Environmental Report

Trumbull Substation Project

October 2005

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ENERGY WATER INFORMATION GOVERNMENT

Trumbull Substation Project

Environmental Report

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Table of Contents

Figures

Tables

Appendices

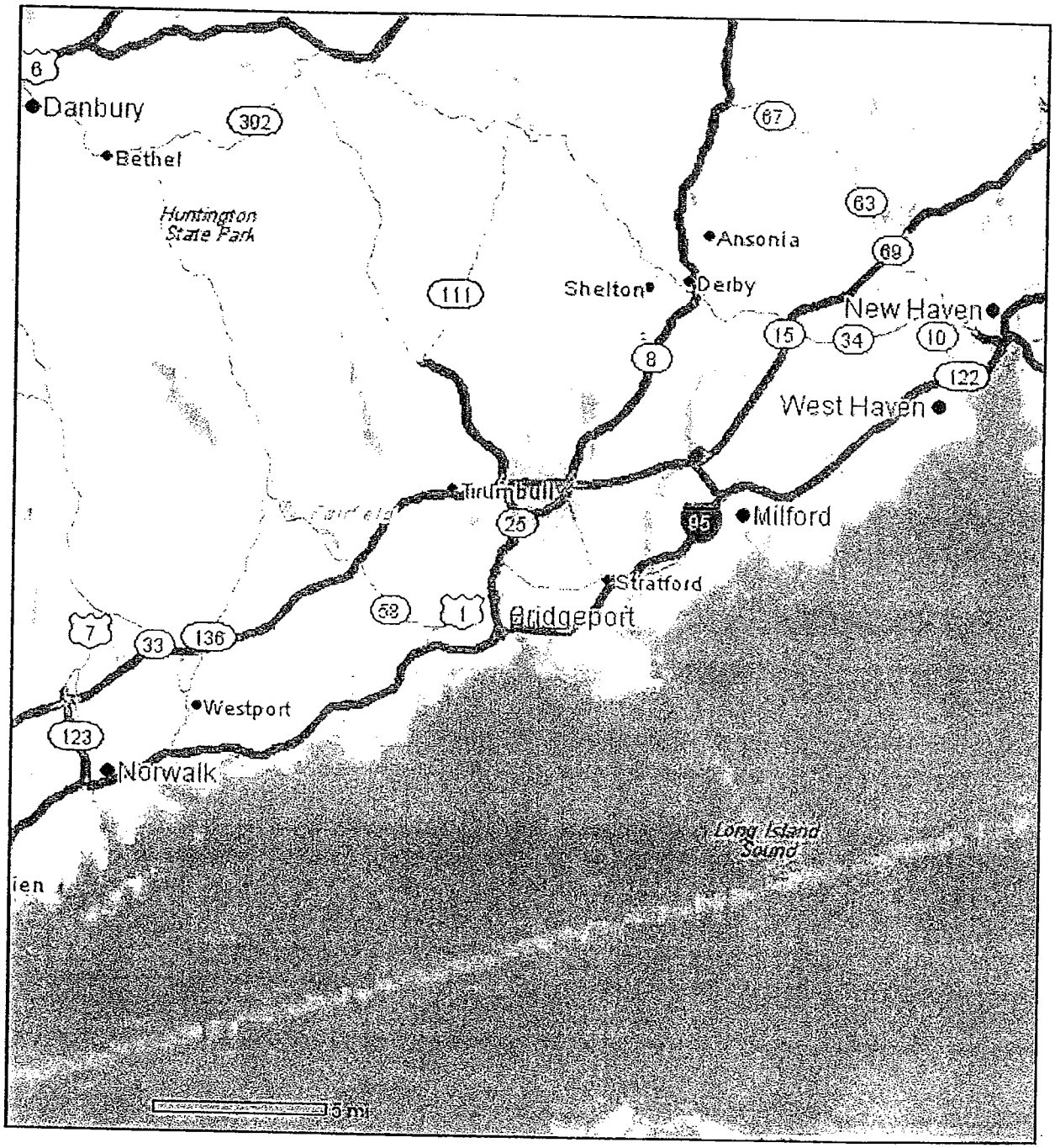
1.0 Executive Summary

The United Illuminating Company (United Illuminating or UI) of New Haven, Connecticut proposes to construct and operate a new 115,000/13,800 volt (115/13.8 kV) substation in the Town of Trumbull, Connecticut (Figure 1-1). The proposed Trumbull Substation will be located on UI property at 3-7 Wildflower Lane immediately west of the Connecticut State Route 8/Nichols Avenue (State Route 108) interchange. An existing 115 kV transmission line, UI line #1730, will be connected to the new substation. The location of this existing line will be modified to pass through the Trumbull Substation by means of three new takeoff structures, a new single pole tubular steel dead-end structure (NB 31A) located adjacent to UI's existing switch structure NB 31 to the east of the new substation, and a new single pole tubular steel dead-end structure (#833B) located adjacent to Connecticut Light & Power's (CL&P) existing structure #833A.

Based on a recent site selection study conducted by UI, nine candidate sites were evaluated on environmental, engineering and economic factors. As a result of this evaluation, Site Location 1 was selected as the preferred substation site. The site for the proposed Trumbull Substation consists of 4.85 acres of land currently owned by UI. Some years ago, UI cleared a portion of the site and used it for a line worker training area. Today, while the cleared portions of the site are now overgrown with weeds and low-growing woody vegetation, the remainder of the site continues to be mostly wooded. The actual substation site will consume approximately half of the UI property. It will be located adjacent to and immediately south of an existing CL&P double circuit 115 kV transmission line and adjacent to and immediately west of an existing UI double circuit 115 kV transmission line. The CL&P and UI 115 kV transmission lines are #1710 and #1730.

The proposed project is being developed by UI as a direct result of load growth in and around the town of Trumbull, and to relieve potential overloading conditions at UI's existing Old Town and Trap Falls Substations. Both of these existing substations are operating at or near capacity, and any overload condition would require load shedding. This could result in severe outages of varying durations for most of the town of Trumbull and surrounding areas in the cities of Bridgeport and Shelton and the town of Stratford.

The proposed substation will consist of an outdoor, air-insulated, low-profile 115 kV switchyard that will include two 24/32/40 MVA, 115/13.8 kV power transformers with load tap changers, one 15 kV distribution cable system, three 115 kV SF6 circuit breakers, vertical break disconnect switches, center break vee disconnect switches, instrument transformers, four lightning shielding masts, aluminum tubular bus work, and



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The United Illuminating Company

REGIONAL LOCATION
Figure 1-1

one control/switchgear building. Distribution lines will extend underground from the new substation along Wildflower Lane to UI's existing distribution network. Development of the Trumbull Substation will not require the acquisition of any property not currently owned by United Illuminating.

Construction of the Trumbull Substation is scheduled to commence in late 2006, with a scheduled in-service date of May 15, 2007.

Environmental effects from construction and operation of the Trumbull Substation Project are expected to be minimal. The substation will be located on property already owned by UI. A portion of the site has been cleared and was formerly used as a line worker training area. No residential, commercial, industrial, educational, governmental, institutional, or recreational land uses will be directly impacted by the substation. Likewise, no known and recorded cultural resources will be adversely impacted by construction and operation of the Trumbull Substation. The project will have no adverse impacts on water resources, other natural resources, or federal or state protected plant and animal species or their habitats.

Construction of the substation and the transmission line modification will require the removal of a small amount of woody vegetation and mature trees that are on the site. This vegetation removal is required for safe construction and reliable operation of the substation and rerouted transmission line. A vegetative buffer of mature trees will be left intact to the west and south of the site. Two residences, located on the north side of the existing CL&P transmission line right-of-way to the north of the substation, will have mostly unobstructed views of the new substation facility. Other nearby residences should have obstructed to seasonally obstructed views of portions of the substation. Due to intervening vegetation and topography, no visual impacts are anticipated to other area residents and passing motorists on Connecticut State Route 8, Huntington Turnpike and Nichols Avenue.

While the project area and the lands around the substation site are dominated by single family residential activity, the development of the substation should not preclude the development of further residential activity in the area, as the land for the project is already owned by UI and the site itself is bordered on two sides by existing transmission line rights-of-way.

2.0 Project Description

The United Illuminating Company (UI) is proposing to construct and operate a new 115,000/13,800 volt (115/13.8 kV) substation in the Town of Trumbull, Fairfield County, Connecticut. The new substation will consist of two 13.8 kV buses fed by two 24/32/40 MVA 115/13.8 kV transformers, with a firm capacity of 58 MVA. The new substation is needed to supply the growing load in and around the Town of Trumbull, and to relieve potential overloads at UI's existing Old Town Substation and Trap Falls Substation (Figure 2-1). These two substations currently supply over 95 percent of Trumbull's electric demand. As both of these substations are operating at or near capacity, any overload condition would require load shedding. Such load shedding could result in multiple hour outages for most of the Town of Trumbull, along with portions of Bridgeport, Stratford and Shelton. The proposed Trumbull 115 kV Substation would eliminate this present load/capacity reliability risk to these customers.

The site selected for the substation consists of three irregular shaped parcels at the eastern end of Wildflower Lane in Trumbull. The site's street address is 3-7 Wildflower Lane. The street is a short cul-de-sac with minimal traffic flow. The three parcels, currently owned by UI, have a total land area of 4.85 acres. The northerly portion of the substation site is bordered by the existing CL&P transmission line right-of-way. This right-of-way currently supports CL&P's existing #1710 and #1730 115 kV transmission lines on four-legged self-supporting lattice steel structures, including the transition structure to UI's existing #1710 and #1730 115 kV transmission lines. The existing CL&P right-of-way is 110 feet wide. The easterly portion of the substation site includes portions of UI's existing right-of-way for its #1710 and #1730 115 kV transmission lines. The UI right-of-way is 200 feet wide.

Existing 115 kV transmission lines will be routed through the new substation, thereby providing the substation with access to the transmission grid in southwestern Connecticut. The substation will have a 3-position ring bus that is fed by three 115 kV transmission lines. Two will enter the substation from the north (new line #1714 to Weston and existing line #1730 to Devon), and one will enter from the south (new line #1713 to Pequonnock) (Figure 2-1). While the transmission lines are the same that currently exist, they will be re-numbered after the substation is installed. Existing distribution facilities are approximately 300 feet away from the substation site at Huntington Turnpike. Interconnection to the distribution system will be made via an underground duct bank along Wildflower Lane.

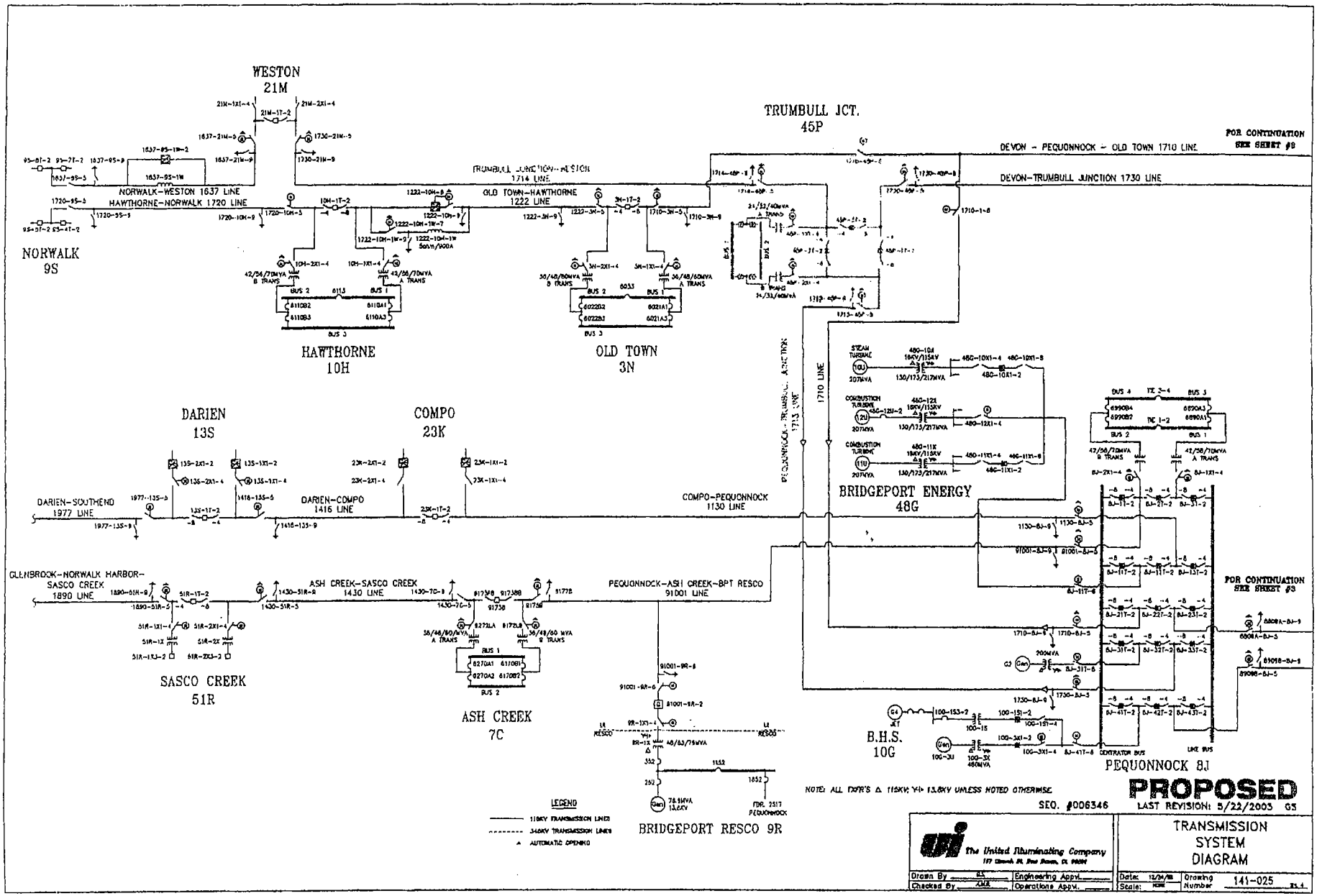


Figure 2-1
UI Transmission System Diagram

The remainder of this section will discuss in greater detail the need for the new substation, the physical design of the substation, the proposed transmission line modifications, and the anticipated construction procedures for the project.

