



**Connecticut
Light & Power**

The Northeast Utilities System

**APPLICATION TO THE
CONNECTICUT SITING COUNCIL**

FOR A

**CERTIFICATE OF ENVIRONMENTAL
COMPATIBILITY AND PUBLIC NEED**

FOR THE

Waterford Substation

**325 Waterford Parkway North
Waterford, Connecticut**

June 2008

Submitted by:

**The Connecticut Light & Power Company
107 Selden Street
Berlin, CT 06037**

Volume 1 of 2

Volume 1, Application

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See Volume 2, Exhibits

Volume 1, Application

CONNECTICUT SITING COUNCIL APPLICATION GUIDELINES CHECKLIST

ELECTRIC SUBSTATION FACILITY

June 2007

This application guide is to assist applicants in filing for a Certificate of Environmental Compatibility and Public Need (Certificate) from the Connecticut Siting Council (Council) for the construction of an electric substation facility. Such facilities are defined in General Statutes

§ 16-50i (a) (4).

Applicants should consult General Statutes §§ 16-50g through 16-50aa and Sections 16-50j-1 through 16-50z-4 of the Regulations of Connecticut State Agencies to assure complete compliance with the requirements of those sections. Where appropriate, statutory and regulatory references are noted below.

Pre-Application Process (General Statutes § 16-50/ (e)) **Refer to Municipal Consultation Filing in separate Bulk attachment**

"....at least 60 days prior to the filing of any application with the Council, the applicant shall consult with the municipality in which the facility may be located and with any other municipality required to be served with a copy of the application under subdivision (1) of subsection (b) of this section [any adjoining municipality having a boundary not more than 2500 feet from such facility] concerning the proposed and alternative sites of the facility.....Such consultation with the municipality shall include, but not be limited to, good faith efforts to meet with the chief elected official of the municipality. At the time of the consultation, the applicant shall provide the chief elected official with any technical reports concerning the public need, the site selection process and the environmental effects of the proposed facility. The municipality may conduct public hearings and meetings as it deems necessary for it to advise the applicant of its recommendations concerning the proposed facility. Within 60 days of the initial consultation, the municipality shall issue its recommendations to the applicant. No later than 15 days after submitting the application to the Council, the applicant shall provide to the Council all materials provided to the municipality and a summary of the consultations with the municipality including all recommendations issued by the municipality."

I. Application to Municipal Agencies (General Statutes § 16-50x (d))

Municipal zoning and inland wetland agencies may regulate and restrict the location of an electric substation facility. Such action must be taken within 30 days of application filed with the Council. Orders made by the municipal zoning and inland wetland agencies may be appealed within thirty days by any party or municipality required to be served with a copy of the application.

Refer to Volume 2, Exhibit 11

II. Quantity, Form, and Filing Requirements (Regs., Conn. State Agencies § 16-50j-12)

- A. Except as may be otherwise required, at the time applications are filed with the Council, there shall be furnished to the Council an original and 20 copies. All filings from the applicant, parties, or interveners must consist of original and 20 copies, labeled with the docket number, properly collated and paginated, and bound. An electronic version of all filings, as appropriate, should be provided.

Refer to Volumes 1 and 2 of this CSC Filing

- B. Bulk filing should be provided of not less than four (4) copies of the applicable town zoning and Inland wetlands regulations (including a map showing the location of inland wetlands if relevant) and plan of development and any other publicly available material in support of the application.

Refer to Volumes 1 and 2 of this CSC Filing

- C. Applications filed for the purpose of any proceeding before the Council shall be printed or typewritten on paper cut or folded to letter size, 8 1/2 by 11 inches. Width of margins shall be not less than one inch. The impression shall be on only one side of the papers, unless printed, and shall be double spaced, except that quotations in excess of five typewritten lines shall be single spaced and indented. Mimeographed, multigraphed, photoduplicated, or the like copies will be accepted as typewritten, provided all copies are clear and permanently legible. In accordance with the State Solid Waste Management Plan, all filings should be submitted on recyclable paper, primarily regular weight white office paper. Applicants should avoid using heavy stock paper, colored paper, and metal or plastic binders and separators.

Refer to Volumes 1 and 2 of this CSC Filing

- D. Every original shall be signed by the applicant or by one or more attorneys in their individual names on behalf of the applicant. All applications shall be filed at the office of the Council, 136 Main Street, Suite 401, New Britain, Connecticut 06051. Service of all documents and other papers filed as applications, briefs, and exhibits, but not limited to those categories, shall be by personal delivery or by first class mail to the Council and all parties and interveners to the proceeding, unless service has been waived.

Refer to Volumes 1 and 2 of this CSC Filing

- E. Any exhibits, sworn written testimony, data, models, illustrations, and all other materials that the applicant deems necessary or desirable to support the granting of the application shall be attached to the application. In addition, annexed materials shall include such exhibits, sworn written testimony, and other data that any statute or regulations may require. The applicant may request that administrative notice be taken of and refer in the application to portions of other Council docket records and generic hearings or statements prepared by the Council as a result of generic hearings.

Refer to Volumes 1 and 2 of this CSC Filing

- F. Applicants may present material in a sequence and format most appropriate for the particular proposal. To allow timely Council review, include with the application a copy of this form with page references for each item required in Section VII below.

Included Herein

- G. Potential applicants are urged to carefully review General Statutes §§ 16-50/(e), 16-50i and 16a-7c to determine whether the proposed project falls within the Connecticut Energy Advisory Board (CEAB) "request-for-proposal" process.

**Pursuant to Conn. Gen. Stats. § 16-50/ (a) (2), this project is exempt from this process.
See Volume 1, Section R.2**

III. Application Filing Fees (Regs., Conn. State Agencies § 16-50v-1a)

The filing fee for an application is determined by the following schedule:

<u>Estimated Construction Cost</u>	<u>Fee</u>
Up to \$5,000,000	0.05% or \$1,000.00, whichever is greater;
Above \$5,000,000	0.1% or \$25,000.00, whichever is less.

All application fees shall be paid to the Council at the time an application is filed with the Council. Additional assessments may be made for expenses in excess of the filing fee. Fees in excess of the Council's actual costs will be refunded to the applicant.

Filing Fees accompany CSC Application

IV. Proof of Service (General Statutes § 16-50/ (b))

Each application shall be accompanied by proof of service of such application on:

See Volume 1, Section Q

- A. The chief elected official, the zoning commission, planning commission, the planning and zoning commissions, and the conservation and wetlands commissions of the site municipality and any adjoining municipality having a boundary not more than 2500 feet from the facility;
- B. The regional planning agency that encompasses the site municipality;
- C. The State Attorney General;
- D. Each member of the Legislature in whose district the facility is proposed;
- E. Any federal agency, department, commission or instrumentality which has jurisdiction over the proposed facility; and
- F. The state departments of environmental protection, public health, public utility control, economic and community development, and transportation; the council on environmental quality; the State Historic Preservation Officer and the office of policy and management.

V. Public Notice (General Statutes § 16-50/ (b))

Notice of the application shall be published at least twice prior to the filing of the application in a newspaper having general circulation in the site municipality or municipalities. The notice shall state the name of the applicant, the date of filing, and a summary of the application. The notice must be published in not less than ten point type.

See Volume 1, Section Q

VI. Notice to Abutting Landowners (General Statutes § 16-50/ (b))

Notice of the application shall be sent by certified or registered mail to all abutting landowners of the proposed and alternative sites of the facility. Notice shall be sent at the same time that notice of the application is given to the general public.

See Volume 1, Section Q

The application shall be accompanied by an affidavit of notice to all abutting landowners and an affidavit of publication each time notice of application is published.

See Volume 1, Section Q

The Council also advises each applicant that at least ten business days prior to the public hearing such applicant should erect and maintain in a legible condition a sign not less than six feet by four feet upon the site at the entrance to the property from a public road where such facility is to be located. The sign shall set forth the name of the applicant, the type of facility, the public hearing date, and contact information for the Council (Web site and phone number).

Example:

PUBLIC NOTICE:

CL&P has filed an application with the Connecticut Siting Council (Council) for construction of an electric substation facility on this site. The Council will hold a public hearing on March 27, 2004 at the Newington Town Hall Auditorium at 3 and 7 p.m. A copy of the application can be reviewed at the town hall or at the Council offices in New Britain, CT. For more information, please contact the Council by telephone at 860-827-2935, electronically at www.ct.gov/csc, or by mail at 10 Franklin Square, New Britain, Connecticut 06051.

VII. Contents of Application (General Statutes § 16-50/ (a) (1) and Regulations § 16-50j-74)

An application for a Certificate for the construction of an electric substation facility should include or be accompanied by the following:

A. An executive summary of the first page of the application with the address of the facility. A brief description and the location of the proposed facility, including an artist's rendering and/or narrative describing its appearance.

See Volume 1, Section A

1. A statement of the purpose for which the application is being made.

See Volume 1, Section B

2. A statement describing the statutory authority for such application.

See Volume 1, Section C

3. The exact legal name of each person seeking the authorization or relief and the address or principal place of business of each such person. If any applicant is a corporation, trust association, or other organized group, it shall also give the state under the laws of which it was created or organized.

See Volume 1, Section D

4. The name, title, address, and telephone number of the attorney or other person to whom correspondence or communications in regard to the application are to be addressed. Notice, orders, and other papers may be served upon the person so named, and such service shall be deemed to be service to the applicant.

See Volume 1, Section E

B. A description of the proposed facility including:

See Volume 1, Section F

1. Access roads and utility services;
2. Special design features;
3. The following list should be included where applicable;
 - a. Itemized estimated costs;
 - b. Comparative costs of alternatives considered;
 - c. Facility service life;
 - d. Bus and specifications;
 - e. Overhead take-off design, appearance, and heights, if any;
 - f. Length of interconnections to transmission and distribution;
 - g. Initial and design voltages and capacities;
 - h. Rights-of-way and access-way acquisition;
 - i. Transmission connections and distribution feeders; and
 - j. Service area;

C. A statement and full explanation of why the proposed facility is needed and how the facility would conform to a long-range plan for the expansion of the electric power grid serving the state and interconnected utility systems that would serve the public need for adequate, reliable, and economic service, including:

See Volume 1, Section G

1. A description and documentation of the existing system and its limitations;
2. Justification for the proposed in-service date;
3. The estimated length of time the existing system is judged to be adequate with and without the proposed facility;

4. Identification of system alternatives with the advantages and disadvantages of each; and
5. If applicable, identification of the facility in the forecast of loads and resources pursuant to General Statutes § 16-50r.

D. A statement of the benefits expected from the proposed facility with as much specific information as is practicable.

See Volume 1, Section G

E. A description of the named sites, including:

1. The most recent U.S.G.S. topographic quadrangle map (scale 1 inch = 2,000 feet) marked to show the site of the facility and any significant changes within a one mile radius of the site;

See Volume 1, Sections A and H

2. A map (scale not less than 1 inch = 200 feet) of the lot or tract on which the facility is proposed to be located showing the acreage and dimensions of such site, the name and location of adjoining public roads or the nearest public road, and the names of abutting owners and the portions of their lands abutting the site;

See Volume 1, Section H, and Volume 2, Exhibit 1

3. A site plan (scale not less than 1 inch = 40 feet) showing the proposed facility, set back radius, existing and proposed contour elevations, 100 year flood zones, waterways, wetlands, and all associated equipment and structures on the site;

See Volume 1, Section H, and Volume 2, Exhibit 1

- a. Settled areas;
 - b. Schools and daycare centers;
 - c. Hospitals;
 - d. Group homes;
 - e. Forests and parks
 - f. Recreational areas;
 - g. Seismic areas;
 - h. Scenic areas;
 - i. Historic areas;
 - j. Areas of geologic or archaeological interest;
 - k. Areas regulated under the Inland Wetlands and Watercourses Act;
 - l. Areas regulated under the Tidal Wetlands Act and Coastal Zone Management Act;
 - m. Public water supplies;
 - n. Hunting or wildlife management areas; and
 - o. Existing transmission lines within one mile of the site.
4. Where relevant, a terrain profile showing the proposed facility and access road with existing and proposed grades; and

See Volume 2, Exhibit 1

5. The most recent aerial photograph (scale not less than 1 inch = 1,000 feet) showing the proposed site, access roads, and all abutting properties.

See Volume 1, Section A and H, and Volume 2, Exhibit 1

F. A justification for selection of the proposed site including a comparison with alternative sites which are environmentally, technically, and economically practicable. Include enough information for a complete comparison between the proposed site and any alternative site contemplated.

See Volume 1, Section I

G. Safety and reliability information, including:

See Volume 1, Section J

1. Provisions for emergency operations and shutdowns; and
2. Fire suppression technology.

H. A description of the effect that the proposed facility would have on the environment, ecology, and scenic, historic, and recreational values, including effects on:

See Volume 1, Section K

1. Public health and safety;
2. Local, state, and federal land use plans;
3. Existing and future development;
4. Roads;
5. Wetlands;
6. Wildlife and vegetation, including rare and endangered species, and species of special concern, with documentation by the Department of Environmental Protection Natural Diversity Data Base;
7. Water supply areas;
8. Archaeological and historic resources, with documentation by the State Historic Preservation Officer; and
9. Other environmental concerns identified by the applicant, the Council, or any public agency.

I. Sight line graphs to the named sites from visually impacted areas such as residential developments, recreational areas, and historic sites;

See Volume 1, Section F

J. A statement explaining mitigation measures for the proposed facility including:

See Volume 1, Section L

1. Construction techniques designed specifically to minimize adverse effects on natural areas and sensitive areas;
2. Special routing or design features made specifically to avoid or minimize adverse effects on natural areas and sensitive areas;
3. Establishment of vegetation proposed near residential, recreational, and scenic areas; and

4. Methods for preservation of vegetation for wildlife habitat and screening.

K. Justification that the location of the proposed facility would not pose an undue safety or health hazard to persons or property at the site of the proposed facility including:

See Volume 1, Section M

1. Measurements of existing electric and magnetic fields (EMF) at site boundaries, and at boundaries of adjacent schools, daycare facilities, playgrounds, and hospitals, with extrapolated calculations of exposure levels during expected normal and peak normal line loading;
2. Calculations of expected EMF levels at the above-listed locations that would occur during normal and peak normal operation of the facility; and
3. A statement describing consistency with the Council's "Best Management Practices for Electric and Magnetic Fields," as amended.

L. A schedule of the proposed program for right-of-way or property acquisition, construction, rehabilitation, testing, and operation.

See Volume I, Section N

M. A statement of estimated costs for site acquisition, construction, and equipment for a facility at the various proposed sites of the facility, including all candidates referred to in the application;

See Volume 1, Section F.1

N. Such information as any department or agency of the State exercising environmental controls may, by regulation, require including:

See Volumes 1 and 2

1. A listing of any federal, State, regional, district, and municipal agencies, including but not limited to the Federal Aviation Administration; State Historic Preservation Officer; State Department of Environmental Protection; and local conservation, inland wetland, and planning and zoning commissions with which reviews were conducted concerning the facility, including a copy of any agency position or decision with respect to the facility; and
2. The most recent conservation, inland wetland, zoning, and plan of development documents of the municipality, including a description of the zoning classification of the site and surrounding areas, and a narrative summary of the consistency of the project with the Town's regulations and plans.

See Volume 1, Section O

See Volume 1 and Bulk Filing

O. Such information the applicant may consider relevant.

See Volume 1, Section R

P. Description of proposed site clearing for access road and compound including type of vegetation scheduled for removal and quantity of trees greater than six inches diameter at breast height and involvement with wetlands;

Proposed for Development & Management Plan Submission

VIII. Procedures

A. The Council will review and may reject the application within 30 days if it fails to comply with specific data or exhibit requirements or if the applicant fails to promptly correct deficiencies. (Regs., Conn. State Agencies §§ 16-50/-4 through 16-50/-5)

B. The Council and any party or intervener to the proceeding may file exhibits and interrogatories requesting supplemental or explanatory materials. All filings will be subject to cross-examination and the Council's discretion for admission into the record. (General Statutes § 16-50o)

C. A public hearing must be held at a location selected by the Council in the county in which the facility is proposed, with one session held after 6:30 p.m. for the convenience of the public. If the proposed facility is to be located in more than one county, the Council shall fix the location for at least one public hearing session in whichever county it deems appropriate, provided that the Council may hold hearing sessions in more than one county. The Council's record must remain open for 30 days after the close of the hearing. (General Statutes § 16-50n (f))

D. The Council must render a decision within 180 days of receipt of an application, extendible by 180 days upon consent of applicant. (General Statutes § 16-50p)

PLEASE NOTE THAT THIS GUIDE IS NO SUBSTITUTION FOR OBTAINING ADVICE FROM LEGAL COUNSEL. IN THE EVENT OF ANY CONFLICT BETWEEN THIS GUIDE AND THE ACTUAL STATUTES AND REGULATIONS, THE STATUTES AND REGULATIONS SHALL GOVERN.

Content Last Modified on 11/1/2007 11:46:42 AM

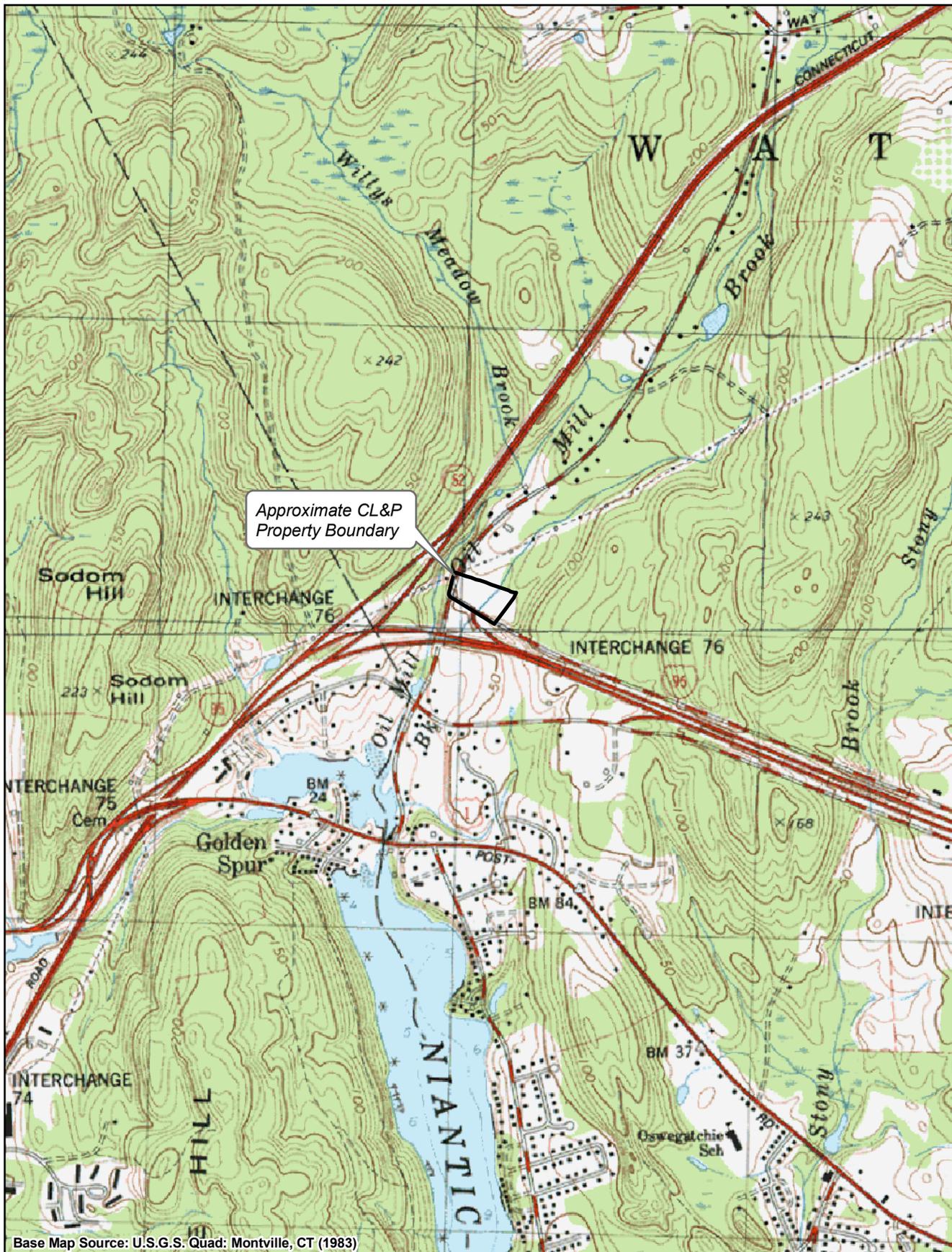
A. SUMMARY DESCRIPTION AND LOCATION OF THE PROJECT

The Applicant, The Connecticut Light and Power Company (“CL&P”), seeks to construct a new bulk-power 115- to 23-kilovolt (“kV”) substation (the “Substation” or “Project”) on property located at 325 Waterford Parkway North in Waterford, Connecticut (the “Property” or “Site”). The Substation will add needed distribution capacity to serve the growing electric power demands in the Town of Waterford, a town that does not currently have its own bulk-power substation source, as well as portions of adjacent towns. The Substation will be strategically positioned to facilitate connection to an existing 115-kV transmission circuit that lies just north of the Property.

The existing distribution system supplying the Town of Waterford lacks the capacity and reliability to efficiently meet growing peak-load demands. Currently, CL&P’s electric load in the Town of Waterford is served primarily from bulk power substations located in New London and East Lyme, with limited contributions from a third substation in Montville. Growing peak demands are straining the capacity of these three substations and they cannot meet future demands without reducing their service area. The addition of a new bulk-power substation in the Town of Waterford will create a more reliable system that will serve the growing needs of the Town while alleviating demands on the existing substations.

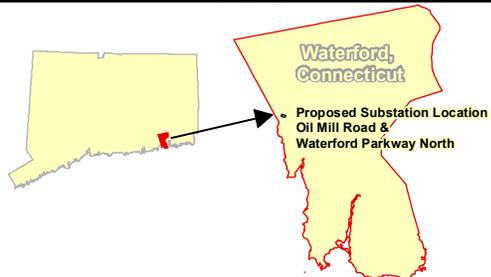
The Substation would be located in the western portion of CL&P’s 5-acre Property, which currently consists of undeveloped land located immediately northeast of the intersection of Oil Mill Road and Waterford Parkway North. The Property location is identified on a United States Geological Survey (“USGS”) and aerial photograph provided as Figure A-1 (*Site Location Map, USGS*) and Figure A-2 (*Site Location Map, Aerial*), respectively.

