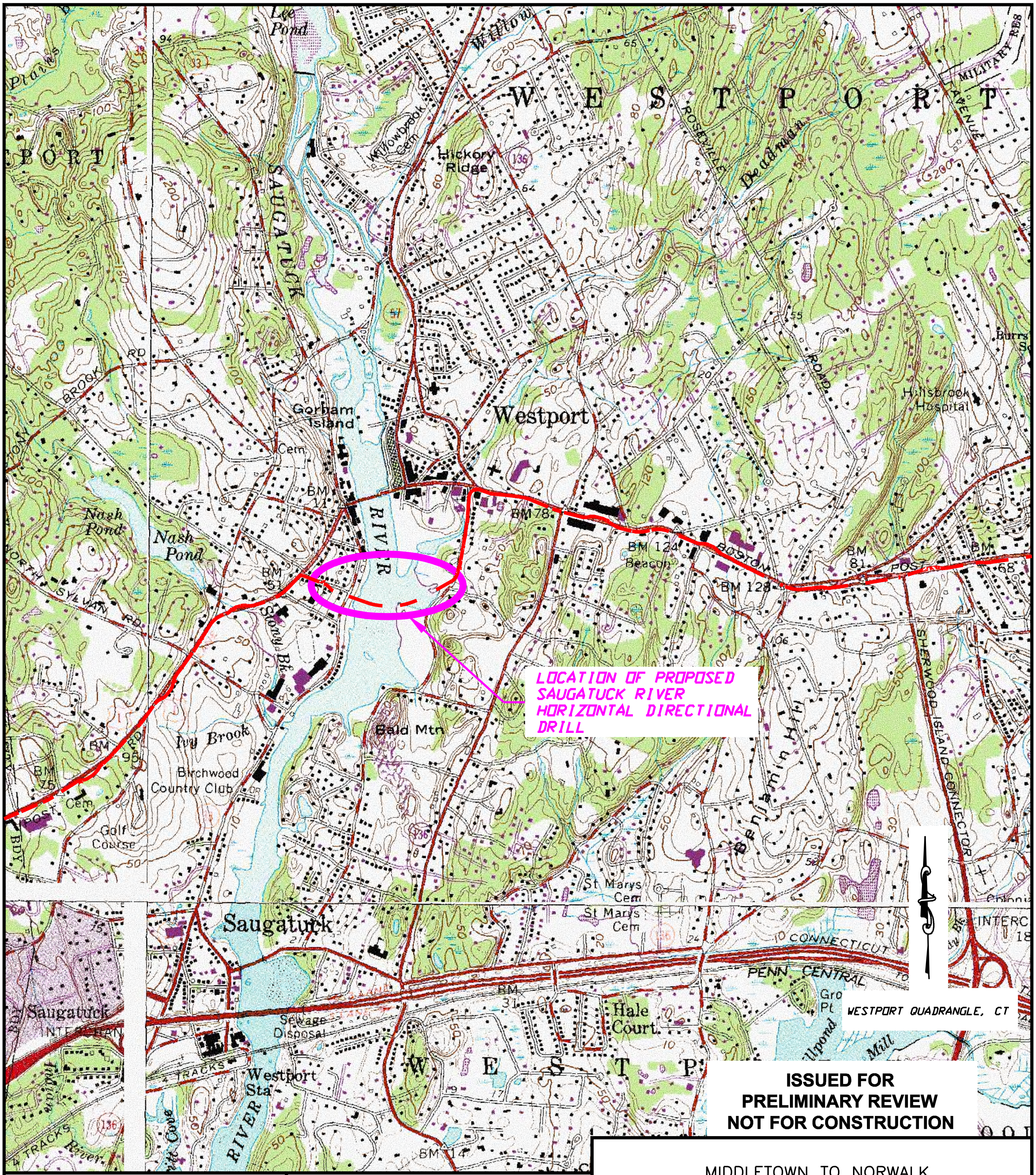
Public roads or surface lands are utilized by three of the seven crossings of watercourses and railroads contained in this D&M Plan; the Route 1 crossing of Sasco Creek on the municipal boundaries of Wetport and Fairfield, the Route 1 crossing of Mill River in Fairfield, and the DEP boat ramp located on the eastern bank of the Housatonic River in Milford.

2.5 TOPOGRAPHY AND GRADING

Locations where HDD and jack and bore installations will be used will be returned to pre-existing topographic conditions. There will be a minor changes in topography at the Utility Bridge due to use of an earthern approach to the abutments. There will be no significant change in grade at any of the seven crossings.

2.6 STRUCTURE AND FOUNDATION LOCATIONS

The design structures for under bridge attachment and foundation details for the utility bridges are located in Volume 2.