2.1 Need

Presently, Old Town Substation, a 115/13.8 kV bulk substation located on Kaechele Place in Bridgeport, and Trap Falls Substation, a 115/13.8 kV bulk substation located on Armstrong Road in Shelton, supply over 95 percent of Trumbull's electric demand, as well as electric service to approximately 80 percent of Trumbull's customers. At the present time, there is no 115/13.8 kV substation physically located in Trumbull.

During the summer peak of 2002, Old Town Substation was operating at 97 percent of its maximum capacity and Trap Falls Substation was operating at 102 percent of its maximum capacity. Load projections, even with very little load growth, indicate that by the summer peak of 2007, the failure of a single 115/13.8 kV substation transformer at either Old Town Substation or at Trap Falls Substation, during summer peaks, will result in overloads that will require load shedding to avoid unacceptable thermal overloading and degradation of the remaining substation transformer. In addition to the Trumbull customers, several thousand customers in Bridgeport, Stratford, and Shelton are also at risk of experiencing multiple hour outages resulting from this load shedding. Construction of the proposed new substation in the geographical area of Trumbull would allow approximately 16 MVA of load to be transferred from Old Town Substation and approximately 16 MVA from Trap Falls Substation (32 MVA total). This would eliminate the existing and steadily worsening load/capacity reliability risk to customers in Trumbull, Bridgeport, Stratford, and Shelton while simultaneously providing substation capacity where it is most needed.

2.2 Proposed Substation

The proposed substation site is located at 3-7 Wildflower Lane. Most of the site is relatively flat and level with some rock outcroppings. The eastern edge of the property exhibits a gentle slope to the south. Over half of the proposed site is within the existing UI transmission line right-of-way. An existing UI switch structure for the #1710 and #1730 transmission lines is located midway along the eastern edge of the site. Ground cover under the two existing UI 115 kV transmission lines mainly consists of grasses and low brush. The western portion of the substation site was cleared by UI several years ago for line maintenance training. Several wood poles were installed and used for line

equipment maintenance access. These gates will be locked at all times, and only authorized UI personnel will have access to the substation yard. Security cameras will be located throughout the new substation. The entire site will be located on property currently owned by UI. No additional property will need to be acquired for the proposed substation project.

Area lighting will be provided within the substation and will be controlled by a switch inside the control building. It is anticipated that the lighting will remain off during normal operation and only be used during routine maintenance or emergency repair activities. Ingress and egress lighting will be installed at the entrances to the control building and will be controlled by photoelectric cells.

Final site work will consist of some form of landscape treatments, to include but not be limited to, the planting of trees, shrubs, grasses, and other indigenous plant species that are appropriate to the area and that will serve to screen the facility.

2.3 Proposed Transmission Line Modifications

A minimum of two independent transmission sources will be required to provide a reliable power supply to the new substation. Initially, due to transmission line loading restrictions, only the UI or CL&P #1730 lines could be used as this source of supply to the substation. To provide two independent primary sources to the substation from a single transmission line, the line must be routed into and out of the substation, and be tapped on either side of a sectionalized circuit breaker.

To connect the proposed substation to the existing Connecticut transmission grid, the existing UI #1730 and CL&P #1730 transmission lines will be routed through the substation. From the tap structure in the CL&P right-of-way (structure #833A), the CL&P #1730 line will be routed due south for approximately 90 feet to one of the substation's north takeoff structures. It will be routed through a sectionalizing circuit breaker and then exit the substation through the other north takeoff structure. It will then span approximately 100 feet to reconnect to CL&P's transmission line through the new single pole tubular steel dead-end structure #833B (Figure 2-2). UI's #1730 line will exit the substation from the south takeoff structure, and span approximately 50 feet to the existing UI right-of-way via a new single pole tubular steel dead-end structure NB 31A. No additional right-of-way will be required for this proposed transmission line modification.

Both lines will transition from a vertical configuration to a horizontal configuration as they approach the north takeoff structures. The lines will then drop down to the substation bus work. Using rigid aluminum bus work and stranded jumper conductors, the lines will be connected to and pass through the switchyard. The three

takeoff structures will also be designed as tubular steel H-frame structures. Total length of the rerouted transmission line from the existing transmission line to the three new substation takeoff structures is approximately 240 feet.

2.4 Construction Detail

The site selected for the proposed Trumbull Substation consists of 4.85 acres of undeveloped land that is owned by UI. It consists of three small irregular-shaped parcels of land at 3-7 Wildflower Lane. The surrounding properties consist of single family residential developments that are bisected by existing UI and CL&P transmission line rights-of-way. Connecticut Route 8 passes to the east of the site. The site itself is partially wooded, with the remainder consisting of grasses, weeds, and low-growing woody vegetation. The transmission line to be rerouted through the proposed substation is located in this same area.

2.4.1 Substation Construction

Construction of the proposed Trumbull Substation is anticipated to include the following activities:

- A 15-foot wide access drive will be cut through the trees from Wildflower Lane to the site. This access drive will likely not exceed 30 feet in length, and will be paved in asphalt following completion of construction.
- The actual construction area of the substation will be cleared of any large woody vegetation and be rough graded to remove the existing ground cover and to level the site.
- The permanent 14-foot-high chain link security fence will be installed around the perimeter of the substation.
- Required foundations will be installed. They will be constructed of reinforced concrete. Such foundations will be required for the takeoff structures, the control/switchgear building, transmission line structures, circuit breakers, power transformers, and the equipment support structures in the substation yard.
- The below-grade cable trenches, conduits, ground rods, grounding grid, and distribution duct bank will be installed.
- All open trenches and excavations at the site will be backfilled. Crushed stone will then be applied to the surface of the site in preparation for the delivery of equipment and structures.
- The switchyard support structures and the transmission line takeoff structures will be erected on their foundations using an appropriately sized crane.

Substation equipment will be installed on the support structures and foundations, along with bus work and supporting insulators.

- The prefabricated, pre-engineered metal control/switchgear building will be delivered to the site by truck. It will be set on its foundation by an appropriately sized crane.
- Any remaining interior construction and installation activities in the control/switchgear building will follow and could include the installation of the metal-clad switchgear, the protection, control and metering equipment, and the auxiliary electric equipment.
- The power and control cables will be installed and terminated.
- All equipment will be tested and placed in a ready-to-energize condition. The overhead 115 kV conductors will be installed and the underground distribution feeders will be installed and terminated in the control/switchgear building, and the 13.8 kV buses energized.
- Appropriate landscaping and restoration will be completed around the outside perimeter of the substation.

2.4.2 Transmission Line Modifications

Construction and operation of the proposed Trumbull Substation will require the modification of existing UI and CL&P 115 kV transmission lines. Line #1730 will be rerouted through the substation. Required construction activities will include the following:

- A single pole tubular steel dead-end structure #833B on a drilled pier foundation will be installed near CL&P's existing structure #833A. This dead-end structure will route CL&P's #1730 line into the substation under the conductors of CL&P line #1710.
- A single pole tubular steel dead-end structure NB 31A will be installed on a drilled pier foundation near UI's existing switch structure NB 31. This new dead-end structure will turn the modified transmission line back to the existing tubular steel structure NB 30.
- Large woody vegetation that could interfere with the safe installation and operation of the rerouted transmission line will be removed prior to conducor stringing operations.
- Conductor and shield wire will be installed from the new dead-end structure NB 31A to UI's existing structure NB 30.

- The portion of UI transmission line #1730 and its shield wire between CL&P structure #833A and UI switch structure NB 31 (approximately 210 feet) will be removed.
- The portion of UI switch structure NB 31 connected to UI transmission line #1730 will be demolished.
- Once the transmission line modifications and removal are complete, any required right-of-way restoration activities will then be completed.

3.0 Alternatives

Several alternatives were considered by UI for the proposed Trumbull Substation Project. These included possible modifications to UI's transmission and distribution system, as well as several possible locations for the proposed substation. The following reviews the system alternatives considered by UI, and the alternative sites evaluated for the proposed substation.

3.1 System Alternatives

In reviewing alternatives to the proposed substation project, UI considered modifications to its existing electric system to resolve the projected load problem. These modifications included the installation of a single 40 MVA Power Delivery System (PDS) at the proposed Trumbull Substation site at an estimated cost of approximately $3,000,000. In addition, distribution automation would be required on the four 13.8 kV feeders to be transferred from Old Town and Trap Falls substations to the 40 MVA PDS at the Trumbull Substation site. The cost of this required distribution automation is approximately $600,000. The estimated load to be shifted to the proposed Trumbull Substation is approximately 32 MVA in 2007 and will exceed the 40 MVA PDS transformer's rating within five years. Therefore, these modifications and expenditures of approximately $3,600,000 to modify the existing system would not solve the load problem within the five-year horizon.

Installing a 115/13.8 kV substation at locations other than the proposed selected site was considered. Based on the total transmission and distribution costs, the selected site for the proposed Trumbull Substation compared to other sites, provides the reliability solution at the lowest capital cost ($1,000,000 or greater differential).

Projections indicate that by the summer peak of 2007, the failure of a single 115/13.8 kV substation transformer at either Old Town or Trap Falls substations, during peak periods, would result in overloads that would require load shedding to avoid unacceptable thermal overloading and further degradation of the remaining substation transformer. Thousands of customers in Trumbull, Bridgeport, Stratford, and Shelton are at risk of experiencing multiple hour outages resulting from load shedding. Postponing construction of the proposed Trumbull Substation is not a recommended alternative due to the large number of customers that would be exposed to multiple hour outages.

3.2 Substation Site Alternatives

UI Distribution Planning determined that a new substation was needed in the town of Trumbull. This location was assessed by UI to be the geographical center of

increasing load growth for the area. In addition, this general location for a new substation would not only serve the growing load, but would also relieve loads at two existing substations that are currently operating at or near capacity.

In August 2003, UI completed a substation site selection study to determine the most suitable location for the new substation. The study was updated in June 2005. Site selection began by establishing a geographical site selection area based on minimizing both transmission and distribution costs, and establishing cost differential threshold values when comparing sites. Six general search areas were defined, each having reasonable access to existing transmission and distribution lines that would allow UI to resolve the identified load growth and substation loading problems. These six general areas, presented below, are all located within the town of Trumbull:

1. Nichols Avenue and Huntington Turnpike between State Route 8 and the Merritt Parkway.
2. White Plains Road between State Route 8 and the Merritt Parkway.
3. Huntington Turnpike between the Merritt Parkway and North Street.
4. White Plains Road between the Merritt Parkway and State Route 25.
5. Huntington Turnpike between North Street and McDonald Road.
6. Daniels Farm Road between State Route 25 and Strobel Road.

In defining substation siting options, it was established that the site must be close to existing transmission and distribution facilities and that the land area must have a minimum size of approximately 200 feet by 200 feet. Site selection considered environmental parameters, technical requirements, and economics. Environmental parameters considered existing and future land uses, improved and unimproved roads, buildings and other structures, watercourses and water bodies, zoning, inland wetlands, streams and floodplains, parks, and church and school property.

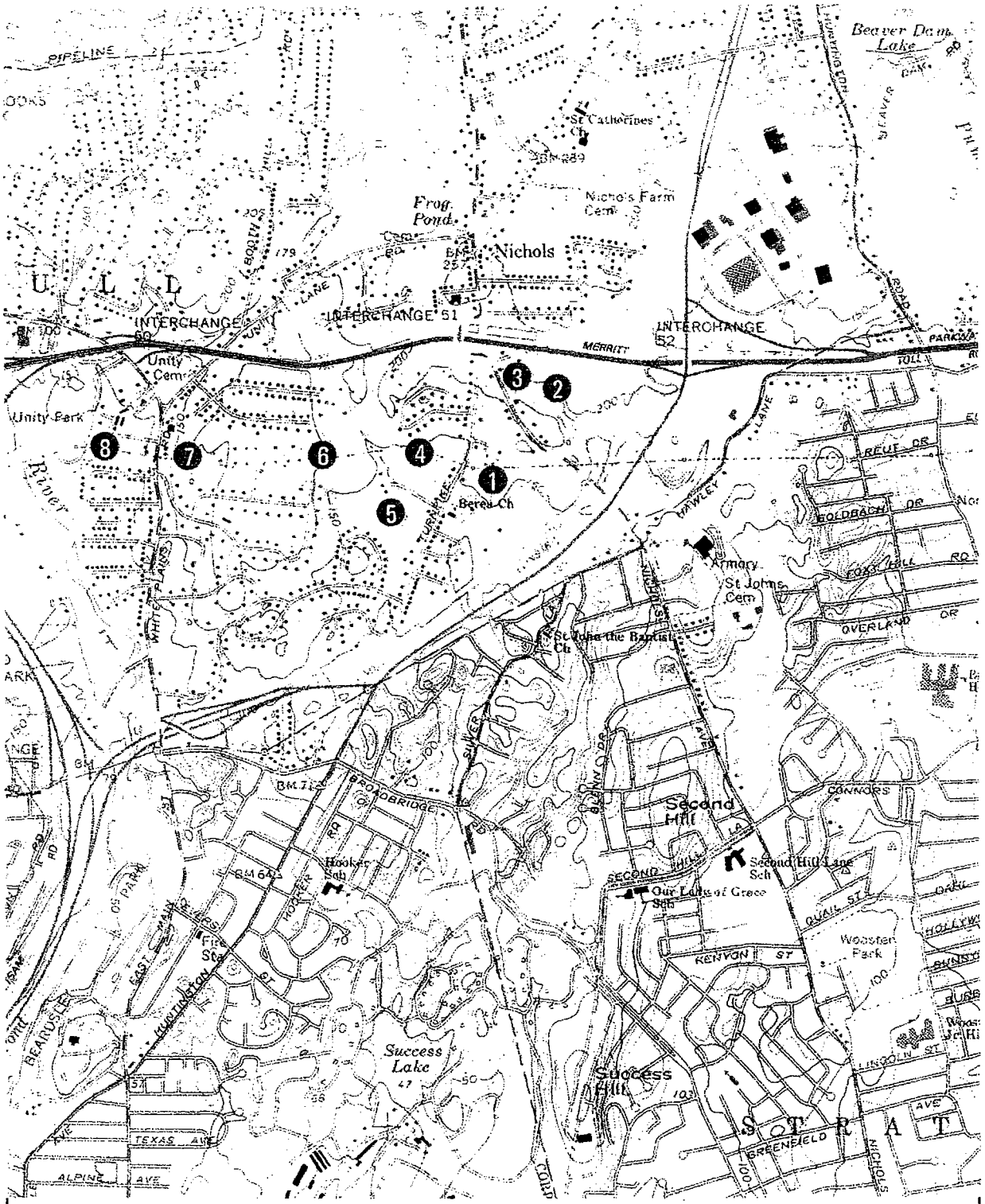
A total of nine candidate substation sites were selected in the six search areas. They are presented below in Table 3-1 and their locations appear on Figure 3-1.