Figure A-1: Site Location Map, USGS



Base Map Source: U.S.G.S. Quad: Montville, CT (1983)

VHB Vanasse Hangen Brustlin, Inc.
Transportation Land Development Environmental Services



1,000 500 0 1,000
Feet

Connecticut Light & Power

The Northeast Utilities System

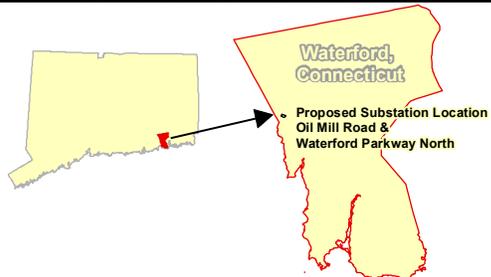
Figure A-2: Site Location Map, Aerial



VHB Vanasse Hangen Brustlin, Inc.
Transportation Land Development Environmental Services



150 75 0 150
Feet



**Connecticut
Light & Power**

The Northeast Utilities System

Prior to and during the municipal consultation process, CL&P consulted with the Town of Waterford Chief Elected Official (“CEO”) and town officials to present an overview of the Project, answer questions, and provide them with a point of contact to obtain additional information. As part of the location approval process, CL&P presented Project information to the Town of Waterford Conservation Commission at its meeting on February 14, 2008, and the Waterford Planning and Zoning Commission at its meeting on February 25, 2008.

Pursuant to the Public Utility Environmental Standards Act, Conn. Gen. Stat. § 16-50g et seq., CL&P also consulted with the Town of East Lyme, which is located within approximately 1,000 feet of the eastern boundary of the Property.

This Project was identified in the *Connecticut Siting Council Review of the Connecticut Electrical Utilities Ten-Year Forecast of Loads and Resources*, published in 2005, 2006, and again in 2007. The proposed Project plan received technical approval from ISO-NE (New England’s Independent System Operator) on January 11, 2008.

CL&P has designed the Substation in a manner that minimizes the potential environmental and visual effects to the greatest extent practicable and has incorporated measures to ensure the protection of existing resources during the construction and operation of the Substation facilities.

As detailed in the remainder of this submission, the Waterford Substation will:

- address a need for additional distribution system capacity and reliability in the Town of Waterford by establishing a new, strategically positioned bulk-power source;
- comply with regional planning and reliability standards and Northeast Utilities' transmission planning guidelines;
- occupy a property purchased by CL&P for this specific use that is immediately adjacent to an existing electric transmission corridor, providing direct interconnection;
- be consistent with applicable public health and safety requirements, standards and codes;
- be constructed in compliance with the standards of the National Electrical Safety Code, the Connecticut Department of Public Utility Control, and good utility practice;
- be consistent with local, State and federal land use plans;
- be designed to avoid effects to existing wetlands and watercourses on the Property;
- be designed to minimize effects on existing wildlife, vegetation, and rare, threatened and endangered species habitat;
- not result in any adverse effects on public water supplies;
- be strategically located and designed to minimize visual impacts to surrounding areas;
- have no adverse effect on historic, cultural and/or archaeological resources;
- be designed to minimize earthwork and soil disturbance during construction, including development of appropriate plans to stabilize and restore affected areas;
- not be located within a floodplain;
- comply with applicable State noise regulations; and,
- have no significant permanent adverse effects on the environment.

B. PURPOSE OF THE APPLICATION

The purpose of CL&P's application (the "Application") to the Connecticut Siting Council ("CSC" or "Council") is to request a Certificate of Environmental Compatibility and Public Need ("Certificate") for the siting and construction of this Project. The purpose of the Project is to address a need for additional distribution system capacity and thus improve reliability in the Town of Waterford by establishing a new, strategically positioned bulk-power source in the Town.

C. STATUTORY AUTHORITY FOR APPLICATION

CL&P is applying to the Council pursuant to Section 16-50g et seq. of the General Statutes of Connecticut.

This filing includes information concerning the Applicant, existing conditions at the Property, and the proposed conditions for construction of the Substation, including:

- its location and design;
- the various alternatives considered to date and the process by which the Property was identified and selected;
- the need for its construction and operation;
- its potential effects on the environment; and
- mitigation measures proposed by CL&P.

D. LEGAL NAME AND ADDRESS OF APPLICANT

The Connecticut Light and Power Company (a specially chartered Connecticut corporation)
107 Selden Street
Berlin, CT 06037

Mailing Address:

CL&P
P.O. Box 270
Hartford, CT 06141-0270
Telephone: (860) 665-5000

Internet Address: Northeast Utilities Transmission website
www.transmission-nu.com

E. APPLICANT CONTACTS

Correspondence and other communications with regard to the Waterford Substation should be addressed to, and notices, orders and other papers should be served upon, the following:

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Girish Behal
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Anthony M. Fitzgerald, Esq.,
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50 Leavenworth Street
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E-mail addresses:
afitzgerald@carmodylaw.com
rgolden@carmodylaw.com
mdubuque@carmodylaw.com

F. DESCRIPTION OF FACILITY

The CL&P Property on which the Waterford Substation would be located was acquired in 2007 for the purpose of building a bulk-power substation. Historically, the Property has been undeveloped. Because of its size, configuration, location and proximity to existing electrical transmission infrastructure, the Property was identified by CL&P as an ideal location for a substation site to address anticipated area load growth and current limitations of the existing local distribution system.

The Substation would be accessible from Waterford Parkway North and would be located to the southeast of the existing overhead transmission line corridor. Two 115-kV circuits (#1605 and #1500) exist within this corridor (see Figure F-1, *Substation Location*). The Substation would occupy an area measuring approximately 200 feet by 245 feet to be covered with a trap rock surface and secured by a seven-foot high chain link fence topped with one foot of barbed wire (three strands). A gravel driveway will be established to provide access from Waterford Parkway North. The Property will accommodate the construction and operation of the Substation without the need to purchase any additional real estate.

Once constructed, the Substation would connect into the 1605 line circuit which now interconnects the Montville¹ Substation in Montville, the Williams Street Substation in New London and the Flanders Substation in East Lyme.

¹ The Montville Substation is a transmission-only facility with no distribution feeders. The new Waterford Substation will tap off the existing 1605 transmission circuit between Cohanzie Junction (located on Vauxhall Street in Waterford) and Flanders Substation. Since the relaying associated with the 1605 circuit will be affected by the Project, transmission-related work at Montville Substation (in addition to Flanders and Williams Street Substations) is required. Uncasville Substation, also located in Montville, supplies distribution load to the northern section of the Town of Waterford. The two transmission circuits that supply Uncasville Substation will not be affected by the Project, and therefore no associated transmission work at Uncasville is necessary.

Figure F-1: Substation Location



Legend

- Existing Line Support Structures
- Proposed Line Support Structures
- Existing Transmission Circuit
- Proposed Interconnecting Circuit
- Proposed Substation Footprint
- Approximate Property Boundary

*Base Map Source: 2006 color aerial photograph with 1 foot resolution

This 1605 transmission circuit is the southernmost of the two transmission circuits on the existing right-of-way (“ROW”), which crosses the northwest corner of the Property.

The existing 1605 circuit and the adjacent 1500 circuit are supported by common steel poles. Two additional single-circuit steel poles will be installed in order to provide a means for the 1605 transmission circuit to be connected to the Substation.

One steel pole will be installed within the existing ROW and one steel pole will be installed in the northwest corner of the Property. The new steel poles will be free standing (no guy wires required) and supported on reinforced concrete foundations. A 115-kV circuit breaker will be installed in the Substation bus to separate the existing 1605 circuit into two circuits: one will retain the 1605 circuit designation and the other will be designated circuit 1617. (See Figure F-1, *Substation Location*).

The 115-kV interconnections between the Substation and the new transmission line poles would be accomplished by installing two new line-terminal structures within the Substation, each of which would also support a line-disconnect switch. The Substation would also be outfitted with one circuit breaker with associated disconnect switches, two transmission line circuit switchers, two 60-megavolt ampere (“MVA”) power transformers to step down the voltage from 115 kV to 23 kV, four transformer disconnect switches and three transformer circuit switchers. A transformer disconnect switch and circuit switcher will be in the supply path to each of the two 60-MVA power transformers. The third transformer disconnect would provide for a future 60-MVA power transformer, when needed. The additional transformer disconnect switch and circuit switcher can also be used for a mobile transformer connection, when necessary to perform transformer maintenance or to replace a failed transformer. Two

metal-clad switchgear enclosures, each approximately 27 feet long, 14 feet wide and 14 feet high will be installed to provide the switching equipment for seven 23-kV distribution feeders, of which four will be activated initially. Cables for each distribution feeder will exit the Substation via underground conduits, and rise above ground on wood poles. There will be a total of four overhead distribution feeders exiting the Substation.

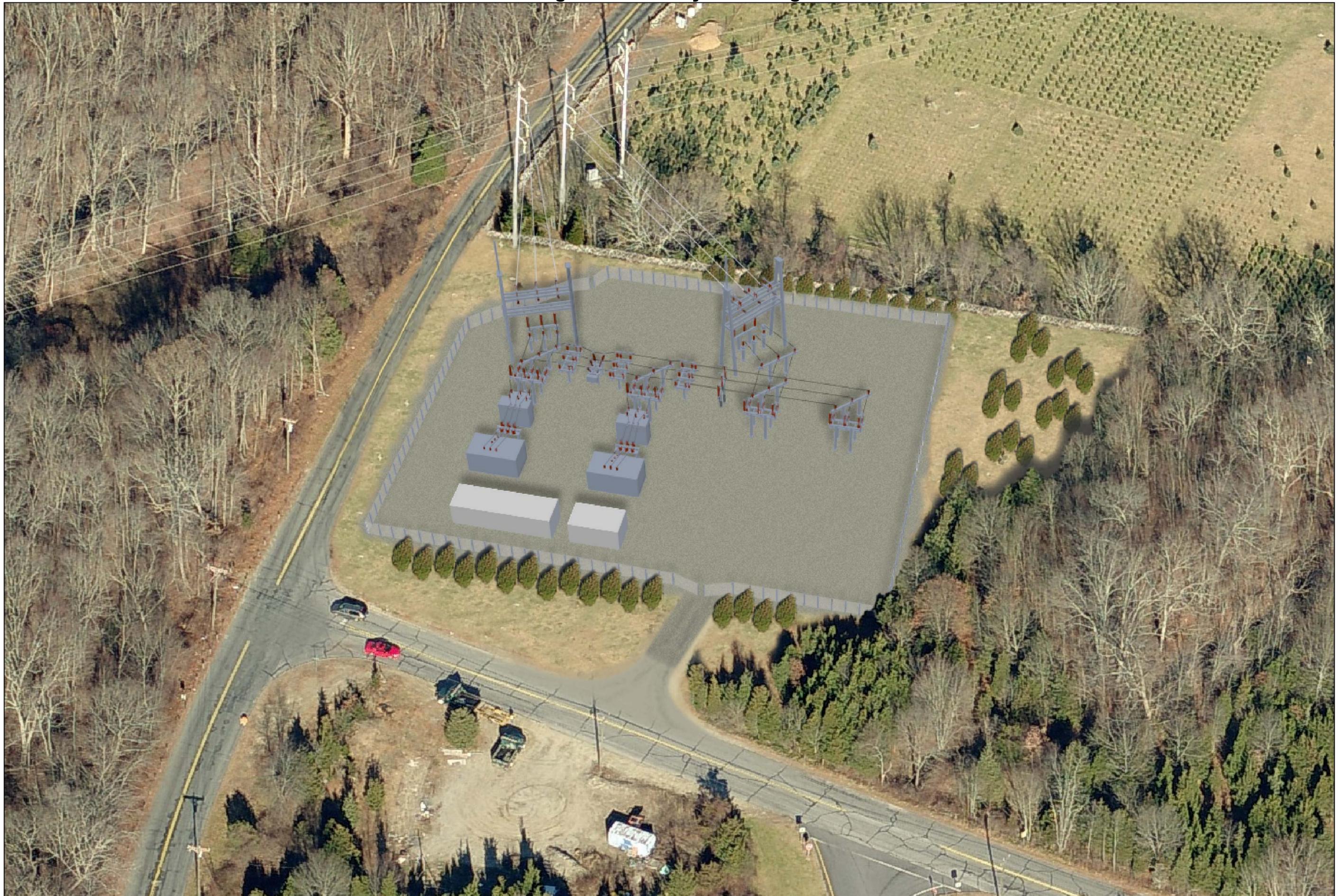
In addition to the switchgear enclosures, a protective relay and control equipment enclosure, approximately 48 feet long by 14 feet wide by 14 feet high, (the “Control Enclosure”) and a battery enclosure, approximately 24 feet long by 14 feet wide by 14 feet high, will be installed in the southwest corner of the Substation. The battery enclosure will house the Substation battery and charger. The Control Enclosure will house protective relaying and control equipment and transmission equipment used to operate the Substation. A well and septic system will be installed to serve the Control Enclosure. Technical specifications and related information are presented in Volume 2, Exhibit 1 (*Site Plan Drawings*). A “*Facility Rendering*” is provided as Figure F-2.

Development of the Substation requires protective relay system changes within the control enclosures at three other existing bulk substations - Montville, Williams Street, and Flanders. These upgrades are required for the safe and proper operation of the proposed Waterford Substation.

F.1 Estimated Cost of the Waterford Substation

The estimated costs for the siting, design, and construction of the Substation and supporting infrastructure is approximately \$13,200,000.

Figure F-2 Facility Rendering



F.2 Facility Service Life

The Substation equipment and supporting infrastructure would have a service life of approximately 40 years and would be capable of capacity increases during this time.

G. NEED FOR FACILITY

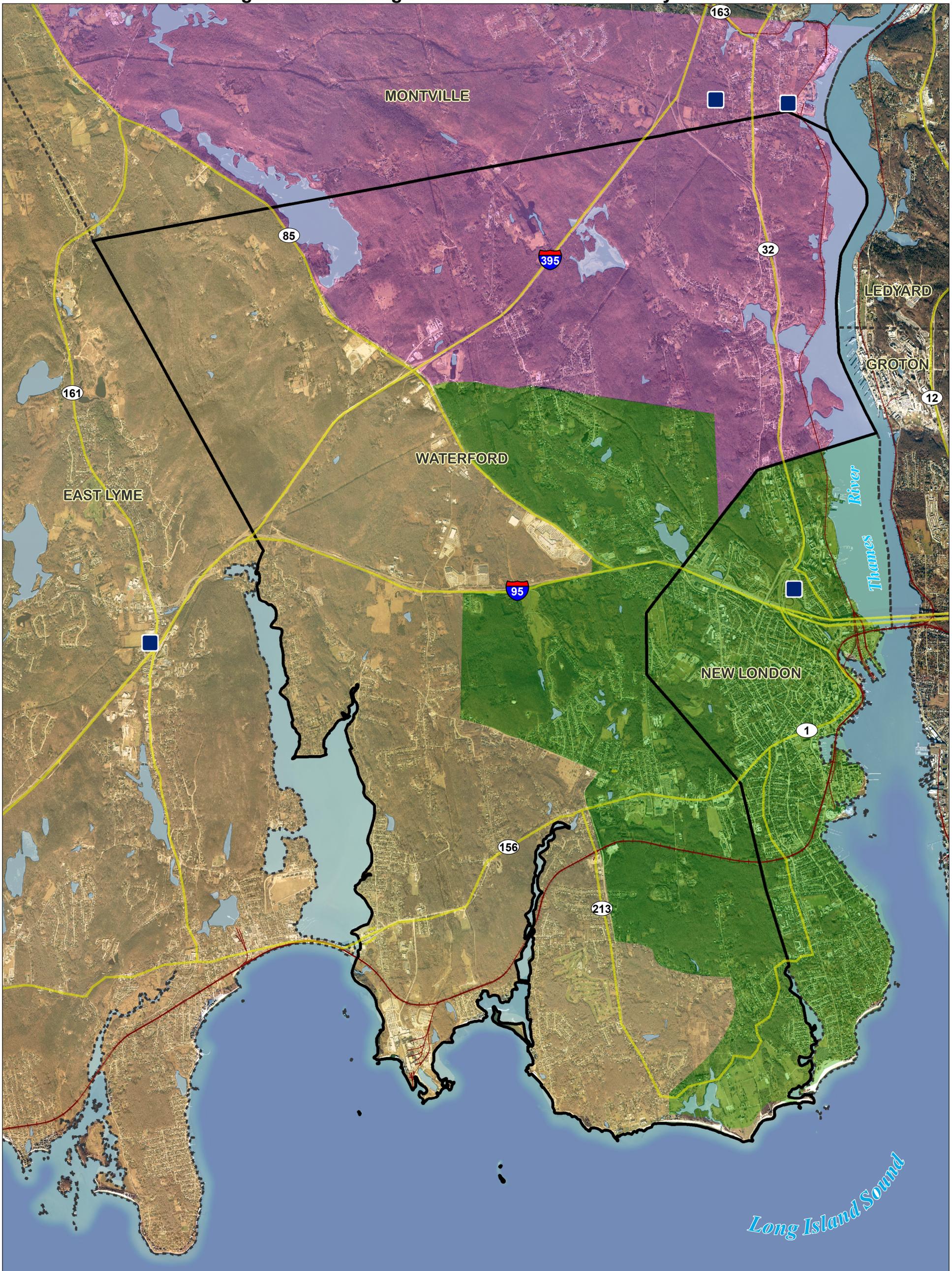
The purpose of the Project is to increase electric distribution system capacity and to improve reliability in Waterford by establishing a new bulk-power substation in the Town. Currently, the electric load in Waterford is served primarily from two bulk-power substations in other towns: Flanders Substation located in East Lyme and Williams Street Substation in New London. Figure G-1 depicts the locations of the surrounding substations and their respective service areas in Waterford. The current configuration is not a viable long-term option for reliably meeting the Town’s growing electric demands. Development of the Waterford Substation would effectively alleviate loads on the Flanders and Williams Street Substations by adding a new capacity source to the distribution system. The addition of the Waterford Substation to the distribution system, and the resultant load redistribution in Waterford, is graphically depicted in Figure G-2.

Peak electric demand continues to increase in the Waterford area, particularly on the two primary substations serving the Town. Table G-1 presents electric power supplied by Flanders and Williams Street Substations from 2004 to 2006.

TABLE G-1: Actual Summer Peak Load in MVA

Substation	2004	2005	2006
Flanders	70.6	73.5	76.3
Williams Street	59.0	63.1	67.4
Total	129.6	136.6	143.7
Annual Percentage Increase		5.40%	5.19%

Figure G-1: Existing Waterford Area Substation System

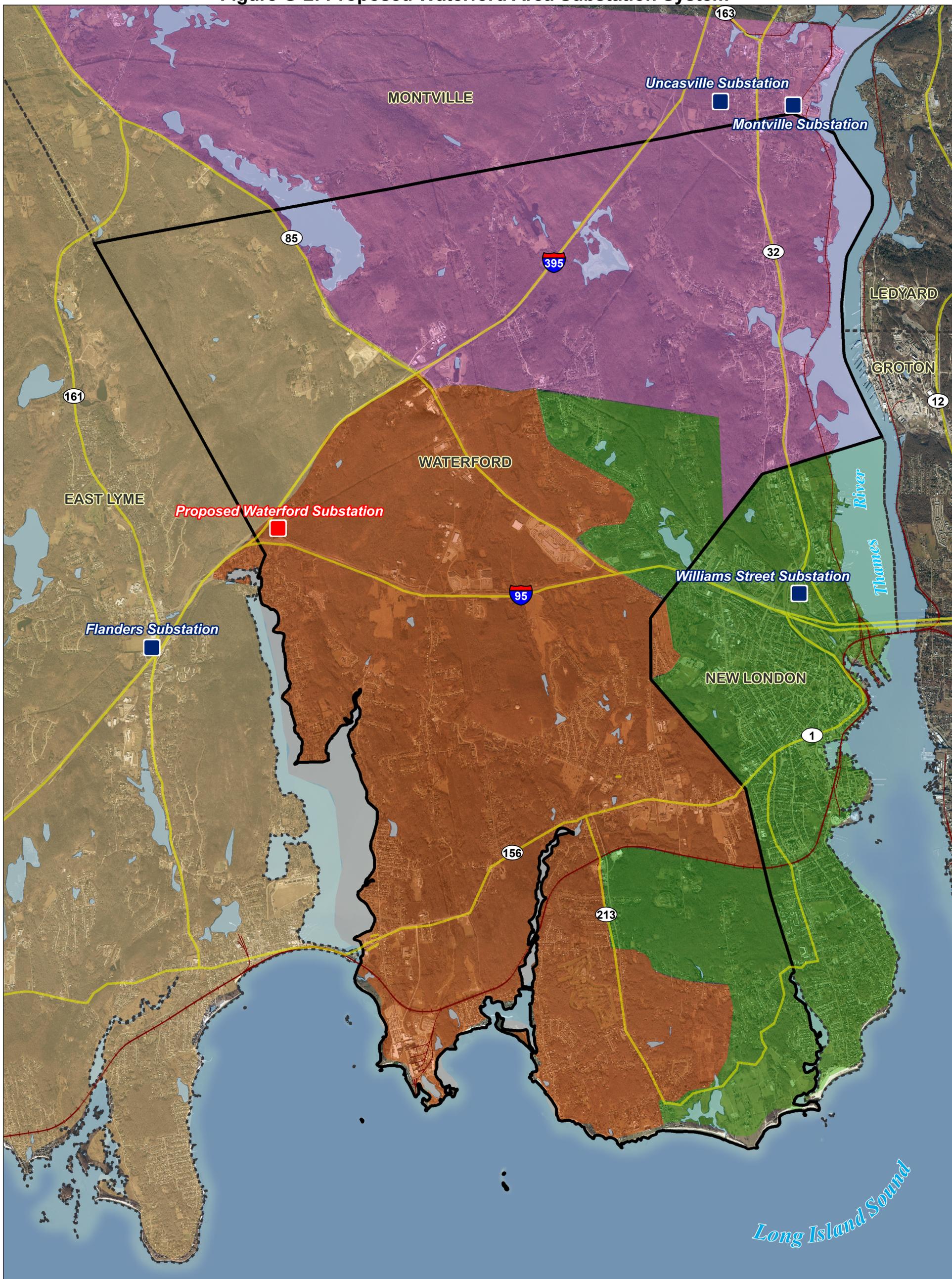


Legend

Substations	Surrounding Town Boundaries	Existing Service Area
Existing	Waterford Town Line	Williams Street
	Open Water	Flanders
Major Roads		Uncasville
Railroad		

0.5 0.25 0 0.5 Miles

Figure G-2: Proposed Waterford Area Substation System



Legend

Substations	—+—+— Railroad	Proposed Service Area
■ Existing	⋯ Surrounding Town Boundaries	■ Waterford
■ Proposed	▭ Waterford Town Line	■ Williams Street
— Major Roads	☁ Open Water	■ Flanders
		■ Uncasville

Beyond the recent growth experienced in Waterford, there is the strong potential for additional commercial development and expansion of existing industrial/institutional facilities in the near- and long-term future, further increasing peak loads and the need for a power source in the Town.

