Connecticut
Light & Power

The Northeast Utilities System

APPLICATION TO THE

CONNECTICUT SITING COUNCIL

FOR A

CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED

FOR THE

Waterford Substation

325 Waterford Parkway North
Waterford, Connecticut

June 2008

Submitted by:

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

Volume 2 of 2

Volume 2, Application

TABLE OF CONTENTS

List of Exhibits

Exhibit 1

Site Plans

Issued for: **Preliminary Siting Council Review**

Date Issued: June 04, 2008

Latest Issue: June 04, 2008

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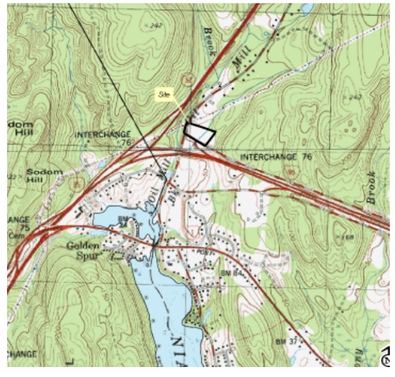
Waterford Substation

325 Waterford Parkway North
Waterford, Connecticut



Site Location Map

0 1000 2000 Feet

* **Property Information**

Owner:
The Connecticut Light and Power Company
P.O. Box 270
Hartford, Connecticut 061414-0270
(860) 605-5000

Applicant:
The Connecticut Light and Power Company
P.O. Box 270
Hartford, Connecticut 061414-0270
(860) 605-5000

Assessor's Plat: Map 88
Lot: 287

Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services

VHB Project No. 41357
325 Waterford Parkway North, Connecticut
Issued for: Preliminary Siting Council Review - 06/04/08

Legend

Exist.	Prop.	
		PROPERTY LINE
		PROJECT LIMIT LINE
		RIGHT-OF-WAY/PROPERTY LINE
		EASEMENT
		BUILDING SETBACK
10+00	10+00	BASELINE
		CONSTRUCTION LAYOUT
		ZONING LINE
		TOWN LINE
		LIMIT OF DISTURBANCE
		WETLAND LINE WITH FLAG
		FLOODPLAIN
BLSF		BORDERING LAND SUBJECT TO FLOODING
BZ		WETLAND BUFFER ZONE
NDZ		NO DISTURB ZONE
200'RA		200' RIVERFRONT AREA
		GRAVEL ROAD
EOP		EDGE OF PAVEMENT
BB	BB	BITUMINOUS BERM
BC	BC	BITUMINOUS CURB
CC	CC	CONCRETE CURB
CG	CG	CURB AND GUTTER
CC	ECC	EXTRUDED CONCRETE CURB
CC	MCC	MONOLITHIC CONCRETE CURB
CC	PCC	PRECAST CONC. CURB
SGE	SGE	SLOPED GRAN. EDGING
VGC	VGC	VERT. GRAN. CURB
		LIMIT OF CURB TYPE
		SAWCUT
		BUILDING
	EN	BUILDING ENTRANCE
	LD	LOADING DOCK
		BOLLARD
D	D	DUMPSTER PAD
		SIGN
		DOUBLE SIGN
		STEEL GUARDRAIL
		WOOD GUARDRAIL
		PATH
		TREE LINE
		WIRE FENCE
		FENCE
		STOCKADE FENCE
		STONE WALL
		RETAINING WALL
		STREAM / POND / WATER COURSE
		DETENTION BASIN
		HAY BALES
		SILT FENCE
4	4	MINOR CONTOUR
20	20	MAJOR CONTOUR
(10)	(10)	PARKING COUNT
(C10)	(C10)	COMPACT PARKING STALLS
DYL	DYL	DOUBLE YELLOW LINE
SL	SL	STOP LINE
		CROSSWALK
		ACCESSIBLE CURB RAMP
		ACCESSIBLE PARKING
VAN	VAN	VAN-ACCESSIBLE PARKING

Exist.	Prop.	
		CONCRETE
		HEAVY DUTY PAVEMENT
		RIPRAP
		CONSTRUCTION ENTRANCE
27.35 TC×	27.35 TC×	TOP OF CURB ELEVATION
26.85 BC×	26.85 BC×	BOTTOM OF CURB ELEVATION
132.75 ×	132.75 ×	SPOT ELEVATION
45.0 TW× 38.5 BW	45.0 TW× 38.5 BW	TOP & BOTTOM OF WALL ELEVATION
		BORING LOCATION
		TEST PIT LOCATION
MW	MW	MONITORING WELL
UD	UD	UNDERDRAIN
12"D	12"D	DRAIN
6"RD	6"RD	ROOF DRAIN
12"S	12"S	SEWER
FM	FM	FORCE MAIN
OHW	OHW	OVERHEAD WIRE
6"W	6"W	WATER
4"FP	4"FP	FIRE PROTECTION
	2"DW	DOMESTIC WATER
3"G	G	GAS
E	E	ELECTRIC
STM	STM	STEAM
T	T	TELEPHONE
FA	FA	FIRE ALARM
CATV	CATV	CABLE TV
		CATCH BASIN
		DOUBLE CATCH BASIN
		GUTTER INLET
Ⓓ		DRAIN MANHOLE
TD		TRENCH DRAIN
C	C	PLUG OR CAP
CO	CO	CLEANOUT
		FLARED END SECTION
		HEADWALL
Ⓢ		SEWER MANHOLE
CS	CS	CURB STOP & BOX
WV	WV	WATER VALVE & BOX
TSV	TSV	TAPPING SLEEVE, VALVE & BOX
		SIAMESE CONNECTION
HYD	HYD	FIRE HYDRANT
WM	WM	WATER METER
PIV	PIV	POST INDICATOR VALVE
Ⓦ	Ⓦ	WATER WELL
GG	GG	GAS GATE
GM	GM	GAS METER
Ⓔ	EMH	ELECTRIC MANHOLE
EM	EM	ELECTRIC METER
		LIGHT POLE
Ⓣ	TMH	TELEPHONE MANHOLE
T	T	TRANSFORMER PAD
		UTILITY POLE
		GUY POLE
		GUY WIRE & ANCHOR
HH	HH	HAND HOLE
PB	PB	PULL BOX
Matchline		MATCHLINE

Abbreviations

General

ABAN	ABANDON
ACR	ACCESSIBLE CURB RAMP
ADJ	ADJUST
APPROX	APPROXIMATE
BIT	BITUMINOUS
BS	BOTTOM OF SLOPE
BWLL	BROKEN WHITE LANE LINE
CONC	CONCRETE
DYCL	DOUBLE YELLOW CENTER LINE
EL	ELEVATION
ELEV	ELEVATION
EXIST	EXISTING
FDN	FOUNDATION
FFE	FIRST FLOOR ELEVATION
GRAN	GRANITE
GTD	GRADE TO DRAIN
LA	LANDSCAPE AREA
LOD	LIMIT OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PERF	PERFORATED
PROP	PROPOSED
REM	REMOVE
RET	RETAIN
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
SWEL	SOLID WHITE EDGE LINE
SWLL	SOLID WHITE LANE LINE
TS	TOP OF SLOPE
TYP	TYPICAL

Utility

CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
DCB	DOUBLE CATCH BASIN
DMH	DRAIN MANHOLE
CIP	CAST IRON PIPE
COND	CONDUIT
DIP	DUCTILE IRON PIPE
FES	FLARED END SECTION
FM	FORCE MAIN
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
GI	GUTTER INLET
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
INV	INVERT ELEVATION
I=	INVERT ELEVATION
LP	LIGHT POLE
MES	METAL END SECTION
PWW	PAVED WATER WAY
PVC	POLYVINYLCHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
R=	RIM ELEVATION
SMH	SEWER MANHOLE
TSV	TAPPING SLEEVE, VALVE AND BOX
UG	UNDERGROUND
UP	UTILITY POLE

Notes:

Erosion Control

THE FOLLOWING EROSION AND SEDIMENTATION CONTROLS SHALL BE EMPLOYED BY THE CONTRACTOR DURING THE EARTHWORK AND CONSTRUCTION PHASES OF THE PROJECT IN ACCORDANCE WITH THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL.

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES, AND REMOVE SEDIMENT THEREFROM ON A WEEKLY BASIS AND WITHIN TWELVE HOURS AFTER EACH STORM EVENT AND DISPOSE OF SEDIMENTS IN AN UPLAND AREA SUCH THAT THEY DO NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.

Existing Conditions Information

1. BASE PLAN: THE PROPERTY LINES SHOWN WERE DETERMINED BY AN ACTUAL FIELD SURVEY CONDUCTED BY VHB, INC.THE TOPOGRAPHY AND PHYSICAL FEATURES ARE BASED ON AN ACTUAL FIELD SURVEY PERFORMED ON THE GROUND BY VHB, INC., DURING OCTOBER, 2007.

A. DELINEATION OF THE WETLANDS AND PLACEMENT OF THE FLAGS WAS PERFORMED BY: VHB, INC.

B. FLAGS MARKING THE WETLANDS WERE LOCATED BY: VHB, INC.

2. TOPOGRAPHY: ELEVATIONS ARE BASED ON CT NAD 83.

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54 Tuttle Place, Middletown, Connecticut 06457-1847
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PLANS AND SPECIFICATIONS ARE SUBJECT TO REVISIONS PENDING FINAL SITING COUNCIL APPROVAL

CAD GENERATED DWG

MF	NO	DATE	REVISIONS	BY	CHK	APP	APP

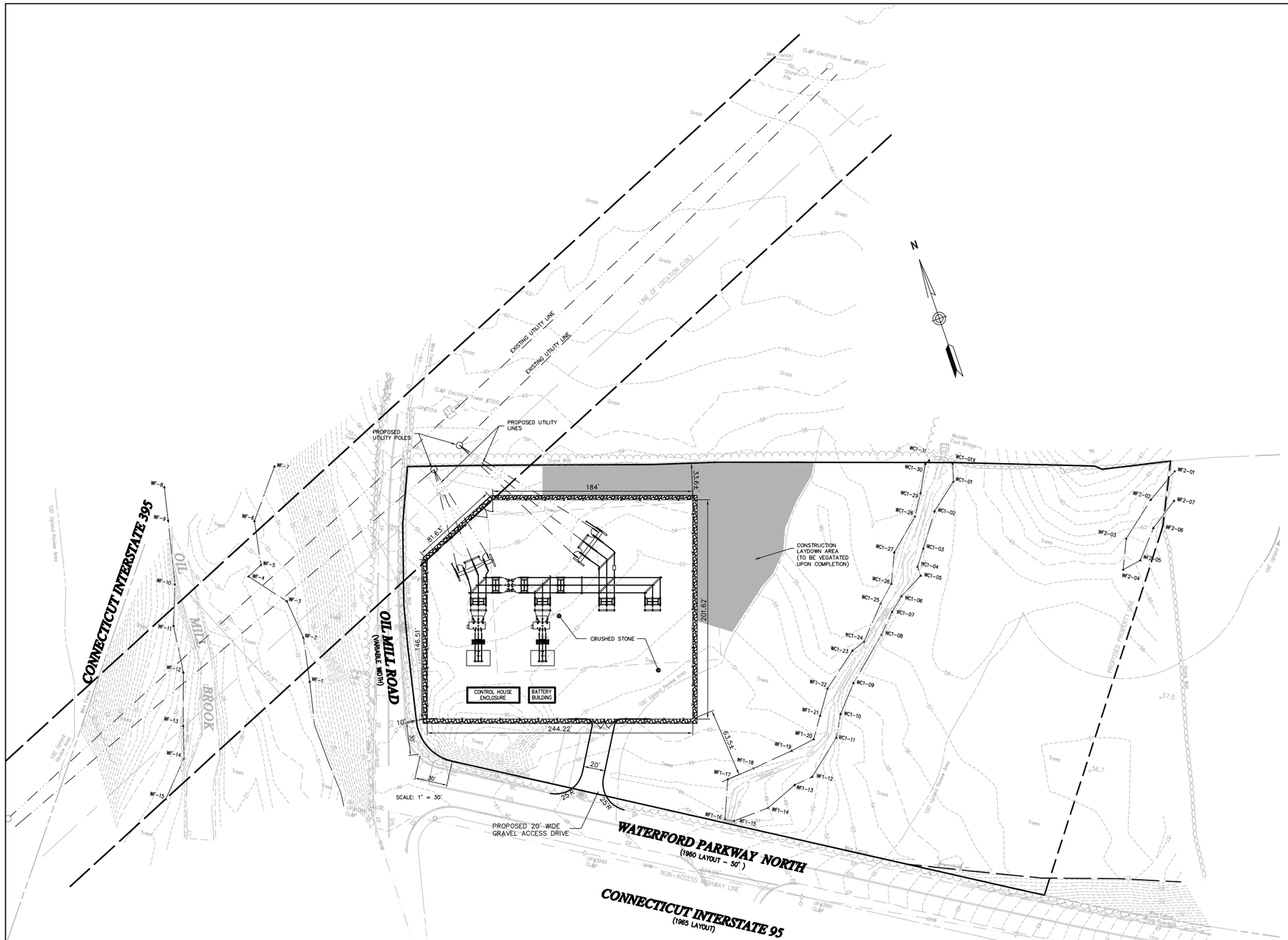
NORTHEAST UTILITIES SERVICE CO.

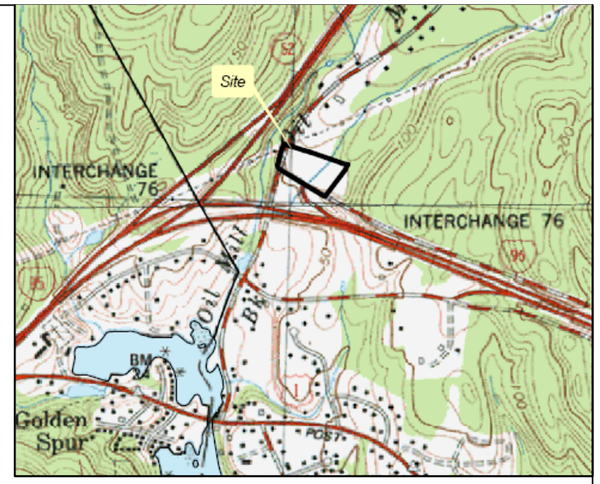
FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE

Legend and General Notes
Waterford Substation
Waterford, Connecticut

BY VHB	CHKD	APP	APP
DATE 06/04/08	DATE	DATE	DATE
SCALE NONE		DWG. NO. C-1	





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MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

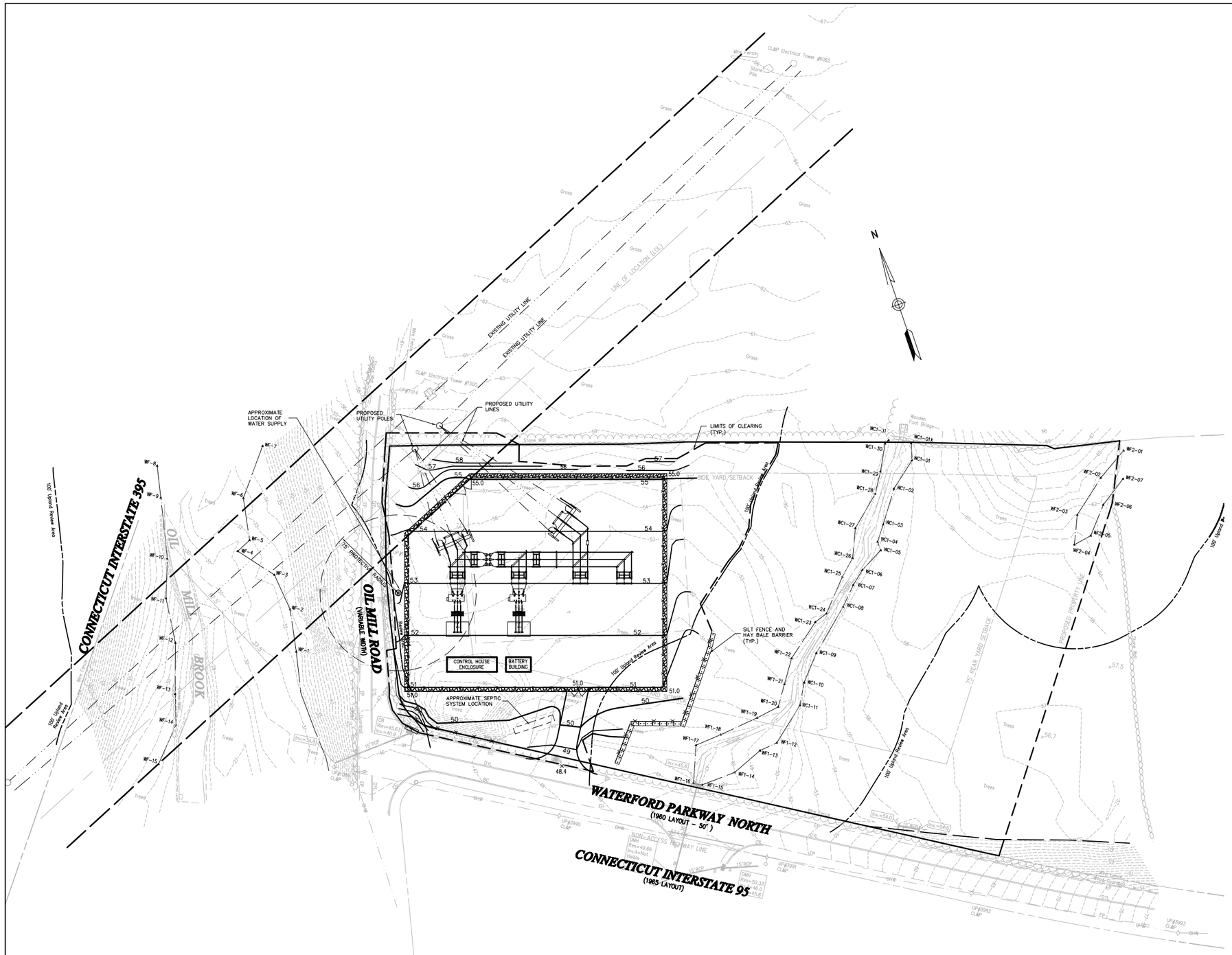
NORTHEAST UTILITIES SERVICE CO.

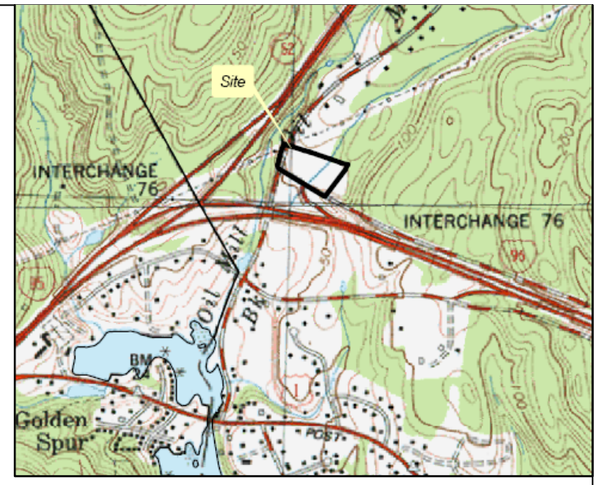
FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE

Layout Plan
Waterford Substation
Waterford, Connecticut

BY		CHKD		APP	APP
DATE	06/04/08	DATE		DATE	DATE
SCALE	1"=50'			DWG. NO.	C-2





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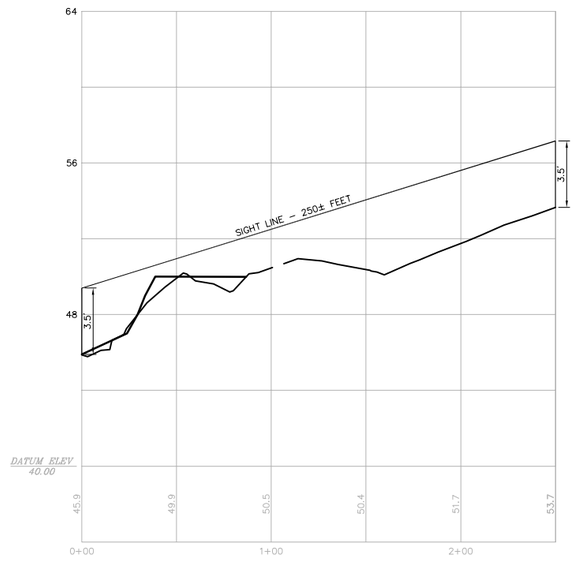
MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

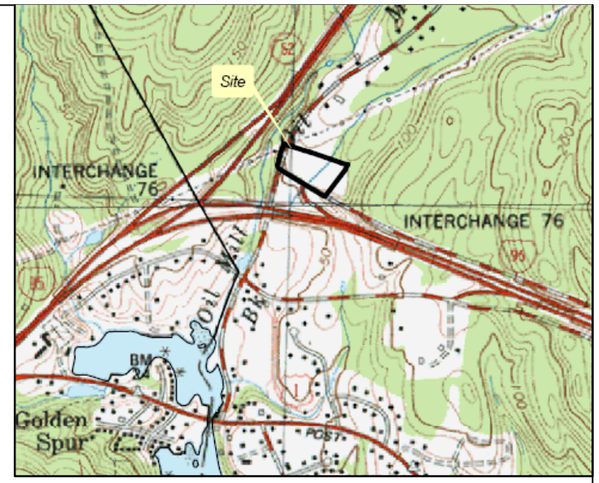
FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE
Grading, Drainage & Erosion Ctrl. Plan
Waterford Substation
Waterford, Connecticut

BY		CHKD		APP	APP
DATE	06/04/08	DATE		DATE	DATE
SCALE	1"=50'			DWG. NO.	C-3



HORIZONTAL
40 0 40 80
4 0 4 8
VERTICAL
SCALE IN FEET



1000 0 1000 2000
SCALE IN FEET

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CAD GENERATED DWG

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

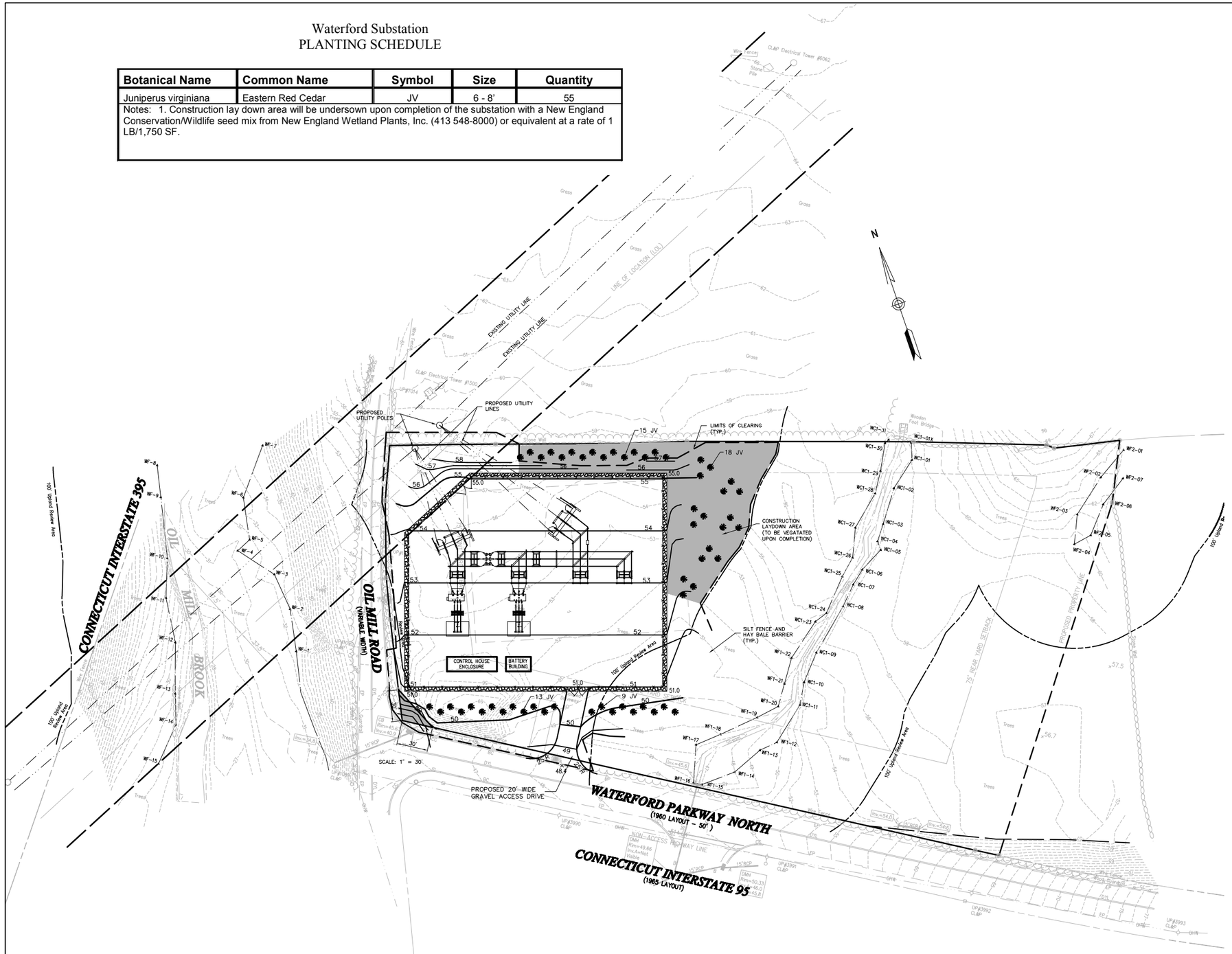
TITLE
Sightline Profile
Waterford Substation
Waterford, Connecticut

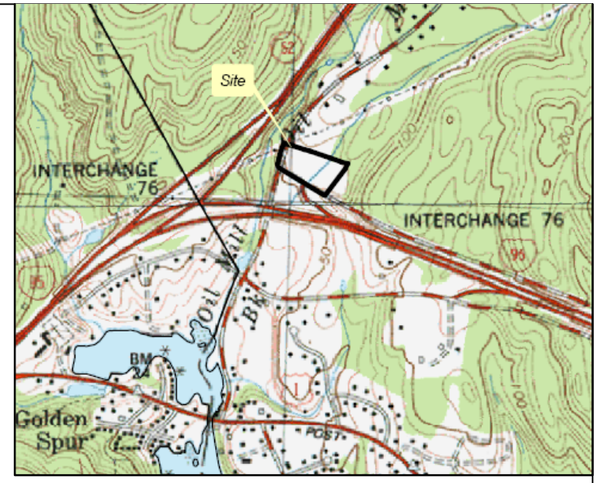
BY		CHKD		APP	APP
DATE	06/04/08	DATE		DATE	DATE
SCALE	1"=40'			DWG. NO.	C-4

Waterford Substation
PLANTING SCHEDULE

Botanical Name	Common Name	Symbol	Size	Quantity
Juniperus virginiana	Eastern Red Cedar	JV	6 - 8'	55

Notes: 1. Construction lay down area will be undersown upon completion of the substation with a New England Conservation/Wildlife seed mix from New England Wetland Plants, Inc. (413 548-8000) or equivalent at a rate of 1 LB/1,750 SF.





1000 0 1000 2000
SCALE IN FEET

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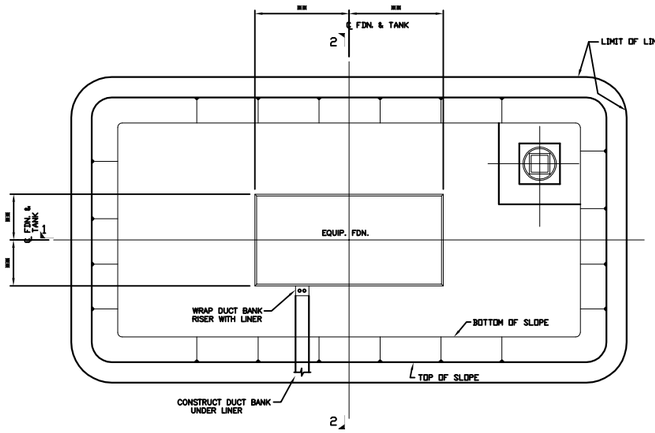
MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

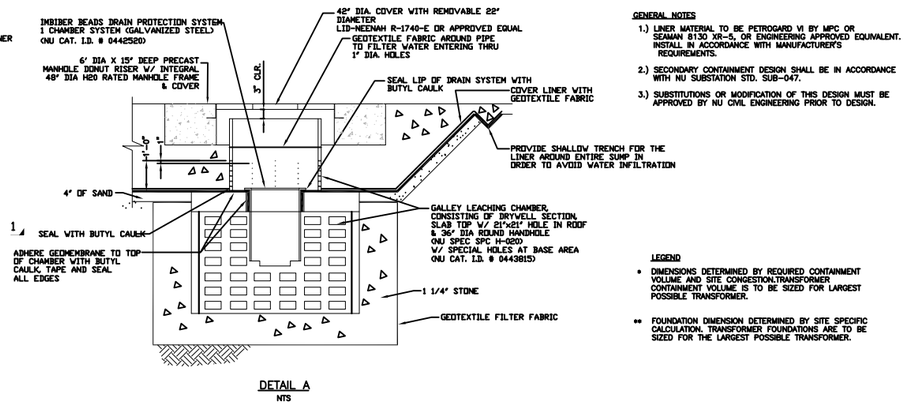
FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE
Landscape Plan
Waterford Substation
Waterford, Connecticut

BY		CHKD		APP	APP
DATE	06/04/08	DATE		DATE	DATE
SCALE	1"=50'			DWG. NO.	C-5



PLAN A-04



DETAIL A
NTS

GENERAL NOTES

1.) LINER MATERIAL TO BE PETROGARD VI BY MPC OR SEAMAN 8130 XR-5, OR ENGINEERING APPROVED EQUIVALENT. INSTALL IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

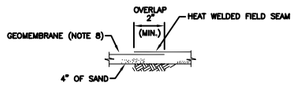
2.) SECONDARY CONTAINMENT DESIGN SHALL BE IN ACCORDANCE WITH NU SUBSTATION STD. SUB-047.

3.) SUBSTITUTIONS OR MODIFICATION OF THIS DESIGN MUST BE APPROVED BY NU CIVIL ENGINEERING PRIOR TO DESIGN.

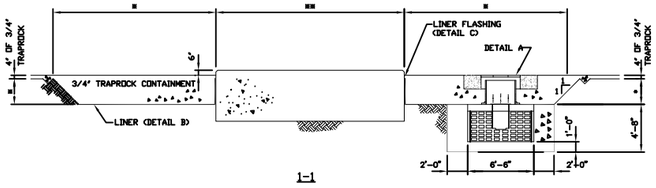
LEGEND

- DIMENSIONS DETERMINED BY REQUIRED CONTAINMENT VOLUME AND SITE CONGESTION.TRANSFORMER CONTAINMENT VOLUME IS TO BE SIZED FOR LARGEST POSSIBLE TRANSFORMER.

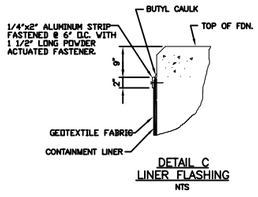
** FOUNDATION DIMENSION DETERMINED BY SITE SPECIFIC CALCULATION. TRANSFORMER FOUNDATIONS ARE TO BE SIZED FOR THE LARGEST POSSIBLE TRANSFORMER.



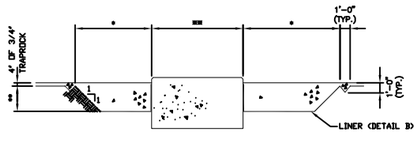
DETAIL B
CONTAINMENT LINER & OVERLAP (IF REQ'D.)
NTS



1-1



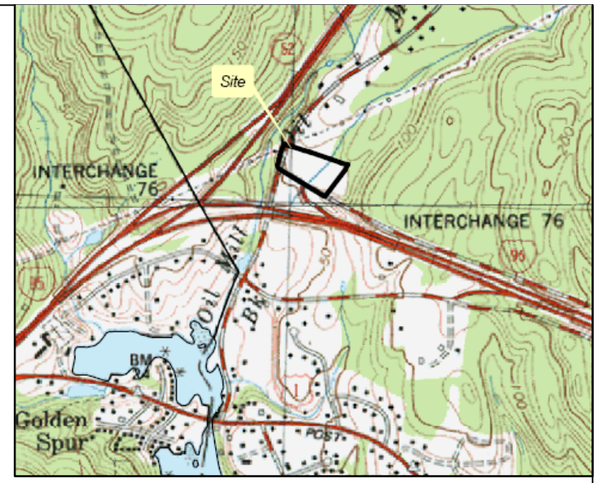
DETAIL C
LINER FLASHING
NTS



2-2

Typical Transformer Foundation and Secondary Containment

N.T.S. Source: NU



1000 0 1000 2000
SCALE IN FEET

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CAD GENERATED DWG

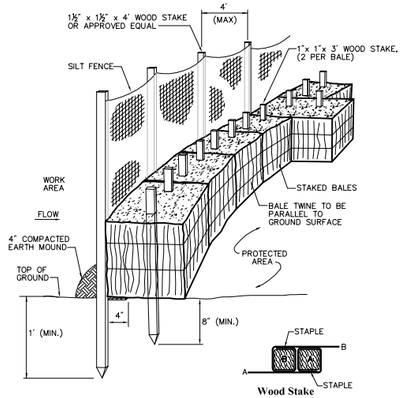
MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE
Site Details
Waterford Substation
Waterford, Connecticut

BY	VHB	CHKD	APP	APP
DATE	06/04/08	DATE	DATE	DATE
SCALE	NONE		DWG. NO.	C-6

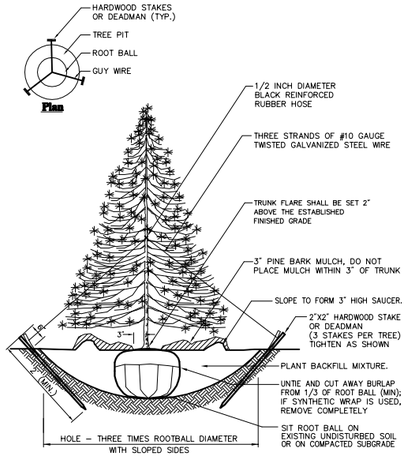


Notes:

PLACE ONE HAY BALE PERPENDICULAR ALONG HAY BALE BARRIER (100' O.C.).

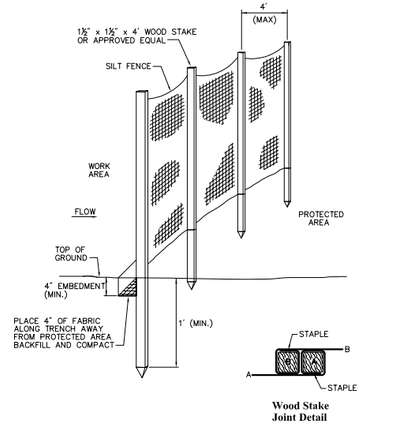
Silt Fence / Hay Bale Barrier

N.T.S. Source: VHB 6/03 LD_655



Evergreen Tree Planting

N.T.S. Source: VHB 6/03 LD_604



Silt Fence Barrier

N.T.S. Source: VHB 6/03 LD_650

Notes:

1. ENTRANCE WIDTH SHALL BE A TWENTY–FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.
3. STABILIZED CONSTRUCTION EXIT SHALL BE REMOVED PRIOR TO FINAL FINISH MATERIALS BEING INSTALLED.

Stabilized Construction Exit

N.T.S. Source: VHB 6/03 LD_682

Temporary Erosion and Sedimentation Control Maintenace

THE SITE CONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING EACH CONTROL SHOWN ON THE SEDIMENTATION AND EROSION CONTROL PLAN.

THE SITECONTRACTOR WILL INSPECT ALL SEDIMENT AND EROSION CONTROL STRUCTURES PERIODICALLY AND AFTER EACH RAINFALL EVENT. RECORDS OF THE INSPECTIONS WILL BE PREPARED AND MAINTAINED ON–SITE BY THE CONTRACTOR.

SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6–INCHES DEEP OR AS NEEDED.

DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.

THE UNDERSIDE OF HAY BALES SHOULD BE KEPT IN CLOSE CONTACT WITH THE EARTH AND RESET AS NECESSARY.

SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON–SITE.

INSPECT THE TEMPORARY SEDIMENT TRAP AT LEAST ONCE A WEEK AND WITHIN 24 HOURS OF A RAINFALL EVENT TO DETERMINE THE CONDITIONS OF THE BASINS DURING CONSTRUCTION. CLEAN OUT SEDIMENT BASINS WHEN ACCUMULATION REACHES 12". SEDIMENT LEVELS SHALL BE MARKED WITHIN THE SEDIMENT STORAGE AREA BY STAKES. DO NOT ALLOW ACCUMULATED SEDIMENTS TO FLUSH INTO WETLAND AREAS.

EROSION CONTROL STRUCTURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SECURELY STABILIZED. AFTER REMOVAL OF STRUCTURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS SOON AS PRACTICAL.

MAINTAIN THE CONSTRUCTION ENTRANCE IN A CONDITION WHICH WILL PREVENT TRACKING AND WASHING OF SEDIMENTS ONTO PAVED SURFACES.

NOTE: MORE DETAILED EROSION CONTROL AND CONSTRUCTION METHODS TO FOLLOW THE MATERIAL HANDLING REPORT.

Erosion and Sedimentation Control Tecniques

THE FOLLOWING EROSION AND SEDIMENTATION CONTROLS SHALL BE EMPLOYED BY THE CONTRACTOR DURING THE EARTHWORK AND CONSTRUCTION PHASES OF THE PROJECT IN ACCORDANCE WITH THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL.

SILT FENCING
IN AREAS WHERE HIGH RUNOFF VELOCITIES OR HIGH SEDIMENT LOADS ARE EXPECTED, HAY BALE BARRIERS WILL BE BACKED UP WITH SILT FENCING. THIS SEMI–PERMEABLE BARRIER MADE OF A SYNTHETIC POROUS FABRIC WILL PROVIDE ADDITIONAL PROTECTION. THE SILT FENCES AND HAY BALE BARRIER WILL BE REPLACED AS DETERMINED BY PERIODIC FIELD INSPECTIONS.

HAY BALE BARRIERS
HAY BALE BARRIERS WILL BE PLACED TO TRAP SEDIMENT TRANSPORTED BY RUNOFF BEFORE IT REACHES THE DRAINAGE SYSTEM OR LEAVES THE CONSTRUCTION SITE. BALES WILL BE SET AT LEAST FOUR INCHES INTO THE EXISTING GROUND TO MINIMIZE UNDERCUTTING BY RUNOFF.

CATCH BASIN PROTECTION
NEWLY CONSTRUCTED AND EXISTING CATCH BASINS WILL BE PROTECTED WITH SILT SACKS THROUGHOUT CONSTRUCTION.

GRAVEL AND CONSTRUCTION ENTRANCE/EXIT
A TEMPORARY CRUSHED–STONE CONSTRUCTION ENTRANCE/EXIT WILL BE CONSTRUCTED. A CROSS SLOPE WILL BE PLACED IN THE ENTRANCE TO DIRECT RUNOFF TO THE SEDIMENT TRAP.

VEGETATIVE SLOPE STABILIZATION
STABILIZATION OF OPEN SOIL SURFACES WILL BE IMPLEMENTED WITHIN 14 DAYS AFTER GRADING OR CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, UNLESS THERE IS SUFFICIENT SNOW COVER TO PROHIBIT IMPLEMENTATION. VEGETATIVE SLOPE STABILIZATION WILL BE USED TO MINIMIZE EROSION ON SLOPES OF 3:1 OR FLATTER. ANNUAL GRASSES, SUCH AS ANNUAL RYE, WILL BE USED TO ENSURE RAPID GERMINATION AND PRODUCTION OF ROOTMASS. PERMANENT STABILIZATION WILL BE COMPLETED WITH THE PLANTING OF PERENNIAL GRASSES OR LEGUMES. ESTABLISHMENT OF TEMPORARY AND PERMANENT VEGETATIVE COVER MAY BE ESTABLISHED BY HYDRO–SEEDING OR SODDING. A SUITABLE TOPSOIL, GOOD SEEDBED PREPARATION, AND ADEQUATE LIME, FERTILIZER AND WATER WILL BE PROVIDED FOR EFFECTIVE ESTABLISHMENT OF THESE VEGETATIVE STABILIZATION METHODS. MULCH WILL ALSO BE USED AFTER PERMANENT SEEDING TO PROTECT SOIL FROM THE IMPACT OF FALLING RAIN AND TO INCREASE THE CAPACITY OF THE SOIL TO ABSORB WATER.

STOCKPILE MANAGEMENT
SIDESLOPES OF STOCKPILED MATERIAL SHALL BE NO STEEPER THAN 2:1. STOCKPILES NOT USED WITHIN 30 DAYS NEED TO BE SEEDED AND MULCHED IMMEDIATELY AFTER FORMATION OF THE STOCKPILE. HAYBALES AND SILT FENCE ARE TO BE PLACED AROUND THE STOCKPILE AREA APPROXIMATELY 10 FEET FROM THE TOW OF SLOPE.

SEED MIX TO BE INTEGRALLY MIXED INTO COMPOST–MULCH SLURRY SHALL BE THE "NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES" BY NEW ENGLAND WETLAND PLANTS, AMHERST, MA OR EQUAL. SEED SHALL BE APPLIED WITHIN THE SLURRY AT THE SUPPLIER'S RECOMMENDED SEEDING RATE OF 35 LBS. PER ACRE. IN ADDITION, A NURSE SEED CONSISTING OF ANNUAL RYEGRASS SHALL ALSO BE APPLIED WITHIN THE SLURRY AT A SEEDING RATE OF 15 LBS. PER ACRE. SPECIES TO BE INCLUDED IN THE SPECIFIED NATIVE WETLAND MIX WILL INCLUDE:

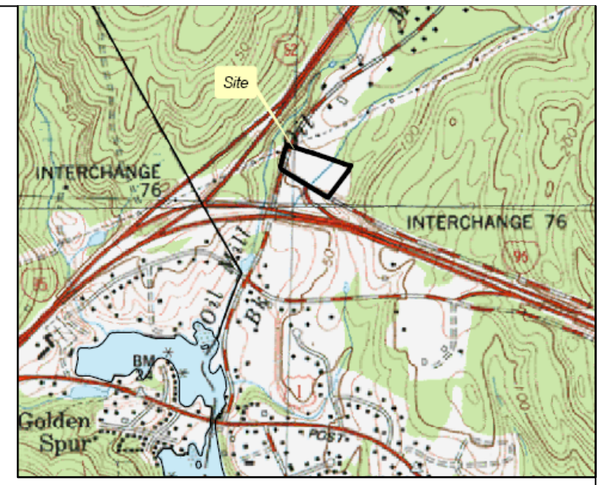
DUST CONTROL
PERIODICALLY MOISTEN EXPOSED SURFACES ON UNPAVED TRAVELWAYS TO KEEP THE TRAVELWAY DAMP AND REDUCE DUST.

Landscape Notes

1. ALL PROPOSED PLANTING LOCATIONS SHALL BE STAKED CAREFULLY AS SHOWN ON THE PLANS FOR FIELD REVIEW BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. THE CONTRACTOR IS RESPONSIBLE TO NOTIFY "CALL BEFORE YOU DIG" PRIOR TO EXCAVATION, IF APPLICABLE.
3. NO PLANT MATERIALS SHALL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
4. ALL PLANTS SHOULD BE DELIVERED TO THE SITE SECURELY BALED IN BURLAP OR IN ORIGINAL CONTAINERS, WITH LABELS INTACT. ALL PLANTS MUST BE FREE OF DISEASE AND INSECTS, AND WILL BE INSPECTED ON THE SITE BY THE OWNER'S REPRESENATIVE PRIOR TO PLANTING.
5. THE OWNER'S REPRESENATIVE RESERVES THE RIGHT TO REJECT ANY PLANTS NOT IN CONFORMANCE WITH THE SPECIFICATIONS OR IN UNACCEPTABLE CONDITION.
6. FINAL QUANTITY FOR EACH PLANT TYPE SHALL BE AS SHOWN ON THE PLAN. THIS NUMBER SHALL TAKE PRECEDENCE IN CASE OF ANY DISCREPANCY BETWEEN QUANTITIES SHOWN ON THE PLANT LIST AND ON THE PLAN. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES BETWEEN THE NUMBER OF PLANTS SHOWN ON THE PLAN AND PLANT LABELS PRIOR TO BIDDING.
7. ANY PROPOSED PLANT SUBSTITUTIONS MUST BE APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE.
8. ALL PLANT MATERIALS INSTALLED SHALL MEET OR EXCEED THE SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
9. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY SNOW FENCE. ERECT SNOW FENCE AT THE DRIP LINE OF THE TREE. CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS WITHIN THE LANDSCAPE AREAS. ANY DAMAGE TO EXISTING TREES, SHRUBS, OR LAWNS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
10. ALL PLANTED TREES AND SHRUBS SHALL BE MULCHED INDIVIDUALLY WITH 4 TO 6 INCHES DEPTH OF WOOD CHIPS PER NU SPECIFICATIONS FOR LANDSCAPING.
11. LOAM AND SEED ALL AREAS NOT OTHERWISE TREATED.
12. ALL PLANT MATERIAL SHALL BE GUARANTEED FOR ONE YEAR AFTER PLANTING, AND CONTRACTOR SHALL MAINTAIN THE PLANTING INCLUDING ALL WATERING, WEEDING, OR OTHER MAINTAINANCE NECCESSARY FOR A PERIOD OF ONE YEAR AFTER PLANTING.
13. THIS PLAN IS INTENDED FOR LANDSCAPING PURPOSES ONLY. REFER TO SITE / CIVIL DRAWINGS FOR ALL OTHER SITE CONSTRUCTION INFORMATION.

Tree Protection

1. EXISTING TREES TO REMAIN SHALL BE PROTECTED WITH TEMPORARY EROSION CONTROL FENCE AND HAY BALE BARRIER. ERECT BARRIER AT EDGE OF THE EARTHWORK CUT LINE PRIOR TO TREE CLEARING. LAY OUT THIS LINE BY FIELD SURVEY.
2. CONTRACTOR SHALL NOT OPERATE VEHICLES WITHIN THE TREE PROTECTION AREA. CONTRACTOR SHALL NOT STORE VEHICLES OR MATERIALS, OR DISPOSE OF ANY WASTE MATERIALS, WITHIN THE TREE PROTECTION AREA.
3. DAMAGE TO EXISTING TREES CAUSED BY THE CONTRACTOR SHALL BE REPAIRED BY A CERTIFIED ARBORIST AT THE CONTRACTOR'S EXPENSE.



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SCALE IN FEET

Connecticut Light & Power

The Northeast Utilities System

Progress Print
Not For Construction

Vanasse Hangen Brustlin, Inc.
Transportation • Land Development • Environmental Services
54 Tuttle Place, Middletown, Connecticut 06457-1847
Tel: 860 632-1500 • Fax: 860 632-7879

PLANS AND SPECIFICATIONS ARE SUBJECT TO REVISIONS PENDING FINAL SITING COUNCIL APPROVAL

CAD GENERATED DWG

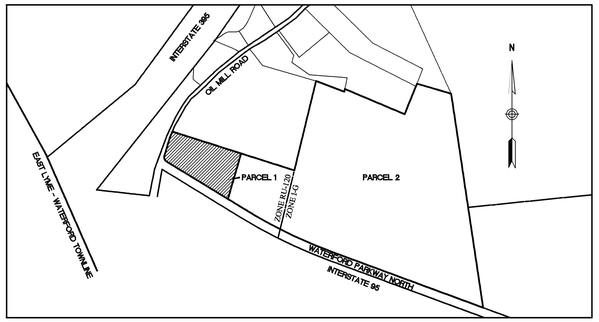
MF	NO	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE
Site Details
Waterford Substation
Waterford, Connecticut

BY	VHB	CHKD	APP	APP
DATE	06/04/08	DATE	DATE	DATE
SCALE	NONE		DWG. NO.	C-7



Area Map
(NOT TO SCALE)

Map References

1. MAP TITLED "PERIMETER SURVEY, PROPERTY OF ANNIE G. KRAVCHUK PREPARED FOR CARRAIGE HOUSE MERCEDES-BENZ" SHEET NO. S-25 DATED JULY 2004, LAST REVISED FEBRUARY 16, 2005, SCALE 1"=100'. PREPARED BY BOUNDARIES LLC.

2. OVERALL SITE PLAN LAYOUT FOR PROPOSED AUTO DEALERSHIP. PREPARED BY E.H. WENKE & ASSOCIATES, P.C. SHEET S-06, SCALE 1"-100', DECEMBER 2003.