Table 3-1 Alternative Substation Sites			
Site No.	**Street Address**	**Ownership**	**Total Land Area (acres)**
1	3-7 Wildflower Lane	UI	4.85
2	Connecticut Route 8	State of Connecticut	1.00
3	2878 Nichols Avenue	Private	3.73
4	Huntington Turnpike	Town of Trumbull	13.08
5	1446 Huntington Turnpike	Private	23.30
6	Rocky Ridge Drive	Town of Trumbull	20.60
7A	330-336 White Plains Road	Private	4.82
B	364 White Plains Road	Private	2.52
8	Unity Park	Town of Trumbull	34.41
9	Huntington Turnpike	State of Connecticut	1.00

Source: Trumbull Substation Site Selection Study, 2003 (updated 2005).

To determine the preferred site, each of these sites was further evaluated relative to the following site evaluation criteria:

- Transmission and Distribution: including interconnection costs and related considerations, system impacts, system access, and right-of-way requirements.
- Substation Construction and Access: including construction constraints, vehicular access, the effects of site size, shape, topography, and development on present land uses, floodplains, streams, wetlands, zoning, and general encumbrances.
- Environmental: including site characteristics, present and past land uses, inland wetlands, ponds, watercourses, public watersheds, the character of the surrounding neighborhood, zoning, and other permitting.
- Real Estate: including site acquisition costs, subdivision requirements (if any), and availability.



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ALTERNATIVE SUBSTATION SITES
Figure 3-1

Based on site evaluations using the above criteria, sites 2, 3, 5, 7B, 8, and 9 were eliminated from further consideration, as their overall cost differential exceeded the $1,000,000 threshold. The remaining sites, 1, 4, 6, and 7A, continued to be evaluated. According to the UI siting study, two possible substation sites were identified at Site Location 4 (Sites 4A and 4B), and three possible sites were identified at Site Location 6 (Sites 6A, 6B and 6C). This resulted in a total of seven specific site locations to be evaluated in detail. Each of these seven site locations was further evaluated based on the four previously mentioned site evaluation criteria. The Trumbull Substation Site Selection Study was updated in June 2005 and confirmed the original conclusions of the 2003 study.

As a result of environmental, engineering, economic, acquisition, and constructability evaluations, Site Location 1 was selected as the preferred substation site. The site offers the following advantages:

- The site offers immediate access to existing UI transmission and distribution facilities and minimizes this development cost.
- The site, which consists of three small parcels, is already owned by UI, thus eliminating the acquisition process and costs.
- The size of the property is adequate to accommodate the proposed substation.
- Portions of the site were previously cleared by UI for line maintenance training. This will minimize the amount of tree clearing required for the new substation.
- The property has direct street access to Huntington Turnpike (via Wildflower Lane) and to Nichols Avenue.
- There are no streams or inland wetlands on or adjacent to the site.
- Potential noise impacts from construction activities and substation operation should be slight to very slight, which is in proximity to busy Connecticut State Route 8.
- Visual impacts to passing motorists will be minimal, while views from nearby land uses will be obstructed to seasonally obstructed by existing woody vegetation.

Reasons for rejecting the remaining sites are summarized below:

Site 4A

- Must be purchased from the Town of Trumbull.
- Increased distribution and transmission facility development costs.

- Distribution duct bank will cross a designated wetland area.
- Additional transmission line structures will be required in the right-of-way to tap the existing transmission line.
- Access would likely have to cross a portion of the wetland area.
- Within 50 feet of an existing pond and within 100 feet of a stream.
- Increased visual impacts to motorists on Huntington Turnpike.

Site 4B

- Must be purchased from the Town of Trumbull.
- Increased distribution and transmission facility development costs.
- Distribution duct bank will cross a designated wetland area and the site is directly adjacent to the wetland area.
- Additional transmission line structures will be required in the right-of-way to tap the existing transmission line.
- Access will have to cross a portion of the wetland area.
- High visibility to nearby residences and to Huntington Turnpike.

Site 6A

- Must be purchased from the Town of Trumbull.
- Increased distribution and transmission facility development costs.
- Less than 50 feet from existing residences.
- One stream passes through the site.
- Existing UI distribution line will require relocation.
- Increased construction traffic in a highly residential area.
- Additional transmission line structures will be required in the right-of-way to tap the existing transmission line.

Site 6B

- Must be purchased from the Town of Trumbull.
- Increased distribution and transmission facility development costs.
- Less than 50 feet from an existing residence and swimming pool.
- One stream passes through the site.
- Partial visibility from Huntington Turnpike.
- Access from a local residential street may not be possible.
- Increased construction traffic in a highly residential area.
- Additional transmission line structures will be required in the right-of-way to tap the existing transmission line.

Site 6C

- Must be purchased from the Town of Trumbull.
- Increased distribution and transmission facility development costs.
- May require the purchase of an additional property (private) for site access.
- Less than 50 feet from an existing residence.
- Less than 50 feet from a stream that passes near the site.
- Existing UI distribution line will require relocation.
- Access from a local residential street may not be possible without the purchase of private property. Otherwise, access will likely have to cross the stream.
- Site topography and steep slopes will increase construction costs.
- Additional transmission line structures will be required in the right-of-way to tap the existing transmission line.

Site 7A

- Must be purchased from a private landowner.
- Increased distribution and transmission facility development costs.
- Topography is moderate to extreme slope with exposed rock.
- Less than 50 feet to an adjoining residence.
- Existing UI distribution line will require relocation.
- Adjacent to wetlands.
- High visibility from nearby residences and White Plains Road.
- Additional transmission line structures will be required in the right-of-way to tap the existing transmission line.

In a further comparison of these six sites to Site Location 1, the estimated differential costs, as presented in Table 3-2, ranged from $386,000 to $1,097,000.

Table 3-2 Estimated Cost Differentials Transmission and Distribution Facilities	
Site Location	**Cost Differential**
1	$ 0
4A	$ 912,000
4B	$ 396,000
6A	$ 496,000
6B	$1,097,000
6C	$ 386,000
7A	$ 789,000

Source: Trumbull Substation Site Selection Study, 2003 (updated 2005).

4.0 Existing Environment

The environmental conditions at United Illuminating's proposed Trumbull Substation site are presented in the following sections. The area's natural systems, surrounding land uses, visual and aesthetic characteristics, and cultural resources are discussed. Potential impacts to the identified natural, human and cultural resources resulting from construction and operation of the new substation are presented in Section 5.0, Environmental Effects.

4.1 Natural Systems

The Trumbull Substation Project is located in southwest Connecticut, within the Town of Trumbull, in southeast Fairfield County. The street address for the UI owned property is 3-7 Wildflower Lane. The 4.85-acre parcel to be developed lies entirely adjacent to and includes a portion of an existing UI transmission line right-of-way. Connecticut State Route 8 lies immediately east and southeast of the site. An existing CL&P transmission line right-of-way borders the north side of the site while private properties border the west and south sides.

The sections that follow describe the existing abiotic and biotic components at the project site, with an emphasis on the site itself, but also provide a generalized description of the surrounding vicinity. The discussion is based on available literature, discussions with federal, state and local agencies, and data gathered during a site visits in October 2002 and March 2005.

4.1.1 Topography, Geology and Soils

The Connecticut landscape is divided into three primary regions, the Western Uplands, the Central Valley (Connecticut River Valley), and the Eastern Uplands. The Town of Trumbull lies at the southern edge of the Western Uplands on the Coastal Slope. The Coastal Slope is an area where the topography slopes abruptly south toward Long Island Sound. Bedrock exposures or rocky soils are common in the area. Most of the rocks are metamorphosed from sedimentary and igneous materials dominated by schist and gneiss (Rogers, 1990).

The project site is situated on relatively high ground (approximately 165 feet above sea level). Although the total relief of the project site is about 65 feet, the area to be developed has only a range of about 10 feet in relief, as some of the site has been previously leveled. The south side of the property drops off sharply toward Long Island Sound. The terrain to the west, north and east is somewhat hilly and the land is generally elevated toward the north.

According to the Soil Survey of Fairfield County, Connecticut (Wolf, 1981) and field observations made at the project site, the soil at the site is dominated by Charlton-Hollis fine sandy loam. This soil complex is common on moderately to very steep slopes and ridges in the vicinity and is characterized by being well drained, stony, shallow, and often with exposed bedrock, which was observed on and around the project site. Farming this land is impractical and the shallow soil and bedrock make certain types of private and commercial development almost impossible.

4.1.2 Groundwater and Surface Waters

The following section briefly describes groundwater and surface water features in the project vicinity.

4.1.2.1 Groundwater

The existence of groundwater in the area is uncertain. However, considering the shallow depth to bedrock, groundwater is probably not present or is at a considerable depth.

4.1.2.2 Watercourses

The project site is situated on an elevated area that drains mostly to the south into unnamed drainages that eventually empty into the Yellow Mill Channel of Bridgeport Harbor, or Johnson Creek that also flows to Bridgeport Harbor. The Pequonnock River lies about 1.25 miles west of the project site but the watercourse does not experience runoff from the project site and will not be affected by project activities.

4.1.2.3 Lakes and Ponds

There are no lakes or ponds on the project site. Several small named and unnamed ponds are scattered within one mile of the site. The largest of these would include Thrush Wood Lake and Frog Pond. However, both are located north of the Merritt Parkway. The nearest lakes are over one mile from the site, and include Beaver Dam Lake, Dogwood Lake, Pinewood Lake, and Success Lake. Due to their small surrounding watershed, no water drainage from the project site reaches any of these water bodies.

4.1.2.4 Coastal Zone

Connecticut's Coastal Zone Management Program (CZM), within the Connecticut Department of Environmental Protection, manages certain areas landward of Long Island Sound. According to staff at the Connecticut Department of Environmental Protection

(DEP), the Trumbull Substation Project site is not located within the designated CZM area and therefore is not subject to CZM regulations.

4.1.2.5 Stormwater Management

The project as proposed will affect a land area of no more than 4.85 acres. At the present time no special structures are in place to control stormwater runoff on the site. The DEP requires a General Permit for the discharge of stormwater associated with construction activities for the disturbance of one acre or more of land area.

4.1.3 Floodplains and Wetlands

4.1.3.1 Floodplains

The project site is not located in or near any designated floodplain. The nearest floodplain is approximately 1.25 miles west of the site along the Pequonnock River where the elevation is about 75 feet above mean sea level. The project site is located on an elevated escarpment at an elevation of approximately 165 feet.

4.1.3.2 Wetlands

Wetlands in the project vicinity are regulated by the Town of Trumbull Inland Wetlands and Watercourses Commission (IWWC) and the U. S. Army Corps of Engineers (COE), New England District. The purpose of the IWWC and COE regulations is to protect and preserve these fragile natural resources in a manner that maintains the functional value of the resource, whether that be related to water quality, flood control, wildlife habitat, biodiversity, or aesthetics.

The project site was examined by a Black & Veatch wetland/soil scientist qualified under Connecticut and COE regulations to certify the presence or absence of regulated wetlands and watercourses. No regulated wetland areas were identified. In addition, the Trumbull IWWC Officer was consulted and the IWWC Bridgeport Map was examined to further determine that no regulated areas are present on the project site or in the immediate vicinity. New England District COE was consulted regarding the project and stated that the COE had no interest in the project unless wetlands or other waters of the United States subject to Clean Water Act Section 404 permitting were present. Again, no such areas are present.

4.1.4 Vegetation and Wildlife

The hills of Fairfield County are covered predominantly by forest vegetation. Species of oak, hickory, maple, poplar, birch, hemlock, and mountain laurel are the most commonly observed components in natural areas. In the project vicinity, native

communities have largely been eliminated by clearing of land, grading, artificial drainage, and the subsequent development of residential areas, businesses and infrastructure. Examples of native vegetation are rare and are usually associated with area parks or preserves. The vegetation existing today is composed mostly of cultivated species, some of which have become naturalized, non-native weeds, and native species that have taken advantage of the new habitats created by man's activities (Wolf, 1981).

The pressure of urbanization has reduced the quality and quantity of wildlife habitat in areas such as Fairfield County. As such, the diversity of wildlife present is likewise reduced compared to historical conditions in the area or less disturbed areas of the state today (T. Dodge in Wolf, 1981).

Vegetation and wildlife conditions specific to the project site are discussed below based on observations made by Black & Veatch environmental staff in October 2002 and March 2005. Plant identifications are based on the *Manual of Vascular Plants of the Northeastern United States and Adjacent Canada* (Gleason and Cronquist, 1991).