Table G-2 provides a summary of available capacity and forecasted summer peak-load growth associated with the area’s electric distribution system.

Table G-2: Available Capacity and Forecasted Summer Peak Load (MVA)

Substation Name	Permissible Load Rating MVA	2006 Actual	2007 Actual	2008	2009	2010	2011	2012	2013	2014	2015
Flanders	75	76.3	67.7	78.6	80.9	83.4	85.9	88.5	91.1	93.8	96.7
Williams Street	69	67.4	55.8	69.4	71.5	73.6	75.9	78.1	80.5	82.9	85.4
Total		143.7	123.5	148.0	152.4	157.0	161.8	166.6	171.6	176.7	182.1

Note: 2007 summer peak loads exhibited a decrease from 2006 due to abnormally cool summer weather. As such, the data is considered an anomaly and not used for future planning purposes.

As the area experiences increased growth, the demands placed on the existing substations currently providing service to Waterford require relief to meet this growing need and to maintain service reliability. The challenges of load growth, projected to be 3% per year in this geographic location, have been recognized and strategies have been employed as interim measures to supply the existing load until the construction of the new facility. For instance, the load on the Flanders Substation reached the substation’s permissible load rating of 75 MVA in 2006. Permissible load rating is the maximum load the substation can supply while meeting CL&P’s reliability standards. In 2006 the actual load was 76.3 MVA, a 3.8% increase from 2005. To alleviate the immediate overload, a Forced Load Transfer (“FLT”) scheme is under development at the Flanders Substation using one 23-kV feeder. The FLT scheme allows the

transfer of approximately 9 MVA of load off of Flanders Substation (to Judd Brook Substation in Colchester and Bokum Substation in Old Saybrook), thus increasing the permissible load rating of this substation by 9 MVA and providing the necessary time window to construct the Waterford Substation for operation beginning in 2010.

Williams Street Substation is projected to exceed its permissible load rating of 69 MVA in 2008. In 2006 the actual load was 67.4 MVA, a 6.8% increase from 2005. Other area substations cannot provide adequate relief due to the limited capacity of the existing distribution lines.

Construction of the proposed Waterford Substation would add necessary capacity to the system through the installation of two 60-MVA, 115- to 23-kV, bulk-power transformers. This new 23-kV distribution power source would allow 30 MVA of load on the Flanders Substation to be transferred to the new Waterford Substation and would add 87 MVA of new capacity to the distribution system. Once Waterford Substation is operative, a new 23-kV feeder would be created from Waterford Substation and allow 10 MVA of load to be transferred from the Williams Street Substation to the Waterford Substation.

G.1 System Alternatives

CL&P considered alternative system options to meet the challenges in Waterford. However, available options would produce a distribution system in Waterford that would not be as reliable and flexible as the system that will result from the proposed Waterford Substation and, ultimately, would not eliminate the need for the proposed facility to meet system capacity projections.

The Waterford Substation is the preferred solution based, in part, on the following:

- Proximity to customer load,
- Proximity to existing distribution feeders,
- Improved reliability with decreased feeder length, and
- Improved reliability for load transfers during feeder outages.

Alternative system options that were considered are discussed below:

Flanders Substation

The addition of a third transformer connection position at Flanders Substation is not possible due to the existing limited space. There is no room within the existing fenced area to safely install another transformer, and there is no room to expand the fence or acquire additional property.

Replacement of the two existing power transformers at this substation with larger transformers was evaluated and ultimately rejected. Although the purchase of new transformers could be off set by the reuse of the existing transformers elsewhere in CL&P's system, the actual change out would be labor intensive, and the net capacity increase is much less than that provided by the proposed Substation with two transformers.

Also, the Niantic River between Flanders Substation and the Town of Waterford creates a bottleneck with three feeders on one pole line. These feeders are at their capacity limits under peak load, with no opportunities to install a new feeder. Three feeders on one pole is the maximum allowed by CL&P standards. The presence of more feeders on a single pole compromises reliability because the separate feeders provide backup for one another. In the event of an accident affecting a pole carrying numerous feeders, a large number of customers would be affected for an extended period of time. There are no other practical alternate routes to cross the river.

Williams Street Substation

Replacement of the existing power transformers at this substation with larger transformers or the installation of a third transformer were evaluated and ultimately rejected. Williams Street Substation is located outside of the Waterford load pocket, its feeders are at their capacity limits under peak load and there is no opportunity to install new feeders in the same duct bank system. The addition of another transformer and new feeders would require extensive and costly underground distribution work. Improvements at Williams Street Substation would be insufficient to address existing and projected load needs in the Town of Waterford.

Construction of the Waterford Substation along with the installation of a new feeder pushes out the projected overload year at Williams Street Substation beyond 2013. At that point in time, more 13.2-kV load would be converted to 23-kV and added to the Waterford Substation.

Uncasville Substation

The option of using Uncasville Substation to relieve load in Waterford is not as reliable as the proposed Project. The 13.2-kV distribution voltage from Uncasville Substation is different than the 23-kV distribution voltage from Flanders Substation, and the most efficient method of supply is for higher voltages to supply lower voltages. In addition, it would be difficult bringing out new feeders from this location to Waterford since it is six miles away from the load area, new feeders would have to traverse residential areas, and long feeders could result in low voltage issues. Uncasville is projected to overload in the year 2013, which makes it a poor candidate to provide near-term load relief to another area.

H. EXISTING CONDITIONS

A map depicting *Existing Conditions* on the Property, its access, abutting properties, and several key features discussed herein, is provided as Figure H-1. The purpose of this section is to describe current conditions on the Property. A detailed discussion of the Waterford Substation's effects on the environment is provided in Section K of this document.

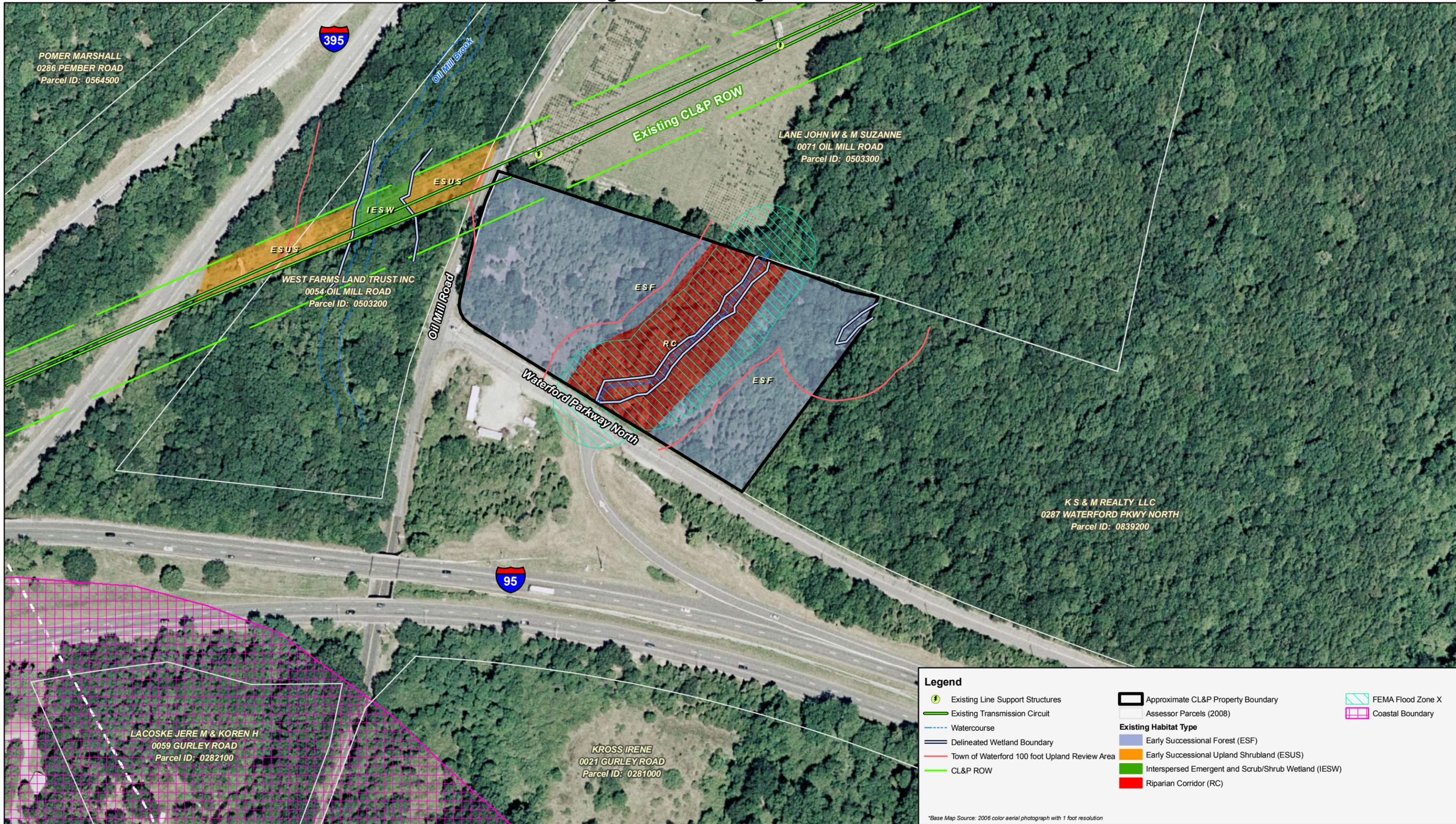
H.1 Existing Development

The undeveloped Property encompasses approximately 5 acres. The Property was recently divided from a larger 55 ± acre parcel identified by the Waterford Assessor's Office on Map 88, as Lot 287. A new lot number has not yet been determined but the Property has been assigned an address of 325 Waterford Parkway North. The 5-acre Property was purchased by CL&P on December 20, 2007.

According to the Tax Assessor's field cards, the Property is zoned "RU-120", which is defined by the Town of Waterford as a "Rural Residential District." The Site currently exists as undeveloped land and is covered with moderate tree growth, with some small clearings and limited growth in its central portion.

Existing on-site topography can be characterized as generally flat at 50 feet above mean sea level with a slight upward slope to the east and northeast. An unnamed stream and associated wetland corridor are present running north to south in the east-central portion of the Property.

Figure H-1: Existing Conditions



Surrounding land use in the vicinity of the Site consists of a highway, residential and undeveloped properties. The Site is abutted to the south (across Waterford Parkway North) by Interstate 95; to the north by an existing transmission line corridor, a tree farm and residence; to the east by undeveloped land; and, to the west (across Oil Mill Road) by undeveloped land. An exit ramp from I-95 south to Waterford Parkway North immediately to the southeast is located across from the Site. Figure H-2 (*Nearest Residences*) depicts the locations and distances of surrounding residences to the Substation.

Several alternate site locations along the transmission line corridor were evaluated for development of this Project (see Section I, *Alternatives Sites Evaluated*). For the following reasons, the Property is well suited for the proposed Substation:

- An existing 115-kV transmission line currently exists immediately north of the Property;
- There are interconnection opportunities to existing 23-kV distribution feeders along Oil Mill Road and Waterford Parkway North;
- The Property has direct access from a local road; and,
- Construction can be completed and the Substation can be operated with minimal effects on the surrounding environment.

H.2 Site Access

The Site has frontage along both Waterford Parkway North and Oil Mill Road. However, no improved driveway currently exists.

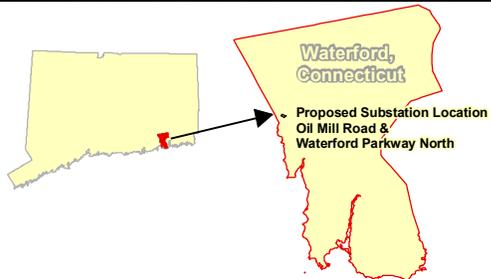
Figure H-2: Nearest Residences



VHB Vanasse Hangen Brustlin, Inc.
Transportation Land Development Environmental Services



150 75 0 150
Feet



Connecticut Light & Power
The Northeast Utilities System

H.3 Wetlands and Watercourses

Wetlands were delineated by a Registered Soil Scientist at Vanasse Hangen Brustlin, Inc. on September 14, 2007. Details of the wetland delineation are included in the *Wetlands Delineation Report* provided in Volume 2, Exhibit 2.

A Riverine Upper Perennial wetland system (Wetland 1) transects the Site from northeast to southwest. This system consists of a perennial stream (WC 1-01X to 1-11 and WC 1-23 to 1-31) with associated bordering wetlands (WF 1-12 to 1-22). The stream flows through the Site within a well-defined, possibly excavated, channel. At its southern extent the channel becomes less defined and bordering wetlands exist. The stream exits the property beneath Waterford Parkway North via a culvert. This stream functions as a discharge (or gaining stream) in its upper reaches then transitions to a recharge (losing stream) as it enters outwash deposits located on the Property. Dominant vegetation within this system includes white ash (*Fraxinus Americana*), red maple (*Acer rubrum*), sweet pepperbush (*Clethra alnifolia*), spicebush (*Lindera benzoin*), winterberry (*Ilex verticillata*) and New York fern (*Thelypteris noveboracensis*).

A Palustrine-Forested wetland system (Wetland 2; WF 2-01 to 2-07) exists within the eastern Site boundary. This wetland, a small shallow depressional system, is the westernmost portion of a larger wetland system that extends off-site immediately east of the northeast corner of the Property. Dominant vegetation in this wetland area includes black birch (*Betula lenta*), red cedar (*Juniperus virginiana*) and New York Fern.

There are no tidal wetland areas in the vicinity of the Property.

H.4 Vegetation and Wildlife

The Site contains two general habitat types. These habitat types are closely related to previous land uses as well as the soil types found on site. Soils on the Site are derived from glacial outwash and consist primarily of sand and gravel. The eastern and western portions of the Site are characterized as old field or early successional forest. Level topography, species composition, infertile soils and evidence of historic access to these areas from Waterford Parkway North are evidence of past agricultural uses as well as possible sand and gravel excavation. Eastern red cedar occurs in virtually pure stands in these two areas, increasing in density on the east side of the Property. Where scattered hardwoods exist within this habitat type, species such as scarlet and black oak are further evidence of a relatively infertile substrate. In areas where the tree canopy is open, a more developed herbaceous layer exists. Species observed such as little bluestem, poverty grass, and pineweed are indicative of dry infertile sites. The location(s) of the vegetative communities on the Property are illustrated in Figure H-1 (“Existing Conditions”). A *Habitat Evaluation* report is provided in Volume 2, Exhibit 3.

H.5 Rare, Threatened, and Endangered Species

CL&P reviewed the CTDEP’s Natural Diversity Database (updated December 2007), which identifies general areas of concern with regard to state and federally listed Endangered, Threatened, and Special Concern species. No areas of concern with regard to threatened, endangered or special species were identified at or in the vicinity of the Site. CL&P also submitted site data to the CTDEP and requested confirmation of this independent review. See Section K.6.1 of this Application for additional information.

H.6 Water Supply Areas

Groundwater below and near the Property is classified by the CTDEP as a GA groundwater area. The GA classification indicates groundwater within the area of existing private water supply wells or an area with the potential to provide water to public or private water supply wells. CTDEP presumes that groundwater in such an area is, at a minimum, suitable for drinking or other domestic uses without treatment.

There are no public water supply wells within a 2-mile radius of the Site. The closest public water supply well is part of the Groton Pond Wellfield (a State-designated Preliminary Aquifer Protection Area), located approximately 2.1 miles southwest of the proposed Substation. The Property is not located within this or any other Aquifer Protection Area.

H.7 Scenic Areas

Based on information provided by the Town of Waterford's Planning and Zoning Office, there are no State or locally designated scenic roads or Natural Scenic Resources in the Town.

H.8 Historic and Archaeological Resources

Environmental characteristics frequently are used to predict the location of archaeological sites. Typically distance to water, slope, and soil types are included as part of these predictive models. A review of environmental characteristics identified in the vicinity of the proposed project area suggests that this location may once have been highly favorable to past human settlement and land use. In particular, the proposed project parcel appears to be situated on a gently sloping topography near the headwaters of the Niantic River. Further, a review of previously recorded cultural resources on file with the Connecticut State Historic Preservation Office ("SHPO") demonstrates that the proposed project area is situated in the vicinity of

several previously identified cultural resources. This file review revealed that there are six historic and four prehistoric, archaeological sites situated within 0.5 mile of the Site. None of these previously identified cultural resources are situated within or immediately adjacent to the Site. Finally, there is no record indicating that the Site has been subjected to a cultural resources survey in the past.

Historically, the Site is situated on a landscape that was characterized primarily as rural and agrarian during the nineteenth through mid-twentieth century. Despite development in the areas surrounding the Site, such as highway- and utility-related construction, the project parcel remained a wooded lot. Based on available mapping and cultural resources data, as well as relevant aerial imagery, it appears that the area encompassing the Site has been only minimally impacted (if at all) by historic and modern occupation and land use. Pedestrian survey and photo-documentation of the Site confirmed this interpretation. At the time of the survey, the Site was described as a wooded lot with limited areas of disturbance noted along the bounding roadways (i.e., to the south by Waterford Parkway North and to the west by Oil Mill Road).

CL&P submitted a request for determination from the SHPO regarding the potential effect or no effect of the Project on cultural resources on January 15, 2008. The SHPO responded in writing on January 17, 2008 that the project boundaries possess moderate to high archaeological sensitivity and requested that further investigation be undertaken. The results of these investigations are provided in Section K.-8.

H.9 Natural Resources

Site bedrock and surficial geology was determined by reviewing the Environmental GIS Data for Connecticut 2003 Edition compiled by the CTDEP. Bedrock geology underlying the

majority of the Property is mapped as the Tatnic Hill Formation, a gray to dark gray, medium-grained gneiss or schist. No bedrock outcroppings are visibly apparent on the Site. Surficial soils at the Property are mapped as an alluvium, classified as Prime Farmland Soils and described as an Agawam fine sandy loam, 3 to 8 percent slopes.

H.10 Floodplain Areas

According to the Flood Insurance Rate Maps for the Site (Community Panel Numbers 090107 0005D and 0010C), the unnamed stream located east of the proposed development area is not associated with a Special Flood Hazard Area or Floodway. The stream is classified by Other Flood Areas as Zone X. Zone X includes areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

H.11 Recreational Areas

There are no recreational areas directly abutting or within one mile of the Property. The nearest recreational area is the Oswegatchie School playground located approximately 1.34 miles southeast of the Property.

H.12 Seismic Areas

The USGS-National Earthquake Reduction Program has developed a series of maps that depict the estimated probability that certain levels of ground shaking from an earthquake will occur within a given period of time. USGS takes into account the seismic history of an area and the expected decrease in intensity with distance from the epicenter. Based on a review of USGS-National Earthquake Reduction Program maps and information obtained by the Weston

Observatory (a geophysical research laboratory), there are no seismic areas located at the Property or within its immediate area.

H.13 Noise

Ambient sound pressure levels were measured at five property line locations between the hours of 6:00 am and 7:00 am on April 7, 2008 (see Figure H-3, *Locations of Ambient Sound Level Measurements*). At all of the locations, the sound pressure levels (“SPLs”) were high enough to qualify as “high background noise” according to the CTDEP’s noise control regulations (RCSA Title 22a, §22a-69-1 to 22a-69-7.4). The main source of noise in the area is traffic noise from I-95 and I-395. Calculations of future conditions with the Substation operative are presented in Section K.9 of this Application.

H.14 Lighting

Currently, there are no lighting facilities present on the Property.

H.15 Coastal Zone Management Areas

As defined in Conn. Gen. Stat. § 22a-94(a), the Connecticut Coastal Area includes the land and water within numerous towns, including the Town of Waterford. A subset of the Coastal Area, called the Coastal Boundary, represents an area within which activities regulated or conducted by coastal municipalities must be consistent with the Coastal Management Act.

The Property is located approximately 660 feet outside and north of the Coastal Boundary.

Figure H-3 Locations of Ambient Sound Level Measurements



Legend - Existing Conditions

 = Measurement Point

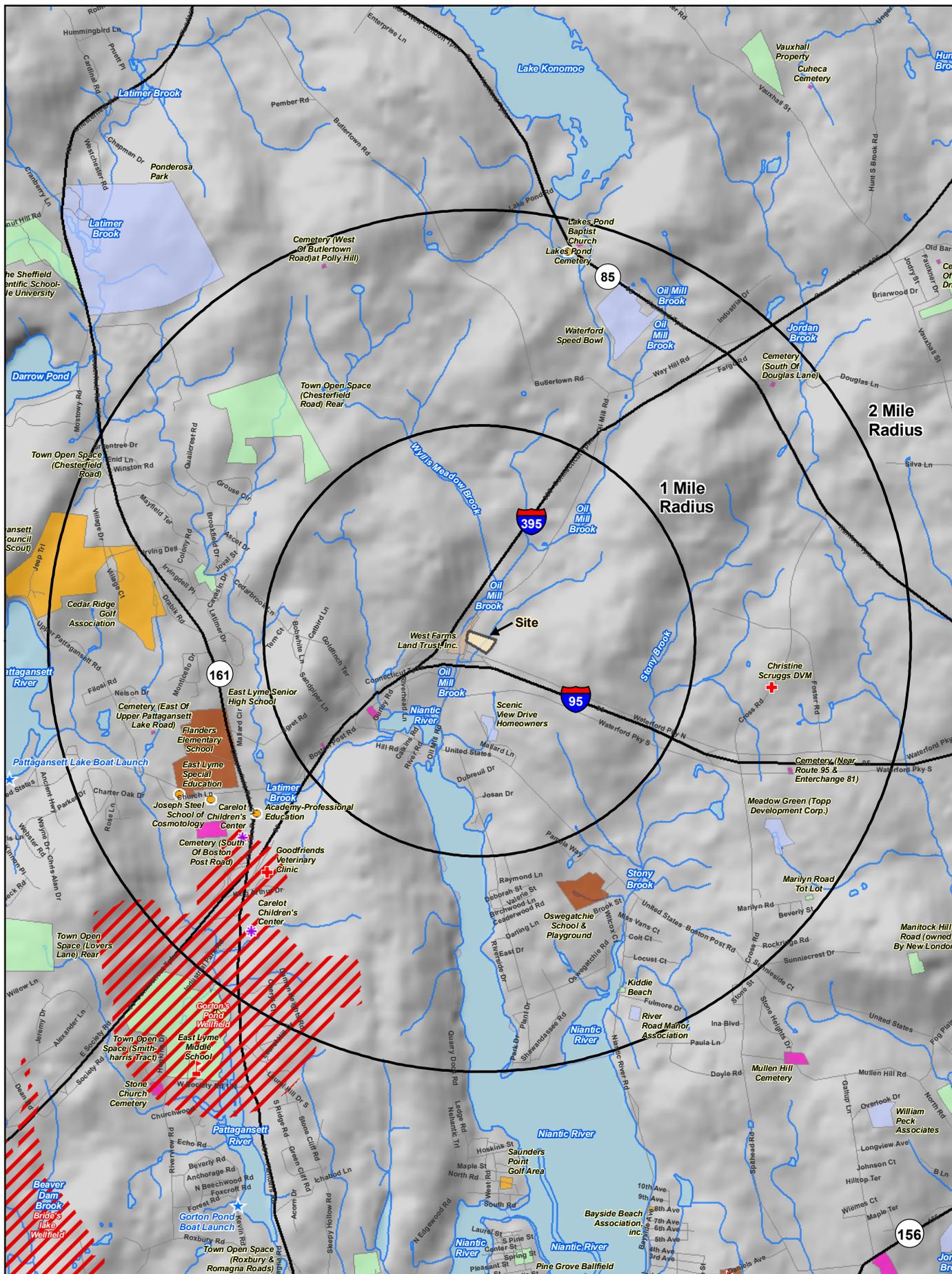
H.16 Other Surrounding Features

Table H-1 lists non-residential features within two miles of the Property. Figure H-4 (*Surrounding Features*) depicts the nearest locations of non-residential development.