3. MAP TITLED "COHANZIE JCT. - FLANDERS S/S 115 KV LINE PLAN & PROFILE" BY NORTHEAST UTILITIES SERVICE CO. DWG. NO. 01087-10002 DATED 12/30/71 SHEET 3 OF 4

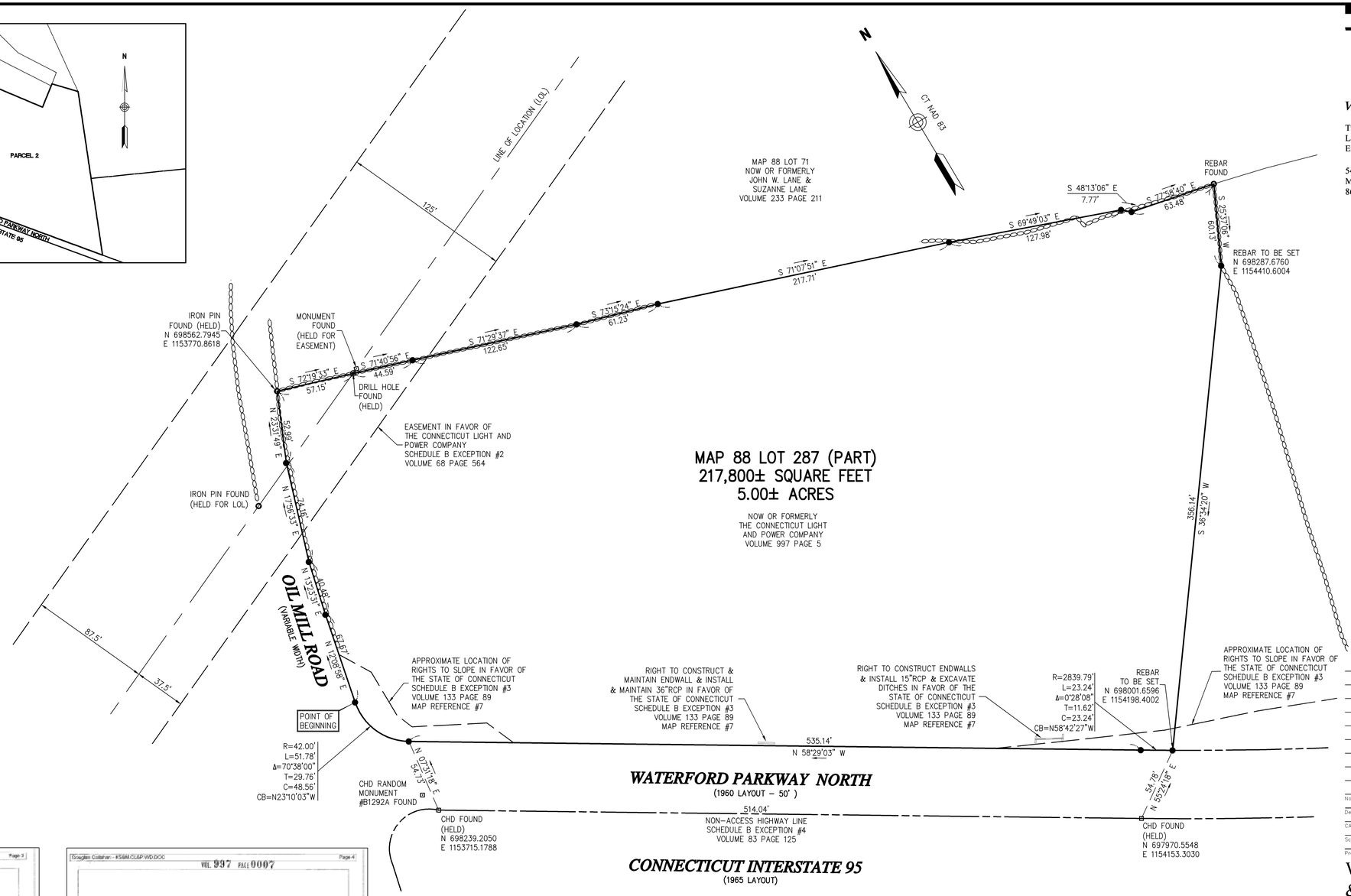
4. MAP TITLED "MAP SHOWING EASEMENT AREA TO BE GRANTED TO CONNECTICUT LIGHT AND POWER COMPANY ACROSS THE PROPERTY OF JOHN W. AND SUZANNE M. LANE #71 OIL MILL ROAD WATERFORD, CT" PROJECT NUMBER 00-346-460 BY DIVERSIFIED TECHNOLOGY CONSULTANTS DATED 7/2/02

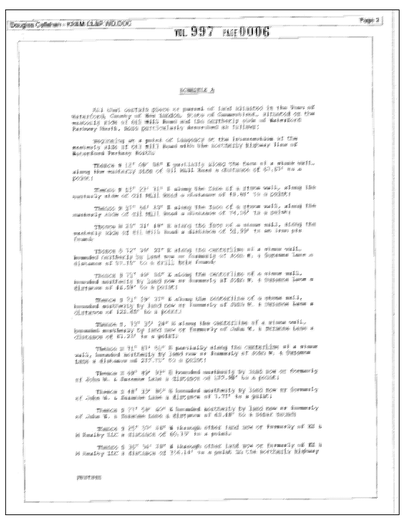
5. MAP TITLED "LOCATION OF RIGHT OF WAY OF THE CONNECTICUT LIGHT & POWER COMPANY ACROSS THE PROPERTY OF ANDREW DOMBROWSKI & ESTATE OF MARY E. DOMBROWSKI" DATED MAY 1943

6. MAPS TITLED "CONNECTICUT STATE HIGHWAY DEPARTMENT RIGHT OF WAY MAP TOWN OF WATERFORD INTERSTATE ROUTE 95 FROM EAST LYME TOWN LINE EASTERLY TO TYKE LANE" DATED OCTOBER 18, 1965 NUMBER 152-12 SHEET NUMBER 1 AND 2 OF 5

7. MAP TITLED "TOWN OF WATERFORD MAP SHOWING LAND, EASEMENTS & RIGHTS OF ACCESS ACQUIRED FROM ANNIE G. KRAVCHUK" PROJECT NO. 152-55 DATED SEPTEMBER 1960, SHEET 1 OF 4

8. MAP TITLED "WATERFORD PARKWAY NORTH & OIL MILL ROAD, WATERFORD, CONNECTICUT, PROPOSED PROPERTY DIVISION MAP" SHEETS 1-2 OF 2 DATED OCTOBER 15, 2007




Douglas Cotterman - KS&M CLMP WD.DOC Page 3
VOL. 997 PAGE 0006

SCHEDULE A

All that certain piece or parcel of land situated in the Town of Waterford, County of New London, State of Connecticut, situated on the easterly side of Oil Mill Road and the southerly side of Waterford Parkway North, being particularly described as follows:

Beginning at a point of tangency of the intersection of the easterly side of Oil Mill Road with the southerly highway line of Waterford Parkway North;

Thence N 12° 08' 58" E partially along the term of a stone wall, along the easterly side of Oil Mill Road a distance of 63.67' to a point;

Thence N 13° 25' 31" E along the term of a stone wall, along the easterly side of Oil Mill Road a distance of 48.48' to a point;

Thence N 17° 56' 33" E along the term of a stone wall, along the easterly side of Oil Mill Road a distance of 24.16' to a point;

Thence N 25° 37' 49" E along the term of a stone wall, along the easterly side of Oil Mill Road a distance of 52.98' to an iron pin found;

Thence S 72° 19' 33" E along the centerline of a stone wall, bounded southerly by land now or formerly of Bibb W. & Suzanne Lane a distance of 57.15' to a drill hole found;

Thence S 71° 40' 56" E along the centerline of a stone wall, bounded southerly by land now or formerly at 2080 W. & Suzanne Lane a distance of 44.59' to a point;

Thence S 71° 29' 37" E along the centerline of a stone wall, bounded southerly by land now or formerly at 2080 W. & Suzanne Lane a distance of 122.65' to a point;

Thence S 73° 19' 24" E along the centerline of a stone wall, bounded southerly by land now or formerly of John W. & Suzanne Lane a distance of 61.23' to a point;

Thence S 71° 07' 51" E partially along the centerline of a stone wall, bounded southerly by land now or formerly of 2080 W. & Suzanne Lane & distance of 217.71' to a point;

Thence S 69° 49' 03" E bounded southerly by land now or formerly of John W. & Suzanne Lane a distance of 127.98' to a point;

Thence S 48° 13' 06" E bounded southerly by land now or formerly of John W. & Suzanne Lane a distance of 7.77' to a point;

Thence S 77° 58' 40" E bounded southerly by land now or formerly of John W. & Suzanne Lane a distance of 63.48' to a point;

Thence S 25° 37' 09" W through other land now or formerly of KS & M Realty LLC a distance of 60.13' to a point;

Thence S 36° 34' 20" W through other land now or formerly of KS & M Realty LLC a distance of 356.14' to a point in the northerly highway

PROPERTIES


Douglas Cotterman - KS&M CLMP WD.DOC Page 4
VOL. 997 PAGE 0007

LINE OF MISSING Parkway North:

Thence along the northerly highway line of Waterford Parkway North 23.24' along the arc of a curve, curving to the right, having a radius of 2839.79', an included angle of 00° 28' 08", a tangent of 11.62' and a chord of 23.24' bearing N 58° 42' 27" W to a point of non-tangency;

Thence N 58° 29' 03" W along the northerly highway line of Waterford Parkway North a distance of 535.14' to a point of curvature;

Thence along the northerly highway line of Waterford Parkway North 54.78' along the arc of a curve, curving to the right, having a radius of 42.00', an included angle of 70° 38' 00", a tangent of 29.76' and a chord of 48.56' bearing N 23° 10' 03" W to the point of beginning;

Containing approximately 217,686 square feet (5.00 acres)

Said premises are shown as Parcel 1 on a map entitled: "Waterford Parkway North & Oil Mill Road, Waterford, Connecticut Proposed Property Division Map Prepared for Property Owner" Scale 1" = 40' Date October 15, 2007" prepared by Vanasse Hangen Brustlin, Inc., 54 Tuttle Place, Middletown, Connecticut 06457, which map has been or will be recorded in the Waterford Land Records.

RECEIVED AND RECORDED
01 DEC 27 PM 3:17
KAREN M. SCOTT
TOWN CLERK

PROPERTIES

Title Reference

REFERENCE IS MADE TO FIRST AMERICAN TITLE INSURANCE COMPANY ALTA OWNERS POLICY #CTOE.388810769, EFFECTIVE DATE: FEBRUARY 19, 2008.

SCHEDULE B EXCEPTIONS

1. NOT SURVEY RELATED.

2. EASEMENT RECORDED IN VOLUME 68 PAGE 564 IS PLOTTED ON SURVEY.

3. RIGHTS RECORDED IN VOLUME 138 PAGE 87 ARE PLOTTED ON SURVEY.

4. DENIAL OF RIGHTS IS PLOTTED ON SURVEY.

5. SEE MAP REFERENCE #8.

6. NOT SURVEY RELATED.

Legend

- DRILL HOLE FOUND
- IRON PIN/REBAR FOUND
- MONUMENT FOUND
- REBAR TO BE SET

- LINE OF LOCATION
- EASEMENT LINE
- STATE HIGHWAY LINE
- APPROXIMATE PROPERTY LINE
- TOWN LAYOUT LINE
- ASSESSORS PARCEL LINE
- PROPOSED PROPERTY LINE

40' 0 40' 80'
SCALE IN FEET

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE "MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS", JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS IN 2005, AND INCLUDES ITEMS 2-5, 8-11 AND 13 OF TABLE A THEREOF. PURSUANT TO THE ACCURACY STANDARDS AS ADOPTED BY ALTA AND NSPS AND IN EFFECT ON THE DATE OF THIS CERTIFICATION, UNDERSIGNED FURTHER CERTIFIES THAT IN MY PROFESSIONAL OPINION, AS A LAND SURVEYOR IN THE STATE OF CONNECTICUT, THE RELATIVE POSITIONAL ACCURACY OF THIS SURVEY DOES NOT EXCEED THAT WHICH IS SPECIFIED THEREIN."

THIS SURVEY AND MAP HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.

THIS IS A PROPERTY SURVEY CONFORMING TO A HORIZONTAL CLASS A-2 ACCURACY. THE BOUNDARY DETERMINATION IS A RESURVEY.

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON. THIS PLAN IS NOT VALID WITHOUT A LIVE SIGNATURE AND EMBOSSED SEAL.

CHRISTOPHER C. DANFORTH, L.S. #70118 DATE

VHB
Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
54 Tuttle Place
Middletown, Connecticut 06457
860-632-1500 • FAX 860-632-7879

No.	Revision	Date	Appvd.

Designed by TBD | Drawn by MTD | Checked by
CAD checked by | Approved by CCD
Scale 1"=40' | Date February 19, 2008

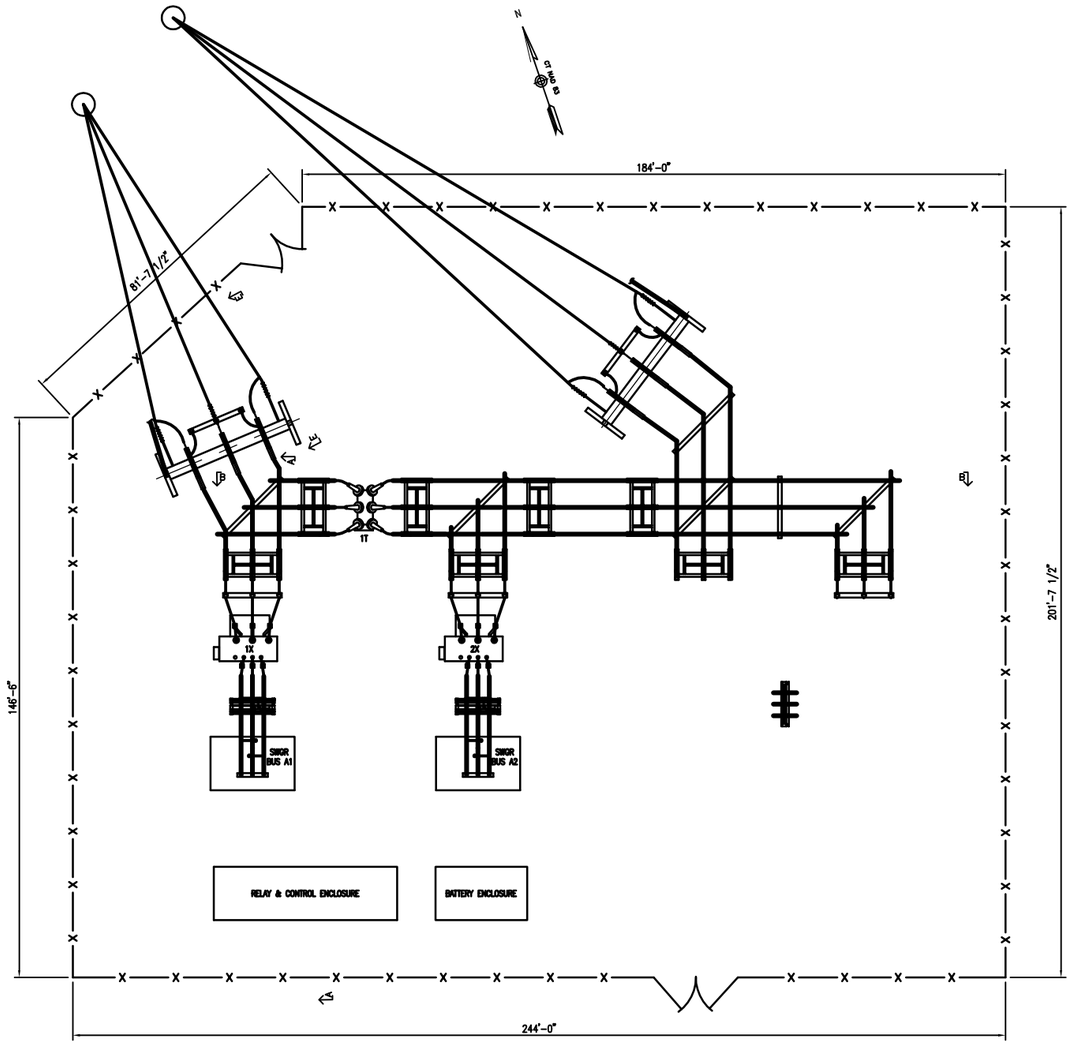
Project Title
Waterford Parkway North & Oil Mill Road

Waterford, Connecticut
Issued for
ALTA/ACSM
Land Title Survey

Drawing Title
Property Survey

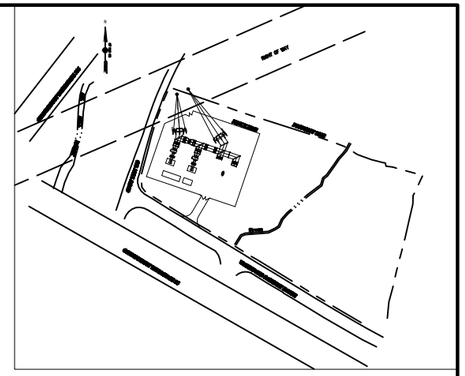
STATE OF CONNECTICUT
CHRISTOPHER C. DANFORTH
NO. 70118
LICENSED
LAND SURVEYOR

Drawing Number
Sv-1
Sheet 1 of 2
Project Number
41357



PLAN VIEW
SCALE: 1" = 20'-0"

20 0 20 40
SCALE IN FEET



LOCATION PLAN
SCALE: 1"=200'-0"

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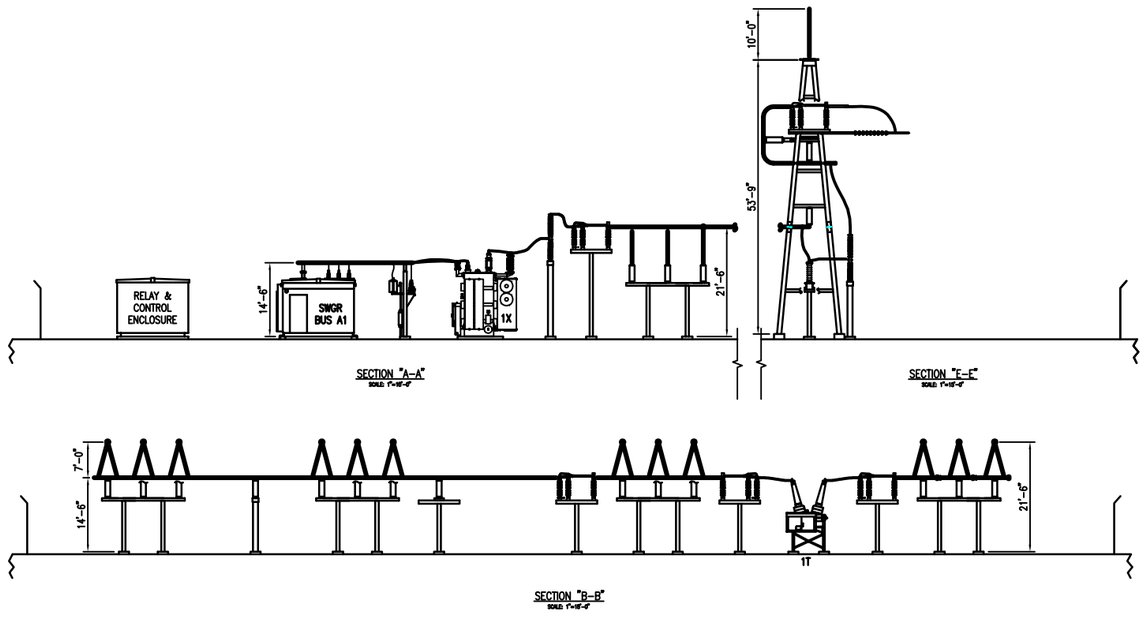
SCALE IN FEET



REVISIONS DURING CONSTRUCTION					
A	4/08	ESTABLISH NEW 115/23kV SUBSTATION – W.O. 20113201	MDW	PLW	RJC
B	4/08	ESTABLISH NEW 115/23kV SUBSTATION – W.O. 402989SS	MDW	PLW	RJC

NO.	DATE	AS BUILT REVISIONS	BY	CHK	APP	APP

Northeast Utilities Service Co.

FOR CONNECTICUT LIGHT & POWER COMPANY

TITLE
WATERFORD 36F
YARD ARRANGEMENT
PLANS & SECTIONS – CSC
WATERFORD, CONNECTICUT

BY	MDW	CHKD	PLW	APP	PLW	APP	RJC
DATE	5/08	DATE	5/08	DATE	5/08	DATE	5/08
SCALE:	AS NOTED	SIZE	D	FIELD BOOK & PAGES			
		V.S.		R.E.DWG.			
R.E. PROJ. NUMBER				NUSCO		25216-92001	

06/05/2008 9:30am – NKirschner – J:\41357.00\cad\er\planset\CSC\yard arrangement.dwg

Exhibit 2

Vanasse Hangen Brustlin, Inc.

WETLANDS DELINEATION REPORT

Date:	November 20, 2007
Project No.:	41357.00
Prepared For:	The Connecticut Light and Power Company
Site Location:	Oil Mill Road (ROW) & Waterford Parkway North Waterford, CT
Site Map:	Wetlands Sketch Map, Dated September 14, 2007
Inspection Date:	September 14, 2007
Field Conditions:	Weather: sunny, low 80's — General Soil Moisture: dry Snow Depth: 0 inches — Frost Depth: 0 inches

Type of Wetlands Identified and Delineated:

Connecticut Inland Wetlands and Watercourses	☒
Tidal Wetlands	☐
U.S. Army Corps of Engineers	☒

Local Regulated Upland Review Areas: Wetlands: 100 feet Watercourses: 100 feet

Field Numbering Sequence of Wetlands Boundary: WC 1-01X to WC 1-11, WF 1-12 to 1-22, WC 1-23 to 1-31, WF 2-01 to 2-07

[as depicted on attached wetland sketch map]

The classification systems of the National Cooperative Soil Survey, the U.S. Department of Agriculture, Natural Resources Conservation Service, County Soil Survey Identification Legend, Connecticut Department of Environmental Protection and United States Army Corps of Engineers New England District were used in this investigation.

All established wetlands boundary lines are subject to change until officially adopted by local, state, or federal regulatory agencies.

The wetlands delineation was conducted and reviewed by:

Matthew Davison
Registered Soil Scientist

Enclosures

54 Tuttle Place
Middletown, Connecticut 06457-1847
860.632.1500 ▪ FAX 860.632.7879
email: info@vhb.com
www.vhb.com

Attachments

- Wetland Delineation Field Form
- Soil Map
- Soil Report
- Wetland Delineation Sketch Map
- Wetland Delineation Map

Wetland Delineation Field Form

Project Address:	Oil Mill Road & Waterford Parkway North	Project Number:	41357.00
Inspection Date:	September 14, 2007	Inspector:	Matthew Davison
Wetland I.D.:	Wetland & Watercourse 1		

Field Conditions:	Weather: sunny, low 80s	Snow Depth: 0
	General Soil Moisture: dry	Frost Depth: 0
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☒	
	Tidal ☐	
Field Numbering Sequence: WC 1-01X to 1-11, WF 1-12 to 1-22, WC 1-23 to 1-31		

WETLAND HYDROLOGY:

NONTIDAL

Regularly Flooded ☐	Irregularly Flooded ☐	Permanently Flooded ☒
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☒
Permanently Saturated ☐	Seasonally Saturated – seepage ☐	Seasonally Saturated - perched ☐
Comments: Perennial watercourse with associated wetland soils.		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Seasonally Flooded ☐	Temporarily Flooded ☐	
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☒	Palustrine ☐
Lacustrine ☐	Marine ☐	
Comments: Perennial watercourse		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☒
Open Water ☒	Disturbed ☐	Wet Meadow ☐
Comments: Perennial watercourse		

WATERCOURSE TYPE:

Perennial ☒	Intermittent ☐	Tidal ☐
Comments:		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments: N/A		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Canton and Charlton	☐	☒	☒	☒
Ridgebury and Leicester	☒	☐	☐	☒
Agawam	☐	☒	☒	☒
Udorthent	☐	☒	☒	☒

DOMINANT PLANTS:

sweet pepperbush	
spicebush	
white ash	
winterberry	
New York fern	

WETLAND NARRATIVE:

Perennial watercourse flows through property from north to south. Watercourse channel is well defined, a result of stones placed along each bank during previous agricultural land use. Barbed wire remnants along streambanks and adjacent old field habitat are further evidence of previous land use. Watercourse exits property through culvert under Waterford Parkway North. Stream banks are less defined in this area and narrow forested bordering wetlands and wetland soils exist to each side of the stream.

Wetland Delineation Field Form

Project Address:	Oil Mill Road & Waterford Parkway North	Project Number:	41357.00
Inspection Date:	September 14, 2007	Inspector:	Matthew Davison
Wetland I.D.:	Wetland 2		

Field Conditions:	Weather: sunny, low 80s	Snow Depth: 0
	General Soil Moisture: dry	Frost Depth: 0
Type of Wetland Delineation:	Connecticut ☒	
	ACOE ☒	
	Tidal ☐	
Field Numbering Sequence: WF 2-01 to 2-07		

WETLAND HYDROLOGY:

NONTIDAL

Regularly Flooded ☐	Irregularly Flooded ☐	Permanently Flooded ☐
Semipermanently Flooded ☐	Seasonally Flooded ☐	Temporarily Flooded ☐
Permanently Saturated ☐	Seasonally Saturated – seepage ☒	Seasonally Saturated - perched ☐
Comments:		

TIDAL

Subtidal ☐	Regularly Flooded ☐	Irregularly Flooded ☐
Seasonally Flooded ☐	Temporarily Flooded ☐	
Comments: N/A		

WETLAND TYPE:

SYSTEM:

Estuarine ☐	Riverine ☐	Palustrine ☒
Lacustrine ☐	Marine ☐	
Comments: Associated with larger wetland system to east.		

CLASS:

Emergent ☐	Scrub-shrub ☐	Forested ☒
Open Water ☐	Disturbed ☐	Wet Meadow ☐
Comments: Associated with larger wetland system to east.		

WATERCOURSE TYPE:

Perennial ☐	Intermittent ☐	Tidal ☐
Comments:		

SPECIAL AQUATIC HABITAT:

Vernal Pool ☐	Other ☐	
Comments: N/A		

Wetland Delineation Field Form (Cont.)

MAPPED SOILS:

SOIL SERIES	WET	UP	NRCS MAPPED	FIELD IDD/ CONFIRMED
Canton and Charlton	☐	☒	☒	☒
Ridgebury and Leicester	☒	☐	☐	☒
Agawam	☐	☒	☒	☒

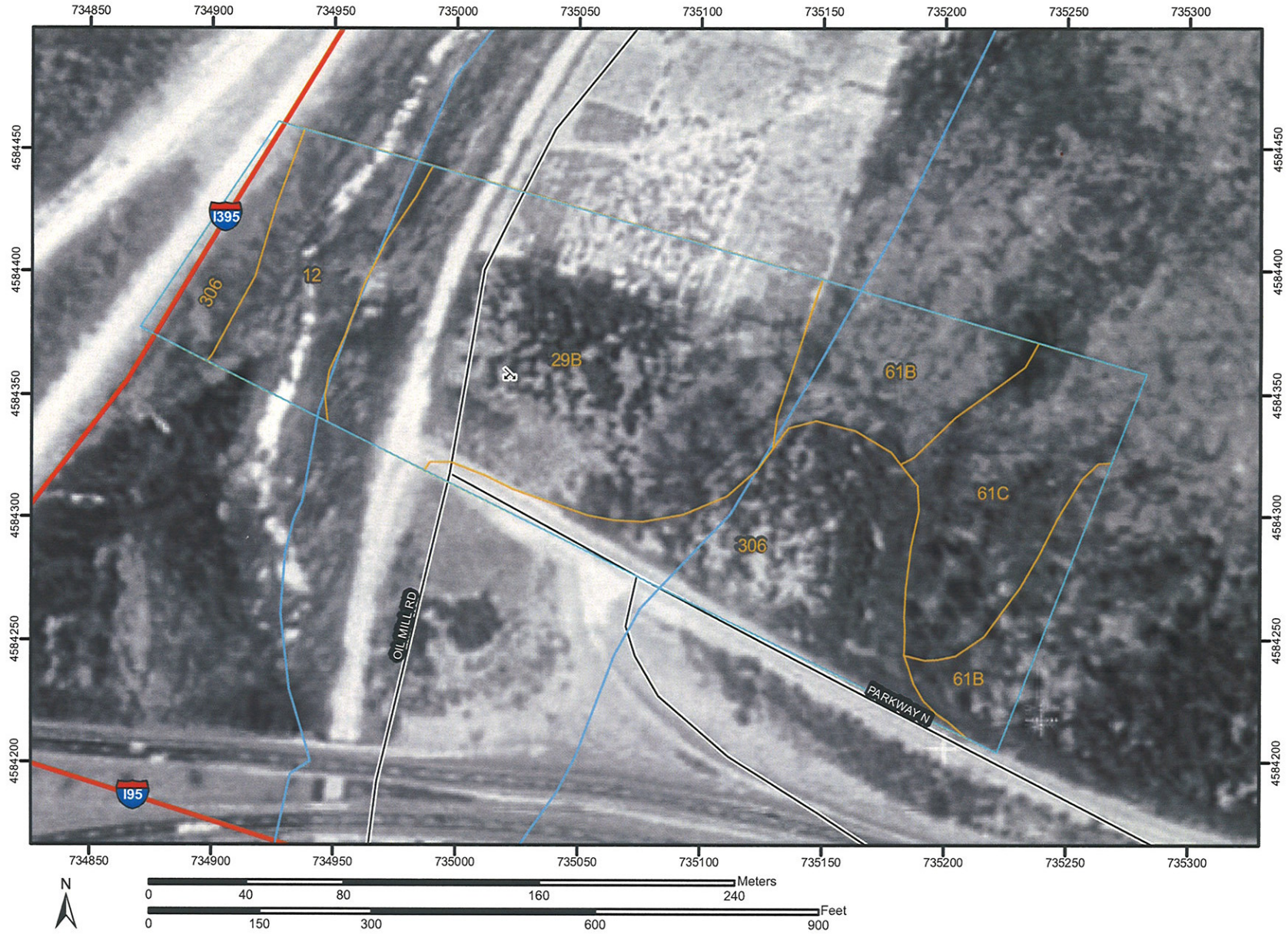
DOMINANT PLANTS:

New York fern	
black birch	
red cedar	

WETLAND NARRATIVE:

Small finger of wetland located immediately east of proposed property boundary. This wetland is an extension of a larger system, including a probable vernal pool located approximately 100 feet northeast and off the site. This area exists at a contact point between upland till and glacial outwash soils.

Soil Map–State of Connecticut
(Oil Mill Road & Waterford Parkway North, Waterford, CT)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 6, Mar 22, 2007

Date(s) aerial images were photographed: 4/12/1991

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

State of Connecticut (CT600)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
12	Raypol silt loam	1.3	10.1%
29B	Agawam fine sandy loam, 3 to 8 percent slopes	4.9	39.4%
61B	Canton and Charlton soils, 3 to 8 percent slopes, very stony	1.7	14.0%
61C	Canton and Charlton soils, 8 to 15 percent slopes, very stony	1.7	13.6%
306	Udorthents-Urban land complex	2.8	22.9%
Totals for Area of Interest (AOI)		12.4	100.0%

Map Unit Description (Brief)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the selected area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit. A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The "Map Unit Description (Brief)" report gives a brief, general description of the major soils that occur in a map unit. Descriptions of nonsoil (miscellaneous areas) and minor map unit components may or may not be included. This description is written by the local soil scientists responsible for the respective soil survey area data. A more detailed description can be generated by the "Map Unit Description" report.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief)

State of Connecticut

Description Category: SOI

Map Unit: 12—Raypol silt loam

Raypol Silt Loam This map unit is in the Connecticut Valley Major Land Resource Area. The mean annual precipitation is 37 to 50 inches (940 to 1270 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 80 percent Raypol soils. 20 percent minor components. Raypol soils This component occurs on outwash plain terrace, depression, and drainageway landforms. The parent material consists of eolian deposits over sandy and gravelly glaciofluvial deposits. The slope ranges from 0 to 3 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is poorly drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 7.3 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is about 6 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 4w Typical Profile: 0 to 8 inches; silt loam 8 to 12 inches; very fine sandy loam 12 to 20 inches; silt loam 20 to 26 inches; silt loam 26 to 29 inches; very fine sandy loam 29 to 52 inches; stratified very gravelly coarse sand to loamy fine sand 52 to 65 inches; stratified very gravelly coarse sand to loamy fine sand

Map Unit: 29B—Agawam fine sandy loam, 3 to 8 percent slopes

Agawam Fine Sandy Loam, 3 To 8 Percent Slopes This map unit is in the Connecticut Valley New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation Is 32 to 50 inches (813 to 1270 millimeters) and the average annual air temperature is 45 to 50 degrees F. (7 to 10 degrees C.) This map unit is 80 percent Agawam soils. 20 percent minor components. Agawam soils This component occurs on valley and outwash plain terrace landforms. The parent material consists of eolian deposits over glaciofluvial deposits derived from schist, granite, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage lass is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 4.8 inches (moderate) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 2e Typical Profile: 0 to 8 inches; fine sandy loam 8 to 14 inches; fine sandy loam 14 to 24 inches; fine sandy loam 24 to 60 inches; stratified very gravelly coarse sand to fine sand

Map Unit: 61B—Canton and Charlton soils, 3 to 8 percent slopes, very stony

Canton And Charlton Soils, 3 To 8 Percent Slopes, Very Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 3 to 8 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 61C—Canton and Charlton soils, 8 to 15 percent slopes, very stony

Canton And Charlton Soils, 8 To 15 Percent Slopes, Very Stony This map unit is in the New England and Eastern New York Upland, Southern Part Major Land Resource Area. The mean annual precipitation is 37 to 49 inches (940 to 1244 millimeters) and the average annual air temperature is 45 to 52 degrees F. (7 to 11 degrees C.) This map unit is 45 percent Canton soils, 35 percent Charlton soils. 20 percent minor components Canton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from schist, granite, and gneiss. The slope ranges from 8 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 1.98 in/hr (moderately rapid), with about 5.6 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 1 inches; moderately decomposed plant material 1 to 3 inches; gravelly fine sandy loam 3 to 15 inches; gravelly loam 15 to 24 inches; gravelly loam 24 to 30 inches; gravelly loam 30 to 60 inches; very gravelly loamy sand Charlton soils This component occurs on upland hill landforms. The parent material consists of melt-out till derived from granite, schist, and gneiss. The slope ranges from 8 to 15 percent and the runoff class is low. The depth to a restrictive feature is greater than 60 inches. The drainage class is well drained. The slowest permeability within 60 inches is about 0.57 in/hr (moderate), with about 6.4 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.5 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table, when present, is greater than 6 feet. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 6s Typical Profile: 0 to 4 inches; fine sandy loam 4 to 7 inches; fine sandy loam 7 to 19 inches; fine sandy loam 19 to 27 inches; gravelly fine sandy loam 27 to 65 inches; gravelly fine sandy loam

Map Unit: 306—Udorthents-Urban land complex

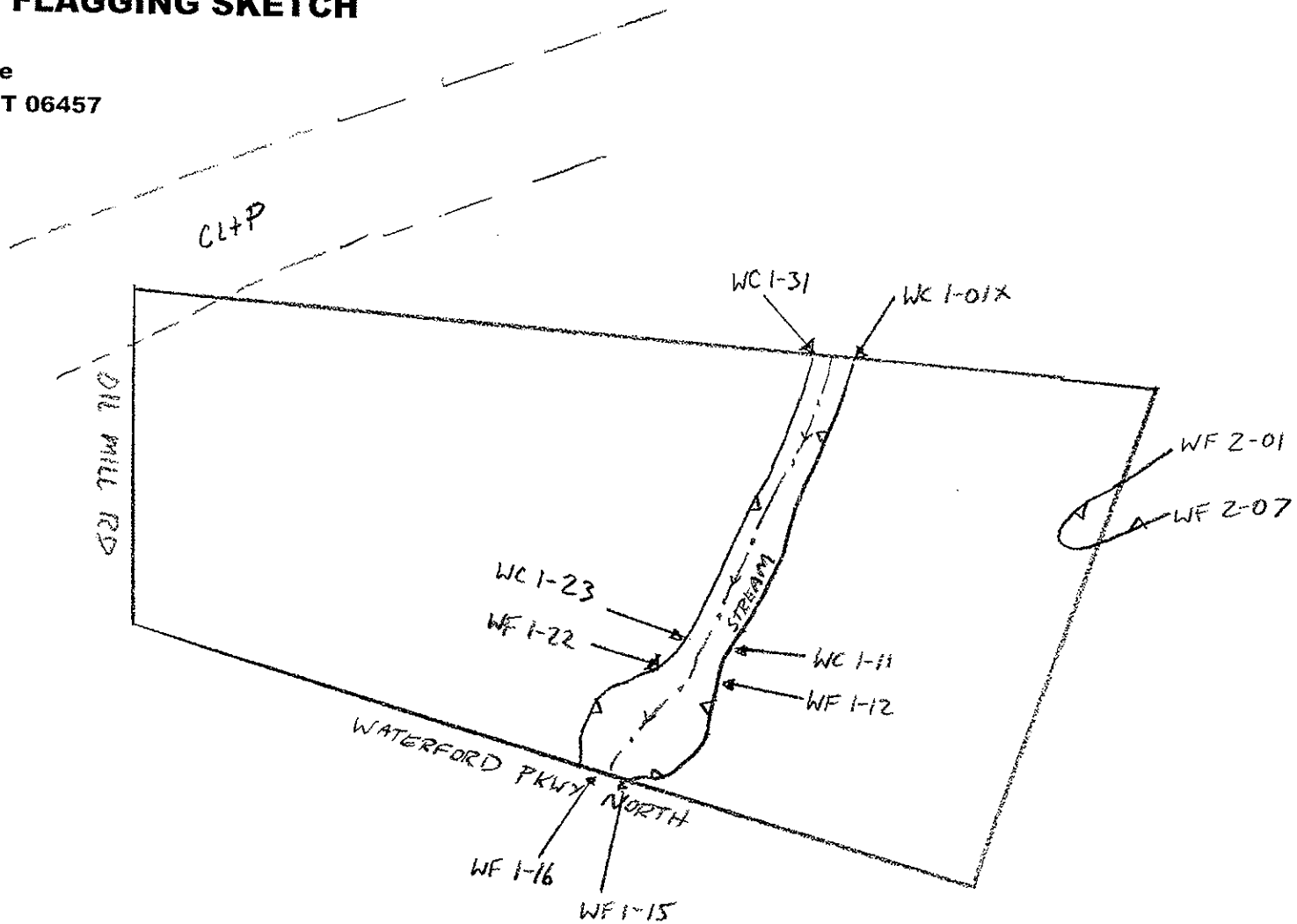
Udorthents-Urban Land Complex This map unit is in the New England and Eastern New York Upland, Southern Part Connecticut Valley Major Land Resource Area. The mean annual precipitation is 32 to 50 inches (813 to 1270 millimeters) and the average annual air temperature is 45 to 55 degrees F. (7 to 13 degrees C.) This map unit is 50 percent Udorthents soils, 35 percent Urban Land. 15 percent minor components. Udorthents soils This component occurs on cut (road, railroad, etc.), railroad bed, road bed, spoil pile, urban land, fill, and spoil pile landforms. The slope ranges from 0 to 25 percent and the runoff class is medium. The depth to a restrictive feature varies, but is commonly greater than 60 inches. The drainage class is typically well drained. The slowest permeability within 60 inches is about 0.00 in/hr (very slow), with about 9.0 inches (high) available water capacity. The weighted average shrink-swell potential in 10 to 60 inches is about 1.4 LEP (low). The flooding frequency for this component is none. The ponding hazard is none. The minimum depth to a seasonal water table is greater than 60 inches. The maximum calcium carbonate within 40 inches is none. The maximum amount of salinity in any layer is about 0 mmhos/cm (nonsaline). The Nonirrigated Land Capability Class is 3e Typical Profile: 0 to 5 inches; loam 5 to 21 inches; gravelly loam 21 to 80 inches; very gravelly sandy loam Urban Land Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. The slope ranges from 0 to 35 percent and the runoff class is very high. The Nonirrigated Land Capability Class is 8

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 6, Mar 22, 2007

WETLAND FLAGGING SKETCH

VHB, Inc.
54 Tuttle Place
Middletown, CT 06457



SITE LOCATION: Oil Mill Rd & Waterford Parkway North, Waterford CT
FLAGGED BY: Matthew Davison
DATE: September 14, 2007

Note: the information shown on this sketch, including the wetland boundary, is approximate. This map is intended for surveying purposes only.

Exhibit 3

Wildlife Habitat Evaluation

Proposed Waterford Substation

325 Waterford Parkway North
Waterford, Connecticut

Prepared for

Connecticut Light & Power

The Northeast Utilities System

Prepared by

VHB/Vanasse Hangen Brustlin, Inc.
54 Tuttle Place
Middletown, Connecticut 06457
(860) 632-1500

May 2008

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Introduction

The Connecticut Light and Power Company ("CL&P") is evaluating the potential construction of a new substation (the "Substation") on its property located at 325 Waterford Parkway North in Waterford, Connecticut (the "Site"). The 5-acre Site consists of undeveloped land located at the northeast intersection of Oil Mill Road and Waterford Parkway North. The proposed Substation would be located within an irregularly shaped fenced compound which would encompass a 47,578 ± square foot area in the western portion of the Property, just south of the existing transmission line corridor. A gravel access drive to the Substation will be established from Waterford Parkway North. The *Site Location Map, USGS*, provided as Figure 1 depicts the approximate CL&P property boundary location.

This Wildlife Habitat Evaluation was conducted in accordance with the requirements for a Certificate of Environmental Compatibility and Public Need from the Connecticut Siting Council ("CSC") for the construction of an electric substation facility as defined in General Statues *§ 16-50l (a) (1)*. The overall goal of the study is to identify and document the wildlife and vegetation existing on the entire 5-acre Site and to determine potential environmental impacts of the proposed Substation development. This report provides a detailed analysis of the various wildlife habitats occupying the Site.

Study Methodology

The Wildlife Habitat Evaluation was divided into three parts: 1) Vegetative Habitat Evaluation, 2) Avian Survey, and 3) Mammal and Herpetofauna Evaluation. Vanasse Hangen Brustlin, Inc. ("VHB") personnel reviewed the CTDEP's Natural Diversity Database which identifies general areas of concern with regards to state and federally listed Endangered, Threatened, and Special Concern species and significant natural communities. No areas of concern with regard to threatened or endangered species and/or significant natural communities were identified at or in the vicinity of the Site. In addition, CL&P received written confirmation that no such areas of concern occur at or in the vicinity of the Site (as documented in an agency letter dated January 28, 2008).

Vegetative Habitat Evaluation

The Site consists of 5.00± acres located just northeast of the convergence of Interstates 95 and 395 in the Town of Waterford, Connecticut. Oil Mill Road borders the Site to the west and Waterford Parkway North provides the southern property boundary. A tree farm located within a utility line right-of-way ("ROW") abuts the Site to the north. A larger undeveloped property borders the Site to the east. The Site is situated at a contact between glacial till uplands along the northeast property boundary and outwash deposits which dominate the surficial geology of the Site. Soils on the Site, derived from these glacial outwash deposits, consist primarily of excessively drained sand and gravel. Two general habitat types, Early Successional Forest and Riparian Corridor, were identified on the Site. Please see attached Figure 2, *Habitat Type and Avian Survey Point Count Locations Map*. These habitat types are the result of previous activities at

the Site (e.g., agriculture, sand and gravel removal) and its surficial geology. The dominant tree, shrub and herbaceous layers of each habitat were identified and documented on a VHB Wildlife Habitat Evaluation Checklist, included in Appendix A of this report.

Early Successional Forest

The eastern and western portions of the Site are characterized as early successional forest. Level topography, species composition, infertile soils and evidence of historic access to these areas from Waterford Parkway North are indicative of past agricultural uses as well as apparent sand and gravel excavation. Eastern red cedar occurs in virtually pure stands in the successional forest area, increasing in density on the east side of the property. Where scattered hardwoods exist within this habitat type, species such as scarlet oak *(Quercus coccinea)* and black oak *(Quercus velutina)* are further evidence of a dry, relatively infertile substrate. In areas where the tree canopy is open, a more developed herbaceous layer exists. Herbaceous species observed include little bluestem *(Scizachyrium scoparium)*, poverty grass *(Danthonia spicata)*, and pineweed *(Hypericum gentianoides), all* indicative of a dry infertile site.

Riparian Corridor

A riparian corridor transects the Site in a north-south direction in its eastern portion. An unnamed perennial watercourse (tributary to Oil Mill Brook) flows south through this area, in an excavated channel, exiting the property via a culvert under Waterford Parkway North. This stream corridor separates the two areas of early successional forest habitat, forming a second distinct habitat type on the Site. The stream appears to function as a discharge (or gaining) stream in

its upper reaches then transitions to a recharge (or losing) stream into the stratified drift aquifer as it enters the outwash deposits located on Site. As the stream flows through the Site, particularly in the southern portion, fewer signs of historic disturbance are evident. The riparian corridor overstory is characterized as an oak-hickory forest type dominated by pole-sized trees (4 to 11 inches diameter breast height ("DBH") with scattered saw-timber (11 inches DBH and greater) occurring. A transition area exists on the western fringe of this area dominated by a black birch (*Betula lenta)* overstory. The shrub layer is dominated by species such as spicebush *(Lindera benzoin)* and winterberry *(Ilex verticillata)*. The herbaceous layer, while less developed in this area due to the established tree canopy, is vegetated by species such as cinnamon fern *(Osmunda cinnamomea)* and New York fern *(Thelypteris noveboracensis)*. The adjoining parcel to the east is dominated by glacial till uplands including a mesic oak-hickory forest type dominated by saw-timber size trees.

Avian Survey

The avian survey component of this Wildlife Habitat Evaluation was designed in general accordance with standard avian monitoring techniques, such as those being utilized by the Massachusetts Audubon Society, which are recognized by the Connecticut Audubon Society and Connecticut Department of Environmental Protection[1]. Bird observations were conducted on September 18, 2007 ("Fall Survey") and April 16, 2008 ("Spring Survey") by trained scientists between 7:30 am and 10 am. Three avian survey point count locations were selected on the Site (refer to the attached *Habitat Type and Avian Survey Point Count Locations Map*). At each of these locations five-minute, fixed position point counts were conducted and all visual and auditory observations of avifauna

[1] Vickery P.D, and Perkins, S.A. *Massachusetts Audubon Society Recommended Protocol for Monitoring Songbird Populations.*

were recorded. Observations included bird calls, songs, and visual sightings such as nesting/brooding, and birds in flight. These points were selected after a reconnaissance of the Site on the morning of the initial survey. In order to ensure that the surveys captured the full spectrum of birdlife on the property, points were placed in the two basic habitat types found on the Site and spaced as far apart as possible to reduce the possibility of double counting species and individuals. Under different circumstances, points would be spaced a minimum of 100 meters apart, but due to the small size of the Site and noise intrusion from I-95, the points were placed closer together. Point #1 was located at the northern edge of a small old field off Waterford Parkway North; Point #2 was located at the northern edge of the Site in a forested area bordering the adjacent tree farm; and Point #3 was located near the eastern edge of the Site in a forested area by the stream.

Fall Survey

A total of seven bird species were observed, two of which (species identified below with *) were observed outside of the official point count location:

Species observed during fall 2007 survey:
Hairy Woodpecker* (*Picoides villosus*)
American Crow* (*Corvus brachyrhynchos*)
Blue Jay (*Cyanocitta cristata*)
Black-capped Chickadee (*Poecile atricapilla*)
Gray Catbird (*Dumetella carolinensis*)
Cedar Waxwing (*Bombycilla cedrorum*)
American Goldfinch (*Carduelis tristis*)

The above species are all habitat generalists to some degree, with the exception of the Hairy Woodpecker, which is a forest-dwelling species. This individual was heard while walking in the area near Point #3, which is closest to the large adjacent tract of forest that borders the Site to the east and northeast. It is likely

that this individual occupies a territory in this larger off-site forest, but may make forays into the Site. Gray catbird and American goldfinch are species that trend toward inhabiting open areas such as old field, but are seen in a variety of habitats, including around forest edges and in suburban neighborhoods. Forest interior specialists and early successional specialists were not observed.