4.1.4.1 Vegetation

The UI property is dominated by herbaceous and shrub vegetation indicative of severe disturbance. Scattered areas are barren or the rocky soil supports sparse growths of weedy species, such as love grass (*Eragrostis* sp.) and prostrate knotweed (*Polygonum aviculare*). Where the soil is slightly deeper there occur larger, but equally weedy species such as goldenrod (*Solidago cf. canadensis*) and biennial mugwort (*Artemisia biennis*). Dense thickets of blackberry (*Rubus* sp.) and smooth sumac (*Rhus glabra*) are common and poison ivy (*Toxicodendron radicans*) is widely scattered in open areas as well as on the ground or vining in the surrounding woodlots. Other common species observed in the open spaces include dandelion (*Taraxacum officinale*), common plantain (*Plantago major*), spotted knapweed (*Centaurea maculata*), giant foxtail (*Setaria faberi*) and evening primrose (*Oenothera biennis*).

Narrow woodlots surround most of the site. These are dominated by the adventitious growth of a variety of tree species native to the region. The few large trees present are estimated to be 15-20 inches in diameter, but the majority of the trees are much smaller. The common species present include northern red oak or (*Quercus cf. rubra*), black oak (*Quercus velutina*), pignut hickory (*Carya glabra*), and red maple (*Acer rubrum*). The shrub layer in these areas is generally dense with saplings representative of the canopy, but equally common are blackberries (*Rubus* sp.) and introduced shrubs such as burning bush (*Euonymous alatus*) and mock-orange (*Philadelphicus cf. coronarius*). Vines are abundant and include greenbriar (*Smilax* sp.), poison ivy, and the introduced Japanese honeysuckle (*Lonicera japonicus*). In some

areas the honeysuckle is so dense that other ground cover has been eliminated completely. Herbaceous ground cover is generally sparse since the area has been severely disturbed in the past and portions remain covered by abandoned piles of wood chips. Despite the disturbance at the site, an occasional native forb managed to survive in the area, including a few specimens of spotted wintergreen (*Chimaphila maculata*).

No wetland or riparian habitat is present on or adjacent to the proposed substation site.

4.1.4.2 Wildlife

Wildlife observed at the proposed site was limited to a few birds, including the common crow, starling, and pigeon. No mammals, reptiles or amphibians were directly observed nor were there tracks, scat, burrows or other signs that indicated their presence. The isolated nature of the site due to the surrounding residential areas and major highway to the east presumably impacts the ability of wildlife to move through the area. In addition, the vegetation provides limited forage resources. Aside from species common to urban environments, such as raccoon, opossum, skunk, squirrel, and various songbirds, the project site provides wildlife habitat with limited value.

4.1.5 Special Status Areas and Species

The U. S. Fish and Wildlife Service (USFWS) and the DEP were notified of the proposed project in September 2002 and again in March 2005. These agencies were asked to comment on the known presence or potential occurrence of any federal or state protected plant or animal species in the project area. In addition, DEP and Black & Veatch staff reviewed the DEP threatened and endangered species maps at the DEP Public File Room in Hartford. The maps do not identify any federal or state protected species within a five-mile radius of the project. Correspondence received from the USFWS regarding this matter is included in Section 8.0 Pertinent Correspondence of this Environmental Report.

DEP lists 42 species of animals (amphibians, reptiles, birds, and mammals) as threatened, endangered or of special concern. The list includes federal threatened and endangered species. Since none of these species occur in the project vicinity, the extensive list is not included herein but may be reviewed at the DEP web site: *http://dep.state.ct.us/cgnhs/PDFs/fairfieldctyspecies.pdf.*

An on-site survey revealed that the project site does not provide habitat sufficient to support federal or state listed protected species. Open areas of the project site are dominated by non-native or otherwise weedy herbaceous plants. In the small surrounding woodlots the disturbed ground varies from barren to densely covered with

invasive vines and shrubs. The site is isolated by the surrounding residential areas and Connecticut State Route 8 to the east.

4.2 Land Use

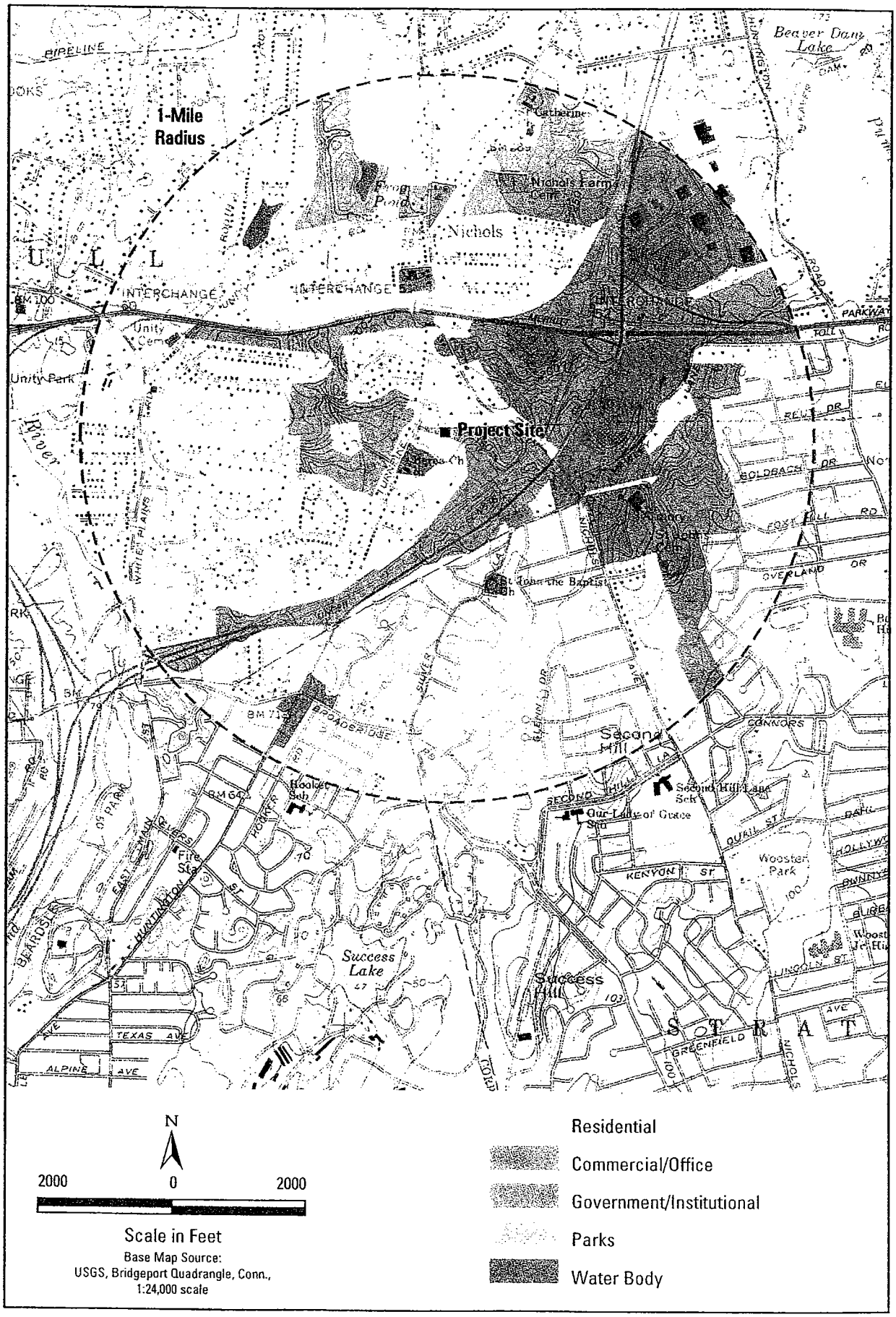
The proposed Trumbull Substation site is located in a developed area in the southeast corner of the town of Trumbull. Surrounding land uses are predominantly residential, with major transportation facilities nearby. The actual site is located on property owned by UI (4.85 acres) that has been used in the past as a line worker training site. Portions of the site (approximately half) have been cleared of vegetation, while the remainder of the site is wooded. The site has an existing CL&P double circuit 115 kV transmission line immediately to the north, and an existing UI double circuit 115 kV transmission line immediately to the east. UI maintains a large transmission line switch structure in the right-of-way that is adjacent to the proposed substation site.

Land use categories within one mile of the proposed Trumbull Substation site include the following: residential, commercial/office, parks/recreation/open space, and governmental/institutional (Figure 4-1 and Appendix A). While there is an industrial park within one mile of the site, the park consists of office buildings. There are no actual industrial or manufacturing facilities within one mile of the site.

4.2.1 Residential

The proposed substation site is surrounded by residential land uses. Single family homes are located to the north of the site, as well as to the west and south. These residences are located on Wildflower Lane, Stella Street, and along a private drive off Huntington Turnpike. Major roads that pass through this residential area are Huntington Turnpike, Nichols Avenue, and Connecticut State Route 8, while the Merritt Parkway is located approximately one-quarter mile to the north. Residences on Wildflower Lane, Stella Street, Huntington Turnpike, Nichols Avenue, and other streets in the immediate vicinity of the substation site are attractive, well-maintained residences in relatively mature neighborhoods.

From the nearest edge of the proposed substation, the closest single family residence is located on the cul-de-sac of Wildflower Lane approximately 220 feet west of the project site. Two homes on the Stella Street cul-de-sac are approximately 250 feet south of the project site. North of the project site on the north side of the CL&P right-of-way, two single family houses on the private drive off Huntington Turnpike are approximately 150 feet and 250 feet respectively from the project site. These two residences are separated from the project site by the existing CL&P double circuit 115 kV transmission line in a 110-foot partially cleared right-of-way. It appears that the single



Black & Veatch
Trumbull Substation Project

The United Illuminating Company

GENERALIZED LAND USE
Figure 4-1

home on Wildflower Lane and the homes on Stella Street are the most recent in the area. Additional single family residential activity occurs to the north and south of the proposed substation site along Huntington Turnpike and Nichols Avenue. These homes are also well-maintained and attractive residences. North of the Merritt Parkway, there are additional large residential developments. Likewise, west of the Huntington Turnpike and south of State Route 8, large, well-maintained single family developments occur. Commercial land uses can be found east of State Route 8.

The town's population is projected to increase by approximately 3.8 percent between 2004 and 2009 (CERC, 2004), so it can be expected that additional single and multi-family dwelling units will be added to the town's housing stock in the next few years. However, near the proposed Trumbull Substation site, there are no large residentially-developable tracts that could accommodate substantial new subdivision development. Rather, there are small scattered parcels and lots that will likely see individual house construction as properties are sold.

4.2.2 Commercial/Office

There are no commercial or office establishments near the proposed substation site. The closest retail facility is a commercial nursery some 1,300 feet (0.25 mile) north of the site on the east side of Nichols Avenue. South of State Route 8, office buildings are located on Penny Avenue and Nichols Avenue approximately 1,600 feet (0.3 mile) and 1,900 feet (0.4 mile) respectively from the proposed substation site. A convenience store/gas station is located south of State Route 8 on Nichols Avenue approximately 1,900 feet (0.4 mile) southeast of the site. South and east of Nichols Avenue and State Route 8, a large commercial development, Hawley Lane Shopping Center, has been developed. Several large multi-story office buildings and a Marriott Hotel are also located in this area, which is approximately 0.5 mile or more east of the proposed substation site. The four-lane limited access Connecticut State Route 8 and its associated major interchanges with Nichols Avenue and the Merritt Parkway separates these commercial/office/hotel land uses from the substation site.

4.2.3 Industrial

There are no industrial or manufacturing land uses near the proposed substation site. The Trumbull Industrial Park, located approximately 3,700 feet (0.7 mile) northeast of the substation site, is the nearest industrial complex. However, this industrial park is in fact an office park consisting of several new and well-maintained office buildings in a campus-type development. The industrial park is separated from the proposed substation site by State Route 8 and the Merritt Parkway and an associated interchange.

4.2.4 Parks/Recreation/Open Space

Within the town of Trumbull, there are nearly 1,500 acres of municipal parks and designated recreational open spaces. The State of Connecticut and the town own and maintain 20 parks and open space areas, including the Tashua Knolls Golf Course. The largest of these facilities includes the Pequonnock River Valley Park along State Route 25 (375 acres), Beach Memorial Park on Hedgehog Road (331 acres), and Tashua Knolls Recreation Area and Golf Course on Tashua Road (268 acres). Facilities include picnic and gardening areas, hiking trails, playgrounds, swimming pools, ball fields, tennis courts, roller blading courts, ice skating ponds, soccer fields, a regulation 18-hole golf course and a new 9-hole executive course, horseshoe pits, biking trails, basketball courts, sledding hills, sand volleyball courts, and natural areas. None of these recreation facilities are in proximity to the proposed substation site.

The closest recreation facility to the proposed substation site is the Abraham Nichols Memorial Park. This park, approximately 14 acres in size, is 4,100 feet (0.8 mile) north of the site. It is located north of the Merritt Parkway just east of Shelton Road. The park is an active day-use facility and contains a small picnic area, two tennis courts, one ball field and horseshoe pits. The Trumbull Historical Society is located on the site.

Recreation facilities and playgrounds are also located at town and private school facilities. However, there are no schools near the proposed substation site, with the closest being St. Catherine of Siena School and Church approximately one mile north of the project site.

4.2.5 Government and Institutional

Little land in the project area is devoted to government or institutional uses. The closest government facility is a State of Connecticut Department of Transportation maintenance yard and garage. This facility is approximately 1,700 feet (0.3 mile) northeast of the project site. It is located adjacent to and immediately southwest of the Merritt Parkway/State Route 8 interchange (interchange #52). The Town of Trumbull Senior Center, located on Priscilla Place, is approximately 2,700 feet (0.5 mile) north of the project site. The Center, located just to the north of the Merritt Parkway, provides a variety of recreational and educational programs for the town's senior citizens. Across from the Senior Center on Huntington Turnpike is the Fairchild-Nichols Library, also approximately 0.5 mile from the proposed substation site.