TABLE H-1: Surrounding Non-Residential Features Within Two Miles of the Property

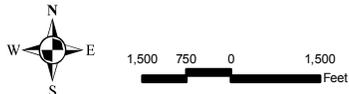
Name	Address	Location from Property
Schools		
East Lyme High School	30 Chesterfield Road, East Lyme	1.30 miles southeast
Oswegatchie Elementary School	470 Boston Post Road, Waterford	1.34 miles southeast
Academy Professional Education	339 Flanders Road, East Lyme	1.45 miles southwest
Joseph Steel School of Cosmetology	144 Boston Post Road, East Lyme	1.50 miles southeast
East Lyme Special Education	165 Boston Post Road, East Lyme	1.61 miles southeast
Flanders Elementary School	167 Boston Post Road, East Lyme	1.61 miles southeast
Lakes Pond Baptist Church	1144 Hartford Tpke., Waterford	1.75 miles northeast
Daycares		
Carelot Children’s Center	315 Flanders Road, East Lyme	1.51 miles southwest
Carelot Children’s Center	245 Flanders Road, Niantic	1.81 miles southwest
Playgrounds		
Oswegatchie School	470 Boston Post Road, Waterford	1.34 miles southeast
Hospitals		
Christine Scruggs, DVM	122 Cross Road, Waterford	1.42 miles east
Goodfriends Children’s Center	339 Flanders Road, #104, Waterford	1.81 miles southwest
Parks/Beaches		
Kiddie Beach	Niantic River Road, Waterford	1.71 miles southeast
Group Homes		
		none identified within two miles
Licensed Youth Camps		
		none identified within two miles
Hunting or wildlife management areas		
		none within two miles
Settled and Residential areas		
	Oil Mill Road – North Gurley Road - South	within 0.5 mile

Figure H-4: Surrounding Features



Legend:

CL&P Property Boundary	Boat Launch Areas	School	CTDEP Municipal Property	Existing Preserved Open Space
Aquifer Protection Well	Daycare	Hospital	School	Preservation
Aquifer Protection Area	Hospital	Group Home	Cemetery	Uncategorized
	Other	General Recreation	Water Bodies	



I. ALTERNATIVE SITES EVALUATED

CL&P identified an area in Waterford, Connecticut where additional bulk substation capacity is needed (i.e., the “load area”). At present the Town of Waterford is supplied power from three substations in other towns. There are technical limitations to increasing capacity at these facilities as discussed in Section G-1. The most viable solution to address this need is the establishment of a new bulk-power substation in Waterford. The ideal location for this Substation would provide: proximity to an existing 115-kV transmission circuit; proximity to the distribution load area; and, accessibility to and from a public road. Locating the facility near an existing 115-kV transmission circuit avoids new transmission line construction and ROW acquisitions. A preferred site is one located within the load area that would minimize distribution feeder lengths and enhance contingency tie capabilities with distribution feeders emanating from adjacent substations. Additionally, direct access to the Substation site is important to reduce overall environmental impacts. Based on these considerations, a site search area was defined and six potential sites were identified.

Undeveloped or vacant properties in the search area generally greater than two acres in size and generally square in shape, which satisfied the parameters discussed above, were initially selected as potential sites. For this Substation, sites of this size would typically provide suitable buffer to surrounding properties. Land that is currently developed and being used is typically excluded, unless the property is intended to be sold. Industrially-zoned sites meeting the same parameters are preferred over non-industrial sites. In this case, the transmission circuits and load pocket are located predominantly within non-industrial areas.

Six potentially viable site locations in Waterford were identified and evaluated (see Figure I-1, *Alternative Sites Evaluated*). The following major criteria were used to determine the most suitable location for construction of this new Substation:

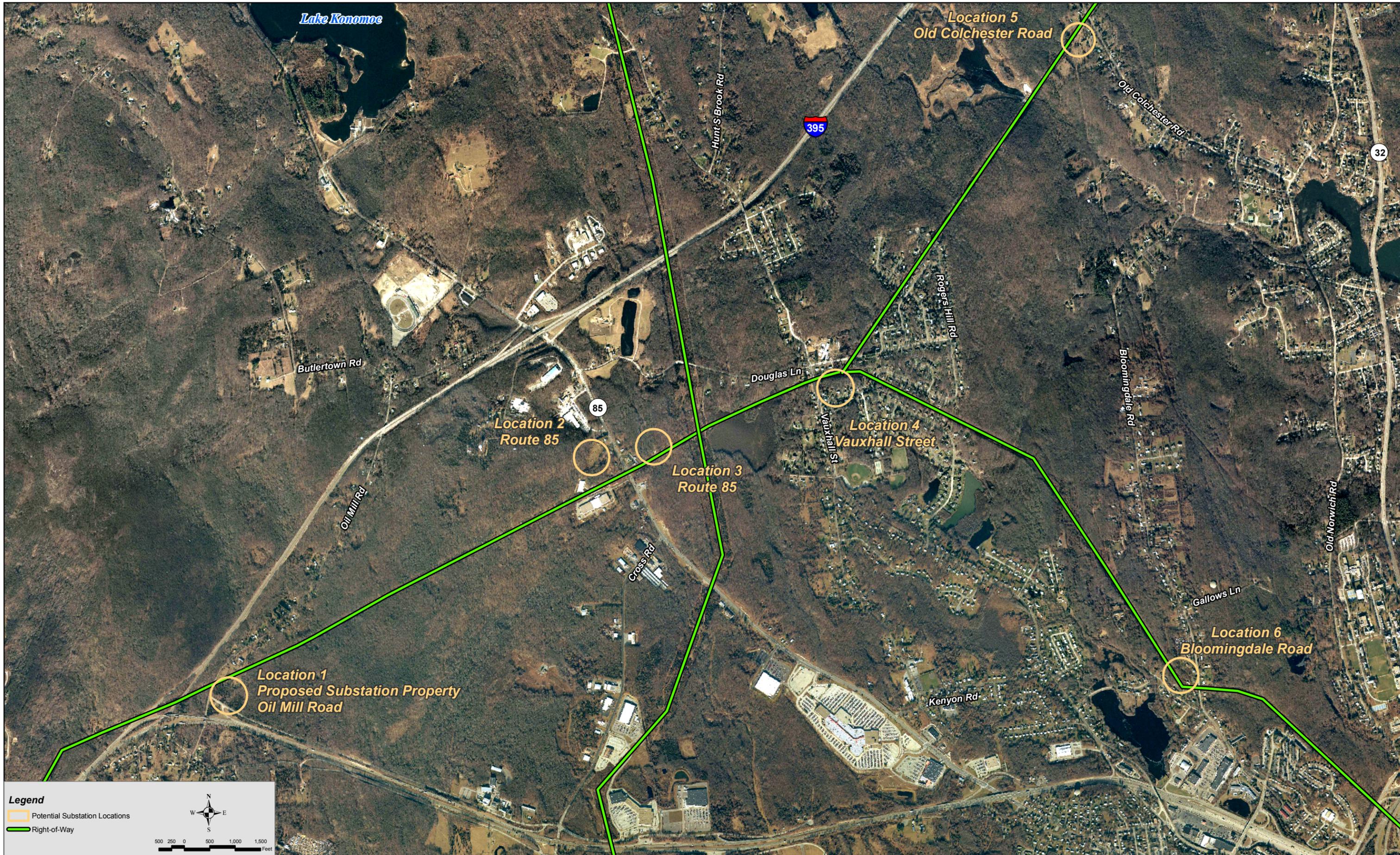
- Proximity to distribution load area and existing feeders
- Proximity to existing transmission circuits
- Ease of access
- Earthwork requirements
- Sufficient size and shape
- Zoning and adjacent land-use constraints
- Environmental considerations (wildlife and habitat; wetlands, watercourses and floodplains)
- Proximity to public water-supply watershed and/or aquifer areas

The Waterford Parkway North Property best satisfied the criteria and is therefore the most feasible location. A summary of the opportunities and constraints associated with each of the potential site locations is provided below.

I.1 Location #1, Waterford Parkway North (the Property)

- Proximity to distribution load area and existing feeders: the Property provides direct connections to 23-kV feeders which can be reconfigured to three 23-kV feeders going in three directions. In addition, up to four additional feeders can be easily added to existing pole lines.
- Proximity to existing transmission circuits: a Substation located at this Property can be easily connected to an adjacent 115-kV transmission circuit.
- Ease of access: direct access exists from Waterford Parkway North.
- Earthwork requirements: the Property is lightly wooded and generally level. Development would require minimal earthwork.

Figure I-1: Alternative Sites Evaluated



- Sufficient size & shape: the Property is approximately five acres in size and somewhat rectangular in shape. There is sufficient size to install Substation facilities in a standard layout. Only one residence is located within the viewshed of this Property and sufficient vegetative buffer could be maintained for screening the facility.
- Zoning and adjacent land uses: the Property is Zoned RU-120 Rural Residential but is bordered to the south by an exit ramp from Interstate 95. Residences are located to the north and southwest of the Property. The Town of Waterford is located within the Connecticut Coastal Area; however, the Property is located approximately 660 feet outside and north of the Coastal Boundary.
- Environmental considerations: a review of the most recent CTDEP Natural Diversity Database revealed that there were no state-listed mapped rare, threatened, or endangered species or habitats of special concern located on site. A narrow, forested-bordering wetland system crosses the east-central portion of the Property. Development can be completed without affecting this resource. The proposed development area is located in Zone X, an area of minimal flooding.
- Proximity to public water-supply watershed and aquifer areas: the Property is not located within a CTDEP-mapped Aquifer Protection Area (“APA”). Groundwater quality beneath the site is classified by the CTDEP as GA. The GA classification is defined as areas where existing private and potential public or private supplies of water suitable for drinking without treatment and baseflow for hydraulically connected surface water bodies. Developed parcels to the north and southwest have private water supply wells.

In summary, this Property provides excellent connections to existing 23-kV distribution feeders in the area. A substation located on this site can be easily connected to an existing 115-kV transmission circuit. The Property is of sufficient size to install the proposed substation facilities without impacting the wetland system in the east-central portion of the Property.

I.2 Location #2, 994 Route 85 Hartford Turnpike

- Proximity to distribution load area and existing feeders: this site provides limited connections to existing 23-kV distribution feeders heading in two directions (north and south along Route 85). Extensive distribution line work would be required in the area.

- Proximity to existing transmission circuits: a substation located at this site could be connected to a nearby existing 115-kV transmission circuit, but would require a new ROW.
- Ease of access: the site is accessible via Route 85.
- Earthwork requirements: existing vegetation would need to be removed from the substation footprint and the new ROW.
- Sufficient size & shape: the property is approximately 10.5 acres in size and is irregular in shape. There is sufficient size to install substation facilities in a standard layout.
- Zoning and adjacent land uses: the property is zoned “General Industrial District” IG. The Town of Waterford is located within the Connecticut Coastal Area; however, this property is located beyond the Coastal Boundary.
- Environmental considerations: a review of the most recent CTDEP Natural Diversity Database revealed that there were no state-listed mapped endangered, threatened, or special species located on the site. CTDEP-mapped wetlands are located on the site and a portion is within a FEMA 500-year flood zone. Wetland impacts would most likely be associated with connections to the transmission circuit.
- Proximity to public water-supply watershed and aquifer areas: this location is not within a CTDEP-mapped APA. Groundwater quality beneath the site is classified by the CTDEP as GA.

This site provides limited connection possibilities to existing 23-kV distribution feeders serving the load pocket area; therefore it would require extensive distribution line work in the area. A substation located at this site could be connected to a nearby existing 115-kV transmission circuit, but the associated work would likely impact wetland resources. The site is of sufficient size to install the proposed substation facilities.

I.3 Location #3, Southeast of # 969 Petroleum Station-Route 85 Hartford Turnpike

- Proximity to distribution load area and existing feeders: the site provides limited connections to existing 23-kV distribution feeders heading in two directions, north and south along Route 85. Extensive distribution line work would be required in the area. Additionally, the site is set back approximately 400 feet from Route 85 which would result in longer distribution feeder exits.

- Proximity to existing transmission circuits: a substation located at this site could be connected to the existing 115-kV transmission circuit.
- Ease of access: this site is not readily accessible from Route 85. A new road, approximately 400 feet in length and traversing steep terrain, would be required to access the site.
- Earthwork requirements: the site is on steep terrain and major cuts and fills would likely be required to facilitate development.
- Sufficient size & shape: the property is approximately five acres in size. There is sufficient size to install substation facilities in a standard layout.
- Zoning and adjacent land uses: the property is zoned “General Industrial District” IG. The Town of Waterford is located within the Connecticut Coastal Area; however, this property is located beyond the Coastal Boundary.
- Environmental considerations: a review of the most recent CTDEP Natural Diversity Database revealed that there were no state-listed mapped endangered, threatened, or special species located on the site. There are no CTDEP-mapped wetlands on the property. The property is not located within a flood zone.
- Proximity to public water-supply watershed and aquifer areas: this location is not within a CTDEP-mapped APA. Groundwater classification on site is classified as GA.

This site provides limited connection possibilities to existing 23-kV distribution feeders serving the load area, therefore, requiring extensive distribution line work in the area. A substation located at this site would require substantial earthwork due to the topography.

I.4 Location #4, North of 813 Vauxhall Street (Cohanzie Junction)

- Proximity to distribution load area and existing feeders: the site provides poor connection possibilities to existing 23-kV distribution circuits, heading in two directions. Extensive distribution line work would be required in the area.
- Proximity to existing transmission circuits: a substation located at this site could be connected to an existing 115-kV transmission circuit; however, major vegetation clearing would be required within close proximity to nearby residences.
- Ease of access: the site is accessible via Vauxhall Street.

- Earthwork requirements: the site is relatively flat, some minor cuts and fills to prepare for the installation of substation facilities would be required.
- Sufficient size & shape: the property is approximately six acres in size and is generally rectangular in shape. There is sufficient size to install substation facilities in a standard layout.
- Zoning and adjacent land uses: the property is Zoned R-20 “Medium Density Residential District” and is proximate to nearby residences. The Town of Waterford is located within the Connecticut Coastal Area; however, this property is located beyond the Coastal Boundary.
- Environmental considerations: a review of the most recent CTDEP Natural Diversity Database revealed that there were no state-listed mapped endangered, threatened, or special species located on the site. CTDEP-mapped wetlands exist on the site. The property is not located within a flood zone.
- Proximity to public water-supply watershed and aquifer areas: this location is not within a CTDEP-mapped APA. Groundwater classification is classified as GAA. The GAA classification is defined as areas where water could be used as existing or potential public supply of water suitable for drinking without treatment and baseflow for hydraulically connected surface water bodies. Discharges are limited to treated domestic sewage, certain agricultural wastes and certain water treatment wastewaters.

This site is farther away from the existing load center and offers poor connection possibilities to existing 23-kV distribution feeders, resulting in the need for extensive distribution line work. A substation located at this site could be connected to an existing 115-kV transmission circuit, but the site is located proximate to surrounding residences with minimal buffer areas.

I.5 Location #5, Northwest of 130 Old Colchester Road

- Proximity to distribution load area and existing feeders: located in the northern portion of the load area, this site provides poor connection possibilities to existing 23-kV distribution feeders, heading in one direction, south. Extensive distribution line work would be required.
- Proximity to existing transmission circuits: a substation located at this site could be connected to an existing 115-kV transmission circuit; however, major vegetation clearing would be required within close proximity to nearby residences.

- Ease of access: the site is accessible from Old Colchester Road.
- Earthwork requirements: the site is mostly level and no major earthwork requirements exist for this property.
- Sufficient size & shape: the property is approximately three acres in size and is generally rectangular in shape. There is sufficient size to install substation facilities in a standard layout; however, sufficient buffering from nearby residences does not exist.
- Zoning and adjacent land uses: the property is Zoned R-40 “Low Density Residential District” and is in close proximity to nearby residences. The Town of Waterford is located within the Connecticut Coastal Area; however, this property is located beyond the Coastal Boundary.
- Environmental considerations: a review of the most recent CTDEP Natural Diversity Database revealed that there were no state-listed mapped endangered, threatened, or special species located on the site. No wetlands appear to exist on the site. The property is not within a flood zone.
- Proximity to public water-supply watershed and aquifer areas: this location is not within a CTDEP-mapped APA. Groundwater quality beneath the Site is classified by the CTDEP as GA.

This site provides poor connection possibilities to existing 23-kV distribution feeders serving the load area; therefore, it would require extensive distribution line work. A substation located on this site could be connected to a nearby 115-kV transmission circuit, but significant vegetative clearing would be required.

I.6 Location #6, North of Bloomingdale Road

- Proximity to distribution load area and existing feeders: the site provides poor connection possibilities to existing 23-kV distribution feeders, therefore requiring extensive distribution line work.
- Proximity to existing transmission circuits: a substation located at this site could be connected to an existing 115-kV transmission circuit; however, major vegetation clearing would be required within close proximity to nearby residences.
- Ease of access: the site is accessible from Bloomingdale Road.

- Earthwork requirements: the site is mostly level and no major earthwork requirements exist for this property.
- Sufficient size & shape: the property is approximately two acres in size and is generally rectangular in shape. There is room to install substation facilities, however, sufficient buffering from nearby residences does not exist and limited space would be available for landscape screening.
- Zoning and adjacent land uses: the property is Zoned R-20 “Medium Density Residential District” and is in close proximity to nearby residences. The Town of Waterford is located within the Connecticut Coastal Area; however, this property is located beyond the Coastal Boundary.
- Environmental considerations: a review of the most recent CTDEP Natural Diversity Database revealed that there were no state-listed mapped endangered, threatened, or special species located on the site. No wetlands appear to exist on the site and it is not within a flood zone.
- Proximity to public water-supply watershed and aquifer areas: this location is not within a CTDEP-mapped APA. Groundwater classification on site is classified as GAA.

This site is farther away from the existing load area with poor connection possibilities to existing 23-kV distribution feeders. Development would result in extensive distribution line work. A substation located on this site could be connected to a nearby 115-kV transmission circuit, but major vegetative clearing would be required within close proximity to nearby residences. In addition, the facility would be visible from several nearby homes.

I.7 System Alternatives

As previously discussed in Section G of this Application, CL&P considered alternative system design options to meet the electrical challenges in the Town of Waterford. However, available options would produce a Waterford distribution system that is not as reliable and flexible as the system which will result from the proposed Waterford Substation and, ultimately, would not eliminate the need for the proposed facility to meet system capacity projections.

CL&P develops and manages an array of traditional energy efficiency and Demand-Side Management (“DSM”) programs statewide through the Connecticut Energy Efficiency Fund (“CEEF”). The *Connecticut Energy Efficiency Fund 2008 Community & Residential Programs* and the *Connecticut Energy Efficiency Fund 2008 Commercial & Industrial Programs* pamphlets are included in Volume 2, Exhibit 4. Currently, CL&P’s residential, commercial and industrial customers in the Town of Waterford are served from two bulk-power substations in other towns (Flanders in East Lyme and Williams Street in New London). In 2005, 2006 and 2007, CL&P estimates that through participation in these CEEF programs, customers in these towns have achieved summer peak-demand savings of approximately 2,608 kW. Annual savings for the period 2005 through 2007 are 15,804,993 kilowatt hours (“kWh”) and customers will save approximately 181,213,277 kWh of energy over the life of the installed measures. See Table I-1 below.

TABLE I-1: CL&P Energy Efficiency

Town	Data	2005	2006	2007	Grand Total
EAST LYME	Annual kWh	925,007	572,403	727,495	2,224,905
	Lifetime kWh	10,790,773	8,202,816	7,740,312	26,733,901
	Summer Peak kW	117	141	139	397
	Incentive	\$232,430	\$126,633	\$177,039	\$536,103
NEW LONDON	Annual kWh	2,296,749	1,308,897	1,438,959	5,044,605
	Lifetime kWh	35,180,947	18,498,787	18,634,908	72,314,642
	Summer Peak kW	281	637	206	1,124
	Incentive	\$201,118	\$250,218	\$538,831	\$990,167
WATERFORD	Annual kWh	1,139,350	3,350,005	4,046,127	8,535,483
	Lifetime kWh	14,182,341	34,456,345	33,526,048	82,164,734
	Summer Peak kW	165	412	510	1,087
	Incentive	\$144,495	\$355,380	\$446,531	\$946,407
Totals	Annual kWh	4,361,106	5,231,305	6,212,581	15,804,993
	Lifetime kWh	60,154,061	61,157,948	59,901,268	181,213,277
	Summer Peak kW	563	1,190	855	2,608
	Incentive	\$ 578,043	\$ 732,231	\$ 1,162,401	\$ 2,472,677

As part of Public Act 05-01, An Act Concerning Energy Independence, the Connecticut Department of Public Utility Control (“Department”) established a program to award monetary grants for capital costs of customer-side distributed resources (“Grant Program”) to support the development of distributed generation (“DG”) and emergency generation (“EG”) projects. The Grant Program is designed to reduce costs borne by Connecticut electric consumers that are associated with the region’s competitive generation market. In CL&P’s overall service territory, 192 customers filed applications with the Department, and 180 of the applications (representing 225 MW) have been approved. Specifically regarding projects in the Waterford area, six projects (5,200 kW) have been approved by the Department consisting of three EGs (2,125 kW) and three DGs (3,075 kW). To date, four of the six projects in the Waterford area, two EGs (875 kW) and two DGs (575 kW), have been completed. It should be noted that the Department has suspended the EG portion of the Grant Program and because it is most likely that the best opportunities for the installation of DG projects have been proposed already, CL&P does not expect a significant level of future DG or EG projects in this area.