None of the species observed were particularly abundant, which is not surprising given the relatively small size of the Site, its condition, and its proximity to the Interstate, adjacent roads and the tree farm. The greatest number of individuals observed of any given species was six blue jays, which were seen and heard from Point #2. The birds were raising alarm calls and mobbing a predator of unknown taxa on the tree farm.

All species observed are local breeders and year-round residents with relatively stable populations in Connecticut and southern New England. Hairy woodpeckers may be experiencing overall regional declines with the breakup of large tracts of forest and removal of dead trees necessary for nesting. The survey was conducted during the end of the fall migration season and therefore the results of this survey contain inherent limitations. It is anticipated that the Site's habitat could support a greater variety and number of bird species during the spring-early summer breeding season.

Spring Survey

During spring months, many bird species migrate through southern New England to breeding grounds further north. During this same period other bird species that breed in southern New England begin to establish territories and prepare for nesting. A total of 10 bird species were observed throughout the Site.

This is an increase from the seven species observed during the fall survey. Only three of the seven species observed during the fall survey were observed again in the spring survey: Black-capped Chickadee, Blue Jay, and American Goldfinch.

Species observed during spring 2008 survey:
Blue Jay
Black-capped Chickadee
Tufted Titmouse (*Parus bicolor*)
American Robin (*Turdus migratorius*)
Northern Cardinal (*Cardinalis cardinalis*)
Chipping Sparrow (*Spizella passerina*)
Field Sparrow (*Spizella pusilla*)
Brown-headed Cowbird (*Molothrus ater*)
House Finch (*Carpodacus mexicanus*)
American Goldfinch

Note:
*Species in italics also observed during fall 2007 survey.

Four of the new species observed during the spring survey, Tufted Titmouse, American Robin, Northern Cardinal, and House Finch, are resident species of Connecticut and habitat generalists that are likely to use the property year-round, but were simply not observed during the fall survey.

Chipping Sparrow, Field Sparrow, and Brown-headed Cowbird are all species that breed in Connecticut, but winter in the southern U.S. and points further south. No true spring migrants – those species that do not breed in the state and are only passing through on the way to northern breeding grounds – were observed using the Site's habitat during the Spring Survey.

Species richness was split nearly equally among the three point count locations, with eight species recorded at Points #1 and #2, and seven species recorded at Point #3. It should be noted that several of the species recorded at Points #2 and #3 were primarily using the habitat of the adjacent tree farm and utility ROW,

including Chipping Sparrow, Field Sparrow, and Brown-headed Cowbird. These species tend to use early successional habitat for nesting and feeding, which is well represented by the shrub habitat typical of ROWs, and the farm's open grassy areas interspersed by young conifers. Chipping Sparrows in particular exhibit a preference for nesting in conifers.

Although Point #1 bordered on the Site's small patch of early successional habitat, the only early successional specialist observed using it was American Goldfinch, an abundant resident of Connecticut. A Chipping Sparrow was heard from this point, but was actually singing from the adjacent tree farm.

At Point #3 there were no bird species observed using the stream itself, and there was a notable absence of avian activity in the forested area east of the riparian corridor. During the fall survey a Hairy Woodpecker was observed in this area. It is likely that other woodpeckers use this area as well as the adjacent tract of forest and simply were not present during the recent point count.

A Red-tailed Hawk nest was observed approximately 400 feet north of the Site in the woods adjacent to the tree farm and transmission line ROW. It is likely that the occupant of this nest uses (or used) the tree farm and utility line ROW for hunting.

In summary, the bird species observed using the habitat of the Site during the spring survey are abundant residents or breeders in Connecticut with relatively stable populations, with the exception of the Field Sparrow, which is declining regionally. The majority of species observed use forested habitat such as that found in the east portion of the Site and in surrounding off-site areas. Early successional specialists recorded during the surveys were observed to primarily

use the more open habitat of the tree farm and utility line ROW adjacent to the Site.

Anticipated Species (not observed)

Potential woodland bird species that might use the eastern portion of the Site year-round include wild turkey (*Meleagris gallopavo*) and a variety of woodpeckers, such as northern flicker (*Colaptes auratus*), and downy (*Picoides pubescens*), hairy (*Picoides villosus*), and red-bellied woodpeckers (*Melanerpes carolinus*). These species likely use the Site for feeding. Although less likely, woodpeckers may also use the Site for nesting, should suitable snags be available. Although the Site is unlikely to support nesting owls, owls may nest on the large tract of adjacent forested property and make forays into the Site for feeding. Owls may also use the trees along the edge of the adjacent tree farm for perching while scouting prey. Great horned owls (*Bubo virginianus*) inhabit a variety of woodlands in the northeast, and along with common species like eastern screech owl (*Otus asio*), may hunt in and around the Site. These two species have relatively robust populations in southern New England.

Additional breeding species may arrive in the area in mid to late spring. Species such as Baltimore oriole (*Icterus galbula*), rose-breasted grosbeak (*Pheucticus ludovicianus*), and great crested flycatcher (*Miarchus crinitus*) are often found feeding and nesting along forest edges in Connecticut, and in particular may use the northern edge of the Site that borders on the tree farm. Great crested flycatchers are cavity nesters, so the availability of dead snags will influence nesting opportunities for this species. These species have stable populations in southern New England, although there may be some concerns about management practiced in wintering grounds in Central and South America.

Several other relatively common species that breed in Connecticut's forests and could conceivably nest on the Site or, more likely, on the adjacent undeveloped forested parcel and make forays onto the Site, include scarlet tanager (*Piranga olivacea*), eastern wood pewee (*Contopus virens*), red-eyed vireo (*Vireo olivaceus*), hermit thrush (*Catharus guttatus*), and ovenbird (*Seiurus aurocapillus*). Some of these species have experienced population declines since the mid-1960s, likely due to loss of forested habitat both on breeding and wintering grounds.

During both spring and fall migration, birds take advantage of a variety of habitats found along the migration corridor in order to fulfill their energy requirements. During spring migration, wood warblers pass through Connecticut on their way to breeding grounds in New England and Canada, stopping along the way to feed on insects associated with the new leaf growth of deciduous trees. These migrants may only pause at a location for a few minutes or hours to feed before continuing their flights. Although these stopover sites are visited briefly, they are critical for replenishing expended energy supplies. Species such as American redstart (*Setophaga ruticilla*), black-throated green warbler (*Dendroica virens*), and black-and-white warbler (*Mniotilta varia*) could conceivably use the Site, as well as dozens of other migrant species. Population status of migrants varies by species.

While several early successional specialists were heard during the spring survey, only American goldfinch (*Carduelis tristis*) was observed actually using the early successional habitat on the Site. Other early successional breeding species such as field sparrow (*Spizella pusilla*) and chipping sparrow (*Spizella passerina*) were recorded during the spring survey, but were using utility line ROW and tree farm habitats adjacent to the Site. It is unlikely that the small area of early

successional habitat found on the Site is sufficient to support early successional breeding species. However, the forest/early successional edge may attract common, generalist species such as house finch (*Carpodacus mexicanus*) and gray catbird (*Dumetella carolinensis*), as well as migrants just passing through the area, which often feed on the abundant insect life associated with edge habitat.

Mammal and Herpetofauna Evaluation

A mammal and herpetofauna evaluation was conducted to determine possible amphibian, reptile and mammal species that may be utilizing the habitats found on the Site. As part of this assessment, a list of potential wildlife species that could utilize the Site as habitat is included. This list was based on wildlife habitat information found in *New England Wildlife* (DeGraaf and Yamasaki, 2001) and is based on the dominant cover types found within the Site as well as in adjacent parcels. General observations regarding wildlife utilization on the Site were made during the avian surveys. White-tailed deer and eastern chipmunk occur throughout the Site as evidenced by the ample amount of deer scat and extensive system of chipmunk holes. Both species are abundant throughout Connecticut. An animal burrow was discovered in the riparian corridor near the stream bank. The burrow was sizeable enough to contain something as large as a woodchuck, although occupation of the hole was not confirmed, nor was any species directly observed. A northern two-lined salamander was found in the stream under a rock. This is a relatively common brookside species in Connecticut.

Mammals

As part of the larger landscape, the Site has the ability to support a number of mammal species ranging in size from the smallest rodent to large canines. Many

small species are likely residents of the Site itself, while large species may make forays into the Site for hunting or feeding, or simply pass through on the way from one area to another.

Small rodents that prefer damp woodlands such as masked shrew (*Sorex cinereus*) and southern red-backed vole (*Clethrionomys gapperi*) are likely residents, particularly in the area along the stream. Other small rodents that are less selective in their habitat requirements, such as woodland vole (*Microtus pinetorum*), white-footed mouse (*Peromyscus leucopus*), and eastern chipmunk (*Tamias striatus*), may occur throughout the Site. Chipmunk burrows were observed in a number of places on the Site. Slightly larger rodents such as gray (*Sciurus carolinensis*) and red squirrel (*Tamiasciurus hudsonicus*) likely feed on the oak-hickory mast and pine cones, and live in tree cavities or make nests in the tree tops. All of the above rodents are abundant throughout southern New England.

A number of mid-sized mammals that may use the Site can be considered habitat generalists, using a variety of habitat types as part of their lifecycles. Species such as eastern cottontail (*Sylvilagus floridanus*), Virginia opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), woodchuck (*Marmota monax*), and fisher (*Martes pennanti*) may use different parts of the Site for feeding, breeding, shelter, etc. as well as use adjoining properties such as the tree farm, the utility line ROW, and the large forested tract adjacent to the east. Populations of the above species are relatively stable and abundant, and in the case of fisher, increasing after a historic low in the early 1900s.

Larger mammals such as red fox (*Vulpes vulpes*) or coyote (*Canis latrans*) also likely use the site for hunting, although the adjacent tree farm and utility ROW

are likely preferred hunting grounds due to the open habitat. These species have adapted relatively well to suburbanization, and are quite common throughout Connecticut and southern New England. They tend not to have overlapping territories. White-tailed deer (*Odocoileus virginianus*) scat was observed during both visits to the Site, and many shrubs and saplings had clear evidence of deer browse, confirming their use of the Site for feeding. This is an exceptionally abundant species in Connecticut and southern New England.

Amphibians

Northern red-backed salamander (*Plethodon cinereus*) and American toad (*Bufo americanus*), common and abundant woodland species, could also be residents of the Site, although none were observed. A potential vernal pool exists off site approximately 100 feet northeast of the northeast corner of the Site. Due to the off-Site location of this pool a survey was not conducted. Potential vernal pool breeding species include wood frog (*Rana sylvatica*) and spotted salamander (*Ambystoma maculatum*), both of which utilize wooded upland habitat after laying eggs in the spring. Wood frog juveniles will migrate an average of 1,550 feet from breeding pools (Berven and Grudzien 1990), while spotted salamanders move an average of 477 feet from breeding pools into adjacent upland areas (Windmiller 1996; Semlitch 1998). These vernal pool breeding species have the potential to occur on the Site, particularly east of the unnamed stream, an area nearest the pool. Westward migration of vernal pool breeding species into the interior and western portions of the Site is likely impeded by the unnamed perennial watercourse flowing from north to south through the Site. Both of these species are experiencing long-term declines in Connecticut and southern

New England, likely due to loss of both vernal pools and upland habitat contiguous with breeding pools.

Reptiles

The snake species that is most likely to be found at the Site is the ubiquitous garter snake (*Thamnophis sirtalis*). This species is found throughout Connecticut and found in a variety of habitats. Ringneck snake (*Diadophis punctatus edwardsii*) is noted for the wide range of habitats utilized including gravel pits and deciduous forests. Klemmens (1993) considered this species extremely common in eastern Connecticut. Other species such as the black rat snake (*Elaphe o. obsoleta*) may also utilize the site as part of its hunting habitat. No snakes were observed during visits to the Site, but temperatures were likely too cool for snakes to emerge from their dens.

Discussion and Conclusions

Wildlife habitats associated with the Site were assessed by conducting field inventories to identify avian, mammal and herpetofauna species present, taking into account the habitat conditions present within each resource area. Habitat variables considered in this wildlife evaluation included the size of the vegetative communities, the plant cover types present, the degree of habitat disturbance, interspersion of cover types, the abundance and diversity of fruit and seed-bearing plants, the size (average diameter) and abundance of tree snags and ground debris, and surrounding land uses. These vegetative communities were evaluated in providing cover, foraging, and breeding habitats.

VHB personnel reviewed the CTDEP's Natural Diversity Database which identifies general areas of concern with regards to state and federally listed Endangered, Threatened, and Special Concern species and significant natural communities. No areas of concern with regard to threatened or endangered species and/or significant natural communities were identified at or in the vicinity of the Site. In addition, CL&P received written confirmation that no such areas of concern occur at or in the vicinity of the Site (as documented in an agency letter dated January 28, 2008).

A potential vernal pool exists off-Site approximately 100 feet northeast of the northeast corner of the Site. While these vernal pool breeding species have the potential to use on the Site, particularly east of the unnamed stream (where no development is proposed to occur), westward migration of vernal pool breeding species into the proposed Substation development is likely impeded by the unnamed perennial watercourse flowing from north to south through the Site. In addition, construction activities associated with the proposed Substation development will not occur anywhere within approximately 450 feet of the potential vernal pool.

The majority of bird species observed on the Site during subsequent surveys have relatively stable and abundant populations regionally. The notable exception is the Field Sparrow, which experienced a population decline of nearly eight percent in southern New England between 1966 and 2006 (Sauer et al. 2007). The primary cause of this decline is loss of suitable early successional habitat. In addition, Field Sparrow nests, along with those of Chipping Sparrows, are often parasitized by Brown-headed Cowbirds. This can lead to reduced nesting success and even nest abandonment. Thus the observation of

Brown-headed Cowbirds in the vicinity of both Chipping and Field Sparrow is neither surprising nor encouraging. A hairy woodpecker was heard near the eastern property line during the fall bird survey. Hairy woodpeckers prefer extensive tracts of forest and while it is likely that this individual may occasionally use the Site for feeding, nesting is assumed to occur on the adjacent forested property east of the Site, where more suitable habitat exists. Hairy woodpeckers are experiencing slight declines in numbers likely due to fragmentation of extensive tracts of forested habitat.

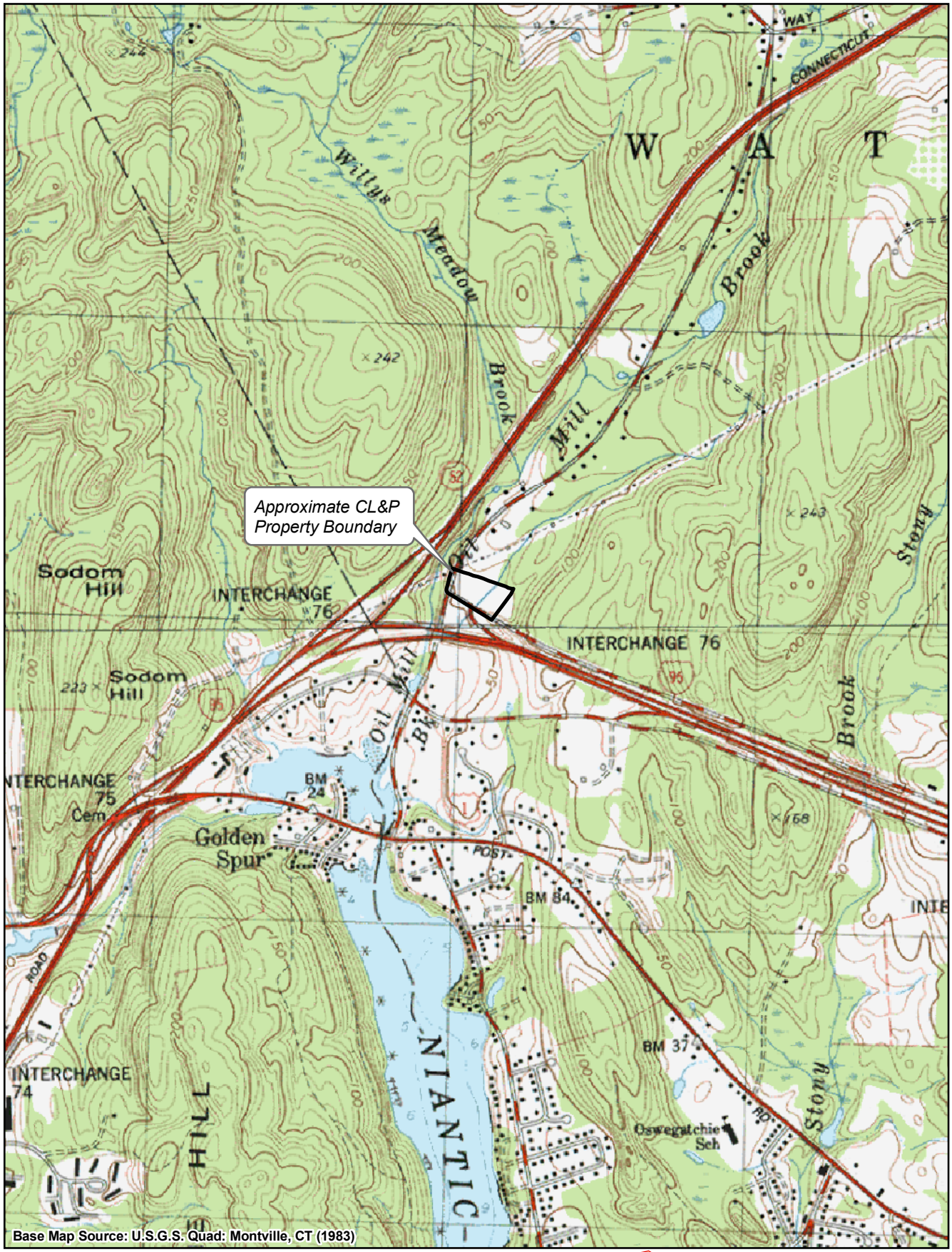
The proposed location of the Waterford Substation within the Site is characterized by an early successional habitat type. The results of the field inventories and assessment of the wildlife conditions indicate that most of the Site contributes relatively moderate value wildlife habitat. Early successional habitat types provide important wildlife habitat due to the overall loss of this habitat type throughout Connecticut through natural succession and elimination by development. Due to its small size, location, and composition, the Site is most likely to support wildlife that are habitat generalists – those that can adapt to disturbance and use a variety of habitats as part their lifecycles. Because of their adaptability, these species generally have abundant populations.

Although the construction of the Substation would affect this habitat, the proposed development area is located within and in proximity to similar habitat both on the eastern portion of the Site and to a far greater extent off-Site on an adjoining 50-acre parcel, as well as an existing utility corridor occupied by overhead electrical transmission lines. This corridor generally extends off the Site in a northeast to southwest direction for numerous miles. Therefore, the proposed development is not anticipated to have a significant impact on wildlife

due to the primarily habitat generalist using the Site, remaining undisturbed habitat, and immediate proximity to similar habitats that will allow for natural relocation of potential wildlife from the development zone. As a result, no long-term impacts on wildlife are anticipated from the proposed development activities at the Site. In addition, since the facility will be unmanned and minimally illuminated, wildlife should not be adversely affected during its operation.

Figures

Figure 1: Site Location Map, USGS



Vanasse Hangen Brustlin, Inc.
Transportation Land Development Environmental Services

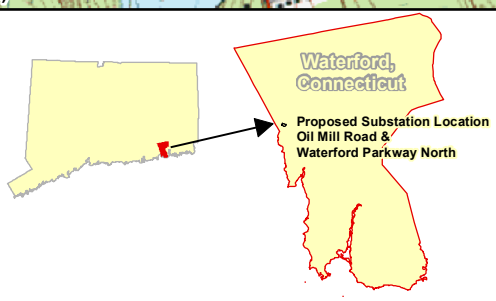


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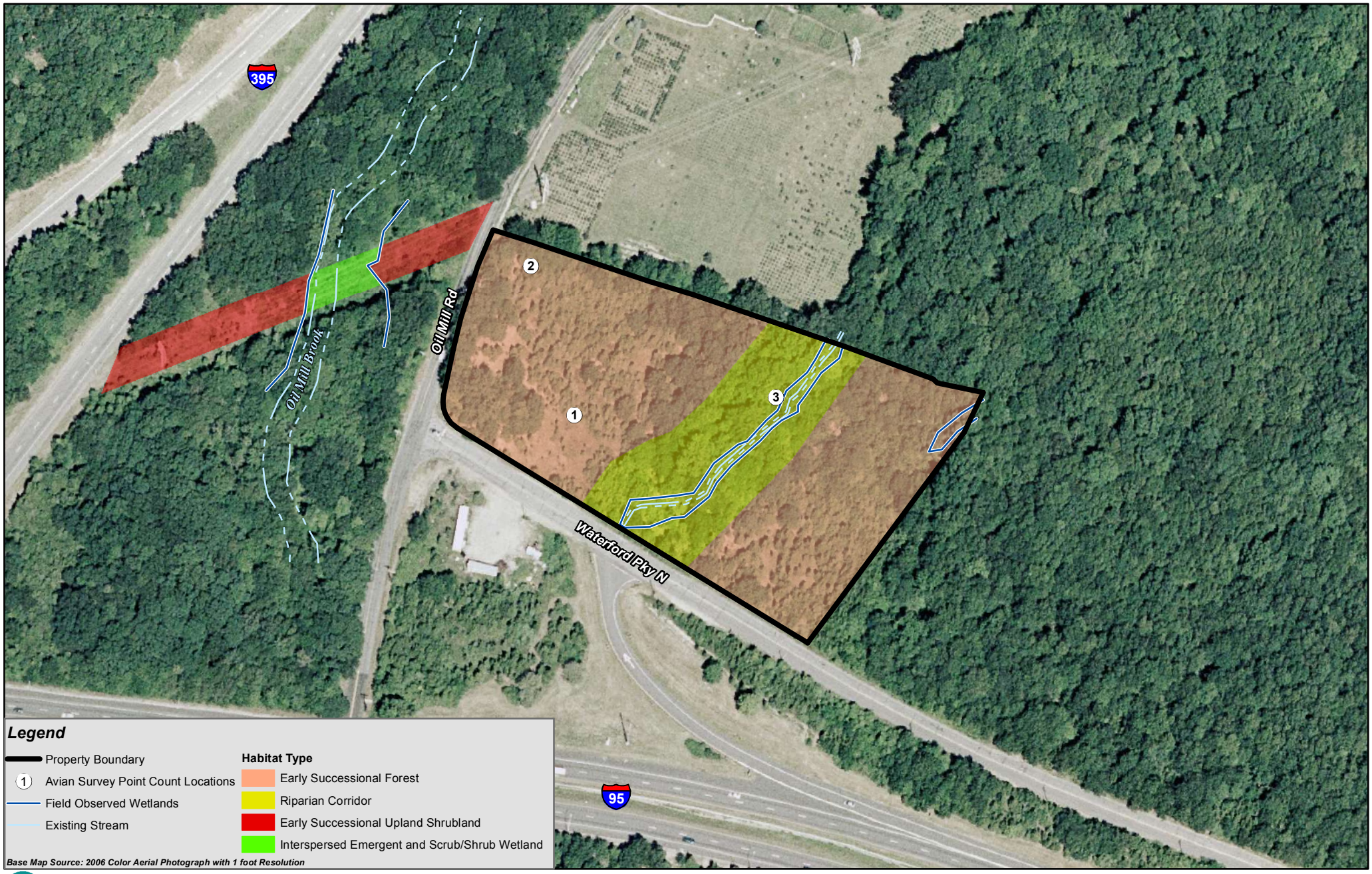
Figure 2: Habitat Type and Avian Survey - Point Count Locations Map



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Transportation Land Development Environmental Services

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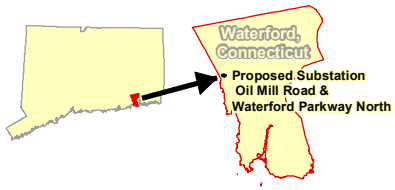

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Appendix A
Wildlife Habitat Evaluation Checklists

VHB WILDLIFE HABITAT EVALUATION CHECKLIST
COVER TYPE: Early Successional Forest

Project Number: 41357	Project Name: Waterford Substation
Date: September 18, 2007	Observer: Jeff Peterson, Linda Vanderveer, Matt Davison

Topography		**Soils**/Substrate	Glacial outwash
Groundwater elevation	9 to 12 feet	Soil/substrate type	Hinckley/Agawam
Depressions	level/graded	Depth to bedrock	unknown
Vernal pools	No	Burrows present (size)	None observed
Rocks or boulders	No	Depth of leaf litter	< 1 inch

Plant Community

Stratum	**Dominant Species**	
Trees	Eastern red cedar Scarlet oak Black oak	*Juniperas virginiana* *Quercus coccinea* *Quercus velutina*
Shrubs	Northern bayberry Autumn olive Highbush blueberry Cherry silverberry	*Viburnum recognitum* *Rhamnus frangula L.* *Rhus typhina L.* *Elaegnus multiflora*
Herbaceous	Spotted knapweed Gray goldenrod Common yarrow Poverty grass Bosc's panicgrass Pineweed Narrowleraf pinweed Little bluestem Forked blucurls	*Centaurea maculosa* *Solidago sp.* *Achillea millefolium* *Danthonia spicata* *Dichanthelium boscii* *Hypericum gentianoides* *Lechea tenuifolia* *Schizachyrium scoparium* *Trichostema dichotomum*
Average DBH:	4 – 8 inches	
% Canopy Closure:	10 %-60% (variable)	
Comments:		

Wildlife Habitat Features

Tree cavities (number, diameter)	None observed
Dead logs (number, diameter)	None observed
Rocks, boulders	None observed
Evidence of wildlife usage	Observed: see Appendix B, Partial List of Species Observed

VHB WILDLIFE HABITAT EVALUATION CHECKLIST
COVER TYPE: Riparian Corridor

Project Number: 41357	Project Name: Waterford Substation
Date: September 18, 2007	Observer: Jeff Peterson, Linda Vanderveer, Matt Davison

Topography		**Soils**/Substrate	Glacial outwash, till
Groundwater elevation	unknown	Soil/substrate type	Canton/Charlton, Hinckley, Ridgebury
Depressions	Perrenial watercourse and associated wetland depression	Depth to bedrock	unknown
Vernal pools	Off site	Burrows present (size)	Yes-streambank <10"
Rocks or boulders	Stone wall on east boundary	Depth of leaf litter	< 1 inch

Plant Community

Stratum	**Dominant Species**	
Trees	Red maple Black birch American hornbeam Pignut hickory Shagbark hickory White ash White oak Scarlet oak Red oak Sassafras	*Acer rubrum* *Betula lenta* *Carpinus caroliniana* *Carya glabra* *Carya ovate* *Fraxinus Americana* *Qurcus alba* *Quercus coccinea* *Quercus rubra* *Sassafras albidum*
Shrubs	Catberry Common winterberry Northern spicebush Highbush blueberry	*Iilex mucronata* *Iilex verticillata* *Lindera benzoin* *Vaccinium corymbosom*
Herbaceous	Drooping woodreed Early meadow-rue New York fern Marsh blue violet	*Cinna latifolia* *Thalictrum dioicum* *Thelypteris noveboracensis* *Viola cucullata*
Average DBH:	8-10 inches	
% Canopy Closure:	60-80 %	
Comments:		

Wildlife Habitat Features

Tree cavities (number, diameter)	None observed
Dead logs (number, diameter)	Few dead logs within riparian corridor
Rocks, boulders	Stone wall on east boundary
Evidence of wildlife usage	see Appendix B, Partial List of Species Observed

Appendix B
Partial List of Species Observed

Partial List of Species Observed
Waterford Parkway North and Oil Mill Road, Waterford, CT
September 18 2007

Species	**Common Name**
Early Successional Habitat Type	
Achillea millefolium	Common yarrow
Centaurea maculosa	**Spotted knapweed**
Danthonia spicata	Poverty grass
Dichanthelium boscii	Bosc's panicgrass
Elaeagnus multiflora	**Cherry silverberry**
Elaeagnus umbellata	**Autumn olive**
Hypericum gentianoides	Pineweed (Orangegrass)
Juniperus virginiana	Eastern red cedar
Lechea tenuifolia	Narrowleaf pinweed
Myrica pensylvanica	Northern bayberry
Quercus coccinea	Scarlet oak
Quercus velutina	Black oak
Schizachyrium scoparium	Little bluestem
Solidago nemoralis	Gray goldenrod
Trichostema dichotomum	Forked bluecurls
Vaccinium corymbosum	Highbush blueberry
Riparian Corridor Habitat Type	
Acer rubrum	Red maple
Betula lenta	Black birch
Carpinus caroliniana	American hornbeam
Carya glabra	Pignut hickory
Carya ovate	Shagbark hickory
Cinna latifolia	Drooping woodreed
Fraxinus Americana	White ash
Ilex mucronata	Catberry
Ilex verticillata	Common winterberry
Lindera benzoin	Northern spicebush
Osmunda cinnamomea	Cinnamon fern
Quercus alba	White oak
Quercus coccinea	Scarlet oak
Quercus rubra	Red oak
Sassafras albidum	Sassafras
Thalictrum dioicum	Early meadow-rue
Thelypteris noveboracensis	New York fern
Vaccinium corymbosum	Highbush blueberry
Viola cucullata	Marsh blue violtet

Bold = non-native

Exhibit 4

Connecticut Energy Efficiency Fund 2008 Community & Residential Programs

DETERMINE YOUR OWN ENERGY FUTURE

We realize that rising energy costs are impacting our customers. The Connecticut Energy Efficiency Fund* has programs that can help reduce the amount of energy you use, in turn reducing the amount you are billed. These programs can help make your larger bill a bit more manageable. *Administered by CL&P, UI, Yankee Gas, CNG & SCG.

Programs	Eligibility	Incentive
ENERGY STAR® Retail Products	All residential customers.	Retail incentives, special events and mail order promotions, to encourage the purchase of energy-efficient lighting.
Residential New Construction	Residential customers in the process of building a new home.	Incentives for high-efficiency HVAC systems, insulation, lighting, ground source heat pumps (geothermal) and home performance.
Residential Heating and Cooling	Residential customers with central air conditioning or heat pumps.	Rebates for high-efficiency central air conditioning, heat pump and ground source heat pump (geothermal) systems. Quality installation incentives for central air conditioning systems available through participating contractors.
Home Energy Solutions	All residential customers, with all electric, electric with gas heat, or high-users with central air-conditioning. This program is free to all electric and natural gas heat customers with central air-conditioning. Co-pay for Connecticut residents who heat with oil.	Comprehensive residential in-home services including: duct sealing, weatherization, energy-efficient bulb installation, education and water heating measures where applicable. Rebates for insulation upgrades and replacement of older appliances.
Weatherization Residential Assistance Partnership/WRAP (CL&P), UI Helps (UI)	Low-income residents with incomes at or below 60% of the Connecticut state median income.	Full cost of installed conservation and energy-efficiency measures.
Energy Conservation Loan	All residential customers who meet income guidelines.	Low-interest loans for residential energy conservation work.
Multi-family Program	All residential multi-family.	Custom offerings for natural gas and electric savings geared towards multi-family projects.
Residential High Efficiency Natural Gas Hot Water Heater Rebate Program	All Yankee Gas, Southern Connecticut Gas, and Connecticut Natural Gas customers.	You may qualify for a $300 incentive for installing an energy-efficient indirect water heater attached to a natural gas ENERGY STAR® rated boiler or an on-demand natural gas fired tankless water heater. See your utility's web-site for rebate form.
ee smarts™	All Connecticut school districts and educators.	Free professional development training for educators provided by PIMMS of Wesleyan University on the topics of energy, energy efficiency, renewable energy and electricity. Free curriculum materials upon completion of training.
SmartLiving™ Center	All residential customers.	Free admission to center, free school tours, free meeting facilities and energy efficiency information.
Stepping Stones Museum	All residential customers.	Interactive museum for children ages ten and under, parents, and educators. Part of the museum is dedicated to educating children about energy conservation.

ENERGY STAR® Retail Products

ENERGY STAR-qualified compact fluorescent bulbs and fixtures provide excellent light throughout your home and use 75% less energy than regular bulbs. If you're in the market for a new refrigerator, clothes washer, dishwasher, dehumidifier or room air conditioner, look for the ENERGY STAR label on your favorite name brand.

Residential New Construction

If you're building a new home, an ENERGY STAR-qualified home can help you achieve the greatest level of energy efficiency through the use of reliable, advanced building techniques and high-quality materials. Through the Fund, CL&P and UI can help you build your dream home and earn incentives for installing energy-efficient measures, such as high-performance HVAC equipment, geothermal heat pumps, enhanced insulation, tightly sealed ducts and energy-efficient lighting.

Residential Heating and Cooling
Through the Fund, you can reduce energy costs by installing energy-efficient central air conditioning or heat pump systems. You may qualify for a $300 or $500 rebate for the installation of ENERGY STAR central air conditioning equipment. Rebates up to $3,000 for installation of performance-tested ground source heat pump (geothermal) systems are also available.

Home Energy Solutions
This comprehensive in-home services program, designed for both electric and natural gas customers in Connecticut, provides energy-saving services to program participants, including advanced weatherization and duct sealing. Installation of other energy-saving technologies (compact fluorescent bulbs) and appliance replacement/insulation rebates are also part ofthe program.

Weatherization Residential Assistance Partnership; WRAP (CL&P), UI Helps (UI)
These programs offer free energy-saving products and services to low-income customers with incomes at or below 60% of the Connecticut state median income. Energy-saving measures include: the installation of energy-efficient light bulbs, low-flow showerheads, caulking and weatherization services, air duct sealing, appliance assessment and education about energy-saving habits.

Energy Conservation Loan
The Energy Conservation Loan Program and the Multifamily Energy Conservation Loan Program provide financing at below market rates to single family and multi-family residential property owners for the purchase and installation of cost-saving energy conservation improvements. The program is administered by the Connecticut Housing Investment Fund, Inc. (CHIF) with funding from the Connecticut Department of Economic and Community Development. For details, call 800.992.3665 or visit www.chif.org

Multi-family Program
This is a flexible program designed to help meet the diverse needs of multi-family projects. Offerings are customized and can include both electric and natural gas measures.

Residential High Efficiency Natural Gas Hot Water Heater Rebate Program
Yankee Gas, Southern Connecticut Gas and Connecticut Natural Gas now offer special incentives for replacing or installing new energy-efficient Hot Water systems. In addition to saving energy and money, you'll be doing your part to conserve our natural resources for future generations.

eesmarts
This program is designed to develop an energy-efficiency ethic among students, encouraging them to incorporate energy-efficiency practices into their lives. eeSmarts offers free Professional Development workshops for Connecticut school teachers and school districts regarding the program's educational curriculum and energy topics.

SmartLiving™ Center
It's not a retail store. It's an idea warehouse, filled with ways to save energy, save resources and save money in your home. Browse through interactive displays of energy efficient products, lights and appliances, building materials and more. A helpful staff ready to answer your energy efficiency questions. It's a must see destination if you want to reduce your energy use. 297 Boston Post Road, Orange.

Stepping Stones Museum
This interactive museum contains hundreds of exciting and educational exhibits geared towards children ages 3-10. A whole section of the museum is dedicated towards educating children about energy and energy conservation. Group tours and field trips are available or make it a family visit. For information, go to www.steppingstones.org

Call 1.877.WISE.USE (1.877.947.3873) for additional information.

Connecticut Light & Power
The Northeast Utilities System

CONNECTICUT ENERGY EFFICIENCY FUND

The United Illuminating Company

www.CTEnergyInfo.com

Connecticut's Energy Efficiency Programs are funded by the Conservation Charge on customer bills.
The Programs are designed to help customers manage their energy usage and cost.

CNG

Southern Connecticut Gas
Service First!

Yankeegas
The Northeast Utilities System

Paid for by CL&P and UI customers.

REV 0108 C0001

Connecticut Energy Efficiency Fund 2008 Commercial & Industrial Programs

DETERMINE YOUR OWN ENERGY FUTURE

Connecticut's commercial and industrial (C&I) energy consumers have an energy-saving resource right at their fingertips—the Connecticut Energy Efficiency Fund. The Fund's purpose is to provide energy efficiency and load management programs that advance the efficient use of energy, promote economic development, enhance energy security and mitigate the environmental impacts of energy generation. The Fund's programs are administered by the state's electric distribution companies, Connecticut Light & Power and United Illuminating, and the natural gas utilities, Yankee Gas, Connecticut Natural Gas and Southern Connecticut Gas.

Programs	Eligibility	Incentive
ENERGY CONSCIOUS BLUEPRINT	Electric and firm natural gas C&I customers engaged in new construction, planned remodeling, major renovations and new equipment.	Up to 100% of incremental cost.
Connecticut Cool Choice	Express Services Rebates for C&I customers replacing rooftop or packaged air conditioning systems or heat pump systems.	Rebates from $70-200 per ton.
Connecticut MotorUp	All C&I customers, replacing three-phase motors.	Rebates from $45-700 per horse power.
***PRIME**	All Industrial manufacturing customers of CL&P.	For qualifying projects at customer location, 100% of cost paid for the first two events, 75% for the third and fourth event, and 50% for the fifth and sixth event.
ENERGY OPPORTUNITIES	All electric and firm natural gas C&I customers, including municipalities, replacing existing inefficient technologies such as lighting and lighting controls (must exceed ASHRAE code by 15%), motors and controls, process-related equipment and HVAC equipment and controls.	Up to 50% of installed cost for non-lighting measures and up to 30% of installed cost for lighting measures.
Express Lighting	Express lighting offers fast and convenient rebates for lighting changes.	Rebates from $10-$55 per fixture (varies with technology and application). Rebates exceeding $1,000 require pre-approval.
SMALL BUSINESS ENERGY ADVANTAGE	All electric C&I customers, including municipalities, with up to 200 kW (CL&P) or 150 kW (UI) of average peak demand. Interest-free financing for up to 36 months available to qualified customers.	Prescriptive incentives for: Lighting and lighting controls up to 40% of installed cost; HVAC controls and tune-ups up to 40% of installed cost; and Refrigeration controls up to 40% of installed cost.
OPERATION & MAINTENANCE (O&M) SERVICES	All electric and firm natural gas C&I customers. Program provides incentives for the implementation of non-capital intensive items that save electric and/or natural gas energy.	Incentives up to 50% of installed cost.
RETROCOMMISSIONING	Large electric and firm natural gas C&I customers. Must have a building energy management system with trending capability.	Incentives up to 50% of installed cost.
ISO-NE LOAD RESPONSE PROGRAM SUPPORT	Electric customers with at least 100 kW of curtailable load that can respond within 30 minutes or 2 hours of notification.	Incentives paid for curtailment when requested. Higher payment available for customer capable of responding within 30 minutes.
***DEMAND REDUCTION**	C&I customers who are capable and willing to control kW demand during peak times through real-time monitoring and control.	Qualifying projects incentives will be the lesser of $500/kW curtailed or 50% of installed costs.
***SMALL INDUSTRIAL & COMMERCIAL LOAN**	Qualified commercial electric customers with average kW demand between 200 and 350 kW over the past 12 months in business for minimum 3 years required.	Interest-free financing for qualified customers.

***CL&P Programs ONLY**

Energy Conscious Blueprint
Whether you're considering new construction, or expansion of your commercial property, this program includes cash incentives, design grants, and technical assistance in order to make your facility more energy efficient and your business more competitive.

- **Connecticut Cool Choice**
  This program provides cash rebates for purchasing premium-efficiency HVAC equipment. See an area dealer for more information or contact your Utility for rebate forms.
- **Connecticut Motor Up**
  This program entitles you to cash rebates on installing qualifying premium-efficiency motors. See an area dealer for more information or contact your Utility for rebate forms.

PRIME
Process Re-engineering for Increased Manufacturing Efficiency (PRIME) is a program designed to help Connecticut's industrial customers become more competitive and energy efficient through recommendations for manufacturing and process improvements. (See Utility for details).

Energy Opportunities
There are many ways your business can profit from improved energy efficiency. This program provides C&I customers with tailored solutions, including cash incentives up to 50% of the cost for maximizing energy efficiency through retrofits. Non-lighting and up to 30% for lighting. Retrofit projects are defined as those where the customer voluntarily exchanges or modifies functioning, inefficient, equipment with high-efficiency alternatives.

- **Lighting Express**
  Rebates designed to cover up to 100% of the incremental cost of installing energy-efficient lighting for commercial applications. Fast and convenient application process, rebate forms are available from your Utility.

Small Business Energy Advantage
This energy-efficiency program is designed specifically to help small businesses save energy and money. It includes a no-obligation energy evaluation of your business, as well as cash incentives and zero-percent financing for qualified customers with a maximum loan term of 36 months to pay for upgrades in areas such as, but not limited to, lighting and refrigeration.

Operation & Maintenance Services
Energy-saving maintenance procedures and energy-efficiency enhancing modifications to existing systems. Other available features include focused studies and training.

Retrocommissioning
The program is designed to analyze a commercial building's Energy Management System and determine the existence and origin, of energy inefficiencies in the building's operational processes. Utility experts conduct a review of the building's operational systems and identify energy inefficiencies and propose the implementation of appropriate energy-efficiency measures.

ISO-NE Load Response Program Support
Maintain the ability of existing participants to reduce load during periods of system capacity deficiency.

Demand Reduction
Incentives for cost-effective projects which provide peak load kW (or kW and kWh) reductions in commercial, industrial and large residential complex applications.

Small Industrial & Commercial Loan
Interest-free loan at $5,000 minimum up to a maximum of $100,000 per qualified customer for energy-efficient equipment replacements only. (Consult your Utility for details).

Connecticut Light & Power
The Northeast Utilities System

CONNECTICUT
ENERGY EFFICIENCY FUND

The United Illuminating Company

www.CTEnergyInfo.com

Connecticut's Energy Efficiency Programs are funded by the Conservation Charge on customer bills.
The Programs are designed to help customers manage their energy usage and cost.

CNG

Southern Connecticut Gas
Service First!

Yankeegas
The Northeast Utilities System

Paid for by CL&P and UI customers.

Exhibit 5

Northeast Utilities System

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 665-4861

January 15, 2008

Ms. Dawn McKay, Biologist/Environmental Analyst
Connecticut Department of Environmental Protection
Natural Resources Center
Environmental and Geographic Information Center
Natural Diversity Data Base
79 Elm Street, Store Level
Hartford, CT 06106-5127

Re: Proposed Substation
287 Waterford Parkway North
Waterford, Connecticut

Dear Ms. McKay:

The Connecticut Light and Power Company ("CL&P") is considering the development of a new 115-kV substation for interconnection with existing overhead transmission facilities off Waterford Parkway North, in Waterford, Connecticut (the "Site"). The new substation is necessary to meet an increasing demand for electricity in the Waterford area. The proposed development of a new substation requires CL&P to submit an application to the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need. Consultation with your office is part of the application process.

The 5-acre Site currently exists as undeveloped land and is covered with moderate tree growth, with some small clearings and limited growth in its central portion. An easement area with overhead electric transmission lines is present in the northwest corner of the Site. The new 115-kV substation facility will interconnect with the existing transmission lines that extend generally east to west immediately north of the Site.

CL&P has reviewed the Natural Diversity Data Base's (NDDB) December 2007 GIS layer of "State and Federally Listed Endangered, Threatened, and Special Concern Species and Significant Natural Communities", and based on your criteria, we have determined that our proposed project does **not** present a potential conflict with *a listed species or significant natural community* (please refer to the attached NDDB Screen map).

We respectfully request your written concurrence with our findings to support our application with the Connecticut Siting Council. At your earliest convenience, please forward the correspondence to my attention. Thank you in advance for your prompt consideration of this request. Should you have any questions, I may be reached at (860) 665-4861 or via email at marotsa@nu.com.

Sincerely,

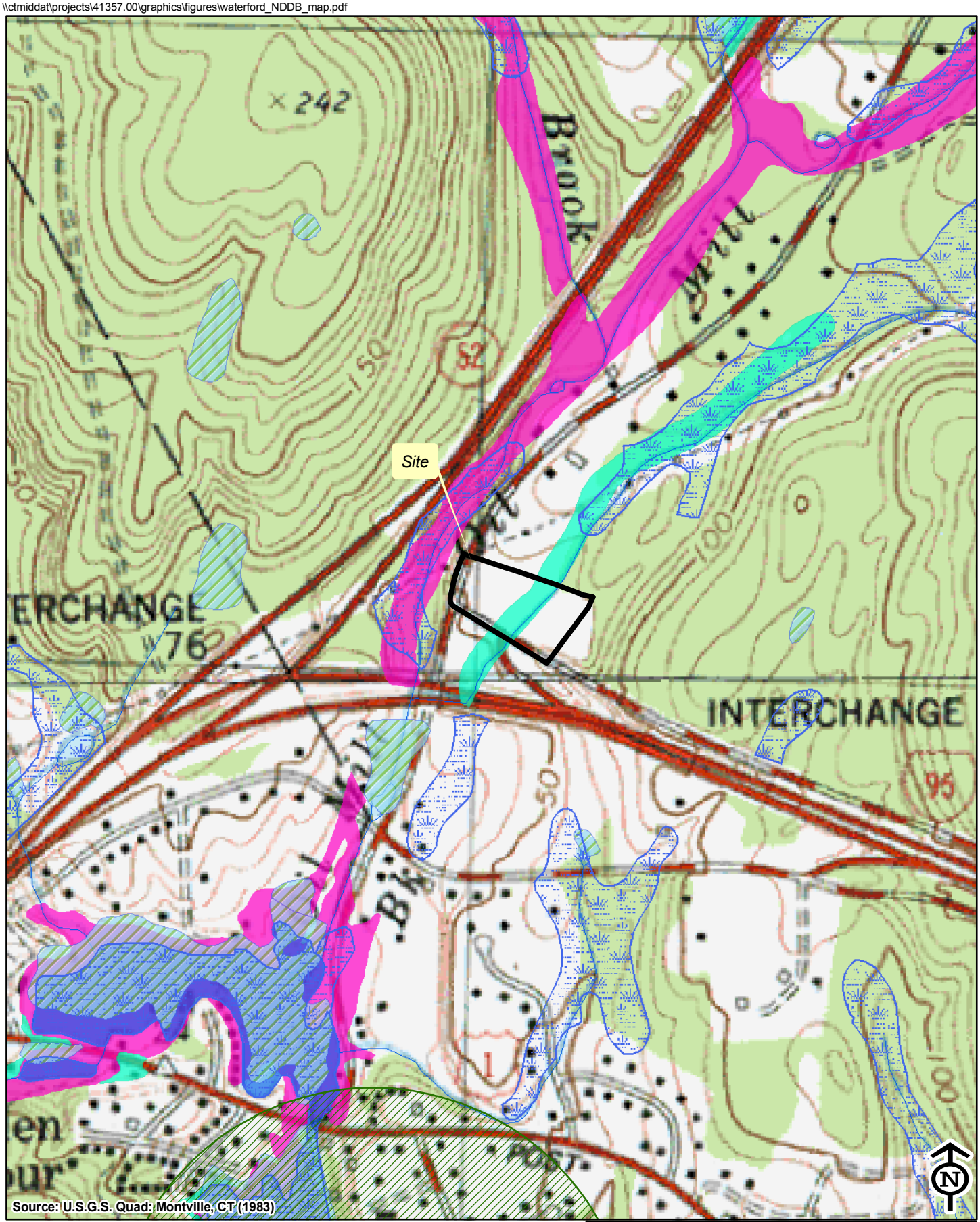
NORTHEAST UTILITIES SERVICE COMPANY

Scott A. Marotta
Environmental Scientist

Enclosures

cc: D. Biondi, Northeast Utilities Service Company

\\ctmiddat\projects\41357.00\graphics\figures\waterford_NDDB_map.pdf



Legend

- Site
- NDDB Areas (buffered; last updated Dec 2007)
- Connecticut Wetlands
- National Wetland Inventory Wetlands
- Open Water

FEMA Flood Zone

- 100 Year Flood Zone
- 500 Year Flood Zone
- Floodway in Zone AE
- Other Flood Areas

500 250 0 500 Feet

Vanasse Hangen Brustlin, Inc.