The project area supports a number of churches of various denominations. The closest church to the project site is the Armenian Church of the Holy Ascension. The property includes the church, parking lot, and a small residence to the rear of the church.

The southern edge of the proposed substation site is approximately 450 feet to the residence, approximately 500 feet to the church parking lot and approximately 700 feet to the back of the church. The church faces Huntington Turnpike and is approximately 35-40 feet lower than the elevation of the proposed substation. The sloping hill between the church and the substation site is covered with a mature stand of large woody vegetation that is quite dense. The Christ Redeemer Lutheran Church is approximately 1,200 feet (0.2 mile) north of the project site on Nichols Avenue.

Several public and private schools are located in the town of Trumbull and in surrounding towns. However, only one school is located within one mile of the proposed substation site. St. Catherine of Siena School (and church) is located approximately 5,100 feet (just under 1.0 mile) north of the project site on Shelton Road. The private school offers K-8 grades on a small campus setting. A playground and recreation area is adjacent to the school. Just over one mile west of the project site is the Christian Heritage School. This private school, located immediately north of the Merritt Parkway on White Plains Road, provides grades K-12.

4.2.6 *Transportation*

The dominant transportation facilities in the project area are Connecticut Route 8 and the Merritt Parkway (State Route 15). Both of these highways are four-lane, limited access freeways in the project area. State Route 8 and the exit/entry ramps to Nichols Avenue (State Route 108) are immediately east of and adjacent to the existing UI substation property and transmission line right-of-way. At its closest point, the travel lanes of State Route 8 are approximately 900 feet from the proposed substation site. The unused portions of land that are owned by UI and the State of Connecticut between the highway and the substation site have been left in their natural state and remain fairly wooded. The other major transportation facility in the area, the Merritt Parkway, is approximately 2,100 feet (0.4 mile) north of the project site.

Other federal and state highways near the project site include the following:

- U. S. Interstate 95, over three miles south in the city of Bridgeport and town of Stratford.
- U. S. Highway 1, over two miles south in the city of Bridgeport.
- State Route 108 (Nichols Avenue), approximately 700 feet east.
- State Route 127 (White Plains Road), approximately one mile west.
- State Route 25, over one mile west.

In the immediate project area, Huntington Turnpike and Nichols Avenue (State Route 108) are the primary north-south thoroughfares.

There are no railroads or airports within one mile of the project site. Railroad facilities are located to the south in the city of Bridgeport and east in the city of Milford, and the Bridgeport Municipal Airport is approximately five miles south of the project site in the town of Stratford. Public transportation in the town of Trumbull is provided by the Greater Bridgeport Transit Authority in the form of scheduled bus service. However, there is no route service on the two closest streets to the proposed substation site, Huntington Turnpike and Nichols Avenue. The closest scheduled bus route is on State Route 8 east of the project site.

4.2.7 Land Use Planning

The Town of Trumbull plans for and guides growth in the community through its Planning and Zoning Commission. The commission is supported by a full-time planning and zoning administrator and a zoning enforcement officer. The town engineering department, public works department and First Selectman also participate in town planning activities. The town does not have a comprehensive master plan or generalized land use plan. Instead, it utilizes its current zoning ordinance to plan for and guide the growth of the community.

4.2.7.1 Zoning

The UI proposed substation site is currently zoned "Residence AA." This zone is one of seven residential zoning categories in the town (Residence AAA, Residence AA, Residence A, Age Restricted Elderly Housing Zone, Housing Opportunity Development Zone, Planned Affordable Housing Zone, and Planned Residential Conservation Zone). Residence AA requires a one-acre minimum lot size for residential development and stipulates minimum road frontage, minimum floor area, maximum building height, and minimum yard depths. According to the Trumbull's Planning and Zoning Administrator, the town's zoning ordinance does not address electric utility facilities in any of its zoning categories (Gruce, 2005).

Surrounding land is mostly zoned "Residence AA" as well, with a small parcel to the south of the proposed substation site on Stella Street being zoned "Residence A," which requires a smaller one-half acre minimum lot size for residential development. Other residential, commercial and industrial zoning districts are located to the east and south of State Route 8 and well to the west and northwest in the town.

4.2.7.2 Noise

The town has a local noise ordinance that appears in the Town of Trumbull Code as Article III, Noise. The State of Connecticut also has published Noise Regulations. Both the town ordinance and the state regulations specify allowable noise levels on the

In order to effectively quantify and qualify the existing daily sound levels, the ambient survey included both continuous monitoring and short-term measurements. The continuous monitoring was conducted for a minimum of 24 hours at each location and collected the hourly L_{eq} sound level and the hourly statistical sound levels, L_{90}, L_{50}, and L_{10}. The results of the continuous monitoring provided an indication of the daily trends in the sound levels.

Continuous noise monitoring was conducted at each location for a 24-hour period to capture typical ambient daytime and nighttime sound levels. The measurements included the equivalent-continuous sound level, L_{eq}; the 90-percentile exceedance sound level, L_{90}; the 50-percentile exceedance sound level, L_{50}; and the 10-percentile exceedance sound level, L_{10}, during each one-hour period. Additionally, short-term octave band noise measurements were conducted at each location in order to evaluate the spectral content of the existing acoustical environment. Weather conditions generally included clear skies with little wind and temperatures ranging from 45 to 57 °F.

The 24-hour noise monitoring results are detailed in Table 4-3. As previously discussed, the L_{90} sound level is typically considered the residual or background sound level and the L_{10} sound level is generally considered the intrusive sound level. The quietest background sound levels (L_{90}) at the monitoring locations were generally consistent and ranged from 36 to 39 dBA during the 2:00 AM to 4:00 AM time periods when the volume of local traffic diminished. During daytime hours when the traffic volumes increased substantially, the hourly background sound levels (L_{90}) at the monitoring locations were higher and ranged from 54 to 59 dBA. As such, the daytime ambient sound levels were generally 20 dB higher than the quietest nighttime hours.

In summary, the existing hourly background sound levels ranged from a median of 46 to 54 dBA at the monitoring locations, which is typical of urban residential areas. While the nearest residences are located adjacent to the north and east property boundaries, other nearby residences are closely located along the surrounding city streets (Refer to Figure 4-2 for the relative locations of the nearest residences). Specifically, the nearest residences to the proposed substation are located along Wildflower Lane approximately 220 feet west of the facility property line, along Huntington Turnpike approximately 200 feet north of the facility property line, and approximately 200 feet south of the facility property line on Stella Street.

Table 4-2 Continuous (24-hour) Ambient Sound Level Measurement Results				
Location	Hourly Exceedance Sound Levels, dBA			
		L90	L50	L10
1	Min	37	41	46
	Median	47	49	52
	Max	54	55	57
2	Min	36	39	43
	Median	46	49	56
	Max	50	52	57
3	Min	39	45	52
	Median	54	57	61
	Max	59	61	64

For short term measurements, the measurement periods were 20 minutes to capture representative sound levels. The octave band sound pressure levels at each location were typical of urban ambient sound levels significantly influenced by traffic.

4.3 Visual and Aesthetic Characteristics

Landscapes and features that are natural and/or manmade, which are unique to an area because of their inherent visual quality, or because of the cultural significance of the area or feature, can be identified as a visual and/or aesthetic resource. The following were considered while determining such resources in the project area:

- Occurrence of natural features that create a landscape of high visual or aesthetic quality.
- Presence of manmade features that create a landscape of high visual or aesthetic quality.
- Areas designated for recreational activities which are dependent upon the visual or aesthetic quality of a landscape.
- Landscapes that exemplify historic/archaeological significance and depend on the undisturbed integrity of the surrounding visual environment.

North of the Merritt Parkway in the vicinity of the original Nichols Farm, several well-maintained and occupied structures have historical significance in this portion of Trumbull. Many of these structures are well over 100 years old and provide architectural

uniqueness to the community. They are being used as residences, offices and activity centers. The well-maintained structures, manicured yards and stately trees offer an attractive and scenic landscape to area residents and passing motorists. This area is approximately 0.5 mile or more from the proposed substation site.

A large wooded area exists west of the project site and the Huntington Turnpike. The area provides an attractive forested landscape. However, it is traversed by an existing overhead double circuit 115 kV transmission line built on self-supporting lattice steel structures in a cleared 110-foot right-of-way. As such, this wooded landscape has already been disrupted by utility development.

No other natural or manmade areas or features have been identified in the project area as having a scenic or aesthetic visual quality.

4.4 Cultural Resources

A brief historical background of the Town of Trumbull is addressed in this section, along with the results of an archive and literature search performed by the Connecticut Historical Commission.

4.4.1 Historical Background

In 1639, the settlement of Cupheag was established by 17 families from the Connecticut Colony at Wethersfield. This settlement claimed lands that are now part of the Town of Trumbull. In 1642, the Town of Stratford was established. It also included portions of Trumbull. The first permanent settlement in Trumbull was in 1690 by Abraham Nichols and his family. In 1705, the Trumbull Center settlement was established. In 1725, the village of Unity was created, followed by the settlement of Long Hill in 1740. In 1744, the two parishes of Unity and Long Hill united to form the Society of North Stratford. In 1797, the Connecticut General Assembly granted the petition of North Stratford, establishing town bounds and declaring that a distinct town should be created and named Trumbull (Trumbull Historical Society, 1997).

By 1800, the population of Trumbull was 1,291. While agriculture sustained most of the early settlers, the town's distance from England made it too expensive to import clothes and needed household articles. As such, the residents of Trumbull began to manufacture what they needed. A variety of industrial pursuits developed in Trumbull, including spinning and weaving, woodworking, and several types of mills (grist, saw, paper, woolen, and cider). Industries that attracted outsiders to Trumbull included the manufacture of chairs, combs, pots and pans, cabinets, saddletrees, and pins. In 1837, construction began on the Housatonic Railroad, and was completed in 1840. By the late 1800s, the largest industry in Trumbull was the manufacture of coaches and light carriages, started by the Nichols brothers. A cigar factory was established in 1882, and

Best engineering practices will be used to develop a stormwater management process in consultation with local authorities that will minimize the potential for any impacts to surrounding properties from stormwater runoff. Final design of the site will maintain, if not improve, the runoff characteristics similar to the present undeveloped site.

5.1.3 Floodplains and Wetlands

5.1.3.1 Floodplains

No designated floodplains occur in the vicinity of the proposed substation. Therefore, no impacts to floodplain areas will occur from construction and operation of the project.

5.1.3.2 Wetlands

No federal- or Connecticut-designated wetlands, or watercourses, occur on the proposed project site and none occur adjacent to the site. A survey of the project site confirmed the absence of wetlands and watercourses. This finding agrees with the Inland Wetlands and Watercourses Commission (IWWC) mapping for the vicinity (Bridgeport Map) and the opinion of the Town of Trumbull IWWC Officer.

5.1.4 Vegetation and Wildlife

5.1.4.1 Vegetation

The impacts to vegetation from project construction are expected to be minimal. The project area includes 4.85 acres, portions of which will require clearing initially for construction of the substation. Most of the project site has already been cleared, and the area is mostly open and occupied by weedy, invasive vegetation. A small wooded area that measures approximately 100 feet x 250 feet on the north and east sides of the proposed substation site will be cleared of all vegetation, and an area approximately 12 feet x 30 feet through the trees that surround the site will be cleared to provide an access driveway to the substation from Wildflower Lane. This access drive will be located at the existing curb cut at the end of the cul-de-sac on Wildflower Lane. A few additional trees may need to be removed for equipment construction or line clearance, but it is UI's intent to save as many trees as possible to provide natural screening for the substation from its surroundings. It is estimated that approximately 0.6 acre of trees and other vegetation will be cleared from the actual site for the substation. Some additional clearing of woody vegetation will likely be required near UI's existing structure #30 to accommodate the new single pole tubular steel structure that is part of the transmission

appearance of a certain landscape, or the creation of an audible sound that is the result of operating the new land use.

5.2.1 Residential

The proposed Trumbull Substation will be located in a residential area in the town of Trumbull. The property on which the substation will be located is immediately west of the Connecticut State Route 8 / Nichols Avenue interchange and is adjacent to existing transmission lines. The nearest occupied residence is located on Wildflower Lane approximately 220 feet west of the substation site. To the south on Stella Street, the closest occupied residences are approximately 250 feet from the substation site. On the north side of the existing CL&P transmission line right-of-way, two occupied residences are approximately 150 feet and 250 feet respectively from the substation site. While these homes are in proximity to the proposed substation development, none will be physically impacted by the proposed project.

During site preparation (clearing and grading) and actual construction, these residences will likely experience some level of construction noise, and possibly fugitive dust. Site clearing will leave a buffer of trees and other vegetation on the west and south sides of the site, helping to reduce construction noise levels and minimize dust. However, mature vegetation that serves as a natural buffer along the CL&P right-of-way on the north side of the site will require removal. While State Route 8 to the southeast of the site generates a considerable amount of background traffic noise 24 hours a day, it is expected that these residences will still experience some increased noise levels during site development and equipment installation.

Substation construction noise will be similar to street or building construction activities in an urban environment. To minimize these indirect impacts, UI will limit construction activities to normal working hours during the work week, and all construction equipment will be required to have the proper engine mufflers that are in good working condition.

It is expected that construction equipment will enter the site from Wildflower Lane. The movement of construction vehicles will occur on Huntington Turnpike and Wildflower Lane. Such vehicular movement will be most noticeable on Wildflower Lane as this dead-end street has minimal traffic on it. This traffic will produce increased levels of noise and occasional fugitive dust to the one residence on the street. Construction vehicles using Huntington Turnpike should not create an appreciable increase in traffic volumes, as this street is one of two major north-south thoroughfares in the area (the other being Nichols Avenue), and commercial vehicles commonly use both streets.