Further, even if these customer-side projects planned for the Waterford area are all completed and operational, the pressing need for the Waterford Substation would remain because the projects would not provide nearly enough relief for the area. The three DG units, could only reduce load during the peak periods by about 3,075 kW. Moreover, the three EG commitments, which are required to participate in the ISO-NE Demand-Response program (see below), will operate only when called upon during ISO-NE, Operating Procedure 4. Operating Procedure 4 is implemented only if the New England-wide demand for electricity exceeds operable limits; and therefore, this Procedure serves to reduce system peaks for a limited number of hours only.

In addition to CEEF and DG, CL&P and ISO-NE jointly support an initiative to reduce the region’s peak electricity demand. The program, Demand-Response, provides incentives to power users, such as manufacturing plants and office complexes, to reduce their electric load during periods of peak demand. The Demand-Response program helps customers manage their facility’s load while obtaining revenue opportunities created by today’s electric market. The Demand-Response Program requires participants to reduce demand when called upon during ISO-NE, Operating Procedure 4. Table I-2 below outlines the reductions in summer peak load for the period 2005 through 2007, which includes the 875 kW of EGs, not the DGs, as previously discussed associated with the Public Act.

TABLE I-2: CL&P Demand Response

Town	2005	2006	2007
	(kW)	(kW)	(kW)
East Lyme	0	0	0
New London	600	1,393	1,628
Waterford	300	262	722
Total	900	1,655	2,350

As a result of the CEEF Grant Program and Demand-Response programs, CL&P experienced reduced summer peak demand in the Waterford area by 5,533 kW in 2007. The Actual Summer Peak Load values for 2006 and 2007 in Table G-2, Available Capacity and Forecasted Summer Peak Load, represent Actual Summer Peak Loads at the substations which were reduced as a result of the programs mentioned in this section. The Forecasted Summer Peak Loads assumes that the same reductions in 2007 are achieved throughout the forecasting period.

I.8 Summary of Alternatives Analysis

A comparative analysis of the sites considered for the Project is provided in Table I-3.

Table I-3: Waterford Substation Site Alternative Analysis Matrix

Review Criteria	Location 1 325 Waterford Parkway North Proposed Site	Location 2 994 Hartford Turnpike	Location 3 Southeast of 969 Hartford Turnpike	Location 4 North of 813 Vauxhall Street	Location 5 Northwest of 130 Old Colchester Road	Location 6 North of Bloomingdale Road
Close Proximity to Distribution Load Area and Existing Feeders	√					
Close Proximity to Existing Transmission Circuits	√	√	√	√	√	√
Ease of Access	√	√		√	√	√
Minimal Earthwork Requirements	√			√		
Sufficient Size and Shape	√	√	√	√		
No Zoning and Adjacent Land Use Constraints	√		√			
No Environmental Constraints	√		√		√	√
Sufficient Distance from Public Watershed/ Aquifers	√	√	√		√	

J. SAFETY AND RELIABILITY INFORMATION

The Substation would be constructed in full compliance with the standards of the National Electrical Safety Code, the Connecticut Department of Public Utility Control, and good utility practice. In the event that an energized line or substation equipment fails, protective relaying equipment would immediately remove the equipment from service, thereby protecting the public and the remaining equipment within the Substation.

The Waterford Substation would be equipped with measures to ensure continued service in the event of outages or faults on transmission or substation equipment. Continued reliability would be achieved by incorporating a “loop through” design configuration for the existing 115-kV overhead transmission line, transformer protection, and redundant automatic protective relaying equipment.

Protective relaying equipment would be provided to automatically detect abnormal system conditions (e.g., a faulted overhead transmission line) and would send a protective trip signal to circuit breakers to isolate the faulted section of the transmission system. The protective relaying schemes would include fully redundant primary and backup equipment so that a failure of one scheme does not require the portion of the system being monitored by the protective relaying equipment to be removed from service.

The protective relaying and associated equipment, along with a Supervisory Control and Data Acquisition (“SCADA”) system for remote control and equipment monitoring by the Connecticut Valley Electric Exchange (“CONVEX”) System Operator, would be housed in a weatherproof, environmentally-controlled electrical enclosure.

CL&P incorporates IEEE/ANSI and NFPA standards for fire protection in its substation designs and operates these facilities to minimize the impact of fire, in case of an unlikely event. CL&P trains its employees and the local fire department on the safe methods to deal with a substation fire. The control enclosure would be locked and equipped with fire extinguishers, as well as smoke detectors that would be monitored from a remote location. Smoke detection would automatically activate an alarm at CONVEX and the system operators would then take appropriate action.

Additional devices would constantly monitor the Substation to alert CL&P of any abnormal or emergency situations. The perimeter of the Substation would be enclosed by a seven-foot high chain link fence topped with an additional foot of three strands of barbed wire to discourage unauthorized entry and/or vandalism. The Substation entrance would be gated and locked. Outdoor lighting would be provided in the Substation for general illumination during periods of occupancy at night or during inclement weather. Lighting would be manually controlled and generally directed downward. During periods of nighttime inspections and response to emergencies, temporary lighting could be used where necessary to illuminate specific task areas.

CL&P would install sumps to serve as oil-spill containment reservoirs around the proposed transformers. The sumps would be sized with sufficient capacity to contain a spill in the event of an inadvertent release of oil. CL&P plans to install an Imbiber Beads Drain Protection System® for the sump, similar to containment systems installed at many other CL&P substations, including Shunock Substation in North Stonington.

K. EFFECTS ON THE ENVIRONMENT

The development of the Waterford Substation would not have any significant, long-term adverse effects on the existing environment and ecology, nor would it affect the scenic, historic and recreational values of the vicinity. *Proposed Conditions* are depicted on Figure K-1.

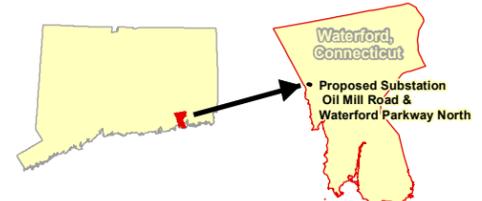
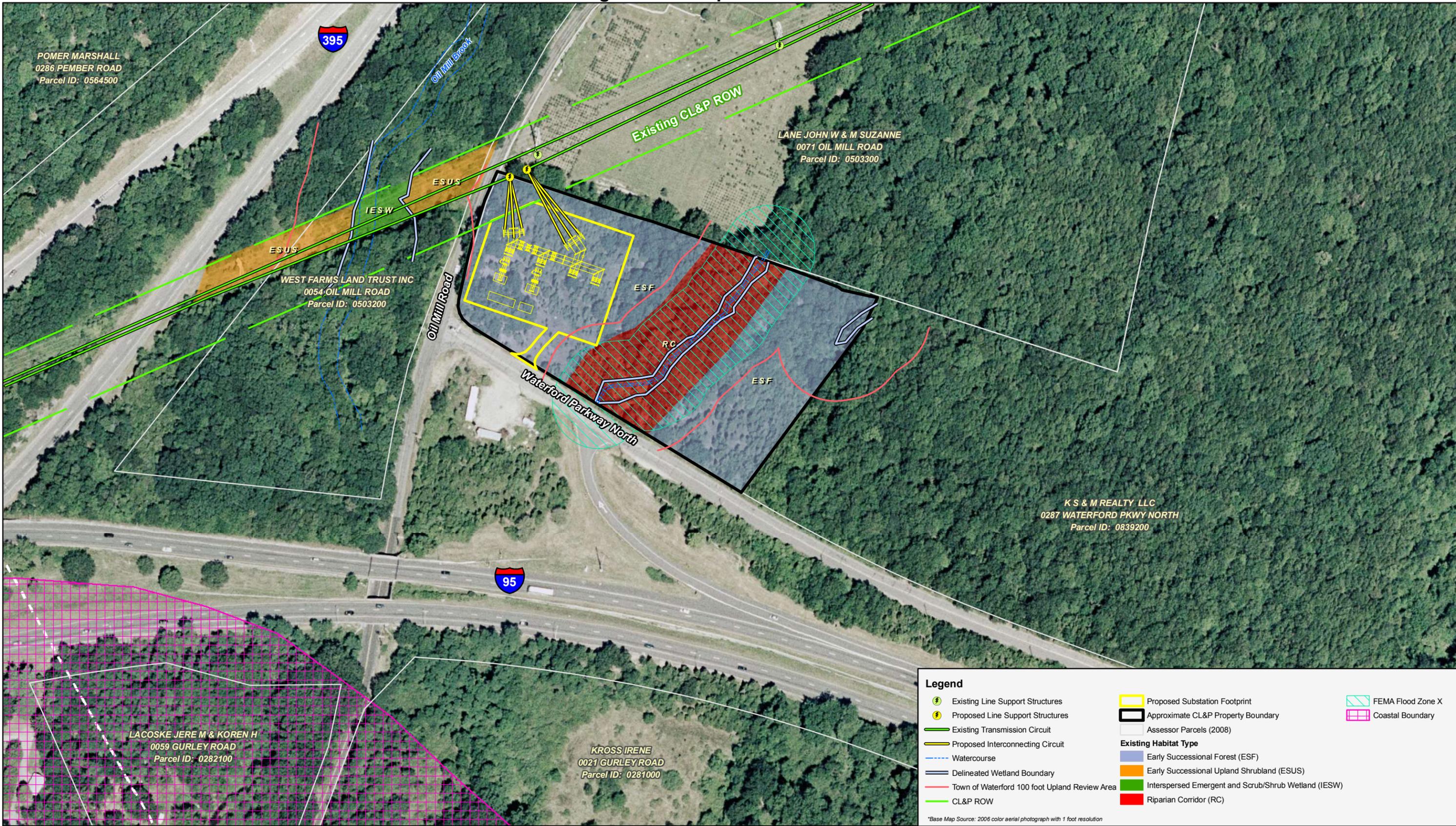
K.1 Public Health and Safety

The Waterford Substation would be designed to applicable CL&P, industry, State, and local codes and standards and would not pose a safety concern or create an undue hazard to the general public. The Substation would not consume any raw materials, would not produce any by-products and would be unmanned during normal operating conditions. Applicable signage would be installed alerting the general public of the dangers of high voltage associated with the Substation.

K.2 Local, State and Federal Land Use Plans

The proposed Project is consistent with local, State, and Federal land use plans. Local land use application processes do not specifically apply to the Project. However, the Project has been designed to meet the intent of local land use regulations. CL&P has met with Town officials and provided Location Review submissions to Waterford's Conservation Commission, and Planning and Zoning Commission. These Commissions provided comments which have been addressed by CL&P. CL&P also met with the Town's Economic Development Commission on April 16, 2008 to present the Project and its benefits to the community. The Economic Development Commission supports the Project.

Figure K-1: Proposed Conditions



CL&P has also reviewed the Office of Policy and Management's *Conservation and Development Policies Plan for Connecticut 2005-2010* ("C&D Plan") for information relating to the State's growth in general, and the Town of Waterford and neighboring communities specifically. The objective of the C&D Plan is to guide and balance response to human, environmental, and economic needs in a manner that best suits Connecticut's future. Based upon the general planning information provided in the C&D Plan, the Project is consistent with the overall goals and objectives of the Plan and serves a public need for a reliable source of electricity for the Town of Waterford.

There are no Federal properties or Federally-designated areas located on or within ¼-mile of the Substation Property; therefore, the Project is not affected by any applicable Federal land-use plan.

K.3 Existing and Future Development

The Waterford Substation would benefit the community by improving electrical service for existing development in the Town and surrounding areas, as well as promoting additional development through enhanced reliability and the capacity to serve additional load. The Town of Waterford does not currently have its own bulk-power substation.

The Substation would be situated immediately south of the existing transmission line corridor, generally in the western portion of the Property. The Substation would be located within an irregularly shaped fenced compound that would encompass a 47,600 ± square foot area (measuring approximately 200 feet by 245 feet at its longest dimensions). Connecting the Substation to an existing 115-kV circuit requires the installation of one new steel-pole structure within the ROW north of the Property line and one new steel utility structure within the Property boundary. See Section F of this Application for a full description of the Facility.

K.4 Roads

A gravel driveway would be developed to serve as entry/egress from Waterford Parkway North to the Substation. A bituminous concrete apron would be provided at the entrance of the Property at its junction with Waterford Parkway North. This would serve as the only access to the Site once the Substation is operative; no access will be established from Oil Mill Road.

During construction of the Substation, the driveway would be stabilized with stone, and anti-tracking mats would be installed to prevent tracking of soil onto local streets. During construction of the transmission interconnection, the existing access to the ROW off Oil Mill Road may also be used.

Upon completion of the Substation, the driveway off Waterford Parkway North would be finished with a gravel base and gated. After construction is completed, approximately three to four vehicular trips per month to the Property would be anticipated for maintenance and inspection activities.

K.5 Wetlands

Construction of the proposed Substation would not result in any effects on wetlands or watercourses. Limited work is anticipated within the 100-foot upland review area of the perennial watercourse and its bordering wetlands located on the Property. Proposed activities within the upland review area include grading and construction of a small 1,241 ± square foot portion of the fenced Substation.

K.6 Wildlife and Vegetation

Construction of the Substation would not have significant adverse effects on vegetation, wildlife or habitat values. The Substation would occupy what is currently early successional

upland forest. Sufficient habitat of similar nature (in excess of 50 acres) exists to the east across the intermittent stream. The Project would not have an adverse effect on wildlife due to the Substation footprint's immediate proximity to similar habitats that would allow for natural relocation of potential wildlife from the construction zone. In addition, the adjacent transmission corridor provides valuable and diverse wildlife habitat.

K.6.1 Rare, Threatened, and Endangered Species

No state or federally listed endangered, threatened or special concern species have been identified on the Property. Based on current CTDEP NDDDB review criteria, the proposed Substation project does not present a potential conflict with a listed species or significant natural community. Further, CL&P submitted a letter request on January 15, 2008 to the CTDEP for concurrence. CL&P received confirmation in writing on January 28, 2008 that no known extant populations of federal- or state-listed Endangered, Threatened, and Special Concern species occur at the Property. The *CTDEP Correspondence* is provided in Volume 2, Exhibit 5.

K.7 Water Supply Areas

The closest public water-supply wells are part of the Groton Pond Wellfield (a State-designated Preliminary Regulated Aquifer Protection Area), located approximately 2.1 miles southwest of the Substation. The transformer at the Waterford Substation would contain insulating fluid; however, the equipment would have secondary containment and accidental spill prevention provisions in place. Based on these design considerations and the physical distance of the water-supply wells to the Substation, the Project would have no adverse environmental effect on the aquifer.

K.8 Historic and Archaeological Resources

Consultation with the Connecticut SHPO indicated the potential for this property to yield subsurface cultural deposits. At the request of SHPO, a Phase I cultural resources survey was conducted at the Property. Prior to the initiation of subsurface testing, a pre-fieldwork archaeological assessment was completed by reviewing previous archaeological studies and resources recorded in the region, historic maps, and aerial images depicting the Property. Fieldwork for this investigation consisted of pedestrian survey, systematic subsurface testing, mapping, and photo-documentation.

During the Phase IB cultural resources reconnaissance survey, 62 shovel test pits were completed on the Property in a grid pattern of points spaced approximately 50 feet apart. In several instances, mottled soil stratigraphy was encountered indicating the presence of prior disturbances throughout the Property. These disturbances included tree throws, mechanical earth movement, and the excavation of percolation tests. Finally, a pedestrian survey of the southwestern corner of the Property revealed the effects of previous gravel operations, which consisted of substantial erosion and the removal of topsoil in this area.

Field work resulted in the identification of two non-site cultural resources, including a ceramic shard and quartz flake. These items do not constitute evidence of cultural significance. No additional testing of the Property was recommended.

Based on the results of this investigation, the construction of the proposed Substation would not impact any significant cultural resources. The SHPO concurred with this finding and provided a “No Adverse Effect” letter dated May 9, 2008 to CL&P. Copies of the SHPO

correspondence and the Phase IB Cultural Resources Reconnaissance Survey are provided in Volume 2, Exhibit 6.

K.9 Noise

The increase in the Property line SPLs due to the addition of the Substation can best be described as negligible, ranging from 0 dBA to 0.2 dBA. Due to existing elevated background levels, the projected noise levels generated by the Substation at the Property boundaries would be below applicable noise regulations.

Table K-1: Summary of Noise Analysis Results

Property Line Location Number	1	1A	2	3	4
Existing SPL (dBA)	63	61	59	61	61
Estimated SPL due to 1X and 2X Transformers (dBA)	42.48	40.25	28.35	43.10	46.06
Estimated SPL due to One Permanent Transformer and a Mobile Transformer (dBA)	44.89	45.94	36.60	45.85	46.86
Estimated new total SPL (dBA), based on operating mode with the highest predicted sound level	63.07	61.15	59.04	61.15	61.18
Maximum allowable nighttime SPL per State Regulations (dBA) (5 dba above existing SPLs)	68	66	64	66	66
Estimated increase in SPL (dBA)	0.07	0.15	0.04	0.15	0.18

Infrequent impulse noise would be generated from switching and circuit-breaker opening and closing. The impulse noise levels and steady-state transformer noise levels are not expected to exceed the levels permitted at the Property line by CTDEP’s noise-control regulations.

The construction and testing of the Substation facilities is expected to occur over a 12- to 15-month period. In general, construction hours would be from 7 am to 5 pm, Monday through Friday. Site preparation, including grading and installation of foundations, would take place during the initial 6 months of construction and involve the use of earth-moving equipment and construction vehicles.

The installation and testing of equipment would take approximately 9 months and would involve the use of cranes to unload and install structural elements and large equipment. The installation of the 115-kV line and Substation terminal structures, interconnection of the supply lines to the Substation, and connections to the distribution system may occur outside of normal work hours because these activities necessitate taking critical transmission and/or distribution equipment out of service. As a result, this work may be scheduled for off-peak electrical demand hours and coordinated with the Town.

K.10 Floodplains

The Zone X associated with the Site stream is approximately 160 feet wide in total, extending 80 feet from either side of the stream channel. The southeast corner of the Substation would encroach approximately 5 feet into the Flood Area Zone X. There are no development restrictions associated with this encroachment.

K.11 Seismic Areas

As with all new substations constructed by CL&P, this Substation will meet or exceed the State Building Code, which includes seismic loading, wind loading, and snow and ice loadings, among others.

K.12 Lighting

The Waterford Substation will have low-level lighting for safety and security purposes. Outdoor lighting would be provided in the Substation for general illumination during periods of occupancy at night or during inclement weather. Lighting would be manually controlled and generally directed downward. During periods of nighttime inspections and response to emergencies, temporary lighting could be used where necessary to illuminate specific task areas.

K.13 Natural Resources

No adverse effects are anticipated on natural resources occurring at and/or nearby the Property. Minor earthwork is required to accommodate the Substation at the Site.

K.14 Coastal Zone Management Areas

The Site is located outside of the Coastal Boundary but the Town of Waterford is located within the Coastal Area, as defined by Conn. Gen. Stat. § 22a-94(a). No coastal resources are located on the Property or within the Site vicinity; the Coastal Boundary is located approximately 660 feet south of the Property. The Project would not result in adverse impacts to coastal resources as defined in the Connecticut Coastal Management Act.

K.15 Other Surrounding Features

No adverse effects are anticipated to the facilities depicted on Figure H-3, primarily because of their sufficient distances from the Substation.

L. MITIGATION MEASURES

Based on the existing conditions at the Property and the proposed design, the construction and operation of the Substation would not have any significant permanent adverse effects on the environment. CL&P has incorporated measures into all phases of Project development and implementation to promote protection of the environment in accordance with Federal, State and local requirements.

L.1 Pre-Construction Considerations

Before any construction activities occur, CL&P would prepare a Development and Management Plan (“D&M Plan”) for approval by the CSC. The D&M Plan would include *CL&P’s 2005 Construction Best Management Practices*, which are designed to minimize or eliminate potential adverse environmental effects which may result from construction activities. The D&M Plan would include specific procedures and information on erosion and sedimentation control, spill prevention and control, construction staffing and hours, traffic control, and provisions for restoration and landscaping after construction of the Substation. The D&M Plan would also provide contact information should questions or concerns arise during construction or operation of the facility.

Prior to the commencement of construction, CL&P intends to install erosion controls at the limits of work in accordance with the approved D&M Plan and the *2002 Connecticut Guidelines for Soil Erosion and Sedimentation Control*. The erosion controls would be inspected and maintained throughout the course of the Project until final site stabilization has been achieved.

L.2 Construction-Related Activities

All construction activities would be conducted in accordance with the D&M Plan as approved by the CSC. The siting and design of the Substation provides for a sufficient setback from on-site wetlands and minimizes vegetation loss such that a natural tree and shrub buffer would be maintained. The driveway and Substation would be graded to contain stormwater runoff on the Property. The remainder of the stormwater would infiltrate through the gravel base of the Substation or would be allowed to run off through vegetated uplands.

During initial discussion with officials of the Town of Waterford, CL&P was asked to evaluate what, if any, improvements could be achieved to sight lines at the intersection of Oil Mill Road and Waterford Parkway North as a part of the Project. Proposed construction activities would include removal of the existing vegetation and reduction of a soil berm in the southwest corner of the Property. As a result of vegetation removal and Site grade reduction in this area, the sight line northwestward (up Oil Mill Road) from the stop sign on Waterford Parkway North would increase from current conditions. Proposed sight line improvements are depicted on Drawing CP-3 in Volume 2, Exhibit 1.

L.3 Post-Construction Features

Upon completion of construction activities, all disturbed/exposed areas would be stabilized and re-vegetated. These areas would be dressed with topsoil and seeded with a New England conservation/wildlife mix, to establish a cover of native grasses, forbs, wildflowers and legumes that would provide both soil stability and wildlife habitat value. Erosion controls would remain in place until final site stabilization is achieved.

The power transformers within the Substation would contain insulating fluid. Surrounding each transformer will be secondary containment, consisting of an Imbiber Beads Drain Protection System® for the sump, designed to hold 110% of a transformer's fluid capacity. Drawing C-6, *Site Details*, in Volume 2, Exhibit 1 depicts the design of the Imbiber Beads system.

Effects on wildlife and wildlife habitat would be temporary disturbance during construction. The Property is currently used by wildlife species that are commonly found and are adaptable to minor habitat modifications. Based on the species identified and habitat types found on the Property and surrounding area, species diversity and abundance should be maintained after the Substation is completed and operational.