Natural Diversity Database (NDDB)
State and Federally Listed Endangered, Threatened, and Special Concern Species and Significant Natural Communities Screen
Proposed Substation
Waterford Parkway North & Oil Mill Road
Waterford, CT
January 2, 2008

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

January 28, 2008

Mr. Scott Marotta
Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270

Re: Proposed Substation, 287 Waterford Parkway North, North Waterford

Dear Mr. Marotta:

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed new 115-kV sub-station for interconnection with existing overhead transmission facilities off Waterford Parkway North in Waterford, Connecticut. According to our information there are no known extant populations of Federal or State Endangered, Threatened or Special Concern Species that occur at the site in question.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at 424-3592. Thank you for consulting the Natural Diversity Data Base. Also be advised thatthis is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

Sincerely,

Dawn M. McKay
Biologist/Environmental Analyst

DMM/blm

Exhibit 6

Connecticut Commission on Culture & Tourism

Historic Preservation
and Museum Division

One Constitution Plaza
Second Floor
Hartford, Connecticut
06103

860.256.2800
860.256.2763 (f)

May 9, 2008

Mr. Scott A. Marotta
Northeast Utilities Service Company
PO Box 270
Hartford, CT 06141-0270

Subject: CL&P 115-kV Substation
Waterford Parkway North
Waterford, CT

Dear Mr. Marotta:

The State Historic Preservation Office has reviewed the reconnaissance survey prepared by Heritage Consultants LLC concerning the above-named project. In the opinion of the State Historic Preservation Office, the archival and archaeological methodologies employed by Heritage Consultants LLC are consistent with our *Environmental Review Primer for Connecticut's Archaeological Resources.*

The State Historic Preservation Office concurs with Heritage Consultants LLC that no further archaeological investigations appear warranted with respect to the proposed undertaking. This office believes that the proposed undertaking will have no effect upon Connecticut's archaeological heritage.

This office recommends that Heritage Consultants LLC consult with the Office of State Archaeology at the University of Connecticut (Storrs) concerning the professional transferal of all field notes, photographs, and artifactual materials generated by the archaeological investigations.

The State Historic Preservation Office appreciates the cooperation of all interested parties concerning the professional management of Connecticut's archaeological resources.

This comment updates and supersedes all previous correspondence regarding the proposed project.

For further information please contact Dr. David A. Poirier, Staff Archaeologist.

Sincerely,

Karen Senich
State Historic Preservation Officer

cc: Dr. Nicholas Bellantoni/OSA
Mr. David George/HC

FINAL REPORT **APRIL 2008**

PHASE IB CULTURAL RESOURCES RECONNAISSANCE SURVEY OF THE WATERFORD SUBSTATION PROJECT AREA, WATERFORD, CONNECTICUT

PREPARED FOR:

VANASSE HANGEN BRUSTLIN, INC.
54 TUTTLE PLACE
MIDDLETOWN, CONNECTICUT 06457

HERITAGE CONSULTANTS, LLC
877 MAIN STREET
NEWINGTON, CONNECTICUT 06111

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CHAPTER I
INTRODUCTION

This report summarizes the results of a Phase IB Cultural Resources Reconnaissance Survey of the proposed Waterford Substation Project in Waterford, Connecticut (Figure 1). The Area of Potential Effect, which will be the location of an electrical substation built by Connecticut Light & Power, is located at the intersection of Waterford Parkway North and Oil Mill Road (Figures 1 and 2). Heritage Consultants, LLC completed the field investigation portion of this project on behalf of Vanasse Hangen Brustlin, Inc., during March of 2008. All work was conducted in accordance with the National Historic Preservation Act of 1966, as amended; the National Environmental Policy Act of 1969, as amended; and the *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987). The remainder of this document presents a description of the Area of Potential Effect, information used as project context, the methods by which the current Phase IB cultural resources reconnaissance survey was completed, results of the investigation, and management recommendations for the project.

Project Description

The Area of Potential Effect consists of 2 ha (5 ac) parcel of land situated at an approximate elevation of 18 m (60 ft) NGVD. It is roughly bounded to the south by Waterford Parkway North, to the east by a forested parcel of land, to the north by a tree farm, and to the west by Oil Mill Road (see Figure 2). At the time of survey, the project parcel was described as a wooded lot with areas of disturbance noted along the bounding roadways (i.e., to the south by Waterford Parkway North and to the west by Oil Mill Road). These disturbed areas were characterized by low lying scrub brush.

Field Methods and Results of the Investigation

As discussed in detail elsewhere in this document (see Chapter II), the Area of Potential Effect is located within the eastern coastal ecoregion of Connecticut, an area of significant topographic relief that is characterized by numerous small streams, wetlands, and soils that have been deposited on glacial till and stratified deposits of sand, gravel, and silt. Planning for the current project took into account the results of previously completed archeological investigations within 1.6 km (1 mi) of the Area of Potential Effect, the distribution of previously recorded archeological sites located within 0.8 km (0.5 mi) of the proposed project parcel, and a geological assessment of the overall study region.

During the current Phase IB cultural resources reconnaissance survey, the proposed project parcel was subjected to pedestrian survey, shovel testing, photo-documentation, and mapping. During the investigation, transect survey was utilized whereby shovel tests were excavated at 15 m (49.2 ft) intervals along eight parallel survey transects (see Figure 3). In addition, local soil conditions and levels of disturbance were noted and recorded on field forms. During the survey, each shovel test measured approximately 50 cm (19.7 in) in diameter and each was excavated to a minimum depth of 50 cmbs (19.7 inbs) or to the sterile subsoil. All shovel test fill was screened through 0.64 cm (0.25 in) hardware cloth. Each shovel test was excavated in 10 cm (4 in) arbitrary levels within natural strata, and the fill from each level was screened separately. Munsell Soil Color Charts were used to record soil color in each excavated shovel test; soil texture and other identifiable characteristics also were recorded using standard soils nomenclature. All shovel tests were backfilled immediately upon completion of the archeological recordation process.

The Phase IB cultural resources reconnaissance survey of the proposed project parcel resulted in the identification of two non-site cultural resources loci (Locus 1 and Locus 2). Pedestrian survey and subsurface testing of the Locus 1 area resulted in the collection of a single historic pearlware ceramic sherd from topsoil deposits in the central portion of the project area. Subsurface testing of Locus 1 failed to reveal evidence of cultural features and/or qualitative/quantitative cultural materials. Thus, it was determined that Locus 1 retained little, if any, research potential. This non-site cultural resources locus was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

Completion of the above-described testing regime also resulted in the identification of Locus 2 within the southern southwestern portion of the proposed project parcel. Examination of Locus 2 resulted in the collection two artifacts dating from an unknown prehistoric period. A single chert flake and a single quartz flake comprised the artifact assemblage. In addition, careful examination of the soil stratigraphy throughout Locus 2 reflected a high degree of past disturbance to the landscape due to gravelling. Due to the lack of cultural material, the presence of disturbed soil deposits, and little to no research potential, Locus 2 also was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of this archeological locus was recommended.

Finally, as part of the current investigation, representatives of Heritage Consultants, LLC investigated a claim by a local resident that a knoll in the southwest corner of the proposed project parcel once contained a small cemetery associated with a former almshouse that was operated to the south of the Area of Potential Effect and on the southern side of Interstate 95. To ascertain whether or not the cemetery claim was valid, detailed historical research into cemeteries in this part of Waterford was undertaken and the knoll in the southwest corner of the project parcel was subjected to pedestrian survey, examined for evidence of burials (e.g., headstones, depressions), and selectively cleared of forest litter. Despite these efforts, no evidence of burials, either historic or physical, was identified. Further, as part of the survey of the larger project parcel indicated, subsurface testing undertaken in this part of the Area of Potential Effect revealed that it has undergone substantial impacts related to graveling. Thus, it appears that either the local informant incorrectly remembered the location of the former cemetery or that it has already been removed by graveling operations and/or construction of the intersection of Oil Mill Road and Waterford Parkway North. Nevertheless, an Unanticipated Discoveries Plan has been drafted in the unlikely event that materials related to a human burial(s), that either were not recorded historically or could not be identified in the field (e.g., buried under layers of fill), are uncovered during construction (see Appendix I).

Project Personnel

Ms. Catherine M. Labadia, M.A., served as Principal Investigator for this project, while Mr. David R. George, M.A., R.P.A. and Mr. Aaron Palermo, B.A., completed the fieldwork for this project and prepared this report. Finally, Mr. William Keegan, B.A., M.A., compiled the History Chapter and he provided data for the Previous Investigations section of this report, as well as GIS support services and project mapping.

Organization of the Report

The natural setting of the region encompassing the proposed project parcel is presented in Chapter II; it includes a brief overview of the geology, hydrology, soils, flora, fauna, and climate of the project region. The prehistory of the project region is outlined briefly in Section Chapter III. The history of the region encompassing the Area of Potential Effect is chronicled in Chapter IV. A review of all previously recorded archeological sites and previously completed cultural resources surveys located in the immediate vicinity of the proposed project parcel is contained in Chapter V; it is based on data maintained by Heritage Consultants, LLC, as well as on data obtained from the Connecticut State Historic Preservation Office. The methods used to complete this investigation are discussed in Chapter VI. Finally, the results

of this investigation and management recommendations for the Locus 1 and Locus 2 are presented in Chapter VII and VIII of this document, respectively.

CHAPTER II
NATURAL SETTING

Introduction

The State of Connecticut exhibits considerable variability in geology, hydrology, soils, flora, and fauna despite the fact that its boundaries encompass only approximately 5,000 mi^2 or roughly 1,295,040 ha (3,200,000 ac) of land. Connecticut's landscape, which lies in the northern temperate deciduous forest biome (Braun 1950; Shelford 1963), contains many subregions, including areas of locally high relief such as the eastern and western uplands areas; extensive riverine systems dominated by wide alluvial floodplains such as those in the north-central part of the state; widespread and extensive wetland systems composed of swamps, freshwater marshes, and tidal estuaries; and, finally, coastal areas. Regional differences in climatic variables, including precipitation, temperature, and growing season, as well as differences in topography and distance from the Long Island Sound, are reflected in the distribution of various floral and faunal resources (Dowhan and Craig 1976:25).

Ecoregions of Connecticut

Throughout the Pleistocene and Holocene Periods, Connecticut has undergone numerous environmental changes. Variations in climate, geology, and physiography have led to the "regionalization" of Connecticut's modern environment. It is clear, for example, that the northwestern portion of the state has very different natural characteristics than the coastline. Recognizing this fact, Dowhan and Craig (1976), as part of their study of the distribution of rare and endangered species in Connecticut, subdivided the state into various ecoregions. Dowhan and Craig (1976:27) defined an ecoregion as:

> "an area characterized by a distinctive pattern of landscapes and regional climate as expressed by the vegetation composition and pattern, and the presence or absence of certain indicator species and species groups. Each ecoregion has a similar interrelationship between landforms, local climate, soil profiles, and plant and animal communities. Furthermore, the pattern of development of plant communities (chronosequences and toposequences) and of soil profile is similar in similar physiographic sites. Ecoregions are thus natural divisions of land, climate, and biota."

Dowhan and Craig defined nine major ecoregions for the State of Connecticut. They are based on regional diversity in plant and animal indicator species (Dowhan and Craig 1976). Only one of the ecoregions is germane to the current investigation: the Eastern Coastal ecoregion. A brief summary of the Eastern Coastal ecoregion is presented below. It is followed by a discussion of the geology of the State of Connecticut, as well as by overviews of the hydrology, soils, flora, fauna, and climate characteristic of the Area of Potential Effect.

<u>Eastern Coastal Ecoregion</u>

The Eastern Coastal ecoregion region consists of a hilly upland terrain located between approximately 5 to 7 mi to the north of Long Island Sound (Dowhan and Craig 1976). It is characterized by "coastlands, including extensive tidal marshes, estuary areas, and sand beaches, by relatively level but rolling near-shore lands, and by protrusions of rugged and rocky upland extending to the coastline" (Dowhan and Craig 1976:29). Elevations in the Eastern Coastal ecoregion range from sea level to 122 m (400 ft) above sea level (Bell 1985). The bedrock of the region is composed of schists, gneisses, and granite deposited during the Paleozoic (Bell 1985). Soils in the region have developed on top of glacial till in upland

locales, and on top of stratified deposits of sand, gravel, and silt in the local valleys and coastal areas (Dowhan and Craig 1976).

The Geology of Connecticut

The development of Connecticut's ecoregions is tied to its underlying geology. The geology of the State of Connecticut is complex, and it is the product of both large scale and long-term constructional and destructional processes. These processes are described briefly below.

Continental Drift, Erosion, and the Early Development of Connecticut

The geology of Connecticut as expressed today has its origins in developmental processes that began as early as 500 million years ago (mya) (Bell 1985). At that time, the earth was characterized by the presence of several proto-continents and large islands that were distributed around the equator and within the southern hemisphere. By approximately 250 mya, these proto-continents and islands, i.e., large tectonic plates, had "drifted" together to form the supercontinent of Pangea. The supercontinent remained in place as a large landmass for approximately 50 million years, after which it began to split into several large pieces that we recognize today as the seven modern continents. During this early developmental sequence, the land that was to become known as Connecticut was positioned within the heart of Pangea. As a result, the formation and eventual disintegration of Pangea has left its mark on the geology of Connecticut (Bell 1985; Robinson and Hall 1980).

Connecticut's Four Terranes

Geologists recognize that the State of Connecticut is composed of four major underlying terranes that were pushed into close proximity with one another during the formation of Pangea (Bell 1985). These terranes are defined on the basis of shared geological attributes, specifically rocks and strata with similar histories and chemical compositions. The four terranes underlying Connecticut's landscape are known as the Proto North American, Newark, Avalonia, and Iapetos terrenes; the proposed project parcel is located within the Iapetos terrain (Bell 1985:140). The eastern edge of the Proto North American terrane, corresponding to today's Northwest Highlands ecoregion, once formed the eastern shoreline of the area now known as the United States. The Newark terrane, corresponding in area to the Central Valley, formed as Pangea began to break apart. This area underwent tremendous stresses as it was pulled apart slowly by the disintegration of Pangea. Avalonia, which can be identified today as a series of gneiss and granitic rocks distributed in a broad arc in the southeastern portion of the state, once was part of a large island that was situated to the southeast of the Proto North American continent prior to the formation of Pangea. Finally, The Iapetos terrane, corresponding roughly to the Eastern and Western Uplands areas, formed during the coalescence of Pangea. These portions of the state represent areas that once were shallow portions of the Iapetos Ocean; it eventually was filled with sediments eroding from the Proto North American terrane and Avalonia. Both the Proto North American terrane and Avalonia, because they existed prior to the formation of Pangea, predate the Iapetos and Newark terranes. They date from prior to 570 mya, whereas the intervening Iapetos and Newark terranes, formed during the period of continental collision, date from approximately 500 to 250 mya (Bell 1985:153).

While these four terranes underlie Connecticut's approximately 160.9 km (100 mi) wide modern landscape, they once spanned more than 804.6 km (500 mi) from east to west (Bell 1985:147). During the course of the formation of Pangea, Avalonia was pushed westward. Sediments from Avalonia and the Proto North American continent eroded and washed into the shrinking Iapetos Ocean, forming what was to become the Eastern and Western Uplands of Connecticut. When Pangea formed, the area became cemented together and confined to the space between the state's modern borders (Bell 1985).

As the supercontinent divided, tremendous forces were put upon the area, forming a large fissure that eventually became the Newark terrane. The Newark terrane was filled with sediments eroding from the east and west, forming the distinctive sandstone and brownstone strata of the Central Valley of

Connecticut. As this area continued to expand, the underlying bedrock began to tilt towards the east, allowing large lava flows to reach the surface and cool into a series of traprock ridges. These ridges still are visible today; prominent among them is Metacomet Ridge. Eventually, the pressures acting upon the Newark terrane were relieved when a larger fissure opened to the east, allowing the European and African continents to move off to the east and the Atlantic Ocean to occupy the intervening area (Bell 1985).

For millennia after the breakup of Pangea, the area that has become known as Connecticut has undergone extensive erosion. Continued washing away of sediments originating from what was Proto North America, the Iapetos terrane, and Avalonia have aided in the formation of today's landscape. These forces, coupled with the tremendous power of the glaciers that scoured the area during the Pleistocene, have left Connecticut what it is today, a rich and varied landscape consisting of a mosaic of mountains, rolling hills, fertile valleys, a rocky coastline, and numerous watercourses.

Hydrology in the Vicinity of the Area of Potential Effect

The proposed project parcel is situated within close proximity to the Niantic River and several streams and brooks. The Niantic River, the nearest major water source, is located adjacent to the southwest of the Area of Potential Effect. In addition, Meadow Brook and Mill Brook converge to the northwest of the proposed project parcel then flow to the west of it and ultimately to the Niantic River. Finally, an unnamed stream bisects the proposed project parcel from north to south. As previously completed archeological investigations in Connecticut have demonstrated, wetlands, streams, and lakes such as those located in close proximity to the Area of Potential Effect were focal points for prehistoric Native American occupation because they provided vital linkages to transportation routes, sources of freshwater, and abundant faunal and floral resources. Further, as historical documents and archaeological sites indicate, streams and smaller rivers served as sources of waterpower for milling operations. Such is the case in the example of the current project parcel where several historic mills were known to have operated in the project region. Thus, from a locational standpoint, the Area of Potential Effect possesses a moderate to high potential for producing cultural deposits.

Soils in the Vicinity of the Area of Potential Effect

Soil formation is the direct result of the interaction of a number of variables, including climate, vegetation, parent material, time, and organisms present (Gerrard 1981). Once archeological deposits are buried within the soil, they are subject to a number of diagenic processes. Different classes of artifacts may be preferentially protected, or unaffected by these processes, whereas others may deteriorate rapidly. Cyclical wetting/drying, freezing/thawing, and compression can accelerate chemically and mechanically the decay processes for animal bones, shells, lithics, ceramics, and plant remains. Lithic and ceramic artifacts are largely unaffected by soil pH, whereas animal bones and shells decay more quickly in acidic soils such as those that are present in within the current study area. In contrast, acidic soils enhance the preservation of charred plant remains. A review of the mapped soils within the study region is presented below, as well as a discussion of their potential to preserve buried archeological deposits.

Specifically, the proposed project parcel, which contains slopes of 0 to 15 percent, is characterized by the presence of three major soil types: Agawam fine sandy loam, Canton and Charlton soils, and Udorthents-Urban Land Complex. Descriptions for these soil types are provided below. They are adapted from USDA Soil Survey Division website (http://ortho.ftw.nrcs.usda.gov/cgi-bin/osd/osdname.cgi).

<u>Agawam Soils</u>

Ap--0 to 11 inches; dark grayish brown (10YR 4/2) fine sandy loam; light brownish gray (10YR 6/2) dry; weak medium and coarse subangular blocky structure; very friable; common fine and medium roots; strongly acid; abrupt smooth boundary (5 to 14 inches thick);

Bw1--11 to 16 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak medium and coarse subangular blocky structure; very friable; common fine and medium roots; strongly acid; abrupt smooth boundary;

Bw2--16 to 26 inches; light olive brown (2.5Y 5/4) fine sandy loam; weak medium subangular blocky structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary (Combined thickness of the Bw horizons is 10 to 30 inches);

2C1--26 to 45 inches; olive (5Y 5/3) loamy fine sand; massive; very friable; few fine roots; strongly acid; clear smooth boundary;

2C2--45 to 55 inches; olive brown (2.5Y 4/4) loamy fine sand; massive; very friable; strongly acid; abrupt smooth boundary;

2C3--55 to 65 inches; olive (5Y 5/3) loamy sand; single grain; loose; strongly acid.

Canton/Charlton Soils
A--O to 1 inch; black (10YR 2/1) fine sandy loam; weak fine granular structure; very friable; many fine roots; 10 percent rock fragments; extremely acid; abrupt smooth boundary (1 to 3 inches thick);

E--1 to 2 inches; dark gray (10YR 4/1) fine sandy loam; weak fine granular structure; very friable; many fine roots; 10 percent rock fragments; extremely acid; abrupt broken boundary (0 to 2 inches thick);

Bw1--2 to 12 inches; yellowish brown (10YR 5/6) fine sandy loam; massive; very friable; many fine and medium roots; many fine pores; 10 percent rock fragments; very strongly acid; clear wavy boundary;

Bw2--12 to 22 inches; light yellowish brown (2.5Y 6/4) gravelly fine sandy loam; massive; very friable; many fine and medium roots; many fine pores; 15 percent rock fragments; very strongly acid; abrupt wavy boundary (Combined thickness of the Bw horizons is 13 to 33 inches);

2C1--22 to 31 inches; light olive gray (5Y 6/2) gravelly loamy sand; single grain; very friable; common medium roots; many medium pores; 25 percent rock fragments; pebbles have thin patchy silt caps; very strongly acid; abrupt wavy boundary (8 to 20 inches thick);

2C2--31 to 65 inches; olive gray (5Y 5/2) very gravelly loamy sand; single grain; friable; few fine roots; 35 percent rock fragments; thick continuous silt caps on pebbles; very strongly acid.

Udorthents-Urban Land Complex
Urban Land Complex soils occur within cuts (road, railroad, etc.), spoil piles, and landfills. The slope ranges from 0 to 25 percent and the runoff class is medium. The depth to a restrictive feature is greater than 60 inches. The drainage class is moderately well drained. The typical profile is as follows:

0 to 5 inches; loam (various colors);

5 to 21 inches; extremely gravelly coarse sand, silty clayey loam (various colors);

21 to 80 inches; extremely gravelly coarse sand, silty clayey loam (various colors).

Flora Noted within the Vicinity of the Area of Potential Effect
A wide variety of trees are found within the vicinity of the proposed project parcel (Niering and Olmstead 1995; Peterson and McKenny 1968). Trees common to the area include oaks (*Quercus* sp.), pines (*Pinus*

sp.), hickories (*Carya* sp.), maples (*Acer* sp.), beech (*Fagus grandifolia*), Eastern Hemlock (*Tsuga canadensis*), and Eastern Red Cedar (*Juniperus virginiana*), among others. Historic Native Americans in the northeastern United States used trees and tree products for a number of technological purposes. Oak, hickory, and other hardwoods were preferred for firewood and construction materials. Pestles and mortars also were made of hardwoods, especially hickory. Hickory nuts were an important food resource for prehistoric (and some historic) Native American populations throughout the eastern United States. Whole hickory nuts were crushed and added to boiling water to produce a rich milky liquid (hickory milk) with high oil and protein content (Larson 1980:187; Swanton 1946:273). Hickory nutshell is a major component of Archaic and Woodland period paleoethnobotanical assemblages (Asch and Asch 1985; Chapman and Shea 1981; Johannessen 1984). In the American Bottom and the Southeast area, hickory nutshell decreased during the Emergent Mississippian period, but still remained an important part of most Eastern Woodland subsistence economies until contact (Johannessen 1984). In addition, pecans (a thin-shelled hickory species) were gathered and later cultivated by European settlers. According to Brown (1965:43) "the cultivated forms have much larger meats, less bitter material in the grooves of the meat, and some better horticultural varieties have much thinner shells."

Archeological acorn nutshell tends to be poorly preserved and highly fragmented, making comparisons between raw counts of acorn and hickory nutshell misleading. Paleoethnobotanical evidence of acorn use begins during the Archaic period (Chapman and Shea 1981) and it continues, at a low rate, until the late prehistoric. At contact, several Native American groups consumed acorn nutmeats that had been leached in water to remove the toxic tannins. These nutmeats were ground and used as flour for breads (Tuck 1978). Another use of acorn nutmeat was for oil, which was used for cooking and personal adornment. According to Larson (1980:187-197), acorns were harvested during the autumn months.

In addition to trees, many of the locally available fleshy fruits were good sources of sugar, vitamins, and minerals. Historic Native American groups in the Northeast dried some fruits for winter use, but most were consumed fresh. European settlers often preserved fruits by drying, canning, or making them into jams. In addition, the seeds of several weedy plants also were collected and processed by historic, northeastern Native Americans. Grains generally are assumed to have been major carbohydrate sources, but many of the wild grains were rich in oils and proteins as well. Some of the more common wild grains in the area include pigweed (*Amaranthus* sp.), ragweed (*Ambrosia trifida*), sedge (*Cyperus* sp.), panic grass (*Panicum* spp.), knotweed (*Polygonum* sp.), and wild rice (*Zizania aquatica*). In addition, there is paleoethnobotanical evidence that goosefoot, sunflower (*Helianthus annus*), sumpweed (*Iva annua*), maygrass (*Phalaris carolinania)*, and knotweed, all of which thrive in bottomland environments, were cultivated or even domesticated in the Eastern Woodlands (Asch and Asch 1985; Chapman and Shea 1981; Ford 1985; Fritz 1990; Smith 1992; Watson 1989), though evidence of this remains scarce in Connecticut (see George and Dewar 1999 for a discussion of the possible domestication of *Chenopodium* sp., in Connecticut).

Plants that were sources of "greens" also were present on the riverbanks and other disturbed areas of the Northeast. These species include goosefoot, pokeweed (*Phytolacca americana*), purslane (*Portulaca* sp.), knotweed, and pigweed. Greens are generally young leaves and shoots that are steamed or boiled prior to consumption. Such foods were important additions to the late winter/early spring diet of Native Americans and Euro-Americans. Greens were a source of numerous minerals and vitamins, as well as a relief from the otherwise monotonous winter meals for both Euro-American and Native American residents.

Root foods were noted as important subsistence items to Native Americans. Roots of sedges, cat/greenbriars (*Smilax* sp.), jack-in-the-pulpit (*Arisaema atrorubens*), and cattail (*Typha* sp.) all were utilized. Roots were important subsistence items because many could be gathered in the late fall and winter when other plant foods were unavailable. In addition, roots foods could have been dried and stored

for long periods of time. Many other plant species also had historic and presumably prehistoric technological uses. Vining species such as grape (*Vitis* sp.) were used for basketry.

Finally, species such as hickory, elms (*Ulmus rubra*), and oaks may have been sold or used locally for lumber by Europeans. The young black willow (*Salix nigra*) twigs can be woven into baskets and wicker furniture. White oak (*Quercus* alba) can be split into fine strips and used for basketry. Wine and beer barrels also were produced from white oak lumber. American elm wood was steamed and bent into forms for barrel and wheel hoops, veneer, and baskets.

This summary indicates that the flora of the proposed project region is not only diverse in nature, but also could have been put to a multitude of uses by both prehistoric and historic inhabitants of the Eastern Coastal area. The vegetation provided not only sustenance, but raw materials for commodities, tools, and fires.

Fauna Noted within the Vicinity of the Area of Potential Effect

The Eastern Coastal ecoregion also contains a wide variety of faunal resources. Most of the terrestrial animal species present in the area range freely between the upland and bottomland environments. The White-tailed deer (*Odocoileus virginianus*) and bear (*Ursus americana*) were important resources to Native Americans (Tuck 1978) and Euro-Americans. Both species were hunted for the large amount of meat present on a given animal (Larson 1980), and they were excellent sources of raw materials, e.g., bone, antler, sinew. Deer bones were made into hide preparation tools, needles, beads, decorative items, and musical instruments. Deer antler was used in the manufacture of arrow points, club tips, glue, ornaments, and tools. Thread and some tools were made from entrails. In short, almost every part of the deer carcass was exploited by these groups.

Historic accounts of northeastern Native Americans suggest that the second most useful animal was bear. Bear fat was a vital food resource during the late winter and early spring when the fresh meat was relatively lean. Bear fat also was used for skin and hair treatment. In addition, bear hides were used as heavy robes and winter moccasins. In addition, a variety of terrestrial mammals such as rabbits (*Sylvilagus* sp.), squirrels (*Sciurus* sp.), raccoons (*Procyon lotor*), and opossums (*Didelphis virginianus*) undoubtedly were hunted by residents of the area (Larson 1980). Additional mammals, like mink (*Mustela vison*) and weasels (Mustela *sp.*) may have been hunted for their pelts, as well as their flesh.

In addition, the Eastern Coastal ecoregion is home to a wide variety of bird species. Large numbers of these birds could have been harvested during the fall and winter. Terrestrial species such as bobwhite quail (*Colinus* sp.) and wild turkey (*Meleagris gallopavo*) would have been abundant in the upland areas. As Swanton (1946:251) pointed out, "the turkey seems anciently to have been the most utilized [by Native Americans] of all birds". The flesh of turkeys was consumed, and the feathers used for ornaments, feather mantels, fans, and arrow production. Non-game birds (e.g. heron [*Ardea herodias*] and woodpecker [Family Picinae]) and raptorial species (e.g., hawks [*Buteo*], eagles [Haliaeetus sp.], and owls [Family Tytonidae]) also may have been captured by Native Americans for feathers, hides, or ceremonial purposes.

The freshwater environments of the Eastern Coastal support a number of fish, reptile, and amphibian species. Among the important freshwater game fish species are bass (Family Centrarchidae), freshwater catfish (Family *Ichtaluridae*), northern pike (*Esox* sp.), and sunfish (*Enneacanthus obesus*). The presence of these fish species within a particular drainage is dependent upon the nature of the distributary. Swamps and low gradient streams and rivers often have slower moving waters, thereby supporting backwater species such as catfish and crawfish. In addition, the Eastern Coastal ecoregion is home to a diversity of saltwater and brackish water species. In terms of their uses, fish bones were made into needles and other small tools by northeastern Native Americans. Frogs (Family Ranidae), snapping turtles (*Chelydra*

serpentina), and box turtles (*Terrapene* sp.), probably were part of local subsistence systems. Other turtle species (*Chrysemys* sp.) and even snakes (Family Coluber) probably were collected by the Native American inhabitants of the area.

Climate in the Vicinity of the Area of Potential Effect

The climate in the area encompassing the proposed project parcel is affected by both cold, dry air masses originating from the Arctic region and warm, humid air masses that move northward from the Gulf of Mexico region (Sheanin and Hill 1953). The average temperature is 69 degrees Fahrenheit in summer and degrees 29 degree Fahrenheit in winter (Crouch 1983).

Annual precipitation in the vicinity of the Area of Potential Effect reaches 48 inches. Rainfall usually is greatest from April until October. During winter, the prevailing winds are from the south and/or west. Thunderstorms, on average, occur approximately 22 times per year. They tend to be the worst type of storm to impact the area; however, tornadoes occur infrequently, causing significant damage to homes, businesses, and crops in the area. Finally, floods are not frequent in the area, but winter ice storms may cause significant power outages, traffic-related difficulties, and damage to vegetation.

CHAPTER III
PREHISTORIC SETTING

Introduction
Prior to the late 1970s and early 1980s, very few systematic archeological surveys of large portions of the state of Connecticut had been undertaken. Rather, the prehistory of the region was studied at the site level. Sites chosen for excavation were highly visible and they were located in such as areas as the coastal zone, e.g., shell middens, and Connecticut River Valley. As a result, a skewed interpretation of the prehistory of Connecticut was developed. It was suggested that the upland portions of the state, i.e., the northeastern and northwestern hills ecoregions, were little used and rarely occupied by prehistoric Native Americans, while the coastal zone, i.e., the eastern and western coastal and the southeastern and southwestern hills ecoregions, were the focus of settlements and exploitation in the prehistoric era.

This interpretation remained unchallenged until the 1970s and 1980s when several town-wide and regional archeological studies were completed, including the Eastern Coastal, Southeast Hills, North-Central Lowlands, and Northeast Hills Ecoregions. In the North-Central Lowlands ecoregion, for example, McBride, Dewar, and Wadleigh (1979) and McBride, Wadleigh, Dewar, and Soulsby (1980) completed town-wide surveys of South Windsor and Glastonbury, respectively. In addition, town-wide surveys were completed in East Haddam and Haddam, e.g., Southeast Hills ecoregion, and in Woodstock, e.g., Northeast Hills ecoregion, in the early 1980s (McBride, Dewar, and Wadleigh 1979; McBride 1984), as well as while conducting the Route 6/1-84 Relocation Survey (McBride and Soulsby 1989). These investigations led to the creation of several archeological phases that subsequently were applied to understand the prehistory of Connecticut.

The remainder of this chapter provides an overview of the prehistoric setting of the region encompassing the proposed project area. For the sake of ease and clarity, the chronology used below employs the standard period/subperiod that has characterized Connecticut prehistory for decades. However, when applicable, the identified archeological phases will be discussed to shed additional light on prehistoric settlement and subsistence patterns noted for particular period of time. The phase names and associated dates used below are adapted from McBride's (1984) unpublished dissertation entitled "*Prehistory of the Lower Connecticut River Valley."*

Paleo-Indian Period (12,000-10,000 B.P.)
The earliest inhabitants of the area encompassing the State of Connecticut, referred to as Paleo-Indians, probably arrived in southern New England after the end of the Wisconian Glaciation (ca. 14,000 B.P.) (Gramly and Funk 1990; Snow 1980). At glacial maximum, sea level was as much as 130 m (426 ft) below its present level (Edwards and Emery 1977; Edwards and Merrill 1977), exposing a large portion of the continental shelf that was suitable for use by human populations that may have moved there from the west and southwest. By the time the glaciers receded from the area (ca. 11,000 B.P.), sea level was still much lower in southern New England than at present (Edwards and Emery 1977). While deglaciation occurred slowly, most of Connecticut was clear of ice by about 13,500 B.P., and the central portion of the state was inundated under glacial Lake Hitchcock (Bell 1985; Snow 1980; Gramly and Funk 1990). Megafauna that existed in the area at the time included mammoth, mastodon, horse, and bears, as well as elk, caribou, giant beaver, and musk ox (Gramly and Funk 1990; Martin and Guilday 1967; Ritchie 1969). Due to the presence of large Pleistocene mammals and the ubiquity of large fluted projectile points

at this time, Paleo-Indians often are described as big-game hunters (Ritchie and Funk 1973; Snow 1980); however, as discussed further below, it is more likely that they hunted a broad spectrum of small and medium sized animals.

According to pollen studies, the tundra environment that developed shortly after deglaciation transformed rapidly into a forested biome, with a spruce forest in place by approximately 12,000 B.P. (Davis 1969). The spread of birch, pine, larch, and fir into the region, as well as limited amounts of oak, occurred by approximately 10,000 B.P. (Davis 1969; Thorson and Webb 1991). It was in this type of environment that Paleo-Indian culture flourished.

While there have been numerous finds of Paleo-Indian projectile points throughout the State of Connecticut, only two sites, the Templeton Site (6-LF-21) in Washington, Connecticut and the Hidden Creek Site (72-163) in Ledyard, Connecticut, have been studied in detail and dated using the radiocarbon method (Jones 1997; Moeller 1980). Almost all other Paleo-Indian sites located in Connecticut are surface finds. Many of these occur within the limits of the former glacial Lake Hitchcock basin (Curren and Dincauze 1977), demonstrating that the lake had drained close in time to the arrival of Paleo-Indian groups in the area.

As mentioned above, the Templeton Site (6-LF-21), excavated by Roger Moeller (1980), is located in Washington, Connecticut; it is positioned on a terrace overlooking the Shepaug River. Moeller (1980:19) indicates that the site area was located approximately 3.4 m (11.5 ft) above the river, and that the site area was characterized by loamy fine sand. Carbon samples recovered during excavation of the site area produced radiocarbon age of 10,190$\pm$300 B.P., for the occupation; thus, the site was used sometime between 10,490 and 9,890 years ago. In addition to a single large and two small fluted points, the Templeton Site produced gravers, drills, core fragments, scrapers, and channel flakes, indicating that the full range of lithic reduction took place within the site area (Moeller 1980). Moreover, use of both exotic and local raw materials was documented in the recovered lithic assemblage, suggesting that the site's occupants also had access to distant lithic sources. Use of these distant sources provides evidence for some level of embedded procurement of lithic raw materials during movement from region to region.

The only other Paleo-Indian site studied in detail in Connecticut is the Hidden Creek Site (72-163) (Jones 1997). Identified in 1992, the Hidden Creek Site is situated on the southeastern margin of the Great Cedar Swamp on the Mashantucket Pequot Reservation in Ledyard, Connecticut. The site area is positioned on a kame terrace that overlooks a small tributary stream that drains into the Great Cedar Swamp. While excavation of the Hidden Creek Site produced evidence of both Terminal Archaic and Woodland Period components in the uppermost soil horizons, the lower levels of the site area yielded artifacts that have been attributed to the Paleo-Indian Period by Jones (1997). Paleo-Indian artifacts recovered from the site area include broken bifaces, side scrapers, a fluted preform, gravers, and end scrapers. Jones (1997:76) argued that based on typological considerations the artifacts likely date from ca., 10,000 to 9,500 years ago.

Based on the types and number of tools present, Jones (1997:77) has hypothesized that the Hidden Creek Site represents a short-term occupation, probably in the range of 7 to 18 days in duration. Moreover, the distribution of artifact types and kinds of lithic debris indicate that discrete activity areas are discernible within the site area. Jones (1997:73-74) contends that separate lithic reduction and tool rejuvenation areas are indicated, and, since they were noted within an oval pattern, they are located within the confines of a former structure, possibly a skin tent.

While the evidence for Paleo-Indian occupation is scarce in Connecticut, combined with data from such sites as the West Athens Road and King's Road Site in the Hudson drainage, and the Davis and Potts Sites in northern New York support the hypothesis that there was human occupation of southern New

England by 11,000 to 10,000 B.P. (Snow 1980). Further, the site types currently known suggest that the settlement pattern is characterized by a high degree of mobility, with groups moving from region to region in search of seasonally abundant food resources, as well as for the procurement of high quality raw materials from which to fashion hunting and processing tools.

Archaic Period (10,000 to 2,700 B.P.)

The Archaic Period, first designated by Ritchie (1943) to describe all pre-ceramic cultures of the Northeast, began by ca., 10,000 B.P. (Ritchie and Funk 1973; Snow 1980). Later, Griffin (1967) and Snow (1980) divided the Archaic Period into three subperiods: the Early Archaic (10,000 to 8,000 B.P.), Middle Archaic (8,000 to 6,000 B.P.), and Late Archaic (6,000 to 3,400 B.P.). These periods were meant to describe all non-horticultural populations in the Northeast. Moreover, the populations lacked ceramic technology.

After additional investigations, northeastern archeologists added a final "transitional" Archaic Period, the Terminal Archaic Period (3,400-2,700 B.P.), which was meant to describe those groups that existed in the area just prior to the onset of the Woodland Period and the widespread adoption of ceramics into the toolkit (Snow 1980; McBride 1984; Pfeiffer 1984, 1990; Witthoft 1949, 1953). Although these divisions are used commonly by northeastern archeologists, McBride (1984) and others have found substantial temporal and stratigraphic overlap in the distribution of "diagnostic" artifact types, especially for the Archaic. As discussed in detail below, this overlap and the presence or absence of various cultural traits has led to the formation of several cultural phases for the Archaic Period of southern New England (McBride 1984).

Early Archaic Period (10,000 to 8,000 B.P.)

To date, very few Early Archaic sites have been identified in southern New England. As a result, researchers such as Fitting (1968) and Ritchie (1969), have suggested the lack of sites of this age likely is tied to cultural discontinuity between the Early Archaic and preceding Paleo-Indian Period, as well as a population decrease from earlier times. However, with continued identification Early Archaic sites in the region, and the recognition of the problems of preservation and visibility of these sites in New England (McBride 1984), it is difficult to maintain the discontinuity hypothesis (Curran and Dincauze 1977; Snow 1980).

In addition to the problems of differential preservation, Early Archaic Period occupations in southern New England, unlike other portions of the country (notably the Southeast), are difficult to identify. Like their Paleo-Indian predecessors, Early Archaic sites tend to be very small, and they produce few artifacts, most of which are not temporally diagnostic. While Early Archaic sites in other portions the United States are represented by projectile points of the Kirk series (Ritchie and Funk 1973) and by Kanawha types (Coe 1964), sites of this age in southern New England are identified based on the recovery of a series of ill-defined bifurcate-based projectile points. These projectile points are identified by the presence of their characteristic bifurcated base, and they generally are made from high quality raw materials, though some quartz and quartzite specimens have been recovered. Moreover, finds of these projectile points have rarely been in stratified contexts. Rather, they occur commonly either as surface expressions or intermixed with artifacts representative of later periods of prehistory.

In Connecticut, a notable site that has produced stratified deposits dating from the Early Archaic Period is the Dill Farm Site in the lower Connecticut River Valley (McBride 1984; Pfeiffer 1986), and others (Barber 1980; Thomas 1980). Extrapolating from the Dill Farm Site, which dates from 8,050$\pm$90 B.P., and from regional surveys in the lower Connecticut River Valley, McBride (1984) has determined that Early Archaic sites generally are positioned within 0.2 km (0.5 mi) of the Connecticut River. This site distribution, combined with a shift in projectile point technology from large lanceolate points in the Paleo-Indian Period to shorter, more robust bifurcate-based projectile points suggests a "settling in"

process occurred and that groups became more focused on locally available and smaller game species. Occupations of this time period are represented by camps that moved periodically to take advantage of seasonally available resources (McBride 1984). In this sense, a foraging type of settlement pattern was employed during the Early Archaic Period.

Middle Archaic Period (8,000 to 6,000 B.P.)

By the onset of the Middle Archaic Period, essentially modern deciduous forests had developed in southern England (Davis 1969). It is at this time that increased numbers and types of sites are noted in the region (McBride 1984). The most well known Middle Archaic site in New England is the Neville Site, which is located in Manchester, New Hampshire and which was studied in detail by Dincauze (1976). The Neville Site produced the first evidence of a Middle Archaic component that was stratigraphically intact and which could be dated reliably using the radiocarbon method.

Careful analysis of the Neville Site indicated that the Middle Archaic occupation dated from between ca., 7,700 and 6,000 years ago. In fact, Dincauze (1976) obtained several radiocarbon dates from the Middle Archaic component of the Neville Site. The dates, associated with the then-newly named Neville type projectile point, ranged from 7,740±280 and 7,015±160 B.P. (Dincauze 1976). Dincauze argued that the Neville projectile point, which is the oldest type of Narrow-Stemmed projectile point in the region (see below), is typologically similar to, but distinct from, the Stanley projectile point described by Broyles (1966) and (Coe 1964) at the St. Albans and Doerschuck Sites in the Southeast.

In addition to Neville projectile points, Dincauze (1976) described two other projectile points styles recovered from stratified contexts at the Neville Site that are attributable to the Middle Archaic Period. They are the Stark and Merrimac projectile points. While no absolute dates were recovered from deposits that yielded Stark points, the Merrimac type dated from 5,910±180 B.P. She argued that both the Neville and later Merrimac and Stark occupations were established to take advantage of the excellent fishing that the falls situated adjacent to the site area would have afforded Native American groups.

As a result of the investigations at the Neville Site, Dincauze (1976) proposed that the Middle Archaic Period is characterized by the "Atlantic Slope Cultural Area," which is represented by the oldest, small or narrow stemmed projectile points in the region. This concept was devised by Dincauze (1976) to unite sites of this age from both the Southeast and Northeast into a single cultural unit, as well as to distinguish this area from other areas to the west of the Appalachian highlands.

During the late 1970s and early 1980s, McBride (1984) conducted archeological investigations in the lower Connecticut River Valley in an attempt to better describe the prehistoric settlement and use of the area. While radiocarbon dates are largely lacking, McBride (1984) noted that Middle Archaic sites in the lower Connecticut River Valley tend to be represented by moderate density artifact scatters that produce examples of Neville and Stark projectile point types; Merrimac projectile points are largely lacking in the region. Further, archeological investigations in the area led to the determination that the lower Connecticut River Valley was occupied fairly intensively by Middle Archaic times, and that occupations identified in the area represent a "diversity of site types, with both large-scale occupations and small special purpose present (McBride 1984:96). As McBride (1984) has pointed out, Middle Archaic sites are distributed in both riverine and upland locales. Based on the available archeological evidence, the Middle Archaic Period is characterized by continued increases in diversification of resources exploited, as well as by sophisticated changes in the settlement pattern to include different site types, including both base camps and task-specific sites (McBride 1984:96).

Late Archaic Period (6,000 to 3,700 B.P.)

The Late Archaic Period in southern New England is divided into two major cultural traditions that appear to have coexisted in the region. They include the Laurentian and Narrow-Stemmed Traditions

(Funk 1976 McBride 1984; Ritchie 1969a and b). Archeological sites, cultural traits, settlement patterns, and land use patterns characteristic of these two traditions are discussed below.

The Laurentian Tradition (ca., 6,000 to 4,200 B.P.)
The Late Archaic of the Northeast was much more regionally diversified than either the Early or Middle Archaic Periods. This difference is attributed to environmental stabilization and population increases. The earliest Late Archaic sites in southern New England can be ascribed loosely to cultures of the Laurentian tradition (ca., 6,000 to 4,200 B.P.) (Dincauze 1974:48-49, Ritchie 1969a:233). They cannot, however, be strictly considered "Laurentian" because they lack many of the traits associated with that complex. Rather, they are local manifestations that rarely exhibit more than the diagnostic projectile point forms associated with the Laurentian Tradition (Snow 1980:2 19).

Artifacts assigned to the Laurentian Tradition include ground stone axes, adzes, gouges, ulus (semi-lunar knives), pestles, atlatl weights and scrapers. The diagnostic projectile point forms of this time period in southern New England include the Brewerton Eared-Notched, Brewerton Eared and Brewerton Side-Notched varieties (McBride 1984; Ritchie 1969a). In general, the lithic assemblage of this tradition is characterized by flint, felsite, rhyolite and quartzite, while quartz was largely avoided as a raw material for stone tool manufacturing.

In terms of settlement and subsistence, archeological evidence in southern New England suggests that Laurentian Tradition populations consists of groups of mobile hunter-gatherers. While a few large Laurentian Tradition occupations have been identified and studied, they generally encompass less than 500 m^2 in area. These base camps reflect frequent movements by small groups of people in search of seasonally abundant resources. The overall settlement pattern of the Laurentian Tradition was dispersed in nature, with base camps located in a wide range of microenvironments, including riverine as well as upland zones (McBride 1984:252).

Subsistence strategies of Laurentian Tradition focused on hunting and gathering of wild plants and animals from multiple ecozones. While White-tailed deer comprised a prominent part of the diet, plant foods, including seeds and hickory nuts, were utilized. For example, the Bashan Lake Site, a Laurentian Tradition campsite located in East Haddam, Connecticut, has yielded evidence of Brewerton projectile points, net sinkers, grinding stones, hearths and charred hickory nuts dating from 4,730$\pm$280 years ago (Pfeiffer 1983:10).

The relative absence of storage pits and structural remains from the Laurentian Tradition occupations in southern New England indicates a lifestyle dominated by a high degree of mobility. Small groups of hunter/gatherers moved across the landscape in pursuit of seasonally abundant resources. An exception to this pattern is the Bliss-Howard Site discovered by Pfeiffer (1984:74-75). The Bliss-Howard Site, located in Old Lyme, Connecticut, is a cremation/occupation complex dating from approximately 4,700 years ago. At this site, Pfeiffer (1984) identified 21 cremation burials with grave offerings including Brewerton projectile points, atlatl weights, axes, pestles, scrapers, faunal remains, and carbonized seed and nut remains (Pfeiffer 1984:74-75). Adjacent to the cremation cemetery is situated a large Laurentian Tradition occupation site. Pfeiffer (1984) argued convincingly that the habitation and cemetery were contemporaneous because artifacts found in these two contexts cross-mended in some cases. The cremation/occupation complex may have been a place where families aggregated for a period of time during the year. Large sites, such as Bliss-Howard and Bashan Lake, suggest that aggregations occurred for at least a portion of the year.

In his study of prehistoric settlement patterns of the lower Connecticut River Valley, McBride (1984) suggested the use of the term Golet phase to discuss occupation sites that have produced Laurentian projectile point types (e.g., Vosburg and Brewerton series). By obtaining radiocarbon dates from a variety

of sites that produced Vosburg and Brewerton projectile points, McBride (1984) derived a time span of 4,700 to 4,200 B.P., for the Golet Phase. The evidence from occupation sites such as Bashan Lake and burial areas such as Bliss-Howard indicate that a significant population of hunter-gatherers inhabited the lower Connecticut River Valley during the early part of the Later Archaic Period (e.g., during the Golet phase). According to McBride (1984) Golet phase populations employed a settlement patter that "appears to be very dispersed, with small mobile groups exploiting a wide range of microenvironments and environmental locales."

The Narrow Stemmed Tradition (ca. 4,200 to 2,900 B.P.)
The latter portion of the Late Archaic is dated between 4,200 and 2,900 years ago, and it is represented by local manifestations of the largest cultural tradition indigenous to southern New England and the mid-Atlantic regions (Dincauze 1975:47, McBride 1984:110). Known regionally as the Narrow-Stemmed Tradition, it is unlike the Laurentian Tradition; it likely represents a different cultural adaptation. The Narrow Stemmed tradition is recognized by the presence of quartz and quartzite narrow stemmed projectile points, triangular quartz Squibnocket projectile points, and a bipolar lithic reduction strategy (McBride 1984).