Once the substation is operational, residences on Wildflower Lane and Stella Street will be partially to mostly screened from the site by distance, existing vegetation, and/or intervening topography. However, those residences to the north will have mostly unobstructed views of the substation. While the substation will offer an industrial appearance in the area, the site itself already includes the existing CL&P and UI 115 kV transmission lines and associated lattice steel and tubular steel structures, along with the large UI switch structure. These industrial-looking facilities are either on the proposed substation site or immediately adjacent to it. Substation transformer noise should not be noticeable at any of these nearby residences (Section 5.5).

5.2.2 Commercial/Office

There are no commercial or office establishments near the proposed substation. The closest retail facility, a commercial nursery some 1,300 feet (0.25 mile) to the north on the east side of Nichols Avenue, will not be impacted by construction or operation of the proposed Trumbull Substation. Other existing retail and services establishments and office buildings are located even farther away from the proposed substation site and will not be impacted by the proposed development.

5.2.3 Industrial

No industrial or manufacturing facilities have been identified at or near the proposed substation site. As such, the project will not adversely impact industrial activity in the town.

5.2.4 Parks/Recreation/Open Space

Construction and operation of the proposed Trumbull Substation should have no adverse effects on parks, recreational areas and designated open spaces in the town. While the Town of Trumbull supports some 20 parks covering nearly 1,500 acres throughout the community, none occur near the proposed substation site. The nearest facility, the Abraham Nichols Memorial Park, will not be impacted, either directly or indirectly, by the proposed project. The park, a day-use activity facility, is located approximately 4,100 feet (0.8 mile) north of the project site. Because of distance and intervening vegetation, topography and land uses, users of the park will not be able to see the proposed substation at any time of the year. Given that the park is located off Shelton Road, it is unlikely that park users will hear construction vehicles pass by the park if such vehicles use Shelton Road. If construction vehicle noise does occur at the park, it will be an intermittent, short-term and temporary noise impact. As such, the recreational experience of the park user should not be diminished in any way by construction and operation of the proposed substation. Likewise, those traveling to the park on Huntington

Turnpike and Nichols Avenue will not likely be able to see the substation. Users of recreation facilities at area schools will also not be impacted by construction and operation of the proposed substation. The nearest school recreation facilities are located approximately one mile north of the proposed substation at St. Catherine of Siena School and Church. The substation site will not be visible from these school facilities.

5.2.5 Government and Institutional

The proposed project will not adversely affect any governmental facilities within the town. The closest government facility to the proposed substation site is the Connecticut Department of Transportation maintenance garage and storage yard approximately 1,700 feet (0.3 mile) to the northeast. This governmental facility, located along the south side of the Merritt Parkway, offers more of an industrial appearance in this residential area. It will not be impacted by construction and operation of the proposed substation. The Town of Trumbull Senior Center and the Fairchild-Nichols Library are both located on the north side of the Merritt Parkway approximately 0.5 mile north of the substation site. Because of distance and intervening vegetation, topography and land uses, visitors to these two government facilities will not be able to see the proposed substation. If visitors to these facilities drive on Huntington Turnpike or Nichols Avenue, they should not be able to see the completed substation

Two churches are fairly close to the project site. The closest is the Armenian Church of the Holy Ascension. The church and its parking lot are approximately 500-700 feet from the nearest point of the proposed substation, and are about 35 feet lower in elevation. In addition, the distance separating the church property from the substation site (about 500 feet) is heavily wooded with mature deciduous vegetation. While the lower elevation and vegetation will obstruct direct views of the substation, some of the tops of some substation equipment may be partially visible from the parking lot during the winter months. Otherwise, such visual impacts to the church property and its parishioners and visitors are expected to be minimal to non-existent.

The second church in proximity to the substation site is the Christ Redeemer Lutheran Church on Nichols Avenue. This church is approximately 1,200 feet (0.2 mile) north of the substation site. Due to distance and intervening vegetation, topography and land uses, visitors and parishioners will not be able to see the new substation. This church will not be impacted by construction or operation of the proposed Trumbull Substation.

The closest school is the St. Catherine of Siena private school approximately one mile north of the site on Shelton Road, and the Christian Heritage School over one mile

west of the project site on White Plains Road. Neither of these school facilities will be directly or indirectly impacted by construction or operation of the proposed project.

5.2.6 Transportation

The proposed project should not adversely affect the primary transportation arteries in this area of Trumbull. Connecticut State Route 8, immediately southeast of the proposed project, will not be impacted in any way. Given the existing intervening vegetation and elevation changes of the various entry/exit ramps and through lanes, it is unlikely that passing motorists will be able to see any portion of the new substation. According to the Connecticut Department of Transportation, there are no plans to widen State Route 8 in this area (Andrini, 2005). The Merritt Parkway to the north of the site will also not be impacted in any way by the project.

The local north-south thoroughfares in the project area are Nichols Avenue (State Route 108) to the east of the project site, and Huntington Turnpike to the west. Both support two primary traffic lanes, with no turn lanes in proximity to the project site. While UI maintains an access road to its property off Nichols Avenue, it is expected that construction and eventual maintenance access to the new substation will be from Huntington Turnpike via Wildflower Lane. None of these streets will be physically impacted by construction and operation of the proposed project. Due to distance and intervening vegetation, it is unlikely that motorists using these two roads will be able to see any of the new substation. Construction, materials delivery and various UI vehicles will use Huntington Turnpike while traveling to the project site. However, commercial truck traffic is a common daily occurrence on Huntington Turnpike. Traffic may be occasionally slowed or briefly stopped as these vehicles make turns off Huntington Turnpike onto Wildflower Lane to access the project site. It is expected that the additional truck traffic, while short-term, temporary and intermittent, should not adversely impact normal daily traffic flow on these streets.

Wildflower Lane has been designed as a residential street with a cul-de-sac at the end. With one residence on the dead-end street, daily traffic is minimal. During construction, there will be an increase of truck traffic on this street during normal working hours. UI intends to develop the access drive to the new substation at the existing curb cut at the end of the cul-de-sac. Once construction is completed and the substation is operational, UI maintenance vehicles will occasionally use the street to gain access to the substation. However, this will occur on an infrequent basis or during emergencies.

5.2.7 *Land Use Planning*

While the town does not have a current land use master plan or a comprehensive general plan, the Greater Bridgeport Regional Planning Agency has indicated that the area of the new Trumbull Substation is proposed to remain in single family residential land uses. As UI already owns the property being proposed for the new substation, development of this utility facility will not preclude the further development of residential activity in the area.

5.3 Visual and Aesthetic Characteristics

No scenic or aesthetic areas or features will be impacted by construction and operation of the proposed substation. Those features identified in Section 4.3 will not be visually impacted by the project, and users of these features will not be able to see the new substation.

Most area residents and motorists will also see very little of the new substation. The one residence on Wildflower Lane will have seasonally obstructed views of the substation. During the winter months, observation points at this residence will likely be able to see portions of the new substation through a 20-foot buffer of trees, shrubs and other woody vegetation. The two residences immediately adjacent to and north of the existing CL&P right-of-way will have mostly unobstructed views of the new substation year-round. Currently, these residences have unobstructed views of the CL&P and UI transmission lines and transition structure. To the south, those single family residences and visitors to the Armenian Church of the Holy Ascension will have seasonally obstructed views of portions of the substation. Given that observation points at these locations will be about 35-40 feet lower than the new substation, views of the substation will likely consist of the tops of some of the structures within the finished yard, such as some of the bus work, the takeoff structures, and the lightning shielding masts. The control/switchgear building should not be visible from Stella Street or the church. Furthermore, views from these locations will be looking uphill through approximately 500 feet of fairly dense and mature deciduous trees. During the winter months, partially obstructed views of portions of the substation will be possible. However, at other times of the year, the dense foliage and topography should all but eliminate any views of the substation from the lower elevations.

The proposed substation should not be visible to motorists on Huntington Turnpike or the Merritt Parkway. Seasonally obstructed views of the new substation will likely occur from Nichols Avenue and from the travel lanes and entry/exit ramps of State Route 8. These views will be similar to that which is available today of the existing

CL&P and UI transmission lines and UI switch structure that are immediately adjacent to the substation site.

Overall, visual impacts from construction and operation of the Trumbull Substation are anticipated to be minimal. Nevertheless, it is recognized that two or three existing single family residences will have seasonally obstructed to unobstructed views of this new facility. Therefore, UI will add additional natural vegetative screening to assist in minimizing visual impacts to area residents and motorists alike. UI will maintain this vegetation throughout the life of the substation. Figures 5-1, 5-3, and 5-5 illustrate existing conditions at the project site as viewed from the general area of the residence on Wildflower Lane, from the State Route 8 Interchange, and from the north edge of the existing CL&P right-of-way. Figure 5-2 is a computerized visual simulation of the proposed substation as viewed from Wildflower Lane, Figure 5-4 is a computerized visual simulation of the new substation as viewed from the State Route 8 Interchange, and Figures 5-6 and 5-7 provide a visual simulation of the new substation as viewed from the north. Figure 5-7 includes the addition of vegetative landscaping outside of the perimeter fence. In addition, Figure 5-8 provides a current view of the CL&P right-of-way looking west, while Figure 5-9 provides a simulation adding the 115 kV tap structure #833B to the CL&P right-of-way

5.4 Cultural Resources

The State of Connecticut has indicated that there are no known and recorded historic and archaeological sites on or near the proposed substation site (Section 8.0). The Connecticut Historical Commission, now the Connecticut Commission on Culture & Tourism, has stated "... that the proposed undertaking will have no effect on historic, architectural or archaeological resources listed on or eligible for the National Register of Historic Places" (Shannahan, 2002) (Loether, 2005). Those historic residences and structures identified over 0.5 mile north of the project site on Huntington Turnpike and Shelton Road will not be impacted by the project, and will not be able to see the new substation from their locations.

Portions of the proposed site have been disturbed by construction of the CL&P and UI transmission lines and the installation by UI of a line worker training area. Each of these utility uses has required associated clearing activities. While no cultural resource sites have been discovered and recorded for the project site, UI nevertheless recognizes that this does not preclude the existence of undiscovered cultural resources. Therefore, if prehistoric archaeological and/or historic resources are discovered during construction of the substation, work will stop in the immediate area of the find and the State Historic Preservation Officer (SHPO) at the Connecticut Commission on Culture & Tourism will