L.4 Construction Sequencing

Construction is expected to occur over a period of 12 to 15 months with the Substation in service by June 2010. The general construction sequence for the Substation and line interconnection would include:

- Installing erosion and sedimentation control barriers
- Constructing the driveway
- Removing trees and shrubs within the areas to be graded
- Preparing the Site (cut, fill, grading)
- Installing Substation foundations, conduits and grounding grid
- Spreading of trap rock
- Installing steel structures and Substation equipment
- Building transmission line interconnections
- Commissioning the Substation
- Completing Site restoration activities
- Removing erosion and sedimentation control barriers

M. HEALTH AND SAFETY

M.1 Electric and Magnetic Fields

Electric fields (“EF”) are produced within the surrounding area of a conducting object (e.g., a wire) when a voltage is applied to it. Electric fields are measured in units of kilovolts per meter (“kV/m”). The level of an electric field near to an energized power line depends on the applied voltage, the distance between the conductors, and the distance to the measurement location.

Magnetic fields (“MF”) are produced within the surrounding area of a conductor or device which is carrying an electric current. Magnetic fields are measured in units of milliGauss (“mG”). The level of a magnetic field near to line conductors carrying current depends on the magnitude of the current, the distance between conductors, and the distance from the conductors to the measurement location.

Both electric and magnetic fields decrease rapidly as the distance from the source increases, and even more rapidly from electric equipment in comparison to line conductors. Electric fields are further weakened by obstructions such as trees and building walls, while magnetic fields pass through most obstructions. In the case of parallel lines of circuit conductors, the levels of EF and MF are also dependent on the phasing of the circuits.

The highest levels of electric and magnetic fields around the perimeter fence of a substation typically occur where transmission and distribution lines cross over or under the substation boundary. The levels of fields from substation equipment decrease rapidly with distance, reaching very low levels at relatively short distances beyond the fenced-in equipment. Substation-caused magnetic fields off the property of a substation will commonly range from

less than 1 mG up to 4 mG, the same range as the background magnetic field levels found in homes.

Pre-Project Magnetic Fields at the Boundaries of the Property

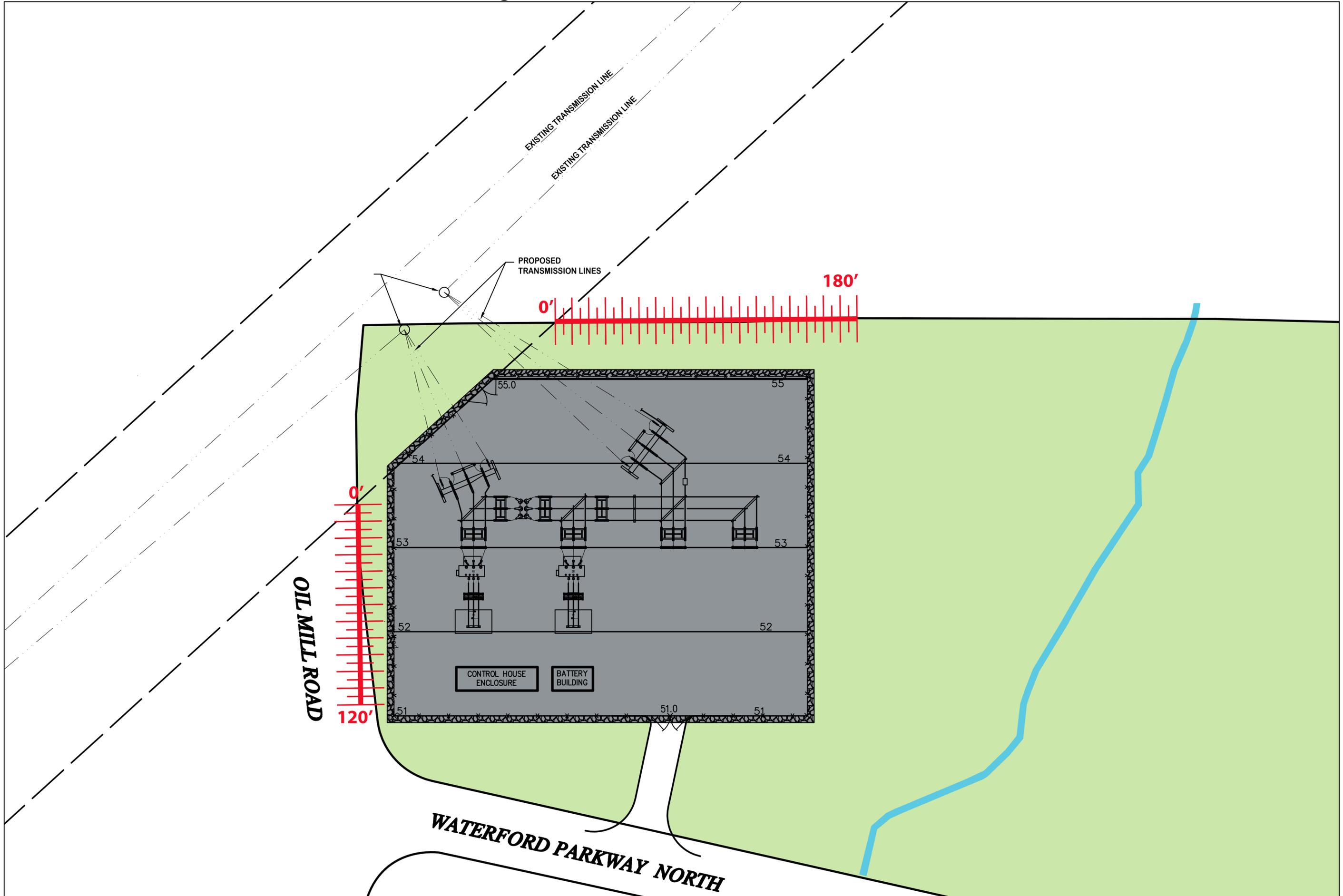
At and beyond the boundaries of the Property, the main source of existing power-frequency electric and magnetic fields (“EMF”) is CL&P’s double-circuit transmission line (115-kV circuits 1500 and 1605). One existing line of steel-monopole transmission structures supports the two transmission circuits. The transmission line crosses the northwest corner of the Property. Other nearby sources of EMF are a three-phase 23-kV distribution line on the south side of Waterford Parkway North, and a single-phase branch of this 23-kV distribution line criss-crossing Oil Mill Road to the west of the Property. These existing distribution lines are nearest to the south and west property lines.

The highest levels of MF along the boundaries of the Property will be found where a property line passes under the existing power lines, in this case, where the transmission line crosses the northwest corner of the Property. Because magnetic field levels drop off rapidly with distance from a source, the levels of MF at all property-line points further to the side of these transmission circuits will be much lower than the levels found beneath the circuits. Along the south and west property lines, very low background levels of MF may also be produced by the nearby distribution lines. The single-phase line along Oil Mill Road carries low current, and the three-phase line along Waterford Parkway North is on the opposite side of the road from the south property line.

Calculations of pre-project, ground-level magnetic fields produced by the existing transmission circuits were made along the two profile paths shown on Figure M-1, specifically along sections of the west property line and the north property line, each beginning at the south edge of the transmission line right-of-way. Per standard practice, these calculations assumed balanced three-phase currents in the two transmission circuits, equal phase angles and predominant directions for the transmission circuit currents, existing circuit phasings, level terrain, and line conductor heights above grade which are typical for the locations modeled. The existing 23-kV distribution lines were ignored in these calculations because they make minimal contributions on the Property, including the north and west property lines.

These pre-project MF calculations were made using projected levels of future currents in the two transmission circuits. For this purpose, projected peak transmission circuit currents in the year 2015 were estimated by system power-flow model simulations. Other assumptions used in the system power-flow model were: ISO-NE's 90/10 forecast of system summer peak load in 2015, no transmission circuit outages, a generation and transmission system which includes all new and modified elements which have already received Council and ISO-NE approvals and which have projected in-service dates before 2015, and a reasonably expected generation dispatch and Connecticut import level for a peak-load day with some large generators unavailable for service. Without the Substation Project, the projected peak currents in 2015 are 225 amperes in each circuit.

Figure M-1 Locations of EMF Calculations



Magnetic fields were calculated using these peak line currents, and then using 65% of these peak circuit currents as estimated average circuit currents during the peak day in 2015. While the proposed project is a new substation and not a transmission line, these choices were made for consistency with Section IV of the Council's December 14, 2007 *Electric and Magnetic Field Best Management Practices for the Construction of Electric Transmission Lines in Connecticut*.

Project Changes Affecting Magnetic Fields on Boundaries of the Property

The project-related changes which are the primary cause of changes to the existing magnetic field levels at points on a property line of the Property are as follows:

1. physical changes will be made to the 1605 transmission line circuit to separate it from the 1500 circuit and interconnect it with the Substation;
2. the Substation and associated distribution load shifts will cause changes to the currents flowing on the 1500 and 1605 transmission circuits;
3. the phasing of the existing 1500 circuit conductors will be reversed between Cohanzie Junction and Flanders Substation;
4. a section of 23-kV bus within the Substation will be located about 60 feet from the west property line; and
5. four new underground 23-kV feeder getaway cables from the Substation will cross under property lines (two on the west and two on the south) and connect to the existing distribution lines on Waterford Parkway North and Oil Mill Road at points away from the property lines.²

Post-Project Magnetic Fields on Boundaries of the Property

Calculations were made of post-project, ground-level magnetic fields produced by the transmission circuits along the two profile paths used for the pre-project calculations (see Figure M-1).

² The two underground cable feeders exiting to Oil Mill Road will continue south and rise to connect to existing overhead line sections at the intersection with Waterford Parkway South. One of the underground cable feeders exiting to the south side of Waterford Parkway North will connect to the existing overhead line while the other will rise on a pole of that line to connect to a new aerial cable to be installed along those poles.

Per standard practice, these calculations assumed balanced three-phase line currents in the transmission circuits, equal phase angles and predominant directions for the transmission circuit currents, the new 1500 circuit phasing, level terrain, and line conductor heights above grade which are typical for the locations modeled.

The calculations of magnetic fields were made assuming that these transmission circuits and the 23-kV substation bus are the only local sources of magnetic fields. Nearby overhead distribution circuits close to the property line were not included in the modeling because:

- 1) the nearest overhead sections of the new backbone 23-kV circuits are not on the same side of the street as the Substation;
- 2) lower current will flow in the existing overhead 23-kV line on Waterford Parkway North;
- 3) the new 23-kV aerial cable circuit on the south side of Waterford Parkway North will produce very low magnetic fields because the three phases are very close together;
- 4) the single-phase line on Oil Mill Road will continue to carry the same low currents; and
- 5) overhead sections of the two other new circuits do not exist on the north side of I-95.

The post-project MF calculations were made using projected levels of future currents in the two transmission circuits and the 23-kV substation bus. For this purpose, projected peak circuit currents in the year 2015, were estimated by system power-flow model simulations. Other assumptions used in the system power-flow model were: ISO-NE's 90/10 forecast of system summer peak load in 2015, no transmission circuit outages, Waterford Substation installed as proposed with anticipated load transfers from other substations, a generation and transmission system which includes all new and modified elements which have already received Council and ISO-NE approvals and which have projected in-service dates before 2015, and a reasonably expected generation dispatch and Connecticut import level for a peak-load day with some large generators unavailable for service. With the substation interconnected the projected peak circuit currents in 2015 are as follows: east of the substation

the 1605 circuit will carry 326 amperes, west of the substation this circuit (renumbered as 1617) will carry 102 amperes, and the 1500 circuit will carry a peak current of 242 amperes.

Magnetic fields were calculated using these peak line currents, and then also using 65% of these peak line currents as an estimated average circuit current during the peak day (i.e., “peak-day average load”) in 2015. While the proposed project is a new substation and not a transmission line, these choices were made for consistency with Section IV of the Council’s December 14, 2007 *Electric and Magnetic Field Best Management Practices for the Construction of Electric Transmission Lines in Connecticut*. Graphical representations of the calculation results along the property line sections shown on Figure M-1 are produced in Figures M-2 through M-5, overlaying the results for the pre-project line configuration for ease of comparison.

MF Calculation Results Summary

The highest post-project levels of MF will continue to be found near to the transmission circuits and on the property lines directly beneath where the transmission circuit conductors cross over or come closest to the property lines.

The MF levels along the west property line will be very low, and lower than for the same load conditions in the pre-project configuration. See Figures M-4 and M-5 for the results. The highest magnetic field level at any off-ROW point along the west property line, post-project, will be 3.77 mG under the modeled peak-load condition and 1.59 mG under the modeled peak-day average load condition. The comparable highest levels of off-ROW magnetic field along the west property line, but without the proposed Substation, would be 6.9 mG and 4.49 mG respectively.