In general, the Narrow-Stemmed Tradition corresponds to when Late Archaic populations in southern New England began to "settle into" well-defined territories. As mentioned above, the lithic industry of this period was dominated almost exclusively by the use of locally available quartz cobbles. The characteristic narrow-stemmed projectile points were manufactured using a bipolar reduction technique whereby a quartz cobble was crushed using a hammerstone and anvil to produce raw material for stone tool manufacture. Other tools found in Narrow-Stemmed Tradition artifact assemblages include choppers, adzes, pestles, antler and bone projectile points, harpoons, and awls, as well as notched atlatl weights. Many of these tools, notably the projectile points and pestles, indicate a subsistence pattern dominated by hunting and collecting of plant foods, especially nuts (Snow 1980:228).

In addition to terrestrial fauna and flora, evidence for the use of shellfish increased during the Narrow-Stemmed Tradition. For example, at the Archaic Midden site in Haddam, Connecticut, a Narrow-Stemmed Tradition site dating to 3 990$\pm$60 years ago, McBride (1984:112) recovered evidence for the use of freshwater clams, oyster, and quahog. Similarly, Ritchie has found abundant evidence for use of the same species on the Horn Blower II site on Martha's Vineyard. The date for the Horn Blower II site is ca., 4,000 years ago (Ritchie 1969b:38).

Further, Narrow-Stemmed Tradition settlement patterns are marked by an increase in the types of sites utilized. Whereas the Laurentian Tradition usually is characterized by smaller sites and higher mobility, the Narrow-Stemmed Tradition witnessed the introduction of large base camps supported by small task-specific sites and temporary camps. The introduction of these new site types suggests a more entrenched settlement pattern than that of the preceding Laurentian Tradition. This is evidenced by the archeological deposits at the Woodchuck Knoll Site (McBride 1978:124).

Woodchuck Knoll is a large Narrow-Stemmed Tradition base camp located on the floodplain of the Connecticut River in South Windsor, Connecticut. The associated radiocarbon dates for Woodchuck Knoll fall between 3,760 and 3,500 years ago. The site is particularly important for understanding Narrow-Stemmed Tradition settlement patterns because it demonstrates the re-occupation of a single area many times, something which was largely lacking during preceding periods. Moreover, Woodchuck Knoll exhibits the remains of numerous features, including hearths, caches and storage pits, all of which indicate a long term, perhaps multi-season, use of the site. This is particularly true of storage pits, which, until Narrow-Stemmed Tradition times, apparently were not utilized in southern New England. Storage pits at the Woodchuck knoll Site contained the charred remains of hickory, walnut, hazelnut, and *Chenopodium* sp., indicating a heavier reliance on local plant foods (McBride 1978:130).

In addition to the Woodchuck Knoll Site, many task-specific and temporary camps of the Narrow-Stemmed Tradition have been detected in almost every microenvironment in southern New England, including riverine areas, interior wetlands, upland streams, coastal zones, and lacustrine settings. These sites were utilized as support mechanisms for the larger base camps, such as Woodchuck Knoll. Further, they attest to a more well-established settlement pattern during the Narrow-Stemmed Tradition. While this pattern was well established, it still relied on frequent groups movement. The difference at this time is that group movements were made between areas that were frequented over and over in the past.

Based on recovered archeological evidence, McBride (1984) has suggested two separate phases for the Narrow Stemmed Tradition. They are the Vibert and Tinkham phases. The Vibert phase was identified first at the Woodchuck Knoll (McBride 1978), while the Tinkham phase was interpreted from archeological deposits encountered at the Tinkham Site in Tolland, Connecticut. In terms of temporally diagnostic tool types, the Vibert phase is recognized by the presence of small, triangular Squibnocket projectile points, while the Tinkham phase is represented by the ubiquitous narrow stemmed projectile point. In addition, the Vibert and Tinkham phases were marked by the introduction of new and diverse site types, a heavier reliance on local plant foods, and re-occupation of and longer stays at base camps. These data suggest larger seasonal aggregations of people than the previous Golet phase, as well as decreased mobility. The increased number of temporary and task specific sites, especially those belonging to the Tinkham phase, indicates frequent movements out of and back into base camps for the purpose of resource procurement; however, the base camps were relocated seasonally to position groups near frequently used, but dispersed, resources (McBride 1984:262).

The Terminal Archaic Period (3,700 to 2,700 B.P.)

The Terminal Archaic, which lasted from ca., 3,700 to 2,700 BP, is perhaps the most interesting, yet confusing of the Archaic Periods in southern New England prehistory. Originally termed the "Transitional Archaic" (Witthoft 1953) and recognized by the introduction of technological innovations, e.g., broadspear projectile points and soapstone bowls, the Terminal Archaic has long posed problems for southern New England archeologists. While the Narrow-Stemmed Tradition persisted through the Terminal Archaic and into the Early Woodland Period, the Terminal Archaic is coeval with what appears to be a different technological adaptation, namely the Susquehanna Tradition (McBride 1984; Ritchie 1969b). The Susquehanna Tradition is recognized in southern New England by the presence of a new lithic industry that was based on the use of high quality raw materials for stone tool production and a settlement pattern different from the "coeval" Narrow-Stemmed Tradition.

The Susquehanna Tradition is based on the classification of several Broadspear projectile point types and associated artifacts. There are several local sequences within the tradition, and they are based on projectile point type chronology. Temporally diagnostic projectile points of these sequences include the Snook Kill, Susquehanna Broad, Mansion Inn, and Orient Fishtail types (Lavin 1984; McBride 1984; Pfeiffer 1984). Generally, the initial portion of the Terminal Archaic Period (ca., 3,700-3,200 BP) is characterized by the presence of Snook Kill and Susquehanna Broadspear projectile points, while the latter Terminal Archaic (3,200-2,700 BP) is distinguished by the use Orient Fishtail projectile points (McBride 1984:119; Ritchie 1971). There is much variation within the suite of artifacts within the Susquehanna Tradition, and, as a result, it should not be interpreted directly as a cultural system (Snow 1980:239).

The Susquehanna Tradition lithic industry was based on the use and modification of such raw material types as flint, chert, argillite, hornfels, rhyolite, and quartzite. Locally abundant quartz was avoided because of its poor fracturing qualities (McBride 1984:115-116). Thus, it can be said that the Narrow-Stemmed Tradition differs from the Susquehanna Tradition in technology, morphology, and raw material preferences. In addition, the material culture of the Terminal Archaic includes soapstone vessels, chipped

and ground stone adzes, atlatl weights, drills, net sinkers, plummets and gorgets (Lavin 1984; McBride 1984; Ritchie 1969a and 1969b; Snow 1980), the most temporally diagnostic of which soapstone or steatite bowl. These vessels are shallow, have flat bottoms, are oval or rectangular in shape, have lugged handles at the narrow ends, and range from 12 to 50 cm (5 to 20 in) in length. The finished bowls are heavy and they demonstrate extended use; that is, many often have evidence of repairs (Snow 1980:240). It has been suggested that they are modeled after wooden prototypes (Snow 1980:240). The soapstone bowls tend to be found only at base camps along river terraces.

In the late Terminal Archaic there also is the appearance of interior cord marked, grit tempered, thick walled ceramics with conoidal bases; these ceramics occur in very minor amounts. These are the first ceramics in the Northeast and are named Vinette I (Ritchie 1969a; Snow 1980:242); this type of ceramic vessels appears with much more frequency during the ensuing Early Woodland Period. The adoption and widespread use of soapstone bowls, as well as the implementation subterranean storage, suggests that Terminal Archaic groups were characterized by reduced mobility (Snow 1980:250).

In addition, the recovery of soapstone bowls from numerous archeological sites in Connecticut indicates that local populations had access to and participated in regional exchange networks. For example, soapstone, or steatite, bowls appear to be tied into large inter-regional exchange networks that extended across the Northeast (Snow 1980:240). Moreover, the increased percentage of high quality lithics, e.g., chert, flint, felsite, etc., recovered from Terminal Archaic sites in the region also attests to the maintenance of long distance exchange networks, since these raw materials do not exist naturally within the borders of the State of Connecticut. As such, this is the best and earliest evidence of trade and exchange in southern New England. The majority of raw materials exchanged at this time can be found in riverine settings, and settlement along the major drainages would have facilitated trade.

There also are a large number of Terminal Archaic cremation cemeteries with burials that have produced broadspear points and radiocarbon dates between 3,700 and 2,700 B.P. (Pfeiffer 1990). Among the grave goods are ritually "killed" (intentionally broken) steatite vessels, as well as ground stone and flaked stone tools (Snow 1980:240); however, this represents an important continuation of traditions from the Late Archaic and it should not be regarded as a cultural trait unique to the Susquehanna Tradition (Snow 1980:244).

In addition, just as the artifact assemblage of the Susquehanna Tradition differed from Narrow-Stemmed Tradition, so too did settlement patterns. While Susquehanna Tradition settlement patterns are centered around large base camps that are analogous to that unearthed at the Late Archaic Woodchuck Knoll Site, they were located in a different ecozone: terrace edges overlooking floodplains. Terminal Archaic settlements generally are situated on river terraces with few, very small task specific upland sites located nearby (McBride 1984:282, Lavin 1988). Ritchie and Funk (1973), for example, noted that nearly all the Orient Fishtail components of the Susquehanna Tradition are located near seashores or along major rivers, usually in locations protected from prevailing winds (see also Snow 1980:249). The Timothy Stevens Site is an example of such a large Terminal Archaic base camp in the Connecticut River drainage. This site, radiocarbon dated from 2,740±60 years ago, is situated on the edge of a terrace adjacent to the Connecticut River floodplain in central Connecticut. The site area has produced evidence of house remains, hearths, caches and storage pits, all of which are indicative of a large-scale, long term occupation (Pagoulatos 1988:76). Prolonged occupation of these sites may explain partially the changes in settlement from occupying the floodplain to moving up onto the terraces. That is, the terraces can be occupied earlier in the spring because they are not threatened by the annual spring flooding.

Acting as support facilities for the large Terminal Archaic base camps were numerous task specific sites and temporary camps. In general, these sites measure between 100 to 200 and 300 m^2 or larger in size, respectively. Such sites were used as extraction points for the procurement of resources not found in the

immediate vicinity of the base camps, and they generally were located adjacent to upland streams and wetlands (McBride 1984:282). It is generally accepted that base camps were occupied from spring to fall in order to harvest anadromous and catadromous (migratory) fish runs, while interior sites were occupied during the colder months (Snow 1980:249).

While superficially it would appear those sites that have produced Susquehanna Tradition materials and sites containing Narrow-Stemmed Tradition materials were similar in nature, they were not. McBride (1984) indicated that settlement patterns associated with the Narrow-Stemmed Tradition, were characterized by large base camps, task-specific sites and temporary camps that were relatively evenly distributed across the landscape; they were ascribed to the above-referenced Tinkham phase. As mentioned above, Tinkham phase occupations appeared in all microenvironments, including riverine, upland, inland wetlands and lakeshores. Susquehanna Tradition settlements, on the other hand, which McBride (1984:278) argues belong to the Salmon Cove phase, were not so evenly distributed. That is, whereas Tinkham phase base camps sometimes occurred in upland locales, Salmon Cove phase base camps appeared almost exclusively within riverine settings (McBride 1984:278). In addition, those Salmon Cove phase temporary camps and task-specific occupations located in the uplands were of short duration, long enough only to replenish supplies for the riverine base camps.

Unlike settlement patterns, however, Terminal Archaic Salmon Cove phase subsistence patterns were analogous to earlier patterns. The subsistence pattern still was diffuse in nature, and it was scheduled carefully. For example, food remains recovered from the Timothy Stevens Site included fragments of white-tailed deer, beaver, turtle, fish and various small mammals. Botanical remains recovered from the site area consisted of *Chenopodium* sp., hickory, butternut and walnut (Pagoulatos 1988:81). Such diversity in food remains suggests at least minimal use of a wide range of microenvironments for subsistence purposes.

Woodland Period (2,700 to 350 B.P.)

Traditionally, the advent of the Woodland Period in southern New England has been associated with the introduction of pottery; however, as mentioned above, early dates associated with ceramics now suggest the presence of Vinette I ceramics appeared toward the end of the preceding Terminal Archaic Period (Ritchie 1969a; McBride 1984). Like the Archaic Period, the Woodland Period has been commonly divided into three subperiods: Early, Middle, and Late Woodland. In contrast, Snow (1980) has segmented the Woodland Period into two subperiods. He combined the Early and Middle Woodland to form the Early Horticultural Period (2,700 to 1,000 B.P.), while he renamed the Late Woodland into the Late Prehistoric Period (1,000-350 B.P.).

While Snow's (1980) reconfiguration of the Woodland Period is not without merit, it has met with resistance among southern New England archeologists, who continue in large measure to use the traditional three subperiod nomenclature. An exception to this rule can be found in McBride's (1984) study of the lower Connecticut River Valley, where he subdivides the Woodland period into four phases: the Broeder Point Phase (ca., 2,700 to 2,000 B.P.), The Roaring Brook phase (ca., 2,000 to 1,250 B.P.), the Selden Creek phase (1,250 to 450 B.P.), and the Niantic phase (ca., 450 to 350 B.P.). The latter phase typically is referred to as the "Final Woodland" period. The various Woodland subperiods and phases are discussed in detail below.

<u>Early Woodland Period (ca., 2,700 to 2,000 B.P.)</u>

The Early Woodland period of the northeastern United States dates from ca., 2,700 to 2,000 B.P., and it has thought to have been characterized by the advent of horticulture, the initial use of ceramic vessels, and increasingly complex burial ceremonialism, with the use of mounds to bury the dead in the Midwest (Dragoo 1967; Griffin 1967; Ritchie 1969a and 1969b; Snow 1980). In the Northeast, the earliest

ceramics of the Early Woodland period are thick walled, cord marked on both the interior and exterior, and possess grit temper.

In southern New England and New York, two different regional complexes have been described for the Early Woodland Period. They are the Meadowood Complex in New York (Ritchie 1969a) and the Lagoon Complex on Martha's Vineyard (Ritchie 1969b). Both are characterized by the presence of Meadowood and Rossville projectile points, settlement patterns focused on riverine and coastal settings, and thick grit-tempered ceramic vessels.

In his study of the lower Connecticut River Valley, McBride (1984) identified a distinct phase for the Early Woodland Period. McBride (1984:294) named it the Broeder Point phase, and it encompasses the entirety of the Early Woodland Period (i.e., 2,700 to 2,000 B.P.). As described, the Broeder Point phase "is characterized by a quartz cobble lithic industry, narrow-stemmed points, an occasional Meadowood projectile point, thick, cord-marked ceramics, and perhaps human cremations" (McBride and Soulsby 1989:50).

Despite this description, data associated with Broeder Point phase are not recovered often; however, one the best known sites of this phase is the Waldo-Hennessey Site in Branford, Connecticut McBride (1984:125). Excavation of the site area revealed the presence of several small seasonal, and perhaps sequential, occupations situated adjacent to a tidal estuary. Careful investigation of the site area also resulted in the recovery of narrow stemmed projectile points in association with ceramic sherds and subsistence remains, including specimens of White-tailed deer, soft and hard shell clams, and oyster shells (McBride 1984:296-297). McBride (1984) argued that the combination of the subsistence remains and the recognition of multiple superimposed cultural features indicates that the site was reoccupied on a seasonal basis by a small co-residential group.

In terms of regional settlement patterns, Broeder Point phase sites, like those of the Late Archaic Tinkham phase, are located in a variety of different ecozones; however, the largest settlements associated with this phase were focused on floodplain, terrace, and lacustrine environments (McBride 1984:300). Thus, while there is similarity to settlements patterns of the Tinkham phase, it is a superficial one. The main difference between the phases is that the Broeder Point phase is characterized by "population aggregations along major rivers, interior lakes, and wetlands" (McBride and Soulsby 1989:50), whereas Tinkham phase occupations reflect seasonal groups movements by smaller numbers of people.

Despite this difference, McBride (1984:299) suggests that the Broeder Point phase was characterized by seasonal base camps only; that is, task-specific and temporary camps are largely lacking during this phase. This may reflect two difference situations. First, such site types were not employed for the collection of resources, which seems unlikely. Second, Broeder Point temporary and task-specific sites are largely unrecognizable because of both their size and the fact that they do not produce the whole suite of Broeder Point technology, namely narrow stemmed projectile points and ceramics. If lacking the latter, such sites are likely to be misinterpreted as Tinkham phase occupations, which were characterized by the presence of narrow stemmed projectile points and the absence of ceramic technology. As a result, it is very likely that southern New England archeologists are misidentifying many Broeder Point phase sites, ultimately leading to the interpretation that the area was occupied by a population smaller than that of previous prehistoric periods (Dincauze 1974).

In terms of Broader Point phase occupations that have been identified and investigated in detail, McBride and Soulsby (1989:50-51) discussed five sites that were identified during the Route 6/I-84 expansion project. They indicate that the identified sites were "distributed fairly evenly between upland streams and interior swamps, and generally found less than 20 meters from a water source" (McBride and Soulsby 1989:50). Radiocarbon samples obtained from Sites 22-2, 19-6, and 12-2 returned dates of 2,380±210

B.P., 2,650±90 B.P., and 2,060±90 B.P., respectively (McBride and Soulsby 50-51). The sites produced multiple cultural features, as well as significant amounts of quartz debitage, including resharpening flakes, which indicate that both tool manufacture and maintenance activities took place within the limits of each site area. McBride and Soulsby (1989:51) argue that the recovered lithic assemblage is reflective of "woodworking, animal butchering, skin working, and plant processing activities." In addition, the recovered faunal assemblage consisted of specimens of raccoon, snake, White-tailed deer, and hickory and walnut shell fragment. Their recovery, as well as the evidence for multiple cultural features and tool manufacturing and curation, suggest that the sites reflect multi-season use as base camps (McBride and Soulsby 1989:51).

In sum, archeological evidence collected by McBride (1984) during his dissertation research in the lower Connecticut River Valley, as well as that noted by McBride and Soulsby (1989) during their survey of the then-proposed Route 6/I-84 expansion corridor, indicates that Broeder Point phase populations consisted a mobile hunter/gatherers that moved seasonally throughout a diversity of environmental zones in search of available plant and animal resources. As such, Broeder Point phase populations employed a foraging type of resource exploitation strategy, reflecting somewhat of a return to a Late Archaic lifestyle.

Middle Woodland Period (2,000 to 1,200 B.P.)

The Middle Woodland Period of southern New England prehistory is marked by an increase in the number of ceramic types and forms utilized (Lizee 1994a), as well as an increase in the amount of exotic lithic raw material used in stone tool manufacture (McBride 1984). The latter indicates that regional exchange networks were operationalized once again, and that they were used extensively to supply local populations with necessary raw materials (McBride 1984; Snow 1980). Specifically, the recovery of certain types of chert and jasper indicate that Middle Woodland populations of the lower Connecticut River Valley had obtained raw material for stone tool manufacturing from the Hudson Valley (cherts) and eastern Pennsylvania (jasper) (George and Tryon 1996). Some authors have argued that the changes in ceramic technology and the increased reliance on regional exchange signified the beginning of a trend toward sedentism (McBride 1984; Snow 1980; Ritchie 1969a, 1969b); this argument is bolstered by the increased use of shellfish on the coast, as well as by the diversification of the diet to include additional types of wild plant foods and animal resources. These trends are discussed in more detail below.

In Connecticut, the Middle Woodland Period is represented archeologically by the Roaring Brook phase, which was defined by McBride (1984:134) during his investigations of settlement patterns in the lower Connecticut River Valley. In particular, McBride (1984:135) indicates that the Roaring Brook phase is marked by use of narrow stemmed and Jack's Reef projectile points; increased amounts of exotic raw materials in recovered lithic assemblages, including chert, argillite, jasper, and hornfels; and conoidal ceramic vessels decorated with dentate stamping. Ceramic types indicative of the Roaring Brook phase include Linear Dentate, Rocker Dentate, Windsor Cord Marked, Windsor Brushed, Windsor Plain, and Hollister Stamped (Lizee 1994a:200). In addition, Lizee (1994a:200) has noted that shifts in Roaring Brook phase "vessel morphology include two contemporary forms: conoidal and elongated conoidal." He further indicates that this change was gradual and that it happened throughout the Roaring Brook phase; in addition to morphological changes, the Roaring Brook phase witnessed the first use of shell tempering in ceramic vessels (Lizee 1994a:200).

What this shift in ceramic technology reflects is difficult to say at present because large-scale investigations of Roaring Brook phase components have been conducted only infrequently. However, in his 1987 article, Braun suggested that changes in ceramic technology, specifically morphological evolution from conoidal toward elongated and globular with constricted necks, may represent a subsistence shift to include the use of starchy plant foods such as maize and/or other domesticated plant foods, e.g., *Chenopodium* sp., which required suspension of pots over fires rather than placement within a heating source. In addition, the addition of shell temper to ceramics has been demonstrated to reduce the

amount of thermal shock to a pot that is put under slow boiling conditions such as would have been the case with the preparation of maize and other domesticated plant foods (Braun 1987).

In terms of settlement patterns, the Roaring Brook phase is characterized by the occupation of village sites by large co-residential groups. These sites were the principal place of occupation, and they were positioned in close proximity to major river valleys, tidal marshes, estuaries, and the nearby coastline, all of which would have supplied an abundance of plant and animal resources (McBride 1984:309). In addition to villages, numerous temporary and task-specific sites were utilized in the surrounding upland areas, as well as in closer ecozones such as wetlands, estuaries, and floodplains. The use of temporary and task-specific sites to support large village populations indicates that the Roaring Brook phase was characterized by a resource acquisition strategy that can best be termed as logistical collection (McBride 1984:310).

Late Woodland Period (ca., 1,200 to 350 B.P.)

The Late Woodland period in southern New England dates from ca., 1,200 to 350 B.P., and it is characterized by the Selden Creek and Niantic phases (McBride 1984). The Selden Creek Phase, which dates from ca., 1,200 to 450 B.P., is considered significant by Connecticut archeologists because it has produced the earliest evidence for the use of maize in the lower Connecticut River Valley (Bendremer 1993; Bendremer and Dewar 1993; Bendremer et al. 1991; George 1997; McBride 1984); an increase in the frequency of exchange of non-local lithics (Feder 1984; George and Tryon 1996; McBride 1984; Lavin 1984); increased variability in ceramic form, function, surface treatment, and decoration (Lavin 1980, 1986, 1987; Lizee 1994a, 1994b); and a continuation of a trend towards larger, more permanent settlements in riverine, estuarine, and coastal ecozones (Dincauze 1973, 1974; McBride 1984; Snow 1980).

Lithic assemblages associated with Selden Creek Phase occupations, especially village-sized sites, are functionally variable and they reflect plant and animal resource processing and consumption on a large scale. McBride (1984:322) argued that lithic assemblages recovered from Selden Creek Phase sites typically contain approximately 20 percent non-local lithics at the beginning of the phase, whereas they reach densities of 60 to 70 percent by the end of the phase. Finished stone tools recovered from Selden Creek Phase sites include Levanna and Madison projectile points; drills; side-, end-, and thumbnail scrapers; mortars and pestles; nutting stones; netsinkers; and celts, adzes, axes, and digging tools. These tools were used in activities ranging from hide preparation to plant processing to the manufacture of canoes, bowls, and utensils, as well as other settlement and subsistence-related items (McBride 1984; Snow 1980).

In addition, ceramic assemblages recovered from Selden Creek Phase sites are as variable as the lithic assemblages. Ceramic types identified in Selden Creek Phase settlements include Windsor Fabric Impressed, Windsor Brushed, Windsor Cord Marked, Windsor Plain, Clearview Stamped, Sebonac Stamped, Selden Island, Hollister Plain, Hollister Stamped, and Shantok Cove Incised (Lavin 1980; Lizee 1994a; Pope 1953; Rouse 1947; Salwen and Ottesen 1972; Smith 1947). These types are more diverse stylistically than their predecessors, with incision, shell stamping, punctation, single point, linear dentate, rocker dentate stamping, and stamp and drag impressions common (Lizee 1994a:216). Surface treatments of Selden Creek Phase ceramics include fabric impression, cord marking, smoothing, and brushing (Lavin 1980; Lizee 1994a; McBride 1984).

Further, ceramic vessel morphology underwent extensive changes during the Selden Creek Phase. For example, Selden Creek Phase vessels exhibit a more globular form, with rounded bottoms, constricted necks, and out-flaring rims becoming common. They also are thinner than their earlier counterparts, and they include collars and castellations, as well as some new forms of lip treatment. The use of shell

tempering also became common and geographically widespread during the Selden Creek Phase (Lavin 1980; Lizee 1994a; McBride 1984).

In addition, as a result of his investigation of the distribution, size, and inferred function of archaeological sites in the lower Connecticut River Valley, McBride (1984:323-329) characterized Selden Creek Phase settlement patterns as more nucleated than the preceding Roaring Brook phase, with fewer, larger sites situated in estuarine and riverine ecozones. Both river confluences and coastal zones were favored for the establishment of large village sites that contain numerous hearths, storage pits, refuse pits, ceramic production areas, house floors, and human and dog burials (Lavin 1988b; McBride 1984). McBride (1984:326) has argued that these sites certainly reflect multi-season use, and were perhaps occupied on a year-round basis (see also Bellantoni 1987).

In addition to large village sites, McBride (1984:326) identified numerous temporary and task-specific sites in the uplands of the lower Connecticut River Valley and along the coastline. These sites likely were employed for the collection of resources such as plant, animal, and lithic raw materials. These sites tend to be very small, lack internal organizational structure, and usually contain a limited artifact assemblage and few cultural features, suggesting that they were occupied from only a few hours to perhaps overnight. Temporary camps, on the other hand reflect a longer stay than task-specific camps, perhaps on the order of a few days to a week, and they contain a more diverse artifact assemblage indicative of more on-site activities, as well as more features (McBride 1984:328-329). In sum, settlement patterns of the Selden Creek Phase in the lower Connecticut River Valley and adjacent coastline area are characterized by "1) aggregation in coastal/riverine areas; 2) increasing sedentism, and; 3) use of upland areas by small task groups of individuals organized for specific tasks" (McBride 1984:326).

In addition to the Selden Creek Phase, the Late Woodland Period encompasses the Niantic phase of Connecticut prehistory. The Niantic phase, sometimes referred to the Final Woodland Period, spans from ca., 450 to 350 B.P. (McBride 1984:145). While encompassing a short period of time, this phase is characterized by the continued increase in the reliance on non-local lithic raw materials for stone tool manufacture, use of maize horticulture, and a decrease in the number of ceramic types utilized. Projectile points characteristic of the Niantic phase are the Levanna type (McBride 1984).

In his dissertation research of the Windsor Tradition ceramics, Lizee (1994a) indicated that stylistic diversity in Niantic phase ceramics decreased, while the numbers and types of tools used to produce and decorate vessels increased. Lizee (1994a:233) argues that decreases in stylistic variation may reflect the consolidation of ceramic production techniques and decorative styles, with such changes possibly related to the evolution of tribal groups within the area. Lizee (1994a) also suggests that increased variety in vessel sizes during the Niantic phase may be attributed to shifts in ceramic vessel function. Various vessel functions apparent at this time include cooking versus storage, among others.

It is important to note that numerous researchers have indicated that maize horticulture is a central feature of the subsistence pattern by Niantic phase times in Connecticut (Bendremer 1993; Bendremer and Dewar 1993; George 1997; Lizee 1994a; Lavin 1988; McBride 1984). This is consistent with Lizee's (1994a) arguments concerning ceramic treatments and the possible development of tribal entities at this time. Interestingly, however, Niantic phase settlement patterns are different from those of the preceding Selden Creek phase. While large village sites still are found in a multitude of eczones, including riverine, estuarine, tidal, lake, and coastal areas, smaller seasonal camps appear in the archeological record at this time. Such sites were absent during the previous Roaring Brook and Selden Creek phases, and their appearance represents a shift in land use patterns during the Niantic phase.

McBride (1984:337) argues that the small seasonal camps of the Niantic phase are located primarily in upland settings near streams and interior wetlands. This is in contrast to Selden Creek settlement patterns,

McBride (1984), McBride and Bellantoni (1983), and McBride and Dewar (1987) suggest that this shift represents the dispersal of village populations at certain times of the year into smaller seasonal camps that likely were occupied by single families. McBride (1984:340) argues that this represents a return to a more mobile settlement pattern for the collection of resources; however, this shift occurs at a time when European contact with Native Americans first occurs and the trade in furs was initiated. Thus, the placement of seasonal camps in upland stream and interior wetland locations may be related to individual families moving to areas favorable to hunting beaver and other fur-bearing animals.

In sum, the prehistory of Connecticut spans from ca., 12,000 to 350 B.P., and it is characterized by numerous changes in tool types, subsistence pattern, and land use strategies. For the majority of the prehistoric era, local Native American groups practiced a subsistence pattern based on a mixed economy of hunting and gathering wild plant and animal resources. It is not until the Selden Creek phase that incontrovertible evidence for the use of maize horticulture as an important subsistence pursuit is available. Further, settlement patterns throughout the prehistoric era shifted from seasonal occupations of small co-residential groups to large aggregations of people in riverine, estuarine, and coastal ecozones. In terms of the region containing the proposed project items, a variety of prehistoric site types may be expected. These range from seasonal camps utilized by Archaic populations to temporary and task-specific sites of the Woodland era.

CHAPTER IV
HISTORIC SETTING

Introduction
As discussed above, the Area of Potential Effect is located at the intersection of Oil Mill Road and Waterford Parkway North in the town of Waterford, Connecticut. The town of Waterford separated from New London in 1801, and historical record indicates that the proposed project parcel was used for farming at least since the early nineteenth century through the middle of the twentieth century. The remainder of this chapter chronicles the history of the region, as well as documents details specific to the Area of Potential Effect.

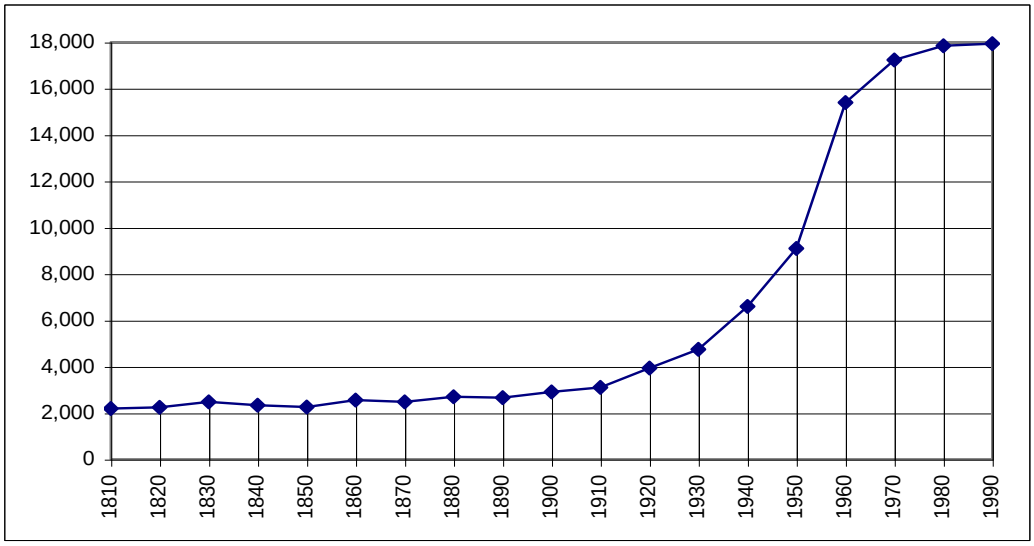
Native American History
The Town of Waterford lies within the region taken from the Pequots during the war prosecuted against them in 1637 by the Massachusetts Bay Colony, the Connecticut Colony, and the Narragansett and Mohegan Indians. Initially, the question of which colony would have jurisdiction over the region was resolved in 1658 by dividing it between Massachusetts Bay and Connecticut at the Mystic River, with Connecticut keeping the west side and Massachusetts Bay retaining the east side. Thus, the latter maintained control over the Waterford area during the first half of the seventeenth century. The Connecticut Colony ordered New London, from which Waterford later separated, to be surveyed in 1641 and division of the area into parcels and colonization of it began shortly thereafter (Crofut 1937). Following the Pequot War, the Connecticut Colony executed the Treaty of Hartford in 1638. One of its terms was that members of the formerly strong Pequot Tribe were not to be allowed to coalesce and once again form themselves into a tribe or other such political entity. To insure this, the Colony exiled members of the tribe to various places, including the stewardship of the Mohegans and Narragansetts, as well as to Bermuda where they were to become slaves. However, prior to the war, various parts of the coastline were occupied by the Pequots (and other smaller groups [e.g. Niantics] during the year, when they established temporary fishing villages, hunting camps, and larger village occupations (De Forest 1852). As discussed below, there is no evidence indicating that the proposed project parcel was used on a long-term basis either by prehistoric or historic Native American groups.

Seventeenth and Eighteenth Centuries
New London was founded in 1648, and the first settlement in what would later become the town of Waterford was probably made there in the 1660s, on the shore near the southeastern corner of the present town (Crofut 1937). The proposed project parcel is located in the northwestern part of Waterford, near the head of the Niantic River and the historic bridge and village there. Unusually, Waterford does not appear to have had a separate Congregational church society separate from New London's. Instead, a Baptist congregation was formed there in the 1670s, and by the 1830s there were three Baptist churches in the town (Barber 1837). The city of New London was incorporated in 1784, and Waterford's creation as a new town may have reflected the divergence of interests between the city and country populations. Although New London was much involved in wars, from the Pequot War to the Revolutionary War to the War of 1812, most of this activity took place on the east side of the town, where the city and the harbor on the Thames River were located (Crofut 1937). New London (then including Waterford) was the terminus of the Mohegan Road, which was laid out through the Indian tribe's lands in 1670. Also in the seventeenth century, the Boston Post Road was established, and it passed across the head of the Niantic River. In the 1790s, when the state began its efforts to improve transportation routes, the Mohegan Road was transformed into a toll road (Wood 1919).

Nineteenth and Twentieth Centuries

As noted above, the town of Waterford separated from New London in 1801. In 1800, the General Assembly incorporated the Hartford and New London Turnpike Company, which built a road diagonally from Waterford's northwestern corner to the city of New London. In 1807, the New London and Lyme Turnpike was incorporated to improve the section of the Old Post Road between those two places, with subsequent improvements to bridges along the routes. This turnpike, located a short distance to the south of the proposed project parcel, remained in business for some time (Wood 1919). In 1850, a railroad link between New Haven and New London was opened; it crossed the Niantic River at its mouth. By 1858 the "Shore Line" railroad as it became known, still partly in operation under a different name, finished a direct rail route between New York and Boston (Turner and Jacobus 1989). The place-names Oil Mill Brook and Oil Mill Road refer to the nearby presence, as shown in an 1813 map of the state, of water-powered mills for the preparation of oils from different types of seeds (Warren and Gillett 1813). The 1854 map of the county still shows an oil mill located to the southwest of the proposed project parcel (Figure 4; Walling 1854). The remains of this mill, including a damn, sluiceway, and partial foundation, can be seen today and they are located to the northwest of where Oil Mill Road and Interstate 95 intersect.

The rural nature of nineteenth-century Waterford is illustrated by its population figures. Between 1810 (its first census year as an independent town) and 1910, the population of Waterford slowly increased from just over 2,000 to just over 3,000 residents. After 1910, the population began to rise substantially: to the level of just under 4,000 residents in 1920, to 9,100 in 1950, and to nearly 18,000 citizens in 1990 (MAGIC 1996; see the chart below). These population changes are consistent with development trends in the state. During the late nineteenth and early twentieth centuries, the rise of leisure activities led to the development of seaside resorts – hotels, boarding houses, and cottage developments, together with a related rise in the number of year-round residents in shoreline towns. At the same time, declines in fish populations reduced the shoreline's fishing industry, and when faced with competition from western grain and cattle production, regional farmers turned to dairying, fruits, and vegetables or went out of business. As the twentieth century progressed, the trend toward suburban living brought many more permanent residents to Waterford, further boosting the local population (Herzan 1997). This is not to say that Waterford had no industrial activity. In 1932, for example, it still had quarrying and "monument work," paper manufacturing, a woolen mill, and bleaching and dyeing, as well as agriculture (Connecticut 1932). The difference is that these businesses were not located in urban areas.



Today, Waterford remains a town with considerable development near the shore and New London, but still with large areas of undeveloped land in the interior, even near the major transportation routes. Based on readily available documentary sources, the proposed project parcel itself does not appear to have been used for any purposes other than agricultural. Currently, the Area of Potential Effect consists of an undeveloped parcel of land that has been allowed to revert to secondary forest and scrub underbrush.

History of the Proposed Project Parcel

The proposed project parcel consists of approximately five acres of land located on the eastern side of Oil Mill Road and to the north side of Waterford Parkway North. This parcel of land was purchased from KS&M Realty, LLC in 2007 (Waterford Land Records, Vol. 997 Pg. 5). The Area of Potential effect was once part of a 55.28 acre parcel of land that KS&M Realty, LLC purchased from the conservator's estate of Irene Kross in 2005 (Waterford Land Records, Vol. 799, Pg. 228). Figure 5 depicts this parcel's boundaries overlaid on a 2004 aerial photograph of the project region. It is clear in this image that the propose project parcel (the southwestern section of the larger parcel) consists of a largely forested area, which is bounded to the north by a tree farm, to the east by more forest, to the south by the parkway and a commercial development south of that, and to the west by Oil Mill Road (Figure 5). In this figure, a high-tension powerline corridor can be seen crossing the northwestern corner of the proposed project parcel.

According to town records, Irene Kross acquired this property from Annie G. Kravchuk (alternately spelled Kravchuk) in 1991 as part of a 107-acre parcel that had had sections condemned for highway purposes by the State of Connecticut (Waterford Land Records, Vol. 385, Pg. 839). Annie G. Kravchuk had purchased this same property, together with a separate 40 acre piece, from Peabody Austin in 1923 (Waterford Land Records, Vol. 38, Pg. 459). Originally, the parcel extended to the south of the Waterford Parkway and Interstate 95; however, it was bisected two by the road construction, as the 1934 aerial photograph shows; this aerial image is annotated with plans for a limited-access highway and the names of adjoining property owners (Figure 6). The condemnation maps filed in the Waterford land records in the 1940s refer to the proposed road as the "New London By-Pass," and the State took 13.86 acres at that time for highway construction (Waterford Land Records, Maps 7/64, 70-71, 74, 8/33, 9/65). The recorded maps also include one from 1944, which shows the current powerline easement across Kravchuk's property (Waterford Land Records, Map 9/4). The highway maps show that the Kravchuk house (and associated well) were located south of the proposed highway – well away from the proposed project parcel, which was in a portion marked as being a mix of pasture and light woods.

Despite the powerful need for an improved traffic route along the shore, however, plans for Interstate 95 were not finalized until 1954, and the highway did not open until 1958, which by that time incorporated a number of earlier improvements to Route 1 (Oglesby 2007). An additional taking of 10 acres of Kravchuk's land occurred in 1961 for improvements to Interstate 95 (Waterford Land Records, Maps #70-73). A 1951 aerial photograph of the project region indicates that the Kravchuks' farm was still an active enterprise at that time, despite the ongoing construction of part of the limited-access highway; most of the area was still cleared fields (Figure 7). The 1953 photograph showed the same situation, except that the highway seemed complete by then (Figure 8). In the subsequent 1970 aerial photograph, the eastern end of the northern part of the Kravchuk farm was mostly re-forested; however, the rest of the property – both north and south of the widened and up-dated Interstate 95 – was still largely cleared fields (Figure 9). It seems that it was after that time, as the Kravchuks aged, that the full reforestation visible in the 2004 aerial photograph took place (Figure 5).

According to the 1930 U.S. Census, Annie G. Kravchuk was a 31-year-old Polish immigrant, whose native language was Ukranian. She had arrived in the United States in 1913, and was still an alien at the time of the 1930 census. She lived with her daughter Irene (age 10), who had been born in Connecticut, and her husband Abraham Kravchuk. According to the census return, Abraham was from Russia (possibly from Kiev, though the form is difficult to read), and his native language was also Ukranian. Abraham Kravchuk

had arrived in the United States in 1910, and he worked as a dairy farmer on his own farm (U.S. Census, 1930, Series: T626 Roll: 283 Page: 198-199). The Kravchuk farm can be seen in the 1934 aerial photograph. It is located between the proposed highway and the road, and it consists of a small house and several barns (Figure 6). The description of their 107-acre purchase in 1923 was repeated without major alteration between 1847 and 1991 (Waterford Land Records, Vol. 385, Pg. 839). It stated as follows:

> START at the SW corner of the premises on the road from Straits Bridge (so-called) by Stanton's Oil Mill; thence
> Northerly by said road to Archibald Davis; thence
> Easterly by said Davis to James Manwaring; thence
> Easterly and Northerly by James Manwaring to Ludowick Beebe; thence
> By said Beebe to John Brown; thence
> Southerly by John Brown and William Gorton to the Old Lyme Road; thence
> Westerly by said road to the starting point.

Peabody Austin, from whom the Kravchuks acquired the 107-acre property in 1923, had purchased it in 1921 from the Town of Waterford, under the description just given and also with the additional 40 acre piece (Waterford Land Records, Vol. 36, Pg. 521). The Town, in turn, had bought the property from Ezra M. Keeney in 1847 for $3,000, at which time the property contained two dwelling houses and other buildings, and was described as above (Waterford Land Records, Vol. 9, Pg. 131). Keeney had purchased it from William P. and Mary L. Benjamin in 1843. At that time, it was described as 107 acres and buildings, and described simply as being abutted

N	Horace Beckwith, James Manwaring, Lodowick Beebe
N & E	William P. & Mary L. Benjamin, William Gaston [or Gorton]
S	Road
W	Road from Stanton's Oil Mill to Lodowick Beebe's

(Waterford Land Records, Vol. 9, Pg. 54). Based on the later description of the northern part of the Kravchuk property and the fact that the western and southern boundaries were roads, a sketch map of this property was prepared (see Figure 10).

This intersection of historic roads is clearly visible in the 1854 and 1868 historic maps (see Figures 4 and 11). Although the accuracy of the 1868 town map is not as high was could be desired, it is very likely that the 107 acres that once belonged to Ezra Keeney, the Town of Waterford, and the Kravchuks extended far enough eastward to encompass all of the structures marked "B.G. Stanton," "B.W. & B.G. Stanton," and "Alms House". However, it likely did not reach far enough to the north to include "J. Beebe" (Figure 11; Beers 1868**)**. The 1854 map is not very different from the 1868 map, only substituting "D. Stanton" on the two Stanton structures and "J.P. Beebe" for "J. Beebe" (Figure 4; Walling 1854).

Because it is known from the land records that the Town of Waterford owned this property from 1847 to 1921, it is almost certain that this property was part of the town's "poor farm," an institution which placed indigent persons in a publicly-owned house and required the able-bodied to work on the associated farm. The almshouse, however, was located near the southeast corner of this parcel, while the proposed project parcel is located at its most westward northern corner. A 1904 report of the State Board of Charities (1905:275) reported the following about Waterford's almshouse:

> Alsmhouse is owned by the town and is situated five and one-half miles northwest from the city of New London, near the head of the Niantic River. About one hundred and fifteen acres of land are attached. Keepers, Mr. and Mrs. Ferdinand Hancock. Terms, $360 a year. Number of inmates at date of visit, 5; 3 men, 2 women, of whom one of the men is insane and one is feeble-minded. Two of the men and two of the women assist about the place and in the housework. The house is very old, but the roofs have recently been reshingled. The inmates occupy small rooms in an ell of the house, one story and a half high, and not supplied with any cellar. The upper rooms are very hot in summer and cold in winter. The inmates appeared well cared for and contented, but a new almshouse is greatly needed.

The 1907 edition of the report of the Board of Charities (1907:181) noted that the Waterford almshouse inmates were housed at the New London house, suggesting that Waterford's had been abandoned at that time. In the 1912 edition, it was reported that "[t]he place owned by the town and formerly used as an almshouse is now rented and persons wholly dependent are boarded in the New London almshouse …" (Board of Charities 1914:154). Back in 1850, however, just after the land was purchased, the almshouse had 12 residents, as the U.S. Census return for that year indicates. The facility was run by Isaac and Nancy Birch, aged 53 and 54, respectively. Isaac's occupation was listed as "Farmer," and he also owned $500 in real estate. The almshouse inmates were:

Name	Age	Race	Name	Age	Race
John Chapel	79	W	Sarah Beebe	70	W
David Bolles	70	W	Lydia Powers	75	W
Morris Dunbar	70	W	Mary Rogers	54	W
Chauncy Dayton	25	W	Rachel Beckwith	45	W
Lydia Bickery	70	W	Jane Beebe	2	B
Abagail Tinker	71	W	George Whipple	43	M

(U.S. Census, 1850, Series: M432 Roll: 49 Page: 204). Given the average age of this population, it is possible that much of the almshouse property was rented out to neighboring farmers, or that the Birches' compensation arrangement included use of the farm.

William P. Benjamin of New London, who with his wife sold the parcel containing the Area of Potential Effect to Ezra M. Keeney in 1843, had purchased it as part of the "Moore Farm" containing 287 acres from Elisha Turner for $2,800.00, also in 1843. This deed provided little description except that the land had come to Elisha Turner and Mary L. Turner from the estate of Guy Turner, deceased (Waterford Land Records, Vol. 8, Pg. 268). According to Guy Turner's 1833 probate records, his personal property was valued at over $5,000.00 and he owned three farms as well as six stores, houses, and lots, located in Waterford, Montville, and New London. The inventory includes the information that the Moore Farm was occupied by W.A. Davis, who owned half the value of the livestock, crops and farm tools on the property – oxen, cows, sheep, swine, fowls, turkeys, ducks, oats, potatoes, and hay, as well as a cart, plow, and a few other things (total value $609.56). The Moore Farm was valued at $4,200.00, out of a total of over $21,000.00 in real estate. According the distribution, Elisha Turner was Guy's youngest son, received "one half of the Farm Situate in Waterford called the Moore Farm with one half of the buildings at Two Thousand One Hundred Dollars," plus half of a farm in Montville and a substantial amount of cash. The other half of the Moore Farm went to Mary Louisa Turner, whose relationship to Guy was not specified, but from context she must have been his younger daughter (New London District Probate Records No. 5401). It is not known when Mary Louisa transferred her interest in the farm to Elisha, but he sold it as the sole owner in 1843. An 1833 map of the county shows few details of this area, except for two district schools to the west and the southeast of the project area, and a gristmill and woolen mill to the southwest (Figure 12; Lester 1833).

Guy Turner had purchased the 287 acre farm, as co-purchaser with Isaac Turner, from William Moore ,IV of New York City (formerly of Waterford) for $3,500.00 in 1826; it was subject to mortgages to Asa Spalding, [illegible] Burback, and Jacob B. Gurthy (Waterford Land Records, Vol. 5, Pg. 70=74). Parts of the metes and bounds description in this deed can be mapped, while others can only be estimated, with the following results (see Figure 13).

It appears from the land records that William Moore, IV assembled this large piece of land in several purchases; although it is possible that he also inherited some of it, the exact names of his parents are now known and thus the probate records have not been examined. At present, the four purchases that are believed to incorporate all or most of the 287 acre farm are as follows:

First, an 1806 purchase from Joseph Smith of 121.5 acres of land with a grist mill and other buildings on it. The description, though detailed, has only some metes and bounds sections:

> START: at the SW corner of said farm = SW [sic] corner of a lot purchased of William Keeney for overflowing with a Mill Pond; thence Easterly on highway to SW corner of Benjamin Gorton; thence Northerly, 120 rods on said Gorton to a Birch Tree near a Rock, which Rock has a Seam in it; thence W 28° N [N 62° W], 100 rods as the fence now runs to a chestnut tree marked standing on the Side Hill; thence W 28° N [N 62° W], 5 rods; thence Southerly, 30 rods to a Rock in the SE corner of a House Lot now improved by Eliphalet Beebe; thence West, 20 rods; thence Northerly to an old White Oak marked; thence W 28° N [N 62° W], to the great Brook; thence … by William Keeney's land with the brook to land Keeney bought of Caleb & Ebenezer Moore; thence East to the pent High Way to the SE [or south end] of said land bought of said Keeney; thence West across said brook to the NW corner of land said Keeney sold said Caleb and Ebenezer Moore; thence Southerly to START

(Waterford Land Records, Vol. 3, Pg. 363=333=182). This does not agree completely with the description given in 1826, except in the presence of the Gorton and Beebe family names, but it is the largest and earliest known purchase by William Moore, IV. This parcel was traced back through four additional transactions over two years, with no change in the description except that the size estimate was only 100 acres when it was sold by Ebenezer Moore of Hartford to George Williams Esq. in 1804 (Waterford Land Records, Vol. 1, Pg. 285=144).