Figure 5-1

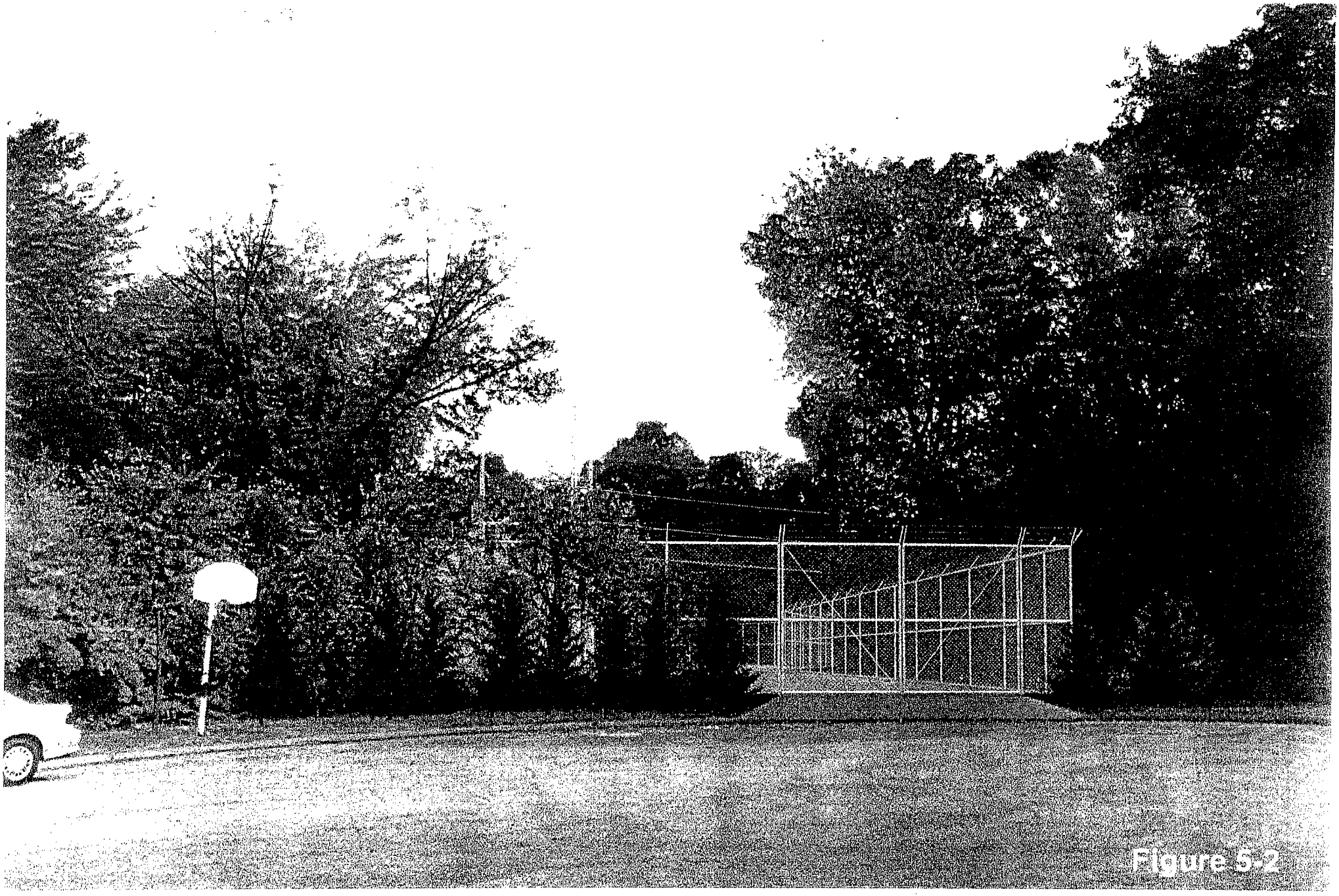


Figure 5-2

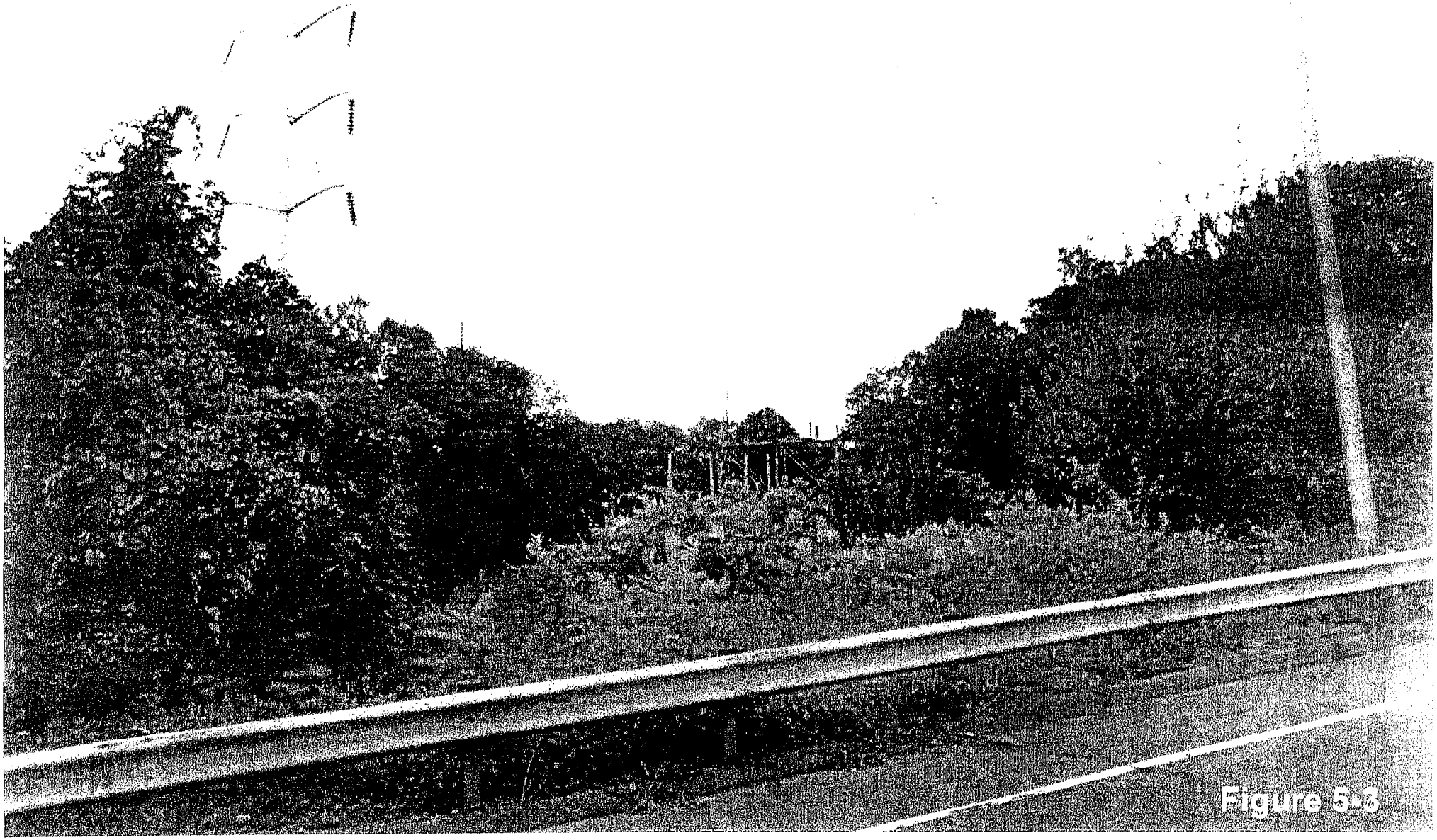


Figure 5.3

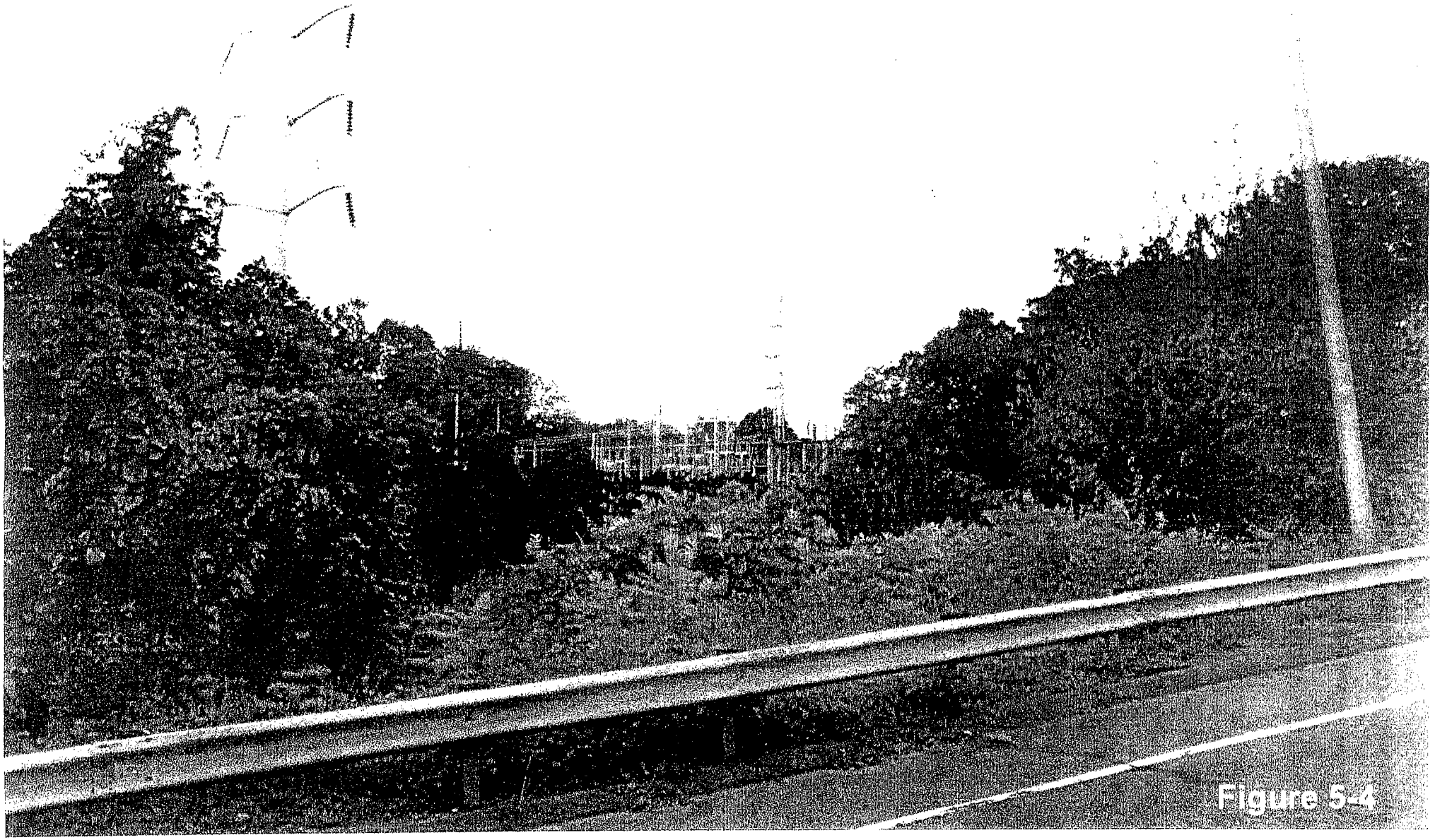


Figure 5-4

Figure 5-5

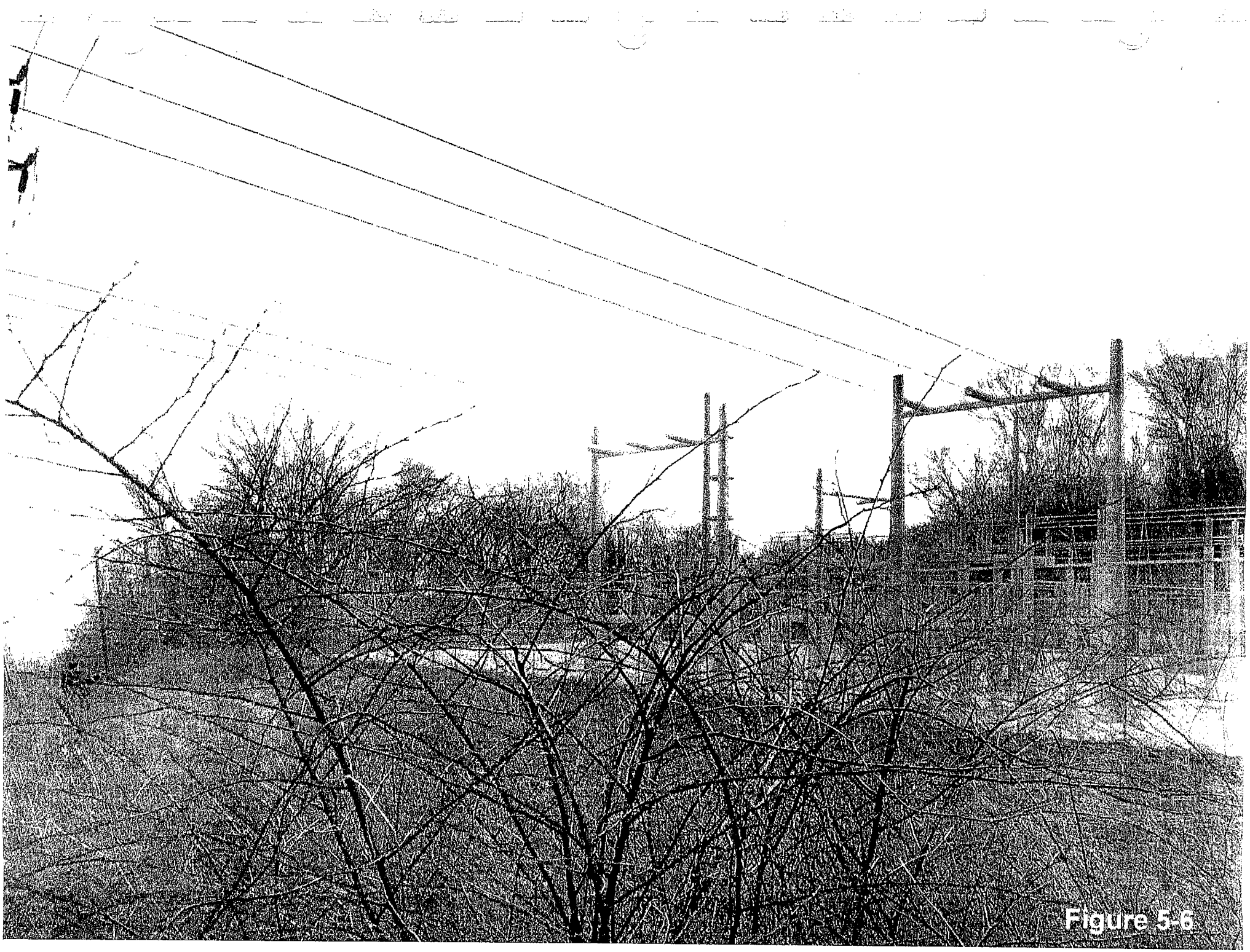


Figure 5-6

Figure 5-7

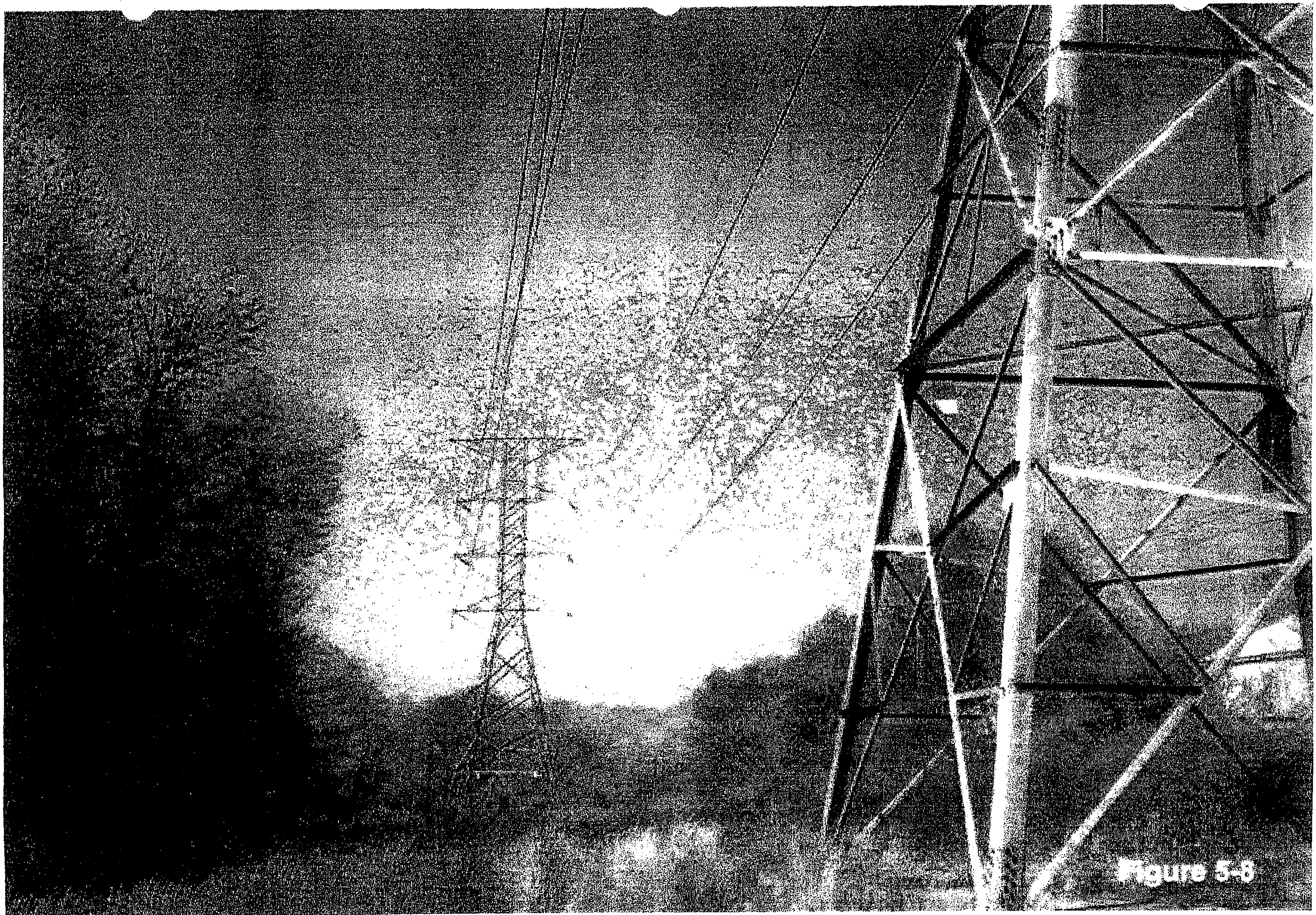
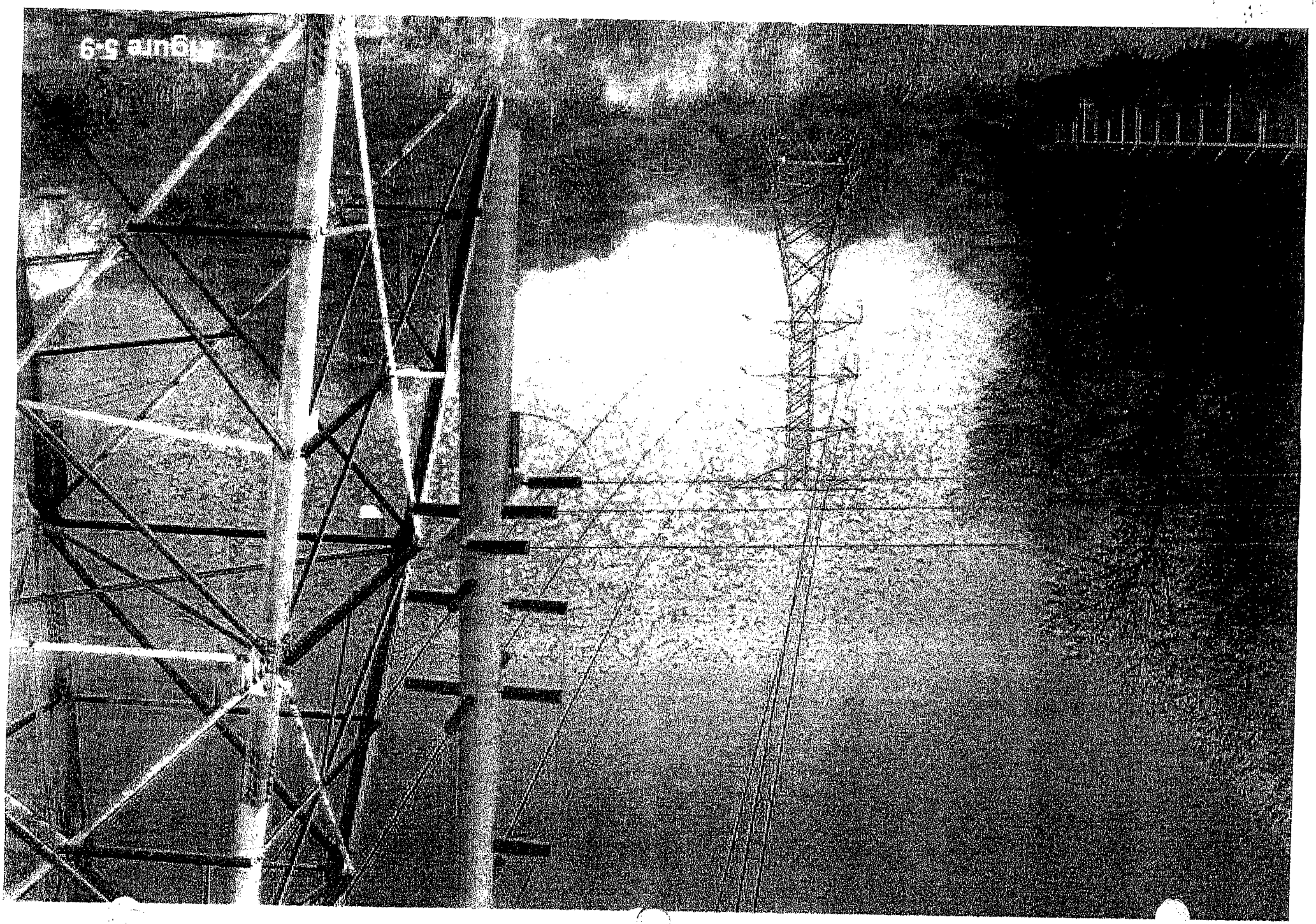


Figure 5-8



be notified at once. Construction will proceed in the area of question only after SHPO review and approval.

5.5 Electrical Effects

5.5.1 Facility Noise Emissions

The major noise sources associated with the proposed substation facility are expected to be the two transformers proposed for the substation. Noise modeling has been conducted to predict the environmental noise emissions from the proposed substation facility. The facility noise emissions have been evaluated based on meeting the town's regulations and reducing the noise impact on nearby residences. Noise mitigation measures were considered and selected to assure compliance with the regulations and reduce the facility noise at the nearest noise sensitive receptors. With noise mitigation, the facility noise emissions will comply with the Town of Trumbull regulations (45 dBA nighttime) and only slightly increase the background sound levels at the nearest residences during the quietest nighttime hours. During other daytime hours, the facility noise emissions will cause no increase to the background sound levels at the nearest residences.

With noise mitigation applied to the power transformers, the facility noise emissions are expected to comply with the local regulations and only slightly increase the background sound levels at the nearest residences. As previously stated, the existing noise levels at the nearest residential boundaries ranged from 48 to 50 dBA. The net result of installing the new transformers with appropriate mitigation is that it will increase the existing background sound level by only 0 - 2 dBA. A 3 dB change is considered "just barely perceptible to the average listener". Therefore, a 0 to 2 dB increase due to the substation would be considered insignificant.

5.5.2 Electric and Magnetic Fields

The design of the proposed substation is consistent with the Connecticut Siting Council's Best Management Practices for electric and magnetic fields. The Company's actions include:

- Recognition of completed and ongoing scientific EMF research.
- Performance of an individual project-specific assessment of EMF.
- Obtaining baseline, preconstruction measurements of EMF levels at the proposed site.
- Consideration of EMF exposure levels and durations with respect to existing and planned uses.

- Consideration of reduced EMF design (optimal phasing of the 115 kV transmission lines).
- Consideration of non-structural alternatives.
- Consideration of project-specific exposure limits for EMF.

Operation of the proposed Trumbull Substation will not significantly increase the magnetic field within the UI property outside of the substation fence line, and may only slightly increase the magnetic field levels at portions of UI's property line. Therefore, UI does not recommend establishing a project-specific electric and magnetic field standard for this facility. The design for the Trumbull Substation will have lower associated EMF levels than exposure guidelines provided by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the American Conference on Govermental Industrial Hygienists (ACGIH). UI believes that Project is consistent with the Council's Best Management Practices for Electric and Magnetic Fields, and that no additional design aspects specifically to reduce EMF needed to be considered.

Ambient EMF measurements and projected calculations were made at the proposed substation's eastern property line where the existing UI 115 kV transmission lines pass overhead. The highest EMF values will occur where the existing transmission lines enter the new substation. At this location, the existing electric field was measured at 0.5 kV/m and the existing magnetic field was measured at 71 mG. At the same location with the substation in operation, the calculated electric field is 0.8 kV/m and the calculated magnetic field is 97 mG.

6.0 Permits and Approvals

The Trumbull Substation project will comply with all applicable local, state and federal laws, regulations, codes, ordinances, and similar requirements concerning noise, excavation and construction activities. Permit applications, if required, will be submitted and permits will be secured for the proposed substation facilities, including the associated transmission line modification. Specific permits/agency approvals are summarized in the following sections.

6.1 Connecticut Siting Council

UI will make application to the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need for the Trumbull Substation Project. Prior to the filing of this application, UI will notify the property owners adjacent to the proposed substation site of the planned construction and operation of the proposed substation and the transmission line modification. Notification will be by certified letter. At least 60 days prior to the application filing, UI will also formally provide information to the Town of Trumbull and other incorporated jurisdictions within 2,500 feet of the project (the City of Bridgeport and the Town of Stratford) regarding the proposed project. Consistent with statutory requirements, UI will seek to meet with the chief elected officials or their designees to consult with them on this project.