Figure M-2

**MAGNETIC FIELD PROFILE ALONG A SECTION OF THE NORTH PROPERTY LINE
WITH PEAK-HOUR CIRCUIT LOADS IN 2015**

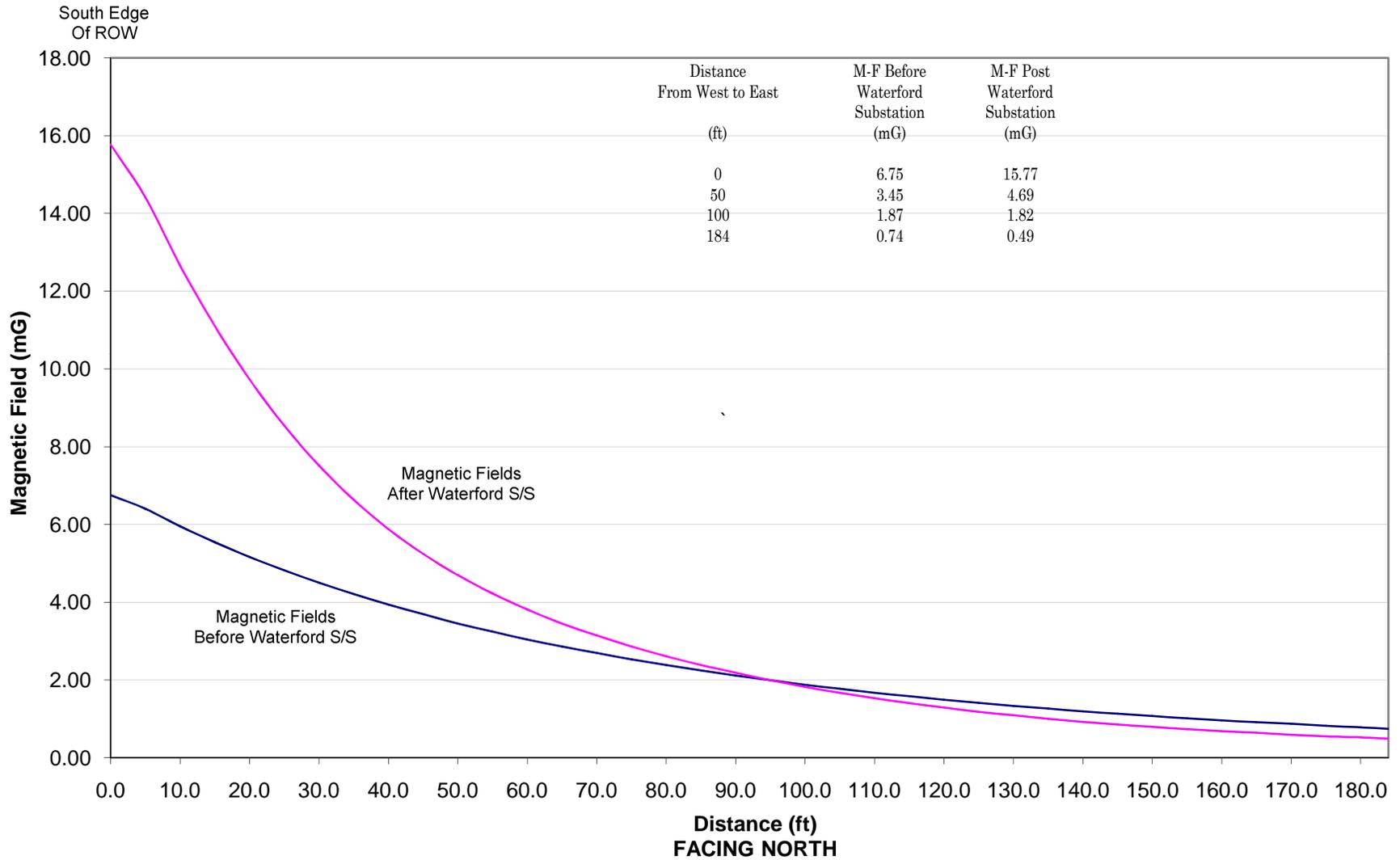


Figure M-3

**MAGNETIC FIELD PROFILE ALONG A SECTION OF THE NORTH PROPERTY LINE
WITH PEAK-DAY AVERAGE CIRCUIT LOADS IN 2015**

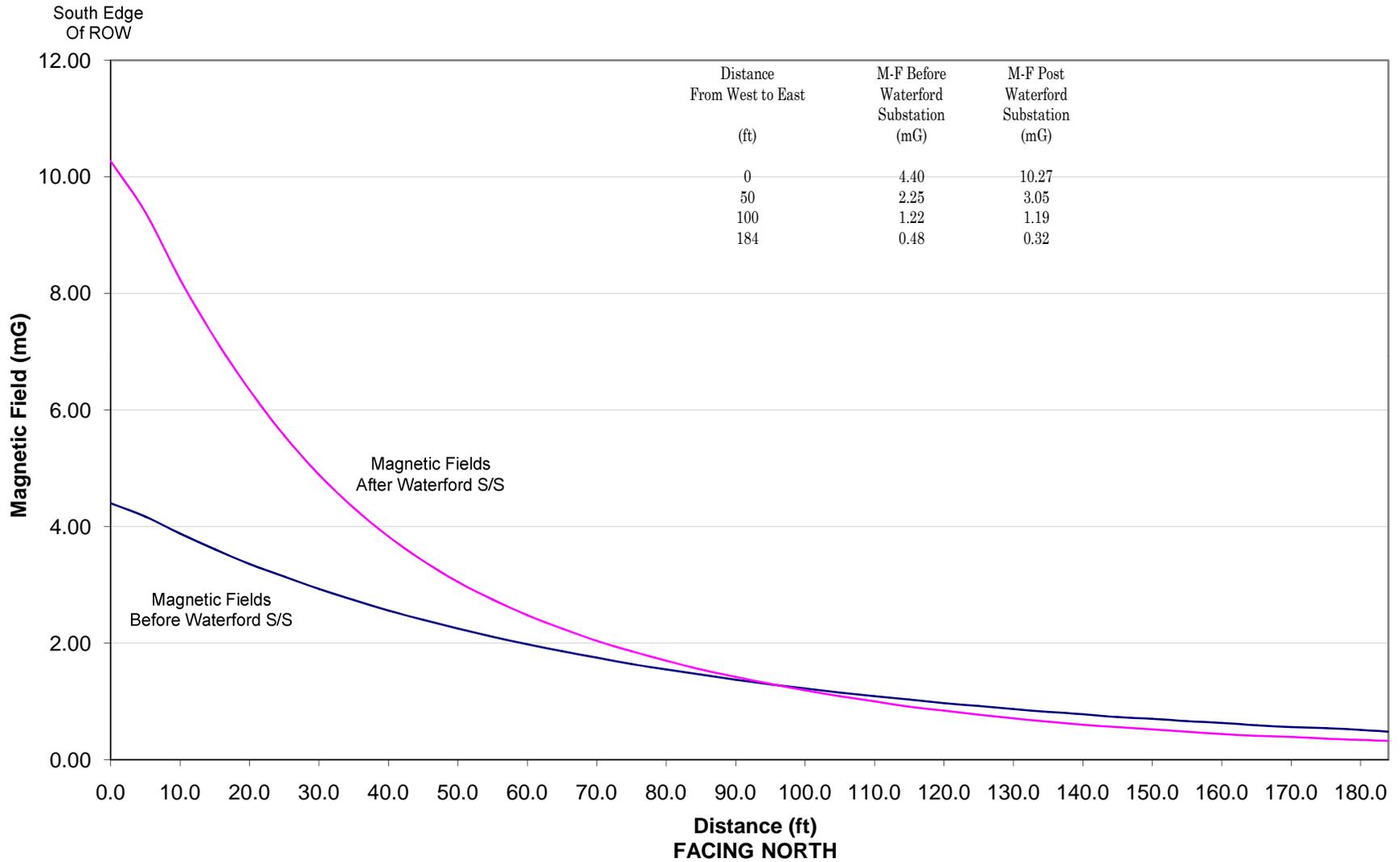


Figure M-4

**MAGNETIC FIELD PROFILE ALONG A SECTION OF THE WEST PROPERTY LINE
WITH PEAK-HOUR CIRCUIT LOADS IN 2015**

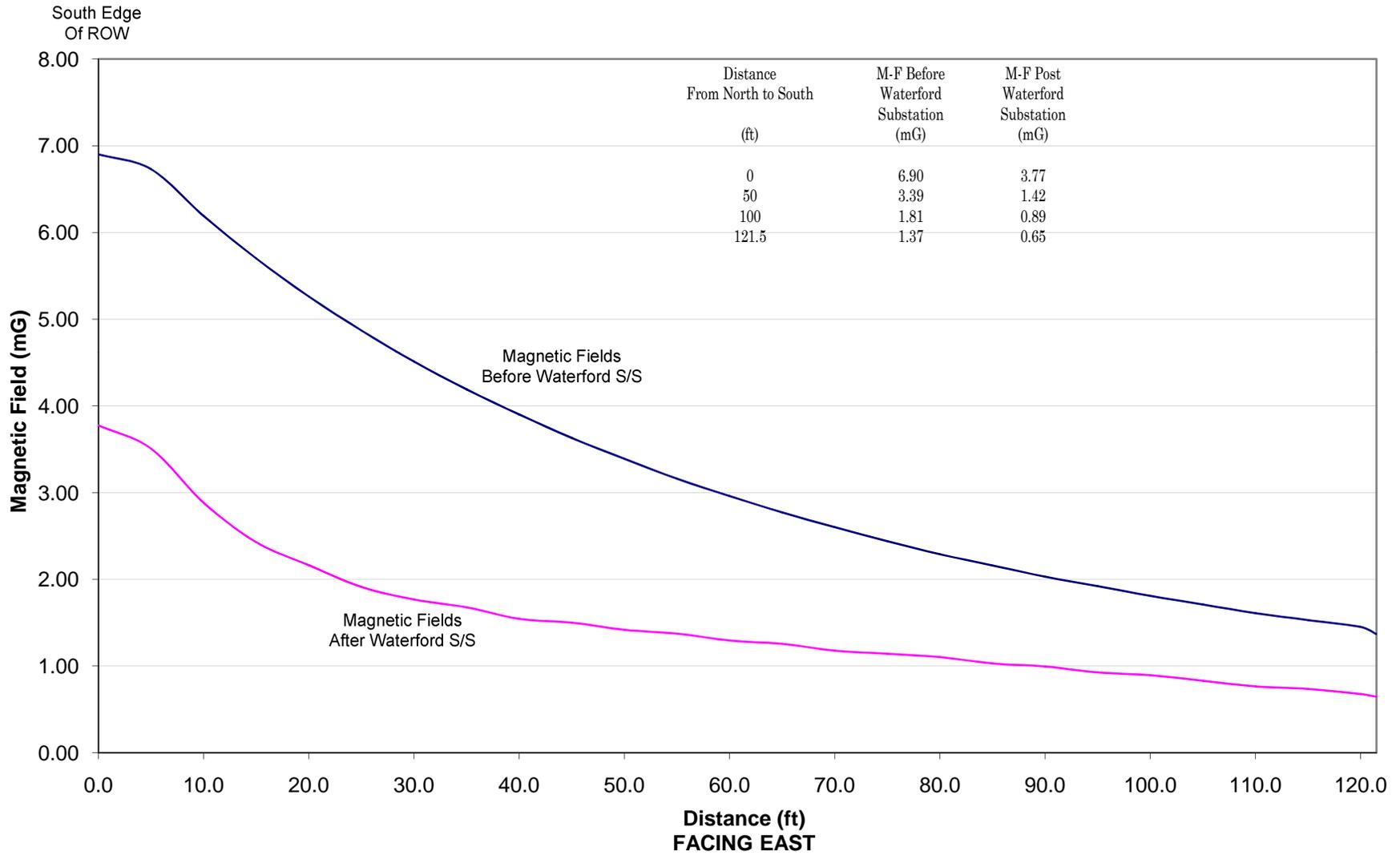
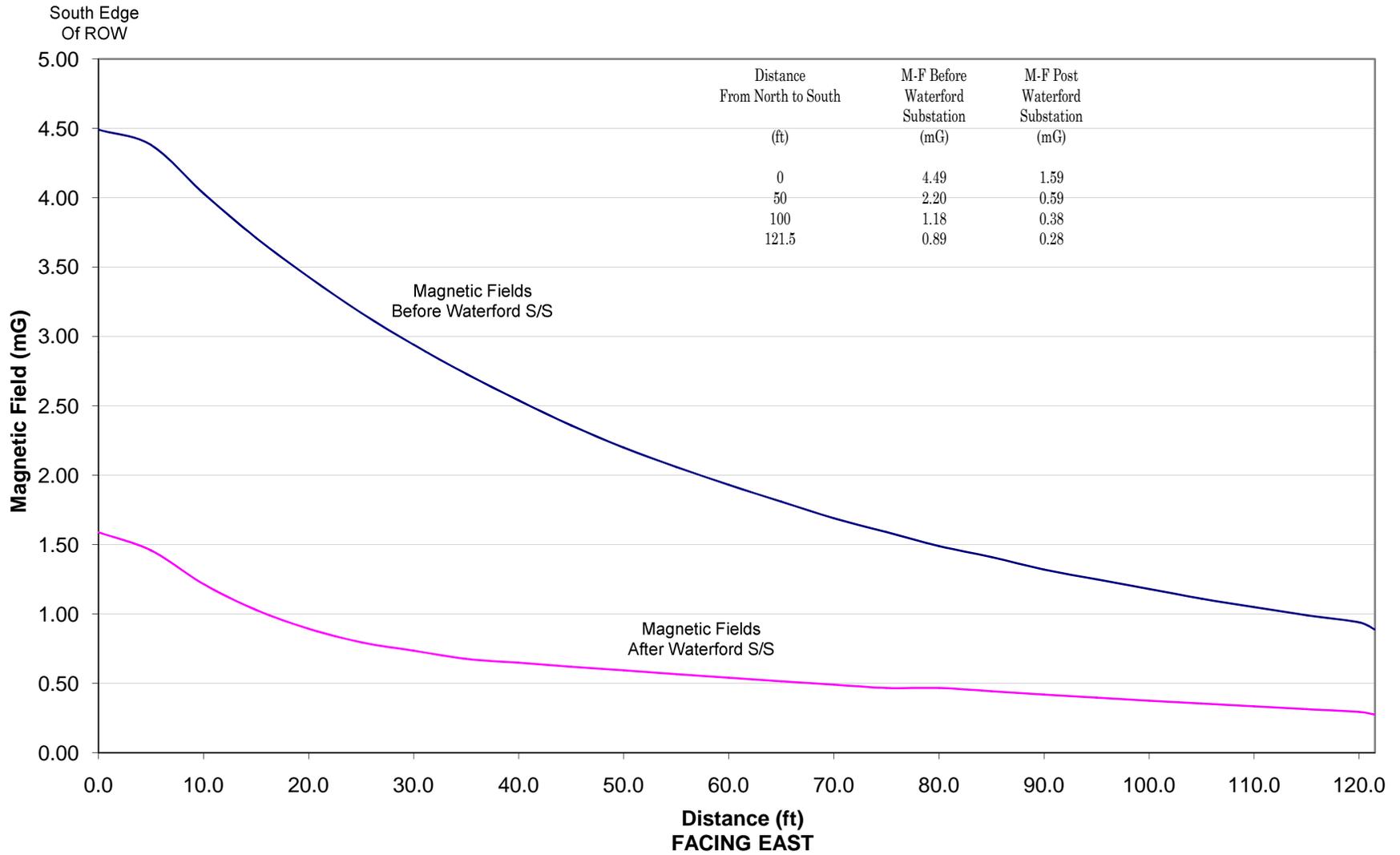


Figure M-5

**MAGNETIC FIELD PROFILE ALONG A SECTION OF THE WEST PROPERTY LINE
WITH PEAK-DAY AVERAGE CIRCUIT LOADS IN 2015**



Changed transmission circuit currents and reverse phasing of the 1500 circuit are the principal causes of the reduced MF levels along the west property line.

Along the north property line, the opposite result will occur because a new Substation entry span of the 1605 circuit crosses the north property line. Notwithstanding the reverse phasing of the 1500 circuit, increases in the nearby circuit currents and the proximity of the line-loop span combine to yield an increase in MF levels. See Figures M-2 and M-3 for the results. The highest magnetic field level at any off-ROW point along the north property line, post-project, will be 15.77 mG under the modeled peak-load condition and 10.27 mG under the modeled peak-day average load condition. The comparable highest levels of off-ROW magnetic field along the north property line, but without the proposed Substation, would be 6.75 mG and 4.40 mG respectively.

Figures M-2 through M-5 also show that MF levels drop off with distance from the transmission line sources, therefore the levels of MF at all points along a property boundary which are further away from the transmission circuits will be lower than the levels found closer to the circuits. Opposite the northeast and southwest corners of the proposed Substation fence, the peak magnetic field levels on the property line will be less than 0.7 mG.

Currents flowing on the underground distribution cables were not modeled, but such cables will produce magnetic fields up to about 20 mG, directly above them, falling off to low background levels within 50 feet of these cables. Where underground 23-kV cables cross the west property line, they will be the dominant source of magnetic fields because the transmission line and substation sources of MF are much lower in level.

Pre- and Post-Project Electric Fields at the Boundaries of the Property

The highest existing levels of electric field south of the transmission line right-of-way are less than 0.1 kV/m, due to the 115-kV circuits. The proposed Substation, which does not change the 115-kV circuit voltage, will cause no electric field increases at off-ROW points along the boundary of the Property. The highest level of electric field on the right-of-way will remain less than 1.5 kV/m.

Measurements of Magnetic Fields

Measurements of magnetic fields were taken across the transmission right-of-way and along the northerly property line of the Property on April 9, 2008. The measurement results are plotted on two attached graphs, Figures M-6 and M-7. Per an industry standard, these measurements were made at 1 meter above grade. The ROW cross-section measurements were made over a distance of 125 feet, the right-of-way width. The north property line measurement profile was made over a distance of 185 feet, beginning at the south edge of the right-of-way. The circuit currents during the time of these measurements were each around 100 amperes. The highest magnetic field levels recorded were 10.7 mG beneath the transmission line on the right-of-way and 4.7 mG at the south edge of the right-of-way.

The magnetic field measurement results in Figures M-6 and M-7 represent magnetic field levels, produced by the set of transmission line currents that existed at a specific time. During peak load periods of a year, the line currents would likely be higher than they were during the measurement period on April 8, 2007, and so magnetic field levels would also be somewhat higher. For these reasons, these measurement results should be considered only as an example of the existing conditions on and near to the Property.

Figure M-6

**MAGNETIC FIELD MEASUREMENT PROFILE CROSSING TRANSMISSION RIGHT-OF-WAY
OPPOSITE TO THE PROPOSED WATERFORD SUBSTATION**

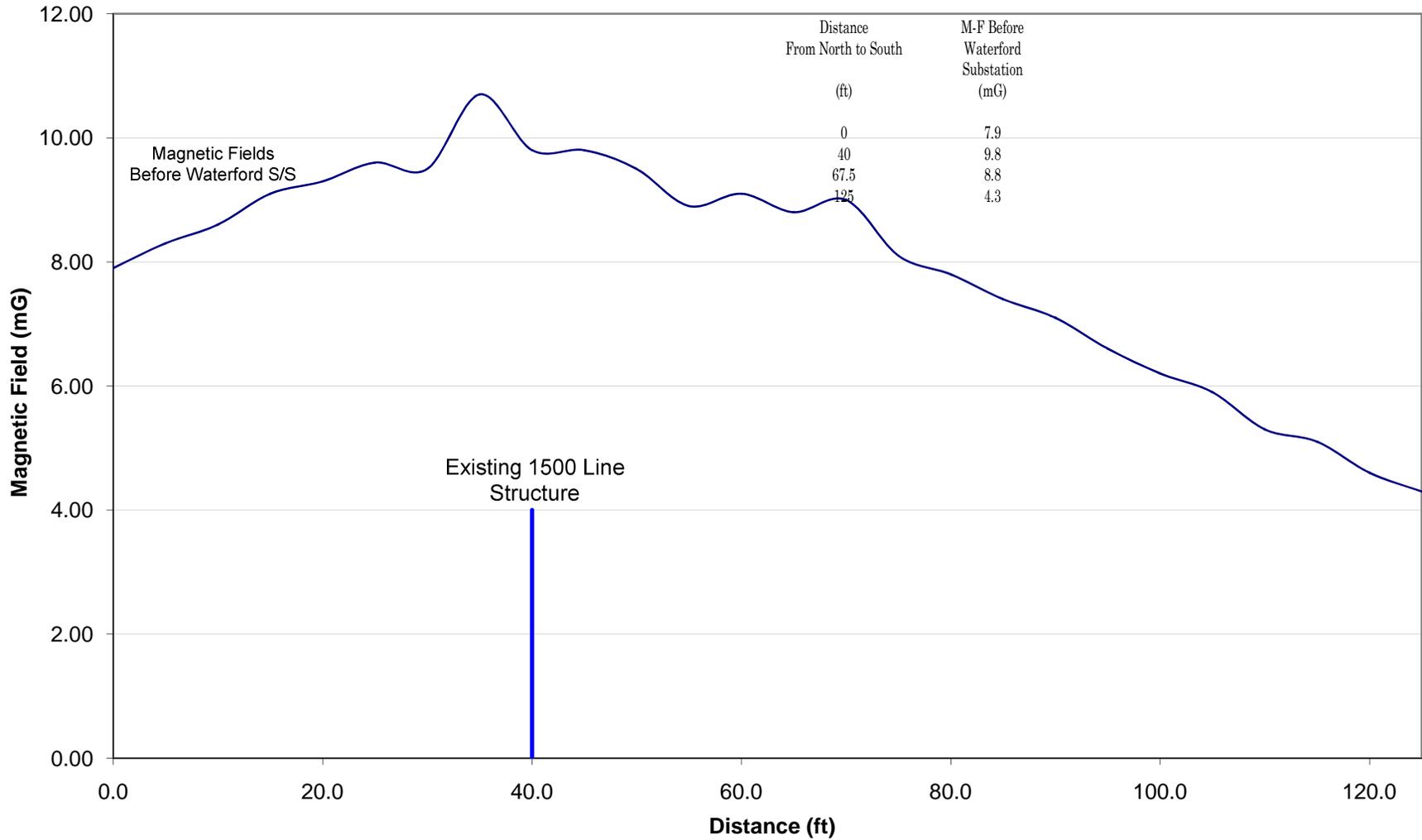
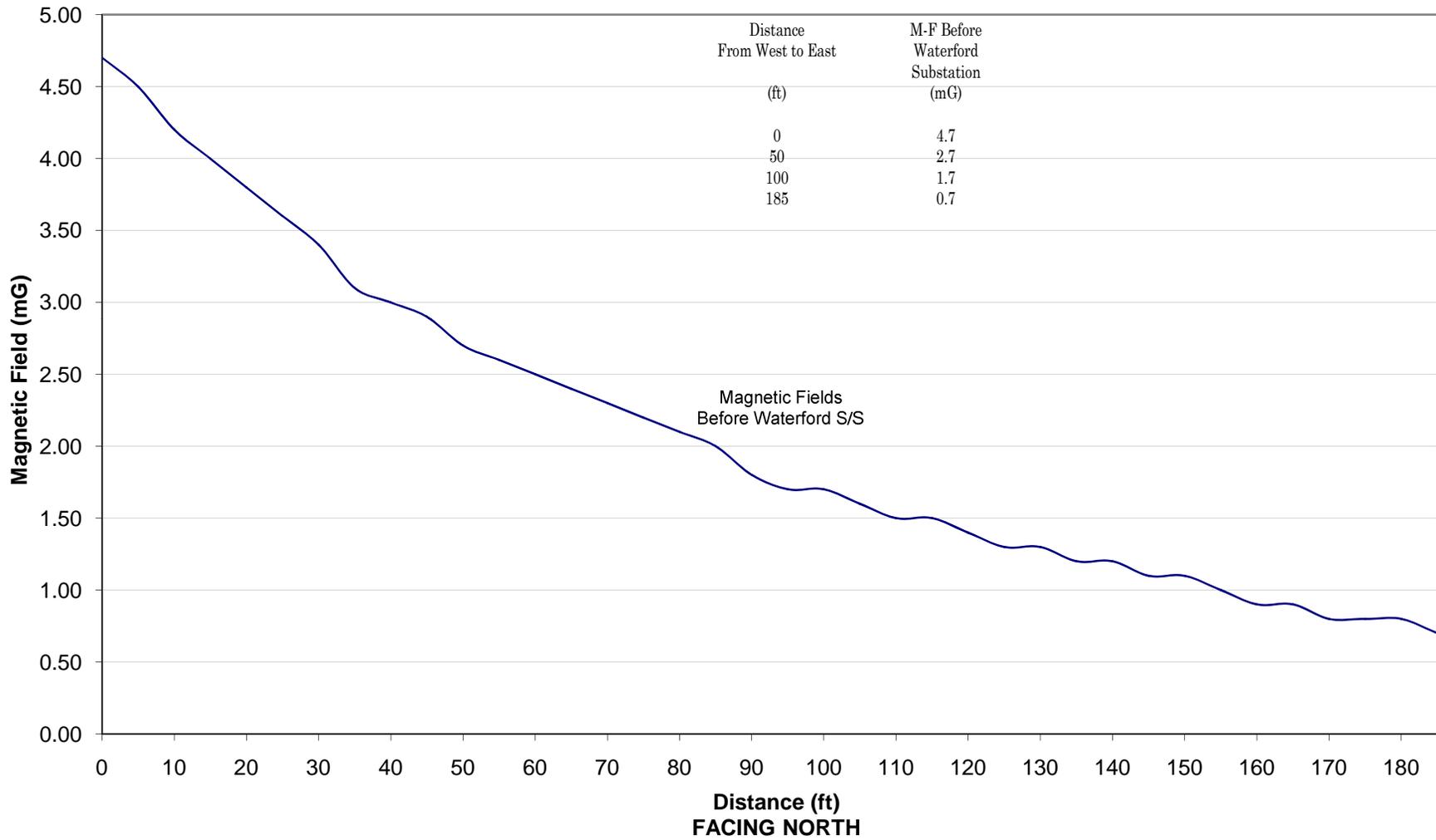


Figure M-7

MAGNETIC FIELD MEASUREMENT PROFILE ALONG THE NORTH PROPERTY LINE OF THE PROPOSED WATERFORD SUBSTATION BEGINNING AT THE EAST EDGE OF RIGHT-OF-WAY



After the circuit phasing of the 1500 circuit is reversed by the proposed Project, the cross-ROW magnetic field profile will be substantially lower such that the peak MF levels at the ROW edges between Cohanzie Junction and Flanders Substation will be less than 50% of the pre-Project levels.

Summary

Consistent with the Connecticut Siting Council's *Electric and Magnetic Field Best Management Practices for the Construction of Electric Transmission Lines in Connecticut* (dated December 14, 2007), the design of the Substation will incorporate field management practices as follows:

- the Substation has been located very close to an existing transmission line so that the length of Substation entry spans is very short;
- the phasing of one of the transmission circuits will be reversed between Cohanzie Junction and Flanders Substation to reduce the net magnetic field produced by current flows over these circuits;
- the Substation equipment has been located at a sufficient distance from property lines so that this equipment makes only a small contribution to MF levels along these property lines;
- new 23-kV distribution lines will exit the Substation underground with close circuit spacings and conductor-phase spacings; and,
- vegetation will effectively screen electric fields

There are no state or federal limits for electric or magnetic field levels at the property line of a substation. However, the Institute of Electrical and Electronic Engineers ("IEEE") and the International Commission on Non-ionizing Radiation Protection ("ICNIRP") have issued guideline limits for long-term public exposures to these fields.

These limits are:

	<u>EF (kV/m)</u>	<u>MF (mG)</u>
IEEE	5.0	9,040
ICNIRP	4.2	833

The existing and proposed levels of electric and magnetic fields at and beyond the property lines of the proposed Substation are typical for all similar Substations and will be well below these IEEE and ICNIRP limits. Based on these aforementioned guidelines and science peer group reviews of epidemiological and laboratory studies, these electric and magnetic field exposure levels will not pose an undue safety or health hazard to persons or property at or adjacent to the Substation property.

M.2 Site Security

A seven-foot-high chain link fence topped with one foot of barbed wire (three strands) would enclose the Substation yard to prevent unauthorized access. The Substation yard would also be gated and locked. All gates would be padlocked at the end of the workday during construction activities and at all times once the Substation is in service. Appropriate signage would be posted at the Substation alerting the general public of high voltage facilities located within the Substation. Should equipment experience a failure, protective relaying would immediately remove the equipment from service, thereby protecting the public and the equipment within the Substation. Other devices installed within the Substation would constantly monitor the equipment to alert CL&P of any abnormal or emergency situations.

M.3 Traffic Considerations and Hours of Operation

Construction traffic would not greatly affect local traffic because Waterford Parkway North provides direct access from I-95 southbound. Access would be gained from the proposed, at-grade driveway to be established along Waterford Parkway North. Post-construction site conditions would not substantially affect existing traffic patterns. Once construction of the Substation is complete, the facility may be remotely operated, with personnel onsite only for periodic inspections, maintenance and emergency work.

N. PROJECT SCHEDULE

Construction is expected to occur over a period of 12 to 15 months with the Substation in service by June 2010.

O. GOVERNMENT APPROVALS OBTAINED

Pursuant to Conn. Gen. Stats. § 16-50l(e), the Municipal Consultation Filing (“MCF”) was completed and delivered to the chief elected officials of the Towns of Waterford and East Lyme on April 4, 2008, beginning the 60-day (minimum) consultation process.

On many occasions over the past twelve months, CL&P has consulted with Town of Waterford officials, including the Planning Director, Thomas Wagner, regarding the electric service provided by CL&P to the Waterford community and CL&P’s desire to improve the reliability of that service. CL&P officials met with the Chief Elected Official of the Town of Waterford, First Selectman Daniel M. Steward on January 23, 2008. CL&P also contacted the Chief Elected Official of the Town of East Lyme, First Selectman Paul Formica by telephone on March 31, 2008 to discuss the Project. Mr. Formica responded in writing that he had found no indication of any adverse impact on residents of the Town of East Lyme resulting from the Project. Mr. Formica’s letter is provided in Volume II, Exhibit 7, *Government Approvals Obtained*.

CL&P filed “Location Review” submissions with the Waterford Conservation Commission on February 11, 2008 and the Planning and Zoning Commission (“P&Z”) on February 21, 2008. At its regular meeting on February 14, 2008, CL&P gave a presentation to the Conservation Commission. The Commission issued comments, which have been addressed by CL&P. CL&P similarly presented the Project to the P&Z on February 25, 2008. At its March 10, 2008 meeting, the P&Z issued its findings. Correspondence from these commissions is attached (see Volume II, Exhibit 7, *Government Approvals Obtained*).

After giving a brief presentation on April 16, 2008, CL&P also received a letter of support from the Waterford Economic Development Commission on May 1, 2008 (see Volume II, Exhibit 7, *Government Approvals Obtained*).

At the request of the Town during the MCF process, CL&P presented an overview of the Project to the Board of Selectmen and received comments and answered questions from neighbors. CL&P provided advance notice of such meeting to the neighbors by certified mail. On June 4, 2008, First Selectman Daniel Steward provided a letter to CL&P indicating that the need exists in Waterford and the selected Property appears to be the logical choice for locating the Substation. A copy of Mr. Steward's letter is provided in Volume II, Exhibit 7, *Government Approvals Obtained*.

Table O-1 summarizes the applicable approvals required for this Project.