Second, a parcel containing 6 acres and 14 square rods that Moore purchased in 1809 of William Richards, for the price of $600.00. This deed described the property with a simple list of abutters:

N	said Moore [the grantee], Paul Rogers
E	Paul Rogers, Samuel Morgan, Benjamin Gorton
S	Benjamin Gorton
W	William Moore 2nd

(Waterford Land Records, Vol. 3, Pg. 211=181=106). In the next preceding deed, dated 1809, William Richards bought from Samuel Prentice a half-interest in the same parcel, and described the bounds in more detail:

> START at a heap of stones on a ledge; thence Westerly, 47 rods by Benjamin Gorton; thence Northerly about 176 rods by William Moor; thence Easterly, 49 rods by Paul Rogers; thence Southerly by Samuel Morgan; thence 148 rods to START (Waterford Land Records, Vol. 2, Pg. 6=3).

Comparing this description to that of 1826 suggests it could be a southeastern piece that at that time abutted south on William Gorton. The two half-interests trace back to an 1806 sale by William Stebbens to James Turner and Joel Lummis [or Loomis], when they paid $825.00 for the 61 acres and 14 square rods. That description provides slightly more detail:

> START at a heap of stones on a ledge; thence Westerly, 47 rods by Benjamin Gorton to a heap of stones on a small ledge; thence N 15° 30' E, 176 rods by William Moors to a heap of stones; thence Easterly by said Moor to a large White Oak; thence Southeast, 49 rods 15 links by Paul Rogers to a chestnut tree; thence Southerly and southwesterly, 148 rods by Paul Rogers, Samuel Morgan and Benjamin Gorton to START

(Waterford Land Records, Vol. 2, Pg. 183=92). Again, this description does not match the 1826 description very well; but, the third piece confirms that it was part of the 287 acre farm.

Third, a 100 acre parcel that William Moore, IV bought from James Moore in 1813, for $1,500.00. The deed described it as follows:

> START at SW corner by Benjamin Gorton's land; thence Easterly, 50 rods by said Gorton to the grantee's land bought of William Richards; thence Northerly, 200 rods by said grantee's land to William Moore 2nd's "Small Gains"; Westerly by said Moore's said land, Lemuel Caulkins, and Solomon Dart to the Great Brook; thence By

> said Brook and Bear's Garden to the road; thence South by said road, Lemuel Caulkins and Ephelet [sic] Beebe to grantee; thence By said grantee to START

(Waterford Land Records, Vol. 4, Pg. 23). This description matches the 1826 description very well, and also mentions the second purchase, from William Richards, placing both of these with some accuracy in the landscape. Further deed research suggests that James Moore acquired some or all of this property from William Moore 2nd, but the descriptions are inconclusive.

Fourth, a 2.75 acre piece purchased from Eliphalet Beebe in 1814 for $40. The description is as follows:

> START at a heap of stones = NE corner of said Moore's farm purchased of *Joseph Smith*; thence N 63° 30' W, 29 rods 21 links on Moore to a heap of stones; thence N 29° E, 18.5 rods by grantor's land to a rock with stones on it; thence Easterly as the old fence runs by said Moore to START

(Waterford Land Records, Vol. 4, Pg. 44). The deed, with its references to Moore's land both north and south of the small parcel, and the 18.5-rod course that is very close to the eastern most course on Lodowick Beebe in the 1826 description, is our best evidence that the first parcel, bought from Joseph Smith, is part of this title chain.

In summary, the longest period of ownership of the proposed project parcel was by the Town of Waterford (1847 to 1921, or 74 years), followed by the Eastern European immigrant Kravchuk family (1923 to 1991, or 68 years). Two members of the native Connecticut Turner family owned the property from 1826 to 1843, or 17 years. William Moore, IV owned it from 1806 to 1826, assuming the Joseph Smith purchase was, as it appears to be, the southernmost section; however, the Moore family's involvement may have been longer than that, as the involvement of an Ebenezer Moore in the title chain of the Smith purchase suggests. The ownership by the town is unusual, but the other owners were not. Many immigrants acquired Connecticut farms during the early twentieth century, and some were able to continue with them for many years. During the early nineteenth century, on the other hand, non-immigrant owners would have been very much the norm.

Summary

The history of the proposed project parcel as part of an active farm runs from the twentieth century back to the early nineteenth century. The most historically significant aspect of the proposed project parcel is that it was part of Waterford's "town farm," a home for indigent town residents, for three-quarters of a century. There is no documentary evidence, however, that the Area of Potential itself has ever been the location of a cemetery, house, barn, or other structure. The development of nearby roads and power transmission lines does not appear to have had any direct impact on the majority of the project parcel.

CHAPTER V
PREVIOUS INVESTIGATIONS

Introduction

This chapter presents an overview of previous archeological research completed within the vicinity of the proposed project parcel in Waterford, Connecticut. This discussion provides the comparative data necessary for assessing the results of the current Phase IB cultural resources survey. In addition, it ensures that the potential impacts to previously recorded cultural resources located within the general vicinity of the proposed project parcel are taken into consideration. Specifically, this section reviews all previously completed cultural resources surveys conducted within the vicinity of current project parcel, as well as those archeological sites situated within 0.8 km (0.5 mi) of the proposed project parcel (Figures 15 through 17).

The discussions presented below are based on information currently on file at the Connecticut State Historic Preservation Office. In addition, the electronic site files maintained by Heritage Consultants, LLC also were examined during the course of this investigation. Both the quantity and quality of the information contained in the examined cultural resources survey reports and site forms are reflected in this document.

Previously Completed Archaeological Investigations in the Project Region

In June of 2006, Archaeological and Historical Services, Inc., submitted a report to the Connecticut Department of Transportation and the Connecticut State Historic Preservation Office documenting the results of a large scale study of the proposed extension of Route 11 from Salem to a proposed intersection with Interstates 95 and 395 in East Lyme and Waterford. This investigation consisted of a Phase IA assessment survey of the proposed corridor alternatives, as well as subsequent Phase I and Phase II investigations. The Phase IA investigation included identification of above ground historic cultural resources along the two proposed highway alternatives. That effort resulted in the identification of 47 historic properties. Of these, 22 were assessed as significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). In addition, four historic properties were determined to be contributing elements of a historic district located at the intersection of Oil Mill and Gurley Roads in Waterford (Jones et al 2006).

Subsequent to the above-referenced Phase IA study, Archaeological and Historical Services, Inc., completed a Phase I cultural resources reconnaissance survey for the proposed project. Fieldwork for this undertaking consisted of pedestrian survey and shovel testing. This effort resulted in the identification of 86 prehistoric and historic-period archaeological sites. Archaeological and Historical Services, Inc., subsequently completed Phase II National Register testing an evaluation of nearly half of the 86 sites in an effort to "determine the physical extent of the sites and to determine the sites' National Register eligibility" (Jones et al. 2006: abstract). As Jones et al. (2006:abstract) indicated, "Because a preferred alternative had been identified by this time, Phase II investigations were undertaken only for sites within the E(4)m-V3 alignment," the preferred highway alternative. The Phase II testing effort included the evaluation of 39 archaeological sites. The results of fieldwork and data analysis resulted in the assessment that 16 of the identified sites were significant as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). Jones et al. (2006) recommended that these sites be avoided during highway construction. If they could not be avoided, Phase II data recovery was recommended.

Finally, Archaeological and Historical Services, Inc., (2006:abstract) indicated in their report that the proposed highway alternative was located in close proximity to the Wolfpit Hill area, which contained a number of late eighteenth and early nineteenth century "building foundations, animal pens, charcoal mounds, and remnants of mills…" Archaeological and Historical Services, Inc., (2006:abstract) recommended that, since these archaeological features "are virtually untouched by modern development," the area should be designated as a historic district and avoided during highway construction or subjected to Phase III data recovery if they could not be preserved in place.

Previously Recorded Archaeological Sites within the Project Region

A review of records maintained by the Connecticut State Historic Preservation Office revealed that there are seven previously recorded archaeological sites situated within the immediate vicinity of the proposed project parcel in Waterford, Connecticut (Figure 14). They include Sites 45-25, 45-39, 45-40, 45-48, 152-37, 152-67, and 152-75. These sites are discussed below in order.

Site 45-25

Site 45-25, also referred to as Transect 182, was recorded by the Public Archaeological Survey Team, Inc., during January of 2004. James Poetzinger, a representative of PAST, characterized the area as a prehistoric Native American campsite, possibly dating from the Late Archaic through Woodland periods. Site 45-25 encompassed three loci, all of which produced cultural materials. These loci were situated at an estimated elevation of 155 ft above sea level. Fieldwork conducted between 1998 and 2002 yielded an assemblage of artifacts including examples of prehistoric pottery, projectile points, flakes, and botanical remains. These artifacts are currently in the possession of Archaeological and Historical Services, Inc., in Storrs, Connecticut. Finally, Site 45-25 was determined to retain "good" site integrity, and it was deemed eligible for the National Register of Historic Places (36 CFR 60.4 [a-d]).

Site 45-39

Site 45-39 was tested by Archaeological and Historical Services, Inc., during 2002, and it was subsequently recorded by Mary Harper on February 19, 2004. According to the submitted site form, the testing revealed evidence of eighteenth through nineteenth century agrarian activity. Although the site boundaries are listed as unknown, Site 45-39 was situated at an elevation of 150 ft above sea level. Historic artifacts recovered during fieldwork included ceramics (i.e., creamware, redware, stoneware, and yelloware), glass shards, kaolin, nails, metal, leather, and faunal remains. These artifacts most likely constitute a domestic assemblage of household waste. In addition, the recovery of four quartz flakes provided evidence of unknown past Native American activity within the area. A total of 961 artifacts were recovered from the specified area. Due to its "good" integrity, Site 45-39 was deemed eligible for the National Register of Historic Places (36 CFR 60.4 [a-d]) by representatives of Archaeological and Historical Services, Inc.

Site 45-40

Site 45-40, a prehistoric occupation site dating from the Late Archaic period, was recorded by James Poetzinger of Archaeological and Historical Services, Inc., in December of 2003. Although the function of the site is listed as unknown, fieldwork conducted throughout the site area resulted in the collection of various prehistoric artifacts. Cultural materials collected from Phase I and Phase II testing of Site 45-40 consisted of one quartz projectile point, one quartz flake, and a single nail. Site 45-40 covered an approximate area of 25 square meters, and was located at an elevation of 140 ft. Sloping topography within the site ranged from 0-5 percent. Finally, due to the lack of significant qualitative and/or quantitative data, Site 45-40 was determined to not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

Site 45-48

Ross Harper of Archaeological and Historical Services, Inc., completed the recordation of Site 45-48 after fieldwork was conducted during December of 2002. Testing of the site area revealed evidence of historic activity spanning from the eighteenth through nineteenth century. Site 45-48 was classified as an agrarian/rural site based on the recovered cultural assemblage. Recovered artifacts were characterized primarily as domestic items, consisting of ceramic sherds (i.e. various types of earthenwares and stonewares), faunal remains (e.g., bone and shell), building materials (e.g., window glass and nails), and recreational objects, specifically, kaolin pipe fragments. Located at an elevation of roughly 80 ft above sea level, the site constitutes a contributing factor to the Wolf Hill Pit Archaeological District, which is recognized under the National Register of Historic Places. However, boundaries have never been determined. For Site 45-48 Representative of Archaeological and Historical Services, Inc., assessed Site 45-48 as significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

Site 152-37

Also referred to as the Stanton Oil Mill, Site 152-37 was recorded by representatives of Public Archaeology Survey Team, Inc., during March of 1998. Prior to recordation, a walkover of the site area was conducted during February of the same year. During fieldwork, the area apparently exhibited evidence of past industrial utilization, encompassing remnants of a former mill situated off of Oil Mill Road. Standing features within the area consisted of portions of a dam, sluiceway, a mill foundation, and a cellar hole. All of these items were estimated to date from an eighteenth or nineteenth century period of activity. Specifically, the mill was allegedly in use by 1782, and operation continued at least into the early nineteenth century. The site area contained slopes spanning from 0 to 5 percent, was located at an elevation of 30 ft above sea level, and it covered an area of roughly 150 meters in length. Finally, Site 152-37 has not been assessed applying the National Register of Historic Places criteria (36 CFR 60.4 [a-d]).

Site 152-67

Mary Harper of Public Archaeology Survey Team, Inc., completed the recordation of the Flat Rock Quarry, or Site 152-67, during June of 1998. Despite a walkover survey of the area, no cultural materials have been surface collected from the site. However, past industrial activities conducted on site, namely stone quarrying operations, have resulted in the classification of the site as historic. Activity is believed to date from the first half of the twentieth century, but an exact timeframe is unknown. According to the submitted site form, stones from the quarry were utilized during the construction process of numerous local structures, including the Customs House in New London, as well as several buildings incorporated within Connecticut College. Little additional information is available on the site, other than its lack of integrity; the submitted site form indicates that it was heavily impacted during construction of the Crystal Mall. Site 152-67 had not been assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

Site 152-75

Finally, Site 152-75 was also called the Waller-Moore House during recordation. Mary Harper of Public Archaeology Survey Team, Inc., recorded the site following a walkover survey of the area during 1998. Although the site's boundaries and orientation have not been specified, a timeframe of the site's occupation has been established. The Waller-Moore House was apparently constructed by Samuel Waller during 1691 and later deeded to Joshua Moore. Allegedly, the property has been continuously occupied since the original construction of the homestead. Little additional information is available concerning this site, and the property has not been assessed applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

CHAPTER VI
FIELD METHODS

Introduction
The current Phase IB cultural resources reconnaissance survey was designed to identify prehistoric and historic cultural resources located within the Area of Potential Effect. Fieldwork for the project was comprehensive in nature. The methods used to complete this investigation were designed to provide complete and thorough coverage of all portions of the proposed project parcel. This undertaking entailed pedestrian survey, systematic subsurface testing, mapping of the proposed project parcel, and photo-documentation of the Area of Potential Effect (see below).

Following the completion of all background research, the Area of Potential Effect was subjected to a Phase IB cultural resources reconnaissance survey utilizing pedestrian survey, photo-documentation, mapping, and systematic shovel testing. The field strategy was designed such that the entire project parcel was examined visually and photographed. During the current fieldwork effort, the Area of Potential Effect was examined using transect survey shovel tests situated at 15 m (49.2 ft) intervals along parallel eight survey transects spaced the same distance apart (Figure 3). A total 62 of 83 (75 percent) planned shovel tests were excavated successfully throughout the Area of Potential Effect. Each shovel test measured 50 x 50 cm (19.7 x 19.7 in) in size and each was excavated to a depth of 50 cmbs (19.7 inbs) or until sterile subsoil or glacial till was encountered. Each shovel test was excavated in 10 cm (3.9 in) arbitrary levels within natural strata, and the fill from each level was screened separately. All shovel test fill was screened through 0.635 cm (0.25 in) hardware cloth; extremely wet soils were hand-sifted, troweled, and examined visually for cultural material. Soil characteristics were recorded in the field using Munsell Soil Color Charts and standard soils nomenclature. Each shovel test was backfilled immediately upon completion of the archeological recordation process. Finally, the Area of Potential Effect was photographed using digital media and all man-made features and shovel test locations were mapped.

Laboratory Analysis
Laboratory analysis of all recovered cultural material followed established archeological protocols. All field specimen bag proveniences first were crosschecked against the field notes and the specimen inventories for accuracy and completeness. Following this quality-control process, all recovered material was washed by hand, air-dried, and sorted into basic material categories.

The nature and structure of the laboratory analysis was determined by the goals of the project. In general, the artifact analysis consisted of making and recording a series of observations for each specimen. The observations were chosen to provide the most significant and temporally/functionally diagnostic information about each specimen. A total of two relational databases were employed to store, organize, and manipulate the data generated by the analytical process.

<u>Historic Cultural Material Analysis</u>
The analysis of the historic cultural material recovered during the Phase IB cultural resources reconnaissance survey was organized by class, functional group, type, and subtype. The first level, class, represented the material category, e.g., ceramic, glass, metal. The second level, functional group, e.g., architecture, kitchen, or personal, was based on classifications established by South (1977). The third and

fourth levels, type and subtype, described the temporally and/or functionally diagnostic artifact attributes. The identification of artifacts was aided by consulting standard reference works.

Prehistoric Lithic Analysis

The lithic analysis protocol used in during the laboratory analysis portion of this project was a "technological" or "functional" one designed to identify prehistoric reduction trajectories, lithic industries, and tool functions. The protocol therefore focused on recording technological characteristics of the recovered lithic artifacts. The lithic artifact database was organized by lithic material group, type, and subtype. The first level described the raw material type of the collected artifact. Lithic materials were identified utilizing geological descriptions and terminology recognized throughout the region. Lithic raw materials were divided into distinct categories based on the following factors: mineral composition, color, texture, and translucence. The second level of lithic analysis, type, was used to define the general class (e.g., unmodified flake, projectile point, perform) of lithic artifact, while the last level, subtype, was employed to specify morphological attributes (e.g., primary cortex, extensively reduced, or corner-notched). These levels followed classifications outlined by such authors as Callahan (1979) and Crabtree (1972), among others.

Curation

Following the completion and acceptance of the final report, all cultural material, drawings, maps, photographs, and field notes will be curated with:

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CHAPTER VII

RESULTS OF THE PHASE IB CULTURAL RESOURCES RECONNAISSANCE SURVEY

Introduction

This chapter presents the results of a Phase IB cultural resources reconnaissance survey of a proposed project parcel located in Waterford, Connecticut (Figures 1 through 3). As described in Chapter I of this document, the Area of Potential Effect associated with this undertaking measured approximately 2.0 ha (5.0 ac) in size and it is situated at the intersection of Oil Mill Road and Waterford Parkway North. At the time of survey, the proposed project parcel was characterized by a mixture of open grassy areas and mixed deciduous forest. It was also noted the Area of Potential Effect was bisected from north to south by a small stream. Finally, the proposed project parcel was characterized by numerous previously disturbed areas, including an area in the southwest corner of the project parcel that has been significantly impacted by previous gravelling operations and construction of the intersection of Oil Mill Road and Waterford Parkway North (Figures 15 through 21).

Personnel representing Heritage Consultants, LLC, completed this Phase IB cultural resources reconnaissance survey on behalf of Vanasse Hangen Brustlin, Inc. All fieldwork was performed in accordance with the National Historic Preservation Act of 1966, as amended; the National Environmental Policy Act of 1969, as amended, and; the *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987) promulgated by the Connecticut State Historic Preservation Office. The Phase IB cultural resources reconnaissance survey results are presented below.

Results of the Phase IB Cultural Resources Reconnaissance Survey of the Area of Potential Effect

As discussed elsewhere in this document, the Area of Potential Effect is located in the northwestern portion of the Town of Waterford, Connecticut and encompasses approximately 2.0 ha (5 ac) of land (Figures 1 through 3). Specifically, the project parcel is bounded to the south by Waterford Parkway North, to the east by mixed forested areas, to the north by a tree farm, to the west by Oil Mill Road, to the north by a stonewall and an extant powerline corridor, and to the east by a stonewall and mixed deciduous forest. The proposed project parcel is situated at an approximate elevation of 18 m (60 ft) NVGD.

During completion of the Phase IB cultural resources reconnaissance survey, 62 of 83 (75 percent) planned shovel tests were excavated successfully throughout the Area of Potential Effect (Figure 3). The 21 planned but unexcavated shovel tests fell within areas that were characterized by standing water, boulders or large stone, or previous disturbances. Shovel tests were positioned at 15 m (50 ft) intervals along eight survey transects (TR1-8) that were situated parallel to one another and spaced 15 m (50 ft) apart. A typical shovel test exhibited two strata in profile and it extended to an average depth of 50 cmbs (19.7 inbs). Stratum I, the topsoil, ranged in depth from the surface to between 20 and 40 cmbs (7.8 and 15.7 inbs); it was classified as a layer of dark brown (10YR 3/3) sandy loam. Stratum I was underlain by Stratum II, a deposit of dark yellowish brown (10YR 4/6) sandy subsoil. Stratum II ranged in depth from between 30 and 50 cmbs (11.8 and 19.7 inbs). In several instances, mottled soil stratigraphy was encountered indicating the presence prior disturbances throughout various portions of the project area. These disturbances included tree throws, mechanical earth movement, and the excavation of percolation tests. Finally, pedestrian survey of the southwestern corner of the Area of Potential Effect revealed the

effects of previous gravel operations and the construction of the intersection of Oil Mill Road and Waterford Parkway North, which consisted of substantial erosion and the removal of the topsoil in this area.

Despite the recognition of these prior disturbances, the Area of Potential Effect was subjected to close interval shovel testing. This fieldwork resulted in the identification of two non-site cultural resources loci (Locus 1 and Locus 2) (see Figure 3). As discussed in more detail below, Locus 1 consisted of a single historic ceramic sherd; it was identified within the topsoil in the central portion of the Area of Potential Effect. This disturbed, non-site cultural resources locus failed to produce substantial numbers of artifacts, evidence of cultural features, and/or research potential. Thus, it was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of Locus 1 is recommended.

In addition, completion of the above described Phase IB cultural resources reconnaissance survey also resulted in the identification of a second non-site cultural resources locus (Locus 2). This non-site cultural resources locus is located within the southwestern portion of the proposed project area. It was identified on top of a knoll that has been impacted by the above-referenced gravelling operation. Disturbed soil stratigraphy within Locus 2 confirmed that the area immediately surrounding the locus had been subjected to substantial impacts in the past. Cultural material collected from the upper soil horizon of Locus 2 consisted of a single chert flake and a single quartz flake. This non-site cultural resources locus lacks temporally diagnostic cultural material and research potential; thus, Locus 2 also was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of this non-site cultural resources locus is recommended.

Locus 1

Locus 1, which was characterized by mixed deciduous vegetation, was confined to a single positive shovel test pit positioned along survey Transect 3. This non-site cultural resources locus was identified within the central portion of the Area of Potential Effect (Figures 3 and 20). This findspot positioned at an approximate elevation of 18 m (60 ft) above sea level. Excavation of Locus 1 resulted in the collection of a single historic artifact. Specifically, this artifact was classified as a sherd of pearlware. Furthermore, this piece was decorated with an unidentified blue pattern, was most likely hand painted; it constituted a post-1780 date of manufacture. This isolated find was recovered from soil Stratum I, which spanned from 10 to 20 cmbs (3.9 to 7.8 inbs). Stratum I consisted of a deposit of dark brown (10YR 3/3) loamy sand. Based on the recovered data, it was determined that Locus 1 did not possess research potential and/or the qualities of significance as defined by the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). Thus, no additional testing of this non-site cultural resources locus is recommended.

Locus 2

Locus 2, which consisted of two of prehistoric artifacts, was identified within the southwest portion of the proposed project parcel (Figure 3). Locus 2 was confined to a single shovel test (ST12 along Transect 5) located to the northeast of the intersection of Oil Mill Road and Waterford Parkway North. Locus 2 was identified at an approximate elevation of 21 m (70 ft) NGVD and it was bounded to the north and east by mixed wooded areas, to the south by Waterford Parkway North, and to the west by Oil Mill Road (Figures 3 and 21). Cultural material recovered from Locus 2 included a single chert thinning flake and 1 quartz thinning flake. Both artifacts were collected from Stratum I (e.g., topsoil) at a depth ranging from 10 to 20 cmbs (3.9 and 7.8 inbs). Shovel tests excavated in the vicinity of Locus 2 exhibited two strata in profile, and terminated at a depth of 40 cmbs (15.8 inbs). Stratum I reached from 0 to 20 cmbs (0 to 7.8 inbs) and it was identified as a layer of mottled dark brown (10YR) loamy sand with gravel. Stratum I was underlain by Stratum II, a deposit of dark yellowish brown (10YR 4/6) loamy sand mixed with soil from Stratum I and gravel; this soil layer spanned from 20 to 40 cmbs (7.8 to 15.8 inbs). Careful examination of the soil stratigraphy within the Locus 2 area indicated clearly that the area has been heavily impacted

by past disturbances. The lack of significant cultural remains and the presence of highly disturbed soil stratigraphy indicated that Locus 2 no longer contains intact soil deposits and/or research potential; thus, this non-site cultural resources locus was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of Locus 2 is recommended.

Finally, as part of the current investigation, representatives of Heritage Consultants, LLC investigated a claim by a local resident that a small knoll located in the southwestern portion of the Area of Potential Effect was the location a small cemetery associated with a former almshouse that was operated to the south of the Area of Potential Effect and on the southern side of Interstate 95. To determine the validity of the claim, historical research into cemeteries in this part of Waterford was completed and the knoll thought to contain the cemetery was subjected to pedestrian survey, examined for evidence of headstones or depressions associated with burials, and selectively cleared of forest litter to examine the ground surface. The following is a list of the historical sources examined during this portion of the current investigation. This list contains those items investigated that were in addition to standard reference works and popular histories of the project region.

- Department of Environmental Protection, Connecticut State Archives, Record Group 079, Connecticut State Library, History & Genealogy Section, Hartford, Connecticut, Records spanning from 1909 to 1998.

- General Assembly, Connecticut State Archives, Record Group 002, Connecticut State Library, History & Genealogy Section, Hartford, Connecticut, Records spanning from 1708 to 2000.

- Hartford Courant Slip Index, Connecticut State Archives. Connecticut State Library, History & Genealogy Section, Hartford, Connecticut.

- Connecticut Department of Transportation, Maps and Plans Division Archives, Sales Office at Pascone Place, Newington, Connecticut.

- Connecticut Department of Transportation, Survey Division Archives, Codes 1A65, 3A53, 152-12 and 152-15, Office of Surveys, Connecticut Department of Transportation, Newington, Connecticut.

- Transportation Department, Connecticut State Archives, Record Group 089, Connecticut State Library, History & Genealogy Section, Hartford, Connecticut, Records spanning from 1895 to 1994.

- Connecticut State Archives, Record Group 072, Vital Records, 1792-1934 (including *Charles R. Hale Collection* and *Barbour Collection*), Connecticut State Library, History & Genealogy Section, Hartford, Connecticut.

- Waterford Land Records, 1801- Present, Office of the Town Clerk, Town Hall, Waterford, Connecticut.

- Caulkins, Frances Manwaring, *History of New London County, Connecticut, from the First Survey of the Coast in 1612, to 1852*. New London: published by the author, 1852.

Despite a search of the above referenced historical records and additional fieldwork, no evidence of a cemetery, either historic or physical, was documented. Further, as discussed above, subsurface testing was undertaken in this part of the Area of Potential Effect as part of the survey of the larger project parcel. This testing effort revealed that the knoll in the southwestern corner of the proposed project parcel appears to have undergone substantial impacts related to graveling and construction of the intersection of Oil Mill Road and Waterford Parkway North. Thus, it appears that either the local informant incorrectly remembered the location of the former cemetery or that it has already been removed by graveling operations and/or construction of the nearby road intersection. Nevertheless, an Unanticipated Discoveries Plan has been drafted in the unlikely event that materials related to a human burial(s), that either were not recorded historically or could not be identified in the field (e.g., buried under layers of fill), are uncovered during construction (see Appendix I).

CHAPTER VIII

SUMMARY AND MANAGEMENT RECOMMENDATIONS

The Phase IB cultural resources reconnaissance survey of the proposed project parcel in Waterford, Connecticut resulted in the identification of two non-site cultural resources loci (Locus 1 and Locus 2). Pedestrian survey and subsurface testing of the Locus 1 area resulted in the collection of a single historic ceramic sherd from topsoil deposits. Subsurface testing of Locus 1 failed to reveal evidence of cultural features, and qualitative/quantitative cultural materials. Thus, it was determined that Locus 1 retained little, if any, research potential. This non-site cultural resources locus was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]).

Finally, completion of the above-described testing regime also resulted in the identification of Locus 2 within the southwestern portion of the proposed project parcel. Examination of Locus 2 resulted in the collection two artifacts dating from an unknown prehistoric period. A single chert flake and a single quartz flake comprised the artifact assemblage recovered from Locus 2. In addition, careful examination of the soil stratigraphy throughout Locus 2 reflected a high degree of past disturbance to the landscape due to gravelling. Due to the paucity of cultural material, the presence of disturbed soil deposits, and the general lack of research potential, Locus 2 also was assessed as not significant applying the National Register of Historic Places criteria for evaluation (36 CFR 60.4 [a-d]). No additional testing of this archeological locus was recommended. In sum, construction of the proposed facility will not impact any significant cultural resources.

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APPENDIX I

UNEXPECTED DISCOVERIES AND EMERGENCY PROCEDURES

On occasion, archeological or historical sites occasionally are discovered during construction projects regardless of whether the proposed project parcel has been subjected to a Phase IB cultural resources reconnaissance survey. As a result, Northeast Utilities (hereafter NU), has planned for unexpected discoveries during the construction process on the proposed project parcel in Waterford, Connecticut. When the initial steps in the Section 106 process (identification and evaluation of historic properties) indicate that historic properties may be discovered during an undertaking, a plan generally is developed for the treatment of such properties, and this plan is included in any documentation submitted to the State Historic Preservation Officer ("SHPO") as part of the effort to assess the effects of the undertaking (36 CFR 800.11 [a]). This document represents such a plan.

If an unidentified cultural resource is discovered during construction, several steps will be taken. Initially, NU will make reasonable efforts to avoid or minimize potential damage to the previously unidentified cultural resource (36 CFR 800.11 [b][3]). However, if a cultural resource is discovered, the SHPO will be contacted and advised as to the situation; the Federal Energy Regulatory Commission (FERC) and the Connecticut Office of State Archaeology (OSA) also will be informed. As much information as possible concerning the cultural resource, such as resource type, location, and size, as well as any information on its National Register eligibility, will be provided to the SHPO and to the staff of the OSA. Then, if required, a mitigation plan will be prepared in consultation with FERC, SHPO, and OSA for the cultural resource encountered. This plan will be sent to the SHPO and to the OSA staff for review and comment. The parties involved will be expected to respond with preliminary comments in a timely manner, and final comments will be expected relatively soon after the special request is made. It will be the policy of NU to avoid further potential destruction to the resource until a formal data recovery mitigation plan can be executed.

If the unanticipated discovery is determined to be ineligible for inclusion in the National Register of Historic Places ("NRHP"), NU will proceed with the project following written concurrence from the SHPO and approval from the FERC. If the cultural resource is deemed to be potentially eligible for inclusion in the NRHP, additional archaeological fieldwork or avoidance will be performed as required/approved by the SHPO and OSA. Further investigation of the identified cultural resource will be suspended until all criteria of Section 106 of the National Historic Preservation Act and other related Federal and state regulations have been successfully completed.

Disposition of Human Remains

The inadvertent discovery and/or disturbance of human remains is a sensitive issue that must be addressed if the situation arises. It is possible that human remains could be identified if an unmarked grave or a cemetery is impacted by the planned construction. If human remains are discovered inadvertently or cannot be avoided, NU will immediately halt work in the area and notify OSA and SHPO, as specified in Connecticut General Statutes, Section 10-388, which mandates that immediate notification be provided to

the Office of the State Archaeologist regarding the accidental discovery or disturbance of human osteological remains. If the unexpected discovery consists of Native American human remains or associated funerary remains, NU will consult with OSA and SHPO staff immediately regarding the appropriate measures to handle such a discovery. If it can be determined adequately that the disturbed burials have an affinity to any federally-recognized Native American group or any other ethnic group, a reasonable effort will be made to identify, locate, and notify leaders or representatives of these groups. If an association with a specific Native American group or other ethnic group cannot be made, NU will make a reasonable effort to locate and notify group(s) that may have a legitimate interest in the disposition of the remains based on a determination of generalized cultural affinity by a recognized professional. Qualified groups will be provided an opportunity to consult in determining the appropriate treatment of the interment. It will be the responsibility of the claimant, however, to document and validate their claim. NU also will coordinate with OSA and SHPO as to the ultimate disposition of the unanticipated discovery.

NU or its agents will treat all discovered human remains with dignity and respect until they are re-interred. If human remains are exposed inadvertently during construction, NU will proceed as in the case of a normal emergency discovery situation. OSA and SHPO will be contacted immediately and qualified professional archeologist will investigate the reported discovery within two days. Written authorization of excavation or re-interment of any historic graves also will be obtained.

Under no circumstances will NU remove human remains from proposed project parcel without completing all coordination processes with local officials, OSA, SHPO, Native American representatives as appropriate.

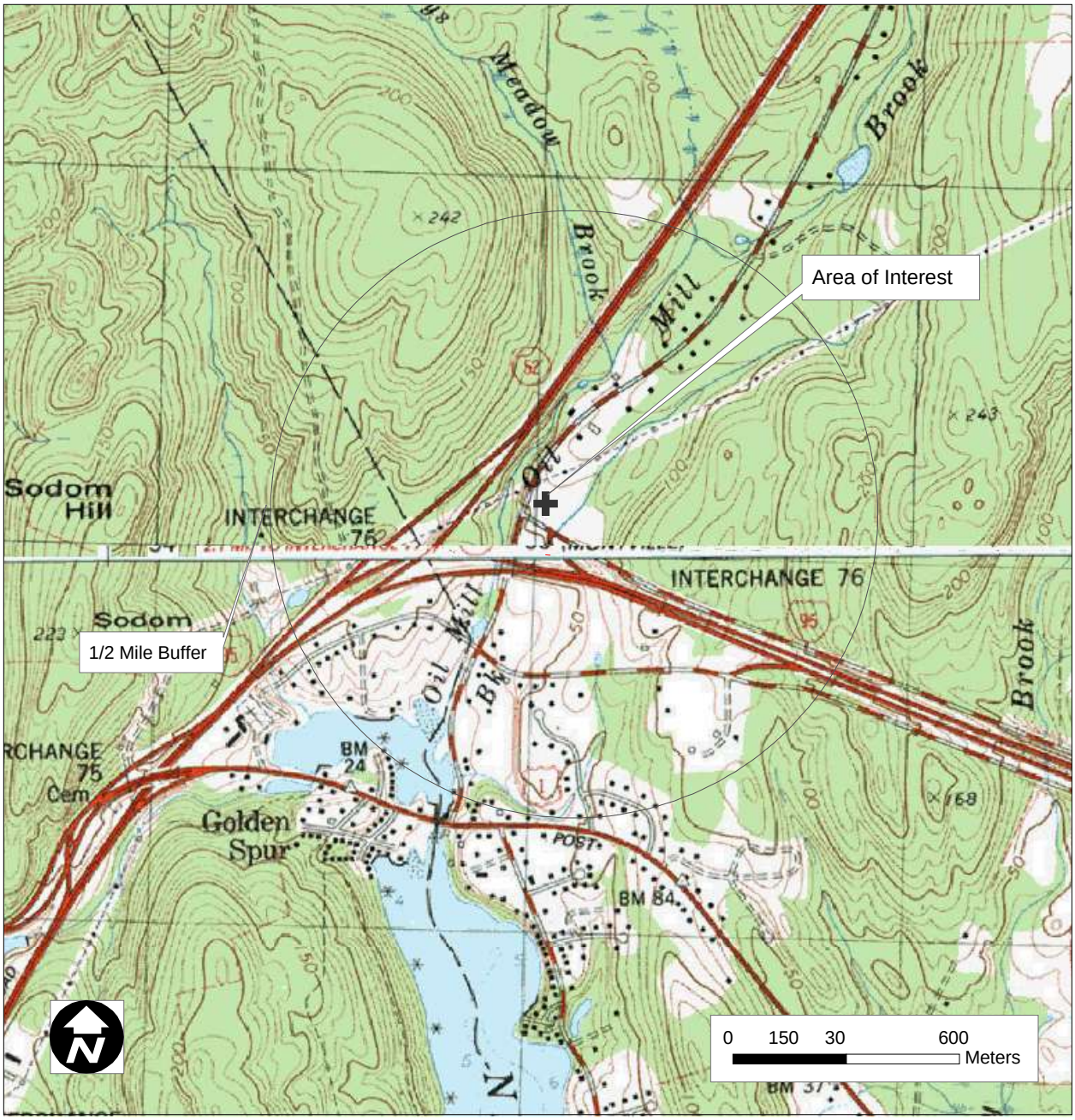


Figure 1. Excerpt from a recent USGS 7.5' series topographic map depicting the approximate location of a proposed development in Waterford, Connecticut.

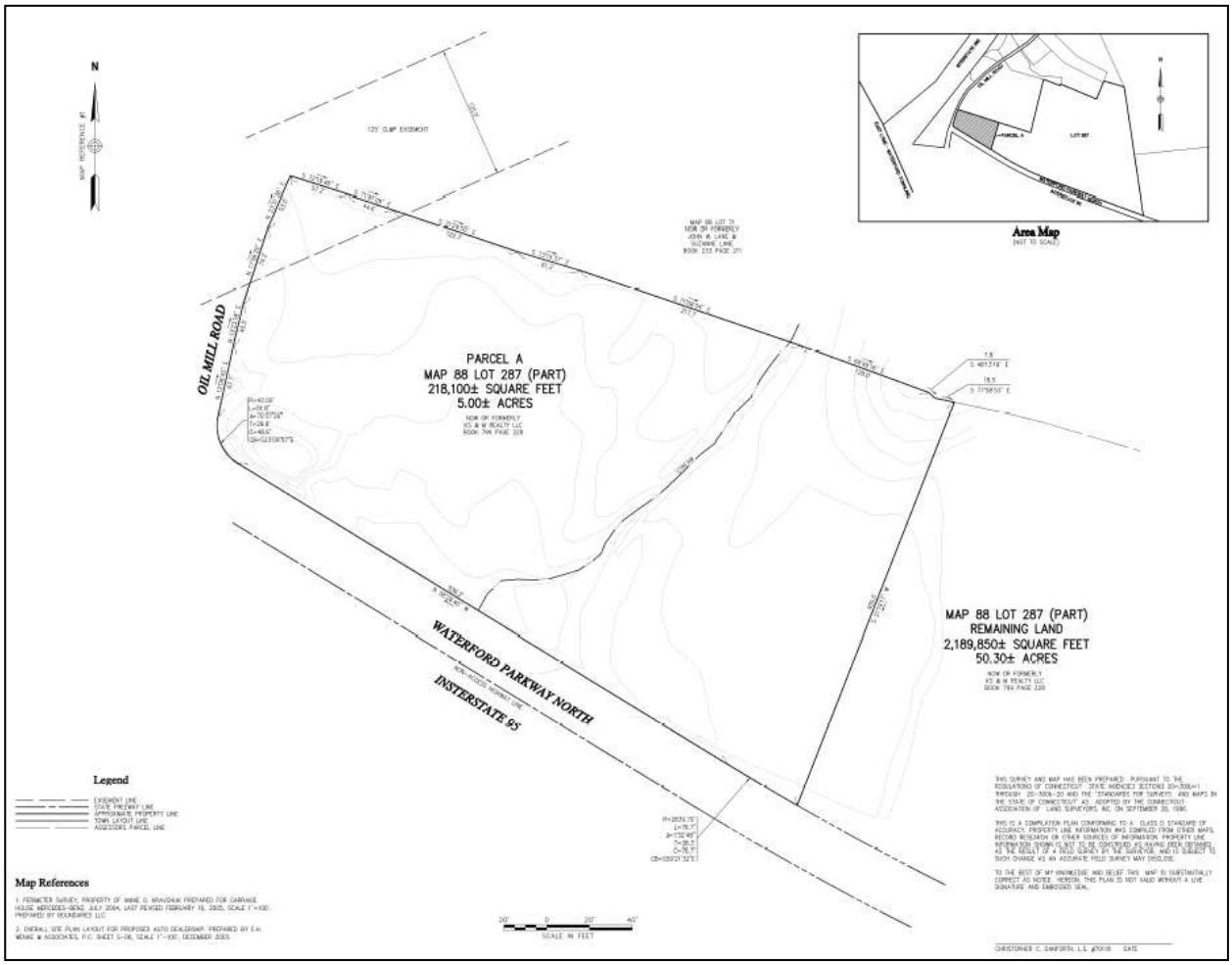


Figure 2. Project parcel map depicting the approximate location of a proposed development of Parcel A in Waterford, Connecticut.

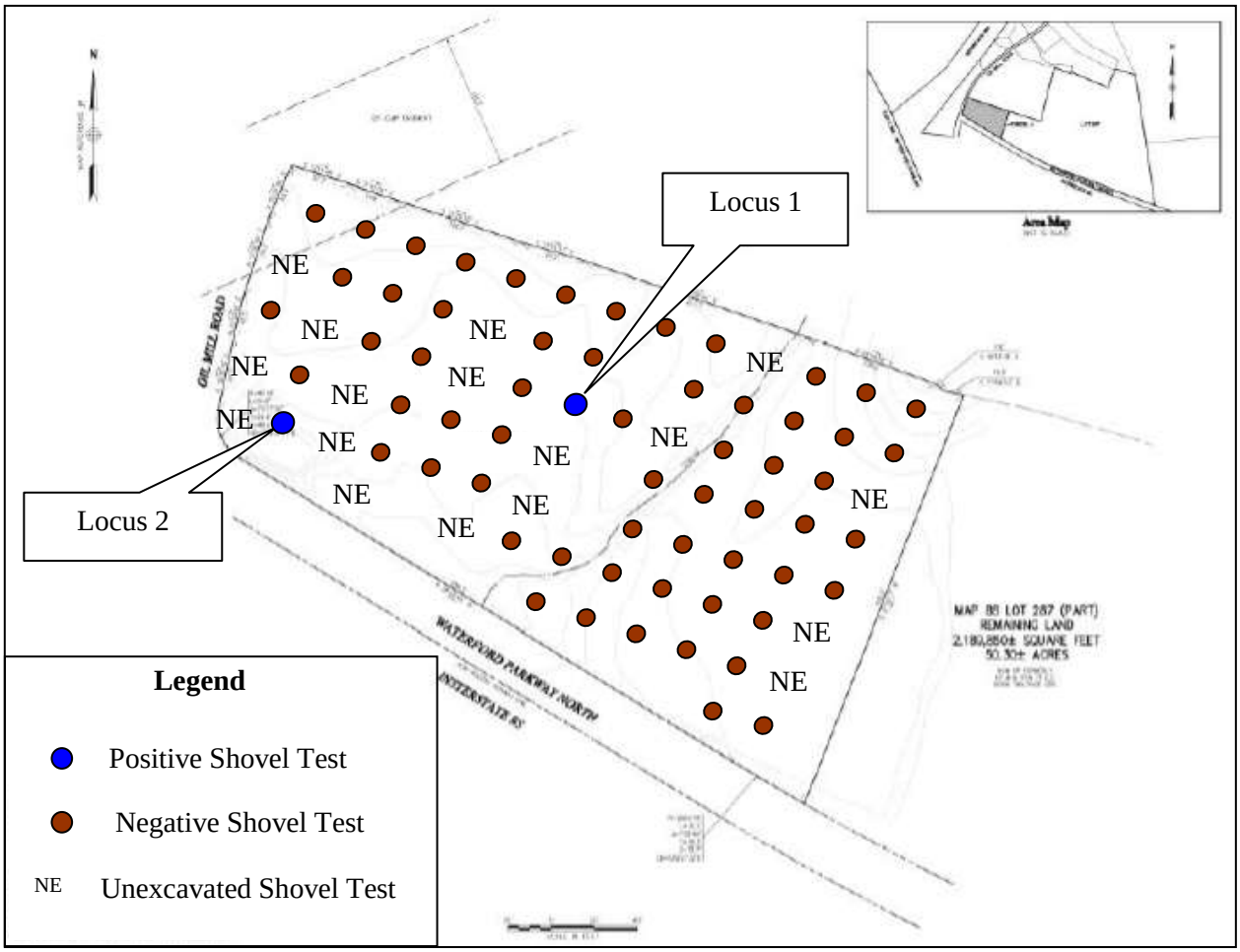


Figure 3. Plan view of the Area of Potential Effect depicting the locations of shovel tests, natural landscape features, and identified non-site cultural resources loci.

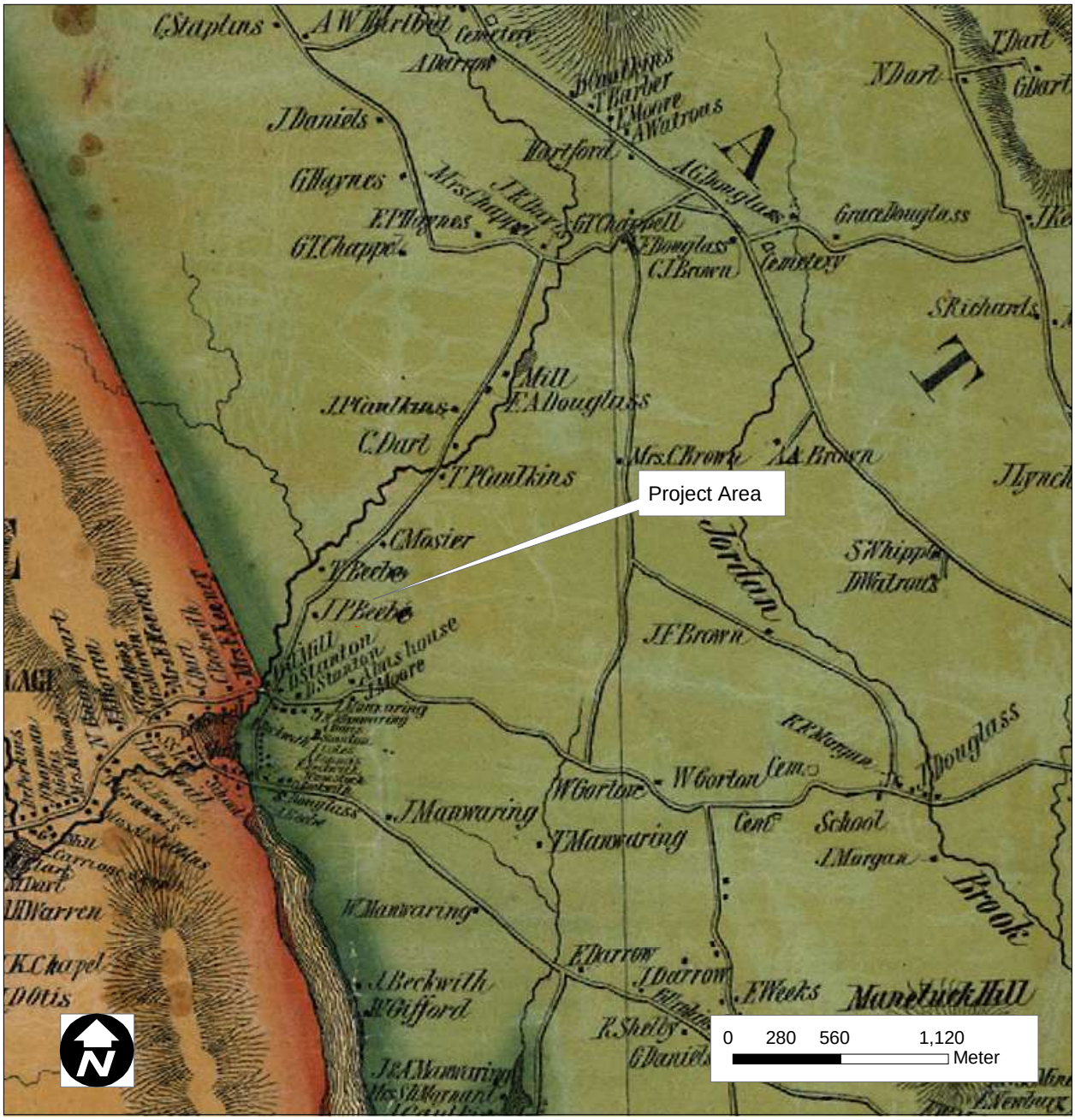


Figure 4. Excerpt from an historic 1854 map depicting the approximate location of a proposed development in Waterford, Connecticut.

Figure 5. Excerpt from a 2004 aerial photograph depicting the location of the larger parcel purchased from the estate of Irene Kross. Note the proposed project parcel consists of the westernmost acreage depicted in red.