6.2 Department of Public Utility Control

At least 30 days prior to the start of construction of the proposed substation and transmission line modification, UI will submit to the Connecticut Department of Public Utility Control (DPUC) the following:

- A map indicating the location of the proposed substation and the associated transmission line modification. The map will show the points where the transmission line will be routed into and through the new substation.
- Copies of letters from other utilities that may be affected by the project, stating that they have been notified of the details of the proposed substation and transmission line connection and that they offer no objection to the method or manner of construction.

Although no formal petition to the DPUC is required with respect to the proposed substation facility, UI will submit to the DPUC staff technical plans for the new substation for the DPUC's review and comment. UI will submit this information to the DPUC prior to the start of construction.

7.0 Consultation and Coordination with Others

The following agencies and individuals were contacted and/or provided information during the environmental analysis and preparation of this Environmental Report for United Illuminating's Trumbull Substation Project.

Federal

U. S. Department of Agriculture	
Natural Resources Conservation Service	Staff Contact
U. S. Department of Defense	
Army Corps of Engineers, New England District	Ruth Ladd
U. S. Department of the Interior	
Fish and Wildlife Service	Michael J. Amaral Phil Morrison

State of Connecticut

Commission on Culture & Tourism	J. Paul Loether
Department of Environmental Protection	
Coastal Zone Management	Robert Hannon
Inland Wetlands and Watercourses	Staff Contact
Permitting Administrator	Bea Milne
Stormwater Management	Chris Stone
Wildlife	Staff Contact

Department of Transportation	
Policy and Planning	James R. Andrini
Historical Commission	John W. Shannahan

Local

Greater Bridgeport Regional Planning Agency	
Executive Director	James T. Wang
Town of Trumbull	
Engineering	Brian E. Smith
First Selectman	Raymond G. Baldwin
Planning and Zoning	Harry Eberhart Joan Gruce

8.0 Pertinent Correspondence

During the course of the preparation of this Environmental Report (ER) for United Illuminating's Trumbull Substation Project, a number of different agencies and individuals were contacted regarding the project (Section 7.0). These contacts served to request detailed environmental information on the proposed substation site and the project area, and also to inform the agencies of the planned project. Some information needed to prepare this ER was gathered from these agencies, as were comments and concerns of agency representatives. While much information has been gathered from agency Internet web sites and from telephone contacts and meetings with individuals, formal letters were sent to the U. S. Fish and Wildlife Service, Connecticut Department of Environmental Protection (Wildlife Division and Permitting Administrator), and the Connecticut Historical Commission in September 2002. These agencies were contacted again in April 2005.

The following written responses have been received by the project. If other written responses are received, copies will be forwarded to the Siting Council for filing with this application.

- Connecticut Commissionon Culture & Tourism
  Deputy State Historic Preservation Officer
  Re: Historic and Archaeological Sites and other Cultural Resources

- Connecticut Historical Commission
  State Historic Preservation Officer
  Re: Historic and Archaeological Sites and other Cultural Resources

- U. S. Department of the Interior
  Fish and Wildlife Service
  Re: Threatened and Endangered Species

Trumbull Historical Society, Internet web page, *Early Trumbull Industries,* Trumbull, CT, no date.

Trumbull Historical Society, Internet web page, *History of the Town of Trumbull,* Trumbull, CT, 1997.

Trumbull Historical Society, Internet web page, *Trumbull, Connecticut's Namesake,* Trumbull, CT, 2000.

Trumbull Historical Society, Internet web page, *Trumbull's Time Line,* Trumbull, CT, 1997.

Trumbull, Town of, *Article III., Noise,* taken from the Trumbull Code, Trumbull, CT, no date.

Trumbull, Town of, *Minimum Lot and House Sizes, Building Lines and Limits on Height and Bulk of Buildings,* taken from the Trumbull Zoning Ordinance, provided to T. A. Varhol on October 10, 2002, Trumbull, CT.

Trumbull, Town of, Trumbull Net web page, *Parks & Recreation Facilities,* Trumbull, CT, April 7, 2005.

Trumbull, Town of, *Zoning Map,* Trumbull, CT, February 2005.

U. S. Department of Commerce, Bureau of the Census, Internet web page, *Profile of General Demographic Characteristics: 2000, Trumbull Town, Fairfield County, Connecticut,* Washington, DC, 2000.

U. S. Department of the Interior, Geological Survey, *Bridgeport Quadrangle Map,* 7.5-Minute Series, Washington, DC, 1970 (Photorevised 1984).

Wolf, B. L., *Soil Survey of Fairfield County, Connecticut,* U. S. Department of Agriculture, Soil Conservation Service, Washington, DC, February 1981.

Appendix A

Aerial Photograph

Date: 2001 (estimated)

Black & Veatch
Trumbull Junction Substation Project
The United Illuminating Company

AERIAL PHOTOGRAPH