TABLE O-1 PERMITS APPLICABLE TO THE WATERFORD SUBSTATION PROJECT				
AGENCY	PERMIT	DATE SUBMITTED	DATE RECEIVED	LOCATION
Connecticut Siting Council	Certificate of Environmental Compatibility and Public Need under Connecticut General Statutes Section 16-50l(a)(1)	June 6, 2008		
Connecticut Natural Diversity Data Base	T&E clearance under state Endangered Species Act (Connecticut General Statutes Sec. 26-303 to Sec. 26-315)	Consultation initiated on January 15, 2008	January 28, 2008	CSC Application Volume II Exhibit 5, CTDEP Correspondence
Connecticut Historical Commission	Cultural Resource Consultation under Section 106 of the National Historic Preservation Act	Consultation initiated on January 15, 2008	May 13, 2008	CSC Application Volume II Exhibit 6, SHPO Determination Letter
Towns of Waterford and East Lyme	Municipal Consultation Filing under Connecticut General Statutes Section 16-50l(e)	April 4, 2008	60-day period ended June 3, 2008	CSC Application Bulk Filing #1
Town of Waterford Conservation Commission	Location Review Application under Connecticut General Statutes Section 16-50 x(d)	February 11, 2008	February 15, 2008	CSC Application Bulk Filing #1
Town of Waterford Planning and Zoning Commission	Location Review Application under Connecticut General Statutes Section 16-50 x(d)	February 21, 2008	March 10, 2008	CSC Application Bulk Filing #1

P. BULK FILING OF MUNICIPAL DOCUMENTS

A bulk filing of municipal regulations and documents that were submitted to the Town of Waterford is being provided solely to the Council under a separate attachment, as part of this Application, including the below referenced applications submitted by CL&P and applicable local regulations, respectively:

- Application to the Town of Waterford Conservation Commission pursuant to Conn. Gen. Stats. § 16-50x(d) Location Review;
- Application to the Town of Waterford Planning and Zoning Commission pursuant to Conn. Gen. Stats. § 16-50x(d) Location Review;
- Inland Wetlands and Watercourses Regulations of the Town of Waterford;
- Town of Waterford, Connecticut Zoning Regulations;
- Waterford Plan of Conservation and Development; and,
- Municipal Consultation Filing (also filed with the Town of East Lyme)

Q. ADMINISTRATIVE NOTICE, PUBLIC AND ABUTTERS NOTICE, SERVICE AND OTHER FILING REQUIREMENTS

As requested by the CSC, CL&P is furnishing to the CSC one original and 20 copies of the Application, as well as an electronic version of the Application.

This Application is presented based on the CSC's June 2007 *Application Guide for Electric Substation Facility* to assist applicants in filing for a Certificate from the CSC for the construction of an electric substation as defined in Conn. Gen. Stat. § 16-50i (a) (4).

CL&P also consulted CGS §§ 16-50g through 16-50aa and Sections 16-50j-1 through 16-50z-4 of the Regulations of Connecticut State Agencies in preparing this Application.

Q.1 Administrative Notice

CL&P requests administrative notice of the following CSC docket records, generic hearings or statements prepared by the CSC as a result of generic hearings, and other pertinent documents. We would suggest the following documents be included.

- *Energy Plan for Connecticut Prepared by the Connecticut Energy Advisory Board, Connecticut Energy Advisory Board, February 6, 2007*
- *An Assessment and Report of Distributed Generation Opportunities in Southwest Connecticut, Institute for Sustainable Energy at Eastern Connecticut State University with assistance from XENERGY, January 14, 2003*
- *Distributed Generation Market Potential: 2004 Update/Connecticut and Southwest Connecticut, Institute for Sustainable Energy at Eastern Connecticut State University with assistance from XENERGY, March 15, 2004*
- *Connecticut Department of Public Utility Control, Docket 05-07-17RE01, DPUC Review of the Development of a Program to Provide Monetary Grants for Capital Costs of Customer-Side Distributed Resources, final decision dated September 25, 2007*
- *Connecticut Siting Council Review of the Connecticut Electric Utilities Ten-Year Forecast of Loads and Resources, 2005, 2006, 2007, and 2008*
- *Connecticut Guidelines for Soil Erosion and Sediment Control 2002*

- *Conservation and Development Policies Plan for Connecticut 2005-2010, adopted by the Connecticut General Assembly, 2006. <http://www.opm.state.ct.us/igp/cdplan/cdplan2.htm>*
- *Connecticut General Statutes Section 16-243 and Sections 16-11-134, and 135 of the Regulations of Connecticut State Agencies (and by reference, the National Electrical Safety Code ANSI C2, 2007 Edition)*
- *National Electrical Safety Code, ANSI C2-2007, August 1, 2006*
- *IEEE Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields From AC Power Lines, IEEE Std 644-1994, December 13, 1994*
- *IEEE Guide for the Design, Construction, and Operation of Electric Power Substations for Community Acceptance and Environmental Compatibility, IEEE Std 1127-1998 (R2004), March 2004. (Revision of IEEE Std 1127-1990)*
- *Electrical Safety Code ANSI C2, 2002 Edition) Current Status of Scientific Research, Consensus, and Regulation Regarding Potential Health Effects of Power-Line Electric and Magnetic Fields (EMF), January 2006*
- *Connecticut Siting Council's Electric and Magnetic Field Best Management Practices for the Construction of Electric Transmission Lines in Connecticut, December 14, 2007*
- *Interagency Task Force Studying Electric and Magnetic Fields, Connecticut 1998 Report on Task Force Activities to Evaluate Health Effects from Electric and Magnetic Fields, January 1998*
- *NIEHS Report to Congress on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields, 1999*
- *EMF, Electric and Magnetic Fields Associated with the Use of Electric Power, Questions and Answers, NIEHS, 2002*
- *Research on Power-Frequency Fields, National Research Council, 1999*
- *Review of the Scientific Evidence for Limiting Exposure to EMF, National Radiation Protection Board, 2004*

Q.2 Pre-Application Process (Conn. Gen. Stat. § 16-50l(e))

CL&P met with representatives of the Town of Waterford on several occasions prior to distribution of the MCF. On April 4, 2008, the MCF was distributed to the CEO, Town

Manager and the Town Librarian, thereby commencing the formal municipal consultation period. CL&P also discussed the Project with the CEO of the Town of East Lyme. Copies of the MCF were also distributed to the Town of East Lyme's CEO and Librarian. During this time, CL&P sought input from the public and local government representatives. On June 3, 2008, CL&P met with the Waterford Board of Selectmen to discuss the Project.

Q.3 Application Filing Fees (Conn. Gen. Stat. § 16-50v-1a)

The filing fee for this application is determined by the following schedule:

<u>Estimated Construction Cost</u>	<u>Fee</u>
Up to \$5,000,000	0.05% or \$1,000.00, whichever is greater
Above \$5,000,000	0.1% or \$25,000.00, whichever is less

Based on this schedule and the estimated construction cost for the Project presented in Section F, a check for the filing fee in the amount of \$13,200.00 payable to the CSC accompanies this Application. CL&P understands that additional assessments may be made for expenses in excess of the filing fee, and that fees in excess of the CSC's actual costs will be refunded to CL&P.

Pursuant to Conn. Gen Stat. § 16-50l(a)(1), CL&P also encloses a separate check in the amount of \$25,000 payable to the CSC for the municipal participation fee.

Q.4 Proof of Service (Conn. Gen. Stat. § 16-50l(b))

This Application was served on the following:

- A. The chief elected official/chief executive officer, and where applicable, the zoning commission, planning commission, the planning and zoning commissions, and the conservation and wetlands commissions of the site municipality and any adjoining municipality having a boundary not more than 2,500 feet from the facility;
- B. The regional planning agency;

- C. The State Attorney General;
- D. Each member of the Legislature in whose district the facility is proposed;
- E. Any federal agency which has jurisdiction over the proposed facility; and,
- F. The State Departments of Agriculture, Environmental Protection, Public Health, Public Utility Control, Economic and Community Development, and Transportation; the Council on Environmental Quality; and the Office of Policy and Management.

The names of governmental officials and agencies on which a copy of the Application is being served (the “Proof of Service”) are provided in Volume II, Exhibit 8 (*Affidavit and Service List*). An Affidavit regarding Proof of Service is also provided in this Exhibit.

Q.5 Public Notices (Conn. Gen. Stat. § 16-50I(b))

Notice of the Application (the “Notice”) was published at least twice prior to the filing of the Application in a newspaper having general circulation in the site municipality. The Notice included the name of the applicant, the date of filing and a summary of the Application. The Notice was published in not less than ten point type and run in the following newspaper:

- New London Day on May 22, and 29, 2008

A copy of the Notice is provided in Volume II, Exhibit 9 (*Public Notice*).

Q.6 Notice to Owners of Property Abutting Substation Site

Notice of the proposed Waterford Substation Project was provided to abutters of the Property. Notification to the abutters was provided via certified mail, return receipt requested.

An Affidavit regarding the notice provided to owners of property abutting and nearby the proposed Substation is provided in Volume II, Exhibit 10 (*Affidavit of Notice to Abutting Landowners*). A *List of Abutting and Nearby Property Owners of Land of CL&P* is also provided in Volume II, Exhibit 10.

R. OTHER RELEVANT INFORMATION

This Project was identified in the *Connecticut Siting Council Review of the Connecticut Electrical Utilities Ten-Year Forecast of Loads and Resources*, published in 2005, 2006, and again in 2007. CL&P received ISO-NE approval per *Section I.3.9 of the ISO New England Inc. Transmission, Markets and Service Tariff for the Waterford Substation* for the proposed Project plan (see letter dated January 11, 2008 in Volume II, Exhibit 11, *Other Relevant Information*).

R.1 Public Outreach

On the morning of March 25, 2008 beginning at approximately 9:00 am, CL&P representatives conducted a door-to-door public outreach program by visiting 15 neighboring homes located at properties along Oil Mill Road (numbers 71 through 109). The purpose of this activity was to inform residents of the upcoming Project, its associated permitting process and a preliminary schedule of events. The CL&P representatives spoke directly with five property owners and offered them an overview of the project, answered preliminary questions, and provided them with project information and a point of contact should they have additional questions. For those neighbors not at home that day, Project and contact information was left on their door in mail hanger packages.

The five property owners included residents at 71 Oil Mill Road, 74 Oil Mill Road, 82 Oil Mill Road, 88 Oil Mill Road and 109 Oil Mill Road.

Mr. Jack Lane of 71 Oil Mill Road, who has a CL&P ROW extending through his property, asked about the height of the proposed poles and equipment, compensation for removed trees from the property and whether a diesel generator would be installed. CL&P representatives indicated the poles would be similar in height to existing poles, and no diesel

generators were to be installed. Mr. Lane indicated there may have been a historical burial mound on the property. However, no evidence was found to substantiate his claim. The four remaining neighbors (at 74, 82, 88 and 109 Oil Mill Road) were briefed and had no additional questions at the time.

Following the direct public outreach, phone calls were placed in the evening of March 25, 2008 by CL&P representatives to attempt to reach residents who were unavailable during the day. A message was left on the answering machines at 92 Oil Mill Road, 103 Oil Mill Road and 106 Oil Mill Road with CL&P contact information. Mr. John DeWolf of 97 Oil Mill Road, Mr. George Mees of 104 Oil Mill Road, and Mr. Rich Brouwer of 103 Oil Mill Road were reached via telephone at home. Mr. DeWolf asked for information regarding the placement of the entry to the Property from Waterford Parkway North. Both Mr. Mees and Mr. Brouwer indicated no concerns and did not have additional questions.

Three more phone calls were placed on March 26, 2008. These calls were placed to Ms. Amy Campbell of 87 Oil Mill Road, Mr. Michael Saunders of 74 Oil Mill Road and Mr. Bruce Karr of 91 Oil Mill Road. The person who answered the phone at the Karr residence confirmed Mr. Karr had received the information left by CL&P. Mr. Saunders indicated his preference for an industrial site for the substation. CL&P representatives explained the need for the Project to be close to existing overhead lines. Ms. Amy Campbell had several questions and concerns about the Project, including noise, EMF, and impacts on wildlife and property values. She was aware of the ROW that extends through her property and also inquired about her recourse and requested she be informed when the MCF was filed.

In addition to the above-named residents, the West Farms Land Trust (owner of the neighboring property to the west, across Oil Mill Road) was contacted on March 25, 2008 via

telephone. The representative for the Trust, Mr. Rob Schacht, questioned the impact of water quality for the Oil Mill Brook, the presence of PCBs in oil contained in the transformers and spill containment. CL&P representatives discussed the use of mineral oil and containment systems for the transformers. Based on these considerations and the Property's topography with respect to the brook, Mr. Schacht was informed that equipment associated with the Substation would not pose a threat to the brook.

Follow up letters were sent to Mr. Lane, Ms. Campbell and Mr. Schacht on April 2, 2008 to provide additional information brought up during previous conversations. CL&P sent additional letters to Ms. Campbell on April 7, 2008 informing her of the MCF filing and April 25, 2008 with additional information, including a copy of the MCF. Ms. Campbell submitted additional correspondence to CL&P at the June 3, 2008 Waterford Board of Selectmen. CL&P provided its preliminary response to issues raised by Ms. Campbell on June 4, 2008. CL&P also sent an additional letter to Mr. Lane on May 22, 2008 informing him of surveying activities within the ROW located on his property.

A listing of those residents and abutting land owners provided copies of the public outreach documents, the information contained in the door hangers and correspondence with residents are included in Volume II, Exhibit 11, *Other Relevant Information*.

R.2 Exemption from CEAB RFP Process

Pursuant to Conn. Gen. Stats. § 16-50l (a) (2), as an electric substation designed to change or regulate voltage of electricity greater than 69kV, this project is exempt from the request for proposal process of the Connecticut Energy Advisory Board ("CEAB"). At the request of the CEAB, CL&P furnished to the CEAB a copy of the municipal consultation filing cover letter on April 4, 2008, and the legal notice for this Application on June 6, 2008.

GENERAL GLOSSARY OF TERMS

(Not all terms are used in this document)

115-kV: 115 kilovolts or 115,000 volts.

345-kV: 345 kilovolts or 345,000 volts.

AC: (alternating current)

An electric current which reverses its direction of flow periodically. (In the United States this occurs 60 times a second-60 cycles or 60 Hertz.) This is the type of current supplied to homes and business.

A-frame Structure: A steel structure constructed of two A-shaped uprights with horizontal cross-members and bracings.

Autotransformer: A single winding step-down transformer (see Transformer).

Ampere (Amp): A unit measure for the flow (current) of electricity. A typical home service capability (i.e., size) is 100 amps; 200 amps are required for homes with electric heat.

Arrester: Protects lines, transformers and equipment from lightning and other voltage surges by carrying the charge to ground. Arresters serve the same purpose on a line as a safety valve on a steam boiler.

Bundle: (circuit) Two or more parallel 3-conductor circuits joined together to operate as one single circuit.

Bundle: (conductor) Two or more phase conductors or cables joined together to operate as a single phase.

Bus: A conductor capable of carrying large amounts of current in a substation.

Cable: A fully insulated conductor usually installed underground but in some circumstances can be installed overhead.

CTDEP: Connecticut Department of Environmental Protection.

CELT: NEPOOL, Annual Capacity, Energy, Load and Transmission report.

CGS: Connecticut General Statutes.

Circuit: A system of conductors (three conductors or three bundles of conductors) through which an electrical current is intended to flow and which may be supported above ground by transmission structures or placed underground.

Circuit Breaker:	A switch that automatically disconnects power to the circuit in the event of a fault condition. Located in substations, this switch performs the same function as a circuit breaker in a home.
CHP:	Combined heat power
CL&P:	The Connecticut Light & Power Company.
CMEEC:	Connecticut Municipal Electric Energy Cooperative, Inc.
Conductor:	A metallic wire, busbar, rod, tube or cable which serves as a path for electric flow.
Conduit:	Pipes, usually PVC plastic, typically encased in concrete, for underground power cables.
Conversion:	Change made to an existing transmission line for use at a higher voltage, sometimes requiring the installation of more insulators. (Lines are sometimes pre-built for future operation at the higher voltage.)
CSC:	Connecticut Siting Council; the Council.
CONVEX:	Connecticut Valley Exchange.
dBA:	Decibel, on the A-weighted scale.
DC:	Direct current; electricity that flows continuously in one direction. A battery produces DC power.
Demand:	The total amount of electricity required at any given time by an electric supplier's customers.
Distribution:	Line, system; the facilities that transport electrical energy from the transmission system to the customer.
DG:	Distributed generation
D&M Plan:	Development & Management Plan.
DPUC:	(Connecticut) Department of Public Utility Control.
Duct:	Pipe or tubular runway for underground power cables (see also Conduit).
Duct Bank:	A group of ducts or conduit usually encased in concrete in a trench.

Electric Field:	Result of voltages applied to electrical conductors and equipment.
Electric Transmission:	The facilities (69-kV+) that transport electrical energy from generating plants to distribution substations.
EMF:	Electric and magnetic fields.
Fault:	A failure or interruption in an electrical circuit (short circuit).
FEMA:	Federal Emergency Management Agency.
Fiber Optic Shield Wire (FOSW):	See Lightning Shield Wire
G:	Gauss; 1G = 1000 mG (milligauss); the unit of measure for magnetic fields.
GIS:	Gas insulated substation using sulfur hexafluoride (SF ₆).
Glacial till:	These deposits are predominantly nonsorted, nonstratified sediment and are deposited directly by glaciers. These deposits consist of boulders, gravel, sand silt, and clay mixed in various proportions.
Gneiss:	Light and dark, medium- to coarse-grained metamorphic rock characterized by compositional banding of light and dark minerals, typically composed of quartz, feldspar and various amount of dark minerals.
Granofels:	Light to dark, medium- to coarse-grained, massively to poorly layered metamorphic rock composed primarily of quartz and feldspar; lacking the compositional banding of gneiss.
Ground Wire:	Cable/wire used to connect wires and metallic structure parts to the earth. Sometimes used to describe the lightning shield wire.
H-frame Structure:	A wood or steel structure constructed of two upright poles with a horizontal cross-arm and bracings.
Hz:	Hertz, a measure of frequency; one cycle/second.
ISO:	Independent System Operator.
ISO-NE:	ISO New England, Inc.; referred to as New England's Independent System Operator.
kcml:	1000 circular mils, approximately 0.0008 sq. in.

kV: kilovolt, equals 1000 volts.

kV/m: Electric field measurement (kilovolts/meter).

Lattice-type Structure:

Transmission or substation structure constructed of lightweight steel members.

Lightning Shield Wire:

Electric cable intended to prevent lightning from striking transmission circuit conductors. May contain glass fibers for communication use, “Fiber Optic Shield Wire”, or “FOSW”.

Line: A series of overhead transmission structures which support one or more circuits; or in the case of underground construction, a single electric circuit.

Load: Amount of power delivered as required at any point or points in the system. Load is created by the power demands of customers' equipment (residential, commercial, and industrial).

LOLE: Loss of Load Expectation; a measure of bulk power system reliability.

Magnetic Field: Produced by the flow of electric current; strength measured as magnetic flux density in units called gauss (G) or milligauss (mG) – 1/1000Gauss.

Magnetic Flux Density:

Strength of magnetic field

mG: milligauss (see Magnetic Field) – 1/1000Gauss.

MOD: Motor-Operated Disconnect switch.

MVA: Megavolt Ampere.

Measure of electrical capacity equal to the product of the voltage times the current. Electrical equipment capacities are sometimes stated in MVA.

MW: Megawatt. Megawatt equals 1 million watts, measure of the work electricity can do.

NDDB: Natural Diversity Data Base (CTDEP).

NEPOOL: New England Power Pool.

NERC: North American Electric Reliability Council.

NESC:	National Electrical Safety Code.
NPCC:	Northeast Power Coordinating Council.
NU:	Northeast Utilities.
OH (Overhead):	Electrical facilities installed above the surface of the earth.
Palustrine:	Marshy, wetland areas described as palustrine include marches, swamps and bogs.
Peaking Facility:	A generating station that runs when demand on the grid exceeds base load generation capacity in the region.
Phases:	Transmission (and some distribution) AC circuits are comprised of three phases that have a voltage differential between them.
PUESA:	Public Utility Environmental Standards Act.
Reinforcement:	Any of a number of approaches to improve the capacity of the transmission system, including rebuild, reconductor, conversion and bundling methods.
Rebuild:	Replacement of an existing overhead transmission line with new structures and conductors generally along the same route as the replaced line.
Reconductor:	Replacement of existing conductors with new conductors, but with little if any replacement or modification of existing structures.
Right of way:	ROW; corridor.
Riprap:	A permanent erosion-resistant ground cover of large, loose, angular stone with filter fabric or granular underlining used to protect soil from the erosion fences of concentrated runoff.
RTEP:	Regional Transmission Expansion Plan prepared by ISO-NE.
SCADA:	System Control and Data Acquisition system – A system installed at the substation which allows control and monitoring from a remote location.
Schist:	Light, silvery to dark, coarse- to very coarse-grained, strongly to very strongly layered metamorphic rock whose layering is typically defined by parallel alignment of micas. Primarily composed of mica, quartz and feldspar; occasionally spotted with conspicuous garnets.

- SF₆:** Sulfur hexafluoride, an insulating gas used in GIS substations and circuit breakers.
- Shield Wire:** See Lightning Shield Wire.
- SHPO:** State Historic Preservation Office (State of Connecticut Commission on Culture and Tourism, Historic Preservation and Museum Division).
- Statutory Facilities:** Environmental, ecological, scenic, historic, recreational or other resources identified by the Connecticut Siting Council in its *Electric Substation Facility Application Guidelines, section VII, items H and K (CGS Section 16-501 (a) (1))*.
- Substation:** A fenced-in yard containing switches, transformers, line terminal structures, and other equipment enclosures and structures. Adjustments of voltage, monitoring of circuits and other service functions take place in this installation.
- Switching Station:** A fenced-in yard containing switches, line terminal structures and other equipment, enclosures and structures. Switching of circuits and other service functions take place in this installation.
- Steel Lattice Tower:** See Lattice-Type Structure.
- Steel Monopole Structure:**
Transmission structure consisting of a single tubular steel column with horizontal arms to support insulators and conductors.
- Step-down Transformer:**
See Transformer.
- Step-up Transformer:**
See Transformer.
- Switchgear:** General term covering electrical switching and interrupting devices. Device used to close or open, or both, one or more electric circuits.
- Terminal Points:** The substation or switching station at which a transmission line terminates.
- Terminal Structure:** Structure typically within a substation that ends a section of transmission line.
- Terminator:** A flared pot-shaped insulated fitting used to connect underground cables to overhead lines.

- Transformer:** A device used to transform voltage levels to facilitate the efficient transfer of power from the generating plant to the customer. A step-up transformer increases the voltage while a step-down transformer decreases it.
- Transmission Line:** Any line operating at 69,000 or more volts.
- Upgrade:** See Reinforcement.
- USGS:** United States Geological Survey (U.S. Department of the Interior).
- V/m:** volts per meter; kilovolt per meter; $1000 \text{ V/m} = 1\text{-kVm}$.
- Voltage:** A measure of the push or force which transmits electricity.
- Voltage Collapse:** A condition where voltage drops to unacceptable levels.
- Watercourse:** Rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, public or private.
- Wetland:** Land, including submerged land, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial or flood plain by the U.S. Department of Agriculture, Natural Resources Conservation Service. Connecticut jurisdictional wetlands are based solely on soil type; federal jurisdictional wetlands are classified based on a combination of soil type, wetland plants, and hydrologic regime.
- Wire:** See Conductor