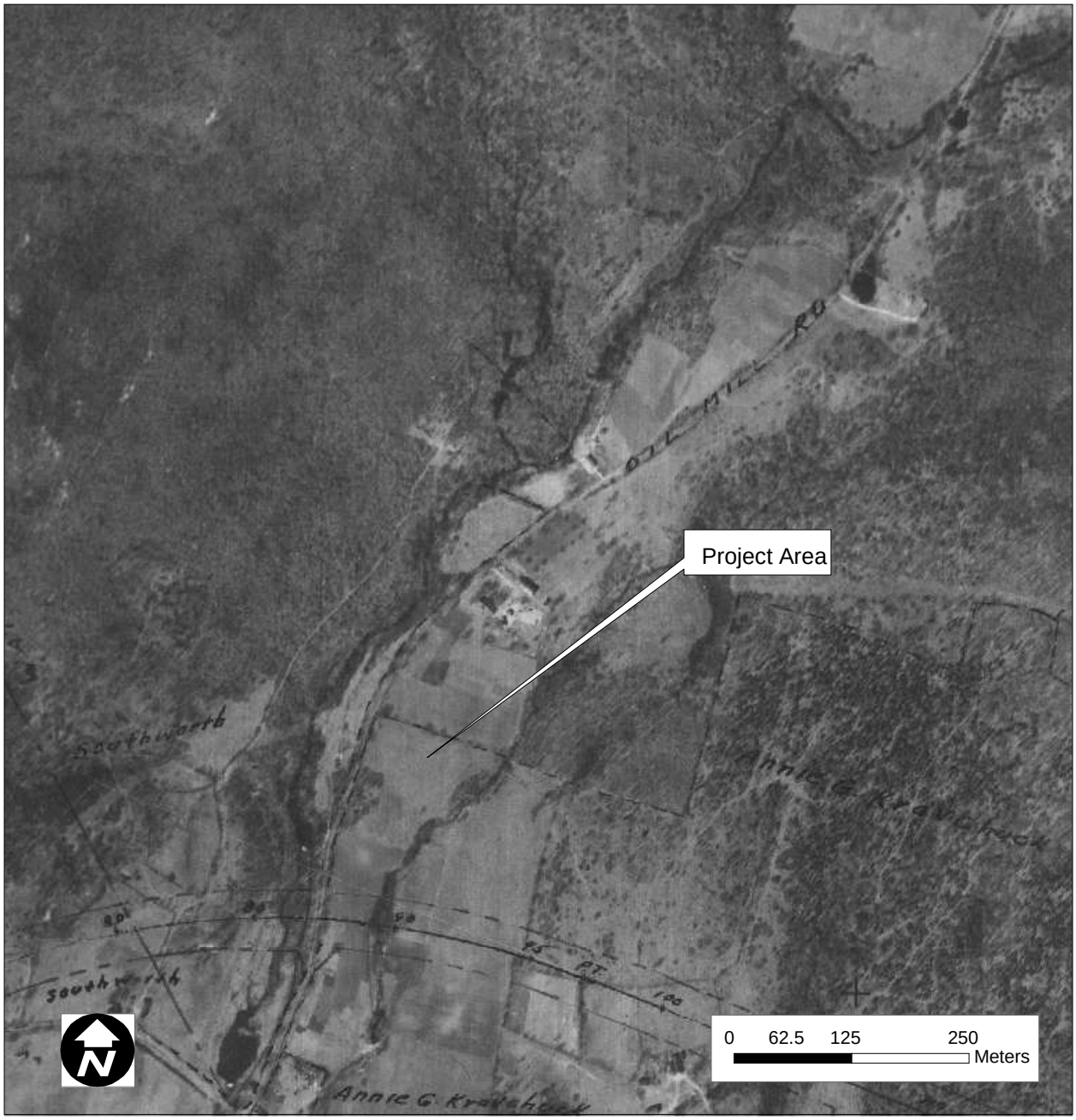


Figure 6. Excerpt from a 1934 aerial photograph depicting the approximate location of a proposed development in Waterford, Connecticut.

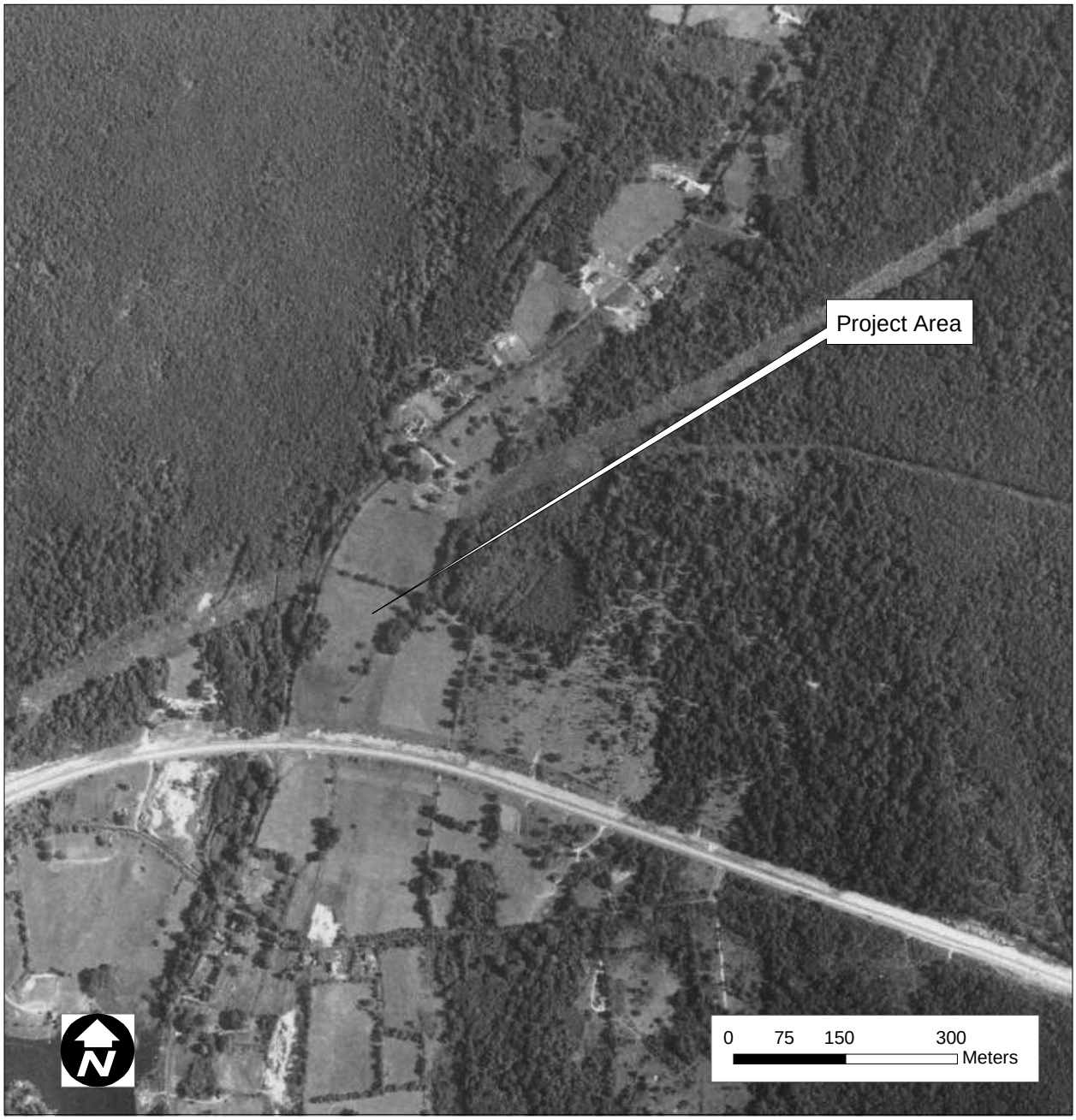


Figure 7. Excerpt from a 1951 aerial photograph depicting the approximate location of a proposed development in Waterford, Connecticut.

Figure 8. Excerpt from a 1953 aerial photograph depicting the approximate location of a proposed development in Waterford, Connecticut.

Figure 9. Excerpt from a 1970 aerial photograph depicting the approximate location of a proposed development in Waterford, Connecticut.

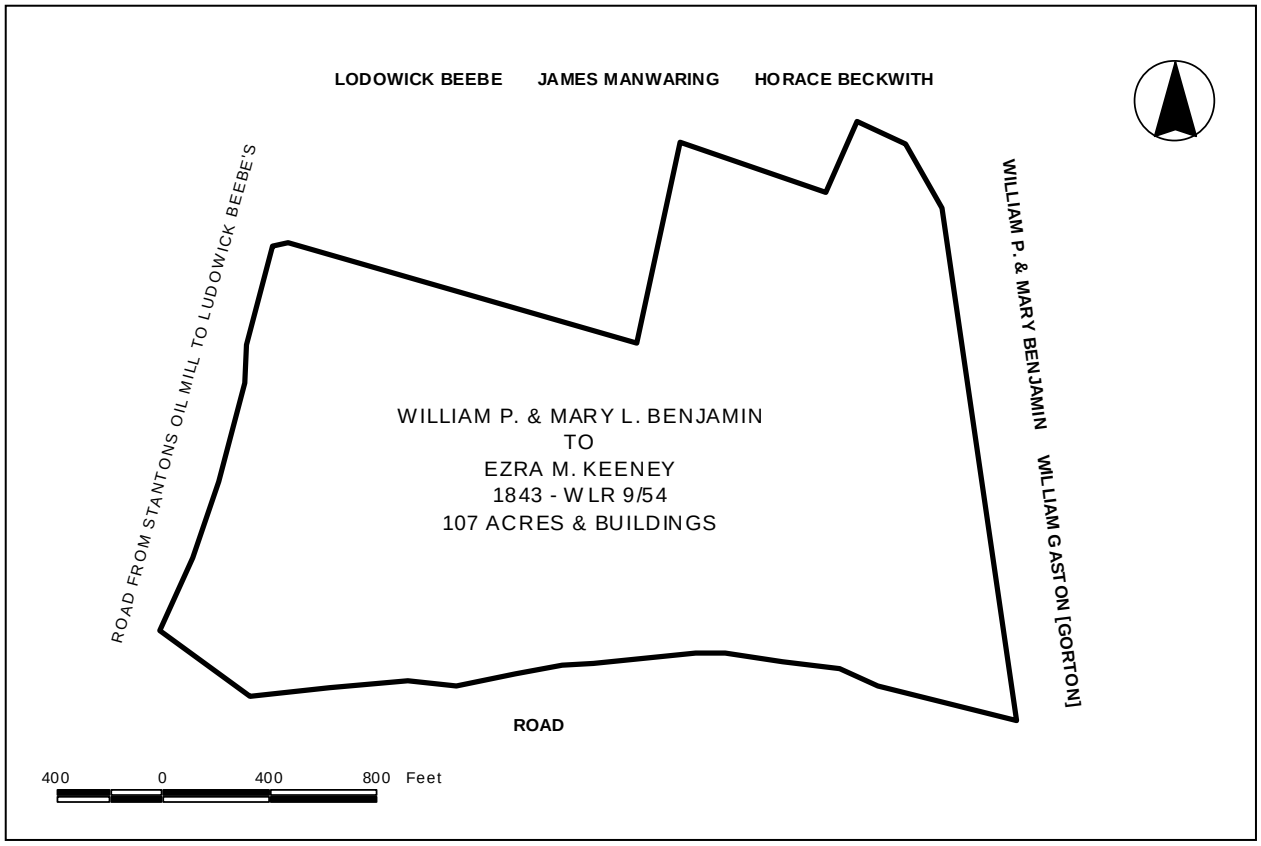


Figure 10. Sketch map or property transferred from William P. and Mary L. Benjamin to Ezra M. Keene in 1843.

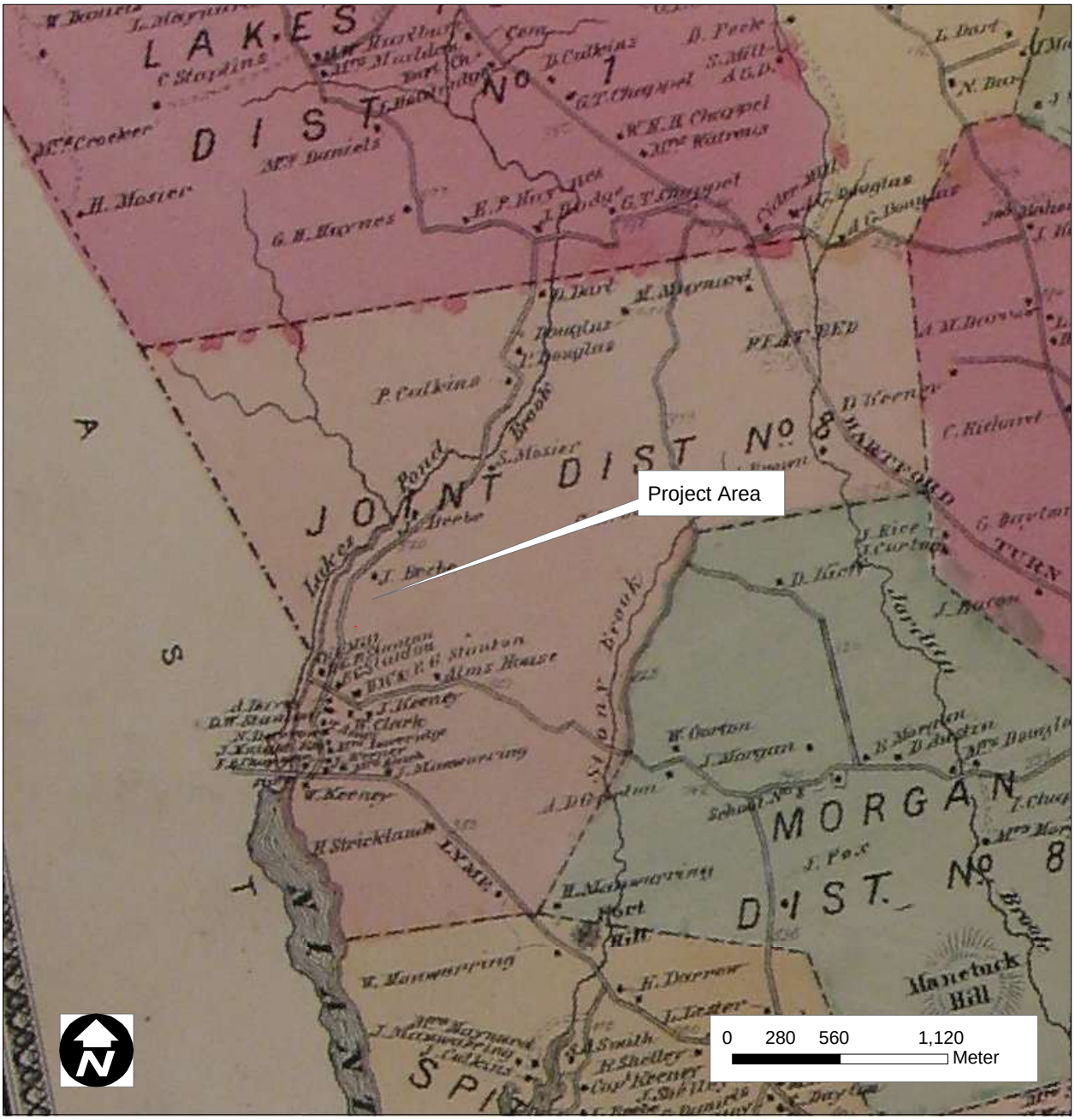


Figure 11. Excerpt from an historic 1868 map depicting the approximate location of a proposed development in Waterford, Connecticut.

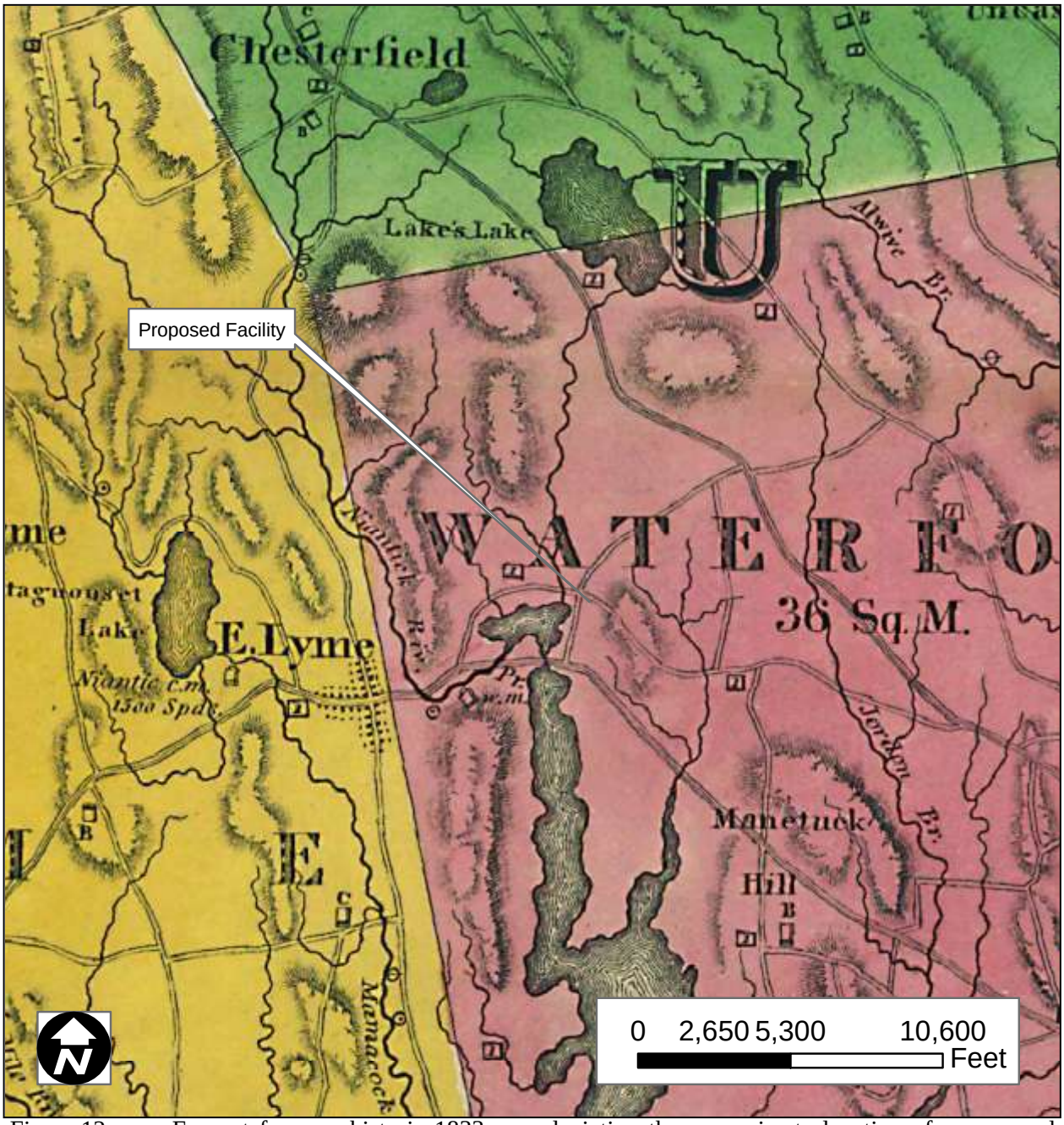


Figure 12. Excerpt from an historic 1833 map depicting the approximate location of a proposed development in Waterford, Connecticut.

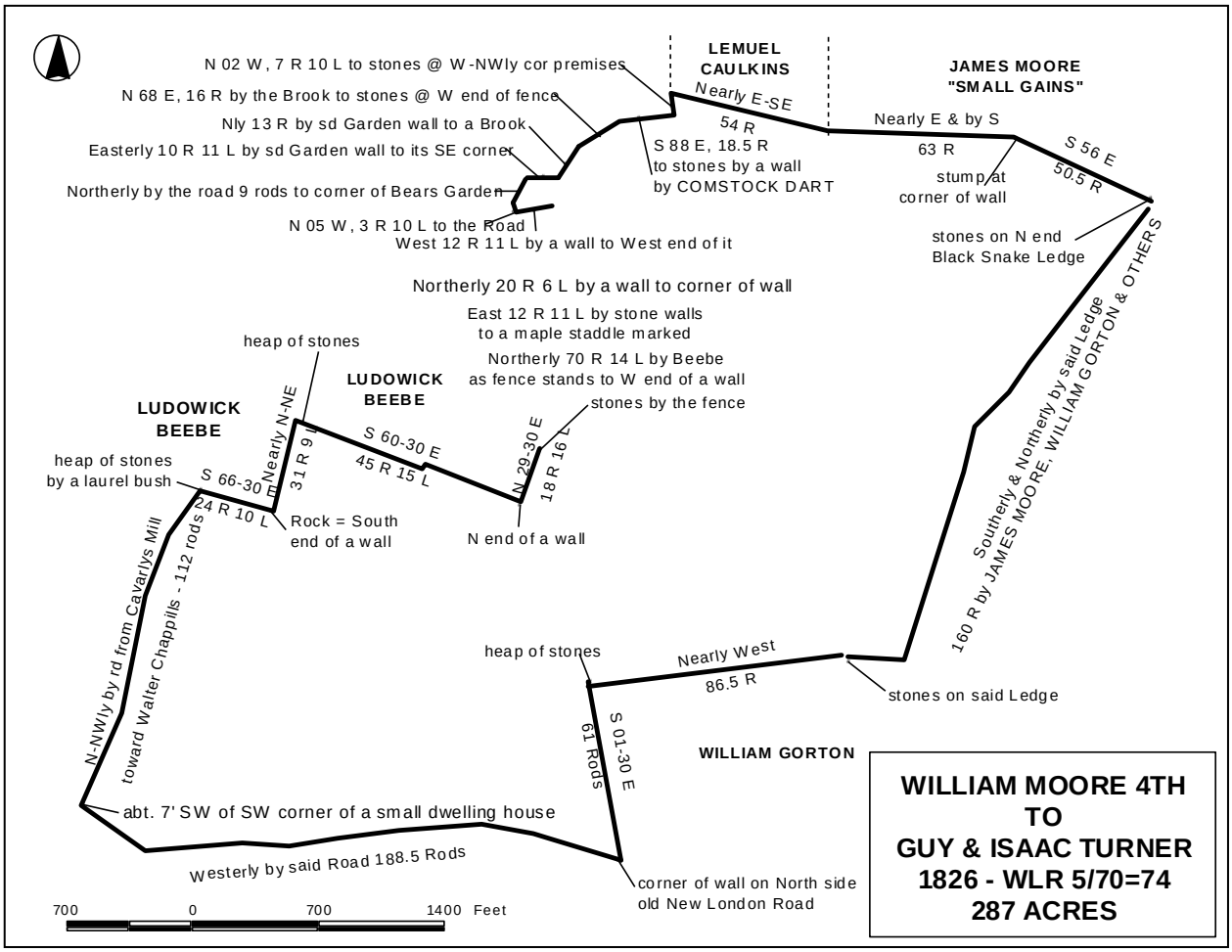


Figure 13. Sketch map or property transferred from William Moore, IV to Guy and Isaac Turner in 1826.

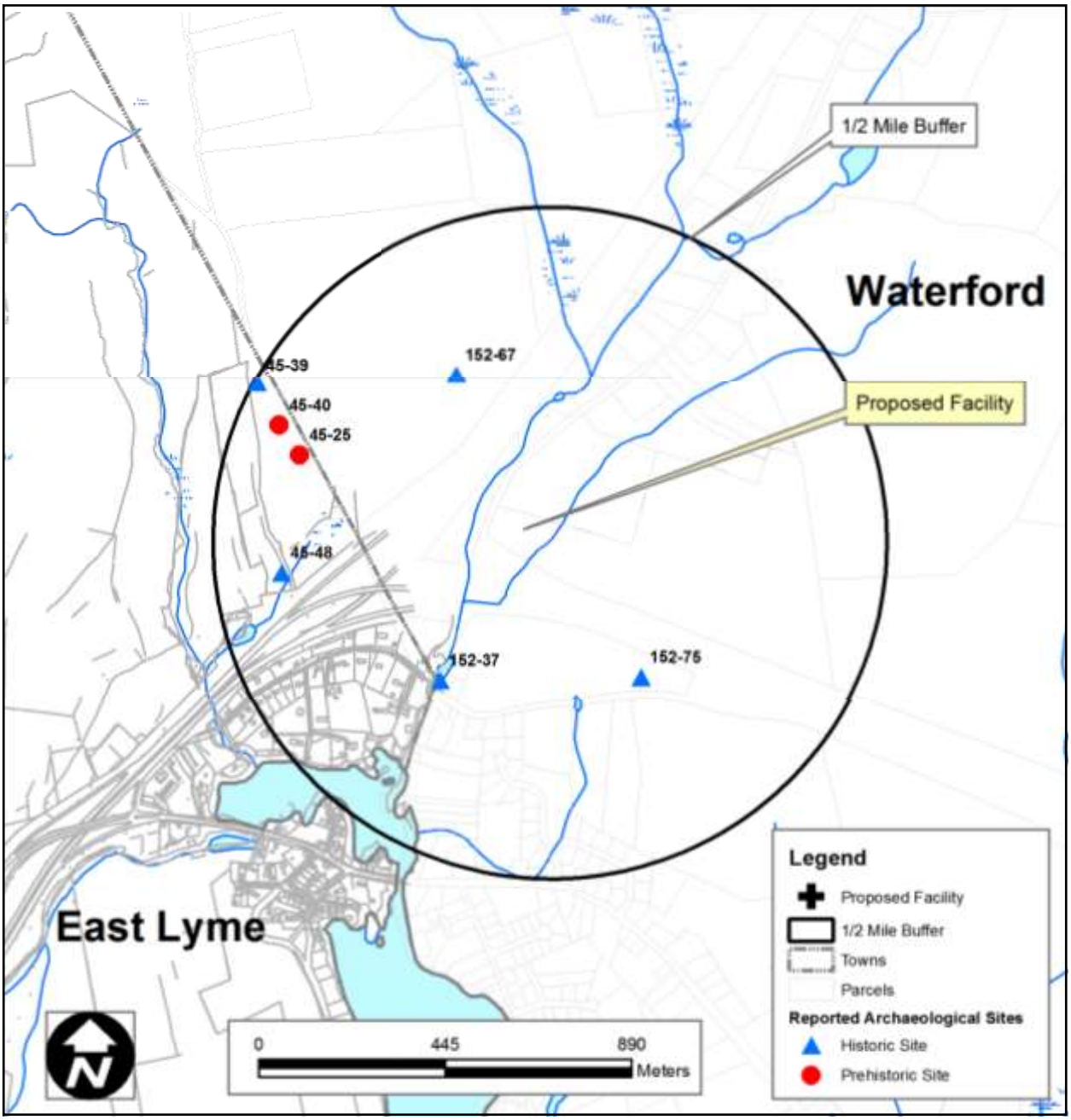


Figure 14. Map of previously identified cultural resources situated in the vicinity of a proposed development in Waterford, Connecticut.

Figure 15. Overview photo of the proposed project parcel facing southeast along Waterford Parkway North.

Figure 16. Overview photo of the proposed project parcel facing northwest from the eastern parcel boundary.

Figure 17. Overview photo of the proposed project parcel facing southeast from the western parcel boundary.

Figure 18. Overview photo of the proposed project parcel facing southwest from the northeastern parcel boundary.

Figure 19. Overview photo of the proposed project parcel facing north along the eastern parcel boundary.

Figure 20. Overview photo of the proposed project parcel facing south from the northern parcel boundary.

Figure 21. Overview photo of Locus 2, facing northwest (note Locus 2 is located on top of the knoll and immediately adjacent to the disturbance created by past gravelling.

CATHERINE LABADIA, M.A.

PRESIDENT & PRINCIPAL INVESTIGATOR

EDUCATION

Bachelor of Arts in Anthropology with specialization in archeology, Central Connecticut State University, New Britain, Connecticut, 1991

Master of Arts in Anthropology with specialization in archeology, University of Connecticut, Storrs, Connecticut, 1996

Ph.D. Candidate, Department of Anthropology, Pennsylvania State University, University Park, Pennsylvania

Introduction to Federal Projects and Historic Preservation Law, Section 106 Compliance Course, 2001

NEPA and the Transportation Decision Making Process, 2003

Federal Energy Regulatory Commission, Environmental Report Preparation Seminar, 2003

HONORS AND AWARDS

Town of Windsor, Connecticut - Research Support, 1998

Sigma Xi, Grant in Aid of Research, 1998

University of Connecticut Anthropology Department Pre-Doctoral Fellowship, 1995

Central Connecticut State University Anthropology Departmental Honors Award, 1991

State of Connecticut Academic Scholarship, 1988-1991

PROFESSIONAL EXPERIENCE

Principal Investigator, Heritage Consultants, LLC, February 2004 - Present.

Project Manager, R. Christopher Goodwin & Associates, Inc., New Orleans, Louisiana, November 1999-2004

Research Assistant, R. Christopher Goodwin & Associates, Inc., New Orleans, Louisiana, April-November 1999

Principal Investigator/Field Supervisor, Town of Windsor, Connecticut, May-July 1998

Principal Investigator/Field Supervisor, Town of Lynne, Connecticut, July-September 1998

Staff, Matson Museum of Anthropology, University Park, Pennsylvania, 1997-1998

Teaching Assistant, Pennsylvania State University, Department of Anthropology, 1996-1998

Undergraduate Laboratory Supervisor, Pennsylvania State University, Department of Anthropology, Fall 1997 and Fall 1996

Teaching Assistant, University of Connecticut, Department of Anthropology, 1994-1996

Crew Chief, Connecticut Office of the State Archaeologist, 1996

Lab Assistant, Mashantucket Pequot Museum Conservation Lab, Ledyard, Connecticut, 1993-1996

Field Technician/Lab Technician, Public Archaeology Survey Team, Inc., 1993-1996

Research Assistant, University of Connecticut, Department of Anthropology, Spring 1995

TRAINING AND SPECIAL SKILLS

Environmental Impact Statement/Environmental Assessment Report Preparation

SHPO/Native American Consultation

Artifact stabilization and conservation

A SAMPLE OF MANUSCRIPTS, TECHNICAL REPORTS, AND PAPERS PRESENTED

1997a *The Read Shell Midden: Site Formation and Structure*. Paper presented at the Southeastern Archeological Conference, Baton Rouge, Louisiana (with G. Milner and R. Jeffries).

1997b *The Mississippian Period Population of Cahokia and the American Bottom.* Delivered at join symposium of the Ontario Archeological Society and the Midwest Archaeological Conference, North York, Ontario.

1999a *Formulating and Testing Archaeological Predictive Models using a Geographic Information System.* Delivered at the 64th annual meeting of the Society for American Archaeology, Chicago Illinois.

1999b *Cultural Resources Background Research and Sample Survey of Areas West of Morgan City, Louisiana as Part of the Lower Atchafalaya Basin Reevaluation Study* (with Randy Lichtenberger and William P.

Athens). Submitted by R. Christopher Goodwin & Associates, Inc to the U.S. Army Corps of Engineers, New Orleans District.

2000 *Cultural Resources Survey and Inventory, Florida Gas Transmission Phase V Expansion, Gulf Power Lateral, Palmetto Power Lateral, Loop C, Loop D, Loop E, Loop G, Loop H St. Petersburg Lateral, Loop I St. Petersburg Lateral, Jacksonville Loop, and FP&L Lateral* (with David George, Jeremy Pincoske, Susan Barrett Smith, Ralph B. Draughon, Jr., Charlene Keck, Colleen Hanratty, and William P. Athens). Submitted by R. Christopher Goodwin & Associates, Inc. to Florida Gas Transmission.

2002 *Phase II National Register Testing and Evaluation of Sites 1LE293, 1LE294, 1EE505, and 1TP54 in Lee, Elmore, and Tallapoosa Counties, Alabama* (with William P. Athens, Kari Krause, Katy Coyle, Jeremy Pincoske, Rebecca Sick, and James Eberwine). Submitted by R. Christopher Goodwin & Associates, Inc. to Southern Natural Gas Company.

2003 *Phase I Cultural Resources Survey and Archeological Inventory of Proposed ANR Pipeline Company, Wisconsin WestLeg Project, Walworth and Rock Counties, Wisconsin* (with William P. Athens, Kari Krause, Alicia Ventresca, Susan Barrett Smith, Jeremy Pincoske, and Sean Coughlin). Submitted by R. Christopher Goodwin & Associates, Inc. to El Paso Corporation.

2004 *Phase I Cultural Resources Survey and Archeological Inventory of a Proposed Project Parcel in Rocky Hill, Connecticut* (with Catherine Labadia, Andrea White, and William P. Athens). Submitted by R. Christopher Goodwin & Associates, Inc. to VHB, Inc.

2005a *Phase I Cultural Resources Reconnaissance Inventory of a Proposed Housing Subdivision in Goshen, Connecticut.* Submitted to Henne Development, Southbury, Connecticut.

2005b *Phase I Cultural Resources Reconnaissance Survey of a Proposed Housing Subdivision at 25 Starrs Ridge Road in Redding, Connecticut* (with William Keegan and Catherine Labadia). Submitted to Mr. Jason Addison, Greenwich, Connecticut.

2005c *Phase I Archeological Assessment and Cultural Resources Reconnaissance Surveys for the Proposed Gateway Zone Sewer Extension Project in Tolland, Connecticut* (with William Keegan and Catherine Labadia). Submitted to Town of Tolland, Tolland, Connecticut.

2005d *Phase I Cultural Resources Reconnaissance Survey of a 4.5 ha (11 ac) Proposed Project Area and Phase II National Register Testing and Evaluation of Site 165-6 in Windsor Locks, Connecticut* (with William Keegan and Catherine Labadia). Submitted to Fahey Landolino & Associates, Windsor Locks, Connecticut.

2006a *Phase I Cultural Resources Reconnaissance Survey of the Proposed Newtown Technology Park, Newtown, Connecticut* (with Catherine Labadia and William Keegan). Submitted to Spath-Bjorklund Associates, Inc., Monroe, Connecticut

2006b *Phase I Cultural Resources Reconnaissance Survey of the Proposed Barbour Hill Substation Modification Project, South Windsor, Connecticut* (with Catherine Labadia and William Keegan). Submitted to Vanasse Hangen Brustlin, Inc., Middletown, Connecticut

2006c *Phase IB Cultural Resources Reconnaissance Survey of the Proposed Cabela's Development Project within Rentschler Field in East Hartford, Connecticut* (with Catherine Labadia and William Keegan). Submitted to Baystate Environmental Consultants, Inc., East Hartford, Connecticut

2006d *Phase I Cultural Resources Survey of the Proposed Day Hill Road Development Project, Windsor, Connecticut* (with Catherine Labadia and William Keegan). Submitted to Clohessy, Harris, and Kaiser, LLC, Simsbury, Connecticut

2006a *Cast Upon a Reef: Archival Research and Mapping of Shipwrecks in the Connecticut Waters of Long Island Sound*. Presented at the Annual Meeting of the Archaeological Society of Connecticut, New London, Connecticut (with D. George and C. Labadia).

DAVID R. GEORGE, M.A, R.P.A.

SENIOR PROJECT MANAGER

EDUCATION

Bachelor of Science in Business Management, Ithaca College, Ithaca, New York, 1990.
Master of Arts in Anthropology, University of Connecticut, Storrs, Connecticut, 1992.
Introduction to Federal Projects and Historic Preservation Law, Section 106 Compliance, 1999.
Federal Energy Regulatory Commission, Environmental Report Preparation Seminar, 2003

ACADEMIC AWARDS AND FELLOWSHIPS

Phi Kappa Phi, 1995.
University of Connecticut Anthropology Department Research Assistantship, 1994.
University of Connecticut Anthropology Department Teaching Assistantship, 1991- 1994.
University of Connecticut Anthropology Department Pre-Doctoral Fellowship, 1992.
University of Connecticut Anthropology Department Lectureship, 1991.

PROFESSIONAL EXPERIENCE

Principal Investigator, Heritage Consultants, LLC, February 2004-Present.
Vice President-Archeological Services, Goodwin & Associates, Inc., December 2002-March 2004.
Assistant Vice President, R. Christopher Goodwin & Associates, Inc., May 2001-December 2002.
Senior Project Manager, R. Christopher Goodwin & Associates, Inc., May 2001-November 2001.
Project Manager, R. Christopher Goodwin & Associates, Inc., September 1998-May 2001.
Laboratory Supervisor/Crew Chief, Archaeological and Historical Consultants, Inc., 1996-1998.
Instructor, Department of Anthropology, University of Connecticut, Storrs, 1995-1996.
Field Director/Project Manager, Public Archaeology Survey Team, Inc., 1990-1996.
Field Technician, Office of the Connecticut State Archaeologist, 1990-1996.
Teaching Assistant, Department of Anthropology, University of Connecticut, 1991, 1994.
Field Instructor, Department of Anthropology Fieldschool, University of Connecticut, 1992-1994.

PROFESSIONAL MEMBERSHIPS

Society for American Archeology
Society for Historical Archaeology
Eastern States Archaeological Federation
Register of Professional Archeologists

SPECIAL SKILLS

Existing Conditions/Disturbance Investigations
SHPO/Native American Consultation
Geographic Information Systems Applications
Faunal, Botanical, and Lithic Analyses

A SAMPLE OF PUBLICATIONS, TECHNICAL REPORTS, AND PAPERS PRESENTED

1992 *Report on a Phase II Archaeological Survey of Sites 85 - 6, 85 - 8, and 85 - 10. Reconstruction of State Route 111 in Monroe and Trumbull, Connecticut.* Prepared for Connecticut Department of Transportation. Public Archaeology Survey Team, Inc., Storrs.

1995 *Report on Phase I Archaeological Reconnaissance Survey for the Reconstruction of Thompson and Avon Old Farms Road in Avon, Connecticut.* Prepared for C. R. Johnson and Associates. Public Archaeology Survey Team, Inc., Storrs.

1997a A Long Row to Hoe: The Cultivation of Archaeobotany in Southern New England. *Archaeology of Eastern North America* 25:175 - 190.

1997b *Determining Relevancy: GIS Analysis and Land Management.* Paper presented at the annual meeting of the Council for Northeastern Historical Archaeology, Altoona, Pennsylvania (with William F. Keegan).

1997c *Report on Phase I Archaeological Reconnaissance Survey of the Connecticut National Guard Camp Hartell, Camp Rowland, and Stone Ranch.* Prepared for the Connecticut National Guard and the Connecticut Historical Commission. Office of the State Archaeologist, Storrs.

1998 *Phase IB Archaeological Survey for the New Cumberland Army Depot, New Cumberland, York County, Pennsylvania*. Centre Hall, Pennsylvania: Archaeological and Historical Consultants, Inc.

2000 *Historical Research and Remote Sensing of the Former Location of the Braziel Baptist Church and Cemetery Complex (Site 16IV49), Iberville Parish, Louisiana* (with Katy Coyle, Kari Krause, Susan Barrett Smith, Ralph Draughon, Jr., James Eberwine, J.B. Pelletier, William Lowthert, and William P. Athens) Submitted by R. Christopher Goodwin & Associates, Inc. to the U.S. Army Corps of Engineers, New Orleans District.

2001 *Remote Sensing and Ground-Truthing Investigations at Site 40SW319, Stewart County, Tennessee* (with Sean Coughlin, Meg Thornton, and William P. Athens). Submitted by R. Christopher Goodwin & Associates, Inc. to URS Corporation.

2002 *Phase I Cultural Resources Survey and Archeological Inventory of the Alabama Portion of the Proposed Colonial Pipeline Project Corridor, Talladega, Calhoun, St. Clair, Blount, Cullman, Marshall, Morgan, Madison, and Limestone Counties, Alabama* (with Catherine Labadia, Alicia Ventresca, Susan Barrett Smith, Jeremy Pincoske, Kari Krause and, William P. Athens). Submitted by R. Christopher Goodwin & Associates, Inc. to Colonial Pipeline Company.

2003 *Phase IB Cultural Resources Survey and Archeological Inventory of a 16.2 ha (40 ac) Project Parcel Rocky Hill, Connecticut* (with Catherine Labadia and Andrea White). Submitted by R. Christopher Goodwin & Associates, Inc., to Vanasse Hangen Brustlin, Inc.

2004 *Historic Research and Building Documentation of the Hanford House, 180-182 Main Street, Bridgeport, Connecticut.* (with William Keegan and Catherine Labadia). Submitted to Vanasse Hangen Brustlin, Inc., Middletown, Connecticut.

2005a *Phase I Cultural Resources Reconnaissance Survey of a Proposed Housing Subdivision at 25 Starrs Ridge Road in Redding, Connecticut* (with William Keegan and Catherine Labadia). Submitted to Mr. Jason Addison, Greenwich, Connecticut.

2005b *Phase I Archeological Assessment and Cultural Resources Reconnaissance Surveys for the Proposed Gateway Zone Sewer Extension Project in Tolland, Connecticut* (with William Keegan and Catherine Labadia). Submitted to Town of Tolland, Tolland, Connecticut.

2005c *Phase I Cultural Resources Reconnaissance Survey of a 4.5 ha (11 ac) Proposed Project Area and Phase II National Register Testing and Evaluation of Site 165-6 in Windsor Locks, Connecticut* (with William Keegan and Catherine Labadia). Submitted to Fahey Landolino & Associates, Windsor Locks, Connecticut.

2006a *Phase I Cultural Resources Reconnaissance Survey of the Proposed Newtown Technology Park, Newtown, Connecticut* (with Catherine Labadia and William Keegan). Submitted to Spath-Bjorklund Associates, Inc., Monroe, Connecticut

2006b *Phase I Cultural Resources Reconnaissance Survey of the Proposed Barbour Hill Substation Modification Project, South Windsor, Connecticut* (with Catherine Labadia and William Keegan). Submitted to Vanasse Hangen Brustlin, Inc., Middletown, Connecticut

2006c *Phase IB Cultural Resources Reconnaissance Survey of the Proposed Cabela's Development Project within Rentschler Field in East Hartford, Connecticut* (with Catherine Labadia and William Keegan). Submitted to Baystate Environmental Consultants, Inc., East Hartford, Connecticut

2006d *Phase I Cultural Resources Survey of the Proposed Day Hill Road Development Project, Windsor, Connecticut* (with Catherine Labadia and William Keegan). Submitted to Clohessy, Harris, and Kaiser, LLC, Simsbury, Connecticut

WILLIAM F. KEEGAN, B.A., A.B.T.
HISTORICAL GEOGRAPHER & GIS SPECIALIST

EDUCATION

Bachelor of Arts in Anthropology and Geography, University of Connecticut, Storrs, 1996
Master of Arts Candidate in Geography, University of Connecticut, Storrs (all but thesis)
Certificate in Geographic Information Systems, University of Connecticut, Storrs (application pending)

PROFESSIONAL EXPERIENCE

Partner, Heritage Consultants, LLC, February 2004 - Present
Partner, Keegans Associates, LLC, April 1997 - April 2004
Teaching Assistant, Department of Geography, University of Connecticut, Storrs, 2000-2001

PROFESSIONAL MEMBERSHIPS

Archeological Society of Connecticut
Northeast Arc Users Group
Council for Northeastern Historic Archaeology

SPECIAL SKILLS

Geographic Information Systems
Cartography
Archival, Cartographic, and Historical Research

A SAMPLE OF MANUSCRIPTS, TECHNICAL REPORTS, AND PAPERS PRESENTED

1994 *Reconstructing the Enfield Shaker Site Through Census Records.* Annual Meeting of the Sons of the American Revolution, Connecticut.

1995a Illustration maps in *Achieving Racial Balance: Case Studies of Contemporary School Desegregation* by Sondra Astor Stave. Contributions to the Study of Education, Number 65. Westport, Connecticut: Greenwood Press.

1995b History and Geography of the Meriden School for Boys Cemetery, Meriden, Connecticut. Research reports prepared for the Office of State Archaeology.

1996 History of the Huntington Family Home, Scotland, Connecticut. Research reports prepared for Dr. Harold Juli of Connecticut College.

1997 *GIS Applications in Archaeology: Connecticut National Guard Project.* Conference for Northeast Archaeology, Altoona, Pennsylvania.

1998a Illustration maps in *The Boys From Rockville*, Robert L. Bee, ed. Knoxville, Tennessee: University of Tennessee Press.

1998b *Historical and Cultural Reconnaissance Survey, Cultural Resource Management Plan, Connecticut National Guard Properties, Camp Rowland, Camp Hartell, Stone's Ranch* [Windsor Locks, East Lyme, and Lyme, Connecticut]. Prepared for the Office of Connecticut Archaeology.

1998c *Camp Rowland Historical Report: An Overview of Town History, Military History, and Landholdings* [East Lyme, Connecticut]. Prepared for Archeological Research Specialists, Inc. and United International Corporation.

1998d *Archeological Site Locations and Characteristics in the Connecticut River Valley.* Prepared with Nicholas Bellantoni, Conn. State Archaeologist. Archeological Societies of Connecticut and Massachusetts.

1998e Development of GIS data layer of open space in the Town of Willington, Connecticut. Prepared for Town of Willington.

1999a Contributing co-editor, *The Archaeology of Connecticut: The Human Era, 11,000 Years Ago to the Present*. Storrs, Connecticut: Bibliopola Press; Hanover, NH: New England University Press.

1999b Historical materials in *Phase I Archeological Reconnaissance Survey, Long Lane School, Middletown, Connecticut.* Prepared for PAST Inc.

1999c *Residence Patterns of Nineteenth Century Industrial Workers in Hartford, Connecticut.* Annual Northeast ARC Users Conference.

1999d Development of GIS data layers of Hartford architectural resources. Prepared for Connecticut Historical Commission.

1999e Cartographic research in support of archeological survey of Adriaen's Landing Development, Hartford, Connecticut. Prepared for PAST, Inc.

1999f Historical research and mapping of General Rochambeau march routes in Connecticut. Prepared for PAST, Inc.

1999g Cartographic research on property of Talcott Mountain Science Center, Avon, Connecticut. Prepared for Talcott Mountain Science Center.

2000a Historical and cartographic research reports for archeological surveys in Glastonbury, Newtown, and Windham, Connecticut. Prepared for American Cultural Specialists, Inc.

2000b Development of GIS data layers of cultural resource locations in East Hartford, Connecticut. Prepared for Town of East Hartford, Connecticut.

2001 *Planning for the Future, Dealing with the Past.* Annual meeting of the Connecticut Chapter of the American Planning Association.

2002 Cartographic research for archeological reconnaissance survey of Goodspeed Opera House Expansion, East Haddam, Connecticut. Prepared for American Cultural Specialists, Inc.

2003 *Survey Methods and Results: Cultural Resources Along the Appalachian Trail in Connecticut*. With Nicholas Bellantoni, Connecticut State Archaeologist, and Kristen N. Keegan. Biannual meeting of the Appalachian Trail Conference.

2004 *Data Recovery Excavations at the Daniel Benton Homestead in Tolland, Connecticut.* With Catherine Labadia and David George. Presented at the Town of Tolland, Connecticut Celebration on the Green.

2005 *Phase I Cultural Resources Reconnaissance Survey of a Proposed Housing Subdivision at 80 Laurel Lane, Redding, Connecticut* (with Catherine Labadia and David George). Submitted to Mr. Adam Lubarsky, Redding, Connecticut.

2006a *Cast Upon a Reef: Archival Research and Mapping of Shipwrecks in the Connecticut Waters of Long Island Sound*. Presented at the Annual Meeting of the Archaeological Society of Connecticut, New London, Connecticut (with D. George and C. Labadia).

2006b *Phase IA Cultural Resources Assessment and Phase IB Cultural Resources Reconnaissance Surveys of the Proposed Ryder Farm Subdivision at 224 Umpawaug Road in Redding, Connecticut* (with David George and Catherine Labadia). Submitted to Falciglia & Valeri Construction LLC, Danbury, Connecticut

2006c *Phase IA Cultural Resources Assessment Survey and Phase IB Cultural Resources Reconnaissance Survey of the Killingly 2G Substation Project*, Killingly and Putnam, Connecticut (with David George and Catherine Labadia). Submitted to Vanasse Hangen Brustlin, Inc., Middletown, Connecticut

Exhibit 7

FIFTEEN ROPE FERRY ROAD WATERFORD, CT 06385-2886

TOWN OF WATERFORD, CT
PLANNING DEPARTMENT

Date: February 14, 2008
To: Waterford Conservation Commission
Cc: Girish Behal; Project Manager, Northeast Utilities Systems

Re: CL&P Proposed Waterford Substation
325 Waterford Parkway North
Request For Location Review: CT Siting Council Jurisdiction

Review Comments:

Site of substation is located in area of mapped Agawam sandy loam soil type. This is a well-drained soil formed in glacial outwash. Soil test borings document sandy subsoil conditions with depth to seasonal water in excess of 6 ft. below grade.

The vegetation in the proposed substation area is second growth woodland, dominated by red cedar. Understory is relatively open.