ISSUED FOR PRELIMINARY REVIEW NOT FOR CONSTRUCTION

MAP SOURCE: ENVIROMENTAL GIS DATA FOR CONNECTICUT TOPOGRAPHIC QUADRANGLE MAP FILES 2005

KEY MAP

SCALE
1" = 2,000'
1: 24,000
1000 500 0 1000 2000

MIDDLETOWN TO NORWALK
345-kV TRANSMISSION PROJECT
PROPOSED TRENCHLESS CROSSINGS

LOCATION: CITY OF NORWALK

COUNTY: FAIRFIELD

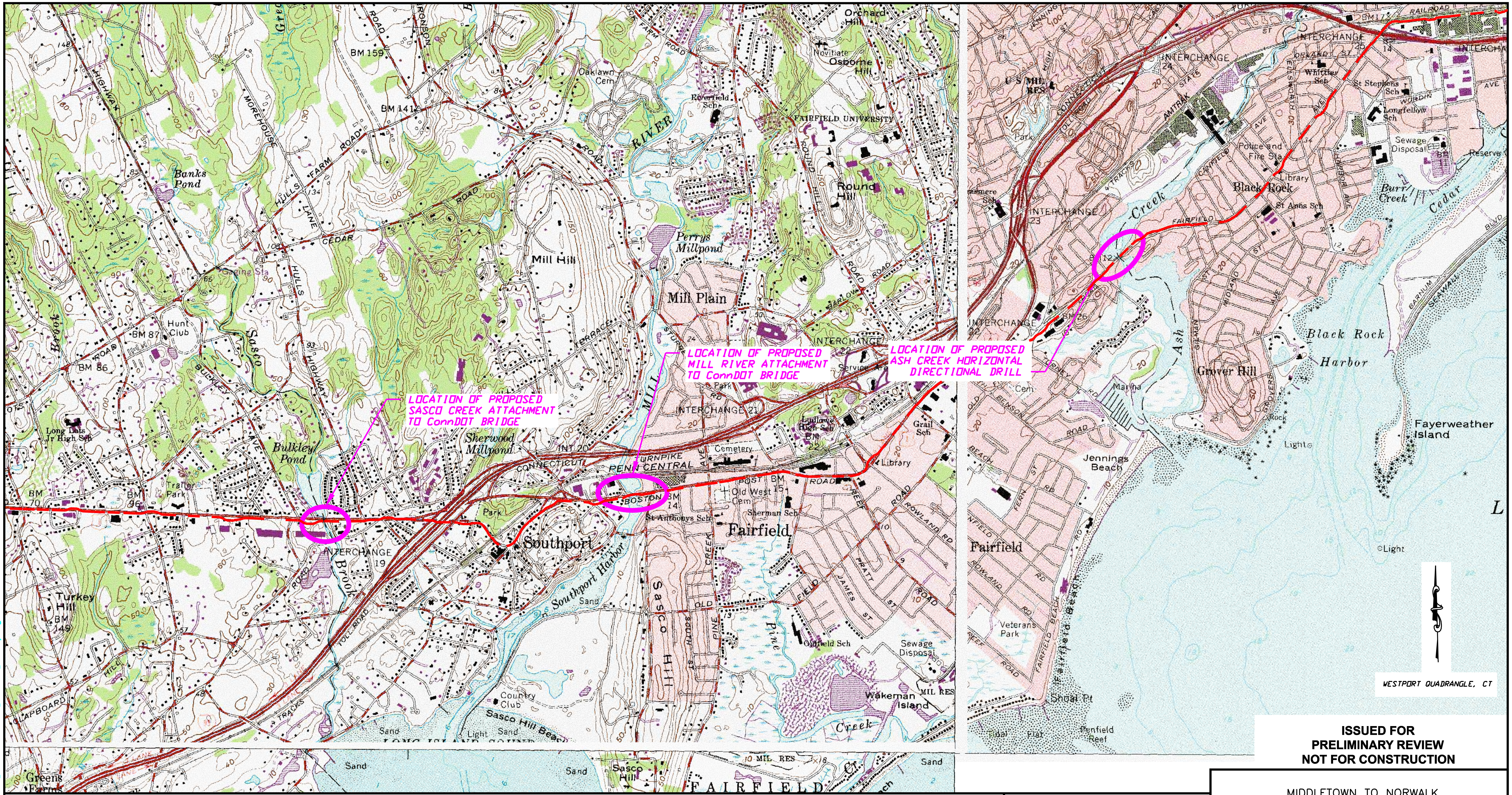
STATE: CT

Connecticut Light & Power
The Northeast Utilities System

FIGURE 2.1a

DATE: 02/27/07

N:\NUSCO\30520\Cadd\BRIDGE_XING\M-N_PERMIT\VICINITY_MAP\PDC_vicinity.dwg (Sasco Creek) 04-07-2005 14:52 DDL B&McD



ISSUED FOR PRELIMINARY REVIEW NOT FOR CONSTRUCTION

MAP SOURCE: ENVIRONMENTAL GIS DATA FOR CONNECTICUT TOPOGRAPHIC QUADRANGLE MAP FILES 2005

KEY MAP

SCALE
1" = 2,000'
1: 24,000
1000 500 0 1000 2000

MIDDLETOWN TO NORWALK
345-kV TRANSMISSION PROJECT
PROPOSED TRENCHLESS CROSSINGS

LOCATION: TOWN OF WESTPORT, TOWN OF FAIRFIELD, CITY OF BRIDGEPORT
COUNTY: FAIRFIELD STATE: CT

Connecticut Light & Power
The Northeast Utilities System

FIGURE 2.1b

DATE: 02/27/07