Activity proposed within 100 ft of the delineated perennial watercourse includes clearing of vegetation, grading, placement of crushed stone substrate and installation of a biofiltration swale and level spreader outlet.

Plan Comments:

1. Relocate perimeter hay bale/silt fence barrier closer to limit of disturbance to reduce clearing and soil disturbance in vicinity of wetland flag #s 17 and 18.

2. Plan needs to identify limits of clearing and disturbance. These should be located as close as possible to crushed stone pad, providing required maintenance/access area.

3. Add sediment controls in the southwest portion of the site near the intersection of Oil Mill Road.

4. The proposed biofiltration swale is sized to accommodate an estimated 480 cubic ft. of run-off volume. This is less than 0.2 of the WQV estimated from the substation pad, presuming no infiltration. With an estimated 50% infiltration from the crushed stone, the QV is 2180 cubic feet. The swale does not provide for capture and treatment of the water quality volume in accordance with the 2004 CT Stormwater manual. Identify what criteria were applied in the design.

5. With the minimal capacity, the anticipated high infiltration rate of the existing subsoil, use of crushed stone for the substation pad, it is not clear the added disturbance for the swale and level

spreader in the vicinity of the perennial stream provides greater benefit than the option of leaving the existing soils and vegetation in place.

If it is determined that providing some run-off control at the edge of the substation pad is preferable, then consider reducing the length of this swale to reduce the amount of encroachment into the area adjacent to wetland flags 17 and 18. Consider elimination or reduction of swale length. An existing depressional swale occurs along the north edge of Parkway North between the proposed station and the stream. This feature may serve to collect and direct run-off from the site.

6. Provide a construction detail for the level spreader if it remains part of the stormwater control plan.

7. The well-drained nature of the site soils will affect what vegetation can establish in the swale and surrounding areas. Use of drought-tolerant species and seed mixes is recommended.

Submitted By:

_____

Maureen FitzGerald
Environmental Planner
2/14/08

FIFTEEN ROPE FERRY ROAD

WATERFORD, CT 06385-2886

TOWN OF WATERFORD

PERMITTING DEPARTMENT

DATE: March 7, 2008

TO: Waterford Planning and Zoning Commission

FROM: Thomas V. Wagner, AICP, Planning Director

RE: LOCATION REVIEW
CL&P SUBSTATION
325 WATERFORD PARKWAY NORTH –

This is a request for location approval to site a substation on the above referenced property as described in the report entitled "Waterford Planning and Zoning Commission Location Review, Proposed Waterford Substation, prepared by VHB Inc. dated February 2008." The installation of the substation requires action by the Connecticut Siting Council and as part of the application the State requires input from the Planning and Zoning Commission on the appropriateness of the location selected. The following findings and determinations are made relative to the proposed substation location:

1. The proposed location is at the intersection of Waterford Parkway North and Oil Mill Road. It is located adjacent to an existing 115 Kv transmission line to which the station will be connected.
2. There were six sites considered as detailed in the report referenced above. The Planning and Zoning Commission concurs that the subject site is the best location because of accessibility, location adjacent to I-95 and capacity to accommodate the use and future expansion.
3. The subject site is located in a Rural Residential Zoning District which allows by special permit "Buildings and structures and sub-stations operated by utility companies....", and therefore the proposed use is consistent with the comprehensive plan for the community.
4. The site is also adjacent to the industrial districts which define the "Business Triangle" and are located within the area created by the intersection of I-95, I-395 and CT Route 85. The Commission accepts that there is a need for this

substation if the future development of the town is to occur in accordance with the 1998 Plan of Preservation, Conservation and Development.

5. As part of the review and expected future submission of more detailed plans the Commission acknowledges that specific conformance to the Zoning Regulations is not required, but that certain proposed on site improvements as well as off site impacts be considered.

    a. Final plans conform to the State of Connecticut Stormwater manual as well as Erosion Control Guidelines. In addition the recommendations of the Waterford Conservation Commission as issued are addressed.

    b. The plan was reviewed with respect to the future widening of I-95 and completion of Route 11 and a determination made that these infrastructure priority projects will not be impacted by the location of the substation.

    c. The site line at the intersection of Oil Mill Rd. and Waterford Parkway North is proposed to be improved. The fence surrounding the substation is proposed to be installed adjacent to Oil Mill Road. It is requested that the maximum site line achievable as calculated using Fhwa standards be accommodated as measured at the stop sign. Additional clearing and grading proposed that will not assist with site line improvement at the intersection and could provide some screening of the substation should be retained.

This document constitutes the Planning and Zoning Commission's position on the proposed location of the substation. The Commission will be participating in the application review process which may include the issuance of an order to regulate and restrict.

FIFTEEN ROPE FERRY ROAD

Town of Waterford

WATERFORD, CT 06385-2886

May 1, 2008

Mr. John Morissette
Manager, Transmission Siting and P
ermitting
Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270

Re: CL&P–Waterford Substation

Dear Mr. Morissette:

On April 16, 2008, Mr. Girish Behal, Project Manager, of CL&P presented an overview of the Waterford Substation Project to the Economic Development Commission. The Commission supports this Project as an effort by CL&P to improve reliability and increase capacity for electric service in Waterford. The Commission believes that a more reliable and robust electric system will not only promote the Commission's efforts to support the business community but will also benefit all other electric customers in Waterford. In addition, the Town will receive an equitable property tax income for the substation.

Very Truly Yours,

Peter A. Karpinski
Chair, Waterford Economic Development Commission

Town of East Lyme

108 Pennsylvania Ave.
P.O. Drawer 519
Paul M. Formica
First Selectman

Niantic, Connecticut 06357
Phone: (860) 739-6931
ext. 110
Fax: (860) 739-2851

Manager James Morissette
Transmission Siting and Permitting
P O Box 270
Hartford, CT 06141-0270

Dear Sir:

I have reviewed your filing regarding the proposed Waterford Parkway North Substation along with our Public Works Department and have found no indication of any adverse impact on the residents of East Lyme. It is our hope that the new substation will free up capacity in East Lyme's current substation located at the Exit 74 interchange.

Our only concern, which I have already mentioned to you, is the proposed site seems to be in the path of the Route 11 Interchange stated to be located in Waterford. You have indicated that CL& P is aware of the Route 11 plan and that the proposed substation will not interfere should Route 11 ever be constructed.

Thank you for the opportunity to review and comment on this proposal.

Regards,

Paul M. Formica
First Selectman

C: Director of Public Works

FIFTEEN ROPE FERRY ROAD

WATERFORD, CT 06385-2886

June 4, 2008

Daniel F. Caruso, Chairman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: CL&P SUBSTATION, 325 WATERFORD PARKWAY NORTH

Dear Mr. Chairman and Siting Council Members:

At a meeting of the Waterford Board of Selectmen held on June 3, 2008 representatives of CL&P described to the members of the board and residents of the area the proposal to install a new substation at the above referenced address. The information provided in the municipal consultation document supports the need for this new facility as a result of growth in Waterford and the surrounding towns.

Located in a residential area on the edge of Waterford's business triangle and in close proximity to I-95 and its interchange with I-395, this site appears to be the logical choice of all the sites considered in the site selection process. As a result of meetings with local land use commissions, issues regarding wetlands protection, intersection site lines, and buffering the visual impact of the substation were reviewed. In addition, the public raised similar concerns, questioning the level and intensity of lighting as well as the necessity for the substation to be located at the selected site. The size and height of the proposed substation will have a visual impact that will be difficult to fully screen especially from the interstate. It is my desire that as much screening as possible be provided so that the visual impact of the facility as viewed from adjacent residential properties and Oil Mill Road is minimized.

As CL&P moves forward with the filing of its application with the Connecticut Siting Council for this facility, the Town of Waterford will continue to participate in the review of this project and will advise the council of the application's consistency with local recommendations. I look forward to attending the public hearing to be held and appreciate the opportunity provided to participate in the siting of this facility under your jurisdiction.

Sincerely,

Daniel M. Steward
First Selectman

cc: S. Derek Phelps, Executive Director
Robert A. Avena, Esq
Marianne B. Dubuque, Esq.
Girish Behal, CL&P
Michael Libertine, VHB
Thomas V. Wagner, AICP Planning Director
Maureen FitzGerald, Environmental Planner

Exhibit 8

AFFIDAVIT OF SERVICE OF APPLICATION

State of Connecticut)
) ss: Middletown, Connecticut
)
County of Middlesex)

Pursuant to Section 16-50*l*(b) of the Connecticut General Statutes, I hereby certify that on June 5, 2008, I caused a copy of the Application of The Connecticut Light and Power Company to the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need for the proposed Waterford Substation (Waterford, Connecticut) to be served upon individuals and agencies set forth on the attached list by mail, express mail, or courier.

Michael Libertine, on behalf of
The Connecticut Light and Power Company

On this the 5 day of June, 2008, before me, the undersigned officer, personally appeared Michael Libertine, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for the purposes therein contained.

In Witness Whereof, I hereunto set my hand and official seal.

Notary Public
My Commission Expires
August 31, 2010

Application Service List - Waterford Substation

Local Authorities

Chief Elected Official - Waterford

Daniel Steward, First Selectman
Town of Waterford
15 Rope Ferry Road
Waterford, CT 06385

Planning & Zoning Commission

Edwin J. Maguire, Chairman
Planning & Zoning Commission
15 Rope Ferry Road
Waterford, CT 06385

Conservation Commission

Gary Johnson, Chair
Conservation Commission
15 Rope Ferry Road
Waterford, CT 06385

Chief Elected Official – East Lyme

Paul Formica, First Selectman
Town of East Lyme
108 Pennsylvania Avenue
Niantic, CT 06357

Regional Planning Agency

Lyle Wray, Executive Director
Capitol Region Council of Governments
241 Main Street, 4th Floor
Hartford, CT 06106-5310

State Elected Officials

State Senator
Andrea L. Stillman
Legislative Office Building
Room 3600
Hartford, CT 06106-1591

State Representatives
Elizabeth B. Ritter
Legislative Office Building, Room 4002
Hartford, CT 06106-1591

Ed Jutila
Legislative Office Building, Room 4046
Hartford, CT 06106-1591

State Agencies Service List

Attorney General
Attorney General Richard Blumenthal
Office of the Attorney General
55 Elm Street
Hartford, CT 06106

Department of Environmental Protection
Gina McCarthy, Commissioner
The Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Department of Public Health
J. Robert Galvin, M.D., M.P.H., Commissioner
Department of Public Health
410 Capitol Avenue,
Hartford, Connecticut 06134-0308

Council on Environmental Quality
Thomas F. Harrison, Chairman
Connecticut Council on Environmental Quality
79 Elm Street
Hartford, CT 06106

Council on Environmental Quality (Cont.)

Karl J. Wagener, Executive Director
Connecticut Council on Environmental Quality
79 Elm Street
Hartford, CT 06106

Department of Agriculture

F. Philip Prelli, Commissioner
Department of Agriculture
65 Capitol Avenue
Hartford, CT 06106

Department of Public Utility Control

Donald W. Downes, Chairman
Department of Public Utility Control
Ten Franklin Square
New Britain, CT 06051

Office of Policy and Management

Robert L. Genuario, Secretary
Office of Policy and Management
450 Capitol Avenue
Hartford, CT 06106-1308

Department of Economic and Community Development

Joan McDonald, Commissioner
Department of Economic and Community Development
505 Hudson Street
Hartford, CT 06106

Department of Transportation

Joseph F. Marie, Commissioner
Department of Transportation
2800 Berlin Turnpike
Newington, CT 06131-7546

Federal Agencies

Federal Energy Regulatory Commission

Kimberly D. Bose, Secretary
Nathaniel J. Davis, Sr., Acting Deputy Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Army Corps of Engineers

US Army Corps of Engineers
Attention: Steve Andon, Executive Assistant
New England District
696 Virginia Road
Concord, MA 01742-2751

Others (Courtesy Copies)

Connecticut Energy Advisory Board

Connecticut Energy Advisory Board
c/o Gretchen Deans
CERC
805 Brook Street
Building 4
Rocky Hill, CT 06067

State Archaeologist

David A. Poirier, Staff Archaeologist
Historic Preservation and Museum Division
59 South Prospect Street
Hartford, CT 06106

Exhibit 9

Notice of Application by The Connecticut Light and Power Company to the Connecticut Siting Council for Certificate of Environmental Compatibility and Public Need for the Waterford Substation in Waterford, Connecticut

Pursuant to the provisions of §§ 16-50*l*(b) of the General Statutes of Connecticut, §§ 16-50*l*-1-(e) of the Regulations of the Connecticut Siting Council and the Application Guide for Electric Substation Facilities of the Connecticut Siting Council (June 2007), notice is hereby given that The Connecticut Light and Power Company ("CL&P") will, on or about June 5, 2008, submit an application to the Connecticut Siting Council seeking a Certificate of Environmental Compatibility and Public Need for a new substation in Waterford, Connecticut. The project will consist primarily of the construction of the substation. The property where the substation is proposed consists of 5 acres located at 325 Waterford Parkway North.

The purpose of the new Waterford Substation is to provide needed increased distribution system capacity and reliability for the Town of Waterford and the surrounding service area.

If the project is approved by the Connecticut Siting Council, construction is projected to begin in February 2009 with an in-service date of June 2010.

Exhibit 10

AFFIDAVIT OF ABUTTERS LEGAL NOTICE

STATE OF CONNECTICUT)
) ss: Waterbury, Connecticut
COUNTY OF NEW HAVEN)

Pursuant to Section 16-50*l* (b) of the Connecticut General Statutes, I hereby certify that on May 28, 2008 I caused notice of the intent of The Connecticut Light and Power Company to file an Application with the Connecticut Siting Council for a Certificate of Environmental Compatibility and Public Need for the Waterford Substation, 325 Waterford Parkway North, Waterford, Connecticut, to be sent by certified mail to each person who is appearing of record as the owner of property which abuts and/or is nearby the proposed site at 325 Waterford Parkway North, Waterford, Connecticut, on which the facility would be located. A summary of the Application and the date on or about which it would be filed was included in said notice.

Name: Robert S. Golden Jr.
Title: Attorney

On this the 2nd day of June, 2008, before me, the undersigned officer, personally appeared ROBERT S. GOLDEN JR. known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument and acknowledged that he executed the same for the purposes therein contained.

In Witness Whereof, I hereunto set my hand and official seal.

Marianne Barbino Dubuque
Notary Public
My Commission Expires: 9/30/2010

LISTNO_1	OWNER NAME	LOCATION	ADD1	ADD2	PURCHASE DATE	PHONE NUMBERS	Designation
0504700	MACKEY IRMGARD J	0106 OIL MILL ROAD	106 OIL MILL RD	WATERFORD CT	6/20/2001	860-444-7860	N
0839200	K S & M REALTY LLC	0287 WATERFORD PKWY NORTH	208-24 NORTHERN BLVD	BAYSIDE NY	7/20/2005		A
0504900	CROWLEY NAN K	0111 OIL MILL ROAD	111 OIL MILL RD	WATERFORD CT	7/23/1993	860-443-1813	N
0507600	MARNET MIRIAM E	111R OIL MILL ROAD	8 CYPRESS WAY	NIANTIC CT	8/12/1927	860-739-8754	N
0504600	MEES DUANE L	0104 OIL MILL ROAD	104 OIL MILL RD	WATERFORD CT	2/16/1959	860-444-1101	N
0504100	SHALHOUT AHLAM	0098 OIL MILL ROAD	98 OIL MILL RD	WATERFORD CT	6/25/1990	860-442-1332	N
0504400	BROUWER RICHARD F JR	0102 OIL MILL ROAD	102 OIL MILL RD	WATERFORD CT	11/5/1996	447-3874	N
0504800	TRUSLER PAUL C	0109 OIL MILL ROAD	109 OIL MILL RD	WATERFORD CT	5/17/2002	437-1539	N
0503900	KOKOSZKA MICHAEL S & FRANCES	0092 OIL MILL ROAD	92 OIL MILL RD	WATERFORD CT	8/29/1979	447-1308	N
0504500	BUTTERMORE ROBERT E JR & PATRICIA J	0103 OIL MILL ROAD	103 OIL MILL RD	WATERFORD CT	2/15/1985	442-3744	N
0504300	POLIZZI MARIA G	0101 OIL MILL ROAD	33 JORDAN COVE CIR	WATERFORD CT	8/15/2005	860-447-0707	N
0504000	DEWOLF JOHN A & BERTHA	0097 OIL MILL ROAD	97 OIL MILL RD	WATERFORD CT	5/21/2007	443-1202	N
0503700	DEWOLF LOIS M	0088 OIL MILL ROAD	88 OIL MILL RD	WATERFORD CT	7/6/1976	443-1057	N
0503800	KARR INA VIRGINIA EST	0091 OIL MILL ROAD	91 OIL MILL RD	WATERFORD CT	9/29/1954	437-7151	N
0503500	DEWOLF GARY D	0082 OIL MILL ROAD	82 OIL MILL RD	WATERFORD CT	10/4/1977	860-437-0286	N
0503400	SAUNDERS MICHAEL C & KATHLEEN	0074 OIL MILL ROAD	74 OIL MILL RD	WATERFORD CT	4/27/2007	440-0624	A
0503300	LANE JOHN W & M SUZANNE	0071 OIL MILL ROAD	71 OIL MILL RD	WATERFORD CT	4/18/1977	442-9871	A
0503200	WEST FARMS LAND TRUST INC	0054 OIL MILL ROAD	BOX 113	QUAKER HILL CT	5/13/1974	860-912-2352	A
0503610	MEARA AMY E	0089 OIL MILL ROAD	87 OIL MILL RD	WATERFORD CT	4/28/2003	860-447-9675	N
0503600	MEARA AMY E	0087 OIL MILL ROAD	87 OIL MILL RD	WATERFORD CT	4/28/2003	860-447-9675	N

A =Abutter
N =Neighbor in vicinity

50 Leavenworth Street
Post Office Box 1110
Waterbury, Connecticut
06721-1110

Telephone: 203 573-1200
Facsimile: 203 575-2600
Direct: 203 575-2630
rgolden@carmodylaw.com

CARMODY & TORRANCE LLP

Robert S. Golden Jr.
Of-Counsel

May 28, 2008

CERTIFIED MAIL,
RETURN RECEIPT REQUESTED

XXXXXXX XXXXXX
XXX XXXXXXXX XX
Waterford, CT 06385

Re: Notice to Owners of Property Abutting Proposed Waterford Substation

Dear Sir/Madam:

Pursuant to Connecticut General Statutes Section 16-50*l*(b), The Connecticut Light and Power Company (CL&P) is providing notice of its intent to apply to the Connecticut Siting Council on or about June 5, 2008 for a Certificate of Environmental Compatibility and Public Need for a proposed Substation, including the construction of associated equipment, in Waterford, on property owned by CL&P, located at 325 Waterford Parkway North, Waterford, Connecticut, which abuts or is near your property. Details regarding the project are set forth in the enclosed Public Notice.

For further information about this project, please contact:

Mr. Girish Behal, Project Manager
Transmission Projects
Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 665-3634
E-mail address: behalg@nu.com

Very truly yours,

Robert S. Golden, Jr.

RSG/mkw
Enclosure

Exhibit 11

Stephen G. Whitley
Senior Vice President & Chief Operating Officer

January 11, 2008

Mr. Allen Scarfone
Mr. Oswaldo Ortega
Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270

Subject: NU-07-T22

Messrs. Scarfone and Ortega:

ISO New England has determined pursuant to Section I.3.9 of the ISO New England Inc. Transmission, Markets and Services Tariff ("ISO Tariff") that implementation of the Participant's Proposed Plan identified in the following application will not have a significant adverse effect on the stability, reliability or operating characteristics of the Northeast Utilities System Companies' ("NU") transmission facilities, the transmission facilities of another Transmission Owner, or the system of a Market Participant, subject to satisfaction of conditions identified below with respect thereto:

The Northeast Utilities System Companies' ("NU") Transmission Facilities Proposed Plan Application NU-07-T22, for the construction of a new Waterford 25Y Substation, to be located in Waterford, Connecticut, including the addition of a 115 kV circuit breaker to sectionalize the existing #1605 115 kV Line that is to be looped into the new substation, with the Waterford-Flanders line segment of the line to be designated as the #1617 Line, and including the installation of two new 60 MVA 115/23 kV two-winding transformers, with a proposed in-service date of May 30, 2010 as detailed in Mr. Oswaldo Ortega's November 16, 2007 transmittal to Mr. Donald Gates, Chairman, NEPOOL Reliability Committee, subject to the upgrade of terminal equipment at the Flanders end of the #1617 Waterford – Flanders Line to a rating that is not more limiting than the #1617 Line's conductor.

Additionally, it is recognized that NU has requested that the substation be identified as the Waterford 36F Substation to avoid confusion with distribution circuits that are similar in designation to the originally requested identifier, as detailed in Mr. Oswaldo Ortega's January 2, 2008 e-mail transmittal to Ms. Wilma Lawrence. It was agreed that a change in substation identifier does not require a Proposed Plan Application or revision under the I.3.9 process.

Sincerely,

Stephen G. Whitley
Senior Vice President and Chief Operating Officer

cc: Proposed Plan Applications

ISO New England Inc.
One Sullivan Road, Holyoke, MA 01040-2841
www.iso-ne.com T 413 535 4361 F 413 535 4150

List of Residents and Abutting Land Owners

Provided Copies of Public Outreach Documents

Name	**Address**
Mr. Jack Lane*	71 Oil Mill Road, Waterford, CT
Ms. Bonnie O'Brien*	74 Oil Mill Road, Waterford, CT
DeWolf Residence*	82 Oil Mill Road, Waterford, CT
Ms. Amy Campbell*	87 Oil Mill Road, Waterford, CT
Ms. Lois DeWolf*	88 Oil Mill Road, Waterford, CT
Mr. Bruce Karr*	91 Oil Mill Road, Waterford, CT
Kokoszka Residence	92 Oil Mill Road, Waterford, CT
Mr. John DeWolf*	97 Oil Mill Road, Waterford, CT
Shalhout Residence	98 Oil Mill Road, Waterford, CT
Polizzi Residence	101 Oil Mill Road, Waterford, CT
Mr. Richard Brouwer*	102 Oil Mill Road, Waterford, CT
Buttermore Residence	103 Oil Mill Road, Waterford, CT
Mr. George Mees*	104 Oil Mill Road, Waterford, CT
Mackay Residence	106 Oil Mill Road, Waterford, CT
Mr. Paul Trusler*	109 Oil Mill Road, Waterford, CT
Mr. Rob Schacht*	West Farms Land Trust, 54 Oil Mill Road, Waterford, CT

* Spoken to directly, either by telephone or in person, by CL&P representative

Connecticut Light & Power
The Northeast Utilities System

The Connecticut Light and Power Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 947-2000
www.cl-p.com

March 25, 2007

Dear Resident:

With demand for electricity growing in the area, The Connecticut Light and Power Company (CL&P) is looking for ways to better serve our customers in Waterford.

CL&P is in the preliminary steps of planning to build a new substation for Waterford – a first for the town. Waterford customers are currently served by similar facilities located in East Lyme, New London and Montville, but with the continued growth in the area additional capacity is needed.

A parcel of land, currently owned by CL&P, at the intersection of Oil Mill Road and Waterford Parkway North has been selected as the best possible location for this facility (please see the site map attached to this letter).

As a part of the regulatory review process, CL&P will soon file a Municipal Consultation filing with the Town of Waterford. This filing will include detailed information about the Substation Project and will be followed (after at least 60-days) by the filing of an application with the Connecticut Siting Council.

Our current schedule contemplates:

- Municipal consultation filing early spring 2008
- Connecticut Siting Council application review starting mid 2008
- Construction starting early in 2009
- The facility going in service in mid 2010.

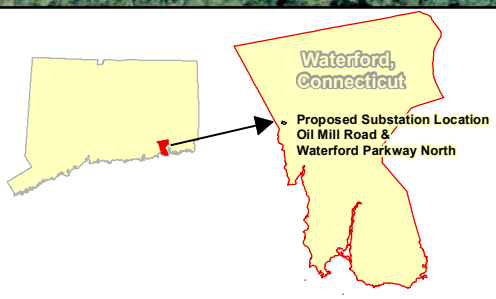
Please contact Frank Poirot at 860-665-3409 if you have any questions.

Sincerely,

Girish Behal,
Project Manager
The Connecticut Light and Power Company

Site Location

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



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Connecticut
Light & Power
The Northeast Utilities System

Connecticut Light & Power

The Northeast Utilities System

The Connecticut Light and Power Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 947-2000
www.cl-p.com

April 02, 2007

KS&M Realty LLC:

Dear Sir/Madam:

With demand for electricity growing in the area, The Connecticut Light and Power Company (CL&P) is looking for ways to better serve our customers in Waterford.

CL&P is in the preliminary steps of planning to build a new substation for Waterford – a first for the town. Waterford customers are currently served by similar facilities located in East Lyme, New London and Montville, but with the continued growth in the area additional capacity is needed.

A parcel of land, currently owned by CL&P, at the intersection of Oil Mill Road and Waterford Parkway North has been selected as the best possible location for this facility (please see the site map attached to this letter).

As a part of the regulatory review process, CL&P will soon file a Municipal Consultation filing with the Town of Waterford. This filing will include detailed information about the Substation Project and will be followed (after at least 60-days) by the filing of an application with the Connecticut Siting Council.

Our current schedule contemplates:

- Municipal consultation filing early spring 2008
- Connecticut Siting Council application review starting mid 2008
- Construction starting early in 2009
- The facility going in service in mid 2010.

Please contact Frank Poirot at 860-665-3409 if you have any questions.

Sincerely,

Girish Behal,
Project Manager
The Connecticut Light and Power Company

Connecticut
Light & Power
The Northeast Utilities System

The Connecticut Light and Power Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 947-2000
www.cl-p.com

April 02, 2008

Dear Ms. Campbell:

Re: New Waterford substation at 325 Waterford Parkway North, Waterford, CT.

This letter is to follow up on our telephone discussion on March 26, 2008 with regard to the new Waterford substation planned by Connecticut Light and Power Company (CL&P).

We appreciate your interest in the Waterford substation with you. Based on our discussion, I have collected additional information to address.

Proposed Facility:
The substation will be located on the parcel of land, identified as 325 Waterford Parkway North, at the intersection of Oil Mill Road and Waterford Parkway North. The fence line of the substation will be approximately 200 feet by 244 feet. The substation will be located in the western end of the property adjacent to Oil Mill Road, with access to the property from the Waterford Parkway North.

Maintenance of the Facility:
The substation surface will be a gravel surface that requires minimal vegetative maintenance. CL&P will perform regular maintenance on the substation equipment that will not impact the nearby property owners.

Noise from the Facility:
At present, sources for ambient noise in the area include traffic sounds from Interstate 95 and the surrounding local roads.

The substation is not expected to contribute to ambient noise in the area. CL&P is in the process of performing the noise studies and expects the substation to comply with the Connecticut Department of Environmental Protection's (DEP) noise control regulations (RCSA Title 22a, §22a-69-1 to 22a-69-7.4).

However, infrequent impulse sounds will be created by switching and circuit breaker equipment opening and closing. The impulse sound levels are not expected to exceed the levels permitted at the property line by DEP's noise control regulations

Electric and Magnetic Fields (EMF):
Both electric and magnetic fields decrease rapidly as the distance from the source increases.

For more information on EMF please visit the webpage at
http://www.transmission-nu.com/residential/YourSafety.asp

Additional forums:
As you are aware from a previous communication dated March 25, 2008, CL&P plans to submit a Municipal Consultation Filing (MCF) with the Town of Waterford very shortly. A copy of the filing will be made available to the public through the public library of the Town of Waterford.

The MCF filing is followed by a full siting application to the Connecticut Siting Council. During the Council's review process, it usually hosts a public hearing in the town where the facility is proposed. A sign announcing the hearing's time, date and location will be posted on the property 10 days before the hearing.

Based on your request, CL&P will notify you when the MCF and the application is filed with the Council.

Please contact Frank Poirot at 860-665-3409, or myself at 860-665-3634, if you have any questions.

Sincerely,

Girish Behal,
Project Manager
The Connecticut Light and Power Company

Connecticut
Light & Power
The Northeast Utilities System

The Connecticut Light and Power Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 947-2000
www.cl-p.com

April 02, 2008

Dear Mr. Lane:

Re: New Waterford substation at 325 Waterford Parkway North, Waterford.

This letter is to follow up on our telephone discussion on March 26, 2008 with regard to the new Waterford substation planned by Connecticut Light and Power Company (CL&P).

We appreciate the opportunity to discuss the Waterford substation with you.

The substation fence line will be approximately 200 feet by 244 feet and located in the western end of the property adjacent to Oil Mill Road. The access to the property will be from the Waterford Parkway North.

Two transmission line support structures are expected to be installed to connect the new substation to existing transmission lines. One of the structures will be located on the existing transmission right of way located on your property at 71 Oil Mill Road. The second structure will be installed on adjacent CL&P's property. The structures will be similar in height to the existing structures that are 85 feet in height. At your request, CL&P will stake out the structure location so that you can remove your trees in advance of the work.

CL&P's construction activities will occur only on its property and within the right of way. Therefore, no additional rights will be needed from yourself or any third parties.

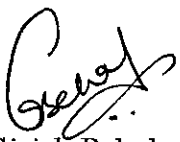
The tallest structure in the substation will be the terminal structure used to connect the incoming overhead lines to the substation equipment. This structure is about 60 feet in height
There are no plans to install an emergency generator in the station.

Finally, CL&P's consultants are investigating how this land was used in the 1800's. We will respond further after their investigation is complete.

CL&P will work with you to provide a reasonable amount of screening to your property.

Please contact me at 860-665-3634 or Frank Poirot at 860-665-3409, or me at 860-665-3634, if you have any questions.

Sincerely,



Girish Behal,
Project Manager
The Connecticut Light and Power Company

Connecticut
Light & Power
The Northeast Utilities System

The Connecticut Light and Power Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 947-2000
www.cl-p.com

April 02, 2008

Dear Mr. Schacht:

Re: New Waterford Substation at 325 Waterford Parkway North, Waterford

This letter is to follow up on our telephone discussion on March 26, 2008 with regard to the new Waterford substation planned by Connecticut Light and Power Company (CL&P).

CL&P is in the preliminary steps of planning to build a new substation in Waterford – a first for the town. Waterford customers are currently served by similar facilities located in East Lyme, New London and Montville; however growing customer demand for electricity in Mystic has created the need to increase capacity of the delivery system.

A parcel of land, currently owned by CL&P, at the intersection of Oil Mill Road and Waterford Parkway North has been selected as the best possible site for this facility (please see the site map attached to this letter). This parcel of the land is immediately across from the property identified as "Kashanski Tract" on the West Farms Land Trust website.

As a part of the regulatory review process, CL&P will soon submit a Municipal Consultation Filing (MCF) with the Town of Waterford. This filing will include detailed information about the substation project and will be followed (after at least 60-days) by the filing of an application with the Connecticut Siting Council.

Our current schedule includes:

- Filing the MCF in the spring 2008
- Starting the Connecticut Siting Council application review by mid 2008
- Begin construction early in 2009
- Placing the facility in service during mid 2010.

Two 60 MVA transformers (115-kV/23-kV) are proposed to be installed at the substation. The transformers will contain insulating fluid which does not contain any polychlorinated biphenyl (PCB). There will be a secondary containment system around the equipment and accidental spill prevention provisions in place. Greater detail about the substation will be included in the MCF and related council filings.

No impact is anticipated on the water quality to both ground water and surface water sources in the area.

Please contact Frank Poirot at 860-665-3409, or me at 860-665-3634, if you have any questions.

Sincerely,

Girish Behal,
Project Manager
The Connecticut Light and Power Company

Attachment:
Site Location Map

Connecticut Light & Power

The Northeast Utilities System

The Connecticut Light and Power Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 947-2000
www.cl-p.com

April 07, 2008

Dear Ms. Campbell:

Re: New Waterford substation at 325 Waterford Parkway North, Waterford, CT.

This letter is to follow up to Connecticut Light and Power Company's (CL&P) letter dated April 2, 2008 with regard to the new Waterford substation by CL&P.

As you are aware from a previous communication CL&P plans to submit a Municipal Consultation Filing (MCF) with the Town of Waterford.

This letter is to inform you that CL&P has submitted the MCF to the Town of Waterford. A copy of the filing has been submitted to the public library of the Town of Waterford to be made available to the public.

Please contact Frank Poirot at 860-665-3409, or myself at 860-665-3634, if you have any questions.

Sincerely,

Girish Behal,
Project Manager
The Connecticut Light and Power Company

Connecticut
Light & Power
The Northeast Utilities System

The Connecticut Light and Power Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 947-2000
www.cl-p.com

April 25, 2008

Ms. Amy Campbell
87 Oil Mill Road
Waterford, CT 06385

Re: Waterford Substation

Dear Ms. Campbell:

This letter is in response to your letter to me dated April 17, 2008 and further supplements my letter to you dated April 2, 2008 (copy enclosed). Please note the following:

Waterford Substation

The Waterford Substation is designed to facilitate the transformation of electric power from the existing 115-kV overhead transmission line abutting the Substation property, which is located at 325 Waterford Parkway North (the "Property"). The Substation is not considered a transfer station.

Property Studies

CL&P has been conducting various inspections, tests and studies on the Property to gain information as its planning process for the Substation continues. As indicated in my voicemail message to you of April 21, 2008, during the week of April 4, 2008, CL&P was conducting boring tests on the soils. Work on the Substation will not commence until CL&P obtains approval from the Connecticut Siting Council. The application for the Siting Council's review will be filed on or about June 5, 2008.

Municipal Consultation Filing

Prior to filing the application with the Siting Council, CL&P is required by law to file information with Town officials; that filing occurred on April 4, 2008. An extra copy was placed at the Waterford Library for the convenience of the public. For your convenience, I am enclosing a copy of such filing.

Location of the Substation

As set forth in the Municipal Consultation Filing (Section I), there are a number of important criteria for locating a substation. The site for the Waterford Substation was carefully selected to accomplish the project objectives in a manner that minimizes impact on the environment and the neighborhood.

Furthermore, note that CL&P has approximately 234 substations; more than half of these substations are located in residential areas. CL&P is shortly expected to receive approval from the Siting Council to construct the Rood Avenue Substation in Windsor. There are many nearby residences, with the nearest residence within 365 feet of the Rood Avenue Substation.

Devaluation of Property

CL&P is not aware of any studies supporting property devaluation due to the location of a substation in a residential neighborhood. In fact, over the years, many residential subdivisions have been built in close proximity to substations, after the substations were in operation.

Your property at 87 Oil Mill Road is located approximately 1056 feet or 0.2 miles from where the Waterford Substation will be built. At that distance, the Waterford Substation will not adversely affect your property.

Electric and Magnetic Fields

In your letter, you mentioned "extra electrical currents." I encourage you to read Section M of the Municipal Consultation Filing that explains electric and magnetic fields. Greater information will be included in the Siting Council application, including projected levels.

Significantly, the Siting Council has thoroughly studied the issues concerning electric and magnetic fields. In its Best Management Practices for transmission lines, the Council states:

> The Council recognizes that a causal link between power-line MF exposure and demonstrated health effects has not been established, even after much scientific investigation in the U.S. and abroad.

(See page 4 of 11).

Conclusion

For many of the reasons outlined above, CL&P declines to pay you compensation of $15,000, as requested in your letter dated April 17, 2008. We understand that you may have questions or concerns, and we are confident that we can provide you with information to address them. Rest assured that CL&P will construct the Waterford Substation, upon receipt of required approvals, in accordance with all applicable regulations and good utility practices.

Our studies indicate that a new substation is needed in Waterford to assure reliable electric service and to provide distribution delivery-system capacity. With the Waterford Substation, we look forward to providing a more reliable electric system to you and to all our customers in Waterford.

Please contact Frank Poirot at 860-665-3409, or myself at 860-665-3634, if you have any questions.

Sincerely,

Girish Behal, 04/28/08
Project Manager
The Connecticut Light and Power Company

Connecticut
Light & Power
The Northeast Utilities System

The Connecticut Light and Power Company
P.O. Box 270
Hartford, CT 06141-0270
(860) 947-2000
www.cl-p.com

May 22, 2008

Dear Mr. Lane:

Re: New Waterford substation at 325 Waterford Parkway North

This letter is to follow up on our telephone discussion on March 26, 2008 and my subsequent letter to you on April 2, 2008 with regard to the new Waterford substation planned by The Connecticut Light and Power Company (CL&P).

This letter is to inform you that CL&P has performed a field survey and staked out the proposed location of the transmission tower on the existing transmission right-of-way located on your property at 71 Oil Mill Road. This will help you identify the approximate area from which you would need to remove your trees in advance of the work.

Please contact Frank Poirot at 860-665-3409, or me at 860-665-3634, if you have any questions.

Sincerely,

Girish Behal,
Project Manager
The Connecticut Light and Power Company

June 3, 2008

To:
Connecticut Light & Power
Connecticut Siting Council

From:
Amy Campbell
87 & 89 Oil Mill Road
Waterford, CT 06385

Re:
Application for approval of environmental compatibility for proposed Waterford Parkway North Substation by Connecticut Light and Power (The Northeast Utilities System)

I understand that the Connecticut Siting Council makes the final approval for the above mentioned substation project with granting a certificate of environmental compatibility. I am asking that the Council give my concerns considerable review.

I have lived at 87 Oil Mill Road for more than 17 years and am opposed to the Substation Site at 325 Parkway North, Waterford, CT for the following reasons:

- Electro Magnetic Frequency increase.

What changes will occur with EMF levels?
CL&P currently evaluating what changes specifically would occur to EMF levels at the property lines as a result of the project. This information will be provided in the CSC application per CL&P. I am interested in these studies and findings for I have a 2 ½ year old who plays in the yard daily which is approximately 900' to 1000' North from proposed Site.
CL&P states that there are no recreational areas within 1 mile of site. Are there concerns for play around the proposed substation or is this statement for knowledge purposes only?
Water – the CL&P report states that there is no public water supply wells within 2 miles of site. Private water supply wells area with potential to provide water to public or private water supply wells. Does this mean that there is a concern for water contamination from electrical transmission or is it simply stated for knowledge purposes?
Electric and Magnetic Fields
EF weakened by obstructions – trees, building walls;
MF pass through most obstructions.
Highest levels of EMF would be found on the northerly property boundary and northwesterly property. My home is North of proposed substation by approximately 900' to 1000'.
New underground distribution circuit getaway cables would cross under property lines
Underground conduits for cables for each distribution feeder seven (7) with four (4) at first in operation. Will these cables carry electrical currents into ground?

- Insulation fluid around transformers.

Sumps are oil spill reservoirs around transformers for insulation fluid for possible contamination from uneventful spill of land and water. In the event of a spill, CL&P is assuring that there will be no land or water contamination? Do the sumps prevent seepage and what are they constructed of?

- Future expansion

The site was undeveloped land 12/20/07 purchased by CL&P for current and future demands and possible expansion of site?
Location review letter from CL&P to Planning and Zoning states site was chosen mainly for accessibility, adjacent I-95, capacity to accommodate the use and future expansion
Future 60-MVA power transformer if needed.
Facility service life – 40 years – capable of capacity increases
What happens after service life is reached? The initial substation would increase EMF and with future expansion, these levels will increase also!

Mystic Article – Once CL&P builds a substation, it seems that they have the go ahead for any type of expansion necessary with the right to claim the law on land-use agency input does not apply to an existing substation!
Noise was also a concern for the Mystic/Stonington residences in the attached article. CL&P states that this substation in Waterford would have infrequent impulse noise generated from switching and circuit breaker opening and closing. Not expected to exceed levels permitted by CTDEP noise regulations.

- Connecticut State Historic Preservation Office "SHPO"

SHPO findings – the project boundaries possess moderate to high archaeological sensitivity. Further studies done? No record indicating site subjected to cultural resources survey in the past.
Field work found 2 non-site cultural resources – ceramic shard and a quartz flake.

- Property devaluation

- Environmental disruption and construction noise and disruption.

The residences are zoned with three (3) acre parcels (RU120) Zoned rural residential district RU120 on Oil Mill Road. My neighbors and myself like the country setting and hope to keep it that way.
The surrounding residences are so few compared to the "general public" and also are very tiny compared to the CL&P giants. This project seems overwhelming for surrounding residences. The site will not pose a safety concern or create undue hazard to the general public per CL&P.
Signage will be installed alerting general public of the dangers of high voltage associated with substation.

Transmission circuits and load pocket would be located in non-industrial area.

Why not reconsider the proposed sites and construct the substation in a developed (commercial/industrial) area such as 994 Route 85 Htfd Tnpke or 969 Perolum Station Route 85 Htfd Tpke? I realize that the reasons the above sites were not chosen were due to connection and line work increase, but what is a little more expense to keep a balanced community? I suggest that a more suitable site is where the need starts from which is Cross Roads and Route 85 (commercial/industrial) draw of electricity, not the residences on Oil Mill Road!

Because we are less populated (3 acre zoning) than other proposed sites, we were chosen and also with non development, creating a buffer zone, we were chosen to live amongst additional electrical emissions. CL&P are not bound by Town zoning regulations, only by what the Connecticut Siting Council approves.
Please reconsider the proposed site. Is it really the best suitable with undeveloped neighborhood residences? Would anyone want an electrical substation in their backyard?

Why not keep a more balanced location and place the site proximity to customer load mainly in already developed areas such as Route 85? This way transmission circuits and load pocket would be located in industrial areas already developed.

Your time and consideration regarding the above concerns are greatly appreciated.
Thank you in advance.

Sincerely,

Amy Campbell
Oil Mill Road Resident

Electric and Magnetic Fields

Referred to as EMF, the fields of energy surrounding electric power wires and other current-carrying devices.

Electric power lines, household wiring, and appliances all carry electric current. Since the late 1970s, concerns have been raised about the link between electric and magnetic fields, the invisible lines of force that surround all electrical devices, and **cancer.** Alternating current (AC), the form of electric power used in the United States, produces fields that induce weak electric currents in objects that conduct electricity, including humans. Direct current, the form of current produced by batteries, is unlikely to induce electric current in humans. The currents induced by AC fields have been the focus of most research on how EMFs may affect human health.

Some studies in **epidemiology** (studies with humans to understand the cause and progression of disease) have suggested a possible link may exist between exposure to power-frequency electric and magnetic fields (EMFs) and certain types of cancer, primarily leukemia and brain cancer.

From 1979 to 1993, 14 studies analyzed the possible association between proximity to power lines and types of childhood cancer. Of these, eight have reported correlation between proximity to power lines and some form of cancer. Four of the 14 studies showed a statistically significant association with leukemia.

57% Cancer
3% Leukemia

As of 1995, there is no scientific consensus about EMF and its relation to cancer. However, in 1992, the Energy Policy Act in the United States provided $65 million to fund the five-year program of EMF Research and Public Information Dissemination Program (EMF RAPID). The EMF RAPID program reported its findings to the U.S. Congress in 1997.

For the typical homeowner, identifying and measuring sources of

Housing project for Fort Trumbull could miss deadline

From B1

ly interested in building the rental housing. "That's why she's here," Joplin said of Corcoran Jennison President Marty Jones. "Otherwise, she would have stayed in Boston and gone to dinner."

Jones told the NLDC members, "We're not ready to fold our tent and cut our losses and walk away."

Between the office complex and preconstruction work on the housing project, the company has roughly $5 million of its own money invested in Fort Trumbull, according to Joplin and Jones.

"We have been in New London for close to eight years now," Jones said in an interview after the meeting. "Our intention here was always in a comprehensive development," not only a commercial building, she said.

"We are not walking away," Jones said. "We want to complete all parts of the deal."

But barring a sudden economic upswing, any deal on the housing project will rely on what both Joplin and Jones referred to as "creative" options — possibly government-backed loans — to close the widening "financing gap."

Based on a recent assessment, Joplin said the company is looking $3 million to $3.5 million gap.

"We are trying to fill that gap through creative thinking and creative financing. I'm not sure that we'll succeed. I'm just putting it out there," Joplin said to NLDC members.

He said securing the additional money will be a "tremendous task" that will take months of application paperwork for lenders and any state programs that could help close the gap.

When asked if the company would be willing to boost its share above 20 percent, Jones said, "We have to negotiate what make sense for everybody." She said the project's financing will have to incorporate "other sources that are not on the table right now."

Jones said she understand that "people are very frustrated that it's taken a long time to get something done. I hope that New London is willing to continue to work with us to make the deal work."

New London Mayor Kevin Cavanagh said he was assured by his conversation with Jones Tuesday night that Corcoran Jennison wants to bring the housing to Fort Trumbull.

When asked if it may be time for the city to part with the company, Cavanagh said: "I'm sort of like,

CL&P To Buy Land To Expand In Mystic

By **JOE WOJTAS**
Day Staff Writer

Mystic — The Connecticut Light & Power Co. is planning to buy a 5.8-acre parcel from the Coogan family so it can expand its electrical substation off Route 27.

CL&P officials are slated to appear before the Stonington Inland Wetlands Commission Thursday and the Planning and Zoning Commission on May 6 to outline their plans.

The current substation sits on a 4.6-acre piece of land that borders homes on Pleasant Street and has been in operation for more than 40 years. Half the property is fenced and contains the electrical equipment.

According to a letter to the town from CL&P, the project is designed to improve system reliability in Mystic and expand capacity in the Stonington area. Plans call for adding two new transformers, replacing another and modernizing existing equipment to take advantage of new computer technology.

The land CL&P plans to buy from the Coogans would house the two new transformers and is separated from homes on Pleasant Street by the current site. The company said the replacement transformer would be quieter than the one there now, addressing noise concerns from residents.

CL&P, which will use one acre of the new land for the improvements, hopes to begin clearing the property in September and begin construction a month later. It expects to complete the 15-month-long project in 2009.

CL&P pointed out in its letter to Stonington officials that the Connecticut Siting Council has sole jurisdiction over the project and it is asking the agency to find that the work would not pose a substantial adverse impact to the environment. State law, however, does allow town land-use agencies to offer input on such projects. CL&P has asked the two town commissions to place its project on a separate part of their agendas so residents would not confuse its presentation with a typical application. CL&P also said it was reserving its right to claim the law on land-use agency input does not apply to an existing substation.

j.wojtas@theday.com

NL housing authority employee, wife charged with stealing public funds

A maintenance worker for New London Housing Authority and his wife, an executive director of the East Haven Housing Authority, were arrested Tuesday for allegedly stealing funds from the East Haven authority and using the money for their personal use.

Jonathan Ashe, 43, and Cassandra Ashe, 36, of North Haven were each charged with embezzling more than $5,000 from a program receiving federal funds and conspiracy to steal federal funds.

According to the affidavit, the Ashes engaged in an ongoing scheme to steal money from a bank account used by the East Haven Housing Authority to administer the U.S. Housing and Urban Development's Section 8 Housing Choice Voucher program, which gives low-income individuals assistance in renting housing on the private market. The East Haven Housing Authority received federal assistance in excess of $10,000 from the Section 8 program, the affidavit said. The funds then are either made in check or wire transfer to the landlord, not in cash.

The affidavit alleges that from about May 1, 2007, to March 2008, Cassandra Ashe and Jonathan Ashe stole about $173,000 from an East Haven Housing Authority bank account with an ATM card that Cassandra Ashe got in her name but was linked to an East Haven's Section 8 bank account, the affidavit said. In all, there were 253 separate ATM withdrawals.

The affidavit claims that Cassandra Ashe deposited the money into a joint account shared with her husband or made out deposit slips in her husband's name.

The couple spent the money on trips and at various outings to the Connecticut Post Mall in Milford.

The Ashes appeared Tuesday in U.S. District Court in Hartford, where they were released on bonds in the amount of $200,000.

If convicted, the Ashes each face a maximum term of imprisonment of 10 years and a fine of up to $250,000 on the charge of embezzling from a program receiving federal funds and five years each and up to a $250,000 fine on the conspiracy charge.

Joseph A. Abrams, executive director of New London Housing Authority, said he had no comment on the matter because he did not know anything about the case.

Connecticut
Light & Power
The Northeast Utilities System

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June 4th, 2008

Ms. Amy Campbell
87 Oil Mill Road
Waterford, CT 06385

Re: Waterford Substation

Dear Ms. Campbell:

This letter is in response to your participation at the Board of Selectmen presentation on June 3, 2008 and report provided by you to me and my colleagues at the public meeting.

We are in the process of reviewing the report and expect to get back to you shortly addressing the questions raised by you.

Please contact Frank Poirot at 860-665-3409, or myself at 860-665-3634, if you have any questions.

Sincerely,

Girish Behal,
Project Manager
The Connecticut Light and Power Company

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